



TeSys

> Control > Protect > Power > Active

Catalogue 2021

Innovative and connected solutions for motor starters



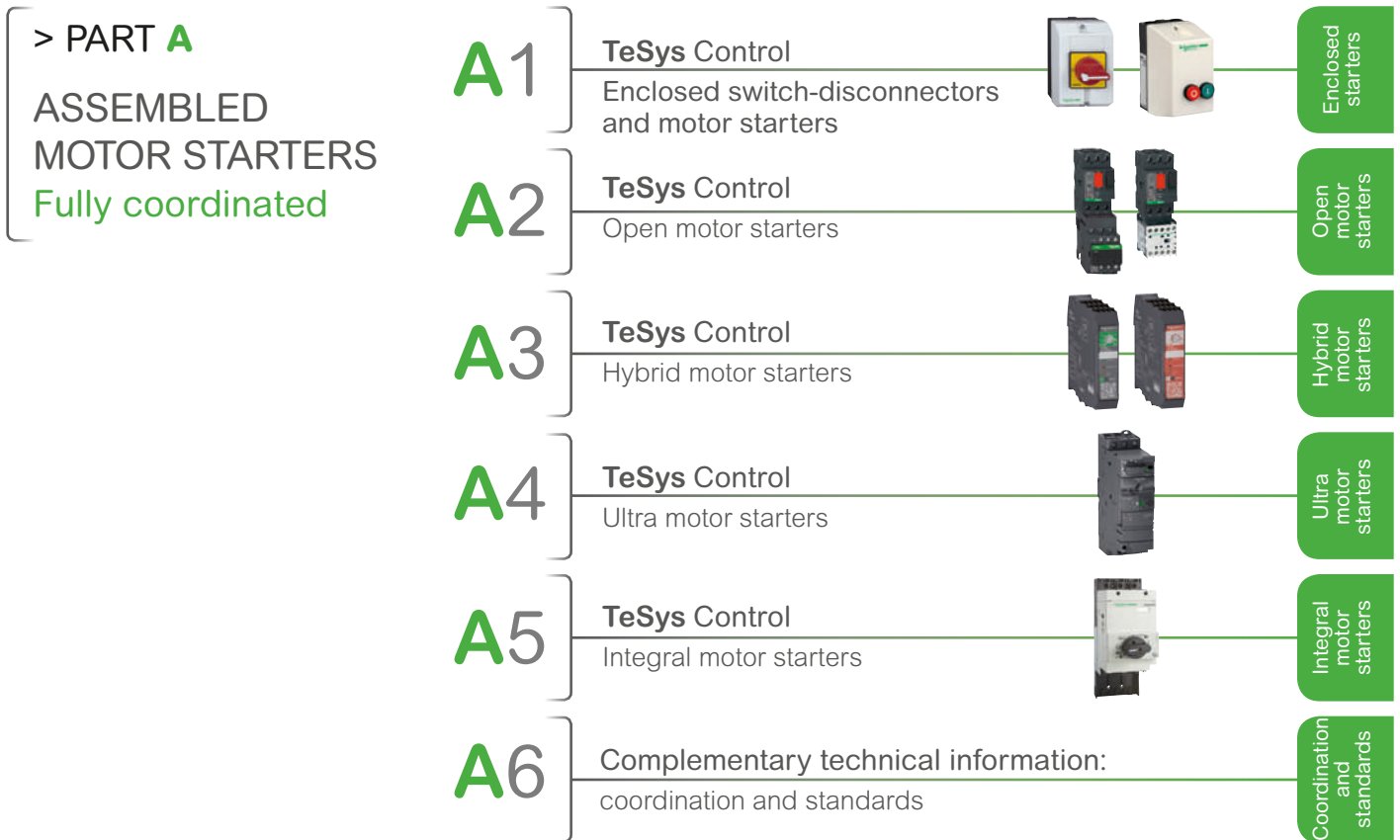
se.com/tesys

Life Is On

Schneider
Electric

TeSys is an innovative motor control and management solution from the global market leader.
TeSys offers connected, efficient products and solutions for switching and protection of motors and electrical loads in compliance with all major global electrical standards.

> ARCHITECTURE of your TeSys catalogue



TeSys components are classified by function:

> TeSys Control

Components for controlling motors

> TeSys Protect

Components for protecting motors

> TeSys Power

Components for powering motors

> TeSys Active

Connected components for motor circuits

> PART B

COMPONENTS

for conventional solutions:

TeSys K series

(ex-TeSys K, LRK)

- 0 to 16 A (AC-3)

TeSys Deca series

(ex-TeSys GV2, GV3, GV4,

TeSys D, LRD, LR9D)

- 9 to 150 A (AC-3)

TeSys Giga series

(ex-TeSys GV5, GV6,

TeSys LRG)

- 185 to 800 A (AC-3)

> PART C

COMPONENTS

for advanced solutions:

TeSys Ultra series

(ex-TeSys U)

- 0 to 38 A (AC-3)

TeSys T series

(ex-TeSys T)

- 0 to 800 A (AC-3)

TeSys island series

(ex-TeSys island)

- 0 to 80 A (AC-3)

B1

Linergy BZ, HK Busbar systems



Power busbar systems

B2

GV, LAD, U

Motor starter wiring systems



Wiring systems

B3

TeSys Control

Switch-disconnectors



Switch-disconnectors

B4

TeSys Power

Fuse carriers



Fuse carriers

B5

TeSys Power

Switch-disconnector fuses



Switch-disconnector fuses

B6

TeSys Power

Deca, Giga and Modular Motor circuit breakers



Motor circuit breakers

B7

TeSys Control

SK, K, Deca Control relays



Control relays

B8

TeSys Control

SK, K, SKGC, Deca, Modular and other Contactors



Contactors

B9

TeSys Control

F High power contactors



High power contactors

B10

TeSys Control

B Bar mounted contactors



Bar mounted contactors

B11

TeSys Protect

LRK, Deca, F Overload relays



Overload relays

C1

TeSys Control

Ultra motor management controller

TeSys Active

T motor management system



Motor management devices

C2

TeSys Active

Island motor starters



Control and monitoring island



Start smart. Run smart. With TeSys motor controls.

Stay smart with the world's best-selling motor control solutions from the inventor of the world's first contactor - Schneider Electric™.

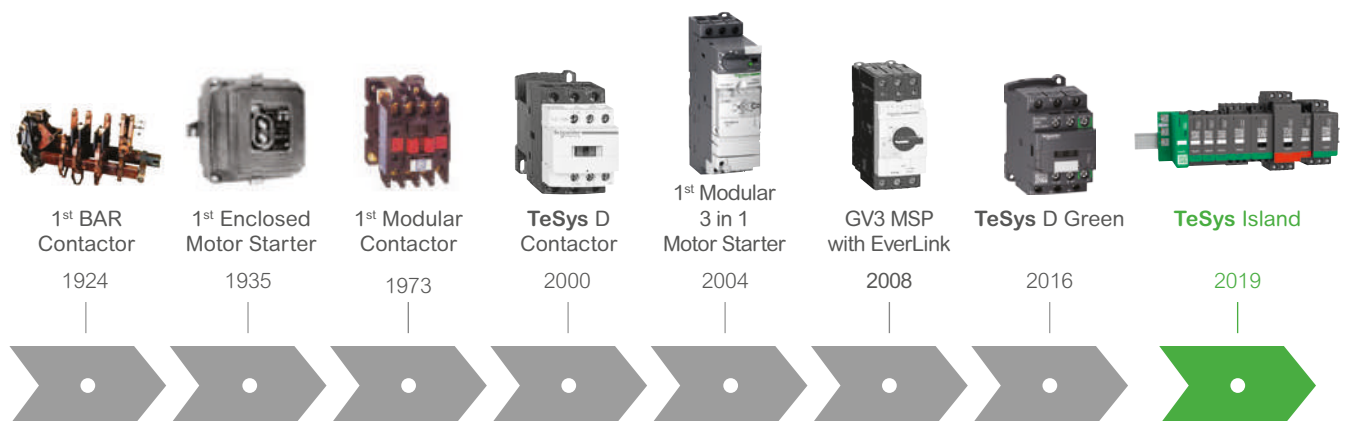
For almost a century, **TeSys** motor controls have driven the industry with innovations in motor protection, monitoring, and control.

It started with the introduction of the industry's first BAR contactor in 1924, and today, the legacy of innovation is built into every **TeSys** motor control device.

Best-in-class safety and reliability, plug-and-play architecture, and flexible functionality mean **TeSys** motor control solutions can meet your requirements across a wide range of applications, from the most common to the most advanced.

Wherever you are and anywhere your projects come together, you can trust Schneider Electric and **TeSys** contactors, circuit breakers, relays, and switches for unmatched reliability, complete compatibility with international standards, and the robust support of the Schneider Electric global supply network.

Start smart, run smart and stay smart with **TeSys** motor controls.



Superior safety for all industries

TeSys motor controls come with all of the isolation, protection and emergency handling you need to comply with international codes. High-contrast covers identify safety-critical devices to prevent inadvertent manual operation. Every TeSys contactor is both mechanically linked and equipped with mirror contacts for safety applications and wherever auxiliary contact state reliability is critical.



HVAC

Ensure 24/7 availability of your HVAC system with reliable products that can reach high ambient temperatures without derating.



Conveying

Decentralize the control cabinet of your conveyor line and benefit from up to 80% space reduction.



Genset

Make certain your generator starts even in the harshest conditions with robust TeSys solutions.



Pumping

Optimize single or multi-drive boosters for industry or infrastructure with energy and cost-effective solutions.



Packaging

Keep pace with the most demanding, high-end packing applications with solutions that can perform 30 million AC53a electrical cycles, like TeSys H.



Oil and Gas

Keep your employees and assets safe and improve uptime in onshore and offshore applications: pipeline operations: LNG and natural gas processing: and refining and petrochemical applications.



Water and Wastewater

Optimize the treatment and delivery of safer water by reducing energy usage and lowering operating costs.



Food and Beverage

Serve your customers with environmentally friendly products to improve sustainability, efficiency, and flexibility, allowing you to adapt to changing customer habits.

Online selection tool

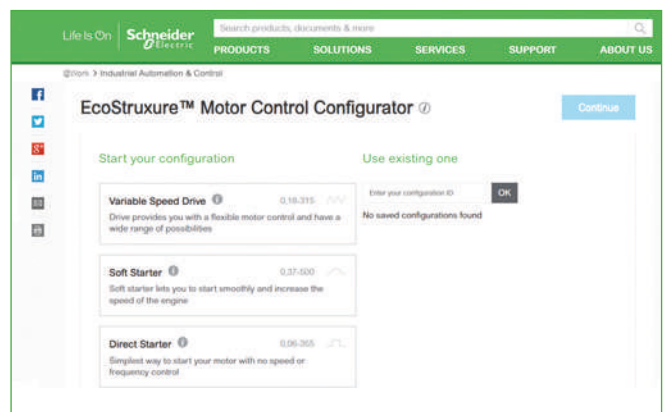
EcoStruxure™ Motor Control Configurator

For Direct-On-Line and Star-Delta starters, motor circuit breakers with advanced protection, motor management relays, configurations for total coordination, drives, and soft starters.

No matter what kind of starting method you need, our online **EcoStruxure™ Motor Control Starter Configurator** will help you to quickly and easily select the optimal combination of components to ensure maximized motor safety, protection, and uptime.



Scan or click on the QR code



EDITO

Welcome to your NEW TeSys catalog!

Your catalog continues to evolve, as it does year after year.

- The first evolution concerns the products, it will bring a **Premium design** to your control panels thanks to the main TeSys components that now present the **same visual homogeneity**.
- The **structuring of the components naming** is the second point of evolution, it answers the need to classify the products by function and by range in the selection tools, the catalog and the Schneider Electric website (www.se.com).
- The last new feature is the presence of a **product reference table at the end of the commercial part of each chapter** (before the information for designers). It allows you to quickly check the availability of a product variant and access its technical data sheet online.

NEW

VISUAL ASPECT

The design of the TeSys core offer is evolving. Circuit breakers, contactors and several other components are now sharing a modern look giving the control panel a new and qualitative visual aspect.

Schneider Electric's identity is fully revealed by the green parts.



NEW

TESYS FUNCTION NAMES

TeSys components are grouped by function name, for easier identification. These functions are related to motor, power, control and protection.

> TeSys Power:

Components for powering motors



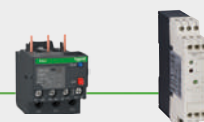
> TeSys Control:

Components for controlling motors



> TeSys Protect:

Components for protecting motors



TeSys Active gathers the devices providing built-in communication with motor monitoring and control functions.

> TeSys Active:

Connected components for motor circuits





TESYS COMPONENT SERIES NAMES

- Series names group conventional components (circuit breakers, contactors, relays, overcurrent relays) by current rating ranges.
 - 0 to 16 A > **TeSys K** Series
 - 9 to 150 A > **TeSys 'Deca'** Series
 - 185 to 800 A > **TeSys 'Giga'** Series.
- TeSys advanced components have a specific classification.
 - 0 to 38 A All-in-one starters > **TeSys 'Ultra'** Series
 - 0 to 80 A Motor Control/Protection/Monitoring system > **TeSys 'island'** Series.
- Other TeSys component names remain unchanged (TeSys F, TeSys B, TeSys T).



TESYS COMPONENTS FULL NAMES AT A GLANCE

| Old names | > NEW names: TeSys Function - Component Series | Complementary indications |
|-------------------------------------|--|-------------------------------|
| TeSys Vario, mini Vario | TeSys Control – Switch-disconnectors | |
| TeSys DF TeSys LS TeSys GK | TeSys Power – Fuse carriers | DF type LS type GK type |
| TeSys GS | TeSys Power – Switch-disconnector fuses | |
| TeSys GV2 TeSys GV3 TeSys GV4 | TeSys Power – Deca circuit breakers | Frame 2 Frame 3 Frame 4 |
| TeSys GV5 TeSys GV6 | TeSys Power – Giga circuit breakers | Frame 5 Frame 6 |
| TeSys D | TeSys Control – Deca control relays TeSys Control – Deca contactors | |
| TeSys LRD, LR9D | TeSys Protect – Deca overload relays | |
| TeSys H | TeSys Control – Hybrid motor starters | |
| TeSys U | TeSys Control – Ultra motor starters | |
| TeSys island | TeSys Active – island motor starter | |

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| LC1DT●●●● | A6/57, B8/26, B8/27, B8/31, B8/32, B8/33, B8/34 |
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Part A

ASSEMBLED MOTOR STARTERS

FULLY
COORDINATED

TeSys Control

Enclosed switch-disconnectors
and motor starters

From 0.25 to 40 kW



A1/1

Enclosed
starters

TeSys Control

Open motor starters

From 0.06 to 315 kW



A2/1

Open
motor
starters

TeSys Control

Hybrid motor starters

Up to 3 kW

From 9 A to 32 A



A3/1

Hybrid
motor
starters

TeSys Control

Ultra motor starters

From 0.09 to 18.5 kW



A4/1

Ultra
motor
starters

TeSys Control

Integral motor starters

Up to 32 kW

Up to 63 A



A5/1


Integral
motor
starters

Complementary technical
information:

coordination and standards

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Coordination
and
standards

| Enclosed switch-disconnectors | | |
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Technical Data for Designers A1/37

Enclosed Motor Starter Solution Guide

The software to help you to select intuitively your enclosed motor starter solution.

The new Enclosed Motor Starter Solution Guide software is available for both PC and iPad.



TeSys Control

Enclosed switch-disconnectors

Introduction & selection table

Enclosed starters



Range of pre-assembled casings with handle and their rotary switch

They can be fixed on a wall, a panel, or on the chassis of a machine. For simple isolation and/or control of an electrical circuit. Red/yellow handle provides a clear indication of the device safety function ⁽¹⁾, while black handle is usually dedicated to ON/OFF control.

⁽¹⁾ Conforming to IEC 60947-3 and IEC 60204.

With numerous advantages to meet OEM's most common needs

- IEC or UL
- Multiple ratings and sizes
- IP65
- Additional poles
- Replaceable switch bodies

Selection in 2 steps

1 Identify your need (1 line one or more) in the **Selection criteria** area (example.: Load 5 kW– Emergency Stop - IEC)

2 Choose your enclosed switch-disconnector in the **Solutions** area, note the radical of the product references

| Selection criteria | | | | | | | |
|--|--------------------|-------------------|----------------|------|------|-----|----------|
| Ithe (A) | Load power (kW) | Circuit isolation | Emergency stop | IP55 | IP65 | IEC | UL & CSA |
| 10...140 | 4...45 (400 V) | ● | | | ● | ● | |
| 10...140 | 4...45 (400 V) | ● | ● | | ● | ● | |
| 10...32 | 4...15 (400 V) | ● | ● | ● | | ● | |
| 32...175 (Ithe IEC) 20...115 (Ith UL) | 10...50 HP (480 V) | ● | ● | | ● | ● | ● |

| Solutions | | | |
|-----------|-----|------|--------|
| | | | |
| VBF | VCF | VCFN | VC•GUN |

See page

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A1/3

A1/4

TeSys Control

Enclosed switch-disconnectors / Ready-to-use

Product references



VCF0GE



VCF3GE



VCF5GEN



VCFN12GE



VBF0GE



VBF6GEN

Control + Disconnection (IEC)

Enclosed switch-disconnectors, ready to be fixed on workshop wall or directly on the machine and wired to main supply circuit and to load.

Functions / Range / Specificities:

- Direct Control: ON/OFF of 3-phase motor (black handle) or ON/Emergency Stop (red handle)
- 23 IEC motor starters, for 3P motors from 4 to 45 kW (10 to 140 A)
- 6 UL motor starters for 3P motors from 5 to 30 HP (240 V)
- Padlockable handle (1 to 3 padlocks – not included)
- Sealable, lockable cover when handle in position 1 (up to 63 A rating).

Included:

- rotary switch-disconnector body
- handle.

Enclosures for ON / Emergency Stop – IP65 – conforming IEC 60947-3, IEC 60204 (1)

| Operator Handle | Front plate Dim. | Ithe | Power AC-23 at 400 V | Incorporated switch body | Possible attachments (2) | With ground plate | Reference (3) | Weight | Overall dimensions (4) |
|---|------------------|------|----------------------|--------------------------|--------------------------|-------------------|---------------|--------|------------------------|
| | mm | A | kW | | | | | kg | mm |
| Red, standard, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shank) | Yellow 60 x 60 | 10 | 4 | V02 | 2 | No | VCF02GE | 0.500 | 90x146x131 |
| | | | | | | Yes | VCF02GEGP | 0.560 | 90x146x131 |
| | | 16 | 5.5 | V01 | 2 | No | VCF01GE | 0.500 | 90x146x131 |
| | | | | | | Yes | VCF01GEGP | 0.560 | 90x146x131 |
| | | 20 | 7.5 | V0 | 2 | No | VCF0GE | 0.500 | 90x146x131 |
| | | | | | | Yes | VCF0GEGP | 0.560 | 90x146x131 |
| Red, long, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shanks) | Yellow 90 x 90 | 25 | 11 | V1 | 2 | No | VCF1GE | 0.500 | 90x146x131 |
| | | | | | | Yes | VCF1GEGP | 0.560 | 90x146x131 |
| | | 32 | 15 | V2 | 2 | No | VCF2GE | 0.500 | 90x146x131 |
| | | 50 | 22 | V3 | 3 | No | VCF3GE | 0.930 | 157x180x152 |
| | | 63 | 30 | V4 | 3 | No | VCF4GE | 0.930 | 157x180x152 |
| | | 100 | 37 | V5 | 1 | No | VCF5GEN | 2.190 | 241x291x190.5 |
| 140 | 45 | V6 | 1 | No | VCF6GEN | 2.190 | 241x291x190.5 | | |

Protection of sensitive equipment: ground plate available for VCF02GE...VCF1GE – see page A1/5.

Enclosures for ON / Emergency Stop – IP65 - conforming IEC 60947-3 (1)

| Operator Handle | Front plate Dim. | Ithe | Power AC-23 at 400 V | Incorporated switch body | Possible attachments (2) | Reference (3) | Weight | Overall dimensions (4) |
|---|------------------|------|----------------------|--------------------------|--------------------------|---------------|--------|------------------------|
| | mm | A | kW | | | | kg | mm |
| Red padlockable, either by 1 (Ø 8 shank) or by 3 padlocks (Ø 6 shank) | Yellow 60 x 60 | 10 | 4 | VN12 | 2 | VCFN12GE | 0.422 | 82.5x131x106 |
| | | 16 | 5.5 | VN20 | 2 | VCFN20GE | 0.422 | 82.5x131x106 |
| | | 20 | 7.5 | V0 | 0 | VCFN25GE | 0.512 | 82.5x131x106 |
| | | 25 | 11 | V1 | 0 | VCFN32GE | 0.512 | 82.5x131x106 |
| | | 32 | 15 | V2 | 0 | VCFN40GE | 0.512 | 82.5x131x106 |

Enclosures for ON/OFF F– IP65 – conforming IEC 60947-3, IEC 60204 (1)

| Operator Handle | Front plate Dim. | Ithe | Power AC-23 at 400 V | Incorporated switch body | Possible attachments (2) | Reference (3) | Weight | Overall dimensions (4) |
|---|------------------|------|----------------------|--------------------------|--------------------------|---------------|--------|------------------------|
| | mm | A | kW | | | | kg | mm |
| Black, standard, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shank) | Black 60 x 60 | 10 | 4 | V02 | 2 | VBF02GE | 0.500 | 90x146x131 |
| | | 16 | 5.5 | V01 | 2 | VBF01GE | 0.500 | 90x146x131 |
| | | 20 | 7.5 | V0 | 2 | VBF0GE | 0.500 | 90x146x131 |
| | | 25 | 11 | V1 | 2 | VBF1GE | 0.500 | 90x146x131 |
| | | 32 | 15 | V2 | 2 | VBF2GE | 0.500 | 90x146x131 |
| | | 50 | 22 | V3 | 3 | VBF3GE | 0.930 | 157x180x152 |
| Black, long, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shank) | Black 90 x 90 | 63 | 30 | V4 | 3 | VBF4GE | 0.930 | 157x180x152 |
| | | 100 | 37 | V5 | 1 | VBF5GEN | 2.190 | 241x291x190.5 |
| | | 140 | 45 | V6 | 1 | VBF6GEN | 2.190 | 241x291x190.5 |

(1) For characteristics of switch-disconnectors, please consult your Regional Sales Office.

(2) Number of add-on modules that can be attached.

(3) Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

(4) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

Note: For VCF and VBF enclosures from 02GE to 2GE, only one auxiliary contact block VZ7 or VZ20 can be mounted.

Dimensions:
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Schemes:
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TeSys Control

Enclosed switches (UL) / Ready-to-use - Additional modules

Product references

Enclosed starters



VC1GUN



VC3GUN



VC5GUN

Control + Disconnection (UL)

ON / Emergency Stop – IP65

Conforming UL508 CSA22.2 n° 14, IEC 60947-3, IEC 60204 (1)

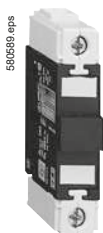
| Operator | Rating | Standard power ratings of UL motors | Incorporated switch body | Possible attachments | Reference (2) | Weight | Overall dimensions (1) | | | | |
|---|------------------|-------------------------------------|--------------------------|----------------------|---------------|--------|------------------------|---------------|---------------|---------------|---------------|
| | | | | | | | | IEC (lth) | UL | | |
| Handle | Front plate Dim. | 600 V | | | | | | | | | |
| | | A | A | HP | HP | | | | | | |
| Red, standard, padlockable with up to 3 padlocks (Ø 4 to Ø 8) | Yellow 60 x 60 | 32 | 20 | 5 | 10 | V1 | 2 | VC1GUN | 0.500 | 121x164x132.1 | |
| | | 40 | 25 | 5 | 10 | 15 | V2 | 2 | VC2GUN | 0.500 | 121x164x132.1 |
| | | 63 | 45 | 10 | 20 | 30 | V3 | 2 | VC3GUN | 0.930 | 164x193x132.1 |
| | | 80 | 63 | 15 | 30 | 40 | V4 | 2 | VC4GUN | 0.930 | 164x193x132.1 |
| Red, long, padlockable with up to 3 padlocks (Ø 4 to Ø 8) | Yellow 90 x 90 | 125 | 100 | 25 | 50 | 50 | V5 | 1 | VC5GUN | 2.190 | 241x291x190.5 |
| | | 175 | 115 | 30 | 50 | 60 | V6 | 1 | VC6GUN | 2.190 | 241x291x190.5 |

Additional modules for VZ switch bodies

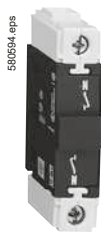
Enclosed switches include a VZ switch body. Additional modules can be plugged on 1 or 2 sides of the switch body to provide additional contacts or extra connectivity.

Common modules for enclosed switch disconnectors – with exceptions (3)

| Description | Rating | Reference |
|--|------------------|---------------------------------------|
| Main pole module (mounted in enclosure) | A | |
| | 10 | VZ02 (not for VCxGUN starters) |
| | 16 | VZ01 (not for VCxGUN starters) |
| | 20 | VZ0 (not for VCxGUN starters) |
| | 25 | VZ1 |
| | 32 | VZ2 |
| | 50 | VZ3 |
| | 63 | VZ4 |
| Neutral pole modules with early make and late break contacts | 10 to 32 | VZ11 |
| | 50 and 63 | VZ12 |
| | 100 and 140 | VZ13 |
| Earthing modules | 10 to 32 | VZ14 |
| | 50 and 63 | VZ15 |
| | 100 and 140 | VZ16 |
| Description | Type of contacts | Reference |
| Auxiliary contact block modules with 2 auxiliary contacts | N/O + N/C (4) | VZ7 |
| | N/O + N/O | VZ20 |



VZ0
Main pole



VZ11
Neutral pole



VZ15
Earthing terminal



VZ20
Auxiliary contacts

(1) For characteristics of switch-disconnectors, please consult your Regional Sales Office.

(2) Enclosure not suitable in atmosphere contaminated with harsh substances

(detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

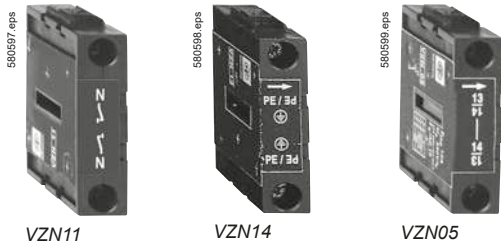
(3) Not compatible with V●F5GEN, V●F6GEN, VC5GUN, VC6GUN, VCFN12GE, VCFN20GE.

(4) Late make N/O, early break N/C contacts.

TeSys Control

Enclosed switch-disconnectors / Ready-to-use - Additional modules - Accessories

Product references



VZN11

VZN14

VZN05

Additional modules for switch bodies

Specific modules for VCFN12GE and VCFN20GE

| Description | Rating | Reference |
|---|-----------|-----------|
| | A | |
| Main pole modules | 10 | VZN12 |
| | 16 | VZN20 |
| Neutral pole module with early make and late break contacts | 10 and 16 | VZN11 |
| Earthing module | 10 and 16 | VZN14 |

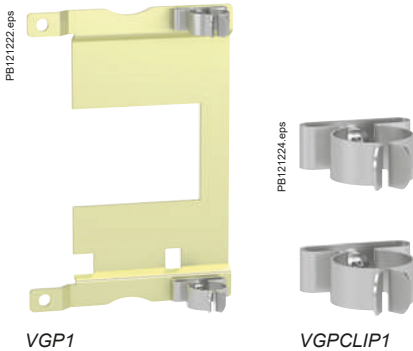
| Description | Type of contacts | Reference |
|---------------------------------|---------------------------|-----------|
| Auxiliary contact block modules | 1 N/O late make contact | VZN05 |
| | 1 N/C early break contact | VZN06 |

Accessories for enclosed switch-disconnectors

Ground plate and accessories for VCF02GE, VCF01GE, VCF0GE, VCF1GE

Metallic ground plate, for shielded cables connection. To be installed between back of enclosed switch-disconnectors, 2 fixing screws. Cable shield grounding ensured by 2 clamps, clamping from Ø11 to 14 mm

| For switch body | Reference |
|------------------------------------|-----------|
| Ground plate + 2 clamps + 2 screws | VGP1 |
| 2 clamps + 2 screws | VGPClip1 |



VGP1

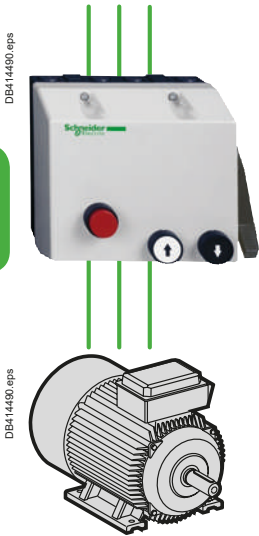
VGPClip1

TeSys Control

Enclosed standard starters

Introduction & selection table

Enclosed starters



Range of pre-assembled motor starters, with pushbuttons, selectors, protection and control components in a robust casing

They can be fixed on a wall, on a panel, or on the chassis of a machine. They provide an operator with an easy access with visual simplicity

Numerous advantages to meet OEM's most common needs

- IEC
- Multiple ratings and sizes
- IP55, IP65
- IK08, IK09
- Totally or partially pre-wired

Standard starters

They are used to isolate a circuit, to protect and/or to control a motor

Customized protection

Enclosed starter offer is available in fully pre-equipped and pre-wired enclosures, also in partially pre-equipped enclosures to be completed with protective components of the required rating

Accessories

Additional accessories provide reinforced sealing, padlock locking, additional contacts...

Selection in 2 steps

1 Identify your need (1 line one or more) in the **Selection criteria** area (example: Load 5 kW – ON/OFF control with overload protection)

2 Choose your starter in the **Solutions** area by adding column contents, note the radical of the product references (example: LE1D + LRD)

Selection criteria

| Load Power (kW) / 400V | Circuit isolation | Direct starter - ON/OFF | Reverser ON/REVERSE/OFF | Short circuit protection | Overload protection | Star - delta |
|------------------------|-------------------|-------------------------|-------------------------|--------------------------|---------------------|--------------|
| 0.25..7.5 | | ● | | | ● | |
| 4 ... 30 | | ● | | | ● | |
| 0.02... 30 | | ● | | ● | | |
| 0.02... 30 | | | | | | |
| 0.06... 11 | | ● | | ● | ● | |
| 2.2 ... 15 | | | | | | |
| 2.2 ... 30 | | | ● | | ● | |
| 2.2 ... 15 | | | ● | ● | ● | |
| 7.5...30 | | ● | | | ● | ● |
| 7.5...18.5 | | ● | ● | ● | ● | ● |

Solutions

| Protection device to be added by customer (of appropriate rating) | | | | See page |
|--|----------------|--------------|-------------|-----------------|
| LE1M35 | | | | A1/7 |
| | | LE1D | LRD | A1/8 |
| | GV2PC GV3PC | | GV2L | A1/9 + A1/10 |
| | GV2PC GV3PC | | GV2P | A1/9 + A1/10 |
| | GV2MC GV3MP | | GV2ME | A1/11 |
| | | LE4K LE4D | LR2K LRD | A1/12 |
| | | LE2K LE2D | LR2K LRD | A1/13 |
| | | LE8K LE8D | LR2K LRD | A1/14 |
| | | LE3D | LRD | A1/15 |
| | | LE6D | LRD | A1/16 |

TeSys Control

Enclosed standard starters / DOL / Ready-to-use

Product references



LE1M35●●●●

Control + Protection against Overloads

- Direct Control: ON/OFF of 3-phase motor
- Motor protection: motor OFF in case of overload – manual reset with the red pushbutton.
- Indication: yellow light activated with the contactor coil.
- The LE1M35 starter, combined with short-circuit protection components, provides type 1 or type 2 coordination, depending on the type of devices used.

Range:

- 10 IEC motor starters, for 3P motors from 0.25 to 7.5 kW (400V AC)
- Configurable pushbuttons: impulse or latched
- Conforming to IEC 60947-4-1 standard
- Degree of protection IP65, according IEC 60529
- Ambient air temperature in operation -5 to +40°C
- Operating position: same as K series contactors
- Material: self extinguishing ABS.

Included (standard version):

- 1 contactor LC1K●●⁽¹⁾
- 1 thermal overload relay LR2K⁽²⁾
- 1 green Start button "I",
- 1 red Stop/Reset button "O/R",
- 1 yellow operating indicator
- earth + neutral terminals at bottom of enclosure.

For supply voltages between 380 and 440 V (codes Q7, V7, N7 or R7) the control circuit is pre-wired between phases. For other supply voltages, the control circuit must be wired by the customer.

Direct-on-line starters

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | Setting range of thermal overload relay LR2K | Basic reference, to be completed by adding the voltage code ^{(3) (4)} | Overall dimensions ⁽⁵⁾ WxHxD |
|--|-------|-------|-------|------------|--|--|---|
| 220 V | 240 V | 380 V | 415 V | 400 V | | | |
| kW | kW | kW | kW | A | | mm | |
| 0.12 | 0.12 | 0.25 | 0.25 | 0.54...0.8 | LE1M35●●05 | 78x160x108 | |
| 0.18 | 0.18 | 0.37 | 0.37 | 0.8...1.2 | LE1M35●●06 | 78x160x108 | |
| 0.25 | 0.25 | 0.55 | 0.55 | 1.2...1.8 | LE1M35●●07 | 78x160x108 | |
| 0.37 | 0.37 | 1.1 | 0.75 | 1.8...2.6 | LE1M35●●08 | 78x160x108 | |
| 0.55 | 0.55 | 1.5 | 1.5 | 2.6...3.7 | LE1M35●●10 | 78x160x108 | |
| 1.1 | 0.75 | 2.2 | 2.2 | 3.7...5.5 | LE1M35●●12 | 78x160x108 | |
| 1.5 | 1.1 | 3 | 3 | 5.5...8 | LE1M35●●14 | 78x160x108 | |
| 2.2 | 2.2 | 4 | 4 | 8...11.5 | LE1M35●●16 | 78x160x108 | |
| 3 | 3 | 5.5 | 5.5 | 10...14 | LE1M35●●21 | 78x160x108 | |
| 3.7 | 4 | 7.5 | 7.5 | 12...16 | LE1M35●●22 | 78x160x108 | |
| Replacement contactor | | | | | LC1K●●A80 | - | |

Coil voltage codes

| Volts ~ 50/60 Hz | 24 | 110 | 220 | 230 | 240 | 380 | 400 | 415 | 440 |
|---------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | B7 | F7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |

(1) K contactor characteristic: refer to chapter B8.

(2) LR2K overload relay characteristics: refer to chapter B11.

(3) Remove the 2 last numbers if the thermal overload relay is not required.
Example: LE1M35P7 instead of LE1M35P714.

(4) Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

(5) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

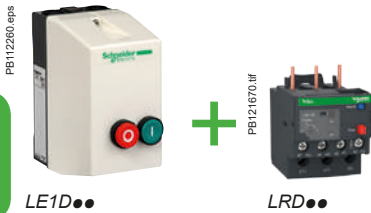


TeSys Control

Enclosed standard starters / DOL / to be completed with Deca ⁽¹⁾ overload relay

Product references

Enclosed starters



Control + Protection against Overloads

- ON/OFF motor starters: 1-way rotation control of 3-phase motor, by green & red pushbuttons
- Motor protection against overload: manual reset with the red pushbutton or remotely.

Range:

- 8 direct-on-line starters for 3P motors from 4 to 30 kW (9 to 65 A AC-3)
- Choice of up to 12 AC coil voltages for control supply circuit (depending on starter rating).

Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529:
 - IP65,
 - IK07 for LED09...D35,
 - IK09 for LE1D40A...D65A
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: LE1D09... D35 polycarbonate ⁽²⁾
- LE●D40A... D65A steel sheet.

Included:

- 1 pre-wired LC1D contactor
- 2 Harmony XB5 pushbuttons.

An LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

Direct on-line starters

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | Max. current lth up to | Basic reference, to be completed by adding the voltage code ⁽³⁾ | Weight kg | Overall dimensions ⁽⁴⁾ WxHxD mm |
|--|-------|-------|-------|-------|-------|------------------------|--|-----------|--|
| 220 V | 380 V | 415 V | 440 V | 500 V | 660 V | | | | |
| kW | kW | kW | kW | kW | kW | A | | | |
| 2.2 | 4 | 4 | 4 | 5.5 | 5.5 | 9 | LE1D09●● | 0.920 | 88x166x128.5 |
| 3 | 5.5 | 5.5 | 5.5 | 7.5 | 7.5 | 12 | LE1D12●● | 0.920 | 88x166x128.5 |
| 4 | 7.5 | 7.5 | 7.5 | 9 | 10 | 17 | LE1D18●● | 1.015 | 101x201x153.5 |
| 5.5 | 11 | 11 | 11 | 15 | 15 | 22 | LE1D25●● | 1.015 | 101x201x153.5 |
| 7.5 | 15 | 15 | 15 | 18.5 | 18.5 | 26.5 | LE1D35●● | 4.320 | 101x201x153.5 |
| 11 | 18.5 | 22 | 22 | 22 | 30 | 40 | LE1D40A●● | 4.820 | 200x300x158.5 |
| 15 | 22 | 25 | 30 | 30 | 33 | 50 | LE1D50A●● | 4.850 | 200x300x158.5 |
| 18.5 | 30 | 37 | 37 | 37 | 37 | 65 | LE1D65A●● | 4.850 | 200x300x158.5 |

Variants (pre-assembled)

| Description | Available variants for starter | Suffix to be added to the starter reference ⁽³⁾ |
|--|--------------------------------|--|
| No pushbuttons on cover | LE1D09...D65A●● | A04 |
| 1 blue Reset button "R" | LE1D09...D65A●● | A05 |
| 1 3-position stay put selector switch ("I"- "O"- "II") ("I": Automatic Start; "O": Stop; "II": Manual Start) 1 blue Reset button "R" | LE1D09...D25●● | A09 |
| 1 2-position stay put selector switch "O"- "I" ("O": Stop; "I": Manual Start) 1 blue Reset button "R" | LE1D09...D25●● | A13 |
| Mounting of an LC1D09 contactor in an enclosure identical to LE1D18 | LE1D09P7 LE1D09P7A13 | T |

Coil voltage codes ⁽³⁾

| Volts ~ 50/60 Hz | 24 | 48 | 110 | 115 | 120 | 220 | 230 | 240 | 380 | 400 | 415 | 440 |
|------------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LE1D09 to D35 | B7 | E7 | F7 | FE7 | G7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |
| LE1D40A to D65A | - | - | - | FE7 | - | - | P7 | - | Q7 | - | - | - |

⁽¹⁾ LRD overload relay selection: product reference page A1/33, more details in chapter B11.

⁽²⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents ketones, alcohol, aromatic hydrocarbons).

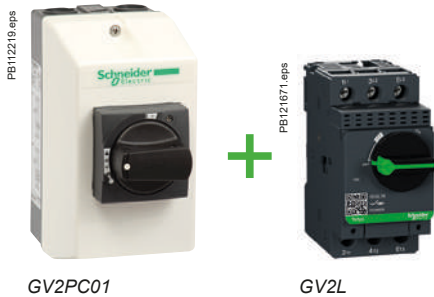
⁽³⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

⁽⁴⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

TeSys Control

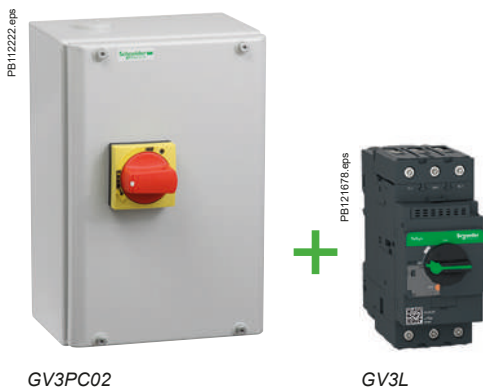
Enclosed standard starters / DOL / to be completed with Deca ⁽¹⁾ magnetic circuit breaker

Product references



GV2PC01

GV2L



GV3PC02

GV3L

Control + Isolation + Protection against Short circuits

2 solutions according to the required current rating.

GV2PC + GV2L > up to 23 A (Ithe)

GV3PC + GV3L > up to 55 A (Ithe)

The GV2L or GV3L circuit breaker of the required rating must be ordered separately.

- Circuit isolation
- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Padlocking:
 - in ON or OFF position (PGV2PC01, GV3PC01),
 - in OFF position (GV2PC02, GV3PC02).

Suitable circuit breakers:

- GV2L - 12 ratings (3P motors from 0.09 to 11 kW - 400/415 V AC)
- GV3L - 3 ratings (3P motors from 18.5 to 30 kW - 400/415 V AC).

Enclosures characteristics:

- Conforming to IEC 60947-2
- Degree of protection according IEC 60529:
 - IP65, IK08 (for GV2PC),
 - IK09 (for GV3PC)
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue): 690V
- Material: GV2PC polycarbonate ⁽²⁾, GV3PC steel sheet.

Included:

- GV rotary handle.

Enclosures fitted with padlockable rotary handle

| Composition | Type | Reference | Overall dimensions ⁽³⁾ WxHxD mm |
|--|------------------------------|----------------|--|
| <ul style="list-style-type: none"> ■ Insulating enclosure ■ Black handle, padlockable in ON/OFF position | Surface mounting For GV2L | GV2PC01 | 88x166x163 |
| <ul style="list-style-type: none"> ■ Insulating enclosure ■ Red handle on yellow background, padlockable in OFF position | Surface mounting For GV2L | GV2PC02 | 88x166x163 |
| <ul style="list-style-type: none"> ■ Metal enclosure ■ Black handle, padlocking in ON/OFF position ■ Circuit breaker/handle adapter | Surface mounting For GV3L | GV3PC01 | 200x300x200 |
| <ul style="list-style-type: none"> ■ Metal enclosure ■ Red handle, padlocking in OFF position ■ Circuit breaker/handle adapter | Surface mounting For GV3L | GV3PC02 | 200x300x200 |

GV2L, GV3L product references: add code to product reference ⁽⁴⁾

| | | | | | | | | | | | | |
|-----------------|------------|-------------|-----------|------------|------------|----------|------------|----------|-----------|-----------|-----------|-----------|
| Ithe (A) | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6.3 | 9 | 13 | 17 | 21 | 23 |
| GV2L codes | 03 | 04 | 05 | 06 | 07 | 08 | 10 | 14 | 16 | 20 | 21 | 22 |
| Ithe (A) | 35 | 41 | 55 | | | | | | | | | |
| GV3L codes | 40 | 50 | 65 | | | | | | | | | |

⁽¹⁾ GV2, GV3 circuit breaker not included - characteristics: refer to chapter B6.

⁽²⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽³⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

⁽⁴⁾ Example: for Ithe 17 A, magnetic circuit breaker is GV2L20.

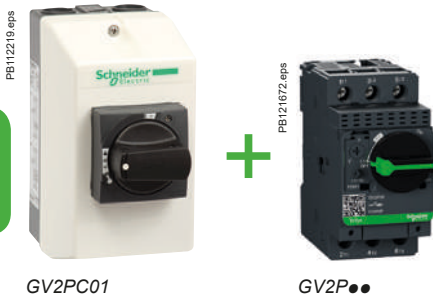


TeSys Control

Enclosed standard starters / DOL / to be completed with Deca ⁽¹⁾ thermal-magnetic circuit breaker

Product references

Enclosed starters



GV2PC01

GV2P●●



GV3PC02

GV3P●●



Control + Isolation + Protection against Short circuits and Overloads

For OEM, 2 solutions according to the required current rating.

GV2PC + GV2P > up to 23 A (Ithe)

GV3PC + GV3P > up to 55 A (Ithe) The enclosure includes a rotary handle.

The GV2P or GV3P circuit breaker of the required rating must be ordered separately.

- Circuit isolation
- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Padlocking:
 - in ON or OFF position (GV2PC01, GV3PC01),
 - in OFF position (GV2PC02, GV3PC02).

Suitable circuit breakers:

- GV2P - 14 ratings (3P motors from 0.06 to 11 kW - 400/415 V AC)
- GV3P - 2 ratings (3P motors from 18.5 to 30 kW - 400/415 V AC).

Enclosures characteristics:

- Conforming to IEC 60947-2
- Degree of protection according IEC 60529: IP65, IK08 (for GV2PC), IK09 (for GV3PC)
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690V
- Material: GV2PC polycarbonate ⁽²⁾, GV3PC steel sheet.

Included:

- GV rotary handle.

Enclosures fitted with padlockable rotary handle

| Composition | Type | Reference | Overall dimensions ⁽³⁾ WxHxD mm |
|--|------------------------------|----------------|--|
| <ul style="list-style-type: none"> ■ Insulating enclosure ■ Black handle, padlockable in ON/OFF position | Surface mounting For GV2L | GV2PC01 | 88x166x163 |
| <ul style="list-style-type: none"> ■ Insulating enclosure ■ Red handle on yellow background, padlockable in OFF position | Surface mounting For GV2L | GV2PC02 | 88x166x163 |
| <ul style="list-style-type: none"> ■ Metal enclosure ■ Black handle, padlocking in ON/OFF position ■ Circuit breaker/handle adapter | Surface mounting For GV3L | GV3PC01 | 200x300x200 |
| <ul style="list-style-type: none"> ■ Metal enclosure ■ Red handle, padlocking in OFF position ■ Circuit breaker/handle adapter | Surface mounting For GV3L | GV3PC02 | 200x300x200 |

GV2P, GV3P product references: add code to product reference ⁽⁴⁾

| | | | | | | | | | | | | | | |
|------------|------|------|-----|------|----|-----|-----|----|-----|----|----|----|----|----|
| Ithe (A) | 0.16 | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6.3 | 9 | 13 | 17 | 21 | 23 |
| GV2P codes | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 10 | 14 | 16 | 20 | 21 | 22 |
| Ithe (A) | 35 | 41 | 55 | | | | | | | | | | | |
| GV3P codes | 40 | 50 | 65 | | | | | | | | | | | |

⁽¹⁾ GV2, GV3 circuit breaker not included - characteristics: refer to chapter B6.

⁽²⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

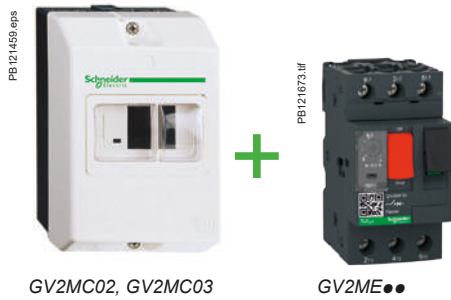
⁽³⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

⁽⁴⁾ Example: for Ithe 17 A, magnetic circuit breaker is GV2P20.

TeSys Control

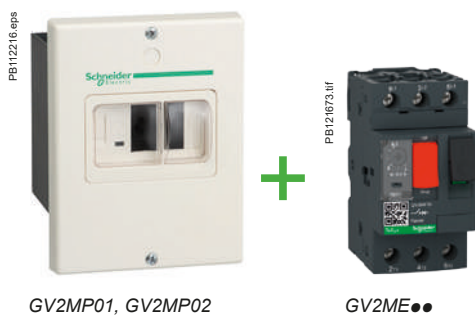
Enclosed standard starters / DOL / to be completed with Deca ⁽¹⁾ thermal-magnetic circuit breaker (ref. GV2ME)

Product references



GV2MC02, GV2MC03

GV2ME●●



GV2MP01, GV2MP02

GV2ME●●

Control + Isolation + Protection against Short circuits and Overloads

For OEM, 2 solutions, according to the enclosure installation mode:
 GV2MC surface mounting enclosure for GV2ME circuit breaker
 GV2MP flush mounting enclosure for GV2ME circuit breaker.
 The GV2ME circuit breaker of the required rating must be ordered separately.

- Circuit isolation
- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Short-circuit and adjustable overload protection
- Padlocking in OFF position.

Suitable circuit breakers:

- GV2ME - 14 ratings (3P motors from 0.06 to 11 kW - 400/415 V AC).

Enclosures characteristics:

- Conforming to IEC 60947-2; IEC 60947-4-1
- Degree of protection according IEC 60529: refer to selection chart
- Operational voltage (Ue) 690 V
- Material: polycarbonate ⁽²⁾.

Included:

- GV2E01 or GV2E02 sealing kit (fixed on the front plate).

Enclosures for thermal-magnetic circuit breakers GV2ME

| Type | Degree of protection | Possible no. of side mounting auxiliary contact blocks on GV2ME | | Reference | Weight kg | Overall dimensions ⁽³⁾ WxHxD mm |
|--|--|---|---------|----------------------------|--------------|--|
| | | LH side | RH side | | | |
| Surface mounting, double insulated with protective conductor. Sealable cover | IP41 | 1 | 1 | GV2MC01 | 0.290 | 93x147x84 |
| | IP55 | 1 | 1 | GV2MC02 | 0.300 | 93x147x84 |
| | | | | or GV2MCK04 ⁽⁴⁾ | 0.420 | 93x147x145.5 |
| | IP55 for temperature < +5 °C | 1 | 1 | GV2MC03 | 0.300 | 93x147x84 |
| Flush mounting, with protective conductor | IP41 (front face) | 1 | 1 | GV2MP01 | 0.115 | 106.5x140x83 |
| | IP41 (front face – reduced flush mounting) | – | 1 | GV2MP03 | 0.115 | 106.5x140x98 |
| | IP55 (front face) | 1 | 1 | GV2MP02 | 0.130 | 106.5x140x83 |
| | IP55 (front face – reduced flush mounting) | – | 1 | GV2MP04 | 0.130 | 106.5x140x98 |

GV2ME product references: add code to product reference ⁽⁵⁾

| lthe (A) | 0.16 | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6.3 | 9 | 13 | 17 | 21 | 23 |
|-------------|------|------|-----|------|----|-----|-----|----|-----|----|----|----|----|----|
| GV2ME codes | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 10 | 14 | 16 | 20 | 21 | 22 |

GV2MC, GV2MP enclosures with complementary circuit breaker and mushroom head pushbutton allow the construction of safety direct-on-line starters conforming INRS and VDE0113.

Surface and flush mounting enclosures, mushroom heads, circuit breakers and undervoltage release cover a large number of applications.

⁽¹⁾ Characteristics of GV2ME circuit breakers and additives: refer to page A1/32.

⁽²⁾ Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽³⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light

⁽⁴⁾ Enclosure GV2MCK04 is fitted with a GV2K04 mushroom head Emergency stop pushbutton as standard.

⁽⁵⁾ Example: for lthe 17 A, magnetic circuit breaker is GV2ME20.



TeSys Control

Enclosed standard starters / DOL / to be completed with LR2K, Deca ⁽¹⁾ overload relays

Product references

Enclosed starters



Control + Isolation + Protection against Short circuits and Overloads

- ON/OFF motor starters: 1-way rotation control of 3-phase motor, by green & red pushbuttons
 - Option: no pushbutton on cover
 - Circuit disconnection by side black handle
 - Protection against short circuits by NFC fuses type aM (to be ordered separately)
 - Motor protection against overload – manual reset with the red pushbutton or remotely. Option: cover with just a “Reset” blue pushbutton.
- An LR2K or LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor ⁽¹⁾.

Ranges:

- 8 partially pre-equipped enclosures to build-up 3P motor starters from 2.2 to 15 kW (6 to 35 AAC-3)
- Choice of 5 coils for LE4K●●, 12 coils for LE4D●●, for control with different AC voltages.

Enclosures characteristics:

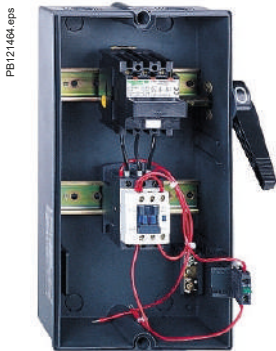
- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529:
 - IP65, IK09 for LE4KIP65,
 - IK07 for LE4D,
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: LE4K and LE4D polycarbonate ⁽²⁾.

Included:

- 1 fuse carrier with external side handle
- 1 pre-wired LC1K or LC1D contactor
- 2 Harmony XB5 pushbuttons.



Direct-on-line starters



| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | Max. current lth up to | Fuses to be fitted by the customer | | Basic reference, to be completed by adding the voltage code ^{(3) (4)} | Weight kg | Overall dimensions ⁽⁵⁾ WxHxD mm |
|--|-------|-------|-------|-------|-------|------|------------------------|------------------------------------|----------------------------|--|---------------|--|
| 220 V | 380 V | 415 V | 440 V | 500 V | 660 V | Size | | Type aM | | | | |
| 230 V | 400 V | | | | | | | | | | | |
| kW | kW | kW | kW | kW | kW | A | A | | | | | |
| 1.5 | 2.2 | 2.2 | 3 | – | – | 6 | 10 x 38 | 10 | LE4K065●● | 1.450 | 206x165x146 | |
| 2.2 | 4 | 4 | 4 | – | – | 9 | 10 x 38 | 12 | LE4K095●● | 1.450 | 206x165x146 | |
| | | | | | | | | | or LE4D09●● ⁽⁶⁾ | 1.960 | 217x348x175.5 | |
| 2.2 | 4 | 4 | 4 | 5.5 | – | 9 | 10 x 38 | 12 | LE4D09●● | 1.960 | 217x348x175.5 | |
| 3 | 5.5 | 5.5 | 5.5 | 7.5 | – | 12 | 10 x 38 | 16 | LE4D12●● | 1.960 | 217x348x175.5 | |
| 4 | 7.5 | 9 | 9 | 10 | – | 18 | 10 x 38 | 20 | LE4D18●● | 2.200 | 217x348x175.5 | |
| 5.5 | 11 | 11 | 11 | 15 | – | 25 | 10 x 38 | 25 | LE4D25●● | 2.200 | 217x348x175.5 | |
| 7.5 | 15 | 15 | 15 | 18.5 | 18.5 | 26.5 | 14 x 51 | 32 | LE4D35●● | 5.190 | 217x348x175.5 | |

Voltages code ⁽⁴⁾

| Volts | 24 | 48 | 110 | 115 | 120 | 220 | 230 | 240 | 380 | 400 | 415 | 440 |
|------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ~ 50/60 Hz | | | | | | | | | | | | |
| LE4D | B7 | E7 | F7 | FE7 | G7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |
| LE4K | – | – | – | – | – | M7 | P7 | U7 | Q7 | V7 | – | – |

Supply voltages between 380 and 440 V (codes Q7, V7, N7 or R7): pre-wired control circuit between phases.

Other supply voltages: control circuit must be wired by the customer.

⁽¹⁾ LR2K, LRD overload relay selection: product references page A1/33, more details in chapter B11.

⁽²⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽³⁾ LE4D●●● (with P7 and V7 coil) with no pushbutton on cover: add “A04” to product reference (example: LE4D25V7A04).

LE4D●●● (with P7 and V7 coil) with overload “Reset” blue pushbutton only on cover: > add “A05” to full product reference.

⁽⁴⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

⁽⁵⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

⁽⁶⁾ Selection according to dimensions and the number of operating cycles, please consult your Regional Sales Office.

TeSys Control

Enclosed standard starters / Reverser / to be completed with LR2K, Deca ⁽¹⁾ overload relays

Product references



LE2K09●●●



LR2K●●



LE2D12●●●



LRD●●

Reverse Control + Isolation + Protection against Overloads

- ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
 - by black I-II position spring return selector, red STOP/RESET pushbuttons for LE2K●● starters
 - by black ON ↑ , ON ↓ pushbuttons, red STOP/RESET pushbutton for LE2D●● starters
 - Motor protection against overload: manual reset with the red pushbutton or remotely.
- An LR2K or LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

Ranges:

- for 3P motors from 4 to 30 kW (9 to 65 A AC-3), in 11 ranges of reverser starters
- Choice of up to 7 AC coils voltages (depending on starter) for control supply circuit.

Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529: IP65, IK07 for LE2D09●●●D35, IK09 for LE2K and LE●D40A●●●D65A,
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: LE2K and LE●D09●●●D35 polycarbonate ⁽²⁾
- LE●D40A●●● D65A steel sheet.

Included:

- 2 pre-wired LC1K or LC1D contactor
- 3 Harmony XB5 pushbuttons - or -1 Harmony XB5 pushbutton + 1 Harmony XB5 switch.

Reversing starters

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | Maximum current lth up to | Basic reference, to be completed by adding the voltage code ⁽³⁾ | Weight | Overall dimensions ⁽⁴⁾ WxHxD |
|--|-------|-------|-------|-------|-------|-------|---------------------------|--|---------------|---|
| 220 V | 380 V | 415 V | 440 V | 500 V | 660 V | 690 V | | | | |
| 230 V | 400 V | | | | | | A | kg | | |
| 1.5 | 2.2 | 2.2 | 3 | - | - | - | 6 | 1.080 | 175x165x146 | |
| 2.2 | 4 | 4 | 4 | - | - | - | 9 | 1.080 | 175x165x146 | |
| - | - | - | - | 5.5 | 5.5 | - | 9 | 2.100 | 101x201x153.5 | |
| - | - | - | - | 5.5 | 5.5 | - | 9 | 2.100 | 101x201x153.5 | |
| 3 | 5.5 | 5.5 | 5.5 | 7.5 | 7.5 | - | 12 | 2.100 | 101x201x153.5 | |
| 4 | 7.5 | 7.5 | 7.5 | 9 | 10 | - | 17 | 2.410 | 101x201x153.5 | |
| 5.5 | 11 | 11 | 11 | 15 | 15 | - | 22 | 2.570 | 101x201x153.5 | |
| 7.5 | 15 | 15 | 15 | 18.5 | 18.5 | - | 26.5 | 4.100 | 101x201x153.5 | |
| 11 | 18.5 | 22 | 22 | 22 | 30 | - | 40 | 5.270 | 200x300x174 | |
| 15 | 22 | 25 | 30 | 30 | 33 | - | 50 | 5.470 | 200x300x174 | |
| 18.5 | 30 | 37 | 37 | 37 | 37 | - | 65 | 5.470 | 200x300x174 | |

Coil voltage codes ⁽³⁾

| Volts ~ 50/60 Hz | 24 | 48 | 110 | 115 | 120 | 220 | 230 | 240 | 380 | 400 | 415 | 440 |
|------------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LE2D40A to D65A | - | - | - | FE7 | - | - | P7 | - | Q7 | - | - | - |
| LE2D09 to D35 | B7 | - | - | - | - | M7 | P7 | U7 | Q7 | V7 | N7 | - |
| LE2K | - | - | - | - | - | M7 | P7 | U7 | Q7 | V7 | - | - |

⁽¹⁾ LR2K, LRD overload relay selection: product references page A1/33, more details in chapter B11.

⁽²⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽³⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

⁽⁴⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

⁽⁵⁾ Selection according to dimensions and the number of operating cycles, please consult your Regional Sales Office.



TeSys Control

Enclosed standard starters / Star-delta / to be completed with Deca ⁽¹⁾ overload relays

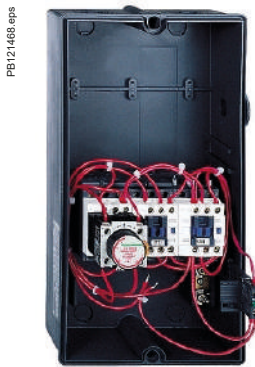
Product references



LE3D



LRD●●



LE3D

Star-delta Control + Protection against Overload

- Star-delta starting of 3-phase motor: ON by green pushbutton, OFF by red pushbutton. Option: no pushbutton on cover
- Maximum operating rate: 30 starts/hour.
- Maximum starting time: 30 seconds.
- Delay of 40 ms ±15 ms at changeover by LAD S2 timer on delta contactor to provide sufficient time for star contactor to break.
- Motor protection against overload: manual reset with the red pushbutton or remotely.

An LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

Range:

- 4 partially pre-equipped enclosures to build-up 3P motor starters from 7.5 to 30 kW.
- Choice of 7 coils for control with different AC voltages.

Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529: IP65, IK07
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: polycarbonate ⁽²⁾.

Included:

- 3 pre-wired LC1D contactors
- 2 Harmony XB5 pushbuttons.

Star-delta starters

| Standard power ratings of squirrel cage motors Mains voltage - delta connection | | | | Basic reference, to be completed by adding the voltage code ⁽³⁾ ⁽⁴⁾ | Weight | Overall dimensions ⁽⁵⁾ WxHxD |
|--|-----------|-------|-------|---|--------|--|
| 220 V | 380/400 V | 415 V | 440 V | | | |
| kW | kW | kW | kW | | kg | |
| 4 | 7.5 | 7.5 | 7.5 | LE3D09●● | 3.650 | 186x348x175.5 |
| 5.5 | 11 | 11 | 11 | LE3D12●● | 3.650 | 186x348x175.5 |
| 11 | 18.5 | 22 | 22 | LE3D18●● | 3.750 | 186x348x175.5 |
| 11 | 22 | 26 | 26 | LE3D35●● | 5.160 | 186x348x175.5 |

Voltage codes ⁽⁴⁾

| Volts ~ 50/60 Hz | 24 | 220 | 230 | 240 | 380 | 400 | 415 |
|---------------------|----|-----|-----|-----|-----|-----|-----|
| LE3 D | B7 | M7 | P7 | U7 | Q7 | V7 | N7 |

⁽¹⁾ LRD overload relay selection: product references page A1/33, more details in chapter B11 - Select appropriate overload relay for setting at 0.58 of the full load rated motor current.

⁽²⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽³⁾ LE3D●●●● (with P7 and V7 coil) with no pushbutton on cover: add "A04" to product reference (example: LE3D18P7A04).

⁽⁴⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

⁽⁵⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.



TeSys Control

Enclosed standard starters / Star-delta / to be completed with Deca ⁽¹⁾ overload relays

Product references

Enclosed starters



LE6D●●●●



LRD●●

Star-delta Control + Disconnection + Protection against Short circuits and Overloads

- Star-delta starting of 3-phase motor: ON by green pushbutton, OFF by red pushbutton. Options: no pushbutton, "Reset" pushbutton only
- Maximum operating rate: 30 starts/hour.
- Maximum starting time: 30 seconds.
- Delay of 40 ms ±15 ms at changeover by LAD S2 timer on delta contactor to provide sufficient time for star contactor to break.
- Circuit disconnection by side black handle
- Protection against short circuits by NFC fuses type aM (to be ordered separately)
- Motor protection against overload: manual reset with the red pushbutton or remotely.

An LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

Range:

- 4 partially pre-equipped enclosures to build-up 3P motor starters from 7.5 to 30 kW choice of 7 coils for control with different AC voltages.

Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529: IP65, IK07
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: polycarbonate ⁽²⁾.

Included:

- 1 fuse carrier with external side handle
- 3 pre-wired LC1D contactors
- 2 Harmony XB5 pushbuttons.



Star-delta starters

| Standard power ratings of squirrel cage motors | | | | Fuses to be fitted by the customer | | Basic reference, to be completed by adding the voltage code ⁽³⁾ | Weight | Overall dimensions ⁽⁴⁾ WxHxD |
|--|-----------|-------|-------|------------------------------------|------|--|--------|---|
| Mains voltage - delta connection | | | | Size | Type | | | |
| 220 V | 380/400 V | 415 V | 440 V | | aM | | kg | |
| kW | kW | kW | kW | | | | | |
| 4 | 7.5 | 7.5 | 7.5 | 10 x 38 | 20 | LE6D09●● | 3.900 | 217x348x175.5 |
| 5.5 | 11 | 11 | 11 | 10 x 38 | 25 | LE6D12●● | 3.900 | 217x348x175.5 |
| 11 | 18.5 | 22 | 22 | 14 x 51 | 40 | LE6D18●● | 4.850 | 217x348x175.5 |

Voltage codes

| Volts | 24 | 230 | 400 |
|------------|----|-----|-----|
| ~ 50/60 Hz | | | |
| LE6 D | B7 | P7 | V7 |

⁽¹⁾ LRD overload relay selection: product references page A1/33, more details in chapter B11 - Select appropriate overload relay for setting at 0.58 of the full load rated motor current.

⁽²⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

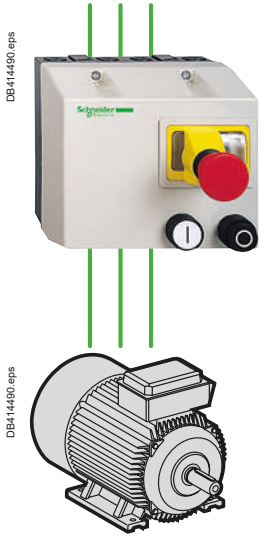
⁽³⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

⁽⁴⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

TeSys Control

Enclosed safety starters

Introduction & selection table



Range of pre-assembled safety motor starters, with mushroom pushbuttons, protection and control components in a robust casing

They can be fixed on a wall, on a panel, or on the chassis of a machine. They provide the operator with safety machine controls complying with IEC 60204-1.

With numerous advantages to meet OEM's most common needs

- IEC
- Multiple ratings and sizes
- IP55
- IK07
- Pre-wired

Safety starters

They provide similar functions as standard starters but also include emergency stops to comply with IEC 60204-1 machine safety standards.

Enclosed starters

Selection in 2 steps

1 Identify your need (on a single line) in the **Selection criteria** area (example: Load 5 kW – Visible circuit isolation, ON/OFF control with short circuit / overload protection)

2 Choose your **Solutions** by adding column contents, note the radical of the product references (example: LG1D)

| Selection criteria | | | | | | |
|--------------------------------|-----------------------|-------------------------|-------------------------------------|-------------------------|------------------------------------|-------------------------------------|
| Load Power (kW) / 400 V supply | Direct starter ON/OFF | Reverser ON/REVERSE/OFF | Short circuit / overload protection | Power circuit isolation | Visible isolation by rotary switch | Isolated control circuit by transfo |
| 0.06...4 | ● | | ● | ● | | |
| 4 ... 9 | | | | | | |
| 0.06... 4 | ● | | ● | ● | ● | |
| 4... 9 | | | | | | |
| 0.06... 4 | ● | | ● | ● | | ● |
| 0.06... 5.5 | | ● | ● | ● | | |
| 0.06 ... 4 | | ● | ● | ● | | ● |
| 0.06 ... 15 | ● | | ● | ● | | |

| Solutions | | | | | | See page |
|-----------|------|------|------|------|----------------------------|----------|
| | | | | | | |
| LG7K | | | | | | A1/18 |
| LG7D | | | | | | A1/18 |
| | LG1K | | | | | A1/19 |
| | LG1D | | | | | A1/19 |
| | | LJ7K | | | | A1/20 |
| | | | LG8K | | | A1/21 |
| | | | | LJ8K | | A1/22 |
| | | | | | GV2MCK04 GV2ME GV2AX | A1/23 |

TeSys Control

Enclosed safety starters / DOL / Ready-to-use

Product references

Enclosed starters



LG7K06



LG7K09, LG7D●●



For Control + Isolation + Short circuit / Overload Protection

Enclosed safety motor starters complying with IEC 60204-1 "Safety of machinery" standards.

- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Emergency stop
- Electrical circuit isolation, lockable (from LG7K09) with up to 3 padlocks
- Short circuit protection
- Overload protection
- Undervoltage protection (LG7K06: with additional undervoltage release module). Switching back on power supply after tripping must be a deliberate action.

Range:

- 12 pre-equipped enclosed safety starters from 0.06 to 9 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate ⁽¹⁾.

Included:

- 1 GV2ME thermal magnetic circuit breaker (with mushroom emergency stop with LG7K06) ⁽²⁾
- 1 LC1K or LC1D pre-wired contactor
- 1 Harmony emergency stop pushbutton (from LG7K09)
- 2 Harmony XB5 pushbuttons.
- 1 GVAX undervoltage release module (from LG7K09).

Additional GVAX●● undervoltage release module for LG7K06 – to be ordered separately.

Additional GV2SN●● Indicator light – to be ordered separately.

| Non-reversing starters (with pushbutton control of isolation) | | | | | | |
|--|-----------|-------|--|--|--------|---|
| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Circuit breaker Setting range of thermal trips | Dust & damp protected starter Basic reference, to be completed by adding the voltage code ⁽³⁾ | Weight | Overall dimensions ⁽⁴⁾ WxHxD |
| 220/230 V | 400/415 V | 440 V | A | | kg | |
| – | 0.06 | 0.06 | 0.16...0.25 | LG7K06●●02 | 1.300 | 175x165x177 |
| 0.06 | 0.09 | 0.12 | 0.25...0.40 | LG7K06●●03 | 1.300 | 175x165x177 |
| – | 0.18 | 0.18 | 0.40...0.63 | LG7K06●●04 | 1.300 | 175x165x177 |
| 0.12 | 0.25 | 0.37 | 0.63...1 | LG7K06●●05 | 1.300 | 175x165x177 |
| 0.25 | 0.55 | 0.55 | 1...1.6 | LG7K06●●06 | 1.300 | 175x165x177 |
| 0.37 | 0.75 | 1.1 | 1.6...2.5 | LG7K06●●07 | 1.300 | 175x165x177 |
| 0.75 | 1.5 | 1.5 | 2.5...4 | LG7K06●●08 | 1.300 | 175x165x177 |
| 1.1 | 2.2 | 3 | 4...6.3 | LG7K06●●10 | 1.300 | 175x165x177 |
| 1.5 | 4 | 4 | 6...10 | LG7K09●●14 | 1.450 | 175x165x177 |
| 3 | 5.5 | 5.5 | 9...14 | LG7D12●●16 | 1.600 | 175x165x177 |
| 4 | 7.5 | 9 | 13...18 | LG7D18●●20 | 1.630 | 175x165x177 |
| 4 | 9 | 9 | 17...23 | LG7D18●●21 | 1.630 | 175x165x177 |

Voltage codes ⁽³⁾

| Volts ~ 50/60 Hz | 24 | 220/230 | 230 | 380/400 | 400 | 400/415 for LG7K) |
|-------------------|----|---------|-----|---------|-----|-------------------|
| LG7K, LG7D | B7 | M7 | P7 | Q7 | V7 | N7 |

⁽¹⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽²⁾ **LG7K09, D12, D18**: the Emergency Stop function is performed by an undervoltage trip module acting on the circuit breaker. This circuit breaker is always pre-wired for use on 380/400/415 V 50 Hz supply.

For a 60 Hz supply, please consult your Regional Sales Office.

⁽³⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

⁽⁴⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.



LG1K065

For Control + Visible Isolation + Short circuit / Overload Protection

Enclosed safety motor starters complying with IEC 60204-1 "Safety of machinery" standards.

- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Emergency stop
- Electrical circuit isolation, lockable with up to 3 padlocks
- Short circuit protection
- Overload protection
- Undervoltage protection (with additional undervoltage release module). Switching back on power supply after tripping must be a deliberate action.

Range:

- 12 pre-equipped enclosed safety starters from 0.06 to 9 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529 : IP55, IK07
- Ambient air temperature in operation -5 to + 40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate ⁽¹⁾
- Enclosure cannot be opened when energized in position "I".

Included:

- 1 GV2ME thermal magnetic circuit breaker
- 1 LC1K (LG1K starters) or LC1D (LG1D starters) pre-wired contactor
- Switch with rotary red/yellow handle for isolation and emergency
- 2 Harmony XB5 pushbuttons.

Additional GVAX●● undervoltage release module – to be ordered separately.
Additional GV2SN●● indicator light – to be ordered separately.

Non-reversing starters (with rotary operator for control of isolation) Enclosure cannot be opened when energised in position "I".

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Circuit breaker Setting range of thermal trips | Dust & damp protected starter Basic reference, to be completed by adding the voltage code ⁽²⁾ | Weight | Overall dimensions ⁽³⁾ WxHxD |
|--|-----------|-------|--|--|--------|---|
| 220/230 V | 400/415 V | 440 V | A | | kg | |
| – | 0.06 | 0.06 | 0.16...0.25 | LG1K065●●02 | 0.970 | 175x165x165 |
| 0.06 | 0.09 | 0.12 | 0.25...0.40 | LG1K065●●03 | 0.970 | 175x165x165 |
| – | 0.18 | 0.18 | 0.40...0.63 | LG1K065●●04 | 0.970 | 175x165x165 |
| 0.12 | 0.25 | 0.25 | 0.63...1 | LG1K065●●05 | 0.970 | 175x165x165 |
| 0.25 | 0.55 | 0.55 | 1...1.6 | LG1K065●●06 | 0.970 | 175x165x165 |
| 0.37 | 0.75 | 1.1 | 1.6...2.5 | LG1K065●●07 | 0.970 | 175x165x165 |
| 0.75 | 1.5 | 1.5 | 2.5...4 | LG1K065●●08 | 0.970 | 175x165x165 |
| 1.1 | 2.2 | 3 | 4...6.3 | LG1K065●●10 | 0.970 | 175x165x165 |
| 1.5 | 4 | 4 | 6...10 | LG1K095●●14 | 1.120 | 175x165x165 |
| 3 | 5.5 | 5.5 | 9...14 | LG1D122●●16 | 1.270 | 175x165x165 |
| 4 | 7.5 | 9 | 13...18 | LG1D182●●20 | 1.290 | 175x165x165 |
| 4 | 9 | 9 | 17...23 | LG1D182●●21 | 1.290 | 175x165x165 |

Voltage codes ⁽²⁾

| Volts ~ 50/60 Hz | 220/230 | 230 | 380/400 | 400 | 400/415 (for LG1K) |
|------------------|---------|-----|---------|-----|--------------------|
| LG1K, LG1D | M7 | P7 | Q7 | V7 | N7 |

⁽¹⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽²⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

⁽³⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.



PB111680 eps



LJ7K06

Enclosed starters

For Control + Isolation + Short circuit / Overload Protection, with isolated 24 V control circuit

Enclosed safety motor starters complying with IEC 60204-1 "Safety of machinery" standards.

- ON/OFF motor starters: 1-way rotation control of 3-phase motor
 - Emergency stop ⁽¹⁾
 - Electrical circuit isolation, lockable on LJ7K09 with up to 3 padlocks
 - Short circuit protection
 - Overload protection
 - Protection against voltage drops for LJ7K09. For LJ7K06, a GVAX●● undervoltage trip may be added
 - Possible signaling with GV2SN●● indicator (to be ordered separately).
- Switching back on power supply after tripping must be a deliberate action.

Range:

- 9 pre-equipped enclosed safety starters from 0.06 to 4 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (U_e) 690 V
- Operating position: same that as contactors
- Material: polycarbonate ⁽²⁾.

Included:

- 1 GV2ME thermal magnetic circuit breaker with mushroom emergency stop (release on ¼ turn),
 - 1 LC1K pre-wired contactor
 - 2 Harmony XB5 pushbuttons
 - 1 Integral transformer: 400/24 V, 25 VA
 - 1 GVAX undervoltage release module (with LJ7K09).
- Additional GVAX●● undervoltage release module for LJ7K06 - to be ordered separately.
Additional GV2SN●● indicator light – to be ordered separately.
- Terminal allowing the connection of a volt-free contact, if required, in the control circuit.

Non-reversing motor starters with integral transformer, pre-wired for operation on a 3-phase 380 to 400 V 50 Hz supply (with pushbutton control of isolator function)

| Standard power ratings of 3-phase motors 50 Hz in category AC-3 | Circuit breaker | Dust and damp protected starter | Weight | Overall dimensions ⁽⁵⁾ WxHxD |
|---|--------------------------------|---------------------------------|--------|---|
| 380/400 V | Setting range of thermal trips | Reference ^{(3) (4)} | | |
| kW | A | | kg | |
| 0.06 | 0.16...0.25 | LJ7K06Q702 | 2.270 | 175x165x177 |
| 0.09 | 0.25...0.40 | LJ7K06Q703 | 2.270 | 175x165x177 |
| 0.25 | 0.63...1 | LJ7K06Q705 | 2.270 | 175x165x177 |
| 0.55 | 1...1.6 | LJ7K06Q706 | 2.270 | 175x165x177 |
| 0.75 | 1.6...2.5 | LJ7K06Q707 | 2.270 | 175x165x177 |
| 1.5 | 2.5...4 | LJ7K06Q708 | 2.270 | 175x165x177 |
| 2.2 | 4...6.3 | LJ7K06Q710 | 2.270 | 175x165x177 |
| 4 | 6...10 | LJ7K09Q714 | 2.270 | 175x165x146 |

Variants (pre-assembled) ⁽⁴⁾

| Description | Variants available for starter | Suffix to be added to the starter reference ⁽⁶⁾ |
|---|--------------------------------|--|
| With Emergency Stop No control pushbuttons | LJ7K06Q705...K09Q714 | A04 |
| With padlocking facility (fitted as standard on LJ7 K09) | LJ7K06Q705...K06Q710 | A29 |
| Without circuit breaker ⁽⁸⁾ (or undervoltage release voltage) | LJ7 | ⁽⁷⁾ |
| Without circuit breaker ⁽⁸⁾ With Emergency Stop No control pushbuttons | LJ7K09Q7 | A04 |
| Without circuit breaker ⁽⁸⁾ Without Emergency Stop (if the emergency stop is on the machine) | LJ7K09Q7 | A39 |
| Without circuit breaker ⁽⁸⁾ Without Emergency Stop No control pushbuttons | LJ7K09Q7 | A04A39 |

- (1) LJ7K06: the mushroom head type Emergency Stop acts mechanically on the circuit breaker.
LJ7K09: the Emergency Stop function is performed by an undervoltage trip GVAX385, acting on the circuit breaker.
This circuit breaker is always supplied pre-wired for use on 380/400 V 50 Hz.
- (2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
- (3) In the reference, the voltage code Q7 (380/400 V) indicates the power supply voltage to which the starter will be connected, it being assumed that the contactor has a ~ 24 V coil (see control circuit scheme).
- (4) Some combinations of variants / control voltage may not be available. Please consult us.
- (5) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.
- (6) Example: LJ7K06Q705A04.
- (7) Delete the last 2 digits of the selected starter reference.
Example: LJ7K06Q705 becomes LJ7K06Q7.
- (8) Circuit breaker to be ordered separately.
References GV2ME: see chapter B6 "Circuit breakers".

TeSys Control

Enclosed safety starters / Reverser / Ready-to-use

Product references



LG8K06



LG8K09

For Control + Isolation + Short circuit / Overload Protection

For OEM, the enclosed safety motor reverser starters comply with IEC 60204-1 "Safety of machinery" standards.

- ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
- Emergency stop ⁽¹⁾
- Electrical circuit isolation, lockable on LG8K09 and LG8K12 with up to 3 padlocks
- Short circuit protection (switching back on power supply after tripping must be a deliberate action)
- Overload protection
- Protection against voltage drops for LG8K09, LG8K12. For LG8K06, a GVAX●● undervoltage trip may be added.
- Possible signaling with GV2SN●● indicator (to be ordered separately).

Range:

- 10 pre-equipped enclosed safety inverter starters from 0.06 to 5.5 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1 ⁽¹⁾
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate ⁽²⁾.

Included:

- 2 LC1K prewired contactors
- 1 GV2ME thermal magnetic circuit breaker with mushroom emergency stop (release on ¼ turn)
- 1 "Stop" black pushbutton + 1 2-position spring return selector switch "I – II"
- 1 GVAX undervoltage release module with LG8K09, LG8K12 (to be ordered separately for LG8K06).

Reversing starters (with pushbutton control of isolation)

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Circuit breaker Setting range of thermal trips | Dust & damp protected starter Basic reference, to be completed by adding the voltage code ⁽³⁾ | Weight | Overall dimensions ⁽⁴⁾ WxHxD |
|--|-----------|-------|--|--|--------|---|
| 220/230 V | 400/415 V | 440 V | A | | kg | |
| – | 0.06 | 0.06 | 0.16...0.25 | LG8K06●●02 | 1.640 | 175x165x177 |
| 0.06 | 0.09 | 0.12 | 0.25...0.40 | LG8K06●●03 | 1.640 | 175x165x177 |
| – | 0.18 | 0.18 | 0.40...0.63 | LG8K06●●04 | 1.640 | 175x165x177 |
| 0.12 | 0.25 | 0.25 | 0.63...1 | LG8K06●●05 | 1.640 | 175x165x177 |
| 0.25 | 0.55 | 0.55 | 1...1.6 | LG8K06●●06 | 1.640 | 175x165x177 |
| 0.37 | 0.75 | 1.1 | 1.6...2.5 | LG8K06●●07 | 1.640 | 175x165x177 |
| 0.75 | 1.5 | 1.5 | 2.5...4 | LG8K06●●08 | 1.640 | 175x165x177 |
| 1.1 | 2.2 | 3 | 4...6.3 | LG8K06●●10 | 1.640 | 175x165x177 |
| 1.5 | 4 | 4 | 6...10 | LG8K09●●14 | 1.640 | 175x165x177 |
| 3 | 5.5 | 5.5 | 9...14 | LG8K12●●16 | 1.640 | 175x165x177 |

Voltage codes ⁽³⁾

| Volts ~ 50/60 Hz | 220/230 | 380/400 | 400/415 |
|------------------|---------|---------|---------|
| | M7 | Q7 | N7 |

⁽¹⁾ **LG8K06**: the mushroom head type Emergency Stop acts mechanically on the circuit breaker. **LG8K09, LG8K12**: the Emergency Stop function is performed by an undervoltage trip, acting on the circuit breaker.

This circuit breaker is always supplied pre-wired for use on 380/400/415 V 50 Hz. For a 60 Hz supply, please consult your Regional Sales Office.

⁽²⁾ Avoid allowing the material to come into contact with strong bases (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽³⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

⁽⁴⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.



PB111998.eps



LJ8K06

PB111999.eps



LJ8K09



For Control + Isolation + Short circuit /Overload Protection, with isolated 24 V control circuit

For OEM, the enclosed safety motor reverser starters comply with IEC 60204-1 "Safety of machinery" standards.

- ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
- Emergency stop ⁽¹⁾
- Electrical circuit isolation, lockable on LJ8K09 with up to 3 padlocks
- Short circuit protection (switching back on power supply after tripping must be a deliberate action)
- Overload protection
- Protection against voltage drops for LJ8K09. For LJ8K06, a GVAX●● undervoltage trip may be added
- Possible signaling with GV2SN●● indicator (to be ordered separately).

Range:

- 9 pre-equipped enclosed safety inverter starters from 0.06 to 4 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate ⁽²⁾.

Included:

- 2 LC1K prewired contactors
- 1 GV2ME thermal magnetic circuit breaker with mushroom emergency stop (release on ¼ turn)
- 1 Integral transformer: 400/24 V, 25 VA
- 1 "Stop" black pushbutton + 1 2-position spring return selector switch "I – II"
- 1 GVAX undervoltage release module with LJ8K09 (to be ordered separately for LJ8K06).
- Terminal allowing the connection of a volt-free contact, if required, in the control circuit.

Reversing motor starters with integral transformer, pre-wired for operation on a 3-phase 380 to 400 V 50 Hz supply (with pushbutton control of isolator function)

| Standard power ratings of 3-phase motors 50 Hz in category AC-3 380/400 V | Circuit breaker | Dust and damp protected starter | Weight | Overall dimensions ⁽⁵⁾ WxHxD |
|--|--------------------------------|---------------------------------|--------|--|
| | Setting range of thermal trips | Reference ^{(3) (4)} | | |
| kW | A | | kg | |
| 0.06 | 0.16...0.25 | LJ8K06Q702 | 2.650 | 175x165x177 |
| 0.18 | 0.40...0.63 | LJ8K06Q704 | 2.650 | 175x165x177 |
| 0.25 | 0.63...1 | LJ8K06Q705 | 2.650 | 175x165x177 |
| 0.55 | 1...1.6 | LJ8K06Q706 | 2.650 | 175x165x177 |
| 0.75 | 1.6...2.5 | LJ8K06Q707 | 2.650 | 175x165x177 |
| 1.5 | 2.5...4 | LJ8K06Q708 | 2.650 | 175x165x177 |
| 2.2 | 4...6.3 | LJ8K06Q710 | 2.650 | 175x165x177 |
| 4 | 6...10 | LJ8K09Q714 | 2.650 | 175x165x146 |

Variants (pre-assembled) ⁽⁴⁾

| Description | Variants available for starter | Suffix to be added to the starter reference |
|---|--------------------------------|---|
| Without circuit breaker ⁽⁷⁾ (or undervoltage release voltage) | LJ8 | ⁽⁶⁾ |

⁽¹⁾ LJ8K06: the mushroom head type Emergency Stop acts mechanically on the circuit breaker. LJ8K09: the Emergency Stop function is performed by an undervoltage trip GVAX385, acting on the circuit breaker. This circuit breaker is always supplied pre-wired for use on 380/400 V 50 Hz.

⁽²⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽³⁾ In the reference, the voltage code Q7 (380/400 V) indicates the power supply voltage to which the starter will be connected, it being assumed that the contactor has a ~ 24 V coil (see control circuit scheme).

⁽⁴⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.

⁽⁵⁾ Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

⁽⁶⁾ Delete the last 2 digits of the selected starter reference. Example: LJ8K09Q714 becomes LJ8K09Q7.

⁽⁷⁾ Circuit breaker to be ordered separately. References GV2ME: see chapter B6 "Circuit breakers".

TeSys Control

Enclosure for safety starters / DOL / to be completed with ref. GV2ME, GVAX

Product references



GV2MCK04



GV2ME●●



GVAX●●●

GV2MCK04 enclosure is fitted with a mushroom pushbutton. It allows, with addition of a circuit breaker and undervoltage trip, the construction of a safety direct-on-line starter conforming INRS and VDE0113.

Enclosures characteristics:

- Conforming to IEC 60947-2; IEC 60947-4-1
- Degree of protection according IEC 60529: refer to selection chart
- Operational voltage (Ue) 690 V
- Material : polycarbonate ⁽¹⁾.

Enclosure

Enclosure for thermal-magnetic circuit breakers GV2ME

| Type | Degree of protection | Possible no. of side mounting auxiliary contact blocks on GV2ME | | Reference | Weight kg | Overall dimensions WxHxD |
|--|----------------------|---|---------|-----------------|-----------|--------------------------|
| | | LH side | RH side | | | |
| Surface mounting, double insulated with protective conductor. Sealable cover | IP55 | 1 | 1 | GV2MCK04 | 0.420 | 93x147x145.5 |

GV2ME circuit breaker, GVAX undervoltage trip

Product references: page A1/32.

⁽¹⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).



TeSys Control

Enclosures, components,
for customer assemblies
Spare parts



TeSys Control

Enclosures / To be completed with switch bodies

Product references

Enclosed starters



VCFXGE4



VBFXGE2



V0



V4

Empty enclosures with rotary handle

IP65 enclosure with red padlockable handle operator and yellow front plate (for mounting a main or Emergency Stop switch-disconnector)

| lthe | For switch body | Nb. of possible add. module attachments | Reference ⁽¹⁾ | Weight |
|-------------|------------------------|---|--------------------------|--------|
| A | | | | |
| kg | | | | |
| 10...32 | VN12, VN20 V02...V2 | 2 | VCFXGE1 | 0.340 |
| 10...32 | V02...V2 | 4 | VCFXGE4 | 0.660 |
| 50...63 | V3 - V4 | 3 | VCFXGE2 | 0.660 |
| 100.... 140 | V5 - V6 | 1 | VCFXGE6 | 1.04 |

IP65 enclosure with black padlockable handle and black front plate (for mounting a main switch-disconnector)

| | | | | |
|-------------|------------------------|---|---------|-------|
| 10...32 | VN12, VN20 V02...V2 | 2 | VBFXGE1 | 0.340 |
| 10...32 | V02...V2 | 4 | VBFXGE4 | 0.660 |
| 50...63 | V3-V4 | 3 | VBFXGE2 | 0.660 |
| 100.... 140 | V5 - V6 | 1 | VBFXGE6 | 1.04 |

Switch bodies to fit VCFX, VBFX enclosures ⁽²⁾

Standard applications

| Description | Rating | Reference | Weight |
|--------------------------------|--------|-----------|--------|
| A | | | |
| kg | | | |
| 3-pole switch-disconnectors | 10 | VN12 | 0.110 |
| | 16 | VN20 | 0.110 |

High performance applications

| Description | Rating | Reference | Weight |
|--------------------------------|--------|-----------|--------|
| A | | | |
| kg | | | |
| 3-pole switch-disconnectors | 10 | V02 | 0.200 |
| | 16 | V01 | 0.200 |
| | 20 | V0 | 0.200 |
| | 25 | V1 | 0.200 |
| | 32 | V2 | 0.200 |
| | 50 | V3 | 0.500 |
| | 80 | V4 | 0.500 |
| | 125 | V5 | 0.900 |
| 175 | V6 | 0.900 | |

⁽¹⁾ Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽²⁾ For characteristics of switch-disconnectors, please consult your Regional Sales Office.

TeSys Control

Enclosures for DOL starters / To be completed with ref. GV2ME, LC1K

Product references



LE1GVMEK, LE1GVMEKA59

Empty enclosures with sealing device

| Composition | Reference |
|---|-------------|
| Insulating enclosure with GV2E01 sealing device | LE1GVMEK |
| Insulating enclosure with GV2E01 sealing device, neutral terminal | LE1GVMEKA59 |

Direct-on-line starters characteristics

(based on LE1GVMEK enclosure + GV2ME circuit breaker + LC1K contactor assemblies)

Functions / range / specificities:

- Circuit Isolation
- Protection against short circuit
- Motor protection: motor OFF in case of overload – manual reset with the black pushbutton.
- ON/OFF motor control
- Functions can be completed with optional components: remote control, signaling.

Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection IP55 , according IEC 60529
- Ambient air temperature in operation -5 to +40°C
- Operating position: same as K series contactors
- Material: polycarbonate ⁽¹⁾.

■ 6 ratings of direct-on-line starters from 0.37 to 5.5 kW (400 V AC) can be realized, based the combinations of circuit breaker + contactor to be ordered separately:

- GV2ME thermal magnetic circuit breaker, of the required rating (see below)
- LC1K contactor, of the required rating (see below)
- optional accessories (indicating light, On pushbutton, sealing kit...).

Circuit breakers + contactors - Type 1 coordination ⁽²⁾

| Standard power ratings of 3-phase motors 50/60 Hz in AC-3 | | | Setting range of thermal trips | Fixed magnetic current 13 Irth | For customer assembly | |
|---|-------|-------|--------------------------------|--------------------------------|---------------------------------|---|
| 400/415 V | 440 V | 500 V | | | Motor circuit breaker Reference | Contactor Reference to be completed with the coil voltage code ⁽³⁾ |
| kW | kW | kW | A | A | | |
| 0.37 | 0.37 | 0.37 | 1...1.6 | 22.5 | GV2ME06 | LC1K0610●● |
| 0.55 | 0.55 | 0.55 | - | - | - | - |
| - | - | 0.75 | - | - | - | - |
| 0.75 | 0.75 | - | 1.6...2.5 | 33.5 | GV2ME07 | LC1K0610●● |
| - | 1.1 | 1.1 | - | - | - | - |
| 1.1 | - | 1.5 | 2.5...4 | 51 | GV2ME08 | LC1K0610●● |
| 1.5 | 1.5 | 2.2 | - | - | - | - |
| 2.2 | 2.2 | - | 4...6.3 | 78 | GV2ME10 | LC1K0610●● |
| - | 3 | 3 | - | - | - | - |
| 3 | - | 4 | 6...10 | 138 | GV2ME14 | LC1K0910●● |
| 4 | 4 | 5.5 | - | - | - | - |
| 5.5 | 5.5 | 7.5 | 9...14 | 170 | GV2ME16 | LC1K1210●● |

Coil voltage codes

| Volts | 24 | 110 | 220/230 | 230 | 230/240 | 380/400 |
|------------|-----|-----|---------|-----|---------|---------|
| ~ 50/60 Hz | B7 | F7 | M7 | P7 | U7 | Q7 |
| --- | BW3 | - | - | - | - | - |

BW3 coil: low consumption (1.5 W), wide range (0.7...1.3 Uc) with integral suppression device as standard.

⁽¹⁾ Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

⁽²⁾ Extract from Coordination tables see chapter A6.

⁽³⁾ Please check the availability of your variant in the index page A1/34. The SEARCH function of your viewer can be used.



GV2ME●●



LC1K0610●●



TeSys Control

Empty enclosures for standard starters

Product references

Enclosed starters

PB112264.eps



DE1DS1A04

PB112269.eps



DE1DS1A05

PB112269.eps



DE1DS1

PB112276.eps



DE1DS1A13

Empty enclosures for starters without isolating device

| Head(s) mounted on cover | Designed for use with | Reference |
|--|-----------------------|-----------|
| Without | LE1D09 and D12 | DE1DS1A04 |
| | LE1D18...D35 | DE1DS2A04 |
| | LE2D09...D35 | DE1DS2A04 |
| 1 flush blue head "R" | LE1D09 and D12 | DE1DS1A05 |
| | LE1D18...D35 | DE1DS2A05 |
| | LE2D09...D35 | DE1DS2A05 |
| 1 flush green head "I" 1 projecting red head "O" | LE1D09 and D12 | DE1DS1 |
| | LE1D18...D35 | DE1DS2 |
| 1 flush blue head "R" 1 switch with 2 fixed positions | LE1D09 and D12 | DE1DS1A13 |
| | LE1D18...D35 | DE1DS2A13 |

TeSys Control

Empty enclosures for safety starters

Product references

PB11091.eps



DE1KS217A06

PB11090.eps



DE1KS217A06A37

Empty enclosures for security starters

| Designed for use with | Head(s) mounted on cover | Add-on blocks | Reference |
|-----------------------|--------------------------|---------------|-------------|
| LG7 | Without | | DE1KS217A04 |

1 flush white head "I"
1 projecting black head "O"

DE1KS217A06

1 flush white head "I"
1 projecting black head "O"
1 head emergency stop

Padlocking devices

DE1KS217A06A37

Enclosed starters



TeSys Control

TeSys Control accessories for standard and safety starters

Product references

Enclosed starters



GV2V01



GV2K011



GV2K021



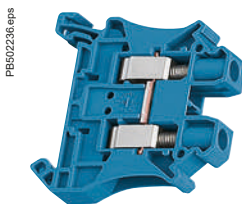
GV2K031



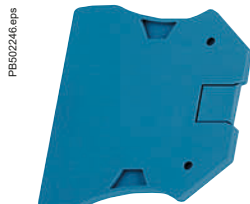
GV2K04



GV2E01 – GV2E02



NSYTRV62BL



NSYTRAC22BL



GV2CP21

| Accessories | | | | | |
|---|--------------------------------|---|-----------------------|-----------|-------|
| Description | | Sold in lots of | Unit reference | Weight kg | |
| Padlocking device ⁽⁶⁾ for GV2ME operator (padlocking is only possible in the "O" position) | 1 to 3 padlocks Ø 4 to 8 mm | 1 | GV2V01 | 0.075 | |
| Mushroom head Spring return ⁽²⁾ pushbutton Ø 40 mm, red, IP55 | | 1 | GV2K011 | 0.052 | |
| Emergency stop Latching ⁽²⁾ | Key release, key n° 455 | 1 | GV2K021 | 0.160 | |
| | Turn to release | 1 | GV2K031 | 0.115 | |
| | Turn to release, padlockable | 1 | GV2K04 ⁽¹⁾ | 0.120 | |
| Sealing kit | For enclosures and front plate | IP 55 for temperature between +5 °C and +40 °C | 10 | GV2E01 | 0.012 |
| | | IP 55 for temperature between -20 °C and +40 °C | 10 | GV2E02 | 0.012 |
| Linery passthrough neutral terminal block – 6 mm ² 41 A single-level 1x1 screw | | 50 | NSYTRV62BL | 0.015 | |
| End cover for Linery screw single-level terminal block | | 50 | NSYTRAC22BL | 0.003 | |

⁽¹⁾ Circuit breaker to be ordered separately. Commercial references of GV2ME01 to M22: see chapter B6 "Circuit breakers".

⁽²⁾ Supplied with IP55 GV2E01 sealing kit. To be fitted with enclosure GV2M●01.

⁽³⁾ Padlockable in "O" position using Ø 4 to 8 mm shank padlocks.

Separate front plate for GV2ME

Provides a sealing cover to GV2ME circuit breaker, on any kind of front panel.

| Front plate | | | |
|---|------|-----------|-----------|
| Description | | Reference | Weight kg |
| For direct control, through a panel, of a chassis mounted GV2ME | IP55 | GV2CP21 | 0.800 |

TeSys Control

TeSys Control accessories for standard and safety starters

Product references

Enclosed starters



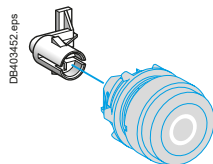
ZB5AA331



ZB5AL432



LAD9091



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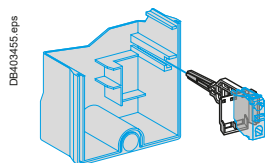
ZB5AD●



ZENL1111



LAD90909



D6403465.eps

Heads for Start and Stop/Reset pushbuttons

| Description | For use on | Unit reference |
|------------------------------------|------------------------------------|----------------|
| Flush, green "I" ⁽¹⁾ | LE1, LE3, LE4, LE6 D09...D35 | ZB5AA331 |
| Projecting, red "O" ⁽¹⁾ | LE●D09...D35 | ZB5AL432 |
| Adaptation kit for head ZB5AL432 | LE1D09 and D12 | LAD9091 |
| | LE1D18...D35, LE2D09...D35 | LAD91810 |
| | LE3, LE4, LE6 and LE8 D09...D35 | LAD9T4 |

Heads for Reset pushbuttons

| | | |
|---|-----------------------------------|-------------------------|
| Flush, blue "R" ⁽²⁾ | LE●D09...D35 | ZB5AA0 |
| | | + ZBA639 ⁽³⁾ |
| Adaptation kit for head ZB5AA0 + ZBA639 | LE1D09 and D12 | LAD9092 |
| | LE1D18...D35, LE2D09...D35 | LAD91810 |
| | LE3, LE6, LE4 and LE8D09...D35 | LAD9T4 |

Heads for selector switches

| | | |
|------------------------------------|------------------------------|--------|
| 3-position stay put | LE1D09...D35●●A09 | ZB5AD3 |
| 2-position stay put | LE1D09...D35●●A13 | ZB5AD2 |
| 3-position spring return to centre | LE2D09...D35 LE8D09...D35 | ZB5AD5 |

Contact blocks

| | | |
|----------------------------|---|----------|
| 1 N/O spring return | LE●D09...D35 | ZENL1111 |
| 1 N/C spring return | LE●D09...D35 | ZENL1121 |
| Mounting for contact block | LE1D09 and D12 | LAD90909 |
| | LE1D18...D35, LE2, LE3, LE4, LE6 and LE8D09...D35 | LAD91809 |

⁽¹⁾ Remember to order adaptation kit LAD9091 or LAD91810 or LAD9T4, depending on size.

⁽²⁾ Remember to order adaptation kit LAD9092 or LAD91810 or LAD9T4, depending on size.

⁽³⁾ Sold in lots of 10.

TeSys Control

Deca circuit breakers ref. GV2ME, undervoltage trips

Product references

Enclosed starters

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GV2ME●●

Thermal magnetic circuit breakers, with screw clamp terminals

GV2ME with pushbutton control

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Setting range of thermal trips (2) | Magnetic tripping current I _d ± 20 % | Reference |
|---|-----------------|---------------------|-------|-----------------|---------------------|-------|-----------------|---------------------|--|--|-------------|
| 400/415 V | | | 500 V | | | 690 V | | | | | |
| P | I _{cu} | I _{cs} (1) | P | I _{cu} | I _{cs} (1) | P | I _{cu} | I _{cs} (1) | | | |
| kW | kA | % | kW | kA | % | kW | kA | % | A | A | |
| – | – | – | – | – | – | – | – | – | 0.1...0.16 | 1.5 | GV2ME01 |
| 0.06 | ★ | ★ | – | – | – | – | – | – | 0.16...0.25 | 2.4 | GV2ME02 |
| 0.09 | ★ | ★ | – | – | – | – | – | – | 0.25...0.40 | 5 | GV2ME03 |
| 0.12 | ★ | ★ | – | – | – | 0.37 | ★ | ★ | 0.40...0.63 | 8 | GV2ME04 |
| 0.18 | ★ | ★ | – | – | – | – | – | – | | | |
| 0.25 | ★ | ★ | – | – | – | 0.55 | ★ | ★ | 0.63...1 | 13 | GV2ME05 |
| 0.37 | ★ | ★ | 0.37 | ★ | ★ | – | – | – | 1...1.6 | 22.5 | GV2ME06 |
| 0.55 | ★ | ★ | 0.55 | ★ | ★ | 0.75 | ★ | ★ | | | |
| – | – | – | 0.75 | ★ | ★ | 1.1 | ★ | ★ | 1.6...2.5 | 33.5 | GV2ME07 |
| 0.75 | ★ | ★ | 1.1 | ★ | ★ | 1.5 | 3 | 75 | | | |
| 1.1 | ★ | ★ | 1.5 | ★ | ★ | 2.2 | 3 | 75 | 2.5...4 | 51 | GV2ME08 |
| 1.5 | ★ | ★ | 2.2 | ★ | ★ | 3 | 3 | 75 | | | |
| 2.2 | ★ | ★ | 3 | 50 | 100 | 4 | 3 | 75 | 4...6.3 | 78 | GV2ME10 |
| 3 | ★ | ★ | 4 | 10 | 100 | 5.5 | 3 | 75 | 6...10 | 138 | GV2ME14 |
| 4 | ★ | ★ | 5.5 | 10 | 100 | 7.5 | 3 | 75 | | | |
| 5.5 | 15 | 50 | 7.5 | 6 | 75 | 9 | 3 | 75 | 9...14 | 170 | GV2ME16 |
| – | – | – | – | – | – | 11 | 3 | 75 | | | |
| 7.5 | 15 | 50 | 9 | 6 | 75 | 15 | 3 | 75 | 13...18 | 223 | GV2ME20 |
| 9 | 15 | 40 | 11 | 4 | 75 | 18.5 | 3 | 75 | 17...23 | 327 | GV2ME21 |
| 11 | 15 | 40 | 15 | 4 | 75 | – | – | – | 20...25 | 327 | GV2ME22 (3) |

GV2ME technical characteristics: see in chapter B6.

Undervoltage trip, INRS (can only be mounted on GV2ME) Safety device for dangerous machines conforming to INRS and VDE0113

| Side (1 block on RH side of circuit breaker GV2 ME) | Voltage | Frequency | Reference |
|---|-------------|-----------|-----------|
| | 110...115 V | 50 Hz | GVAX115 |
| | | 60 Hz | GVAX116 |
| | 127 V | 60 Hz | GVAX115 |
| | | 60 Hz | GVAX225 |
| | 220...240 V | 50 Hz | GVAX225 |
| | | 60 Hz | GVAX226 |
| | 380...400 V | 50 Hz | GVAX385 |
| | | 60 Hz | GVAX386 |
| | 415...440 V | 50 Hz | GVAX415 |
| | 440 V | 60 Hz | GVAX385 |

GVAX technical characteristics: see in chapter B6.

(1) As % of I_{cu}.

(2) The thermal trip setting must be within the range marked on the graduated knob.

(3) Maximum rating which can be mounted in enclosures GV2MC or MP, please consult your Regional Sales Office.

★ > 100 kA.

PB121677.eps



GVAX●●●

TeSys Control

LR2K, Deca thermal overload relays

Product references

PB121461-695



LR2K●●

Thermal overload relays - selection table

LR2K thermal overload relays can be mounted on all 3P LC1K contactors with screw clamp connectors.

Class 10 A (the standard specifies a tripping time of between 2 and 10 seconds at 7.2 In)

| Relay setting range | Fuses to be used with selected relay Maximum rating Type | | | Reference |
|---------------------|--|-----|------|-----------|
| | aM | gG | BS88 | |
| A | A | A | A | |
| 0.11...0.16 | 0.25 | 0.5 | – | LR2K0301 |
| 0.16...0.23 | 0.25 | 0.5 | – | LR2K0302 |
| 0.23...0.36 | 0.5 | 1 | – | LR2K0303 |
| 0.36...0.54 | 1 | 1.6 | – | LR2K0304 |
| 0.54...0.8 | 1 | 2 | – | LR2K0305 |
| 0.8...1.2 | 2 | 4 | 6 | LR2K0306 |
| 1.2...1.8 | 2 | 6 | 6 | LR2K0307 |
| 1.8...2.6 | 4 | 8 | 10 | LR2K0308 |
| 2.6...3.7 | 4 | 10 | 16 | LR2K0310 |
| 3.7...5.5 | 6 | 16 | 16 | LR2K0312 |
| 5.5...8 | 8 | 20 | 20 | LR2K0314 |
| 8...11.5 | 10 | 25 | 20 | LR2K0316 |
| 10...14 | 16 | 32 | 25 | LR2K0321 |
| 12...16 | 20 | 40 | 32 | LR2K0322 |

Enclosed starters

PB121670-01




LRD●●

LRD thermal overload relays can only be mounted on LC1D contactors of same size ratio and with screw clamp connectors.

| Relay setting range (A) | Fuses to be used with selected relay | | | For use with contactor LC1 | Reference |
|---|--------------------------------------|--------|----------|----------------------------|-----------|
| | aM (A) | gG (A) | BS88 (A) | | |
| Class 10 A⁽¹⁾ for connection by screw clamp terminals or connectors | | | | | |
| 0.10...0.16 | 0.25 | 2 | – | D09...D38 | LRD01 |
| 0.16...0.25 | 0.5 | 2 | – | D09...D38 | LRD02 |
| 0.25...0.40 | 1 | 2 | – | D09...D38 | LRD03 |
| 0.40...0.63 | 1 | 2 | – | D09...D38 | LRD04 |
| 0.63...1 | 2 | 4 | – | D09...D38 | LRD05 |
| 1...1.6 | 2 | 4 | 6 | D09...D38 | LRD06 |
| 1.6...2.5 | 4 | 6 | 10 | D09...D38 | LRD07 |
| 2.5...4 | 6 | 10 | 16 | D09...D38 | LRD08 |
| 4...6 | 8 | 16 | 16 | D09...D38 | LRD10 |
| 5.5...8 | 12 | 20 | 20 | D09...D38 | LRD12 |
| 7...10 | 12 | 20 | 20 | D09...D38 | LRD14 |
| 9...13 | 16 | 25 | 25 | D12...D38 | LRD16 |
| 12...18 | 20 | 35 | 32 | D18...D38 | LRD21 |
| 16...24 | 25 | 50 | 50 | D25...D38 | LRD22 |
| 23...32 | 40 | 63 | 63 | D25...D38 | LRD32 |
| 30...38 | 40 | 80 | 80 | D32 and D38 | LRD35 |

| | | | |
|----------------|--------------|--------------|------------|
| DE1DS1 | KZ16 | LE1D18N7A04 | LE1M35N705 |
| DE1DS1A04 | KZ18 | LE1D18P7 | LE1M35N706 |
| DE1DS1A05 | KZ20 | LE1D18P7A04 | LE1M35N707 |
| DE1DS1A13 | KZ21 | LE1D18P7A05 | LE1M35N708 |
| DE1DS2 | KZ27 | LE1D18P7A13 | LE1M35N710 |
| DE1DS2A04 | KZ28 | LE1D18Q7 | LE1M35N712 |
| DE1DS2A05 | KZ30 | LE1D18Q7A09 | LE1M35N714 |
| DE1DS2A13 | KZ50 | LE1D18R7 | LE1M35N716 |
| DE1KS217A04 | KZ52 | LE1D18U7 | LE1M35N721 |
| DE1KS217A06 | KZ62 | LE1D18V7 | LE1M35N722 |
| DE1KS217A06A29 | KZ65 | LE1D18V7A04 | LE1M35P7 |
| DE1KS217A06A37 | KZ66 | LE1D18V7A05 | LE1M35P705 |
| DE1KS217A29 | KZ67 | LE1D18V7A13 | LE1M35P706 |
| DE1KS217A29A37 | KZ77 | LE1D25B7 | LE1M35P707 |
| DE1KS217A37 | KZ93 | LE1D25F7 | LE1M35P708 |
| DE2DS2 | LAD90909 | LE1D25M7 | LE1M35P710 |
| DK1FB005 | LAD9091 | LE1D25M7A09 | LE1M35P712 |
| GC2530M5D | LAD9092 | LE1D25N7 | LE1M35P714 |
| GV2CP21 | LAD91809 | LE1D25P7 | LE1M35P716 |
| GV2E01 | LAD91810 | LE1D25P7A04 | LE1M35P721 |
| GV2E02 | LAD9T4 | LE1D25P7A05 | LE1M35P722 |
| GV2E03 | LC1KV7A80 | LE1D25P7A13 | LE1M35Q7 |
| GV2K011 | LE1D09B7 | LE1D25Q7 | LE1M35Q705 |
| GV2K021 | LE1D09E7 | LE1D25Q7A09 | LE1M35Q706 |
| GV2K031 | LE1D09F7 | LE1D25R7 | LE1M35Q707 |
| GV2K04 | LE1D09M7 | LE1D25U7 | LE1M35Q708 |
| GV2MC01 | LE1D09M7A04 | LE1D25V7 | LE1M35Q710 |
| GV2MC02 | LE1D09M7A13 | LE1D25V7A04 | LE1M35Q712 |
| GV2MC03 | LE1D09N7 | LE1D25V7A13 | LE1M35Q714 |
| GV2MCK04 | LE1D09N7A04 | LE1D35B7 | LE1M35Q716 |
| GV2ME01 | LE1D09P7 | LE1D35E7 | LE1M35Q721 |
| GV2ME02 | LE1D09P7A04 | LE1D35F7 | LE1M35Q722 |
| GV2ME03 | LE1D09P7A05 | LE1D35M7 | LE1M35R705 |
| GV2ME04 | LE1D09P7A09 | LE1D35N7 | LE1M35R706 |
| GV2ME05 | LE1D09P7A13 | LE1D35P7 | LE1M35R708 |
| GV2ME06 | LE1D09P7A13T | LE1D35P7A04 | LE1M35R710 |
| GV2ME07 | LE1D09P7A95 | LE1D35P7A05 | LE1M35R714 |
| GV2ME08 | LE1D09P7T | LE1D35Q7 | LE1M35R716 |
| GV2ME10 | LE1D09Q7 | LE1D35R7 | LE1M35R721 |
| GV2ME14 | LE1D09Q7A04 | LE1D35U7 | LE1M35R722 |
| GV2ME16 | LE1D09Q7A05 | LE1D35V7 | LE1M35U706 |
| GV2ME20 | LE1D09Q7A13 | LE1D40AFE7 | LE1M35U707 |
| GV2ME21 | LE1D09R7 | LE1D40AP7 | LE1M35U708 |
| GV2ME22 | LE1D09U7 | LE1D40AQ7 | LE1M35U710 |
| GV2MP01 | LE1D09U7A13 | LE1D50AFE7 | LE1M35U712 |
| GV2MP02 | LE1D09V7 | LE1D50AP7 | LE1M35U714 |
| GV2MP03 | LE1D09V7A04 | LE1D50AP7A04 | LE1M35U716 |
| GV2MP04 | LE1D09V7A09 | LE1D50AQ7 | LE1M35U721 |
| GV2PC01 | LE1D09V7A13 | LE1D65AP7 | LE1M35U722 |
| GV2PC02 | LE1D12E7 | LE1D65AP7A04 | LE1M35V7 |
| GV2SN23 | LE1D12F7 | LE1D65AQ7 | LE1M35V706 |
| GV2SN24 | LE1D12M7 | LE1GVMEK | LE1M35V707 |
| GV2SN33 | LE1D12M7A04 | LE1GVMEKA59 | LE1M35V708 |
| GV2SN34 | LE1D12M7A09 | LE1M35B705 | LE1M35V710 |
| GV2V01 | LE1D12N7 | LE1M35B706 | LE1M35V712 |
| GV3PC01 | LE1D12P7 | LE1M35B707 | LE1M35V714 |
| GV3PC02 | LE1D12P7A04 | LE1M35B710 | LE1M35V716 |
| GVAX115 | LE1D12P7A05 | LE1M35B712 | LE1M35V721 |
| GVAX116 | LE1D12P7A13 | LE1M35B714 | LE1M35V722 |
| GVAX225 | LE1D12Q7 | LE1M35B716 | LE2D09M7 |
| GVAX226 | LE1D12R7 | LE1M35F710 | LE2D09N7 |
| GVAX385 | LE1D12U7 | LE1M35M7 | LE2D09P7 |
| GVAX386 | LE1D12U7A09 | LE1M35M705 | LE2D09Q7 |
| GVAX415 | LE1D12V7 | LE1M35M706 | LE2D09U7 |
| KAD1PZ | LE1D12V7A04 | LE1M35M707 | LE2D09V7 |
| KCC1Y | LE1D12V7A05 | LE1M35M708 | LE2D12B7 |
| KZ101 | LE1D12V7A09 | LE1M35M710 | LE2D12N7 |
| KZ103 | LE1D12V7A13 | LE1M35M712 | LE2D12Q7 |
| KZ106 | LE1D18E7 | LE1M35M714 | LE2D12U7 |
| KZ13 | LE1D18F7 | LE1M35M716 | LE2D12V7 |
| KZ14 | LE1D18M7 | LE1M35M721 | LE2D18M7 |
| KZ15 | LE1D18N7 | LE1M35M722 | LE2D18N7 |

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| | | | |
|-------------|----------------|----------------|---------------|
| LE2D18P7 | LE4D12V7A05 | LG1K065Q703 | LG7K06P708 |
| LE2D18V7 | LE4D18B7 | LG1K065Q704 | LG7K06P710 |
| LE2D25M7 | LE4D18F7 | LG1K065Q705 | LG7K06Q7 |
| LE2D25N7 | LE4D18M7 | LG1K065Q706 | LG7K06Q702 |
| LE2D25P7 | LE4D18N7 | LG1K065Q706A37 | LG7K06Q704 |
| LE2D25V7 | LE4D18P7 | LG1K065Q707 | LG7K06Q705 |
| LE2D35P7 | LE4D18Q7 | LG1K065Q707A37 | LG7K06Q706 |
| LE2D35V7 | LE4D18U7 | LG1K065Q708 | LG7K06Q706A29 |
| LE2D40AP7 | LE4D18V7 | LG1K065Q708A37 | LG7K06Q707 |
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| LE2K065U7 | LE4D25P7A05 | LG1K095M7 | LG7K06V708 |
| LE2K065V7 | LE4D25Q7 | LG1K095M714 | LG7K06V710 |
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| LE2K095V7 | LE4D35B7 | LG1K095N714 | LG7K09M714 |
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| LE3D12B7 | LE6D09B7 | LG7D12N716 | LG8K06M702 |
| LE3D12M7 | LE6D12B7 | LG7D12P716 | LG8K06M704 |
| LE3D12N7 | LE6D12P7 | LG7D12Q716 | LG8K06M705 |
| LE3D12P7 | LE6D12V7 | LG7D12V716 | LG8K06M706 |
| LE3D12P7A04 | LE6D18B7 | LG7D18B720 | LG8K06M707 |
| LE3D12Q7 | LE6D18P7 | LG7D18B721 | LG8K06M710 |
| LE3D12U7 | LE6D18V7 | LG7D18M7 | LG8K06N705 |
| LE3D12V7 | LE8D09V7 | LG7D18M720 | LG8K06N706 |
| LE3D18B7 | LE8D12P7 | LG7D18M721 | LG8K06N707 |
| LE3D18M7 | LE8D12Q7 | LG7D18P720 | LG8K06Q7 |
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| LE4D09B7 | LG1D182Q7 | LG7K06M703 | LG8K09N714 |
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| LE4D09P7A04 | LG1K065M705 | LG7K06M705A04 | LJ7K06Q7 |
| LE4D09P7A05 | LG1K065M705A37 | LG7K06M705A29 | LJ7K06Q702 |
| LE4D09Q7 | LG1K065M706 | LG7K06M706 | LJ7K06Q703 |
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| LE4D12V7 | LG1K065Q7 | LG7K06N710 | LJ7K09Q7 |
| LE4D12V7A04 | LG1K065Q702 | LG7K06P704 | LJ7K09Q714 |

Enclosed starters

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TeSys Control

Enclosed switch-disconnectors and motor starters

Product references

Enclosed
starters

| | | | |
|----------------|---------|-----------|----------|
| LJ7K09Q714A04 | V6 | VCD0 | VVE4 |
| LJ7K09Q7A04A39 | VBD0 | VCD01 | VZ0 |
| LJ8K06Q702 | VBD01 | VCD02 | VZ01 |
| LJ8K06Q704 | VBD02 | VCD1 | VZ02 |
| LJ8K06Q705 | VBD1 | VCD2 | VZ1 |
| LJ8K06Q706 | VBD2 | VCDN12 | VZ10 |
| LJ8K06Q707 | VBDN12 | VCDN20 | VZ11 |
| LJ8K06Q707A04 | VBDN20 | VCF0 | VZ12 |
| LJ8K06Q708 | VBF0 | VCF01 | VZ13 |
| LJ8K06Q710 | VBF01 | VCF01GE | VZ14 |
| LJ8K09Q7 | VBF01GE | VCF01GEGP | VZ15 |
| LJ8K09Q714 | VBF02 | VCF02 | VZ16 |
| LR2K0301 | VBF02GE | VCF02GE | VZ17 |
| LR2K0302 | VBF0GE | VCF02GEGP | VZ17L127 |
| LR2K0303 | VBF1 | VCF0GE | VZ17L69 |
| LR2K0304 | VBF1GE | VCF0GEGP | VZ18 |
| LR2K0305 | VBF2 | VCF1 | VZ2 |
| LR2K0306 | VBF2GE | VCF1GE | VZ20 |
| LR2K0307 | VBF3 | VCF1GEGP | VZ26 |
| LR2K0308 | VBF3GE | VCF1YZ | VZ27 |
| LR2K0310 | VBF4 | VCF2 | VZ28 |
| LR2K0312 | VBF4GE | VCF2GE | VZ29 |
| LR2K0314 | VBF5 | VCF3 | VZ3 |
| LR2K0316 | VBF5GEN | VCF3GE | VZ30 |
| LR2K0321 | VBF6 | VCF4 | VZ31 |
| LR2K0322 | VBF6GEN | VCF4GE | VZ4 |
| LRD01 | VBFXGE1 | VCF5 | VZ45 |
| LRD02 | VBFXGE2 | VCF5GEN | VZ7 |
| LRD03 | VBFXGE4 | VCF6 | VZ8 |
| LRD04 | VBFXGE6 | VCF6GEN | VZ9 |
| LRD05 | VC1GUN | VCFN12GE | VZN05 |
| LRD06 | VC2GUN | VCFN20GE | VZN06 |
| LRD07 | VC3GUN | VCFN25GE | VZN08 |
| LRD08 | VC4GUN | VCFN32GE | VZN11 |
| LRD10 | VC5GUN | VCFN40GE | VZN12 |
| LRD12 | VC6GUN | VCFXGE1 | VZN14 |
| LRD14 | VCCD0 | VCFXGE2 | VZN17 |
| LRD16 | VCCD01 | VCFXGE4 | VZN19 |
| LRD21 | VCCD02 | VCFXGE6 | VZN20 |
| LRD22 | VCCD1 | VGP1 | VZN26 |
| LRD32 | VCCD2 | VGPCLIP1 | VZN30 |
| LRD35 | VCCDN12 | VN12 | Z01 |
| NSYTRAC22BL | VCCDN20 | VN20 | ZB5AA331 |
| NSYTRV62BL | VCCF0 | VVD0 | ZB5AD2 |
| V0 | VCCF01 | VVD1 | ZB5AD3 |
| V01 | VCCF02 | VVD2 | ZB5AD5 |
| V02 | VCCF1 | VVD3 | ZB5AL432 |
| V1 | VCCF2 | VVD4 | ZENL1111 |
| V2 | VCCF3 | VVE0 | ZENL1121 |
| V3 | VCCF4 | VVE1 | |
| V4 | VCCF5 | VVE2 | |
| V5 | VCCF6 | VVE3 | |

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Technical Data for Designers

Contents

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| Direct-on-line starters | A1/41, A1/43 to A1/49 |
|and A1/51 | |
| Star-delta starters | A1/42 and A1/50 |
| Starters for safety applications | A1/52 to A1/55 |

TeSys Control

Enclosed switch-disconnectors

Dimensions

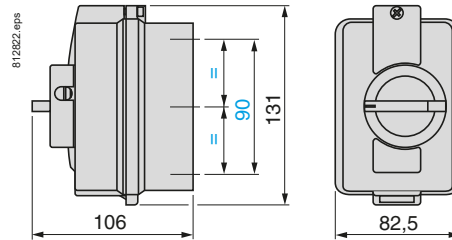
Enclosed starters

Ref.



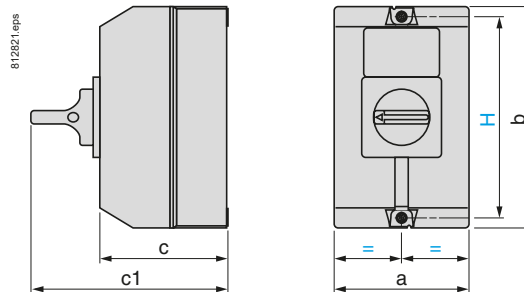
Dimensions

VCFN12GE to VCFN40GE



Cable glands: 2x ISO 20 top and bottom, 2x ISO 16 rear.

VCF or VBF02GE to 4GE, VCF●●GEGP and VCF●GEGP, VCFX or VBFXGE1 to GE4

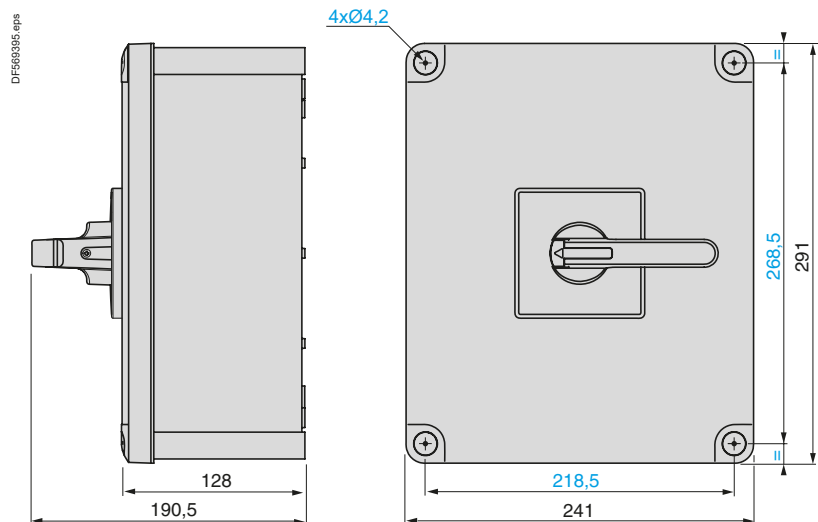


| | a | b | c | c1 | H |
|---|-----|-----|-----|-----|-----|
| V●F02GE to V●F2GE, V●FXGE1 VCF●●GEGP and VCF●GEGP ⁽¹⁾ | 90 | 146 | 85 | 131 | 130 |
| V●F3GE and V●F4GE ⁽²⁾ | 157 | 180 | 107 | 152 | 164 |
| V●FXGE2 and V●FXGE4 ⁽²⁾ | 157 | 180 | 107 | 152 | 164 |

⁽¹⁾ Cable glands: 2x ISO 16 rear, 4x ISO 20/25 top and bottom.

⁽²⁾ Cable glands: 4x ISO 25/32 rear, 4x ISO 25/32 top and bottom.

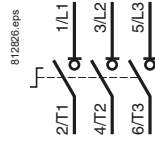
VCF or VBF5GEN and 6GEN



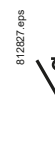
Schemes

Switch-disconnectors

Enclosed or switch bodies



Main pole module



Neutral pole module



Auxiliary contact blocks

VZ7



VZ20



VZN05



VZN06



TeSys Control

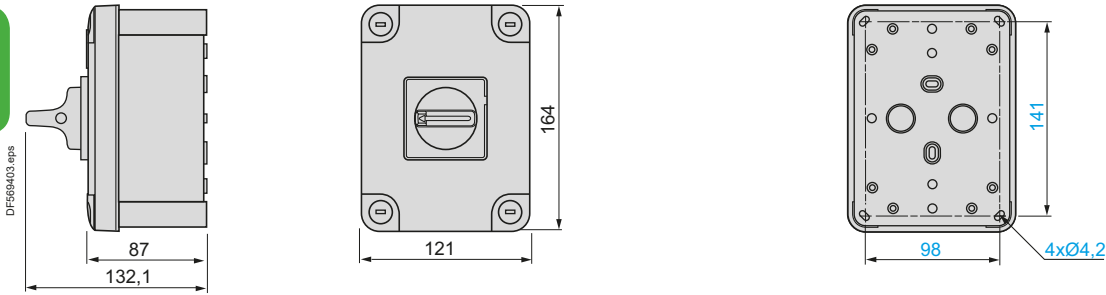
Enclosed switch-disconnectors / UL - CSA

Dimensions, schemes

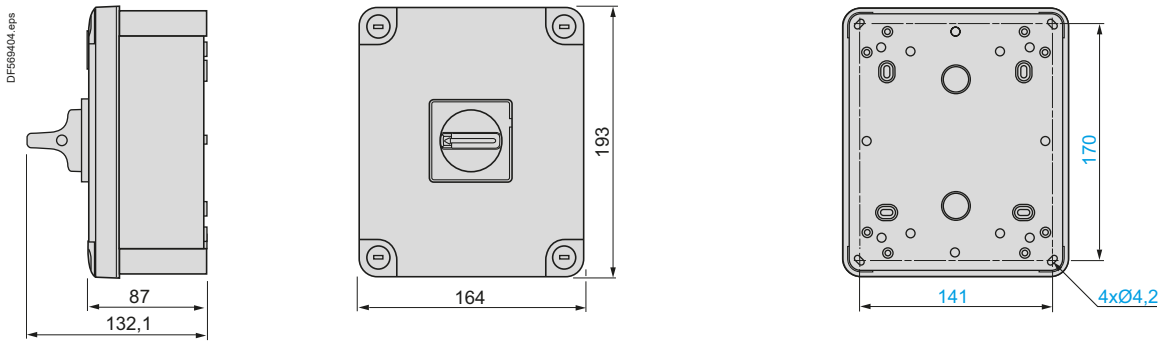
Enclosed starters

Dimensions

VC1GUN and VC2GUN

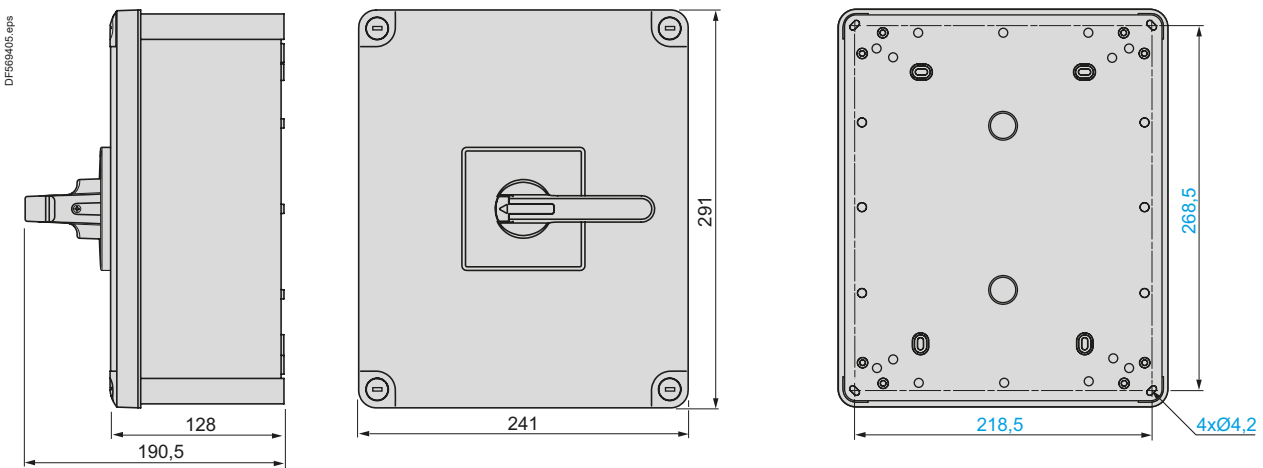


VC3GUN and VC4GUN



Ref.

VC5GUN and VC6GUN



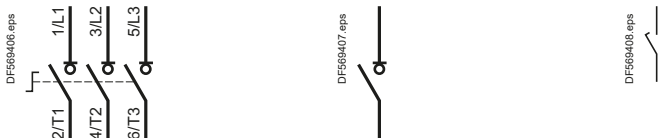
Schemes

Switch-disconnectors

Enclosed switch-disconnectors or switch bodies

Main pole module

Neutral pole module



Auxiliary contact block modules

VZ7

VZ20



References:
page A1/4

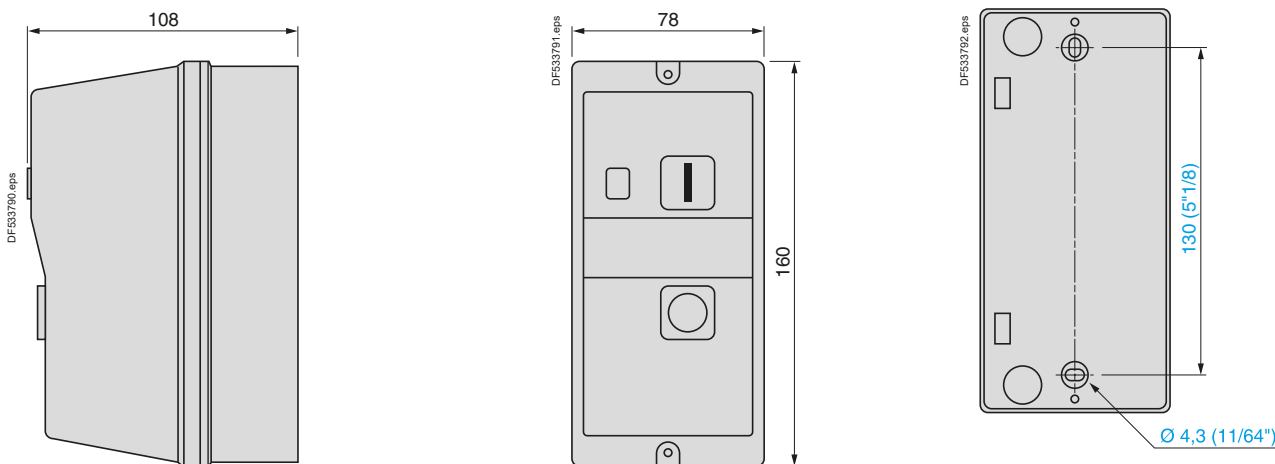
TeSys Control

Enclosed standard starters / DOL

Dimensions, schemes

Dimensions

LE1M35 ⁽¹⁾



Knock-outs or blanking plugs for cable glands

| Enclosure type | At top | | At bottom | |
|----------------|------------------|------------------|------------------|------------------|
| | PG | ISO | PG | ISO |
| LE1 M | 2 x 13 to 2 x 21 | 2 x 20 or 2 x 25 | 2 x 13 to 2 x 21 | 2 x 20 or 2 x 25 |

(1) Can be mounted on machine panel or frame. Knock-outs for 4 x 13 P cable glands.

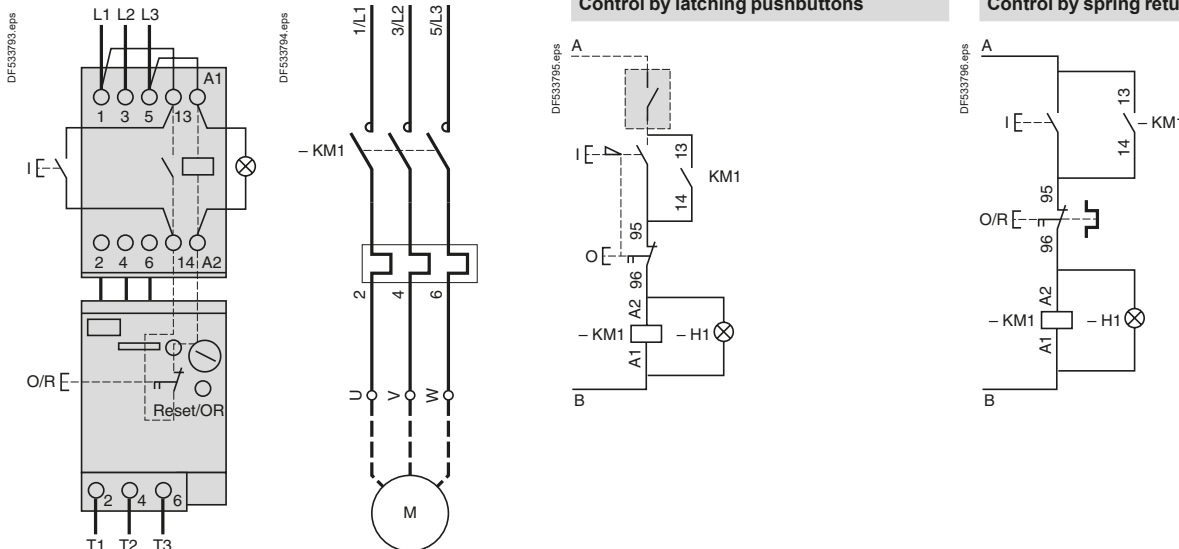
Schemes

LE1M35

Choice of type of control built into the product

Control by latching pushbuttons

Control by spring return pushbuttons



Connections

| Power voltage | Control circuit voltage | A | B |
|----------------------------|----------------------------|-----------------------|---------|
| 380 V, 400 V, 415 V, 440 V | 220 V, 230 V, 240 V | L3 | Neutral |
| | 380 V, 400 V, 415 V, 440 V | L3 | L1 |
| | Other voltages | For customer assembly | |
| Other voltages | All voltages (440 V max) | For customer assembly | |

References:
page A1/7

TeSys Control

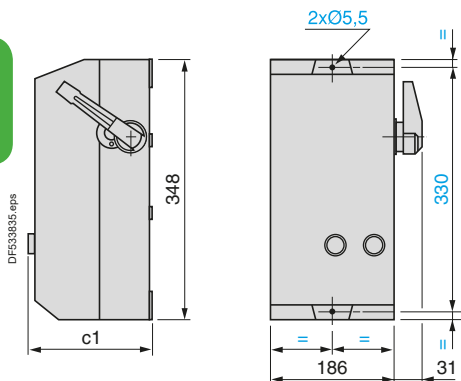
Enclosed standard starters / Star-delta

Dimensions, schemes

Enclosed starters

Dimensions

LE6D09...D18



| | c1 |
|------------------|-------|
| Standard version | 175.5 |
| Variant A04 | 167 |
| Variant A05 | 175.5 |

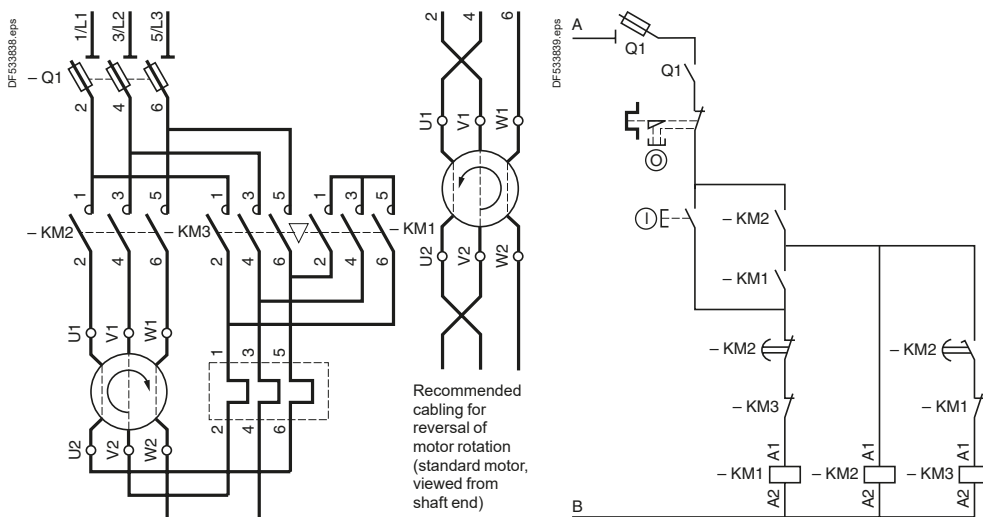
Knock-outs or blanking plugs for cable glands

| Type of enclosure | At top | | At bottom | |
|-------------------|--------|---|-----------|---|
| | PG | ISO | PG | ISO |
| LE6D09...D18 | - | 2 x 20 or 2 x 25 or 2 x 32 or 2 x 40 | - | 2 x 20 or 2 x 25 or 2 x 32 or 2 x 40 |

Ref.

Schemes

LE6D09...D18



Connections

| Power voltage | Control circuit voltage | A | B |
|----------------------------|----------------------------|-----------------------|------------------|
| 380 V, 400 V, 415 V, 440 V | 220 V, 230 V, 240 V | L3 | Neutral terminal |
| | 380 V, 400 V, 415 V, 440 V | L3 | L1 |
| | Other voltages | Terminal 1 | Terminal 2 |
| Other voltages | All voltages (600 V max) | For customer assembly | |

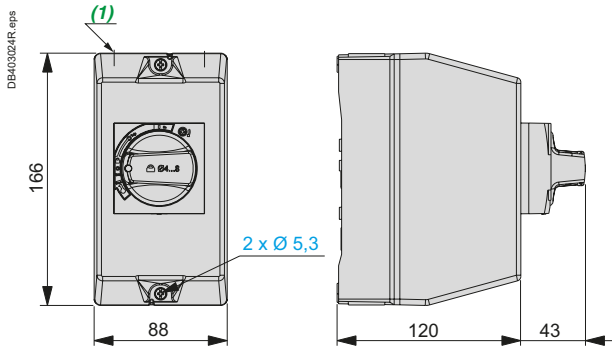
TeSys Control

Enclosed standard starters / DOL

Dimensions, schemes

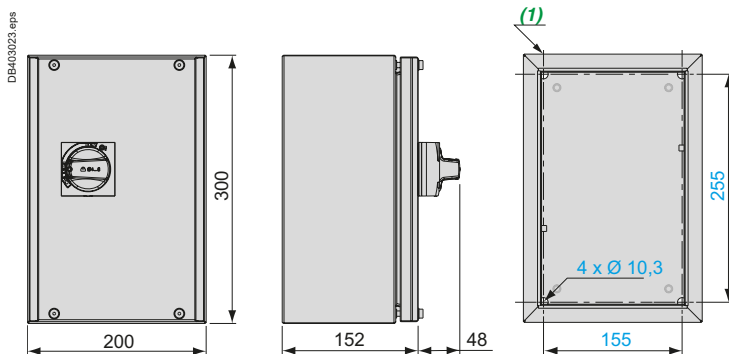
Dimensions

GV2PC●●



(1) Top face: 2 knock-outs for ISO20 cable glands.
Bottom face: 2 knock-outs for ISO20 cable glands.

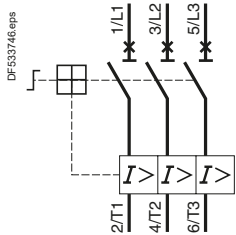
GV3PC●●



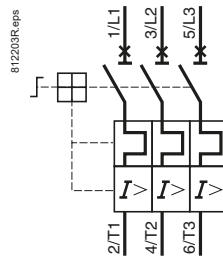
(1) Top face: 1 blanking plug for ISO32 cable gland.
Bottom face: 2 blanking plugs for ISO32 cable gland + 1 blanking plug for ISO20 cable gland.

Schemes

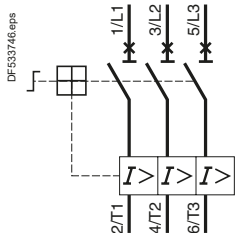
GV2L



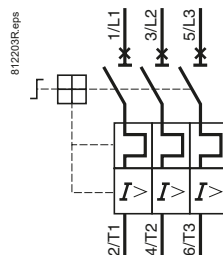
GV2P



GV3L



GV3P



TeSys Control

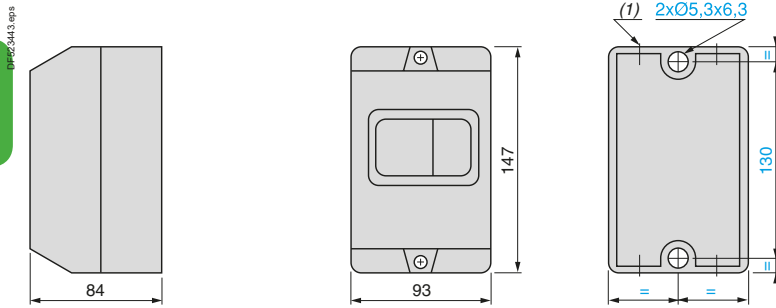
Enclosed standard starters / DOL

Dimensions, mounting

Enclosed starters

Dimensions

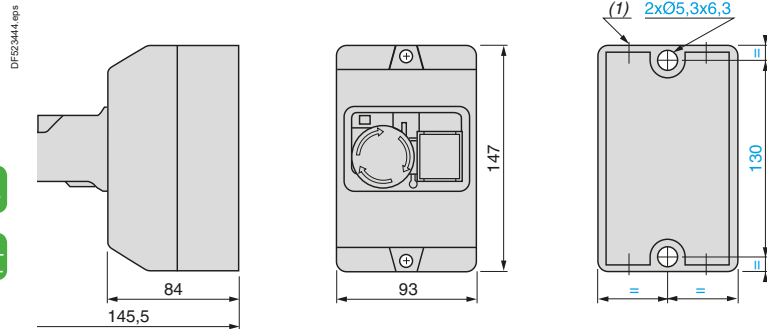
Surface mounting enclosure GV2MC0●



(1) Top face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.
Bottom face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.

Surface mounting enclosure GV2MCK04

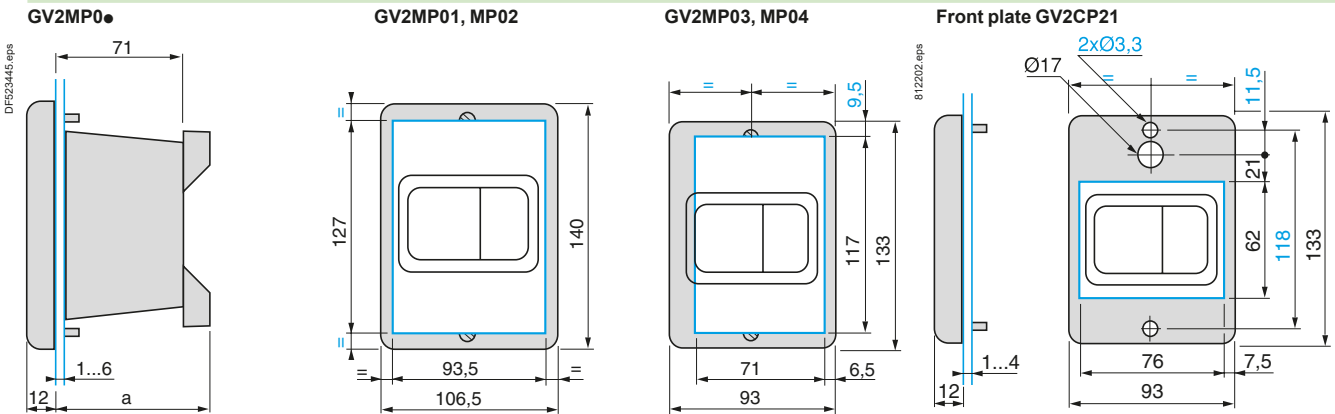
Ref.



(1) Top face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.
Bottom face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.

Mounting

Flush mounting enclosures GV2MP0● (panel cut-out)



| GV2 | a |
|------------|----|
| MP01, MP02 | — |
| MP03, MP04 | 86 |

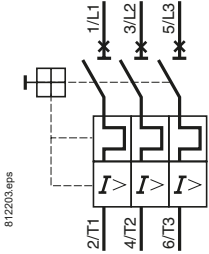
TeSys Control

Circuit breaker and auxiliaries / accessories

Schemes

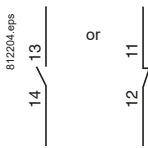
Schemes

GV2ME●●

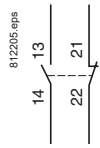


Instantaneous auxiliary contacts

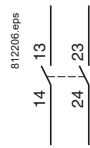
GVAE1



GVAE11

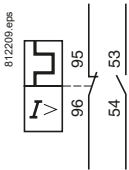


GVAE20

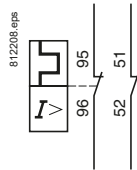


Instantaneous auxiliary contacts and fault signalling contacts

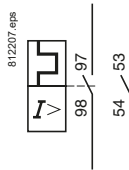
GVAD0110



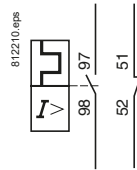
GVAD0101



GVAD1010

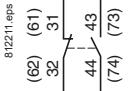


GVAD1001

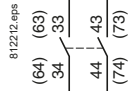


Instantaneous auxiliary contacts

GVAN11



GVAN20



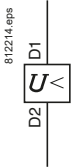
Short-circuit signalling contacts

GVAM11

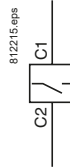


Undervoltage trips

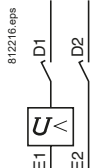
GVAU●●●



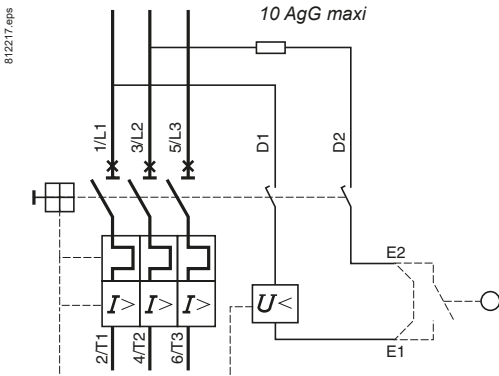
GVAS●●●



GVAX●●●



Wiring diagram for undervoltage trip used on potentially dangerous machines, conforming to INRS



TeSys Control

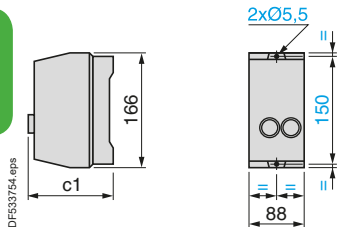
Enclosed standard starters / DOL, Reverser

Dimensions

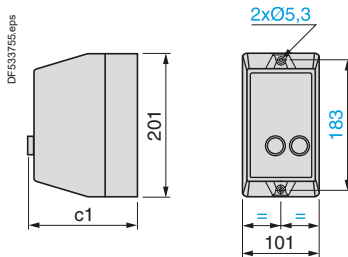
Enclosed starters

Dimensions

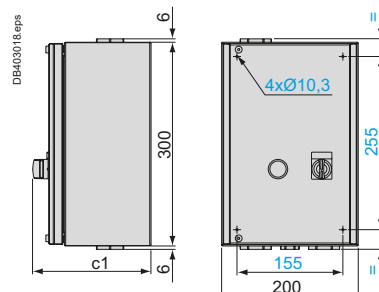
LE1D09 and D12



LE1D09...T LE1D18...D35 and LE2D09...D35



LE1D40A...D65A LE2D40A...D65A

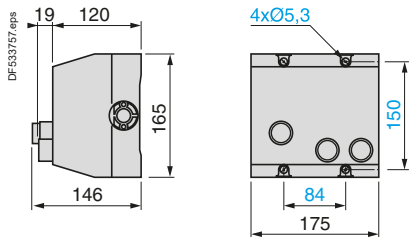


| | c1 |
|------------------|-------|
| Standard version | 128.5 |
| Variant A04 | 120 |
| Variant A05 | 128.5 |
| Variant A09 | 120 |
| Variant A13 | 120 |

| | c1 | |
|------------------|-------|-------|
| | LE1D | LE2D |
| Standard version | 153.5 | 160 |
| Variant A04 | 145 | 145 |
| Variant A05 | 153.5 | 153.5 |
| Variant A09 | 160 | – |
| Variant A13 | 160 | – |

| | c1 | |
|------------------|-------|-------|
| | LE1D | LE2D |
| Standard version | 158.5 | 174 |
| Variant A04 | 150 | 150 |
| Variant A05 | 158.5 | 158.5 |

LE2K06 and K09



Knock-outs or blanking plugs for cable glands

| Type of enclosure | At top | | At bottom | |
|-------------------------------|-------------------|------------------|-------------------|-------------------|
| | PG | ISO | PG | ISO |
| LE1D09 and D12 | – | 2 x 20 | – | 2 x 20 |
| LE1D18...D35 and LE2D09...D35 | – | 2 x 20 or 2 x 25 | – | 2 x 20 or 2 x 25 |
| LE1 and LE2D40A...D65A | – | 1 x 32 | – | 1 x 20 and 2 x 32 |
| LE2K06 and K09 | 2 x 13 and 2 x 16 | 4 x 20 | 2 x 13 and 2 x 16 | 4 x 20 |

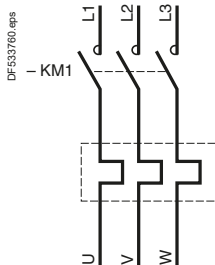
TeSys Control

Enclosed standard starters / DOL, Reverser

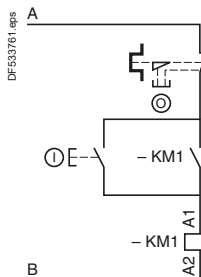
Schemes

Schemes

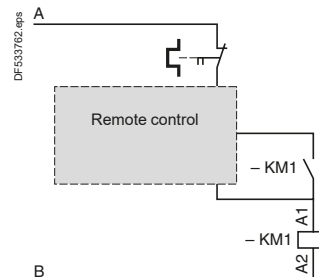
LE1D09...D65A



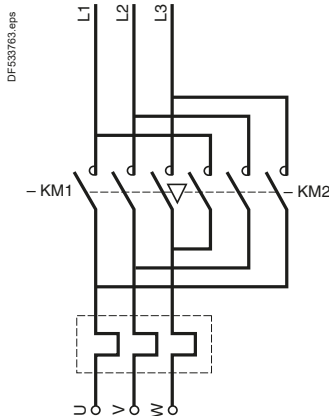
LE1D09...D65A



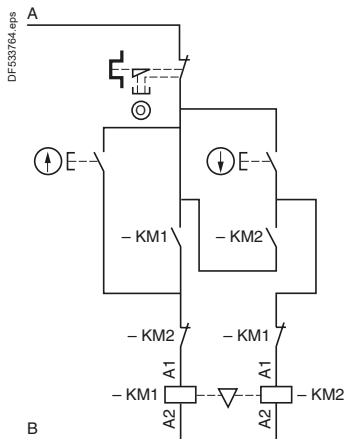
LE1D09...D65A with variant A04 or A05



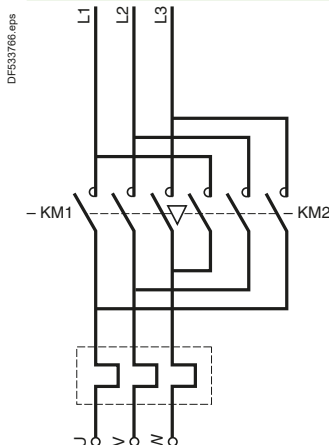
LE2K06, K09



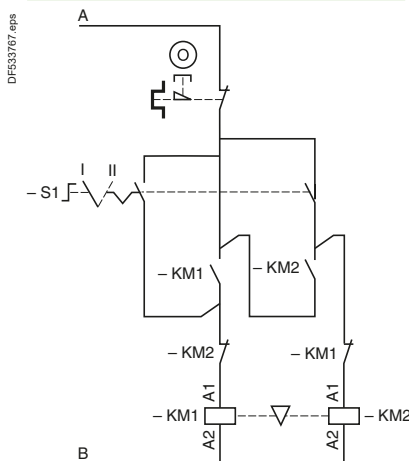
LE2K06, K09



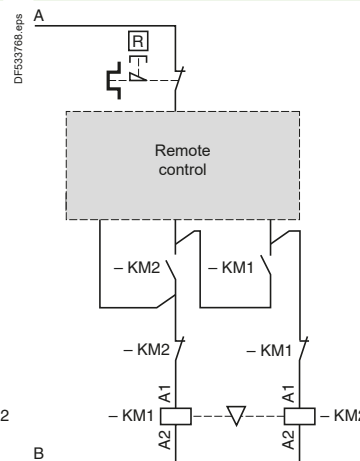
LE2D09...D65A



LE2D09...D65A



LE2D40A...D65A with variants A04 or A05



LE1D09...D65A, LE2D09...D65A Connections

| Power voltage | Control circuit voltage | A | B |
|----------------------------|----------------------------|-----------------------|------------------|
| 380 V, 400 V, 415 V, 440 V | 220 V, 230 V, 240 V | L3 | Neutral terminal |
| | 380 V, 400 V, 415 V, 440 V | L3 | L1 |
| Other voltages | Other voltages (600 V max) | Terminal 1 | Terminal 2 |
| Other voltages | Other voltages (600 V max) | For customer assembly | |

LE2K06, K09 Connections

| Power voltage | Control circuit voltage | A | B |
|---------------------|----------------------------|-----------------------|---------|
| 380 V, 400 V, 415 V | 220 V, 230 V, 240 V | L3 | Neutral |
| | 380 V, 400 V, 415 V | L3 | L1 |
| Other voltages | Other voltages (440 V max) | For customer assembly | |

References:
pages A1/8 and A1/13

Dimensions:
page A1/46

Enclosed starters

Ref.



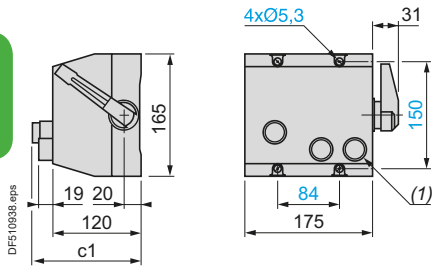
TeSys Control

Enclosed standard starters / DOL, reverser

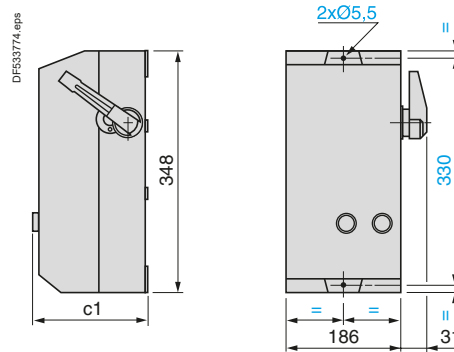
Dimensions

Dimensions

LE4K06 and K09, LE8K06 and K09



LE4D09...D35, LE8D09...D35



Enclosed starters

| | c1 | |
|------------------|------|------|
| | LE4K | LE8K |
| Standard version | 146 | 146 |
| Variant A05 | – | 139 |

(1) For LE8 only.

| | c1 | |
|------------------|-------|-------|
| | LE4D | LE8D |
| Standard version | 175.5 | 182 |
| Variant A04 | 167 | 167 |
| Variant A05 | 175.5 | 175.5 |

Knock-outs or blanking plugs for cable glands

| Type of enclosure | At top | | At bottom | |
|------------------------|-------------------|---|-------------------|---|
| | PG | ISO | PG | ISO |
| LE4 and LE8D09...D35 | – | 2 x 20 or 2 x 25 or 2 x 32 or 2 x 40 | – | 2 x 20 or 2 x 25 or 2 x 32 or 2 x 40 |
| LE4 and LE8K06 and K09 | 2 x 13 and 2 x 16 | 4 x 20 | 2 x 13 and 2 x 16 | 4 x 20 |

Ref.



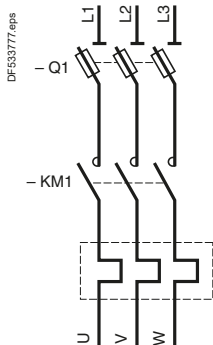
TeSys Control

Enclosed standard starters / DOL, Reverser

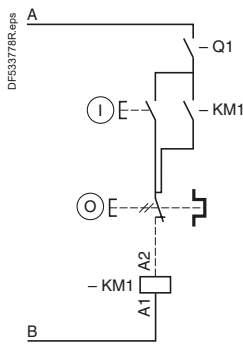
Schemes

Schemes

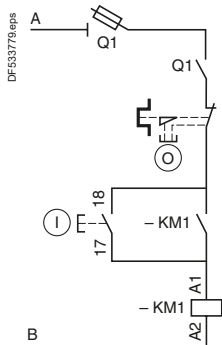
LE4K06, K09 LE4D09...D35



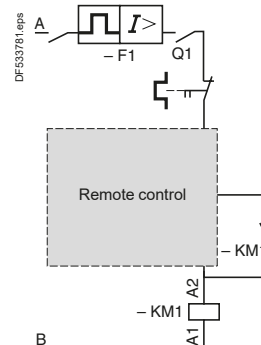
LE4K06, K09



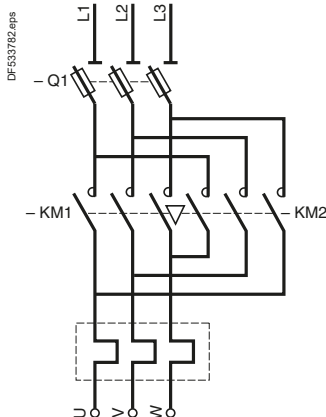
LE4D09...D35



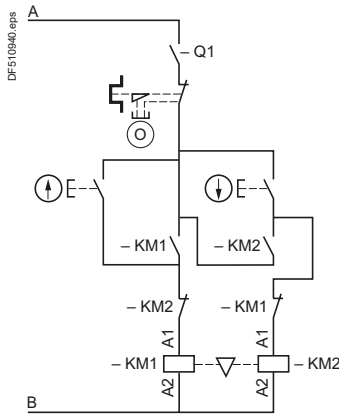
LE4D09...D35 with variant A04 or A05



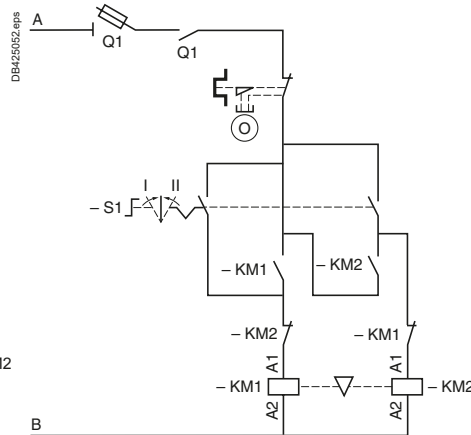
LE8K06, K09 LE8D09...D35



LE8K06, K09



LE8D09...D35



LE4D09 and D12, LE8D09 and D12 Connections

| Power voltage | Control circuit voltage | A | B |
|----------------------------|----------------------------|-----------------------|------------|
| 380 V, 400 V, 415 V, 440 V | 220 V, 230 V, 240 V | L3 | Neutral |
| | 380 V, 400 V, 415 V, 440 V | L3 | L1 |
| | Other voltages | Terminal 1 | Terminal 2 |
| Other voltages | Other voltages (600 V max) | For customer assembly | |

LE4D18...D35, LE8D18...D35 Connections

| Power voltage | Control circuit voltage | A | B |
|----------------------------|----------------------------|-----------------------|------------------|
| 380 V, 400 V, 415 V, 440 V | 220 V, 230 V, 240 V | L3 | Neutral terminal |
| | 380 V, 400 V, 415 V, 440 V | L3 | L1 |
| | Other voltages | Terminal 1 | Terminal 2 |
| Other voltages | Other voltages (600 V max) | For customer assembly | |

LE4K06, K09, LE8K06, K09 Connections

| Power voltage | Control circuit voltage | A | B |
|---------------------|----------------------------|-----------------------|---------|
| 380 V, 400 V, 415 V | 220 V, 230 V, 240 V | L3 | Neutral |
| | 380 V, 400 V, 415 V | L3 | L1 |
| Other voltages | Other voltages (440 V max) | For customer assembly | |

TeSys Control

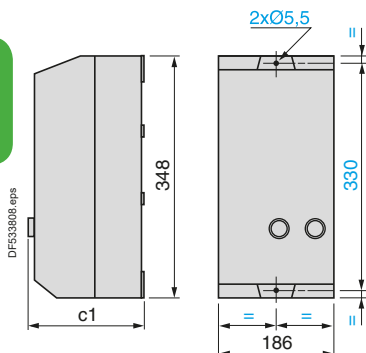
Enclosed standard starters / Star-delta

Dimensions, schemes

Enclosed starters

Dimensions

LE3D09...D35



| | c1 |
|------------------|-------|
| Standard version | 175.5 |
| Variant A04 | 167 |
| Variant A05 | 175.5 |

Knock-outs or blanking plugs for cable glands

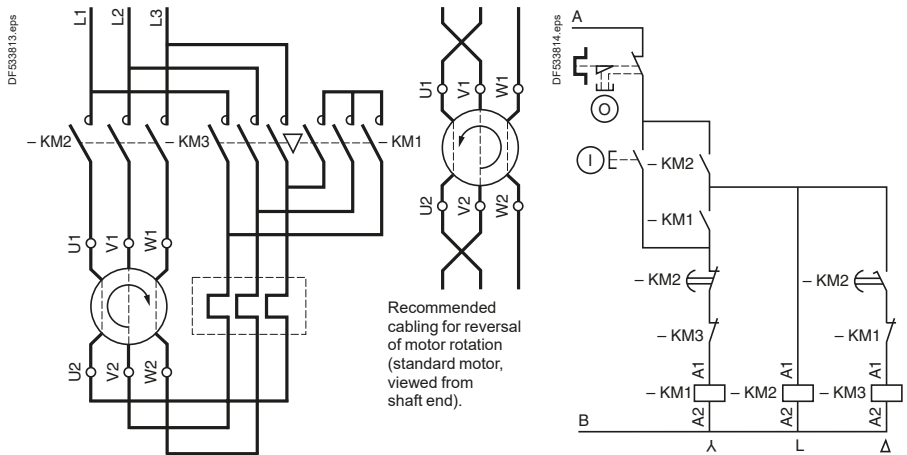
| Type of enclosure | At top | | At bottom | |
|-------------------|--------|--------------------------------------|-----------|--------------------------------------|
| | PG | ISO | PG | ISO |
| LE3D09...D35 | - | 2 x 20 or 2 x 25 or 2 x 32 or 2 x 40 | - | 2 x 20 or 2 x 25 or 2 x 32 or 2 x 40 |

Ref.

Schemes

LE3D09...D35

LE3D09...D35



Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end).

Note: in accordance with current installation regulations, short-circuit protection must be provided by fuses or a circuit breaker.

Connections

| Power voltage | Control circuit voltage | A | B |
|----------------------------|----------------------------|-----------------------|------------------|
| 380 V, 400 V, 415 V, 440 V | 220 V, 230 V, 240 V | L3 | Neutral terminal |
| | 380 V, 400 V, 415 V, 440 V | L3 | L 1 |
| | Other voltages | Terminal 1 | Terminal 2 |
| Other voltages | All voltages (600 V max) | For customer assembly | |

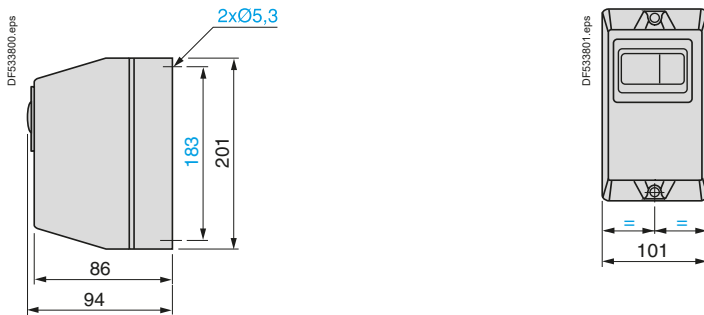
TeSys Control

Enclosures for DOL starters

Dimensions, schemes

Dimensions

LE1GVMEK

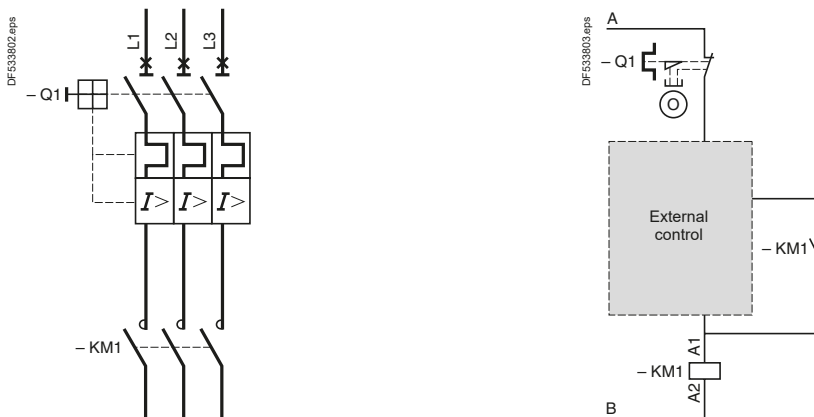


Knock-outs or blanking plugs for cable glands

| Enclosure type | At top | At bottom |
|----------------|-------------------------|-------------------------|
| LE1GV | ISO 2 x 20 or 2 x 25 | ISO 2 x 20 or 2 x 25 |

Schemes

LE1GVMEK



Connections

| Power voltage | Control circuit voltage | A | B |
|----------------------------|----------------------------|-----------------------|---------|
| 380 V, 400 V, 415 V, 440 V | 220 V, 230 V, 240 V | L3 | Neutral |
| | 380 V, 400 V, 415 V, 440 V | L3 | L1 |
| | Other voltages | For customer assembly | |
| Other voltages | All voltages (440 V max) | For customer assembly | |

TeSys Control

Enclosed safety starters / DOL

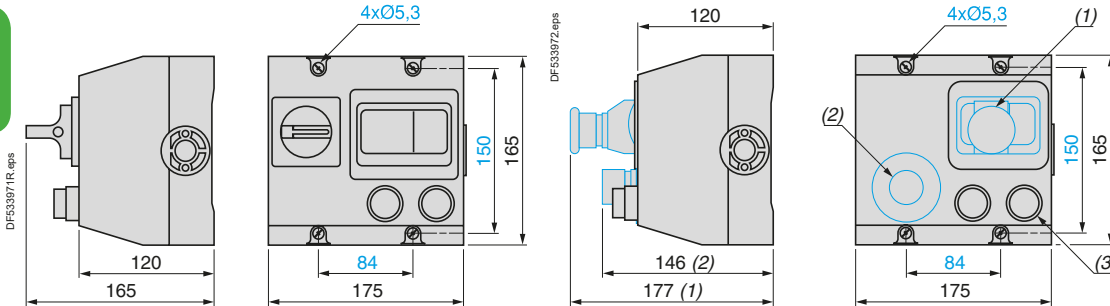
Dimensions

Enclosed starters

Dimensions

LG1K06, K09
LG1D12, D18

LG7K06, K09, LG7D12, D18
LG8K06, K09, K12



- (1) Emergency Stop for starters LG●K06.
- (2) Emergency Stop for starters LG●K09, K12, D12 et D18.
- (3) Only for LG7.

Knock-outs or blanking plugs for cable glands

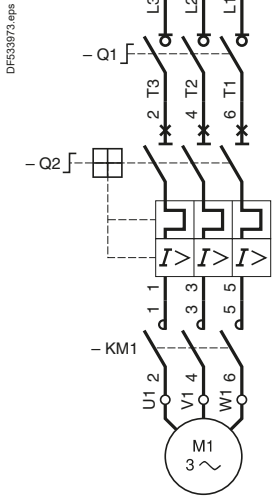
| Type of enclosure | At top | At bottom |
|-------------------|-----------------------|-----------------------|
| LG1K and LG1D | 2 x 13 P and 2 x 16 P | 2 x 13 P and 2 x 16 P |
| LG7K and LG7D | 2 x 13 P and 2 x 16 P | 2 x 13 P and 2 x 16 P |
| LG8K | 2 x 13 P and 2 x 16 P | 2 x 13 P and 2 x 16 P |

Ref.



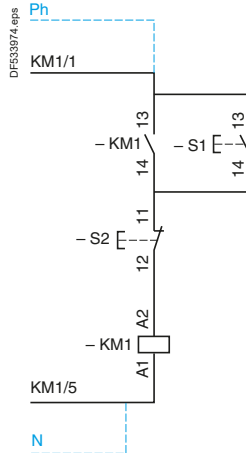
Schemes

LG1K06, K09, D12, D18

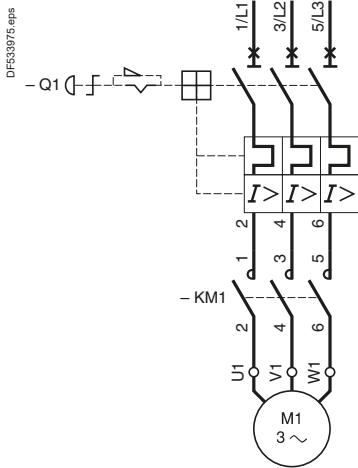


LG1K06, K09, D12, D18

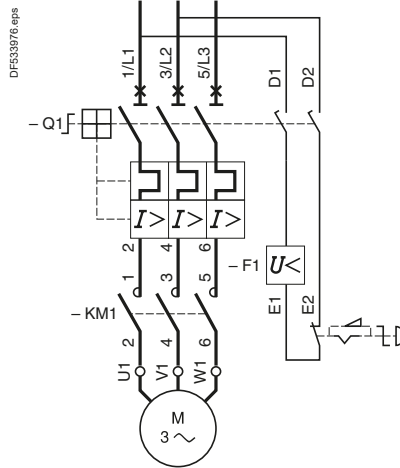
380/400 V, code Q7 or 400/415 V, code N7
220/230 V, code M7



LG7K06

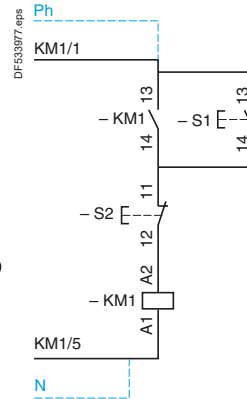


LG7K09, D12, D18

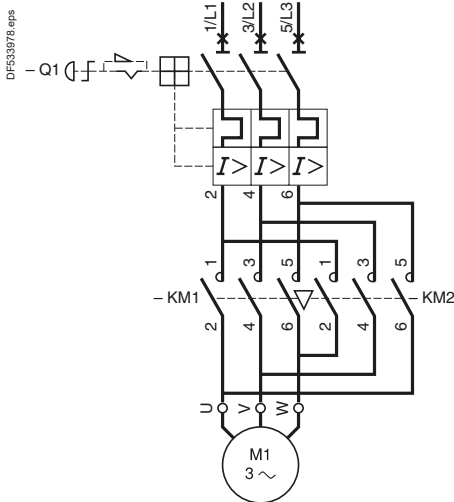


LG7K06, K09, D12, D18

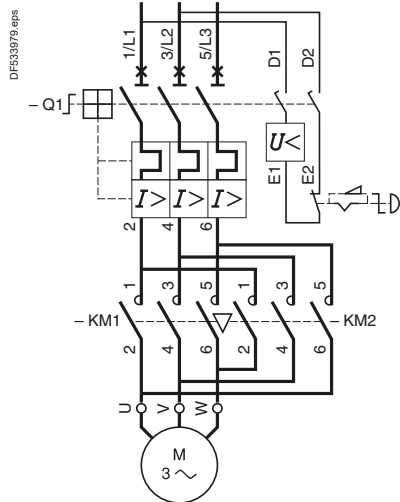
380/400 V, code Q7 or
400/415 V, code N7
220/230 V, code M7



LG8K06

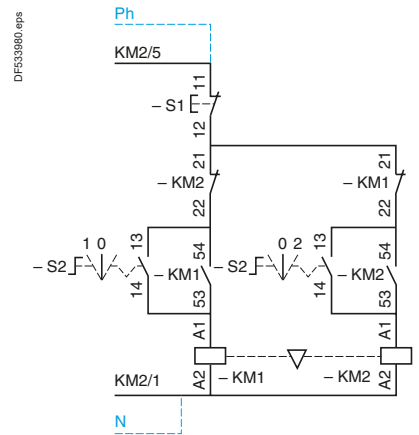


LG8K09, K12



LG8K06, K09, K12

380/400 V, code Q7 or
400/415 V, code N7
220/230 V, code M7



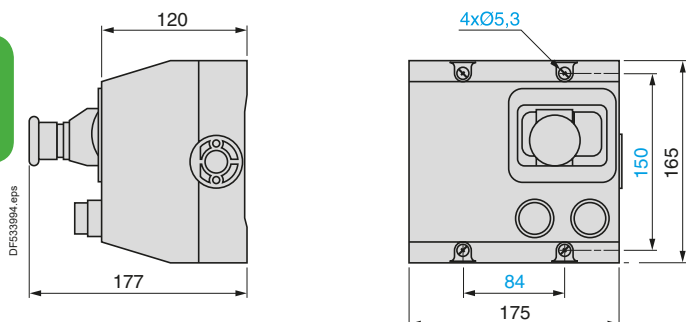
TeSys Control

Enclosed safety starters / DOL, Reverser

Dimensions

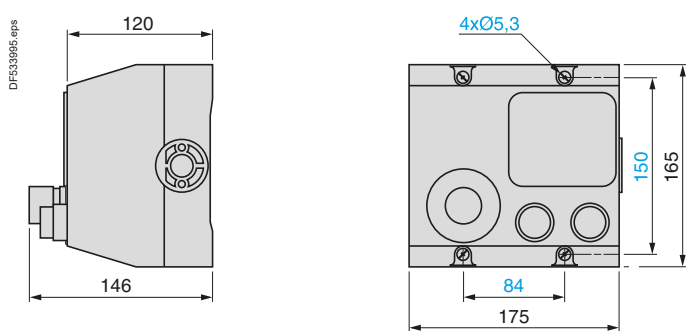
Dimensions

LJ7K06, LJ8K06



Enclosed
starters

LJ7K09, LJ8K09



Ref.



Cut-outs or blanking plugs for cable glands at the top and at the bottom 2 x 13 P and 2 x 16 P.

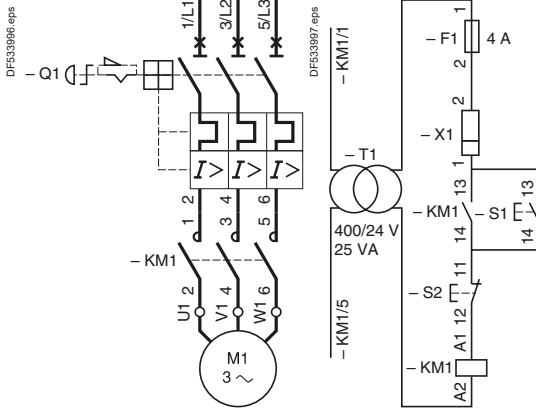
TeSys Control

Enclosed safety starters / DOL, Reverser

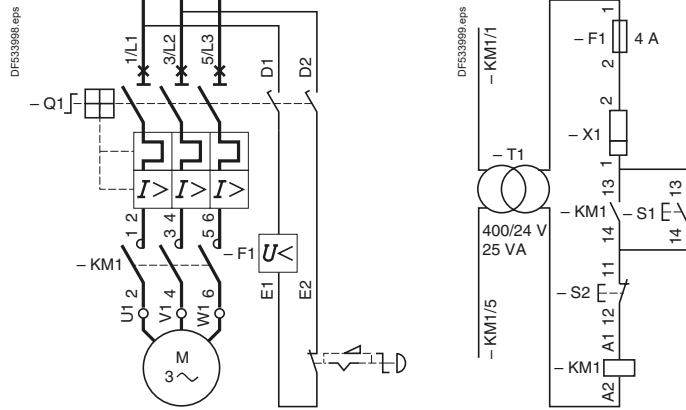
Schemes

Schemes

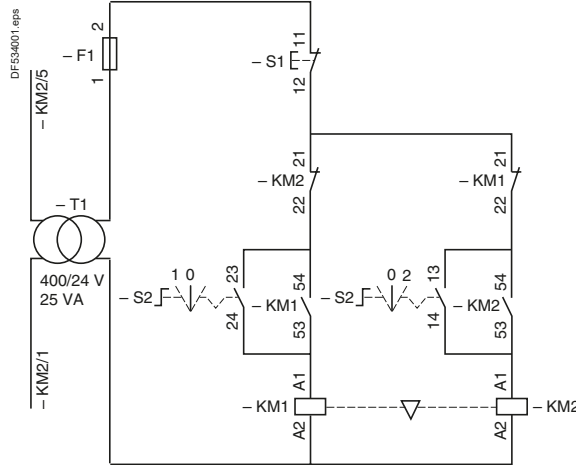
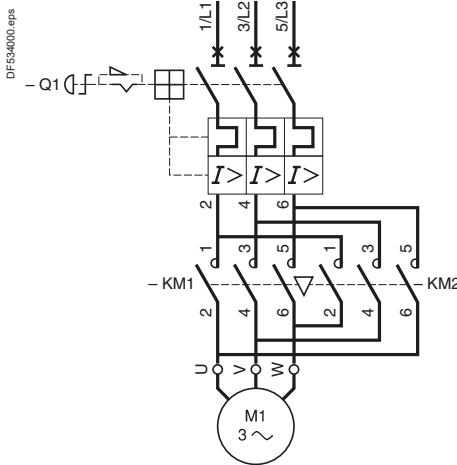
LJ7K06



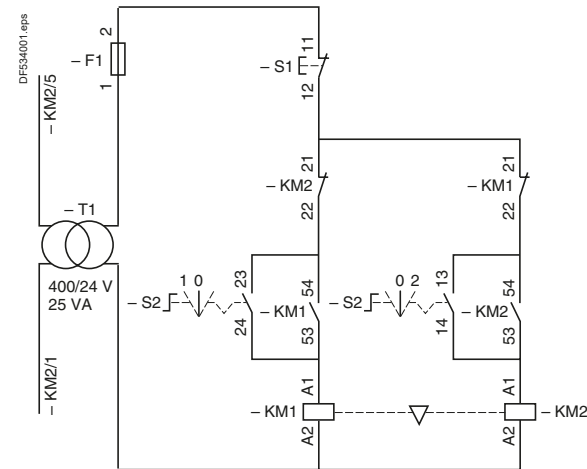
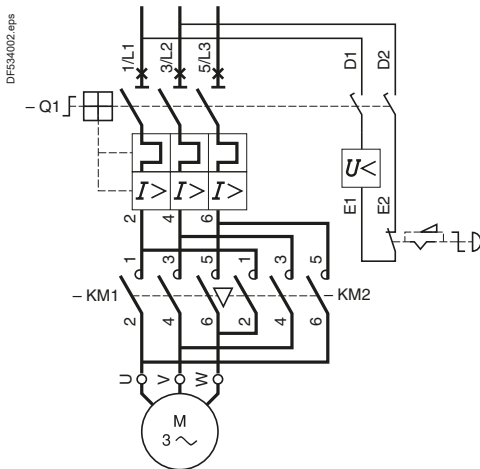
LJ7K09



LJ8K06



LJ8K09



| Direct-on-line and reversing starters | | | |
|--|--------------|---|-------|
| Composition | Range | | Page |
| Motor circuit breaker + contactor (direct-on-line) Coordination type 1 | Up to 4 kW |  | A2/2 |
| Motor circuit breaker + 2 contactors (reversing) Coordination type 1 | Up to 5.5 kW |  | A2/3 |
| Motor circuit breaker + contactor (direct-on-line) Coordination type 1 | Up to 15 kW |  | A2/4 |
| Motor circuit breaker + 2 contactors (reversing) Coordination type 1 | Up to 15 kW | | A2/5 |
| Motor circuit breaker + contactor (direct-on-line) Coordination type 2 to be assembled by customer | Up to 30 kW |  | A2/6 |
| Motor circuit breaker + 2 contactors (reversing) Coordination type 2 to be assembled by customer | Up to 30 kW | | A2/7 |
| Star-delta starters | | | |
| 3 contactors + 1 time delay aux. block | Up to 132 kW |  | A2/8 |
| 3 contactors + 1 time delay aux. block + 1 control relay | Up to 315 kW |  | A2/9 |
| Star-delta starters for customer assembly | | | |
| Separated components and mounting kits for suggested motor starter components combinations - on plate or mounting rail | Up to 132 kW |  | A2/10 |
| Separated components for suggested motor starter combinations - on chassis | Up to 315 kW |  | A2/14 |

TeSys Control

Direct-on-line starters - with overload protection - up to 5.5 kW

Product references

D.O.L. starters, non-reversing, from 0.37 to 4 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2ME,
- 1 3-pole contactor LC1K,
- 1 combination block GV2AF01.

Characteristics

| Starter type | | GV2 | ME06K1 | ME07K1 | ME08K1 | ME10K1 | ME14K1 |
|--|-----------------------------|-----------|--------|--------|--------|--------|-------------------------|
| Breaking capacity (I _q) ⁽¹⁾ | Conforming to IEC 60947-4-1 | 400/415 V | kA | 50 | 50 | 50 | 50 |
| | | 440 V | kA | 50 | 50 | 50 | 15 |
| | | 500 V | kA | 50 | 50 | 50 | 10 (4 kW) 6 (5.5 kW) |

References

D.O.L. starters, non-reversing

| Standard power ratings of 3-phase motors 50/60 Hz in AC-3 | | | Setting range of thermal trips | Fixed magnetic tripping current 13 Irth | For customer assembly | | Pre-assembled | Weight |
|---|-------|-------|--------------------------------|---|---------------------------------|--|---------------|--------|
| 400/415 V | 440 V | 500 V | | | Motor circuit-breaker Reference | Contactor Reference to be completed ⁽²⁾ | | |
| kW | kW | kW | A | A | | | | kg |
| 0.37 | 0.37 | 0.37 | 1...1.6 | 22.5 | GV2ME06 | LC1K06 | GV2ME06K1●● | 0.460 |
| 0.55 | 0.55 | 0.55 | | | | | | |
| – | – | 0.75 | | | | | | |
| 0.75 | 0.75 | – | 1.6...2.5 | 33.5 | GV2ME07 | LC1K06 | GV2ME07K1●● | 0.460 |
| – | 1.1 | 1.1 | | | | | | |
| 1.1 | – | 1.5 | 2.5...4 | 51 | GV2ME08 | LC1K06 | GV2ME08K1●● | 0.460 |
| 1.5 | 1.5 | 2.2 | | | | | | |
| 2.2 | 2.2 | – | 4...6.3 | 78 | GV2ME10 | LC1K06 | GV2ME10K1●● | 0.460 |
| – | 3 | 3 | | | | | | |
| 3 | – | 4 | 6...10 | 138 | GV2ME14 | LC1K09 | GV2ME14K1●● | 0.460 |
| 4 | 4 | 5.5 | | | | | | |

Add-on blocks

| Description | Sold in lots of | Unit reference |
|---|-----------------|----------------|
| Combination block between circuit breaker and contactor | 10 | GV2AF01 |

(1) The breaking performance of circuit breakers GV2ME can be increased by adding a current limiter GV1L3, see page B6/21.

(2) Please consult your Regional Sales Office.

(3) Please check the availability of your variant in the index page A2/18. The SEARCH function of your viewer can be used.

| Volts | 24 | 110 | 220/230 | 230 | 230/240 | 380/400 |
|------------------|-----|-----|---------|-----|---------|---------|
| ~ 50/60 Hz | B7 | F7 | M7 | P7 | U7 | Q7 |
| ☰ ⁽⁴⁾ | BW3 | – | – | – | – | – |

(4) Coil: low consumption (1.5 W), wide range (0.7...1.3 Uc) with integral suppression device as standard.

Open motor starters



GV2ME10K1●●

TeSys Control

Reversing starters - with overload protection - up to 5.5 kW

Product references

D.O.L. starters, reversing, from 0.37 to 4 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2ME,
- 1 3-pole reversing contactor LC2K,
- 1 combination block GV2AF01.

Characteristics

| Starter type | GV2 | ME06K2 | ME07K2 | ME08K2 | ME10K2 | ME14K2 |
|--|-----------------------------|--------|--------|--------|--------|-------------------------|
| Breaking capacity (I _q) (1) | Conforming to IEC 60947-4-1 | | | | | |
| | 400/415 V | kA | 50 | 50 | 50 | 50 |
| | 440 V | kA | 50 | 50 | 50 | 15 |
| | 500 V | kA | 50 | 50 | 50 | 10 (4 kW) 6 (5.5 kW) |

References



GV2ME10K2●●

D.O.L. starters, reversing

| Standard power ratings of 3-phase motors 50/60 Hz in AC-3 | | | Setting range of thermal trips | Fixed magnetic tripping current 13 Irth | For customer assembly | | Pre-assembled | Weight |
|---|-------|-------|--------------------------------|---|---------------------------------|---|---------------|--------|
| 400/415 V | 440 V | 500 V | | | Motor circuit-breaker Reference | Contactor Reference to be completed (2) | | |
| 0.37 | 0.37 | 0.37 | 1...1.6 | 22.5 | GV2ME06 | LC2K06 | GV2ME06K2●● | 0.460 |
| 0.55 | 0.55 | 0.55 | | | | | | |
| – | – | 0.75 | | | | | | |
| 0.75 | 0.75 | – | 1.6...2.5 | 33.5 | GV2ME07 | LC2K06 | GV2ME07K2●● | 0.460 |
| – | 1.1 | 1.1 | | | | | | |
| 1.1 | – | 1.5 | 2.5...4 | 51 | GV2ME08 | LC2K06 | GV2ME08K2●● | 0.460 |
| 1.5 | 1.5 | 2.2 | | | | | | |
| 2.2 | 2.2 | – | 4...6.3 | 78 | GV2ME10 | LC2K06 | GV2ME10K2●● | 0.460 |
| – | 3 | 3 | | | | | | |
| 3 | – | 4 | 6...10 | 138 | GV2ME14 | LC2K09 | GV2ME14K2●● | 0.460 |
| 4 | 4 | 5.5 | | | | | | |

Add-on blocks

| Description | Sold in lots of | Unit reference |
|---|-----------------|----------------|
| Combination block between circuit breaker and contactor | 10 | GV2AF01 |

(1) The breaking performance of circuit breakers GV2ME can be increased by adding a current limiter GV1L3, see page B6/21.

(2) Please consult your Regional Sales Office.

(3) Please check the availability of your variant in the index page A2/18. The SEARCH function of your viewer can be used.

| Volts | 24 | 110 | 220/230 | 230 | 230/240 | 380/400 |
|------------|-----|-----|---------|-----|---------|---------|
| ~ 50/60 Hz | B7 | F7 | M7 | P7 | U7 | Q7 |
| --- (4) | BW3 | – | – | – | – | – |

(4) Coil: low consumption (1.5 W), wide range (0.7...1.3 U_c) with integral suppression device as standard.

Note: The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).

Open motor starters



TeSys Control

Direct-on-line starters - with overload protection - up to 15 kW

Product references

D.O.L. starters, non-reversing, from 0.06 to 15 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2ME,
- 1 3-pole contactor LC1D,
- 1 combination block GV2AF3.

Characteristics

| Starter type | GV2 | DM102 to DM110 | DM114 | DM116 | DM132 | | |
|--|-----------------------------|----------------|-------|-------|-------|----|----|
| Breaking capacity (I _q) ⁽¹⁾ | Conforming to IEC 60947-4-1 | 400/415 V | kA | 50 | 50 | 15 | 10 |
| | | 440 V | kA | 50 | 15 | 8 | 6 |
| | | 500 V | kA | 50 | 6 | 6 | 4 |

References

D.O.L. starters, non-reversing

| Standard power ratings of 3-phase motors 50/60 Hz in AC-3 | | | Setting range of thermal trips | Fixed magnetic tripping current 13 Irth | For customer assembly | | Pre-assembled | Weight |
|---|-------|-------|--------------------------------|---|---------------------------------|--|---------------------------|--------|
| 400/415 V | 440 V | 500 V | | | Motor circuit-breaker Reference | Contactor Reference to be completed ⁽²⁾ | | |
| kW | kW | kW | A | A | | | | kg |
| 0.06 | 0.06 | – | 0.16...0.25 | 2.4 | GV2ME02 | LC1D09●● | GV2DM102●● ⁽⁴⁾ | 0.596 |
| 0.75 | 0.75 | – | 1.6...2.5 | 33.5 | GV2ME07 | LC1D09●● | GV2DM107●● ⁽⁴⁾ | 0.596 |
| – | 1.1 | 1.1 | | | | | | |
| 1.1 | – | 1.5 | 2.5...4 | 51 | GV2ME08 | LC1D09●● | GV2DM108●● ⁽⁴⁾ | 0.596 |
| 1.5 | 1.5 | 2.2 | | | | | | |
| 2.2 | 2.2 | – | 4...6.3 | 78 | GV2ME10 | LC1D09●● | GV2DM110●● ⁽⁴⁾ | 0.596 |
| – | 3 | 3 | | | | | | |
| 3 | – | 4 | 6...10 | 138 | GV2ME14 | LC1D09●● | GV2DM114●● ⁽⁴⁾ | 0.596 |
| 4 | 4 | 5.5 | | | | | | |
| 5.5 | 5.5 | 7.5 | 9...14 | 170 | GV2ME16 | LC1D12●● | GV2DM116●● | 0.601 |
| 15 | 15 | 18.5 | 24...32 | 416 | GV2ME32 | LC1D32●● | GV2DM132●● | 0.651 |

Add-on blocks

| Description | Mounting of GV2 | Sold in lots of | Unit reference |
|---|------------------------|-----------------|----------------|
| Combination block between circuit breaker and contactor | ┌ rail | 10 | GV2AF3 |
| | Mounting plate LAD 311 | 10 | GV2AF4 |

⁽¹⁾ The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/21.

⁽²⁾ Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

| Volts | 24 | 220 | 230 |
|--------------------|----|-----|-----|
| ~ 50/60 Hz | B7 | M7 | P7 |
| --- ⁽⁵⁾ | BD | – | – |

⁽³⁾ Please check the availability of your variant in the index page A2/18. The **SEARCH** function of your viewer can be used.

⁽⁴⁾ Type 2 coordination also possible, see page A6/10.

⁽⁵⁾ Only available for **GV2DM**. Coil with integral suppression device as standard.

Note: The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).

Open motor starters

PB121676.eps



GV2DM102●●

D.O.L. starters, reversing, from 0.12 to 15 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2 ME,
- 1 3-pole reversing contactor LC2 D,
- 1 combination block GV2AF3.

Characteristics

| Starter type | GV2 | DM202 to DM210 | DM214 | DM216 | DM220 | DM221 | DM222 | DM232 | | |
|--|-----------------------------|----------------|-------|-------|-------|-------|-------|-------|----|----|
| Breaking capacity (I _q) ⁽¹⁾ | Conforming to IEC 60947-4-1 | 400/415 V | kA | 50 | 50 | 15 | 15 | 15 | 15 | 10 |
| | | 440 V | kA | 50 | 15 | 8 | 8 | 6 | 6 | 6 |
| | | 500 V | kA | 50 | 10 | 6 | 6 | 4 | 4 | 4 |

References

D.O.L. starters, reversing⁽²⁾

| Standard power ratings of 3-phase motors 50/60 Hz in AC-3 | | | Setting range of thermal trips | Fixed magnetic tripping current 13 Irth | For customer assembly | | Pre-assembled | Weight |
|---|-------|-------|--------------------------------|---|---------------------------------|--|---------------|--------|
| 400/415V | 440 V | 500 V | | | Motor circuit-breaker Reference | Contactor Reference to be completed ⁽³⁾ | | |
| kW | kW | kW | A | A | | | | kg |
| 0.12 | – | – | 0.40...0.63 | 8 | GV2ME04 | LC2D09●● | GV2DM204●● | 0.963 |
| 0.18 | 0.18 | – | – | – | – | – | – | – |
| 0.25 | 0.25 | – | 0.63...1 | 13 | GV2ME05 | LC2D09●● | GV2DM205●● | 0.963 |
| 0.37 | 0.37 | – | – | – | – | – | – | – |
| – | – | 0.37 | 1...1.6 | 22.5 | GV2ME06 | LC2D09●● | GV2DM206●● | 0.963 |
| 0.55 | 0.55 | 0.55 | – | – | – | – | – | – |
| – | – | 0.75 | – | – | – | – | – | – |
| 1.1 | – | 1.5 | 2.5...4 | 51 | GV2ME08 | LC2D09●● | GV2DM208●● | 0.963 |
| 1.5 | 1.5 | 2.2 | – | – | – | – | – | – |
| 9 | 11 | 11 | 17...23 | 327 | GV2ME21 | LC2D25●● | GV2DM221●● | 1.063 |
| 15 | 15 | 18.5 | 24...32 | 416 | GV2ME32 | LC2D32●● | GV2DM232●● | 1.073 |

Add-on blocks

| Description | Mounting of GV2 | Sold in lots of | Unit reference |
|---|------------------------|-----------------|----------------|
| Combination block between circuit breaker and contactor | ┌ rail | 10 | GV2AF3 |
| | Mounting plate LAD 311 | 10 | GV2AF4 |

(1) The breaking performance of circuit breakers GV2ME can be increased by adding a current limiter GV1L3, see page B6/21.

(2) Type 2 coordination also possible, see page B6/21.

(3) See page B8/22.

(4) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

| Volts | 24 | 220 | 230 |
|--------------------|----|-----|-----|
| ~ 50/60 Hz | B7 | M7 | P7 |
| --- ⁽⁶⁾ | BD | – | – |

(5) Please check the availability of your variant in the index page A2/18. The SEARCH function of your viewer can be used.

(6) Coil with integral suppression device as standard.

Note: The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).



GV2DM202●●

Open motor starters



TeSys Control

Direct-on-line starters - with overload protection - up to 30 kW

Product references

D.O.L. starters, non-reversing, from 0.06 to 30 kW at 400/415 V, type 2 coordination

To be assembled by customer, using:

- 1 motor circuit breaker GV2P,
- 1 3-pole contactor LC1D,
- 1 combination block GV2AF3.

Characteristics

| Starter type | GV2 | P02 to P110 | P14 | P16 | P20 | P21 | P22 | P32 | |
|--|-----------------------------|-------------|-----|-----|-----|-----|-----|-----|----|
| Breaking capacity (I _q) ⁽¹⁾ | Conforming to IEC 60947-4-1 | 400/415 V | kA | 130 | 130 | 130 | 50 | 50 | 50 |
| | | 440 V | kA | 130 | 130 | 50 | 20 | 20 | 20 |
| | | 500 V | kA | 130 | 50 | 42 | 10 | 10 | 10 |

References

D.O.L. starters, non-reversing

| Standard power ratings of 3-phase motors 50/60 Hz in AC-3 | | Setting range of thermal trips | Fixed magnetic tripping current 13 Irth | For customer assembly | | Weight | |
|---|-------|--------------------------------|---|---------------------------------|--|-----------|-------|
| 400/ 415 V | 440 V | 500 V | | Motor circuit-breaker Reference | Contactor Reference to be completed ⁽²⁾ | | |
| kW | kW | kW | A | A | | kg | |
| 0.06 | 0.06 | – | 0.16...0.25 | 2.4 | GV2P02 | LC1D09●● | 0.686 |
| – | 0.09 | – | 0.25...0.40 | 5 | GV2P03 | LC1D09●● | 0.686 |
| 0.09 | 0.12 | – | – | – | – | – | – |
| 0.12 | – | – | 0.40...0.63 | 8 | GV2P04 | LC1D09●● | 0.686 |
| 0.18 | 0.18 | – | – | – | – | – | – |
| 0.25 | 0.25 | – | 0.63...1 | 13 | GV2P05 | LC1D09●● | 0.686 |
| 0.37 | 0.37 | – | – | – | – | – | – |
| – | – | 0.37 | 1...1.6 | 22.5 | GV2P06 | LC1D09●● | 0.686 |
| 0.55 | 0.55 | 0.55 | – | – | – | – | – |
| – | – | 0.75 | – | – | – | – | – |
| 0.75 | 0.75 | – | 1.6...2.5 | 33.5 | GV2P07 | LC1D09●● | 0.686 |
| – | 1.1 | 1.1 | – | – | – | – | – |
| 1.1 | – | 1.5 | 2.5...4 | 51 | GV2P08 | LC1D09●● | 0.696 |
| 1.5 | 1.5 | 2.2 | – | – | – | – | – |
| 2.2 | 2.2 | – | 4...6.3 | 78 | GV2P10 | LC1D09●● | 0.736 |
| – | 3 | 3 | – | – | – | – | – |
| 3 | – | 4 | 6...10 | 138 | GV2P14 | LC1D09●● | 0.736 |
| 4 | 4 | 5.5 | – | – | – | – | – |
| 5.5 | 5.5 | 7.5 | 9...14 | 170 | GV2P16 | LC1D25●● | 0.741 |
| – | 7.5 | 9 | – | – | – | – | – |
| 7.5 | 9 | – | 13...18 | 223 | GV2P20 | LC1D25●● | 0.736 |
| 9 | 11 | 11 | 17...23 | 327 | GV2P21 | LC1D25●● | 0.741 |
| 11 | – | 15 | 20...25 | 327 | GV2P22 | LC1D25●● | 0.741 |
| 15 | 15 | 18.5 | 24...32 | 416 | GV2P32 | LC1D32●● | 0.741 |
| 18.5 | – | – | 30...40 | 560 | GV3P401 ⁽⁵⁾ | LC1D50A●● | 1.725 |
| – | 18.5 | 22 | 30...40 | 560 | GV3P401 ⁽⁵⁾ | LC1D65A●● | 1.730 |
| 22 | – | – | 37...50 | 700 | GV3P501 ⁽⁵⁾ | LC1D50A●● | 1.725 |
| – | 22 | 30 | 37...50 | 700 | GV3P501 ⁽⁵⁾ | LC1D65A●● | 1.730 |
| 30 | 37 | – | 48...65 | 910 | GV3P651 ⁽⁵⁾ | LC1D65A●● | 1.730 |

Add-on blocks

| Description | Mounting of GV2 | Sold in lots of | Unit reference |
|---|-----------------|-----------------|----------------|
| Combination block between circuit breaker and contactor | └ rail | 10 | GV2AF3 |

(1) The breaking performance of circuit breakers GV2P can be increased by adding a current limiter GV1L3, see page B6/11.
 (2) See page B8/22.
 (3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

| Volts | 24 | 220 | 230 |
|--------------------|----|-----|-----|
| ~ 50/60 Hz | B7 | M7 | P7 |
| --- ⁽⁶⁾ | BD | – | – |

(4) Please check the availability of your variant in the index page A2/18. The SEARCH function of your viewer can be used.

(5) Circuit breaker supplied without downstream EverLink® power terminal block, which is required for vertical mounting. For side by side mounting, use a GV3P circuit breaker with terminal blocks and the GV3S set of S-shape busbars (see page B8/42).

(6) Coil with integral suppression device as standard.

Note: The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).

Dimensions: pages A2/20 and A2/21

Schemes: page A2/23

A2/6

Life Is On

Schneider Electric

Open motor starters

PB121702.tif



GV2P●● + LC1D09 + GV2AF3

PB121675.eps



PB121684.eps



GV3P651 + LC1D65A●●

TeSys Control

Reversing starters - with overload protection - up to 30 kW

Product references

D.O.L. starters, reversing, from 0.06 to 30 kW at 400/415 V, type 2 coordination

To be assembled by customer, using:

- 1 motor circuit breaker GV2P,
- 1 3-pole reversing contactor LC2D,
- 1 combination block GV2AF3.

Characteristics

| Starter type | GV2 | P02 to P10 | P14 | P16 | P20 | P21 | P22 | P32 | |
|---------------------------------------|-----------------------------|------------|-----|-----|-----|-----|-----|-----|----|
| Breaking capacity (Iq) ⁽¹⁾ | Conforming to IEC 60947-4-1 | 400/415 V | kA | 130 | 130 | 130 | 50 | 50 | 50 |
| | | 440 V | kA | 130 | 130 | 50 | 20 | 20 | 20 |
| | | 500 V | kA | 130 | 50 | 42 | 10 | 10 | 10 |

References

D.O.L. starters, reversing

| Standard power ratings of 3-phase motors 50/60 Hz in AC-3 | | | Setting range of thermal trips | Fixed magnetic tripping current 13 Irth | For customer assembly | | Weight |
|---|-------|-------|--------------------------------|---|---------------------------------|--|--------|
| 400/ 415 V | 440 V | 500 V | | | Motor circuit-breaker Reference | Contactor Reference to be completed ⁽²⁾ | |
| kW | kW | kW | A | A | | | kg |
| 0.06 | 0.06 | – | 0.16...0.25 | 2.4 | GV2P02 | LC2D09●● | 1.053 |
| – | 0.09 | – | 0.25...0.40 | 5 | GV2P03 | LC2D09●● | 1.053 |
| 0.09 | 0.12 | – | 0.40...0.63 | 8 | GV2P04 | LC2D09●● | 1.053 |
| 0.12 | – | – | 0.63...1 | 13 | GV2P05 | LC2D09●● | 1.053 |
| 0.18 | 0.18 | – | – | – | – | – | – |
| 0.25 | 0.25 | – | 0.63...1 | 13 | GV2P05 | LC2D09●● | 1.053 |
| 0.37 | 0.37 | – | – | – | – | – | – |
| – | – | 0.37 | 1...1.6 | 22.5 | GV2P06 | LC2D09●● | 1.053 |
| 0.55 | 0.55 | 0.55 | – | – | – | – | – |
| – | – | 0.75 | – | – | – | – | – |
| 0.75 | 0.75 | – | 1.6...2.5 | 33.5 | GV2P07 | LC2D09●● | 1.053 |
| – | 1.1 | 1.1 | – | – | – | – | – |
| 1.1 | – | 1.5 | 2.5...4 | 51 | GV2P08 | LC2D09●● | 1.073 |
| 1.5 | 1.5 | 2.2 | – | – | – | – | – |
| 2.2 | 2.2 | – | 4...6.3 | 78 | GV2P10 | LC2D09●● | 1.153 |
| – | 3 | 3 | – | – | – | – | – |
| 3 | – | 4 | 6...10 | 138 | GV2P14 | LC2D09●● | 1.153 |
| 4 | 4 | 5.5 | – | – | – | – | – |
| 5.5 | 5.5 | 7.5 | 9...14 | 170 | GV2P16 | LC2D25●● | 1.163 |
| – | 7.5 | 9 | – | – | – | – | – |
| 7.5 | 9 | – | 13...18 | 223 | GV2P20 | LC2D25●● | 1.153 |
| 9 | 11 | 11 | 17...23 | 327 | GV2P21 | LC2D25●● | 1.163 |
| 11 | – | 15 | 20...25 | 327 | GV2P22 | LC2D25●● | 1.163 |
| 15 | 15 | 18.5 | 24...32 | 416 | GV2P32 | LC2D32●● | 1.163 |
| 18.5 | – | – | 30...40 | 560 | GV3P401 ⁽⁵⁾ | LC2D50A●● | 2.750 |
| – | 18.5 | 22 | 30...40 | 560 | GV3P401 ⁽⁵⁾ | LC2D65A●● | 2.760 |
| 22 | – | – | 37...50 | 700 | GV3P501 ⁽⁵⁾ | LC2D50A●● | 2.750 |
| – | 22 | 30 | 37...50 | 700 | GV3P501 ⁽⁵⁾ | LC2D65A●● | 2.760 |
| 30 | 37 | – | 48...65 | 910 | GV3P651 ⁽⁵⁾ | LC2D65A●● | 2.760 |

Add-on blocks

| Description | Mounting of GV2 | Sold in lots of | Unit reference |
|---|-----------------|-----------------|----------------|
| Combination block between circuit breaker and contactor | └ rail | 10 | GV2AF3 |

(1) The breaking performance of circuit breakers GV2P can be increased by adding a current limiter GV1L3, see page B6/11.

(2) See page B8/22.

(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

| Volts | 24 | 220 | 230 |
|--------------------|----|-----|-----|
| ~ 50/60 Hz | B7 | M7 | P7 |
| --- ⁽⁶⁾ | BD | – | – |

(4) Please check the availability of your variant in the index page A2/18. The SEARCH function of your viewer can be used.

(5) Circuit breaker supplied without downstream EverLink® power terminal block, which is required for vertical mounting. For side by side mounting, use a GV3P circuit breaker with terminal blocks and the GV3S set of S-shape busbars (see page B8/42).

(6) Coil with integral suppression device as standard.

Note: The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).



GV2P●● + LC1D09 + GV2AF3



GV3P651 + LC2D65A●●



TeSys Control

Star-delta starters - up to 132 kW ⁽¹⁾

Product references

Open motor starters

FB121688.eps



LC3D32A●●

Plate mounted starters without isolating device

Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds.

| Standard power ratings of squirrel cage motors | | | | Auxiliary contacts available on each contactor | | | | | | Star delta mechanical interlock | Basic reference, to be completed by adding the voltage code ^{(2) (3)} | Weight |
|--|-----------|-------|-------|--|-------|-----|------------------|---|------------------|---------------------------------|--|--------|
| Mains voltage - delta connection | | | | line | delta | | star | | | | | |
| 220/230 V | 380/400 V | 415 V | 440 V | KM2 | KM3 | KM1 | | | | | | |
| kW | kW | kW | kW | | | | | | | kg | | |
| 4 | 7.5 | 7.5 | 7.5 | - | - | - | - ⁽⁴⁾ | - | 1 | With | LC3D09A●● | 1.530 |
| 5.5 | 11 | 11 | 11 | - | - | - | - ⁽⁴⁾ | - | 1 | With | LC3D12A●● | 1.530 |
| 11 | 18.5 | 22 | 22 | - | - | - | - ⁽⁴⁾ | - | 1 | With | LC3D18A●● | 1.730 |
| 15 | 25 | 30 | 30 | - | - | - | - ⁽⁴⁾ | - | 1 | With | LC3D32A●● | 2.030 |
| 37 | 75 | 75 | 75 | - | 1 | 1 | - ⁽⁴⁾ | - | - ⁽⁴⁾ | Without | LC3D80●● | 5.200 |
| | | | | | | | | | | With | LC3D80●●A64 | 5.400 |
| 63 | 110 | 110 | 110 | - | 1 | 1 | - ⁽⁴⁾ | - | - ⁽⁴⁾ | Without | LC3D115●● ⁽⁵⁾ | 11.800 |
| | | | | | | | | | | With | LC3D115●●A64 ⁽⁵⁾ | 12.100 |
| 75 | 132 | 132 | 147 | - | 1 | 1 | - ⁽⁴⁾ | - | 1 ⁽⁴⁾ | Without | LC3D150●● ⁽⁵⁾ | 12.100 |
| | | | | | | | | | | With | LC3D150●●A64 ⁽⁵⁾ | 12.100 |

Rail mounted starters (35 mm rail) without isolating device

Maximum operating rate: 12 starts/hour. Maximum starting time: 30 seconds.

| Standard power ratings of squirrel cage motors | | | | Auxiliary contacts available on each contactor | | | | | | Star delta mechanical interlock | Basic reference, to be completed by adding the voltage code ^{(2) (3)} | Weight |
|--|-----------|-------|-------|--|-------|-----|------------------|---|---|---------------------------------|--|--------|
| Mains voltage - delta connection | | | | line | delta | | star | | | | | |
| 220/230 V | 380/400 V | 415 V | 440 V | KM2 | KM3 | KM1 | | | | | | |
| kW | kW | kW | kW | | | | | | | kg | | |
| 4 | 7.5 | 7.5 | 7.5 | - | - | - | - | - | 1 | With | LC3K09●● | 0.740 |
| 4 | 7.5 | 7.5 | 7.5 | - | - | - | - ⁽⁴⁾ | - | 1 | With | LC3D090A●● | 1.530 |
| 5.5 | 11 | 11 | 11 | - | - | - | - ⁽⁴⁾ | - | 1 | With | LC3D120A●● | 1.530 |
| 11 | 18.5 | 22 | 22 | - | - | - | - ⁽⁴⁾ | - | 1 | With | LC3D180A●● | 1.730 |
| 15 | 25 | 30 | 30 | - | - | - | - ⁽⁴⁾ | - | 1 | With | LC3D320A●● | 2.030 |

⁽¹⁾ Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current (see pages B11/4 and B11/5).

⁽²⁾ Standard control circuit voltages:

Volts ~ 50/60 Hz 24 36 42 48 110 220 230 240 380 400 415 440

Star-delta starters LC3K09

Code B7 C7 D7 E7 F7 M7 P7 U7 - - - -

Star-delta starters LC3D09A...D150, LC3D090A...D320A

Code B7 - D7 E7 F7 M7 P7 U7 Q7 V7 N7 R7

For other voltages, please consult your Regional Sales Office.

⁽³⁾ Please check the availability of your variant in the index page A2/18. The SEARCH function of your viewer can be used.

⁽⁴⁾ One auxiliary contact block type LADN can also be fitted, see page B8/36.

⁽⁵⁾ These starters consist of contactors LC1D115 or D150 without connectors.

TeSys Control

Star-delta starters - up to 315 kW ⁽¹⁾

Product references

Pre-assembled starters without isolating device

Maximum operating rate: 12 starts/hour.

Maximum starting time:

LC3F●●●●●: 20 seconds,

LC3F●●●●●A64: 30 seconds (3 identical contactors).

Composition of starters without mechanical interlock, see pages A2/14, A2/15.

Star-delta starters

| Standard power ratings of squirrel cage motors | | | | Auxiliary contacts available on each contactor | | | | | | Star delta mechanical interlock | Basic reference, to be completed by adding the voltage code ^{(3) (4)} | Weight |
|--|-----------|-------|-------|--|-------|-----|------|-----|-----|---------------------------------|--|--------|
| Mains voltage - delta connection | | | | line | delta | | star | | | | | |
| 220/230 V | 380/400 V | 415 V | 440 V | KM2 | KM3 | KM3 | KM1 | KM1 | (2) | | | |
| kW | kW | kW | kW | | | | | | | | | kg |
| 90 | 160 | 160 | 185 | 1 | 2 | 2 | 1 | 1 | 1 | Without | LC3F185●● | 16.500 |
| 100 | 200 | 200 | 220 | 1 | 2 | 2 | 1 | 1 | 1 | Without | LC3F225●● | 16.500 |
| 110 | 220 | 220 | 250 | 1 | 2 | 2 | 1 | 1 | 1 | Without | LC3F265●● | 27.300 |

⁽¹⁾ Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/11 and B11/12.

⁽²⁾ One auxiliary contact block type LADN can be fitted.

⁽³⁾ Standard control circuit voltages:

| Volts ~ 50/60 Hz | 24 | 220/230 | 380/400 |
|------------------|----|---------|---------|
| Code | B7 | M7 | Q7 |

For other voltages, please consult your Regional Sales Office.

⁽⁴⁾ Please check the availability of your variant in the index page A2/18. The SEARCH function of your viewer can be used.

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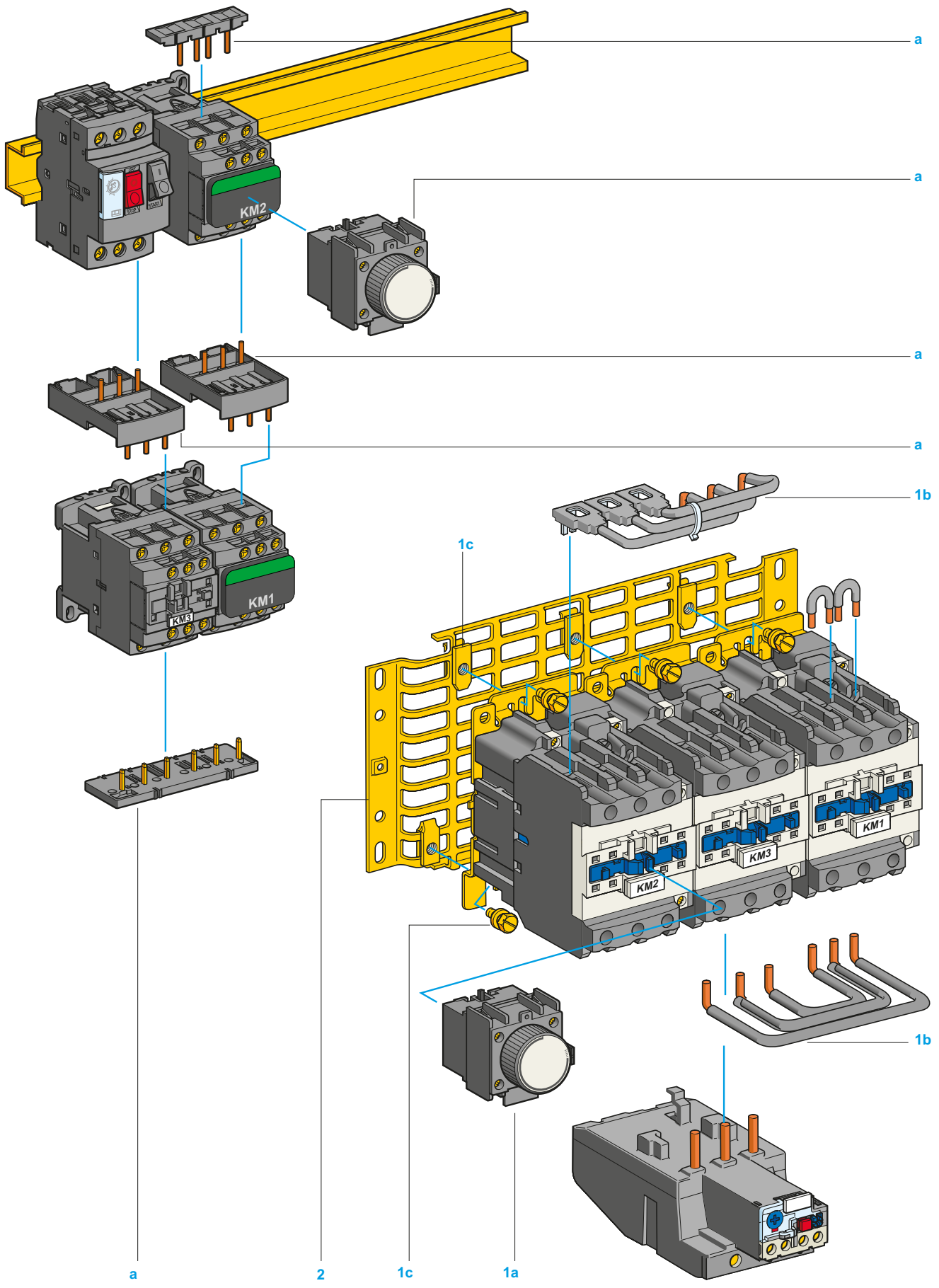


LC3F185M7

Open motor starters



Open motor starters



Star-delta starters without mechanical interlock, for customer assembly on plate or on mounting rail ⁽²⁾

Starters for direct combination with a circuit breaker

Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds

| Standard power ratings of squirrel cage motors ⁽³⁾ | Thermal-magnetic motor circuit breaker <i>References in italics are available in CEE zone only</i> | Contactors (basic references, to be completed by adding the voltage code) ⁽⁴⁾ | | | |
|---|---|---|----------|----------|----------|
| | | Mains voltage - delta connection | | | |
| 400/ 415 V | 440 V | line | delta | star | |
| kW | kW | KM2 | KM3 | KM1 | |
| 7.5 | 7.5 | GV2ME20 or GV2ME20AP | LC1D09●● | LC1D09●● | LC1D09●● |
| – | 9 | GV2ME20 or GV2ME20AP | LC1D12●● | LC1D12●● | LC1D09●● |
| 9 | 11 | GV2ME21 or GV2ME21AP | LC1D12●● | LC1D12●● | LC1D09●● |
| 11 | – | GV2ME22 or GV2ME22AP | LC1D12●● | LC1D12●● | LC1D09●● |
| 15 | 15 | GV2ME32 or GV2ME32AP | LC1D18●● | LC1D18●● | LC1D09●● |

Separate component

| Description | Illustration item no. | Reference |
|---|-----------------------|-----------|
| Mounting kit comprising: power circuit connections and 1 time delay contact block LADS2 | a | LAD912GV |

Starters for mounting separately from upstream protection

Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds.

| Standard power ratings of squirrel cage motors ⁽³⁾ | | | | Contactors (basic references, to be completed by adding the voltage code) ⁽⁴⁾ | | | Separate components (see below) |
|---|---------------|-------|-------|---|-------------------------|-----------|------------------------------------|
| Mains voltage - delta connection | | | | | | | |
| 220/ 230 V | 380/ 400 V | 415 V | 440 V | line | delta | star | Component types |
| kW | kW | kW | kW | KM2 | KM3 | KM1 | |
| 4 | 7.5 | 7.5 | 7.5 | LC1D09●● | LC1D09●● | LC1D09●● | D09 |
| 5.5 | 11 | 11 | 11 | LC1D18●● ⁽⁶⁾ | LC1D12●● | LC1D09●● | D12 |
| 11 | 18.5 | 22 | 22 | LC1D25●● ⁽⁷⁾ | LC1D25●● ⁽⁷⁾ | LC1D09●● | D18 |
| 15 | 25 | 30 | 30 | LC1D32●● | LC1D32●● | LC1D18●● | D32 |
| 18.5 | 37 | 37 | 37 | LC1D40A●● | LC1D40A●● | LC1D40A●● | D40 |
| 30 | 55 | 59 | 59 | LC1D50A●● | LC1D50A●● | LC1D40A●● | D50 |
| 37 | 75 | 75 | 75 | LC1D80●● | LC1D80●● | LC1D50A●● | D80 |
| 63 | 110 | 110 | 110 | LC1D115●● | LC1D115●● | LC1D80●● | D115 ⁽⁵⁾ |
| 75 | 132 | 132 | 147 | LC1D150●● | LC1D150●● | LC1D115●● | D150 ⁽⁵⁾ |

Separate components

| Description | Illustration item no. | For components type ⁽⁵⁾ | Reference | Without timer LADS2 |
|---|-----------------------|------------------------------------|------------------------|---------------------|
| Mounting kit comprising: - 1 time delay contact block LADS2 (D09...D80) ⁽³⁾ , - power circuit connections (D09...D80), - screws and clamps for fixing contactors to the plate (D40...D80). | 1 a | LC1D09 to D38 ⁽⁸⁾ | LAD91217 | LAD91218 |
| | 1 b | LC1D09 to D38 ⁽⁹⁾ | LAD93217 | LAD93218 |
| | 1 c | D40 and D50 | LA9D5017 | – |
| | | D80 | LA9D8017 | – |
| Equipment mounting plates | 2 | LC1D09 to D38 D80 | LA9D12974 LA9D80973 | |

⁽¹⁾ Protection must be provided by the addition of a thermal overload relay, to be ordered separately.

Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/4 and B11/5.

⁽²⁾ For mounting, assembly and cabling: please refer to installation instructions supplied with the equipment.

⁽³⁾ See comments on page A2/24.

⁽⁴⁾ See page B8/22.

⁽⁵⁾ For D115 and D150 components, see illustration and separate parts on pages A2/12 and A2/13.

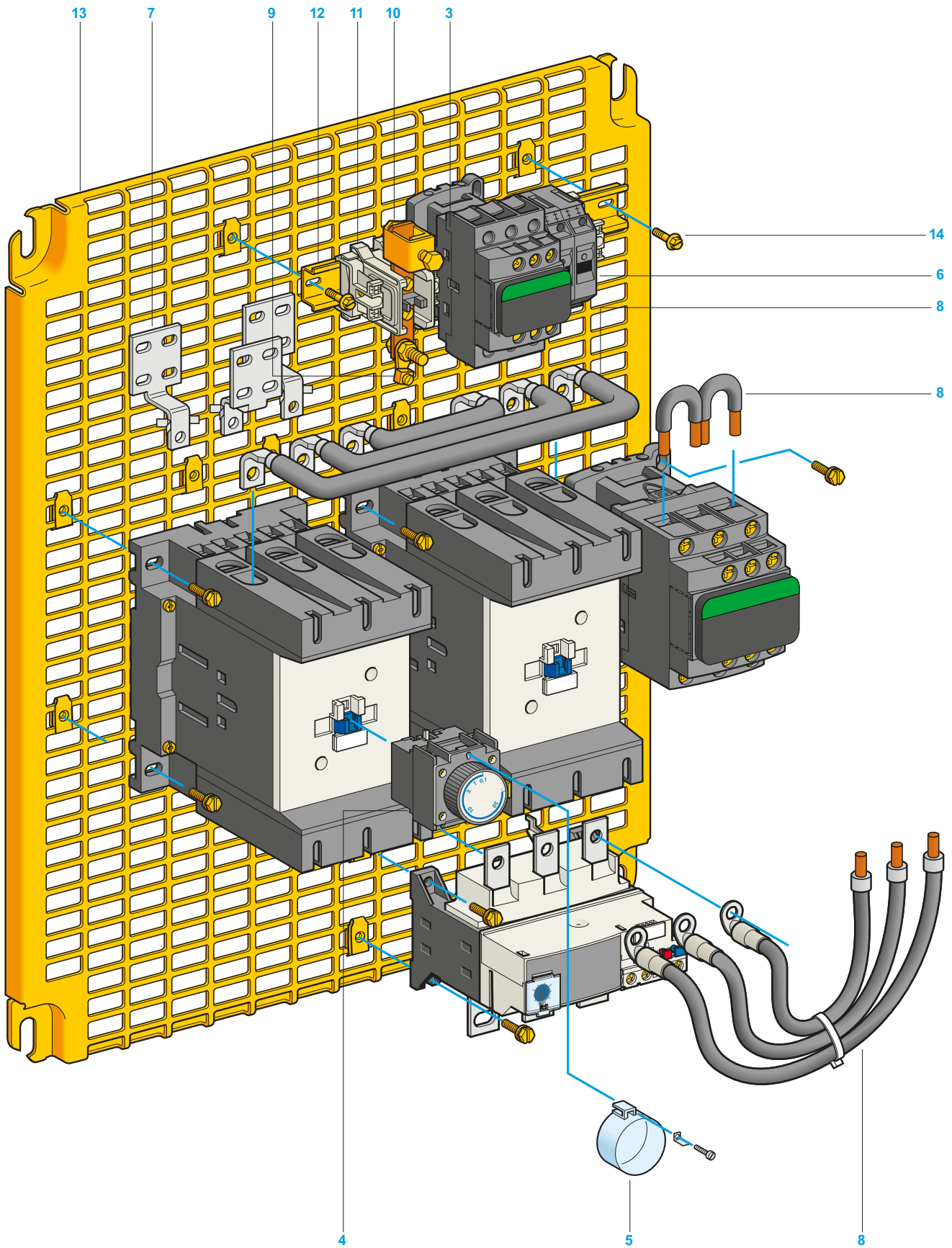
⁽⁶⁾ A D12 component is adequate for the application, but use of a D18 is recommended.
(connection capacity, correct use of power connection kit and connections).

⁽⁷⁾ A D18 component is adequate for the application, but use of a D25 is recommended.
(connection capacity, correct use of power connection kit and connections).

⁽⁸⁾ For assembly of 3 contactors of the same physical size (depth).

⁽⁹⁾ For assembly of 3 contactors with star contactor physically smaller (depth).

Open motor starters



Starters for mounting separately from upstream protection

Separate components (continued)

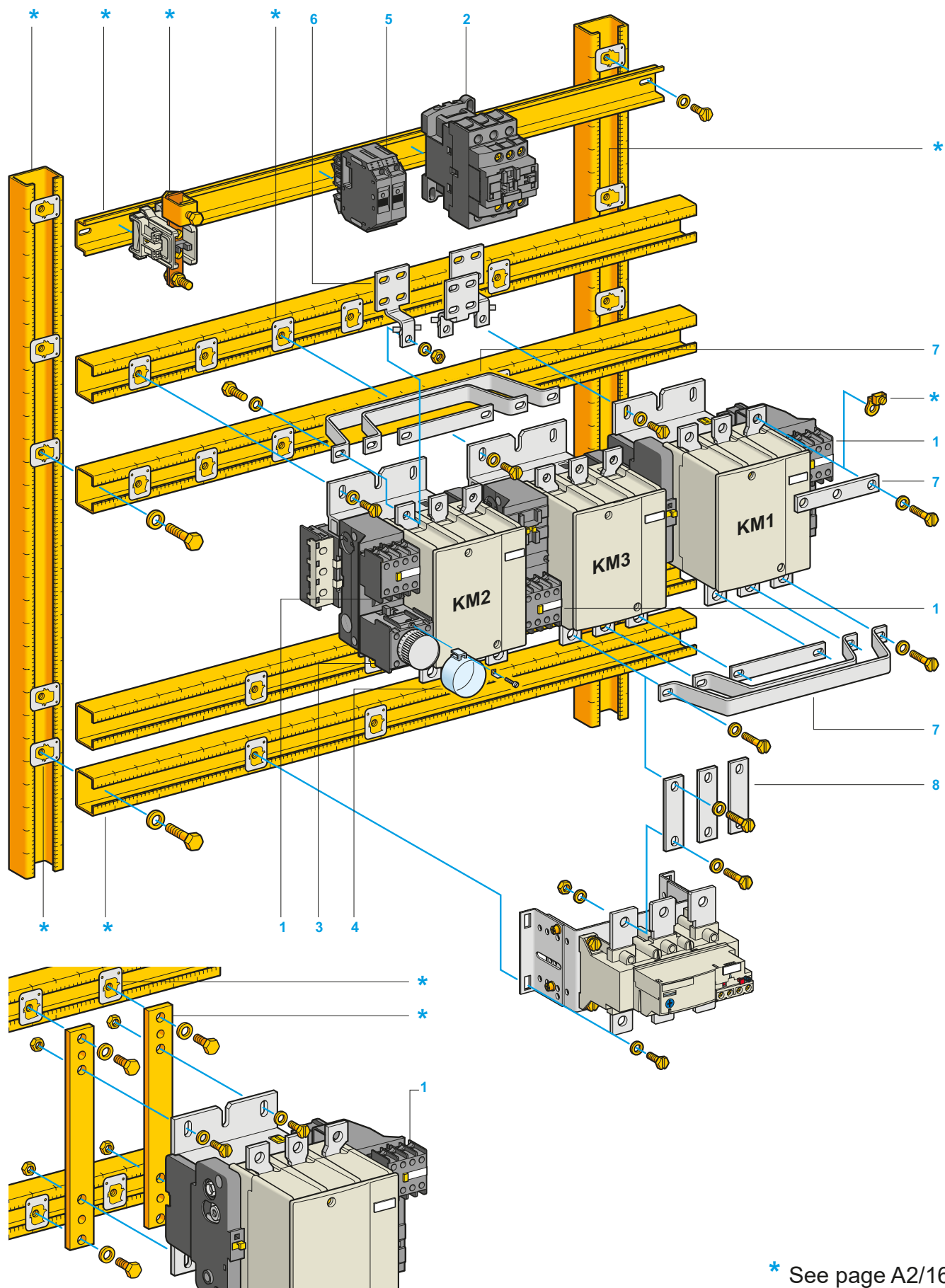
| Description | Illustration item no. | For use on | No. | Sold in lots of | Unit reference | Weight kg |
|--|-----------------------|-------------|-----|-----------------|----------------|-----------|
| Instantaneous auxiliary contact blocks 1 N/O | 1 | D115 (star) | 1 | 1 | LADN10 | 0.020 |
| Control relay | 3 | D115, D150 | 1 | 1 | CAD32 | 0.320 |
| Time delay auxiliary contact blocks | 4 | D115, D150 | 1 | 1 | LADT2 | 0.060 |
| Lead sealing kit for time delay auxiliary contact blocks | 5 | D115, D150 | 1 | 1 | LA9D901 | 0.005 |
| Thermal magnetic circuit breaker for control circuit (200...415 V) | 6 | D115, D150 | 2 | 6 | GB2CB05 | 0.060 |
| Set of 3 connectors for wider terminations (optional) | 7 | D115, D150 | 1 | 1 | LA9FG980 | 0.200 |
| Set of power connections with fixing accessories | 8 | D115 | 1 | 1 | LA9D11517 | 0.800 |
| | | D150 | 1 | 1 | LA9D15017 | 1.050 |
| Spare volt free terminals | 9 | D115, D150 | 1 | 10 | DZ3HA3 | 0.007 |
| | | | 2 | 10 | DZ3GA3 | 0.006 |
| Lug-connector terminal block | 10 | D115, D150 | 1 | 10 | AB1BC9535 | 0.236 |
| End stop | 11 | D115, D150 | 3 | 100 | AB1AB8M35 | 0.005 |
| Mounting rail ┌ 35 mm | 12 | D115, D150 | 1 | 10 | NSYDPR25 | 0.210 |
| Pre-slotted mounting plate | 13 | D115, D150 | 1 | 1 | AM3PA65 | 1.950 |
| Screw with captive washer | 14 | D115, D150 | 12 | 100 | AF1VA618 | 0.006 |
| | | | 2 | 100 | AF1VA410 | 0.002 |

⁽¹⁾ Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/4 and B11/5.

Open motor starters



Open motor starters



* See page A2/16

Star-delta starters without mechanical interlock for customer assembly on chassis

| Contactors | | | | | | | |
|--|----------|------|------|---------------------------|-----------|-----------|---------------------------------|
| Maximum operating rate: 12 starts/hour. Maximum starting time: 20 seconds ⁽²⁾ | | | | | | | |
| Standard power ratings of squirrel cage motors | | | | Contactors ⁽³⁾ | | | Separate components (see below) |
| 220/230V | 380/400V | 415V | 440V | line | delta | star | |
| kW | kW | kW | kW | KM2 | KM3 | KM1 | Component types |
| 90 | 160 | 160 | 185 | LC1F185●● | LC1F185●● | LC1D150●● | F185 |
| 100 | 200 | 200 | 220 | LC1F225●● | LC1F225●● | LC1F185●● | F225 |
| 110 | 220 | 220 | 250 | LC1F265●● | LC1F265●● | LC1F185●● | F265 |
| 160 | 280 | 280 | 315 | LC1F330●● | LC1F330●● | LC1F265●● | F330 |
| 185 | 315 | 355 | 375 | LC1F400●● | LC1F400●● | LC1F265●● | F400 |

| Separate components ⁽⁴⁾ | | | | | | | |
|--|-----------------------|---------------|-----|-----------------|---|-----------|--|
| Description | Illustration item no. | For use on | No. | Sold in lots of | Unit reference | Weight kg | |
| Instantaneous auxiliary contact blocks 2 N/O + 2 N/C | 1 | F185 to F400 | 3 | 1 | LADN22 | 0.050 | |
| Control relay | 2 | F185 to F400 | 1 | 1 | CAD32 | 0.580 | |
| Time delay auxiliary contact blocks | 3 | F185 to F400 | 1 | 1 | LADT2 | 0.060 | |
| Sealing cover | 4 | F185 to F400 | 1 | 1 | LA9D901 | 0.005 | |
| Thermal magnetic circuit breaker for 5 A control circuit | 5 | F185 to F400 | 2 | 6 | GB2CB10 | 0.050 | |
| Sets of 3 connectors for wider terminations (optional) | 6 | F185 | 1 | 1 | LA9FG980 | 0.200 | |
| | | F225 to F400 | 1 | 1 | LA9FJ980 | 0.490 | |
| Sets of power connections | 7 | F185 | 1 | 1 | LA9F18517 | 0.800 | |
| | | F265 | 1 | 1 | LA9FH610 | 1.400 | |
| | | F330 and F400 | 1 | 1 | LA9FJ610 | 1.500 | |
| Set of 3 busbars for thermal overload connections | 8 | F185 to F400 | 1 | 1 | LA7F●●● (Selected according to size of thermal overload relay) see pages B11/11 and B11/12. | | |

⁽¹⁾ Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/11 and B11/12.

⁽²⁾ For longer starting times, please consult your Regional Sales Office.

⁽³⁾ Contactors supplied with coil. Complete the reference by adding the control circuit voltage code.

Standard control circuit voltages, please check the availability of your variant in the index page A2/18. The SEARCH function of your viewer can be used.

| LC1D150 | | | | | | | | | | | |
|----------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Volts | 48 | 110 | 115 | 120 | 220 | 230 | 240 | 380 | 400 | 415 | |
| 50/60 Hz | E7 | F7 | FE7 | G7 | M7 | P7 | U7 | Q7 | V7 | N7 | |

| LC1F185 to F400 | | | | | | | | | | | |
|-----------------------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Volts | 48 | 110 | 115 | 120 | 220 | 230 | 240 | 380 | 400 | 415 | |
| 40... 400 Hz ⁽⁵⁾ | E7 ⁽⁶⁾ | F7 | FE7 | G7 | M7 | P7 | U7 | Q7 | V7 | N7 | |

Standard voltages, see page B9/2.

For other voltages between 24 and 660 V, see pages B9/17 and B9/18.

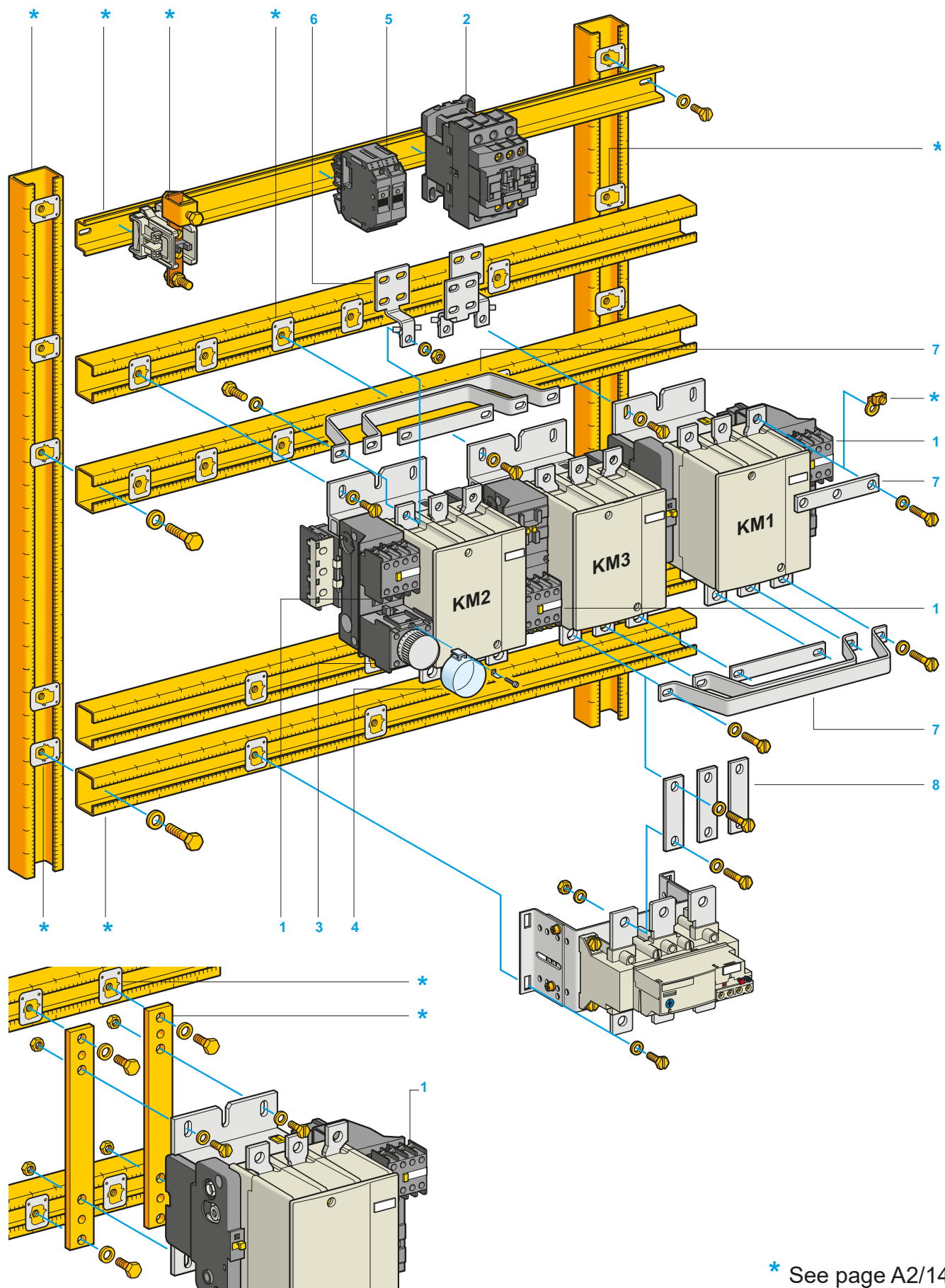
⁽⁴⁾ Other separate components, see page A2/17.

⁽⁵⁾ Coil LX1: LC1F265, F330 and F400. Coil LX9: LC1F185 and F225.

⁽⁶⁾ Except for LC1F400.



Open motor starters



* See page A2/14

| Separate components (continued from page A2/15) | | | | | | |
|--|-----------------------|---------------|-----------|-----------------|----------------|-----------|
| Description | Illustration item no. | For use on | No. | Sold in lots of | Unit reference | Weight kg |
| Spare volt free terminals | 9 | F185 | 3 | 10 | DZ3GA3 | 0.006 |
| | | F225...F400 | 3 | 10 | DZ3HA3 | 0.007 |
| Neutral terminals with stop and spare volt free terminal (for control circuit) | 10 | F185 | 1 | 10 | AB1BC9535 | 0.236 |
| | | | 2 | 100 | AB1AB8P35 | 0.006 |
| | | | 1 | 10 | DZ3HA3 | 0.007 |
| | | F225 and F265 | 1 | 10 | AB1BC15035 | 0.277 |
| | | | 2 | 100 | AB1AB8M35 | 0.007 |
| | | | 1 | 10 | DZ3JA3 | 0.010 |
| | | F330 and F400 | 1 | 10 | AB1BC24035 | 0.287 |
| 2 | 100 | | AB1AB8M35 | 0.007 | | |
| 1 | 10 | | DZ3JA3 | 0.010 | | |
| Reducer bracket | 11 | F400 | 2 | 1 | LA9F100 | 0.100 |
| Mounting rails ⁽²⁾ | 12 | F185...F400 | 1 | 10 | NSYSDR200 | 0.900 |
| | 13 | F185...F400 | 1 | 4 | AM1EC200 | 2.980 |
| Uprights ⁽²⁾ | 14 | F115...F400 | 2 | 4 | AM1EC200 | 2.980 |
| 1/4 turn sliding clip nuts and corresponding bolts for rails NSYSDR | 15 | F185...F400 | 2 | 10 | NSYSNM6 | 0.020 |
| | | | | 100 | AF1VA618 | 0.006 |
| 1/4 turn sliding clip nuts and corresponding bolts for rails NSYSDR | 16 | F185...F400 | 8 | 10 | NSYSNM8 | 0.020 |
| | | | | 10 | AF1VC820 | 0.024 |
| 1/4 turn sliding clip nuts and corresponding bolts for equipment fixing | 17 | F185...F330 | 15 | 10 | AF1CD061 | 0.020 |
| | | | | 100 | AF1VA618 | 0.006 |
| | | | | F400 | 8 | 10 |
| | | 10 | AF1CD081 | 0.020 | | |
| | | 100 | AF1VA618 | 0.006 | | |
| | | 10 | AF1VC820 | 0.024 | | |
| Enclosures: metal, grey RAL 7032 | - | F185...F225 | 1 | 1 | ACMGV763 | 19.090 |
| | | F265 | 1 | 1 | ACMGV973 | 33.310 |
| | | F330 and F400 | 1 | 1 | ACMGV1084 | 54.000 |
| Fixing lugs adjustable for enclosure ACM | - | - | 4 | 4 | AE3FX122 | 0.080 |

⁽¹⁾ Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/11 and B11/12.

⁽²⁾ Supplied in 2 m lengths. See page A2/27 for cutting to length.

TeSys Control

Open pre-cabled motor starters

Product references

Open
motor
starters

| | | |
|--------------|--------------|--------------|
| AB1AB8M35 | GV2ME08K1P7 | LADN10 |
| AB1AB8P35 | GV2ME10K1BW3 | LADN22 |
| AB1BC15035 | GV2ME14K1B7 | LADT2 |
| AB1BC9535 | GV2MP01 | LC3D090AB7 |
| ACMGV1084 | GV2MP02 | LC3D090AP7 |
| ACMGV763 | GV2MP03 | LC3D09AB7 |
| ACMGV973 | GV2MP04 | LC3D09AP7 |
| AE3FX122 | LA7F403 | LC3D115F7A64 |
| AF1CD061 | LA7F404 | LC3D115M7A64 |
| AF1CD081 | LA7F406 | LC3D115P7 |
| AF1VA410 | LA7F407 | LC3D115P7A64 |
| AF1VA618 | LA7F701 | LC3D120AP7 |
| AF1VC820 | LA7F702 | LC3D12AB7 |
| AM3PA65 | LA7F703 | LC3D12AP7 |
| CAD32 | LA7F901 | LC3D150M7A64 |
| DZ3GA3 | LA7F902 | LC3D150P7 |
| DZ3HA3 | LA9D11517 | LC3D150P7A64 |
| DZ3JA3 | LA9D115604 | LC3D180AB7 |
| GB2CB05 | LA9D115692 | LC3D180AP7 |
| GB2CB10 | LA9D11570 | LC3D18AB7 |
| GK2AX50 | LA9D115704 | LC3D18AF7 |
| GV2AF01 | LA9D12974 | LC3D18AP7 |
| GV2AF3 | LA9D15017 | LC3D18AU7 |
| GV2AF4 | LA9D5017 | LC3D320AG7 |
| GV2DM102BD | LA9D730 | LC3D320AP7 |
| GV2DM107BD | LA9D80973 | LC3D32AB7 |
| GV2DM107P7 | LA9D901 | LC3D32AF7 |
| GV2DM108B7 | LA9F100 | LC3D32AP7 |
| GV2DM108BD | LA9F15076 | LC3D80B7 |
| GV2DM108P7 | LA9F18517 | LC3D80B7A64 |
| GV2DM110BD | LA9F2100 | LC3D80E7A64 |
| GV2DM114B7 | LA9F22582 | LC3D80F7 |
| GV2DM114BD | LA9F705 | LC3D80F7A64 |
| GV2DM116BD | LA9F709 | LC3D80M7 |
| GV2DM132B7 | LA9F801 | LC3D80P7 |
| GV2DM204B7 | LA9FF601 | LC3D80P7A64 |
| GV2DM205BD | LA9FF981 | LC3D80U7A64 |
| GV2DM206BD | LA9FG601 | LC3F115Q7A64 |
| GV2DM208BD | LA9FG979 | LC3F185M7 |
| GV2DM221M7 | LA9FG980 | LC3F225M7 |
| GV2DM221P7 | LA9FH601 | LC3F265B7 |
| GV2DM232P7 | LA9FH610 | LC3K09P7 |
| GV2MC01 | LA9FH982 | LC4D12AP7 |
| GV2MC02 | LA9FJ610 | LC4D12AV7 |
| GV2MC03 | LA9FJ980 | LC4D25AB7 |
| GV2MCK04 | LA9FK982 | LC4D25AP7 |
| GV2ME06K1BW3 | LA9FL976 | NSYDPR25 |
| GV2ME06K2BW3 | LAD31 | NSYSNM6 |
| GV2ME06K2M7 | LAD91217 | NSYSNM8 |
| GV2ME07K1BW3 | LAD91218 | |
| GV2ME07K2BW3 | LAD93217 | |
| GV2ME08K1BW3 | LAD93219 | |

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

Contents

Non-reversing / Reversing starters A2/20 to A2/23

Star-delta starters A2/24 to A2/28

TeSys Control

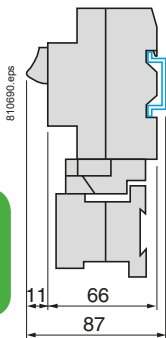
Open pre-cabled motor starters

Dimensions, mounting

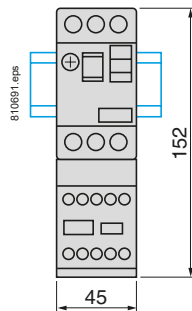
Open motor starters

GV2ME●●K●●

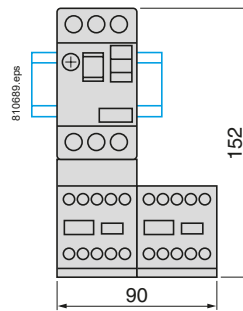
On mounting rail NSYSDR200



GV2ME●●K1●●

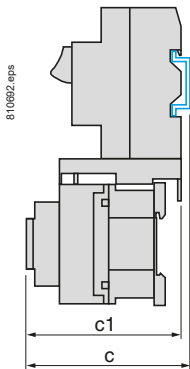


GV2ME●●K2●●

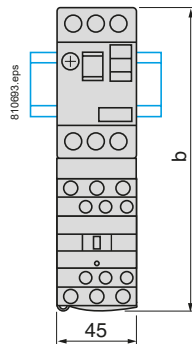


GV2DM●●●●

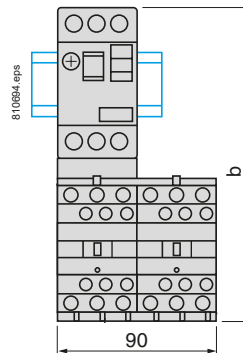
On mounting rail NSYSDR200



GV2DM1●●●●



GV2DM2●●●●



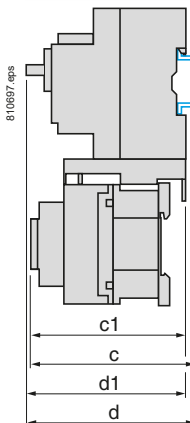
Ref.
4
7

GV2DM●●●● contactor with AC or DC coil on mounting rail NSYSDR200

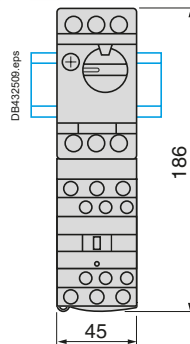
| GV2 | DM●02●● to DM●20●● | DM●21●● to DM●32●● |
|-----|--------------------|--------------------|
| b | 177 | 187 |
| c | 106 | 113 |
| c1 | 96 | 103 |

GV2P●● + LC●D09 + GV2AF3

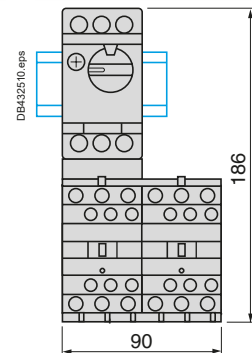
On mounting rail NSYSDR200



GV2P●● + LC1D●● + GV2AF3



GV2P●● + LC2D●●●● + GV2AF3



LC1D, LC2D contactor with AC or DC coil on mounting rail

| GV2 | P02 to P08 | P10 to P32 |
|-----|------------|------------|
| c | 111 | 118 |
| c1 | 101 | 108 |
| d | 107 | 107 |
| d1 | 97 | 97 |

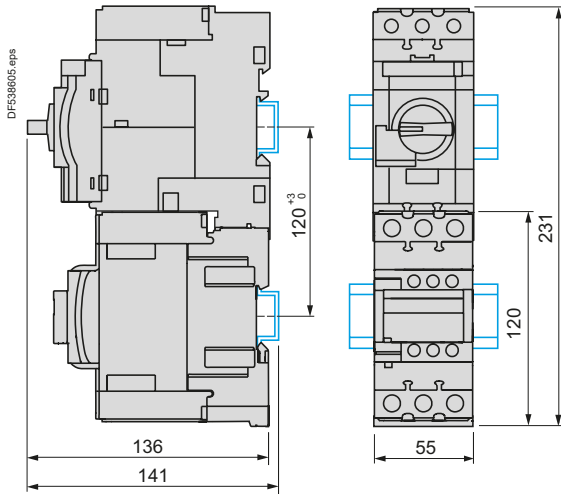
TeSys Control

Open pre-cabled motor starters

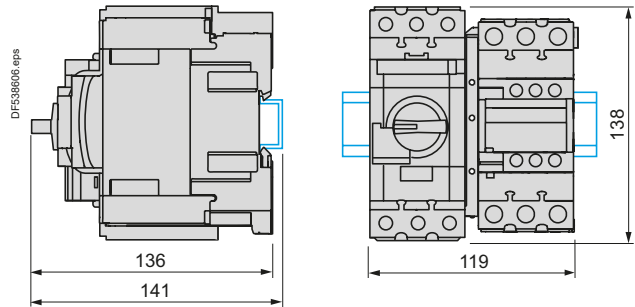
Dimensions, mounting

GV3P●●1 + LC1D40A...D65A (for customer assembly)

Vertical mounting ⁽¹⁾

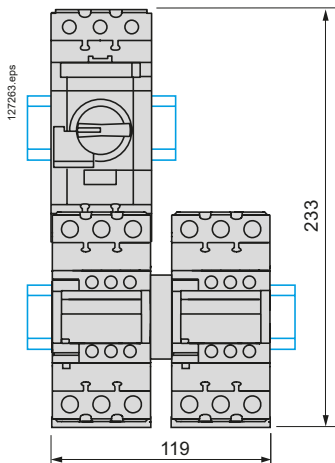


Side by side mounting with S-shape busbar system GV3 S ⁽²⁾

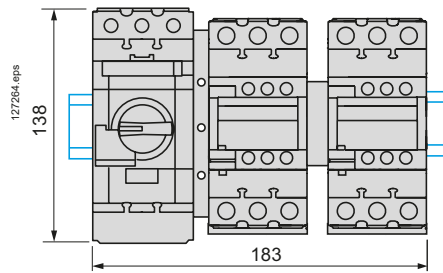


GV3P●●1 + LC2D40A...D65A (for customer assembly)

Vertical mounting ⁽¹⁾



Side by side mounting with S-shape busbar system GV3 S ⁽²⁾



- (1) For several side-by-side motor starters, the maximum current allowed is equal to the nominal current under 400 V.
Example: 55 A for a 30 kW motor under 400 V, for a GV3 P65 circuit breaker and a LC1 D65A contactor association.
- (2) The maximum current allowed is equal to 90 % of maximum current. Example: 45 A for a LC1 D50A contactor.

Open
motor
starters

Ref.



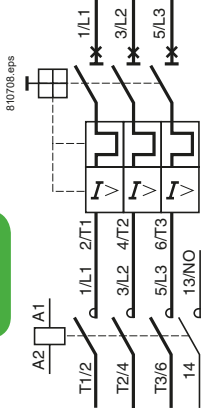
TeSys Control

Open pre-cabled motor starters

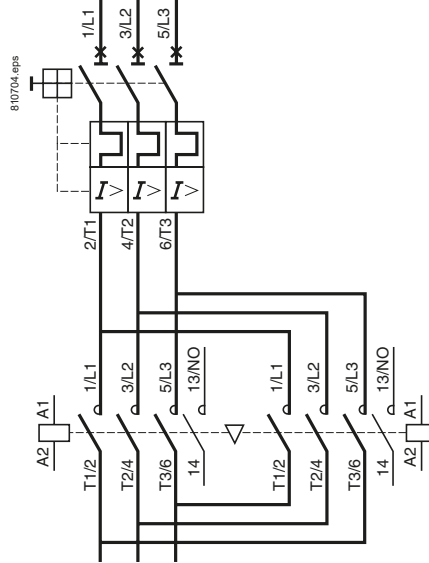
Schemes

Open motor starters

GV2ME●●K1●●

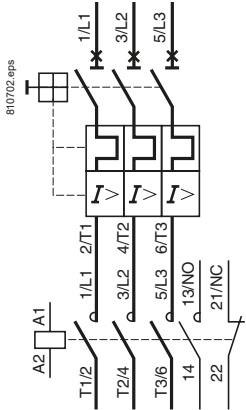


GV2ME●●K2●●

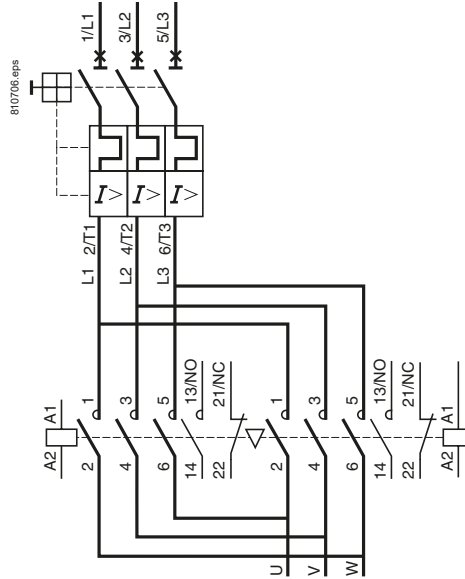


Ref.

GV2DM1●●●●



GV2DM2●●●●

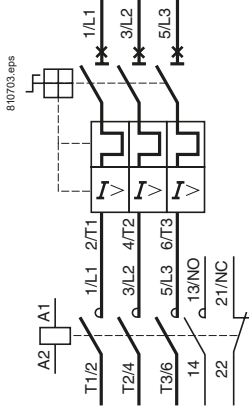


TeSys Control

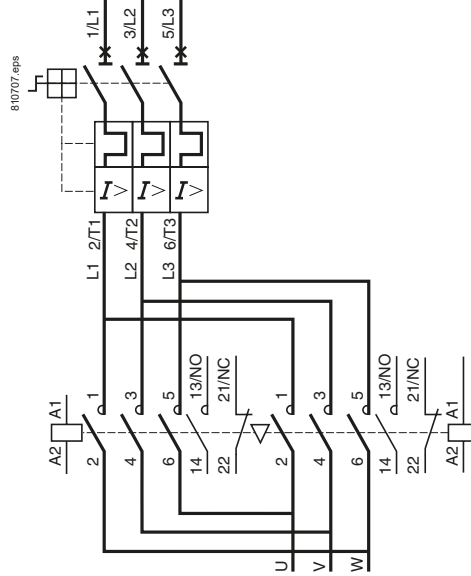
Open pre-cabled motor starters

Schemes

GV2P●● + LC1D●●●●

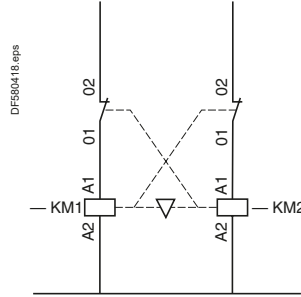
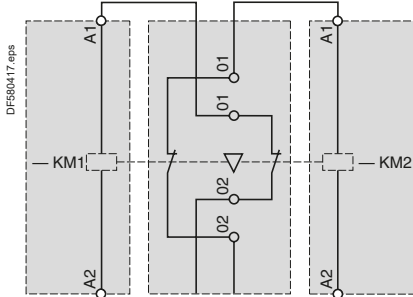


GV2P●● + LC2D●●●●

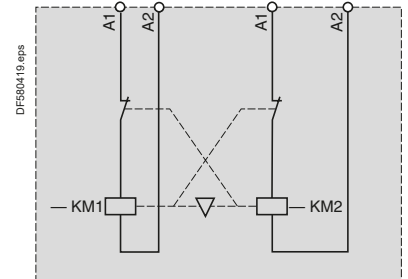


Mechanical interlock with integral electrical contacts

Control circuit ~



Control circuit ⋯

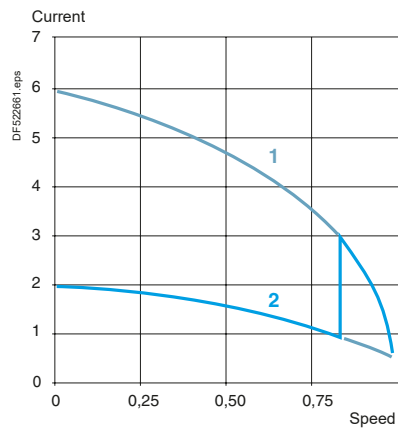


Open
motor
starters

Ref.



Star-delta starting

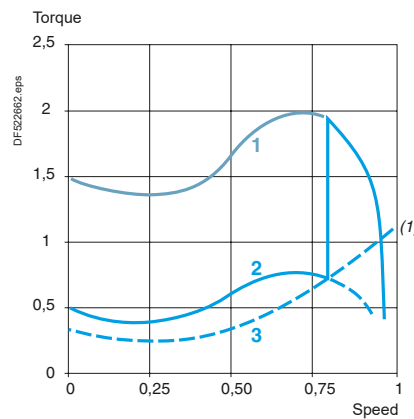


- 1 Starting in direct delta connection
- 2 Starting in star connection

This method of starting is applicable to motors on which all 6 stator terminals are accessible and whose delta connection voltage corresponds to the mains voltage.

Star-delta starting should be used for motors starting on no-load or having a low load torque and gradual build-up:

- the starting torque in star connection is reduced to one third of the direct starting torque, i.e. about 50 % of the rated torque.
- the starting current in star connection is about 1.8 to 2.6 times the rated current.



- 1 Starting in direct delta connection
- 2 Starting in star connection
- 3 Resistive torque of the machine

The transition from star to delta connection must occur when the machine has run up to speed. A too rapid build-up in load torque would cause the stabilised run-up speed to be too low and would therefore eliminate any advantage in this method of starting: this is the case with certain machines whose load torque depends on the machine speed (a characteristic of centrifugal machines, for example).

All star-delta starters are supplied with a special LADS2 or LA2KT2 time delay relay which imposes a delay on the delta contactor during the transition period in order to allow the star contactor sufficient breaking time.

For ratings D115 and D150, this function is performed by a time delay auxiliary contact block LADT2 and a control relay.

(1) Motor manufacturers generally specify machine load torques.
Example: maximum resistive torque on completion of star-delta start (expressed as a proportion of the rated torque).

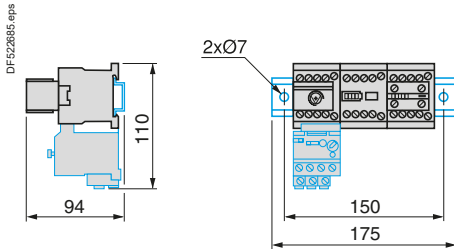
TeSys Control

Star-delta starters

Dimensions, mounting

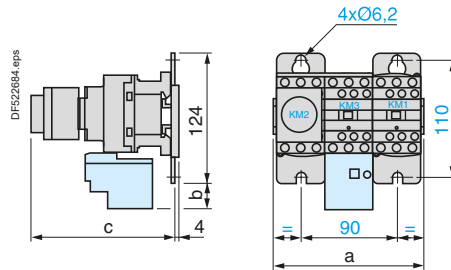
Dimensions

LC3K plate mounted, pre-assembled



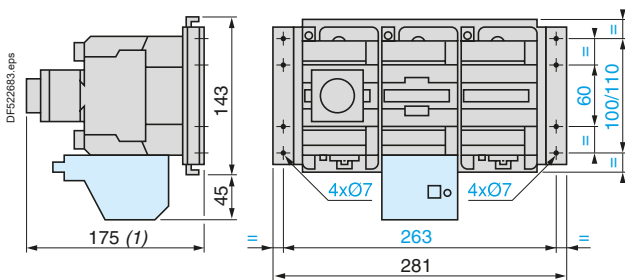
On starters LC3D09A to D18A, a connection block is mounted on the upper part of contactor KM2, increasing the overall height of the product by 6.5 mm.

LC3D09A...D32A pre-assembled or 3 x LC1D09A...D32A (customer assembly) + components



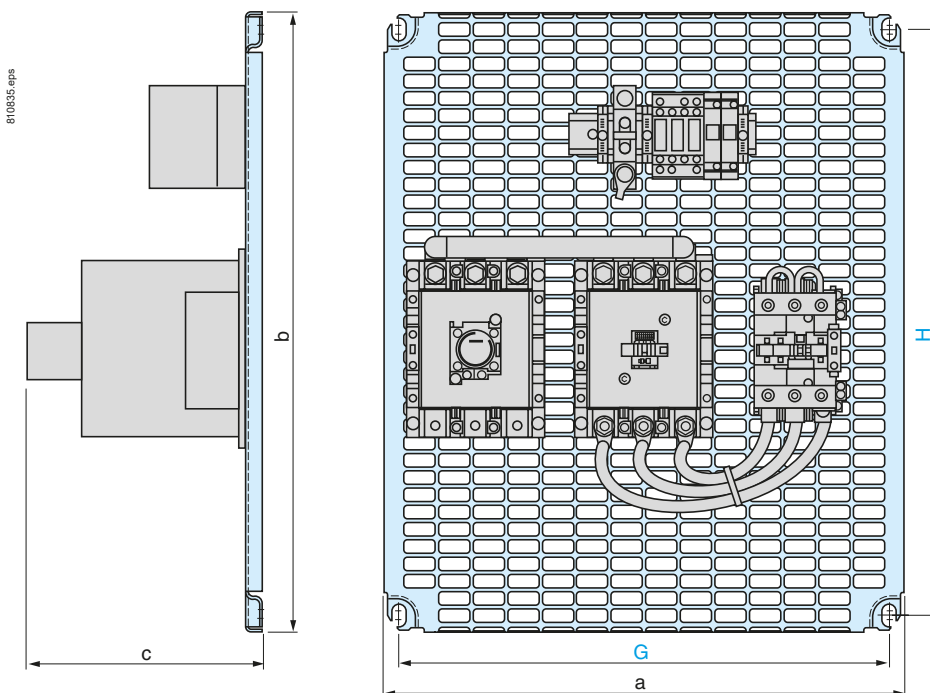
| LC3 | D09A | D12A | D18A | D32A |
|-----|-----------------------------|------|------|------|
| a | 143 | 143 | 144 | 165 |
| b | 26.5 | 26.5 | 26.5 | 32.5 |
| c | with LADS | 139 | 139 | 145 |
| | with LADS and sealing cover | 143 | 143 | 149 |

LC3D80 pre-assembled or 3 x LC1D80 (customer assembly) + components



(1) +4 mm with sealing cover

LC3D115, D150 pre-assembled or 3 x LC1D115...D150 (customer assembly) + components



| | | a | b | c | G | H |
|-------------------------------------|------|-----|-----|-----|-----|-----|
| LC3D115 or 3 x LC1D with components | D115 | 450 | 555 | 205 | 425 | 525 |
| LC3D150 or 3 x LC1D with components | D150 | 450 | 555 | 205 | 425 | 525 |

References:
pages A2/8 to A2/13

Introduction:
page A2/24

Schemes:
page A2/26

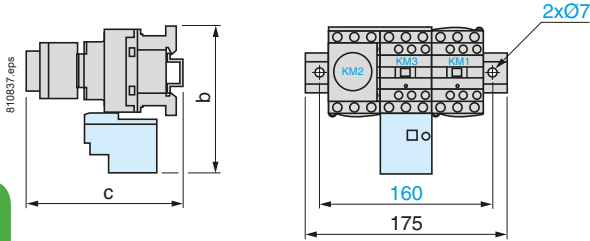
TeSys Control

Star-delta starters

Dimensions, mounting, schemes

Dimensions

LC3D090A à D320A on NSYS DR mounting rail, pre-assembled



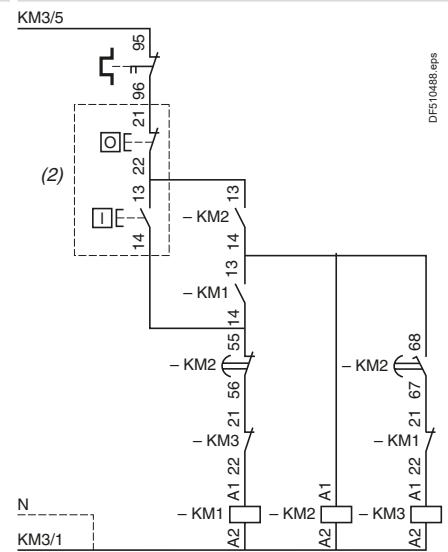
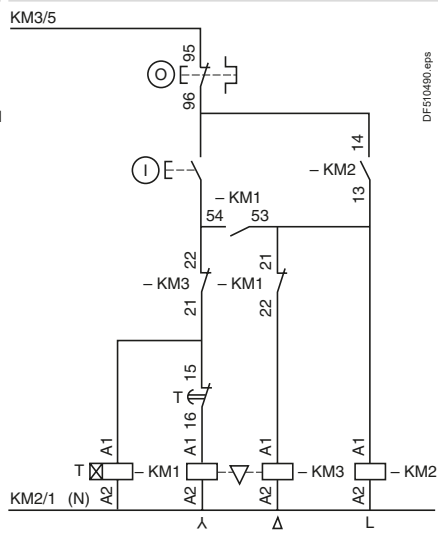
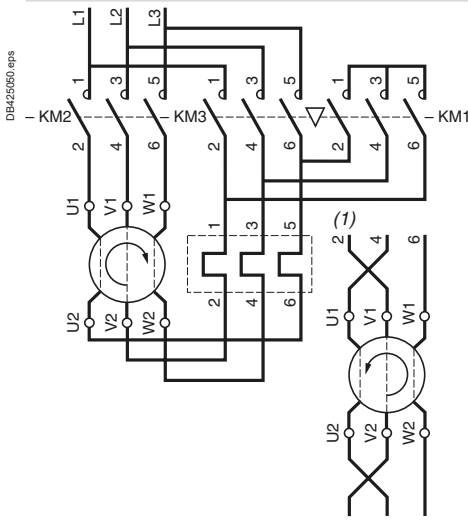
| LC3 | D090A à D180A | D320A |
|-----|-----------------------------|-------|
| b | 153 | 137 |
| c | with LADS | 145 |
| | with LADS and sealing cover | 149 |

Schemes

LC3K, LC3D09A to D80
LC3D090A to D320A

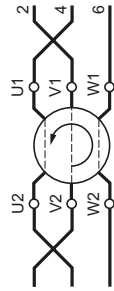
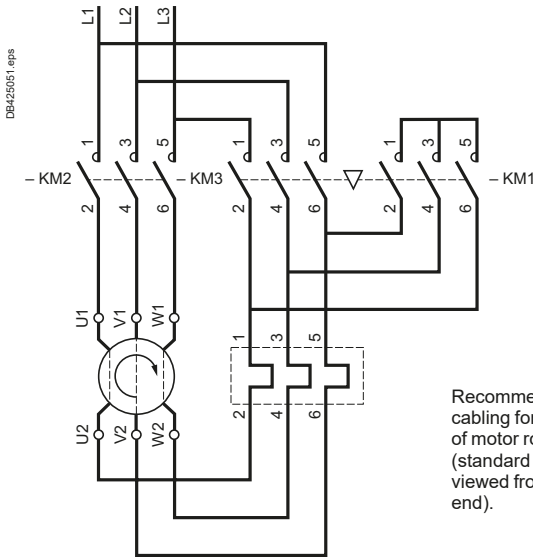
LC3K

LC3D

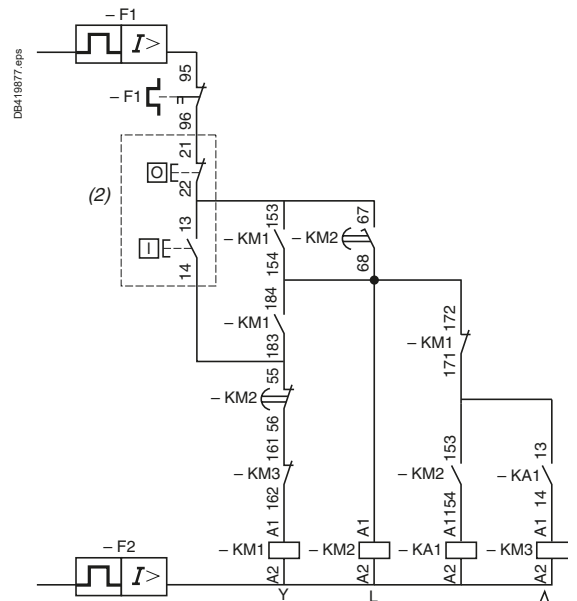


Note: LC3D09A to D18A: Mechanical interlock between KM3 and KM1.

LC3D115 and D150



Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end).



(1) Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end).

(2) Remote control.

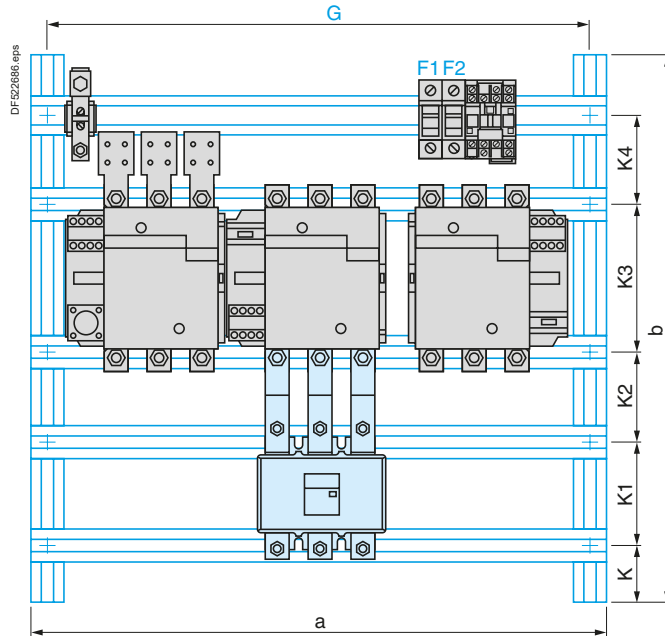
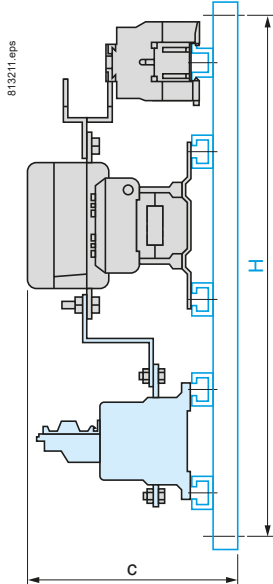
TeSys Control

Star-delta starters

Dimensions, mounting

Dimensions

LC3F185 to LC3F400 - pre-assembled - chassis mounted or 2 x LC1F●●● and 1 x LC1D150 or 3 x LC1F●●● (customer assembly)



| | a | b | c | G | H | K | K1 | K2 | K3 | K4 |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LC3F185 or 2 x LC1F●●● + 1 x LC1D with components F185 | 565 | 675 | 235 | 525 | 625 | 160 | 110 | 80 | 110 | 80 |
| LC3F225 or 3 x LC1F●●● with components F225 | 565 | 675 | 235 | 525 | 625 | 160 | 110 | 80 | 110 | 80 |
| LC3F265 or 3 x LC1F●●● with components F265 | 665 | 775 | 266 | 625 | 725 | 165 | 110 | 100 | 110 | 110 |
| LC3F330 or 3 x LC1F●●● with components F330 | 765 | 975 | 276 | 725 | 825 | 195 | 140 | 100 | 110 | 180 |
| LC3F400 or 3 x LC1F●●● with components F400 | 765 | 975 | 276 | 725 | 925 | 195 | 140 | 100 | 180 | 110 |

Open
motor
starters

Ref.



TeSys Control

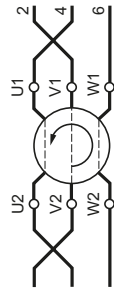
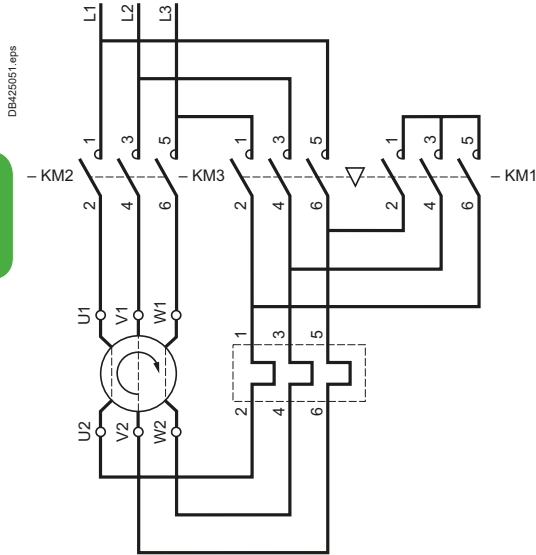
Star-delta starters

Schemes

Schemes

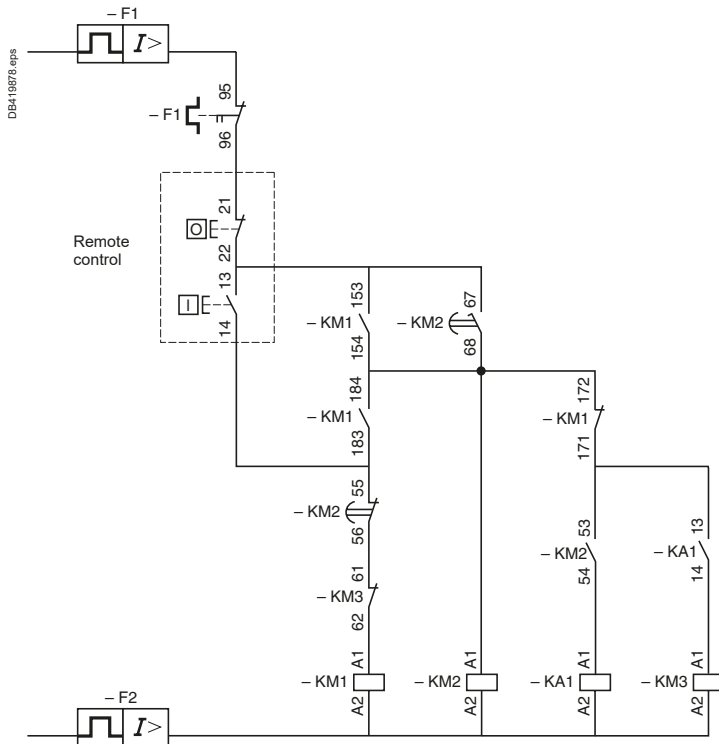
LC3F185 to F265

Open motor starters



Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end).

Ref.
i
↑



Introduction

A3/2

TeSys Hybrid motor starters

| Type of product | Range | | Page |
|---|--|--|------|
| <p>Ultra-compact starters IEC ratings Standard starters, screw or spring terminals, direct-on-line or reverse</p> <p>Safety starters, screw or spring terminals, direct-on-line or reverse</p> | <p>Up to 3 kW AC53a Up to 9 A AC51</p> |  | A3/6 |
| <p>Ultra-compact starters UL ratings Standard starters, screw or spring terminals, direct-on-line or reverse</p> <p>Safety starters, screw or spring terminals, direct-on-line or reverse</p> | <p>Up to 3 hp AC53a Up to 9 A AC51</p> |  | A3/7 |
| <p>TeSys Deca Circuit breakers for a group of starters Selection of magnetic motor circuit breakers TeSys GV2L – rotary knob TeSys GV2LE – rocker lever</p> | <p>Up to 32 A</p> |  | A3/8 |

Hybrid
motor
starters

Technical Data for Designers

A3/11

The most compact 3 KW / 400 V starter in the world

Hybrid motor starters



Up to 75 % of space reduction

- Ultra-compact 22.5 mm starter
- Reversing starter in the same width
- Maximum space savings for group starter architecture

Long electrical durability

- Suitable for high demanding application
- 30 000 000 of AC53a electrical cycles

> With printed QR code, referring directly to the product data sheet.

Easy Design

- Wide range setting motor protection
- Automatic, manual or remote reset after thermal trip
- Wide range of control voltage

Easy to integrate

- Direct mounting installation on DIN rail
- Control terminals on the upper side
- Power terminal on the lower side

Standard version

- 2 ratings:
 - 2.4 A 400 V AC53a
 - 6.5 A 400 V AC53a
- 2 control voltages:
 - 24 V DC
 - 110 V / 230 V AC
- 2 terminal types:
 - Screw clamps
 - Spring
- Can provide up to 3 functions:
 - Forward running
 - Reverse running
 - Overload protection



Hybrid motor starters



Safety version

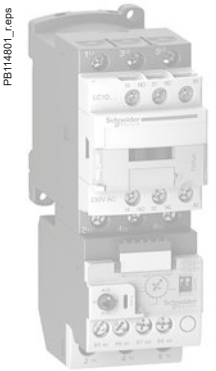
- Safe Torque Off embedded:
 - SIL3 according to IEC61508-1
 - PlE according to ISO13849-1
- ATEX:
 - As associated devices for motor protection

> Hybrid motor starters are a solution dedicated to low footprint applications, in industries as food and beverage, logistics, and durable goods.

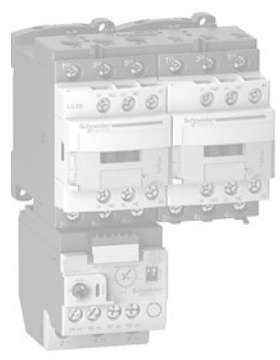


Hybrid motor starters

Conventional OR Hybrid Standard starter



Direct-on-line



Reverse

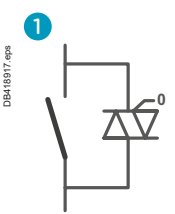


> How does the hybrid technology work ?

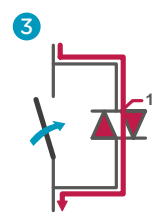
Hybrid technology:
Each contact is coupled with a power semiconductor for switching

> Higher number of on/off switches, extended durability.

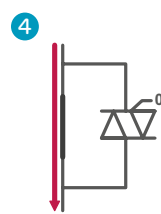
> Closing



Start: conduction through the semiconductor.

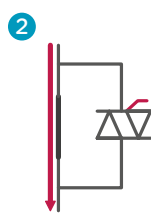
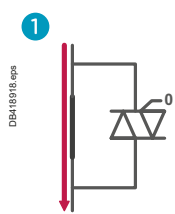


Contact closure under zero voltage. No electrical arc: the contact is preserved.



The semiconductor is non-conducting.

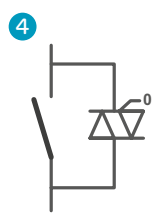
> Opening



Before the opening of the contact the semiconductor is triggered.

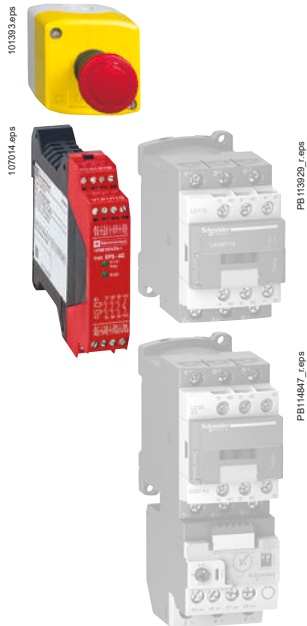


Contact opening: - no arc: the contact is preserved.



Stop: the semiconductor becomes non-conducting.

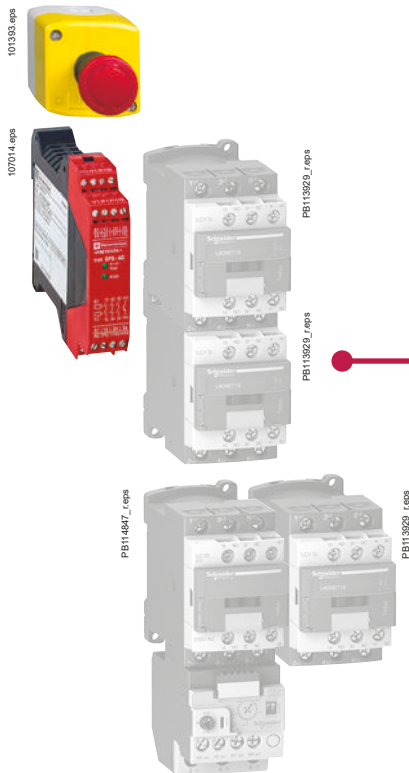
Conventional OR Hybrid Safety starter



Direct-on-line



Hybrid motor starters



Reverse



Hybrid Safety starter

- Immediate respect of the highest safety standards
- Simplified design of your safety electrical architecture
- Quicker panel implementation

TeSys Control

DOL/Reverser, Standard/Safety Hybrid starters

Product references (per IEC ratings)

PB114711.eps



LZ1H2X4BD

Hybrid motor starters

Starters for asynchronous motors - AC53a utilization category:

Standard starters hybrid per IEC ratings

| Starters | 3- phases motor: max power (KW) for various voltage | | | | | | | Current range | Commercial references ⁽¹⁾ |
|-----------------------|---|-------|-------|-------|-------|-------|-------|---------------|--------------------------------------|
| | 220 V | 230 V | 380 V | 400 V | 415 V | 440 V | 500 V | | |
| Direct-on-line | | | | | | | | | |
| Screw terminals | 0.37 | 0.37 | 0.75 | 0.75 | 0.75 | 0.75 | 1.1 | 0.18...2.4 | LZ1H2X4●● |
| | 1.5 | 1.5 | 2.2 | 3 | 3 | 3 | 3 | 1.5...6.5 | LZ1H6X5●● |
| Spring terminals | 0.37 | 0.37 | 0.75 | 0.75 | 0.75 | 0.75 | 1.1 | 0.18...2.4 | LZ1H2X43●● |
| | 1.5 | 1.5 | 2.2 | 3 | 3 | 3 | 3 | 1.5...6.5 | LZ1H6X53●● |
| Reverse | | | | | | | | | |
| Screw terminals | 0.37 | 0.37 | 0.75 | 0.75 | 0.75 | 0.75 | 1.1 | 0.18...2.4 | LZ2H2X4●● |
| | 1.5 | 1.5 | 2.2 | 3 | 3 | 3 | 3 | 1.5...6.5 | LZ2H6X5●● |
| Spring terminals | 0.37 | 0.37 | 0.75 | 0.75 | 0.75 | 0.75 | 1.1 | 0.18...2.4 | LZ2H2X43●● |
| | 1.5 | 1.5 | 2.2 | 3 | 3 | 3 | 3 | 1.5...6.5 | LZ2H6X53●● |

(1) Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

PB114715.eps



LZ7H2X4BD



Safety starters hybrid per IEC ratings

| Starters | 3- phases motor: max power (KW) for different tensions | | | | | | | Current range | Commercial references ⁽¹⁾ |
|-----------------------|--|-------|-------|-------|-------|-------|-------|---------------|--------------------------------------|
| | 220 V | 230 V | 380 V | 400 V | 415 V | 440 V | 500 V | | |
| Direct-on-line | | | | | | | | | |
| Screw terminals | 0.37 | 0.37 | 0.75 | 0.75 | 0.75 | 0.75 | 1.1 | 0.18...2.4 | LZ7H2X4●● |
| | 1.5 | 1.5 | 2.2 | 3 | 3 | 3 | 3 | 1.5...6.5 | LZ7H6X5●● |
| Spring terminals | 0.37 | 0.37 | 0.75 | 0.75 | 0.75 | 0.75 | 1.1 | 0.18...2.4 | LZ7H2X43●● |
| | 1.5 | 1.5 | 2.2 | 3 | 3 | 3 | 3 | 1.5...6.5 | LZ7H6X53●● |
| Reverse | | | | | | | | | |
| Screw terminals | 0.37 | 0.37 | 0.75 | 0.75 | 0.75 | 0.75 | 1.1 | 0.18...2.4 | LZ8H2X4●● |
| | 1.5 | 1.5 | 2.2 | 3 | 3 | 3 | 3 | 1.5...6.5 | LZ8H6X5●● |
| Spring terminals | 0.37 | 0.37 | 0.75 | 0.75 | 0.75 | 0.75 | 1.1 | 0.18...2.4 | LZ8H2X43●● |
| | 1.5 | 1.5 | 2.2 | 3 | 3 | 3 | 3 | 1.5...6.5 | LZ8H6X53●● |

(1) Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

Starters for resistive load AC51 utilization category:

| Starters | Resistive load current A | Application | Commercial references ⁽¹⁾ |
|------------------|-----------------------------|-------------|--------------------------------------|
| | | | |
| | | Safety | LZ7H2X4●● |
| | 9 | Standard | LZ1H6X5●● |
| | | Safety | LZ7H6X5●● |
| Spring terminals | 2.4 | Standard | LZ1H2X43●● |
| | | Safety | LZ7H2X43●● |
| | 9 | Standard | LZ1H6X53●● |
| | | Safety | LZ7H6X53●● |

(1) Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

TeSys Control

DOL/Reverser, Standard/Safety Hybrid starters

Product references (per UL ratings)

PB114713.eps



LZ1H2X43BD

Starters for asynchronous motors - AC53a utilization category:

Standard starters hybrid per UL ratings

| Starters | 3-phases motor in HP | | | Current range A | Commercial references ⁽¹⁾ |
|-----------------------|----------------------|---------------|---------------|--------------------|--------------------------------------|
| | 208 V | 220 V - 240 V | 440 V - 480 V | | |
| Direct-on-line | | | | | |
| Screw terminals | 1/2 | 1/2 | 1 | 0.18...2.4 | LZ1H2X4●● |
| | 1 | 1.5 | 3 | 1.5...6.5 | LZ1H6X5●● |
| Spring terminals | 1/2 | 1/2 | 1 | 0.18...2.4 | LZ1H2X43●● |
| | 1 | 1.5 | 3 | 1.5...6.5 | LZ1H6X53●● |
| Reverse | | | | | |
| Screw terminals | 1/2 | 1/2 | 1 | 0.18...2.4 | LZ2H2X4●● |
| | 1 | 1.5 | 3 | 1.5...6.5 | LZ2H6X5●● |
| Spring terminals | 1/2 | 1/2 | 1 | 0.18...2.4 | LZ2H2X43●● |
| | 1 | 1.5 | 3 | 1.5...6.5 | LZ2H6X53●● |

⁽¹⁾ Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

Hybrid motor starters

PB114716.eps



LZ8H6X5BD

Safety starters hybrid per UL ratings

| Starters | 3-phases motor in HP | | | Current range A | Commercial references ⁽¹⁾ |
|-----------------------|----------------------|---------------|---------------|--------------------|--------------------------------------|
| | 208 V | 220 V - 240 V | 440 V - 480 V | | |
| Direct-on-line | | | | | |
| Screw terminals | 1/2 | 1/2 | 1 | 0.18...2.4 | LZ7H2X4●● |
| | 1 | 1.5 | 3 | 1.5...6.5 | LZ7H6X5●● |
| Spring terminals | 1/2 | 1/2 | 1 | 0.18...2.4 | LZ7H2X43●● |
| | 1 | 1.5 | 3 | 1.5...6.5 | LZ7H6X53●● |
| Reverse | | | | | |
| Screw terminals | 1/2 | 1/2 | 1 | 0.18...2.4 | LZ8H2X4●● |
| | 1 | 1.5 | 3 | 1.5...6.5 | LZ8H6X5●● |
| Spring terminals | 1/2 | 1/2 | 1 | 0.18...2.4 | LZ8H2X43●● |
| | 1 | 1.5 | 3 | 1.5...6.5 | LZ8H6X53●● |

⁽¹⁾ Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).



Starters for resistive load AC51 utilization category:

| Starters | Resistive load current | Application | Commercial references ⁽¹⁾ |
|------------------|------------------------|-------------|--------------------------------------|
| | A | | |
| Screw terminals | 2.4 | Standard | LZ1H2X4●● |
| | | Safety | LZ7H2X4●● |
| | 9 | Standard | LZ1H6X5●● |
| | | Safety | LZ7H6X5●● |
| Spring terminals | 2.4 | Standard | LZ1H2X43●● |
| | | Safety | LZ7H2X43●● |
| | 9 | Standard | LZ1H6X53●● |
| | | Safety | LZ7H6X53●● |

⁽¹⁾ Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

TeSys Control

Deca Magnetic circuit breakers for group protection

Selection table



Hybrid motor starters



GV2L + LZ2H2X4BD

Magnetic motor circuit breakers:

- GV2L: rotary knob type - Ue = 500 V
- GV2LE: rocker lever type - Ue = 415 V.

Selection of the circuit breaker Type 1 coordination according to IEC/EN 60947-4-2

| Max A | Iq kA | Number of H | | Reference Circuit breaker | |
|----------|----------|-------------|-------|------------------------------|---------|
| | | 2.4 A | 6.5 A | Rotary | Rocker |
| 0.4 | 50.0 | 1 | – | GV2L03 | GV2LE03 |
| 0.63 | 50.0 | 1 | – | GV2L04 | GV2LE04 |
| 1 | 50.0 | 1 | 1 | GV2L05 | GV2LE05 |
| 1.6 | 50.0 | 1 | 1 | GV2L06 | GV2LE06 |
| 2.5 | 35.0 | 1 | 1 | GV2L07 | GV2LE07 |
| 4 | 12.5 | 1 | 1 | GV2L08 | GV2LE08 |
| 6.3 | 8.0 | 2 | 1 | GV2L10 | GV2LE10 |
| 10 | 7.0 | 4 | 1 | GV2L14 | GV2LE14 |
| 14 | 5.0 | 5 | 2 | GV2L16 | GV2LE16 |
| 18 | 4.0 | 7 | 2 | GV2L20 | GV2LE20 |
| 25 | 4.0 | 10 | 3 | GV2L22 | GV2LE22 |
| 32 | 3.0 | 13 | 4 | GV2L32 | GV2LE32 |

TeSys Control


Hybrid motor starters

Product references

LZ1H2X43BD
LZ1H2X43FU
LZ1H2X4BD
LZ1H2X4FU
LZ1H6X53BD
LZ1H6X53FU
LZ1H6X5BD
LZ1H6X5FU
LZ2H2X43BD
LZ2H2X43FU
LZ2H2X4BD
LZ2H2X4FU
LZ2H6X53BD
LZ2H6X53FU
LZ2H6X5BD
LZ2H6X5FU

LZ7H2X43BD
LZ7H2X43FU
LZ7H2X4BD
LZ7H2X4FU
LZ7H6X53BD
LZ7H6X53FU
LZ7H6X5BD
LZ7H6X5FU
LZ8H2X43BD
LZ8H2X43FU
LZ8H2X4BD
LZ8H2X4FU
LZ8H6X53BD
LZ8H6X53FU
LZ8H6X5BD
LZ8H6X5FU

Hybrid
motor
starters

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

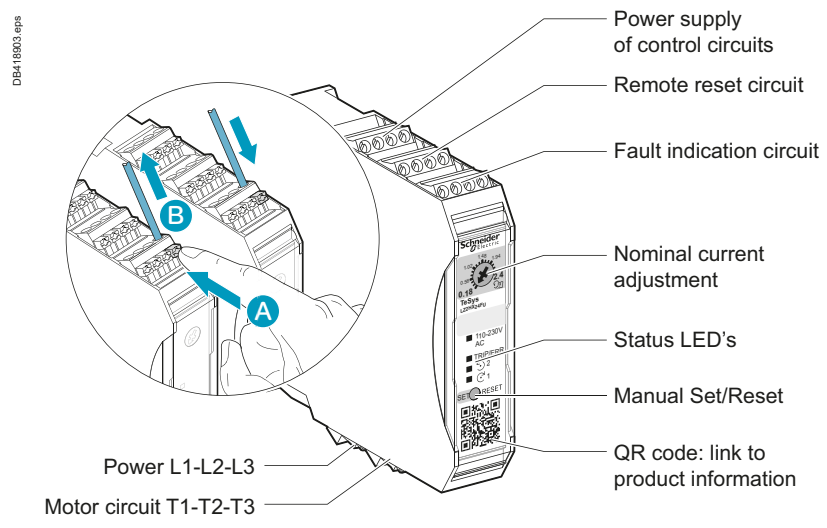
Technical Data for Designers

Contents

| | |
|------------------------------|----------------|
| Description | A3/12 to A3/13 |
| Characteristics..... | A3/14 to A3/15 |
| Curves | A3/16 to A3/17 |
| Dimensions and schemes | A3/18 |

Identification of terminals / Indicators / Setting means and procedure

Setting procedure



| STEP | ACTION |
|------|--|
| 1 | Lift the cover on the front of the Hybrid motor starter to access the SET/RESET button. |
| 2 | Press and hold down the SET/RESET button for at least 6 seconds. After 6 seconds the 110-230 V AC or 24 V DC LED flashes once. |
| 3 | After the LED has flashed once, release the SET/RESET button. |
| 4 | Turn the potentiometer to select a nominal current, and then fine-tune the position until the LEDs indicate the exact nominal current. |
| 5 | Press the SET/RESET button to save the selected nominal current. The 110-230 V AC or 24 V DC LED comes on and the other LEDs go off. |
| 6 | Drop the cover back over the front of the Hybrid motor starter. |

Protection functions

The protection of three - phase motors is ensured against potential faults

- Thermal overload: the motor currents exceed the set value.
- Phase unbalanced: the motor currents differ from each other by more than 33 %
- Phase loss: power missing on one or several phases
- Stall and jam: motor current exceeding 45 A for more that 2 s during starting or running phase - No motor is connected - Motor current is lower that the minimum configurable current for more than 2 seconds, on at least two phases.

For all this detected situations, the Hybrid motor starter will switch off, activate its TRP/ERR LED and fault signaling contact.

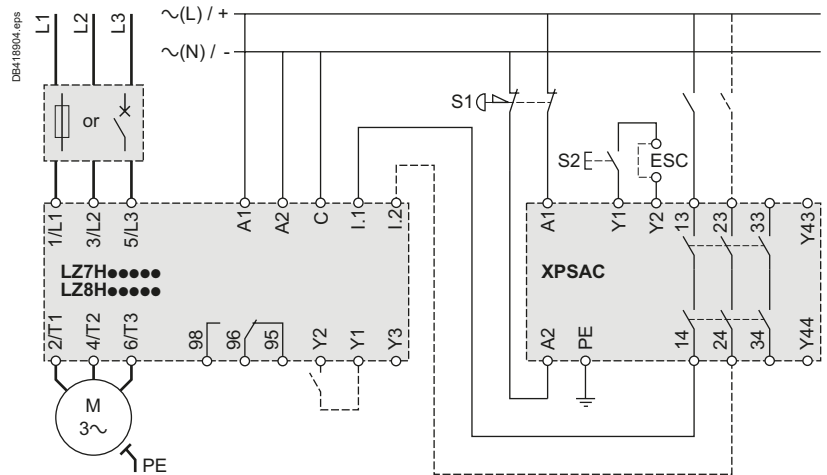
Please refer to the "Instruction sheet and User Guide" for more information.

Electrical diagrams for Safety chain applications

Preferred

Electrical life time: 30000000 AC53a electrical cycles

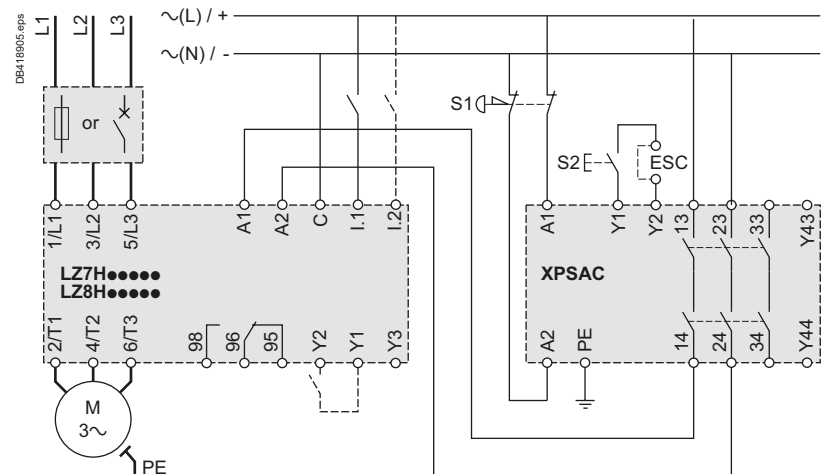
Safety Chain Application for Monitoring Emergency STOP Circuits with Two Channel Inputs and Two Channel Outputs with Preventa XPSAF Safety Processing Device.



Possible but non- recommended

Electrical life time: 10000 AC53 a electrical cycles

Safety Chain Application for Monitoring Emergency Stop Circuits with Two Channel Inputs and Two Channel Outputs with Preventa XPSAC Safety Processing Device.



TeSys Control

Hybrid motor starters

Characteristics

Hybrid motor starters

- Ref.
- i
-
-
-

| Environment | | | |
|--|--|-----------------|---|
| Rated insulation voltage (Ui) | Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 2 | V | 500 |
| Rated impulse withstand voltage (Uimp) | Conforming to IEC/EN 60947-4-2 | kV | 6 (24 V DC control voltage); 4 (110 V - 230 V AC control voltage) |
| Conforming to standards | | | IEC / EN 60947-4-2 |
| Product certifications | | | CE, CUL, ATEX (for failsafe product), CCC, UKCA |
| Degree of protection | Conforming to IEC / EN 60947-1 | | IP20 |
| Environment category | Conforming to IEC / EN 60947-1 | | E |
| Climatic withstand | | | Conforming to IEC/EN 60068-2-30 |
| Ambient air temperature around the device | Storage | °C | -40...+80 |
| | Operation (see derating curves) | °C | -25...+70 |
| Maximum operating altitude | without derating | m | 2000 |
| | with derating | m | No |
| Operating positions (see derating curves) | Vertical axis (horizontal DIN rail) | | Yes |
| | Horizontal axis (vertical DIN rail) | | Not authorised |
| Shock resistance | Conforming to IEC/EN 60068-2-27 | gn | 30 Starter OFF |
| 1/2 sine wave = 18 ms | | gn | 30 Starter ON |
| Vibration resistance | Conforming to IEC/EN 60068-2-6 | gn | 5 Starter OFF |
| 10... 150 Hz | | gn | 5 Starter ON |
| Resistance to electrostatic discharge | Conforming to IEC/EN 61000-4-2 | kV | Air discharge: 8 kV |
| | | kV | Contact discharge: 6 kV |
| Immunity to radiated high-frequency disturbance | Conforming to IEC/EN 61000-4-3 | | |
| | 80 - 1 GHz | V/m | 20 |
| | 1.0 - 6 GHz | V/m | 10 |
| Immunity to fast transient currents | Conforming to IEC/EN 61000-4-4 | kV | 3 |
| Immunity to conducted high frequency disturbances | Conforming to IEC/EN 61000-4-6 | V | 10 |
| Radiated emission and conducted | Conforming to CISPR 11 and EN 55011 | | Class A |
| Surge | Conforming to IEC/EN 61000-4-5 | kV | 1 symmetrical |
| | | kV | 2 asymmetrical |
| Control circuit characteristics | | | |
| Rated voltage | ~ 50/60 Hz | V | 110 - 230 |
| | --- | V | 24 |
| Voltage limits | ~ 50/60 Hz | V | 85...253 |
| | --- | V | 19.2...30 |
| Voltage dips | | ms | 3 |
| Short time interruptions | | ms | 3 |
| Power circuit characteristics | | | |
| | | | LZ●2X4●● |
| | | | LZ●6X5●● |
| Power dissipation for corresponding Rated Operating Current (see derating curve) | | W | 0.88 ... 4.1 |
| Rated Operating Current | AC51 conforming to IEC/EN 60947-4-3 | A | 0.18 - 2.4 |
| | AC53a conforming to IEC/EN 60947-4-2 | A | 0.18 - 2.4 |
| Electrical life | AC51 | Op | 30 000 000 ⁽¹⁾ |
| | | Op | 10 000 ⁽²⁾ |
| | AC53A | Op | 30 000 000 ⁽¹⁾ |
| | | Op | 10 000 ⁽²⁾ |
| Maximum Operating rate | AC51 | Op/h | 7200 |
| | AC53A | | See curves |
| Time to restart after overload trip | Manual or remote mode | mn | 2 |
| | Automatic | mn | 20 |
| Power and control terminal Characteristics | | | |
| | Terminal type | | Screw M3 |
| | | | Push in |
| Flexible cable without cable end | 1 conductor | mm ² | 0.25...2.5 |
| | 2 conductors | mm ² | 0.25...0.75 |
| Flexible cable with cable end | 1 conductor | mm ² | 0.25...2.5 |
| | 2 conductors | mm ² | 0.25...1.5 |
| Solid cable without cable end | 1 conductor | mm ² | 0.25...2.5 |
| | 2 conductors | mm ² | 0.25...0.75 |
| Screwdriver | | mm | flat screwdriver: 3 mm |
| Tightening torque | | N.m | 0.5..0.6 |

(1) With ON/OFF control through control inputs (I₁, I₂ terminals) (2) With ON/OFF control through power supply (A₁, A₂ terminals).

References: pages A3/6 and A3/7 Description: pages A3/12 and A3/13 Curves: pages A3/16 and A3/17 Dimensions, schemes: page A3/18

TeSys Control

Hybrid motor starters

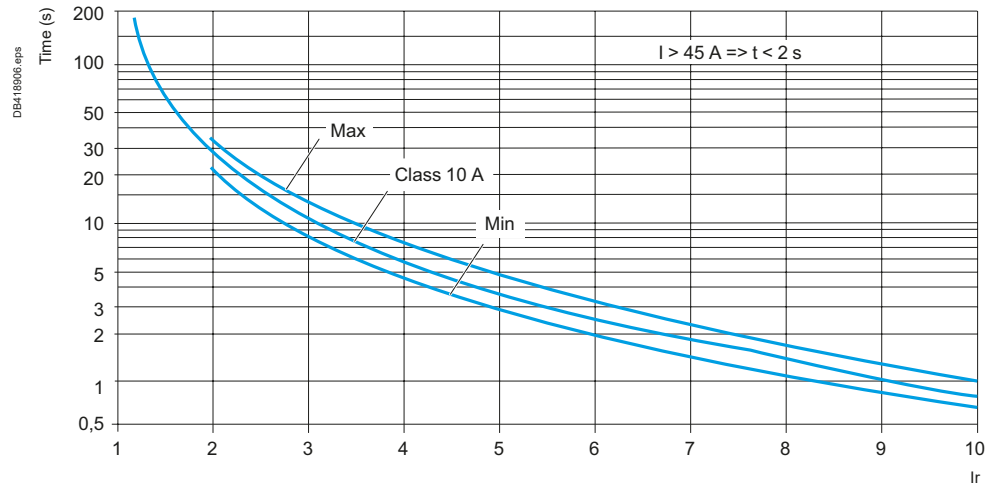
Characteristics

| System conditons | | |
|---|--|---|
| Database for failure rates | | SN 29500 |
| System type | | Type B |
| Standard used | | IEC 61508 |
| Beta factor | | 1 % |
| Mean time to failure (MTTF) at an ambient temperature 40 °C | | 39.3 (LZ7H or LZ8H 24 V DC) 39.1 (LZ7H or LZ8H 110/230 V AC) |

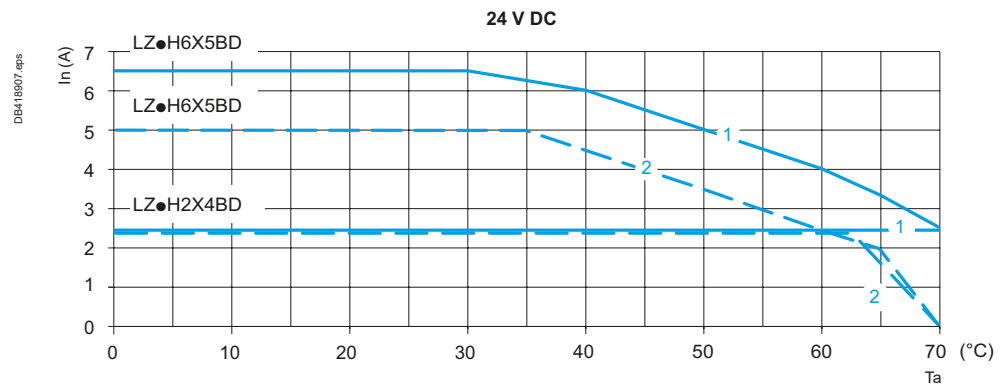
| Safe torque-off | | | |
|---|----|--|---------------------------|
| | | LZ7H or LZ8H 24 V DC | LZ7H or LZ8H 110/230 V AC |
| Ambient temperature | °C | 40 | 40 |
| Mean time to failure (MTTF) | | 517 | 289 |
| Switch-off time | | 80 | 100 |
| λ_{sd} [FIT] safe, detectable | | 664 | 638 |
| λ_{su} [FIT] safe, undetectable | | 968 | 935 |
| λ_{dd} [FIT] dangerous, detectable | | 218 | 388 |
| λ_{du} [FIT] dangerous, undetectable | | 2.67 | 6.82 |
| SFF [%] Safe failure fraction | | 99 | 99 |
| DCS [%] Diagnostic coverage safe | | 40.7 | 40.6 |
| DC [%] Diagnosctic coverage | | 98 | 98 |
| PFH Probability of dangerous failure per hour | | 2.67×10^{-9} | 6.82×10^{-9} |
| Safety level | | IEC/CEI 61508-1: SIL 3 ISO 13849-1: Category 3 PL e EN 60954-1: Category 3 | |

| Motor overload protection | | | |
|--|----|--------------------------------------|---------------------------|
| | | LZ7H or LZ8H 24 V DC | LZ7H or LZ8H 110/230 V AC |
| Ambient temperature | °C | 40 | 40 |
| Mean time to failure (MTTF) | | 447 | 273 |
| Time to trip | | As for Class 10 A, IEC/CEI 60947-4-2 | |
| λ_{sd} [FIT] safe, detectable | | 637 | 636 |
| λ_{su} [FIT] safe, undetectable | | 870 | 841 |
| λ_{dd} [FIT] dangerous, detectable | | 239 | 402 |
| λ_{du} [FIT] dangerous, undetectable | | 17 | 17 |
| SFF [%] Safe failure fraction | | 99 | 99 |
| DCS [%] Diagnostic coverage safe | | 42.3 | 43.1 |
| DC [%] Diagnosctic coverage | | 93 | 95 |
| Safety level | | IEC/CEI 61508-1: SIL 2 | |

Overload protection tripping curve at 20 °C

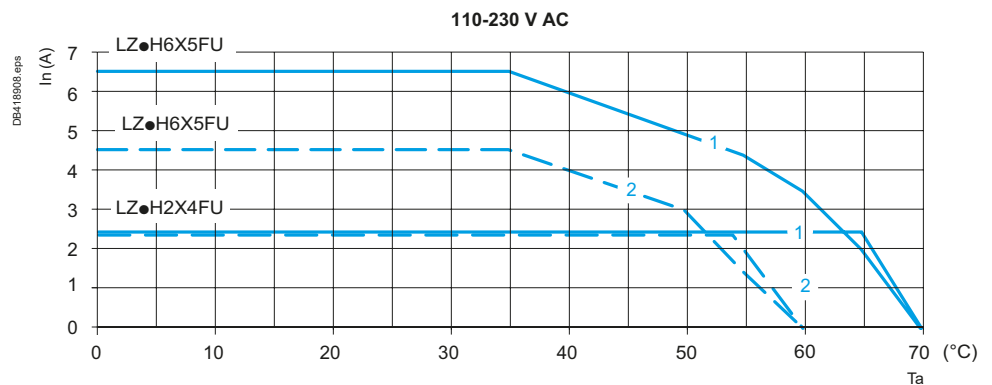


Derating curves: maximum load current (In)



Derating according:

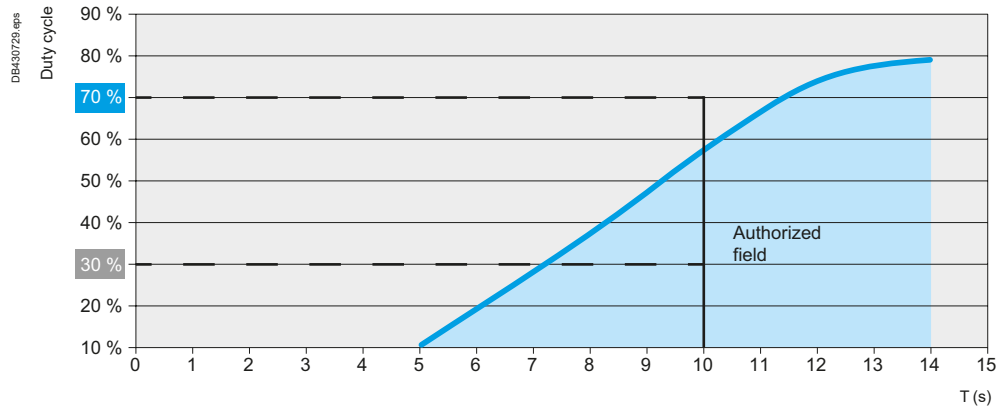
- motor starter control power supply
- ambient temperature (T_a)
- distance between devices 1: 20 mm, with spacing
2: without spacing.



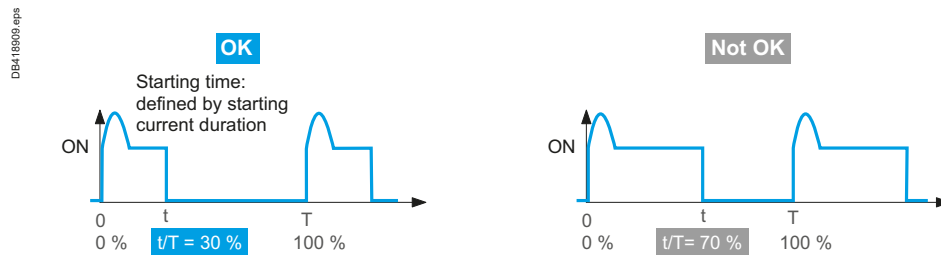
Minimum duty cycle t/T (%) versus cycle duration T (s)

Due to the effect of the peak current on the H monitoring circuit during the starting time, a stop/start sequence should not occur before a certain amount of time. The diagrams below show the minimum duty cycle according to the total period for 2 typical starting time values.

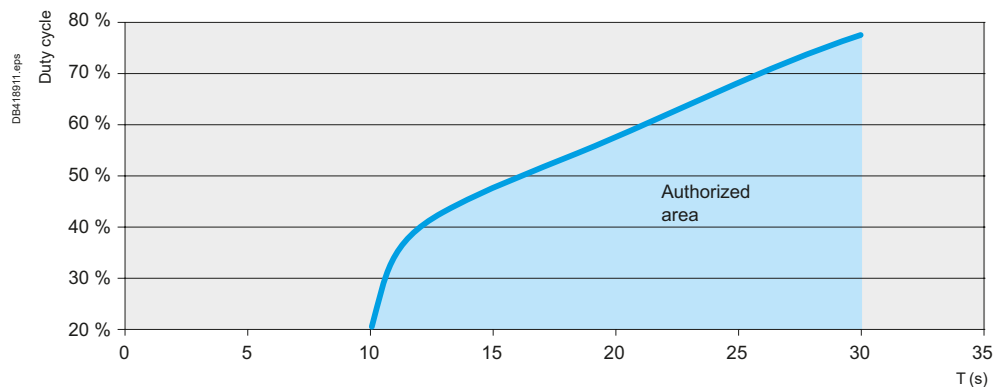
With a starting time = 100 ms



Example for starting time of 100 ms with period $T = 10$ s.

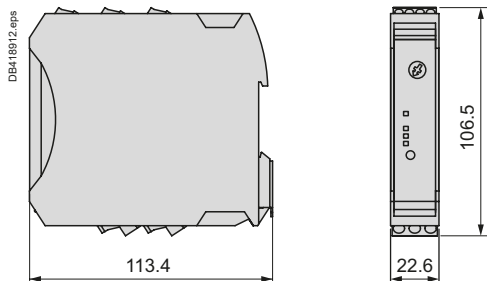


With a starting time = 150 ms

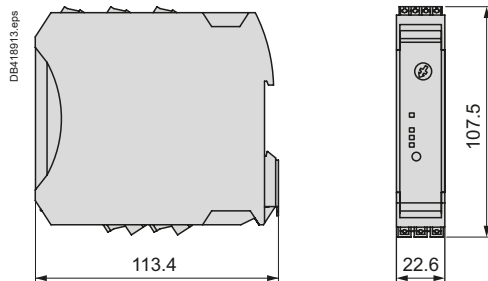


Dimensions mm

LZ●H●●●●●

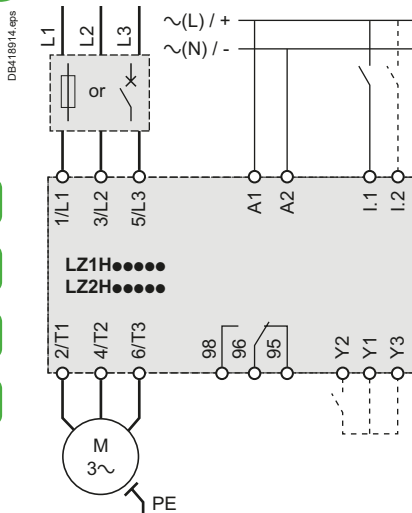


LZ●H●●●3●●

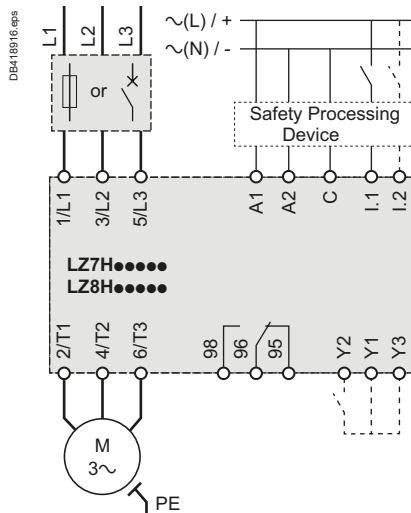


Wiring diagrams

Motor control by standard starter



Motor control by safety starter



Power terminals


T1, T2, T3 Motor connection
L1, L2, L3 Power inputs

Control terminals

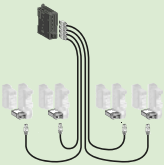
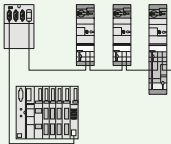

A1, A2 Auxiliary power unit
I.1 Control input, direction 1
I.2 Control input, direction 2
(LZ2H and LZ8H only)
C Control inputs common point
(LZ7H and LZ8H only)
Y1 Reset mode, common point
Y2 Reset mode, remote, manual
Y3 Reset mode, automatic
98, 96, 95 Trip or error signaling contact

Introduction A4/2

TeSys Ultra - Power bases, control modules, connectors

| Type of product | Range | | Page |
|---|---------------|---|-------|
| Standard power base, basic control functionalities Direct and reversing | Up to 18.5 kW |  | A4/10 |

TeSys Ultra - Communication components

| | | | |
|--|--|---|-------|
| Parallel type cabling system Principle and components | |  | A4/16 |
| Bus type cabling systems Principle, panorama and components | |  | A4/21 |
| TeSys LUFPP communication gateway | |  | A4/30 |

TeSys Ultra - Accessories

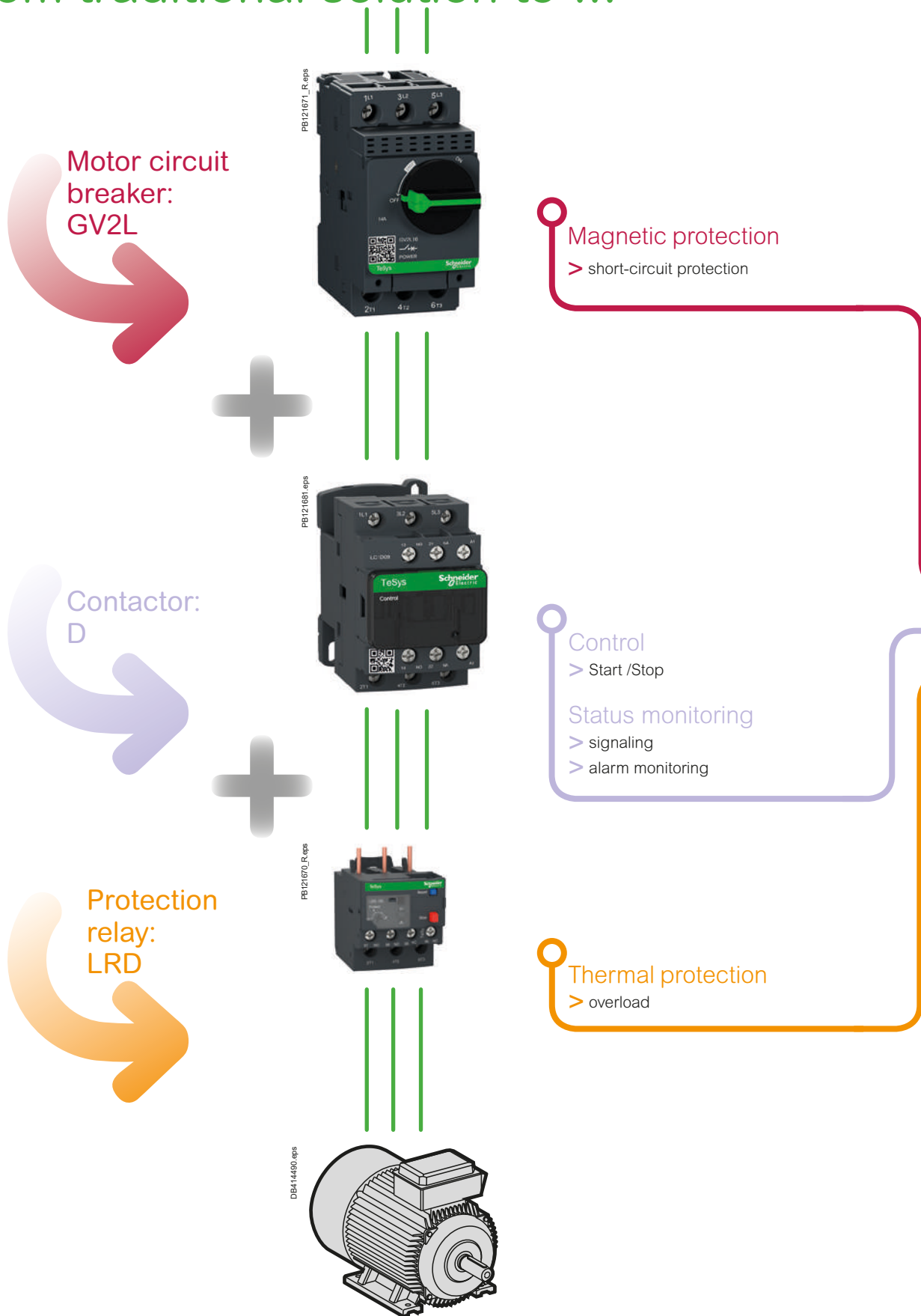
| | | | |
|--|--|---|-------|
| Short circuit current limiter | |  | A4/31 |
| Handles and accessories for rotary control | |  | A4/32 |
| Handles and accessories for integration into a MCC drawer | |  | A4/33 |
| TeSys Ultra with Altistart U01 Soft starters and Variable speed controllers | |  | A4/34 |

Ultra
motor
starters

Technical Data for Designers A4/43

From traditional solution to ...

Ultra motor starters



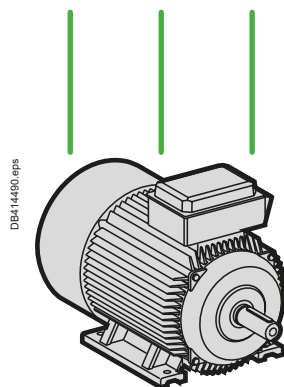
...Ultra motor starter



Ultra
motor
starters

Ultra motor starter

- > All basic or advanced protection and control functions in one block and more...
- > Overload indication and alarm
- > Status report, remote control via communication bus



Ultra motor starters
can be used in **80 %**
of motor protection and control applications.



Ultra motor starters

1 All in one

- Optimising space in enclosures.
- Total coordination (No contact welding on short circuit).
- Reduces installation times.

2 Simplicity of choice

- Controlled power.
- Protection functions ensured.
- Signaling functions, communication with PLC ensured.

3 Universal mounting

- On DIN rail or grid.

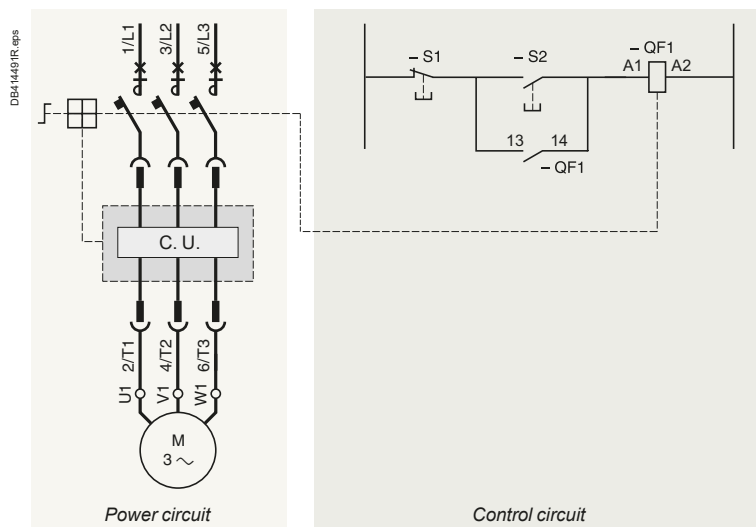
4 Conventional projet design

- Conventional control scheme with start , stop push buttons.

5 Electrically simple

Basic scheme of a Ultra starter-controller

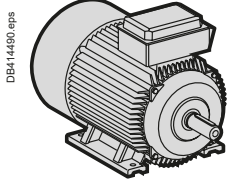
- Protection and power control functions acting on a single set of contact (QF1).
- The control unit (CU) monitors the voltage and current. In case of fault, it releases the coil, causing tripping.
- The coil is controlled by manual orders from an operator. Automatic control from a PLC is achieved with other diagrams.



TeSys Control

Ultra motor starters

Introduction



Motor up to

- 7.5 kW / 1-phase 230 V / 50-60 Hz.
- 18.5 kW / 3-phase 400-440 V / 50-60 Hz.
- 18.5 kW / 3-phase 500 V / 50-60 Hz.
- 22 kW / 3-phase 690 V / 50-60 Hz.
- Non-reversing or reversing.

Common characteristics

Short-circuit protection

- I_{sc}:
 - 50 kA at ≤ 400 V
 - 10 kA at 500 V
 - 4 kA at 690 V.
- Up to 690 V AC.

Overload protection

- From 0.15 to 38 A, 6 setting ranges (tripping 14.2 x I setting).
- Test button.
- Adjustment lock.
- Coil choice: 24 V, 48...72 V, 110...240 V DC/AC.

3 power contacts

- For non-reversing (reversing with reverser block).
- I_{max}, for 12 A power base (direct - reversing):
 - 12 A at up to 500 V / 50 Hz
 - 9 A > 500 V, up to 690 V.
- I_{max}, for 38 A power base (direct - reversing):
 - 38 A at up to 500 V / 50 Hz
 - 21 A > 500 V, up to 690 V.

1 NO contact

1 NC contact

- 5 A / max. 690 V AC or 250 V CC.

Other monitoring contacts

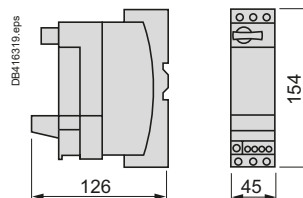
- 5 A / max. 690 V AC or 250 V DC.

Communication modules

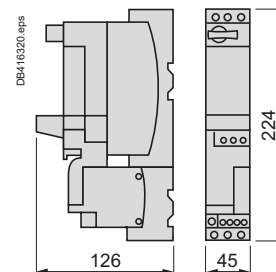
- Modbus,
- Ethernet,
- CANopen,
- DeviceNet,
- Advantys stb,
- Profibus DP,
- AS-interface.

Dimensions

■ Base:



■ Base + reverser block:



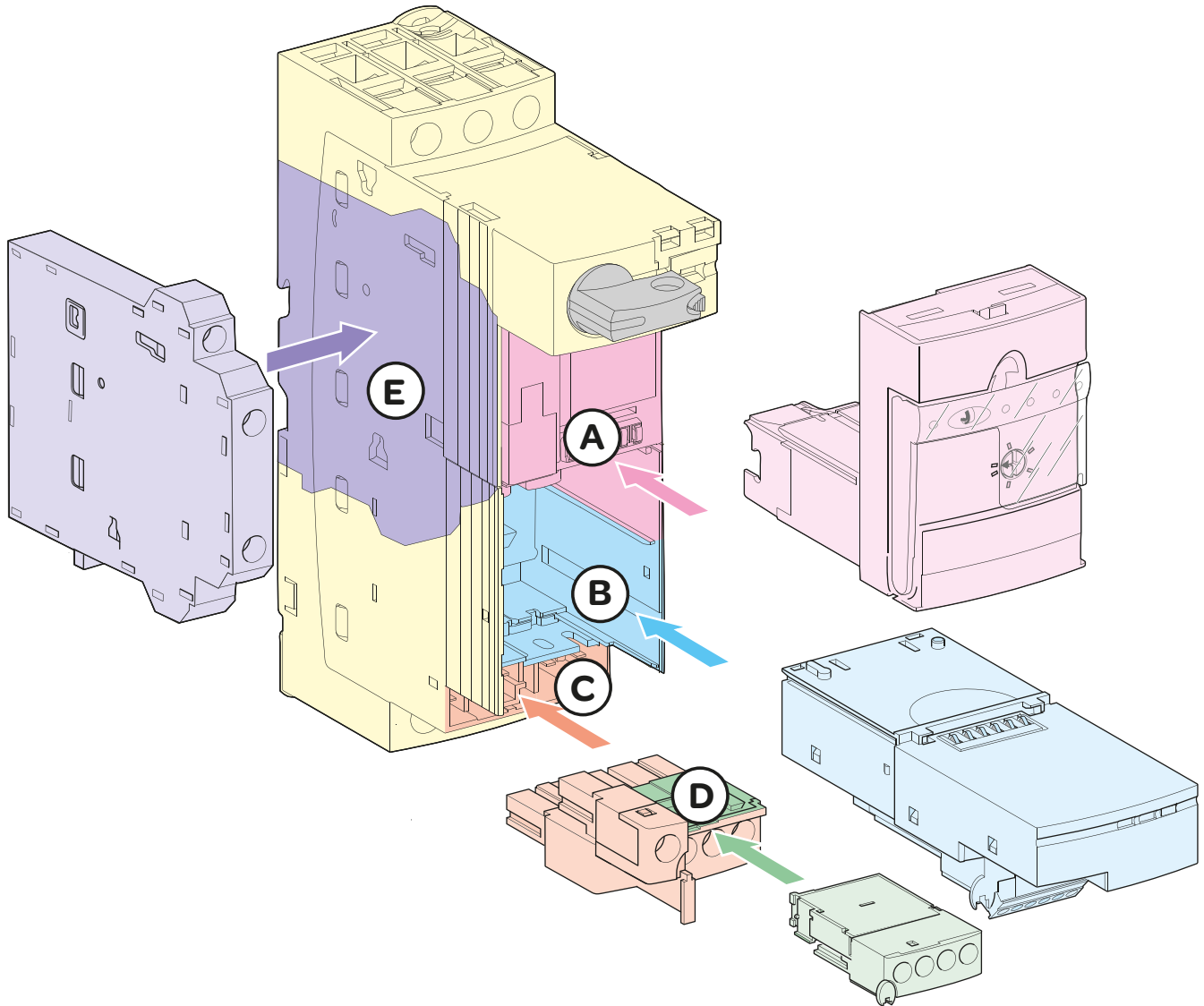
TeSys Control

Ultra motor starters

Introduction

DB-14483_eps

Ultra motor starters



The modularity principle

- Power base
- (A) Cavity for control unit
- (B) Cavity for auxiliary module
- (C) Cavity for control terminal block
- (D) Cavity for additional contact block or shutter
- (E) Space for additional block fastening

Power Base

This is the basic constituent of the motor starter, it is composed of the power contacts, the control coil, the opening / closing mechanism of the protection device and the control pad.

Additional lateral block

Composed of the protection device signaling contacts.

Control unit

Composed of the power base management processor and setting knobs.

Auxiliary module

Depending on its type, it integrates load status contacts or a communication processor or an alarm processor.

Control terminal block

It is composed of two terminals "coil control", 1 NO auxiliary contact, 1 NC auxiliary contact. It can be eventually connected to an auxiliary communication module via a dedicated cable.

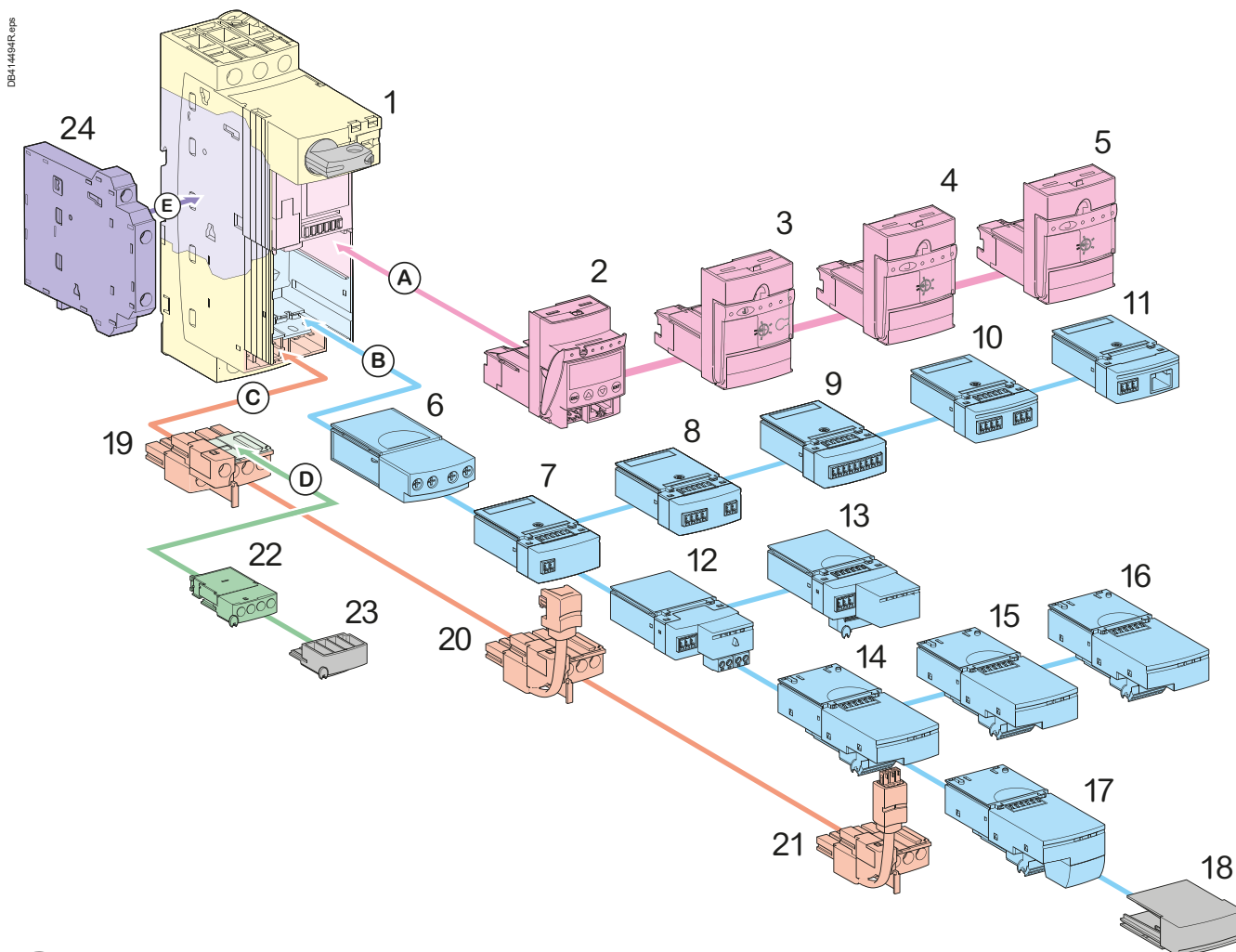
Additional block

It includes protection device additional signaling contacts. By default, this is a simple shutter.

TeSys Control

Ultra motor starters

Introduction



Ultra motor starters

Components overview

Power base

- 1- LUB
Non reversing power base - 1 rotation direction

Control units

- 2- LUCM
Multifunctional control unit
- 3- LUCB/LUCC/LUCD
Advanced control units
- 4- LUCA
Standard control unit
- 5- LUCL
Magnetic protection control unit

Auxiliary module

- 6- LUFN
Auxiliary contacts module

Load monitoring auxiliary modules

- 7- LUFW10
Overload alarm module
- 8- LUFDH11
Overload alarm module with manual reset
- 9- LUFDA01/LUFAD10
Overload alarm module with automatic reset/remote reset
- 10- LUFV2
Motor load indication module

Communication auxiliary modules

- 11- LUFC00
Telefast parallel liaison module, with RJ45 connector
- 12- ASILUFC5/ASILUFC51
AS-Interface c. m.
- 13- LULC033
Modbus c. m.
- 14- LULC07 Profibus DP c. m.
- 15- LULC08 CANopen c. m.
- 16- LULC09 DeviceNET c. m.
- 17- LULC15 Advantys STB c. m.

Shutters

- 18- LU9C1
Shutter for module cavity
- 23- Shutter for contacts additional block cavity

Control terminal blocks

- 19- LU9BN11
Terminal block for imbedded auxiliary contacts
- 20- LU9BN11C
Coil terminal block with its connecting cable
- 21- LU9BN11L
Coil terminal block with its connecting cable

Additional contacts blocks

- 22- LUA1
Additional contacts
- 24- LUA8
side-mounting additional contacts

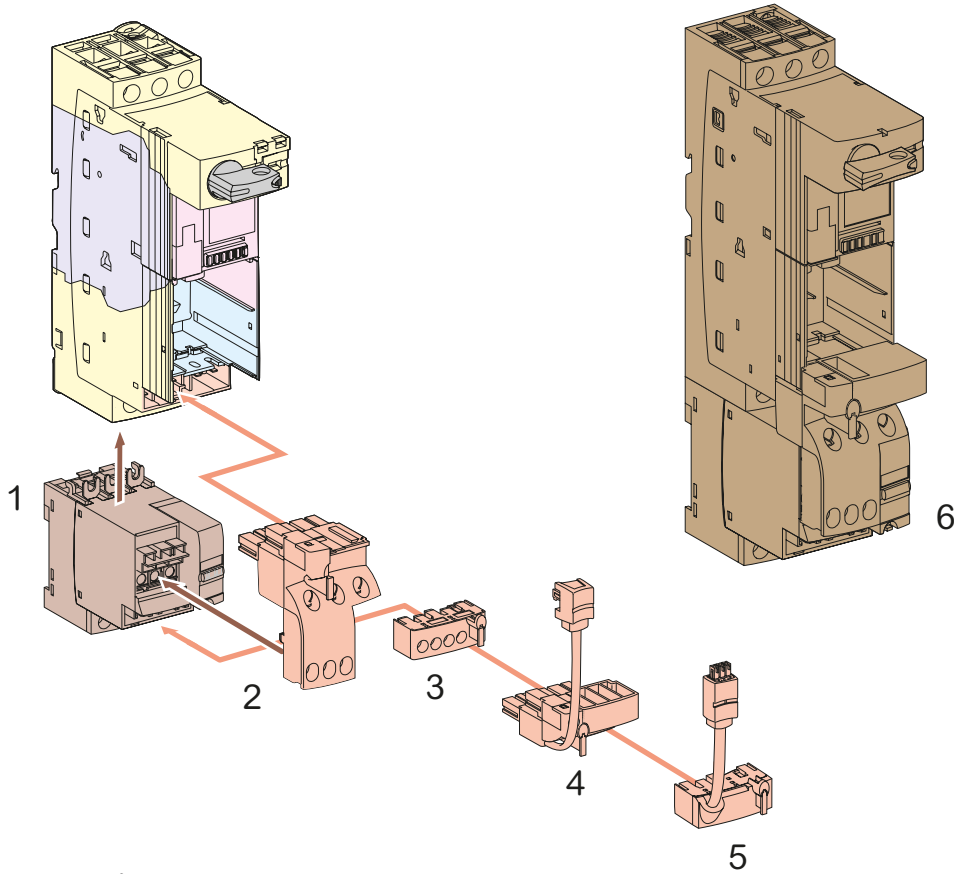
TeSys Control

Ultra motor starters

Introduction

DB1445R.eps

Ultra motor starters



Additional components overview

Reverser block

- 1- LU2MB0●●
vertical-mounting reverser block

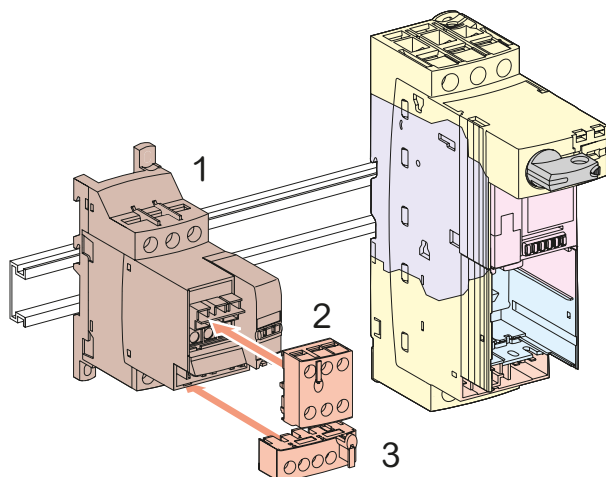
Evolving reversing power base

- 6- Pre-assembled reversing power base LU2B12

Control terminal blocks

- 2- LU9MR1C
Base/block assembling connector, with terminal block for imbedded auxiliary contacts
- 3- LU9M1
Coil terminal block for wired control
- 4- LU9MRC
Coil terminal block with its connecting cable for communicating control (only compatible with a selection of com. modules).
- 5- LU9MRL
Coil terminal block with its connecting cable for communicating control (only compatible with a selection of com. modules).

DB414497 eps



Ultra
motor
starters

Additional components overview

Reverser block

- 1- LU6MB0●●
Side-mounting reverser block

Terminal blocks for electrical remote control

- 2- LU9MR1
Terminal block for 2 direction control (pulse or maintained control)
- 3- LU9M1
Terminal block for power base coil interlocking.
With direction of rotation monitoring contacts

TeSys Control

Ultra motor starters - Power bases

Product references



1 direction:
LUB12, LUB32, LUB38



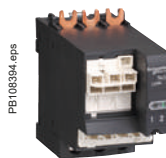
1 direction:
LUB120, LUB320, LUB380
*LU9BN11: Terminal block
for embedded auxiliary
contacts to be ordered
separately.



2 direction:
LU2B12●●, LU2B32●●,
LU2B38●●



LU9MR1C



LU2MB0●●



LU9M1



LU6MB0●●



LU9MR1

Power bases

Ultra starters are composed with separate elements: power component + control units + auxiliary components.

The power base includes the electro mechanical parts. It is selected according to:

- Motor power to be handled
- Number of direction of rotation to be controlled: 1 or 2
- Type of control to be achieved: Basic or Advanced.

Basic control

- 1- direction rotation control
- 2 - direction rotation control
- Overload + Short circuit protection
- Main power monitoring
- Status signaling contacts

Advanced control

- Functions of basic control
- + Digital display of electrical values
- + Overload alarms
- + Network/bus communication

| Function | Max motor standard power (400 V) kW | Lip_in (400 V) A | References | |
|----------------------|--|---------------------|----------------------------|------------------------------|
| | | | Basic ctrl | Advanced ctrl |
| 1-direction rotation | 5.5 | 12 | LUB12 | LUB120 |
| | 15 | 32 | LUB32 | LUB320 |
| | 18.5 | 38 | LUB38 | LUB380 |
| 2-direction rotation | 5.5 | 12 | LU2B12●● ⁽¹⁾ | LUB120 + reverser block ass. |
| | 15 | 32 | LU2B32●● ⁽¹⁾ | LUB320 + reverser block ass. |
| | 18.5 | 38 | LU2B38●● ⁽¹⁾⁽²⁾ | LUB380 + reverser block ass. |

(1) Replace the 2 dots by the coil voltage code below – AC is 50-60 Hz.

(2) With BL or FU code only.

| Coil voltage (V) | 24--- | 24~ | 48...72 --- or ~ | 110...220 --- and 110...240~ |
|------------------|-------|-----|---------------------|---------------------------------|
| Code | BL | B | ES | FU |

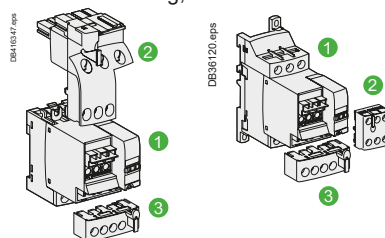
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Reverser blocks - assemblies

A reverser block assembly has to be added to the power base (LUB120 to 380) to build an 'Advanced control' with '2-direction of rotation' Ultra starter.

Reverser blocks with 2 mounting possibilities:

- vertical mounting – mounted aspect: refer to LU2B12, 32, 38
- side mounting, on a Din rail.



Vertical mounting Side mounting

| Blocks | References | |
|---------------------------|-------------------------|-------------------------|
| | Vertical mounting | Side mounting |
| 1 Reverser block | LU2MB0●● ⁽¹⁾ | LU6MB0●● ⁽¹⁾ |
| 2 Aux. contacts connector | LU9MR1C | LU9MR1 |
| 3 Coil supply connector | LU9M1 | LU9M1 |

(1) Replace the 2 dots by the coil voltage code below – AC is 50-60 Hz.

| Coil voltage (V) | 24--- | 24~ | 48...72 --- or ~ | 110...220 --- and 110...240~ |
|------------------|-------|-----|---------------------|---------------------------------|
| Code | BL | B | ES | FU |

Main technical characteristics

Power bases

1-direction power base overall dimensions (HxWxD) : 154 x 45 x 126 mm

2-direction power base (assembly with vertical mounting reverser block) overall dimensions (HxWxD): 224 x 45 x 126 mm

Power bases are delivered with protective blanking plates.

3 power poles, for connections of a 1-phase or 3-phase motor

Screw clamp power terminals, for up to 2 x 6 mm² conductors

Screw clamp control terminals, for up to 2 x 1.5 mm² conductors

LUB12,32,38 imbedded terminals:

- coil supply,
- NO (13-14) contact (for control push button)
- NC (21-22) contact (for control push button).

Additional signaling contact modules provide more possibilities.

Reversing assemblies

LU2MB0, LU6MB0:

3 power poles, for connections of a 1-phase or 3-phase motor,

screw clamp power terminals, for up to 2 x 6 mm² conductors

LU9 connectors: screw clamp control terminals, for up to 2 x 1.5 mm² conductors

LU2MB0●●, LU6MB0●● provide terminals for power circuits.

LU9MR1C, LU9MR1 provide signalling contact terminals (82-81-84) that indicate the direction of rotation.

LU9M1 provides coil supply terminals (A2-A1-A3) and 2 NO contact terminals (A1-B1, A3-B3) for direction control.

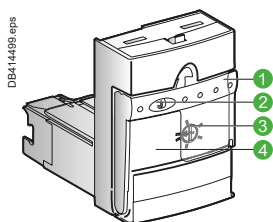
TeSys Control

Ultra motor starters - Control units

Product references



LUCA, LUCB, LUCC, LUCD, LUCL series



LUCA●●●●

- 1 Extraction and locking handle.
- 2 Sealing of locking handle.
- 3 Ir adjustment dial.
- 4 Locking of settings by sealing the transparent cover.

Ultra starters are composed with separate elements: power component + control units + auxiliary modules. The control unit includes electronic components and the current adjustment dial. The control unit is selected according to:

- Motor power to be handled.
- Type of protection: thermal+magnetic or magnetic only.

Control units for power bases with basic control

LUCA - thermal + magnetic (standard) units

- Protection against overload: 14.2 x Ir (setting current).
- Protection against short circuit: 13 x Ir max (max setting current).
- Protection against missing or unbalanced phases.
- Protection against insulation fault (protection of equipment only).
- Class 10 tripping.
- Frequency 50...60 Hz.

LUCL - magnetic units

- Protection against short circuits.
- To be used when a standard power base is connected to a motor drive or a soft starter, as they provide the overload protection.

Note: both **LUCA** and **LUCL** units can be used in the advanced power bases **LUB120** and **LUB320**.

| Maximum standardized power ratings of 3 phases motors 50/60 Hz | | | Setting range | Lip in mounting on the power base - Rating | Control unit product reference ⁽¹⁾ | |
|--|-------|-------|---------------|--|---|-------------------------|
| 400/440 V | 500 V | 690 V | | | Thermal + magnetic | Magnetic |
| kW | kW | kW | A | A | LUCA | LUCL |
| 0.09 | - | - | 0.15...0,6 | 12 and 32 | LUCAX6●● | LUCLX6●● |
| 0.25 | - | - | 0.35...1,4 | 12 and 32 | LUCA1X●● | LUCL1X●● |
| 1.5 | 2.2 | 3 | 1.25...5 | 12 and 32 | LUCA05●● | LUCL05●● |
| 5.5 | 5.5 | 9 | 3...12 | 12 and 32 | LUCA12●● | LUCL12●● |
| 7.5 | 9 | 15 | 4.5...18 | 32 | LUCA18●● | LUCL18●● |
| 15 | 15 | 18.5 | 8...32 | 32 | LUCA32●● | LUCL32●● |
| 18.5 | 18.5 | 22 | 9.5...38 | 38 | LUCA38●● ⁽²⁾ | LUCL38●● ⁽²⁾ |

⁽¹⁾ Replace the 2 dots by the coil voltage code below – AC is 50-60 Hz.

⁽²⁾ With **BL** or **FU** code only.

| Coil voltage (V) | 24--- | 24~ | 48...72 --- or ~ | 110...220 --- and 110...240~ |
|------------------|-------|-----|------------------|------------------------------|
| Code | BL | B | ES | FU |

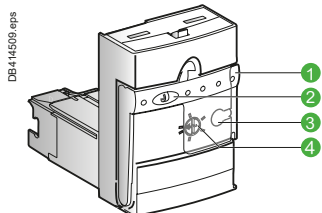
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TeSys Control

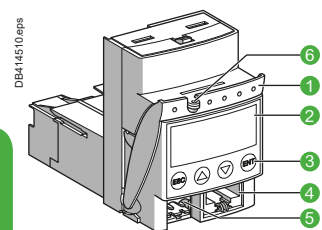
Ultra motor starters - Control units

Product references



LUCB●●●●, LUCC●●●●, LUCD●●●● control units

- 1 Extraction and locking.
- 2 Handle sealing of locking.
- 3 Handle
- 4 Ir adjustment dial test push button.



LUCM●●BL control unit

- 1 Extraction and locking handle.
- 2 Built-in LCD display (2 lines, 12 characters).
- 3 4 button keyboard.
- 4 RJ45 connector for RS485 Modbus communication
- 5 Connector for external 24 V DC power supply.
- 6 Sealing of locking handle.

Ultra motor starters



LUCM12BL

Control units for power bases with advanced control

LUCB, LUCC, LUCD control and diagnostic units

Motor protection, fault diagnostic.

Protection against

- overload: 14.2 x Ir (setting current).
- simulation of an overload by depressing the test push button.
- short circuit: 13 x Ir max (max setting current).
- missing or unbalanced phases.
- insulation fault (protection of equipment only).

Overload alarm management:

- locally: with one of the LUF family module
- Remotely: with LULC031, LULC033, LULC07, LULC08, LULC09 or LULC15 (thermal alarm only) communication module.

Reset:

- manual
- automatic, with a communication module.

LUCM multifunctional control unit

Motor protection, operational values display and diagnostic.

To be associated with 24 V DC coil only.

LUCM●●BL: tripping class 5 to 30, single phase, three phase

Same functions as LUCB●●●● with complementary functions:

- in working mode: display of electrical values, setting parameters and events
- in configuration mode: display of protection and alarm settings.

These functions are available for local display on a display panel, and for remote display via a RJ45 Modbus connector.

LUCM is not compatible with LUB38.

Note: a 24 V DC power supply is required during the configuration process.

| Maximum standardized power ratings of 3 phases motors 50/60 Hz | | | | Setting range | Lip_in mounting on the power base - Rating | DBA14489 eps | Protection type: - overload - short-circuit - Main power fault - alarm | | | DBA14504 eps |
|--|-------|-------|----------|---------------|--|-------------------------|--|-------------------------|----------|--------------|
| 400/440 V | 500 V | 600 V | | | | | Class 10 | Class 10 | Class 20 | |
| kW 1P | kW 3P | kW 3P | kW 3P | A | A | 3P | 1P | 3P | 1 - 3P | |
| - | 0.09 | - | - | 0.15...0.6 | 12 and 32 | LUCBX6●● | LUCCX6●● | LUCDX6●● | LUCMX6BL | |
| 0.09 | 0.25 | - | - | 0.35...1.4 | 12 and 32 | LUCB1X●● | LUCC1X●● | LUCD1X●● | LUCM1XB | |
| 0.55 | 1.5 | 2.2 | 3 | 1.25...5 | 12 and 32 | LUCB05●● | LUCC05●● | LUCD05●● | LUCM05BL | |
| 2.2 | 5.5 | 5.5 | 9 | 3...12 | 12 and 32 | LUCB12●● | LUCC12●● | LUCD12●● | LUCM12BL | |
| 4 | 7.5 | 9 | 15 | 4.5...18 | 32 | LUCB18●● | LUCC18●● | LUCD18●● | LUCM18BL | |
| 7.5 | 15 | 15 | 18.5 | 8...32 | 32 | LUCB32●● | LUCC32●● | LUCD32●● | LUCM32BL | |
| 18.5 | 18.5 | 22 | 9.5...38 | 38 | | LUCB38●● ⁽¹⁾ | | LUCD38●● ⁽¹⁾ | | |

Cial. ref. of the control unit: replace dots by the coil code.

Please check the availability of your variant in the index page A4/42. The SEARCH function of your viewer can be used.

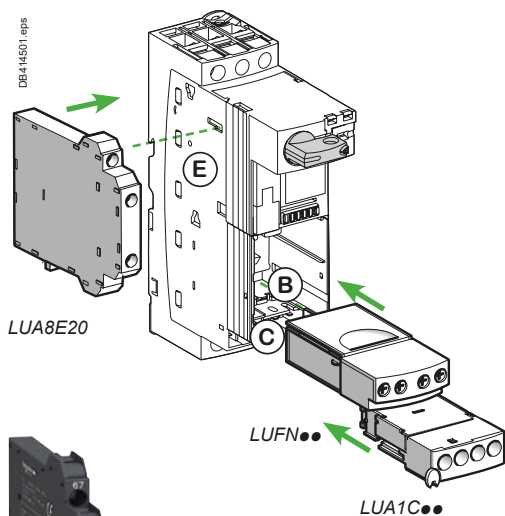
| Coil voltage (V) | 24--- | 24~ | 48...72 --- and 48~ | 110...220 --- and 110...240~ |
|------------------|-------|-----|---------------------|------------------------------|
| Coil code | BL | B | ES | FU |

⁽¹⁾ With BL or FU code only.

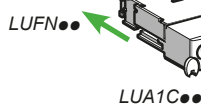
TeSys Control

Ultra motor starters - Signaling Modules/Blocks - Function modules

Product references



LUA8E20



LUA1C20



LUFN02



LUA1C20



LUFV2



LUFW10



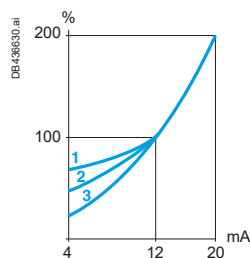
LUFDH11



LUFDA01



LUFDA10



- 1 2.2 kW
- 2 4 kW
- 3 7.5 kW

LUFV2 typical response curve

Signaling module and blocks

They provide dry contacts of Normally Open (NO) or Normally Closed (NC) type for signaling purpose. The monitored status can be either the motor running status or the protection device status, depending on the commercial reference of the module or block.

Common electrical characteristics

Standard operating voltage: 24...250 V AC/DC.

Maximum current: 5 A.

Compatibility - Positioning

The signaling module and blocks can be used in any power base

LUA8E20 is clipped on the E side of the power base

LUFN11, LUFN02, LUFN02 inserted into B cavity

LUA1C20, LUA1C11 inserted into C cavity

Note: B and C cavities may be already used for reverser-starter, communication.

| Signaling module and blocks | Output | References |
|--|-------------|------------|
| Module | 1 NO + 1 NC | LUFN11 |
| Motor running status: ON / OFF | 2 NC | LUFN02 |
| | 2 NO | LUFN20 |
| Block | 2 NO | LUA1C20 |
| Protection status: OPEN / CLOSED (OF) STANDBY / TRIPPED (SD) | 1 NO + 1 NC | LUA1C11 |
| | 2 NO | LUA8E20 |
| Side block | 2 NO | LUA8E20 |
| Protection status: OPEN / CLOSED (OF) | | |

Function modules

They provide analog output or dry contacts of Normally Open (NO) or Normally Closed (NC) type for measurement or signaling purpose.

Common electrical characteristics

Standard operating voltage: 24...250 V AC/DC.

Maximum current: 5 A.

Compatibility - Positioning

The function modules can only be used in a LUB120, LUB320 or LUB380 power base, in cavity B.

| Function modules | Output type | References |
|--|-----------------|------------|
| Electrical value: average current in each phase. The signal is the image of the percentage of I_n . External 24 V DC power supply needed | Analog: 4-20 mA | LUFV2 |
| Contact closes if average current in the phases = 105 % of I_n | 1 NO | LUFW10 |
| Contacts change state if tripping is caused by overload | 1 NO + 1 NC | LUFDH11 |
| Contact opens if overload tripping is reset with control pad or remotely | 1 NC | LUFDA01 |
| Contact closes if overload tripping is reset with control pad or remotely | 1 NO | LUFDA10 |

TeSys Control

Ultra motor starters - Communication modules

Product references



LUFC00



LULC033



ASILUFC51



LULC07



LULC15



LU9BN11C



LU9BN11L



LU9MRC



LU9MRL

Auxiliary parallel wiring module ⁽¹⁾

Auxiliary parallel wiring module for Modicon Telefast system

Inputs

They collect the FWD, REV controls from an automation process. An RJ45 parallel port is used, for connection to the 24 V DC outputs of a PLC.

Outputs

They give the position of the control pad and the state of the poles. They provide 24 V DC controls to the LUB120, 320 or 380 power base coil via the LU9BN11C adapter (A2, A1) or to the LU2B12, 32, 38 power base coil with a LU9MRC adapter (A2, A1, A3).

Compatibility - Positioning

The parallel wiring module can only be used in any Ultra power base, with **LUC●●● control unit with coil voltage**

Compatible with:

- Modicon TM3 (map I/O controllers for RJ45 M221, M241, M25)
- Modicon STB modules (I/O for automation island)
- Modicon Telefast (interfaces RJ45/HE10).

The parallel wiring module is inserted in cavity B.

Note: the parallel wiring module must be connected to a LU9G02 or LU9G03 Telefast distribution

Note: more details on parallel wiring page A4/16.

| Designation | References |
|---|------------|
| Ultra power base parallel wiring module | LUFC00 |

Communication modules

Communication modules

These modules send the control pad position and pole state to a communicating system (PLC, monitoring system,...)

They collect the Forward, Reverse motor controls from an automation process.

The status and controls are coded according to an industrial communication protocol, depending on the communication module.

Bus cable connection, external power supply by crew clamp terminals.

Connector for coil control (to A1-A3-A2) via a prewired connection (LU9BN● for 1-direction control, LU9MR● for 2-direction control)

Compatibility - Positioning

The communication modules can only be used in a LUB120, LUB320 or LUB380 power base, in cavity B.

| Designation | References |
|---|------------|
| Ultra Modbus communication module | LULC033 |
| Ultra AS-Interface communication module | ASILUFC51 |
| Ultra Profibus DP communication module | LULC07 |
| Ultra CANopen communication module | LULC08 |
| Ultra DeviceNet communication module | LULC09 |
| Ultra Advantys STB communication module | LULC15 |

Note: Ethernet communication can be achieved with LULC033 + ConneXium Port (ref. TCSEQM113M13M)

Note: more details on bus-type communication page A4/21.

Prewired connectors

They provide the necessary electrical link between a parallel or communication module and the coil supply connector, on the power base or reverser block. Thus, ON-OFF (1 direction) or FORWARD-REVERSE (2 direction) controls can be achieved.

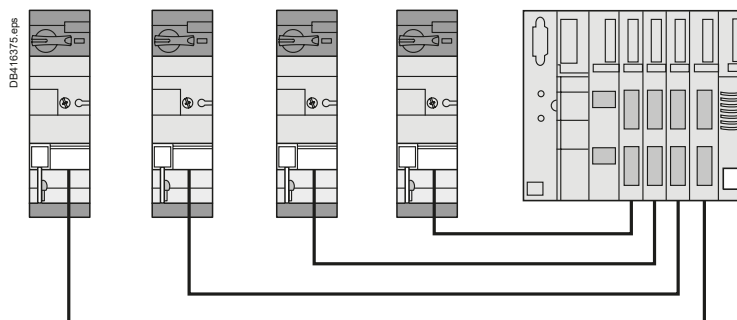
| Prewired connection | References | Compatibility with modules |
|----------------------------|-------------------|---------------------------------------|
| 1 direction Short cable | Side connection | LU9BN11C LUF00, LULC033, ASILUFC51 |
| | Bottom connection | LU9BN11L LULC07, 08, 09, 15 |
| 2 direction Long cable | Side connection | LU9MRC LUF00, LULC033, ASILUFC51 |
| | Bottom connection | LU9MRL LULC07, 08, 09, 15 |





Ultra motor starters

Point-to-point wiring

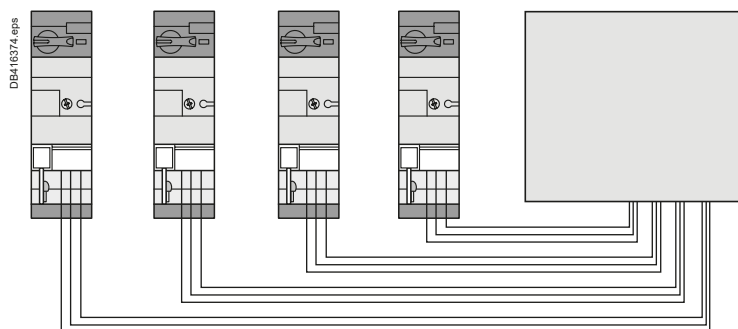


- The control inputs and signaling outputs of the starter are grouped in a single socket, usually RJ45. They are individually connected to PLC outputs and inputs.
- The wires run in parallel in a multicore cable equipped with a multipin connectors, RJ45 in the case of Telefast type system.
- 3 parallel wiring systems are available:
 - Modicon TM3, based on a RJ45 I/O module for M221, M241, M25 PLC
 - Modicon STB, based on I/O modules for automation island
 - Modicon Telefast: RJ45 / HE10 interfaces.
- Simple way of proximity wiring. Quick cabling. It is suitable for machine control panels when a large number of Ultra starter-controller are installed.

informations

- The control and signaling terminals of the starters are connected to the output and input terminals of a PLC. No specific connectors or cables are required.
- Conventional wiring mode, without optimization of the cabling time. May be suitable when a very small number of starters is used, with a very small number of links.

Parallel cabling systems



TeSys Control

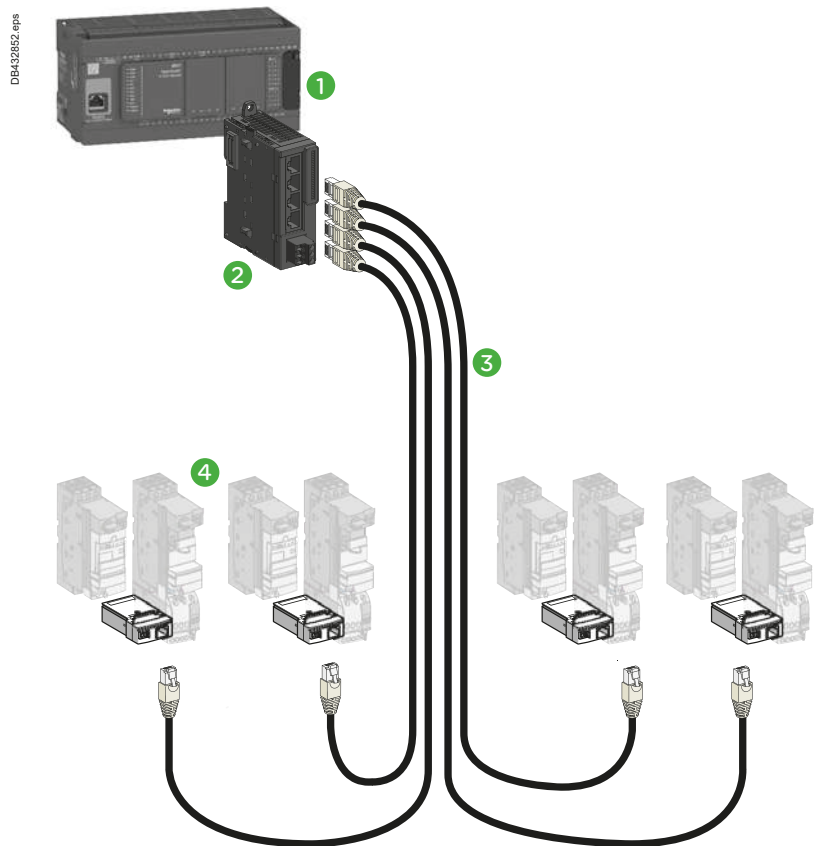
Ultra motor starters - Parallel-type cabling systems

Introduction

Integration in the Modicon TM3 wiring system

The Ultra starter-controller are directly connected to a I/O module equipped with RJ45 connectors.

- 1 Modicon M221, M241, M251 PLC's
- 2 TM3XTY I/O module for 4 starters
- 3 LU9R●● cables with RJ45 connectors,
- 4 LUFC00 module for TeSys Control parallel connection (1 or 2 direction of rotation).



Ultra
motor
starters

Integration in the Modicon Advantys STB system

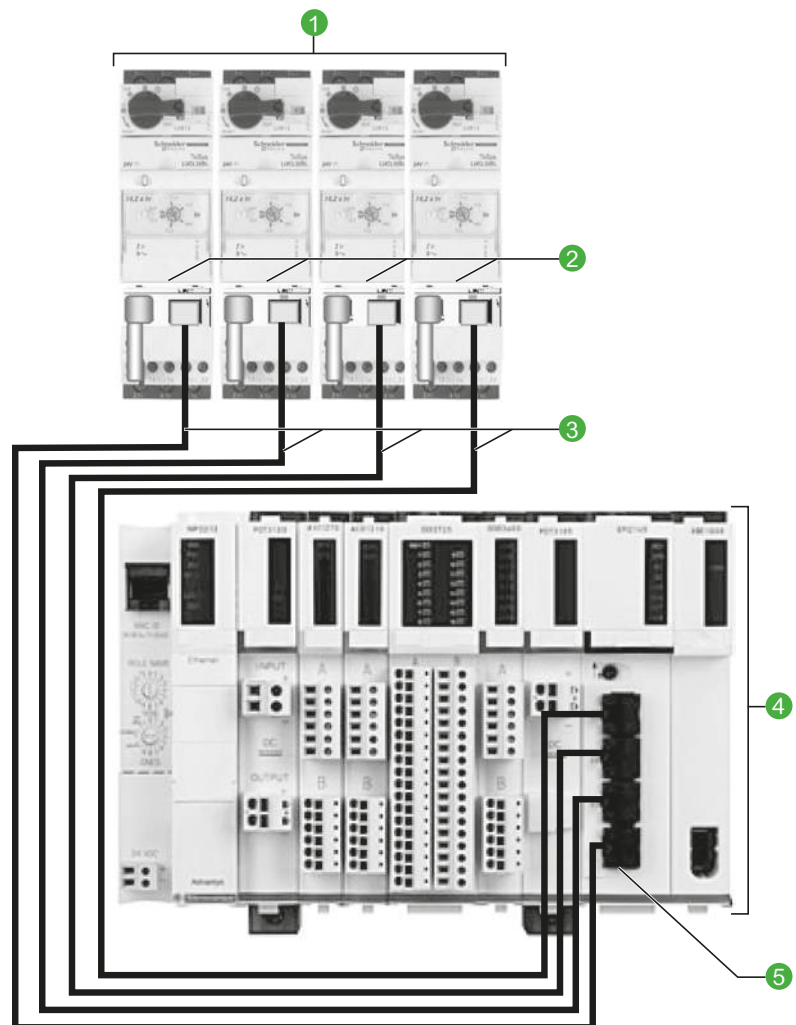
Advantys STB is a solution for remote I/O modules.

These communicate with the Modicon PLCs range thanks to a serial liaison, using the Advantys STB protocol.

In this example an Advantys I/O module is used to facilitate wiring.

Each of its four terminals receives a preassembled RJ45 cable connected to a Ultra starter-controller.

- 1 Ultra LUB120, 320 or 380 power base (equipped with 24 V DC LUC●●●●BL control modules)
- 2 TeSys Control module for parallel RJ45 wiring: LUFC00 + LU9BN11C (one direction) or LU9MRC (2 directions for LU2B12, 32 or 38 power base)
- 3 RJ45 cables (2 connectors):
≤ 3 m: LU9R●●
> 3 m: 490 NTW000●● (5, 12, 40 or 80 m)
- 4 PLC: Modicon range
- 5 I/O Modicon Advantys module: STB EPI 2145K



TeSys Control

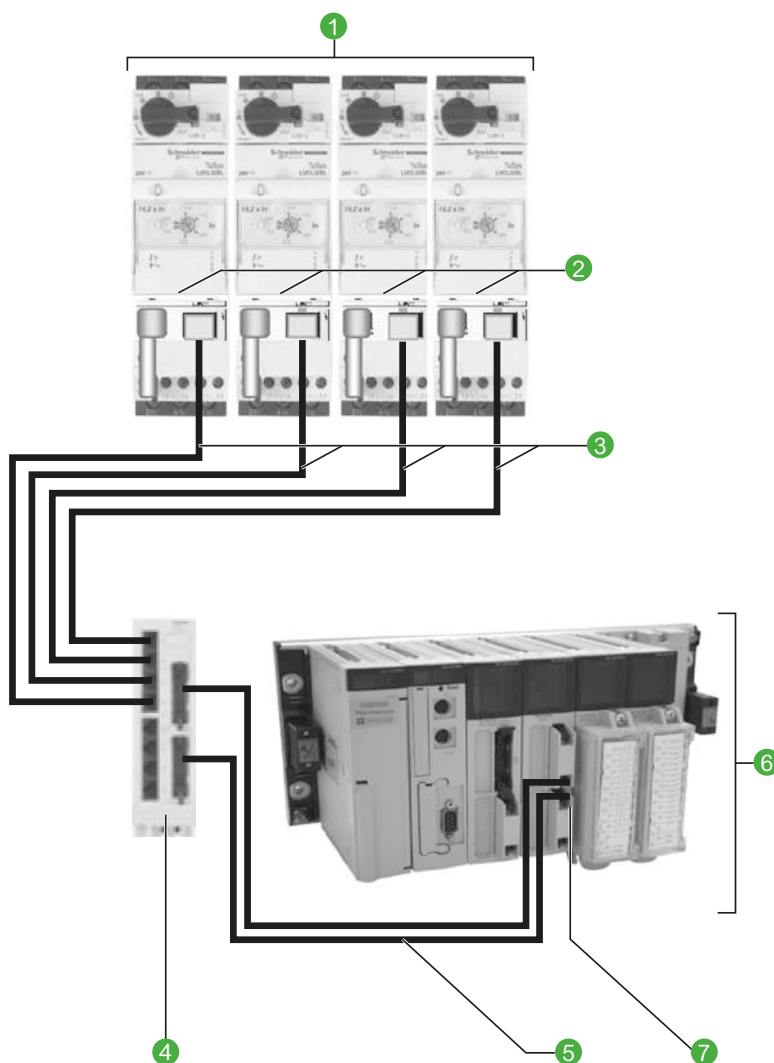
Ultra motor starters - Parallel-type cabling systems

Introduction

Integration in the Modicon Telefast system

The wiring hubb **LU9G0** facilitates the connection to Modicon Premium PLCs. It adapts RJ45 connectors to HE10 available on the Telefast I/O modules. Connection: up to 8 Ultra per hubb.

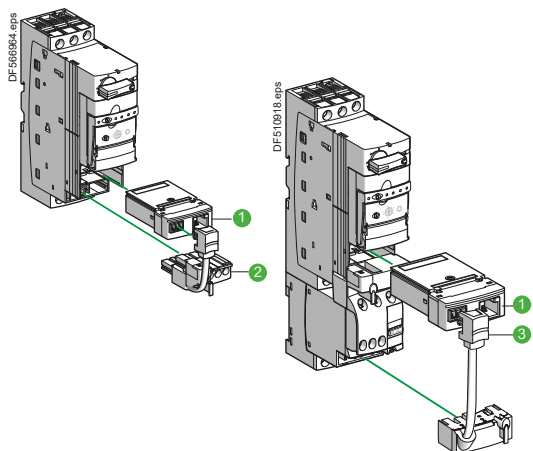
- 1 Ultra LUB120, 320 or 380 power base (equipped with 24 V DC LUC...BL control units)
- 2 TeSys Control module for parallel wiring RJ45: LUFC00 + LU9BN11C (one direction) or LU9MRC (2 directions for LU2B12, 32 or 38 power base)
- 3 RJ45 cables (2 connectors):
≤ 3 m: LU9R...
> 3 m: 490 NTW000... (5, 12, 40 or 80 m)
- 4 Telefast RJ45 / HE10 splitter box: LU9G02 or LU9G03 (different Ultra connection capacities)
- 5 HE10 cables (2 connectors): TSXCDP...
- 6 PLC: Modicon Premium range
- 7 I/O module: TSX DMY 28FK



TeSys Control

Ultra motor starters - Parallel-type cabling systems

Product references



| Components for connection of a starter - 1 direction of rotation | |
|--|-----------|
| Designation | Reference |
| ① Parallel connection module, RJ45 output 2 coil control inputs, 3 signal outputs | LUFC00 |
| ② Pre wired connector, one direction of rotation, for LUB120, 320 or 380 power base coil connection and one contact for emergency stop | LU9BN11C |

| Components for connection of a starter - 2 directions of rotation | |
|---|-----------|
| Designation | Reference |
| ① Parallel connection module, RJ45 output | LUFC00 |
| ③ Pre wired connector, 2 directions of rotation, for LU2B12, 32 or 38 power base coil connection and one contact for emergency stop | LU9MRC |

Ultra motor starters

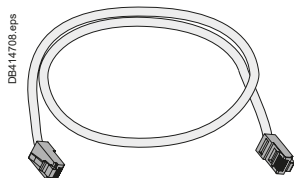


LU9G02



LU9G03

| Telefast RJ45/ HE10 splitter box | |
|--|-----------|
| Designation | Reference |
| Splitter box Connection to U: 4 RJ45 connectors: for 1 to 4 U, 1 or 2 directions 4 RJ45 connectors: for 1 to 4 U, 1 direction Connection to PLC: 1 x HE10 connector - 20 channels, for pole status, alarms 1 x HE10 connector - 20 channels, for control. 24 V DC auxiliary power supply required | LU9G02 |
| Splitter box Connection to U: 8 RJ45 connectors: for 1 to 8 U, 1 or 2 directions Connection to PLC: 1 x HE10 connector - 20 channels, for pole status, alarms 1 x HE10 connector - 20 channels, for control. 24 V DC auxiliary power supply required. | LU9G03 |



RJ45 cables.

| RJ45 connection cables, with 2 RJ45 connectors | |
|--|--------|
| 0.3 m | LU9R03 |
| 1 m | LU9R10 |
| 3 m | LU9R30 |

| HE10 connection cables, with 2 HE10/20 way connectors | |
|---|------------|
| Section: AWG 22 / 0.324 mm ² | |
| 0.5 m | TSXCDP053 |
| 1 m | TSXCDP103 |
| 2 m | TSXCDP203 |
| 3 m | TSXCDP303 |
| 5 m | TSXCDP503 |
| Section: AWG 28 / 0.080 mm ² (flat cable) | |
| 1 m | ABFH20H100 |
| 2 m | ABFH20H200 |
| 3 m | ABFH20H300 |

| Cable with stripped wires (PLC side) 1 x HE10/20 ways connector (Splitter box side) | |
|--|-----------|
| Section: AWG 22 / 0.324 mm ² | |
| 3 m | TSXCDP301 |
| 5 m | TSXCDP501 |

TeSys Control

Ultra motor starters - Bus-type cabling systems

Introduction

PB105992.eps



> Application functionality, topology

1 Geographically expanded process

Many motors are scattered on the site, the process control requires individual control to ensure safety and proper operation. Ultra is a suitable communicating actuator. The integration of a bus communication module in the starter-controller saves space in the control board and simplifies wiring, compared to solutions based on conventional components (circuit breaker + contactor).

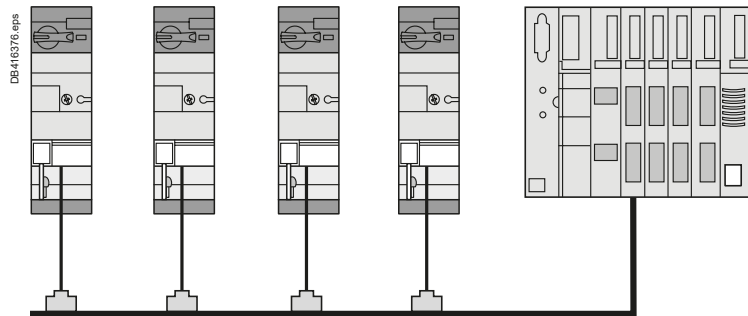
2 Application: automatic motor control / monitoring

Thanks to a communication bus, starter-controllers are part of an automation system controlled by a PLC and (or) various communicating controllers. These equipment can then share the status and alarm information related to each motor control and perform specific treatments.

3 Bus-type connection

This type of connection allows different topologies (star, ring ...) and supports various protocols dialogue. It is therefore recommended for geographically expanded process, in order to to simplify wiring and ensure multiple-controller management.

- The bus wiring interconnects Ultra starters controllers and components of the installation via a single the cable.
- Commands and status are coded according to the selected protocol and transmitted on the communication bus.
- This wiring is simple, usually a shielded (or not) pair of wires, suitable for monitored automation, regardless of the number of Ultra and their locations.



Available Ultra status and controls via a communication module

| Control unit | LUCA | LUCB LUCC LUCD | LUCM |
|--|------|----------------------|------|
| Starter status (ready, running, fault) | ■ | ■ | ■ |
| Start and Stop commands | ■ | ■ | ■ |
| Thermal overload alarm | | ■ | ■ |
| Remote reset via the bus | | ■ | ■ |
| Indication of motor load | | ■ | ■ |
| Fault signalling and differentiation | | ■ | ■ |
| Remote programming and monitoring of all functions | | | ■ |
| "Log" function | | | ■ |
| "Monitoring" function | | | ■ |
| Alarms (overcurrent, ...) | | | ■ |

Ultra motor starters

TeSys Control

Ultra motor starters - Bus-type cabling systems

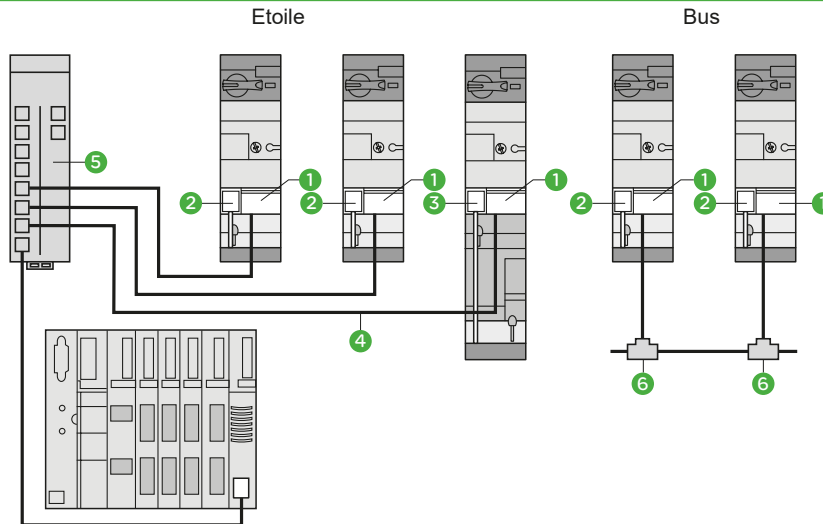
Introduction

Network

Architecture

Component references

Modbus



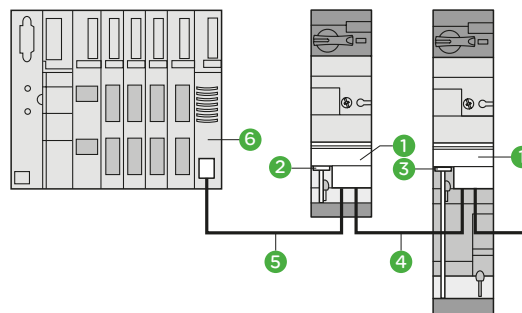
- ① LULC033
- ② LU9BN11C
- ③ LU9MRC
- ④ VW3A8306R●●●
- ⑤ LU9GC3
- ⑥ VW3A8306TF

Ultra motor starters

Details page
[A4/26](#)

Advantys STB

Starter-controllers communicate using ADVANTYS STB protocol to fit into a remote I/O architecture.



- ① LULC15
- ② LU9BN11L
- ③ LU9MRL
- ④ LU9RDD●●●
- ⑤ LU9RCD
- ⑥ STBxBE1100

Details page
[A4/27](#)

TeSys Control

Ultra motor starters - Bus-type cabling systems

Introduction

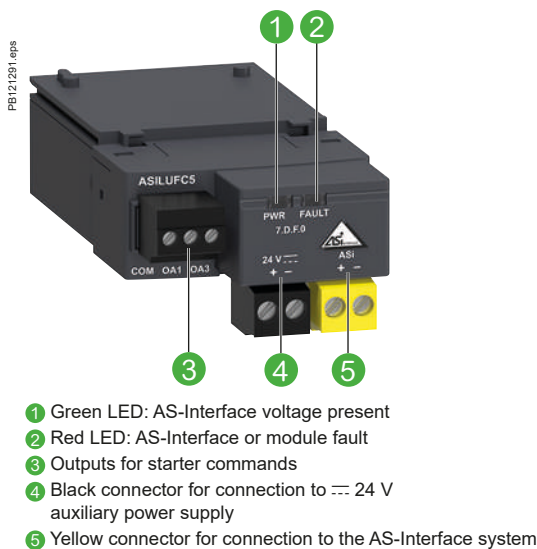
| Network | Architecture | Component references |
|---|--------------|---|
| <p>Profibus-DP (Decentralized Peripherals)</p> <p>is used for connecting actuators and sensors to a central controller for applications in industrial production. The standard bus provides a number of diagnostic means</p> <p>Details page A4/28</p> | | <ul style="list-style-type: none"> ① LULC07 ② LU9BN11L ③ LU9MRL ④ LU9RPB010 LU9RPB100 LU9RPB400 ⑤ LU9AD7 ⑥ LU9GC7 |
| <p>DeviceNet</p> <p>Details page A4/29</p> | | <ul style="list-style-type: none"> ① LULC09 ② LU9BN11L ③ LU9MRL |

Ultra motor starters

TeSys Control

Ultra motor starters - AS-Interface communication modules

Product references



The ASILUFC5 communication module, combined with the power base and control unit is used to control Ultra starters-controllers via DeviceNet bus. The LULC09 communication module is slave type.

Module Specifications

I/O terminal block

- Powered by external 24 V DC (power supply not included):
- 2 x configurable inputs for binary sensors
- 1 x 24 V DC output - 0.5 A local auxiliary command.

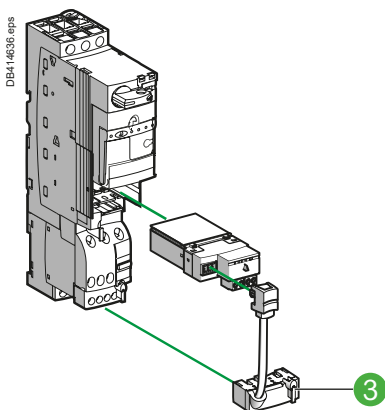
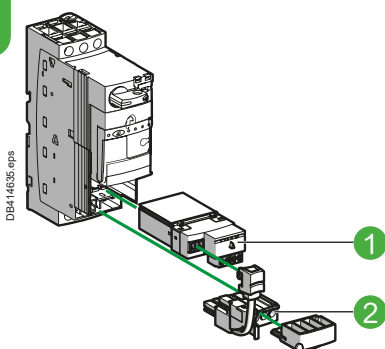
Connectors

- For Ultra 24 V DC coil (common, direction 1, direction 2).
- For AS-Interface bus.

Signaling

- Module Status - Error - 24 V, by LED.

Ultra motor starters



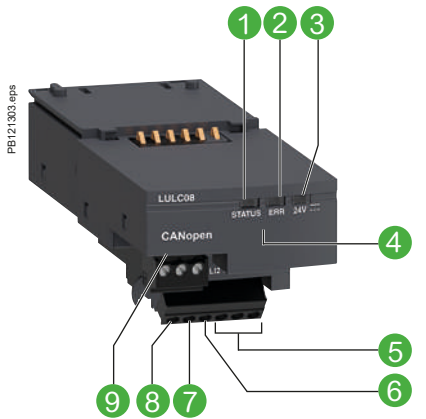
Tesys Control components

| Description | Mark | Max number of slaves | References |
|--|------|----------------------|------------|
| AS-Interface communication module | 1 | 31 | ASILUFC5 |
| | | 62 | ASILUFC51 |
| Pre-wired connector: coil - LUB powerbase | 2 | - | LU9BN11C |
| Pre-wired connector: coil - LU2B powerbase | 3 | - | LU9MRC |

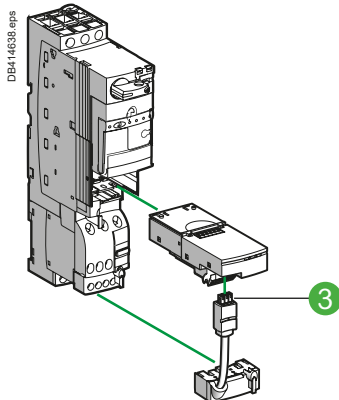
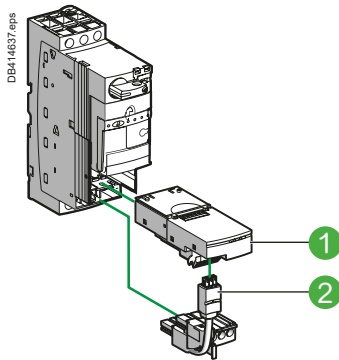
TeSys Control

Ultra motor starters - CANopen communication module

Product references



- 1 LED indicating module status
- 2 Fault signalling LED
- 3 LED indicating 24 V supply ON for outputs OA1, OA3 and LO1
- 4 SUB-D connector for bus link
- 5 24 V supply connection
- 6 Discrete input
- 7 Discrete input
- 8 Discrete output
- 9 Outputs for starter commands



The LULC08 communication module, combined with the power base and control unit is used to control Ultra starters-controllers via CANopen bus. The LULC08 communication module is slave type.

Module Specifications

I/O terminal block

- Powered by external 24 V DC (power supply not included):
 - 2 x configurable inputs for binary sensors
 - 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

- For Ultra 24 V DC coil (common, direction 1, direction 2).
- For CANopen bus.

Signaling

- Module Status - Error - 24 V, by LED.

Tesys Control components

| Description | Item | References |
|--|------|------------|
| CANopen communication module | 1 | LULC08 |
| Pre-wired connector: coil - LUB powerbase | 2 | LU9BN11L |
| Pre-wired connector: coil - LU2B powerbase | 3 | LU9MRL |

Compatibility of CANopen communication module with control units

| | |
|--------------------------------------|---|
| LUCA ●●BL / B ●●BL / C ●●BL / D ●●BL | All versions marketed after 2T0481 ⁽¹⁾ |
| LUCM●●BL | All versions ≥ V3.2 |
| LUCMT1BL | All versions ≥ V3.2 |

(1) This "date code" is made up as follows:
 2T or 2C: factory code.
 04, 05, 06 and so on: year of manufacture.
 08: week.
 1: 1st day of the week.

How to get information on the design of a CANopen architecture and the choice of network accessories

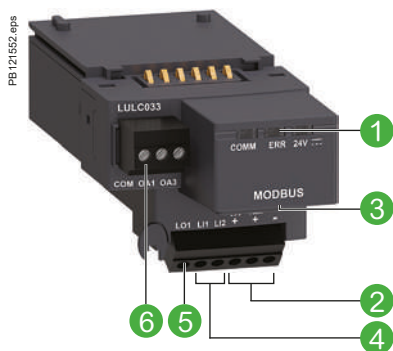
Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

TeSys Control

Ultra motor starters - Modbus communication module

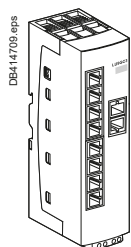
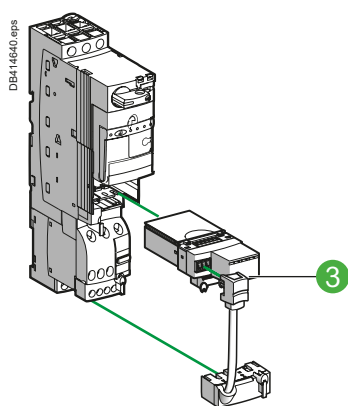
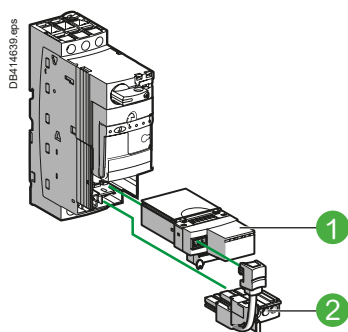
Product references

LULC033



- 1 Module status signalling LED
- 2 24 V supply connection
- 3 RJ45 connector for RS485 Modbus link
- 4 2 discrete inputs
- 5 1 discrete output
- 6 Outputs for starter commands

Ultra motor starters



LULC033 communication module, combined with the power base and control unit is used to control Ultra starters-controllers via Modbus.

Module Specifications

I/O terminal block

- Powered by external 24 V DC (power supply not included):
- 2 x configurable inputs for binary sensors (on LULC033 only)
- 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

- For Ultra 24 V DC coil (common, direction 1, direction 2).
- RJ45, For Modbus line.

Signaling

- Module Status - Error - 24 V, by LED.

Tesys Control components

| Description | Item | Bin. input | References |
|--|------|------------|------------|
| Modbus communication module | 1 | 2 | LULC033 |
| Pre-wired connector: coil - LUB powerbase | 2 | - | LU9BN11C |
| Pre-wired connector: coil - LU2B powerbase | 3 | - | LU9MRC |

Modbus hub

| Description | Length (m) | References |
|--|------------|--------------|
| Modbus communication distributor | - | LU9GC3 |
| Cables fitted with 2 x RJ45 connectors | 0.3 | VW3A8306R03 |
| | 1 | VW3A8306R10 |
| | 3 | VW3A8306R30 |
| Tees derivations | 0.3 | VW3A8306TF03 |
| | 1 | VW3A8306TF10 |

| Description | References |
|------------------------|------------|
| RS 485 line terminator | VW3A8306R |

Compatibility of Modbus communication modules

| Communication modules (software version) | | LUCLC033 from V2.1 | LUCLC033 from V2.2 |
|--|----------------|--------------------|--------------------|
| Power base | LUB●● / LU2B●2 | ■ | ■ |
| | LUTM●●BL | ■ | ■ |
| Control unit | LUCA●●BL | | ■ |
| | LUCB●●BL | | ■ |
| | LUC●●BL | | ■ |
| | LUCD●●BL | | ■ |
| | LUCM●●BL | | ■ ⁽¹⁾ |
| | LUCBT●●BL | ■ | |
| | LUCDT●●BL | ■ | |
| LUCMT●●BL | ■ | | |

(1) Except LUCM●●BL V1.04 and V1.06.

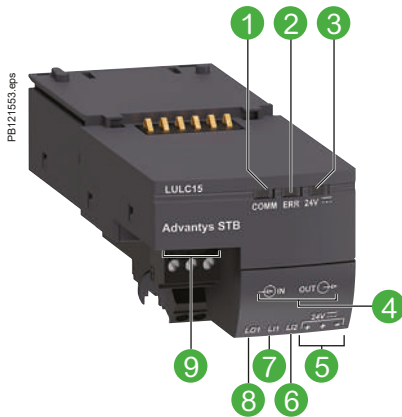
How to get information on the design of a Modbus architecture and the choice of network accessories

Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

TeSys Control

Ultra motor starters - Advantys STB communication module

Product references



- 1 Two-colour LED indicating module status
- 2 Fault signalling LED
- 3 LED indicating that 24 V supply is ON
- 4 Bus connectors
- 5 24 V supply connection
- 6 Discrete input
- 7 Discrete input
- 8 Discrete output
- 9 Outputs for starter commands

Communication module LULC15 allows direct connection of Ultra starter-controllers and controllers on an Advantys STB island, between two segments or at the end of a segment. The starter-controller will then be able to make use of the services provided by Advantys STB: self-addressing, autobaud, fallback positions.

Module Specifications

I/O terminal block

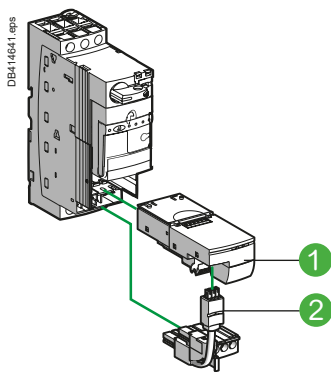
- Powered by external 24 V DC (power supply not included):
 - 2 x configurable inputs for binary sensors (on LULC033 only)
 - 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

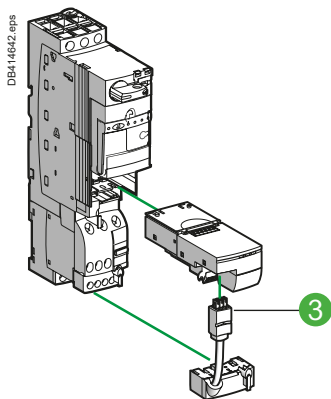
- For Ultra 24 V DC coil (common, direction 1, direction 2).
- For Advantys STB bus.

Signaling

- Com - Error - 24 V, by LED.



LUB + LULC15 + LU9BN11L



LU2B + LULC15 + LU9MRL

Tesys Control components

| Description | Item | References |
|--|------|------------|
| Advantys STB communication module | 1 | LULC15 |
| Pre-wired connector: coil - LUB powerbase | 2 | LU9BN11L |
| Pre-wired connector: coil - LU2B powerbase | 3 | LU9MRL |

Cables

| Description | Length (m) | References |
|---|------------|------------|
| Cables fitted with connectors, one straight and one elbowed | 0.3 | LU9RCD03 |
| | 1 | LU9RCD10 |
| | 5 | LU9RCD50 |
| Cables fitted with two straight connectors | 0.3 | LU9RDD03 |
| | 3 | LU9RDD30 |

Compatibility of Advantys STB communication module with control units

| | |
|----------------------------------|---|
| LUCA●●BL / B●●BL / C●●BL / D●●BL | All versions marketed after 2T0481 ⁽¹⁾ |
| LUCM●●BL | All versions ≥ V3.2 |
| LUCMT1BL | All versions ≥ V3.2 |

(1) This "date code" is made up as follows:
 2T or 2C: factory code.
 04, 05, 06 and so on: year of manufacture.
 08: week.
 1: 1st day of the week.

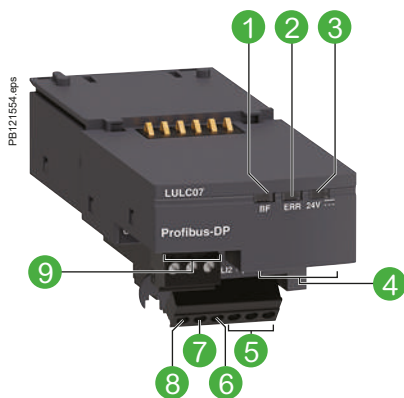
How to get information on the design of a Advantys STB architecture and the choice of network accessories

Consulter la librairie des documents téléchargeables sur le site schneider-electric.com en faisant une recherche sur le nom du protocole de transmission.

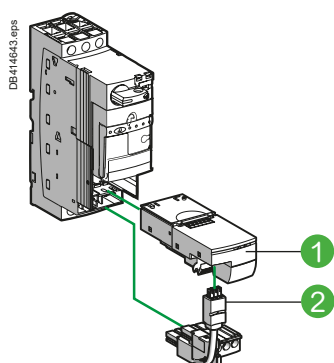
TeSys Control

Ultra motor starters - Profibus DP communication module

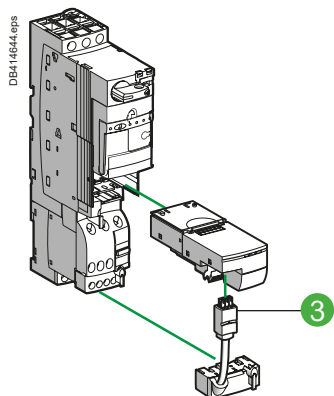
Product references



- 1 Two-colour LED indicating module status
- 2 Fault signalling LED
- 3 LED indicating 24 V supply ON for outputs OA1, OA3 and LO1
- 4 SUB-D connector for bus link
- 5 24 V supply connection
- 6 Discrete input
- 7 Discrete input
- 8 Discrete output
- 9 Outputs for starter-controller commands (non-reversing and reversing)



LUB + LUC...BL + LULC07 + LU9BN11L



LU2B + LUC...BL + LULC07 + LU9MRL

When used in conjunction with the power base and control unit, communication module LULC07 allows Ultra starter-controllers to be controlled via Profibus DP (Deported Periphery) bus.
Communication module LULC07 is of the slave type.

Module Specifications

I/O terminal block

- Powered by external 24 V DC (power supply not included):
 - 2 x configurable inputs for binary sensors
 - 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

- For Ultra 24 V DC coil (common, direction 1, direction 2).
- For Profibus DP bus.

Signaling

- Com - Error - 24 V, by LED.

Tesys Control components

| Description | Item | References |
|--|------|------------|
| Profibus DP communication module | 1 | LULC07 |
| Pre-wired connector: coil - LUB powerbase | 2 | LU9BN11L |
| Pre-wired connector: coil - LU2B powerbase | 3 | LU9MRL |

Components for connection to the bus and to the installation

The 24 V DC -Aux supply to Profibus DP modules LULC07 must pass through power supply module LU9GC7.

LULC07 modules must be connected to the LU9GC7 splitter box in order to be powered.

The number of Ultra starter-controllers that can be powered by an LU9GC7 module is limited by the maximum current (1.5 A) which it can deliver.

The 24 V supply for the inputs/outputs must be provided separately..

| Description | Length (m) | References |
|---------------------------------|------------|-------------|
| Profibus DP power supply module | - | LU9GC7 |
| Profibus DP connector | - | LU9AD7 |
| Profibus DP cables 2-wire | 100 | TSXPBSCA100 |
| | 400 | TSXPBSCA400 |
| Profibus DP cables 4-wire | 10 | LU9RPB010 |
| | 100 | LU9RPB100 |
| | 400 | LU9RPB400 |

How to get information on the design of a Profibus DP architecture and the choice of network accessories

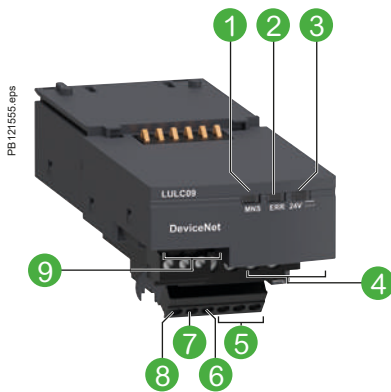
Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.



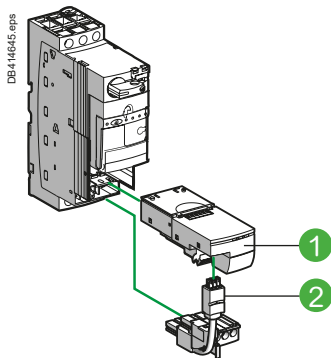
TeSys Control

Ultra motor starters - DeviceNet communication module

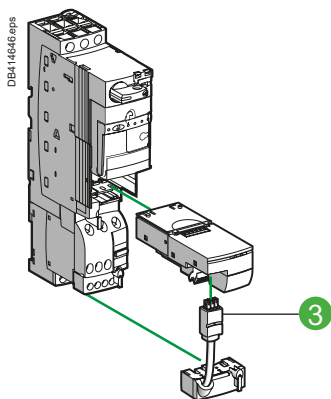
Product references



- 1 LED indicating module status
- 2 Fault signalling LED
- 3 LED indicating $\overline{\text{24 V}}$ supply ON for outputs OA1, OA3 and LO1 and 24 V bus
- 4 DeviceNet connector for bus link
- 5 $\overline{\text{24 V}}$ supply connection
- 6 Discrete input
- 7 Discrete input
- 8 Discrete output
- 9 Outputs for starter-controller commands (non-reversing and reversing)



LUB + LUC●●●BL + LULC07 + LU9BN11L



LU2B + LUC●●●BL + LULC07 + LU9MRL

When used in conjunction with the power base and control unit, communication module LULC09 allows Ultra starter-controllers to be controlled via DeviceNet bus. Communication module LULC09 is of the slave type.

Module Specifications

I/O terminal block

- Powered by external 24 V DC (power supply not included):
- 2 x configurable inputs for binary sensors
- 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

- For Ultra 24 V DC coil (common, direction 1, direction 2).
- For DeviceNet bus.

Signaling

- Com - Error - 24 V , by LED.

Tesys Control components

| Description | Item | References |
|--|------|------------|
| DeviceNet communication module | 1 | LULC09 |
| Pre-wired connector: coil - LUB powerbase | 2 | LU9BN11L |
| Pre-wired connector: coil - LU2B powerbase | 3 | LU9MRL |

How to get information on the design of a DeviceNet architecture and the choice of network accessories

Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

TeSys Control

Ultra motor starters - LUF communication gateways

Product references

PB 121517 eps



LUF9

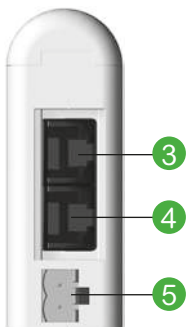
Ultra motor starters



DF526109-17-M eps



561512 eps



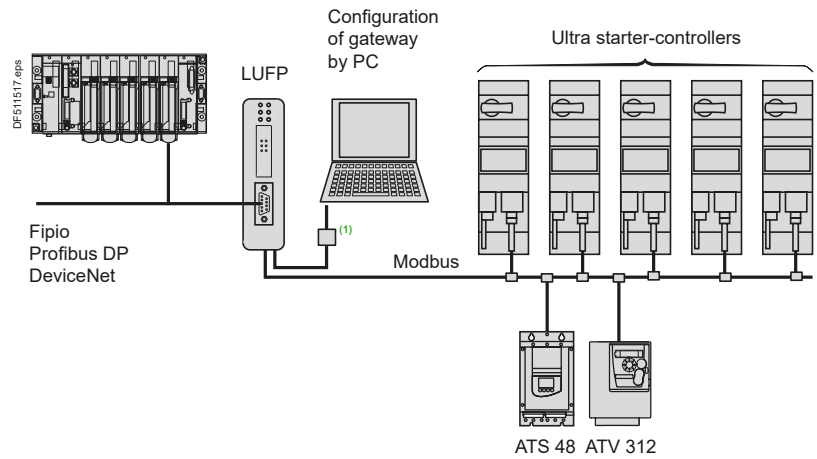
Introduction

LUF communication gateways allow connection between the Modbus serial link and Fipio, Profibus DP or DeviceNet field buses.

After configuration, these gateways manage information which can be accessed by the Modbus serial link and make this information available for read/write functions (command, monitoring, configuration and adjustment) on the field buses.

An LUF communication gateway consists of a box which can be clipped onto a 35 mm omega rail, allowing connection of up to 8 Slaves connected on the Modbus serial link.

Example of architecture



Communication gateway LUF

| Description | Reference |
|------------------------------|-----------|
| Fipio / Modbus gateway | LUF9 |
| Profibus DP / Modbus gateway | LUF7 |
| DeviceNet / Modbus gateway | LUF9 |

Description

Front panel of the product

- ① LED indicating :
 - communication status of the Modbus serial links,
 - gateway status,
 - communication status of the Fipio, Profibus DP or DeviceNet bus.
- ② Connectors for connection to Fipio, Profibus DP or DeviceNet buses.

Underside of product

- ③ RJ45 connector for connection of the Modbus serial link
- ④ RJ45 connector for link to a PC
- ⑤ 24 V power supply

Software set-up

For the Fipio bus, software set-up of the gateway is performed using either PL7 Micro/Junior/Pro software or ABC Configurator software.

For the Profibus DP and DeviceNet buses, software set-up is performed using ABC Configurator.

This software is included in the Ultra user's manual.

(1) Connection kit for PowerSuite software workshop.

Schemes:
page A4/70

A4/30

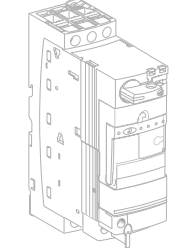
Life Is On

Schneider
Electric

TeSys Control

Ultra motor starters - Current limiter blocks - Accessories

Product references



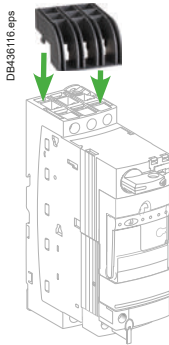
LUALB1



LUALF1



LA9LB920



LU9SP0



LU9ET1S

Short-circuit current limiter block

To be connected in series and upstream of a Ultra starter-controller. It increases its ability to withstand the short circuit current from 50 kA to 100 or 130 kA under 400 V.

Principle: under the action of a short-circuit, the opening of two contacts of each phase of the limiter creates a resistive arc. The current then decreases to a value tolerable by a Ultra power base.

Limiter blocks and accessories

| Description | Breaking capacity Iq (kA) | | Ie (A) | Ith (A) | Mounting | Unit reference |
|--|---------------------------|-------|--------|---------|---------------------------------------|-------------------------|
| | ≤ 440 V | 690 V | | | | |
| Limiter-disconnector (1 x LUALF1 cartridge supplied) | 130 | 70 | - | 32 | Direct on power base up to 15 kW/32 A | LUALB1 ⁽¹⁾ |
| Limiter | 100 | 35 | 32 | 63 | Separate | LA9LB920 ⁽²⁾ |
| limiter cartridge for LUALB1 | 130 | 70 | - | - | Limiter-disconnector | LUALF1 |

⁽¹⁾ Must be connected to one power base only.

⁽²⁾ Can be connected to multiple Ultra power bases in parallel with limitation :

- Total Ith max 63 A
- Total nominal current (Ie) 32 A from motor with simultaneous start (LA9LB920 could not withstand higher inrush peak current)

Phase barrier

Ensures a complementary electrical insulation between phases.

690 V AC network: compulsory.

440 V AC network: compulsory when assembling a UL508 type E compliant motor starter (Self Protected Starter).

| Description | Use | Mounting | Reference |
|-----------------|--|------------------------------|-----------|
| Phase separator | LUB or LU2B 12 or 120 LUB or LU2B 32 or 320 LUALB1 | Live terminals L1, L2, L3 | LU9SP0 |

Clip-in labels

Can be clipped on any Ultra power base, on LU6MB0●● inverter block, and Linergy HK busbar system.

Marking accessory

| Description | Sold by lot of | Reference per unit |
|-------------------------|----------------|--------------------|
| Clip-in label 8 x 18 mm | 100 | LAD90 |

Safety-chain identification - Red label

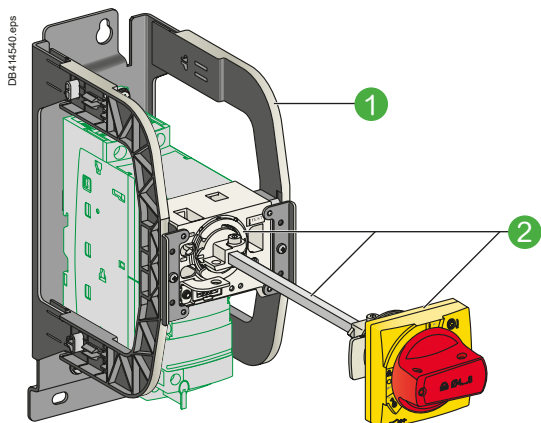
The red sticker is dedicated to Ultra LUCA, LUCB, LUCC, LUCL and LUCL control units.

| Description | Reference per unit |
|--|--------------------|
| Retrofit safety-chain identification sticker | LU9ET1S |

TeSys Control

Ultra motor starters - Rotary handles

Product references



LU9APN21 mounting kit

Extended rotary handle

Allows a circuit breaker or a Ultra starter-controller installed in back of an enclosure to be operated from the front panel.

The rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (OFF) or I (ON) position (depending on the type of rotary handle) by means of up to 3 padlocks with a shank diameter of 4 to 8 mm.

The extension shaft must be adjusted to the depth of the enclosure.

The IP54 rotary handle is fixed with a nut (Ø22) to make it easier to assemble.

Mounting kit

① Ultra power base bracket; its horseshoe shaped sides hold the rotary mechanism facing the original handle.

② Mechanism, shaft and handle; the shaft enters the handle attached to the door during closing.

Long shaft

■ to be cut to the required length. Equipped with a connection endpiece.

Shaft support plate for deep enclosure

■ Provides horizontal guiding of the shaft, when the door is open.

Spacer base (retrofit accessory)

■ Fixed on a side of the box, for heightening an GVAP●●● handle.

Handle

■ Delivered as a single unit, to be fitted on a side of the enclosure.

Note: references below are suitable for Ultra power bases after 2004.

"Laser Square" Tool

■ On the principle of an angle extended with a laser beam, the "Laser Square" facilitates tracing the piercing marks on the door or the sides of an enclosure.

"Safety" stickers

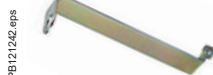
■ Marking: Electrical hazard, etc.

Ultra motor starters



GVAPA1 long shaft

PB100291 eps



GVAPK12 shaft support plate for deep enclosure

PB121242 eps



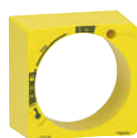
GVAPP1 spacer base (retrofit accessory)

PB100296 eps



GVAPR54 red handle, IP 54

PB100289 eps



GVAPYPHP external handle protection frame



GVAPL01 "Laser square" plotting tool

PB100297 eps

| Description | Tripping indication | Reference |
|--|---|------------|
| Mounting kit | Black handle, with error status, IP54 | ● LU9APN21 |
| | Red handle, with error status, IP54 | ● LU9APN22 |
| | Red handle, without error status, IP65 | - LU9APN24 |
| Separate elements | Long shaft = 315 mm | - GVAPA1 |
| | Shaft (≥ 300 mm) support plate for deep enclosure | - GVAPK12 |
| | Spacer base | - GVAPP1 |
| | Black handle, IP54 | ● GVAPB54 |
| | Red handle, IP54 | ● GVAPR54 |
| | Red handle, IP65 | ● GVAPR65 |
| Tool | "Laser square" plotting tool | GVAPL01 |
| "Safety" stickers | German (x10) | GVAPSDE |
| | Chinese (x10) | GVAPSCN |
| | Portuguese (x10) | GVAPSPT |
| | Italian (x10) | GVAPSIT |
| External handle protection frame for U | Yellow frame | GVAPYPHP |
| | Black frame | GVAPBPHP |

TeSys Control

Ultra motor starters - Handle mounting kit for MCC drawers

Product references



PB11807_104.eps

MCC drawers (Motor Control Center)

The drawers are composed of:

- a fixed part, in the frame of the panel,
- a fully withdrawable part, integrating the protection, control and automation components.

With a height of 3/4/6/8/12/18/24/36 modules, they allow the assembling of motor protection/control feeders:

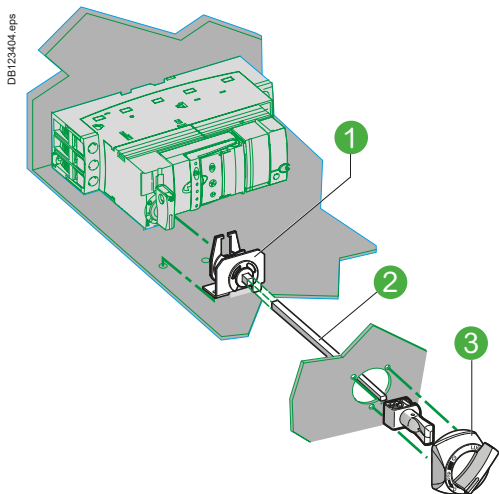
- Direct, one direction of rotation
- Direct, 2 directions of rotation
- Star-delta
- Dahlander (2 speeds)
- 2-speed, separate winding
- Motor drives from 0 to 500 kW
- Soft starters of 0 to 75 kW.

Ultra
motor
starters

Mounting kit and handle for MCC drawer

Together, this provides manual control of a Ultra starter-controller from the front face of the drawer.

As the clamping part on top of Ultra control pad is open, the kit may be used on Ultra power bases before 2005.



DB123404.eps

Mounting kit + small handle

| Description | Item | Reference |
|---|-----------|-----------|
| Handle with mounting kit for MCC drawer | 1 + 2 + 3 | LU9AP20 |

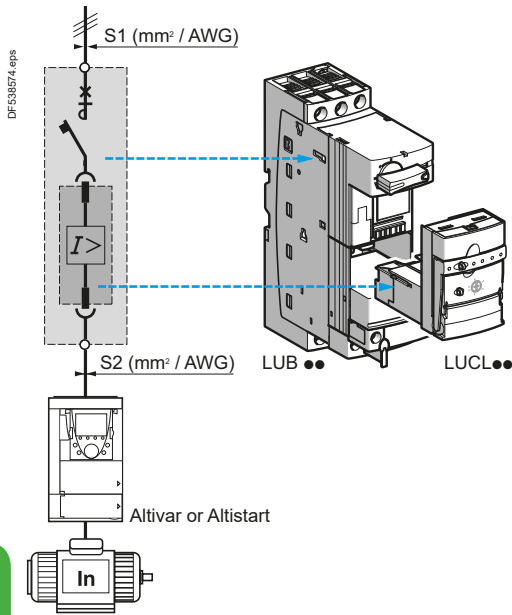


PB121243.eps

TeSys Control

Ultra motor starters - Use with soft starter / Variable Speed Drive - LUCL control module

Product references



Ultra motor starters



Introduction

When installed upstream of a variable speed controller or soft start unit, control unit LUCL●●, used in conjunction with an LUB12 or LUB32 power base, provides:

- isolation,
- short-circuit protection of the motor starter.
(variable speed controller-based or soft start unit-based motor starters).

Note: control unit LUCL, when used in conjunction with power base LUB12 or LUB32, conforms to standard IEC 60947-6-2.

Installation regulations

When the length of the cable between the Ultra starter and the variable speed controller is more than 1.5 m, the c.s.a. of the cable between the variable speed controller and the Ultra starter (S2) must be equal to the c.s.a. of the cable upstream of Ultra (S1).

Description of LUCL magnetic control unit

- ① Extraction and locking handle
- ② Sealing of locking handle
- ③ Dial for magnetic adjustment of motor In
- ④ Locking of settings by sealing the transparent cover

References

| Description | Line current of the variable speed controller or soft start unit | Reference ⁽¹⁾ |
|-----------------------|--|--------------------------|
| A | | |
| Magnetic control unit | 0.15...0.6 | LUCLX6●● |
| | 0.35...1.4 | LUCL1X●● |
| | 1.25...5 | LUCL05●● |
| | 3...12 | LUCL12●● |
| | 4.5...18 | LUCL18●● |
| | 8...32 | LUCL32●● |

⁽¹⁾ Standard control circuit voltage:

| Volts | 24 | 48...72 | 110...240 |
|--------|-----------------------|-------------------|-------------------|
| ☰ | BL ^{(2) (3)} | — | — |
| ~ | B | — | — |
| ☰ or ~ | — | ES ⁽⁴⁾ | FU ⁽⁵⁾ |

Please check the availability of your variant in the index page A4/42. The SEARCH function of your viewer can be used.

⁽²⁾ Voltage code to be used for a starter-controller with communication module.

⁽³⁾ d.c. voltage with maximum ripple of ±10 %.

⁽⁴⁾ ☰: 48...72 V, ~: 48 V.

⁽⁵⁾ ☰: 110...220 V, ~: 110...240 V.

| Control unit and associated power base selection | | | | | | |
|--|--------------------------------------|-------|-------|----------------------|------------------------|--------------|
| Functions provided | Maximum motor power ratings 50/60 Hz | | | Power base reference | Control unit reference | Line current |
| | < 400/415 V | 500 V | 690 V | | | |
| | KW | KW | KW | | | |
| ■ Short-circuit protection | 0.09 | – | – | LUB12 or LUB32 | LUCLX6●● | 0.15...0.6 |
| ■ Manual reset | 0.25 | – | – | LUB12 or LUB32 | LUCL1X●● | 0.35...1.4 |
| | 1.5 | 2.2 | 3 | LUB12 or LUB32 | LUCL05●● | 1.25...5 |
| | 5.5 | 5.5 | 9 | LUB12 or LUB32 | LUCL12●● | 3...12 |
| | 7.5 | 9 | 15 | LUB32 | LUCL18●● | 4.5...18 |
| | 15 | 15 | 18.5 | LUB32 | LUCL32●● | 8...32 |

| Operating characteristics | | | | | | |
|--|---|--|--------------|---------|--------------------------|---|
| Control units | Standard | | Advanced | | | Multifunction |
| | LUCA | LUCB | LUCB | LUCB | LUCD | LUCM |
| Thermal overload protection | Integrated function | | | | | |
| Over current protection | 14.2 x the setting current | | | | | 3 to 17 x the setting current |
| Short-circuit protection | 13 x I _r max (max current setting) | | | | | |
| Protection against phase loss | Integrated function | | | | | |
| Protection against phase imbalance | Integrated function | | | | | |
| Earth fault protection (equipment protection only) | Integrated function | | | | | |
| Tripping class | 10 | 10 | 10 | 20 | | 5...30 |
| Motor type | 3-phase | | Single-phase | 3-phase | Single-phase and 3-phase | |
| Thermal overload test function | Integrated function | | | | | |
| Overtorque | Integrated function | | | | | |
| No-load running | Integrated function | | | | | |
| Long starting time | Integrated function | | | | | |
| Reset method | Manual | Integrated function | | | | Parameters can be set |
| | Automatic or remote | Function provided with accessory | | | | Parameters can be set |
| | | With function module, or parameters can be set via the bus with a communication module (see page 24614/2). | | | | Parameters can be set via the bus with a communication module (see page 24614/2). |

Integrated function

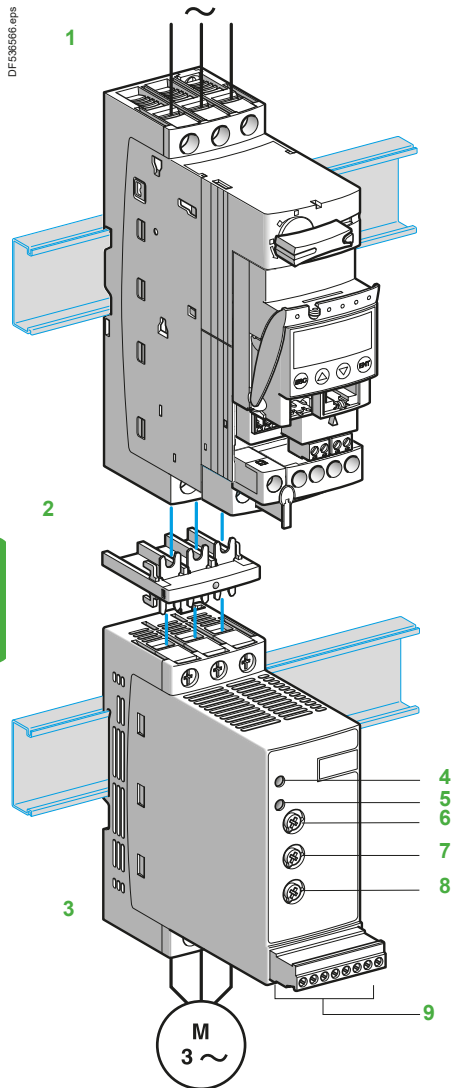
Function provided with accessory

| Compatibility | | | |
|--|------------|--|--|
| Compatibility of control unit LUCL●● with | References | Functions | |
| The controller | No | LUTM | Controller (without thermal overload protection) |
| Add-on contact blocks with fault signalling and auxiliary contacts | Yes | LUA1C11 LUA1C20 LUFN20 LUFN11 LUFN02 | Add-on contact blocks with fault signalling (1 N/O + 1 N/C) Add-on contact blocks with fault signalling (2 N/O) Auxiliary contacts (2 N/O) Auxiliary contacts (1 N/O + 1 N/C) Auxiliary contacts (2 N/C) |
| Communication modules | Yes | ASILUFC5 and ASILUFC51 L UFC00 LULC07 LULC08 LULC09 LULC15 LULC033 | AS-Interface communication modules Parallel wiring module Profibus DP communication module (1 output/2 inputs) CANopen communication module (1 output/2 inputs) DeviceNet communication module (1 output/2 inputs) Advantys STB communication module (1 output/2 inputs) Modbus communication module (1 output/2 inputs) |
| Function modules | No | LUFW10 LUFDH11 LUFDA01 LUFDA10 LUFV2 | Alarm function module Thermal overload signalling module with manual reset Thermal overload signalling module with automatic or remote reset (1 N/C) Thermal overload signalling module with automatic or remote reset (1 N/O) Motor load indication module |

TeSys Control

Ultra motor starters - with Altistart U01 soft starter

Introduction



Introduction

The Altistart U01 is a soft start/soft stop unit for asynchronous motors. It is designed primarily for combinations with Ultra controller-starters.

When combined with a Ultra 1 controller by means of a connector 2, the Altistart U01 3 is a power option which provides the "Soft start/soft stop" function. The result is a unique, innovative motor starter.

Using the Altistart U01 starter enhances the starting performance of asynchronous motors by allowing them to start gradually, smoothly and in a controlled manner. It prevents mechanical shocks, which lead to wear and tear, and limits the amount of maintenance work and production downtime.

The Altistart U01 limits the starting torque and current peaks on starting, on machines which do not require a high starting torque.

The Altistart U01 is designed for the following simple applications:

- Conveyors
- Conveyor belts
- Pumps
- Fans
- Compressors
- Automatic doors and gates
- Small cranes
- Belt-driven machines, etc.

The Altistart U01 is compact and easy to install. It complies with standards IEC/EN 60947-4-2, carries UL, CSA, C-Tick, CCC certifications and CE marking.

■ ATSU01N2●●LT soft start/soft stop units

- Control two phases of the motor power supply to limit the starting current and for deceleration
- Internal bypass relay
- Motor power ratings ranging from 0.75 kW to 15 kW
- Motor supply voltages ranging from 200 V to 480 V, 50/60 Hz.

An external power supply is required for controlling the starter.

Description

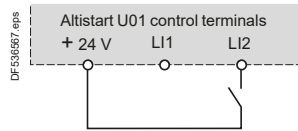
■ Altistart U01 soft start/soft stop units are equipped with:

- A potentiometer for setting the starting time 6
- A potentiometer for setting the deceleration time 8
- A potentiometer for adjusting the start voltage threshold according to the motor load 7
- 1 green LED 4 to indicate that the unit is switched on
- 1 yellow LED 5 to indicate that the motor is powered at nominal voltage, if it is connected to the starter
- A connector 9:
 - 2 logic inputs for Run/Stop commands
 - 1 logic input for the BOOST function
 - 1 logic output to indicate the end of starting
 - 1 relay output to indicate the starter has a power supply fault or the motor has reached a standstill at the end of the deceleration stage

ATSU01N2●●●LT soft start unit functions

■ 2-wire control

The run and stop commands are controlled by a single logic input. State 1 of logic input LI2 controls starting and state 0 controls stopping.



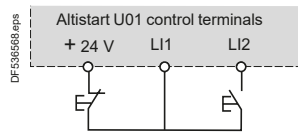
Wiring diagram for 2-wire control

■ 3-wire control

The run and stop commands are controlled by 2 different logic inputs.

Stopping is achieved when logic input LI1 opens (state 0).

The pulse on input LI2 is stored until input LI1 opens.



Wiring diagram for 3-wire control

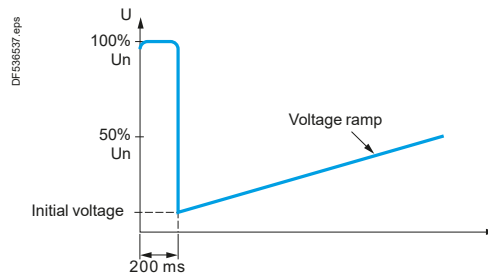
■ Starting time

Controlling the starting time means that the time of the voltage ramp applied to the motor can be adjusted to obtain a gradual starting time, dependent on the motor load.

■ Voltage boost function via logic input

Activating the BOOST logic input enables the function for supplying a starting overtorque capable of overcoming any mechanical friction.

When the input is at state 1, the function is active (input connected to the + 24 V) and the starter applies a fixed voltage to the motor for a limited time before starting.



Application of a voltage boost equal to 100% of the nominal motor voltage

■ End of starting

○ application function for logic output LO1

ATSU01N2●●●LT soft start/soft stop units are equipped with an open collector logic output LO, which indicates the end of starting when the motor has reached nominal speed.

TeSys Control

Altistart U01 soft starter

Product references

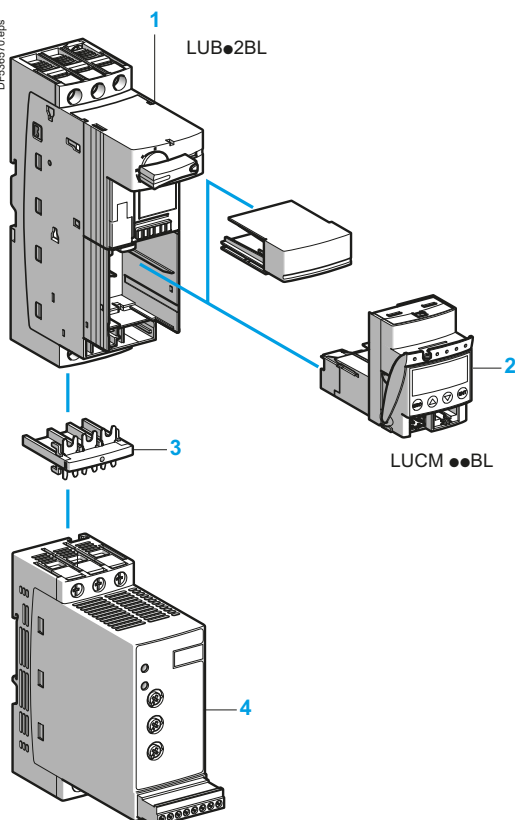
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ATSU01N222LT

Ultra motor starters

DF538570.eps



ATSU 01N2●●LT

Soft start/soft stop units for 0.75 to 15 kW motors (can be combined with the Ultra starter)

| Motor | | | | Starter | |
|---|-----|-------|-------|-----------------|--------------|
| Motor power ⁽¹⁾ | | | | Nominal current | Reference |
| 230 V | | 400 V | 460 V | A | |
| kW | HP | kW | HP | | |
| 3-phase supply voltage: 200...480 V 50/60 Hz | | | | | |
| 0.75 | 1 | 1.5 | 2 | 6 | ATSU01N206LT |
| 1.1 | 1.5 | 2.2 | 3 | | |
| 1.5 | 2 | – | 5 | 9 | ATSU01N209LT |
| – | – | 4 | – | | |
| 2.2 | 3 | 5.5 | 7.5 | 12 | ATSU01N212LT |
| 3 | – | – | – | | |
| 4 | 5 | 7.5 | 10 | 22 | ATSU01N222LT |
| 5.5 | 7.5 | 11 | 15 | | |
| 7.5 | 10 | 15 | 20 | 32 | ATSU01N232LT |

Accessories

| Description | Used for starter | Reference |
|--|------------------|-----------|
| Power connector between ATSU01N2●●LT and U | ATSU01N2●●LT | VW3G4104 |

Ultra starter and soft start unit combinations

Numerous possibilities for combinations and options are offered. Please consult the "Ultra Starters-open version" specialist catalogue.

| Motor power | Soft starter | | | U | |
|-------------|--------------|-------|-------|--------------|-----------------------------|
| | 230 V | 400 V | 460 V | Power base | Control unit ⁽²⁾ |
| Voltage | kW/HP | kW | HP | | |
| 0.75/1 | 1.5 | 2 | | ATSU01N206LT | LUB12 LUC●05BL |
| 1.1/1.5 | 2.2/3 | 3 | | ATSU01N206LT | LUB12 LUC●12BL |
| 1.5/2 | – | – | | ATSU01N209LT | LUB12 LUC●12BL |
| – | 4 | 5 | | ATSU01N209LT | LUB12 LUC●12BL |
| 2.2/3 | – | – | | ATSU01N212LT | LUB12 LUC●12BL |
| 3/– | 5.5 | 7.5 | | ATSU01N212LT | LUB32 LUC●18BL |
| 4/5 | 7.5 | 10 | | ATSU01N222LT | LUB32 LUC●18BL |
| 5.5/7.5 | 11 | 15 | | ATSU01N222LT | LUB32 LUC●32BL |
| 7.5/10 | 15 | 20 | | ATSU01N232LT | LUB32 LUC●32BL |

Example of a starter-motor combination with:

- 1 non-reversing power base for DOL starting (LUB●2BL)
- 2 control unit (LUC●●BL)
- 3 power connector (VW3G4104)
- 4 Altistart U01 soft start/soft stop unit (ATSU01N2●●LT)

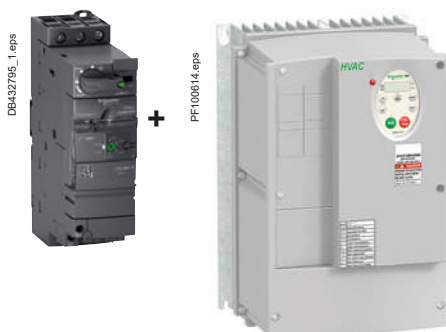
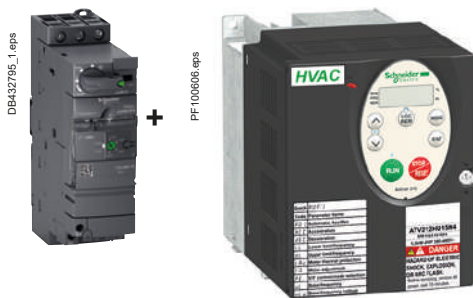
⁽¹⁾ Standard motor power ratings, HP power ratings indicated according to standard UL508.

⁽²⁾ Depending on the configuration of the chosen Ultra starter, replace the ● with A for standard, B for expandable, and M for multifunction.

TeSys Control

Ultra motor starters - Association with Soft starters / Variable speed controllers

Product references



Soft starter coordination

The standard defines tests at different levels of current; the purpose of these tests is to place the equipment in extreme conditions.

The standard defines 2 types of coordination, according to the condition of the components after testing: type 1 and type 2.

Type 1 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must not be able to resume operation without repair or the replacement of parts.

The product combinations given below provide type 1 coordination

Soft start-soft stop unit/ Ultra starter controller combination with magnetic protection

Ultra / Altistart 48: type 1 coordination

| Power 400 V (kW) | Ultra references (protection + power switching) | Soft starter reference | |
|---------------------|--|------------------------|----------|
| | | Class 10 | Class 20 |
| 5.5 | LUB32 + LUCL32 or LUCL18 | – | ATS48D17 |
| 7.5 | LUB32 + LUCL32 | ATS48D17 | ATS48D22 |
| 11 | LUB32 + LUCL32 | ATS48D22 | ATS48D32 |
| 15 | LUB32 + LUCL32 | ATS48D32 | ATS48D38 |

Variable speed controller/ Ultra starter controller combination with magnetic protection

Ultra / Altivar 212 UL Type 1/IP 20

| Power 400 V (kW) | Ultra references (protection + power switching) | Variable speed controller reference | |
|---------------------|--|-------------------------------------|--------------|
| | | | |
| 0.75 | LUB12 + LUCL05 | ATV212H075N4 | ATV212HU15N4 |
| 2.2 | LUB12 + LUCL12 | ATV212HU22N4 | |
| 3 | LUB12 + LUCL12 | ATV212HU30N4 | |
| 4 | LUB12 + LUCL12 | ATV212HU40N4 | |
| 5.5 | LUB32 + LUCL32 or LUCL18 | ATV212HU55N4 | |
| 7.5 | LUB32 + LUCL32 or LUCL18 | ATV212HU75N4 | |
| 11 | LUB32 + LUCL32 | ATV212HD11N4 | |
| 15 | LUB32 + LUCL32 | ATV212HD15N4 | |

Ultra / Altivar 212 IP 54

| Power 400 V (kW) | Ultra references (protection + power switching) | Variable speed controller reference | |
|---------------------|--|-------------------------------------|--|
| | | | |
| 0.75 | LUB12 + LUCL05 | ATV212W075N4 | |
| 1.5 | LUB12 + LUCL12 or LUCL05 | ATV212WU15N4 | |
| 2.2 | LUB12 + LUCL12 | ATV212WU22N4 | |
| 3 | LUB12 + LUCL12 | ATV212WU30N4 | |
| 4 | LUB12 + LUCL12 | ATV212WU40N4 | |
| 5.5 | LUB32 + LUCL32 or LUCL18 | ATV212WU55N4 | |
| 7.5 | LUB32 + LUCL32 or LUCL18 | ATV212WU75N4 | |
| 11 | LUB32 + LUCL32 | ATV212WD11N4 | |
| 15 | LUB32 + LUCL32 | ATV212WD15N4 | |

Ultra
motor
starters

TeSys Control

Ultra motor starters - Association with Soft starters / Variable speed controllers

Products references



Variable speed controller/Ultra starter controller combination with magnetic protection (continued)

Ultra / Altivar 320

| Power 400 V (kW) | Ultra references (protection + power switching) | Variable speed controller reference |
|------------------|---|-------------------------------------|
| 0.37 | LUB12 + LUCL05 | ATV320U04N4C |
| 0.55 | LUB12 + LUCL05 | ATV320U06N4C |
| 0.75 | LUB12 + LUCL05 | ATV320U07N4C |
| 1.1 | LUB12 + LUCL12 | ATV320U11N4C |
| 1.5 | LUB12 + LUCL12 | ATV320U15N4C |
| 2.2 | LUB12 + LUCL12 | ATV320U22N4C |
| 3 | LUB32 + LUCL18 | ATV320U30N4C |
| 4 | LUB32 + LUCL18 | ATV320U40N4C |
| 5.5 | LUB32 + LUCL32 | ATV320U55N4C |
| 7.5 | LUB32 + LUCL32 | ATV320U75N4C |

Ultra / Altivar 630

| Power 400V (kW) | Ultra references (protection + power switching) | Variable speed controller reference |
|-----------------|---|-------------------------------------|
| 0.75 | LUB12 + LUCL05 | ATV630U07N4 |
| 1.5 | LUB12 + LUCL12 | ATV630U15N4 |
| 2.2 | LUB12 + LUCL12 | ATV630U22N4 |
| 3 | LUB32 + LUCL18 | ATV630U30N4 |
| 4 | LUB32 + LUCL18 | ATV630U40N4 |
| 5.5 | LUB32 + LUCL32 | ATV630U55N4 |
| 7.5 | LUB32 + LUCL32 | ATV630U75N4 |

Ultra motor starters


TeSys Control

Ultra motor starters

Product references

| | | | |
|-----------|-----------|----------|----------|
| ASILUFC5 | LU9R30 | LUCB12FU | LUCD32FU |
| ASILUFC51 | LU9RCD03 | LUCB18B | LUCD38BL |
| GV1G10 | LU9RCD10 | LUCB18BL | LUCD38FU |
| GVAPA1 | LU9RCD50 | LUCB18ES | LUCDT1BL |
| GVAPA2 | LU9RDD03 | LUCB18FU | LUCDX6BL |
| GVAPB54S | LU9RDD30 | LUCB1XB | LUCDX6FU |
| GVAPK12 | LU9RFL15 | LUCB1XBL | LUCL05B |
| GVAPL01 | LU9RPB010 | LUCB1XES | LUCL05BL |
| GVAPP1 | LU9RPB100 | LUCB1XFU | LUCL05ES |
| GVAPR65S | LU9RPB400 | LUCB32B | LUCL05FU |
| LA9LB920 | LU9SP0 | LUCB32BL | LUCL12B |
| LU2B12B | LUA1C11 | LUCB32ES | LUCL12BL |
| LU2B12BL | LUA1C20 | LUCB32FU | LUCL12ES |
| LU2B12ES | LUA8E20 | LUCB38BL | LUCL12FU |
| LU2B12FU | LUALB1 | LUCB38FU | LUCL18B |
| LU2B32B | LUALF1 | LUCBT1BL | LUCL18BL |
| LU2B32BL | LUB12 | LUCBX6B | LUCL18ES |
| LU2B32ES | LUB120 | LUCBX6BL | LUCL18FU |
| LU2B32FU | LUB32 | LUCBX6FU | LUCL1XB |
| LU2B38BL | LUB320 | LUCC05B | LUCL1XBL |
| LU2B38FU | LUB32NR | LUCC05BL | LUCL1XFU |
| LU2BA0BL | LUB38 | LUCC05ES | LUCL32B |
| LU2BA0ES | LUB380 | LUCC05FU | LUCL32BL |
| LU2BB0BL | LUCA05B | LUCC12B | LUCL32FU |
| LU2MB0B | LUCA05BL | LUCC12BL | LUCL38BL |
| LU2MB0BL | LUCA05ES | LUCC12ES | LUCL38FU |
| LU2MB0ES | LUCA05FU | LUCC12FU | LUCLX6BL |
| LU2MB0FU | LUCA12B | LUCC18BL | LUCM05BL |
| LU6MB0B | LUCA12BL | LUCC18FU | LUCM12BL |
| LU6MB0BL | LUCA12ES | LUCC1XB | LUCM18BL |
| LU6MB0ES | LUCA12FU | LUCC1XBL | LUCM1XBL |
| LU6MB0FU | LUCA18B | LUCC1XES | LUCM32BL |
| LU9AD7 | LUCA18BL | LUCC1XFU | LUCMT1BL |
| LU9AP00 | LUCA18ES | LUCC32B | LUCMX6BL |
| LU9AP11 | LUCA18FU | LUCC32BL | LUCF00 |
| LU9AP20 | LUCA1XB | LUCC32FU | LUFDA01 |
| LU9APN21 | LUCA1XBL | LUCCX6B | LUFDA10 |
| LU9APN22 | LUCA1XES | LUCCX6BL | LUFDH11 |
| LU9APN24 | LUCA1XFU | LUCCX6FU | LUFN02 |
| LU9BN11 | LUCA32B | LUCD05B | LUFN11 |
| LU9BN11C | LUCA32BL | LUCD05BL | LUFN20 |
| LU9BN11L | LUCA32ES | LUCD05ES | LUFN1 |
| LU9C1 | LUCA32FU | LUCD05FU | LUFN7 |
| LU9C2 | LUCA38BL | LUCD12B | LUFN9 |
| LU9ET1S | LUCA38FU | LUCD12BL | LUFV2 |
| LU9G02 | LUCAX6B | LUCD12ES | LUFW10 |
| LU9G03 | LUCAX6BL | LUCD12FU | LULC031 |
| LU9GC3 | LUCAX6ES | LUCD18BL | LULC033 |
| LU9GC7 | LUCAX6FU | LUCD18FU | LULC07 |
| LU9M1 | LUCB05B | LUCD1XB | LULC08 |
| LU9MR1 | LUCB05BL | LUCD1XBL | LULC09 |
| LU9MR1C | LUCB05ES | LUCD1XES | LULC15 |
| LU9MRC | LUCB05FU | LUCD1XFU | |
| LU9MRL | LUCB12B | LUCD32B | |
| LU9R03 | LUCB12BL | LUCD32BL | |
| LU9R10 | LUCB12ES | LUCD32ES | |

Ultra
motor
starters

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

Contents

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| Curves | A4/56 to A4/61 |
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| Altistart U01 Soft starter | A4/77 to A4/83 |

TeSys Control

Ultra motor starters

Characteristics

Ultra motor starters

Ref.



| Environment | | | |
|--|--|--------|--|
| Product certifications | | | UL, CSA, CCC, GOST, ASEFA, UKCA. ABS, BV, DNV, GL, LROS. ATEX. |
| Conforming to standards | | | IEC/EN 60947-6-2, CSA-22.2 N° 60947-4-1-14 UL 60947-4-1: with phase barrier LU9 SP0 |
| Rated insulation voltage (Ui) | Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3 | V | 690 |
| | Conforming to UL508, CSA C22-2 n°14 | V | 600 |
| Rated impulse withstand voltage (Uimp) | Conforming to IEC/EN 60947-6-2 | kV | 6 |
| Degree of protection Conforming to IEC/EN 60947-1 (protection against direct finger contact) | Front panel outside connection zone | | IP 40 |
| | Front panel and wired terminals | | IP 20 |
| | Other faces | | IP 20 |
| Protective treatment | Conforming to IEC/EN 60068 | | "TH" |
| | Conforming to IEC/EN 60068-2-30 | Cycles | 12 |
| | Conforming to IEC/EN 60068-2-11 | h | 48 |
| Ambient air temperature around the device | Storage | °C | -40...+85 |
| | Operation | °C | Power bases and standard and advanced control units: -25... +70. (At temperatures above 60 °C and up to 70 °C, for starter-controller LUB32, LUB38, leave a minimum gap of 9 mm between products). Power bases and multifunction control units: -25...+60. (At temperatures above 45 °C, leave a minimum gap of 9 mm between products. At temperatures above 55 °C and up to 60 °C, leave a gap of 20 mm between products.) |
| Maximum operating altitude | | m | 2000 |
| Operating positions | In relation to normal vertical mounting plane | | |
| Flame resistance | Conforming to UL 94 | | V2 |
| | Conforming to IEC/EN 60695-2-12 | °C | 960 (parts supporting live components) |
| | | °C | 650 |
| Environmental restrictions | | | Cadmium and silicone-free, recyclable |
| Shock resistance 1/2 sine wave = 11 ms | Conforming to IEC/EN 60068-2-27 ⁽¹⁾ | | Power poles open: 10 gn |
| | | | Power poles closed: 15 gn |
| Vibration resistance 5...300 Hz | Conforming to IEC/EN 60068-2-6 ⁽¹⁾ | | Power poles open: 2 gn |
| | | | Power poles closed: 4 gn ⁽²⁾ |
| Resistance to electrostatic discharge | Conforming to IEC/EN 61000-4-2 | kV | In open air: 8 - Level 3 |
| | | kV | On contact: 8 - Level 4 |
| Immunity to radiated high-frequency disturbance | Conforming to IEC/EN 61000-4-3 | V/m | 10 - Level 3 |
| Immunity to fast transient currents | Conforming to IEC/EN 61000-4-4 | kV | All circuits except for serial link: 4 - Level 4 |
| | | kV | Serial link: 2 - Level 3 |
| Immunity to dissipated shock waves | Conforming to IEC/EN 60947-6-2 Uc ~ 24...240 V, Uc --- 48...220 V Uc = 24 V --- | kV | Common mode |
| | | | Serial mode |
| | | | 2 |
| Immunity to conducted high-frequency disturbance | Conforming to IEC/EN 61000-4-6 | V | 10 |
| Radiated emission and conducted | Conforming to CISPR 11 and EN 55011 | | Class A |

⁽¹⁾ Without modifying the contact states, in the most unfavourable direction.

⁽²⁾ 2 gn with Advantys STB or CANopen communication modules.

References:
pages A4/10 to A4/14

Curves:
pages A4/56 to A4/61

Dimensions:
pages A4/62 and A4/63

Schemes:
pages A4/64 to A4/76

A4/44

Life Is On

Schneider
Electric

Power circuit connection characteristics

Connection to Ø4 mm screw clamp terminals

| Power base, control unit or reverser block type | | | LUB12 + LUCA or LUCB or LUCC or LUCD | LUB32/LUB38 + LUCA or LUCB or LUCC or LUCD | LUB12 + LUCM | LUB32 + LUCM | LU2B LU2M LU6M |
|---|--------------|-----------------|---|--|--------------|--------------|----------------|
| Flexible cable without cable end | 1 conductor | mm ² | 2.5...10 | 2.5...10 | 2.5...10 | 2.5...10 | 2.5...10 |
| | 2 conductors | mm ² | 1.5...6 | 1.5...6 | 1.5...6 | 1.5...6 | 1.5...6 |
| Flexible cable with cable end | 1 conductor | mm ² | 1...6 | 1...6 | 1...6 | 1...6 | 1...6 |
| | 2 conductors | mm ² | 1...6 | 1...6 | 1...6 | 1...6 | 1...6 |
| Solid cable without cable end | 1 conductor | mm ² | 1...10 | 1...10 | 1...10 | 1...10 | 1...10 |
| | 2 conductors | mm ² | 1...6 | 1...6 | 1...6 | 1...6 | 1...6 |
| Screwdriver | | | Philips n° 2 or flat screwdriver: Ø6 mm | | | | |
| Tightening torque | | | N.m | 1.9...2.5 | 1.9...2.5 | 1.9...2.5 | 1.9...2.5 |

Control circuit connection characteristics

Connection to Ø3 mm screw clamp terminals

| | | | | | | | |
|----------------------------------|--------------|-----------------|---|------------|------------|------------|------------|
| Flexible cable without cable end | 1 conductor | mm ² | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 |
| | 2 conductors | mm ² | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 |
| Flexible cable with cable end | 1 conductor | mm ² | 0.34...1.5 | 0.34...1.5 | 0.34...1.5 | 0.34...1.5 | 0.34...1.5 |
| | 2 conductors | mm ² | 0.34...1.5 | 0.34...1.5 | 0.34...1.5 | 0.34...1.5 | 0.34...1.5 |
| Solid cable without cable end | 1 conductor | mm ² | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 |
| | 2 conductors | mm ² | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 | 0.75...1.5 |
| Screwdriver | | | Philips n° 1 or flat screwdriver: Ø5 mm | | | | |
| Tightening torque | | | N.m | 0.8...1.2 | 0.8...1.2 | 0.8...1.2 | 0.8...1.2 |

Control circuit characteristics

| | | | | | | | |
|----------------------------------|------------------------------|---------------------------------|--|------------|-----------|---------|----------------|
| Rated voltage of control circuit | ~ 50/60 Hz | V | 24...240 | 24...240 | – | – | – |
| | ≡ | V | 24...220 | 24...220 | 24 | 24 | – |
| Voltage limits | ≡ 24 V ⁽¹⁾ | V | 20...27 | 20...27 | 20...28 | 20...28 | – |
| | Operation | ~ 24 V | V | 20...26.5 | 20...26.5 | – | – |
| Drop-out | ~ or ≡ 48...72 V | V | ~ 38.5...72. ≡ 38.5...93 | – | – | – | |
| | ~ 110...240 V | V | ~ 88...264 | ~ 88...264 | – | – | |
| | ≡ 110...220 V | V | ≡ 88...242 | ≡ 88...242 | – | – | |
| | ≡ 24 V | V | 14.5 | 14.5 | 14.5 | 14.5 | |
| | ~ 24 V | V | 14.5 | 14.5 | – | – | |
| | ~ or ≡ 48...72 V | V | 29 | 29 | – | – | |
| Typical consumption | ≡ 24 V | mA | 130 | 220 | 150 | 200 | 120 |
| | I max while closing | ~ 24 V | mA | 140 | 220 | – | 2360 |
| | ~ or ≡ 48...72 V | mA | 280 | 280 | – | – | 2300 |
| | ~ 110...240 V, ≡ 110...220 V | mA | 280 | 280 | – | – | 1000 |
| I rms sealed | ≡ 24 V | mA | 60 | 80 | 70 | 75 | 120 |
| | ~ 24 V | mA | 70 | 90 | – | – | ⁽²⁾ |
| | ~ or ≡ 48...72 V | mA | 35 | 45 | – | – | ⁽²⁾ |
| | ~ 110...240 V, ≡ 110...220 V | mA | 35 | 25 | – | – | ⁽²⁾ |
| Heat dissipation | | W | 2 | 3 | 1.7 | 1.8 | – |
| Operating time | Closing | ms | 24 V: 70; 48 V: 60; ≥ 72 V: 50 | | 75 | 65 | – |
| | Opening | ms | 35 | 35 | 35 | 35 | – |
| Resistance to micro-breaks | | ms | 3 | 3 | 3 | 3 | – |
| Resistance to voltage dips | | IEC/EN 61000-4-11 | At least 70 % of U _c for 500 ms | | | | – |
| Mechanical durability | | In millions of operating cycles | 15 | 15 | 15 | 15 | – |
| Maximum operating rate | | In operating cycles per hour | 3600 | 3600 | 3600 | 3600 | – |

Main pole characteristics

| | | | | | | | |
|---|-------------------------------------|-----------------------------------|------------------------------|--------------------|--------------------|--------------------|----------------|
| Number of poles | | | 3 | 3 | 3 | 3 | – |
| Isolation conforming to IEC/EN 60947-1 | Possible | | Yes | Yes | Yes | Yes | – |
| | Padlocking | | 1 padlock with Ø6.9 mm shank | | | | – |
| Rated thermal current | | A | 12 | 32/38 | 12 | 32 | – |
| Rated operational current (U _e ≤ 440V) | To IEC/ Category AC-41 | | θ ≤ 70°C: 12 A | | θ ≤ 70°C: 32/38 A | θ ≤ 55°C: 12 A | θ ≤ 55°C: 32 A |
| | EN 60947-6-2 Category AC-43 | | θ ≤ 70°C: 12 A | | θ ≤ 70°C: 32/38 A | θ ≤ 55°C: 12 A | θ ≤ 55°C: 32 A |
| Rated operational voltage | | V | 690 ⁽³⁾ | 690 ⁽³⁾ | 690 ⁽³⁾ | 690 ⁽³⁾ | – |
| Frequency limits | | Of the operating current | Hz | 40...60 | 40...60 | 40...60 | 40...60 |
| Power dissipated in the power circuits | Operational current | A | 3 6 9 12 | 18 25 32 38 | | | – |
| | Power dissipated in all three poles | W | 0.1 0.3 0.6 1.1 | 2.4 4.6 7.5 10.6 | | | – |
| Rated breaking capacity on short-circuit | | V | 230 440 500 690 | | | | – |
| | | kA | 50 50 (25 for LUB38) 10 4 | | | | – |
| Total breaking time | | ms | 2 2 | 2 | | | – |
| Thermal limit | | With I _{sc} max on 440 V | kA ² s | 90 120 | 90 | 120 | – |

⁽¹⁾ Voltage with maximum ripple of ±10 %.

⁽²⁾ No consumption sealed.

⁽³⁾ For 690 V, use phase barrier LU9SP0.

References:
pages A4/10 to A4/14

Curves:
pages A4/56 to A4/61

Dimensions:
pages A4/62 and A4/63

Schemes:
pages A4/64 to A4/76

TeSys Control

Ultra motor starters

Characteristics

Specific characteristics of power bases LU2B and reverser blocks LU2M or LU6M

| | | | |
|--------------------------|-----------------------------|-----------|-----|
| Duration of inrush phase | ~ 50/60 Hz | ms | 25 |
| | --- | ms | 15 |
| Maximum operating time | Without change of direction | ms | 75 |
| | With change of direction | ms | 150 |

General characteristics of auxiliary contacts

| | | | |
|--|---|-----------|--|
| Conventional thermal current (Ith) | For ambient temperature $\theta < 70\text{ }^{\circ}\text{C}$ | A | 5 |
| Frequency of the operational current | | Hz | Up to 400 |
| Minimum switching capacity $\lambda = 10^{-8}$ | U min | V | 17 |
| | I min | mA | 5 |
| Short-circuit protection | Conforming to IEC/EN 60947-5-1 | A | gG fuse: 4 |
| Short-time rating | Permissible for | 1 s | A 30 |
| | | 500 ms | A 40 |
| | | 100 ms | A 50 |
| Insulation resistance | | mΩ | 10 |
| Non-overlap time | Guaranteed between N/C and N/O contacts | ms | 2 (on energisation and on de-energisation) |

Specific characteristics of auxiliary contacts built-into the power base

| | | | |
|--------------------------------|--------------------------------|----------|---|
| Linked contacts | Conforming to IEC/EN 60947-4-1 | | Each power base has 1 N/O contact and 1 N/C contact which are mechanically linked |
| Mirror contact | Conforming to IEC/EN 60947-1 | | The N/C contact fitted in each power base reliably represents the state of the power contacts (safety scheme) |
| Rated operational voltage (Ue) | | V | Up to ~ 690; --- 250 |
| Rated insulation voltage (Ui) | Conforming to IEC/EN 60947-5-1 | V | 690 |
| | Conforming to UL, CSA | V | 600 |

Specific characteristics of auxiliary contacts in modules LUFN, of auxiliary contacts LUA1 and of reverser blocks LU2M and LU6M

| | | | |
|--------------------------------|--------------------------------|----------|----------------------|
| Rated operational voltage (Ue) | | V | Up to ~ 250; --- 250 |
| Rated insulation voltage (Ui) | Conforming to IEC/EN 60947-5-1 | V | 250 |
| | Conforming to UL, CSA | V | 250 |

Rated operational power of contacts

Conforming to IEC/EN 60947-5-1

a.c. supply, categories AC-14 and AC-15

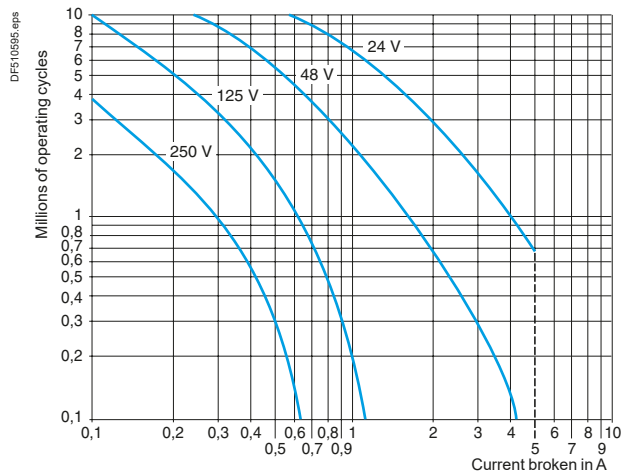
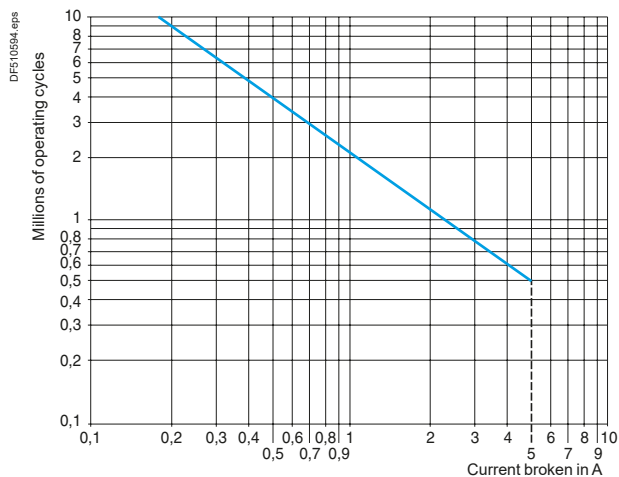
Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \varphi 0.7$) = 10 times the power broken ($\cos \varphi = 0.4$)

| | V | 24 | 48 | 115 | 230 | 400 | 440 | 690 |
|-----------------------------|----|----|-----|-----|-----|-----|------|------|
| 1 million operating cycles | VA | 60 | 120 | 280 | 560 | 960 | 1050 | 1440 |
| 3 million operating cycles | VA | 16 | 32 | 80 | 160 | 280 | 300 | 420 |
| 10 million operating cycles | VA | 4 | 8 | 20 | 40 | 70 | 80 | 100 |

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

| | V | 24 | 48 | 125 | 250 |
|---|---|-----|----|-----|-----|
| W | | 120 | 90 | 75 | 68 |
| W | | 70 | 50 | 38 | 33 |
| W | | 25 | 18 | 14 | 12 |



TeSys Control

Ultra motor starters - Control units

Characteristics

Characteristics of standard control units LUCA

| | | | |
|--------------------------|---|----|--|
| Protection | Motor type | | 3-phase |
| | Conforming to standard | | IEC/EN 60947-6-2, UL 60947-4-1, CSA C22-2 n°14 |
| Overload protection | Tripping class conforming to UL 508, IEC/EN 60947-6-2 | | 10 |
| | Frequency limits of the operational current | Hz | 40...60 |
| | Temperature compensation | °C | -25...+70 |
| | Protection against phase imbalance | | Yes |
| Short-circuit protection | Tripping threshold | | 13 x I _r max (max current setting) |
| | Tripping tolerance | | ±20 % |

Characteristics of advanced control units LUCB, LUCC and LUCD

| Control unit type | | LUCB | LUCC | LUCD |
|--------------------------|---|----------------------------------|----------------------------------|----------------------------------|
| Protection | Motor type | 3-phase | Single-phase | 3-phase |
| | Conforming to standard | IEC/EN 60947-6-2, CSA C22-2 n°14 | IEC/EN 60947-6-2, CSA C22-2 n°14 | IEC/EN 60947-6-2, CSA C22-2 n°14 |
| Overload protection | Tripping class conforming to UL 508, IEC/EN 60947-6-2 | 10 | 10 | 20 |
| | Frequency limits of the operational current | Hz | 40...60 | 40...60 |
| | Temperature compensation | °C | -25...+70 | -25...+55 |
| | Protection against phase imbalance | | Yes | – |
| Short-circuit protection | Tripping threshold | 13 x I _r max. | 13 x I _r max. | 13 x I _r max. |
| | Tripping tolerance | ±20 % | ±20 % | ±20 % |

Characteristics of multifunction control units LUCM

| | | | | |
|--|---|-------|---|--|
| Protection | Motor type | | Parameters can be set: single-phase or 3-phase | |
| | Conforming to standard | | IEC/EN 60947-6-2 | |
| Overload protection | Tripping class conforming to IEC/EN 60947-6-2 | | 5, 10, 15, 20, 25, 30 (selectable) | |
| | Frequency limits of the operational current | Hz | 50...60 | |
| | Temperature compensation | °C | -25...+55 | |
| | Protection against phase imbalance | | Yes | |
| Communication interface for terminal on enclosure door | Physical interface | | RS 485 multi-drop | |
| | Connections | | RJ45 on front panel | |
| | Protocol | | Modbus RTU | |
| | Maximum transmission speed | bit/s | 19 200 (self-configuration up to this value) | |
| | Maximum return time | ms | 200 | |
| Display | Type | | LCD, 2 lines of 12 characters | |
| | Language version | | Multilanguage (English, French, German, Italian, Spanish) | |
| | Precision | | ±5 % | |
| | Resolution | | 1 % of I _r | |
| Auxiliary supply | External type | V | ~ 24, with maximum ripple of ±10 %. | |
| | Heat dissipation | W | 0.8 | |

Configuration table for protection devices and alarms on multifunction control units LUCM

| | Tripping | Alarm | Adjustment of tripping threshold | | Adjustment of time before tripping | | Adjustment of alarm threshold | |
|--------------------|--------------------------|-----------------|----------------------------------|------------------------|------------------------------------|---------------|---------------------------------|------------------------|
| | Factory setting | Factory setting | Range | Default value | Range | Default value | Range | Default value |
| Overcurrent | Activated ⁽¹⁾ | – | 3...17 I _r | 14.2 | – | – | – | – |
| Overload | Activated ⁽¹⁾ | Activated | 0.5...32 A ⁽²⁾ | I _r min | Class: 5...30 | 5 | 10...100 % of the thermal state | 85 % |
| Earth fault | Activated | Activated | 0.2...5 I _r min | 0.3 I _r min | 0.1...1.2 s | 0.1 s | 0.2...5 I _r min | 0.3 I _r min |
| Phase imbalance | Activated | Activated | 10...30 % | 10 % | 0.2...20 s | 5 s | 10...30 % | 10 % |
| Torque limitation | Deactivated | Deactivated | 1...8 I _r | 2 I _r | 1...30 s | 5 s | 1...8 I _r | 2 I _r |
| No-load running | Deactivated | Deactivated | 0.3...1 I _r | 0.5 I _r | 1...200 s | 10 s | 0.3...1 I _r | 0.5 I _r |
| Long starting time | Deactivated | Deactivated | 1...8 I _r | I _r | 1...200 s | 10 s | 1...8 I _r | I _r |

Configuration of additional functions on multifunction control units LUCM

| | Factory setting | Setting range |
|-------------------|-----------------|---|
| Reset | Manual | Manual, automatic or remote |
| Time before reset | 120 s | 1...1000 s |
| Type of load | 3-phase motor | 3-phase motor, single-phase motor |
| | Self-cooled | Self-cooled, force cooled |
| Language | English | English, French, German, Italian, Spanish |
| Display | Average current | Average current, thermal state of motor, current in phase 1 / 2 / 3, earth leakage current, phase imbalance, cause of last 5 faults |

(1) This function cannot be deactivated.

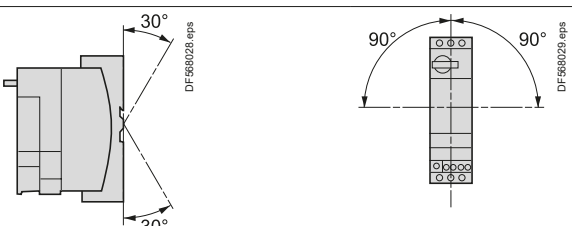
(2) The setting range depends on the rating of the control unit used.

TeSys Control

Ultra motor starters - Control units

Characteristics

Characteristics of magnetic control unit LUCL

| | | | |
|---|--|---------------|--|
| Protection | Motor type | | 3-phase |
| | Conforming to standard | | When used in conjunction with an LUB12, LUB32 or LUB38 power base, magnetic control unit LUCL conforms to standard IEC 60947-6-2. |
| Short-circuit protection | Tripping threshold | | 14.2 x I _n (max. setting current) |
| | Tripping tolerance | | ±20 % |
| Environment | | | |
| Product certifications | | | CE |
| Conforming to standards | | | When used in conjunction an LUB power base, control unit LUCL conforms to standard 60947-6-2. |
| Rated insulation voltage (U _i) | Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3 | V | 690 |
| Rated impulse withstand voltage (U _{imp}) | Conforming to IEC/EN 60947-6-2 | kV | 6 |
| Safety separation of circuits SELV | Conforming to IEC/EN 60947-1 appendix N | V | Between the control or auxiliary circuit and the main circuit: 400 Between the control and auxiliary circuits: 40 |
| Degree of protection (protection against direct finger contact) | Front panel outside connection zone | | IP 40 |
| | Front panel and wired terminals | | IP 20 |
| | Other faces | | IP 20 |
| Protective treatment | Conforming to IEC/EN 60068 | | "TH" |
| | Conforming to/EN 60068-2-30 | Cycles | 12 |
| | Conforming to IEC/EN 60068-2-11 | h | 48 |
| Ambient air temperature around the device | Storage | °C | - 40...+ 85 |
| | Operation | °C | Power bases and standard and advanced control units: - 25... + 70. (At temperatures above 60 °C and up to 70 °C, for I _e = 32 A, leave a minimum gap of 9 mm between products). Power bases and multifunction control units: - 25... + 60. (At temperatures above 45 °C, leave a minimum gap of 9 mm between products. At temperatures above 55 °C up to 60 °C, leave a gap of 20 mm between products.) |
| Maximum operating altitude | | m | 2000 |
| Operating positions | In relation to normal vertical mounting plane | |  |
| Flame resistance | Conforming to UL 94 | | V2 |
| | Conforming to IEC/EN 60695-2-12 | °C | 960 (parts supporting live components) °C 650 |
| Environmental restrictions | | | Cadmium and silicone-free, recyclable |
| Shock resistance 1/2 sine wave = 11 ms | Conforming to IEC/EN60068-2-27 ⁽¹⁾ | | Power poles open: 10 gn Power poles closed: 15 gn |
| | | | Power poles open: 2 gn Power poles closed: 4 gn ⁽²⁾ |
| Vibration resistance 5...300 Hz | Conforming to IEC/EN 60068-2-6 ⁽¹⁾ | | |
| Resistance to electrostatic discharge | Conforming to IEC/EN 61000-4-2 | kV | In open air: 8 - Level 3 |
| | | kV | On contact: 8 - Level 4 |
| Immunity to radiated high-frequency disturbance | Conforming to IEC/EN 61000-4-3 | V/m | 10 - Level 3 |
| Immunity to fast transient currents | Conforming to IEC/EN 61000-4-4 | kV | All circuits except for serial link: 4 - Level 4 |
| | | kV | Serial link: 2 - Level 3 |
| Immunity to dissipated shock waves | Conforming to IEC/EN 60947-6-2 U _c ~ 24...240 V, U _c ~ 48...220 V U _c = 24 V ~ | | Common mode |
| | | kV | 2 |
| | | | Serial mode 1 |
| Immunity to conducted high-frequency disturbance | Conforming to IEC/EN 61000-4-6 | V | 10 |

(1) Without modifying the contact states, in the most unfavourable direction.
(2) 2 gn with Advantys STB or CANopen communication modules.

TeSys Control

Ultra motor starters - Control units

Characteristics

| Power circuit connection characteristics of LUCL | | | | | |
|--|-------------------------------------|---|--|--------------------------------|------------------|
| Power base and control unit type | | LUB12 + LUCL | | LUB32 + LUCL | LUB38 + LUCL |
| Connection to Ø4 mm screw clamp terminals | | | | | |
| Flexible cable without cable end | 1 conductor | mm ² | 2.5...10 | 2.5...10 | |
| | 2 conductors | mm ² | 1.5...6 | 1.5...6 | |
| Flexible cable with cable end | 1 conductor | mm ² | 1...6 | 1...6 | |
| | 2 conductors | mm ² | 1...6 | 1...6 | |
| Flexible cable without cable end | 1 conductor | mm ² | 1...10 | 1...10 | |
| | 2 conductors | mm ² | 1...6 | 1...6 | |
| Screwdriver | | Philips n° 2 or flat screwdriver: Ø6 mm | | | |
| Tightening torque | | N.m | 1.9...2.5 | 1.9...2.5 | |
| Control circuit connection characteristics of LUCL | | | | | |
| Connection to Ø3 mm screw clamp terminals | | | | | |
| Flexible cable without cable end | 1 conductor | mm ² | 0.75...1.5 | 0.75...1.5 | |
| | 2 conductors | mm ² | 0.75...1.5 | 0.75...1.5 | |
| Flexible cable with cable end | 1 conductor | mm ² | 0.34...1.5 | 0.34...1.5 | |
| | 2 conductors | mm ² | 0.34...1.5 | 0.34...1.5 | |
| Flexible cable without cable end | 1 conductor | mm ² | 0.75...1.5 | 0.75...1.5 | |
| | 2 conductors | mm ² | 0.75...1.5 | 0.75...1.5 | |
| Screwdriver | | Philips n° 2 or flat screwdriver: Ø5 mm | | | |
| Tightening torque | | N.m | 0.8...1.2 | 0.8...1.2 | |
| Control circuit characteristics of LUCL | | | | | |
| Rated control circuit voltage | ~ 50/60 Hz | V | 24...240 | 24...240 | |
| | ≡ | V | 24...220 | 24...220 | |
| Voltage limits | ≡ 24 V ⁽¹⁾ | V | 20...27 | 20...27 | |
| | Operation | V | 20...26.5 | 20...26.5 | |
| Drop-out | ~ or ≡ 48...72 V | V | ~ 38.5...72, ≡ 38.5...93 | ~ 38.5...72, ≡ 38.5...93 | |
| | ~ 110...240 V | V | ~ 88...264 | ~ 88...264 | |
| | ≡ 110...240 V | V | ≡ 88...242 | ≡ 88...242 | |
| | ≡ 24 V | V | 14.5 | 14.5 | |
| Typical consumption | ~ 24 V | V | 14.5 | 14.5 | |
| | ~ or ≡ 48...72 V | V | 29 | 29 | |
| | ~ 110...240 V, ≡ 110...220 V | V | 55 | 55 | |
| | I max while closing | mA | 280 | 280 | |
| I rms sealed | ~ 24 V | mA | 280 | 280 | |
| | ~ 24 V | mA | 60 | 80 | |
| | ~ 24 V | mA | 70 | 90 | |
| | ~ or ≡ 48...72 V | mA | 35 | 45 | |
| Heat dissipation | ~ 110...240 V, ≡ 110...220 V | mA | 35 | 25 | |
| | | W | 2 | 3 | |
| Operating time | Closing | ms | 24 V: 70; 48 V: 60; ≥ 72 V: 50 | 24 V: 70; 48 V: 60; ≥ 72 V: 50 | |
| | Opening | ms | 35 | 35 | |
| Resistance to micro-breaks | | ms | 3 | 3 | |
| Resistance to voltage dips | IEC/EN 61000-4-11 | | At least 70 % of U _c for 500 ms | | |
| Mechanical durability | In millions of operating cycles | | 15 | 15 | |
| Maximum operating rate | In operating cycles per hour | | 3600 | 3600 | |
| Main pole characteristics of LUCL | | | | | |
| Number of poles | | | 3 | 3 | |
| Isolation conforming to IEC/EN 60947-1 | Possible | | Yes | Yes | |
| | Padlocking | | 1 padlock with Ø6.9 mm shank | 1 padlock with Ø6.9 mm shank | |
| Rated thermal current | | A | 12 | 32 | (38 A for LUB38) |
| Rated operational current (U _e ≤ 440 V) | Conforming to IEC/EN 60947-6-2 | Category AC-41 | θ ≤ 70 °C: 12 A | θ ≤ 70 °C: 32 A | (38 A for LUB38) |
| | | Category AC-43 | θ ≤ 70 °C: 12 A | θ ≤ 70 °C: 32 A | 38 |
| Rated operational voltage | | V | 690 ⁽³⁾ | 690 ⁽³⁾ | 690 |
| Frequency limits | | Of the operating current | Hz | 40...60 | 40...60 |
| Power dissipated in the power circuits | Operational current | A | 3 6 9 12 18 25 32 38 | | |
| | Power dissipated in all three poles | W | 0.1 0.3 0.6 1.1 2.4 4.6 7.5 10.5 | | |
| Rated breaking capacity on short-circuit | | V | 230 440 500 690 | | |
| | | kA | 50 50 10 4 | | |
| Total breaking time | | ms | 2 2 2 | | |
| Thermal limit | | With I _{sc} max on 440 V | kA ² s | 90 | 120 |

⁽¹⁾ d.c. voltage with maximum ripple of ± 10 %.

⁽²⁾ No consumption sealed.

⁽³⁾ For 690 V, use phase barrier LU9SP0.

Characteristics of limiter-disconnector LUALB1

| | | |
|--|--------------|--|
| Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1 | V | 690 |
| Conventional thermal current (Ith) conforming to standard IEC/EN 60947-1 | A | 32 |
| Operating threshold I rms | kA | 50 |
| Breaking capacity | V | 440 690 |
| | kA | 130 70 |
| Mounting | | Directly on the upstream terminals of the starter-controller |
| Cabling | | |
| Solid cable | 1 conductor | mm² 1.5...10 |
| | 2 conductors | mm² 1.5...6 |
| Flexible cable without cable end | 1 conductor | mm² 1...10 |
| | 2 conductors | mm² 1...6 |
| Flexible cable with cable end | 1 conductor | mm² 1...6 |
| | 2 conductors | mm² 1...6 |
| Screwdriver | | Phillips n°2 or flat screwdriver Ø6 mm |
| Tightening torque | N.m | 1.9...2.5 |

Characteristics of current limiter LA9LB920

| | | |
|--|--------------|--|
| Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1 | V | 690 |
| Conventional thermal current (Ith) conforming to standard IEC/EN 60947-1 | A | 63 |
| Operating threshold I rms | A | 1000 |
| Breaking capacity | V | 440 690 |
| | kA | 100 35 |
| Mounting | | Separate |
| Cabling | | |
| Solid cable | 1 conductor | mm² 1.5...25 |
| | 2 conductors | mm² 1.5...10 |
| Flexible cable without cable end | 1 conductor | mm² 1.5...25 |
| | 2 conductors | mm² 2.5...10 |
| Flexible cable with cable end | 1 conductor | mm² 1.5...16 |
| | 2 conductors | mm² 1.5...4 |
| Screwdriver | | Phillips n°2 or flat screwdriver Ø6 mm |
| Tightening torque | N.m | 2.2 |

Characteristics of thermal overload alarm function modules LUFW10

| | | |
|---|--|---|
| Activation threshold | | Fixed at 88 % of the thermal tripping state |
| Hysteresis between activation and switching off | | 5 % |
| Display | | By LED on front panel |
| Supply | | Powered by the control unit |
| Discrete output characteristics | Type | N/O contact |
| | AC-15 | 230 V max; 400 VA 100 000 operating cycles |
| | DC-13 | 24 V; 50 W 100 000 operating cycles |
| Conventional thermal current (Ith) | For ambient temperature $\theta < 70$ °C | A 2 |
| Short-circuit protection | Conforming to IEC/EN 60947-5-1 | A gG fuse: 2 |

Characteristics of thermal overload fault signalling and reset modules

| Module type | | LUFDH11 | LUFDA01 | LUFDA10 |
|------------------------------------|--|--|---------|---------|
| Fault signalling | | By LED on front panel | | |
| External power supply | V | ~/~ 24... 240 | | |
| Module consumption | mA | 7 at ~ 24 1.1 at ~ 240 | | |
| Discrete outputs | Type | 1 N/C+ 1 N/O | 1 N/C | 1 N/O |
| | AC-15 | 230 V max; 400 VA 100 000 operating cycles | | |
| | DC-13 | 24 V; 50 W 100 000 operating cycles | | |
| Conventional thermal current (Ith) | For ambient temperature $\theta < 70$ °C | A 2 | | |
| Short-circuit protection | Conforming to IEC/EN 60947-5-1 | A gG fuse: 2 | | |
| Reset input | Conductor c.s.a. | mm² 0.2 min | | |
| | Length | m 500 (R = 50 Ω , L = 52.8 mH, Cp = 93 pF) | | |



Characteristics of motor load indication function module LUFV2

| | | | |
|--|------------|----|--|
| Analogue output | | | 4 - 20 mA |
| Signal delivered | | | Value of I average/I _r ratio within the range of 0 to 2 for LUCB and LUCD Value of I average/I _r ratio within the range of 0 to 3 for LUC C |
| Load impedance | Minimum | kΩ | – |
| | Maximum | Ω | 500 |
| | Typical | Ω | 100 |
| Signal characteristics with advanced control unit | Precision | | ±6 % |
| Signal characteristics with multifunction control unit | Precision | | ±10 % |
| | Resolution | | 1 % of I _r |
| Supply | | | External ~ 24 V |

Characteristics of AS-Interface communication modules ASILUFC5 and ASILUFC51

| Module type | | ASILUF C5 | ASILUF C51 |
|---|--------------------------------|---|----------------------------|
| Product certification | | AS-Interface V2.1 n° 52901 | AS-Interface V2.1 n° 52303 |
| AS-Interface profile | | 7.D.F.0 | 7.A.7.E |
| Ambient air temperature | | °C Operation -25...+70 | |
| Cycle time | | 5 ms | 10 |
| Addressing | | 31 slaves | 62 slaves |
| AS-Interface supply | | V 29.5...31.5 | |
| Current consumption | On the AS-Interface bus | mA | Normal operation: 25 |
| | | mA | Fault condition: 30 |
| | On 24 V supply for the outputs | mA | 200 |
| Auxiliary supply | | V ~ 24 ±30 % | |
| Number of outputs | | 2 dedicated to starter-controller coil operation | |
| Switching capacity of the solid state outputs | | 0.5 A/24 V (outputs protected against short-circuits) | |
| Indication/diagnostics | | By 2 LEDs on front panel | |

Characteristics of Modbus communication module LULC033

| | | | |
|----------------------------|-------------------|-------|--|
| Physical interface | | | RS 485 multi-drop |
| Connections | | | RJ45 on front panel |
| Protocol | | | Modbus RTU |
| Maximum transmission speed | | bit/s | 19 200 (self-configuration up to this value) |
| Maximum return time | | ms | 30 |
| Addressing | | | By switches: from 0...31 |
| Ambient air temperature | | °C | Operation -25...+55 |
| Discrete inputs | Number | | 2 (to be assigned according to the configuration) |
| | Supply | V | ~ 24 |
| | Input current | mA | 7 |
| Nominal input values | Voltage | V | ~ 24 (positive logic) |
| | Current | mA | 7 |
| Response time | Change to state 1 | ms | 10 (±30 %) |
| | Change to state 0 | ms | 10 (±30 %) |
| Input type | | | Resistive |
| Solid state outputs | Number | | 3, of which 2 dedicated to starter-controller coil operation |
| | Supply | V | ~ 24 |
| | Max. current | mA | 500 |
| Protection | gl fuse | A | 1 |
| Switching capacity | | | 0.5 A/24 V |
| Indication/diagnostics | | | By 3 LEDs on front panel |

TeSys Control

Ultra motor starters - Communication modules

Characteristics

| Characteristics of CANopen, Profibus DP and DeviceNet communication modules | | | | | | |
|---|--------------------------|-------------------|--|--|---|--|
| Communication module | | | Profibus DP LULC07 | CANopen LULC08 | DeviceNet LULC09 | |
| Services | Conformity class | | NA | S 20 (Schneider Electric) | NA | |
| | Standard | | Profibus DP | CIADS-301 V4.02 DR 303-2 | IEC 62026-1, overvoltage category III, degree of pollution: 3 | |
| | Profile | | LVSG V1.0 MS (Motor Starter) and MMS (Motor Management Starter) | – | ODVA (Open DeviceNet Vendor Association) MS (Motor Starter) | |
| | Protocol | | Profibus DP | CAN 2.0A (2B passive) | CAN 2.0A (2B passive) | |
| Structure | Address | | 1...125 | 0...127 (by switches) | 0...63 | |
| | Physical interface | | 9-way SUB-D male | 9-way SUB-D female | "Open Style" connector | |
| | Binary rate | | 9600 Kbits/s...12 Mbits/s | 10, 20, 50, 125, 250, 500 and 1000 Kbits/s (by switches) | 125...500 kbaud | |
| Supply for the discrete outputs and control | Cables | | 2 shielded twisted pairs | | | |
| | --- 24 V | V | 20...28 | | | |
| | Current consumption | A | 1.5 (max) | | | |
| Ambient air temperature | Protection by gl fuse | A | 2 | | | |
| | | °C | Operation -25...+55 | | | |
| Logic inputs | Number | | 2 (to be assigned according to the configuration) | | | |
| | Supply | V | --- 24 | | | |
| | Input current | mA | 7 | | | |
| | Nominal input values | Voltage | V | --- 24 (positive logic) | | |
| | | Current | mA | 7 | | |
| | Response time | Change to state 1 | ms | 10 (±30 %) | | |
| Change to state 0 | | ms | 10 (±30 %) | | | |
| Input type | | | Resistive | | | |
| Discrete outputs | Number | | 3, of which 2 dedicated to starter-controller coil operation | | | |
| | Max. current | mA | 500 | | | |
| | Short-circuit protection | | Yes | | | |
| | Switching capacity | | 0.5 A / --- 24 V | | | |
| Indication/diagnostics | | | By 3 LEDs on front panel | | | |

| Characteristics of Advantys STB communication module LULC15 | | | | | |
|---|--------------------------|-------------------|--|-------------------------|--|
| Physical interface | | | CAN | | |
| Connections | | | Fire Wire | | |
| Protocol | | | CAN 2.0 and CAN 2.B (passive mode) | | |
| Transmission speed | | kbit/s | 800 | | |
| Addressing | | | Self-addressing | | |
| Supply for the discrete outputs and control | --- 24 V | V | 20...28 | | |
| | Current consumption | A | 1.5 (max) | | |
| | Protection by gl fuse | A | 2 | | |
| Ambient air temperature | | °C | Operation -25...+55 | | |
| Discrete inputs | Number | | 2 (to be assigned according to configuration) | | |
| | Supply | V | --- 24 | | |
| | Input current | mA | 7 | | |
| | Nominal input values | Voltage | V | --- 24 (positive logic) | |
| | | Current | mA | 7 | |
| | Response time | Change to state 1 | ms | 10 (± 30 %) | |
| Change to state 0 | | ms | 10 (± 30 %) | | |
| Input type | | | Resistive | | |
| Discrete outputs | Number | | 3, of which 2 dedicated to starter-controller coil operation | | |
| | Max. current | mA | 500 | | |
| | Short-circuit protection | | Yes | | |
| | Switching capacity | | 0.5 A / --- 24 V | | |
| Indication/diagnostics | | | By 3 LEDs on front panel | | |

References: pages A4/25, A4/27, A4/28, A4/29 Schemes: pages A4/68 and A4/69


















































| Connection characteristics | | | | | | | |
|----------------------------------|---------------------------|---|-----------------|----------------------------------|-----------------------|--------------------------|-------------|
| Module type | | LUFW10, LUFDH11, LUFDA01 and LUFDA10 | LUFV2 | ASILUFC5 and ASILUFC51 | | | |
| | | | | Inputs and 24 V auxiliary supply | Outputs | | |
| Connectors | Pitch | | 5.08 | 3.81 | 5.08 | 3.81 | |
| Flexible cable without cable end | 1 conductor | mm ² | 0.2...1.5 | 0.14...1 | 0.2...1.5 | 0.14...1 | |
| | 2 identical conductors | mm ² | 0.2...1 | 0.14...0.75 | 0.2...1 | 0.14...0.75 | |
| Flexible cable with cable end | Without insulated ferrule | 1 conductor | mm ² | 0.25...1.5 | 0.25...1 | 0.25...1 | |
| | | 2 identical conductors | mm ² | 0.25...1 | 0.25...0.34 | 0.25...1 | 0.25...0.34 |
| | With insulated ferrule | 1 conductor | mm ² | 0.25...1.5 | 0.25...0.5 | 0.25...1.5 | 0.25...0.5 |
| | | 2 identical conductors (Use a double cable end) | mm ² | 0.5...1 | 0.5 | 0.5...1 | 0.5 |
| Solid cable without cable end | 1 conductor | mm ² | 0.2...1.5 | 0.14...1 | 0.2...1.5 | 0.14...1 | |
| | 2 identical conductors | mm ² | 0.2...1 | 0.14...0.5 | 0.2...1 | 0.14...0.5 | |
| Conductor size | 1 conductor | | AWG24... AWG16 | AWG26... AWG16 | AWG24... AWG16 | AWG26... AWG16 | |
| Tightening torque | | N.m | 0.5...0.6 | 0.20...0.25 | 0.5...0.6 | 0.20...0.25 | |
| Flat screwdriver | | mm | 3.5 | 2.5 | 3.5 | 2.5 | |
| Module type | | LULC033, LULC08 and LULC15 | LUFC00 | LULC09 | | | |
| | | | | Inputs and 24 V auxiliary supply | Connection on the bus | | |
| Connectors | Pitch | | 3.81 | 3.81 | 3.81 | 5 (Open Style) DeviceNet | |
| Flexible cable without cable end | 1 conductor | mm ² | 0.14...1 | 0.14...1 | 0.14...1 | 0.2...2.5 | |
| | 2 identical conductors | mm ² | 0.14...0.75 | 0.14...0.75 | 0.14...0.75 | 0.5...1.5 | |
| Flexible cable with cable end | Without insulated ferrule | 1 conductor | mm ² | 0.25...1 | 0.25...1 | 0.25...2.5 | |
| | | 2 identical conductors | mm ² | 0.25...0.34 | 0.25...0.34 | 0.25...1 | |
| | With insulated ferrule | 1 conductor | mm ² | 0.25...0.5 | 0.25...0.5 | 0.25...0.5 | 0.25...2.5 |
| | | 2 identical conductors (Use a double cable end) | mm ² | 0.5 | 0.5 | 0.75 | 0.5...1.5 |
| Solid cable without cable end | 1 conductor | mm ² | 0.14...1 | 0.14...1 | 0.14...1 | 0.2...2.5 | |
| | 2 identical conductors | mm ² | 0.14...0.5 | 0.14...0.5 | 0.14...0.5 | 0.14...0.5 | |
| Conductor size | 1 conductor | | AWG26... AWG16 | AWG26... AWG16 | AWG26... AWG16 | AWG24... AWG16 | |
| Tightening torque | | N.m | 0.20...0.25 | 0.20...0.25 | 0.20...0.25 | 0.5...0.6 | |
| Flat screwdriver | | mm | 2.5 | 2.5 | 2.5 | 3.5 | |


TeSys Control

Ultra motor starters - Operating status indication

Characteristics

| Knob positions - Poles and Signaling contact states | | | | | | | | |
|---|--|--|---|---|---|--|---|---|
| Ultra operating status | Position of rotary knob | Indication on front panel | N/O pole contact | N/C pole contact | N/O contact any fault | N/C ontact any fault | ⊕ N/O contact product ready | N/C contact Rotary knob on OFF position |
| References of add-on contact blocks and auxiliary contact modules Terminal referencing | – | – | – | LUFN11 31-32 | LUA1C20 97-98 | LUA1C11 95-96 | LUA1C20 17-18 | – |
| | or | – | – | LUFN02 31-32 41-42 | – | – | – | LUA8E20 57/58 67/68 |
| | or | – | – | LUFN20 33-34 43-44 | LU9BN11 21-22 | – | – | LUA1C11 17-18 |
| | or | – | – | LUFN11 43-44 | – | – | – | – |
| | or | – | – | LU9BN11 13-14 | – | – | – | – |
| Off | OFF  | 0 |  |  |  |  |  |  |
| Ready to operate |  | 0 |  |  |  |  |  |  |
| Start |  | 1 |  |  |  |  |  |  |
| Tripped on short-circuit | TRIP  | I>> |  |  |  |  |  |  |
| Tripped on thermal overload | Manual reset mode | TRIP  | 0 |  |  |  |  |  |
| | Automatic reset on thermal overload fault mode |  | 0 |  |  |  |  |  |
| | Remote reset mode |  | 0 |  |  |  |  |  |

N/O contact  in closed position.

N/C contact  in open position.

Ultra motor starters

Ref.



TeSys Control

Ultra motor starters - Available status

Characteristics

| Data profile under AS-Interface | | | | Standard LUCA | Advanced LUCB, CC, CD | Multifunction LUCM |
|-------------------------------------|--|----|-------------------------|---------------|-----------------------|--------------------|
| Control unit present in the product | | | | | | |
| Status | | D0 | Ready (available) | | | |
| | | D1 | Poles closed (running) | | | |
| Commands | | D0 | Start - forward running | | | |
| | | D1 | Start - reverse running | | | |

| Main registers accessible with Modbus, CANopen, Advantys STB, Profibus DP and DeviceNet communication modules. | | | | | | |
|--|-----------------------------|--------------|---|----------|----------|---------------|
| For other registers and for further information, please consult the User's Manual <i>Communication variables</i> on the website www.schneider-electric.com | | | | | | |
| Control unit present in the product | | | | Standard | Advanced | Multifunction |
| Marking | Register 0...Register 99 | Words...Bits | Commercial reference, serial number, software version | | | |
| Log | Register 100...Register 450 | Words...Bits | Fault log, Operating log, Log of last 5 trips | | | |
| Status | Register 451...Register 464 | Words...Bits | Alarm signalling (bits), Fault signalling (bits) | | | |
| Values | Register 465...Register 473 | Words | Irms phase 1, phase 2, phase 3. Motor load, thermal status Earth leakage current. Phase imbalance and phase failure | | | |
| | Register 474...Register 599 | Words...Bits | Reserved | | | |
| Configuration | Register 600...Register 699 | Words...Bits | Protection and alarm thresholds, fallback mode and reset mode | | | |
| Commands | Register 700...Register 714 | Words...Bits | Commands | | | |

| | | | | | | |
|-------------------|--------------|--------------------------|-------------------------------|--|--|--|
| Status and values | Register 452 | Bit 0 | Short-circuit fault | | | |
| | | Bit 1 | Overcurrent fault | | | |
| | | Bit 2 | Thermal overload fault | | | |
| | Register 455 | Bit 0 | Ready (available) | | | |
| | | Bit 1 | Poles closed | | | |
| | | Bit 2 | Fault | | | |
| | | Bit 3 | Alarms | | | |
| | | Bit 4 | Tripped ("TRIP" position) | | | |
| | | Bit 5 | Fault acknowledgement allowed | | | |
| | | Bit 6 | Reserved | | | |
| | | Bit 7 | Motor running | | | |
| | | Bit 8 | Motor current % (bit 0) | | | |
| | | Bit 9 | Motor current % (bit 1) | | | |
| | | Bit 10 | Motor current % (bit 2) | | | |
| | | Bit 11 | Motor current % (bit 3) | | | |
| | | Bit 12 | Motor current % (bit 4) | | | |
| | | Bit 13 | Motor current % (bit 5) | | | |
| | | Bit 14 | Reserved | | | |
| | Bit 15 | Motor starting | | | | |
| Register 461 | Bit 3 | Thermal overload alarm | | | | |
| Register 465 | Word | Thermal status value | | | | |
| Register 466 | Word | Motor load value (Im/Ir) | | | | |

| | | | | | | |
|---------------|---|---------|--|--|--|--|
| Configuration | Register 602 | Bit 0 | Manual reset on thermal overload fault | | | |
| | | Bit 1 | Remote reset on thermal overload fault | | | |
| | | Bit 2 | Automatic reset on thermal overload fault | | | |
| | Register 682 | Value 0 | Fallback mode validation | | | |
| | | Value 1 | Outputs OA1 and OA3 unchanged | | | |
| | | Value 2 | Outputs OA1 and OA3 forced to 0 | | | |
| | | Value 3 | Outputs OA1 and OA3 unchanged, signalling existence of communication failure | | | |
| | | Value 4 | Outputs OA1 forced to 1 and OA3 unchanged | | | |
| Value 5 | Outputs OA3 forced to 1 and OA1 unchanged | | | | | |

| | | | | | | |
|----------|--------------|------------|-----------------------|--|--|--|
| Commands | Register 700 | Bit 0 | LO1 output command | | | |
| | Register 704 | Bit 0 | OA1 output command | | | |
| | | Bit 1 | OA3 output command | | | |
| | | Bit 2 | Reserved | | | |
| | | Bit 3 | Fault acknowledgement | | | |
| | | Bit 4 | Reserved | | | |
| | | Bit 5 | Trip test | | | |
| | | Bit 6...15 | Reserved | | | |

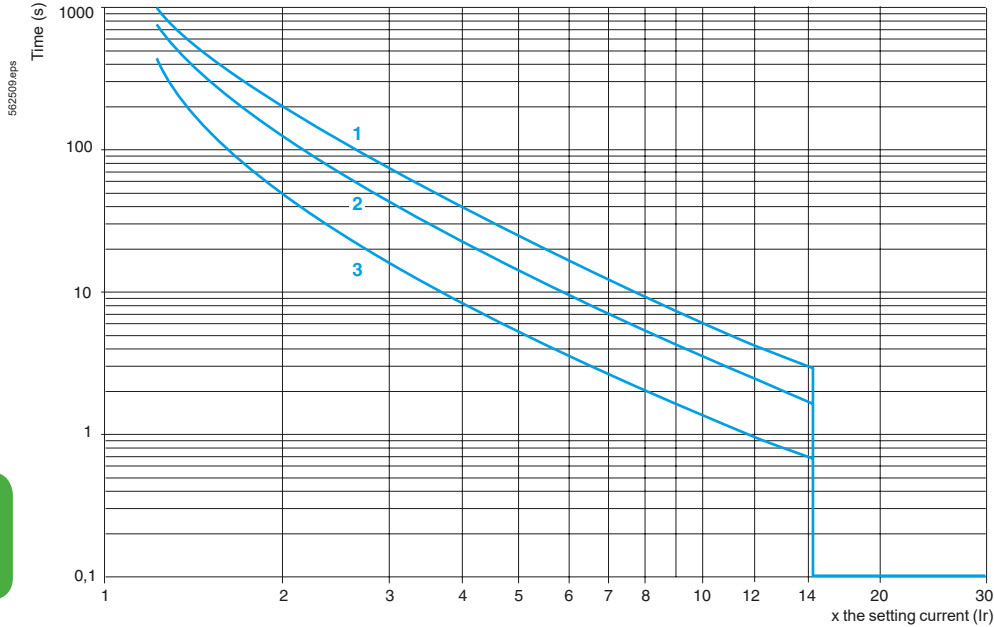
 Data accessible

References:
pages A4/24 to A4/29

Schemes:
pages A4/66 and A4/67

Tripping curves for control units LUCA, LUCB, LUCD

Average operating times at 20 °C according to multiples of the setting current, tolerance : $\pm 20\%$.



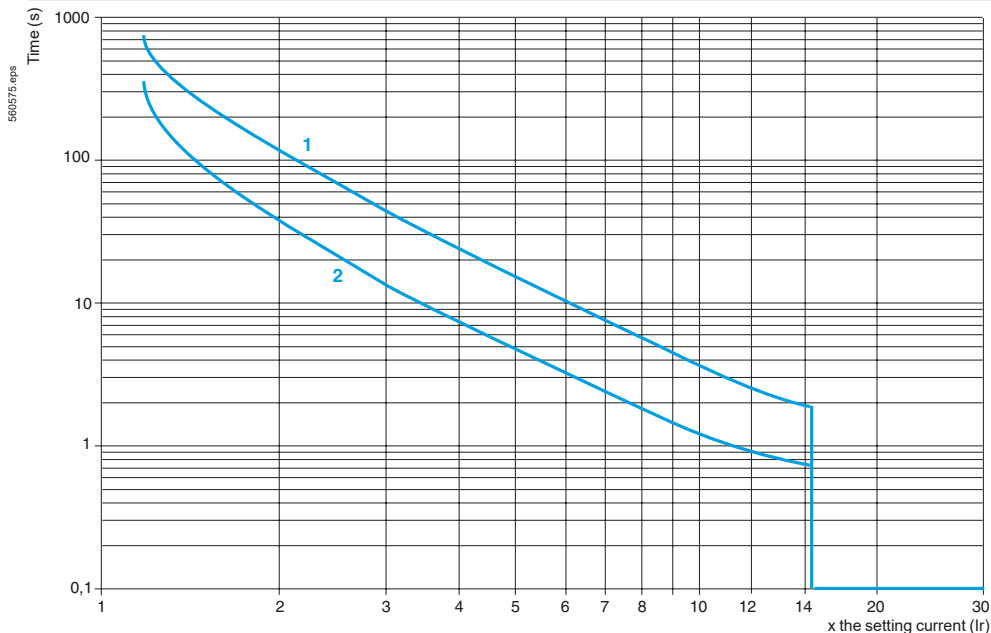
Ultra motor starters

Ref.

- 1 LUCD, 3 poles from cold state, class 20.
- 2 LUCA, LUCB, 3 poles from cold state, class 10.
- 3 LUCA, LUCB, LUCD, 3 poles from hot state.

Tripping curves for control units LUCC

Average operating times at 20 °C according to multiples of the setting current, tolerance : $\pm 20\%$.

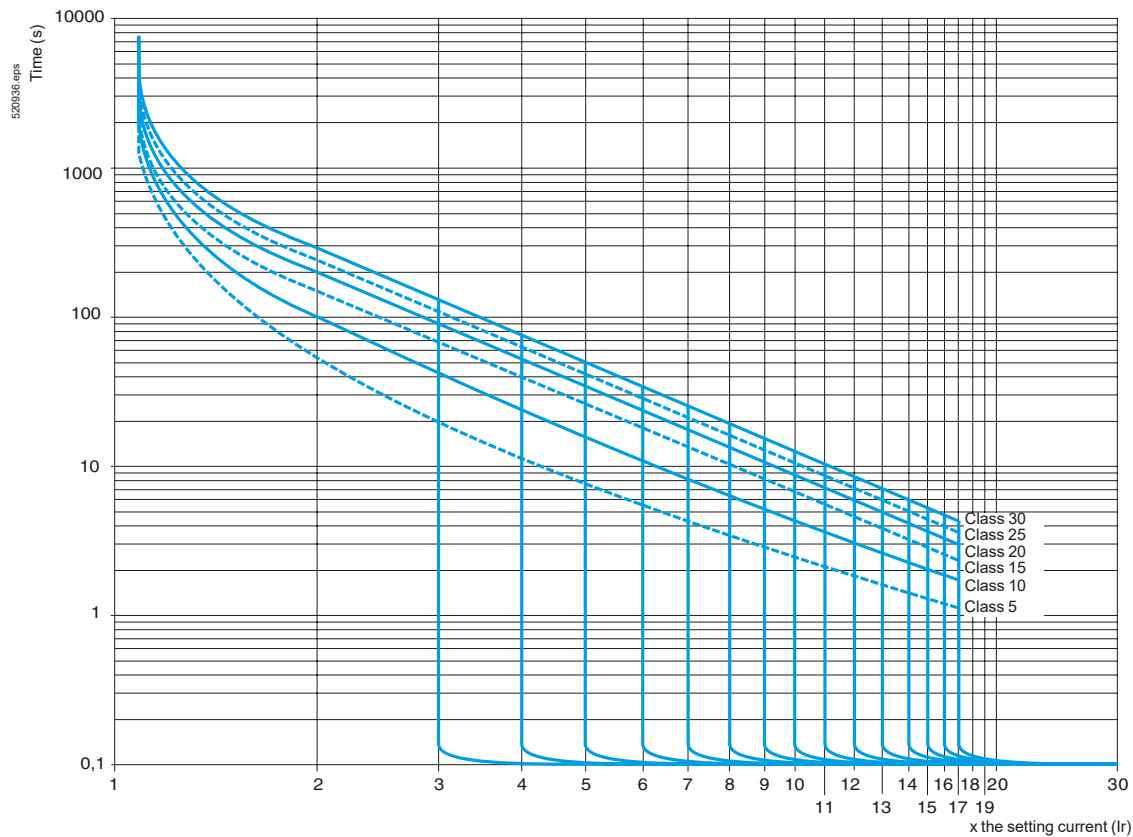


- 1 LUCC, single-phase, cold state.
- 2 LUCC, single-phase, hot state.

Tripping curves for control units LUCM

Cold state curves

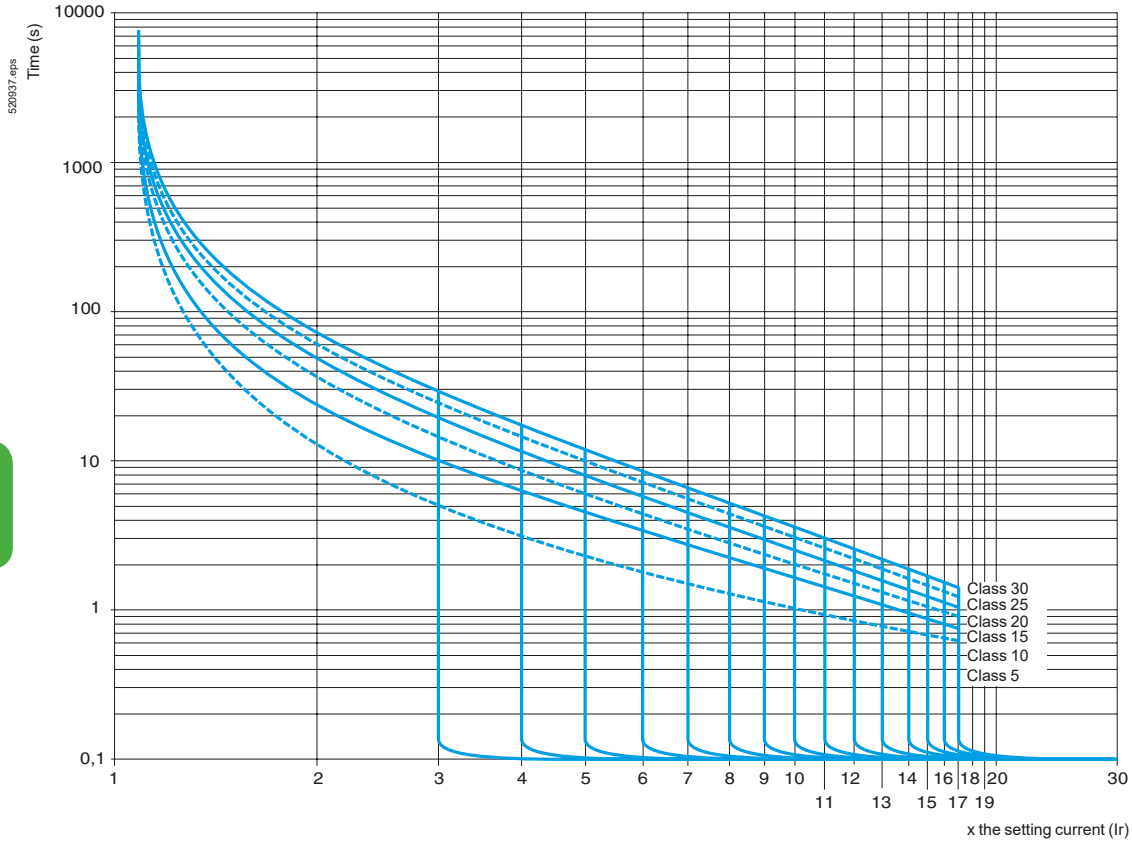
Average operating times at 20 °C according to multiples of the setting current, tolerance : ± 20 %.



Tripping curves for control units LUCM

Hot state curves

Average operating times at 20 °C according to multiples of the setting current, tolerance : $\pm 20\%$



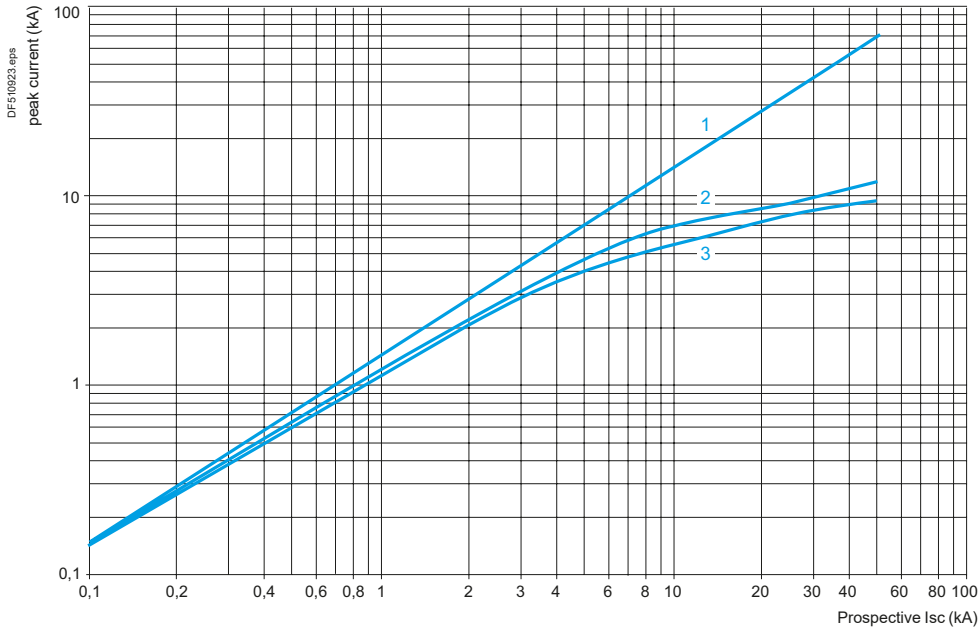
Ultra motor starters

Ref.



Current limitation on short-circuit

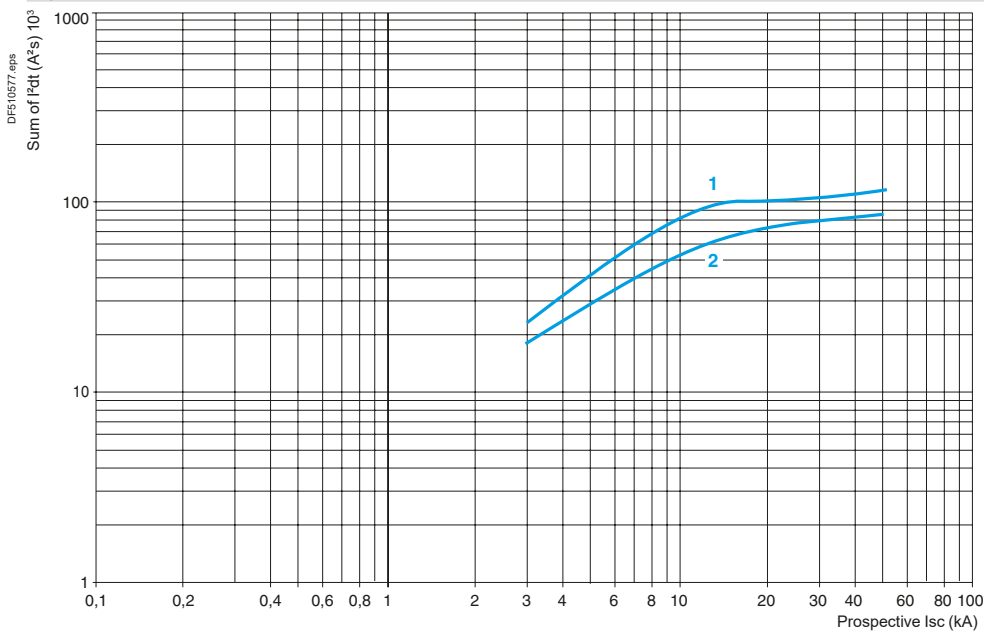
$U_e = 460 \text{ V}$



- 1 Maximum peak current
- 2 32 A, 38 A power base
- 3 12 A power base

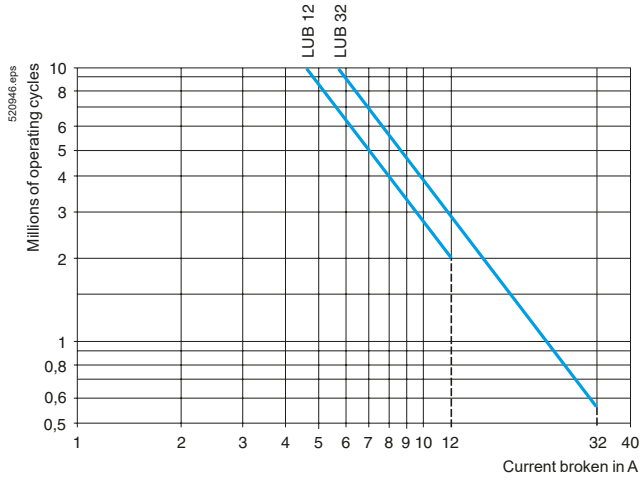
Thermal limit on short-circuit

$U_e = 460 \text{ V}$



- 1 32 A, 38 A power base
- 2 12 A power base

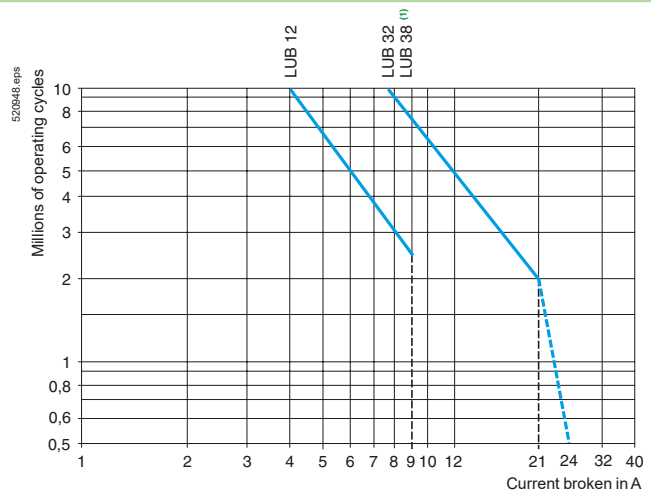
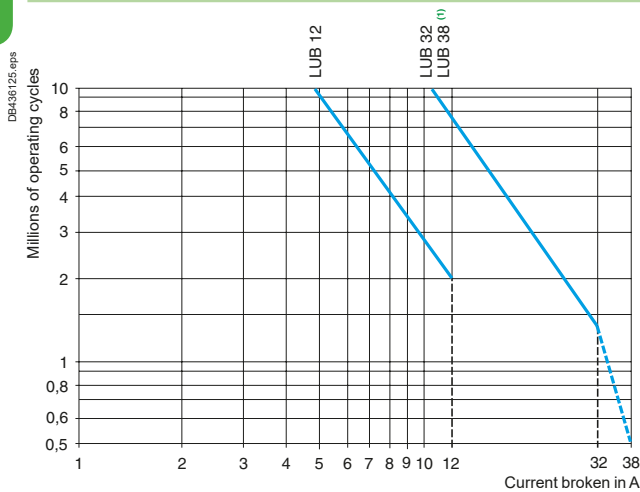
Use in category AC-41



Use in category AC-43

Ue ≤ 440 V

Ue = 690 V

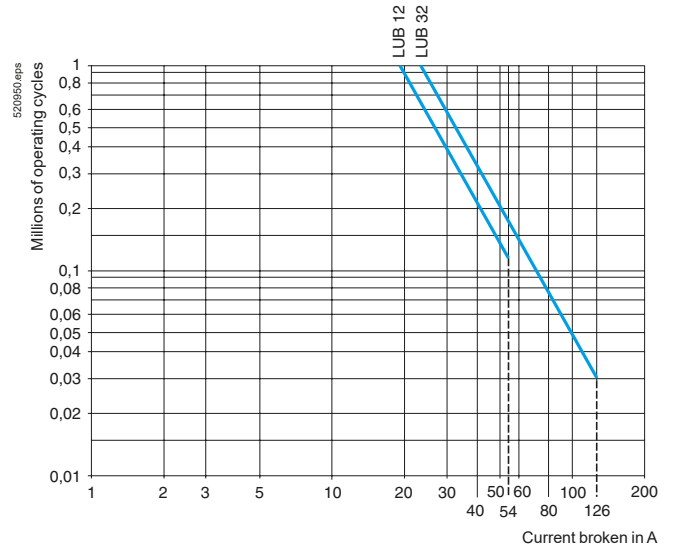
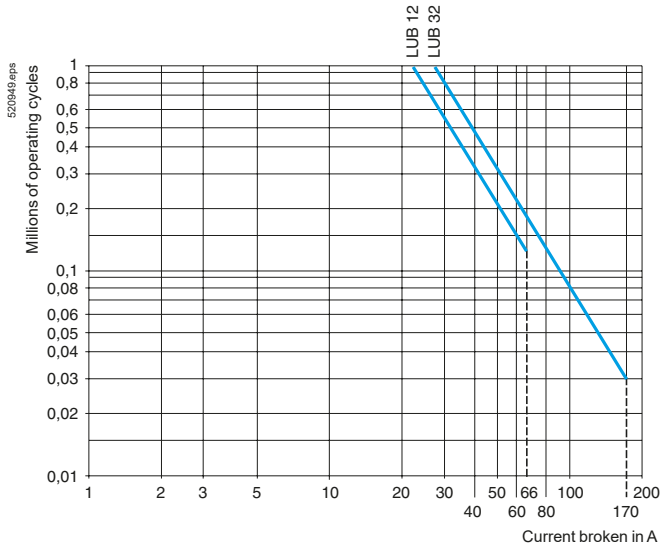


(1) Plain curve: LUB32 + LUB38, dotted curve: LUB38 only.

Use in category AC-44

Ue ≤ 440 V

Ue = 690 V



Ultra motor starters

Ref.

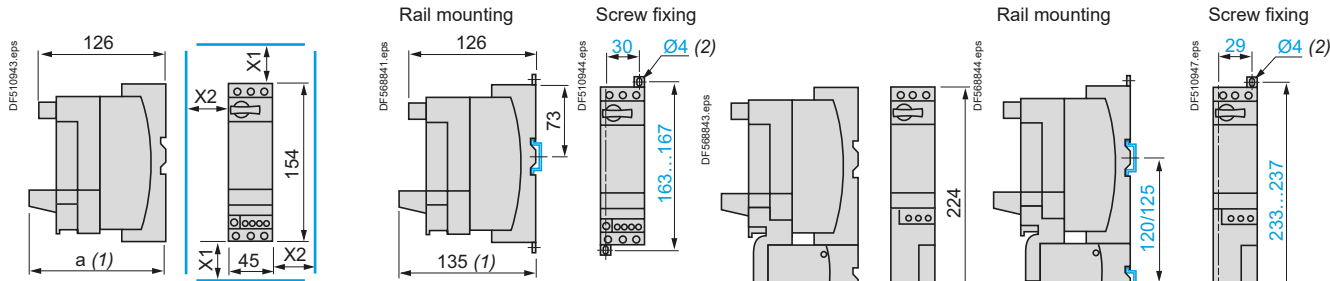


Dimensions

Starter-controllers

LUB: non-reversing

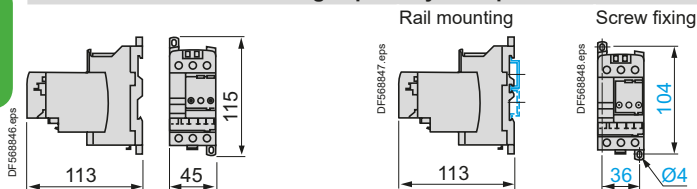
LU2B: reversing



| | |
|--|-----|
| With Modbus module | 135 |
| With Advantys STB, CANopen, Profibus DP or DeviceNet modules | 147 |

Minimum electrical clearance:
 X1 = 50 mm for Ue = 440 V and 70 mm for Ue = 500 and 690 V, X2 = 0

Reverser block for mounting separately from power base

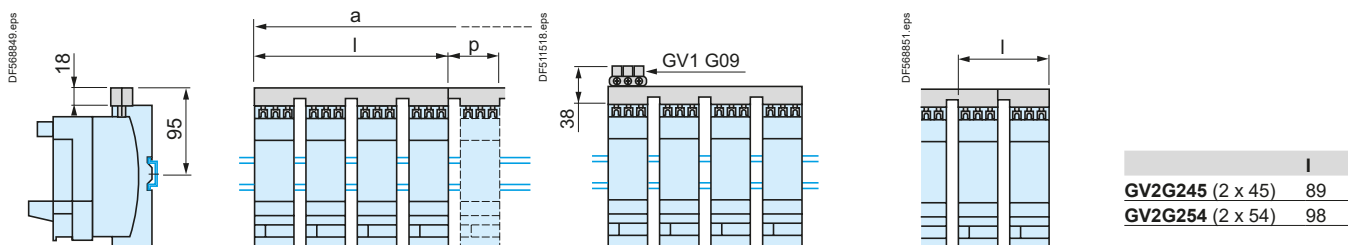


Sets of busbars and plug-in power sockets

GV2G445 and GV2G454

GV2G●●● with terminal block GV1G09

GV2G245 and G254

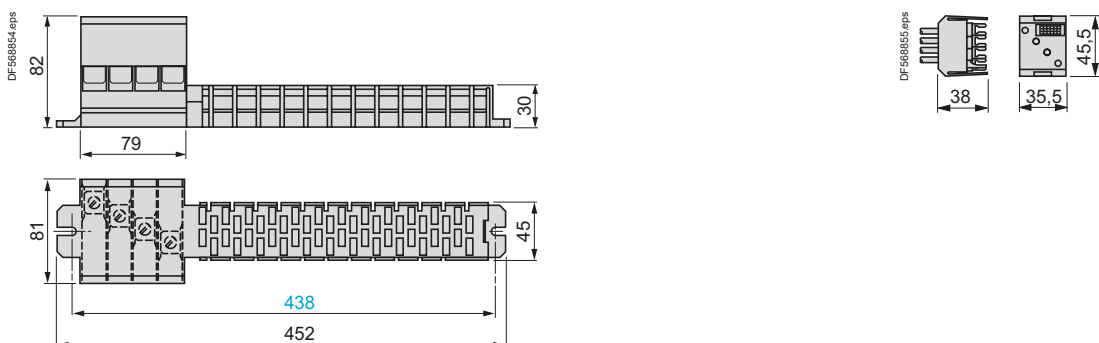


| | I | P |
|------------------|-----|----|
| GV2G445 (2 x 45) | 179 | 45 |
| GV2G454 (2 x 54) | 206 | 54 |

| | a | | | |
|--------------------|-----|-----|-----|-----|
| Number of tap-offs | 5 | 6 | 7 | 8 |
| GV2G445 (2 x 45) | 224 | 269 | 314 | 359 |
| GV2G454 (2 x 54) | 260 | 314 | 368 | 422 |

AK5JB144

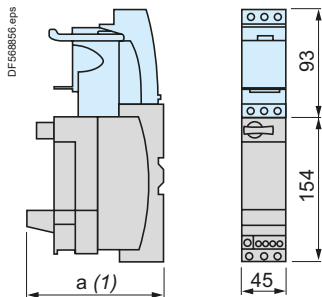
AK5PC13, PC33, PC33L



(1) Depth with communication module.
 (2) Retractable fixing lugs.

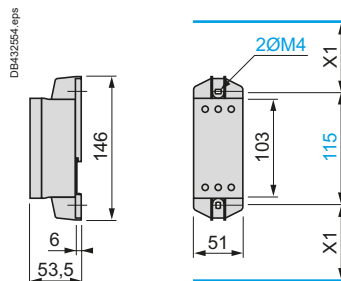
Dimensions, mounting

Limiter-disconnector LUALB1 Disconnector LUALB10



| a | |
|--|-----|
| With Modbus module | 135 |
| With Advantys STB, CANopen, Profibus DP or DeviceNet modules | 147 |

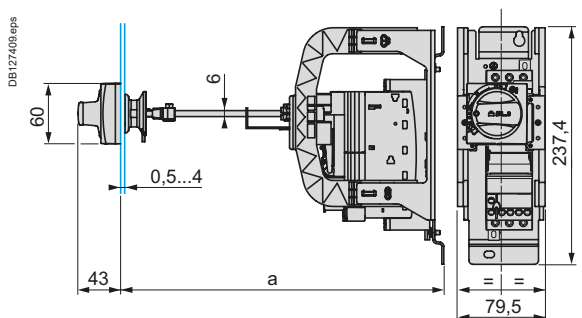
Current limiter LA9LB920



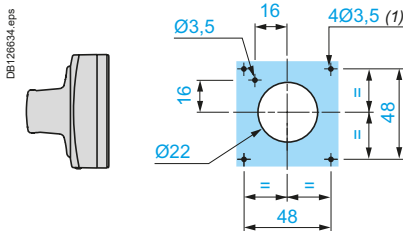
X1: Electrical clearance = 30 mm for $U_e \leq 690$ V

Door interlock mechanisms

LU9APN21, LU9APN22, LU9APN24



Door cut-out



(1) For IP65 only.

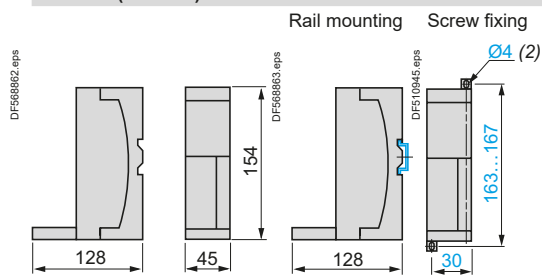
| | a | |
|-----------------------|------|------|
| | Mini | Maxi |
| LU9APN●● | 191 | 300 |
| LU9APN●● + GVAPK12 | 300 | 483 |

Ultra
motor
starters

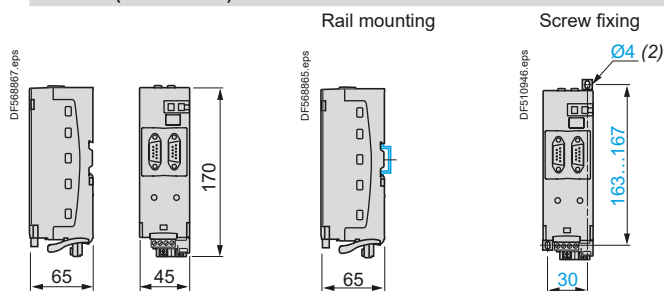
Ref.

Splitter boxes

LU9GC3 (Modbus) LU9G02 and LU9G03



LU9GC7 (Profibus DP)



(1) Depth with communication module.

(2) Retractable fixing lugs.

TeSys Control

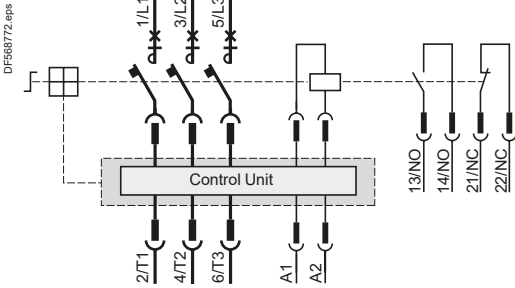
Ultra motor starters - Terminal identifications

Schemes

12, 32, 38 A power bases with standard, advanced or multifunction control unit

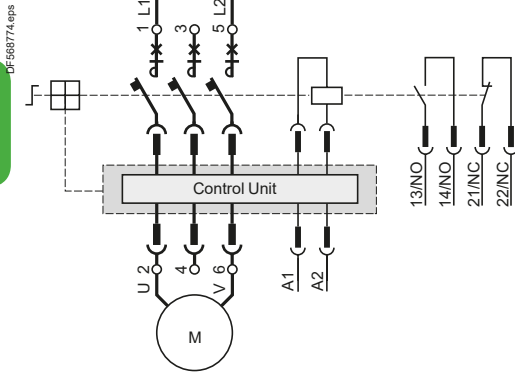
LUB

Non-reversing



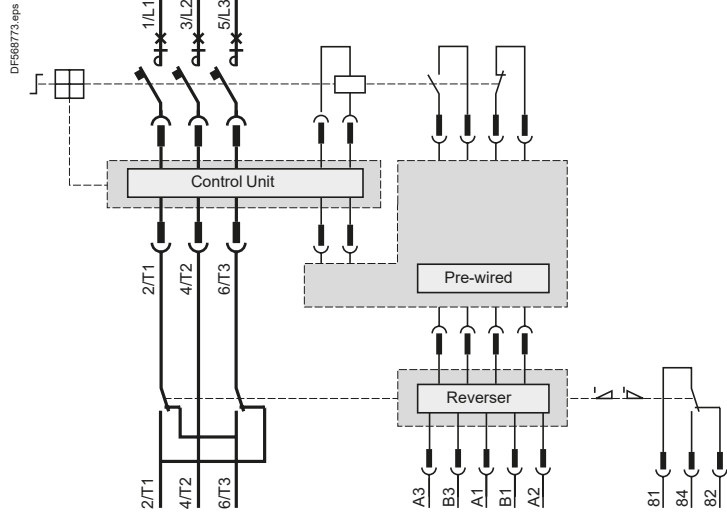
With control unit LUCC or LUCM

Connection of a single-phase motor

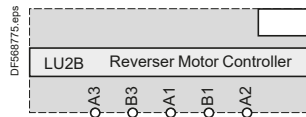


LU2B

Reversing

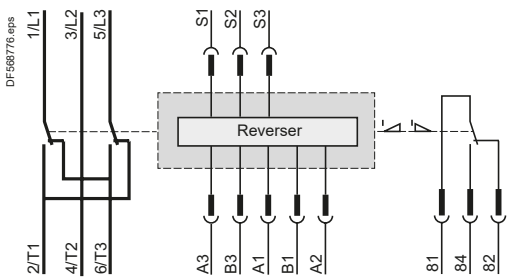


Control terminal block

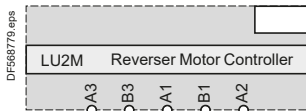


Reverser blocks

LU2M

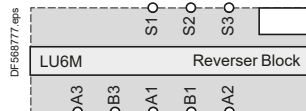


Control terminal block

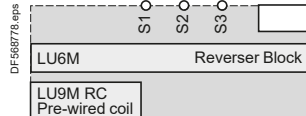


LU6M

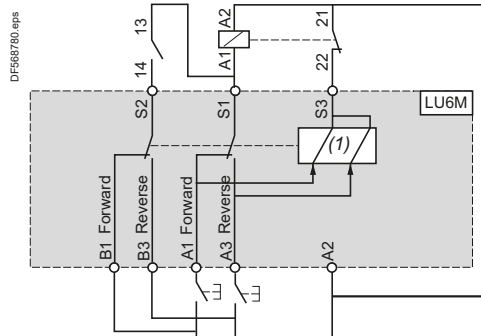
Control terminal blocks



With pre-wired connector LU9MRC



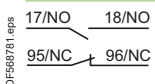
Basic scheme



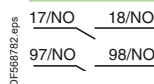
- S1 Start next stage
- S2 Electrical interlocking
- S3 Maintaining contact
- B1 Maintain forward running
- B3 Maintain reverse running
- A1 Pulse forward running
- A2 Common
- A3 Pulse reverse running
- (1) Electronically operated bistable electromagnet.

Add-on contact blocks

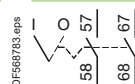
LUA1C11



LUA1C20

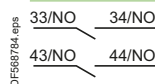


LUA8E20

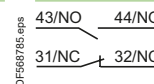


Add-on contact modules

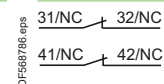
LUFN20



LUFN11



LUFN02



References:
pages A4/10 and A4/11

Characteristics:
pages A4/44 and A4/45

Curves:
pages A4/56 to A4/61

TeSys Control

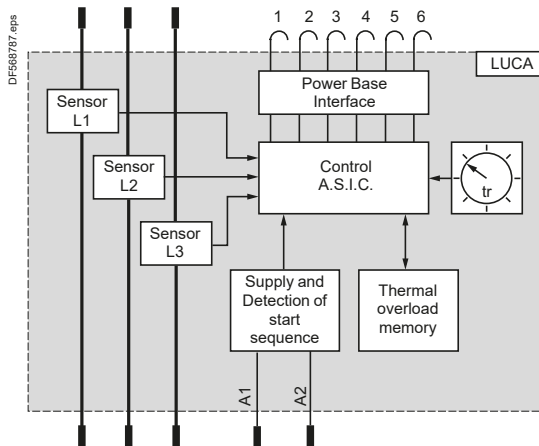
Ultra motor starters - Terminal identifications

Schemes

Control units

Standard control units LUCA

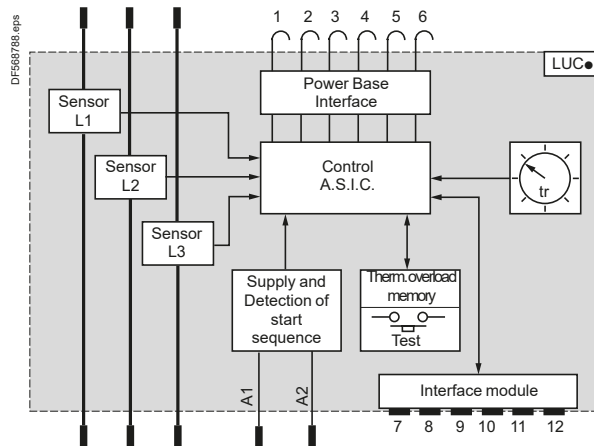
Basic scheme



- 1 and 2 Trips
- 3 and 4 Electromagnet
- 5 Power base rating
- 6 N/C

Advanced control units LUCB, LUCC, LUCD

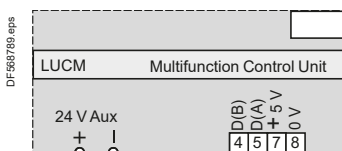
Basic schemehd



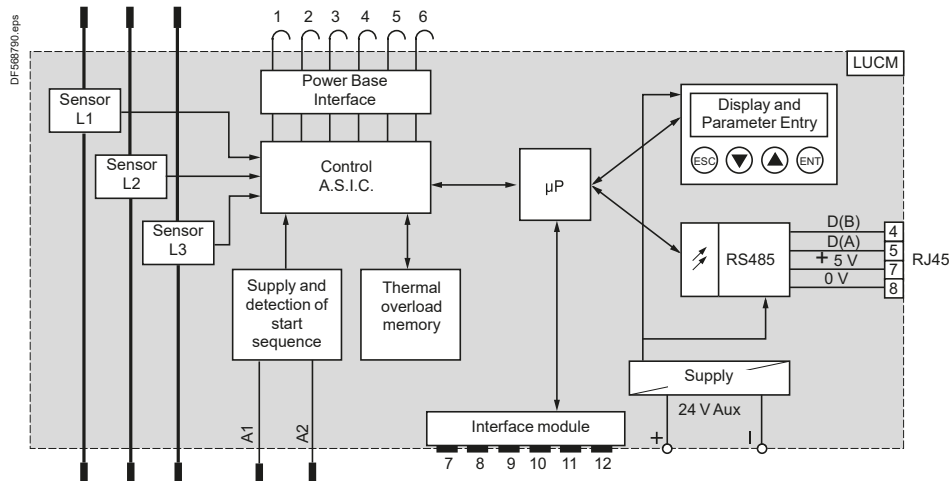
- 1 and 2 Trips
- 3 and 4 Electromagnet
- 5 Power base rating
- 6 N/C
- 7 Earth
- 8 Thermal status/Set
- 9 Reset mode/Reset
- 10 (Im/Ir)
- 11 Vc2
- 12 Vc1

Multifunction control units LUCM

Control terminal block



Basic scheme



- 1 and 2 Trips
- 3 and 4 Electromagnet
- 5 Power base rating
- 6 N/C
- 7 Earth
- 8 N/C
- 9 Earth
- 10 (Im/Ir)
- 11 Rx/Tx
- 12 Vc1

References:
pages A4/11 and A4/12

Characteristics:
pages A4/47 to A4/49

Curves:
pages A4/56 to A4/58

Ultra
motor
starters

Ref.



TeSys Control

Ultra motor starters - Terminal identifications

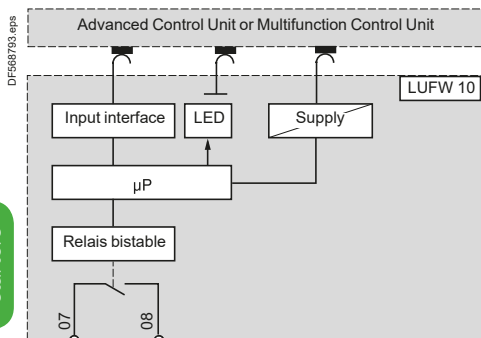
Schemes

Function modules

Alarm LUFW10



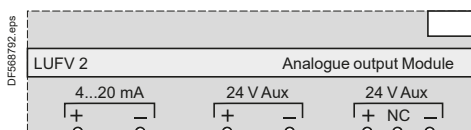
Basic scheme



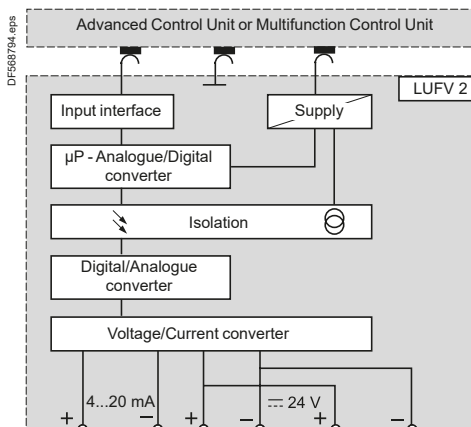
~ 250 V, 2 A
 ≍ 24 V, 2 A

Indication of motor load LUFV2

4-20 mA output



Basic scheme



100 Ω < load < 500 Ω ≍ 30 V max and 40 mA min

Ultra motor starters

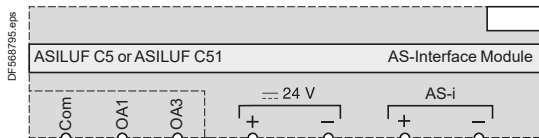
Ref.



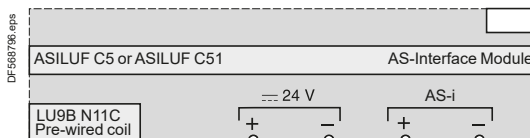
Communication modules

Communication modules ASILUFC5 and ASILUFC51

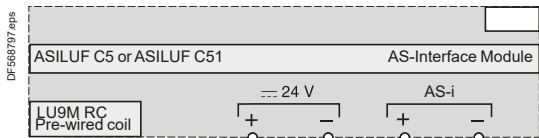
Without pre-wired coil connection



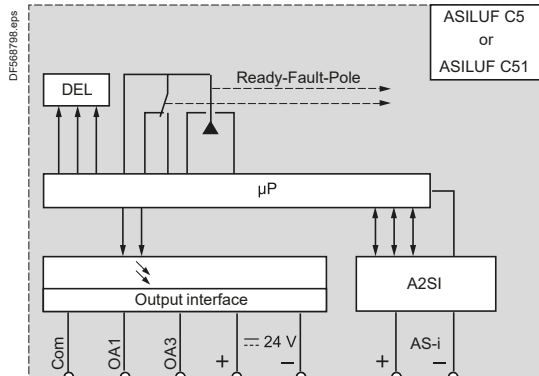
With pre-wired coil connection LU9BN11C



With pre-wired coil connection LU9MRC



Basic scheme



References:
 pages A4/13, A4/24

Characteristics:
 pages A4/50 to A4/55

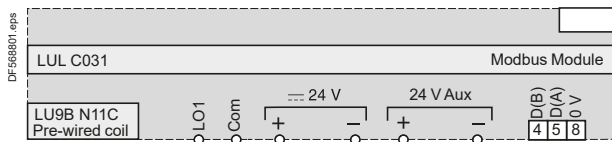
TeSys Control

Ultra motor starters - Terminal identifications

Schemes

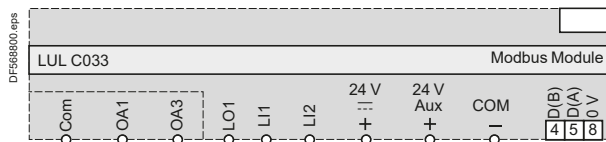
Communication modules (continued)

With pre-wired coil connection LU9BN11C

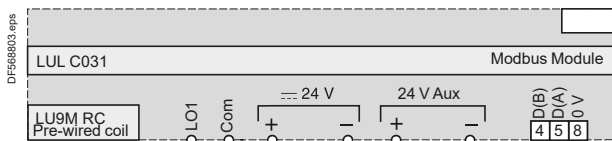


Modbus communication module LULC033

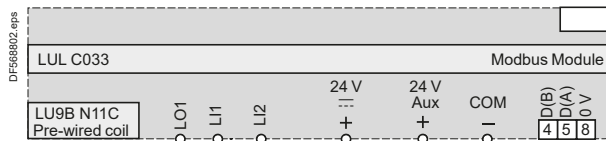
Without pre-wired coil connection



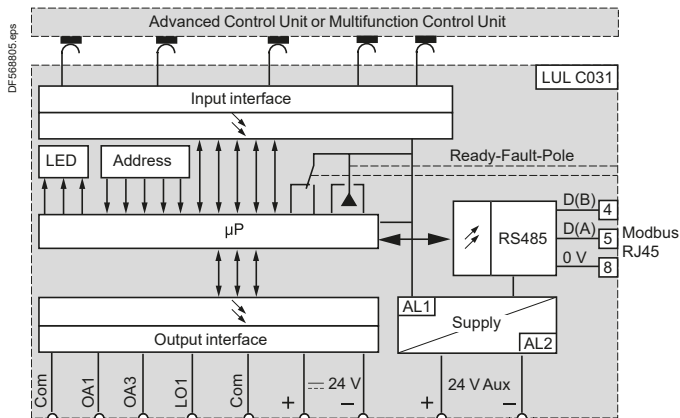
With pre-wired coil connection LU9MRC



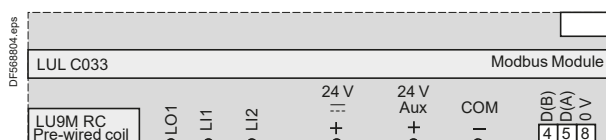
With pre-wired coil connection LU9BN11C



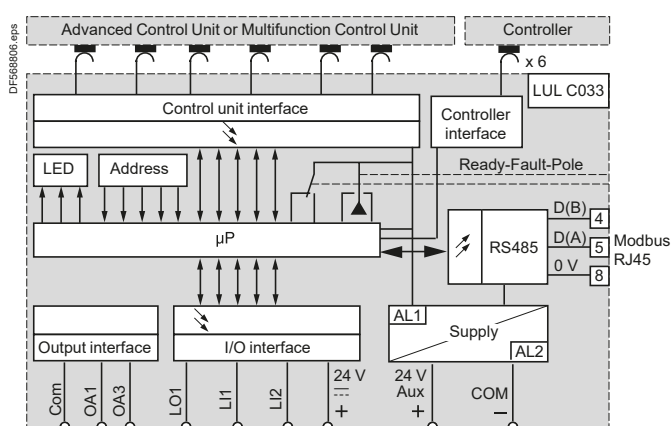
Basic scheme



With pre-wired coil connection LU9MRC



Basic scheme



Ultra motor starters

Ref.



TeSys Control

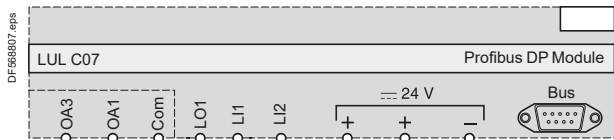
Ultra motor starters - Terminal identifications

Schemes

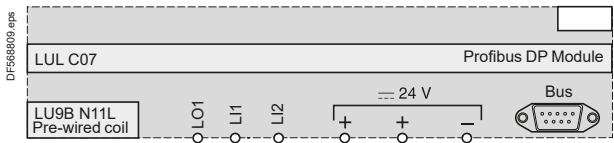
Communication modules (continued)

Profibus DP communication module LULC07

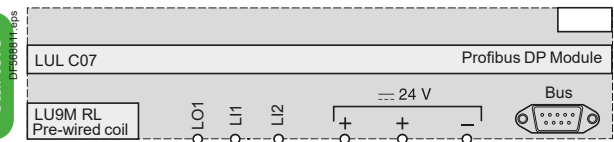
Without pre-wired coil connection



With pre-wired coil connection LU9BN11LC

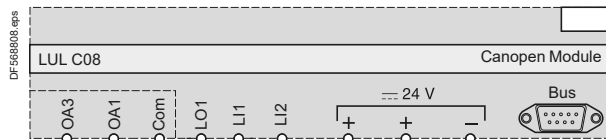


With pre-wired coil connection LU9MRC

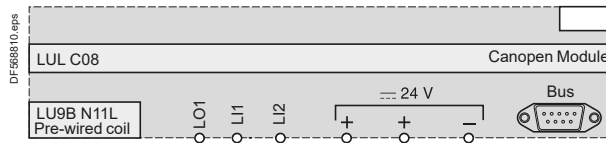


CANopen communication module LULC08

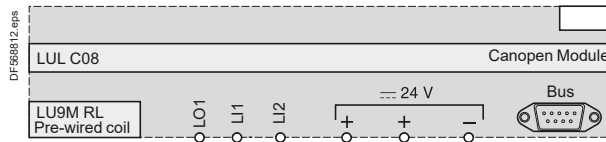
Without pre-wired coil connection



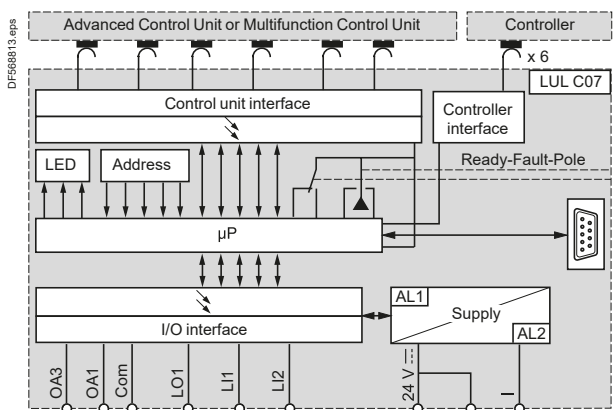
With pre-wired coil connection LU9BN11LC



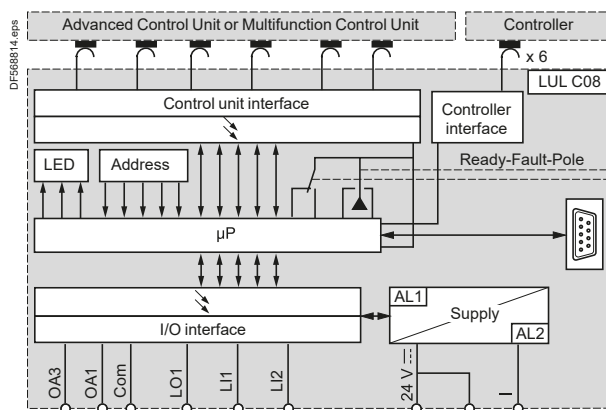
With pre-wired coil connection LU9MRC



Basic scheme

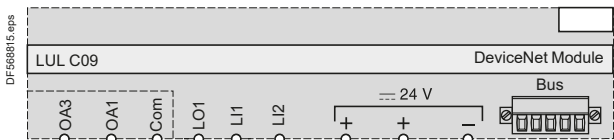


Basic scheme

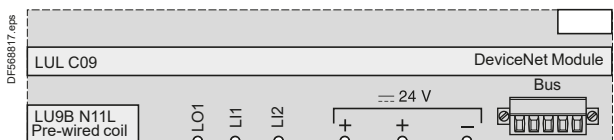


DeviceNet communication module LULC09

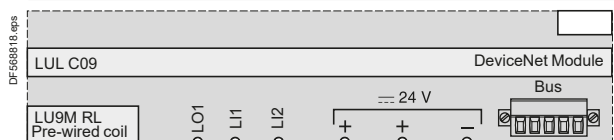
Without pre-wired coil connection



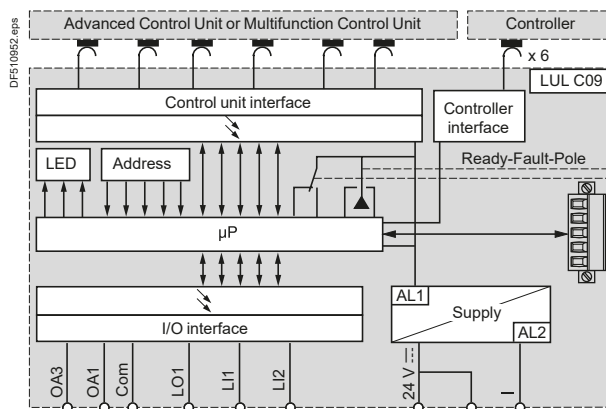
With pre-wired coil connection LU9BN11LC



With pre-wired coil connection LU9M RL



Basic scheme



TeSys Control

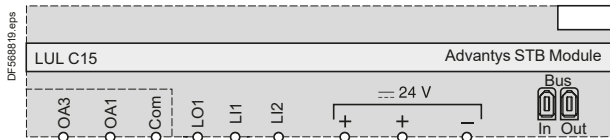
Ultra motor starters - Terminal identifications

Schemes

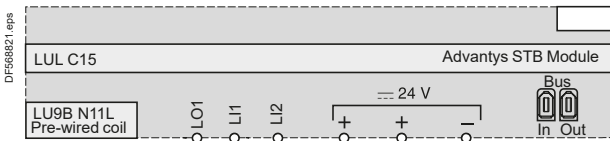
Communication modules (continued)

Advantys STB communication module LULC15

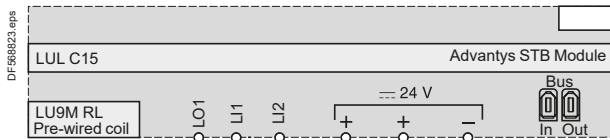
Without pre-wired coil connection



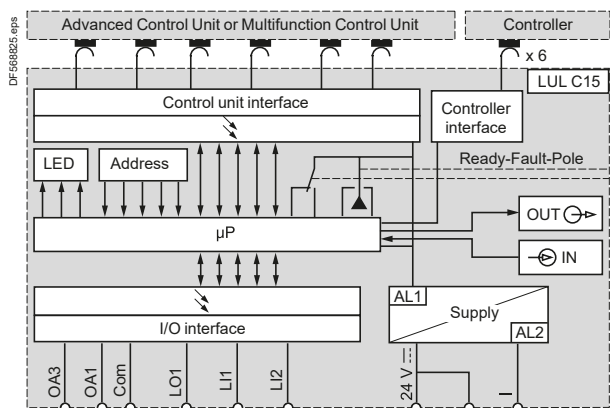
With pre-wired coil connection LU9BN11LC



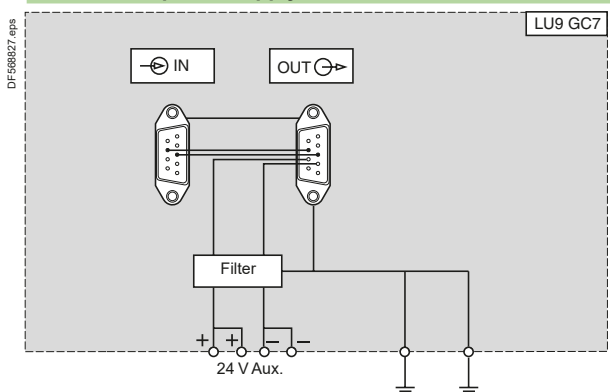
With pre-wired coil connection LU9MRC



Basic scheme



Profibus DP power supply module LU9GC7

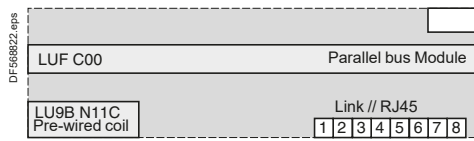


Parallel wiring modules

Without pre-wired coil connection



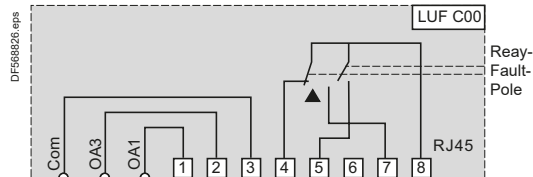
With pre-wired coil connection LU9BN11LC



With pre-wired coil connection LU9MRC



Basic scheme



- 1 Forward running
- 2 Reverse running
- 3 Output common
- 4 Selector in position
- 5 Pole state
- 6 Reserved
- 7 Fault
- 8 Input common

Ultra motor starters

Ref.



TeSys Control

Ultra motor starters - Terminal identifications

Schemes

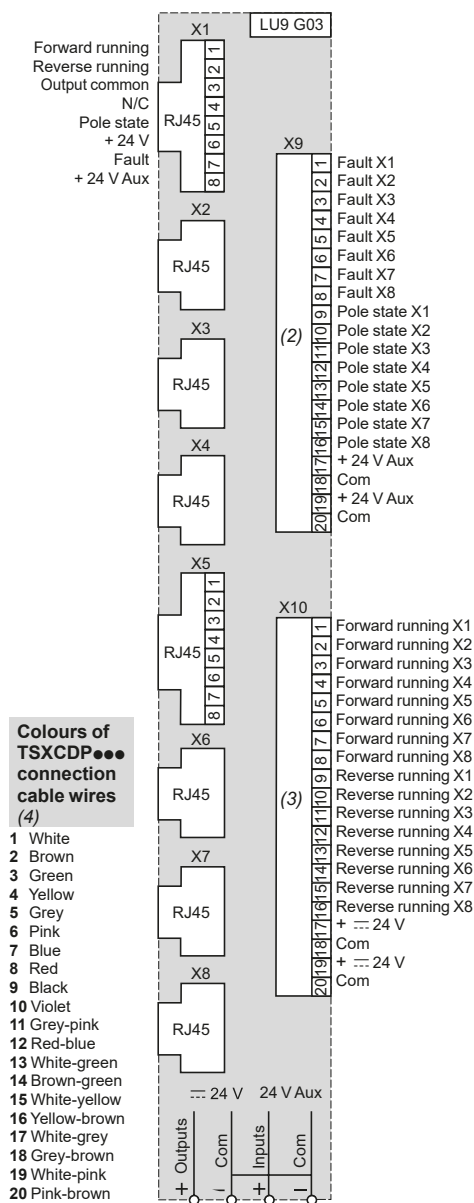
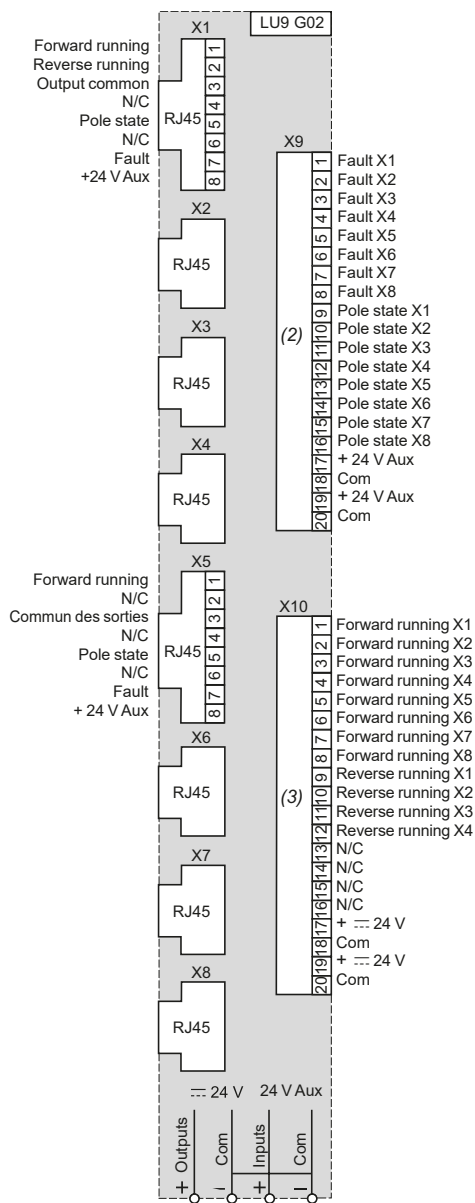
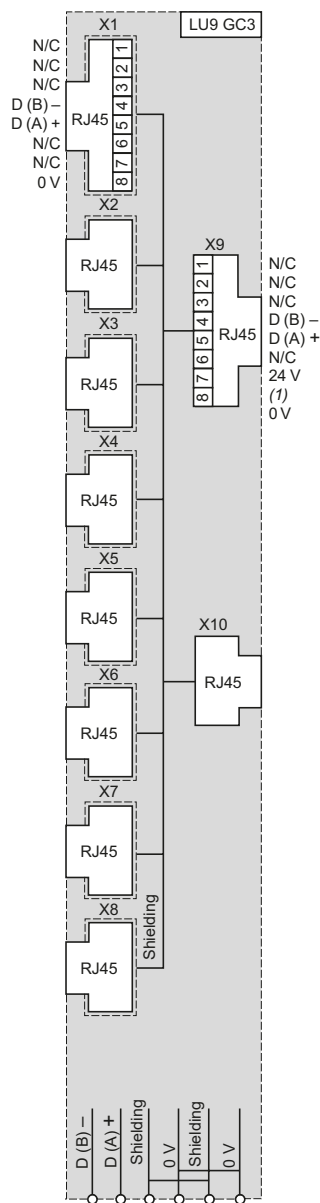
Communication modules (continued)

Wiring hub and splitter boxes

Modbus hub LU9GC3

Parallel wiring splitter box LU9G02

Parallel wiring splitter box LU9G03



Colours of TSXCDP... connection cable wires (4)

- 1 White
- 2 Brown
- 3 Green
- 4 Yellow
- 5 Grey
- 6 Pink
- 7 Blue
- 8 Red
- 9 Black
- 10 Violet
- 11 Grey-pink
- 12 Red-blue
- 13 White-green
- 14 Brown-green
- 15 White-yellow
- 16 Yellow-brown
- 17 White-grey
- 18 Grey-brown
- 19 White-pink
- 20 Pink-brown

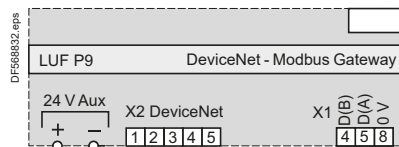
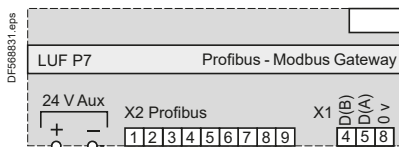
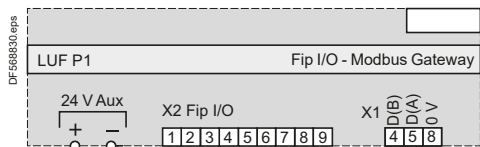
- (1) Not connected on connectors X1 to X8. Only present on RJ45 IN and OUT connectors.
 (2) 20-way HE10 input connector.
 (3) 20-way HE10 output connector.
 (4) Wire colours and corresponding HE10 connector pin numbers.

Gateways

LUF P1

LUF P7

LUF P9



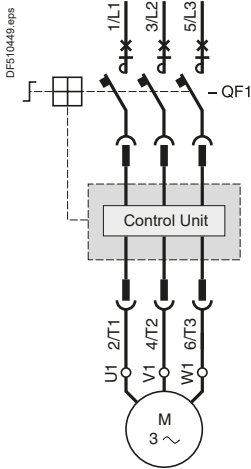
References: pages A4/20 and A4/30
 Dimensions: pages A4/63 and A4/70

TeSys Control

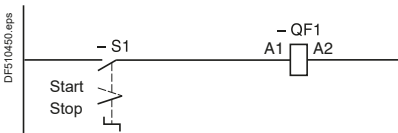
Ultra motor starters - Non-reversing basic applications

Schemes

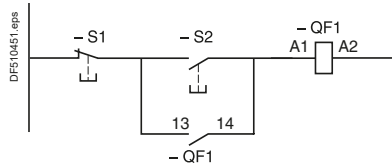
Non-reversing starter-controllers LUB



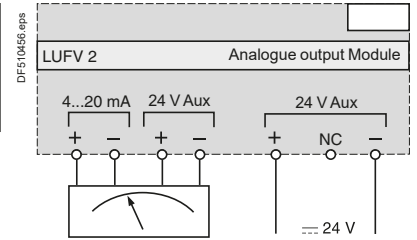
2-wire control via 2-position switch



3-wire control, pulsed start with maintaining contact



Connection of a motor load indicator module LUFV2

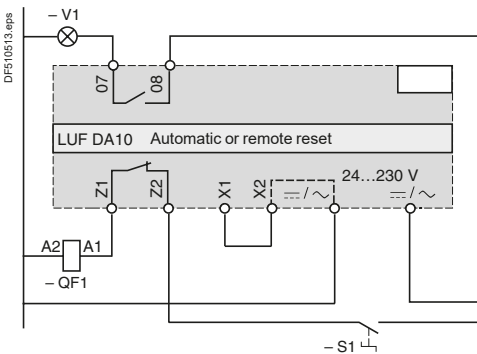


Ultra motor starters

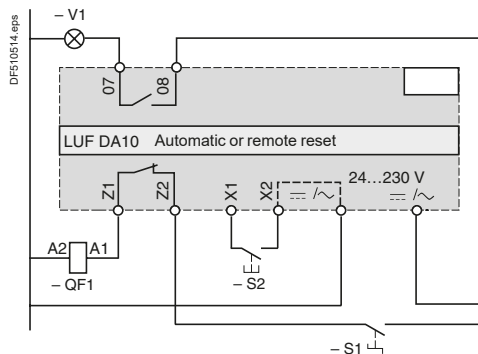
Ref.

Connection of thermal overload fault signalling modules LUFDA10

Automatic reset

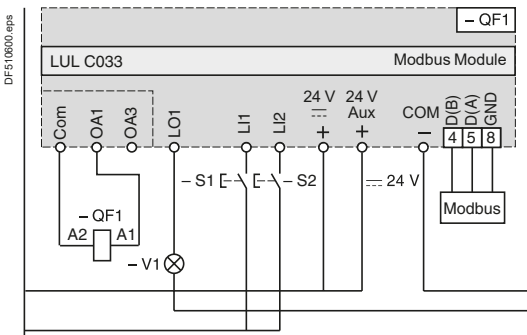


Remote reset



Control via Modbus communication module LULC033

Without pre-wired coil connection



References:
pages A4/10 to A4/14

TeSys Control

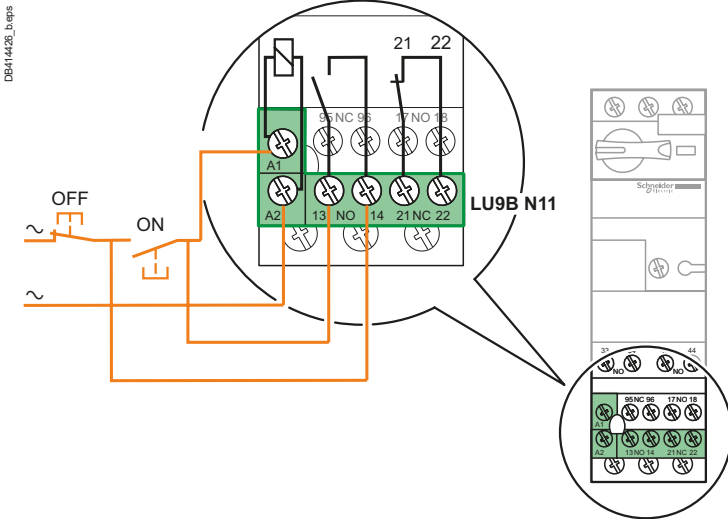
Ultra motor starters - Non-reversing basic applications

Schemes

Standard or advanced power base

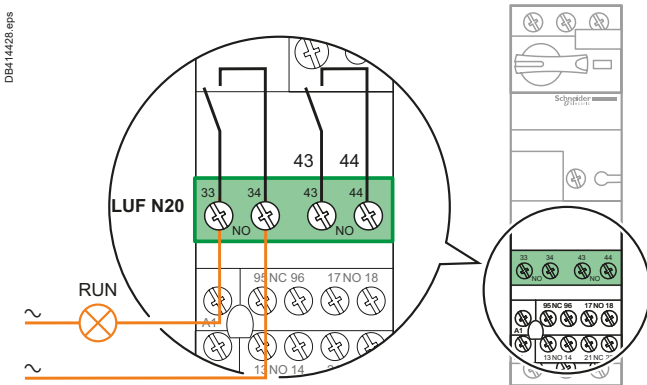
ON/OFF control (1 direction of rotation)

Push buttons wiring

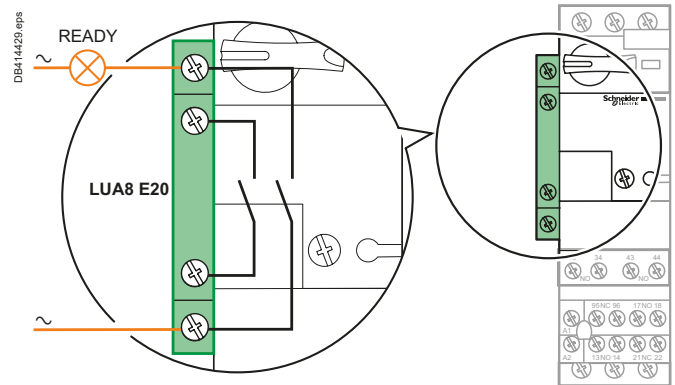


ON indication

"Motor RUN" indicator wiring

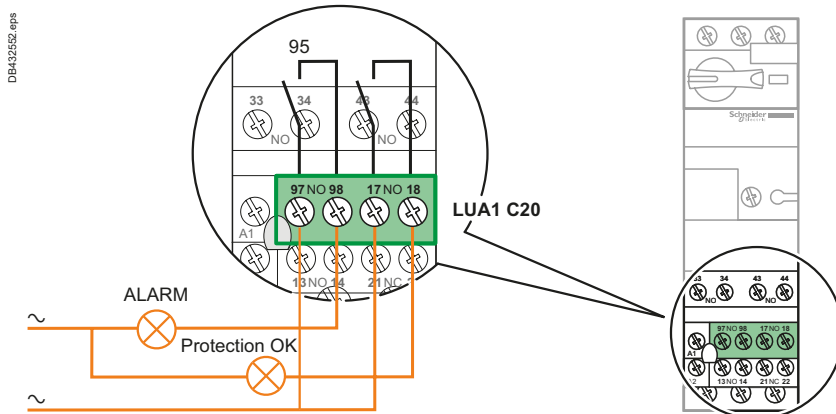


"Motor starter READY" indicator wiring



ALARM indication

Protection device status indicator wiring

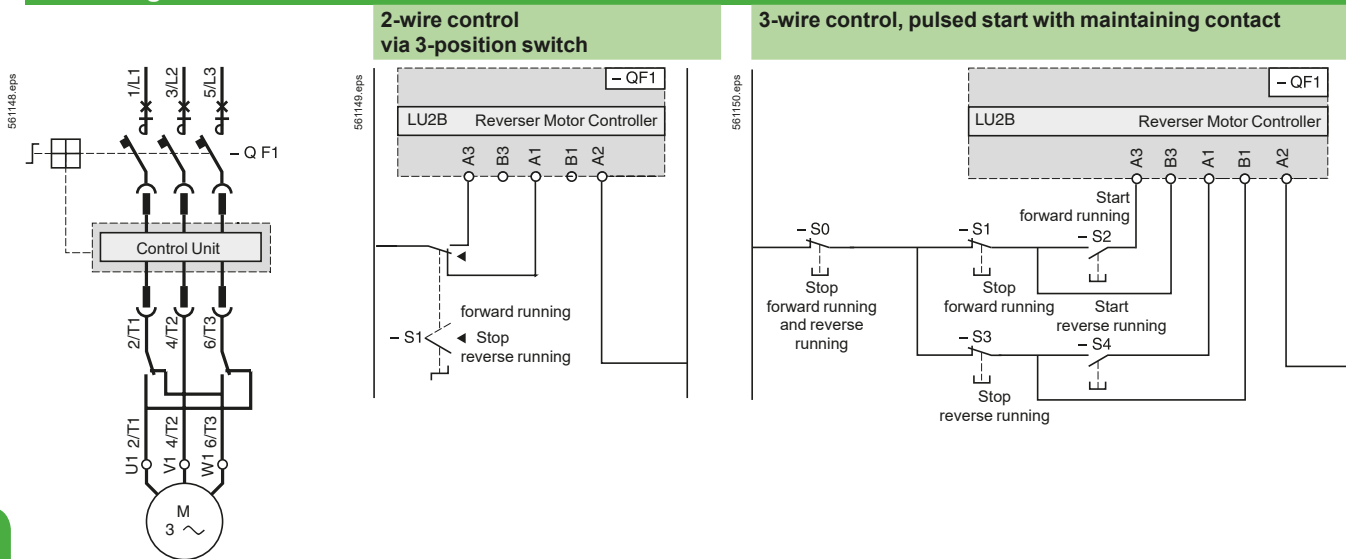


TeSys Control

Ultra motor starters - Reversing basic applications

Schemes

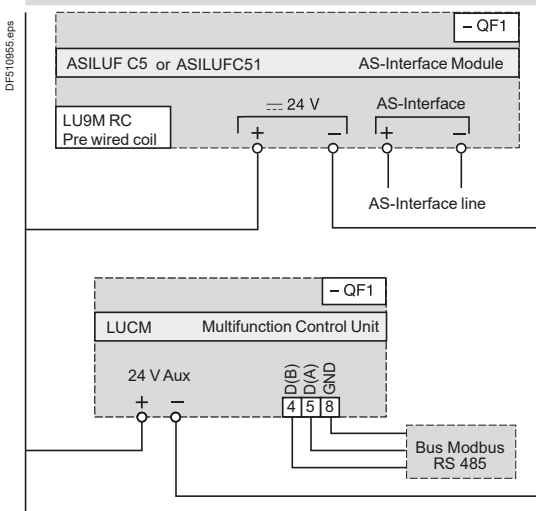
Reversing starter-controllers LUB



Ultra motor starters

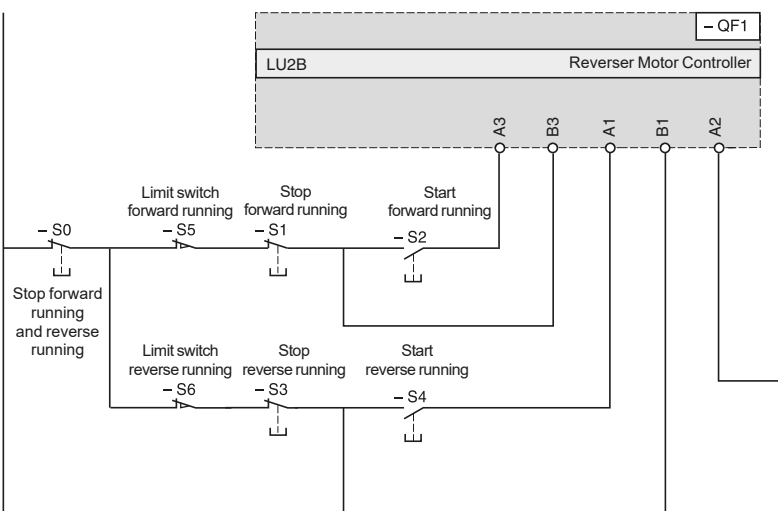
Control by communication modules ASILUFC5 and ASILUFC51

With pre-wired coil connection LU9MRC
With multifunction control unit LUCM



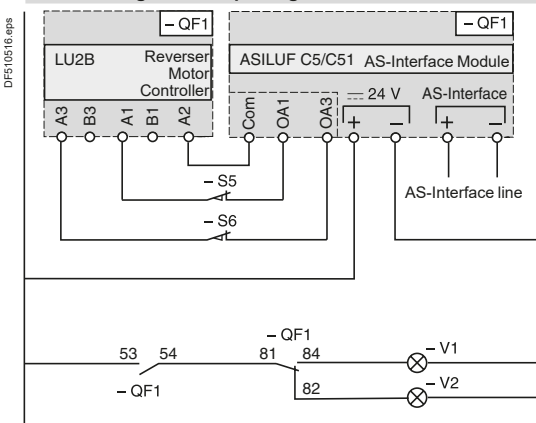
Ref.

3-wire control, pulsed start with maintaining contact and limit switches



Control by communication modules ASILUFC5 and ASILUFC51

Without pre-wired coil connection
With running direction pilot lights and limit switches

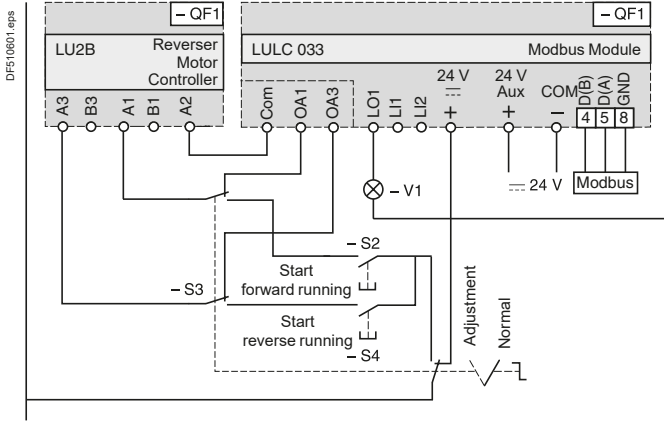


References:
pages A4/10 and A4/24

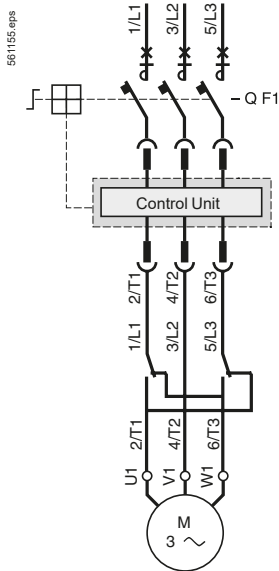
Reversing starter controllers LU2B (continued)

Control via Modbus communication module LULC033

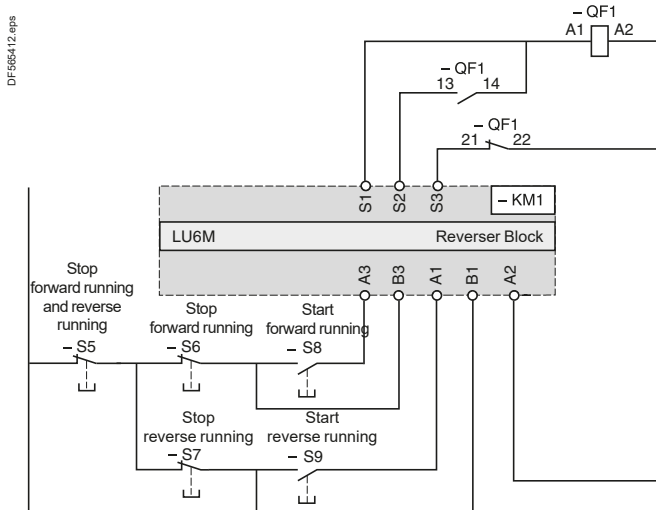
Without pre-wired coil connection. With local control



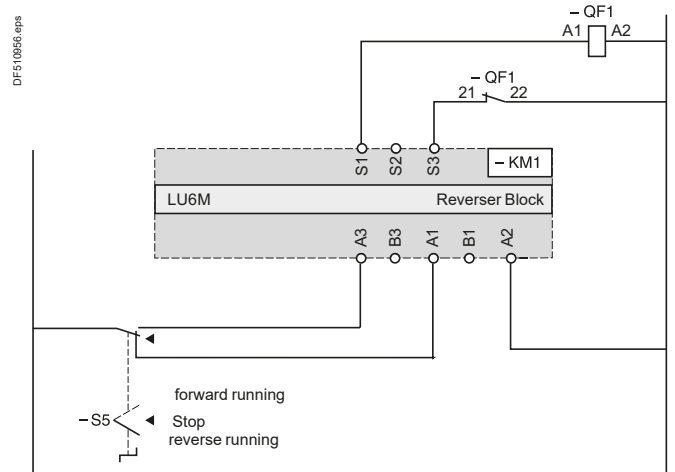
Reversing starter-controllers LUB + LU6M



3-wire control, pulsed start with maintaining contact



2-wire control via 3-position switch



TeSys Control

Ultra motor starters - Reversing basic applications

Schemes

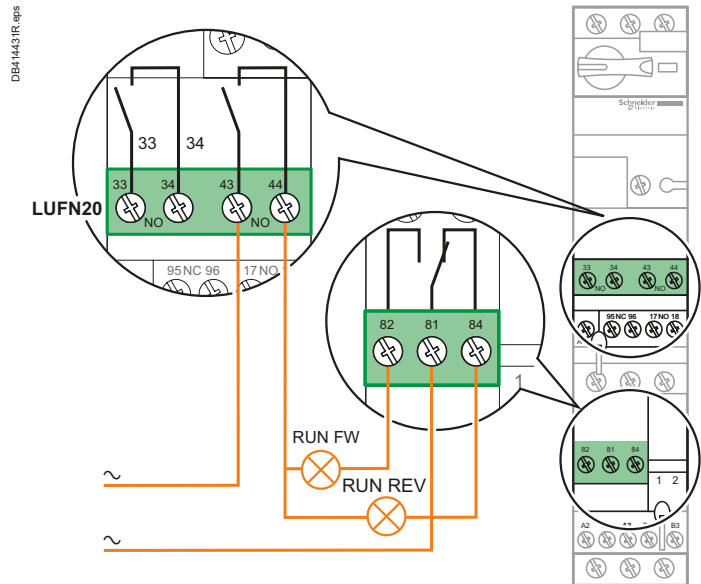
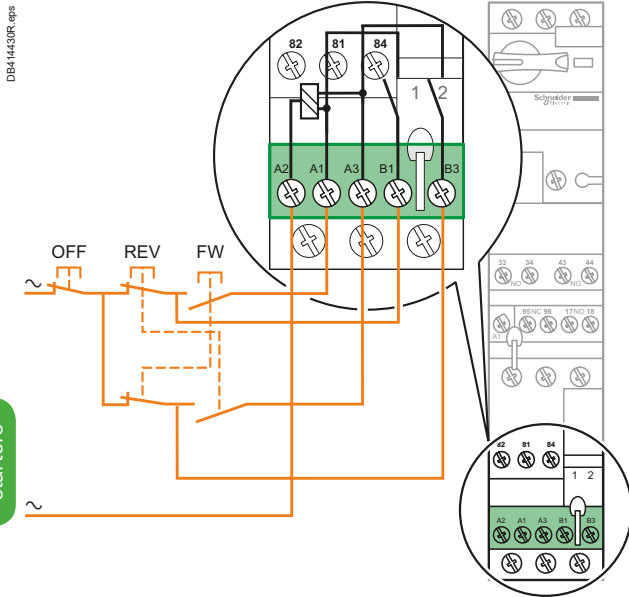
Power base with vertical mounting reverser block

FW/REV/OFF control (2 directions of rotation)

Push buttons wiring

FW/REV control

FW, REV indicators wiring



TeSys Control

Altistart U01 Soft starter

Characteristics

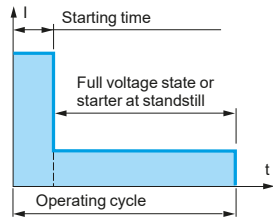
Ultra motor starters

Ref.



| Environmental characteristics | | ATSU01N2●●LT | |
|--|--|---|--|
| Type of starter | | ATSU01N2●●LT | |
| Conformity to standards | | Altistart U01 electronic starters have been developed to conform to the strictest international standards and the recommendations relating to electrical industrial control devices (IEC, EN), in particular standard IEC/EN 60947-4-2. | |
| Electromagnetic compatibility EMC | | CISPR 11 level B, IEC 60947-4-2, level B | |
| Conducted and radiated emissions | | CISPR 11 level B, IEC 60947-4-2, level B | |
| Harmonics | | IEC 1000-3-2, IEC 1000-3-4 | |
| EMC immunity | | EN 50082-2, EN 50082-1 | |
| Electrostatic discharge | | IEC 61000-4-2 level 3 | |
| Immunity to radiated radio-electrical interference | | IEC 61000-4-3 level 3 | |
| Immunity to electrical transients | | IEC 61000-4-4 level 4 | |
| Voltage/current impulse | | IEC 61000-4-5 level 3 | |
| Conducted and radiated emissions | | IEC 61000-4-6 level 3 | |
| Immunity to conducted interference caused by radio-electrical fields | | IEC 61000-4-11 | |
| Damped oscillating waves | | IEC 61000-4-12 level 3 | |
| CE marking | | The starters carry CE marking in accordance with the European low voltage directives IEC/EN 60947-4-2. | |
| Product certifications | | UL, CSA, C-Tick and CCC | |
| Degree of protection | | IP 20 | |
| Degree of pollution | | 2 conforming to IEC/EN 60947-4-2 | |
| Vibration resistance | | 1.5 mm peak to peak from 3 to 13 Hz, 1 gn from 13 to 150 Hz, conforming to IEC/EN 60068-2-6 | |
| Shock resistance | | 15 gn for 11 ms conforming to IEC/EN 60068-2-27 | |
| Relative humidity | | 5...95 % without condensation or dripping water conforming to IEC 60068-2-3 | |
| Ambient temperature around the unit | | Storage | °C -25...+70 conforming to IEC/EN 60947-4-2 |
| | | Operation | °C -10...+40 without derating, up to 50°C with current derating of 2 % per °C above 40°C |
| Maximum operating altitude | | m 1000 without derating (above this, derate the current by 2.2 % per additional 100 m) | |
| Operating position | | 10° 10° | |
| Maximum permanent angle in relation to the normal vertical mounting position | | | |

| Electrical characteristics | | ATSU01N2●●LT | | | | | | |
|-----------------------------------|--|---|---|----------|--------------|----------------|----------|-------|
| Type of starter | | ATSU01N2●●LT | | | | | | |
| Category of use | | Conforming to IEC 60947-4-2 | | | | | | |
| Rated operating voltage | | 3-phase ~ voltage | | | | | | |
| | | V | 200 - 10 % to 480 + 10 % | | | | | |
| Frequency | | Hz | 50 - 5 % to 60 + 5 % | | | | | |
| Output voltage | | Maximum 3-phase voltage equal to line supply voltage | | | | | | |
| Control supply voltage | | 24 V ~, 100 mA ±10 % | | | | | | |
| Rated operating current | | A | 6...32 | | | | | |
| Adjustable starting time | | s | 1...10 | | | | | |
| Adjustable deceleration time | | s | 1...10 | | | | | |
| Starting torque | | % | 30... 80 % of DOL motor starting torque | | | | | |
| Type of starter | | ATSU | 01N206LT | 01N209LT | 01N212LT | 01N222LT | 01N232LT | |
| Control power supply consumption | | | 24 V ~, 65 mA | | | 24 V ~, 100 mA | | |
| Power dissipated | | At full load at end of starting | W | 1.5 | 1.5 | 1.5 | 2.5 | 2.5 |
| | | In transient state at 5 times the rated operating current | W | 61.5 | 91.5 | 121.5 | 222.5 | 322.5 |
| Type of starter | | ATSU01N206LT to ATSU01N222LT | | | ATSU01N232LT | | | |
| Use | | | | | | | | |
| Starting time | | s | 1 | 5 | 10 | 1 | 5 | 10 |
| Maximum number of cycles per hour | | | 100 | 20 | 10 | 50 | 10 | 5 |



TeSys Control

Altistart U01 Soft starter

Characteristics

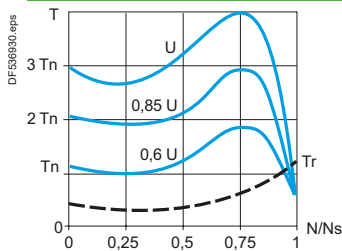
Electrical characteristics (continued)

| | | |
|--|-------------------------|---|
| Logic input power supply (electrically isolated between power and control) + 24 V, COM | | 24 V \pm 10 % Isolated Max. current 100 mA |
| Logic inputs LI1, LI2, BOOST Stop, run and boost on start-up functions | | Logic inputs with impedance 27 k Ω ; 24 V power supply (U max 40 V) Max. current 8 mA State 0 if U < 5 V and I < 0.2 mA State 1 if U > 13 V and I > 0.5 mA |
| Logic output LO1 End of starting signal | | Open collector logic output: External 24 V power supply (minimum 6 V, maximum 30 V) Max. current 200 mA |
| Relay output R1A R1C | | Normally open (N/O) contact Minimum switching capacity: 10 mA for 6 V --- Maximum switching capacity on inductive load ($\cos \varphi = 0.5$ and L/R = 20 ms): 2 A for 250 V \sim or 30 V --- (AC-15) Maximum operating voltage 440 V |
| LED signalling | Green LED Yellow LED | Starter powered up Nominal voltage reached |

Connections (maximum connection capacity and tightening torque)

| Power circuit | | | Connection to \varnothing 4 mm screw clamps | |
|---------------------------------|--------------|-----------------|---|--------|
| Flexible wire without cable end | 1 conductor | mm ² | 1.5...10 | 8 AWG |
| | 2 conductors | mm ² | 1.5...6 | 10 AWG |
| Flexible wire with cable end | 1 conductor | mm ² | 1...6 | 10 AWG |
| | 2 conductors | mm ² | 1...6 | 10 AWG |
| Rigid wire | 1 conductor | mm ² | 1...10 | 8 AWG |
| | 2 conductors | mm ² | 1...6 | 10 AWG |
| Tightening torque | | N.m | 1.9...2.5 | |
| Control circuit | | | Screw connector | |
| Flexible wire without cable end | 1 conductor | mm ² | 0.5...2.5 | 14 AWG |
| | 2 conductors | mm ² | 0.5...1.5 | 16 AWG |
| Flexible wire with cable end | 1 conductor | mm ² | 0.5...1.5 | 16 AWG |
| | 2 conductors | mm ² | 0.5...1.5 | 16 AWG |
| Rigid wire | 1 conductor | mm ² | 0.5...2.5 | 14 AWG |
| | 2 conductors | mm ² | 0.5...1 | 17 AWG |
| Tightening torque | | N.m | 0.5 | |

Torque characteristics (typical curves)



The diagram opposite shows the torque/speed characteristic of a cage motor in relation to the supply voltage. The torque varies in line with the square of the voltage at a fixed frequency. The gradual increase in the voltage prevents the instantaneous current peak on power-up.

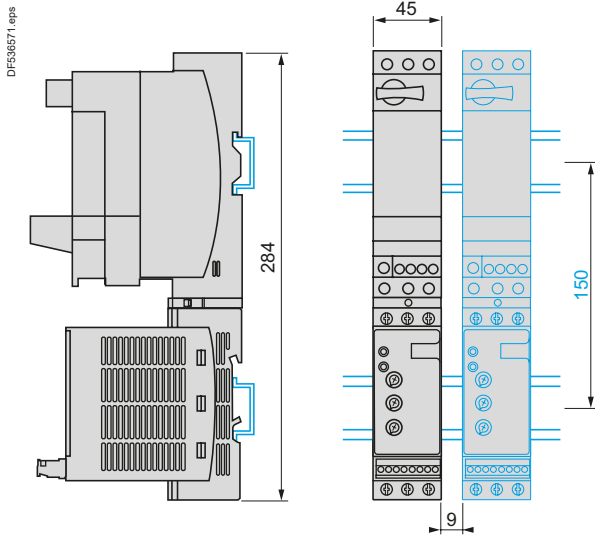


TeSys Control

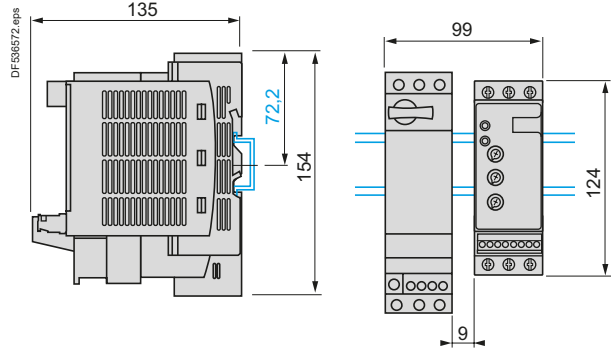
Altistart U01 Soft starter

Dimensions

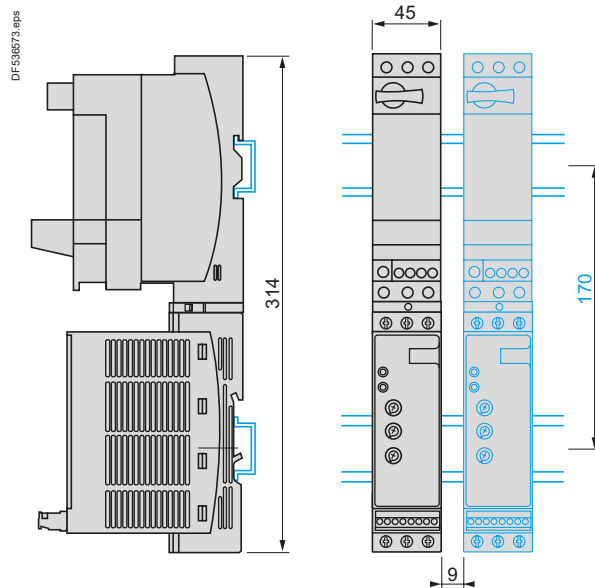
Ultra combination (non-reversing power base) and ATSU01N206LT to ATSU01N212LT
Mounting on \perp (35 mm) rail with VW3G4104 connector



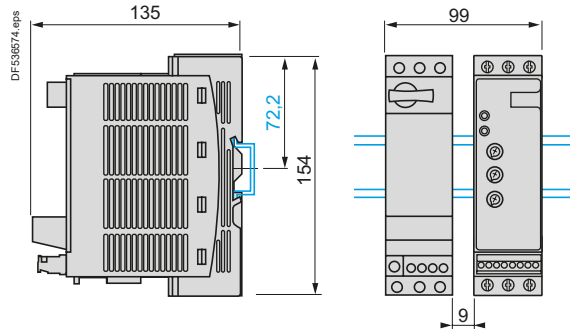
Ultra combination (non-reversing or reversing power base) and ATSU01N206LT to ATSU01N212LT
Side by side mounting



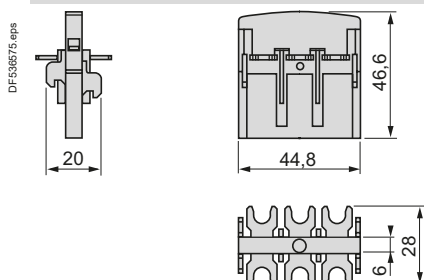
Ultra combination (non-reversing power base) and ATSU01N222LT to ATSU01N232LT
Mounting on \perp (35 mm) rail with VW3G4104 connector



Ultra combination (non-reversing or reversing power base) and ATSU01N222LT to ATSU01N232LT
Side by side mounting



VW3G4104 connector



References:
 page A4/38

Characteristics:
 pages A4/77 and A4/78

Schemes:
 pages A4/80 to A4/83

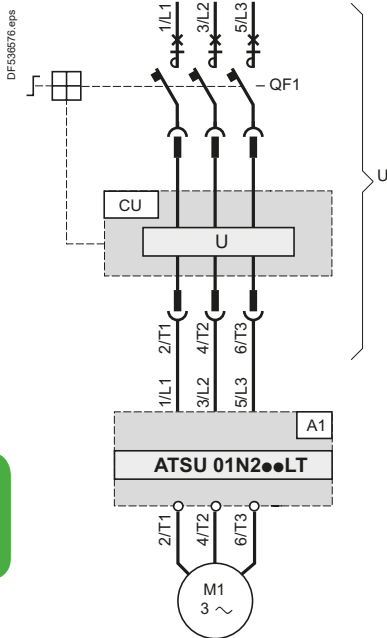
Ultra
 motor
 starters

Ref.

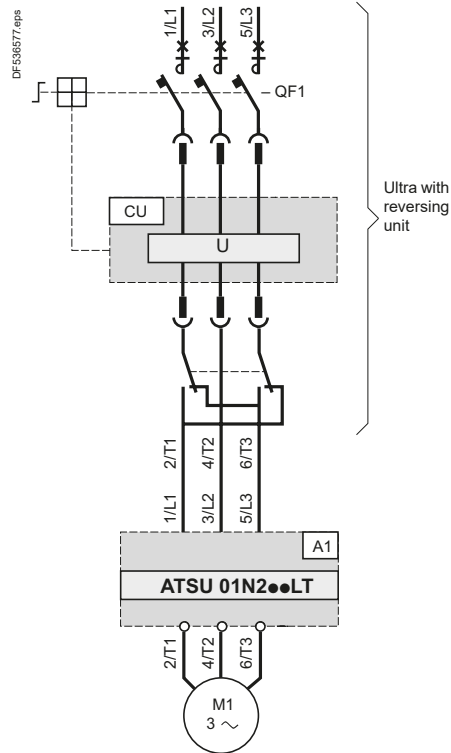


ATSU01N2●●LT soft start/soft stop units

Power wiring



Power wiring with reversing unit



Ultra motor starters

Ref.



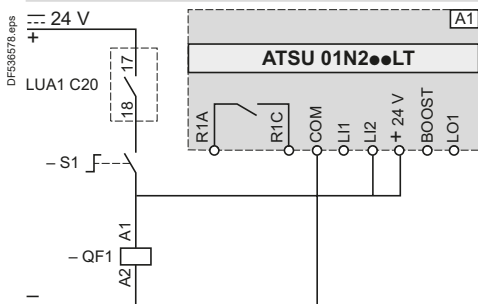
Compatible components

| Code | Description |
|------|---------------------------|
| A1 | Soft start/soft stop unit |
| QF1 | Ultra controller-starter |
| CU | Ultra control unit |

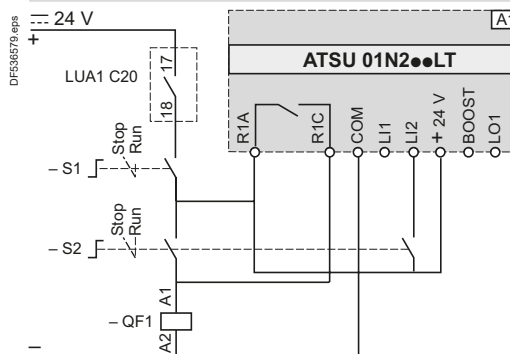
ATSU01N2●●LT soft start/soft stop units (continued)

Automatic 2-wire control

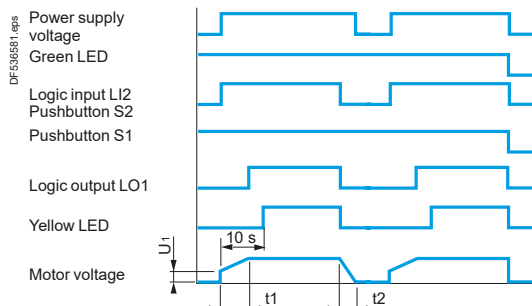
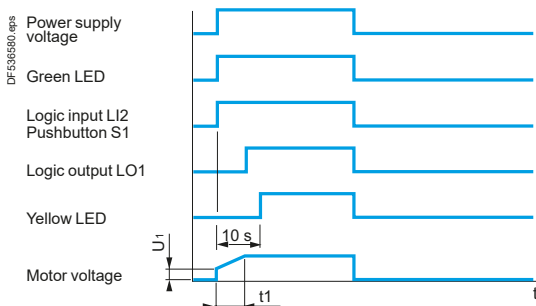
Without deceleration



With and without deceleration

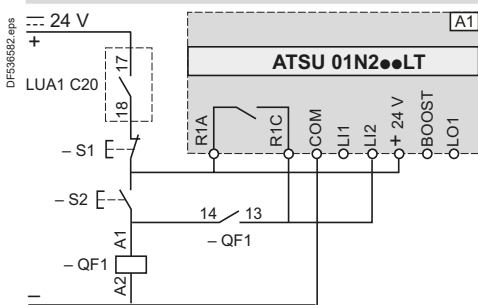


Functional diagrams

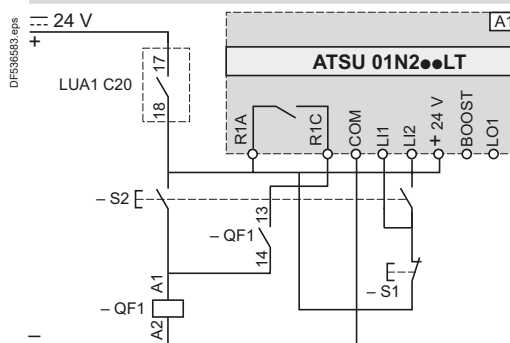


Automatic 3-wire control

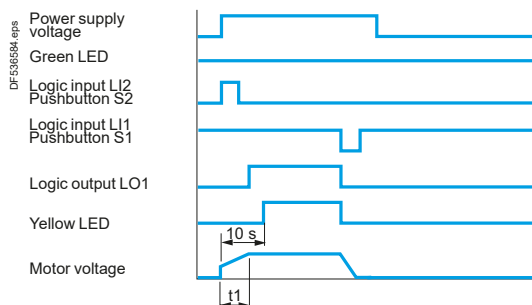
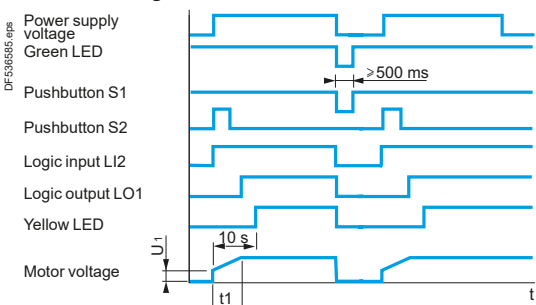
Without deceleration



With deceleration



Functional diagrams

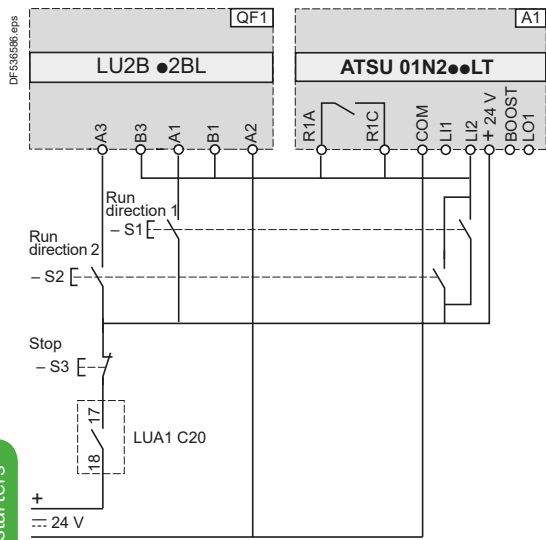


A1: Soft start/soft stop unit
 S1, S2: XB4B or XB5B pushbuttons
 QF1: Ultra controller-starter
 t1: Acceleration time can be controlled by a potentiometer
 t2: Deceleration time can be controlled by a potentiometer
 U_s: Starting time can be controlled by a potentiometer

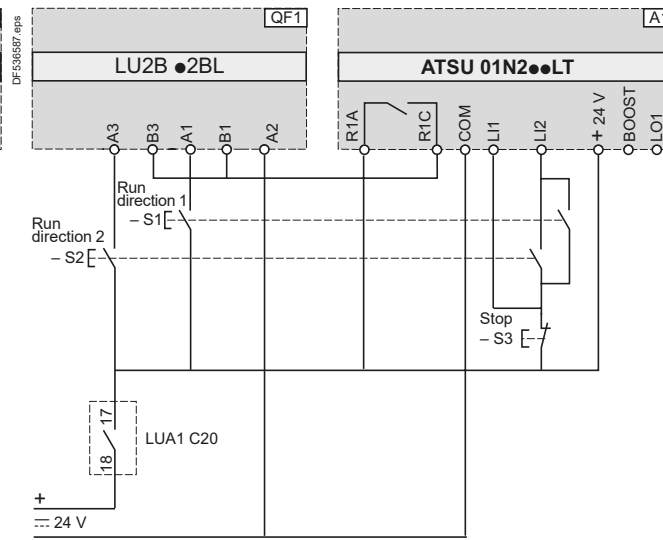
ATSU01N2●●LT soft start/soft stop units (continued)

Automatic 3-wire control, with reversing unit

Without deceleration



With deceleration



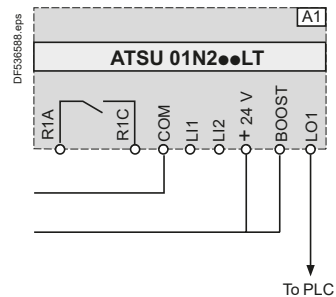
Ultra motor starters

Ref.

QF1: Ultra controller-starter with reversing unit
 A1: Soft start/soft stop unit
 S1, S2, S3: XB4B or XB5B pushbuttons
 S3: minimum depression time 500 ms

QF1: Ultra controller-starter with reversing unit
 A1: Soft start/soft stop unit
 S1, S2, S3: XB4B or XB5B pushbuttons

Boost on starting and end of starting signal

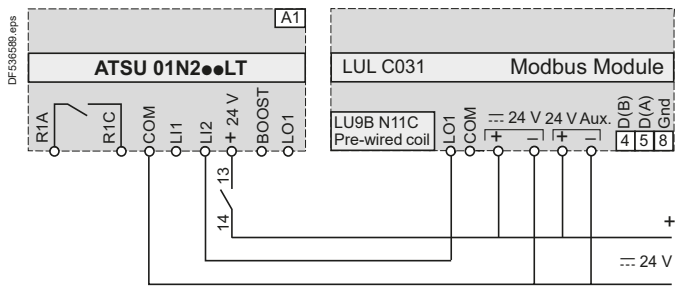


A1: Soft start/soft stop unit

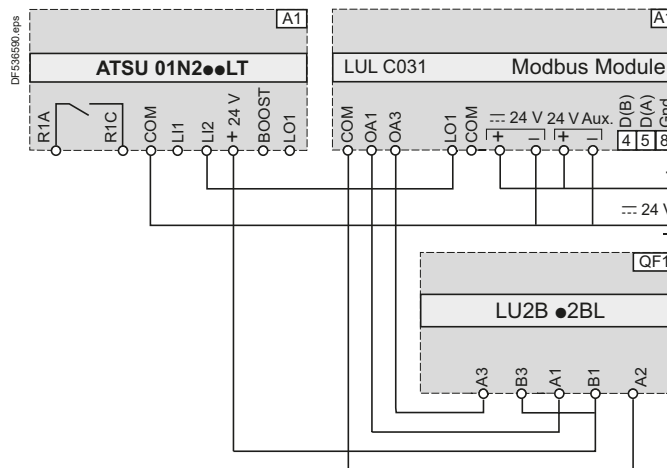
ATSU01N2●●LT soft start/soft stop units (continued)

Automatic control with Modbus communication module, with and without deceleration

Without reversing unit



With reversing unit



| Function | Register | Bit | Value |
|---|----------|-----|-------|
| Powering down U and ATSU | | | |
| - | 704 | 0 | 0 |
| Automatic control without deceleration | | | |
| Run | 700 | 0 | 1 |
| Stop | 704 | 0 | 0 |
| Automatic control with deceleration | | | |
| Run | 700 | 0 | 1 |
| Soft stop | 700 | 0 | 0 |

| Function | Register | Bit | Value |
|---|----------|-----|-------|
| Powering up U and ATSU | | | |
| Forward | 704 | 0 | 1 |
| Reverse | 704 | 1 | 1 |
| Powering down U and ATSU | | | |
| Forward | 704 | 0 | 0 |
| Reverse | 704 | 1 | 0 |
| Automatic control without deceleration | | | |
| Run | 700 | 0 | 1 |
| Stop forward | 704 | 0 | 0 |
| Stop reverse | 704 | 1 | 0 |
| Automatic control with deceleration (forward or reverse) | | | |
| Run | 700 | 0 | 1 |
| Soft stop | 700 | 0 | 0 |

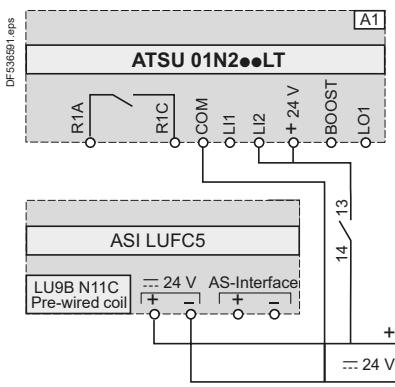
A1: Soft start/soft stop unit

A1: Soft start/soft stop unit

QF1: Ultra controller-starter with reversing unit

Automatic control with AS-Interface communication module, without deceleration

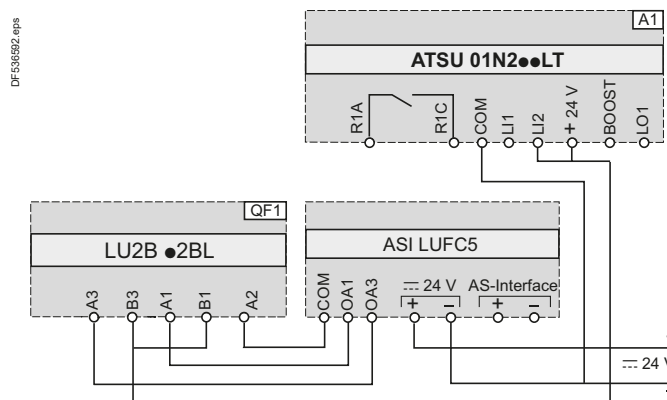
Without reversing unit



| Function | Bit | Value |
|--|-----|-------|
| Power-up and automatic control without deceleration | | |
| Run | D0 | 1 |
| Stop | D0 | 0 |

A1: Soft start/soft stop unit

With reversing unit



| Function | Bit | Value |
|--|-----|-------|
| Power-up and automatic control without deceleration | | |
| Run forward | D0 | 1 |
| Stop | D0 | 0 |
| Run reverse | D1 | 1 |
| Stop | D1 | 0 |

A1: Soft start/soft stop unit








QF1: Ultra controller-starter with reversing unit

Integral motor starters

Page

Introduction

A5/2

| Type of product | Direct | Reversing | Range | | |
|--|--------|-----------|-------------|---|---|
| 3 pole Integral motor starter | ✓ | ✓ | Up to 33 kW |  |  |
| 3 pole Integral motor starter for resistive loads – AC-1 | ✓ | | Up to 63 kW | |  |
| Add-on blocks | | | |  |  |
| Accessories and spare parts | | | |  |  |

Technical Data for Designers

A5/17

Integral
motor
starters

TeSys Control

Integral motor starters

Introduction

PB121271.eps



Ref.



PB121272.eps



Integral motor starters

Integral motor starter: a high performance concept for reliability of operation

Integral motor starters combine all the functions of a power switching assembly up to 63 A in a single compact device, with performance equivalent to that of the best separate specialist devices.

They conform to the main standards currently in force, in particular IEC 60947-1, IEC 60947-2, IEC 60947-3, IEC 60947-4-1 and IEC 60947-6-2 (welding of power poles impossible), as well as to international approvals UL, CSA..., and the European directives.

The integral range ensures reliability of operation up to 63 A. In addition to safety of operation, integral has numerous other functions: increased protection, communication, remote control, fault identification, isolation, padlocking.

Functions performed by Integral motor starter units

The equipment in a power switching circuit must perform 4 main functions:

- power switching,
- isolation,
- overload protection,
- short-circuit protection.

These functions are traditionally performed by separate devices which must be combined to form a motor starter assembly, the most common being:

- fuses + contactor + thermal overload relay,
- circuit breaker + contactor + thermal overload relay.

Power switching

Contactor (for automatic and remote control)

- Operational power for use in category AC-43:
 - up to 30 kW at 400/415 V 50 Hz,
 - up to 33 kW at 440/415 V 50 Hz.
- Electrical life in number of operating cycles, in category AC-43, at 415 V and at rated power: 1.2 million.
- Mechanical life in number of operating cycles: 5 million.

Reversing pairs

Two 3-pole contactors, horizontally mounted:

- mechanically interlocked.

Can be fitted with the same protection modules as Integral motor starter.

TeSys Control

Integral motor starters

Introduction



Functions performed by Integral motor starter units (continued)

Isolation

Isolation conforming to IEC 60947

Integral motor starters provide isolation and padlocking functions conforming to standards IEC 60947.

In addition, Integral "LD4" motor starters and "LD5" reversing motor starters incorporate specific poles for control testing and padlocking.

Overload protection

Thermal-magnetic protection module (for protection against overload and overcurrent)

A range of interchangeable modules allows the equipment to be adapted to suit:

- the application:
 - motors,
 - frequent starting motors,
 - distribution circuits.

Short-circuit protection

High breaking capacity current limiting circuit breaker

For short-circuit protection.

High breaking capacity with short-circuit limited by ultra-fast tripping.

Possibility of increasing the breaking capacity of the integral unit by adding a current limiter (**LA9LB920**).

The current limiter is fitted upstream of the integral unit.
Several integral units may be fitted downstream of the current limiter (I_{th} = 63 A, I_e = 32 A).

Signalling and attachments

These devices provide comprehensive local signalling:

- pole position indicator,
- different signalling for "overload" and "short-circuit".

They also allow dialogue with the automated control system by means of numerous add-on blocks:

- auxiliary contact and signalling blocks,
- remote electrical reset device,
- undervoltage and shunt trips,
- control circuit switching,
- etc.

Simple fixing and cabling methods

Integral contractor breakers and reversing motor starters fit onto 75 mm $\bar{_}$ rails using a separate mounting plate.

Integral units can also be mounted on:

- panels,
- pre-slotted mounting plates type AM1 P,
- 2 x 35 mm $\bar{_}$ rails using sliding clip nuts,
- CMD prefabricated plug-in busbar trunking (providing an economical assembly, combining safety and simplicity of use),
- AK5 panel busbar systems.

TeSys Control

Integral motor starters for AC-3 applications

Product references



LD1LD030●

3-pole power bases for AC-3 ⁽¹⁾

Without control test function, with padlocking facility

| Standard power ratings of 3-phase motors 50/60 Hz in AC-43 | | | | | Operational current | Breaking capacity (I _q) for U _e ≤ 415 V | Basic reference ⁽³⁾ To be completed by adding the control circuit voltage code ⁽²⁾ | Weight |
|--|----------|-------|-------|-------|---------------------|--|---|--------|
| 220 V | 400 V | 440 V | 500 V | 660 V | | | | |
| kW | kW | kW | kW | kW | A | kA | | kg |
| Black knob | | | | | | | | |
| 15 | 30 33 | 33 | 37 | 55 | 63 | 50 | LD1LD030● | 3.700 |

With control test function and padlocking facility

| Standard power ratings of 3-phase motors 50/60 Hz in AC-43 | | | | | Operational current | Breaking capacity (I _q) for U _e ≤ 415 V | Basic reference ⁽³⁾ To be completed by adding the control circuit voltage code ⁽²⁾ | Weight |
|--|----------|-------|-------|-------|---------------------|--|---|--------|
| 220 V | 400 V | 440 V | 500 V | 660 V | | | | |
| kW | kW | kW | kW | kW | A | kA | | kg |
| Black knob (CNOMO, VDE 0113) | | | | | | | | |
| 15 | 30 33 | 33 | 37 | 55 | 63 | 50 | LD4LD130● | 3.800 |

Red knob on yellow background (CNOMO) Emergency Stop

| | | | | | | | | |
|----|----------|----|----|----|----|----|------------------|-------|
| 15 | 30 33 | 33 | 37 | 55 | 63 | 50 | LD4LD030● | 3.800 |
|----|----------|----|----|----|----|----|------------------|-------|

3-pole reversing power bases ⁽¹⁾

With control test function and padlocking facility

| Standard power ratings of 3-phase motors 50/60 Hz in AC-43 | | | | | Operational current | Breaking capacity (I _q) for U _e ≤ 415 V | Basic reference ⁽³⁾ To be completed by adding the control circuit voltage code ⁽²⁾ | Weight |
|---|----------|-------|-------|-------|---------------------|--|---|--------|
| 220 V | 400 V | 440 V | 500 V | 660 V | | | | |
| kW | kW | kW | kW | kW | A | kA | | kg |
| Red knob on yellow background (CNOMO) Emergency Stop | | | | | | | | |
| 15 | 30 33 | 33 | 37 | 55 | 63 | 50 | LD5LD030● | 7.600 |

⁽¹⁾ To be completed with a protection module (to be ordered separately).

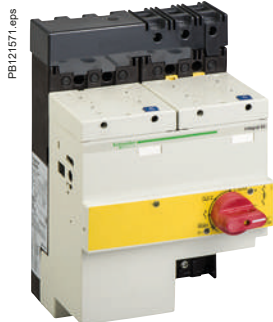
⁽²⁾ Standard control circuit voltages, please check the availability of your variant in the index page A5/16. The SEARCH function of your viewer can be used:

| Volts | 24 | 36 | 42 | 48 | 110 | 120 | 220 | 230 | 240 | 380 400 | 415 | 440 | 480 | 500 | 600 | 660 |
|------------------|----|----|----|----|-----|-----|-----|-----|-----|------------|-----|-----|-----|-----|-----|-----|
| 50 Hz | B | - | D | E | F | - | M | M | U | Q | N | N | - | S | - | Y |
| 60 Hz | BC | CC | - | CE | K | FC | LC | MC | MC | - | - | UX | Q | - | S | - |
| ☰ ⁽⁴⁾ | BD | - | - | ED | FD | - | - | - | - | - | - | - | - | - | - | - |

⁽³⁾ Variant: UL508 "type E" approved version (SPCD) at 347/600 V; to order, add suffix H5 to the reference.

Example: LD1LD030MH5.

⁽⁴⁾ For use on d.c., the unit is supplied with 1 or 2 converters, including coil suppression devices (2 converters for reversing Integral motor starters).



LD5LD030M

TeSys Control

Integral motor starters for AC-3 applications

Product references

PB 12/273 eps



LB1LD03M●●

| Thermal-magnetic protection modules (compensated and differential for normal starting motors) ⁽¹⁾ | | | | | | | | |
|--|-------|-------|-------|-------|---|---------------------|------------|--------|
| Fixed magnetic protection, set at 15 Irth max, for mounting on Integral motor starter | | | | | | | | |
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-43 | | | | | Thermal setting range (Irth min to Irth max) | Magnetic protection | Reference | Weight |
| 220 V | 400 V | 480 V | 600 V | | | | | |
| 240 V | 415 V | 440 V | 525 V | 690 V | | | | |
| kW | kW | kW | kW | kW | A | A | | kg |
| 9 | 22 | 22 | 25 | 33 | 28...40 | – | LB1LD03P55 | 0.780 |

| Adjustable magnetic protection from 6 to 12 Irth max, for mounting on Integral motor starter | | | | | | | | |
|--|-------|-------|-------|-------|---|---------------------|------------|--------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-43 | | | | | Thermal setting range (Irth min to Irth max) | Magnetic protection | Reference | Weight |
| 220 V | 400 V | 480 V | 600 V | | | | | |
| 240 V | 415 V | 440 V | 525 V | 690 V | | | | |
| kW | kW | kW | kW | kW | A | A | | kg |
| 5.5 | 11 | 11 | 15 | 18.5 | 18...25 | 150...300 | LB1LD03M22 | 0.780 |
| 7.5 | 22 | 22 | 25 | 33 | 23...32 | 190...380 | LB1LD03M53 | 0.780 |
| 9 | 22 | 22 | 25 | 33 | 28...40 | 240...480 | LB1LD03M55 | 0.780 |
| 11 | 25 | 25 | 33 | 45 | 35...50 | 300...600 | LB1LD03M57 | 0.780 |
| 15 | 33 | 33 | 40 | 55 | 45...63 | 380...760 | LB1LD03M61 | 0.780 |

| Magnetic only protection modules (for frequent starting motors) | | | | | | | | |
|--|-------|-------|-------|-------|---------------------|------------|--------|--|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-43 | | | | | Magnetic protection | Reference | Weight | |
| 220 V | 400 V | 480 V | 600 V | | | | | |
| 240 V | 415 V | 440 V | 525 V | 690 V | | | | |
| kW | kW | kW | kW | kW | A | | kg | |
| 3 | 5.5 | 5.5 | 7.5 | 10 | 78...156 | LB6LD03M16 | 0.780 | |
| 5.5 | 11 | 11 | 15 | 18.5 | 150...300 | LB6LD03M22 | 0.780 | |

⁽¹⁾ Protection modules UL and CSA approved.

PB 12/273 eps



LB6LD03M●●



Integral motor starters

TeSys Control

Integral motor starters for AC-1 applications

Product references

PB121271.eps



LD1LD030●



Integral motor starters



LB1LD03L●●

3-pole power bases for AC-1 ⁽¹⁾

Without control test function, with padlocking facility

| Rated thermal current I _{th} θ ≤ 40 °C | Maximum operational current AC-1 θ ≤ 40 °C | Maximum operational voltage | Breaking capacity (I _q) for U _e ≤ 415 V | Number of poles | Basic reference. To be completed by adding the control voltage code ⁽²⁾ | Weight |
|---|--|-----------------------------|--|-----------------|--|--------|
| A | A | V | kA | | | kg |
| Black knob | | | | | | |
| 63 | 63 | 690 | 50 | 3 | LD1LD030● | 3.700 |

With control test function and padlocking facility

| Rated thermal current I _{th} θ ≤ 40 °C | Maximum operational current AC-1 θ ≤ 40 °C | Maximum operational voltage | Breaking capacity (I _q) for U _e ≤ 415 V | Number of poles | Basic reference. To be completed by adding the control voltage code ⁽²⁾ | Weight |
|---|--|-----------------------------|--|-----------------|--|--------|
| A | A | V | kA | | | kg |
| Black knob (CNOMO. VDE0113) | | | | | | |
| 63 | 63 | 690 | 50 | 3 | LD4LD130● | 3.800 |

| | | | | | | |
|--|----|-----|----|---|-----------|-------|
| Red knob on yellow background (CNOMO. VDE0113) Emergency Stop | | | | | | |
| 63 | 63 | 690 | 50 | 3 | LD4LD030● | 3.800 |

Protection modules ^(for customer assembly)

Thermal-magnetic (compensated)

| Thermal setting range (I _{rt} h min./I _{rt} h max.) | Magnetic setting range (3...6 I _{rt} h max) | Number of poles | Number of protected poles | Reference | Weight |
|---|--|-----------------|---------------------------|------------|--------|
| A | A | | | | kg |
| 10...13 | 39...78 | 3 | 3 | LB1LD03L16 | 0.780 |
| 28...40 | 120...240 | 3 | 3 | LB1LD03L55 | 0.780 |
| 35...50 | 150...300 | 3 | 3 | LB1LD03L57 | 0.780 |
| 45...63 | 190...380 | 3 | 3 | LB1LD03L61 | 0.780 |

⁽¹⁾ To be completed with a protection module (to be ordered separately).

⁽²⁾ Standard control circuit voltages, please check the availability of your variant in the index page A5/16. The SEARCH function of your viewer can be used:

| Volts | 24 | 36 | 42 | 48 | 110 | 120 | 220 | 230 | 240 | 380 400 | 415 | 440 | 480 | 500 | 600 | 660 |
|------------------------|----|----|----|----|-----|-----|-----|-----|-----|------------|-----|-----|-----|-----|-----|-----|
| 50 Hz | B | – | D | E | F | – | M | M | U | Q | N | N | – | S | – | Y |
| 60 Hz | BC | CC | – | CE | K | FC | LC | MC | MC | – | – | UX | Q | – | S | – |
| –⁽³⁾ | BD | – | – | ED | FD | – | – | – | – | – | – | – | – | – | – | – |

⁽³⁾ For use on d.c., the unit is supplied with a converter, including coil suppression device.

TeSys Control

Integral motor starters for AC-1 applications

Product references

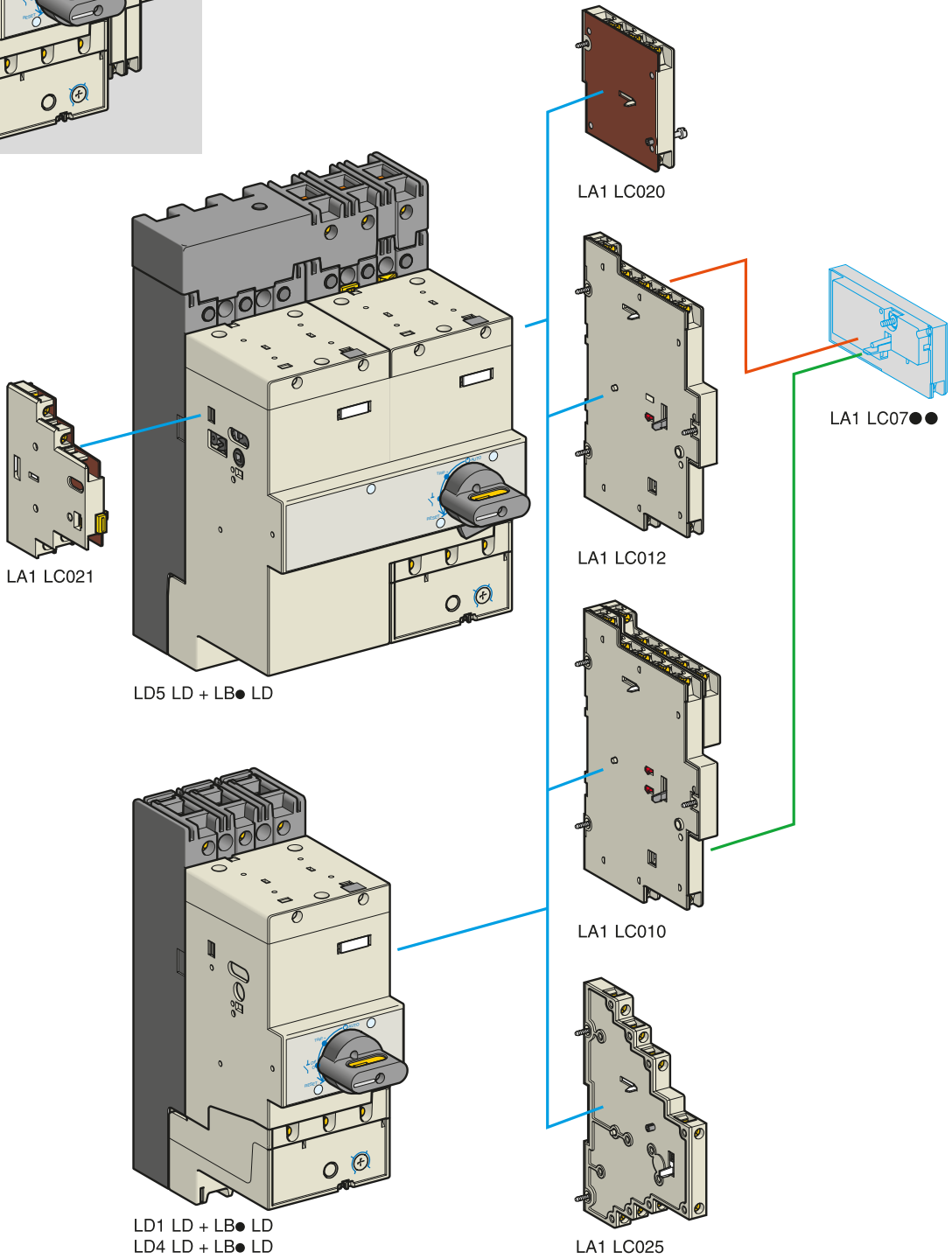
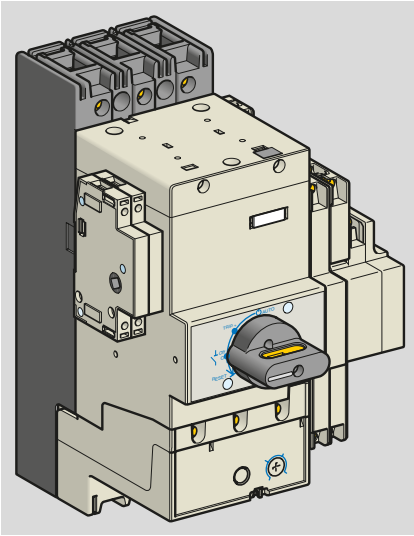
| Selection of Integral starter and protection module for AC-1 | | | |
|--|-----------------|------------------|------------------------|
| Earthing system | Type of circuit | Equipment scheme | Product combinations |
| TNC (Neutral and PE are combined) | 3-pole + PEN | | LD1LD030● + LB1LD03L●● |
| | | | LD4LD130● + LB1LD03L●● |
| | | | LD4LD030● + LB1LD03L●● |
| | | | |




Note: the PEN conductor must not be isolated.

| Earthing system | Type of circuit | Equipment scheme | Product references |
|---------------------------------------|-----------------|------------------|------------------------|
| TNS (Neutral and PE are separated) | 3-pole | | LD1LD030● + LB1LD03L●● |
| | | | LD4LD130● + LB1LD03L●● |
| | | | LD4LD030● + LB1LD03L●● |
| | | | |

Note: all live conductors must be isolated. Neutral protection optional.

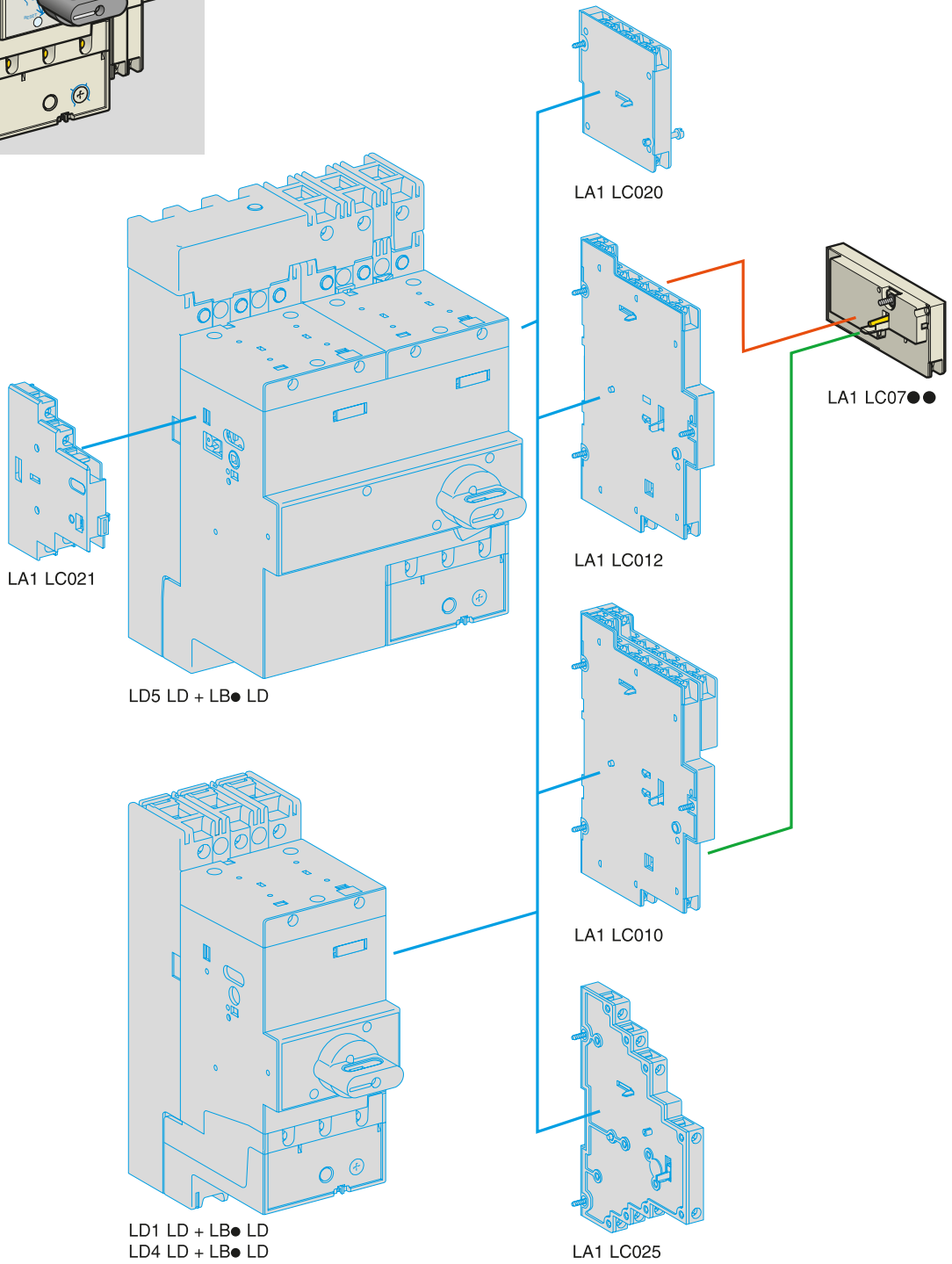
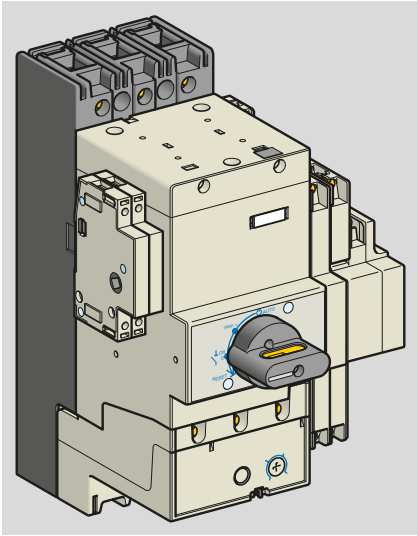




| Instantaneous auxiliary contact blocks (IP 20) ⁽¹⁾ | | | |
|---|---|---|-----------|
| For use on | Type and number of blocks per unit | Composition | Reference |
| | |    | |
| | | N/O N/C C/O | |
| LD1D, LD4 or L5 Mounted on RH side | 1 block of 6 contacts comprising: | | LA1LC010 |
| | ■ 3 signalling contacts "contactor state" | 2 1 - | |
| | ■ 1 signalling contact "control knob in any position other than Auto" | - - 1 | |
| | ■ 1 signalling contact tripped on short-circuit | - - 1 | |
| | 1 block of 5 contacts comprising: | | LA1LC012 |
| | ■ 3 signalling contacts "contactor state" | 2 1 - | |
| | ■ 1 signalling contact tripped on short-circuit | 1 - - | |
| | ■ 1 signalling contact "tripped" | 1 - - | |
| | 1 block of 4 contacts comprising: | | LA1LC025 |
| | ■ 3 signalling contacts "contactor state" | 2 1 - | |
| | ■ 1 signalling contact "tripped", selectable by the user | 1 1 - | |
| | 1 block of 3 signalling contacts "contactor state" | 2 1 - | LA1LC020 |
| LD5 Mounted on LH side | 1 block of 3 signalling contacts "contactor state" | 2 1 - | LA1LB021 |

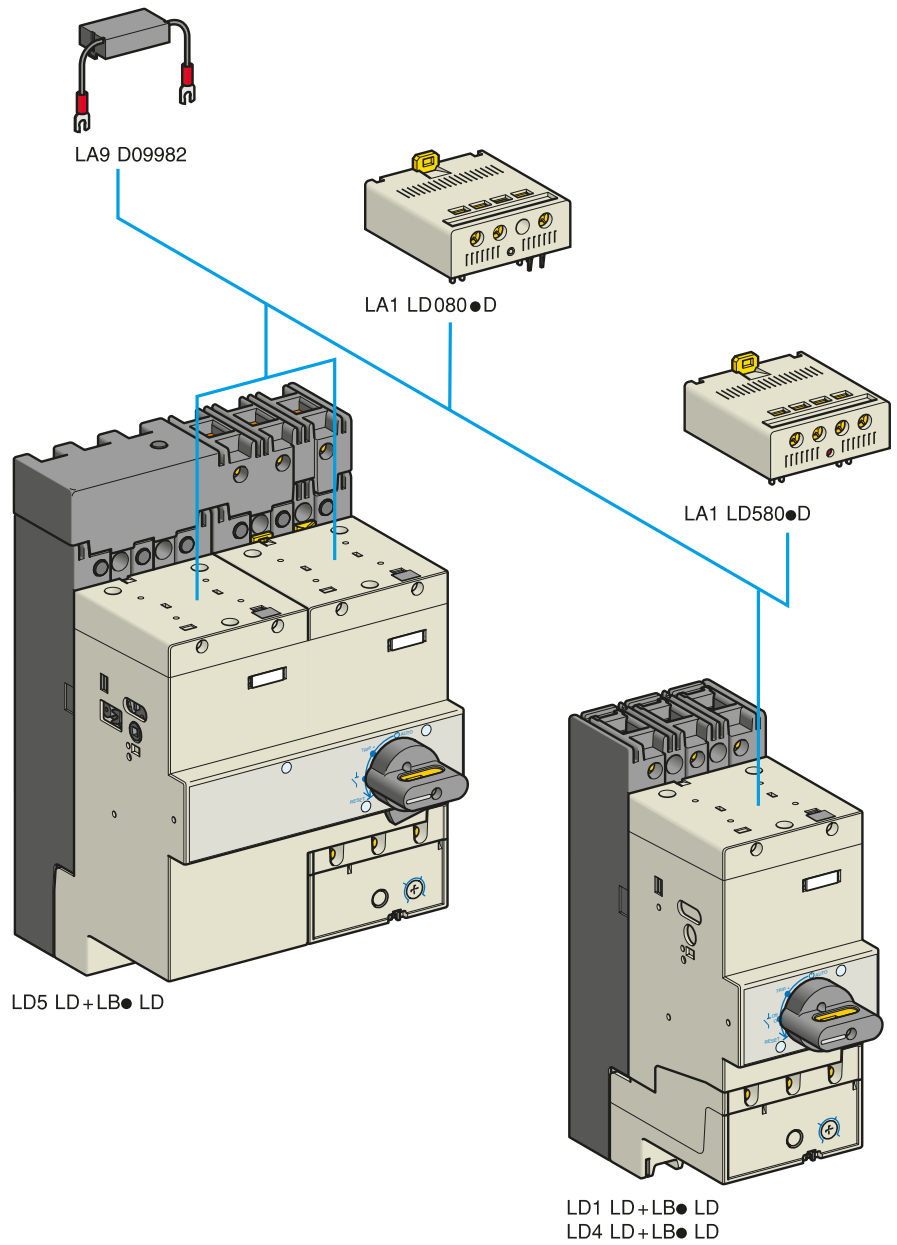
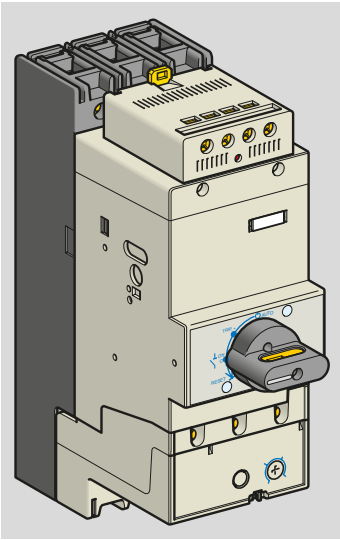
(1) UL and CSA approved.





| Electrical tripping and reset devices | | | | | | | | | |
|---|-------------------------------------|----|------------------|-----|--|-----|---------|-----|-----|
| For use on | Type and number of devices per unit | | | | Basic reference. To be completed by adding the control voltage code ⁽¹⁾ | | | | |
| LD1, LD4 or LD5 fitted with an LA1LC010 or LA1LC012 block | 1 undervoltage trip | | Time delay 0.2 s | | LA1LC070● | | | | |
| | | | Instantaneous | | LA1LC072● | | | | |
| | or 1 shunt trip | | Instantaneous | | LA1LC071● | | | | |
| <p><i>(1) Standard control circuit voltages, please check the availability of your variant in the index page A5/16. The SEARCH function of your viewer can be used:</i></p> | | | | | | | | | |
| Volts | 24 | 48 | 110 | 120 | 220/230 | 240 | 380/400 | 415 | 440 |
| 50 Hz | B | E | F | – | M | U | Q | N | N |
| 60 Hz | B | E | F | F | M | M | Q | – | N |





| Interface modules for coil control by a programmable Logic controller ⁽¹⁾ | | | | |
|--|--------------|------------------------------|--|------------|
| Mounting | Type | Input control voltage --- | Output operational voltage 50/60 Hz | Reference |
| | | V | V | |
| On top of the power base | Relay output | 24 | 24...240 | LA1LD580BD |

| Voltage converters for d.c. control by a PLC | | | |
|--|----------------------|----------------------|------------|
| Each converter is dedicated to a specific coil. The d.c. coil and its voltage converter are automatically delivered with every d.c. power base. | | | |
| Input voltage --- | Consumption (Inrush) | Consumption (Sealed) | Reference |
| V | W | W | |
| 110 | 300 | 8 | LA1LD080FD |

| Suppressor module | | | |
|-------------------|--|---------------------------------|-----------|
| Mounting | Type | Operational voltage 50/60 Hz | Reference |
| | | V | |
| Clip-on | RC circuit (Resistor-Capacitor) ⁽²⁾ | ≤ 250 | LA9D09982 |

⁽¹⁾ For reversing Integral motor starters, order 2 interface modules or 2 voltage converters.

⁽²⁾ An RC circuit provides effective protection for circuits highly sensitive to high frequency interference.
Voltage limited to 3 U_c max. and oscillating frequency limited to 400 Hz max.
Slight increase in drop-out time (1.2 to 2 times the normal time).



TeSys Control

Integral motor starters - Auxiliaries and accessories

Product references

PB121572.eps



LA9LC530

Door interlock mechanisms (IP 54)

| Type | For use on | Colour of knob | Unit reference |
|---|------------|----------------|-----------------|
| Adjustable from 0 to 185 mm with extension (control knob mounted on plate or door) | LD4, LD5 | Red | LA9LC530 |



Integral
motor
starters

TeSys Control

Integral motor starters - Auxiliaries and accessories

Product references

PS12/276.eps



LX1LD●●●

Replacement a.c. coils

| Rated control circuit voltages | | Average resistance at 20 °C ±10 % | Inductance of closed circuit | Voltage code ⁽¹⁾ | Reference |
|--------------------------------|----------|-----------------------------------|------------------------------|-----------------------------|-----------|
| Uc 50 Hz | Uc 60 Hz | | | | |
| V | V | Ω | H | | |
| – | 48 | 0.845 | 0.19 | CE | LX1LD040 |
| 42 | – | 0.987 | 0.22 | D | LX1LD042 |
| – | 110 | 4.88 | 1 | K | LX1LD090 |
| 127 | – | 9.80 | 2.13 | G | LX1LD127 |
| – | 220 | 19.82 | 4.2 | LC | LX1LD180 |
| – | 230/240 | 23.24 | 4.5 | MC | LX1LD190 |
| – | 440 | 80.46 | 16.7 | UX | LX1LD360 |
| 380/400 | 460/480 | 93.63 | 20 | Q | LX1LD380 |
| 415/440 | – | 116.46 | 23.7 | N | LX1LD415 |
| 500 | 575/600 | 152.18 | 31 | S | LX1LD500 |
| 660 | – | 290.80 | 60 | Y | LX1LD660 |

Consumption at 50 Hz: inrush (cos φ: 0.55) 350 to 400 VA; sealed (cos φ: 0.28) 20 to 30 VA.

Consumption at 60 Hz: inrush (cos φ: 0.55) 420 to 500 VA; sealed (cos φ: 0.30) 24 to 36 VA.

⁽¹⁾ Coil voltage code, used to complete the power base basic reference.

Replacement d.c. coils and associated voltage converters ⁽²⁾

| Mounting | For use on power base ref. | Input operational voltage ⁽³⁾ | Consumption | | Description | Reference ⁽⁴⁾ |
|----------------------|----------------------------|--|-------------|--------|-------------|--------------------------|
| | | | Inrush | Sealed | | |
| | | V | W | W | | |
| On top of power base | LD●LD●●●FD | 110 | 300 | 8 | Coil | LX1LD01109 |
| | | | | | Converter | LA1LD080FD |

⁽²⁾ For reversing integral motor starters, order 2 interface modules or 2 voltage converters.

⁽³⁾ When used on rectified single-phase or 3-phase supply, the peak to peak ripple voltage must be equal to or less than 0.14 of the average voltage.

Operating limits 0.8 to 1.1 Uc for an ambient temperature ≤ 40 °C.

⁽⁴⁾ It is essential that the voltage converter be associated with the specific coil indicated.




TeSys Control

Integral motor starters

Product references

| | |
|------------|------------|
| LA1LB017 | LD1LD030F |
| LA1LC010 | LD1LD030FC |
| LA1LC012 | LD1LD030K |
| LA1LC020 | LD1LD030LC |
| LA1LC025 | LD1LD030M |
| LA1LD580BD | LD1LD030MC |
| LA9D09982 | LD1LD030Q |
| LA9LB321 | LD1LD030U |
| LA9LC530 | LD4LD030BD |
| LB1LD03L16 | LD4LD030F |
| LB1LD03L55 | LD4LD030FC |
| LB1LD03L57 | LD4LD030K |
| LB1LD03L61 | LD4LD030LC |
| LB1LD03M22 | LD4LD030M |
| LB1LD03M53 | LD4LD030U |
| LB1LD03M55 | LD4LD130BC |
| LB1LD03M57 | LD4LD130BD |
| LB1LD03M61 | LD4LD130E |
| LB1LD03P55 | LD4LD130F |
| LB6LD03M16 | LD4LD130LC |
| LD1LD030B | LD4LD130M |
| LD1LD030BD | LD5LD030M |
| LD1LD030E | |
| LD1LD030ED | |

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

Contents

| | |
|-----------------------------------|-----------------|
| Introduction | A5/18 to A5/21 |
| Characteristics | A5/22 to A5/27 |
| Curves | A5/28 to A5/31 |
| Operating status indication | A5/32 and A5/33 |
| Dimensions, mounting | A5/34 and A5/35 |
| Schemes | A5/36 and A5/37 |
| Terminology | A5/38 to A5/41 |

When designing an installation, it is essential to take into account precise criteria for determining the conductor c.s.a. and selecting equipment.

In particular:

- permissible currents for the conductors,
- maximum voltage drops,
- short-circuit protection,
- protection against indirect contact.

The latter three criteria must be taken into account when selecting the integral unit.

The principle behind the rules described below is, on the whole, common to all European publications. However, the calculations and values concerning protection against indirect contact are based on French standard NF C 15-100, and it is up to the user to check the regulations in force in the country concerned.

Cable protection against overload

To achieve this, the thermal setting value I_{rth} selected must be greater than the current drawn I_B and less than or equal to the permissible current I_z in the cable to be protected.

$$I_B < I_{rth} \leq I_z$$

Short-circuit protection

Breaking capacity rule

Check that the breaking capacity (BC) of the integral unit is equal to or greater than the prospective short-circuit current ($I_{sc \max}$) at the point where it is to be installed.

$$BC \geq I_{sc \max}$$

Breaking time rule

2 conditions must be fulfilled:

- The short-circuit current at the end of the circuit, $I_{sc \min}$, must be greater than or equal to the minimum current required for magnetic tripping of the device,
- The short-circuit current at the start of the circuit, $I_{sc \max}$, must be such that:

$$I_{sc \max}^2 t_m \leq I_o^2 t_o$$

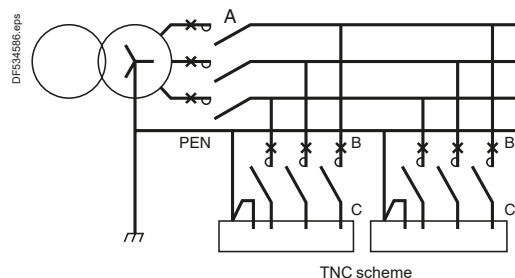
$I_o^2 t_o$ = permissible thermal stress limit for the circuit,
 t_m = operating time of the integral unit or of the short-circuit protection device.

These 2 checks need only be made when modules with a low rating are used.

Example: for a 6.3/10 A module, a cable c.s.a. $\geq 2.5 \text{ mm}^2$ is required to withstand $I_{sc \max} = 50 \text{ kA}$.

Protection against indirect contact in TN schemes

TN multiple earthed neutral scheme



- Neutral is connected to earth.
- The earths are connected to neutral.
- Any phase/earth insulation fault causes a short-circuit.
- As contact voltage is dangerous, breaking must occur at the first fault.
- The PE conductor and the neutral conductor may be:
 - combined (TNC scheme),
 - separate (TNS scheme).

Ref.



Integral motor starters

Protection against indirect contact in TN schemes

- Protection against indirect contact (TN schemes), for dead shorts only, requires that the following 2 conditions be fulfilled simultaneously:
 - the fault current I_d must be greater than or equal to the minimum current required for magnetic tripping of the integral unit, i.e. $1.12 \mu I_{rth \max}$.

$$I_d = c \cdot q \cdot \frac{U_0}{Z_b}$$

c = coefficient taking into account the upstream part of the fault loop impedance assumed to be equal to 0.8, unless otherwise indicated.

q = coefficient dependent on the earth connection scheme and equal to 1 in the TN scheme.

U_0 = phase-neutral voltage in volts.

Z_b = fault loop impedance in $m\Omega/m$ such that:

$Z_b \neq R$ (fault loop resistance).

L = length of the fault loop equal to twice the length L_c of the circuit.

S = Sph, c.s.a of the phase conductors = S_{PE} = c.s.a. of the protective conductors.

ρ = resistivity of the copper = 0.0225.

μ = ratio between the magnetic tripping current and the maximum setting current of the instantaneous thermal tripping device.

$$R = \rho \frac{L}{S} = 2 \rho \frac{L_c}{S}$$

- the contact voltage (U_L) for a dead short is at most equal to the value determined by the safety curve for the operating time t_m of the integral unit in its magnetic tripping zone.

This condition is generally fulfilled for power supplies of 230/415 V.

(In fact, for $U_L = 50$ V, a $t_m \leq 500$ ms would be required and for $U_L = 25$ V, a $t_m \leq 110$ ms would be required).

The first condition allows us to calculate the maximum length of the circuit to provide protection against indirect contact in the TN scheme.

For the TN scheme:

$$L \leq \frac{c \cdot q \cdot U_0 \cdot S_{ph}}{2 \rho \cdot 1 \cdot \mu I_{rth}}$$

$$\text{i.e. } L_{\max} = \frac{0.8 \times U_0 \times S_{ph}}{2 \times 0.0225 \times 1.2 \mu I_{rth \max}}$$

Maximum length of 230/415 V circuits with TN scheme

| C.s.a. | $I_{rth \max}$ | $\mu = 3$ | $\mu = 6$ | $\mu = 12$ | $\mu = 15$ |
|-----------------|----------------|-----------|-----------|------------|------------|
| mm ² | A | m | m | m | m |
| 1.5 | 10 | 180 | 90 | 45 | 36 |
| | 16 | 112 | 56 | 28 | 22 |
| 2.5 | 10 | 298 | 149 | 75 | 60 |
| | 16 | 186 | 93 | 47 | 37 |
| | 25 | 118 | 59 | 32 | – |
| | 32 | 92 | 46 | 23 | – |
| 4 | 16 | 296 | 148 | 74 | 60 |
| | 25 | 190 | 95 | 48 | – |
| | 32 | 148 | 74 | 37 | – |
| | 40 | 118 | 59 | 30 | – |
| 6 | 25 | 284 | 142 | 71 | – |
| | 32 | 222 | 111 | 56 | – |
| | 40 | 178 | 89 | 45 | – |
| | 50 | 142 | 71 | 36 | – |
| 10 | 32 | 370 | 185 | 93 | – |
| | 40 | 296 | 148 | 74 | – |
| | 50 | 236 | 118 | 59 | – |
| | 63 | 188 | 94 | 47 | – |
| 16 | 32 | 590 | 295 | 148 | – |
| | 40 | 472 | 236 | 118 | – |
| | 50 | 378 | 189 | 95 | – |
| | 63 | 300 | 150 | 75 | – |
| 25 | 32 | 922 | 461 | 281 | – |
| | 40 | 738 | 369 | 185 | – |
| | 50 | 590 | 295 | 148 | – |
| | 63 | 468 | 234 | 117 | – |

Selection for a temperature $\theta \leq 40\text{ }^\circ\text{C}$

| Rated operational voltage | V | 220/240 | 400/415 | 440 | 480/525 | 600/690 |
|--|---|---------|---------|-----|---------|---------|
| Rated operational currents (according to the rated operational voltage) | | | | | | |
| Integral motor starter | A | 63 | 63 | 63 | 63 | 63 |

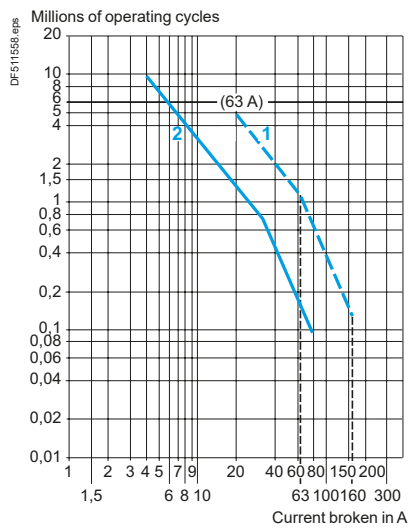
Rated operational powers (for standard motors)

| Integral motor starter | kW | 15 | 33 | 33 | 37 | 55 |
|------------------------|----|----|----|----|----|----|
|------------------------|----|----|----|----|----|----|

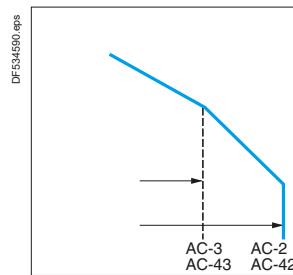
Electrical durability

Control and protection of motors at $U_e \leq 415\text{ V}$

- in utilisation categories AC2, AC3 conforming to IEC 60947-4-1,
- in utilisation categories AC2, AC3 conforming to IEC 60947-6-2.



- 1 Not having previously broken a short-circuit current
- 2 Having broken a short-circuit current 10 times at 30 Ie (most common values of short-circuit current during operation)



TeSys Control

Integral motor starters - Selection principle

Introduction

a.c. supply, utilisation categories AC-1, AC-3, AC-41, AC-43

Rated operational currents (according to ambient temperature)

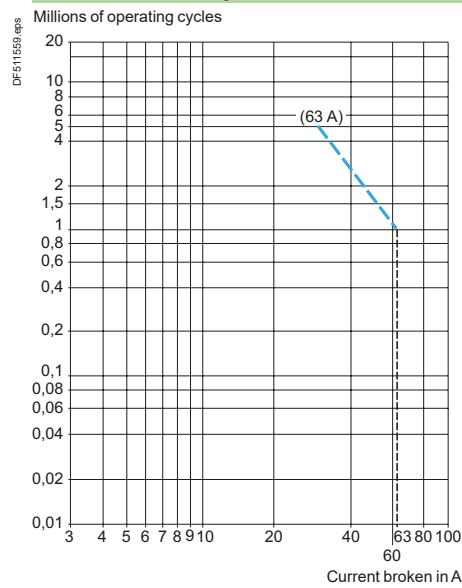
| | With cable c.s.a. | A | $\theta \leq 40\text{ }^\circ\text{C}$ | $\theta \leq 55\text{ }^\circ\text{C}$ | $\theta \leq 70\text{ }^\circ\text{C}$ |
|------------------------|--------------------|---|--|--|--|
| Integral motor starter | 16 mm ² | A | 63 | 55 | 50 |

a.c. supply, utilisation categories AC-1, AC-41

Maximum operating rates in operating cycles/hour

| | Operating cycles/h | On-load factor 85 % | | On-load factor 25 % |
|------------------------|--------------------|---------------------|---------------------|---------------------|
| | | Operation at le max | Operation at 0.5 le | Operation at le max |
| Integral motor starter | | 1200 | 2400 | 1800 |

Electrical durability $U_e \leq 415\text{ V}$



Note: for use in category AC-44, please consult your Regional Sales Office.

Ref.



Integral motor starters

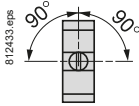
TeSys Control

Integral motor starters

Characteristics

| Type | | Integral motor starter | |
|---|-------------------------|------------------------|---|
| Number of poles | | | 3 |
| Rated operational current (Ie) | In AC-3 | A | 63 |
| Rated operational voltage (Ue) | | V | 690 |
| Electrical durability | In AC-3 at 400 V | | 1.2 million operating cycles |
| Mechanical durability at Uc | | | 5 million operating cycles |
| Maximum operating rate at ambient temperature ≤ 55 °C | ~ --- with converter | | 3600 operating cycles/hour 600 operating cycles/hour |

Environment

| | | | |
|---|---|----------|--|
| Conforming to standards | | | IEC: 158-1, 204-1, 204-2, 364, 947-1/2 and 4 UTE: NF C 63-110, C 63-120, C 63-130, C 63-650, C 79-100, C 20-040 VDE: 0100, 0110, 0113, 0170, 0171, 471, 0660 BS: 5424, 4752, 4941 NEN, NBN |
| Product certifications | | | ASE, ASEFA, ASTA, BV, CSA, DEMKO, DNV, GL NEMKO, NKK, ÖVE, RINA, SCC, SETI, UL, USSR, LROS |
| Protective treatment | | | "TH" |
| Ambient air temperature around the device | ~ Operation Storage | °C | -20...+60 -40...+80 |
| | --- (1) Operation Storage | °C | -25...+50 -25...+70 |
| Vibration resistance | 5...100 Hz | | Energised state: 3 gn De-energised state: 3 gn |
| Shock resistance | Impulse duration: 11 ms | | Energised state: 8 gn De-energised state: 8 gn |
| Degree of protection | Conforming to IEC 60144 & 60529 Conforming to VDE 0106 | | IP 20B Protection against direct finger contact |
| Flame resistance | | | Conforming to IEC 60295-2-1, NF C 20-455 and decree of 22-12-81 (JO 27 NC of 1 st and 2/2/1982) Conforming to UL 94 - V0 and NF T 51-072 |
| Maximum operating altitude | Without derating | m | 3000 |
| Operating positions (without derating) | In relation to normal vertical mounting plane | | From main axis (left-right tilt)  |

Control circuit characteristics

| | | | |
|--|--------------------|-----------|--------------------------|
| Rated control circuit voltage (Uc) | ~ 50 Hz | V | 24...660 |
| | ~ 60 Hz | V | 24...600 |
| | --- with converter | V | 24, 48, 110 |
| Voltage limits at θ ≤ 55 °C | Operation | | 0.85...1.1 Uc |
| | Drop-out | | 0.25...0.7 Uc |
| Average consumption at 20 °C and at Uc | ~ Inrush | VA | 375 (50 Hz), 450 (60 Hz) |
| | Sealed | VA | 25 (50 Hz or 60 Hz) |
| | --- (1) Inrush | W | 300 for 50 ms |
| | Sealed | W | 8 |
| Heat dissipation | | W | 8 (50 Hz), 11 (60 Hz) |
| Operating time (2) at 20 °C and at Uc | ~ 50/60 Hz "C" | ms | 12...35 |
| | "O" | ms | 7...20 |
| | --- with "C" | ms | 25...40 |
| | converter "O" | ms | 15...25 |

(1) With converter.

(2) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.
The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

TeSys Control

Integral motor starters

Characteristics

| Pole characteristics | | Integral motor starter | | | | | | |
|---|--|---------------------------|---|---------------------------------|-------------------------|----------------|----------------|----------------|
| Type | | | | | | | | |
| Conventional thermal current (I _{th}) | θ ≤ 40 °C | A | 63 | | | | | |
| Frequency limits of the operational current | | Hz | 40...60 | | | | | |
| Rated impulse withstand voltage (U _{imp}) | Conforming to IEC 60947-4 | kV | 8 | | | | | |
| Rated insulation voltage (U _i) | Conforming to IEC 60947-1 | V | 690 | | | | | |
| Heat dissipation in the power circuits of the Integral motor starter and its protection module | Operational current | A | 25 | 32 | 40 | 50 | 63 | |
| | Power per pole, hot state | W | 4.4 | 5 | 5.8 | 7 | 9 | |
| Rated making capacity | I _{rms} | Conforming to IEC 60947-4 | A 12 or 15 x I _{th} (above this value, the breaker trips) | | | | | |
| | I _{peak} | Conforming to IEC 60947-2 | kA 105 | | | | | |
| Rated breaking capacity conforming to IEC 60947-2 | Operational voltage | V | 220/240 | 380/415 | 440 | 480/525 | 600/690 | |
| | Value of cos φ | | 0.25 | 0.25 | 0.25 | 0.25 | 0.5 | |
| | Cycle P1 (O-t-CO) I _{cu} ⁽¹⁾ | kA rms | 50 | 50 | 50 | 35 | 10 | |
| | Cycle P2 (O-t-CO-t-CO) I _{cs} ⁽¹⁾ | kA rms | 50 | 50 | 50 | 35 | 10 | |
| | I _{cu} = I _{cs} | kA rms | up to 80 (see table page A5/27) | up to 80 (see table page A5/27) | 50 | 30 | 10 | |
| Total breaking time | | ms | 4 | | | | | |
| Electrical durability in AC-3 at I _e max and at 415 V after 1 cycle O-CO-r-CO at I _{sc} | Prospective rms short-circuit current at terminals of a new device | kA | 3 | 10 | 25 | 35 | 50 | 80 |
| | Millions of operating cycles | | 1 | 0.9 | 0.6 | 0.5 | 0.2 | ⁽²⁾ |
| Thermal limit | With I _{sc} max. at 415 V, 50 Hz | A²s | 300 x 10 ³ | | | | | |
| Cabling | Flexible cable without cable end | mm² | Maximum c.s.a. 1 x 50 or 2 x 35 | | Minimum c.s.a. 1 x 6 | | | |
| | Flexible cable with cable end | mm² | 2 x 25 | | 1 x 6 | | | |
| | Solid cable | mm² | 1 x 50 | | 1 x 6 | | | |
| Tightening torque | | N.m | 6 | | | | | |

| Characteristics of thermal-magnetic or magnetic only protection modules | | LB1LD03P | LB1LD03M | LB6LD03M | LB1LD03L |
|---|---|------------------------|---------------------------------|--|----------------------------|
| Protection | Module type | Standard motors | Standard motors | Frequent starting | Distribution circuits |
| | Conforming to standards | NF C 63-650 | NF C 63-650 | NF C 63-650 | NF C 63-120 |
| | Number of poles | 3 | 3 | 3 | 3 |
| | Number of protected poles | 3 | 3 | 3 | 3 |
| | Rated operational voltage | V 690 | 690 | 690 | 690 |
| Thermal protection | Max. continuous current | A 13...63 | 13...63 | 13...63 | 13...63 |
| | Setting (I _{rt} min./I _{rt} max.) | A 10/13...45/63 | 10/13...45/63 | — | 10/13...45/63 |
| | Temperature compensation | °C -20...+60 | 20...+60 | 20...+60 | 20...+60 |
| | Protection against phase imbalance | | With | With | Without |
| | Tripping class | | 20 | 20 | — |
| Magnetic protection conforming to IEC 60947-1/2/4/6-2 | Instantaneous trip current setting range | | Fixed at 15 I _{rt} max | 6...12 I _{rt} max (usual setting 9...10 I _{rt} maxi) | 6...12 I _{rt} max |
| | Tripping tolerance | | ±20 % | ±20 % | ±20 % |

| Characteristics of versions without control test function, with padlocking facility | |
|---|------------------------------------|
| Conforming to standards | IEC 60947 |
| Rated operational voltage | V 690 |
| Mechanical durability | Operating cycles 10 000 |
| Padlocking | By 1, 2 or 3 padlocks, Ø8 mm shank |

| Characteristics of versions with control test function and padlocking facility | |
|--|--|
| Conforming to standards | IEC 60947, NF C 63-130, VDE 0660, VDE 0113 |
| Rated operational voltage | V 690 |
| Mechanical durability | Operating cycles 10 000 |
| Padlocking | 1, 2 or 3 padlocks, shank Ø8 mm max and Ø5 mm min. When flush mounting, interlocking of the enclosure or cabinet door is possible. |

⁽¹⁾ O: breaking short-circuit current (open),
t: time
CO: closing on short-circuit, breaking short-circuit current (closed-open)
⁽²⁾ Please consult us.

| Instantaneous auxiliary contacts LA1L00 | | | | | | | |
|--|------------------------------|-----------------------|--|----------------|----------------|----------------|------------|
| Conventional thermal current (I _{th}) | | A | 6 | | | | |
| Rated insulation voltage (U _i) | Conforming to IEC 60947-5-1 | V | 690 | | | | |
| Switching capacity | With U ≥ 17 V and I ≥ 10 mA | mVA | 600 | | | | |
| Rated operational ~ category power AC-15 ⁽¹⁾ | Voltage | V | 48 | 110/127 | 220/240 | 380/415 | 440 |
| | 1 million operating cycles | VA | 300 | 500 | 600 | 520 | 500 |
| | 1.5 million operating cycles | VA | 160 | 300 | 330 | 300 | 280 |
| Making capacity | ~ category AC-15 | VA | 1500 | 3500 | 6000 | 7500 | 7000 |
| Rated operational --- category power DC-13 ⁽²⁾ | Voltage | V | 24 | 48 | 110 | 220 | 440 |
| | 1 million operating cycles | W | 120 | 90 | 75 | 68 | 61 |
| | 1.5 million operating cycles | W | 70 | 50 | 38 | 33 | 28 |
| Making capacity | --- category DC-13 | W | 800 | 700 | 400 | 260 | 220 |
| Cabling | | mm² | Maximum c.s.a.: 2 x 2.5 Minimum c.s.a.: 2 x 1 | | | | |

| Isolating auxiliary contacts LA1LC030 | | | | | | | |
|---|--|-----------------------|------------------------------------|--|--|--|--|
| Conventional thermal current (I _{th}) | | A | 6 | | | | |
| Rated insulation voltage (U _i) | a.c. supply | V | 690 | | | | |
| | Conforming to IEC 60947 and NF C 63-130 d.c. supply | V | 125 | | | | |
| Cabling | | mm² | Maximum c.s.a.: 2 x 1.5 or 1 x 2.5 | | | | |

(1) Electrical durability on an inductive load such as the coil of an electromagnet: making current ($\cos \varphi 0.7$) = 10 times the power broken ($\cos \varphi 0.4$).

(2) Electrical durability on an inductive load such as the coil of an electromagnet, the time constant increasing with the load.

Ref.



TeSys Control

Integral motor starters

Characteristics

| Type | | Interface modules | | | Converters | | | |
|---|-----------|--|---|-------|--|---|-------|-------|
| Used for control of the integral 32 | | By a programmable controller, with a.c. control of the electromagnet | | | By a programmable controller, with d.c. control of the electromagnet Control on d.c. supply | | | |
| Ambient air temperature around the device | | | | | | | | |
| | Storage | °C | -25...+70 | | | -25...+70 | | |
| | Operation | °C | -25...+50 | | | -25...+50 | | |
| Isolation | | kV | rms voltage between inputs and outputs: 2.5 | | | Common negative terminal | | |
| Cabling | Min. | mm ² | 1 x 1 | | | 1 x 1 | | |
| | Max. | mm ² | 2 x 2.5 | | | 2 x 2.5 | | |
| Operating limits | | | 0.85...10.1 Uc | | | 0.8...1.1 Uc ⁽²⁾ | | |
| Protection | | | Against reverse polarity (by diode) and against overvoltage | | | Against reverse polarity (by diode) and against overvoltage | | |
| Module or converter type | | | LA1LC 580BD | 580ED | 180BD | LA1LC 080BD | 080ED | 080FD |

Control circuit characteristics

| Schemes | | LA1LC•580•D | | | LA1LC•180BD | | | LA1LC•080BD LA1LC•080ED | | LA1LC•080FD | | | | |
|----------------------------|---------|-------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|----------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|---------------------------------|
| Indication of input state | | By LED | | | - | | | - | | - | | | | |
| Input signals (logic side) | Voltage | V | ~ 24 (E1-E2) | ~ 48 (E1-E2) | ~ 5...24 (E1-E2) | ~ 24 (E1-E2) | ~ 48 (E1-E2) | ~ 5...24 (E1-E2) | ~ 24 ⁽¹⁾ (E3-E2) | ~ 48 ⁽¹⁾ (E3-E2) | - | ~ 24 ⁽¹⁾ (E3-E2) | ~ 48 ⁽¹⁾ (E3-E2) | - |
| | Current | mA | 30 | 20 | 15...24 V 8.5...5 V | 50 | 25 | 15...24 V 8.5...5 V | 20 | 10 | - | 20 | 10 | - |
| State "0" guaranteed | For U | V | < 2.4 | < 4.8 | < 2.5 | < 2.4 | < 4.8 | < 2.5 | < 7 | < 14 | - | < 7 | < 14 | - |
| | For I | mA | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 5 | < 2.5 | - | < 5 | < 2.5 | - |
| State "1" guaranteed | For U | V | > 20.4 | > 40.8 | > 4 | > 20.4 | > 4 | > 4 | > 14 | > 28 | - | > 14 | > 28 | - |
| Supply voltage | | V | ~ 24...240 (A1-A2) | ~ 24...240 (A1-A2) | ~ 24...240 (A1-A2) | ~ 24...240 (A1-A2) | ~ 24...240 (A1-A2) | ~ 24...240 (A1-A2) | ~ 24 ⁽²⁾ (E1-E2) | ~ 48 ⁽²⁾ (E1-E2) | ~ 110 ⁽²⁾ (E1-E2) | ~ 24 ⁽²⁾ (E1-E2) | ~ 48 ⁽²⁾ (E1-E2) | ~ 110 ⁽²⁾ (E1-E2) |

Operating characteristics

| Electrical durability in millions of operating cycles | | 5 | | | | | | 1 | | | | | | | |
|---|----------|----------|---------|---------|---------|---------|---------|---------|-----|----|----|----|----|----|---|
| Average consumption | Inrush | 50 Hz | VA | 160 | 160 | 160 | 375 | 375 | 375 | - | - | - | - | - | - |
| | | 60 Hz | VA | 185 | 185 | 185 | 450 | 450 | 450 | - | - | - | - | - | - |
| | Sealed | 50/60 Hz | VA | 12 | 12 | 12 | 25 | 25 | 25 | - | - | - | - | - | - |
| | | ... | W | - | - | - | - | - | - | 4 | 4 | 4 | 8 | 8 | 8 |
| Operating time at 20 °C and at Uc | Pull-in | ms | 15...30 | 15...30 | 10...35 | 20...40 | 20...40 | 10...45 | 30 | 30 | 30 | 35 | 35 | 35 | |
| | Drop-out | ms | 22...35 | 22...35 | 8...30 | 25...45 | 25...45 | 8...30 | 15 | 15 | 15 | 20 | 20 | 20 | |

(1) For direct control by external contact: connect E1-E3.

(2) Warning: for supply from rectified a.c., the 2 following conditions must be met: the power supply must exceed 300 VA and the maximum ripple must be ≤ 14 %.

TeSys Control

Integral motor starters

Characteristics

Environment

| | | | |
|---|---|----|------------------------|
| Conforming to standards | | | IEC 60337-1 |
| Protective treatment | | | "TH" |
| Ambient air temperature around the device | Storage | °C | -40...+80 |
| | Operation | °C | -25...+55 |
| | Permissible for operation at U _c | °C | -25...+70 |
| Protection against direct finger contact | | | Conforming to VDE 0106 |


Tripping devices

| Type | | | LA1LC070●, LC072● | LA1LC071● |
|---------------------|----------------|----|-------------------|-----------|
| Pull-in voltage | U _c | | 0.8...1.1 | 0.7...1.1 |
| Drop-out voltage | U _c | | 0.35...0.7 | – |
| Average consumption | Inrush | VA | 8 | 8 |
| | Sealed | VA | 4 | 4 |
| Minimum pulse time | | ms | – | 10 |

Reset devices

| Type | | | LA1LC052● |
|---------------------------|--|----|-----------|
| Consumption | | VA | 9 |
| Duration of a reset cycle | | s | 9 |
| Minimum pulse duration | | s | 0.5 |

Suppressor module LA9D09982

| | | | |
|---------------------|---|--|--|
| Type of protection | | | RC (resistor-capacitor) |
| Connection scheme | | |  |
| Operational voltage | V | | ≤ 250 |

Ref.

i



Integral motor starters

TeSys Control

Integral motor starters

Characteristics

Breaking capacity of Integral motor starters, according to the operational voltage and protection module fitted.

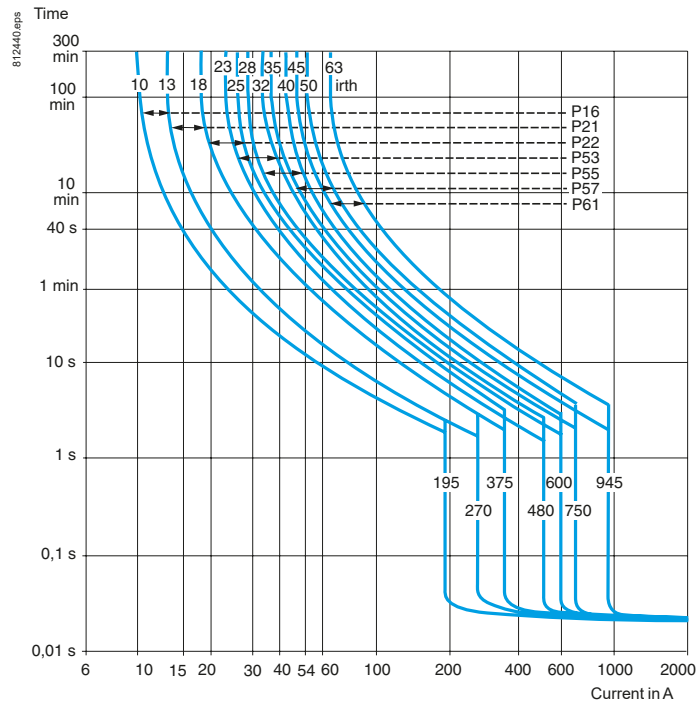
| Breaking capacity | | | | | | | |
|-------------------|------------------|-----|---------------------|-----------|-------|-------|-----------|
| Protection module | | | Operational voltage | | | | |
| Reference | I _{rth} | | 220/240 V | 400/415 V | 440 V | 500 V | 600/690 V |
| | min | max | kA | kA | kA | kA | kA |
| LB●LD03●16 | 10 | 13 | ≥ 130 | ≥ 130 | ≥ 130 | ≥ 130 | 10 |
| LB●LD03●21 | 13 | 18 | ≥ 130 | ≥ 130 | ≥ 130 | ≥ 130 | 10 |
| LB●LD03●22 | 18 | 25 | ≥ 130 | ≥ 130 | 50 | 35 | 10 |
| LB●LD03●53 | 23 | 32 | ≥ 130 | 80 | 50 | 35 | 10 |
| LB●LD03●55 | 28 | 40 | ≥ 130 | 80 | 50 | 30 | 10 |
| LB●LD03●57 | 35 | 50 | ≥ 130 | 80 | 50 | 30 | 10 |
| LB●LD03●61 | 45 | 63 | ≥ 130 | 50 | 50 | 30 | 10 |

Ref.

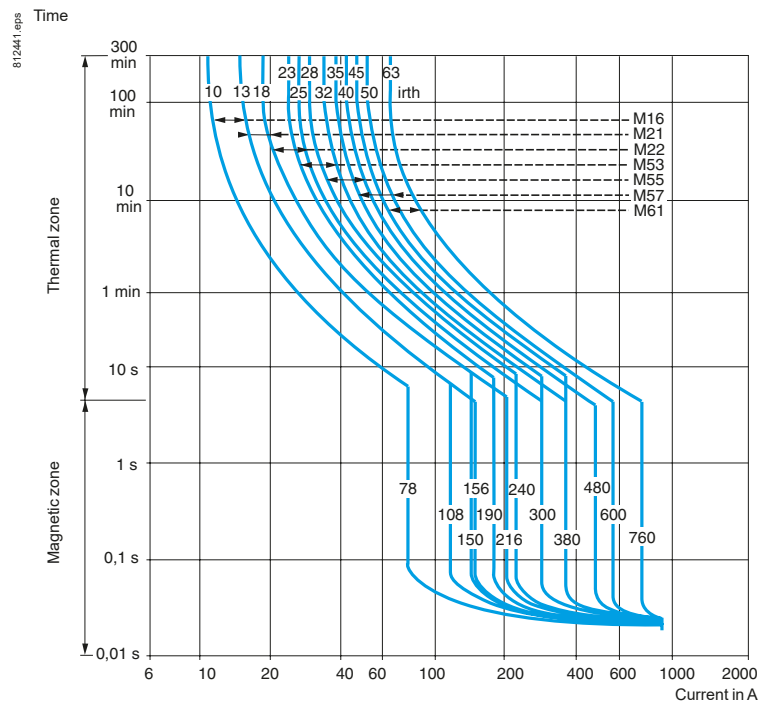


Integral motor starters

Motor protection (normal starting) - Tripping curves
By thermal-magnetic modules LB1LD03P ⁽¹⁾



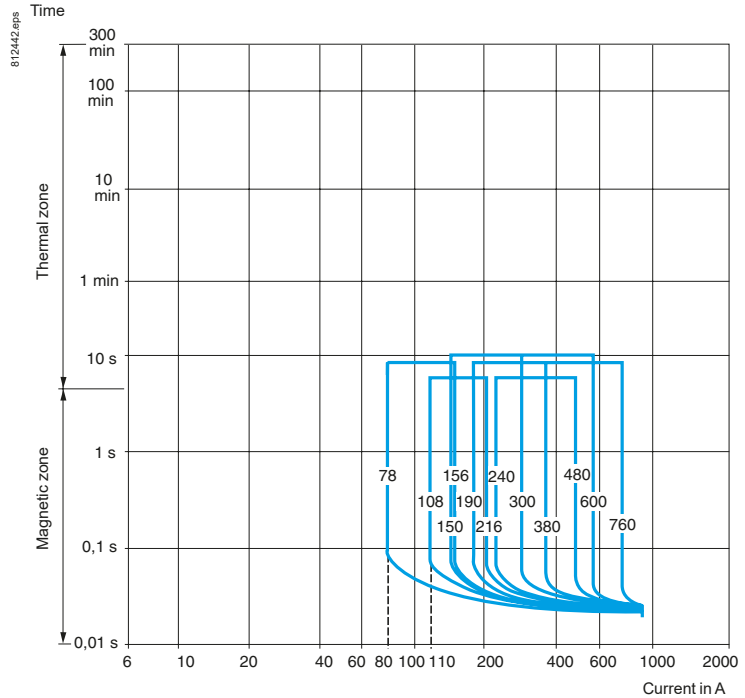
By thermal-magnetic modules LB1LD03M ⁽¹⁾



⁽¹⁾ Thermal protection: the average operating times shown in the above curves are for an ambient air temperature of 20 °C, without prior current flow (cold state). The average operating times after prolonged current flow (hot state) can be calculated by applying the coefficient 0.5.

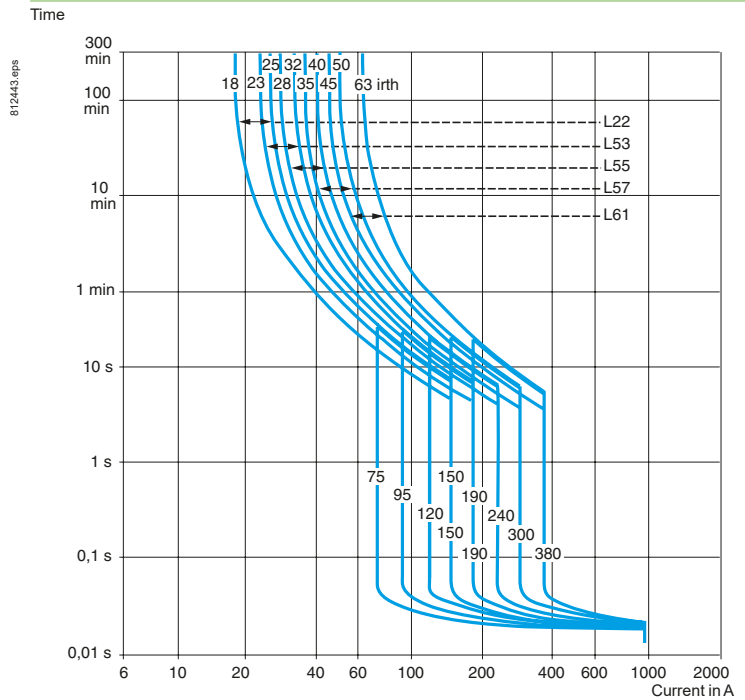
Motor protection (frequent starting) - Tripping curves

By magnetic modules LB6LD03M



Distribution circuit protection - Tripping curves

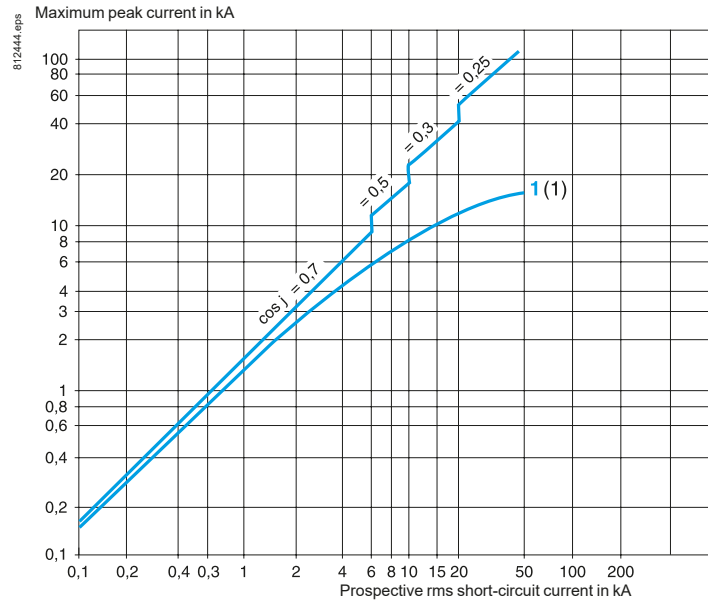
By thermal-magnetic modules LB1LD03L



Current limitation and thermal limit on short-circuit

3-phase 400/415 V, 50 Hz

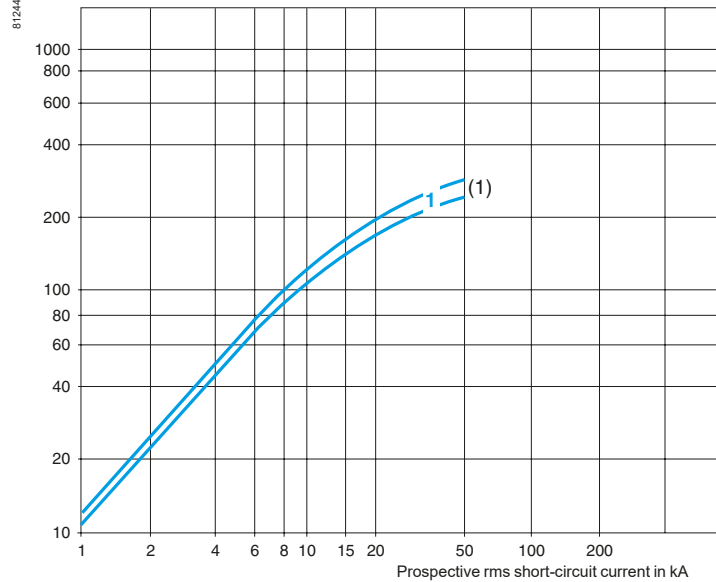
Current limitation on short-circuit



1 18 to 25 A up to 45 to 63 A

Maximum thermal limit on short-circuit

Thermal limit I²t in kA²s in the short-circuit protection zone



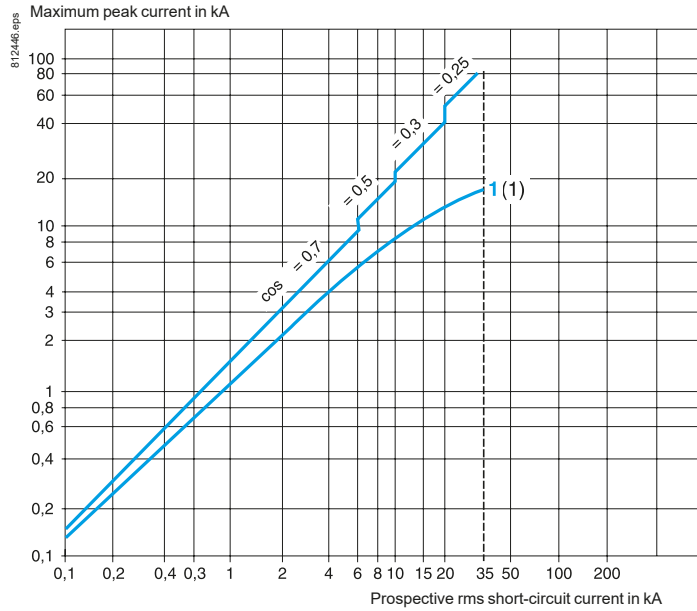
1 18 to 25 A up to 45 to 63 A

(1) LB1LD03M22 to LD06●61: rating of associated thermal overload module.

Current limitation and thermal limit on short-circuit

3-phase 480/500 V, 50 Hz

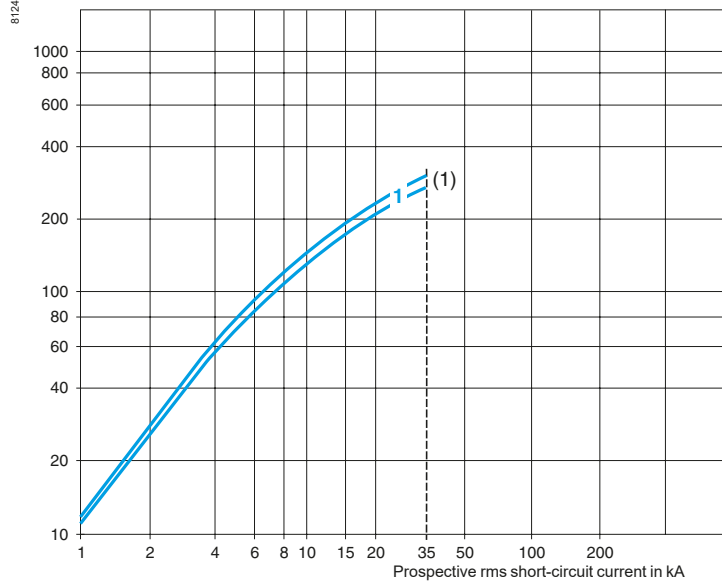
Current limitation on short-circuit



1 18 to 25 A up to 45 to 63 A

Current limitation on short-circuit

Thermal limit I^2t in kA²s in the short-circuit protection zone



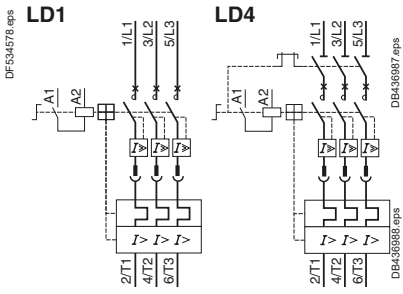
1 18 to 25 A up to 45 to 63 A

(1) LB1LD03M22 to LD03●61: rating of associated thermal overload module.

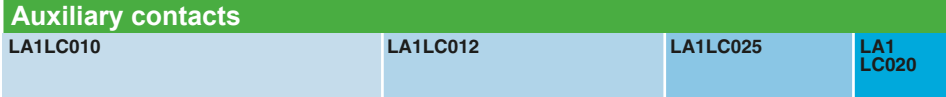
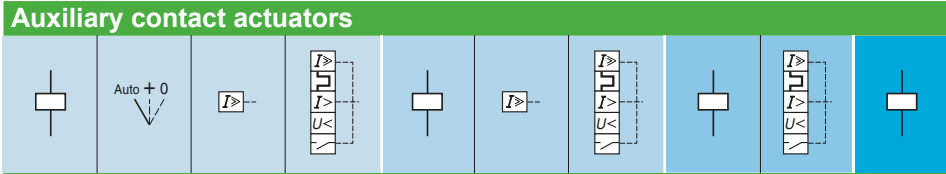
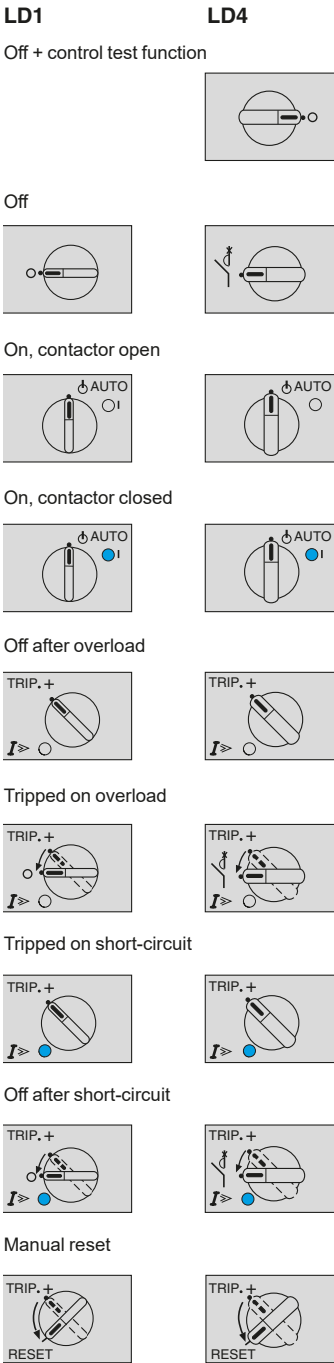
TeSys Control

Integral motor starters

Operating status indication



□ Contact open
 ■ Contact closed

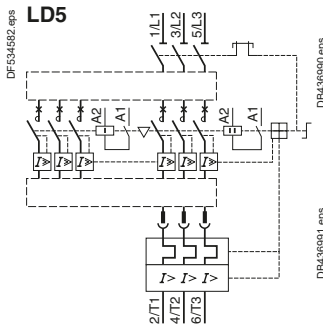


| LA1LC010 | | | | LA1LC012 | | | LA1LC025 | | LA1 LC020 |
|----------------------|-------------|-------------|-------------|----------------------|----------|----------|--|----------------------|-----------|
| | | | | | | | | | |
| 13 23 31 14 24 32 | 16 18 15 | 06 08 05 | 96 98 95 | 13 23 31 14 24 32 | 08 05 | 98 95 | 13 23 31 14 24 32 96 98 95 95 | 13 23 31 14 24 32 | |
| 13 23 31 14 24 32 | 16 18 15 | 06 08 05 | 96 98 95 | 13 23 31 14 24 32 | 08 05 | 98 95 | 13 23 31 14 24 32 96 98 95 95 | 13 23 31 14 24 32 | |
| 13 23 31 14 24 32 | 16 18 15 | 06 08 05 | 96 98 95 | 13 23 31 14 24 32 | 08 05 | 98 95 | 13 23 31 14 24 32 96 98 95 95 | 13 23 31 14 24 32 | |
| 13 23 31 14 24 32 | 16 18 15 | 06 08 05 | 96 98 95 | 13 23 31 14 24 32 | 08 05 | 98 95 | 13 23 31 14 24 32 96 98 95 95 | 13 23 31 14 24 32 | |
| 13 23 31 14 24 32 | 16 18 15 | 06 08 05 | 96 98 95 | 13 23 31 14 24 32 | 08 05 | 98 95 | 13 23 31 14 24 32 96 98 95 95 | 13 23 31 14 24 32 | |
| 13 23 31 14 24 32 | 16 18 15 | 06 08 05 | 96 98 95 | 13 23 31 14 24 32 | 08 05 | 98 95 | 13 23 31 14 24 32 96 98 95 95 | 13 23 31 14 24 32 | |
| 13 23 31 14 24 32 | 16 18 15 | 06 08 05 | 96 98 95 | 13 23 31 14 24 32 | 08 05 | 98 95 | 13 23 31 14 24 32 96 98 95 95 | 13 23 31 14 24 32 | |
| 13 23 31 14 24 32 | 16 18 15 | 06 08 05 | 96 98 95 | 13 23 31 14 24 32 | 08 05 | 98 95 | 13 23 31 14 24 32 96 98 95 95 | 13 23 31 14 24 32 | |

TeSys Control

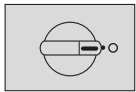
Integral motor starters

Operating status indication

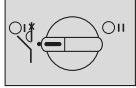


□ Contact open
 ■ Contact closed

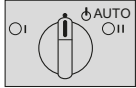
DB436953 eps
 Off + control test function



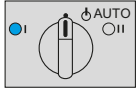
Off



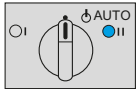
On, reversing contactor open



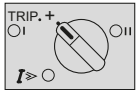
On, closed



On, closed



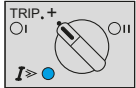
Tripped on overload



Off after overload



Tripped on short-circuit



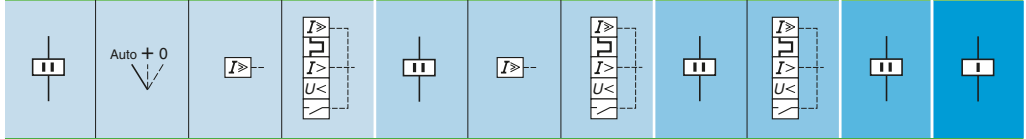
Off after short-circuit



Manual reset



Auxiliary contact actuators



Auxiliary contacts

| | LA1LC010 | LA1LC012 | LA1LC025 | LA1LC020 | LA1LC021 |
|----------|----------|----------|----------|----------|----------|
| 13 23 31 | 16 18 | 06 | 96 98 | 13 23 31 | 13 23 31 |
| 14 24 32 | 15 | 05 | 95 | 14 24 32 | 14 24 32 |
| 16 18 | 06 | 96 98 | 13 23 31 | 16 18 | 16 18 |
| 15 | 05 | 95 | 14 24 32 | 15 | 15 |
| 06 | 96 98 | 13 23 31 | 06 | 06 | 06 |
| 05 | 95 | 14 24 32 | 05 | 05 | 05 |
| 96 98 | 13 23 31 | 08 | 96 98 | 96 98 | 96 98 |
| 95 | 14 24 32 | 05 | 95 | 95 | 95 |
| 13 23 31 | 16 18 | 06 | 96 98 | 13 23 31 | 13 23 31 |
| 14 24 32 | 15 | 05 | 95 | 14 24 32 | 14 24 32 |
| 16 18 | 06 | 96 98 | 13 23 31 | 16 18 | 16 18 |
| 15 | 05 | 95 | 14 24 32 | 15 | 15 |
| 06 | 96 98 | 13 23 31 | 06 | 06 | 06 |
| 05 | 95 | 14 24 32 | 05 | 05 | 05 |
| 96 98 | 13 23 31 | 08 | 96 98 | 96 98 | 96 98 |
| 95 | 14 24 32 | 05 | 95 | 95 | 95 |
| 13 23 31 | 16 18 | 06 | 96 98 | 13 23 31 | 13 23 31 |
| 14 24 32 | 15 | 05 | 95 | 14 24 32 | 14 24 32 |
| 16 18 | 06 | 96 98 | 13 23 31 | 16 18 | 16 18 |
| 15 | 05 | 95 | 14 24 32 | 15 | 15 |
| 06 | 96 98 | 13 23 31 | 06 | 06 | 06 |
| 05 | 95 | 14 24 32 | 05 | 05 | 05 |
| 96 98 | 13 23 31 | 08 | 96 98 | 96 98 | 96 98 |
| 95 | 14 24 32 | 05 | 95 | 95 | 95 |
| 13 23 31 | 16 18 | 06 | 96 98 | 13 23 31 | 13 23 31 |
| 14 24 32 | 15 | 05 | 95 | 14 24 32 | 14 24 32 |
| 16 18 | 06 | 96 98 | 13 23 31 | 16 18 | 16 18 |
| 15 | 05 | 95 | 14 24 32 | 15 | 15 |
| 06 | 96 98 | 13 23 31 | 06 | 06 | 06 |
| 05 | 95 | 14 24 32 | 05 | 05 | 05 |
| 96 98 | 13 23 31 | 08 | 96 98 | 96 98 | 96 98 |
| 95 | 14 24 32 | 05 | 95 | 95 | 95 |

TeSys Control

Integral motor starters

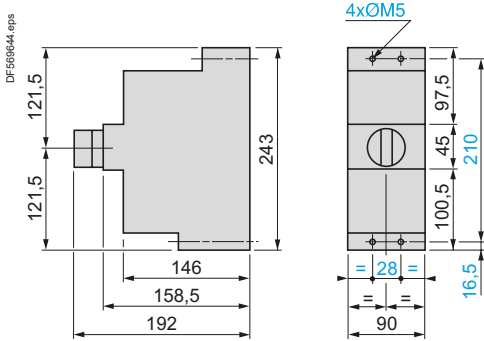
Dimensions, mounting

- Ref.
- i
- ☰
- ✍
- Integral motor starters
- ⚡

Integral motor starters

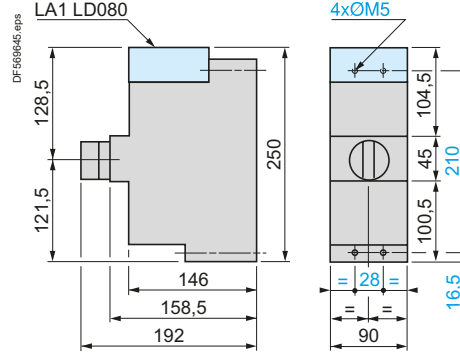
Control circuit: a.c.

LD●LD●30 + LB●LD03



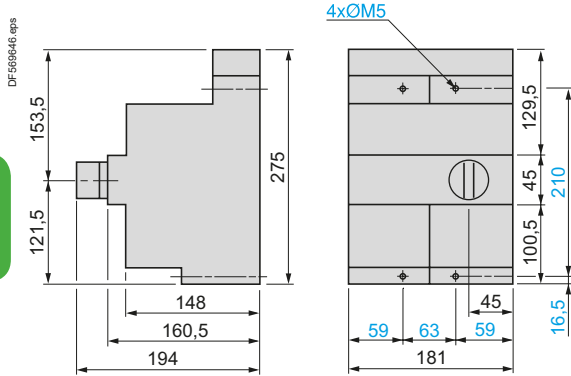
Control circuit: d.c.

LD●LD●30 + LB●LD03 + LA1LD080



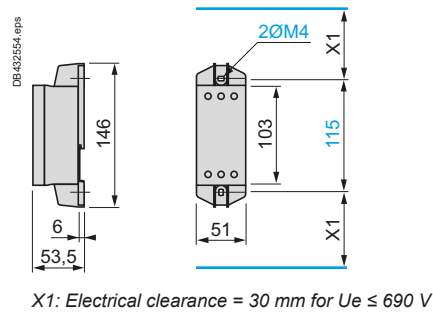
Reversing Integral motor starters

LD5LD●30 + LB●LD03M



Current limiter

LA9LB920



Add-on blocks

For mounting on Integral motor starters

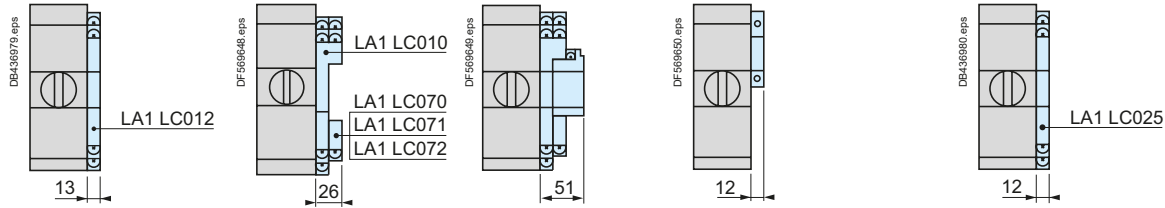
LA1LC012

LA1LC010
LA1LC07●

LA1LC052

LA1LC020

LA1LC025



For mounting on reversing Integral motor starters

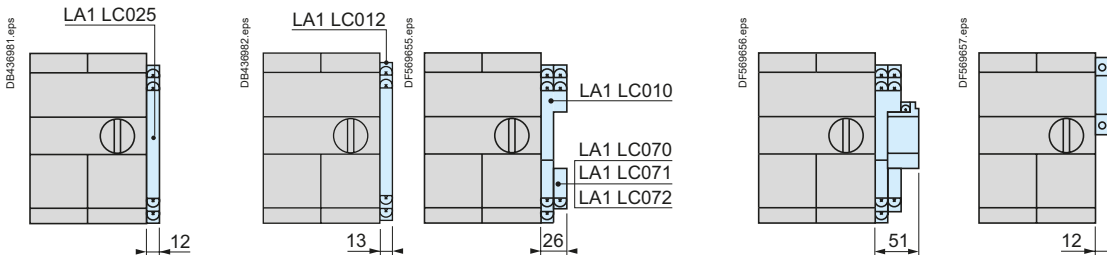
LA1LC025

LA1LC012

LA1LC010
LA1LC07●●

LA1LC052●

LA1LC020



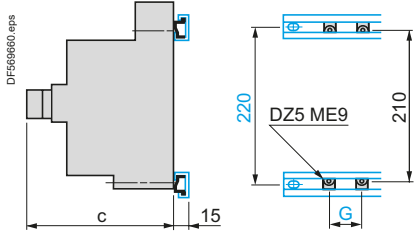
TeSys Control

Integral motor starters

Dimensions, mounting

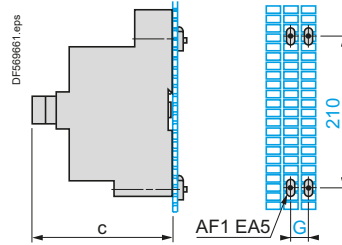
Mounting

On 32 mm rails, at 220 mm centres



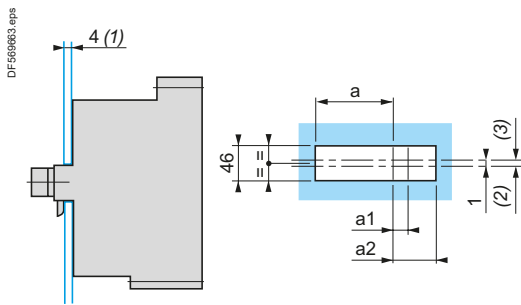
| | c | G |
|-----|-----|----|
| LD1 | 192 | 28 |
| LD4 | 192 | 28 |
| LD5 | 194 | 63 |

On pre-slotted mounting plate AM1P



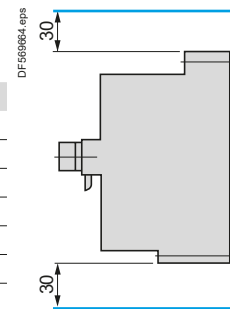
| | c | G |
|-----|-----|----|
| LD1 | 192 | 28 |
| LD4 | 192 | 28 |
| LD5 | 194 | 63 |

Flush mounting (Integral motor starters and reversing motor starters)



| | a | a1 | a2 |
|----------------------|-----|----|----|
| LD1LD030 | 90 | - | - |
| LD4LD●30 | 90 | - | - |
| LD5LD●30 | 181 | - | - |
| LA1LC010 | - | 13 | - |
| LA1LC012 | - | 13 | - |
| LA1LC010 + LA1LC052● | - | - | 51 |
| LA1LC012 + LA1LC052● | - | - | 51 |

Minimum electrical clearance

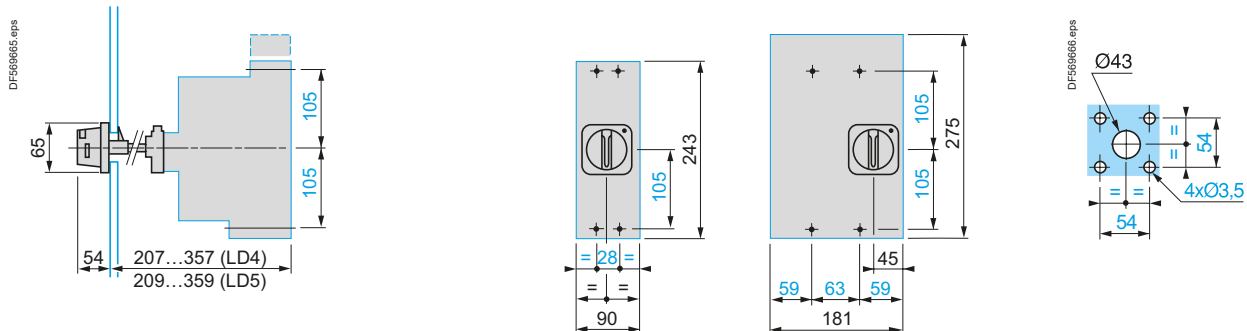


- (1) Maximum door thickness for interlocking by LD4 and LD5.
- (2) Centre of operating handle.
- (3) Fixing centre.

Adjustable door interlock mechanisms LA9LC33● and LA9LC53●

For mounting on LD4LD●30 and LD5LD●30

Door drillings



TeSys Control

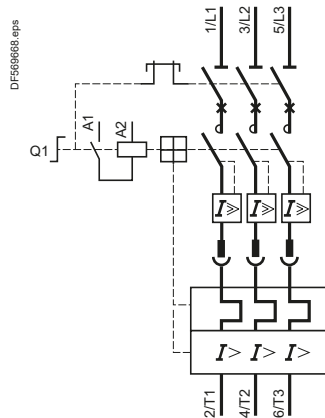
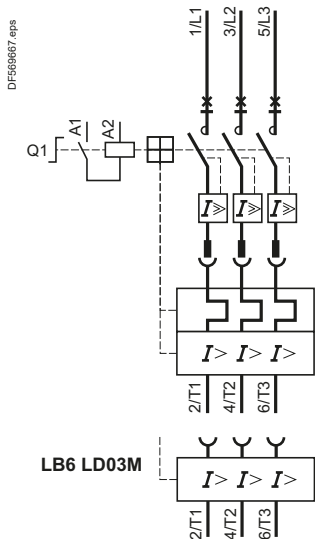
Integral motor starters

Schemes

Integral motor starters with protection module LB●

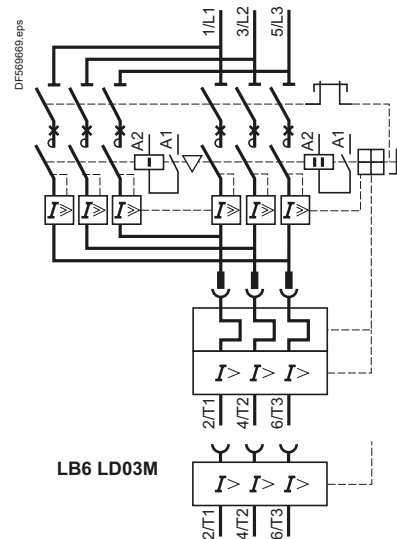
LD1LD030 + LB1LD03●

LD4LD●30 + LB1LD03●



Reversing Integral motor starters with protection module LB●

LD5LD●30 + LB1LD03M ou LD03P

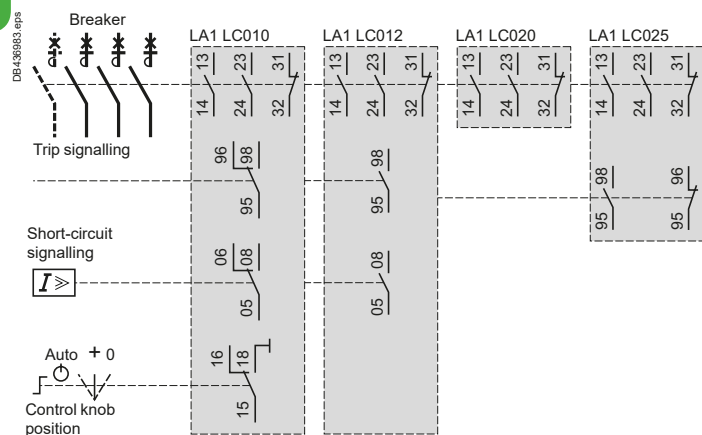


- Ref.
- i
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Add-on blocks

For Integral motor starters LD1 or LD4 and reversing Integral motor starters LD5

Mounted on RH side



Integral motor starters



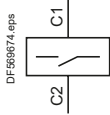
TeSys Control

Integral motor starters

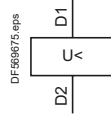
Schemes

Tripping devices ⁽¹⁾ for LD1, LD4, LD5

LA1LC071



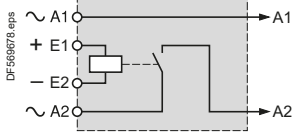
LA1LC070, LC072



(1) For Integral motor starters and reversing motor starters already fitted with an LA1LC010 or LA1LC012 instantaneous auxiliary contact block.

Interface modules

LA1LD580



Ref.

i

Table icon

Graph icon

Integral motor starters

Dimensions icon

Terminology

Altitude

The rarefied atmosphere at high altitude reduces the dielectric strength of the air and hence the rated operational voltage of the Integral motor starter. It also reduces the cooling effect of the air and hence the rated operational current of the Integral motor starter (unless the temperature drops at the same time).

No derating is necessary up to 3000 m.

Derating factors to be applied above this altitude for main pole operational voltage and current (a.c. supply) are as follows:

| Altitude | 3500 m | 4000 m | 4500 m | 5000 m |
|---------------------------|--------|--------|--------|--------|
| Rated operational voltage | 0.90 | 0.80 | 0.70 | 0.60 |
| Rated operational current | 0.92 | 0.90 | 0.88 | 0.86 |

Ambient air temperature

The temperature of the air surrounding the device, measured near to the device.

The operating characteristics are given:

- with no restriction for temperatures between - 5 and + 55 °C.
- with restrictions, if necessary, for temperatures between - 50 and + 70 °C.

Rated operational current (Ie)

This is defined taking into account the rated operational voltage, operating rate and duty, utilisation category and air temperature around the device.

Conventional rated thermal current (Ith) ⁽¹⁾

The current Ith which a closed Integral motor starter can sustain for a minimum of 8 hours without its temperature rise exceeding the limits given in the standards.

Short time rating

The current which a closed Integral motor starter can sustain for a short time, after a period of no load, without dangerous overheating.

Rated operational voltage (Ue)

This is the voltage value which, in conjunction with the rated operational current, determines the use of the Integral motor starter or starter, and on which the corresponding tests and the utilisation category are based. For 3-phase circuits, it is expressed as the voltage between phases.

Apart from exceptional cases such as rotor short-circuiting, the rated operational voltage Ue is less than or equal to the rated insulation voltage Ui.

Rated control circuit voltage (Uc)

The rated value of the control circuit voltage, on which the operating characteristics are based. For a.c. applications, the values are given for a near sinusoidal wave form (less than 5 % total harmonic distortion).

Rated insulation voltage (Ui)

This is the voltage value used to define the insulation characteristics of a device and referred to in dielectric tests determining leakage paths and creepage distances. As the specifications are not identical for all standards, the rated values given for each of them are not necessarily the same.

Rated impulse withstand voltage (Uimp)

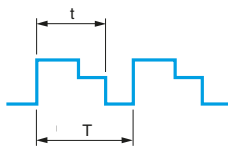
This is the highest peak value of an impulse voltage, of prescribed form and polarity, which the device is able to withstand without failure under specified test conditions, and to which isolation clearance values are referred.

The rated impulse withstand voltage of a device must be equal to or higher than the values stated for the transient overvoltages appearing in the circuit in which the device is fitted.

Note: these definitions are based on extracts from standard IEC 60947.

(1) Conventional free air thermal current, conforming to IEC standards.

DF504532.eps



Terminology

Rated operational power (expressed in kW)

The rated power of the standard motor which can be switched by the Integral motor starter, at the stated operational voltage.

Rated breaking capacity (Iq) ⁽¹⁾

This is the current value which the Integral motor starter can break in accordance with the breaking conditions specified in the IEC standard.

Rated making capacity ⁽¹⁾

This is the current value which the Integral motor starter can make in accordance with the making conditions specified in the IEC standard.

On-load factor (m)

This is the ratio between the time the current flows (t) and the duration of the cycle (T):

$$m = \frac{t}{T}$$

Cycle duration: duration of current flow + time at zero current.

Pole impedance

The impedance of one pole is the sum of the impedance of all the circuit components between the input terminal and the output terminal.

The impedance comprises a resistive component (R) and an inductive component (X = Lω). The total impedance therefore depends on the frequency and is normally given for 50 Hz. The average value is given for the pole at its rated operational current.

Electrical durability

This is the average number of on-load operating cycles which the main pole contacts can perform without maintenance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage.

Mechanical durability

This is the average number of no-load operating cycles (i.e. with zero current flow through the main poles) which the Integral motor starter can perform without mechanical failure.

Coordination

The coordination of protection devices involves combining, in a selective way, a short-circuit protection device (fuses or magnetic circuit-breakers) with a contactor and an overload protection device. Its objective is to break any abnormal current, in plenty of time, without any danger to personnel, whilst providing adequate protection of the equipment against an overload or short-circuit current.

Type 1 - IEC 60947-4-1

In a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and may not be able to resume operation without repair or the replacement of parts.

Type 2 - IEC 60947-4-1

In a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must be able to resume operation. The risk of contact welding is permissible if they can be easily separated.

Total, ensuring reliability of operation - IEC 60947-6-2

In the event of a short-circuit, no damage or risk of welding is permissible on the equipment constituting the motor starter. Operation can be resumed without any maintenance.

Note: these definitions are based on extracts from standard IEC 60947.

(1) For a.c. applications, the breaking and making capacities are expressed by the rms value of the symmetrical component of the short-circuit current. Taking into account the maximum asymmetry which may exist in the circuit, the contacts therefore have to withstand a peak asymmetrical current which may be twice the rms symmetrical component.

Definition

The standard utilisation categories define the current values which the Integral motor starter must be able to make or break. These values depend on:

- the type of load being switched: squirrel cage or slip ring motor, resistors,
- the conditions under which making or breaking takes place: motor stalled, starting or running, reversing, plugging.

Reminder of standards IEC 60947

- IEC 60947-1: general rules,
- IEC 60947-2: circuit breakers,
- IEC 60947-3: isolating devices,
- IEC 60947-4-1: contactors and motor starters,
- IEC 60947-5-1: control and signalling units,
- IEC 60947-6-2: control and protection devices,

Standards for Integral motor starters

IEC 60947-4-1

Standard IEC 60947-4-1: covers contactors and electromechanical motor starters. It concerns:

- types of equipment with main contacts designed for connection to circuits whose rated operational voltage does not exceed 1000 V for a.c. applications or 1500 V for d.c. applications,
- contactors used in conjunction with overload and/or short-circuit protection devices,
- motor starters used in conjunction with separate short-circuit protection devices and/or with separate short-circuit protection devices and built-in overload protection devices,
- contactors and combination motor starters which incorporate their own short-circuit protection device.

IEC 60947-6-2

Standard IEC 60947-6: covers multi-function equipment.

It concerns connection, power switching and protection devices (or equipment) with main contacts designed for connection to circuits whose rated operational voltage is less than or equal to 1000 V for a.c. applications, or 1500 V for d.c. applications. Such devices are designed to perform both the power switching function and the protection of remotely controlled circuits function; they can also perform other functions, such as isolation.

After short-circuit (I_{sc}) tests, the products must be able to make and break the currents corresponding to the specified utilisation categories, and to the number of operating cycles specified in the standard, without failing. This series of tests is completed by temperature rise tests.

Standard IEC 947-6-2 specifies that, in the event of a short-circuit, no damage or risk of contact welding is permissible on the devices constituting the motor starter.

The integral motor starter, through its design, ensures reliability of operation. After eliminating the fault, operation can be resumed instantly without any maintenance work on the product, other than resetting.

Utilisation categories for a.c. applications

Category AC-1

This category applies to all types of a.c. device (load) with a power factor equal to or greater than 0.95 ($\cos \varphi \leq 0.95$). Non inductive or slightly inductive loads.

Application examples: heating, distribution.

Category AC-2

This category applies to starting, plugging and inching of slip ring motors.

- On closing, the Integral motor starter makes the starting current, which is about 2.5 times the rated current of the motor.
- On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.

Category AC-3

This category applies to squirrel cage motors with breaking while motor running.

- On closing the Integral motor starter makes the starting current, which is about 5 to 7 times the rated current of the motor.
- On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the Integral motor starter terminals is about 20 % of the mains supply voltage. Breaking is light.

Application examples: all standard squirrel cage motors (lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc.).

Standards for Integral motor starter

Utilisation categories for a.c. applications

Category AC-4

This category covers starting, plug braking and inching of squirrel cage motors. On closing, the Integral motor starter makes a current peak which may be as high as 5 to 7 times the rated motor current. On opening, it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.

Application examples: printing machines, wire drawing machines, hoisting equipment, metallurgy industry.

Category AC-41

This category applies to all types of a.c. device (load) with a power factor equal to or greater than 0.95 ($\cos \varphi \leq 0.95$). Non inductive or slightly inductive loads.

Application examples: heating, distribution.

Category AC-42

This category applies to starting, plugging and inching of slip ring motors.

- On closing, the Integral motor starter makes the starting current, which is about 2.5 times the rated current of the motor.

- On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.

Category AC-43

This category applies to squirrel cage motors with breaking while motor running; inching or occasional reversing of limited duration are permissible if the number of operating cycles does not exceed 5 per minute, or 10 within a 10 minute period.

- On closing the Integral motor starter makes the starting current, which is about 5 to 7 times the rated current of the motor.

- On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the Integral motor starter terminals is about 20% of the mains supply voltage. Breaking is light.

Application examples: all standard squirrel cage motors: lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc.).

Category AC-44

This category covers applications with plug braking and inching of squirrel cage or slip ring motors.

On closing, the Integral motor starter makes a current peak which may be as high as 5 to 7 times the rated motor current. On opening, it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.

Application examples: printing machines, wire drawing machines, hoisting equipment, metallurgy industry.

Tripping classes of protection modules

The creation of thermal tripping classes allows better adaptation of the thermal protection to suit different motor and application technologies (short or long starting times). Conforming to IEC 60947-4-1 and IEC 60947-6-2.

| Class | 10 A | 10 | 20 | 30 |
|--|----------|----------|----------|----------|
| Tripping time at 7.2 I _r ⁽¹⁾ | 2...10 s | 4...10 s | 6...20 s | 9...30 s |

Standards for auxiliary contacts

IEC 60947-5

Standard IEC 60947-5-1: covers switching devices and components for control circuits.

It concerns electromechanical devices for control circuits.

Utilisation categories for a.c. applications

Category AC-14 ⁽²⁾

This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is less than 72 VA.

Application example: switching the operating coil of contactors and relays.

Category AC-15 ⁽²⁾

This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is greater than 72 VA.

Application example: switching the operating coil of contactors.

Utilisation categories for d.c. applications

Category DC-13 ⁽³⁾

This category applies to the switching of electromagnetic loads for which the time taken to reach 95 % of the steady state current ($T = 0.95$) is equal to 6 times the power P drawn by the load (with $P \leq 50$ W).

Application example: switching the operating coil of Integral motor starters.

⁽¹⁾ I_r = protection module setting current.

⁽²⁾ Replaces category AC-11.

⁽³⁾ Replaces category DC-11.

Coordination between protection and control components**Type of information****Page**

Types of coordination, according to the standard currents in the circuit to be considered

A6/2

Selection of the coordination type

A6/3

Suggested coordinated Direct-On-Line motor starter combinations

Fuse + contactors + thermal overload relay

A6/4

Circuit breaker (with built in overload protection) + contactors

A6/9

Circuit breaker + contactors + thermal overload relay

A6/11

Suggested coordinated Star-delta motor starter combinations

Fuse + contactors + thermal overload relay

A6/16

Circuit breaker (with built in overload protection) + contactors

A6/19

Circuit breaker + contactors + thermal overload relay

A6/21

Suggested coordinated TeSys island motor starter combinations

Protection Components / Starters - Coordination - IEC

A6/25

Protection Components / Starters - SCCR Ratings - UL

A6/32

Contactors: Utilisation categories – Standard characteristics – Selection tables per categorie

Definition: utilisation categories : AC-1, AC-2, AC-3, etc...

A6/33

Definition: contactor standard characteristics

A6/34

Contactor selection tables per utilisation categorie

A6/36

Contactors for specific application – Design information

Selection of contactors for lighting circuits

A6/50

Selection of contactors for heating circuits

A6/56

Selection of contactors for switching primaries of 3P LV/LV transformers

A6/58

Selection of contactors for switching 3P capacitor banks (factor correction)

A6/59

Selection of contactors auto-transformer starting

A6/60

Selection of contactors for rotor circuit of slip-ring motors

A6/62

Design of long distance remote control for contactors

A6/64

Current of asynchronous squirrel cage motors at nominal load

A6/68

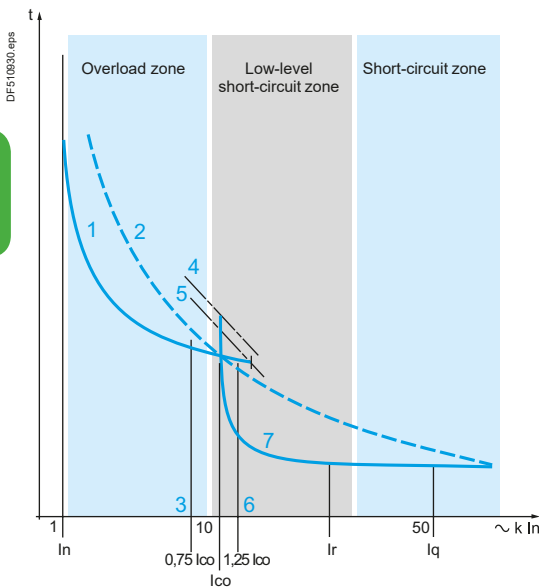
Standards – Protection against contact – Protective treatments

International standards and certifications

A6/69

Protection against accidental direct contacts / IP codes

A6/71



- 1 Thermal overload relay curve.
- 2 Fuse.
- 3 Tripping of thermal overload relay only.
- 4 Thermal limit of the circuit breaker.
- 5 Thermal overload relay limit.
- 6 Current broken by the SCPD ⁽¹⁾.
- 7 Circuit breaker magnetic trip.

Type 1 and type 2 coordination according to the standard

The standard defines tests at different levels of current; the purpose of these tests is to place the equipment in extreme conditions.

The standard defines 2 types of coordination, according to the condition of the components after testing:

- type 1,**
- type 2.**

To determine the type of coordination, the standard requires that the behaviour of the equipment be tested under overload and short-circuit conditions for 3 fault current values, covering overload and short-circuit conditions.

Type 1 coordination

Type 1 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must not be able to resume operation without repair or the replacement of parts.

Type 2 coordination

Type 2 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must subsequently be able to resume operation. The risk of contact welding is permissible; in this case, the manufacturer must indicate measures to be taken regarding maintenance of the equipment.

Type 2 coordination increases reliability of operation.

Current values

Current “Ico” (overload $I < 10 I_n$)

The thermal overload relay associated with the contactor provides protection against this type of fault, up to a value I_{co} (see curve) defined by the manufacturer.

Standard IEC 60947-4-1 specifies the 2 current values to be used for checking coordination between the thermal overload relay and the short-circuit protection device:

- at $0.75 I_{co}$ only the thermal overload relay must trip,
- at $1.25 I_{co}$ the short-circuit protection device must operate.

Current “r” (low level short-circuit $10 < I < 50 I_n$)

The main cause of this type of fault is the deterioration of insulating materials. Standard IEC 60947-4-1 defines an intermediate short-circuit current “r”. This test current makes it possible to check whether the protection device is providing protection against low-level short-circuits.

| Operational current I_e (AC-3) (A) | Current “r” (kA) |
|--------------------------------------|------------------|
| $I_e \leq 16$ | 1 |
| $16 < I_e \leq 63$ | 3 |
| $63 < I_e \leq 125$ | 5 |
| $125 < I_e \leq 315$ | 10 |
| $315 < I_e \leq 630$ | 18 |
| $630 < I_e \leq 1000$ | 30 |

Current “Iq” (short-circuit $>$ current “r”)

This type of fault corresponds to a dead short and is relatively rare. It can be caused by a connection error during maintenance work. Short-circuit protection is provided by fast operating devices.

Standard IEC 60947-4-1 defines a current “Iq”. The coordination tables supplied by Schneider Electric are based on a current “Iq” that is generally ≥ 50 kA.

⁽¹⁾ SCPD: short-circuit protection device.

Selection

No coordination

Considerable risks to both persons and equipment.

Not authorised by standards:

- NF C 15-100 and IEC 60364-1, article 133-1 (installation regulations),
- EN/IEC 60204-1, article 7 (electrical equipment in machines),
- IEC 60947-4-1, article 8.2.5. (starters)

Type 1 coordination

The most frequently used solution.

- Equipment costs are lower.
- Reliability of operation is not a requirement.
- Before restarting, it may be necessary to repair the motor starter.

Consequences:

- significant amount of machine downtime,
- skilled maintenance personnel required to repair, check, obtain supplies.

Example: air conditioning in commercial premises.

Type 2 coordination

This solution ensures reliability of operation.

Consequences:

- reduced machine downtime,
- reduced maintenance after a short-circuit.

Example: escalators.

Total coordination

With this solution, no damage or misadjustment is permissible and reliability of operation is guaranteed.

Consequences:

- immediate return to service,
- no special precautions required.

Examples: smoke extraction, fire-fighting pumps.

| 0.06 to 55 kW at 400/415 V: type 1 coordination | | | | | | | | | | | |
|--|----------------|-------|----------------|-------|----------------|--|----------|--------|--------------------------|---------------------------------|---------------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Fuse carrier ⁽¹⁾ (basic block) | aM fuses | | Contactor | Thermal overload relay class 10 | |
| 400/415 V | | 440 V | | 500 V | | Reference | Size | Rating | Reference ⁽²⁾ | Reference | Setting range |
| P | I _e | P | I _e | P | I _e | | | A | | | A |
| kW | A | kW | A | kW | A | | | | | | A |
| 0.06 | 0.2 | 0.06 | 0.19 | – | – | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0302 | 0.16...0.23 |
| – | – | 0.09 | 0.28 | – | – | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0303 | 0.23...0.36 |
| 0.09 | 0.3 | – | – | – | – | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0304 | 0.36...0.54 |
| 0.12 | 0.44 | 0.12 | 0.37 | – | – | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0304 | 0.36...0.54 |
| 0.18 | 0.6 | 0.18 | 0.55 | – | – | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0305 | 0.54...0.8 |
| – | – | 0.25 | 0.76 | – | – | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0305 | 0.54...0.8 |
| 0.25 | 0.85 | – | – | – | – | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0306 | 0.8...1.2 |
| 0.37 | 1.1 | 0.37 | 1 | 0.37 | 0.88 | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0306 | 0.8...1.2 |
| 0.55 | 1.5 | 0.55 | 1.36 | 0.55 | 1.2 | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0307 | 1.2...1.8 |
| – | – | 0.75 | 1.68 | 0.75 | 1.5 | LS1D32 | 10 x 38 | 2 | LC1K06 | LR2K0307 | 1.2...1.8 |
| 0.75 | 1.9 | – | – | 1.1 | 2.2 | LS1D32 | 10 x 38 | 4 | LC1K06 | LR2K0308 | 1.8...2.6 |
| 1.1 | 2.7 | 1.1 | 2.37 | 1.5 | 2.9 | LS1D32 | 10 x 38 | 4 | LC1K06 | LR2K0308 | 1.8...2.6 |
| 1.5 | 3.6 | 1.5 | 3.06 | – | – | LS1D32 | 10 x 38 | 4 | LC1K06 | LR2K0310 | 2.6...3.7 |
| 2.2 | 4.9 | – | – | 2.2 | 3.9 | LS1D32 | 10 x 38 | 6 | LC1K06 | LR2K0312 | 3.7...5.5 |
| – | – | – | – | 3 | 5.2 | LS1D32 | 10 x 38 | 6 | LC1K06 | LR2K0312 | 3.7...5.5 |
| – | – | 2.2 | 4.42 | – | – | LS1D32 | 10 x 38 | 8 | LC1K06 | LR2K0312 | 3.7...5.5 |
| 3 | 6.5 | 3 | 5.77 | 4 | 6.8 | LS1D32 | 10 x 38 | 8 | LC1K09 | LR2K0314 | 5.5...8 |
| 4 | 8.5 | 4 | 7.9 | 5.5 | 9.2 | LS1D32 | 10 x 38 | 12 | LC1K09 | LR2K0316 | 8...11.5 |

(1) For breaking under load, add a rotary switch-disconnector.

(2) For reversing operation, replace the prefix LC1 with LC2.

| 0.06 to 55 kW at 400/415 V: type 1 coordination | | | | | | | | | | | |
|--|----------------|-------|----------------|-------|----------------|--|----------|--------|--------------------------|----------------------------------|---------------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Fuse carrier ⁽¹⁾ (basic block) | aM fuses | | Contactor | Thermal overload relay classe 10 | |
| 400/415 V | | 440 V | | 500 V | | Reference | Size | Rating | Reference ⁽²⁾ | Reference | Setting range |
| P | I _e | P | I _e | P | I _e | | | A | | | A |
| kW | A | kW | A | kW | A | | | | | | A |
| 5.5 | 11.5 | 5.5 | 10.4 | 7.5 | 12.4 | LS1D32 | 10 x 38 | 16 | LC1K12 | LR2K0321 | 10...14 |
| 7.5 | 15.5 | 7.5 | 13.7 | 9 | 13.9 | LS1D32 | 10 x 38 | 16 | LC1D18 | LRD21 | 12...18 |
| - | - | 9 | 16.9 | - | - | LS1D32 | 10 x 38 | 20 | LC1D25 | LRD21 | 12...18 |
| 9 | 18.1 | - | - | 11 | 17.6 | | | | | | |
| 11 | 22 | 11 | 20.1 | 15 | 23 | GK1EK | 14 x 51 | 25 | LC1D25 | LRD22 | 16...24 |
| 15 | 29 | 15 | 26.5 | 18.5 | 28 | GK1EK | 14 x 51 | 32 | LC1D32 | LRD32 | 23...32 |
| 18.5 | 35 | 18.5 | 32.8 | 22 | 33 | GK1EK | 14 x 51 | 40 | LC1D40A | LRD340 | 30...40 |
| 22 | 41 | 22 | 39 | 30 | 44 | GS●J | 22 x 58 | 50 | LC1D50A | LRD350 | 37...50 |
| - | - | 30 | 51.5 | - | - | GS●J | 22 x 58 | 80 | LC1D50A | LRD365 | 48...65 |
| - | - | - | - | 37 | 53 | GS●J | 22 x 58 | 80 | LC1D65A | LRD365 | 48...65 |
| 30 | 55 | 37 | 64 | - | - | GS●J | 22 x 58 | 80 | LC1D65A | LRD365 | 48...65 |
| - | - | - | - | 45 | 64 | GS●J | 22 x 58 | 80 | LC1D80 | LRD3361 | 55...70 |
| 37 ⁽³⁾ | 66 | 45 | 76 | - | - | GS●J | 22 x 58 | 100 | LC1D80 | LRD3363 | 63...80 |
| 45 | 80 | - | - | 55 | 78 | GS●J | 22 x 58 | 100 | LC1D95 | LRD3365 | 80...93 |
| - | - | 55 | 90 | - | - | GS●J | 22 x 58 | 125 | LC1D115 | LRD4365 | 80...104 |
| 55 | 97 | - | - | 75 | 106 | GS●J | 22 x 58 | 125 | LC1D115 | LRD4367 | 95...120 |

(1) For breaking under load, add a rotary switch-disconnector.

(2) For reversing operation, replace the prefix LC1 with LC2.

(3) 400 V maximum.

| 0.06 to 315 kW at 400/415 V: type 2 coordination | | | | | | | | | | | |
|--|----------------|-------|----------------|-------|----------------|--------------------------|----------|--------|--------------------------|----------------------------------|---------------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Switch-disconnector | aM fuses | | Contactor | Thermal overload relay classe 10 | |
| 400/415 V | | 440 V | | 500 V | | Reference ⁽¹⁾ | Size | Rating | Reference ⁽²⁾ | Reference | Setting range |
| P | I _e | P | I _e | P | I _e | | | A | | | A |
| kW | A | kW | A | kW | A | | | | | | |
| 0.06 | 0.2 | 0.06 | 0.19 | – | – | GS1DD | 10 x 38 | 2 | LC1D09 | LRD02 | 0.16...0.25 |
| – | – | 0.09 | 0.28 | – | – | GS1DD | 10 x 38 | 2 | LC1D09 | LRD03 | 0.25...0.4 |
| 0.09 | 0.3 | – | – | – | – | | | | | | |
| 0.12 | 0.44 | 0.12 | 0.37 | – | – | GS1DD | 10 x 38 | 2 | LC1D09 | LRD04 | 0.4...0.63 |
| 0.18 | 0.6 | 0.18 | 0.55 | – | – | | | | | | |
| – | – | 0.25 | 0.76 | – | – | GS1DD | 10 x 38 | 2 | LC1D09 | LRD05 | 0.63...1 |
| 0.25 | 0.85 | – | – | 0.37 | 0.88 | | | | | | |
| 0.37 | 1.1 | 0.37 | 1 | 0.55 | 1.2 | | | | | | |
| 0.55 | 1.5 | 0.55 | 1.36 | 0.75 | 1.5 | GS1DD | 10 x 38 | 2 | LC1D09 | LRD06 | 1...1.7 |
| 0.75 | 1.9 | 0.75 | 1.68 | – | – | | | | | | |
| – | – | 1.1 | 2.37 | 1.1 | 2.2 | GS1DD | 10 x 38 | 4 | LC1D09 | LRD07 | 1.6...2.5 |
| 1.1 | 2.7 | – | – | 1.5 | 2.9 | | | | | | |
| 1.5 | 3.6 | 1.5 | 3.06 | 2.2 | 3.9 | GS1DD | 10 x 38 | 4 | LC1D09 | LRD08 | 2.5...4 |
| 2.2 | 4.9 | 2.2 | 4.42 | 3 | 5.2 | GS1DD | 10 x 38 | 6 | LC1D09 | LRD10 | 4...6 |
| 3 | 6.5 | 3 | 5.77 | 4 | 6.8 | GS1DD | 10 x 38 | 8 | LC1D09 | LRD12 | 5.5...8 |
| 4 | 8.5 | 4 | 7.9 | 5.5 | 9.2 | GS1DD | 10 x 38 | 10 | LC1D09 | LRD14 | 7...10 |
| 5.5 | 11.5 | 5.5 | 10.4 | 7.5 | 12.4 | GS1DD | 10 x 38 | 16 | LC1D12 | LRD16 | 9...13 |
| 7.5 | 15.5 | 7.5 | 13.7 | 9 | 13.9 | GS1DD | 10 x 38 | 16 | LC1D18 | LRD21 | 12...18 |
| – | – | 9 | 16.9 | – | – | GS●F | 14 x 51 | 20 | LC1D25 | LRD21 | 12...18 |
| 9 | 18.1 | 11 | 20.1 | 11 | 17.6 | | | | | | |
| 11 | 22 | – | – | 15 | 23 | GS●F | 14 x 51 | 25 | LC1D25 | LRD22 | 16...24 |
| 15 | 29 | 15 | 26.5 | 18.5 | 28 | GS●F | 14 x 51 | 32 | LC1D32 | LRD32 | 23...32 |
| 18.5 | 35 | 18.5 | 32.8 | 22 | 33 | GS●F | 14 x 51 | 40 | LC1D40A | LRD340 | 30...40 |
| 22 | 41 | 22 | 39 | 30 | 44 | GS●J | 22 x 58 | 50 | LC1D50A | LRD350 | 37...50 |
| – | – | 30 | 51.5 | – | – | GS●J | 22 x 58 | 80 | LC1D65A | LRD365 | 48...65 |
| – | – | – | – | 37 | 53 | GS●J | 22 x 58 | 80 | LC1D65A | LRD365 | 48...65 |
| 30 | 55 | 37 | 64 | – | – | GS●J | 22 x 58 | 80 | LC1D65A | LRD365 | 48...65 |
| – | – | – | – | 45 | 64 | GS●J | 22 x 58 | 80 | LC1D95 | LRD3361 | 55...70 |
| 37 | 66 | 45 | 76 | – | – | GS●J | 22 x 58 | 100 | LC1D80 | LRD3363 | 63...80 |
| – | – | – | – | 55 | 78 | GS●J | 22 x 58 | 100 | LC1D115 | LR9D5367 | 60...100 |
| 45 | 80 | – | – | – | – | GS●J | 22 x 58 | 100 | LC1D95 | LRD3365 | 80...93 |
| 55 | 97 | 55 | 90 | 75 | 106 | GS●L | T0 | 125 | LC1D150 | LR9D5369 | 90...150 |
| 75 | 132 | 75 | 125 | 90 | 128 | GS●L | T0 | 160 | LC1D150 | LR9D5369 | 90...150 |
| 90 | 160 | 90 | 146 | 110 | 156 | GS●N | T1 | 200 | LC1F185 | LR9F5371 | 132...220 |
| 110 | 195 | 110 | 178 | 132 | 184 | GS●N | T1 | 250 | LC1F225 | LR9F5371 | 132...220 |
| 132 | 230 | 132 | 215 | 160 | 224 | GS●QQ | T2 | 315 | LC1F265 | LR9F7375 | 200...330 |
| – | – | 160 | 256 | – | – | GS●QQ | T2 | 315 | LC1F330 | LR9F7375 | 200...330 |
| 160 | 280 | 200 | 321 | 200 | 280 | GS●QQ | T2 | 400 | LC1F330 | LR9F7375 | 200...330 |
| – | – | – | – | 220 | 310 | GS●QQ | T2 | 400 | LC1F400 | LR9F7375 | 200...330 |
| 200 | 350 | – | – | – | – | | | | | | |
| 220 | 388 | 220 | 353 | 250 | 344 | GS2S | T3 | 500 | LC1F400 | LR9F7379 | 300...500 |
| 250 | 430 | 250 | 401 | – | – | GS2S | T3 | 500 | LC1F500 | LR9F7379 | 300...500 |
| – | – | – | – | 315 | 432 | | | | | | |
| – | – | – | – | 355 | 488 | GS2S | T3 | 630 | LC1F500 | LR9F7381 | 380...630 |
| 315 | 540 | 315 | 505 | – | – | GS2S | T3 | 630 | LC1F630 | LR9F7381 | 380...630 |
| – | – | 355 | 549 | – | – | | | | | | |
| – | – | 400 | 611 | 400 | 552 | GS2V | T4 | 800 | LC1F630 | LR9F7381 | 380...630 |

(1) GS●: GS1 for direct operator or GS2 for external operator.

(2) For reversing operation, replace the prefix LC1 with LC2.

| 0.75 to 400 kW at 690 V: type 2 coordination | | | | | | | |
|--|----------------|--------------------------|----------|--------|--------------------------|----------------------------------|---------------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | Switch-disconnector | aM fuses | | Contactor | Thermal overload relay classe 10 | |
| P | I _e | Reference ⁽¹⁾ | Size | Rating | Reference ⁽²⁾ | Reference | Setting range |
| kW | A | | | A | | | A |
| 0.75 | 1.1 | GS●F | 14 x 51 | 2 | LC1D09 | LRD06 | 1...1.6 |
| 1.1 | 1.6 | GS●F | 14 x 51 | 2 | LC1D09 | LRD06 | 1...1.6 |
| 1.5 | 2.1 | GS●F | 14 x 51 | 4 | LC1D09 | LRD07 | 1.6...2.5 |
| 2.2 | 2.8 | GS●F | 14 x 51 | 4 | LC1D09 | LRD08 | 2.5...4 |
| 3 | 3.8 | GS●F | 14 x 51 | 6 | LC1D09 | LRD08 | 2.5...4 |
| 4 | 4.9 | GS●F | 14 x 51 | 6 | LC1D09 | LRD10 | 4...6 |
| 5.5 | 6.7 | GS●F | 14 x 51 | 8 | LC1D09 | LRD12 | 5.5...8 |
| 7.5 | 8.9 | GS●F | 14 x 51 | 10 | LC1D25 | LRD16 | 9...13 |
| 11 | 12.8 | GS●F | 14 x 51 | 16 | LC1D25 | LRD16 | 9...13 |
| 15 | 17 | GS●F | 14 x 51 | 20 | LC1D25 | LRD22 | 16...24 |
| 18.5 | 21 | GS●F | 14 x 51 | 25 | LC1D32 | LRD22 | 16...24 |
| 22 | 24 | GS●J | 22 x 58 | 32 | LC1D40A | LRD332 | 23...32 |
| 30 | 32 | GS●J | 22 x 58 | 40 | LC1D40A | LRD340 | 30...40 |
| 37 | 39 | GS●J | 22 x 58 | 50 | LC1D65A | LRD350 | 37...50 |
| 45 | 47 | GS●J | 22 x 58 | 63 | LC1D80 | LRD3357 | 37...50 |
| 55 | 57 | GS●J | 22 x 58 | 80 | LC1D115 | LRD3359 | 48...65 |
| 75 | 77 | GS●KK | T00 | 100 | LC1D115 | LRD3363 | 63...80 |
| 90 | 93 | GS●KK | T00 | 125 | LC1D150 | LR9D5369 | 90...150 |
| 110 | 113 | GS●KK | T00 | 125 | LC1F185 | LR9D5369 | 90...150 |
| 132 | 134 | GS●L | T0 | 160 | LC1F265 | LR9F5371 | 132...220 |
| 160 | 162 | GS●N | T1 | 200 | LC1F265 | LR9F5371 | 132...220 |
| 200 | 203 | GS●N | T1 | 250 | LC1F330 | LR9F7375 | 200...330 |
| 220 | 224 | GS●QQ | T2 | 250 | LC1F400 | LR9F7375 | 200...330 |
| 250 | 250 | GS●QQ | T2 | 315 | LC1F400 | LR9F7375 | 200...330 |
| 315 | 313 | GS●QQ | T2 | 355 | LC1F500 | LR9F7379 | 300...500 |
| 355 | 354 | GS●QQ | T2 | 400 | LC1F630 | LR9F7379 | 300...500 |
| 400 | 400 | GS2S | T3 | 500 | LC1F630 | LR9F7379 | 300...500 |

(1) GS●: GS1 for direct operator or GS2 for external operator.

(2) For reversing operation, replace the prefix LC1 with LC2.

| 0.18 to 55 kW at 400/415 V: type 2 coordination | | | | | | | | | | | |
|---|----------------|----------------|-------|----------------|----------------|-----------------------|-----------|------|-----------|--------------------------------------|-----------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Switch- disconnect | aM fuses | | Contactor | Electronic thermal overload relay | |
| 400/415 V | | | 690 V | | | | Reference | Size | | Rating | Reference |
| P | I _e | I _q | P | I _e | I _q | | | | | | |
| kW | A | kA | kW | A | kA | | | A | | | A |
| 0.18 | 0.6 | 100 | – | – | – | GS1DD | 10 x 38 | 2 | LC1D09 | LR9D02 | 0.4...2.0 |
| 0.25 | 0.85 | 100 | – | – | – | GS1DD | 10 x 38 | 2 | LC1D09 | LR9D02 | 0.4...2.0 |
| 0.37 | 1.1 | 100 | – | – | – | GS1DD | 10 x 38 | 2 | LC1D09 | LR9D02 | 0.4...2.0 |
| 0.55 | 1.5 | 100 | – | – | – | GS1DD | 10 x 38 | 2 | LC1D09 | LR9D02 | 0.4...2.0 |
| 0.75 | 1.9 | 100 | – | – | – | GS1DD | 10 x 38 | 4 | LC1D09 | LR9D02 | 0.4...2.0 |
| 1.1 | 2.7 | 100 | – | – | – | GS1DD | 10 x 38 | 4 | LC1D18 | LR9D08 | 1.6...8.0 |
| 1.5 | 3.6 | 100 | – | – | – | GS1DD | 10 x 38 | 4 | LC1D18 | LR9D08 | 1.6...8.0 |
| 2.2 | 4.9 | 100 | – | – | – | GS1DD | 10 x 38 | 6 | LC1D18 | LR9D08 | 1.6...8.0 |
| 3 | 6.5 | 100 | – | – | – | GS1DD | 10 x 38 | 8 | LC1D18 | LR9D32 | 6.4...32 |
| 4 | 8.5 | 100 | – | – | – | GS1DD | 10 x 38 | 10 | LC1D18 | LR9D32 | 6.4...32 |
| 5.5 | 11.5 | 100 | – | – | – | GS1DD | 10 x 38 | 16 | LC1D25 | LR9D32 | 6.4...32 |
| 7.5 | 15.5 | 50 | – | – | – | GS1DD | 10 x 38 | 16 | LC1D25 | LR9D32 | 6.4...32 |
| 11 | 22 | 50 | – | – | – | GS●F | 14 x 51 | 25 | LC1D25 | LR9D32 | 6.4...32 |
| 15 | 29 | 50 | – | – | – | GS●J | 22 x 58 | 32 | LC1D65A | LR9D110S | 22...110 |
| 18.5 | 35 | 50 | – | – | – | GS●J | 22 x 58 | 40 | LC1D65A | LR9D110S | 22...110 |
| 22 | 41 | 50 | – | – | – | GS●J | 22 x 58 | 50 | LC1D65A | LR9D110S | 22...110 |
| 45 ⁽¹⁾ | 80 | 100 | – | – | – | GS●N | T 1 | 100 | LC1D150 | LR9D110S | 22...110 |
| 55 ⁽¹⁾ | 97 | 100 | – | – | – | GS●N | T 1 | 125 | LC1D150 | LR9D110S | 22...110 |
| – | – | – | 0.37 | 0.64 | 100 | GS●F | 14 x 51 | 2 | LC1D09 | LR9D02 | 0.4...2.0 |
| – | – | – | 0.55 | 0.87 | 100 | GS●F | 14 x 51 | 2 | LC1D09 | LR9D02 | 0.4...2.0 |
| – | – | – | 0.75 | 1.1 | 100 | GS●F | 14 x 51 | 2 | LC1D09 | LR9D02 | 0.4...2.0 |
| – | – | – | 1.1 | 1.6 | 100 | GS●F | 14 x 51 | 2 | LC1D25 | LR9D08 | 1.6...8.0 |
| – | – | – | 1.5 | 2.1 | 100 | GS●F | 14 x 51 | 4 | LC1D25 | LR9D08 | 1.6...8.0 |
| – | – | – | 2.2 | 2.8 | 100 | GS●F | 14 x 51 | 4 | LC1D25 | LR9D08 | 1.6...8.0 |
| – | – | – | 3 | 4 | 100 | GS●F | 14 x 51 | 6 | LC1D25 | LR9D08 | 1.6...8.0 |
| – | – | – | 4 | 5 | 100 | GS●F | 14 x 51 | 6 | LC1D25 | LR9D08 | 1.6...8.0 |
| – | – | – | 5.5 | 7 | 50 | GS●F | 14 x 51 | 8 | LC1D25 | LR9D32 | 6.4...32 |
| – | – | – | 7.5 | 8.9 | 50 | GS●F | 14 x 51 | 10 | LC1D25 | LR9D32 | 6.4...32 |
| – | – | – | 11 | 13 | 50 | GS●F | 14 x 51 | 16 | LC1D32 | LR9D32 | 6.4...32 |
| – | – | – | 15 | 16.5 | 50 | GS●F | 14 x 51 | 20 | LC1D32 | LR9D32 | 6.4...32 |
| – | – | – | 18.5 | 21 | 100 | GS●F | 14 x 51 | 25 | LC1D95 | LR9D32 | 6.4...32 |
| – | – | – | 18.5 | 21 | 50 | GS●F | 14 x 51 | 25 | LC1D65A | LR9D32 | 6.4...32 |
| – | – | – | 22 | 25 | 50 | GS●F | 14 x 51 | 32 | LC1D65A | LR9D32 | 6.4...32 |
| – | – | – | 30 | 33 | 100 | GS●F | 14 x 51 | 40 | LC1D95 | LR9D110 | 22...110 |
| – | – | – | 37 | 40 | 100 | GS●F | 14 x 51 | 50 | LC1D95 | LR9D110 | 22...110 |
| – | – | – | 45 | 49 | 100 | GS●J | 22 x 58 | 63 | LC1D95 | LR9D110 | 22...110 |

(1) Ratings valid up to 400 V AC only.

| 0.06 to 375 kW at 415 V: type 2 coordination | | | | | | | | | | | |
|--|----------------|-------|----------------|-------|----------------|--------------------------|----------|-------------|--------------------------|------------------------|---------------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Switch-disconnector-fuse | BS fuses | | Contactor | Thermal overload relay | |
| 415 V | | 440 V | | 500 V | | Reference | Size | Rating | Reference ⁽¹⁾ | Reference | Setting range |
| P | I _e | P | I _e | P | I _e | | | | | | |
| kW | A | kW | A | kW | kA | | A | | | A | |
| 0.06 | 0.22 | 0.06 | 0.19 | – | – | GS1DDB | A1 | NIT 2 | LC1D09 | LRD02 | 0.16...0.25 |
| – | – | 0.09 | 0.28 | – | – | GS1DDB | A1 | NIT 2 | LC1D09 | LRD03 | 0.25...0.4 |
| 0.09 | 0.36 | – | – | – | – | | | | | | |
| 0.12 | 0.42 | 0.12 | 0.37 | – | – | GS1DDB | A1 | NIT 2 | LC1D09 | LRD04 | 0.4...0.63 |
| 0.18 | 0.6 | 0.18 | 0.55 | – | – | GS1DDB | A1 | NIT 2 | LC1D09 | LRD05 | 0.63...1 |
| – | – | 0.25 | 0.76 | – | – | GS1DDB | A1 | NIT 4 | LC1D09 | LRD05 | 0.63...1 |
| 0.25 | 0.88 | 0.37 | 1 | 0.37 | 1 | | | | | | |
| 0.37 | 1 | 0.55 | 1.36 | 0.55 | 1.2 | | | | | | |
| 0.55 | 1.5 | 0.75 | 1.68 | 0.75 | 1.5 | GS1DDB | A1 | NIT 6 | LC1D09 | LRD06 | 1...1.7 |
| 0.75 | 2 | – | – | – | – | GS1DDB | A1 | NIT 10 | LC1D09 | LRD07 | 1.6...2.5 |
| – | – | – | – | 1.5 | 2.6 | GS1DDB | A1 | NIT 10 | LC1D09 | LRD08 | 2.5...4 |
| 1.5 | 3.5 | 1.5 | 3.06 | 2.2 | 3.8 | GS1DDB | A1 | NIT 16 | LC1D09 | LRD08 | 2.5...4 |
| 2.2 | 5 | 2.2 | 4.42 | 3 | 5 | GS1DDB | A1 | NIT 16 | LC1D09 | LRD10 | 4...6 |
| 3 | 6.5 | 3 | 5.77 | 4 | 6.5 | GS1DDB | A1 | NIT 20 | LC1D09 | LRD12 | 5.5...8 |
| 4 | 8.4 | 4 | 7.9 | 5.5 | 9 | GS1DDB | A1 | NIT 20 | LC1D09 | LRD14 | 7...10 |
| 5.5 | 11 | 5.5 | 10.4 | 7.5 | 12 | GS1DDB | A1 | NIT 20M25 | LC1D12 | LRD16 | 9...13 |
| 7.5 | 14 | 7.5 | 13.7 | 9 | 13.9 | GS1DDB | A1 | NIT 20M32 | LC1D18 | LRD21 | 12...18 |
| 9 | 18.1 | 9 | 16.9 | – | – | GS2GB | A2 | TIA 32M35 | LC1D18 | LRD21 | 12...18 |
| 11 | 21 | 11 | 20 | 11 | 18.4 | | | | | | |
| – | – | – | – | 15 | 23 | GS2GB | A2 | TIA 32M50 | LC1D25 | LRD22 | 16...24 |
| 15 | 28.5 | 15 | 26.5 | – | – | GS2GB | A2 | TIA 32M63 | LC1D32 | LRD32 | 23...32 |
| 18.5 | 35 | 18.5 | 32.8 | – | – | GS2GB | A3 | TIS 63M80 | LC1D40A | LRD340 | 25...40 |
| 22 | 41 | 22 | 39 | – | – | GS2GB | A3 | TIS 63M80 | LC1D50A | LRD350 | 37...50 |
| 30 | 55 | 30 | 51.5 | – | – | GS2GB | A3 | TIS 63M100 | LC1D65A | LRD365 | 48...65 |
| – | – | 37 | 64 | – | – | GS2GB | A3 | TIS 63M100 | LC1D65A | LRD365 | 48...65 |
| – | – | 45 | 76 | 45 | 65 | GS2LLB | A4 | TCP 100M125 | LC1D80 | LRD3363 | 63...80 |
| 45 | 81 | – | – | 55 | 80 | GS2LLB | A4 | TCP 100M125 | LC1D95 | LRD3365 | 80...93 |
| 55 | 100 | – | – | – | – | GS2LLB | A4 | TCP 100M160 | LC1D115 | LR9D5369 | 90...150 |
| – | – | 55 | 90 | – | – | GS2LLB | A4 | TCP 100M160 | LC1D115 | LR9D5367 | 60...100 |
| – | – | – | – | 80 | 116 | GS2LB | B2 | TF 200 | LC1D150 | LR9D5369 | 90...150 |
| 80 | 138 | 80 | 132 | – | – | GS2LB | B2 | TF 200M250 | LC1D150 | LR9D5369 | 90...150 |
| – | – | – | – | 100 | 143 | | | | | | |
| – | – | – | – | 110 | 156 | GS2LB | B2 | TF 200M250 | LC1F185 | LR9F5371 | 132...220 |
| 100 | 182 | 100 | 162 | – | – | GS2MMB | B2 | TF 200M250 | LC1F185 | LR9F5371 | 132...220 |
| 110 | 196 | 110 | 178 | – | – | GS2MMB | B2 | TF 200M315 | LC1F225 | LR9F5371 | 132...220 |
| – | – | – | – | 140 | 200 | GS2NB | B3 | TKF 315M355 | LC1F265 | LR9F5371 | 132...220 |
| 140 | 250 | 140 | 226 | 160 | 220 | GS2NB | B3 | TKF 315M355 | LC1F265 | LR9F7375 | 200...330 |
| 160 | 285 | 160 | 256 | – | – | GS2QQB | B4 | TKF 315M355 | LC1F330 | LR9F7375 | 200...330 |
| – | – | – | – | 220 | 310 | GS2QQB | B4 | TMF 400 | LC1F400 | LR9F7379 | 300...500 |
| 220 | 388 | 220 | 353 | 257 | 362 | GS2QQB | B4 | TMF 400M450 | LC1F400 | LR9F7379 | 300...500 |
| – | – | – | – | 270 | 380 | GS2SB | C2 | TTM 500 | LC1F500 | LR9F7379 | 300...500 |
| 257 | 450 | 257 | 412 | – | – | | | | | | |
| 270 | 460 | 270 | 433 | – | – | GS2SB | C2 | TTM 500 | LC1F500 | LR9F7381 | 380...630 |
| 375 | 610 | 375 | 577 | 375 | 508 | | | | | | |
| – | – | – | – | 425 | 556 | GS2SB | C2 | TTM 630 | LC1F630 | LR9F7381 | 380...630 |

(1) For reversing operation, replace the prefix LC1 with LC2.

| 0.06 to 250 kW at 400/415 V: type 1 coordination | | | | | | | | | | | | |
|---|----------------|-------------------------------|--------------|----------------|-------------------------------|-------|----------------|-------------------------------|--|--------------------------------|--------------------------|--|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Circuit breaker | | Contactor | |
| 400/415 V | | | 440 V | | | 500 V | | | Reference <i>References in italics are available in CEE zone only</i> | Setting range of thermal trips | Reference ⁽²⁾ | |
| P | I _e | I _q ⁽¹⁾ | P | I _e | I _q ⁽¹⁾ | P | I _e | I _q ⁽¹⁾ | | | | |
| kW | A | kA | kW | A | kA | kW | A | kA | A | | | |
| 0.06 | 0.2 | 50 | 0.06 | 0.19 | 50 | – | – | – | GV2ME02 GV2ME02AP | 0.16...0.25 | LC1K06 or LC1D09 | |
| 0.09 | 0.3 | 50 | 0.09 0.12 | 0.28 0.37 | 50 50 | – | – | – | GV2ME03 GV2ME03AP | 0.25...0.40 | LC1K06 or LC1D09 | |
| 0.12 | 0.44 | 50 | – | – | – | – | – | – | GV2ME04 GV2ME04AP | 0.40...0.63 | LC1K06 or LC1D09 | |
| 0.18 | 0.6 | 50 | 0.18 | 0.55 | 50 | – | – | – | GV2ME05 GV2ME05AP | 0.63...1 | LC1K06 or LC1D09 | |
| 0.25 | 0.85 | 50 | 0.25 | 0.76 | 50 | – | – | – | GV2ME06 GV2ME06AP | 1...1.6 | LC1K06 or LC1D09 | |
| 0.37 | 1.1 | 50 | 0.37 | 0.99 | 50 | – | – | – | GV2ME06 GV2ME06AP | 1...1.6 | LC1K06 or LC1D09 | |
| – | – | – | – | – | – | 0.37 | 0.88 | 50 | GV2ME07 GV2ME07AP | 1.6...2.5 | LC1K06 or LC1D09 | |
| 0.55 | 1.5 | 50 | 0.55 | 1.36 | 50 | 0.55 | 1.2 | 50 | GV2ME08 GV2ME08AP | 2.5...4 | LC1K06 or LC1D09 | |
| – | – | – | – | – | – | 0.75 | 1.5 | 50 | GV2ME10 GV2ME10AP | 4...6.3 | LC1K06 or LC1D09 | |
| 0.75 | 1.9 | 50 | 0.75 | 1.68 | 50 | – | – | – | GV2ME14 GV2ME14AP | 6...10 | LC1K09 or LC1D09 | |
| – | – | – | 1.1 | 2.37 | 50 | 1.1 | 2.2 | 50 | GV2ME16 GV2ME16AP | 9...14 | LC1K12 or LC1D12 | |
| 1.1 | 2.7 | 50 | – | – | – | 1.5 | 2.9 | 50 | GV2ME20 GV2ME20AP | 13...18 | LC1D18 | |
| 1.5 | 3.6 | 50 | 1.5 | 3.06 | 50 | 2.2 | 3.9 | 50 | GV2ME21 GV2ME21AP | 17...23 | LC1D25 | |
| 2.2 | 4.9 | 50 | 2.2 | 4.42 | 50 | – | – | – | GV2ME22 GV2ME22AP | 20...25 | LC1D25 | |
| – | – | – | 3 | 5.77 | 50 | 3 | 5.2 | 50 | GV2ME32 GV2ME32AP | 24...32 | LC1D32 | |
| 3 | 6.5 | 50 | – | – | – | 4 | 6.8 | 10 | GV3P40 | 30...40 | LC1D40A | |
| 4 | 8.5 | 50 | 4 | 7.9 | 15 | 5.5 | 9.2 | 10 | GV3P50 | 37...50 | LC1D50A | |
| 5.5 | 11.5 | 15 | 5.5 | 10.4 | 8 | 7.5 | 12.4 | 6 | GV3P65 | 48...65 | LC1D65A | |
| 7.5 | 15.5 | 15 | 7.5 | 13.7 | 8 | 9 | 13.9 | 6 | GV3P73 | 62...73 | LC1D80A | |
| – | – | – | 9 | 16.9 | 8 | – | – | – | GV4P80 | 40...80 | LC1D65A | |
| 9 | 18.1 | 15 | 11 | 20.1 | 6 | 11 | 17.6 | 4 | GV4P80 | 40...80 | LC1D80 | |
| 11 | 22 | 15 | – | – | – | 15 | 23 | 4 | GV4P115 | 65...115 | LC1D95 | |
| 15 | 29 | 10 | 15 | 26.5 | 6 | 18.5 | 28 | 4 | GV4P115 | 65...115 | LC1D115 | |
| 18.5 | 35 | 50 | 18.5 | 32.8 | 50 | 22 | 33 | 10 | GV5P150F | 70...150 | LC1D150 | |
| 22 | 41 | 50 | 22 | 39 | 50 | 30 | 44 | 10 | GV5P150F | 70...150 | LC1F185 | |
| 30 | 55 | 50 | 30 | 51.5 | 50 | 37 | 53 | 10 | GV5P220F | 100...220 | LC1F185 | |
| 37 | 66 | 50 | – | – | – | – | – | – | GV5P220F | 100...220 | LC1F225 | |
| – | – | – | 37 | 64 | 70 | 45 | 64 | 30 | GV6P320F | 160...320 | LC1F330 | |
| 37 | 66 | 100 | 45 | 76 | 70 | 55 | 78 | 30 | GV6P320F | 160...320 | LC1F400 | |
| 45 | 80 | 100 | – | – | – | – | – | – | GV6P500F | 250...500 | LC1F400 | |
| 55 | 97 | 100 | 55 | 90 | 70 | 75 | 106 | 30 | GV6P500F | 250...500 | LC1F500 | |
| 75 | 132 | 36 | 75 | 125 | 35 | 90 | 128 | 30 | | | | |
| – | – | – | 90 | 146 | 35 | – | – | – | | | | |
| 90 | 160 | 36 | – | – | – | 110 | 156 | 30 | | | | |
| 110 | 195 | 36 | – | – | – | – | – | – | | | | |
| 160 | 280 | 36 | 318 | 280 | 35 | – | – | – | | | | |
| – | – | – | – | – | – | 220 | 308 | 30 | | | | |
| 200 | 350 | 36 | 220 | 318 | 35 | – | – | – | | | | |
| 250 | 430 | 36 | 250 | 401 | 35 | 335 | 460 | 30 | | | | |

(1) The breaking performance of circuit breakers GV2ME can be increased by adding a current limiter GV1L3.

(2) For reversing operation, replace the prefix LC1 with LC2.

| 0.06 to 250 kW at 400/415 V: type 2 coordination | | | | | | | | | | Circuit breaker Reference <i>References in italics are available in CEE zone only</i> | Setting range of thermal trips A | Contactor Reference ⁽²⁾ |
|---|----------------|-------------------------------|-------|----------------|-------------------------------|----------------|----------------|-------------------------------|-----------------------------------|---|--|---------------------------------------|
| Standard power ratings of 3-phase motors 50/60 Hz in categ or y AC-3 | | | | | | | | | | | | |
| 400/415 V | | | 440 V | | | 500 V | | | | | | |
| P | I _e | I _q ⁽¹⁾ | P | I _e | I _q ⁽¹⁾ | P | I _e | I _q ⁽¹⁾ | | | | |
| kW | A | kA | kW | A | kA | kW | A | kA | | | | |
| 0.06 | 0.2 | 130 | 0.06 | 0.19 | 130 | – | – | – | GV2P02 or GV2ME02 or GV2ME02AP | 0.16...0.25 | LC1D09 | |
| – | – | – | 0.09 | 0.28 | 130 | – | – | – | GV2P03 or GV2ME03 or GV2ME03AP | 0.25...0.4 | LC1D09 | |
| 0.09 | 0.3 | 130 | 0.12 | 0.37 | 130 | – | – | – | GV2P04 or GV2ME04 or GV2ME04AP | 0.4...0.63 | LC1D09 | |
| 0.12 | 0.44 | 130 | – | – | – | – | – | – | GV2P05 or GV2ME05 or GV2ME05AP | 0.63...1 | LC1D09 | |
| 0.18 | 0.6 | 130 | 0.18 | 0.55 | 130 | – | – | – | GV2P06 or GV2ME06 or GV2ME06AP | 1...1.6 | LC1D09 | |
| 0.25 | 0.85 | 130 | 0.25 | 0.76 | 130 | – | – | – | GV2P06 or GV2ME06 or GV2ME06AP | 1...1.6 | LC1D09 | |
| 0.37 | 1.1 | 130 | 0.37 | 0.99 | 130 | – | – | – | GV2P07 or GV2ME07 or GV2ME07AP | 1.6...2.5 | LC1D09 | |
| – | – | – | – | – | – | 0.37 | 0.88 | 130 | GV2P08 or GV2ME08 or GV2ME08P | 2.5...4 | LC1D09 | |
| 0.55 | 1.5 | 130 | 0.55 | 1.36 | 130 | 0.55 | 1.2 | 130 | GV2P10 or GV2ME10 or GV2ME10AP | 4...6.3 | LC1D09 | |
| – | – | – | – | – | – | 0.75 | 1.5 | 130 | GV2ME10 or GV2ME10AP | 4...6.3 | LC1D09 | |
| 0.75 | 1.9 | 130 | 0.75 | 1.68 | 130 | – | – | – | GV2P10 | 4...6.3 | LC1D09 | |
| – | – | – | 1.1 | 2.37 | 130 | 1.1 | 2.2 | 130 | GV2P14 or GV2ME14 or GV2ME14AP | 6...10 | LC1D09 | |
| 1.1 | 2.7 | 130 | – | – | – | 1.5 | 2.9 | 130 | GV2ME14 or GV2ME14AP | 6...10 | LC1D09 | |
| 1.5 | 3.6 | 130 | 1.5 | 3.06 | 130 | 2.2 | 3.9 | 130 | GV2P14 | 6...10 | LC1D12 | |
| – | – | – | – | – | – | – | – | – | GV2P16 or GV2ME16 or GV2ME16AP | 9...14 | LC1D25 | |
| 2.2 | 4.9 | 130 | – | – | – | – | – | – | GV2P20 or GV2ME20 or GV2ME20AP | 13...18 | LC1D25 | |
| – | – | – | 2.2 | 4.42 | 50 | – | – | – | GV2P21 or GV2ME21 or GV2ME21AP | 17...23 | LC1D25 | |
| – | – | – | 3 | 5.77 | 50 | 3 | 5.2 | 50 | GV2P22 or GV2ME22 or GV2ME22AP | 20...25 | LC1D25 | |
| – | – | – | 2.2 | 4.42 | 130 | – | – | – | GV2P22 | 20...25 | LC1D32 | |
| – | – | – | 3 | 5.77 | 130 | 3 | 5.2 | 130 | GV2P32 or GV2ME32 or GV2ME32AP | 24...32 | LC1D32 | |
| 3 | 6.5 | 130 | – | – | – | – | – | – | GV3P40 | 30...40 | LC1D50A | |
| 4 | 8.5 | 130 | – | – | – | – | – | – | GV3P40 | 30...40 | LC1D65A | |
| – | – | – | 4 | 7.9 | 15 | 4 | 6.8 | 10 | GV3P50 | 37...50 | LC1D50A | |
| – | – | – | – | – | – | 5.5 | 9.2 | 10 | GV3P50 | 37...50 | LC1D65A | |
| – | – | – | – | – | – | – | – | – | GV3P65 | 48...65 | LC1D65A | |
| 5.5 | 11.5 | 130 | 5.5 | 10.4 | 50 or 8 | 7.5 | 12.4 | 42 or 6 | GV3P65 | 48...65 | LC1D65A | |
| – | – | – | 7.5 | 13.7 | 50 or 8 | 9 | 13.9 | 42 or 6 | GV3P73 | 62...73 | LC1D80A | |
| 7.5 | 15.5 | 50 or 15 | 9 | 16.9 | 20 or 8 | – | – | – | GV4P80 | 40...80 | LC1D65A | |
| 9 | 18.1 | 50 or 15 | 11 | 20.1 | 20 or 8 | 11 | 17.6 | 10 or 6 | GV4P80 | 40...80 | LC1D80 | |
| 11 | 22 | 50 or 15 | – | – | – | – | – | – | GV4P115 | 65...115 | LC1D115/F115 | |
| – | – | – | – | – | – | 15 | 23 | 10 or 6 | GV5P150H | 70...150 | LC1D150 | |
| 15 | 29 | 50 or 10 | 15 | 26.5 | 20 or 6 | 18.5 | 28 | 10 or 4 | GV5P220H | 100...220 | LC1F225 | |
| 18.5 | 35 | 50 | – | – | – | – | – | – | GV5P220H | 100...220 | LC1F225 | |
| – | – | – | 18.5 | 32.8 | 50 | 22 | 33 | 10 | GV6P320H | 160...320 | LC1F265 | |
| 22 | 41 | 50 | – | – | – | – | – | – | GV6P320H | 160...320 | LC1F330 | |
| – | – | – | 22 | 39 | 50 | 30 | 44 | 10 | GV6P500H | 250...500 | LC1F500 | |
| 30 | 55 | 50 | 30 | 51.5 | 50 | – | – | – | | | | |
| – | – | – | – | – | – | 37 | 53 | 10 | | | | |
| 37 | 66 | 50 | – | – | – | – | – | – | | | | |
| – | – | – | 37 | 64 | 70 | – | – | – | | | | |
| 37 | 66 | 100 | 45 | 76 | 70 | ⁽³⁾ | ⁽³⁾ | ⁽³⁾ | | | | |
| 45 | 80 | 100 | 55 | 90 | 70 | ⁽³⁾ | ⁽³⁾ | ⁽³⁾ | | | | |
| 55 | 97 | 100 | – | – | – | ⁽³⁾ | ⁽³⁾ | ⁽³⁾ | | | | |
| 75 | 132 | 70 | 75 | 125 | 65 | – | – | – | | | | |
| – | – | – | 90 | 146 | 65 | – | – | – | | | | |
| 90 | 160 | 70 | 110 | 178 | 65 | – | – | – | | | | |
| 110 | 195 | 70 | – | – | – | – | – | – | | | | |
| 132 | 230 | 70 | 160 | 256 | 65 | – | – | – | | | | |
| 160 | 280 | 70 | 200 | 318 | 65 | – | – | – | | | | |
| 220 | 385 | 70 | 250 | 450 | 65 | – | – | – | | | | |
| 250 | 450 | 70 | 300 | 473 | 65 | – | – | – | | | | |

(1) The breaking performance of circuit breakers GV2P can be increased by adding a current limiter GV1L3.

(2) Combinations with circuit breaker GV2ME are type 2 co or dinated only at 400/415 V and 440 V.

(3) Please consult your regional sales office.

½ to 80 hp at 460 V - 3P

GV2P + contactor: compact, high SCCR solution.

GV3P + contactor: medium power, Everlink (long lasting power connection).

GV4PB + contactor: high power, advanced protection settings, Everlink (long lasting power connection), 18 (GV4PB●●●B), 35 (GV4PB●●●N) or 65 (GV4PB●●●S) kA SCCR.

| Standard power ratings | | | | | | Circuit breaker | | Contactor | | Circuit breaker | | Contactor | | Circuit breaker | | Contactor | |
|------------------------|------|----------|------|----------|-----|-------------------|------------|-------------------|-------------------|-------------------|------------|-------------------|-----------------|-------------------|------------|-------------------|----------------------|
| 200 V 3P | | 230 V 3P | | 460 V 3P | | Product reference | Dial range | Product reference | Comb. SCCR 480Y | Product reference | Dial range | Product reference | Comb. SCCR 480Y | Product reference | Dial range | Product reference | SCCR 480Y As applied |
| HP | FLA | HP | FLA | HP | FLA | (2) | | (3) | (4) | (3) | | (3) | (4) | | (3) | | |
| | | | | | | A | | | | A | | kA | | A | | kA | |
| ½ | 1.1 | | | ½ | 1.1 | GV2P06 | 1 to 1.6 | LC1D09 | 100 | | | | | GV4PB02S | 0.8 to 2 | LC1D09 | 65 |
| | | ¾ | 1.6 | | | GV2P06 | 1 to 1.6 | LC1D09 | 100 | | | | | GV4PB02S | 0.8 to 2 | LC1D09 | 65 |
| ½ | 2.5 | ½ | 2.2 | 1 | 2.1 | GV2P07 | 1.6 to 2.5 | LC1D09 | 100 | | | | | GV4PB03S | 1.4 to 3.5 | LC1D09 | 65 |
| | | | | 1½ | 3 | GV2P08 | 2.5 to 4 | LC1D09 | 100 | | | | | GV4PB03S | 1.4 to 3.5 | LC1D09 | 65 |
| ¾ | 3.7 | ¾ | 3.2 | 2 | 3.4 | GV2P08 | 2.5 to 4 | LC1D09 | 100 | | | | | GV4PB07S | 2.9 to 7 | LC1D09 | 65 |
| 1 | 4.6 | 1 | 4.2 | 3 | 4.8 | GV2P10 | 4 to 6.3 | LC1D09 | 100 | | | | | GV4PB07S | 2.9 to 7 | LC1D09 | 65 |
| | | | | 1½ | 6 | GV2P10 | 4 to 6.3 | LC1D09 | 100 | | | | | GV4PB12S | 5 to 12.5 | LC1D12 | 65 |
| 1½ | 6.9 | 2 | 6.8 | | | GV2P14 | 6 to 10 | LC1D12 | 100 | | | | | GV4PB12S | 5 to 12.5 | LC1D12 | 65 |
| 2 | 7.8 | | | 5 | 7.6 | GV2P14 | 6 to 10 | LC1D12 | 100 | | | | | GV4PB12S | 5 to 12.5 | LC1D12 | 65 |
| | | 3 | 9.6 | | | GV2P14 | 6 to 10 | LC1D12 | 100 | GV3P13 | 9 to 13 | LC1D18 | 65 | GV4PB12S | 5 to 12.5 | LC1D12 | 65 |
| 3 | 11 | | | 7½ | 11 | GV2P16 | 9 to 14 | LC1D18 | 50 ⁽⁵⁾ | GV3P13 | 9 to 13 | LC1D18 | 65 | GV4PB25S | 10 to 25 | LC1D25 | 65 |
| | | | | 10 | 14 | GV2P16 | 9 to 14 | LC1D18 | 50 ⁽⁵⁾ | GV3P18 | 12 to 18 | LC1D18 | 65 | GV4PB25S | 10 to 25 | LC1D25 | 65 |
| 5 | 17.5 | 5 | 15.2 | | | GV2P20 | 13 to 18 | LC1D18 | 50 ⁽⁵⁾ | GV3P18 | 12 to 18 | LC1D18 | 65 | GV4PB25S | 10 to 25 | LC1D25 | 65 |
| | | 7½ | 22 | 15 | 21 | GV2P21 | 17 to 23 | LC1D25 | 50 ⁽⁵⁾ | GV3G25 | 17 to 25 | LC1D25 | 65 | GV4PB25S | 10 to 25 | LC1D25 | 65 |
| 7½ | 25.3 | | | | | GV2P22 | 20 to 25 | LC1D25 | 50 ⁽⁵⁾ | GV3P32 | 23 to 32 | LC1D32 | 65 | GV4PB50S | 20 to 50 | LC1D50A | 65 |
| | | 10 | 28 | 20 | 27 | | | | | GV3P32 | 23 to 32 | LC1D32 | 65 | GV4PB50S | 20 to 50 | LC1D50A | 65 |
| 10 | 32.2 | | | 25 | 34 | | | | | GV3P40 | 30 to 40 | LC1D40A | 65 | GV4PB50S | 20 to 50 | LC1D50A | 65 |
| | | 15 | 42 | 30 | 40 | | | | | GV3P50 | 37 to 50 | LC1D50A | 65 | GV4PB50S | 20 to 50 | LC1D50A | 65 |
| 15 | 48 | | | | | | | | | GV3P65 | 48 to 65 | LC1D65A | 65 | GV4PB50S | 20 to 50 | LC1D50A | 65 |
| | | 20 | 54 | 40 | 52 | | | | | GV3P65 | 48 to 65 | LC1D65A | 65 | GV4PB80S | 40 to 80 | LC1D80 | 65 |
| 20 | 62.1 | | | | | | | | | | | | | GV4PB115S | 40 to 80 | LC1D80 | 65 |
| 25 | 78.2 | 25 | 68 | 50 | 65 | | | | | | | | | GV4PB115S | 40 to 80 | LC1D80 | 65 |
| 30 | 92 | 30 | 80 | 60 | 77 | | | | | | | | | GV4PB115S | 65 to 115 | LC1D115 | 65 |

(1) Motor Full Load Amp Sizes are based on NEC Table 430.250.

(2) Requires use of GV1G09 or GV2GH7 line spacer for Type F rating.

(3) Add coil suffix to complete reference part number. For example, an LC1D09G7 includes a 120 V AC coil.

(4) Requires use of GV3G66 line spacer and GVAM11 short-circuit signaling contact for Type F rating.

(5) SCCR is 42 kA at 480Y when using GV2G busbar links.

Coordination and standards

| 0.06 to 250 kW at 400/415 V: type 1 coordination | | | | | | | | | | | | | | |
|---|----------------|----------------|-------|----------------|----------------|-------|----------------|----------------|-----------------|--------|--------------------------------|--------------------------|------------------------|---------------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Circuit breaker | | | Contactor | Thermal overload relay | |
| 400/415 V | | | 440 V | | | 500 V | | | Reference | Rating | I _{rm} ⁽¹⁾ | Reference ⁽²⁾ | Reference | Setting range |
| P | I _e | I _q | P | I _e | I _q | P | I _e | I _q | | A | A | | | A |
| kW | A | kA | kW | A | kA | kW | A | kA | | | | | | |
| 0.06 | 0.2 | 50 | 0.06 | 0.19 | 50 | – | – | – | GV2LE03 | 0.4 | 5 | LC1K06 | LR2K0302 | 0.16...0.23 |
| – | – | – | 0.09 | 0.28 | 50 | – | – | – | GV2LE03 | 0.4 | 5 | LC1K06 | LR2K0303 | 0.23...0.36 |
| 0.09 | 0.3 | 50 | 0.12 | 0.37 | 50 | – | – | – | GV2LE03 | 0.4 | 5 | LC1K06 | LR2K0304 | 0.36...0.54 |
| 0.12 | 0.44 | 50 | – | – | – | – | – | – | GV2LE04 | 0.63 | 8 | LC1K06 | LR2K0304 | 0.36...0.54 |
| 0.18 | 0.6 | 50 | 0.18 | 0.55 | 50 | – | – | – | GV2LE04 | 0.63 | 8 | LC1K06 | LR2K0305 | 0.54...0.8 |
| – | – | – | 0.25 | 0.76 | 50 | – | – | – | GV2LE05 | 1 | 13 | LC1K06 | LR2K0305 | 0.54...0.8 |
| 0.25 | 0.85 | 50 | – | – | – | – | – | – | GV2LE05 | 1 | 13 | LC1K06 | LR2K0306 | 0.8...1.2 |
| 0.37 | 1.1 | 50 | 0.37 | 1 | 50 | 0.37 | 0.88 | 50 | – | – | – | – | – | – |
| 0.55 | 1.5 | 50 | 0.55 | 1.36 | 50 | 0.55 | 1.2 | 50 | GV2LE06 | 1.6 | 22.5 | LC1K06 | LR2K0307 | 1.2...1.8 |
| – | – | – | – | – | – | 0.75 | 1.5 | 50 | – | – | – | – | – | – |
| – | – | – | 0.75 | 1.68 | 50 | – | – | – | GV2LE07 | 2.5 | 33.5 | LC1K06 | LR2K0307 | 1.2...1.8 |
| 0.75 | 1.9 | 50 | – | – | – | – | – | – | GV2LE07 | 2.5 | 33.5 | LC1K06 | LR2K0308 | 1.8...2.6 |
| 1.1 | 2.7 | 50 | 1.1 | 2.37 | 50 | 1.1 | 2.2 | 50 | – | – | – | – | – | – |
| 1.5 | 3.6 | 50 | 1.5 | 3.06 | 50 | 1.5 | 2.9 | 50 | GV2LE08 | 4 | 51 | LC1K06 | LR2K0310 | 2.6...3.7 |
| – | – | – | – | – | – | 2.2 | 3.9 | 50 | GV2LE08 | 4 | 51 | LC1K06 | LR2K0312 | 3.7...5.5 |
| 2.2 | 4.9 | 50 | 2.2 | 4.4 | 50 | 3 | 5.2 | 50 | GV2LE10 | 6.3 | 78 | LC1K06 | LR2K0312 | 3.7...5.5 |
| – | – | – | 3 | 5.77 | 50 | – | – | – | GV2LE10 | 6.3 | 78 | LC1K06 | LR2K0314 | 5.5...8 |
| – | – | – | 4 | 7.9 | 15 | – | – | – | GV2LE14 | 10 | 138 | LC1K09 | LR2K0314 | 5.5...8 |
| 3 | 6.5 | 50 | – | – | – | 4 | 6.8 | 10 | GV2LE14 | 10 | 138 | LC1K09 | LR2K0314 | 5.5...8 |
| 4 | 8.5 | 50 | – | – | – | – | – | – | GV2LE14 | 10 | 138 | LC1K09 | LR2K0316 | 8...11.5 |
| 5.5 | 11.5 | 15 | 5.5 | 10.4 | 8 | 7.5 | 12.4 | 6 | GV2LE16 | 14 | 170 | LC1K12 | LR2K0321 | 10...14 |
| – | – | – | 7.5 | 13.7 | 8 | 9 | 13.9 | 6 | GV2LE16 | 14 | 170 | LC1D18 | LRD21 | 12...18 |
| 7.5 | 15.5 | 15 | 9 | 16.9 | 8 | – | – | – | GV2LE20 | 18 | 223 | LC1D18 | LRD21 | 12...18 |
| 9 | 18.1 | 15 | – | – | – | 11 | 17.6 | 4 | GV2LE22 | 25 | 327 | LC1D25 | LRD22 | 16...24 |
| 11 | 22 | 15 | 11 | 20.1 | 6 | 15 | 23 | 4 | GV2LE22 | 25 | 327 | LC1D25 | LRD22 | 16...24 |
| 15 | 29 | 10 | 15 | 26.5 | 6 | 18.5 | 28 | 4 | GV2LE32 | 32 | 416 | LC1D32 | LRD32 | 23...32 |
| 18.5 | 35 | 50 | 18.5 | 32.5 | 50 | 22 | 33 | 10 | GV3L40 | 40 | 560 | LC1D40A | LRD340 | 30...40 |
| 22 | 41 | 50 | 22 | 39 | 50 | 30 | 44 | 10 | GV3L50 | 50 | 700 | LC1D50A | LRD350 | 37...50 |

(1) I_{rm}: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

0.06 to 250 kW at 400/415 V: type 1 coordination

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Circuit breaker | | | Contactor | Thermal overload relay | |
|---|----------------|----------------|-------|----------------|----------------|-------|----------------|----------------|---|---------------------------------------|------|--------------------------|------------------------|---------------|
| 400/415 V | | | 440 V | | | 500 V | | | Reference | Rating I _{rm} ⁽¹⁾ | | Reference ⁽²⁾ | Reference | Setting range |
| P | I _e | I _q | P | I _e | I _q | P | I _e | I _q | | A | A | | | A |
| kW | A | kA | kW | A | kA | kW | A | kA | | | | | | |
| 30 | 55 | 50 | 30 | 51.5 | 50 | 37 | 53 | 10 | GV3L65 | 65 | 910 | LC1D65A | LRD365 | 48...65 |
| - | - | - | 37 | 64 | 50 | 37 | 53 | 10 | GV3L65 | 65 | 910 | LC1D65A | LRD365 | 48...65 |
| - | - | - | - | - | - | 45 | 64 | 50 | GV3L65 | 65 | 910 | LC1D80 | LRD3361 | 48...65 |
| 37 | 66 | 50 | - | - | - | - | - | - | GV3L73 | 73 | 1120 | LC1D80A | LRD380 | 62...80 |
| - | - | - | 37 | 64 | 70 | - | - | - | GV4L80 | 80 | 880 | LC1D65A | LRD365 | 48...65 |
| - | - | - | - | - | - | 45 | 64 | 30 | GV4L80 | 80 | 880 | LC1D80 | LRD3361 | 48...65 |
| 37 | 66 | 100 | - | - | - | - | - | - | GV4L80 | 80 | 1040 | LC1D80 | LRD3361 | 48...65 |
| - | - | - | 45 | 76 | 70 | 55 | 78 | 30 | GV4L80 | 80 | 1040 | LC1D80 | LRD3363 | 63...80 |
| 45 | 80 | 100 | - | - | - | - | - | - | GV4L115 | 115 | 1380 | LC1D95 | LRD3365 | 80...104 |
| - | - | - | - | - | - | 75 | 106 | 30 | GV4L115 | 115 | 1380 | LC1D115 | LRD4367 | 95...120 |
| - | - | - | 55 | 90 | 70 | - | - | - | GV4L115 | 115 | 1380 | LC1D115 | LRD4365 | 80...104 |
| 55 | 97 | 100 | - | - | - | - | - | - | GV4L115 | 115 | 1495 | LC1D115 | LRD4367 | 95...120 |
| - | - | - | - | - | - | 50 | 90 | ⁽³⁾ | NSX100●MA ⁽³⁾ | 100 | 1200 | LC1D115 | LRD4365 | 80...104 |
| - | - | - | - | - | - | 75 | 106 | ⁽³⁾ | NSX160●MA ⁽³⁾ | 150 | 1500 | LC1D115 | LRD4367 | 95...120 |
| 55 | 97 | ⁽³⁾ | - | - | - | - | - | - | NSX160●MA ⁽³⁾ | 150 | 1350 | LC1D115 | LRD4367 | 95...120 |
| 75 | 132 | ⁽³⁾ | 75 | 125 | ⁽³⁾ | 90 | 128 | ⁽³⁾ | NSX160●MA ⁽³⁾ | 150 | 1800 | LC1D150 | LRD4369 | 110...140 |
| - | - | - | 90 | 146 | ⁽³⁾ | - | - | - | NSX160●MA ⁽³⁾ | 150 | 1950 | LC1F185 | LR9F5371 | 132...220 |
| 90 | 160 | ⁽³⁾ | - | - | - | 110 | 156 | ⁽³⁾ | NSX250●MA ⁽³⁾ | 220 | 2200 | LC1F185 | LR9F5371 | 132...220 |
| 110 | 195 | ⁽³⁾ | - | - | - | - | - | - | NSX250●MA ⁽³⁾ | 220 | 2640 | LC1F225 | LR9F5371 | 132...220 |
| - | - | - | 110 | 178 | ⁽³⁾ | - | - | - | NSX250●MA ⁽³⁾ | 220 | 2420 | LC1F225 | LR9F5371 | 132...220 |
| - | - | - | - | - | - | 132 | 184 | ⁽³⁾ | NSX250●MA ⁽³⁾ | 220 | 2640 | LC1F265 | LR9F5371 | 132...220 |
| - | - | - | 132 | 215 | ⁽³⁾ | - | - | - | NSX250●MA ⁽³⁾ | 220 | 2860 | LC1F265 | LR9F5371 | 132...220 |
| 132 | 230 | ⁽³⁾ | - | - | - | - | - | - | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 3200 | LC1F265 | LR9F7375 | 200...330 |
| - | - | - | - | - | - | 160 | 224 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 2860 | LC1F265 | LR9F7375 | 200...330 |
| - | - | - | 160 | 256 | ⁽³⁾ | - | - | - | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 3520 | LC1F330 | LR9F7375 | 200...330 |
| 160 | 280 | ⁽³⁾ | 200 | 321 | ⁽³⁾ | - | - | - | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 4160 | LC1F330 | LR9F7375 | 200...330 |
| - | - | - | - | - | - | 200 | 280 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 3840 | LC1F330 | LR9F7375 | 200...330 |
| - | - | - | - | - | - | 220 | 310 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 4160 | LC1F400 | LR9F7379 | 300...500 |
| 200 | 350 | ⁽³⁾ | 220 | 353 | ⁽³⁾ | - | - | - | NSX400● + Micrologic 1.3M ⁽³⁾ | 500 | 5000 | LC1F400 | LR9F7379 | 300...500 |
| - | - | - | 250 | 401 | ⁽³⁾ | - | - | - | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 5550 | LC1F400 | LR9F7379 | 300...500 |
| - | - | - | - | - | - | 250 | 344 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 5000 | LC1F400 | LR9F7379 | 300...500 |
| 220 | 388 | ⁽³⁾ | - | - | - | - | - | - | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 5500 | LC1F400 | LR9F7379 | 300...500 |
| 250 | 430 | ⁽³⁾ | 280 | 470 | ⁽³⁾ | 315 | 432 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 6000 | LC1F500 | LR9F7379 | 300...500 |
| - | - | - | - | - | - | 355 | 488 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 6500 | LC1F500 | LR9F7381 | 380...630 |

(1) I_{rm}: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

(3) Reference to be completed by replacing the ● with the breaking performance code:

| Breaking performance I _q (kA) | NSX100●MA | | NSX160●MA and NSX250●MA | | NSX400● and NSX630● |
|--|-----------|----|-------------------------|----|---------------------|
| 400/415 V | 36 | 70 | 36 | 70 | 70 150 |
| 440 V | 35 | 65 | 35 | 65 | 65 130 |
| 500 V | 25 | 50 | 25 | 50 | 50 70 |
| 660/690 V | 8 | 10 | 8 | 10 | 20 20 |
| Code | F | H | F | H | H L |

Coordination and standards

| 0.06 to 250 kW at 400/415 V: type 2 coordination | | | | | | | | | | | | | | | |
|---|----------------|----------------|-------|----------------|----------------|-------|----------------|----------------|-----------------|--------|--------------------------------|--------------------------|-----------|------------------------|--|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Circuit breaker | | | Contactor | | Thermal overload relay | |
| 400/415 V | | | 440 V | | | 500 V | | | Reference | Rating | I _{rm} ⁽¹⁾ | Reference ⁽²⁾ | Reference | Setting range | |
| P | I _e | I _q | P | I _e | I _q | P | I _e | I _q | | | | | | | |
| kW | A | kA | kW | A | kA | kW | A | kA | A | A | A | A | A | | |
| 0.06 | 0.2 | 130 | 0.06 | 0.19 | 130 | – | – | – | GV2L03 or LE03 | 0.4 | 5 | LC1D09 | LRD02 | 0.16...0.25 | |
| 0.09 | 0.3 | 130 | 0.09 | 0.28 | 130 | – | – | – | GV2L03 or LE03 | 0.4 | 5 | LC1D09 | LRD03 | 0.25...0.40 | |
| – | – | – | 0.12 | 0.37 | 130 | – | – | – | | | | | | | |
| 0.12 | 0.44 | 130 | – | – | – | – | – | – | GV2L04 or LE04 | 0.63 | 8 | LC1D09 | LRD04 | 0.4...0.63 | |
| 0.18 | 0.6 | 130 | 0.18 | 0.55 | 130 | – | – | – | | | | | | | |
| 0.25 | 0.85 | 130 | 0.25 | 0.76 | 130 | – | – | – | GV2L05 or LE05 | 1 | 13 | LC1D09 | LRD05 | 0.63...1 | |
| 0.37 | 1.1 | 130 | 0.37 | 0.99 | 130 | – | – | – | | | | | | | |
| – | – | – | – | – | – | 0.37 | 0.88 | 130 | GV2L05 or LE05 | 1 | 13 | LC1D09 | LRD06 | 1...1.7 | |
| 0.55 | 1.5 | 130 | – | – | – | 0.55 | 1.2 | 130 | GV2L06 or LE06 | 1.6 | 22.5 | LC1D09 | LRD06 | 1...1.7 | |
| – | – | – | 0.55 | 1.36 | 130 | 0.75 | 1.5 | 130 | | | | | | | |
| 0.75 | 1.9 | 130 | 0.75 | 1.68 | 130 | 1.1 | 2.2 | 130 | GV2L07 or LE07 | 2.5 | 33.5 | LC1D09 | LRD07 | 1.6...2.5 | |
| 1.1 | 2.7 | 130 | 1.1 | 2.37 | 130 | 1.5 | 2.9 | 130 | GV2L08 or LE08 | 4 | 51 | LC1D09 | LRD08 | 2.5...4 | |
| 1.5 | 3.6 | 130 | – | – | – | 2.2 | 3.9 | 130 | | | | | | | |
| – | – | – | 1.5 | 3.06 | 130 | – | – | – | GV2L08 or LE08 | 4 | 51 | LC1D09 | LRD10 | 4...6 | |
| 2.2 | 4.9 | 130 | – | – | – | – | – | – | GV2L10 or LE10 | 6.3 | 78 | LC1D09 | LRD10 | 4...6 | |
| – | – | – | – | – | – | 3 | 5.2 | 13 | | | | | | | |
| – | – | – | 2.2 | 4.42 | 50 | – | – | – | GV2LE10 | 6.3 | 78 | LC1D09 | LRD10 | 4...6 | |
| – | – | – | 3 | 5.77 | 50 | 3 | 5.2 | 50 | | | | | | | |
| – | – | – | 2.2 | 4.42 | 130 | – | – | – | GV2L10 | 6.3 | 78 | LC1D09 | LRD10 | 4...6 | |
| – | – | – | 3 | 5.77 | 130 | 3 | 5.2 | 130 | | | | | | | |
| 3 | 6.5 | 130 | – | – | – | – | – | – | GV2L14 or LE14 | 10 | 10 | LC1D09 | LRD12 | 5.5...8 | |
| – | – | – | – | – | – | 4 | 6.8 | 10 | GV2LE14 | 10 | 138 | LC1D12 | LRD12 | 5.5...8 | |
| – | – | – | – | – | – | 4 | 6.8 | 50 | GV2L14 | 10 | 138 | LC1D12 | LRD12 | 5.5...8 | |
| 4 | 8.5 | 130 | – | – | – | – | – | – | GV2L14 or LE14 | 10 | 138 | LC1D09 | LRD14 | 7...10 | |
| – | – | – | 4 | 7.9 | 15 | – | – | – | GV2LE14 | 10 | 138 | LC1D09 | LRD14 | 7...10 | |
| – | – | – | 4 | 7.9 | 130 | – | – | – | GV2L14 | 10 | 138 | LC1D09 | LRD14 | 7...10 | |
| – | – | – | – | – | – | 5.5 | 9.2 | 10 | GV2LE14 | 10 | 138 | LC1D09 | LRD14 | 7...10 | |
| – | – | – | – | – | – | 5.5 | 9.2 | 50 | GV2L14 | 10 | 138 | LC1D09 | LRD14 | 7...10 | |
| 5.5 | 11.5 | 130 | 5.5 | 10.4 | 50 | 7.5 | 12.4 | 42 | GV2L16 | 14 | 170 | LC1D25 | LRD16 | 9...13 | |
| – | – | – | 7.5 | 13.7 | 50 | – | – | – | GV2L16 | 14 | 170 | LC1D25 | LRD21 | 12...18 | |
| 7.5 | 15.5 | 50 | 9 | 16.9 | 20 | 9 | 13.9 | 10 | GV2L20 | 18 | 223 | LC1D25 | LRD21 | 12...18 | |
| 9 | 18.1 | 50 | – | – | – | – | – | – | GV2L22 | 25 | 327 | LC1D25 | LRD22 | 16...24 | |
| 11 | 22 | 50 | 11 | 20.1 | 20 | – | – | – | | | | | | | |
| – | – | – | – | – | – | 11 | 17.6 | 10 | GV2L22 | 25 | 327 | LC1D32 | LRD22 | 16...24 | |
| – | – | – | – | – | – | 15 | 23 | 10 | | | | | | | |
| 15 | 29 | 50 | 15 | 26.5 | 50 | – | – | – | GV3L32 | 32 | 448 | LC1D40A | LRD332 | 23...32 | |
| – | – | – | – | – | – | 18.5 | 28 | 10 | GV3L32 | 32 | 448 | LC1D65A | LRD332 | 23...32 | |

(1) I_{rm}: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

| 0.06 to 250 kW at 400/415 V: type 2 coordination | | | | | | | | | | Circuit breaker | | | Contactor | Thermal overload relay | | |
|---|----------------|----------------|-------|----------------|----------------|----------------|----------------|----------------|---|-----------------|--------------------------------|--------------------------|--------------------------------|--------------------------|-----------|---------------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Reference | | | Rating | I _{rm} ⁽¹⁾ | Reference ⁽²⁾ | Reference | Setting range |
| 400/415 V | | | 440 V | | | 500 V | | | Reference | Rating | I _{rm} ⁽¹⁾ | Reference ⁽²⁾ | Reference | Setting range | | |
| P | I _e | I _q | P | I _e | I _q | P | I _e | I _q | | A | A | | | A | | |
| kW | A | kA | kW | A | kA | kW | A | kA | | | | | | | | |
| 18.5 | 35 | 50 | – | – | – | – | – | – | GV3L40 | 40 | 560 | LC1D50A | LRD340 | 30...40 | | |
| – | – | – | 18.5 | 32.5 | 50 | – | – | – | GV3L40 | 40 | 560 | LC1D65A | LRD340 | 30...40 | | |
| 22 | 41 | 50 | – | – | – | – | – | – | GV3L50 | 50 | 700 | LC1D50A | LRD350 | 37...50 | | |
| – | – | – | 22 | 39 | 50 | 30 | 44 | 10 | GV3L50 | 50 | 700 | LC1D65A | LRD350 | 37...50 | | |
| 30 | 55 | 50 | 30 | 51.5 | 50 | 37 | 53 | 10 | GV3L65 | 65 | 910 | LC1D65A | LRD365 | 48...65 | | |
| 37 | 66 | 50 | – | – | – | – | – | – | GV3L73 | 73 | 1120 | LC1D80A | LRD380 | 62...80 | | |
| 45 | 60 | 50 | – | – | – | – | – | – | GV3L80 | 80 | 1120 | LC1D95 | LRD3363 | 63...80 | | |
| – | – | – | 37 | 64 | 70 | – | – | – | GV4L80 | 80 | 880 | LC1D65A | LRD365 | 48...65 | | |
| 37 | 66 | 100 | 45 | 76 | 70 | ⁽⁴⁾ | ⁽⁴⁾ | ⁽⁴⁾ | GV4L80 | 80 | 1040 | LC1D80 | LRD3363 | 63...80 | | |
| 45 | 80 | 100 | 55 | 90 | 70 | ⁽⁴⁾ | ⁽⁴⁾ | ⁽⁴⁾ | GV4L115 | 115 | 1380 | LC1D115 LC1F115 | LR9D5367 LR9F5367 | 60...100 60...100 | | |
| 55 | 97 | 100 | – | – | – | ⁽⁴⁾ | ⁽⁴⁾ | ⁽⁴⁾ | GV4L115 | 115 | 1495 | LC1D115 LC1F115 | LR9D5369 LR9F5369 | 90...150 90...150 | | |
| – | – | – | – | – | – | 55 | 78 | ⁽³⁾ | NSX100●MA ⁽³⁾ | 100 | 1040 | LC1D80 | LRD3363 | 63...80 | | |
| 45 | 80 | ⁽³⁾ | 55 | 90 | ⁽³⁾ | – | – | – | NSX100●MA ⁽³⁾ | 100 | 1300 | LC1D115 | LR9D5367 | 60...100 | | |
| 55 | 97 | ⁽³⁾ | – | – | – | – | – | – | NSX160●MA ⁽³⁾ | 150 | 1500 | LC1D115 | LR9D5369 | 90...150 | | |
| – | – | – | – | – | – | 75 | 106 | ⁽³⁾ | NSX160●MA ⁽³⁾ | 150 | 1950 | LC1D115 | LR9D5369 | 90...150 | | |
| 75 | 132 | ⁽³⁾ | 75 | 125 | ⁽³⁾ | – | – | – | NSX160●MA ⁽³⁾ | 150 | 1950 | LC1D150 | LR9D5369 | 90...150 | | |
| – | – | – | 90 | 146 | ⁽³⁾ | – | – | – | NSX160●MA ⁽³⁾ | 150 | 1950 | LC1D150 | LR9D5369 | 90...150 | | |
| – | – | – | – | – | – | 90 | 128 | ⁽³⁾ | NSX160●MA ⁽³⁾ | 150 | 1200 | LC1D150 | LR9D5369 | 90...150 | | |
| 90 | 160 | ⁽³⁾ | 110 | 178 | ⁽³⁾ | – | – | – | NSX250●MA ⁽³⁾ | 220 | 2420 | LC1F185 | LR9F5371 | 132...220 | | |
| – | – | – | – | – | – | 110 | 156 | ⁽³⁾ | NSX250●MA ⁽³⁾ | 220 | 1540 | LC1F185 | LR9F5371 | 132...220 | | |
| 110 | 195 | ⁽³⁾ | – | – | – | – | – | – | NSX250●MA ⁽³⁾ | 220 | 2860 | LC1F225 | LR9F5371 | 132...220 | | |
| – | – | – | 132 | 215 | ⁽³⁾ | 132 | 184 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 3500 | LC1F265 | LR9F5371 | 132...220 | | |
| 132 | 230 | ⁽³⁾ | 160 | 256 | ⁽³⁾ | – | – | – | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 3520 | LC1F265 | LR9F7375 | 200...330 | | |
| – | – | – | – | – | – | 160 | 224 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 2200 | LC1F265 | LR9F7375 | 200...330 | | |
| 160 | 280 | ⁽³⁾ | – | – | – | – | – | – | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 4000 | LC1F330 | LR9F7375 | 200...330 | | |
| – | – | – | 200 | 321 | ⁽³⁾ | – | – | – | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 4000 | LC1F330 | LR9F7379 | 300...500 | | |
| – | – | – | – | – | – | 200 | 280 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 3500 | LC1F400 | LR9F7375 | 200...330 | | |
| – | – | – | – | – | – | 220 | 310 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 3500 | LC1F400 | LR9F7379 | 300...500 | | |
| – | – | – | 220 | 353 | ⁽³⁾ | – | – | – | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 5500 | LC1F400 | LR9F7379 | 300...500 | | |
| 200 | 350 | ⁽³⁾ | 250 | 401 | ⁽³⁾ | – | – | – | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 4500 | LC1F500 | LR9F7379 | 300...500 | | |
| – | – | – | – | – | – | 250 | 344 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 4500 | LC1F500 | LR9F7379 | 300...500 | | |
| 220 | 388 | ⁽³⁾ | – | – | – | – | – | – | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 6250 | LC1F500 | LR9F7379 | 300...500 | | |
| 250 | 430 | ⁽³⁾ | – | – | – | – | – | – | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 6250 | LC1F500 | LR9F7379 | 300...500 | | |
| – | – | – | – | – | – | 355 | 488 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 5000 | LC1F630 | LR9F7381 | 380...630 | | |

(1) I_{rm}: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

(3) Reference to be completed by replacing the ● with the breaking performance code:

| Breaking performance I _q (kA) | NSX100●MA | NSX160●MA and NSX250●MA | NSX400● and NSX630● |
|--|-----------|-------------------------|---------------------|
| 400/415 V | 36 | 70 | 150 |
| 440 V | 35 | 65 | 130 |
| 500 V | 25 | 50 | 70 |
| 660/690 V | 8 | 10 | 20 |
| Code | F | H | L |

(4) Please consult your regional sales office.

| 0.06 to 30 kW at 400/415 V: type 2 coordination | | | | | | | | | | | | |
|---|----------------|----------------|-------|----------------|----------------|----------------------|--------|-----------------|-----------|-----------|--------------------------------------|--|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Circuit breaker | | | Contactor | | Electronic thermal overload relay | |
| 400/415 V | | | 690 V | | | Reference | Rating | I _{rm} | Reference | Reference | Setting range | |
| P | I _e | I _q | P | I _e | I _q | | A | A | | | A | |
| kW | A | kA | kW | A | kA | | | | | | | |
| 0.06 | 0.2 | 100 | – | – | – | GV2L03 | 0.4 | 5 | LC1D09 | LR9D01 | 0.1...0.5 | |
| 0.09 | 0.3 | 100 | – | – | – | GV2L03 | 0.4 | 5 | LC1D09 | LR9D01 | 0.1...0.5 | |
| 0.12 | 0.44 | 100 | – | – | – | GV2L04 | 0.63 | 8 | LC1D18 | LR9D02 | 0.4...2.0 | |
| 0.18 | 0.6 | 100 | – | – | – | GV2L04 | 0.63 | 8 | LC1D18 | LR9D02 | 0.4...2.0 | |
| 0.25 | 0.85 | 100 | – | – | – | GV2L05 | 1 | 13 | LC1D18 | LR9D02 | 0.4...2.0 | |
| 0.37 | 1.1 | 100 | – | – | – | GV2L05 | 1 | 13 | LC1D18 | LR9D02 | 0.4...2.0 | |
| 0.55 | 1.5 | 100 | – | – | – | GV2L06 | 1.6 | 22.5 | LC1D18 | LR9D02 | 0.4...2.0 | |
| 0.75 | 1.9 | 100 | – | – | – | GV2L07 | 2.5 | 33.5 | LC1D18 | LR9D08 | 1.6...8.0 | |
| 1.1 | 2.7 | 100 | – | – | – | GV2L08 | 4 | 51 | LC1D18 | LR9D08 | 1.6...8.0 | |
| 1.5 | 3.6 | 100 | – | – | – | GV2L08 | 4 | 51 | LC1D18 | LR9D08 | 1.6...8.0 | |
| 2.2 | 4.9 | 100 | – | – | – | GV2L10 | 6.3 | 78 | LC1D18 | LR9D08 | 1.6...8.0 | |
| 3 | 6.5 | 100 | – | – | – | GV2L14 | 10 | 138 | LC1D25 | LR9D32 | 6.4...32 | |
| 4 | 8.5 | 100 | – | – | – | GV2L14 | 10 | 138 | LC1D25 | LR9D32 | 6.4...32 | |
| 5.5 | 11.5 | 100 | – | – | – | GV2L16 | 14 | 170 | LC1D25 | LR9D32 | 6.4...32 | |
| 7.5 | 15.5 | 50 | – | – | – | GV2L20 | 18 | 223 | LC1D25 | LR9D32 | 6.4...32 | |
| 11 | 22 | 50 | – | – | – | GV2L22 | 25 | 327 | LC1D25 | LR9D32 | 6.4...32 | |
| 15 | 29 | 50 | – | – | – | GV3L32 | 40 | 448 | LC1D65A | LR9D110S | 22...110 | |
| 18.5 | 35 | 50 | – | – | – | GV3L40 | 40 | 560 | LC1D65A | LR9D110S | 22...110 | |
| 22 | 41 | 50 | – | – | – | GV3L50 | 50 | 700 | LC1D65A | LR9D110S | 22...110 | |
| 30 | 55 | 50 | – | – | – | GV3L65 | 65 | 910 | LC1D65A | LR9D110S | 22...110 | |
| – | – | – | 0.37 | 0.64 | 50 | GV2L05 | 1 | 13 | LC1D09 | LR9D02 | 0.4...2.0 | |
| – | – | – | 0.55 | 0.87 | 50 | GV2L05 | 1 | 13 | LC1D09 | LR9D02 | 0.4...2.0 | |
| – | – | – | 0.75 | 1.1 | 50 | GV2L06 | 1.6 | 22.5 | LC1D09 | LR9D02 | 0.4...2.0 | |
| – | – | – | 1.1 | 1.6 | 50 | GV2L07 + LA9LB920 | 2.5 | 33.5 | LC1D25 | LR9D08 | 1.6...8.0 | |
| – | – | – | 1.5 | 2.1 | 50 | GV2L07 + LA9LB920 | 2.5 | 33.5 | LC1D25 | LR9D08 | 1.6...8.0 | |
| – | – | – | 2.2 | 2.8 | 50 | GV2L08 + LA9LB920 | 4 | 51 | LC1D25 | LR9D08 | 1.6...8.0 | |
| – | – | – | 3 | 4 | 50 | GV2L08 + LA9LB920 | 4 | 51 | LC1D25 | LR9D08 | 1.6...8.0 | |
| – | – | – | 4 | 5 | 50 | GV2L10 + LA9LB920 | 6.3 | 78 | LC1D25 | LR9D08 | 1.6...8.0 | |
| – | – | – | 5.5 | 7 | 50 | GV2L14 + LA9LB920 | 10 | 138 | LC1D25 | LR9D32 | 6.4...32 | |
| – | – | – | 7.5 | 8.9 | 50 | GV2L14 + LA9LB920 | 10 | 138 | LC1D25 | LR9D32 | 6.4...32 | |
| – | – | – | 11 | 13 | 3 | GV3L18+ LA9LB920 | 14 | 252 | LC1D32 | LR9D32 | 6.4...32 | |
| – | – | – | 15 | 16.5 | 3 | GV2L22 + LA9LB920 | 18 | 327 | LC1D32 | LR9D32 | 6.4...32 | |
| – | – | – | 18.5 | 21 | 3 | GV3L25 + LA9LB920 | 25 | 350 | LC1D65A | LR9D32 | 6.4...32 | |
| – | – | – | 22 | 25 | 3 | GV2L32 + LA9LB920 | 32 | 416 | LC1D65A | LR9D32 | 6.4...32 | |

1.5 to 315 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3K and LC3F: 12 starts/hour; LC3D: 30 starts/hour.

Maximum starting time: LC3K and LC3D: 30 seconds; LC3F: 20 seconds.

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | Fuse carrier (basic block) | aM fuses | | Star-delta contactors | Thermal overload relay | |
|--|----------------|--------------------------------|----------------|-------|----------------|--------------------------------|----------------|----------------------------|----------|--------|-----------------------|------------------------|---------------|
| 400/415 V | | | | 440 V | | | | Reference | Size | Rating | Reference | Reference | Setting range |
| P | I _e | I _{rD} ⁽¹⁾ | I _q | P | I _e | I _{rD} ⁽¹⁾ | I _q | | | | | | |
| kW | A | A | kA | kW | A | A | kA | | | A | | A | |
| 1.5 | 3.5 | 2 | 50 | 1.5 | 3.06 | 2 | 50 | LS1D32 | 10 x 38 | 4 | LC3K06 | LR2K0308 | 1.8...2.6 |
| 2.2 | 5 | 3 | 50 | - | - | - | - | LS1D32 | 10 x 38 | 6 | LC3K06 | LR2K0310 | 2.6...3.7 |
| - | - | - | - | 2.2 | 4.42 | 3 | 50 | | | | | | |
| - | - | - | - | 3 | 5.77 | 3 | 50 | LS1D32 | 10 x 38 | 8 | LC3K06 | LR2K0310 | 2.6...3.7 |
| 3 | 6.5 | 4 | 50 | - | - | - | - | LS1D32 | 10 x 38 | 8 | LC3K06 | LR2K0312 | 3.7...5.5 |
| 4 | 8.4 | 5 | 50 | 4 | 7.9 | 5 | 50 | LS1D32 | 10 x 38 | 12 | LC3K06 | LR2K0312 | 3.7...5.5 |
| 5.5 | 11 | 6 | 50 | 5.5 | 10.4 | 6 | 50 | LS1D32 | 10 x 38 | 16 | LC3K06 | LR2K0314 | 5.5...8 |
| 7.5 | 14.8 | 9 | 50 | 7.5 | 13.7 | 8 | 50 | LS1D32 | 10 x 38 | 16 | LC3K09 | LR2K0316 | 8...11.5 |
| 9 | 18.1 | 10 | 100 | 9 | 16.9 | 10 | 50 | LS1D32 | 10 x 38 | 20 | LC3D12A | LRD16 | 9...13 |
| 11 | 21 | 12 | 100 | 11 | 20.1 | 12 | 100 | GK1EK | 14 x 51 | 25 | LC3D12A | LRD16 | 9...13 |
| 15 | 28.5 | 16 | 100 | 15 | 26.5 | 15 | 100 | GK1EK | 14 x 51 | 32 | LC3D18A | LRD21 | 12...18 |
| 18.5 | 35 | 20 | 100 | 18.5 | 32.8 | 19 | 100 | GK1EK | 14 x 51 | 40 | LC3D18A | LRD22 | 16...24 |
| - | - | - | - | 22 | 39 | 23 | 100 | GS●J | 22 x 58 | 50 | LC3D18A | LRD22 | 16...24 |
| 22 | 42 | 24 | 100 | - | - | - | - | GS●J | 22 x 58 | 50 | LC3D32A | LRD32 | 23...32 |
| - | - | - | - | 30 | 51.5 | 30 | 100 | GS●J | 22 x 58 | 63 | LC3D32A | LRD32 | 23...32 |
| 30 | 57 | 33 | 100 | 37 | 64 | 37 | 100 | GS●J | 22 x 58 | 80 | 3 x LC1D40A | LRD340 | 30...40 |
| 37 | 69 | 40 | 100 | - | - | - | - | GS●J | 22 x 58 | 80 | 3 x LC1D40A | LRD350 | 37...50 |
| - | - | - | - | 45 | 76 | 44 | 100 | GS●J | 22 x 58 | 80 | 3 x LC1D50A | LRD350 | 37...50 |
| 45 | 81 | 47 | 100 | - | - | - | - | GS●J | 22 x 58 | 100 | 3 x LC1D50A | LRD350 | 37...50 |
| - | - | - | - | 55 | 90 | 52 | 100 | GS●K | 22 x 58 | 100 | 3 x LC1D50A | LRD365 | 48...65 |
| 55 | 100 | 58 | 100 | - | - | - | - | GS●K | 22 x 58 | 125 | 3 x LC1D65A | LRD365 | 48...65 |
| 75 | 135 | 78 | 100 | 75 | 125 | 72 | 100 | GS●L | T0 | 160 | LC3D80 | LRD3363 | 63...80 |
| - | - | - | - | 90 | 146 | 84 | 100 | GS●L | T0 | 160 | LC3D115 | LRD4365 | 80...104 |
| 90 | 165 | 95 | 100 | - | - | - | - | GS●N | T1 | 200 | LC3D115 | LRD4367 | 95...120 |
| 110 | 200 | 115 | 100 | 110 | 178 | 103 | 100 | GS●N | T1 | 200 | LC3D115 | LRD4367 | 95...120 |
| 132 | 240 | 139 | 100 | 132 | 215 | 124 | 100 | GS●QQ | T2 | 250 | LC3D150 | LRD4369 | 110...140 |
| 160 | 285 | 165 | 100 | 160 | 256 | 148 | 100 | GS●QQ | T2 | 315 | LC3F185 | LR9F5371 | 132...220 |
| - | - | - | - | 200 | 321 | 185 | 100 | GS●QQ | T2 | 400 | LC3F225 | LR9F5369 | 132...220 |
| 220 | 388 | 225 | 100 | - | - | - | - | GS●QQ | T2 | 400 | LC3F265 | LR9F7375 | 200...330 |
| - | - | - | - | 250 | 401 | 233 | 100 | GS2S | T3 | 500 | LC3F265 | LR9F7375 | 200...330 |
| 280 | 480 | 278 | 100 | - | - | - | - | GS2S | T3 | 500 | LC3F330 | LR9F7375 | 200...330 |
| - | - | - | - | 315 | 505 | 293 | 100 | | | | | | |
| 315 | 555 | 322 | 100 | 355 | 518 | 300 | 100 | GS2S | T3 | 630 | LC3F330 | LR9F7375 | 200...330 |
| - | - | - | - | 375 | 575 | 334 | 100 | GS2S | T3 | 630 | LC3F400 | LR9F7379 | 300...500 |

(1) I_{rD}: current in the motor windings in delta connection.

1.5 to 355 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC1D: 30 starts/hour; LC1F: 12 starts/hour.

Maximum starting time: LC1D: 30 seconds; LC1F: 20 seconds.

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Switch-disconnector-fuse | aM fuses | | Star-delta contactors | Thermal overload relay | |
|--|------|-----|-------|------|-----|--------------------------|-----------|------|-----------------------|------------------------|-----------|
| 400/415 V | | | 440 V | | | | Reference | Size | | Rating | Reference |
| P | le | Iq | P | le | Iq | | | A | | | A |
| kW | A | kA | kW | A | kA | | | | | | |
| 1.5 | 3.5 | 50 | 1.5 | 3.06 | 50 | GS1DD | 10 x 38 | 4 | 3 x LC1D09 | LRD08 | 2.5...4 |
| 2.2 | 5 | 50 | 2.2 | 4.42 | 50 | GS1DD | 10 x 38 | 6 | 3 x LC1D09 | LRD10 | 4...6 |
| 3 | 6.5 | 50 | 3 | 5.77 | 50 | GS1DD | 10 x 38 | 8 | 3 x LC1D09 | LRD12 | 5.5...8 |
| 4 | 8.4 | 50 | 4 | 7.9 | 50 | GS1DD | 10 x 38 | 10 | 3 x LC1D09 | LRD14 | 7...10 |
| 5.5 | 11 | 50 | 5.5 | 10.4 | 50 | GS1DD | 10 x 38 | 16 | 3 x LC1D12 | LRD16 | 9...13 |
| 7.5 | 14.8 | 50 | 7.5 | 13.7 | 50 | GS1DD | 10 x 38 | 16 | 3 x LC1D18 | LRD21 | 12...18 |
| 9 | 18.1 | 100 | 9 | 16.9 | 100 | | | | | | |
| 11 | 21 | 100 | 11 | 20.1 | 100 | GS●F | 14 x 51 | 25 | 3 x LC1D25 | LRD22 | 16...24 |
| 15 | 28.5 | 100 | 15 | 26.5 | 100 | GS●F | 14 x 51 | 32 | 3 x LC1D32 | LRD32 | 23...32 |
| 18.5 | 35 | 100 | 18.5 | 32.8 | 100 | GS●F | 14 x 51 | 40 | 3 x LC1D40A | LRD340 | 30...40 |
| 22 | 42 | 100 | 22 | 39 | 100 | GS●J | 22 x 58 | 50 | 3 x LC1D50A | LRD350 | 37...50 |
| 30 | 57 | 100 | 30 | 51.5 | 100 | GS●J | 22 x 58 | 80 | 3 x LC1D65A | LRD365 | 48...65 |
| 37 | 69 | 100 | 37 | 64 | 100 | GS●J | 22 x 58 | 80 | 3 x LC1D80 | LRD3363 | 63...80 |
| – | – | – | 45 | 76 | 100 | GS●J | 22 x 58 | 80 | 3 x LC1D80 | LRD3365 | 80...93 |
| 45 | 81 | 100 | – | – | – | GS●J | 22 x 58 | 100 | 3 x LC1D115 | LR9D5367 | 60...100 |
| – | – | – | 55 | 90 | 100 | GS●L | T0 | 125 | 3 x LC1D115 | LR9D5369 | 90...150 |
| 55 | 100 | 100 | – | – | – | GS●L | T0 | 125 | 3 x LC1D150 | LR9D5369 | 90...150 |
| – | – | – | 75 | 125 | 100 | GS●L | T0 | 160 | 3 x LC1D150 | LR9D5369 | 90...150 |
| 75 | 135 | 100 | – | – | – | GS●L | T0 | 160 | 3 x LC1F185 | LR9D5369 | 90...150 |
| 90 | 165 | 100 | 90 | 146 | 100 | GS●N | T1 | 200 | 3 x LC1F185 | LR9F5371 | 132...220 |
| 110 | 200 | 100 | 110 | 178 | 100 | GS●N | T1 | 250 | 3 x LC1F225 | LR9F5371 | 132...220 |
| 132 | 240 | 100 | 132 | 215 | 100 | GS●QQ | T2 | 315 | 3 x LC1F265 | LR9F7375 | 200...330 |
| 160 | 285 | 100 | 160 | 256 | 100 | GS●QQ | T2 | 400 | 3 x LC1F330 | LR9F7375 | 200...330 |
| – | – | – | 200 | 321 | 100 | GS●QQ | T2 | 400 | 3 x LC1F330 | LR9F7379 | 300...500 |
| 200 | 352 | 100 | 220 | 353 | 100 | | | | | | |
| 220 | 388 | 100 | 250 | 401 | 100 | GS2S | T3 | 500 | 3 x LC1F400 | LR9F7379 | 300...500 |
| 250 | 437 | 100 | – | – | – | GS2S | T3 | 500 | 3 x LC1F500 | LR9F7379 | 300...500 |
| 315 | 555 | 100 | 315 | 505 | 100 | GS2S | T3 | 630 | 3 x LC1F630 | LR9F7381 | 380...630 |
| – | – | – | 355 | 549 | 100 | | | | | | |
| – | – | – | 400 | 611 | 100 | GS2V | T4 | 800 | 3 x LC1F630 | LR9F7381 | 380...630 |
| 355 | 605 | 100 | – | – | – | GS2V | T4 | 800 | 3 x LC1F780 | LR9F7381 | 380...630 |

1.5 to 375 kW at 415 V: type 2 coordination

Maximum operating rate: LC1D: 30 starts/hour; LC1F: 12 starts/hour.

Maximum starting time: LC1D: 30 seconds; LC1F: 20 seconds.

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Switch-disconnector-fuse | BS fuses | | Star-delta contactors | Thermal overload relay | |
|--|----------------|----------------|-------|----------------|----------------|--------------------------|-----------|-------------|-----------------------|------------------------|-----------|
| 415 V | | | 440 V | | | | Reference | Size | Rating | Reference | Reference |
| P | I _e | I _q | P | I _e | I _q | | | A | | | A |
| kW | A | kA | kW | A | kA | | | | | | |
| 1.5 | 3.5 | 50 | 1.5 | 3.06 | 50 | GS1DDB | A1 | NIT 16 | 3 x LC1D09 | LRD08 | 2.5...4 |
| 2.2 | 5 | 50 | 2.2 | 4.42 | 50 | GS1DDB | A1 | NIT 16 | 3 x LC1D09 | LRD10 | 4...6 |
| 3 | 6.5 | 50 | 3 | 5.77 | 50 | GS1DDB | A1 | NIT 20 | 3 x LC1D09 | LRD12 | 5.5...8 |
| 4 | 8.4 | 50 | 4 | 7.9 | 50 | GS1DDB | A1 | NIT 20 | 3 x LC1D09 | LRD14 | 7...10 |
| 5.5 | 11 | 50 | 5.5 | 10.4 | 50 | GS1DDB | A1 | NIT 20M25 | 3 x LC1D12 | LRD16 | 9...13 |
| 7.5 | 14.8 | 50 | 7.5 | 13.7 | 50 | GS1DDB | A1 | NIT 20M32 | 3 x LC1D18 | LRD21 | 12...18 |
| 9 | 18.1 | 50 | 9 | 16.9 | 50 | GS2GB | A2 | TIA 32M35 | 3 x LC1D18 | LRD21 | 12...18 |
| 11 | 21 | 50 | 11 | 20.1 | 50 | GS2GB | A2 | TIA 32M50 | 3 x LC1D25 | LRD22 | 16...24 |
| 15 | 28.5 | 50 | 15 | 26.5 | 50 | GS2GB | A2 | TIA 32M63 | 3 x LC1D32 | LRD32 | 23...32 |
| 22 | 42 | 50 | 22 | 39 | 50 | GS2GB | A3 | TIS 63M80 | 3 x LC1D50A | LRD350 | 37...50 |
| - | - | - | 30 | 51.5 | 50 | GS2GB | A3 | TIS 63M100 | 3 x LC1D65A | LRD365 | 48...65 |
| 30 | 57 | 50 | - | - | - | GS2GB | A3 | TIS 63M100 | 3 x LC1D65A | LRD365 | 48...65 |
| 45 | 81 | 50 | 45 | 76 | 50 | GS2LLB | A4 | TCP 100M125 | 3 x LC1D80 | LRD3363 | 63...80 |
| 55 | 100 | 80 | 55 | 90 | 80 | GS2LLB | A4 | TCP 100M160 | 3 x LC1D115 | LR9D5369 | 90...150 |
| 80 | 138 | 80 | 80 | 132 | 80 | GS2LB | B2 | TF 200M250 | 3 x LC1D150 | LR9D5369 | 90...150 |
| 100 | 182 | 80 | 100 | 162 | 80 | GS2MMB | B2 | TF 200M250 | 3 x LC1F185 | LR9F5371 | 132...220 |
| 110 | 196 | 80 | 110 | 178 | 80 | GS2MMB | B2 | TF 200M315 | 3 x LC1F225 | LR9F5371 | 132...220 |
| 140 | 250 | 80 | 140 | 226 | 80 | GS2NB | B3 | TFK 315M355 | 3 x LC1F265 | LR9F7375 | 200...330 |
| 160 | 285 | 80 | 160 | 256 | 80 | GS2QQB | B3 | TFK 315M355 | 3 x LC1F330 | LR9F7375 | 200...330 |
| 220 | 388 | 80 | 220 | 353 | 80 | GS2QQB | B4 | TMF 400M450 | 3 x LC1F400 | LR9F7379 | 300...500 |
| 257 | 450 | 80 | 257 | 412 | 80 | GS2SB | C2 | TTM 500 | 3 x LC1F500 | LR9F7379 | 300...500 |
| 270 | 460 | 80 | 270 | 433 | 80 | | | | | | |
| 375 | 610 | 80 | 375 | 577 | 80 | GS2SB | C2 | TTM 630 | 3 x LC1F630 | LR9F7381 | 380...630 |

1.5 to 250 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3K: 12 starts/hour; LC3D: 30 starts/hour.

Maximum starting time: 30 seconds.

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | | Circuit breaker | | Star-delta contactors |
|---|----------------|--------------------------------|-------------------------------|-------|----------------|--------------------------------|-------------------------------|---|-----------------------------------|--|
| 400/415 V | | | | 440 V | | | | Reference | Setting range of thermal trips | Reference |
| P | I _e | I _{rD} ⁽¹⁾ | I _q ⁽²⁾ | P | I _e | I _{rD} ⁽¹⁾ | I _q ⁽²⁾ | <i>References in italics are available in CEE zone only</i> | | |
| kW | A | A | kA | kW | A | A | kA | | A | |
| 1.5 | 3.6 | 2 | 50 | 1.5 | 3.06 | 1.8 | 50 | GV2ME08 <i>GV2ME08AP</i> | 2.5...4 | LC3K06 |
| 2.2 | 4.9 | 2.9 | 50 | 2.2 | 4.42 | 2.6 | 50 | GV2ME10 <i>GV2ME10AP</i> | 4...6.3 | LC3K06 |
| – | – | – | – | 3 | 5.77 | 3.3 | 50 | | | |
| 3 | 6.5 | 3.8 | 50 | – | – | – | – | GV2ME14 <i>GV2ME14AP</i> | 6...10 | LC3K06 |
| 4 | 8.5 | 4.9 | 50 | 4 | 7.9 | 4.6 | 15 | | | |
| 5.5 | 11.5 | 6.4 | 15 | 5.5 | 10.4 | 6 | 8 | GV2ME16 <i>GV2ME16AP</i> | 9...14 | LC3K06 |
| 7.5 | 15.5 | 8.6 | 15 | 7.5 | 13.7 | 7.9 | 8 | GV2ME20 <i>GV2ME20AP</i> | 13...18 | LC3K09 |
| – | – | – | – | 9 | 16.9 | 9.8 | 8 | GV2ME20 <i>GV2ME20AP</i> | 13...18 | LC3D12A |
| 9 | 18.1 | 10 | 15 | 11 | 20.1 | 12 | 6 | GV2ME21 <i>GV2ME21AP</i> | 17...23 | LC3D12A |
| 11 | 22 | 12 | 15 | – | – | – | – | GV2ME22 <i>GV2ME22AP</i> | 20...25 | LC3D12A |
| 15 | 29 | 17 | 10 | 15 | 26.5 | 15 | 6 | GV2ME32 <i>GV2ME32AP</i> | 24...32 | LC3D18A |
| 18.5 | 35 | 20 | 50 | 18.5 | 32.8 | 19 | 50 | GV3P40 | 30...40 | LC3D18A |
| – | – | – | – | 22 | 39 | 23 | 50 | GV3P50 | 37...50 | LC3D32A |
| 22 | 41 | 24 | 50 | 30 | 51.5 | 30 | 50 | GV3P50 | 37...50 | LC3D32A |
| 30 | 55 | 33 | 50 | 30 | 51.5 | 30 | 50 | GV3P65 | 48...65 | LC3D32A |
| 37 | 66 | 40 | 50 | 37 | 64 | 37 | 50 | GV3P65 | 48...65 | 3 x LC1D40A ⁽³⁾ |
| 37 | 66 | 40 | 100 | 37 | 64 | 37 | 70 | GV4P80 | 40...80 | 3 x LC1D40A ⁽³⁾ |
| – | – | – | – | 45 | 76 | 44 | 70 | GV4P80 | 40...80 | 2 x LC1D50A +1 x LC1D40A ⁽³⁾ |
| 45 | 80 | 47 | 100 | – | – | – | – | GV4P115 | 65...115 | 2 x LC1D50A +1 x LC1D40A ⁽³⁾ |
| 55 | 97 | 58 | 100 | 55 | 90 | 52 | 70 | GV4P115 | 65...115 | 2 x LC1D65A +1 x LC1D40A ⁽³⁾ |
| 75 | 132 | 78 | 35 | 75 | 125 | 72 | 35 | GV5P150F | 70...150 | LC3D80 |
| – | – | – | – | 90 | 146 | 84 | 35 | GV5P150F | 0...150 | LC3D115 |
| 90 | 160 | 95 | 35 | 110 | 178 | 103 | 35 | GV5P220F | 100...220 | LC3D115 |
| 110 | 195 | 115 | 35 | – | – | – | – | | | |
| – | – | – | – | 132 | 215 | 124 | 35 | GV5P220F | 100...220 | LC3D150 |
| 132 | 230 | 135 | 36 | – | – | – | – | GV6P320F | 160...320 | LC3D150 or 3 x LC1F150 |
| 160 | 270 | 158 | 36 | 160 | 256 | 94 | 35 | GV6P320F | 160...320 | 3 x LC1F185 |
| 220 | 380 | 220 | 36 | 250 | 401 | 146 | 35 | GV6P500F | 250...500 | 3 x LC1F265 |
| 250 | 430 | 250 | 36 | 300 | 480 | 175 | 35 | GV6P500F | 250...500 | 3 x LC1F330 |

(1) I_{rD}: current in the motor windings in delta connection.

(2) The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/23.

(3) For mounting 3 contactors **LC1D●●A**, star-delta starter kit **LAD9SD3** must be ordered separately, see page B8/43.

1.5 to 250 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC1D: 30 starts/hour; LC1F: 12 starts/hour.

Maximum starting time: LC1D: 30 seconds; LC1F: 20 seconds.

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | | Circuit breaker | | Star-delta contactors |
|--|----------------|--------------------------------|----------------|-------|----------------|--------------------------------|-------------------------------|-----------------|--------------------------------|--|
| 400/415 V | | | | 440 V | | | | Reference | Setting range of thermal trips | Reference |
| P | I _e | I _{rD} ⁽⁸⁾ | I _q | P | I _e | I _{rD} ⁽⁸⁾ | I _q ⁽¹⁾ | | A | |
| kW | A | A | kA | kW | A | A | kA | | | |
| 1.5 | 3.6 | – | 130 | 1.5 | 3.06 | – | 130 | GV2P08 | 2.5...4 | 3 x LC1D09 ⁽²⁾ |
| 2.2 | 4.9 | – | 130 | 2.2 | 4.42 | – | 130 | GV2P10 | 4...6.3 | 3 x LC1D18 ⁽³⁾ |
| – | – | – | – | 3 | 5.77 | – | 130 | GV2P10 | 4...6.3 | 3 x LC1D18 ⁽³⁾ |
| 3 | 6.5 | – | 130 | – | – | – | – | GV2P14 | 6...10 | 3 x LC1D18 ⁽³⁾ |
| 4 | 8.5 | – | 130 | 4 | 7.9 | – | 130 | GV2P14 | 6...10 | 3 x LC1D18 ⁽³⁾ |
| 5.5 | 11.5 | – | 130 | 5.5 | 10.4 | – | 50 | GV2P16 | 9...14 | 3 x LC1D25 ⁽³⁾ |
| – | – | – | – | 7.5 | 13.7 | – | 50 | GV2P16 | 9...14 | 3 x LC1D25 ⁽³⁾ |
| 7.5 | 15.5 | – | 50 | 9 | 16.9 | – | 20 | GV2P20 | 13...18 | 3 x LC1D25 ⁽³⁾ |
| 9 | 18.1 | – | 50 | 11 | 20.1 | – | 20 | GV2P21 | 17...23 | 3 x LC1D25 ⁽³⁾ |
| 11 | 22 | – | 50 | – | – | – | – | GV2P22 | 20...25 | 3 x LC1D25 ⁽³⁾ |
| 15 | 29 | – | 50 | 15 | 26.5 | – | 50 | GV3P32 | 23...32 | 3 x LC1D40A ⁽⁴⁾ |
| 18.5 | 35 | – | 50 | – | – | – | – | GV3P40 | 30...40 | 2 x LC1D50A +1 x LC1D40A ⁽³⁾ |
| – | – | – | – | 18.5 | 32.8 | – | 50 | GV3P40 | 30...40 | 2 x LC1D65A +1 x LC1D40A ⁽⁴⁾ |
| 22 | 41 | – | 50 | – | – | – | – | GV3P50 | 37...50 | 2 x LC1D50A +1 x LC1D40A ⁽³⁾ |
| – | – | – | – | 22 | 39 | – | 50 | GV3P50 | 37...50 | 2 x LC1D65A +1 x LC1D40A ⁽⁴⁾ |
| 30 | 55 | – | 50 | 30 | 51.5 | – | 50 | GV3P65 | 48...65 | 2 x LC1D65A +1 x LC1D40A ⁽⁴⁾ |
| 37 | 66 | – | 100 | 45 | 76 | – | 70 | GV4P80 | 40...80 | 3 x LC1D80 ⁽⁵⁾ |
| – | – | – | – | 37 | 64 | – | 70 | GV4P80 | 40...80 | 3 x LC1D65A ⁽⁴⁾ |
| 45 | 80 | – | 100 | – | – | – | – | GV4P115 | 65...115 | 3 x LC1D115 ⁽⁶⁾ |
| 55 | 97 | – | 100 | 55 | 90 | – | 70 | GV4P115 | 65...115 | 3 x LC1D115 ⁽⁶⁾ |
| 75 | 132 | 78 | 70 | 75 | 125 | 74 | 65 | GV5P150H | 70...150 | 3 x LC1D150 ⁽⁶⁾ |
| – | – | – | – | 90 | 146 | 86 | 65 | GV5P150H | 70...150 | 3 x LC1D150 ⁽⁶⁾ |
| 90 | 160 | 95 | 70 | 110 | 178 | 104 | 65 | GV5P220H | 100...220 | 3 x LC1F185 ⁽⁷⁾ |
| 110 | 195 | 115 | 70 | 132 | 215 | 126 | 65 | GV5P220H | 100...220 | 3 x LC1F225 ⁽⁷⁾ |
| 132 | 230 | 135 | 70 | – | – | – | – | GV6P320H | 160...320 | 3 x LC1F265 |
| 160 | 270 | 156 | 70 | 160 | 256 | 150 | 65 | GV6P320H | 160...320 | 3 x LC1F265 |
| 220 | 380 | 220 | 70 | 250 | 401 | 234 | 65 | GV6P500H | 250...500 | 3 x LC1F500 |
| 250 | 430 | 250 | 70 | 300 | 480 | 279 | 65 | GV6P500H | 250...500 | 3 x LC1F500 |

(1) The breaking performance of circuit breakers GV2P can be increased by adding a current limiter GV1L3, see page B6/54.

(2) For mounting 3 contactors LC1D09, star-delta starter kit LAD91217 must be ordered separately, see page B8/43.

(3) For mounting 3 contactors LC1D18 or LC1D25, star-delta starter kit LAD93217 must be ordered separately, see page B8/43.

(4) For mounting 3 contactors LC1D65A, star-delta starter kit LAD9SD3 must be ordered separately, see page B8/43.

(5) For mounting 3 contactors LC1D80, star-delta starter kit LA9D8017 must be ordered separately, see page B8/43.

(6) For mounting 3 contactors LC1D115 or LC1D150, see A2/13.

(7) For mounting 3 contactors LC1F185 or LC1F225, see pages A2/15 and A2/17.

(8) I_{rD}: current in the motor windings in delta connection.

1.5 to 315 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3K and LC3F: 12 starts/hour; LC3D: 30 starts/hour.

Maximum starting time: LC3K and LC3D: 30 seconds; LC3F: 20 seconds.

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | Circuit breaker | | | Star-delta contactors | Thermal overload relay | |
|---|----------------|--------------------------------|----------------|-------|----------------|--------------------------------|----------------|---|---------------------------------------|------|--|------------------------|------------------|
| 400/415 V | | | | 440 V | | | | Reference | Rating I _{rm} ⁽²⁾ | | Reference | Reference | Setting range |
| P | I _e | I _{rD} ⁽¹⁾ | I _q | P | I _e | I _{rD} ⁽¹⁾ | I _q | | A | A | | | A |
| kW | A | A | kA | kW | A | A | kA | | | | | | |
| – | – | – | – | 1.5 | 3.06 | 1.8 | 50 | LC3D32A | 4 | 51 | LC3K06 | LR2K0308 | 1.8...2.6 |
| 1.5 | 3.6 | 2 | 50 | 2.2 | 4.42 | 3 | 50 | | | | | | |
| 2.2 | 4.9 | 3 | 50 | 3 | 5.77 | 3 | 50 | GV2LE10 | 6.3 | 78 | LC3K06 | LR2K0310 | 2.6...3.7 |
| 3 | 6.5 | 4 | 50 | – | – | – | – | GV2LE14 | 10 | 138 | LC3K06 | LR2K0312 | 3.7...5.5 |
| – | – | – | – | 4 | 7.9 | 5 | 50 | GV2LE10 | 6.3 | 78 | LC3K06 | LR2K0312 | 3.7...5.5 |
| 4 | 8.5 | 5 | 50 | – | – | – | – | GV2LE14 | 10 | 138 | LC3K06 | LR2K0312 | 3.7...5.5 |
| – | – | – | – | 5.5 | 10.4 | 6 | 15 | GV2LE14 | 10 | 138 | LC3K06 | LR2K0314 | 5.5...8 |
| 5.5 | 11.5 | 6 | 15 | – | – | – | – | GV2LE16 | 14 | 170 | LC3K06 | LR2K0314 | 5.5...8 |
| – | – | – | – | 7.5 | 13.7 | 8 | 8 | GV2LE16 | 14 | 170 | LC3K09 | LR2K0316 | 8...11.5 |
| 7.5 | 15.5 | 9 | 15 | – | – | – | – | GV2LE20 | 18 | 223 | LC3K09 | LR2K0316 | 8...11.5 |
| – | – | – | – | 9 | 16.9 | 1 | 8 | GV2LE16 | 14 | 170 | LC3D12A | LRD16 | 9...13 |
| 9 | 18.1 | 10 | 15 | – | – | – | – | GV2LE22 | 25 | 327 | LC3K12 | LR2K0316 | 8...11.5 |
| – | – | – | – | 11 | 20.1 | 12 | 8 | GV2LE20 | 18 | 223 | LC3K12 | LR2K0321 | 10...14 |
| 11 | 22 | 12 | 15 | – | – | – | – | GV2LE22 | 25 | 327 | LC3K12 | LR2K0321 | 10...14 |
| – | – | – | – | 15 | 26.5 | 15 | 6 | GV2LE22 | 25 | 327 | LC3D18A | LRD21 | 12...18 |
| 15 | 29 | 16 | 10 | – | – | – | – | GV2LE32 | 32 | 384 | LC3D18A | LRD21 | 12...18 |
| 18.5 | 35 | 20 | 50 | 18.5 | 32.8 | 19 | 50 | GV3L40 | 40 | 560 | LC3D18A | LRD22 | 16...24 |
| 22 | 41 | 24 | 50 | 22 | 39 | 23 | 50 | GV3L50 | 50 | 700 | LC3D32A | LRD32 | 23...32 |
| – | – | – | – | 30 | 51.5 | 30 | 50 | GV3L65 | 65 | 910 | LC3D32A | LRD32 | 23...32 |
| 30 | 55 | 33 | 50 | – | – | – | – | GV3L65 | 65 | 910 | LC3D32A | LRD35 | 30...38 |
| – | – | – | – | 37 | 64 | 37 | 50 | GV3L65 | 65 | 910 | 3 x LC1D40A ⁽⁴⁾ | LRD340 | 30...40 |
| 37 | 66 | 40 | 100 | – | – | – | – | GV4L80 | 80 | 640 | 3 x LC1D40A ⁽⁴⁾ | LRD350 | 37...50 |
| – | – | – | – | 37 | 64 | 37 | 70 | GV4L80 | 80 | 640 | 3 x LC1D40A ⁽⁴⁾ | LRD340 | 30...40 |
| – | – | – | – | 45 | 76 | 44 | 70 | GV4L80 | 80 | 800 | 2 x LC1D50A +1 x LC1D40A ⁽⁴⁾ | LRD350 | 30...40 |
| 45 | 80 | 47 | 100 | – | – | – | – | GV4L115 | 115 | 805 | 2 x LC1D50A +1 x LC1D40A ⁽⁴⁾ | LRD350 | 30...40 |
| 55 | 97 | 58 | 100 | 55 | 90 | 52 | 70 | GV4L115 | 115 | 805 | 2 x LC1D50A +1 x LC1D40A ⁽⁴⁾ | LRD350 | 30...40 |
| – | – | – | – | 75 | 125 | 72 | ⁽³⁾ | NSX160●MA ⁽³⁾ | 150 | 1200 | LC3D80 | LRD3363 | 63...80 |
| 75 | 132 | 78 | ⁽³⁾ | – | – | – | – | NSX160●MA ⁽³⁾ | 150 | 1200 | LC3D80 | LRD3363 | 63...80 |
| – | – | – | – | 90 | 146 | 85 | ⁽³⁾ | NSX160●MA ⁽³⁾ | 150 | 1200 | LC3D115 | LRD4365 | 80...104 |
| 90 | 160 | 96 | ⁽³⁾ | 110 | 178 | 103 | ⁽³⁾ | NSX250●MA ⁽³⁾ | 220 | 1760 | LC3D115 | LRD4365 | 80...104 |
| – | – | – | – | 132 | 215 | 125 | ⁽³⁾ | NSX250●MA ⁽³⁾ | 220 | 1760 | LC3D150 | LRD4369 | 110...140 |
| 110 | 195 | 116 | ⁽³⁾ | – | – | – | – | NSX250●MA ⁽³⁾ | 220 | 1760 | LC3D115 | LRD4367 | 95...120 |
| – | – | – | – | 160 | 256 | 148 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 2240 | LC3D150 | LR9D5369 | 90...150 |
| – | – | – | – | 200 | 321 | 186 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 3150 | LC3F225 | LR9F5371 | 132...220 |
| 132 | 230 | 139 | ⁽³⁾ | – | – | – | – | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 2240 | LC3D150 | LRD4369 | 110...140 |
| 160 | 280 | 165 | ⁽³⁾ | – | – | – | – | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 2560 | LC3F185 | LR9F5371 | 132...220 |
| 200 | 350 | 204 | ⁽³⁾ | 220 | 353 | 204 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 3150 | LC3F225 | LR9F5371 | 132...220 |
| 220 | 388 | 225 | ⁽³⁾ | 250 | 401 | 233 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 3500 | LC3F265 | LR9F7375 | 200...330 |
| 280 | 480 | 278 | ⁽³⁾ | – | – | – | – | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 4000 | LC3F330 | LR9F7375 | 200...330 |
| – | – | – | – | 315 | 505 | 295 | ⁽³⁾ | NSX800● + Micrologic 5.0 - LR off | 800 | 4000 | LC3F330 | LR9F7375 | 200...330 |
| 315 | 540 | 322 | ⁽³⁾ | 355 | 518 | 300 | ⁽³⁾ | NSX800● + Micrologic 5.0 - LR off | 800 | 4500 | LC3F330 | LR9F7375 | 200...330 |
| – | – | – | – | 375 | 575 | 334 | ⁽³⁾ | NSX800● + Micrologic 5.0 - LR off | 800 | 5000 | LC3F400 | LR9F7379 | 300...500 |

(1) I_{rD}: current in the motor windings in delta connection.

(2) I_{rm}: setting current of the magnetic trip.

(3) Products marketed under the Merlin Gerin brand. Reference to be completed by replacing the ● with the breaking performance code:

| Breaking performance I _q (kA) | NSX100●MA | | NSX160●MA, NSX250●MA | | NSX400●, NSX630● | | NS800● | |
|--|-----------|----|----------------------|----|------------------|-----|--------|-----|
| 400/415 V | 36 | 70 | 36 | 70 | 70 | 150 | 70 | 150 |
| 440 V | 35 | 65 | 35 | 65 | 65 | 130 | 65 | 130 |
| Code | F | H | F | H | H | L | H | L |

(4) For mounting 3 contactors LC1D●●A, star-delta starter kit LAD9SD3 must be ordered separately, see page B8/43.

1.5 to 250 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC3D: 30 starts/hour; LC3F: 12 starts/hour.

Maximum starting time: LC3D: 30 seconds; LC3F: 20 seconds.

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Circuit breaker | | | Star-delta contactors | Thermal overload relay | |
|---|----------------|----------------|-------|----------------|----------------|---|--------|--------------------------------|--|------------------------|------------------|
| 400/415 V | | | 440 V | | | Reference | Rating | I _{rm} ⁽¹⁾ | Reference | Reference | Setting range |
| P | I _e | I _q | P | I _e | I _q | | A | A | | | A |
| kW | A | kA | kW | A | kA | | | | | | |
| 1.5 | 3.6 | 130 | 1.5 | 3.06 | 130 | GV2L08 | 4 | 51 | 3 x LC1D09 | LRD08 | 2.5...4 |
| 2.2 | 4.9 | 130 | 2.2 | 4.42 | 130 | GV2L10 | 6.3 | 78 | 3 x LC1D09 | LRD10 | 4...6 |
| 3 | 6.5 | 130 | 3 | 5.77 | 130 | | | | | | |
| – | – | – | 4 | 7.9 | 20 | GV2L14 | 10 | 138 | 3 x LC1D18 | LRD14 | 7...10 |
| 4 | 8.5 | 130 | – | – | – | GV2L14 | 10 | 138 | 3 x LC1D18 | LRD16 | 9...13 |
| 5.5 | 11.5 | 50 | 5.5 | 10.4 | 20 | GV2L16 | 14 | 170 | 3 x LC1D25 | LRD16 | 9...13 |
| 7.5 | 15.5 | 50 | 7.5 | 13.7 | 20 | GV2L20 | 18 | 223 | 3 x LC1D25 | LRD21 | 12...18 |
| – | – | – | 9 | 16.9 | 20 | GV2L22 | 25 | 327 | 3 x LC1D25 | LRD21 | 12...18 |
| 9 | 18.1 | 50 | – | – | – | GV2L22 | 25 | 327 | 3 x LC1D25 | LRD22 | 16...24 |
| 11 | 22 | 50 | 11 | 20.1 | 20 | | | | | | |
| 15 | 29 | 50 | 15 | 26.5 | 50 | GV3L32 | 32 | 448 | 3 x LC1D40A ⁽²⁾ | LRD332 | 23...32 |
| 18.5 | 35 | 50 | – | – | – | GV3L40 | 40 | 560 | 2 x LC1D50A +1 x LC1D40A ⁽²⁾ | LRD340 | 30...40 |
| – | – | – | 18.5 | 32.8 | 50 | GV3L40 | 40 | 560 | 2 x LC1D65A +1 x LC1D40A ⁽²⁾ | LRD340 | 30...40 |
| 22 | 41 | 50 | – | – | – | GV3L50 | 50 | 700 | 2 x LC1D50A +1 x LC1D40A ⁽²⁾ | LRD350 | 37...50 |
| – | – | – | 22 | 39 | 50 | GV3L50 | 50 | 700 | 2 x LC1D65A +1 x LC1D40A ⁽²⁾ | LRD350 | 37...50 |
| 30 | 55 | 50 | 30 | 51.5 | 50 | GV3L65 | 65 | 910 | 2 x LC1D65A +1 x LC1D40A ⁽²⁾ | LRD365 | 48...65 |
| – | – | – | 37 | 64 | 50 | GV3L65 | 65 | 910 | 3 x LC1D80 | LRD3359 | 48...65 |
| 37 | 66 | 100 | – | – | – | GV4L80 | 80 | 640 | 3 x LC1D80 | LRD3363 | 63...80 |
| – | – | – | 45 | 76 | 70 | GV4L80 | 80 | 800 | 3 x LC1D80 | LRD3363 | 63...80 |
| 45 | 80 | 100 | – | – | – | GV4L115 | 115 | 805 | 3 x LC1D115 | LR9D5367 | 60...100 |
| – | – | – | 55 | 90 | 70 | GV4L115 | 115 | 920 | 3 x LC1D115 | LR9D5367 | 60...100 |
| 55 | 97 | 100 | – | – | – | GV4L115 | 115 | 920 | 3 x LC1D115 | LR9D5369 | 90...150 |
| 55 | 97 | ⁽³⁾ | – | – | – | NSX160●MA ⁽³⁾ | 150 | 1200 | 3 x LC1D115 | LR9D5369 | 90...150 |
| – | – | – | 75 | 125 | ⁽³⁾ | NSX160●MA ⁽³⁾ | 150 | 1200 | 3 x LC1D150 | LR9D5369 | 90...150 |
| 75 | 132 | ⁽³⁾ | 90 | 146 | ⁽³⁾ | NSX160●MA ⁽³⁾ | 150 | 1200 | 3 x LC1D150 | LR9D5369 | 90...150 |
| 90 | 160 | ⁽³⁾ | 110 | 178 | ⁽³⁾ | NSX250●MA ⁽³⁾ | 220 | 1760 | 3 x LC1F185 | LR9F5371 | 132...220 |
| 110 | 195 | ⁽³⁾ | – | – | – | NSX250●MA ⁽³⁾ | 220 | 1760 | 3 x LC1F225 | LR9F5371 | 132...220 |
| – | – | – | 132 | 215 | ⁽³⁾ | NSX250●MA ⁽³⁾ | 220 | 1760 | 3 x LC1F225 | LR9F7375 | 200...330 |
| 132 | 230 | ⁽³⁾ | 160 | 256 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 2240 | 3 x LC1F265 | LR9F7375 | 200...330 |
| 160 | 280 | ⁽³⁾ | – | – | – | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 2560 | 3 x LC1F330 | LR9F7375 | 200...330 |
| – | – | – | 200 | 321 | ⁽³⁾ | NSX400● + Micrologic 1.3M ⁽³⁾ | 320 | 2880 | 3 x LC1F330 | LR9F7379 | 300...500 |
| 200 | 350 | ⁽³⁾ | 220 | 353 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 3150 | 3 x LC1F400 | LR9F7379 | 300...500 |
| 220 | 388 | ⁽³⁾ | 250 | 401 | ⁽³⁾ | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 3500 | 3 x LC1F400 | LR9F7379 | 300...500 |
| 250 | 430 | ⁽³⁾ | – | – | – | NSX630● + Micrologic 1.3M ⁽³⁾ | 500 | 4000 | 3 x LC1F500 | LR9F7379 | 300...500 |

(1) I_{rm}: setting current of the magnetic trip.

(2) For mounting 3 contactors LC1D●●A, star-delta starter kit LAD9SD3 must be ordered separately, see page B8/43.

(3) Products marketed under the Merlin Gerin brand. Reference to be completed by replacing the ● with the breaking performance code:

| Breaking performance I _q (kA) | NSX100●MA | | NSX160●MA, NSX250●MA | | NSX400●, NSX630● | |
|--|-----------|----|----------------------|----|------------------|-----|
| 400/415 V | 36 | 70 | 36 | 70 | 70 | 150 |
| 440 V | 35 | 65 | 35 | 65 | 65 | 130 |
| Code | F | H | F | H | H | L |

TeSys island motor starters

Standard, SIL starters - Power interface modules

IEC - Type 1 or 2 coordination with fuses - 690 V

| 690 V - Type 1 or 2 coordination with fuses | | | |
|---|----------|--|---------------|
| Applications with 3-phase motors 50-60 Hz in category AC-3 | aM fuses | Standard Starters SIL Starters Power Interface Modules | |
| 690 V | Rating | References | Setting range |
| I _q | | | |
| kA | A | | A |
| 80 | ≤10 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| | ≤25 | TPRST025 TPRSS025 - | 0.5-25 |
| | ≤40 | TPRST038 TPRSS038 TPRPM038 | 0.76-38 |
| | ≤80 | TPRST065 TPRSS065 - | 3.25-65 |
| | ≤80 | TPRST080 TPRSS080 TPRPM080 | 4-80 |

TeSys island motor starters

Standard, SIL starters - Power interface modules

IEC - Type 1 coordination with circuit breakers - 230 V

| 0.06 to 22 kW at 230 V: Type 1 coordination | | | | | |
|--|----------------|----------------|--------------------------------------|--|------------------|
| Applications power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Circuit breaker (Trip class 5 to 15) | Standard Starters SIL Starters Power Interface Modules | |
| 230 V | | | References | References | Setting range |
| P | I _e | I _q | | | |
| kW | A | kA | | | A |
| 0.06 | 0.35 | 100 | GV2L03 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.09 | 0.52 | 100 | GV2L04 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.12 | 0.7 | 100 | GV2L05 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.18 | 1 | 100 | GV2L06 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.25 | 1.5 | 100 | GV2L06 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.37 | 1.9 | 100 | GV2L07 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.55 | 2.6 | 100 | GV2L08 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.75 | 3.3 | 100 | GV2L08 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 1.1 | 4.7 | 100 | GV2L10 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 1.5 | 6.3 | 100 | GV2L14 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 2.2 | 8.5 | 100 | GV2L14 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 3 | 11.3 | 100 | GV2L16 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| 4 | 15 | 100 | GV2L20 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| 5.5 | 20 | 50 | GV2L22 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| 7.5 | 27 | 50 | GV2L32 | TPRST038 TPRSS038 TPRPM038 | 0.76-38 |
| 9 | 32 | 100 | GV3L40 | TPRST038 TPRSS038 TPRPM038 | 0.76-38 |
| 11 | 38 | 100 | GV3L40 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |
| 15 | 51 | 100 | GV3L65 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |
| 18.5 | 61 | 100 | GV3L65 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |
| 22 | 72 | 100 | GV3L73 | TPRPM080 | 4-80 |

TeSys island motor starters

Standard, SIL starters

IEC - Type 2 coordination with circuit breakers - 230 V

| 0.06 to 22 kW at 230 V: Type 2 coordination | | | | | |
|--|----------------|----------------|---|-----------------------------------|---------------|
| Applications power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Circuit breaker (Trip class 5 to 15) | Standard Starters SIL Starters | |
| 230 V | | | References | References | Setting range |
| P | I _e | I _q | | | |
| kW | A | kA | | | A |
| 0.06 | 0.35 | 100 | GV2L03 | TPRST009 TPRSS009 | 0.18-9 |
| 0.09 | 0.52 | 100 | GV2L04 | TPRST009 TPRSS009 | 0.18-9 |
| 0.12 | 0.7 | 100 | GV2L05 | TPRST009 TPRSS009 | 0.18-9 |
| 0.18 | 1 | 100 | GV2L06 | TPRST009 TPRSS009 | 0.18-9 |
| 0.25 | 1.5 | 100 | GV2L06 | TPRST009 TPRSS009 | 0.18-9 |
| 0.37 | 1.9 | 100 | GV2L07 | TPRST009 TPRSS009 | 0.18-9 |
| 0.55 | 2.6 | 100 | GV2L08 | TPRST009 TPRSS009 | 0.18-9 |
| 0.75 | 3.3 | 100 | GV2L08 | TPRST025 TPRSS025 | 0.5-25 |
| 1.1 | 4.7 | 100 | GV2L10 | TPRST025 TPRSS025 | 0.5-25 |
| 1.5 | 6.3 | 100 | GV2L14 | TPRST025 TPRSS025 | 0.5-25 |
| 2.2 | 8.5 | 100 | GV2L14 | TPRST025 TPRSS025 | 0.5-25 |
| 3 | 11.3 | 100 | GV2L16 | TPRST025 TPRSS025 | 0.5-25 |
| 4 | 15 | 100 | GV2L20 | TPRST025 TPRSS025 | 0.5-25 |
| 5.5 | 20 | 50 | GV2L22 | TPRST025 TPRSS025 | 0.5-25 |
| 7.5 | 27 | 50 | GV2L32 | TPRST038 TPRSS038 | 0.76-38 |
| 9 | 32 | 100 | GV3L40 | TPRST038 TPRSS038 | 0.76-38 |
| 11 | 38 | 100 | GV3L40 | TPRST065 TPRSS065 | 3.25-65 |
| 15 | 51 | 100 | GV3L65 | TPRST065 TPRSS065 | 3.25-65 |
| 18.5 | 61 | 100 | GV3L65 | TPRST065 TPRSS065 | 3.25-65 |

Coordination
and
standards

TeSys island motor starters

Standard, SIL starters - Power interface modules

IEC - Type 1 coordination with circuit breakers - 400/415 - 440 - 500 V

| 0.06 to 37 kW at 400/415 - 440 - 500 V: Type 1 coordination | | | | | | | | | | | |
|---|----------------|----------------|-------|----------------|----------------|-------|----------------|----------------|---|--|------------------|
| Applications power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | | | Circuit breaker (Trip class 5 to 15) | Standard Starters SIL Starters Power Interface Modules | |
| 400/415 V | | | 440 V | | | 500 V | | | References | References | Setting range |
| P | I _e | I _q | P | I _e | I _q | P | I _e | I _q | | | |
| kW | A | kA | kW | A | kA | kW | A | kA | | A | |
| 0.06 | 0.2 | 100 | 0.06 | 0.18 | 100 | - | - | - | GV2L03 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.09 | 0.3 | 100 | 0.09 | 0.27 | 100 | - | - | - | | | |
| 0.12 | 0.44 | 100 | 0.12 | 0.4 | 100 | - | - | - | GV2L04 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.18 | 0.6 | 100 | 0.18 | 0.55 | 100 | - | - | - | | | |
| 0.25 | 0.85 | 100 | 0.25 | 0.77 | 100 | - | - | - | GV2L05 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.37 | 1.1 | 100 | - | - | - | 0.37 | 0.88 | 100 | | | |
| - | - | - | 0.37 | 1 | 100 | - | - | - | GV2L06 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.55 | 1.5 | 100 | 0.55 | 1.4 | 100 | 0.55 | 1.2 | 100 | | | |
| - | - | - | - | - | - | 0.75 | 1.5 | 100 | GV2L07 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.75 | 1.9 | 100 | 0.75 | 1.7 | 100 | - | - | - | | | |
| 1.1 | 2.7 | 100 | - | - | - | 1.1 | 2.2 | 100 | | | |
| - | - | - | 1.1 | 2.4 | 100 | - | - | - | GV2L08 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 1.5 | 3.6 | 100 | 1.5 | 3.3 | 100 | 1.5 | 2.9 | 100 | | | |
| 2.2 | 4.9 | 100 | 2.2 | 4.5 | 100 | 2.2 | 3.9 | 100 | GV2L10 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| - | - | - | 3 | 5.9 | 100 | 3 | 5.2 | 100 | | | |
| 3 | 6.5 | 100 | - | - | - | - | - | - | GV2L14 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 4 | 8.5 | 100 | 4 | 7.7 | 20 | 4 | 6.8 | 10 | | | |
| - | - | - | - | - | - | 5.5 | 9.2 | 10 | | | |
| 5.5 | 11.5 | 50 | 5.5 | 10.5 | 20 | - | - | - | GV2L16 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| - | - | - | - | - | - | 7.5 | 12.4 | 10 | | | |
| 7.5 | 15.5 | 50 | 7.5 | 14.1 | 20 | - | - | - | GV2L20 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| - | - | - | 9 | 16.5 | 20 | 9 | 13.9 | 10 | | | |
| 9 | 18.1 | 50 | - | - | - | - | - | - | GV2L22 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| 11 | 22 | 50 | 11 | 20 | 20 | 11 | 17.6 | 10 | | | |
| - | - | - | - | - | - | 15 | 23 | 10 | | | |
| 15 | 29 | 50 | 15 | 26.4 | 20 | - | - | - | GV2L32 | TPRST038 TPRSS038 TPRPM038 | 0.76-38 |
| - | - | - | - | - | - | 18.5 | 28 | 10 | | | |
| 18.5 | 35 | 50 | 18.5 | 31.8 | 50 | - | - | - | GV3L40 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |
| - | - | - | - | - | - | 22 | 33 | 12 | | | |
| 22 | 41 | 50 | 22 | 37.3 | 50 | - | - | - | GV3L50 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |
| - | - | - | - | - | - | 30 | 44 | 12 | | | |
| 30 | 55 | 50 | 30 | 50 | 50 | - | - | - | GV3L65 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |
| - | - | - | 37 | 60 | 50 | 37 | 53 | 12 | | | |
| 37 | 66 | 50 | - | - | - | - | - | - | GV3L73 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |

Coordination and standards

TeSys island motor starters

Standard, SIL starters

IEC - Type 2 coordination with circuit breakers - 400/415 - 440 - 500 V

| 0.06 to 37 kW at 400/415 - 440 - 500 V: Type 2 coordination | | | | | | | | | | Circuit breaker (Trip class 5 to 15) | Standard Starters SIL Starters | Setting range |
|---|------|-----|-------|------|-----|-------|------|-----|------------|---|-----------------------------------|---------------|
| Applications power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | | | References | | | |
| 400/415 V | | | 440 V | | | 500 V | | | | P | le | Iq |
| P | Ie | Iq | P | Ie | Iq | P | Ie | Iq | A | | | |
| kW | A | kA | kW | A | kA | kW | A | kA | | | | |
| 0.06 | 0.2 | 100 | 0.06 | 0.18 | 100 | - | - | - | GV2L03 | TPRST009 TPRSS009 | 0.18-9 | |
| 0.09 | 0.3 | 100 | 0.09 | 0.27 | 100 | - | - | - | | | | |
| 0.12 | 0.44 | 100 | 0.12 | 0.4 | 100 | - | - | - | GV2L04 | TPRST009 TPRSS009 | 0.18-9 | |
| 0.18 | 0.6 | 100 | 0.18 | 0.55 | 100 | - | - | - | | | | |
| 0.25 | 0.85 | 100 | 0.25 | 0.77 | 100 | - | - | - | GV2L05 | TPRST009 TPRSS009 | 0.18-9 | |
| 0.37 | 1.1 | 100 | - | - | - | 0.37 | 0.88 | 100 | | | | |
| - | - | - | 0.37 | 1 | 100 | - | - | - | GV2L06 | TPRST009 TPRSS009 | 0.18-9 | |
| 0.55 | 1.5 | 100 | 0.55 | 1.4 | 100 | 0.55 | 1.2 | 100 | | | | |
| - | - | - | - | - | - | 0.75 | 1.5 | 100 | GV2L07 | TPRST009 TPRSS009 | 0.18-9 | |
| 0.75 | 1.9 | 100 | 0.75 | 1.7 | 100 | - | - | - | | | | |
| | | | | | | 1.1 | 2.2 | 100 | | | | |
| 1.1 | 2.7 | 100 | - | - | - | - | - | - | GV2L07 | TPRST025 TPRSS025 | 0.5-25 | |
| - | - | - | 1.1 | 2.4 | 100 | - | - | - | GV2L08 | TPRST009 TPRSS009 | 0.18-9 | |
| - | - | - | - | - | - | 1.5 | 2.9 | 100 | | | | |
| 1.5 | 3.6 | 100 | 1.5 | 3.3 | 100 | - | - | - | GV2L08 | TPRST025 TPRSS025 | 0.5-25 | |
| 2.2 | 4.9 | 100 | 2.2 | 4.5 | 100 | 2.2 | 3.9 | 100 | GV2L10 | TPRST025 TPRSS025 | 0.5-25 | |
| - | - | - | 3 | 5.9 | 100 | 3 | 5.2 | 100 | | | | |
| 3 | 6.5 | 100 | - | - | - | - | - | - | GV2L14 | TPRST025 TPRSS025 | 0.5-25 | |
| 4 | 8.5 | 100 | 4 | 7.7 | 20 | 4 | 6.8 | 10 | | | | |
| - | - | - | - | - | - | 5.5 | 9.2 | 10 | | | | |
| 5.5 | 11.5 | 50 | 5.5 | 10.5 | 20 | - | - | - | GV2L16 | TPRST025 TPRSS025 | 0.5-25 | |
| - | - | - | - | - | - | 7.5 | 12.4 | 10 | | | | |
| 7.5 | 15.5 | 50 | 7.5 | 14.1 | 20 | - | - | - | GV2L20 | TPRST025 TPRSS025 | 0.5-25 | |
| - | - | - | 9 | 16.5 | 20 | 9 | 13.9 | 10 | | | | |
| 9 | 18.1 | 50 | - | - | - | - | - | - | GV2L22 | TPRST025 TPRSS025 | 0.5-25 | |
| 11 | 22 | 50 | 11 | 20 | 20 | 11 | 17.6 | 10 | | | | |
| - | - | - | - | - | - | 15 | 23 | 10 | | | | |
| 15 | 29 | 50 | 15 | 26.4 | 20 | - | - | - | GV2L32 | TPRST038 TPRSS038 | 0.76-38 | |
| - | - | - | - | - | - | 18.5 | 28 | 10 | | | | |
| 18.5 | 35 | 50 | 18.5 | 31.8 | 50 | - | - | - | GV3L40 | TPRST065 TPRSS065 | 3.25-65 | |
| - | - | - | - | - | - | 22 | 33 | 12 | | | | |
| 22 | 41 | 50 | 22 | 37.3 | 50 | - | - | - | GV3L50 | TPRST065 TPRSS065 | 3.25-65 | |
| - | - | - | - | - | - | 30 | 44 | 12 | | | | |
| 30 | 55 | 50 | 30 | 50 | 50 | - | - | - | GV3L65 | TPRST065 TPRSS065 | 3.25-65 | |
| - | - | - | 37 | 60 | 50 | 37 | 53 | 12 | | | | |
| 37 | 66 | 50 | - | - | - | - | - | - | GV3L73 | TPRST065 TPRSS065 | 3.25-65 | |

Coordination
and
standards

TeSys island motor starters

Standard, SIL starters - Power interface modules

IEC - Type 1 coordination with circuit breakers - 690 V

| 0.06 to 37 kW at 690 V: Type 1 coordination | | | | | |
|--|----------------|----------------|--------------------------------------|--|------------------|
| Applications power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Circuit breaker (Trip class 5 to 15) | Standard Starters SIL Starters Power Interface Modules | |
| 690 V | | | References | References | Setting range |
| P | I _e | I _q | | | |
| kW | A | kA | | | A |
| 0.37 | 0.64 | 100 | GV2L05 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.55 | 0.87 | 4 | GV2L05 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 0.75 | 1.1 | 4 | GV2L06 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 1.1 | 1.6 | 4 | GV2L07 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 1.5 | 2.1 | 4 | GV2L07 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 2.2 | 2.8 | 4 | GV2L08 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 3 | 3.8 | 4 | GV2L08 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 4 | 4.9 | 4 | GV2L10 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 5.5 | 6.7 | 4 | GV2L14 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 7.5 | 8.9 | 4 | GV2L14 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| 9 | 10.5 | 4 | GV2L16 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| 11 | 12.8 | 4 | GV2L16 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| 15 | 17 | 4 | GV2L20 | TPRST025 TPRSS025 TPRPM038 | 0.5-25 / 0.76-38 |
| 18.5 | 21 | 4 | GV2L22 | TPRST038 TPRSS038 TPRPM038 | 0.76-38 |
| 22 | 24 | 4 | GV2L22 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |
| 30 | 32 | 6 | GV3L40 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |
| 37 | 39 | 6 | GV3L50 | TPRST065 TPRSS065 TPRPM080 | 3.25-65 / 4-80 |

Coordination and standards

TeSys island motor starters

Standard, SIL starters

IEC - Type 2 coordination with circuit breakers - 690 V

| 0.06 to 37 kW at 690 V: Type 2 coordination | | | | | |
|--|----------------|----------------|--------------------------------------|--------------------------------|---------------|
| Applications power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Circuit breaker (Trip class 5 to 15) | Standard Starters SIL Starters | |
| 690 V | | | References | References | Setting range |
| P | I _e | I _q | | | |
| kW | A | kA | | | A |
| 0.37 | 0.64 | 100 | GV2L05 | TPRST009 TPRSS009 | 0.18-9 |
| 0.55 | 0.87 | 4 | GV2L05 | TPRST009 TPRSS009 | 0.18-9 |
| 0.75 | 1.1 | 4 | GV2L06 | TPRST009 TPRSS009 | 0.18-9 |
| 1.1 | 1.6 | 4 | GV2L07 | TPRST009 TPRSS009 | 0.18-9 |
| 1.1 | 1.6 | 50 | GV2L07 + LA9LB920 | TPRST025 TPRSS025 | 0.5-25 |
| 1.5 | 2.1 | 4 | GV2L07 | TPRST009 TPRSS009 | 0.18-9 |
| 1.5 | 2.1 | 50 | GV2L07 + LA9LB920 | TPRST025 TPRSS025 | 0.5-25 |
| 2.2 | 2.8 | 4 | GV2L08 | TPRST025 TPRSS025 | 0.5-25 |
| 2.2 | 2.8 | 50 | GV2L08 + LA9LB920 | TPRST025 TPRSS025 | 0.5-25 |
| 3 | 3.8 | 4 | GV2L08 | TPRST025 TPRSS025 | 0.5-25 |
| 3 | 3.8 | 50 | GV2L08 + LA9LB920 | TPRST025 TPRSS025 | 0.5-25 |
| 4 | 4.9 | 4 | GV2L10 | TPRST025 TPRSS025 | 0.5-25 |
| 4 | 4.9 | 50 | GV2L10 + LA9LB920 | TPRST025 TPRSS025 | 0.5-25 |
| 5.5 | 6.7 | 4 | GV2L14 | TPRST025 TPRSS025 | 0.5-25 |
| 5.5 | 6.7 | 50 | GV2L14 + LA9LB920 | TPRST025 TPRSS025 | 0.5-25 |
| 7.5 | 8.9 | 4 | GV2L14 | TPRST025 TPRSS025 | 0.5-25 |
| 7.5 | 8.9 | 50 | GV2L14 + LA9LB920 | TPRST025 TPRSS025 | 0.5-25 |
| 9 | 10.5 | 4 | GV2L16 | TPRST025 TPRSS025 | 0.5-25 |
| 11 | 12.8 | 4 | GV2L16 | TPRST025 TPRSS025 | 0.5-25 |
| 11 | 12.8 | 3 | GV3L18 + LA9LB920 | TPRST038 TPRSS038 | 0.76-38 |
| 15 | 17 | 4 | GV2L20 | TPRST025 TPRSS025 | 0.5-25 |
| 15 | 17 | 3 | GV2L22 + LA9LB920 | TPRST038 TPRSS038 | 0.76-38 |
| 18.5 | 21 | 4 | GV2L22 | TPRST038 TPRSS038 | 0.76-38 |
| 18.5 | 21 | 3 | GV3L25 + LA9LB920 | TPRST065 TPRSS065 | 3.25-65 |
| 22 | 24 | 4 | GV2L22 | TPRST065 TPRSS065 | 3.25-65 |
| 22 | 24 | 3 | GV2L32 + LA9LB920 | TPRST065 TPRSS065 | 3.25-65 |
| 30 | 32 | 6 | GV3L40 | TPRST065 TPRSS065 | 3.25-65 |
| 37 | 39 | 6 | GV3L50 | TPRST065 TPRSS065 | 3.25-65 |

Coordination
and
standards

TeSys island motor starters

Standard, SIL starters - Power interface modules

UL - SCCR Ratings

Short Circuit Current Ratings (SCCR)

| UL File E39281 and File E48539 Suitable for use on a circuit delivering not more than: | | | | | | | | Standard Starters SIL Starters Power Interface Modules | |
|---|------------------|--------------------------------------|------------------|--------------------------------------|------------------|--|------------------|--|---------------|
| High SCCR | | | | | | Standard SCCR | | References | Setting range |
| Max Voltage 600 V Class J Fuse ⁽¹⁾ | | Max Voltage 480 V Circuit Breaker | | Max Voltage 600 V Circuit Breaker | | Max Voltage 600 V Circuit Breaker or Fuse | | | |
| SCCR | Maximum Amperage | SCCR | Maximum Amperage | SCCR | Maximum Amperage | SCCR | Maximum Amperage | | A |
| kA | A | kA | A | kA | A | kA | A | | |
| 100 | 25 | 85 | 35 | 50 | 35 | 5 | 35 | TPRST009 TPRSS009 TPRPM009 | 0.18-9 |
| 100 | 60 | 85 | 60 | 50 | 60 | 5 | 100 | TPRST025 TPRSS025 | 0.5-25 |
| 100 | 100 | 85 | 60 | 50 | 60 | 5 | 125 | TPRST038 TPRSS038 TPRPM038 | 0.76-38 |
| 100 | 125 | 85 | 110 | 50 | 110 | 5 | 250 | TPRST065 TPRSS065 | 3.25-65 |
| 100 | 125 | 85 | 110 | 50 | 110 | 5 | 250 | TPRST080 TPRSS080 TPRPM080 | 4-80 |

(1) When protected by any Class J or CC time-delay fuse (Class CC applicable up to 30 A only).

Group Motor Rating

| Suitable for group installation on a circuit delivering not more than: | | | | Standard Starters SIL Starters | |
|--|------------------|-------------------------------------|------------------|-----------------------------------|---------------|
| Max voltage 600 V - Class J Fuse ⁽¹⁾ | | Max voltage 480 V - Circuit Breaker | | References | Setting range |
| SCCR | Maximum Amperage | SCCR | Maximum Amperage | | |
| kA | A | kA | A | | A |
| 5 | 90 | 5 | 90 | TPRST009 TPRSS009 | 0.18-9 |
| 5 | 175 | 5 | 175 | TPRST025 TPRSS025 | 0.5-25 |
| 5 | 175 | 5 | 175 | TPRST038 TPRSS038 | 0.76-38 |
| 5 | 600 | 5 | 600 | TPRST065 TPRSS065 | 3.25-65 |
| 5 | 600 | 5 | 600 | TPRST080 TPRSS080 | 4-80 |

(1) When protected by any Class J or CC time-delay fuse.

TeSys Control

Contactors - Definitions and comments

General - Coordination and standards

Contactor utilisation categories conforming to IEC 60947-1

The standard utilisation categories define the current values which the contactor must be able to make or break.

These values depend on:

- the type of load being switched: squirrel cage or slip ring motor, resistors,
- the conditions under which making or breaking takes place: motor stalled, starting or running, reversing, plugging.

a.c. applications

| | |
|----------------------|---|
| Category AC-1 | <p>This category applies to all types of a.c. load with a power factor equal to or greater than 0.95 ($\cos \varphi \geq 0.95$).</p> <p>Application examples: heating, distribution.</p> |
| Category AC-2 | <p>This category applies to starting, plugging and inching of slip ring motors.</p> <ul style="list-style-type: none"> ■ On closing, the contactor makes the starting current, which is about 2.5 times the rated current of the motor. ■ On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage. |
| Category AC-3 | <p>This category applies to squirrel cage motors with breaking during normal running of the motor.</p> <ul style="list-style-type: none"> ■ On closing, the contactor makes the starting current, which is about 5 to 7 times the rated current of the motor. ■ On opening, it breaks the rated current drawn by the motor. <p>Application examples: all standard squirrel cage motors: lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc... .</p> |
| Category AC-4 | <p>This category covers applications with plugging and inching of squirrel cage and slip ring motors. The contactor closes at a current peak which may be as high as 5 or 7 times the rated motor current. On opening it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.</p> <p>Application examples: printing machines, wire drawing machines, cranes and hoists, metallurgy industry.</p> |

d.c. applications

| | |
|----------------------|--|
| Category DC-1 | <p>This category applies to all types of d.c. load with a time constant (L/R) of less than or equal to 1 ms.</p> |
| Category DC-3 | <p>This category applies to starting, counter-current braking and inching of shunt motors. Time constant ≤ 2 ms.</p> <ul style="list-style-type: none"> ■ On closing, the contactor makes the starting current, which is about 2.5 times the rated motor current. ■ On opening, the contactor must be able to break 2.5 times the starting current at a voltage which is less than or equal to the mains voltage. The slower the motor speed, and therefore the lower its back e.m.f., the higher this voltage. Breaking is difficult. |
| Category DC-5 | <p>This category applies to starting, counter-current braking and inching of series wound motors. Time constant ≤ 7.5 ms.</p> <p>On closing, the contactor makes a starting current peak which may be as high as 2.5 times the rated motor current. On opening, the contactor breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.</p> |

Utilisation categories for auxiliary contacts & control relays conforming to IEC 60947-1

a.c. applications

| | |
|-------------------------------------|---|
| Category AC-14⁽¹⁾ | <p>This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is less than 72 VA.</p> <p>Application example: switching the operating coil of contactors and relays.</p> |
| Category AC-15⁽¹⁾ | <p>This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is more than 72 VA.</p> <p>Application example: switching the operating coil of contactors.</p> |

d.c. applications

| | |
|-------------------------------------|---|
| Category DC-13⁽²⁾ | <p>This category applies to the switching of electromagnetic loads for which the time taken to reach 95 % of the steady state current ($T = 0.95$) is equal to 6 times the power P drawn by the load (with $P \leq 50$ W).</p> <p>Application example: switching the operating coil of contactors without economy resistor.</p> |
|-------------------------------------|---|

(1) Replaces category AC-11.

(2) Replaces category DC-11.

TeSys Control

Contactors - Definitions and comments

General - Coordination and standards

Definitions

| Altitude | <p>The rarefied atmosphere at high altitude reduces the dielectric strength of the air and hence the rated operational voltage of the contactor. It also reduces the cooling effect of the air and hence the rated operational current of the contactor (unless the temperature drops at the same time).</p> <p>No derating is necessary up to 3000 m.</p> <p>Derating factors to be applied above this altitude for main pole operational voltage and current (a.c. supply) are as follows.</p> <table border="1"> <thead> <tr> <th>Altitude</th> <th>3500 m</th> <th>4000 m</th> <th>4500 m</th> <th>5000 m</th> </tr> </thead> <tbody> <tr> <td>Rated operational voltage</td> <td>0.90</td> <td>0.80</td> <td>0.70</td> <td>0.60</td> </tr> <tr> <td>Rated operational current</td> <td>0.92</td> <td>0.90</td> <td>0.88</td> <td>0.86</td> </tr> </tbody> </table> | Altitude | 3500 m | 4000 m | 4500 m | 5000 m | Rated operational voltage | 0.90 | 0.80 | 0.70 | 0.60 | Rated operational current | 0.92 | 0.90 | 0.88 | 0.86 |
|--|---|----------|--------|--------|--------|--------|---------------------------|------|------|------|------|---------------------------|------|------|------|------|
| Altitude | 3500 m | 4000 m | 4500 m | 5000 m | | | | | | | | | | | | |
| Rated operational voltage | 0.90 | 0.80 | 0.70 | 0.60 | | | | | | | | | | | | |
| Rated operational current | 0.92 | 0.90 | 0.88 | 0.86 | | | | | | | | | | | | |
| Ambient air temperature | <p>The temperature of the air surrounding the device, measured near to the device.</p> <p>The operating characteristics are given:</p> <ul style="list-style-type: none"> - with no restriction for temperatures between -5 and +55 °C, - with restrictions, if necessary, for temperatures between -50 and +70 °C. | | | | | | | | | | | | | | | |
| Rated operational current (Ie) | This is defined taking into account the rated operational voltage, operating rate and duty, utilisation category and ambient temperature around the device. | | | | | | | | | | | | | | | |
| Rated conventional thermal current (Ith) ⁽¹⁾ | The current which a closed contactor can sustain for a minimum of 8 hours without its temperature rise exceeding the limits given in the standards. | | | | | | | | | | | | | | | |
| Permissible short time rating | The current which a closed contactor can sustain for a short time after a period of no load, without dangerous overheating. | | | | | | | | | | | | | | | |
| Rated operational voltage (Ue) | <p>This is the voltage value which, in conjunction with the rated operational current, determines the use of the contactor or starter, and on which the corresponding tests and the utilisation category are based. For 3-phase circuits it is expressed as the voltage between phases.</p> <p>Apart from exceptional cases such as rotor short-circuiting, the rated operational voltage Ue is less than or equal to the rated insulation voltage Ui.</p> | | | | | | | | | | | | | | | |
| Rated control circuit voltage (Uc) | The rated value of the control circuit voltage, on which the operating characteristics are based. For a.c. applications, the values are given for a near sinusoidal wave form (less than 5 % total harmonic distortion). | | | | | | | | | | | | | | | |
| Rated insulation voltage (Ui) | This is the voltage value used to define the insulation characteristics of a device and referred to in dielectric tests determining leakage paths and creepage distances. As the specifications are not identical for all standards, the rated value given for each of them is not necessarily the same. | | | | | | | | | | | | | | | |
| Rated impulse withstand voltage (Uimp) | The peak value of a voltage surge which the device is able to withstand without breaking down. | | | | | | | | | | | | | | | |
| Rated operational power (expressed in kW) | The rated power of the standard motor which can be switched by the contactor, at the stated operational voltage. | | | | | | | | | | | | | | | |

⁽¹⁾ Conventional thermal current, in free air, conforming to IEC standards.

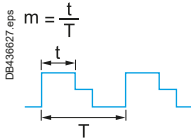
Note: these definitions are extracted from standard IEC 60947-1.

TeSys Control

Contactors - Definitions and comments

General - Coordination and standards

Definitions

| | |
|---|---|
| Rated breaking capacity ⁽¹⁾ | This is the current value which the contactor can break in accordance with the breaking conditions specified in the IEC standard. |
| Rated making capacity ⁽¹⁾ | This is the current value which the contactor can make in accordance with the making conditions specified in the IEC standard. |
| On-load factor (m) | <div style="display: flex; align-items: center;"> <div style="flex: 1;">  </div> <div style="flex: 2;"> <p>This is the ratio between the time the current flows (t) and the duration of the cycle (T). Cycle duration: duration of current flow + time at zero current.</p> </div> </div> |
| Pole impedance | <p>The impedance of one pole is the sum of the impedance of all the circuit components between the input terminal and the output terminal.</p> <p>The impedance comprises a resistive component (R) and an inductive component ($X = L\omega$).</p> <p>The total impedance therefore depends on the frequency and is normally given for 50 Hz.</p> <p>This average value is given for the pole at its rated operational current.</p> |
| Electrical durability | This is the average number of on-load operating cycles which the main pole contacts can perform without maintenance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage. |
| Mechanical durability | This is the average number of no-load operating cycles (i.e. with zero current flow through the main poles) which the contactor can perform without mechanical failure. |

⁽¹⁾ For a.c. applications, the breaking and making capacities are expressed by the rms value of the symmetrical component of the short-circuit current. Taking into account the maximum asymmetry which may exist in the circuit, the contacts therefore have to withstand a peak asymmetrical current which may be twice the rms symmetrical component.

Note: these definitions are extracted from standard IEC 60947-1.

TeSys Control

Contactors for utilisation category AC-3

Selection - Coordination and standards

Operational current and power conforming to IEC ($\theta \leq 60^\circ\text{C}$)

| Contactor size | | | LC1/ LP1 K06 | LC1/ LP1 K09 | LC1 K12 | LC1 K16 | LC1 D09 | LC1 D12 | LC1 D18 | LC1 D25 | LC1 D32 | LC1 D38 | LC1 D40A |
|--|---------------------|-----------|--------------------|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| Maximum operational current in AC-3 | $\leq 440\text{ V}$ | A | 6 | 9 | 12 | 16 | 9 | 12 | 18 | 25 | 32 | 38 | 40 |
| Rated operational power P (standard motor power ratings) | 220/240 V | kW | 1.5 | 2.2 | 3 | 3 | 2.2 | 3 | 4 | 5.5 | 7.5 | 9 | 11 |
| | 380/400 V | kW | 2.2 | 4 | 5.5 | 7.5 | 4 | 5.5 | 7.5 | 11 | 15 | 18.5 | 18.5 |
| | 415 V | kW | 2.2 | 4 | 5.5 | 7.5 | 4 | 5.5 | 9 | 11 | 15 | 18.5 | 22 |
| | 440 V | kW | 3 | 4 | 5.5 | 7.5 | 4 | 5.5 | 9 | 11 | 15 | 18.5 | 22 |
| | 500 V | kW | 3 | 4 | 4 | 5.5 | 5.5 | 7.5 | 10 | 15 | 18.5 | 18.5 | 22 |
| | 660/690 V | kW | 3 | 4 | 4 | 4 | 5.5 | 7.5 | 10 | 15 | 18.5 | 18.5 | 30 |
| | 1000 V | kW | – | – | – | – | – | – | – | – | – | – | – |

Maximum operating rate in operating cycles/hour⁽¹⁾

| On-load factor | Operational power | LC1 D09 | LC1 D12 | LC1 D18 | LC1 D25 | LC1 D32 | LC1 D38 | LC1 D40A | | | | |
|----------------|-------------------|------------|------------|------------|------------|------------|------------|-------------|------|------|------|------|
| $\leq 85\%$ | P | – | – | – | – | 1200 | 1200 | 1200 | 1200 | 1000 | 1000 | 1000 |
| | 0.5 P | – | – | – | – | 3000 | 3000 | 2500 | 2500 | 2500 | 2500 | 2500 |
| $\leq 25\%$ | P | – | – | – | – | 1800 | 1800 | 1800 | 1800 | 1200 | 1200 | 1200 |

Operational current and power conforming to UL, CSA ($\theta \leq 60^\circ\text{C}$)

| Contactor size | | | LC1/ LP1 K06 | LC1/ LP1 K09 | LC1/ LP1 K12 | LC1 D09 | LC1 D12 | LC1 D18 | LC1 D25 | LC1 D32 | LC1 D38 | LC1 D40A |
|--|---------------------|-----------|--------------------|--------------------|--------------------|------------|------------|------------|------------|------------|------------|-------------|
| Maximum operational current in AC-3 | $\leq 440\text{ V}$ | A | 6 | 9 | 12 | 9 | 12 | 18 | 25 | 32 | – | 40 |
| Rated operational power P (standard motor power ratings 60 Hz) | 200/208 V | HP | 1.5 | 2 | 3 | 2 | 3 | 5 | 7.5 | 10 | – | 10 |
| | 230/240 V | HP | 1.5 | 3 | 3 | 2 | 3 | 5 | 7.5 | 10 | – | 10 |
| | 460/480 V | HP | 3 | 5 | 7.5 | 5 | 7.5 | 10 | 15 | 20 | – | 30 |
| | 575/600 V | HP | 3 | 5 | 10 | 7.5 | 10 | 15 | 20 | 25 | – | 30 |

(1) Depending on the operational power and the on-load factor ($\theta \leq 60^\circ\text{C}$).

(2) Other values: please contact us.

TeSys Control

Contactors for utilisation category AC-3

Selection - Coordination and standards

| LC1 D50A | LC1 D65A | LC1 D80A | LC1 D80 | LC1 D95 | LC1 D115 | LC1 D150 | LC1 F185 | LC1 F225 | LC1 F265 | LC1 F330 | LC1 F400 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 F800 | LC1 F1000 | LC1 BL | LC1 BM | LC1 BP | LC1 BR |
|----------|----------|----------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|--------|--------|--------|--------|
| 50 | 65 | 80 | 80 | 95 | 115 | 150 | 185 | 225 | 265 | 330 | 400 | 500 | 630 | 780 | 800 | 1000 | 750 | 1000 | 1500 | 1800 |
| 15 | 18,5 | 22 | 22 | 25 | 30 | 40 | 55 | 63 | 75 | 100 | 110 | 147 | 200 | 220 | 250 | 315 | 220 | 280 | 425 | 500 |
| 22 | 30 | 37 | 37 | 45 | 55 | 75 | 90 | 110 | 132 | 160 | 200 | 250 | 335 | 400 | 450 | 560 | 400 | 500 | 750 | 900 |
| 25 | 37 | 37 | 45 | 45 | 59 | 80 | 100 | 110 | 140 | 180 | 220 | 280 | 375 | 425 | 450 | 630 | 425 | 530 | 800 | 900 |
| 30 | 37 | 37 | 45 | 45 | 59 | 80 | 100 | 110 | 140 | 200 | 250 | 295 | 400 | 425 | 450 | 670 | 450 | 560 | 800 | 900 |
| 30 | 37 | 37 | 55 | 55 | 75 | 90 | 110 | 129 | 160 | 200 | 257 | 355 | 400 | 450 | 450 | - | 500 | 600 | 750 | 900 |
| 33 | 37 | 37 | 45 | 45 | 80 | 100 | 110 | 129 | 160 | 220 | 280 | 335 | 450 | 475 | 475 | - | 560 | 670 | 750 | 900 |
| - | - | - | 45 | 45 | 65 | 75 | - | - | - | 160 | 185 | - | 450 | 450 | 450 | - | 530 | 530 | 670 | 750 |

| LC1 D50A | LC1 D65A | LC1 D80A | LC1 D80 | LC1 D95 | LC1 D115 | LC1 D150 | LC1 F185 | LC1 F225 | LC1 F265 | LC1 F330 | LC1 F400 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 F800 | LC1 F1000 | LC1 BL | LC1 BM | LC1 BP | LC1 BR |
|----------|----------|----------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|--------|--------|--------|--------|
| 1000 | 1000 | 1000 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 500 | 500 | 500 | 500 | 500 | (2) | 120 | 120 | 120 | 120 |
| 2500 | 2500 | 2500 | 2000 | 2000 | 2000 | 1200 | 2000 | 2000 | 2000 | 2000 | 1200 | 1200 | 1200 | 1200 | 600 | (2) | 120 | 120 | 120 | 120 |
| 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 600 | 600 | (2) | 120 | 120 | 120 | 120 |

| LC1 D50A | LC1 D65A | LC1 D80A | LC1 D80 | LC1 D95 | LC1 D115 | LC1 D150 | LC1 F185 | LC1 F225 | LC1 F265 | LC1 F330 | LC1 F400 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 F800 | LC1 F1000 |
|----------|----------|----------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| 50 | 65 | 65 | 80 | 95 | 115 | 150 | 185 | 225 | 265 | 330 | 400 | 500 | 630 | 780 | 800 | 1000 |
| 15 | 20 | 20 | 30 | 30 | 30 | 40 | 50 | 60 | 60 | 75 | 100 | 150 | 250 | - | 350 | 350 |
| 15 | 20 | 20 | 30 | 30 | 40 | 50 | 60 | 75 | 75 | 100 | 125 | 200 | 300 | 450 | 400 | 400 |
| 40 | 40 | 40 | 60 | 60 | 75 | 100 | 125 | 150 | 150 | 200 | 250 | 400 | 600 | 900 | 900 | 900 |
| 40 | 50 | 50 | 60 | 60 | 100 | 125 | 150 | 150 | 200 | 250 | 300 | 500 | 800 | 900 | 900 | - |

Coordination
and
standards

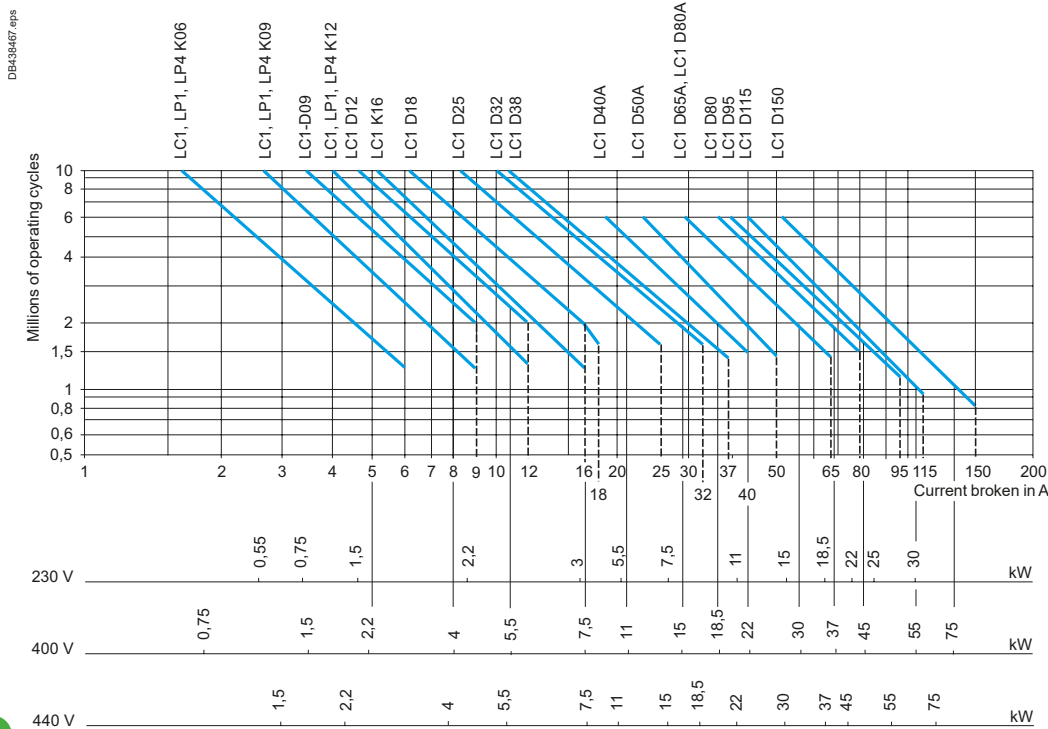
TeSys Control

Contactors for utilisation category AC-3

Selection - Coordination and standards

Selection according to required electrical durability, in category AC-3 ($U_e \leq 440$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.



Operational power in kW-50 Hz.

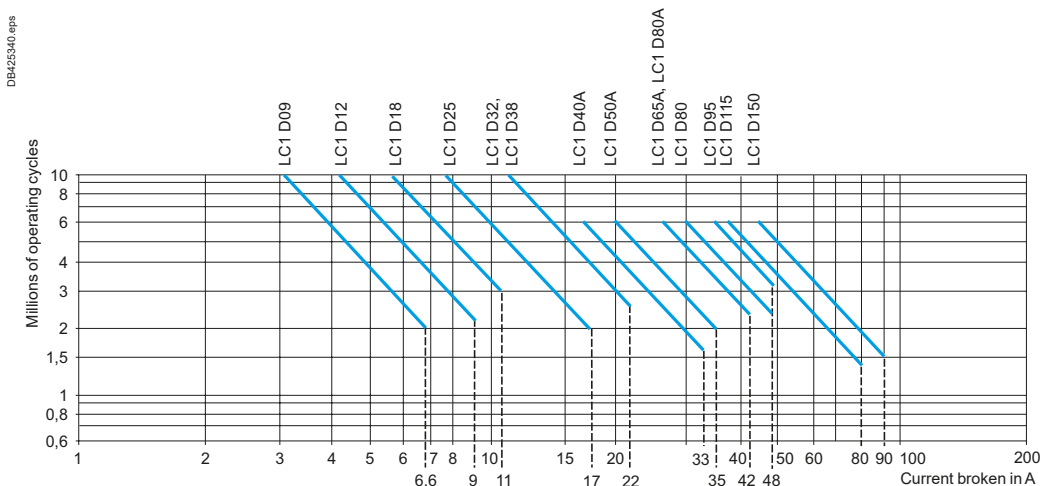
Example:

Asynchronous motor with $P = 5.5$ kW - $U_e = 400$ V - $I_e = 11$ A - $I_c = I_e = 11$ A
or asynchronous motor with $P = 5.5$ kW - $U_e = 415$ V - $I_e = 11$ A - $I_c = I_e = 11$ A
3 million operating cycles required.

The above selection curves show the contactor rating needed: LC1D18.

Selection according to required electrical durability, in category AC-3 ($U_e = 660/690$ V) ⁽¹⁾

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.



⁽¹⁾ For $U_e = 1000$ V, use the 660/690 V curves, but do not exceed the operational current at the operational power indicated for 1000 V.

Coordination and standards

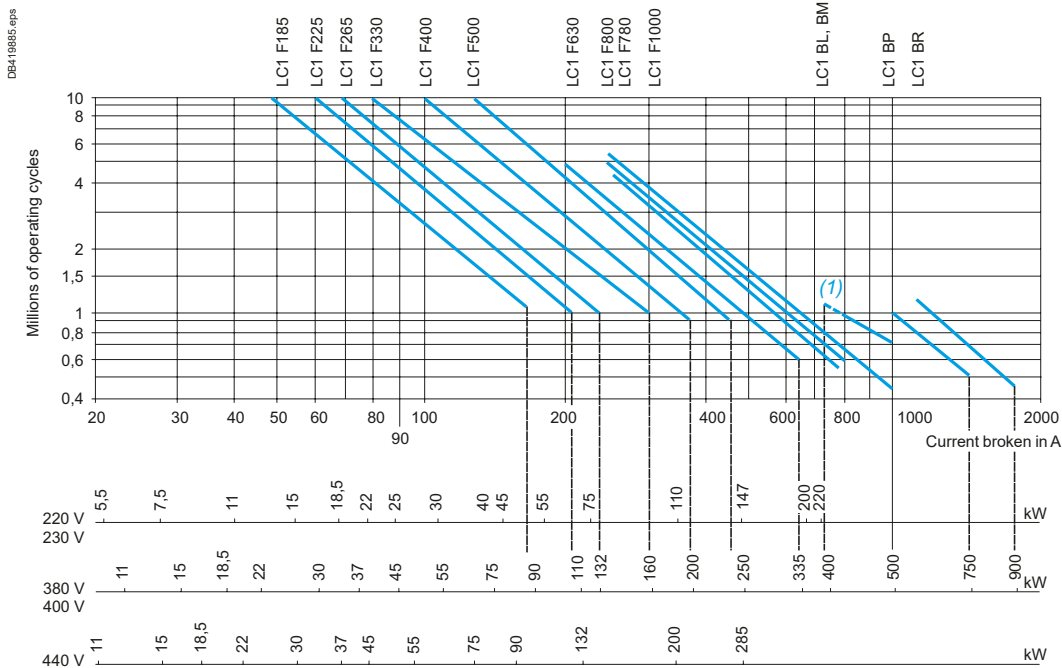
TeSys Control

Contactors for utilisation category AC-3

Selection - Coordination and standards

Selection according to required electrical durability, in category AC-3 ($U_e \leq 440$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.



Operational power in kW-50 Hz.

Example:

Asynchronous motor with $P = 132$ kW - $U_e = 380$ V - $I_e = 245$ A - $I_c = I_e = 245$ A
or asynchronous motor with $P = 132$ kW - $U_e = 415$ V - $I_e = 240$ A - $I_c = I_e = 240$ A
1.5 million operating cycles required.

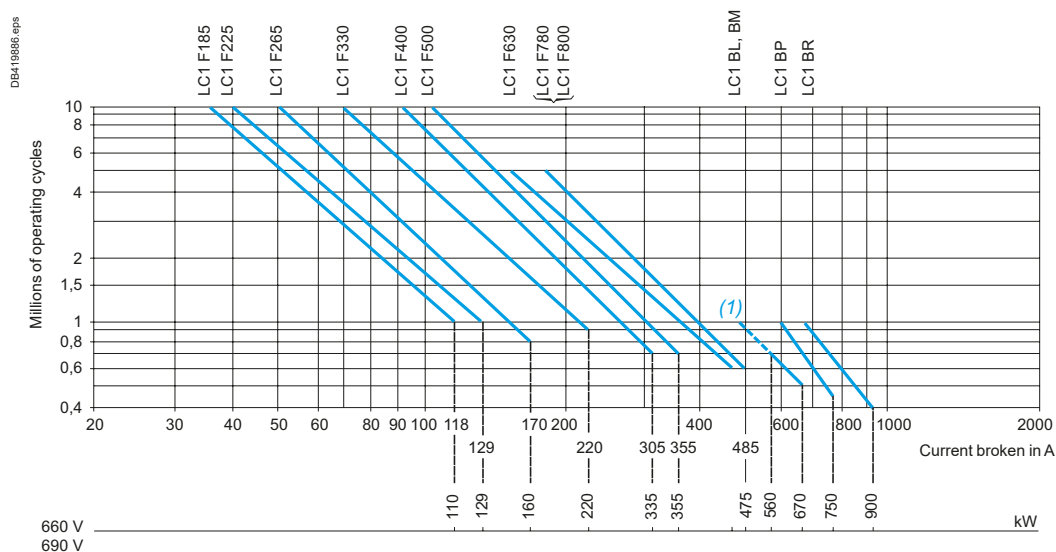
The above selection curves show the contactor rating needed: LC1F330.

(1) The dotted lines are only applicable to LC1BL contactors.

Coordination and standards

Selection according to required electrical durability, in category AC-3 ($U_e = 660/690$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.



Example:

Asynchronous motor with $P = 132$ kW - $U_e = 660$ V - $I_e = 140$ A - $I_c = I_e = 140$ A
1.5 million operating cycles required.

The above selection curves show the contactor rating needed: LC1F330.

(1) The dotted lines are only applicable to LC1BL contactors.

TeSys Control

Contactors for utilisation category AC-1

Selection - Coordination and standards

Maximum operational current (open-mounted device)

| Contactor size | | LC1/LP1 K09 | LC1/LP1 K12 | LC1 D09 | LC1 DT20 | LC1 D12 DT25 | LC1 D18 DT32 | LC1 D25 DT40 | LC1 D32 | LC1 D38 | LC1 D40A DT60A | LC1 D50A | |
|--|------------------------------|------------------|-------------|---------|----------|--------------|--------------|--------------|---------|---------|----------------|----------|----|
| Maximum operating rate in operating cycles/hour | | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | |
| Connection conforming to IEC 60947-1 | Cable c.s.a. mm ² | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 10 | 10 | 35 | 35 | |
| | Bar c.s.a. mm | - | - | - | - | - | - | - | - | - | - | - | |
| Operational current in AC-1 in A, according to the ambient temperature conforming to IEC 60947-1 | ≤ 40 °C | A | 20 | 20 | 25 | 20 | 25 | 32 | 40 | 50 | 50 | 60 | 80 |
| | ≤ 60 °C | A ⁽⁴⁾ | 20 | 20 | 25 | 20 | 25 | 32 | 40 | 50 | 50 | 60 | 80 |
| | ≤ 70 °C | A ⁽⁴⁾ | (1) | (1) | 17 | (1) | 17 | 22 | 28 | 35 | 35 | 42 | 56 |
| Maximum operational power ≤ 60 °C | 220/230 V | kW | 8 | 8 | 9 | 8 | 9 | 11 | 14 | 18 | 18 | 21 | 29 |
| | 240 V | kW | 8 | 8 | 9 | 8 | 9 | 12 | 15 | 19 | 19 | 23 | 31 |
| | 380/400 V | kW | 14 | 14 | 15 | 14 | 15 | 20 | 25 | 31 | 31 | 37 | 50 |
| | 415 V | kW | 14 | 14 | 17 | 14 | 17 | 21 | 27 | 34 | 34 | 41 | 54 |
| | 440 V | kW | 15 | 15 | 18 | 15 | 18 | 23 | 29 | 36 | 36 | 43 | 58 |
| | 500 V | kW | 17 | 17 | 20 | 17 | 20 | 23 | 33 | 41 | 41 | 49 | 65 |
| | 660/690 V | kW | 22 | 22 | 27 | 22 | 27 | 34 | 43 | 54 | 54 | 65 | 80 |
| | 1000 V | kW | - | - | - | - | - | - | - | - | - | - | - |

(1) Please consult your Regional Sales Office.

(2) With set of right-angled connectors LA9F2100.

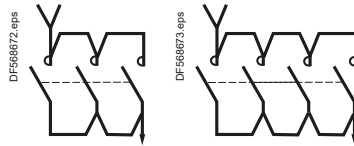
(3) With set of right-angled connectors LA9F2600.

(4) LC1F115 to LC1F2600: maximum coil control voltage must not exceed rated U_c for temperature ≥ 60 °C.

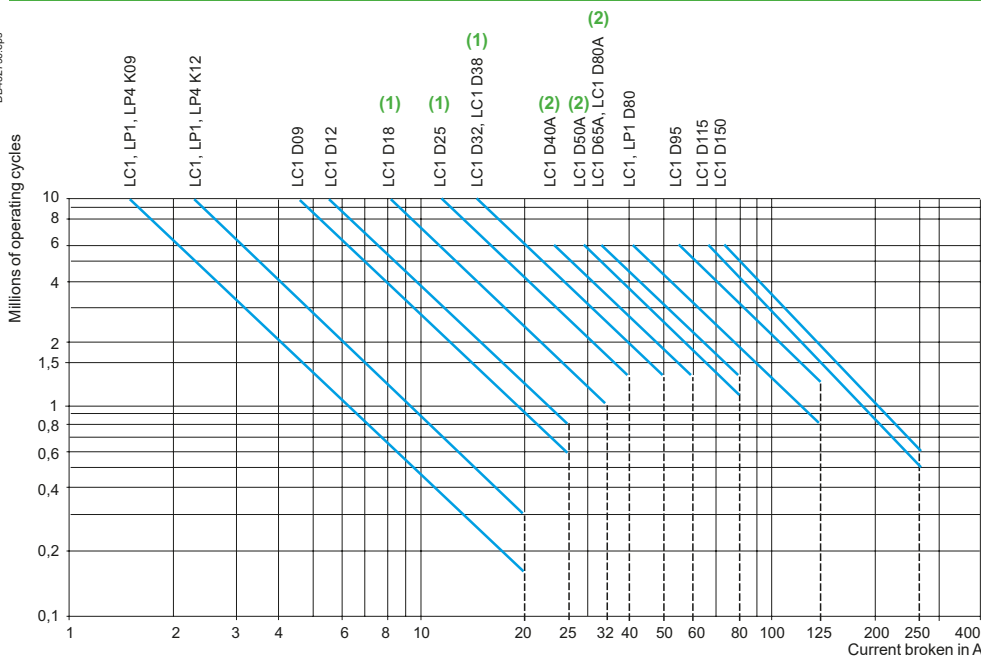
Increase in operational current by parallel connection of poles

Apply the following coefficients to the currents or power values given above; these coefficients take into account an often unbalanced current distribution between the poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8



Selection according to required electrical durability, in category AC-1 (U_e ≤ 690 V)



(1) For D Green, consult online datasheets for values.

(2) For D Green or DC coil, consult online datasheets for values.

Control of resistive circuits (cos φ ≥ 0.95).

The current broken (I_c) in category AC-1 is equal to the current (I_e) normally drawn by the load.

Example:

- U_e = 220 V - I_e = 50 A θ ≤ 40 °C - I_c = I_e = 50 A
- 2 million operating cycles required
- the above selection curves show the contactor rating needed: LC1D50A.

TeSys Control

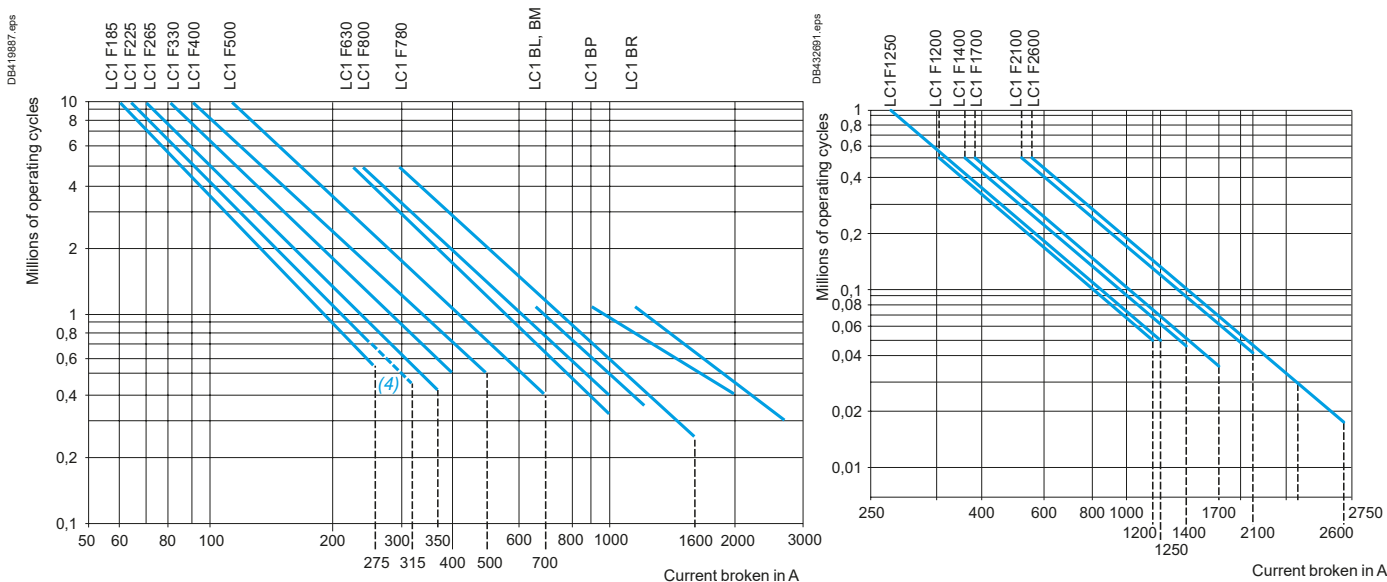
Contactors for utilisation category AC-1

Selection - Coordination and standards

| LC1 D65A D80A DT80A | LC1 LP1 D80 | LC1 D95 | LC1 D115 | LC1 D150 | LC1 F185 | LC1 F225 | LC1 F265 | LC1 F330 | LC1 F400 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 F800 | LC1 F1000 | LC1S F1200 | LC1 F1250 | LC1 F1400 | LC1 F1700 | LC1 F2100 | LC1 F2600 | LC1 BL | LC1 BM | LC1 BP | LC1 BR |
|---------------------|-------------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------|------------|-----------|-----------|-----------|---------------------|---------------------|--------|--------|--------|--------|
| 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 300 | 300 | 200 | 200 | 200 | 200 | 200 | 120 | 120 | 120 | 120 |
| 35 | 50 | 50 | 120 | 120 | 150 | 185 | 185 | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 4 | 3 | 2 | 2 | 2 | 2 |
| - | - | - | - | - | - | - | - | - | 30x5 | 40x5 | 60x5 | 100x5 | 60x5 | 100x5 | 50x8 | 100x5 | 100x5 | 100x5 | 100x5 | 100x10 | 50x5 | 80x5 | 100x5 | 100x10 |
| 80 | 125 | 125 | 250 | 250 | 275 | 315 | 350 | 400 | 500 | 700 | 1000 | 1600 | 1000 | 1250 | 1200 | 1260 | 1400 | 1700 | 2100 ⁽²⁾ | 2600 | 800 | 1250 | 2000 | 2750 |
| 80 | 125 | 125 | 200 | 200 | 240 | 280 | 300 | 360 | 430 | 580 | 850 | 1350 | 850 | ⁽¹⁾ | 1110 | 1060 | 1190 | 1450 | 1750 ⁽²⁾ | 2600 ⁽³⁾ | 700 | 1100 | 1750 | 2400 |
| 56 | 80 | 80 | 160 | 160 | 180 | 200 | 250 | 290 | 340 | 500 | 700 | 1100 | 700 | ⁽¹⁾ | 1020 | 900 | 1080 | 1300 | 1500 ⁽²⁾ | 2150 ⁽³⁾ | 600 | 900 | 1500 | 2000 |
| 29 | 45 | 45 | 80 | 80 | 90 | 100 | 120 | 145 | 170 | 240 | 350 | 550 | 350 | ⁽¹⁾ | 400 | 420 | 474 | 570 | 700 | 840 | 300 | 425 | 700 | 1000 |
| 31 | 49 | 49 | 83 | 83 | 100 | 110 | 125 | 160 | 180 | 255 | 370 | 570 | 370 | ⁽¹⁾ | 410 | 440 | 490 | 600 | 780 | 920 | 330 | 450 | 800 | 1100 |
| 50 | 78 | 78 | 135 | 135 | 165 | 175 | 210 | 250 | 300 | 430 | 600 | 950 | 600 | ⁽¹⁾ | 700 | 730 | 820 | 1000 | 1200 | 1450 | 500 | 800 | 1200 | 1600 |
| 54 | 85 | 85 | 140 | 140 | 170 | 185 | 220 | 260 | 310 | 445 | 630 | 1000 | 630 | ⁽¹⁾ | 720 | 760 | 850 | 1050 | 1300 | 1580 | 525 | 825 | 1250 | 1700 |
| 58 | 90 | 90 | 150 | 150 | 180 | 200 | 230 | 290 | 330 | 470 | 670 | 1050 | 670 | ⁽¹⁾ | 750 | 810 | 910 | 1100 | 1350 | 1680 | 550 | 850 | 1400 | 2000 |
| 65 | 102 | 102 | 170 | 170 | 200 | 220 | 270 | 320 | 380 | 502 | 750 | 1200 | 750 | - | 850 | 920 | 1000 | 1250 | 1550 | 1910 | 600 | 900 | 1500 | 2100 |
| 80 | 135 | 135 | 235 | 235 | 280 | 300 | 370 | 400 | 530 | 740 | 1000 | 1650 | 1000 | - | 1200 | 1260 | 1400 | 1700 | 2100 | 2520 | 800 | 1100 | 1900 | 2700 |
| - | 120 | 120 | 345 | 345 | - | - | 540 | 640 | 760 | 950 | 1500 | 2400 | 1500 | - | - | - | 2100 | 2500 | 3100 ⁽²⁾ | 3820 | 1100 | 1700 | 3000 | 4200 |

- (1) Please consult your Regional Sales Office.
 (2) With set of right-angled connectors LA9F2100.
 (3) With set of right-angled connectors LA9F2600.
 (4) LC1F115 to LC1F2600: maximum coil control voltage must not exceed rated U_c for temperature $\geq 60^\circ\text{C}$.

Selection according to required electrical durability, in category AC-1 ($U_e \leq 690\text{ V}$)



- Example:**
- $U_e = 220\text{ V}$ - $I_e = 500\text{ A}$ - $\theta \leq 40^\circ\text{C}$ - $I_c = I_e = 500\text{ A}$
 - 2 million operating cycles required
 - the above selection curves show the contactor rating needed: LC1F780.
 - (1) Please consult your Regional Sales Office
 - (2) With set of right-angled connectors LA9F2100
 - (3) With set of right-angled connectors LA9F2600
 - (4) The dotted lines are only applicable to LC1F225.

Coordination and standards

TeSys Control

Contactors for utilisation categories AC-2 or AC-4

Selection - Coordination and standards

Maximum breaking current

Category AC-2: slip ring motors - breaking the starting current.

Category AC-4: squirrel cage motors - breaking the starting current.

| Contactor size | | | LC1/ LP1 K06 | LC1/ LP1 K09 | LC1/ LP1 K12 | LC1 D09 | LC1 D12 | LC1 D18 | LC1 D25 | LC1 D32 | LC1 D38 | LC1 D40A |
|---------------------------|--|---|--------------------|--------------------|--------------------|------------|------------|------------|------------|------------|------------|-------------|
| In category AC-4 (Ie max) | Ue ≤ 440 V Ie max broken = 6 x I motor | A | 36 | 54 | 54 | 54 | 72 | 108 | 150 | 192 | 192 | 240 |
| | 440 V < Ue ≤ 690 V Ie max broken = 6 x I motor | A | 26 | 40 | 40 | 40 | 50 | 70 | 90 | 105 | 105 | 150 |

Depending on the maximum operating rate ⁽¹⁾ and the on-load factor, $\theta \leq 60$ °C ⁽²⁾

| | | | | | | | | | | | |
|------------------------------------|---|----|----|----|----|----|----|----|----|----|-----|
| From 150 and 15 % to 300 and 10 % | A | 20 | 30 | 30 | 30 | 40 | 45 | 75 | 80 | 80 | 110 |
| From 150 and 20 % to 600 and 10 % | A | 18 | 27 | 27 | 27 | 36 | 40 | 67 | 70 | 70 | 96 |
| From 150 and 30 % to 1200 and 10 % | A | 16 | 24 | 24 | 24 | 30 | 35 | 56 | 60 | 60 | 80 |
| From 150 and 55 % to 2400 and 10 % | A | 13 | 19 | 19 | 19 | 24 | 30 | 45 | 50 | 50 | 62 |
| From 150 and 85 % to 3600 and 10 % | A | 10 | 16 | 16 | 16 | 21 | 25 | 40 | 45 | 45 | 53 |

(1) Do not exceed the maximum number of operating cycles.

(2) For temperatures higher than 60 °C, use a maximum operating rate value equal to 80 % of the actual value when selecting from the tables.

Counter current braking (plugging)

The current varies from the maximum plug-braking current to the rated motor current.

The making current must be compatible with the rated making and breaking capacities of the contactor.

As breaking normally takes place at a current value at or near the locked rotor current, the contactor can be selected using the criteria for categories AC-2 and AC-4.

Permissible AC-4 power rating for 200 000 operating cycles

| Operational voltage | | LC●/ LP● K06 | LC●/ LP● K09 | LC● LP● K12 | LC● D09 | LC● D12 | LC● D18 | LC● D25 | LC● D32 | LC● D38 | LC● D40A |
|---------------------|----|--------------------|--------------------|-------------------|------------|------------|------------|------------|------------|------------|-------------|
| 220/230 V | kW | 0.75 | 1.1 | 1.1 | 1.5 | 1.5 | 2.2 | 3 | 4 | 4 | 4 |
| 380/400 V | kW | 1.5 | 2.2 | 2.2 | 2.2 | 3.7 | 4 | 5.5 | 7.5 | 7.5 | 9 |
| 415 V | kW | 1.5 | 2.2 | 2.2 | 2.2 | 3 | 3.7 | 5.5 | 7.5 | 7.5 | 9 |
| 440 V | kW | 1.5 | 2.2 | 2.2 | 2.2 | 3 | 3.7 | 5.5 | 7.5 | 7.5 | 11 |
| 500 V | kW | 2.2 | 3 | 3 | 3 | 4 | 5.5 | 7.5 | 9 | 9 | 11 |
| 660/690 V | kW | 3 | 4 | 4 | 4 | 5.5 | 7.5 | 10 | 11 | 11 | 15 |

TeSys Control

Contactors for utilisation categories AC-2 or AC-4

Selection - Coordination and standards

| LC1 D50A | LC1 D65A | LC1 D80A | LC1 D80 | LC1 D95 | LC1 D115 | LC1 D150 | LC1 F185 | LC1 F225 | LC1 F26 | LC1 F330 | LC1 F40 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 F800 | LC1 BL | LC1 BM | LC1 BP | LC1 BR |
|-------------|-------------|-------------|------------|------------|-------------|-------------|-------------|-------------|------------|-------------|------------|-------------|-------------|-------------|-------------|-----------|-----------|-----------|-----------|
| 300 | 390 | 390 | 480 | 570 | 630 | 830 | 1020 | 1230 | 1470 | 1800 | 2220 | 2760 | 3360 | 4260 | 3690 | 4320 | 5000 | 7500 | 9000 |
| 170 | 210 | 210 | 250 | 250 | 540 | 640 | 708 | 810 | 1020 | 1410 | 1830 | 2130 | 2760 | 2910 | 2910 | 4000 | 4800 | 5400 | 6600 |
| 140 | 160 | 160 | 200 | 200 | 280 | 310 | 380 | 420 | 560 | 670 | 780 | 1100 | 1400 | 1600 | 1600 | 2250 | 3000 | 4500 | 5400 |
| 120 | 148 | 148 | 170 | 170 | 250 | 280 | 350 | 400 | 500 | 600 | 700 | 950 | 1250 | 1400 | 1400 | 2000 | 2400 | 3750 | 5000 |
| 100 | 132 | 132 | 145 | 145 | 215 | 240 | 300 | 330 | 400 | 500 | 600 | 750 | 950 | 1100 | 1100 | 1500 | 2000 | 3000 | 3600 |
| 80 | 110 | 110 | 120 | 120 | 150 | 170 | 240 | 270 | 320 | 390 | 450 | 600 | 720 | 820 | 820 | 1000 | 1500 | 2000 | 2500 |
| 70 | 90 | 90 | 100 | 100 | 125 | 145 | 170 | 190 | 230 | 290 | 350 | 500 | 660 | 710 | 710 | 750 | 1000 | 1500 | 1800 |

| LC● D50A | LC● D65A | LC1 D80A | LC● D80 | LC● D95 | LC1 D115 | LC1 D150 | LC1 F185 | LC1 F225 | LC1 F265 | LC1 F330 | LC1 F400 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 F800 | LC1 BL | LC1 BM | LC1 BP | LC1 BR |
|-------------|-------------|-------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|-----------|-----------|-----------|
| 5.5 | 7.5 | 7.5 | 7.5 | 9 | 9 | 11 | 18.5 | 22 | 28 | 33 | 40 | 45 | 55 | 63 | 63 | 90 | 110 | 150 | 200 |
| 11 | 11 | 11 | 15 | 15 | 18.5 | 22 | 33 | 40 | 51 | 59 | 75 | 80 | 100 | 110 | 110 | 160 | 160 | 220 | 250 |
| 11 | 11 | 11 | 15 | 15 | 18.5 | 22 | 37 | 45 | 55 | 63 | 80 | 90 | 100 | 110 | 110 | 160 | 160 | 250 | 280 |
| 11 | 15 | 15 | 15 | 15 | 18.5 | 22 | 37 | 45 | 59 | 63 | 80 | 100 | 110 | 132 | 132 | 160 | 200 | 250 | 315 |
| 15 | 15 | 15 | 22 | 22 | 30 | 37 | 45 | 55 | 63 | 75 | 90 | 110 | 132 | 150 | 150 | 180 | 200 | 250 | 355 |
| 15 | 18.5 | 18.5 | 25 | 25 | 30 | 45 | 63 | 75 | 90 | 110 | 129 | 140 | 160 | 185 | 185 | 200 | 250 | 315 | 450 |

Coordination
and
standards

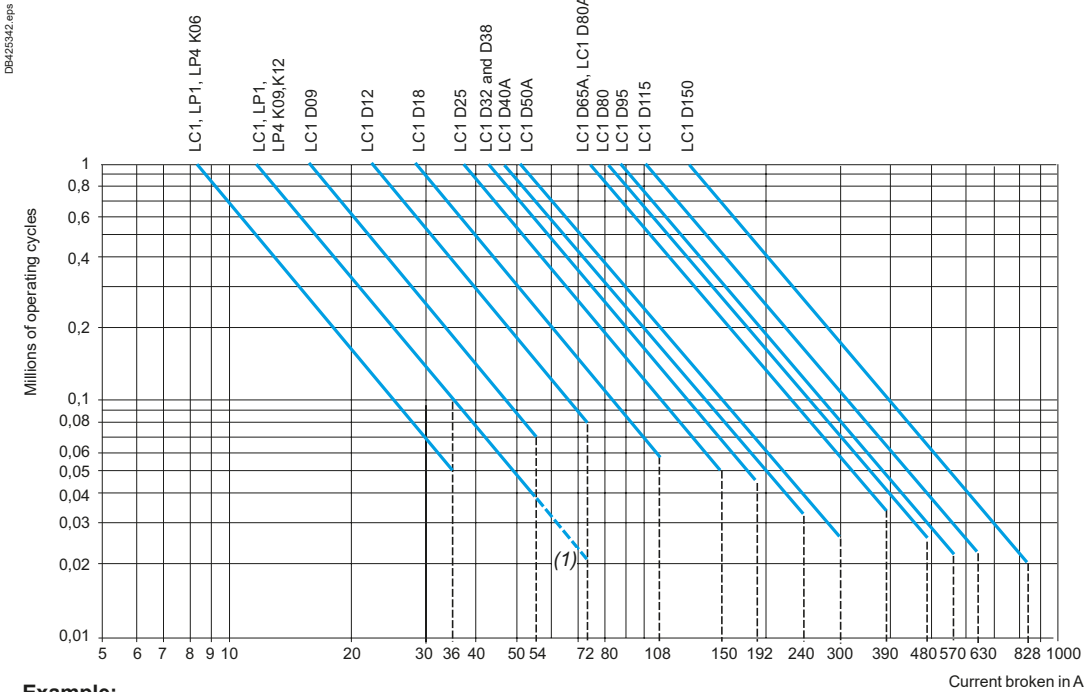
TeSys Control

Contactors for utilisation categories AC-2 or AC-4

Selection - Coordination and standards

Selection according to required electrical durability, in categories AC-2 or AC-4 ($U_e \leq 440 \text{ V}$)

Control of 3-phase asynchronous squirrel cage motors (AC-4) or slip ring motors (AC-2) with breaking whilst motor stalled.
 The current broken (I_c) in AC-2 is equal to $2.5 \times I_e$.
 The current broken (I_c) in AC-4 is equal to $6 \times I_e$ (I_e = rated operational current of the motor).



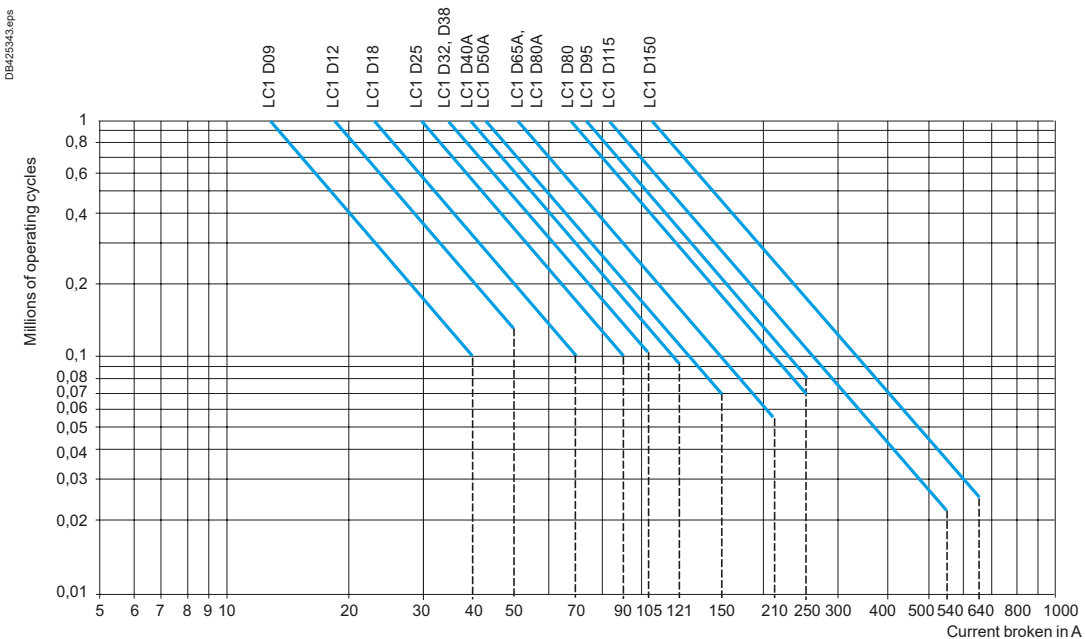
Example:

- asynchronous motor with $P = 5.5 \text{ kW}$ - $U_e = 400 \text{ V}$ - $I_e = 11 \text{ A}$. $I_c = 6 \times I_e = 66 \text{ A}$
- or asynchronous motor with $P = 5.5 \text{ kW}$ - $U_e = 415 \text{ V}$ - $I_e = 11 \text{ A}$. $I_c = 6 \times I_e = 66 \text{ A}$
- 200 000 operating cycles required
- the above selection curves show the contactor rating needed: LC1D25.

(1) The dotted lines are only applicable to LC1, LP1K12 contactors.

Selection according to required electrical durability, use in category AC-4 ($440 \text{ V} < U_e \leq 690 \text{ V}$)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst motor stalled.
 The current broken (I_c) in AC-2 is equal to $2.5 \times I_e$.
 The current broken (I_c) in AC-4 is equal to $6 \times I_e$ (I_e = rated operational current of the motor).



Coordination and standards

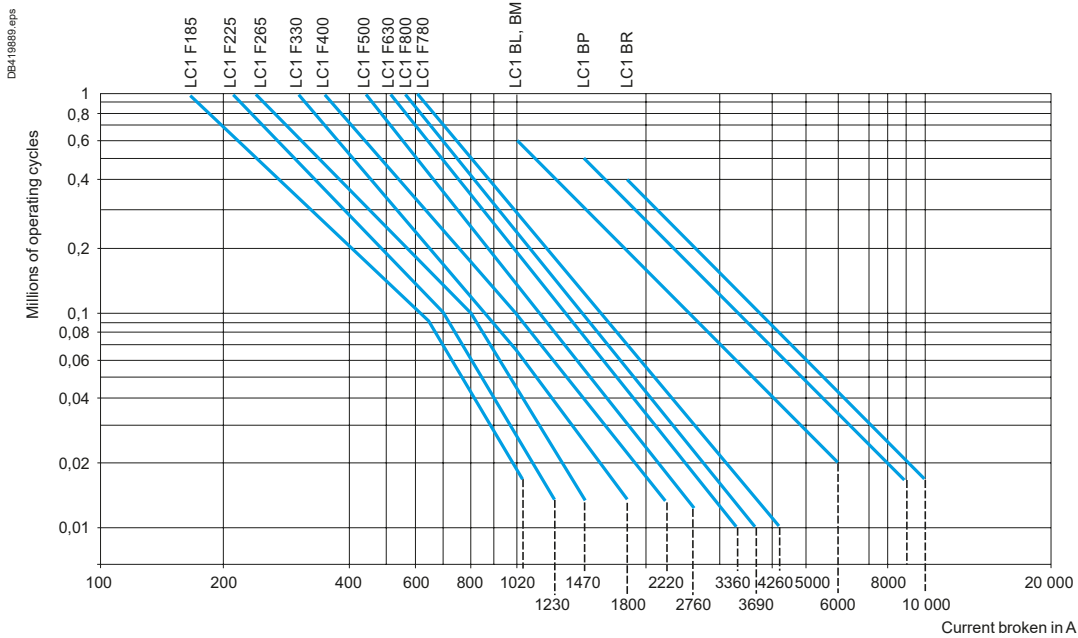
TeSys Control

Contactors for utilisation categories AC-2 or AC-4

Selection - Coordination and standards

Selection according to required electrical durability, in categories AC-2 or AC-4 ($U_e \leq 440 \text{ V}$)

Control of 3-phase asynchronous squirrel cage motors (AC-4) or slip ring motors (AC-2) with breaking whilst motor stalled.
The current broken (I_c) in AC-4 is equal to $6 \times I_e$.
(I_e = rated operational current of the motor).

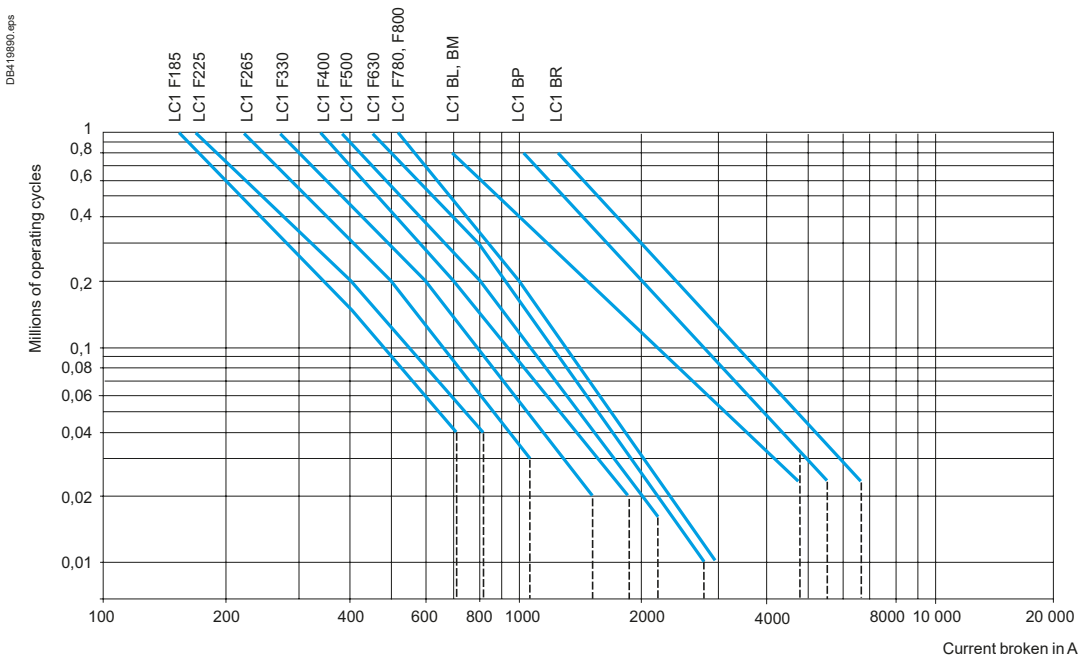


Example:

- asynchronous motor with $P = 90 \text{ kW}$ - $U_e = 380 \text{ V}$ - $I_e = 170 \text{ A}$. $I_c = 6 \times I_e = 1020 \text{ A}$.
- or asynchronous motor with $P = 90 \text{ kW}$ - $U_e = 415 \text{ V}$ - $I_e = 165 \text{ A}$. $I_c = 6 \times I_e = 990 \text{ A}$.
- 60 000 operating cycles required.
- the above selection curves show the contactor rating needed: LC1F265.

Selection according to required electrical durability, use in category AC-4 ($440 \text{ V} < U_e \leq 690 \text{ V}$)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst motor stalled.
The current broken (I_c) in AC-4 is equal to $6 \times I_e$ (I_e = rated operational current of the motor).

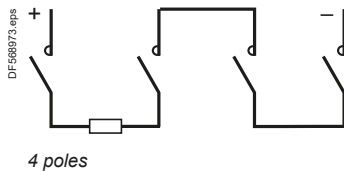
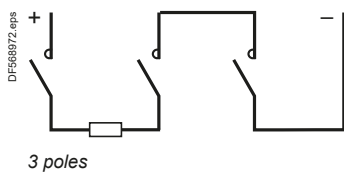
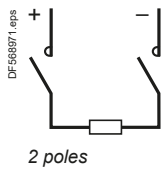
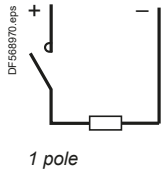


Coordination and standards

TeSys Control

Contactors for utilisation categories DC-1 to DC-5

Selection - Coordination and standards



Coordination
and
standards

Rated operational current (Ie) in Amperes, in utilisation category DC-1, resistive loads: time constant $\frac{L}{R} \leq 1$ ms, ambient temperature ≤ 60 °C

| Rated operational voltage Ue V | No. of poles connected in series | Contactor rating | | | | | | | | | |
|-----------------------------------|----------------------------------|------------------|----------|--------------|--------------|--------------|---------|---------|----------|-----------|--|
| | | LC1 D09 | LC1 DT20 | LC1 D12 DT25 | LC1 D18 DT32 | LC1 D25 DT40 | LC1 D32 | LC1 D38 | LC1 D40A | LC1 DT60A | |
| 24 | 1 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 2 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 3 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 4 | – | 20 | 20 | 25 | 32 | – | – | – | 50 | |
| 48/75 | 1 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 2 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 3 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 4 | – | 20 | 20 | 25 | 32 | – | – | – | 50 | |
| 125 | 1 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | |
| | 2 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 3 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 4 | – | 20 | 20 | 25 | 32 | – | – | – | 50 | |
| 250 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 2 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | |
| | 3 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 4 | – | 20 | 20 | 25 | 32 | – | – | – | 50 | |
| 300 | 3 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | – | |
| | 4 | – | 20 | 20 | 25 | 32 | – | – | – | 50 | |
| 460 | 1 | – | – | – | – | – | – | – | – | – | |
| | 4 | – | – | – | – | – | – | – | – | – | |
| 900 | 2 | – | – | – | – | – | – | – | – | – | |
| 1200 | 3 | – | – | – | – | – | – | – | – | – | |
| 1500 | 4 | – | – | – | – | – | – | – | – | – | |

Rated operational current (Ie) in Amperes, in utilisation category DC-2 to DC-5, inductive loads: time constant $\frac{L}{R} \leq 15$ ms, ambient temperature ≤ 60 °C

| Rated operational voltage Ue V | No. of poles connected in series | Contactor rating | | | | | | | | | |
|-----------------------------------|----------------------------------|------------------|----------|--------------|--------------|--------------|---------|---------|----------|-----------|--|
| | | LC1 D09 | LC1 DT20 | LC1 D12 DT25 | LC1 D18 DT32 | LC1 D25 DT40 | LC1 D32 | LC1 D38 | LC1 D40A | LC1 DT60A | |
| 24 | 1 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 2 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 3 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 4 | – | 20 | 20 | 25 | 32 | – | – | – | 50 | |
| 48/75 | 1 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 2 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 3 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 4 | – | 20 | 20 | 25 | 32 | – | – | – | 50 | |
| 125 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | |
| | 2 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 3 | 20 | 20 | 20 | 25 | 32 | 40 | 40 | 50 | 50 | |
| | 4 | – | 20 | 20 | 25 | 32 | – | – | – | 50 | |
| 250 | 1 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 1 | 1 | |
| | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | |
| | 3 | 8 | 8 | 8 | 8 | 32 | 40 | 40 | 50 | 50 | |
| | 4 | – | 20 | 20 | 25 | 32 | – | – | – | 50 | |
| 300 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | |
| | 4 | – | 8 | 8 | 8 | 32 | – | – | – | 50 | |
| 460 | 1 | – | – | – | – | – | – | – | – | – | |
| | 4 | – | – | – | – | – | – | – | – | – | |
| 900 | 2 | – | – | – | – | – | – | – | – | – | |
| 1200 | 3 | – | – | – | – | – | – | – | – | – | |
| 1500 | 4 | – | – | – | – | – | – | – | – | – | |

TeSys Control

Contactors for utilisation categories DC-1 to DC-5

Selection - Coordination and standards

| LC1 D50A | LC1 D65A D80A | LC1 DT80A D80 | LC1 D80 | LC1 D95 | LC1 D115 | LC1 D150 | LC1 F185 | LC1 F225 | LC1 F265 | LC1 F330 | LC1 F400 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 F800 | LC1 BL | LC1 BM | LC1 BP | LC1 BR |
|----------|---------------|---------------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------|--------|--------|--------|
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 7 | 7 | 7 | 12 | 12 | 12 | 12 | 210 | 230 | 270 | 320 | 380 | 520 | 760 | 1180 | 760 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 210 | 230 | 270 | 320 | 380 | 520 | 760 | 1180 | 760 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 1 | 1.5 | 1.5 | 2 | 2 | 10 | 10 | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |
| 7 | 7 | 7 | 12 | 12 | 200 | 200 | 190 | 200 | 250 | 280 | 350 | 450 | 700 | 1000 | 700 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 7 | 7 | 7 | 12 | 12 | 200 | 200 | 190 | 200 | 250 | 280 | 350 | 450 | 700 | 1000 | 700 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1000 | 850 | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | 200 | - | 190 | 200 | 250 | 280 | 350 | 450 | 700 | 1000 | 700 | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |

Coordination and standards

| LC1 D50A | LC1 D65A D80A | LC1 DT80A D80 | LC1 D80 | LC1 D95 | LC1 D115 | LC1 D150 | LC1 F185 | LC1 F225 | LC1 F265 | LC1 F330 | LC1 F400 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 F800 | LC1 BL | LC1 BM | LC1 BP | LC1 BR |
|----------|---------------|---------------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------|--------|--------|--------|
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | - | - | - | - |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 260 | 300 | 360 | 430 | 580 | 850 | 1300 | 850 | 700 | 1100 | 1750 | 2400 |
| 4 | 4 | 4 | 5 | 5 | 10 | 10 | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 160 | 180 | 250 | 300 | 350 | 500 | 700 | 1000 | 700 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 240 | 240 | 280 | 310 | 350 | 550 | 850 | 1000 | 850 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 240 | 280 | 310 | 350 | 550 | 850 | 1000 | 850 | 700 | 1100 | 1750 | 2400 |
| 1 | 1.5 | 1.5 | 1 | 1 | 3 | 3 | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |
| 4 | 4 | 4 | 5 | 5 | 200 | 200 | 140 | 160 | 220 | 280 | 310 | 480 | 680 | 900 | 680 | 700 | 1100 | 1750 | 2400 |
| 65 | 65 | 65 | 100 | 100 | 200 | 200 | 160 | 180 | 250 | 300 | 350 | 500 | 700 | 1000 | 700 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 240 | 280 | 310 | 350 | 550 | 850 | 1000 | 850 | 700 | 1100 | 1750 | 2400 |
| 3 | 3 | 3 | 5 | 5 | 200 | 200 | 140 | 160 | 220 | 280 | 310 | 480 | 680 | 900 | 680 | 700 | 1100 | 1750 | 2400 |
| - | - | 65 | 100 | - | 200 | - | 240 | 240 | 280 | 300 | 350 | 550 | 850 | 1000 | 850 | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | 200 | - | 140 | 160 | 220 | 280 | 310 | 480 | 680 | 800 | 680 | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 700 | 1100 | 1750 | 2400 |

Selection according to required electrical durability, use in categories DC-1 to DC-5

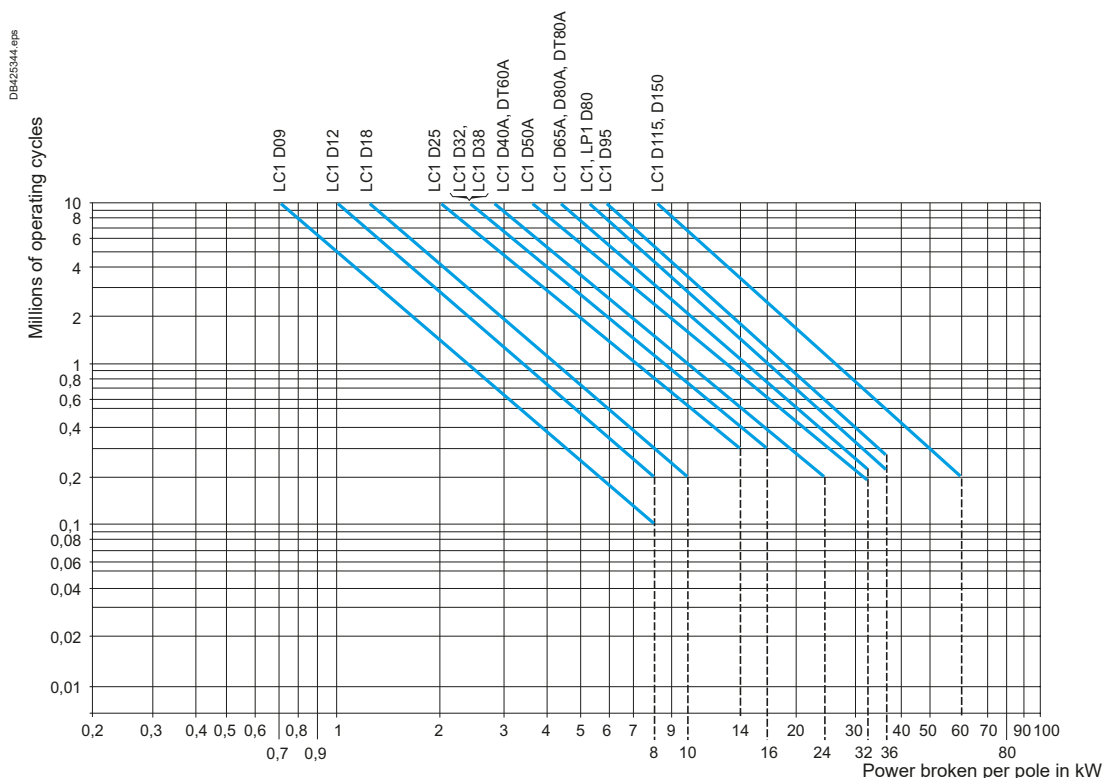
The criteria for contactor selection are:

- the rated operational current I_e
- the rated operational voltage U_e
- the utilisation category and the time constant L/R
- the required electrical durability.

Maximum operating rate (operating cycles)

The following limits must not be exceeded: 120 operating cycles/hour at rated operational current I_e .

Electrical durability

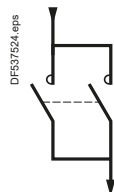


Example

Series wound motor - $P = 1.5 \text{ kW}$ - $U_e = 200 \text{ V}$ - $I_e = 7.5 \text{ A}$.

Utilisation: reversing, inching.

- Utilisation category = DC-5.
- Select contactor LC1D09 with 3 poles in series.
- The power broken is: $P_c \text{ total} = 2.5 \times 200 \times 7.5 = 3.75 \text{ kW}$.
- The power broken per pole is: 1.25 kW .
- The electrical durability read from the curve is ≥ 3 millions of operating cycles.



Use of poles in parallel

Electrical durability can be increased by using poles connected in parallel.

With N poles connected in parallel, the electrical durability becomes: electrical durability read from the curves $\times N \times 0.7$.

Note:

When the poles are connected in parallel, the maximum operational currents indicated on pages A6/46 and A6/47 must not be exceeded.

Note:

Ensure that the connections are made in such a way as to equalise the currents in each pole.

Selection according to required electrical durability, use in categories DC-1 to DC-5

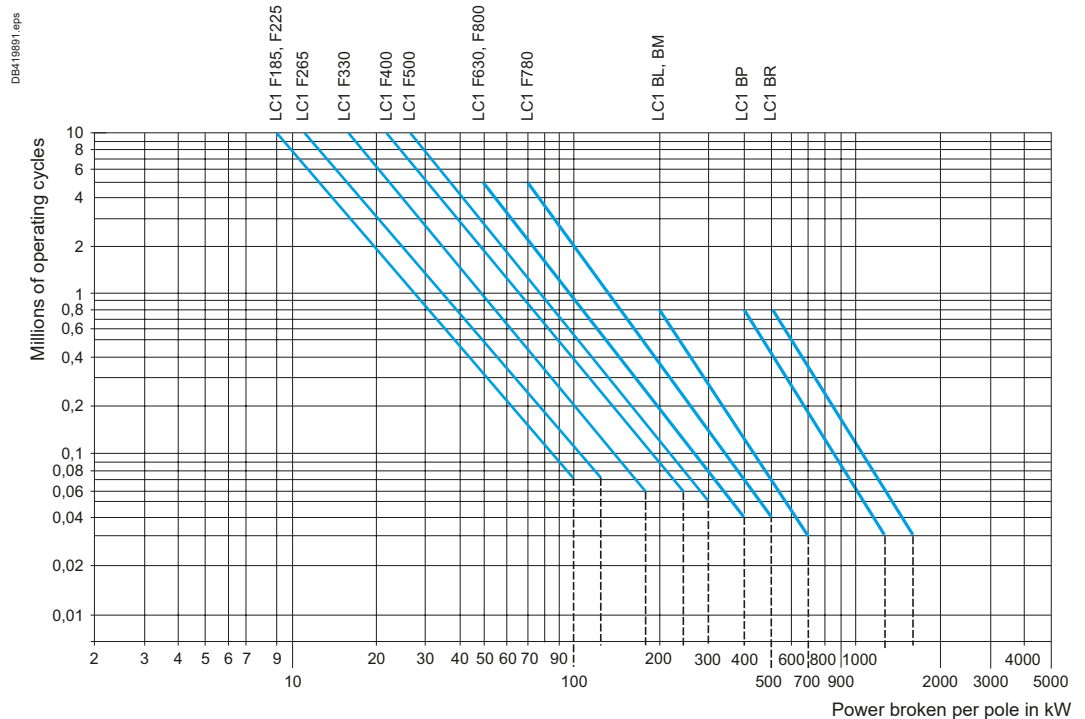
Determining the electrical durability

The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$$P_{\text{broken}} = U_{\text{broken}} \times I_{\text{broken}}$$

The tables below give the values of U_c and I_c for the various utilisation categories.

| Power broken | | | |
|--|-----------|-----------|----------------------|
| Utilisation categories | U broken | I broken | P broken |
| DC-1 Non inductive or slightly inductive loads | U_e | I_e | $U_e \times I_e$ |
| DC-2 Shunt wound motors, breaking whilst motor running | $0.1 U_e$ | I_e | $0.1 U_e \times I_e$ |
| DC-3 Shunt wound motors, reversing, inching | U_e | $2.5 I_e$ | $U_e \times 2.5 I_e$ |
| DC-4 Series wound motors, breaking whilst motor running | $0.3 U_e$ | I_e | $0.3 U_e \times I_e$ |
| DC-5 Series wound motors, reversing, inching | U_e | $2.5 I_e$ | $U_e \times 2.5 I_e$ |



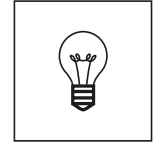
Example

Series wound motor: $P = 40 \text{ kW}$ - $U_e = 200 \text{ V}$ - $I_e = 200 \text{ A}$.

Utilisation: reversing, inching.

Utilisation category = DC-5.

- Select contactor LC1 F265 with 2 poles in series.
- The power broken is: $P_c \text{ total} = 2.5 \times 200 \times 200 = 100 \text{ kW}$.
- The power broken per pole is 50 kW .
- The electrical durability read from the curve is 500000 operating cycles.



General

The operating conditions of lighting circuits have the following characteristics:

- continuous duty: the switching device can remain closed for several days or even months
- a dispersion factor of 1: all luminaires in the same group are switched on or off simultaneously
- a relatively high temperature around the device due to the enclosure, the presence of fuses, or an unventilated control panel location.

This is why the operational current for lighting is lower than the value given for AC-1 duty.

Protection

The continuous duty current drawn by a lighting circuit is constant. In fact:

- it is unlikely that the number of luminaires of an existing circuit will be modified
- this type of circuit cannot create an overload of long duration.

It is therefore only necessary to provide short-circuit protection.

This can be provided by:

- gG type fuses, or
- modular circuit breakers.

Nevertheless, it is always possible and sometimes more economical (smaller cable size) to protect the circuit by a thermal overload relay and associated aM type uses.

Distribution system

Single-phase circuit, 220/240 V

The tables on pages A6/51 to A6/55 are based on a single-phase 220/240 V circuit and can therefore be applied directly in this case.

3-phase circuit, 380/415 V (with neutral)

The total number of lamps (N) to be switched simultaneously is divided into three equal groups, each connected between one phase and neutral. The contactor can then be selected from the 220/240 V single-phase tables for a number of lamps equal to $\frac{N}{3}$ lamps.

3-phase circuit, 220/240 V

The total number of lamps (N) to be switched simultaneously is divided into three equal groups, each connected between 2 phases (L1-L2), (L2-L3), (L3-L1).

The contactor can then be selected from the 220/240 V single-phase table for a number of lamps equal to $\frac{N}{\sqrt{3}}$ lamps.

Contactor selection tables

For the different types of lamps, the tables on pages A6/51 to A6/55 give the maximum number of lamps of unit power P (in Watts), which can be switched simultaneously for each size of contactor.

They are based on:

- a 220/240 V single-phase circuit
- an ambient temperature of 55 °C ⁽²⁾, taking into account the operating conditions (see General paragraph)
- an electrical life of more than 10 years (200 days' operation per year).

They take into account:

- the total current drawn (including ballast)
- transient phenomena which occur at switch-on
- the starting currents and their duration
- the circulation of any harmonics which may be present.

Lamps with compensating capacitor C (µF) connected in parallel

Parallel connected compensating capacitors C cause a current peak at the moment of switch-on. To ensure that the value of this current peak remains compatible with the making characteristics of the contactors, the unit value of the capacitance must not exceed the following:

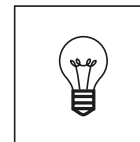
| Switching contactor rating ⁽¹⁾ | LC1 K09 | LP1 K09 | LC1 D09 | LC1 D12 | LC1 D18 | LC1 D25 | LC1 D32 | LC1 D38 | LC1 D40A | LC1 D50A | LC1 D65A | LC1 D80A | LC1 D80 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|---------|
| Maximum unit value C (µF) of parallel connected compensating capacitor | 7 | 3 | 18 | 18 | 25 | 60 | 96 | 96 | 120 | 120 | 240 | 240 | 240 |

| Switching contactor rating ⁽¹⁾ | LC1 D80 | LC1 D95 | LC1 D115 | LC1 D150 | LC1 F185 | LC1 F225 | LC1 F265 | LC1 F330 | LC1 F400 | LC1 F500 | LC1 F630 | LC1 F800 |
|--|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Maximum unit value C (µF) of parallel connected compensating capacitor | 240 | 240 | 300 | 360 | 800 | 1200 | 1700 | 2500 | 4000 | 6000 | 9000 | 10800 |

This value is independent of the number of lamps switched by the contactor.

⁽¹⁾ Validation tests have not been carried out with D Green contactors.

⁽²⁾ For an ambient temperature of 40 °C, multiply the number by 1.2.



Usual values

The tables show the following values:

- IB: value of current drawn by each lamp at its rated voltage,
 - C: unit capacitance for each lamp,
- corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

| Incandescent and halogen lamps | | | | | | | | | | |
|--------------------------------------|------|------|------|------|------|------|------|------|------|--------------------|
| P (W) | 60 | 75 | 100 | 150 | 200 | 300 | 500 | 750 | 1000 | |
| IB (A) | 0.27 | 0.34 | 0.45 | 0.68 | 0.91 | 1.40 | 2.30 | 3.40 | 4.60 | LC1 ⁽¹⁾ |
| Max. no. of lamps according to P (W) | 35 | 28 | 21 | 14 | 10 | 6 | 4 | 2 | 2 | K09 |
| | 59 | 47 | 35 | 23 | 17 | 11 | 7 | 4 | 3 | D09, D12 |
| | 77 | 61 | 46 | 30 | 23 | 15 | 9 | 6 | 4 | D18 |
| | 92 | 73 | 55 | 36 | 27 | 18 | 11 | 7 | 5 | D25 |
| | 129 | 103 | 77 | 51 | 38 | 25 | 15 | 10 | 7 | D32, D38 |
| | 163 | 129 | 97 | 64 | 48 | 31 | 19 | 13 | 9 | D40A |
| | 207 | 164 | 124 | 82 | 62 | 40 | 24 | 16 | 12 | D50A, D65A, D80A |
| | 296 | 235 | 177 | 117 | 88 | 57 | 34 | 23 | 17 | D80, D95 |
| | 430 | 340 | 256 | 170 | 126 | 82 | 50 | 34 | 24 | D115 |
| | 466 | 370 | 280 | 184 | 138 | 90 | 54 | 36 | 26 | D150 |
| | 710 | 564 | 426 | 282 | 210 | 136 | 82 | 56 | 40 | F185 |
| | 770 | 610 | 462 | 304 | 228 | 148 | 90 | 60 | 44 | F225 |
| | 888 | 704 | 532 | 352 | 262 | 170 | 104 | 70 | 52 | F265 |
| | 1006 | 800 | 604 | 400 | 298 | 194 | 118 | 80 | 58 | F330 |
| | 1274 | 1010 | 764 | 504 | 378 | 244 | 148 | 100 | 74 | F400 |
| | 1718 | 1364 | 1030 | 682 | 508 | 330 | 200 | 136 | 100 | F500 |
| | 2328 | 1850 | 1396 | 924 | 690 | 448 | 272 | 184 | 136 | F630 |
| | 2776 | 2204 | 1666 | 1102 | 824 | 534 | 326 | 220 | 162 | F800 |

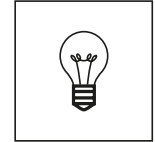
| Mixed lighting lamps | | | | | | |
|--------------------------------------|------|------|------|------|------|--------------------|
| P (W) | 100 | 160 | 250 | 500 | 1000 | |
| IB (A) | 0.45 | 0.72 | 1.10 | 2.30 | 4.50 | LC1 ⁽¹⁾ |
| Max. no. of lamps according to P (W) | 21 | 13 | 8 | 4 | 2 | K09 |
| | 35 | 22 | 14 | 7 | 3 | D09, D12 |
| | 46 | 29 | 18 | 9 | 4 | D18 |
| | 55 | 36 | 23 | 11 | 5 | D25 |
| | 77 | 48 | 30 | 15 | 7 | D32, D38 |
| | 97 | 61 | 38 | 19 | 9 | D40A |
| | 124 | 77 | 49 | 24 | 12 | D50A, D65A, D80A |
| | 177 | 111 | 70 | 34 | 17 | D80, D95 |
| | 256 | 160 | 104 | 50 | 26 | D115 |
| | 280 | 174 | 114 | 54 | 28 | D150 |
| | 426 | 266 | 174 | 82 | 42 | F185 |
| | 462 | 288 | 188 | 90 | 46 | F225 |
| | 532 | 332 | 218 | 104 | 52 | F265 |
| | 604 | 378 | 246 | 118 | 60 | F330 |
| | 764 | 478 | 312 | 150 | 76 | F400 |
| | 1030 | 644 | 422 | 202 | 102 | F500 |
| | 1398 | 874 | 572 | 272 | 140 | F630 |
| | 1666 | 1040 | 680 | 326 | 166 | F800 |

⁽¹⁾ Validation tests have not been carried out with D Green contactors.

TeSys Control

Contactors for lighting circuits ⁽¹⁾

Selection - Coordination and standards



Usual values

The tables show the following values:

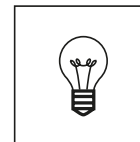
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

| Fluorescent lamps with starter. Single fitting | | | | | | | | | | | | |
|--|---------------|------|------|------|--------------------------|------|------|------|------|------|--------------------|------|
| | Non corrected | | | | With parallel correction | | | | | | LC1 ⁽¹⁾ | |
| | P (W) | 20 | 40 | 65 | 80 | 110 | 20 | 40 | 65 | 80 | | 110 |
| | IB (A) | 0.39 | 0.45 | 0.70 | 0.80 | 1.2 | 0.17 | 0.26 | 0.42 | 0.52 | | 0.72 |
| C (µF) | – | – | – | – | – | 5 | 5 | 7 | 7 | 16 | | |
| Max. no. of lamps according to P (W) | 24 | 21 | 13 | 12 | 8 | 56 | 36 | 22 | 18 | – | K09 | |
| | 41 | 35 | 22 | 20 | 13 | 94 | 61 | 38 | 30 | 22 | D09, D12 | |
| | 53 | 46 | 30 | 26 | 17 | 123 | 80 | 50 | 40 | 29 | D18 | |
| | 66 | 57 | 37 | 32 | 21 | 152 | 100 | 61 | 50 | 36 | D25 | |
| | 89 | 77 | 50 | 43 | 29 | 205 | 134 | 83 | 67 | 48 | D32, D38 | |
| | 112 | 97 | 62 | 55 | 36 | 258 | 169 | 104 | 84 | 61 | D40A | |
| | 143 | 124 | 80 | 70 | 46 | 329 | 215 | 133 | 107 | 77 | D50A, D65A, D80A | |
| | 205 | 177 | 114 | 100 | 66 | 470 | 367 | 190 | 153 | 111 | D80, D95 | |
| | 410 | 354 | 228 | 200 | 132 | 940 | 614 | 380 | 306 | 222 | D115, D150 | |
| | 492 | 426 | 274 | 240 | 160 | 1128 | 738 | 456 | 368 | 266 | F185 | |
| | 532 | 462 | 296 | 260 | 172 | 1224 | 800 | 490 | 400 | 288 | F225 | |
| | 614 | 532 | 342 | 300 | 200 | 1412 | 922 | 570 | 462 | 332 | F265 | |
| | 696 | 604 | 388 | 340 | 226 | 1600 | 1046 | 648 | 522 | 378 | F330 | |
| | 882 | 764 | 490 | 430 | 286 | 2024 | 1322 | 818 | 662 | 478 | F400 | |
| | 1190 | 1030 | 662 | 580 | 386 | 2728 | 1724 | 1104 | 892 | 644 | F500 | |
| | 1612 | 1398 | 698 | 786 | 524 | 3700 | 2418 | 1498 | 1210 | 874 | F630, F800 | |

| Fluorescent lamps with starter. Twin fitting | | | | | | | | | | | | |
|--|---------------|--------|--------|--------|--------|------------------------|--------|--------|--------|--------|--------------------|--------|
| | Non corrected | | | | | With series correction | | | | | LC1 ⁽¹⁾ | |
| | P (W) | 2x20 | 2x40 | 2x65 | 2x80 | 2x110 | 2x20 | 2x40 | 2x65 | 2x80 | | 2x110 |
| | IB (A) | 2x0.22 | 2x0.41 | 2x0.67 | 2x0.82 | 2x1.1 | 2x0.13 | 2x0.24 | 2x0.39 | 2x0.48 | | 2x0.65 |
| Max. no. of lamps according to P (W) | 2x21 | 2x11 | 2x7 | 2x5 | 2x4 | 2x36 | 2x20 | 2x12 | 2x10 | 2x7 | K09 | |
| | 2x36 | 2x18 | 2x10 | 2x8 | 2x6 | 2x60 | 2x32 | 2x20 | 2x16 | 2x12 | D09, D12 | |
| | 2x46 | 2x24 | 2x14 | 2x12 | 2x8 | 2x80 | 2x42 | 2x26 | 2x20 | 2x16 | D18 | |
| | 2x58 | 2x30 | 2x18 | 2x14 | 2x10 | 2x100 | 2x54 | 2x32 | 2x26 | 2x20 | D25 | |
| | 2x78 | 2x42 | 2x26 | 2x20 | 2x14 | 2x134 | 2x72 | 2x44 | 2x36 | 2x26 | D32, D38 | |
| | 2x100 | 2x52 | 2x32 | 2x26 | 2x18 | 2x168 | 2x90 | 2x56 | 2x44 | 2x32 | D40A | |
| | 2x126 | 2x68 | 2x40 | 2x34 | 2x24 | 2x214 | 2x116 | 2x70 | 2x58 | 2x42 | D50A, D65A, D80A | |
| | 2x180 | 2x96 | 2x58 | 2x48 | 2x36 | 2x306 | 2x166 | 2x102 | 2x82 | 2x60 | D80, D95 | |
| | 2x360 | 2x194 | 2x118 | 2x96 | 2x72 | 2x614 | 2x332 | 2x204 | 2x166 | 2x122 | D115, D150 | |
| | 2x436 | 2x234 | 2x142 | 2x116 | 2x86 | 2x738 | 2x400 | 2x246 | 2x200 | 2x148 | F185 | |
| | 2x472 | 2x254 | 2x154 | 2x126 | 2x94 | 2x800 | 2x432 | 2x266 | 2x216 | 2x160 | F225 | |
| | 2x544 | 2x292 | 2x178 | 2x146 | 2x108 | 2x922 | 2x500 | 2x308 | 2x250 | 2x184 | F265 | |
| | 2x618 | 2x332 | 2x202 | 2x166 | 2x124 | 2x1046 | 2x566 | 2x348 | 2x282 | 2x208 | F330 | |
| | 2x782 | 2x420 | 2x256 | 2x210 | 2x156 | 2x1322 | 2x716 | 2x440 | 2x358 | 2x264 | F400 | |
| | 2x1054 | 2x566 | 2x346 | 2x282 | 2x210 | 2x1784 | 2x966 | 2x594 | 2x482 | 2x356 | F500 | |
| | 2x1430 | 2x766 | 2x468 | 2x384 | 2x286 | 2x2418 | 2x1310 | 2x806 | 2x654 | 2x484 | F630, F800 | |

⁽¹⁾ Validation tests have not been carried out with D Green contactors.



Usual values

The tables show the following values:

- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

| Fluorescent lamps without starter. Single fitting | | | | | | | | | | | | |
|---|---------------|------|------|------|------|--------------------------|------|------|------|------|--------------------|------|
| | Non corrected | | | | | With parallel correction | | | | | LC1 ⁽¹⁾ | |
| | P (W) | 20 | 40 | 65 | 80 | 110 | 20 | 40 | 65 | 80 | | 110 |
| | IB (A) | 0.43 | 0.55 | 0.80 | 0.95 | 1.4 | 0.19 | 0.29 | 0.46 | 0.57 | | 0.79 |
| C (µF) | – | – | – | – | – | 5 | 5 | 7 | 7 | 16 | | |
| Max. no. of lamps according to P (W) | 22 | 17 | 12 | 10 | 6 | 50 | 33 | 20 | 16 | – | K09 | |
| | 37 | 29 | 20 | 16 | 11 | 84 | 55 | 34 | 28 | 20 | D09, D12 | |
| | 48 | 38 | 26 | 22 | 15 | 110 | 72 | 45 | 36 | 26 | D18 | |
| | 60 | 47 | 32 | 27 | 18 | 136 | 89 | 56 | 45 | 32 | D25 | |
| | 97 | 63 | 43 | 36 | 25 | 184 | 101 | 76 | 61 | 44 | D32, D38 | |
| | 102 | 80 | 55 | 46 | 31 | 231 | 151 | 95 | 77 | 55 | D40A | |
| | 130 | 101 | 70 | 58 | 40 | 294 | 193 | 121 | 98 | 70 | D50A, D65A, D80A | |
| | 186 | 145 | 100 | 84 | 57 | 421 | 275 | 173 | 140 | 101 | D80, D95 | |
| | 372 | 290 | 200 | 168 | 114 | 842 | 550 | 346 | 280 | 202 | D115, D150 | |
| | 446 | 348 | 240 | 202 | 136 | 1010 | 662 | 416 | 336 | 242 | F185 | |
| | 484 | 378 | 260 | 218 | 148 | 1094 | 716 | 452 | 364 | 262 | F225 | |
| | 558 | 436 | 300 | 252 | 170 | 1262 | 828 | 522 | 420 | 304 | F265 | |
| | 632 | 494 | 340 | 286 | 194 | 1432 | 938 | 590 | 476 | 344 | F330 | |
| | 800 | 624 | 430 | 362 | 246 | 1810 | 1186 | 748 | 604 | 434 | F400 | |
| | 1078 | 844 | 580 | 488 | 330 | 2442 | 1600 | 1008 | 814 | 586 | F500 | |
| | 1462 | 1144 | 786 | 662 | 448 | 3310 | 2168 | 1366 | 1104 | 796 | F630, F800 | |

| Fluorescent lamps without starter. Twin fitting | | | | | | | | | | | | |
|---|---------------|--------|--------|--------|--------|------------------------|--------|--------|--------|--------|--------------------|--------|
| | Non corrected | | | | | With series correction | | | | | LC1 ⁽¹⁾ | |
| | P (W) | 2x20 | 2x40 | 2x65 | 2x80 | 2x110 | 2x20 | 2x40 | 2x65 | 2x80 | | 2x110 |
| | IB (A) | 2x0.25 | 2x0.47 | 2x0.76 | 2x0.93 | 2x1.3 | 2x0.14 | 2x0.26 | 2x0.43 | 2x0.53 | | 2x0.72 |
| C (µF) | – | – | – | – | – | – | – | – | – | – | | |
| Max. no. of lamps according to P (W) | 2x19 | 2x10 | 2x6 | 2x5 | 2x3 | 2x34 | 2x18 | 2x11 | 2x9 | 2x6 | K09 | |
| | 2x32 | 2x16 | 2x10 | 2x8 | 2x6 | 2x56 | 2x30 | 2x18 | 2x14 | 2x10 | D09, D12 | |
| | 2x42 | 2x22 | 2x12 | 2x10 | 2x8 | 2x74 | 2x40 | 2x24 | 2x18 | 2x14 | D18 | |
| | 2x52 | 2x26 | 2x16 | 2x12 | 2x10 | 2x92 | 2x50 | 2x30 | 2x24 | 2x18 | D25 | |
| | 2x70 | 2x36 | 2x22 | 2x18 | 2x12 | 2x124 | 2x66 | 2x40 | 2x32 | 2x24 | D32, D38 | |
| | 2x88 | 2x46 | 2x28 | 2x22 | 2x16 | 2x156 | 2x84 | 2x50 | 2x40 | 2x30 | D40A | |
| | 2x112 | 2x58 | 2x36 | 2x30 | 2x20 | 2x200 | 2x106 | 2x64 | 2x52 | 2x38 | D50A, D65A, D80A | |
| | 2x160 | 2x84 | 2x52 | 2x42 | 2x30 | 2x234 | 2x152 | 2x92 | 2x74 | 2x54 | D80, D95 | |
| | 2x320 | 2x170 | 2x104 | 2x86 | 2x60 | 2x570 | 2x306 | 2x186 | 2x150 | 2x110 | D115, D150 | |
| | 2x384 | 2x204 | 2x126 | 2x102 | 2x74 | 2x686 | 2x368 | 2x222 | 2x180 | 2x132 | F185 | |
| | 2x416 | 2x220 | 2x136 | 2x112 | 2x80 | 2x742 | 2x400 | 2x242 | 2x196 | 2x144 | F225 | |
| | 2x480 | 2x254 | 2x158 | 2x128 | 2x92 | 2x856 | 2x462 | 2x278 | 2x226 | 2x166 | F265 | |
| | 2x544 | 2x288 | 2x178 | 2x146 | 2x104 | 2x970 | 2x522 | 2x316 | 2x256 | 2x188 | F330 | |
| | 2x688 | 2x366 | 2x226 | 2x184 | 2x132 | 2x1228 | 2x662 | 2x400 | 2x324 | 2x238 | F400 | |
| | 2x928 | 2x494 | 2x304 | 2x248 | 2x178 | 2x1656 | 2x892 | 2x540 | 2x438 | 2x322 | F500 | |
| | 2x1258 | 2x668 | 2x414 | 2x338 | 2x242 | 2x2246 | 2x1210 | 2x730 | 2x592 | 2x436 | F630, F800 | |

⁽¹⁾ Validation tests have not been carried out with D Green contactors.

TeSys Control

Contactors for lighting circuits ⁽¹⁾

Selection - Coordination and standards



Usual values

The tables show the following values:

■ IB: value of current drawn by each lamp at its rated voltage

■ C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

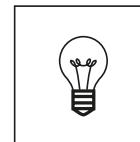
These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

| Low pressure sodium vapour lamps | | | | | | | | | | | | | | | | |
|--------------------------------------|---------------|-----|-----|-----|-----|-----|-----|--------------------------|------|-----|-----|-----|-----|-----|--------------------|------------------|
| | Non corrected | | | | | | | With parallel correction | | | | | | | LC1 ⁽¹⁾ | |
| | P (W) | 35 | 55 | 90 | 135 | 150 | 180 | 200 | 35 | 55 | 90 | 135 | 150 | 180 | | 200 |
| | IB (A) | 1.2 | 1.6 | 2.4 | 3.1 | 3.2 | 3.3 | 3.4 | 0.3 | 0.4 | 0.6 | 0.9 | 1 | 1.2 | | 1.3 |
| C (µF) | – | – | – | – | – | – | – | – | 17 | 17 | 25 | 36 | 36 | 36 | 36 | |
| Max. no. of lamps according to P (W) | 6 | 5 | 3 | 2 | 2 | 2 | 2 | – | – | – | – | – | – | – | – | K09 |
| | 10 | 7 | 5 | 3 | 3 | 3 | 3 | 40 | 30 | – | – | – | – | – | – | D09, D12 |
| | 12 | 9 | 6 | 4 | 4 | 4 | 4 | 50 | 37 | 25 | – | – | – | – | – | D18 |
| | 15 | 11 | 7 | 6 | 5 | 5 | 5 | 63 | 47 | 31 | 21 | 19 | 15 | 14 | – | D25 |
| | 21 | 16 | 10 | 8 | 8 | 7 | 7 | 86 | 65 | 43 | 28 | 26 | 21 | 20 | – | D32, D38 |
| | 27 | 20 | 13 | 10 | 10 | 10 | 9 | 110 | 82 | 55 | 36 | 33 | 27 | 25 | – | D40A |
| | 35 | 26 | 17 | 13 | 13 | 12 | 12 | 140 | 105 | 70 | 46 | 42 | 35 | 32 | – | D50A, D65A, D80A |
| | 50 | 37 | 25 | 19 | 18 | 18 | 17 | 200 | 150 | 100 | 66 | 60 | 50 | 46 | – | D80, D95 |
| | 100 | 75 | 50 | 38 | 36 | 36 | 34 | 400 | 300 | 200 | 132 | 120 | 100 | 92 | – | D115, D150 |
| | 140 | 104 | 70 | 54 | 52 | 50 | 48 | 560 | 420 | 280 | 186 | 168 | 140 | 128 | – | F185 |
| | 152 | 114 | 76 | 58 | 56 | 54 | 54 | 606 | 454 | 302 | 202 | 182 | 152 | 140 | – | F225 |
| | 174 | 130 | 88 | 68 | 66 | 64 | 62 | 700 | 524 | 350 | 232 | 210 | 174 | 162 | – | F265 |
| | 198 | 148 | 98 | 76 | 74 | 72 | 70 | 792 | 594 | 396 | 264 | 238 | 198 | 182 | – | F330 |
| | 250 | 188 | 124 | 96 | 94 | 90 | 88 | 1002 | 752 | 502 | 334 | 300 | 250 | 252 | – | F400 |
| | 338 | 254 | 168 | 130 | 126 | 122 | 118 | 1352 | 1014 | 676 | 450 | 406 | 338 | 312 | – | F500 |
| | 496 | 372 | 248 | 192 | 186 | 180 | 174 | 1982 | 1488 | 992 | 660 | 594 | 496 | 458 | – | F630, F800 |

| High pressure sodium vapour lamps | | | | | | | | | | | | | | | | |
|--------------------------------------|---------------|-----|-----|-----|-----|--------------------------|------|-----|-----|-----|--------------------|------|---|---|---|------------------|
| | Non corrected | | | | | With parallel correction | | | | | LC1 ⁽¹⁾ | | | | | |
| | P (W) | 150 | 250 | 400 | 700 | 1000 | 150 | 250 | 400 | 700 | | 1000 | | | | |
| | IB (A) | 1.9 | 3.2 | 5 | 8.8 | 12.4 | 0.84 | 1.4 | 2.2 | 3.9 | | 5.5 | | | | |
| C (µF) | – | – | – | – | – | 20 | 32 | 48 | 96 | 120 | | | | | | |
| Max. no. of lamps according to P (W) | 4 | 2 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | K09 |
| | 6 | 3 | 2 | 1 | – | – | – | – | – | – | – | – | – | – | – | D09, D12 |
| | 7 | 4 | 3 | 1 | 1 | – | – | – | – | – | – | – | – | – | – | D18 |
| | 10 | 5 | 3 | 2 | 1 | 17 | – | – | – | – | – | – | – | – | – | D25 |
| | 13 | 8 | 5 | 2 | 2 | 22 | 13 | 8 | – | – | – | – | – | – | – | D32, D38 |
| | 17 | 10 | 6 | 3 | 2 | 30 | 18 | 11 | 6 | – | – | – | – | – | – | D40A |
| | 22 | 13 | 8 | 4 | 3 | 39 | 23 | 15 | 8 | 6 | – | – | – | – | – | D50A, D65A, D80A |
| | 31 | 18 | 12 | 6 | 4 | 50 | 30 | 19 | 10 | 7 | – | – | – | – | – | D80, D95 |
| | 62 | 36 | 24 | 12 | 8 | 71 | 42 | 27 | 15 | 10 | – | – | – | – | – | D115, D150 |
| | 88 | 52 | 34 | 18 | 14 | 142 | 84 | 54 | 30 | 20 | – | – | – | – | – | F185 |
| | 96 | 56 | 36 | 20 | 16 | 200 | 120 | 76 | 42 | 30 | – | – | – | – | – | F225 |
| | 110 | 66 | 42 | 24 | 18 | 216 | 130 | 82 | 46 | 32 | – | – | – | – | – | F265 |
| | 124 | 74 | 48 | 26 | 20 | 250 | 150 | 94 | 54 | 38 | – | – | – | – | – | F330 |
| | 158 | 94 | 60 | 34 | 24 | 282 | 170 | 108 | 60 | 42 | – | – | – | – | – | F400 |
| | 214 | 126 | 80 | 46 | 32 | 358 | 214 | 136 | 76 | 54 | – | – | – | – | – | F500 |
| | 312 | 186 | 118 | 68 | 48 | 482 | 290 | 184 | 104 | 74 | – | – | – | – | – | F630, F800 |
| | | | | | | 708 | 424 | 270 | 152 | 108 | – | – | – | – | – | |

⁽¹⁾ Validation tests have not been carried out with D Green contactors.

Coordination and standards



Usual values

The tables show the following values:

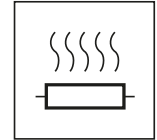
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

| High pressure mercury vapour lamps | | | | | | | | | | | | | | | | |
|--------------------------------------|---------------|------|------|------|------|------|------|--------------------------|------|------|------|-----|-----|-----|------|------------------|
| | Non corrected | | | | | | | With parallel correction | | | | | | | | |
| | P (W) | 50 | 80 | 125 | 250 | 400 | 700 | 1000 | 50 | 80 | 125 | 250 | 400 | 700 | 1000 | |
| | IB (A) | 0.54 | 0.81 | 1.20 | 2.30 | 4.10 | 6.80 | 9.90 | 0.3 | 0.45 | 0.67 | 1.3 | 2.3 | 3.8 | 5.5 | |
| C (µF) | – | – | – | – | – | – | – | – | 10 | 10 | 10 | 18 | 25 | 40 | 60 | |
| Max. no. of lamps according to P (W) | 14 | 9 | 6 | 3 | 1 | – | – | – | – | – | – | – | – | – | – | K09 |
| | 22 | 14 | 9 | 5 | 2 | 1 | 1 | 40 | 26 | 17 | 9 | – | – | – | – | D09, D12 |
| | 27 | 18 | 12 | 6 | 3 | 2 | 1 | 50 | 33 | 22 | 11 | 6 | – | – | – | D18 |
| | 35 | 23 | 15 | 8 | 4 | 2 | 1 | 63 | 42 | 28 | 14 | 8 | 5 | 3 | – | D25 |
| | 48 | 32 | 21 | 11 | 6 | 3 | 2 | 86 | 57 | 38 | 20 | 11 | 6 | 4 | – | D32, D38 |
| | 61 | 40 | 27 | 14 | 8 | 4 | 3 | 110 | 73 | 49 | 25 | 14 | 8 | 6 | – | D40A |
| | 77 | 51 | 34 | 17 | 10 | 6 | 4 | 140 | 93 | 62 | 32 | 18 | 11 | 7 | – | D50A, D65A, D80A |
| | 111 | 74 | 49 | 26 | 14 | 8 | 6 | 200 | 133 | 89 | 46 | 26 | 15 | 10 | – | D80, D95 |
| | 222 | 148 | 100 | 52 | 28 | 16 | 12 | 400 | 266 | 178 | 92 | 52 | 30 | 20 | – | D115, D150 |
| | 310 | 206 | 140 | 72 | 40 | 24 | 17 | 560 | 372 | 250 | 128 | 72 | 44 | 30 | – | F185 |
| | 336 | 224 | 152 | 78 | 44 | 26 | 18 | 606 | 404 | 272 | 140 | 78 | 48 | 32 | – | F225 |
| | 388 | 258 | 174 | 90 | 50 | 30 | 20 | 700 | 466 | 312 | 162 | 90 | 54 | 38 | – | F265 |
| | 440 | 294 | 198 | 102 | 58 | 34 | 24 | 792 | 528 | 354 | 182 | 102 | 62 | 42 | – | F330 |
| | 556 | 372 | 250 | 130 | 72 | 44 | 30 | 1002 | 668 | 448 | 232 | 130 | 78 | 54 | – | F400 |
| | 752 | 500 | 338 | 176 | 98 | 60 | 40 | 1352 | 902 | 606 | 312 | 176 | 106 | 74 | – | F500 |
| | 1102 | 734 | 496 | 258 | 144 | 88 | 60 | 1982 | 1322 | 888 | 458 | 258 | 156 | 108 | – | F630, F800 |

| Metal iodine vapour lamps | | | | | | | | | | |
|--------------------------------------|---------------|-----|-----|------|--------------------------|-----|-----|------|--------------------|------------------|
| | Non corrected | | | | With parallel correction | | | | | |
| | P (W) | 250 | 400 | 1000 | 2000 | 250 | 400 | 1000 | 2000 | |
| | IB (A) | 2.5 | 3.6 | 9.5 | 20 | 1.4 | 2 | 5.3 | 11.2 | |
| C (µF) | – | – | – | – | 32 | 32 | 64 | 140 | LC1 ⁽¹⁾ | |
| Max. no. of lamps according to P (W) | 3 | 2 | – | – | – | – | – | – | – | K09 |
| | 4 | 3 | 1 | – | – | – | – | – | – | D09, D12 |
| | 6 | 4 | 1 | – | – | – | – | – | – | D18 |
| | 7 | 5 | 2 | – | 13 | 9 | – | – | – | D25 |
| | 10 | 7 | 2 | 1 | 18 | 13 | 4 | – | – | D32, D38 |
| | 13 | 9 | 3 | 1 | 23 | 16 | 6 | – | – | D40A |
| | 16 | 11 | 4 | 2 | 30 | 21 | 7 | – | – | D50A, D65A, D80A |
| | 24 | 16 | 6 | 3 | 42 | 30 | 11 | 5 | – | D80, D95 |
| | 48 | 32 | 12 | 6 | 84 | 60 | 22 | 10 | – | D115, D150 |
| | 66 | 46 | 18 | 8 | 120 | 84 | 32 | 14 | – | F185 |
| | 72 | 50 | 20 | 10 | 130 | 90 | 34 | 16 | – | F225 |
| | 84 | 58 | 22 | 12 | 150 | 104 | 40 | 18 | – | F265 |
| | 94 | 66 | 24 | 14 | 170 | 118 | 44 | 20 | – | F330 |
| | 120 | 84 | 32 | 16 | 214 | 150 | 56 | 26 | – | F400 |
| | 162 | 112 | 42 | 20 | 290 | 202 | 76 | 36 | – | F500 |
| | 238 | 164 | 62 | 30 | 424 | 298 | 112 | 52 | – | F630, F800 |

⁽¹⁾ Validation tests have not been carried out with D Green contactors.



Selection

General

A heating circuit is a power switching circuit supplying one or more resistive heating elements switched by a contactor. The same general rules apply as for motor circuits, except that heating circuits are not normally subjected to overload currents. It is therefore only necessary to provide short-circuit protection.

Characteristics of heating elements

The examples below are based on resistive heating elements used for industrial furnaces or for the heating of buildings (infra-red or resistive radiant type, convactor heaters, closed loop heating circuits, etc.). The variation in resistance values between hot and cold states causes a current peak at switch-on which never exceeds 2 to 3 times the rated operational current (I_n). This initial peak does not recur during normal operation where subsequent switching is thermostatically controlled. The rated power and current of a heater are given for the normal operating temperature.

Protection

The steady state current drawn by a heating circuit is constant when the voltage is stable. In fact:

- it is unlikely that the number of loads in an existing circuit will be modified
- this type of circuit cannot create overloads. It is therefore only necessary to provide short-circuit protection.

This can be provided by:

- gG type fuses, or
- modular circuit breakers.

Nevertheless, it is always possible and sometimes more economical (smaller cable size) to protect the circuit by a thermal overload relay and associated aM type fuses.

Switching, control, protection

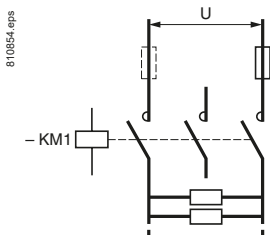
A heating element or group of heating elements of a given power may be either single-phase or 3-phase and may be supplied from a 220/127 V or a 400/230 V distribution system. Excluding a single-phase 127 V system (which is no longer commonly used), the following 3 types of circuit arrangement are possible:

- single-phase, 2-pole switching
- single-phase, 4-pole switching
- 3-phase switching

Component selection according to the power switched

The combinations suggested below are based on an ambient temperature of 55 °C and for powers at the nominal voltage, but they also ensure switching in the event of prolonged overloads up to 1.05 Ue.

| Single-phase, 2-pole switching | | | | |
|--------------------------------|-----------|-----------|--------|-------------------|
| Maximum power (kW) | | | | Contactor rating |
| 220/240 V | 380/415 V | 660/690 V | 1000 V | |
| 3.5 | 6.5 | 11 | – | LC1K09, LP1K09 |
| 4.5 | 8 | 14 | – | LC1D12 |
| 6 | 10.5 | 18.5 | – | LC1D18 |
| 7 | 13 | 22.5 | – | LC1D25 |
| 10 | 18 | 30.5 | – | LC1D32, LC1D38 |
| 13 | 22.5 | 39.5 | – | LC1D40A |
| 16.5 | 28.5 | 43.5 | – | LC1D65A, LC1D80A |
| 24 | 42 | 73 | 82.5 | LC1D80, LP1D80 |
| 44 | 76 | 118 | 157 | LC1D115, LC1D150 |
| 48 | 83 | 130 | – | LC1F185 |
| 52 | 90 | 145 | – | LC1F225 |
| 60 | 104 | 160 | 210 | LC1F265 |
| 75 | 130 | 200 | 250 | LC1F330 |
| 86 | 145 | 230 | 300 | LC1F4002 |
| 116 | 200 | 310 | 400 | LC1F5002 |
| 170 | 290 | 450 | 695 | LC1F6302, LC1F800 |
| 270 | 460 | 715 | 945 | LC1F780 |
| 140 | 242 | 370 | 490 | LC1BL32 |
| 220 | 380 | 580 | 770 | LC1BM32 |
| 350 | 605 | 925 | 1225 | LC1BP32 |
| 480 | 830 | 1270 | 1680 | LC1BR32 |

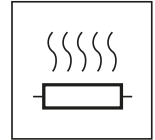


Circuit controlled by 2 poles of the contactor.

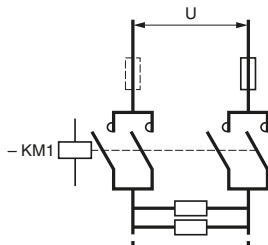
TeSys Control

Contactors for heating circuits

Selection - Coordination and standards

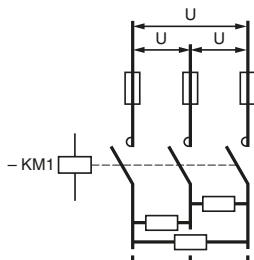


810856.eps



Circuit controlled by a 4-pole contactor with the poles parallel connected in pairs using appropriate connecting links. This solution enables the control of power values approximately equivalent to those controlled by the same contactor on 3-phase.

810857.eps



Circuit controlled by 3 poles of the contactor.

Component selection according to the power switched

Single-phase, 4-pole switching

| Maximum power (kW) | | | | Contactor rating |
|--------------------|-----------|-----------|--------|----------------------|
| 220/240 V | 380/415 V | 660/690 V | 1000 V | |
| 4.5 | 8 | 13.5 | – | LC1K09004, LP1K09004 |
| 7 | 13 | 22.5 | – | LC1DT25 |
| 12 | 21 | 36.5 | – | LC1DT40 |
| 26 | 45.5 | 79.5 | – | LC1DT80A |
| 38 | 66 | 117.5 | 132 | LC1D80004, LP1D80004 |
| 70 | 121 | 190 | 251 | LC1D115004 |
| 76 | 132 | 202 | – | LC1F1854 |
| 80 | 142 | 230 | – | LC1F2254 |
| 96 | 166 | 253 | 335 | LC1F2654 |
| 120 | 205 | 320 | 400 | LC1F3304 |
| 137 | 236 | 363 | 480 | LC1F4004 |
| 185 | 320 | 490 | 650 | LC1F5004 |
| 272 | 470 | 718 | 950 | LC1F6304 |
| 425 | 735 | 1140 | 1520 | LC1F7804 |
| 224 | 387 | 590 | 785 | LC1BL34 |
| 352 | 608 | 930 | 1230 | LC1BM34 |
| 560 | 968 | 1478 | 1960 | LC1BP34 |
| 768 | 1328 | 2025 | 2685 | LC1BR34 |

3-phase switching

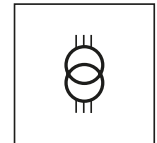
| Maximum power (kW) | | | | Contactor rating |
|--------------------|-----------|-----------|--------|------------------|
| 220/240 V | 380/415 V | 660/690 V | 1000 V | |
| 4.5 | 8 | 13.5 | – | LC1K09, LP1K09 |
| 7 | 13 | 22.5 | – | LC1D12 |
| 10 | 18 | 30.5 | – | LC1D18 |
| 13 | 22.5 | 39.5 | – | LC1D25 |
| 18 | 31 | 52.5 | – | LC1D32, LC1D38 |
| 22.5 | 38 | 68 | – | LC1D40A |
| 28.5 | 49 | 86 | – | LC1D65A, LC1D80A |
| 40.5 | 70.5 | 126 | 135.5 | LC1D80, LP1D80 |
| 83 | 140 | 235 | 345 | LC1D115, LC1D150 |
| 100 | 170 | 280 | – | LC1F185 |
| 110 | 185 | 300 | – | LC1F225 |
| 125 | 220 | 370 | 540 | LC1F265 |
| 160 | 260 | 400 | 640 | LC1F330 |
| 180 | 310 | 530 | 760 | LC1F400 |
| 255 | 445 | 740 | 950 | LC1F500 |
| 370 | 630 | 1000 | 1500 | LC1F630, LC1F800 |
| 570 | 1000 | 1650 | 2400 | LC1F780 |
| 242 | 419 | 640 | 850 | LC1BL33 |
| 380 | 658 | 1005 | 1350 | LC1BM33 |
| 606 | 1047 | 1600 | 2150 | LC1BP33 |
| 830 | 1437 | 2200 | 2950 | LC1BR33 |

Application example

For a 220 V, 50 Hz, single-phase circuit supplying a total heating load of 12.5 kW. Select a 3-pole contactor **LC1D65A**.

(1) See complete contactor references on pages B8/22 to B8/27 or consult your Regional Sales Office.

Coordination
and
standards



Operating conditions

Maximum ambient temperature: 55 °C.

When a transformer is switched on, there is generally an initial current surge which reaches its peak value almost instantaneously and then decreases in a largely exponential manner to quickly reach its steady state value.

The value of this current depends on:

- the characteristics of the magnetic circuit and of the windings (cross sectional area of the core, rated inductance, number of turns, layout and size of the windings, ...)
- the performance of the magnetic laminations used
- the magnetic state of the circuit and the instantaneous value of the a.c. mains voltage at the moment of switch-on.

The inrush current at the moment of switch-on can reach 20 to 40 times the rated current for the various kVA power ratings in the tables below. This value is independent of the “no-load” or “on-load” state of the transformer.

Contactor selection

The peak magnetising current of the transformer must be lower than the values given in the tables below.

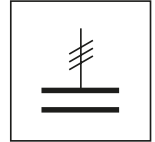
Maximum operating rate: 120 operating cycles/hour.

| Contactor rating ⁽¹⁾ | | LC1/LP1 K06 | LC1/LP1 K09 | LC1 D09 | LC1 D12 | LC1 D18 | LC1 D25 | LC1 D32 | LC1 D38 | LC1 D40A | LC1 D50A | LC1 D65A D80A | LC1 D80 | LC1 D95 | LC1 D115 | LC1 D150 | |
|---|----------------|-------------|-------------|---------|---------|---------|---------|---------|---------|----------|----------|---------------|---------|---------|----------|----------|-----|
| Maximum permissible current peak at switch-on | A | 160 | 225 | 350 | 350 | 420 | 630 | 770 | 770 | 1100 | 1250 | 1400 | 1550 | 1650 | 1800 | 2000 | |
| Maximum operational power ⁽²⁾ | 220 V 240 V | kVA | 2 | 2.5 | 4 | 4 | 5 | 7 | 8.5 | 8.5 | 14 | 16 | 18 | 19.5 | 19.5 | 25 | 25 |
| | 380 V 400 V | kVA | 3.5 | 5 | 7 | 7 | 8 | 12.5 | 15 | 15 | 24 | 27 | 31 | 34 | 34 | 50 | 50 |
| | 415 V 440 V | kVA | 4 | 5.5 | 8 | 8 | 9 | 14 | 17 | 17 | 28 | 32 | 36 | 39 | 39 | 55 | 55 |
| | 500 V | kVA | 5 | 7 | 9 | 9 | 11 | 16.5 | 20 | 20 | 32 | 36 | 40 | 45 | 45 | 65 | 65 |
| | 660 V 690 V | kVA | 6 | 8.5 | 12 | 12 | 14 | 21.5 | 26.5 | 26.5 | 42 | 48 | 53 | 59 | 59 | 80 | 80 |
| | 1000 V | kVA | - | - | - | - | - | - | - | - | - | - | - | 85 | 95 | 100 | 100 |

| Contactor rating ⁽¹⁾ | | LC1 F185 | LC1 F225 | LC1 F265 | LC1 F330 | LP1 F400 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 F800 | LC1 BL | LC1 BM | LC1 BP | LC1 BR | |
|---|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------|--------|--------|--------|------|
| Maximum permissible current peak at switch-on | A | 2900 | 3300 | 3800 | 5000 | 6300 | 7700 | 9000 | 12 000 | 11 000 | 18 000 | 18 000 | 24 000 | 30 000 | |
| Maximum operational power ⁽²⁾ | 220 V 240 V | kVA | 40 | 45 | 50 | 65 | 75 | 100 | 120 | 175 | 145 | 230 | 230 | 300 | 380 |
| | 380 V 400 V | kVA | 75 | 80 | 90 | 120 | 130 | 170 | 200 | 280 | 245 | 400 | 400 | 530 | 660 |
| | 415 V 440 V | kVA | 80 | 90 | 100 | 130 | 140 | 190 | 220 | 310 | 270 | 450 | 450 | 560 | 700 |
| | 500 V | kVA | 95 | 100 | 110 | 140 | 170 | 225 | 260 | 350 | 315 | 480 | 480 | 600 | 750 |
| | 660 V 690 V | kVA | 120 | 130 | 140 | 170 | 200 | 270 | 350 | 400 | 425 | 600 | 600 | 800 | 950 |
| | 1000 V | kVA | - | - | - | 225 | 250 | - | 470 | 650 | 550 | 700 | 700 | 1000 | 1200 |

⁽¹⁾ D Green contactors have not been validated for switching the primaries of 3-phase LV/LV transformers.

⁽²⁾ Maximum operational power corresponding to a current peak at switch-on of 30 In.



Standard contactors

Capacitors, together with the circuits to which they are connected, form oscillatory circuits which can, at the moment of switch-on, give rise to high transient currents (> 180 In) at high frequencies (1 to 15 kHz).

As a general rule, the peak current on energisation is lower when:

- the mains inductances are high
- the line transformer ratings are low
- the transformer short-circuit voltage is high
- the ratio between the sum of the ratings of the capacitors already switched into the circuit and that of the capacitor to be switched in is small (for multiple step capacitor banks).

In accordance with standards IEC 60070, NF C 54-100, VDE 0560, the switching contactor must be able to withstand a continuous current of 1.43 times the rated current of the capacitor bank step being switched.

The rated operational powers given in the tables below take this overload into account. Short-circuit protection is normally provided by gI type HPC fuses rated at 1.7 to 2 In.

Contactor applications

Operating conditions

Capacitors are directly switched. **The values of peak current at switch-on must not exceed the values indicated opposite.**

An inductor may be inserted in each of the three phases supplying the capacitors to reduce the peak current, if necessary.

Inductance values are determined according to the selected operating temperature.

Power factor correction by a single-step capacitor bank

The use of a choke inductor is unnecessary: the inductance of the mains supply is adequate to limit the peak to a value compatible with the contactor characteristics.

Power factor correction by a multiple-step capacitor bank

Select a special contactor as defined on page B8/34.

If a standard contactor is used, it is essential to insert a choke inductor in each of the three phases of each step.

Maximum operational power of contactors

Standard contactors

Maximum operating rate: 120 operating cycles/hour.

Electrical durability at maximum load: 100 000 operating cycles.

With choke inductors connected, where necessary.

| Operational power at 50/60 Hz | | | | | | Max. peak current | Contactor rating ⁽¹⁾ |
|---|-----------|-----------|---|-----------|-----------|-------------------|---------------------------------|
| $\theta \leq 40\text{ °C}$ ⁽²⁾ | | | $\theta \leq 55\text{ °C}$ ⁽²⁾ | | | | |
| 220/240 V | 400/440 V | 600/690 V | 220/240 V | 400/440 V | 600/690 V | A | |
| kvAR | kvAR | kvAR | kvAR | kvAR | kvAR | | |
| 6 | 11 | 15 | 6 | 11 | 15 | 560 | LC1D09, D12 |
| 9 | 15 | 20 | 9 | 15 | 20 | 850 | LC1D18 |
| 11 | 20 | 25 | 11 | 20 | 25 | 1600 | LC1D25 |
| 14 | 25 | 30 | 14 | 25 | 30 | 1900 | LC1D32, D38 |
| 17 | 30 | 37 | 17 | 30 | 37 | 2160 | LC1D40 |
| 22 | 40 | 50 | 22 | 40 | 50 | 2160 | LC1D50 |
| 22 | 40 | 50 | 22 | 40 | 50 | 3040 | LC1D65 |
| 35 | 60 | 75 | 35 | 60 | 75 | 3040 | LC1D80, D95 |
| 50 | 90 | 125 | 38 | 75 | 80 | 3100 | LC1D115 |
| 60 | 110 | 135 | 40 | 85 | 90 | 3300 | LC1D150 |
| 70 | 125 | 160 | 50 | 100 | 100 | 3500 | LC1F185 |
| 80 | 140 | 190 | 60 | 110 | 110 | 4000 | LC1F225 |
| 90 | 160 | 225 | 75 | 125 | 125 | 5000 | LC1F265 |
| 100 | 190 | 275 | 85 | 140 | 165 | 6500 | LC1F330 |
| 125 | 220 | 300 | 100 | 160 | 200 | 8000 | LC1F400 |
| 180 | 300 | 400 | 125 | 220 | 300 | 10 000 | LC1F500 |
| 250 | 400 | 600 | 190 | 350 | 500 | 12 000 | LC1F630 |
| 250 | 400 | 600 | 190 | 350 | 500 | 14 200 | LC1F800 |
| 200 | 350 | 500 | 180 | 350 | 500 | 25 000 | LC1BL |
| 300 | 550 | 650 | 250 | 500 | 600 | 25 000 | LC1BM |
| 500 | 850 | 950 | 400 | 750 | 750 | 25 000 | LC1BP |
| 600 | 1100 | 1300 | 500 | 1000 | 1000 | 25 000 | LC1BR |

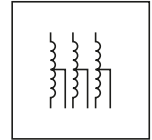
⁽¹⁾ D Green contactors have not been validated for switching the primaries of 3-phase LV/LV transformers.

⁽²⁾ Upper limit of temperature category conforming to IEC 60070.

TeSys Control

Contactors for auto-transformer starting ⁽¹⁾

Recommended wiring scheme, operation, curves
Coordination and standards



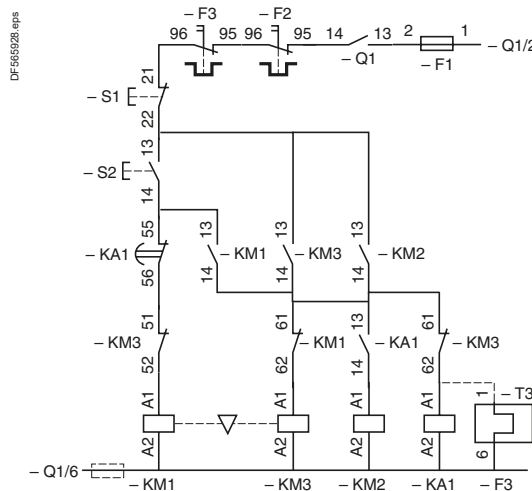
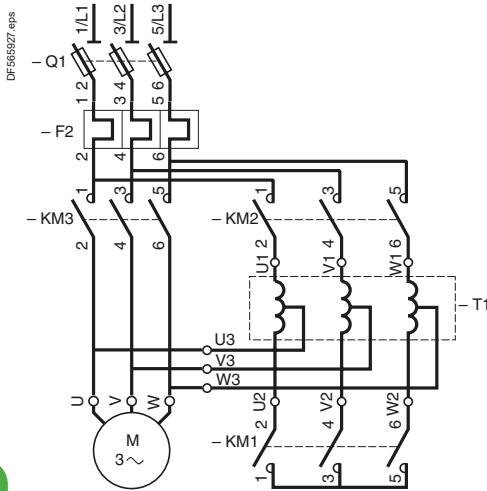
Applications

Auto-transformer starting is suitable for starting all types of squirrel cage motors: with 3, 6 or even 9 terminals according to North American technology. Starting is performed at reduced voltage and produces maximum torque at minimum line current.

It allows the starting torque ($C = f(U)^2$) to be adapted to the resistive torque of the driven machine by means of the 2 or 3 intermediate voltage take-off connections on the auto-transformer (0.65 and 0.8 U_n or 0.5, 0.65 and 0.8 U_n). In general, only one take-off connection is used.

This type of starting is used for high power and/or high inertia machines. The motor is never disconnected from its power supply during starting (closed transition) and transient phenomena are eliminated.

Recommended wiring scheme



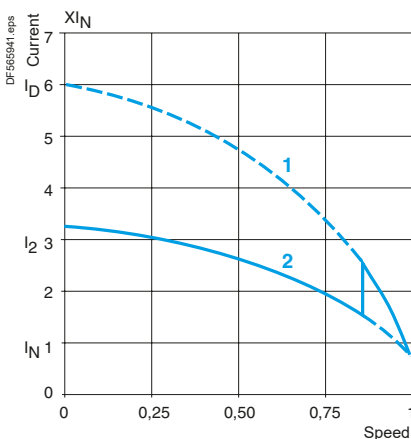
Operation

Starting is performed in 3 stages:

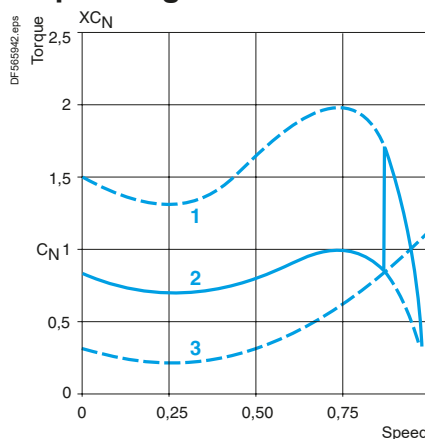
- star connection of the auto-transformer is made by KM1, then contactor KM2 closes and the motor starts under reduced voltage
- the neutral point is opened by KM1; part of the auto-transformer winding is switched into each phase for a short moment, constituting a stator starting inductance
- KM3 switches the motor to full mains voltage and causes the auto-transformer to be shunted out of circuit by KM2.

The auto-transformer used generally has an air gap (adjusted or not) in order to obtain, during the second phase of starting, a series inductance whose value is compatible with correct starting.

Operating curves



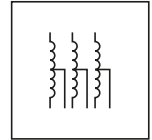
- 1 Direct switching current
- 2 Current with auto-transformer



- 1 Direct motor torque
- 2 Torque with auto-transformer
- 3 Resistive torque of the machine

⁽¹⁾ D Green contactors have not been validated for auto-transformer starting.

Coordination and standards



Auto-transformer starters from 59 to 900 kW up to 440 V (type 1 coordination)

The components recommended in the table below have been determined according to the following characteristics:

- auto-transformer: on 0.65 Un connection with non adjusted air gap
- 3 starts per hour, of which 2 consecutive
- motor starting current: $I_d/I_n = 6$
- $I_q = 70$ kA
- transient current on closing of KM3 $\leq 7 \sqrt{2} I_n$
- maximum starting time: 30 seconds
- ambient temperature $\theta \leq 40$ °C.

Switch-disconnector-fuses: operators and accessories, please consult your Regional Sales Office.

Contactors: 3-pole.

LC1D: see pages B8/22 and B8/27,

LC1F: please consult your Regional Sales Office,

LC1B: please consult your Regional Sales Office.

Auxiliary contact blocks:

- for contactors LC1D: one LADN11 (1 N/O + 1 N/C) on KM1
- for contactors LC1F: one LADN22 (2 N/O + 2 N/C) on KM1, KM2 and KM3.

Thermal overload relays:

- LR: see pages B11/4 to B11/9
- LR9D: see pages B11/5 to B11/9
- LR9F: please consult your Regional Sales Office.

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | Switch-disconnector-fuse Reference | aM fuses | | Contactors ⁽¹⁾ | | | Overload relays | |
|--|-----------|-------|-------|--------|------------------------------------|----------|------------------------|---------------------------|---------|---------|--------------------------|-----------------------|
| 220/230 V | 380/400 V | 415 V | 440 V | In max | | Size | Rating | KM3 LC1 | KM2 LC1 | KM1 LC1 | Reference ⁽²⁾ | Setting range |
| kW | kW | kW | kW | A | | A | | | | | A | |
| 30 | 55 | 59 | 59 | 105 | GS•K | 22 x 58 | 125 | D115 | D115 | D3210 | LR9D5369 LRD4367 | 90...150 95...120 |
| 40 | 75 | 80 | 80 | 138 | GS•L | T0 | 160 | D150 | D115 | D5011 | LR9D5369 LRD4369 | 90...150 110...140 |
| 51 | 90 | 90 | 100 | 170 | GS•N | T1 | 200 | F185 | D115 | D5011 | LR9F5371 | 132...220 |
| 63 | 110 | 110 | 110 | 205 | GS•N | T1 | 250 | F225 | D150 | D8011 | LR9F5371 | 132...220 |
| 75 | 132 | 132 | 150 | 245 | GS•N | T1 | 250 | F265 | F185 | D115 | LR9F7375 | 200...330 |
| 90 | 160 | 160 | 185 | 300 | GS•QQ | T2 | 315 | F330 | F265 | D115 | LR9F7375 | 200...330 |
| 110 | 200 | 200 | 220 | 370 | GS•QQ | T2 | 400 | F400 | F330 | D115 | LR9F7379 | 300...500 |
| 140 | 250 | 257 | 280 | 460 | GS2S | T3 | 500 | F500 | F400 | D115 | LR9F7379 | 300...500 |
| 180 | 315 | 355 | 375 | 584 | GS2S | T3 | 630 | F630 | F400 | D185 | LR9F7381 | 380...630 |
| 200 | 355 | 375 | 400 | 635 | GS2V | T4 | 800 | F800 | F500 | F185 | TC800/1 + LRD05 | 505...800 |
| 220 | 400 | 425 | 450 | 710 | GS2V | T4 | 800 | F800 | F500 | F265 | TC800/1 + LRD05 | 505...800 |
| 250 | 450 | 475 | 500 | 800 | GS2V | T4 | 800 | F800 | F500 | F265 | TC1000/1 + LRD05 | 630...1000 |
| 280 | 500 | 530 | 560 | 900 | GS2V | T4 | 1000 | BM33•22 | F630 | F330 | TC1000/1 LRD05 | 630...1000 |
| 315 | 560 | 600 | 630 | 1000 | GS2V | T4 | 1000 | BM33•22 | F630 | F400 | TC1250/1 LRD05 | 790...1250 |
| 335 | 630 | 670 | 710 | 1100 | GS2V | T4 | 1250 | BP33•22 | F630 | F400 | TC1250/1 LRD05 | 790...1250 |
| 400 | 710 | 750 | 800 | 1260 | On base | T4 | 2 x 800 ⁽³⁾ | BP33•22 | F780 | F400 | TC1500/1 LRD05 | 945...1500 |
| 450 | 800 | 800 | 800 | 1450 | On base | T4 | 2 x 800 ⁽³⁾ | BP33•22 | F780 | F400 | TC1750/1 LRD05 | 100...1750 |
| 500 | 900 | 900 | 900 | 1600 | On base | T4 | 2 x 800 ⁽³⁾ | BR33•22 | F780 | F500 | TC2000/1 LRD05 | 260...2000 |

⁽¹⁾ D Green contactors have not been validated for auto-transformer starting.

⁽²⁾ For power ratings greater than or equal to 400 kW at 415 V, use one LRD-05 on the current transformer.

⁽³⁾ Check with the motor manufacturer whether the fuses should be fitted in parallel.

TeSys Control

Contactors for rotor circuits of slip-ring motors ⁽¹⁾

Operation - Coordination and standards

Applications

These contactors are used to eliminate starting resistance in the rotor circuit of slip-ring motors.

The most common application is for starters without inching and without rotor speed adjustment: pumps, fans, conveyors, compressors, ...

In the case of control by means of a manually operated master controller, the use of contactors with magnetic blow-out is recommended. Please consult your Regional Sales Office.

For hoisting applications, contactor selection must take into account the type of motor duty, the operating rate, the rotor voltage and current, the type of connection, the ambient temperature, etc.
Please consult your Regional Sales Office.

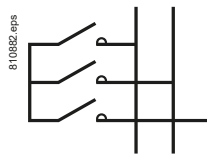
Operation

The rotor circuit contactors are interlocked with the stator contactor and therefore do not open until after the stator contactor has opened, when the rotor voltage has disappeared, or virtually disappeared.

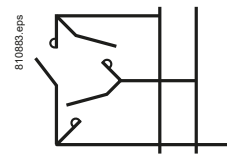
They make the current corresponding to the normal starting peak (1.5 to 2.5 times the rated rotor current) and open the circuit under no-load. Making and breaking are easy.

Different types of rotor connection

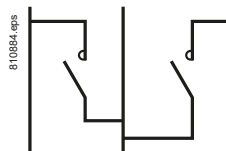
Star connection



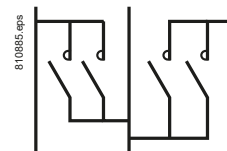
Delta connection



'V' connection



'W' connection



⁽¹⁾ D Green contactors have not been validated for rotor circuits of slip-ring motors.

Contactor selection according to the type of connection

Rotor current and voltage coefficients

Coefficients to be applied to the operational current values shown in the table below.

| Type of connection | Rotor I coefficient | 3-phase rotor U _e ⁽²⁾ | | | |
|--------------------|---------------------|---|----------------------|--------|--------|
| | | Maximum | With counter-current | | |
| | Operational I | LC1 F | LC1B | LC1 F | LC1B |
| Star | 1 | 2000 V | 2000 V | 1000 V | 1000 V |
| Delta | 1.4 | 1700 V | 1700 V | 850 V | 850 V |
| In V | 1 | 1700 V | 1700 V | 850 V | 850 V |
| In W | 1.6 | 1700 V | 1700 V | 850 V | 850 V |

Selection according to the operational current

The selection examples below take into account:

- a ratio of 2 between the maximum operational rotor voltage (U_{er}) and the rated stator operational voltage (U_{es}). This ratio is given in standard IEC 60947-4,
- a guarantee of occasional duty (making and breaking capacities) specified in the above standards.

| Time current flowing | Contactor rating | | | | | | | | | | | |
|---|------------------|----------|----------|----------|----------|----------|----------|--------|--------|--------|--------|--|
| | LC1 D150 | LC1 F185 | LC1 F265 | LC1 F400 | LC1 F500 | LC1 F630 | LC1 F780 | LC1 BL | LC1 BM | LC1 BP | LC1 BR | |
| Intermediate contactor: with number of operating cycles ≤ 30/h | | | | | | | | | | | | |
| 10 s | 450 A | 550 A | 800 A | 1100 A | 1500 A | 2000 A | 2500 A | 2000 A | 2400 A | 3750 A | 5000 A | |
| 30 s | 280 A | 400 A | 550 A | 730 A | 1000 A | 1500 A | 2000 A | 1200 A | 1800 A | 2600 A | 3600 A | |
| 60 s | 220 A | 300 A | 400 A | 550 A | 750 A | 1200 A | 1500 A | 1000 A | 1500 A | 2200 A | 3000 A | |
| Intermediate contactor: with number of operating cycles ≤ 60/h | | | | | | | | | | | | |
| 5 s | 450 A | 550 A | 800 A | 1100 A | 1500 A | 2000 A | 2500 A | 2000 A | 2400 A | 3750 A | 5000 A | |
| 10 s | 330 A | 450 A | 620 A | 860 A | 1250 A | 1800 A | 2300 A | 1600 A | 2200 A | 3400 A | 4500 A | |
| 30 s | 220 A | 300 A | 400 A | 550 A | 750 A | 1200 A | 1500 A | 1000 A | 1500 A | 2200 A | 3000 A | |
| Intermediate contactor: with number of operating cycles ≤ 150/h for LC1F and 120/h for LC1B | | | | | | | | | | | | |
| 5 s | 300 A | 420 A | 580 A | 820 A | 1150 A | 1650 A | 2200 A | 1500 A | 2100 A | 3200 A | 4200 A | |
| 10 s | 250 A | 350 A | 430 A | 600 A | 850 A | 1300 A | 1600 A | 1100 A | 1600 A | 2300 A | 3200 A | |
| Rotor short-circuit contactor and intermediate contactor: with number of operating cycles > 150/h for LC1F and 120/h for LC1B | | | | | | | | | | | | |
| - | 200 A | 270 A | 350 A | 500 A | 700 A | 1000 A | 1600 A | 800 A | 1250 A | 2000 A | 2750 A | |

Electrical durability

For automatic starting, the electrical durability is in the region of 1 million operating cycles.

⁽¹⁾ D Green contactors have not been validated for rotor circuits of slip-ring motors.

⁽²⁾ For use up to 3000 V, please consult your Regional Sales Office.

Voltage drop caused by the inrush current

When the operating coil of a contactor is energised, the inrush current produces a voltage drop in the control circuit cable caused by the resistance of the conductors, which can adversely affect closing of the contactor.

An excessive voltage drop in the control supply cables (both a.c. and d.c.) can lead to non closure of the contactor poles or even destruction of the coil due to overheating.

This phenomenon is aggravated by:

- a long line
- a low control circuit voltage
- a cable with a small c.s.a.
- a high inrush power drawn by the coil.

The maximum length of cable, depending on the control voltage, the inrush power and the conductor c.s.a., is indicated in the graphs below.

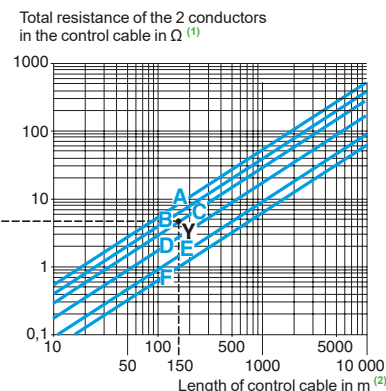
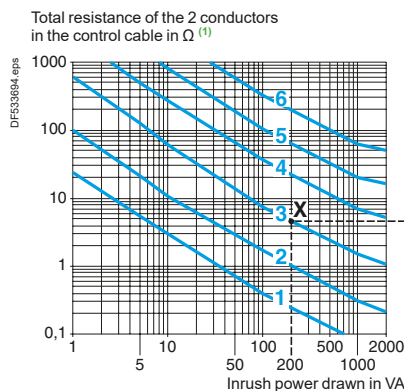
Remedial action

To reduce the voltage drop at switch-on:

- increase the conductor c.s.a.
- use a higher control circuit voltage
- use an intermediate control relay.

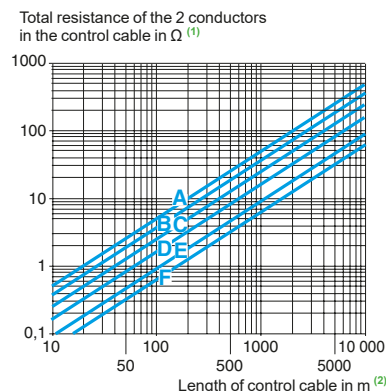
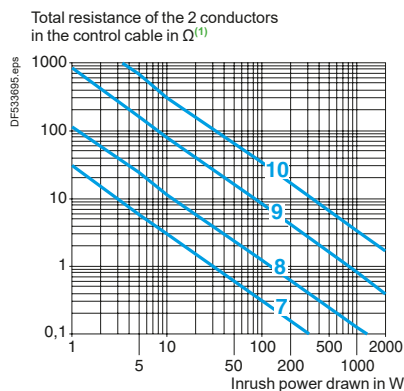
Selection of conductor c.s.a.

These graphs are for a maximum line voltage drop of 5%. They give a direct indication of the copper conductor c.s.a. to be used for the control cable, depending on its length, the inrush power drawn by the contactor coil and the control circuit voltage (see example page A6/65).



1 ~ 24 V 3 ~ 115 V 5 ~ 400 V

C.s.a. of copper cables
 A 0.75 mm² C 1.5 mm² E 4 mm²



2 ~ 48 V 4 ~ 230 V 6 ~ 690 V

B 1 mm² D 2.5 mm² F 6 mm²

7 ~ 24 V 9 ~ 125 V
 8 ~ 48 V 10 ~ 250 V

C.s.a. of copper cables
 A 0.75 mm² C 1.5 mm² E 4 mm²
 B 1 mm² D 2.5 mm² F 6 mm²

(1) For 3-wire control, the current only flows in 2 of the conductors.
 (2) This is the length of the cable comprising 2 or 3 conductors. (Distance between the contactor and the control device).

Voltage drop caused by the inrush current

What cable c.s.a. is required for the control circuit of an LC1 D40A, 115 V contactor, operated from a distance of 150 metres?

- Contactor LC1D40A, voltage 115 V, 50 Hz: inrush power: 200 VA.

On the left-hand graph on the page opposite, point X is at the intersection of the vertical line corresponding to 200 VA and the ~ 115 V voltage curve.

On the right-hand graph on the page opposite, point Y is at the intersection of the vertical line corresponding to 150 m and the horizontal line passing through point X.

Use the conductor c.s.a. indicated by the curve which passes through point Y, i.e.: 1.5 mm².

If point Y lies between two c.s.a. curves, choose the larger of the c.s.a. values.

Calculating the maximum cable length

The maximum permissible length for acceptable line voltage drop is calculated by the formula:

$$L = \frac{U^2}{SA} \cdot s \cdot K$$

where:

- L : distance between the contactor and the control device in m (length of the cable)
- U : supply voltage in V
- SA : apparent inrush power drawn by the coil in VA
- s : conductor c.s.a. in mm²
- K : factor given in the table below.

| a.c. supply | SA in VA | 20 | 40 | 100 | 150 | 200 |
|-------------|--|------|-----|-----|-----|------|
| | K | 1.38 | 1.5 | 1.8 | 2 | 2.15 |
| d.c. supply | Irrespective of the apparent inrush power SA, expressed in W K = 1.38 | | | | | |

Residual current in the coil due to cable capacitance

When the control contact of a contactor is opened, the control cable capacitance is effectively in series with the coil of the electromagnet. This capacitance can cause a residual current to be maintained in the coil, with the risk that the contactor will remain closed.

This only applies to contactors operating on an a.c. supply.

This phenomenon is aggravated by:

- a long line length between the coil control contact and the contactor, or between the coil control contact and the power supply,
- a high control circuit voltage,
- a low coil consumption, sealed,
- a low value of contactor drop-out voltage.

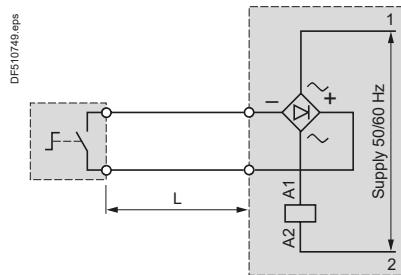
The maximum control cable length, according to the contactor coil supply voltage, is indicated in the graph on the page opposite.

Remedial action

Various solutions can be adopted to avoid the risk of the contactor remaining closed due to cable capacitance:

- use a d.c. control voltage, or
- add a rectifier, connected as shown in the scheme below, but retaining an a.c. operating coil: in this way, rectified a.c. current flows in the control cable.

When calculating the maximum cable length, take the resistance of the conductors into account.



- Connect a resistor in parallel with the contactor coil ⁽¹⁾.

Value of the resistance:

$$R \Omega = \frac{1}{10^{-3} C (\mu F)} \quad (C \text{ capacitance of the control cable})$$

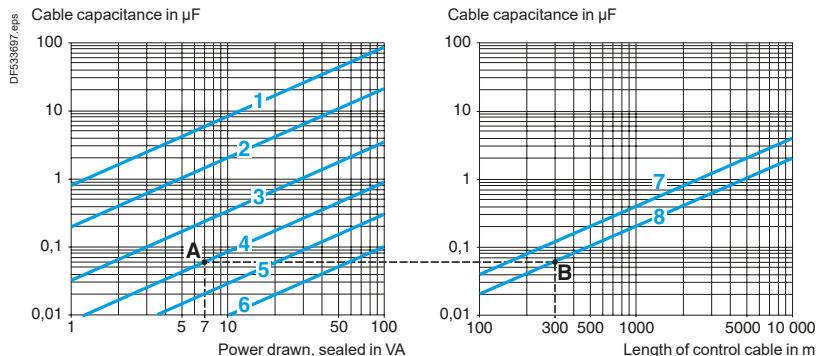
Power to be dissipated:

$$PW = \frac{U^2}{R}$$

⁽¹⁾ To avoid increasing the voltage drop due to inrush current, this resistor must be brought into operation after the contactor has closed by using an N/O contact.

Residual current in the coil due to cable capacitance

These graphs are for a capacitance, between 2 conductors, of 0.2 µF/km. They make it possible to determine whether there is a risk of the contactor remaining closed due to the power drawn by the coil when sealed, as well as the control circuit voltage, according to the length of the control cable.



| | | | |
|----------|-----------|-----------|------------------|
| 1 ~ 24 V | 3 ~ 115 V | 5 ~ 400 V | 7 3-wire control |
| 2 ~ 48 V | 4 ~ 230 V | 6 ~ 690 V | 8 2-wire control |

In the zones below the straight lines for 3-wire and 2-wire control respectively, there is a risk of the contactor remaining closed.

Examples

What is the maximum length for the control cable of an LC1D12 contactor, operating on 230 V, with 2-wire control?

- Contactor LC1D12, voltage 230 V, 50 Hz: power sealed 7 VA.

On the left-hand graph, point A is at the intersection of the vertical line for 7 VA with the ~ 230 V voltage curve.

On the right-hand graph, point B is at the intersection of the horizontal line with the 2-wire control curve.

The maximum cable length is therefore 300 m.

In the same example, with a 600 m cable, the point lies in the risk zone. A resistor must therefore be connected in parallel with the contactor coil.

$$R = \frac{1}{10^{-3} \cdot C} = \frac{1}{10^{-3} \cdot 0.12} = 8.3 \Omega$$

Value of this resistance:

$$P = \frac{U^2}{R} = \frac{(220)^2}{8300} = 6 \text{ W}$$

Power to be dissipated:

Alternative solution: use a d.c. control supply.

Calculating the cable length

The maximum permitted length of control cable to avoid the effects of capacitance is calculated using the formula:

$$L = 455 \cdot \frac{S}{U^2 \cdot C_0}$$

L : distance between the contactor and the control device in km (length of the cable),

S : apparent power, sealed, in VA,

U : control voltage in V,

C₀ : line capacitance of the cable in µF/km.

Technical information

Current of asynchronous squirrel cage motors at nominal load

General - Coordination and standards

| 3-phase 4-pole motors | | | | | Current values for power in hp | | | | | | | |
|--|---|-------|-------|-------|--|---|-------|-------|-------------|-------------|-------------|-------------|
| Current values for power in kW | | | | | Current values for power in hp | | | | | | | |
| Rated operational power ⁽¹⁾ | Indicative rated operational current values at: | | | | Rated operational power ⁽²⁾ | Indicative rated operational current values at: | | | | | | |
| | 230 V | 400 V | 500 V | 690 V | | 110 - 120 V | 200 V | 208 V | 220 - 240 V | 380 - 415 V | 440 - 480 V | 550 - 600 V |
| kW | A | | | | hp | A | | | | | | |
| 0.06 | 0.35 | 0.2 | 0.16 | 0.12 | 1/2 | 4.4 | 2.5 | 2.4 | 2.2 | 1.3 | 1.1 | 0.9 |
| 0.09 | 0.52 | 0.3 | 0.24 | 0.17 | 3/4 | 6.4 | 3.7 | 3.5 | 3.2 | 1.8 | 1.6 | 1.3 |
| 0.12 | 0.7 | 0.44 | 0.32 | 0.23 | 1 | 8.4 | 4.8 | 4.6 | 4.2 | 2.3 | 2.1 | 1.7 |
| 0.18 | 1 | 0.6 | 0.48 | 0.35 | 1 1/2 | 12 | 6.9 | 6.6 | 6 | 3.3 | 3 | 2.4 |
| 0.25 | 1.5 | 0.85 | 0.68 | 0.49 | 2 | 13.6 | 7.8 | 7.5 | 6.8 | 4.3 | 3.4 | 2.7 |
| 0.37 | 1.9 | 1.1 | 0.88 | 0.64 | 3 | 19.2 | 11 | 10.6 | 9.6 | 6.1 | 4.8 | 3.9 |
| 0.55 | 2.6 | 1.5 | 1.2 | 0.87 | 5 | 30.4 | 17.5 | 16.7 | 15.2 | 9.7 | 7.6 | 6.1 |
| 0.75 | 3.3 | 1.9 | 1.5 | 1.1 | 7 1/2 | 44 | 25.3 | 24.2 | 22 | 14 | 11 | 9 |
| 1.1 | 4.7 | 2.7 | 2.2 | 1.6 | 10 | 56 | 32.2 | 30.8 | 28 | 18 | 14 | 11 |
| 1.5 | 6.3 | 3.6 | 2.9 | 2.1 | 15 | 84 | 48.3 | 46.2 | 42 | 27 | 21 | 17 |
| 2.2 | 8.5 | 4.9 | 3.9 | 2.8 | 20 | 108 | 62.1 | 59.4 | 54 | 34 | 27 | 22 |
| 3 | 11.3 | 6.5 | 5.2 | 3.8 | 25 | 136 | 78.2 | 74.8 | 68 | 44 | 34 | 27 |
| 4 | 15 | 8.5 | 6.8 | 4.9 | 30 | 160 | 92 | 88 | 80 | 51 | 40 | 32 |
| 5.5 | 20 | 11.5 | 9.2 | 6.7 | 40 | 208 | 120 | 114 | 104 | 66 | 52 | 41 |
| 7.5 | 27 | 15.5 | 12.4 | 8.9 | 50 | 260 | 150 | 143 | 130 | 83 | 65 | 52 |
| 11 | 38 | 22 | 17.6 | 12.8 | 60 | - | 177 | 169 | 154 | 103 | 77 | 62 |
| 15 | 51 | 29 | 23 | 17 | 75 | - | 221 | 211 | 192 | 128 | 96 | 77 |
| 18.5 | 61 | 35 | 28 | 21 | 100 | - | 285 | 273 | 248 | 165 | 124 | 99 |
| 22 | 72 | 41 | 33 | 24 | 125 | - | 359 | 343 | 312 | 208 | 156 | 125 |
| 30 | 96 | 55 | 44 | 32 | 150 | - | 414 | 396 | 360 | 240 | 180 | 144 |
| 37 | 115 | 66 | 53 | 39 | 200 | - | 552 | 528 | 480 | 320 | 240 | 192 |
| 45 | 140 | 80 | 64 | 47 | 250 | - | - | - | 604 | 403 | 302 | 242 |
| 55 | 169 | 97 | 78 | 57 | 300 | - | - | - | 722 | 482 | 361 | 289 |
| 75 | 230 | 132 | 106 | 77 | 350 | - | - | - | 828 | 560 | 414 | 336 |
| 90 | 278 | 160 | 128 | 93 | 400 | - | - | - | 954 | 636 | 477 | 382 |
| 110 | 340 | 195 | 156 | 113 | 450 | - | - | - | 1030 | - | 515 | 412 |
| 132 | 400 | 230 | 184 | 134 | 500 | - | - | - | 1180 | 786 | 590 | 472 |
| 160 | 487 | 280 | 224 | 162 | | | | | | | | |
| 200 | 609 | 350 | 280 | 203 | | | | | | | | |
| 250 | 748 | 430 | 344 | 250 | | | | | | | | |
| 315 | 940 | 540 | 432 | 313 | | | | | | | | |
| 355 | 1061 | 610 | 488 | 354 | | | | | | | | |
| 400 | 1200 | 690 | 552 | 400 | | | | | | | | |
| 500 | 1478 | 850 | 680 | 493 | | | | | | | | |
| 560 | 1652 | 950 | 760 | 551 | | | | | | | | |
| 630 | 1844 | 1060 | 848 | 615 | | | | | | | | |
| 710 | 2070 | 1190 | 952 | 690 | | | | | | | | |
| 800 | 2340 | 1346 | 1076 | 780 | | | | | | | | |
| 900 | 2640 | 1518 | 1214 | 880 | | | | | | | | |
| 1000 | 2910 | 1673 | 1339 | 970 | | | | | | | | |

(1) Values conforming to standard IEC 60072-1 (at 50 Hz).

(2) Values conforming to standard UL 508 (at 60 Hz).

Note: These values are given as a guide. They may vary depending on the type of motor, its polarity and the manufacturer.

Standardisation

Conformity to standards

Schneider Electric products satisfy, in the majority of cases, national (for example: BS in Great Britain, NF in France, DIN in Germany), European (for example: CENELEC) or international (IEC) standards. These product standards precisely define the performance of the designated products (such as IEC 60947 series for low voltage equipment).

When used correctly, as designated by the manufacturer and in accordance with regulations and correct practices, these products will allow users to build equipment, machine systems or installations that conform to their appropriate standards (for example: IEC 60204-1, relating to electrical equipment used on industrial machines).

Schneider Electric is able to provide proof of conformity of its production to the standards it has chosen to comply with, through its quality assurance system.

On request, and depending on the situation, Schneider Electric can provide the following:

- a declaration of conformity,
- a certificate of conformity (CB certificate, Asefa/Lovag),
- a homologation certificate or approval, in the countries where this procedure is required or for particular specifications, such as those existing in the merchant navy.

| Standard | Certification authority | | Country |
|------------------|--|----------------------|-----------------------------|
| | Name | Regulation authority | |
| ANSI | American National Standards Institute | ANSI | USA |
| BS | British Standards Institution | BSI | Great Britain |
| CEI | Comitato Elettrotecnico Italiano | CEI | Italy |
| DIN/VDE | Verband Deutscher Electrotechniker | VDE | Germany |
| EN | Comité Européen de Normalisation Electrotechnique | CENELEC | Europe |
| TR Regulation | Eurasian Customs Union | EAC | Russia, Belarus, Kazakhstan |
| IEC | International Electrotechnical Commission | IEC | Worldwide |
| JIS | Japanese Industrial Standards Committee | JISC | Japan |
| NBN | Institut Belge de Normalisation | IBN | Belgium |
| NEN | Nederlands Normalisatie Instituut | NNI | Netherlands |
| NF | Union Technique de l'Electricité | UTE | France |
| SAA | Standards Association of Australia | SAA | Australia |
| UNE | Asociacion Española de Normalizacion y Certificacion | AENOR | Spain |

European EN standards

These are technical specifications established in conjunction with, and with approval of, the relative bodies within the various CENELEC member countries (European Union, European Free Trade Association and many central and eastern European countries having «member» or «affiliated» status). Prepared in accordance with the principle of consensus, the European standards are the result of a weighted majority vote. Such adopted standards are then integrated into the national collection of standards, and contradictory national standards are withdrawn.

European standards incorporated within the French collection of standards carry the prefix NF EN. At the 'Union Technique de l'Electricité' (*Technical Union of Electricity*) (UTE), the French version of a corresponding European standard carries a dual number: European reference (NF EN ...) and classification index (C ...).

Therefore, the standard NF EN 60947-4-1 relating to motor contactors and starters, effectively constitutes the French version of the European standard EN 60947-4-1 and carries the UTE classification C 63-110.

This standard is identical to the British standard BS EN 60947-4-1 or the German standard DIN EN 60947-4-1.

Whenever reasonably practical, European standards reflect the international standards (IEC). With regard to automation system components and distribution equipment, in addition to complying with the requirements of French NF standards, Schneider Electric brand components conform to the standards of all other major industrial countries.

Regulations

European Directives

Opening up of European markets assumes harmonisation of the regulations pertaining to each of the member countries of the European Union.

The purpose of the European Directive is to eliminate obstacles hindering the free circulation of goods within the European Union, and it must be applied in all member countries. Member countries are obliged to transcribe each Directive into their national legislation and to simultaneously withdraw any contradictory regulations. The Directives, in particular those of a technical nature which concern us, only establish the objectives to be achieved, referred to as "essential requirements".

The manufacturer must take all the necessary measures to ensure that his products conform to the requirements of each Directive applicable to his production.

As a general rule, the manufacturer certifies conformity to the essential requirements of the Directive(s) for his product by affixing the CE marking.

The CE marking is affixed to Schneider Electric brand products concerned, in order to confirm compliance with French and European regulations.

Significance of the CE marking

- The CE marking affixed to a product signifies that the manufacturer declares that the product conforms to the relevant European Directive(s) which concern it; this condition must be met to allow free distribution and circulation within the countries of the European Union of any product subject to one or more of the E.U. Directives.
- The CE marking is intended solely for national market control authorities.
- The CE marking must not be confused with a conformity mark.

European Directives

For electrical equipment, only conformity to standards signifies that the product is suitable for its designated function, and only the guarantee of an established manufacturer can provide a high level of quality assurance.

For Schneider Electric brand products, one or several Directives are likely to be applicable, depending on the product, and in particular:

- the Low Voltage Directive 2014/35/EU: the CE marking relating to this Directive has been compulsory since April 2016.
- the Electromagnetic Compatibility Directive 2014/30/EU: the CE marking on products covered by this Directive has been compulsory since April 2016.

CB certificate, Asefa/Lovag certificate

- CB certification is issued according to IEC standards in respect to a multilateral agreement between almost industrial countries called CB scheme. It allows international certification of electrical and electronic products so that a single certification facilitates a worldwide market access.
- The function of ASEFA (Association des Stations d'Essais Française d'Appareils électriques - Association of French Testing Stations for Low Voltage Industrial Electrical Equipment) is to carry out tests of conformity to standards and to issue certificates of conformity and test reports. ASEFA laboratories are authorised by the French authorisation committee (COFRAC). ASEFA is now a member of the European agreement group LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognised by all the authorities which are members of the group and carry the same validity as those issued by any of the member authorities.

Quality labels

When components can be used in domestic and similar applications, it is sometimes recommended that a "Quality label" be obtained, which is a form of certification of conformity.

| Code | Quality label | Country |
|-----------|---|-------------|
| CEBEC | Comité Electrotechnique Belge | Belgium |
| KEMA-KEUR | Keuring van Electrotechnische Materialen | Netherlands |
| NF | Union Technique de l'Electricité | France |
| ÖVE | Österreichischer Verband für Electrotechnik | Austria |
| SEMKO | Svenska Elektriska Materiel Kontrollnatanalen | Sweden |

Product certifications

In some countries, the certification of certain electrical components is a legal requirement. In this case, a certificate of conformity to the standard is issued by the official test authority.

Each certified device must bear the relevant certification symbols when these are mandatory:

| Code | Certification authority | Country |
|------|--------------------------------|---------|
| CSA | Canadian Standards Association | Canada |
| UL | Underwriters Laboratories | USA |
| CCC | China Compulsory Certification | China |

Note on certifications issued by the Underwriters Laboratories (UL). There are two levels of approval:

- "Recognized" (UL)** The component is fully approved for inclusion in equipment built in a workshop, where the operating limits are known by the equipment manufacturer and where its use within such limits is acceptable by the Underwriters Laboratories.
The component is not approved as a "Product for general use" because its manufacturing characteristics are incomplete or its application possibilities are limited.
A "Recognized" component does not necessarily carry the certification symbol.
- "Listed" (UL)** The component conforms to all the requirements of the classification applicable to it and may therefore be used both as a "Product for general use" and as a component in assembled equipment. A "Listed" component must carry the certification.

Marine classification societies

Prior recognition by certain marine classification societies is generally required for electrical equipment which is intended for use on board merchant vessels.

Europe community has emitted regulation No. 391/2009 for common rules for Type approval of Marine equipment.

MR TA Mutual Recognition Type Approval is a certificate that is mutually recognized by all 12 classification societies from the **EU RO MR group** (European Recognized Organizations). Renewal of marine certifications, or new products certification is now covered by EU-MR (Mutual Recognition) process and therefore removes the need for multiple marine certifications. Current EU RO members include all major societies like DNV-GL, BV, ABS, LR as well as non-European societies like CCS, KR, NK, RMRS, etc.

| Rules | Classification authority | Country |
|--------|---|--------------------------|
| ABS | American Bureau of Shipping | Unites States of America |
| KRoS | Korean register of Shipping | South Korea |
| BV | Bureau Veritas | France |
| DNV-GL | Det Norske Veritas - Germanischer Lloyd | Norway - Germany |
| LRoS | Lloyd's Register of Shipping | Great Britain |
| NKK | Nippon Kaiji Kyokai | Japan |
| RINA | Registro Italiano Navale | Italy |
| RMRoS | Russian Maritime Register of Shipping | Russia |
| CCS | China Classification Society | Republic of China |

Note: for further details on a specific product, please refer to the "Characteristics" pages in this catalogue or consult your Regional Sales Office.

Technical information

Degrees of protection provided by enclosures IP code

Introduction - Coordination and standards

Degrees of protection against the penetration of solid bodies, water and personnel access to live parts

The European standard EN 60529 dated October 1991, IEC publication 529 (2nd edition - November 1989), defines a coding system (IP code) for indicating the degree of protection provided by electrical equipment enclosures against accidental direct contact with live parts and against the ingress of solid foreign objects or water. This standard does not apply to protection against the risk of explosion or conditions such as humidity, corrosive gasses, fungi or vermin.

Certain equipment is designed to be mounted on an enclosure which will contribute towards achieving the required degree of protection (example : control devices mounted on an enclosure).

Different parts of an equipment can have different degrees of protection (example : enclosure with an opening in the base).

Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.

Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IP ●●● code

The IP code comprises **2 characteristic numerals** (e.g. **IP 55**) and may include **an additional letter** when the actual protection of personnel against direct contact with live parts is better than that indicated by the first numeral (e.g. IP 20C). Any characteristic numeral which is unspecified is replaced by an X (e.g. IP XXB).

| 1 st characteristic numeral | | 2 nd characteristic numeral | | Additional letter | |
|---|--|---|---------------------|--|----------------------------|
| corresponds to protection of the equipment against penetration of solid objects and protection of personnel against direct contact with live parts. | | corresponds to protection of the equipment against penetration of water with harmful effects. | | corresponds to protection of personnel against direct contact with live parts. | |
| Protection of the equipment | Protection of personnel | | | | |
| 0 Non-protected | Non-protected | 0 Non-protected | | A | With the back of the hand. |
| 1 Ø 50 mm | Protected against the penetration of solid objects having a diameter greater than or equal to 50 mm. | Protected against direct contact with the back of the hand (accidental contacts). | 1 | B | With the finger. |
| 2 Ø 12,5 mm | Protected against the penetration of solid objects having a diameter greater than or equal to 12.5 mm. | Protected against direct finger contact. | 2 15° | C | With a Ø2.5 mm tool. |
| 3 Ø 2,5 mm | Protected against the penetration of solid objects having a diameter greater than or equal to 2.5 mm. | Protected against direct contact with a Ø2.5 mm tool. | 3 60° | D | With a Ø1 mm wire. |
| 4 Ø 1 mm | Protected against the penetration of solid objects having a diameter greater than or equal to 1 mm. | Protected against direct contact with a Ø1 mm wire. | 4 | | |
| 5 | Dust protected (no harmful deposits). | Protected against direct contact with a Ø1 mm wire. | 5 | | |
| 6 | Dust tight. | Protected against direct contact with a Ø1 mm wire. | 6 | | |
| | | | 7 | | |
| | | | 8 | | |

Technical information

Degrees of protection provided by enclosures IK code

Introduction - Coordination and standards

Degrees of protection against mechanical impact

The European standard EN 50102 dated March 1995 defines a coding system (IK code) for indicating the degree of protection provided by electrical equipment enclosures against external mechanical impact.

Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.

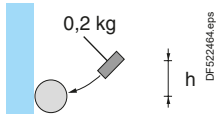
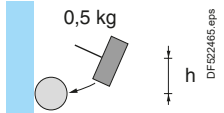
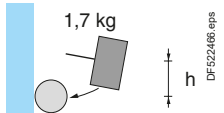
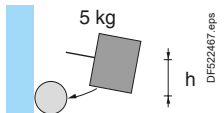
Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IK ●● code

The IK code comprises **2 characteristic numerals** (e.g. **IK 05**).

2 characteristic numerals

corresponding to a value of impact energy.

| | | h (cm) | Energy (J) |
|-----------|---|--------|------------|
| 00 | Non-protected | | |
| 01 |  | 7.5 | 0.15 |
| 02 | | 10 | 0.2 |
| 03 | | 17.5 | 0.35 |
| 04 | | 25 | 0.5 |
| 05 | | 35 | 0.7 |
| 06 |  | 20 | 1 |
| 07 | | 40 | 2 |
| 08 |  | 30 | 5 |
| 09 |  | 20 | 10 |
| 10 | | 40 | 20 |

Part B

COMPONENTS FOR CONVENTIONAL SOLUTIONS

Linergy BZ, HK Busbar systems

Up to 630 A



B1/1

Power
busbar
systems

GV, LAD, U

Wiring systems for motor
starters



B2/1

Wiring
systems

TeSys Control

Switch-disconnectors

Up to 175 A



B3/1

Switch-
disconnectors

TeSys Power

Fuse carriers

Up to 125 A



B4/1

Fuse
carriers

TeSys Power

Switch-disconnector fuses

Up to 1250 A



B5/1

Switch-
disconnector
fuses

TeSys Power

Deca, Giga and Modular
Motor circuit breakers

Up to 250 kW



B6/1

Motor
circuit
breakers

TeSys Control

SK, K, Deca Control relays



B7/1

Control
relays

TeSys Control

SK, K, SKGC, Deca, Modular
and other Contactors

Up to 200 A



B8/1

Contactors

TeSys Control

F High power contactors

Up to 2100 A



B9/1

High power
contactors

TeSys Control

B Bar mounted contactors

Up to 16300 A



B10/1

Bar
mounted
contactors

TeSys Protect

LRK, Deca, F Overload relays

Up to 630 A



B11/1

Overload
relays

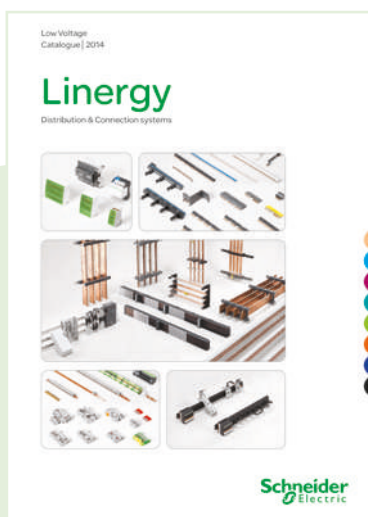
Busbar systems for electrical distribution and motors starters

| Type of product | Range | Pages |
|---|-------------------|-------|
| Introduction Linery BZ | | B1/2 |
| Multistandard power busbar Linery BZ | From 160 to 630 A | B1/4 |
| Introduction Linery HK | | B1/10 |
| Multistandard hot-plug distribution system Linery HK | Up to 160 A | B1/12 |

Power
busbar
systems

Technical Data for Designers

B1/17



All Schneider Electric **distribution and connection systems** are brought together into a single brand name:
Linery

Distribution blocks
Device feeders
Power busbars
Hot plug busbar system
Terminal blocks and bars.

Catalogue reference: **LVED213001EN**

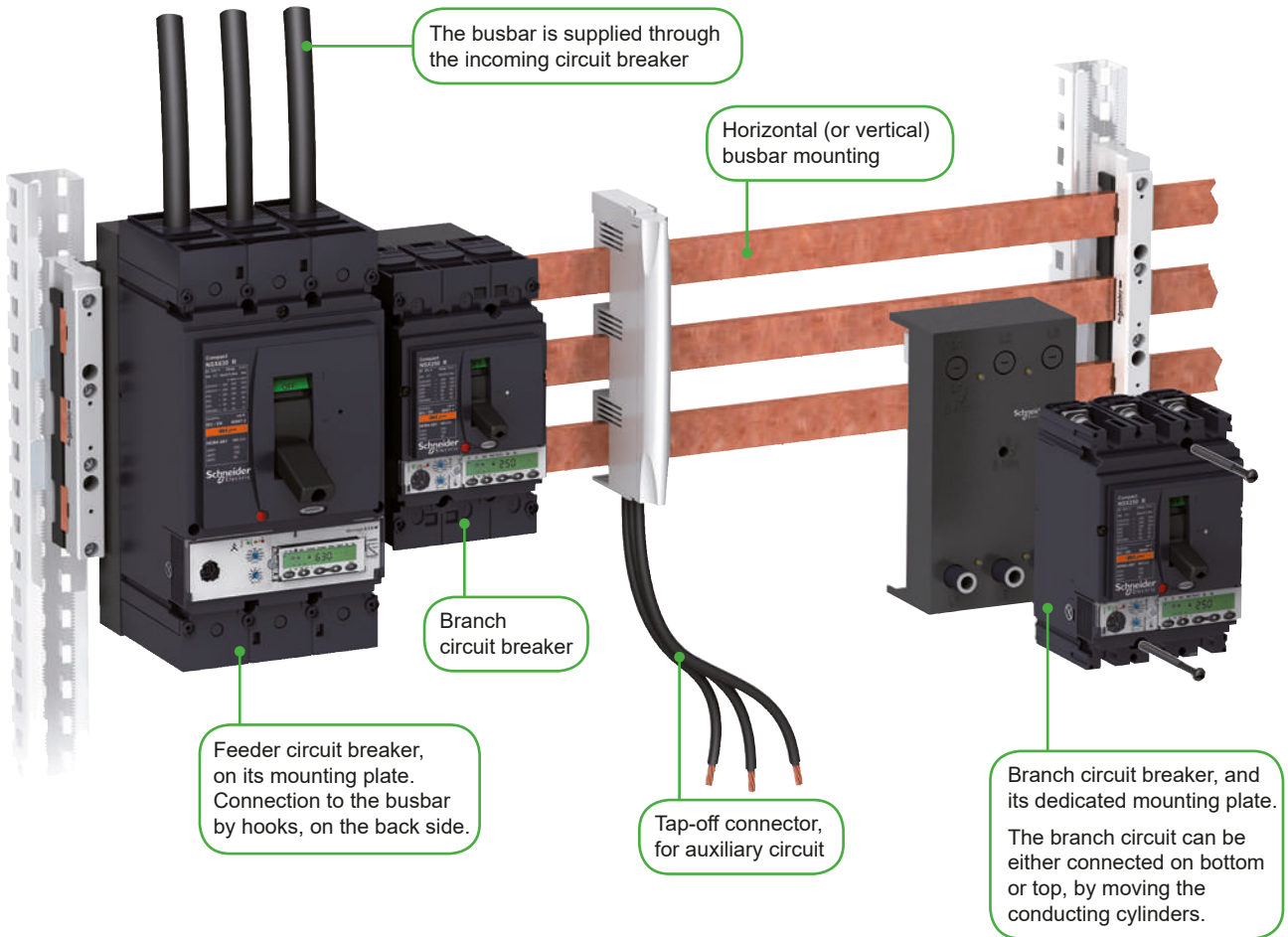
Linergy BZ, HK Busbar systems

Linergy BZ - Electrical distribution up to 630 A

Introduction

In enclosures, when space saving and fast connection are a strong requirement

Power busbar systems



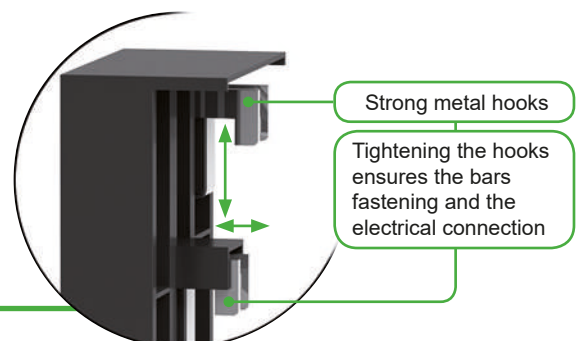
Ideal for industrial process application

Advantages

- Considerable space saving: components are directly mounted on the busbar
- Quick connection, disconnection: a metal hook combines mechanical fastening and electrical connection
- Multi standard: conform to IEC and UL standards

Detailed view: back face of a mounting plate

- Mounting plates, for Compact NSX, Powerpact and GV5 circuit breakers
- Compatible with bars:
 - Height 12, 15, 20, 25 or 30 mm,
 - Width 5 or 10 mm



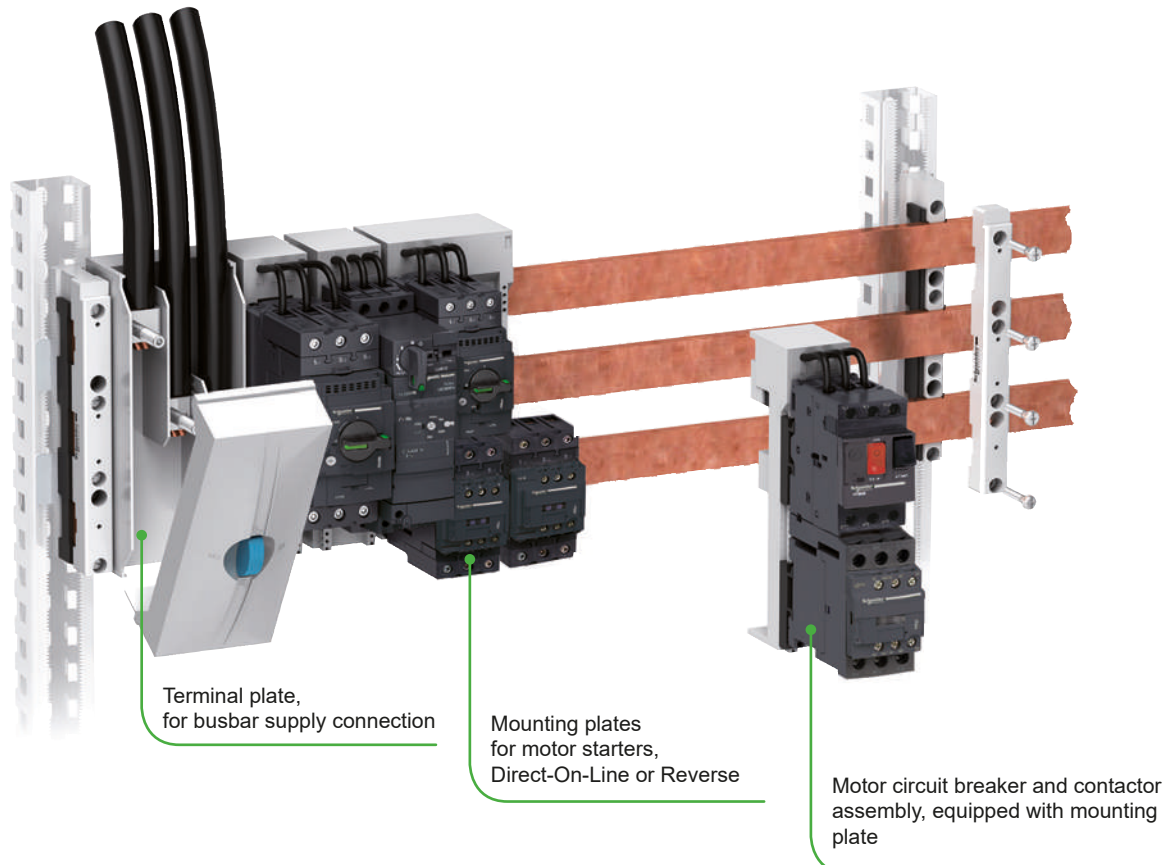
Linergy BZ, HK Busbar systems

Linergy BZ - Electrical distribution to motor starters

Introduction

In control switchboards, when space saving, quick mounting and replacement are required

Power
busbar
systems

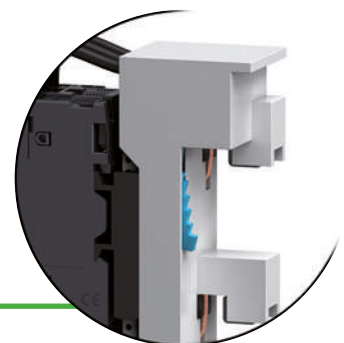


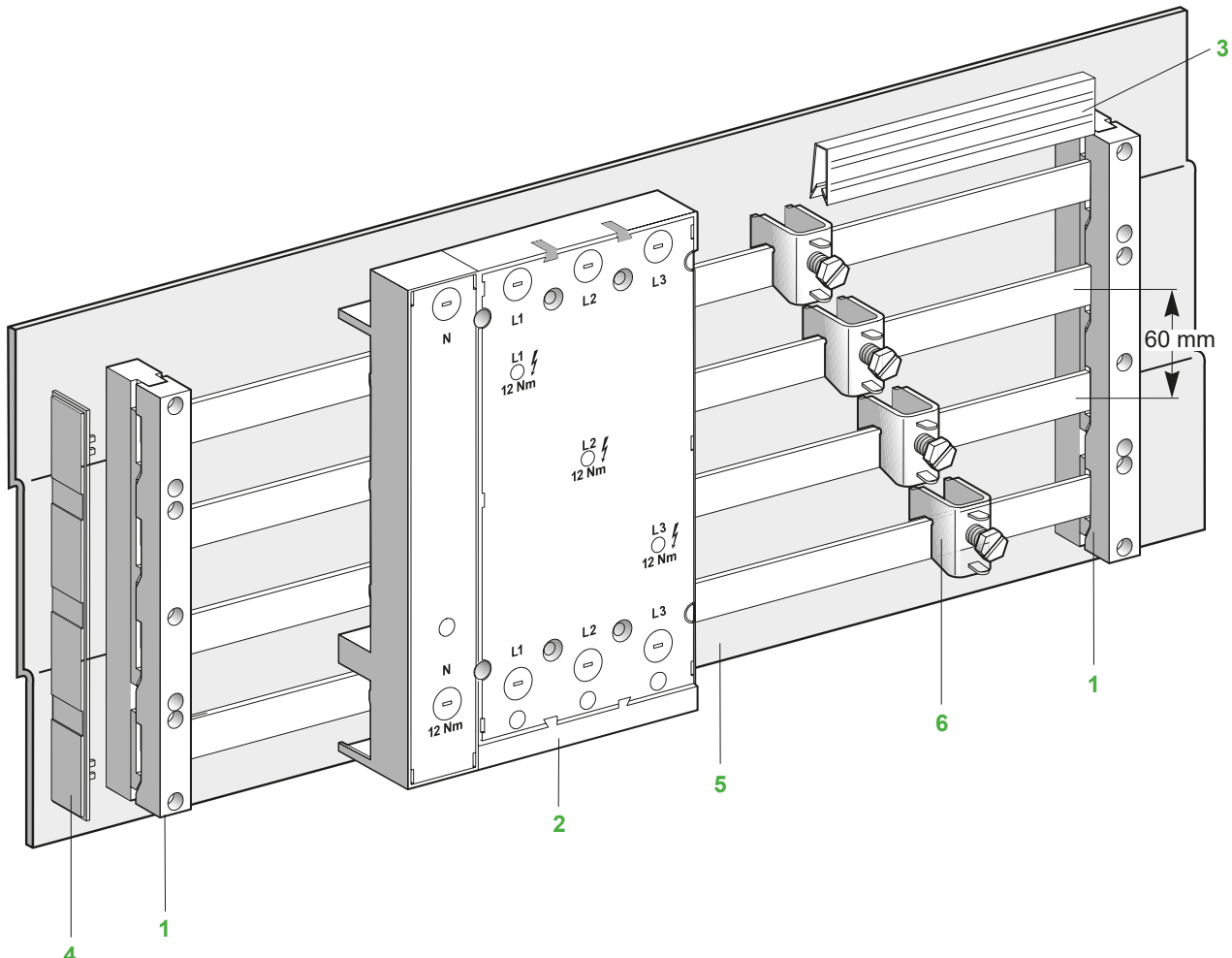
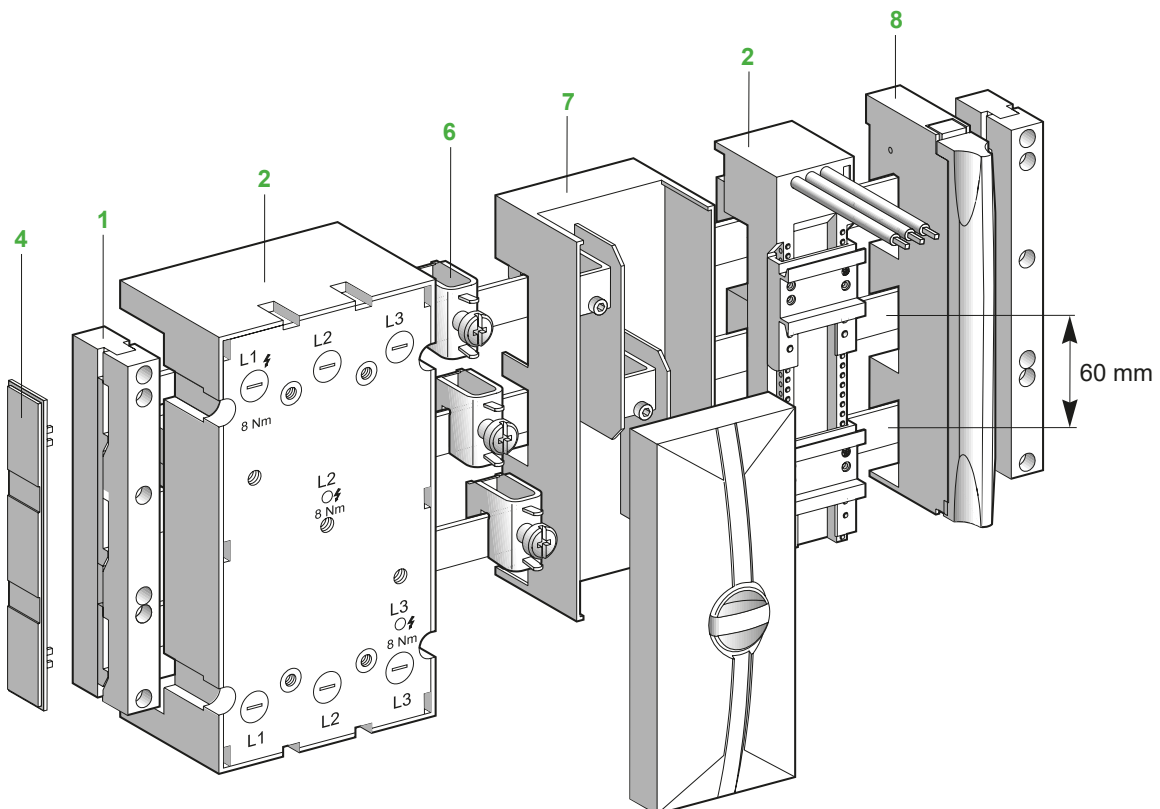
Advantages

- Considerable space saving: components are directly mounted on the busbar
- Large choice of mounting plates (for a Deca Frame 2 (GV2), a Deca Frame 3 (GV3) motor circuit breakers and assemblies, a Deca Frame 5 (GV5) Ultra)
- Quick connection, disconnection (power off): clip-on mounting plates
- Vibration resistant busbar connections: no periodical re-tightening required
- Multi standard: conform to IEC and UL standards

Detailed view: back face of a motor starter mounting plate

- A reliable electrical contact is ensured by copper blades
- The blue part locks the mounting plate on the busbar, compatibility is provided with the standard profiles:
 - Height 12, 15, 20, 25 or 30 mm,
 - Width 5 or 10 mm

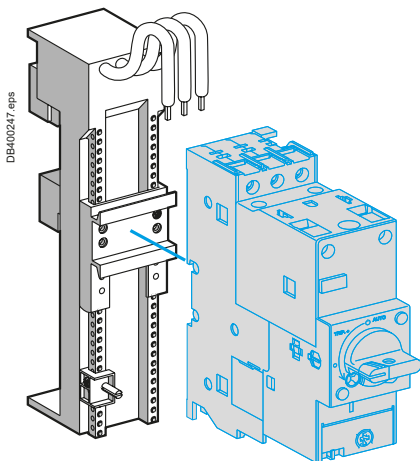
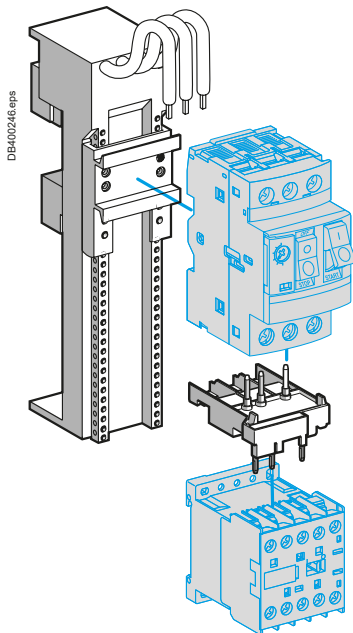




Linergy BZ, HK Busbar systems

Linergy BZ - Mounting plates for motor starters

Introduction



Installation examples.

Description

The mounting plate system for busbars simplifies the installation of motor feeder components used in your electrical installations. Power distribution is performed by a busbar.

The mounting plates are fitted directly on this busbar, by snap-on mounting, thus implementing mechanical and electrical connection.

This system offers numerous benefits:

- space saving in cabinets
- fast, safe and reliable electrical and mechanical connection
- easy connection
- protection for users against electric shocks by direct contacts (IP20) by using busbars end covers
- equipment flexibility and modularity
- increased equipment availability: easier maintenance
- power supply without drilling (connectors) from 1.5 to 120 mm².

Busbars system

The busbar interaxis is 60 mm. Depending on the cross section of the bars, the busbar can withstand a maximum current of 630 A.

Note: The bars forming the busbar are not part of the LA9Z offer. They are not supplied by us. Their selection depends on the maximum current needed for your installation (see next page).

Support for 3P and 4P busbar (1)

These are available in 2 versions: three-pole and four-pole.

For applications having to comply with the UL standard, use the LA9ZX01508 support (3P only).

The mounting plates (2)

These allow mounting of the power feeder components consisting of:

- a Deca Frame 2 (GV2) motor circuit breaker, mounted alone or in conjunction with a TeSys K or Deca contactor
- a Deca Frame 3 (GV3) motor circuit breaker, mounted alone or in conjunction with a Deca contactor
- a Ultra motor starter
- a Deca Frame 5 (GV5) motor circuit breaker
- an Integral motor starter
- a NSX100-250 or NSX400-630 A circuit breaker
- H/J/L PowerPact circuit breaker frame.

Accessories

Accessories complete the offer:

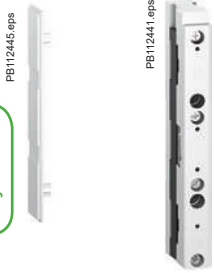
- covers (3) for 5 and 10 mm bars
- end covers (4)
- a base plate (5)
- 1P connectors (6)
- 3P connectors on mounting plate (7)
- a spring terminal 3P connection module (8).

Linergy BZ, HK Busbar systems

Linergy BZ - Busbar supports and accessories

Product references

Power busbar systems



LA9ZX01573 LA9ZX01495



LA9ZX01131 LA9ZX01485



LA9ZX01573 LA9ZX01508



LA9ZX01244

IEC busbar supports and accessories

| | | Min. order qty | Unit reference |
|--------|--|----------------|----------------|
| 3-pole | For 12, 15, 20, 25, 30 x 5/10 mm busbars | 10 | LA9ZX01495 |
| | End covers for 3-pole busbar support | 10 | LA9ZX01573 |
| 4-pole | For 12, 15, 20, 25, 30 x 5/10 mm busbars | 10 | LA9ZX01485 |
| | End covers for 4-pole busbar support (5 left, 5 right) | 10 | LA9ZX01131 |

UL busbar supports and accessories

| | | Min. order qty | Unit reference |
|--------|----------------------------------|----------------|----------------|
| 3-pole | For 12, 20, 30 x 5/10 mm busbars | 10 | LA9ZX01508 |
| | Base plate 240 x 700 | 2 | LA9ZX01515 |
| | End covers for busbar support | 10 | LA9ZX01573 |

Other accessories

| | | Min. order qty | Unit reference |
|--------------------|---------------------------|----------------|----------------|
| Covers, length 1 m | | | |
| | For 12-30 x 5 mm busbars | 10 | LA9ZX01244 |
| | For 12-30 x 10 mm busbars | 10 | LA9ZX01245 |



Linergy BZ, HK Busbar systems

Linergy BZ - Mounting plates

Product references



PB112427_R_1.eps

LA9ZA32627



PB103841_R_1.eps

LV429372



PB103841_R_1.eps

LA9ZA32600



PB112432_R_1.eps

LV432624

For Integral motor starter

| Operating current AC-3 440 V | Protection by contactor-circuit breaker | Mounting plate l x h x d | Min. order qty | Unit reference |
|---------------------------------|--|-----------------------------|----------------------|-------------------|
| 63 A | LD1, LD4LD● | 108 x 260 x 63 | 1 | LA9ZA32627 |

For Deca Frame 5 (GV5), Frame 6 (GV6) motor circuit breakers

| Ratings | Mounting plate l x h x d | Min. order qty | Unit reference |
|---------------|---|----------------------|-------------------|
| 150-220 A GV5 | Mounting plate for 3P circuit breakers | 104 x 190 x 63 | 1 LV429372 |
| | Mounting plate for 4P circuit breakers | 139 x 251 x 63 | 1 LV429373 |
| 320-500 A GV6 | Mounting plate for 3P circuit breakers | 139 x 270 x 63 | 1 LV432623 |
| | Mounting plate for 4P circuit breakers | 184 x 284 x 63 | 1 LV432624 |

For PowerPact 3P circuit breakers

| Ratings | Mounting plate l x h x d | Min. order qty | Unit reference |
|---------------|--|----------------------|-------------------|
| 60-100-150 A | Mounting plate for H frame circuit breakers | 104 x 190 x 63 | 1 LA9ZA32600 |
| 250 A | Mounting plate for J frame circuit breakers | 104 x 190 x 63 | 1 LV429372 |
| 250-400-600 A | Mounting plate for L frame circuit breakers | 139 x 270 x 63 | 1 LV432623 |

Characteristics of busbar mounting plates

| Type of mounting plate | LA9ZA32621 LA9ZA32622 | LA9ZA32427 LA9ZA32428 LA9ZA32434 LA9ZA32623 LA9ZA32442 LA9ZA32443 | LA9ZA32624 LA9ZA32625 LA9ZA32626 LA9ZA32627 | LV429372 LV429373 | LV432623 LV432624 | LA9ZA32600 | |
|---|--------------------------|--|--|----------------------|----------------------|------------|------------|
| Degree of protection as per IEC 60529 | IP | 20 | | | | | |
| Rated insulation voltage | V | 690 | | | | | |
| Permissible current | A | 25 | 32 | 63 | 80-100-250 | 400-630 | 60-100-150 |
| Peak rated current | kA | 50 | 50 ⁽¹⁾ | 50 | 50 | 50 | 50 |
| SCCR (UL) with Compact NSX circuit breaker protection | mm ² | The reinforced breaking capacity due to cascading in circuit breaker combination is maintained | | | | | |
| Conductor cross section (color: black) | mm ² | 4 | 6 | 10 | NA | | |
| | AWG | 12 | 10 | 8 | NA | | |
| Type of conductor insulating material | PVC | 105° | | | NA | | |

(1) 35 kA with LUB12 for LA9ZA32427 and LA9ZA32428.

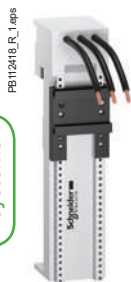


Linergy BZ, HK Busbar systems

Linergy BZ - Mounting plates

Product references

Power busbar systems



LA9ZA32443, LA9ZA32621



LA9ZA32434, LA9ZA32442



LA9ZA32622



LA9ZA32623



LA9ZA32427



LA9ZA32428



LA9ZA32624



LA9ZA32625



LA9ZA32626

For Deca Frame 2 (GV2) motor circuit breakers

| Operating current AC-3 440 V | Protection by motor circuit breaker | For contactor | Mounting plate l x h x d | Min. order qty | Unit reference |
|--|-------------------------------------|----------------------------|--------------------------|----------------|----------------|
| Mounting plate, 1-way | | | | | |
| 25 A | GV2ME GV2P GV2LE | LC1D LC1K LP4K06-K12 | 45 x 200 x 63 | 4 | LA9ZA32621 |
| 32 A | GV2LE | | 63 x 200 x 63 | 4 | LA9ZA32443 |
| Mounting plate, 2-way⁽³⁾ | | | | | |
| 25 A | GV2ME GV2P GV2LE | LC1D LC1K LP4K06-K12 | 90 x 200 x 63 | 2 | LA9ZA32622 |
| 32 A | GV2ME GV2P GV2LE | LC1D | 45 x 200 x 63 | 4 | LA9ZA32434 |
| | | | 54 x 200 x 63 | 4 | LA9ZA32442 |
| | | | 90 x 200 x 63 | 2 | LA9ZA32623 |

Ultra motor starters

| Operating current AC-3 440 V | Protection by power base | Mounting plate l x h x d | Min. order qty | Unit reference |
|------------------------------|--------------------------|--------------------------|----------------|----------------|
| Mounting plate, 1-way | | | | |
| 32 A | LUB12, LUB32 | 45 x 200 x 63 | 4 | LA9ZA32427 |
| Mounting plate, 2-way | | | | |
| 32 A | LUB12, LUB32 | 45 x 260 x 63 | 4 | LA9ZA32428 |

For Deca Frame 3 (GV3) motor circuit breakers

| Operating current AC-3 440 V | Protection by power base | For contactor | Mounting plate l x h x d | Min. order qty | Unit reference |
|--|--------------------------|----------------|--------------------------|----------------|----------------|
| Mounting plate, 1-way⁽¹⁾ | | | | | |
| 63 A | GV3P | – | 54 x 200 x 63 | 4 | LA9ZA32624 |
| | GV3P | LC1D40A...65 A | 54 x 260 x 63 | 4 | LA9ZA32625 |
| Mounting plate, 2-way^{(1) (2)} | | | | | |
| 63 A | GV3P | LC2D40A...65 A | 117 x 260 x 63 | 4 | LA9ZA32626 |

(1) Contactor-circuit breaker combination without additional part.

(2) Use the LAD9R3 kit for the execution of changeover contactors.

(3) Use the LAD9R1 or LAD9R1V kit for the execution of changeover contactors.

Note: the mounting plate rails can be shifted vertically in 1.25 mm increments.

Linergy BZ, HK Busbar systems

Linergy BZ - Accessories

Product references



LA9ZX01285



LA9ZX01287



LA9ZX01413



LA9ZX01243



LA9ZX01563

| Terminals | | | | |
|------------------------------|-------|--------------------------------|--------|----------------|
| | I max | | Set of | Unit reference |
| One-pole for flat bars, 5 mm | 270 A | Capacity 4-35 mm ² | 50 | LA9ZX01285 |
| | 400 A | Capacity 16-70 mm ² | 25 | LA9ZX01287 |
| 3P cover, width 84 mm | | | 10 | LA9ZX01413 |

| Terminals on mounting plate | | | | |
|--|-------|----------------------------------|----------------|----------------|
| | I max | | Min. order qty | Unit reference |
| 3P, on mounting plate + cover, for 12 x 5 to 30 x 10 busbars, width 81 mm | 440 A | Capacity 35-120 mm ² | 1 | LA9ZX01243 |
| 3P, on mounting plate + cover, for 20 x 5 to 30 x 10 busbars, width 135 mm | 560 A | Capacity 120-300 mm ² | 1 | LA9ZX01754 |

| Connection module | | | | |
|--|-------|---------------------------------|----------------|----------------|
| | I max | | Min. order qty | Unit reference |
| 3P, spring terminal connection + cover, for 12 x 5 to 30 x 10 busbars, width 20 mm | 80 A | Capacity 1.5-16 mm ² | 8 | LA9ZX01563 |

| Connection by connectors | | | | | | | | | | | |
|--------------------------|-----------------|------------|------|------------|------|------------------------|------|------------------------|------|------------------------|------|
| | | LA9ZX01285 | | LA9ZX01287 | | LA9ZX01243 | | LA9ZX01563 | | LA9ZX01754 | |
| | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| Flexible wire | mm ² | 4 | 35 | 16 | 70 | 35 | 120 | 1.5 | 16 | 120 | 300 |
| Multi-strand wire | mm ² | 4 | 35 | 16 | 70 | 35 | 120 | 1.5 | 16 | 120 | 300 |
| Rigid wire | mm ² | 4 | 35 | - | - | - | - | 1.5 | 16 | - | - |
| Tightening torque | N.m | ... x 5 | | ... x 5 | | ... x 5-10 | | ... x 5-10 | | ... x 5-10 | |
| Cover | | LA9ZX01413 | | LA9ZX01413 | | Supplied without cover | | Supplied without cover | | Supplied without cover | |

Power busbar systems



Linery BZ, HK Busbar systems

Linery HK - Electrical distribution up to 160 A

Introduction

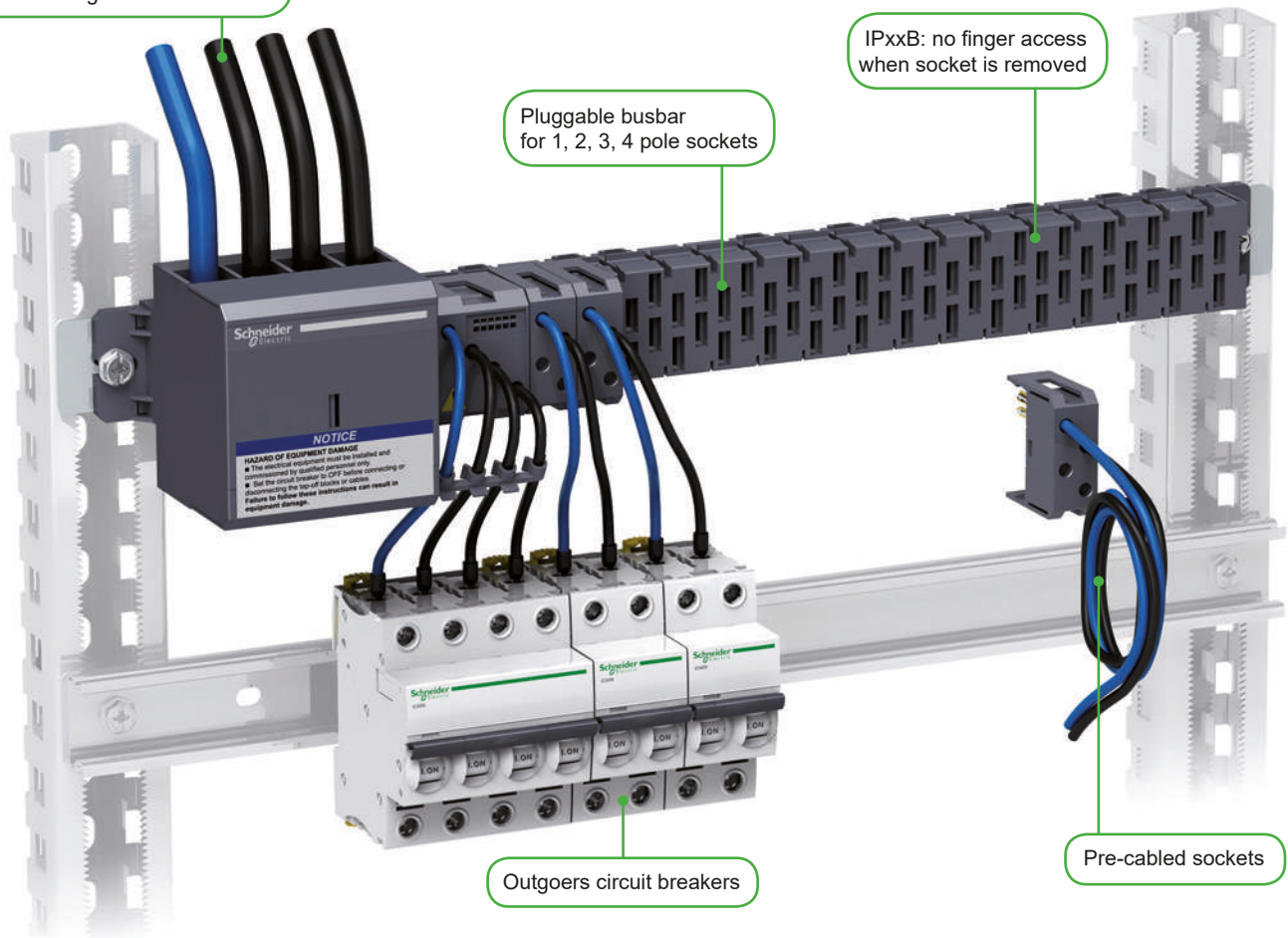
Hot-plug distribution: when continuity of service is required

Power busbar systems

The busbar is supplied through the incoming circuit breaker

IPxxB: no finger access when socket is removed

Pluggable busbar for 1, 2, 3, 4 pole sockets



Outgoers circuit breakers

Pre-cabled sockets

Advantages

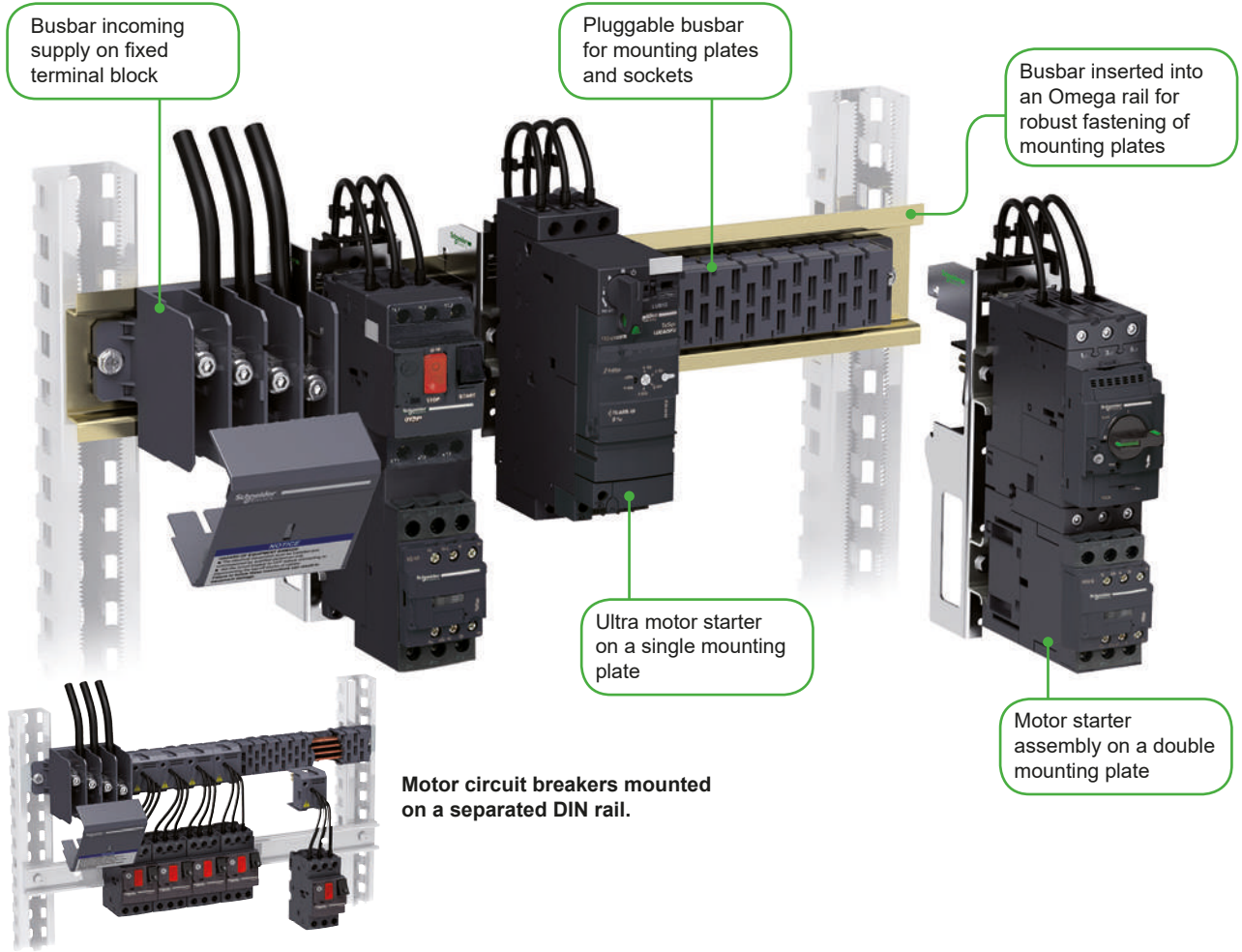
- Considerable time saving: stand alone busbar, fixed to the chassis with 2 screws
- Preserved continuity of service during modification: live connection, disconnection (off load)
- Wide adaptability: 6 busbar lengths from 344 to 1100 mm, 12 models of sockets
- Multi standard: conform to IEC and UL standards

Detailed view: pre cabled socket

- The assembling process and the technological choices ensure a long-lasting reliability
- Each wire is welded on a spring clip providing robustness to the socket and vibration resistant contacts



When compactness and continuity of service are required

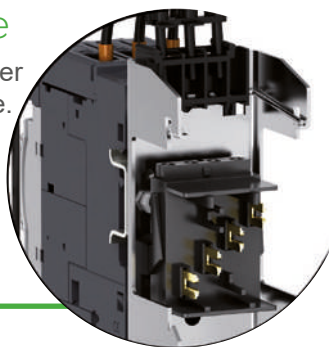


Advantages

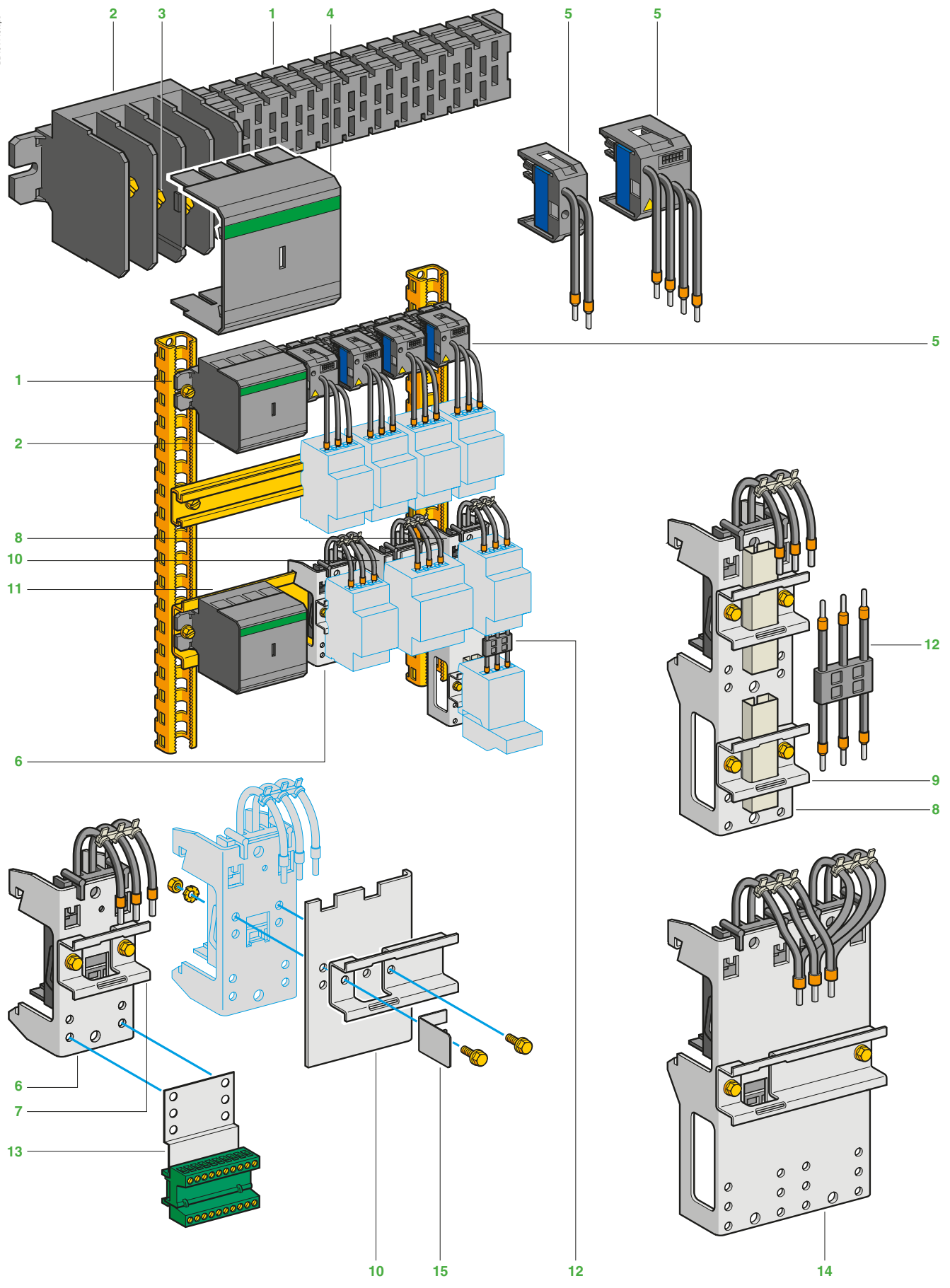
- Space saving in compact enclosures: the total volume is reduced to that of the motor starter assemblies
- Preserved continuity of service during modification and maintenance: live connection, disconnection (off load)
- Wide adaptability: 6 busbar lengths from 344 to 1100 mm, 12 models of sockets, 23 mounting plates for motor starters up to 25 or 50 A
- Multi standard: conform to IEC and UL standards

Detailed view: mounting plate back face

- Thanks to the plug and its pre-cabled wires the motor starter is safely assembled in the workshop, for immediate or later use.
- A piece of DIN profile rail is attached on the front face of the mounting plate for fastening the components.
- The metal mounting plate ensures a rigid and robust fastening on the omega rail.



DB404140 eps



The assembly of automated control and distribution panels requires the use of products that are not only safe but also simple and quick to mount and cable.

The Linergy HK pre-assembled busbar system meets all these criteria by incorporating prefabricated components which cater for 3 principal functions:

Carrying of electric current

By the pre-assembled 4-pole busbar system **1**, 160 A at 35 °C.

4-pole busbars can be used for 3-phase + Neutral or 3-phase + Common.

The busbars are available in 6 lengths: 344, 452, 560, 668, 992, 1100 mm.

An incoming supply terminal block **2** is located at the extreme left of the busbar.

"Knock-out" partitions allow connection of the power supply from above or below to connectors **3** which are protected by a removable cover **4**.

Upstream protection of the busbar is shown on page B1/20.

Current distribution

Tap-off units **5** (factory assembled) are available in 4 versions:

- 2-pole,
- 3-pole,
- 4-pole (3-phase + Neutral),
- 4-pole (3-phase + Common).

The tap-offs clip onto the busbar with instantaneous mechanical and electrical connection to the busbars.

2 ratings are available: 16 and 32 A.

The tap-off units ensure not only rapid mounting, but also a neat appearance for the power distribution system and complete safety when accessing under live circuit conditions.

Component mounting

Component mounting plates with incorporated tap-off allow mounting of and supply of power to components.

They are available in 25 A or 50 A ratings.

These mounting plates clip onto the mounting rail **11**, which also supports the busbar, and at the same time make electrical connection via the incorporated tap-off.

2 types of mounting plate are available:

- single plates **6** (height 105 mm), with bolt-on 35 mm wide rail **7**, which may be bolted on in one of two positions, allowing height adjustment of 10 mm.
- double plates **8** and **14** (height 190 mm), with two bolt-on, 35 mm wide rails **9** mounted on 100 mm fixing centres; each rail may be bolted on in one of 4 positions, allowing height adjustment in 10 mm steps. These plates are supplied with connectors **12** to allow wiring between control and protection devices.

Single mounting plates enable the following types of distribution:

- 2-pole (Ph + N) and (Ph + Ph)
- 3-pole,
- 4-pole (3 Ph + N or 3 Ph + common).

Double mounting plates enable the following types of distribution: 2-pole (Ph + N, Ph + Ph), 3-pole or 4-pole (3Ph+N and 3Ph + common).

Extension plates **10** can be bolted onto single and double mounting plates to enable mounting of wider components. Using a side stop **15** in conjunction with these extension plates also supports the Linergy HK busbar when used vertically.

A control terminal block **13** comprising a support plate bolted onto the single or double mounting plates and a 10-pole plug-in block, enables connection of the control circuit wires (c.s.a. 1.5 mm² max).

Linery BZ, HK Busbar systems

Linery HK

Product references

Power busbar systems

PB112410_Repas



AK5JB1●●

Busbars

The busbars can be screw-mounted onto any type of support. However, if it is to be used in conjunction with component mounting plates incorporating a tap-off, it is essential that it is mounted on the AM1DL201 rail.

When mounting tap-offs, the rated operational current of the busbar should be taken into account: 160 A at 35 °C.

| Number of conductors | Number of tap-offs at 18 mm intervals | Length mm | Suitable for mounting in enclosure width mm | Reference | Weight kg |
|----------------------|---------------------------------------|--------------|--|-----------|--------------|
| 4 ⁽¹⁾ | 12 | 344 | 600 | AK5JB143 | 0.700 |
| | 18 | 452 | 800 | AK5JB144 | 0.900 |
| | 24 | 560 | 800 | AK5JB145 | 1.100 |
| | 30 | 668 | 800 | AK5JB146 | 1.300 |
| | 48 | 992 | 1200 | AK5JB149 | 1.900 |
| | 54 | 1100 | 1200 | AK5JB1410 | 2.100 |

Removable power sockets

| Use | Number of points used on the busbar system | | Thermal current | Cable lengths | Min. order qty | Unit reference |
|------------------------------|--|-------|-----------------|---------------|------------------|----------------|
| | Width | A | A | mm | | |
| Single-phase + Neutral | 1 | 9 mm | 16 | 200 | 6 ⁽²⁾ | AK5PC12 |
| | | | 32 | 1000 | 6 ⁽²⁾ | AK5PC32L |
| 2-phase | 1 | 18 mm | 16 | 200 | 6 ⁽³⁾ | AK5PC12PH |
| | | | 32 | 1000 | 6 ⁽³⁾ | AK5PC32LPH |
| 3-phase | 2 | 18 mm | 16 | 200 | 6 | AK5PC13 |
| | | | 32 | 250 | 6 | AK5PC33 |
| | | | 32 | 1000 | 6 | AK5PC33L |
| 3-phase + Neutral | 2 | 18 mm | 16 | 200 | 6 | AK5PC14 |
| | | | 32 | 250 | 6 | AK5PC34 |
| | | | 32 | 1000 | 6 | AK5PC34L |
| 3-phase + common | 2 | 18 mm | 16 | 200 | 6 | AK5PC131 |
| | | | 10 (common) | 250 | 6 | AK5PC331 |
| | | | 32 | 1000 | 6 | AK5PC331L |

Accessories

| Description | Maximum no. of connections | C.s.a. mm ² | Sold in lots of | Unit reference |
|-------------|----------------------------|------------------------|-----------------|----------------|
| Cable guide | 4 | 2.5 or 4 | 20 | AK5GF1 |

⁽¹⁾ 4-pole: 3-phase + Neutral or 3-phase + Common.

⁽²⁾ Total of 6 sockets supplied: 2 sockets (N + L1), 2 sockets (N + L2), 2 sockets (N + L3).

⁽³⁾ Total of 6 sockets supplied: 2 sockets (L1 + L2), 2 sockets (L1 + L3), 2 sockets (L2 + L3).

⁽⁴⁾ Cut and drill to suit use.

PB112411_Repas



AK5PC12

PB112412_Repas



AK5PC14

PB112405_eps



AK5GF1

Linergy BZ, HK Busbar systems

Linergy HK

Product references

FB112407_Reps



AK5PA241

FB112408_Reps



AK5PA242

FB503054_Reps



AM1DL201

Component mounting plates incorporating tap-off

Single plate (height 105 mm)

| Use | No. of 18 mm points used on the busbar system | Phase | Thermal current A | Number of rails for component support | Min. order qty | Reference |
|------------------------|---|---------|-------------------|---------------------------------------|----------------|--------------|
| Single-phase + neutral | 3 (54 mm width) | Ph1+N | 25 | 1 | 1 | AK5PA211N1 |
| | | Ph2+N | 25 | 1 | 1 | AK5PA211N2 |
| | | Ph3+N | 25 | 1 | 1 | AK5PA211N3 |
| 2-phase | 3 | Ph1+Ph2 | 25 | 1 | 1 | AK5PA211PH12 |
| | | Ph1+Ph3 | 25 | 1 | 1 | AK5PA211PH13 |
| | | Ph2+Ph3 | 25 | 1 | 1 | AK5PA211PH23 |
| 3-phase | 3 | – | 25 | 1 | 1 | AK5PA231 |
| 3-phase + common | 3 | – | 25 | 1 | 1 | AK5PA2311 |
| 3-phase + neutral | 3 | – | 25 | 1 | 1 | AK5PA241 |

Double plate (height 190 mm)

Prefabricated 25 A connectors are supplied for connecting the 2 protection and control devices.

| | | | | | | | |
|------------------------|---|------------------|----------------|----|---|--------------|-----------|
| Single-phase + neutral | 3 | Ph1+N | 25 | 2 | 1 | AK5PA212N1 | |
| | | Ph2+N | 25 | 2 | 1 | AK5PA212N2 | |
| | | Ph3+N | 25 | 2 | 1 | AK5PA212N3 | |
| 2-phase | 3 | Ph1+Ph2 | 25 | 2 | 1 | AK5PA212PH12 | |
| | | Ph1+Ph3 | 25 | 2 | 1 | AK5PA212PH13 | |
| | | Ph2+Ph3 | 25 | 2 | 1 | AK5PA212PH23 | |
| 3-phase | 3 | – | 25 | 2 | 1 | AK5PA232 | |
| | | 6 (108 mm width) | – | 25 | 2 | 1 | AK5PA232S |
| | | | – | 50 | 1 | 1 | AK5PA532 |
| 3-phase + neutral | 3 | – | 25 | 2 | 1 | AK5PA242 | |
| 3-phase + common | 3 | – | 25 (10 common) | 2 | 1 | AK5PA2312 | |
| | | – | 25 (10 common) | 2 | 1 | AK5PA2312S | |
| | | – | 50 (10 common) | 1 | 1 | AK5PA5312 | |
| 3-phase + neutral | 6 | – | 50 | 1 | 1 | AK5PA542 | |

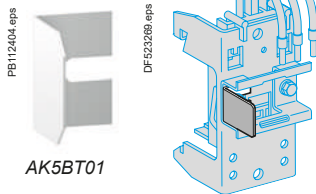
Omega rail, width 75 mm

This rail is designed to accommodate the busbar system when it is used with Linergy HK mounting plates incorporating tap-offs. It supports the busbar system. The plates simply clip onto the rail.

| Material and surface treatment | Depth | Length | Min. order qty | Reference | Weight |
|--------------------------------|-------|---------------------|----------------|-----------|--------|
| | mm | mm | | | kg |
| 2 mm sheet steel | 15 | 2000 ⁽⁴⁾ | 6 | AM1DL201 | 3.000 |

Power busbar systems





Extension plates

These plates bolt onto the equipment support plates, after having removed them from the rails, to be able to mount wider components.

| Use | Number of tap-offs at 18 mm intervals | Reference |
|--|---------------------------------------|-----------|
| For mounting plates incorporating single tap-off | 4 | AK5PE17 |
| For mounting plates incorporating double tap-off | 4 | AK5PE27 |

Side stop (AK5JB mounted vertically)

| Use | Set of | Reference |
|------------------------------------|--------|-----------|
| For extension plate (for AK5PA●●●) | 50 | AK5BT01 |

Control terminal blocks

| Description | Thermal current A | Set of | Reference |
|---|-------------------|--------|-----------|
| 10-pole terminal blocks, for screwing onto plate AK5 PA●●● | | | |
| | 10 | 10 | AK5SB1 |

Accessories

| Description | Marking | Set of | Reference |
|---|---------|--------|----------------------|
| Strips of clip-in markers 10 identical numbers, signs or capital letters per strip | 0...9 | 25 | AB1R● ⁽¹⁾ |
| | + | 25 | AB1R12 |
| | - | 25 | AB1R13 |
| | A...Z | 25 | AB1G● ⁽¹⁾ |

(1) Replace the ● in the selected reference with the number or letter required. Example: AB1R1 or AB1GA.

Note:

■ if the equipment is wider than the mounting plate, an extension plate can be used to increase the width of the support plate.

■ for upstream protection, see page B1/20.

Technical Data for Designers

Contents

Lineryg BZ:

- > characteristics B1/18
- > curves B1/19

Lineryg HK:

- > characteristics B1/20 and B1/21
- > dimensions B1/22 and B1/23

Linery BZ, HK Busbar systems

Linery BZ

Characteristics

Power busbar systems



LA9ZX01495



LA9ZX01485



LA9ZX01508



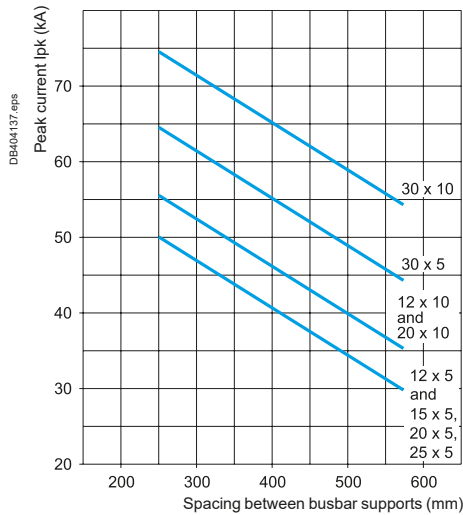
| General characteristics | | | | | | | | | |
|---|----|--|--------|---------|---------|---------|---------|---------|---------|
| | | LA9ZX01495 and LA9ZX01485 (IEC 6.439-1) | | | | | | | |
| Bar dimensions compatibility | mm | 12 x 5 | 15 x 5 | 20 x 5 | 25 x 5 | 30 x 5 | 12 x 10 | 20 x 10 | 30 x 10 |
| Max. rated operating current | A | 200 | 250 | 320 | 400 | 450 | 360 | 520 | 630 |
| Min. peak permissible rated current | kA | 30 | 30 | 30 | 30 | 45 | 35 | 35 | 53 |
| Distance max. between 2 busbars supports | mm | 570 | 570 | 570 | 570 | 570 | 570 | 570 | 570 |
| Degree of protection | IP | 20 (with cover LA9ZX01244 or LA9ZX01245) | | | | | | | |
| Thermal resistance | °C | 125 | | | | | | | |
| Rated current frequency | Hz | 50/60 | | | | | | | |
| Rated insulation voltage | V | 690 | | | | | | | |
| Rated operating voltage | V | 690 | | | | | | | |
| | | LA9ZX01508 (UL) 508 A | | | | | | | |
| Bar dimensions compatibility | mm | 12 x 5 | 20 x 5 | 30 x 5 | 12 x 10 | 20 x 10 | 30 x 10 | | |
| Rated operating current | A | 150 | 362 | 500 | 300 | 564 | 630 | | |
| I _{eff} (RMS) surge current | kA | 18 | 18 | 22 - 25 | 18 | 18 | 22 - 25 | | |
| SCCR (protected by fuses Class J or T ...) | kA | 65 | - | - | 65 | - | - | | |
| 250 A 480 V AC | | 25 | - | - | 25 | - | - | | |
| 250 A 600 V AC | | - | 65 | 65 | - | 65 | 65 | | |
| Compact NSX circuit breaker) | | - | 35 | 35 | - | 35 | 35 | | |
| 400 A 480 V AC | | - | - | 65 | - | - | 65 | | |
| 500 A 480 V AC | | - | - | 35 | - | - | - | | |
| 600 A 600 V AC | | - | - | 50 | - | - | 50 | | |
| 600 A 480 V AC | | - | - | 25 | - | - | 25 | | |
| 600 A 600 V AC | | 100 | 100 | 100 | 100 | 100 | 100 | | |
| 400 A 480 V AC | | - | - | 100 | - | - | 100 | | |
| 500 A 480 V AC | | - | - | 100 | - | - | 100 | | |
| 500 A 600 V AC | | - | - | 100 | - | - | 100 | | |
| Distance max. between 2 busbars supports (busbar protected) | mm | 400 | 800 | 800 | 400 | 800 | 800 | | |
| Degree of protection | IP | 20 (with cover LA9ZX01244 or LA9ZX01245) | | | | | | | |
| Thermal resistance | °C | 125 | | | | | | | |
| Rated current frequency | Hz | 50/60 | | | | | | | |
| Rated operating voltage | V | 600 | | | | | | | |

Linergy BZ, HK Busbar systems

Linergy BZ

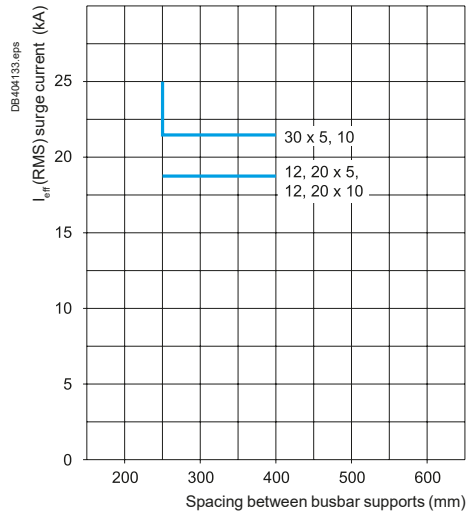
Curves

Determining the spacing between busbar supports (LA9ZX01495 and LA9ZX01485), according to IEC 61439-1 ⁽¹⁾



(1) Depending on the short-circuit current.

Short-circuit strength diagram according to UL845 (LA9ZX01508)

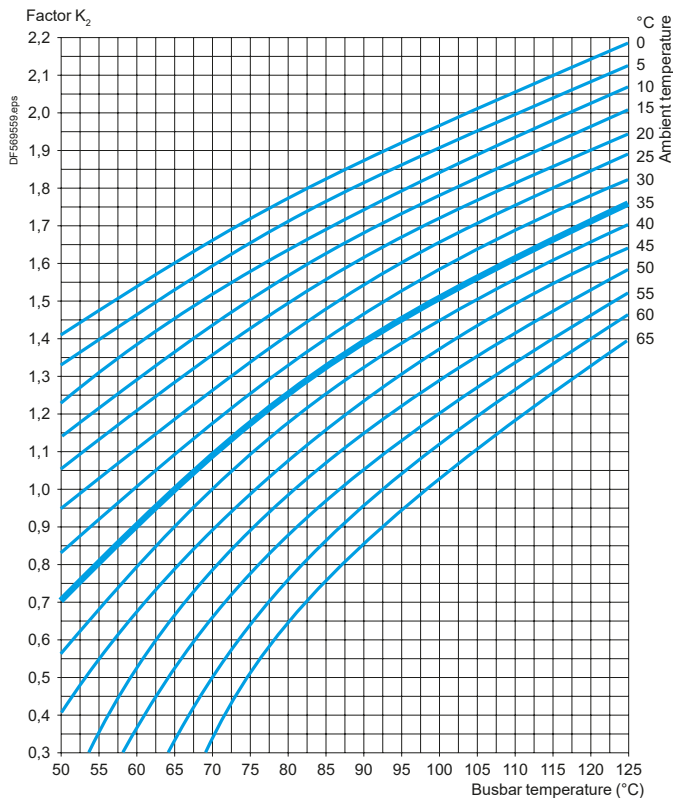


Load resistance of busbar assemblies in IEC applications

For an ambient temperature of 35 °C and a busbar temperature of 65 °C

| Cross section | mm ² | 12 x 5 | 15 x 5 | 20 x 5 | 25 x 5 | 30 x 5 | 12 x 10 | 20 x 10 | 30 x 10 |
|---------------------|-----------------|--------|--------|--------|--------|--------|---------|---------|---------|
| Permissible current | A | 200 | 250 | 320 | 400 | 450 | 360 | 520 | 630 |

In the event of changes in climatic conditions, the following curve indicates the correction factor K_2 to be applied.



Example: In normal operating conditions, a tinned busbar of 30 x 10 can permanently withstand 630 A.

For a load of 800 A, the correction factor K_2 to be applied will be 1.3 ($\frac{800 \text{ A}}{630 \text{ A}}$). As a result, the temperature rise in the busbars will reach 82.5 °C.

Introduction:
page B1/5

References:
pages B1/6 to B1/9

Characteristics:
page B1/18

Lineryg BZ, HK Busbar systems

Lineryg HK

Characteristics

Power busbar systems

i
Ref.
↑↓

| Busbar system characteristics | | | | | | | | |
|---|--|-----------------|------------------------------------|-----------|----------------|------|------|------|
| Conforming to standards | | | IEC 60439 | | | | | |
| Product certifications | | | UL, CSA, DNV, LROS | | | | | |
| Degree of protection | Against access to live parts | | IP XXB conforming to IEC 60529 | | | | | |
| Flame resistance | Conforming to IEC 60695 | °C | 850 (incandescent wire) | | | | | |
| | Conforming to standard UL 94 | | V0 | | | | | |
| Number of conductors | AK5JB14● | | 4 | | | | | |
| Supply current | | | ~ | | | | | |
| Rated operational frequency | | Hz | 50 or 60 | | | | | |
| Rated operational current | Ambient temperature 35 °C | A | 160 | | | | | |
| | Coefficient K to be applied according to the ambient temperature | °C | 35 | 40 | 45 | 50 | 55 | 60 |
| | | K | 1 | 0.96 | 0.92 | 0.88 | 0.83 | 0.78 |
| Rated insulation voltage | Conforming to IEC 60439-1 | V | 690 | | | | | |
| | Conforming to UL and CSA | V | 600 | | | | | |
| Operational voltage | Off-load plugging-in and unplugging, with supply switched on | | | | | | | |
| | Conforming to IEC 60439-1 | V | 400 | | | | | |
| | Conforming to UL, CSA | V | 480 | | | | | |
| | Plugging-in and unplugging, with supply switched off | | | | | | | |
| | Conforming to IEC 60439-1 | V | 690 | | | | | |
| | Conforming to UL, CSA | V | 600 | | | | | |
| Maximum permissible peak current | | kA | 25 | | | | | |
| Maximum let-through energy | | A²s | 1 x 10 ⁷ | | | | | |
| Upstream short-circuit ⁽¹⁾ and overload protection | Type of protection | | Schneider Electric circuit-breaker | | Fuses | | | |
| | | | NSX 160 N | NSX 160 H | aM | gF | | |
| | Rating | A | 160 | 160 | 160 | 160 | | |
| | Prospective short-circuit current | kA | 36 | 70 | 100 | 100 | | |
| | Operational current | A | 160 | 160 | 160 | 160 | | |
| Cabling | | | Maximum c.s.a. | | Minimum c.s.a. | | | |
| | Flexible cable with cable end | mm ² | 70 | | 2.5 | | | |
| | Solid cable | mm ² | 70 | | 2.5 | | | |
| | Tightening torque | Nm | 10 | | | | | |
| Mounting position | Horizontal or vertical ⁽²⁾ | | Fixing with screws provided | | | | | |

(1) For conditions where conditional short-circuit current exceeds 25 kA.

(2) Using side stop AK5BT01 on mounting plates AK5PA.

Linergy BZ, HK Busbar systems

Linergy HK

Characteristics

| Tap-off characteristics | | | | | | | | | | | | |
|---------------------------------|------------------|--|---------------------|-------------|----------------------------|------------------------|----------------------------|---------------------|----------------------|----------------------------|----------------------------|--|
| Type | | AK5 PC12 | AK5 PC12PH | AK5 PC13 | AK5 PC14 | AK5 PC131 | AK5 PC32L | AK5 PC32LPH | AK5 PC33 PC33L | AK5 PC34 PC34L | AK5 PC331 | |
| Conforming to standards | | IEC 60439 | | | | | | | | | | |
| Product certifications | | UL, LROS, CSA, DNV | | | | | | | | | | |
| Degree of protection | | Against access to live parts: IP XXB conforming to IEC 529 | | | | | | | | | | |
| Polarity | | Phase + Neutral | Phase + Phase | 3-phase | 3-phase + Neutral | 3-phase + Common | Phase + Neutral | Phase + Phase | 3-phase | 3-phase + Neutral | 3-phase + Common | |
| Conductor c.s.a. (UL cables) | mm ² | 2 x 2.5 | 2 x 2.5 | 3 x 2.5 | 4 x 2.5 | 3 x 2.5 1 x 1.5 | 2 x 4 | 2 x 4 | 3 x 4 | 4 x 4 | 3 x 4 1 x 1.5 | |
| Conductor colours | | Black Blue (Neutral) | Black | Black | Black Blue (Neutral) | Black White | Black Blue (Neutral) | Black | Black | Black Blue (Neutral) | Black White (Common) | |
| Permissible current | A | 16 | 16 | 16 | 16 | 16 10 (Common) | 32 | 32 | 32 | 32 | 32 10 (Common) | |
| Rated insulation voltage | V | 690 conforming to IEC 60439-1 | | | | | | | | | | |
| Rated peak current | kA | 6 | | | | | | | | | | |
| Maximum let-through energy | A ² s | 100 000 | | | | | 200 000 | | | | | |
| Type of conductor insulation | | PVC 105 °C | | | | | | | | | | |

Power
busbar
systems



| Tap-off characteristics | | | | | | | | | |
|---------------------------------|------------------|---|---|---------------------------------|-----------------------|------------------------------------|--------------|----------------------|------------------------|
| Type | | AK5 PA211N1 PA211N2 PA211N3 PA212N1 PA212N2 PA212N3 | AK5 PA211PH12 PA211PH13 PA211PH23 PA212PH12 PA212PH13 PA212PH23 | AK5 PA231 PA232 PA232S | AK5 PA241 PA242 | AK5 PA2311 PA2312 PA2312S | AK5 PA532 | AK5 PA542 | AK5 PA5312 |
| Conforming to standards | | IEC 60439 | | | | | | | |
| Product certifications | | UL, LROS, CSA, DNV | | | | | | | |
| Degree of protection | | Against access to live parts: IP XXB conforming to IEC 60529 | | | | | | | |
| Polarity | | Phase + Neutral | Phase + Phase | 3-phase | 3-phase + Neutral | 3-phase + Common | 3-phase | 3-phase + Neutral | 3-phase + Common |
| Conductor c.s.a. (UL cables) | mm ² | 2 x 4 | 2 x 4 | 3 x 4 | 4 x 4 | 3 x 4 1 x 1.5 | 2 x (3 x 4) | 2 x (4 x 4) | 2 x (3 x 4) 1 x 1.5 |
| Permissible current | A | 25 | 25 | 25 | 25 | 25 10 (Common) | 50 | 50 | 50 10 (Common) |
| Rated insulation voltage | V | 690 conforming to IEC 60439-1 | | | | | | | |
| Rated peak current | kA | 6 | | | | | | | |
| Maximum let-through energy | A ² s | 200 000 | | | | | | | |
| Type of conductor insulation | | PVC 105 °C | | | | | | | |

| Characteristics of mounting rails AM1DL201 | |
|--|-----------------------------------|
| Type | Omega (width 75 mm, depth 15 mm) |
| Material | 2 mm sheet steel |
| Surface treatment | Galvanized |

Linery BZ, HK Busbar systems

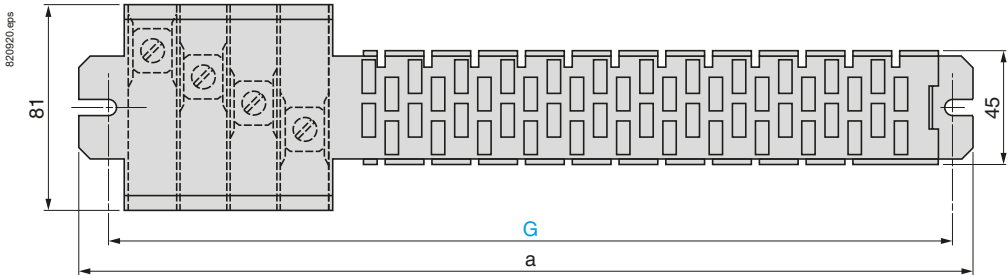
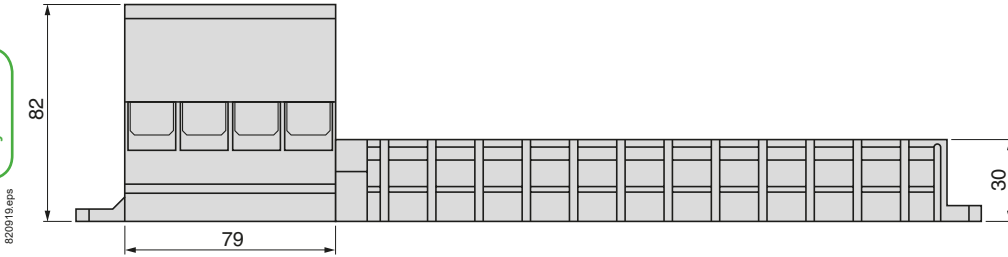
Linery HK

Dimensions

Power busbar systems

Busbars

AK5JB●●●

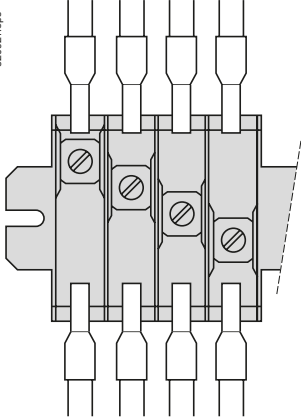


| AK5 | a | G | No. of 18 mm points |
|--------|------|------|---------------------|
| JB143 | 344 | 330 | 12 |
| JB144 | 452 | 438 | 18 |
| JB145 | 560 | 546 | 24 |
| JB146 | 668 | 654 | 30 |
| JB149 | 992 | 978 | 48 |
| JB1410 | 1100 | 1086 | 54 |

Busbar feed units

AK5JB●●●

Installation of AK5JB●●● busbar systems

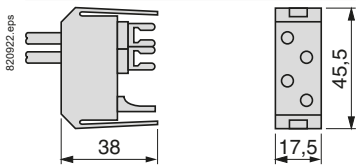


| Connection | C.s.a. in mm ² | |
|--|---------------------------|---------------------------------|
| | min | max |
| Flexible cable with or without cable end | 1 x 2.5 2 x 2.5 | 1 x 70 ⁽¹⁾ 2 x 35 |
| Flexible bar | - | 2 x (9 x 4) |
| Flexible bar | 9 x 4 + | 9 x 4 + |
| + flexible cable with or without cable end | 1 x 2.5 | 1 x 35 |

(1) Maximum c.s.a. or connection of conductor without cable end.

Removable power sockets 16 and 32 A

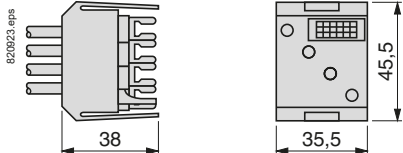
AK5PC12●. AK5PC32L●



AK5PC●3. AK5PC33L

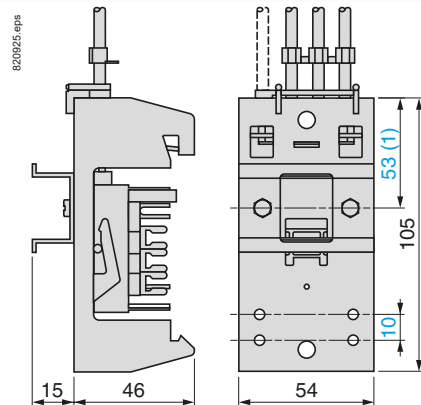
AK5PC●4. AK5PC34L

AK5PC●31



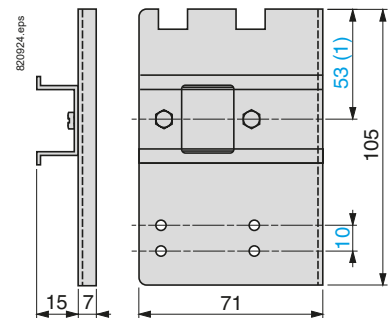
Mounting plates incorporating tap-offs, 25 A

AK5PA2●1. AK5PA2311. AK5PA211●●●●



Single width extension plates

AK5PE17



Note: It is recommended that the power sockets or the removable plates are connected as close as possible to the busbar feed unit.

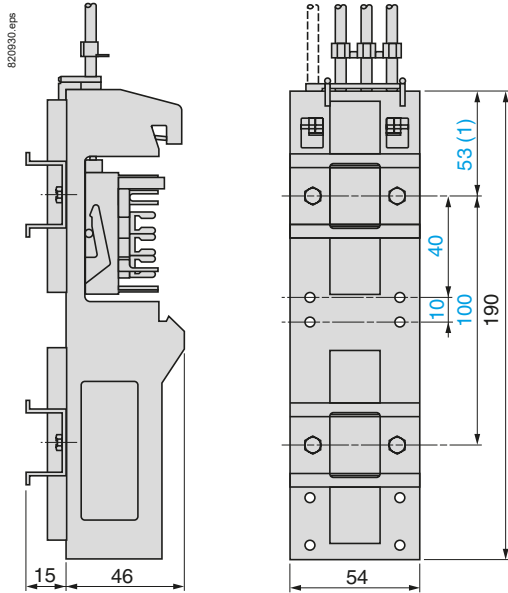
(1) Can be fixed at 43 mm.

Linergy BZ, HK Busbar systems

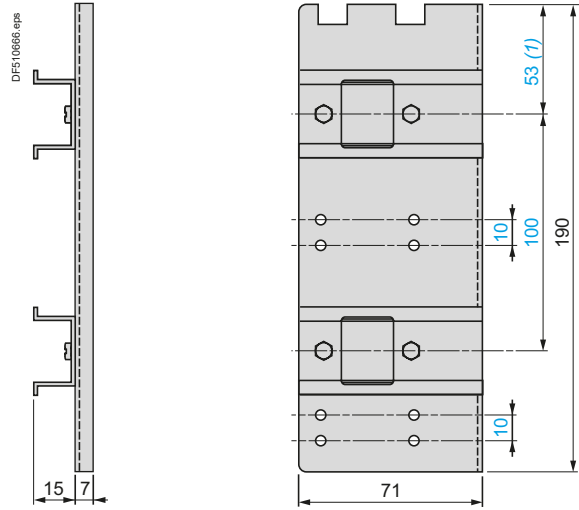
Linergy HK

Dimensions

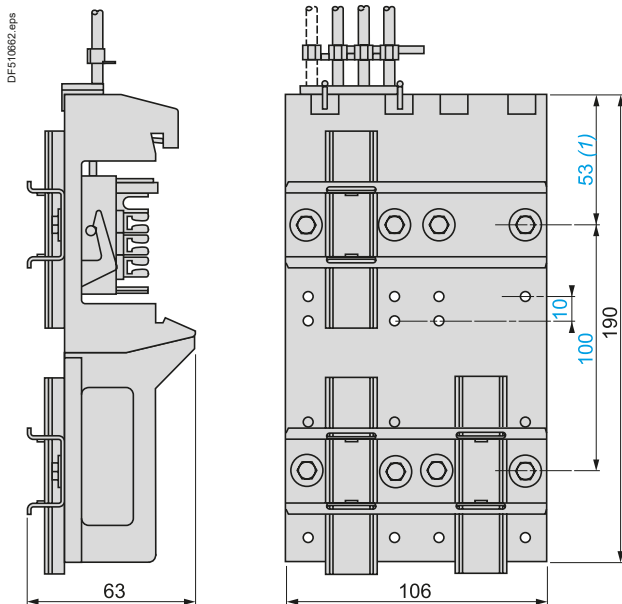
Component mounting plates incorporating tap-off AK5PA232. AK5PA2312. AK5PA242



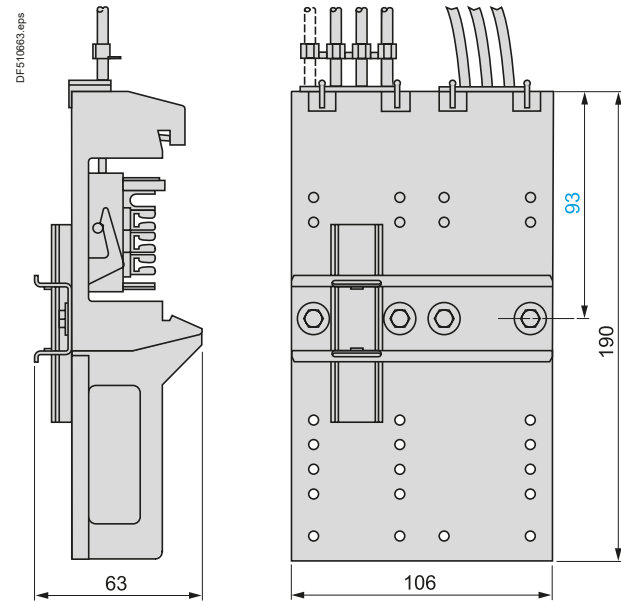
Double extension plate AK5PE27



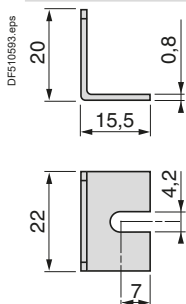
Component mounting plates incorporating tap-off AK5PA232S. AK5PA2312S



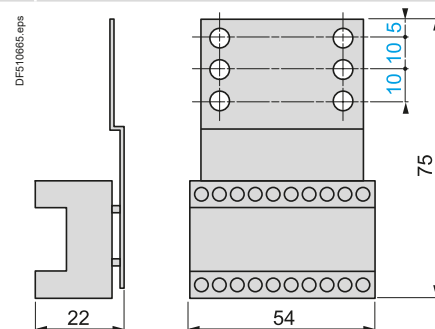
AK5PA532. AK5PA5312. AK5PA542



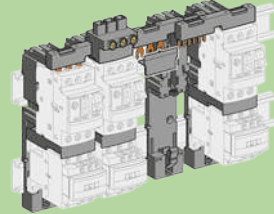
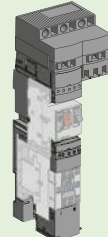

Side stop AK5BT01



Control terminal block AK5SB1

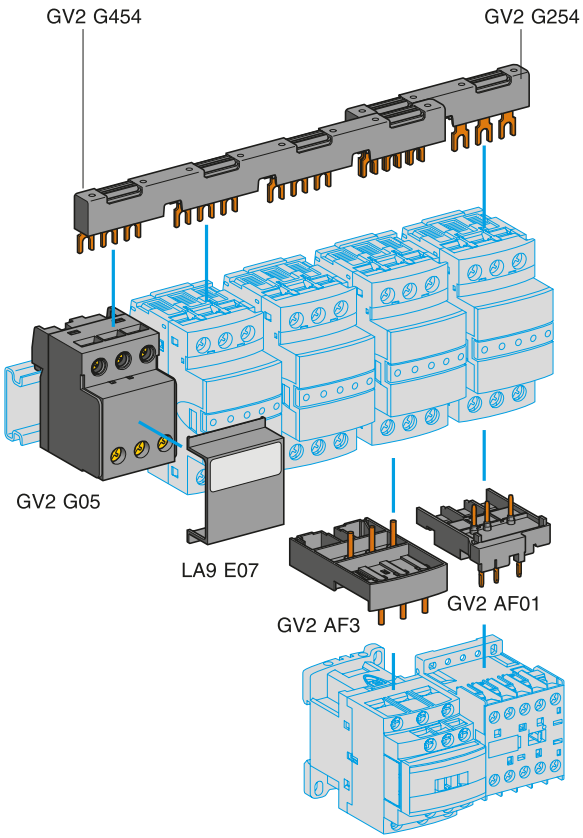


(1) Can be fixed at 43 mm.

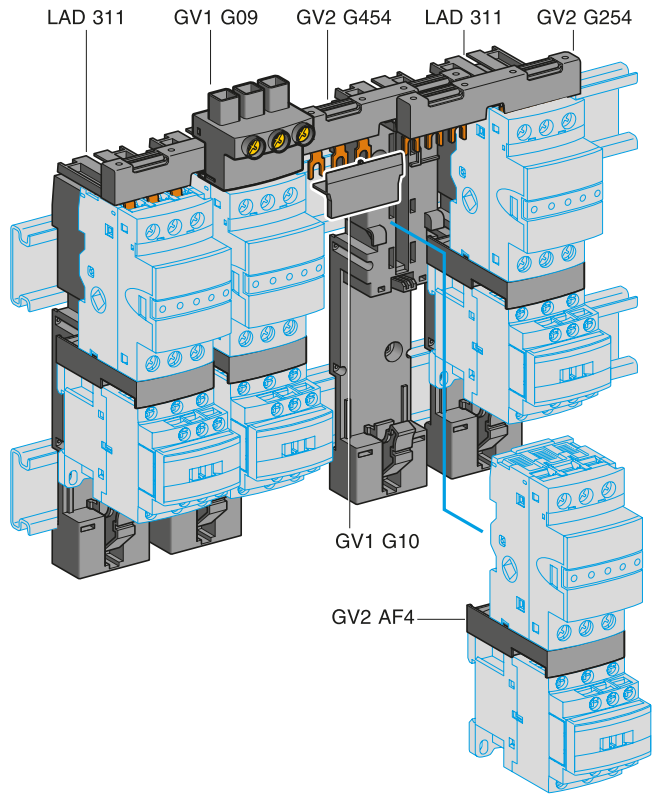
| Power wiring systems for motor starters | |
|--|-------|
| Type of product | Pages |
| <p>Power wiring system for motor starter assemblies: screw clamp connection</p>  | B2/2 |
| <p>Power wiring system for motor starter assemblies: spring terminals connection</p>  | B2/4 |
| RJ45 Control wiring systems for motor starters | |
| <p>Motor starters-to-PLC Control wiring architectures Selection tables</p> | B2/6 |
| <p>RJ45 connection module for Ultra motor starter Pluggable</p>  | B2/8 |

Wiring
systems

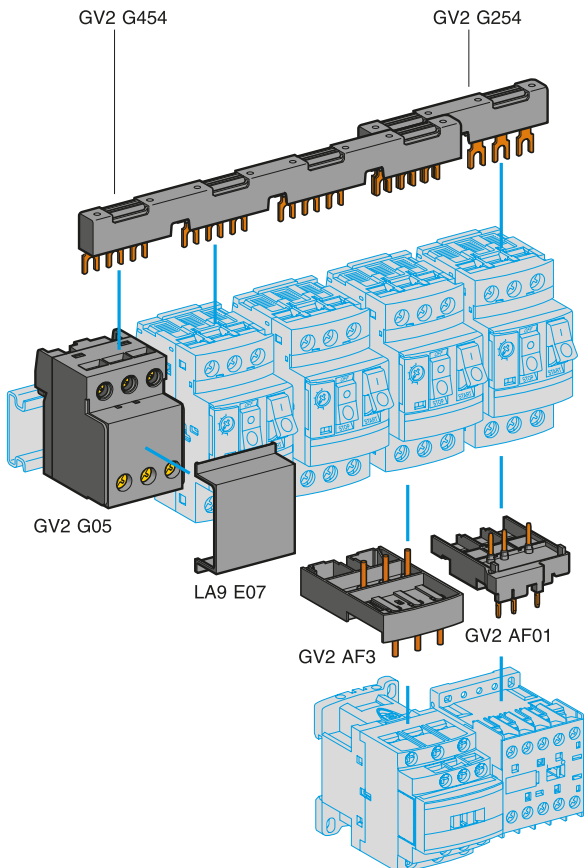
Group of fuse carriers directly mounted on DIN rail



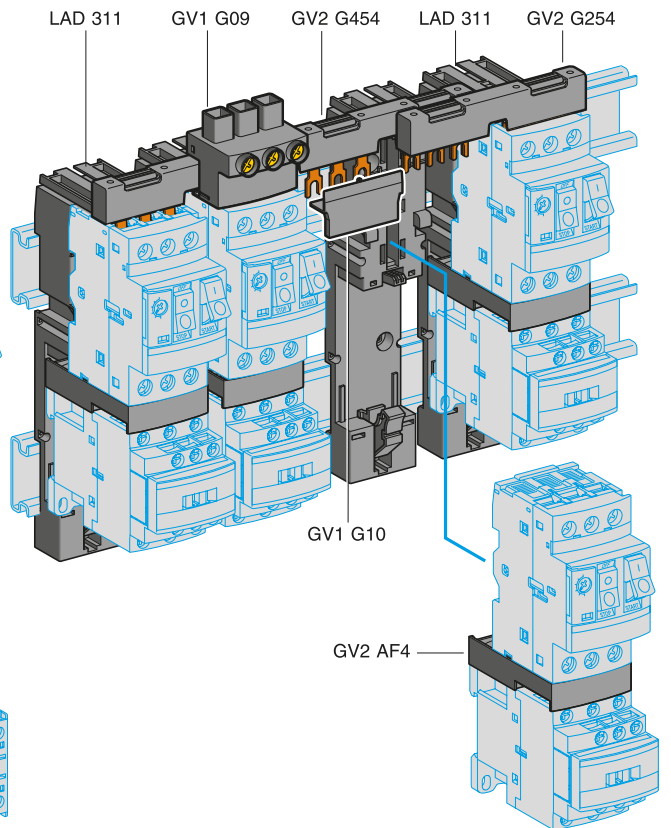
Group of fuse carriers + contactors mounted on adapter plates



Group of circuit breakers directly mounted on DIN rail



Group of circuit breakers + contactors mounted on adapter plates



TeSys Control

Power wiring system for Deca motor starter assemblies

Product references

This system is convenient when time and space savings are required.
The motor starter can be composed of:

- LS1D323 fuse carrier + Deca (LC1D) contactor
- Deca Frame 2 (GV2) circuit breaker + Deca (LC1D) contactor.

Upstream busbars and terminals

| Description | Application | Pitch (mm) | Unit reference |
|---|---|-----------------|----------------|
| Sets of 3-pole 63 A busbars | 2 tap-offs | 45 | GV2G245 |
| | | 54 | GV2G254 |
| | | 72 | GV2G272 |
| | 3 tap-offs | 45 | GV2G345 |
| | | 54 | GV2G354 |
| | | 72 | GV2G372 |
| | 4 tap-offs | 45 | GV2G445 |
| | | 54 | GV2G454 |
| | | 72 | GV2G472 |
| | 5 tap-offs | 45 | GV2G545 |
| 54 | | GV2G554 | |
| 72 | | GV2G572 | |
| Description | Application | Sold in lots of | Unit reference |
| Terminal block for supply to one or more GV2G busbar sets | Connection from the top | 1 | GV1G09 |
| | Can be fitted with current limiter GV1L3 (GV2ME and GV2P) | 1 | GV2G05 |
| Cover for terminal block | For mounting in modular panels | 10 | LA9E07 |
| Protective end cover | For unused busbar outlets | 5 | GV1G10 |

Assembling components

| Description | Application | Sold in lots of | Unit reference |
|---------------------------|--|-----------------|----------------|
| Combination blocks | Between GV2 and contactor LC1K or LP1K ⁽¹⁾ | 10 | GV2AF01 |
| | Between GV2 and contactor LC1D09...D38 ⁽¹⁾ | 10 | GV2AF3 |
| | Between GV2 mounted on LAD311 and contactor LC1D09...D38 | 10 | GV2AF4 |
| Adapter plates | For mounting a GV2ME and contactor LC1D09...D38 with front faces aligned | 1 | LAD311 |
| Height compensation plate | 7.5 mm | 10 | GV1F03 |

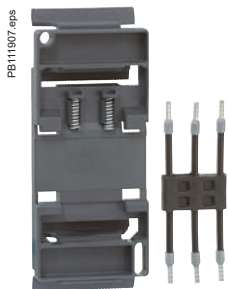
⁽¹⁾ Ensures both the connection and a rigid support to the contactor. No extra fixing mean required.

Accessories

| Description | Application | Sold in lots of | Unit reference |
|--|--|-----------------|----------------|
| Adapter plates | For mounting a GV2 by screw fixing | 10 | GV2AF02 |
| Motor starter adapter plate | For mounting a GV2 and a contactor LC1D09...D25. Item delivered with a GV1G02 flexible connection | 1 | GK2AF01 |
| Flexible 3-pole connection for connecting a GV2 to a contactor LC1-D09...D25 | Centre distance between mounting rails: 100...120 mm | 10 | GV1G02 |
| Incoming line spacer for UL 508 Type E applications | For GV2P (except 32 A) | 1 | GV2GH7 |
| Clip-in marker holders (supplied with each circuit breaker) | For GV2 P, GV2L, GV2LE and GV2RT (8 x 22 mm) | 100 | LA9D92 |



GV2AF02



GK2AF01



GV1G02

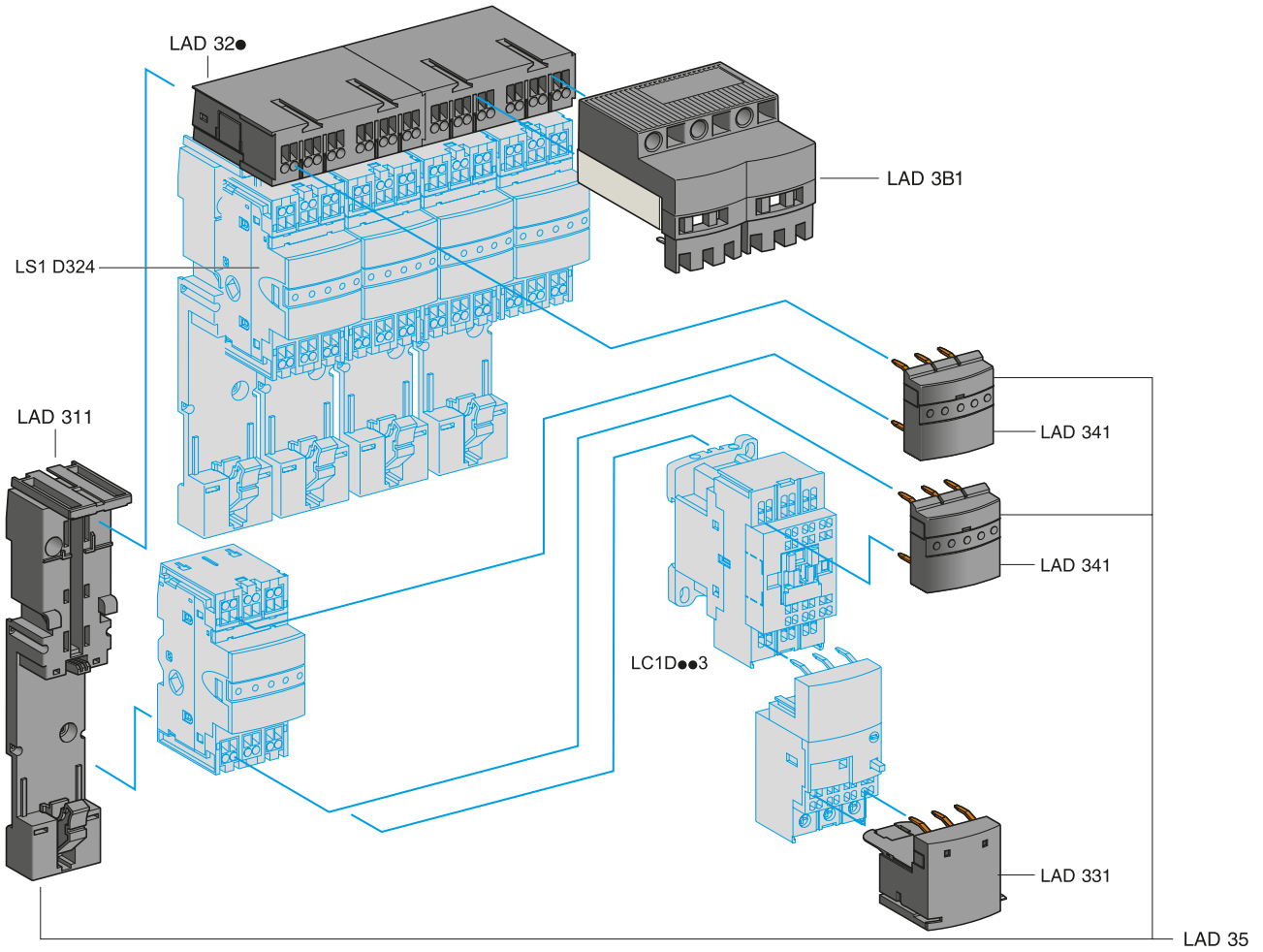
Dimensions:
page B2/13



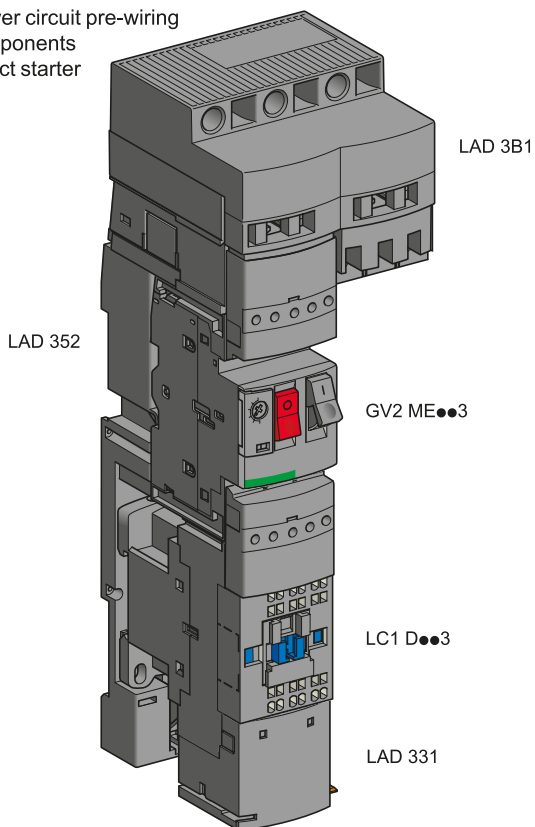
Group of fuse carriers + contactors mounted on adapter plates

D644377.eps

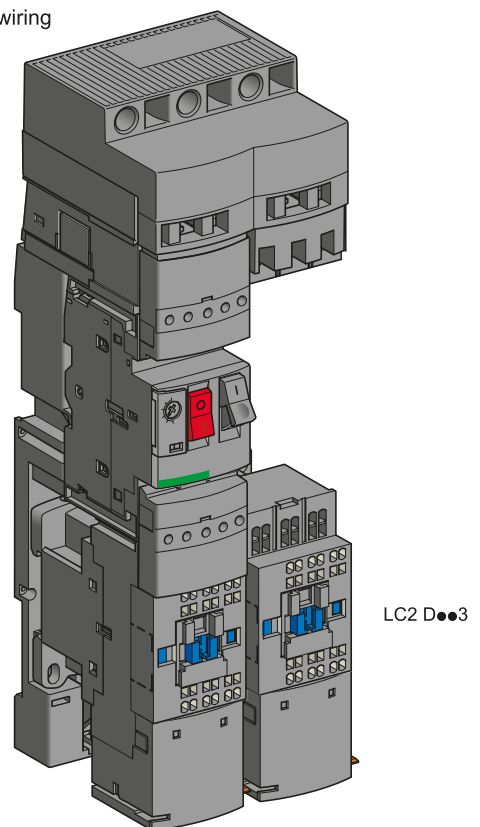
Wiring systems



Power circuit pre-wiring components
Direct starter



Power circuit pre-wiring components
Reversing starter



TeSys Control

Power wiring system for motor starter assemblies

Product references



LAD3B1



LAD324



LAD311



LAD341



LAD331

This system is convenient when time and space savings are required.

The motor starter can be composed of:

- LS1D323 fuse carrier + Deca (LC1D) contactor.
- Deca Frame 2 (GV2) circuit breaker + Deca (LC1D) contactor

Upstream terminal and splitter blocks

| Description | Maximum connection c.s.a. | Application | Sold in lots of | Reference |
|--------------------------|-----------------------------------|---|-----------------|-----------|
| Upstream terminal block | 16 mm ² ⁽¹⁾ | Power supply of 1 or 2 power splitter boxes | 1 | LAD3B1 |
| Description | Extension by | Number of starters | | Reference |
| Power splitter box, 60 A | LAD32● | 2 | 1 | LAD322 |
| | | 4 | 1 | LAD324 |

Assembling components

| Description | Composition | Sold in lots of | Reference |
|--|--|-----------------|-----------|
| Plate for mounting a GV2ME circuit breaker and a contactor | For 1 starter | 10 | LAD311 |
| Power connection module | For 1 starter | 10 | LAD341 |
| Power connection kit for direct starter ⁽²⁾ | 1 plate LAD311 for GV2ME and 2 power connection modules LAD341 | | LAD352 |

Downstream terminal and accessory

| Description | Maximum connection c.s.a. | Application | Sold in lots of | Reference |
|---------------------------|---------------------------|--|-----------------|-----------|
| Downstream terminal block | 6 mm ² | Connection of motor cables | 10 | LAD331 |
| Cable end reducer | - | For connection of conductors from 1 to 1.5 mm ² | 20 | LAD99 |

- ⁽¹⁾ Cables with one end pre-crimped are available to allow fast connection. References:
 1 set of 3 x 6 mm² cables (length 1 m: LAD3B061, length 2 m: LAD3B062 and length 3 m: LAD3B063),
 1 set of 3 x 10 mm² cables (length 1 m: LAD3B101, length 2 m: LAD3B102 and length 3 m: LAD3B103),
 1 set of 3 x 16 mm² cables (length 1 m: LAD3B161, length 2 m: LAD3B162 and length 3 m: LAD3B163).
- ⁽²⁾ To build a reversing starter, order 2 kits LAD352.



TeSys Control

Motor starter-to-PLC control wiring architectures

Selection table

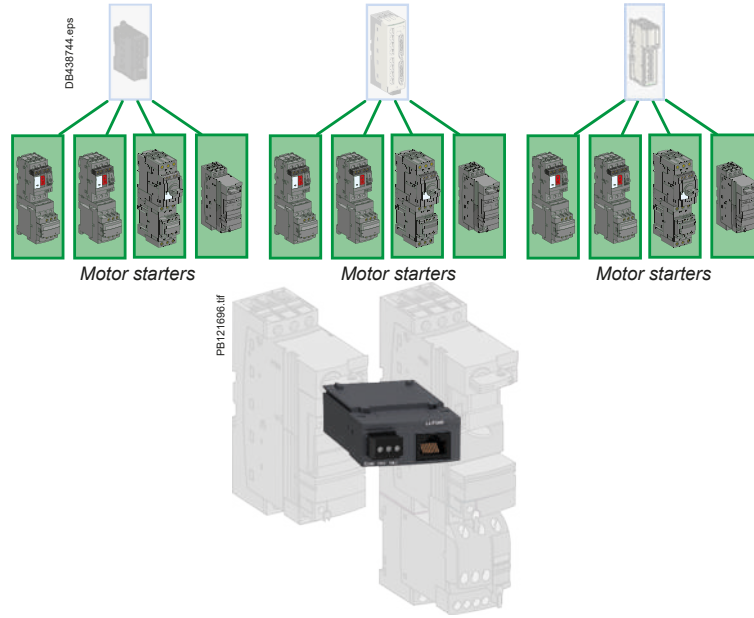
Wiring systems

| Product type | Connection interfaces for a group of motor starters | | |
|---------------------------|--|--|---|
| IO system name | Modicon TM3 | Modicon Telefast | Modicon STB |
| Architecture | <p>DB415974.eps</p> | <p>DB415975.eps</p> | <p>DB415976.eps</p> |
| | <p>PFI3038DC.eps</p> | <p>PB121281.eps</p> | <p>PB121282.eps</p> |
| Application | Control of single or multiple motor-starters assemblies by mean of a logic controller. Machines or processes requiring easy, fast cabling and replacement of motor starters. | | |
| Function | IO module: Ensures the direct connection of up to 4 motor starters to logic controller (Modicon M221, M241, M251) | Splitter box: Ensures the connection of up to 8 motor starters to a logic controller via Modicon Telefast multiwire cable | IO module: Ensures the connection of up to 4 motor starters to a logic controller via an automation island (Modicon STB distributed IO architecture) |
| Upstream compatibility | With Modicon M221, M241, M251 logic controller, via logic controller internal bus | With any logic controller equipped with HE10 inputs/ outputs module | With Modicon STB automation island, via automation island internal bus |
| Upstream connectors | Backplane bus connector | HE10 connector | Backplane bus connector |
| Compatibility | Motor circuit breaker - Type Contactor - Type / Amp Motor circuit breaker + Contactor - terminals All types of motor starters equipped with RJ45 connection system | | |
| Motor control | Reversing / Non reversing | | |
| Number of motor starters | 4 | 8 | 4 |
| Downstream connector type | RJ45 | | |
| Reference | TM3XTYS4 | LU9G02 / LU9G03 | STBEPI2145K * |
| Pages | Refer to Modicon M221/M241/ M251 catalogue | Ultra motor starters - pages B2/8 and A4/20 | Refer to IP20 distributed IO Modicon STB catalogue |

* STBEPI2145K: GV2 + contactor D09 to D32, Ultra only.

RJ45 connection components for motor starter

Common components for Modicon TM3, Modicon Telefast, Modicon STB systems



Wiring systems

Connection module:

ensures the compatibility Ultra motor starters to the RJ45 connection system

TM3XTYS4 / LU9G02 / LU9G03 / STBEPI2145K

RJ45

Ultra motor starters
12 to 38 A

Screw-clamp

Reversing or Non reversing

Plugin module

LUFC00

B2/8

TeSys Control

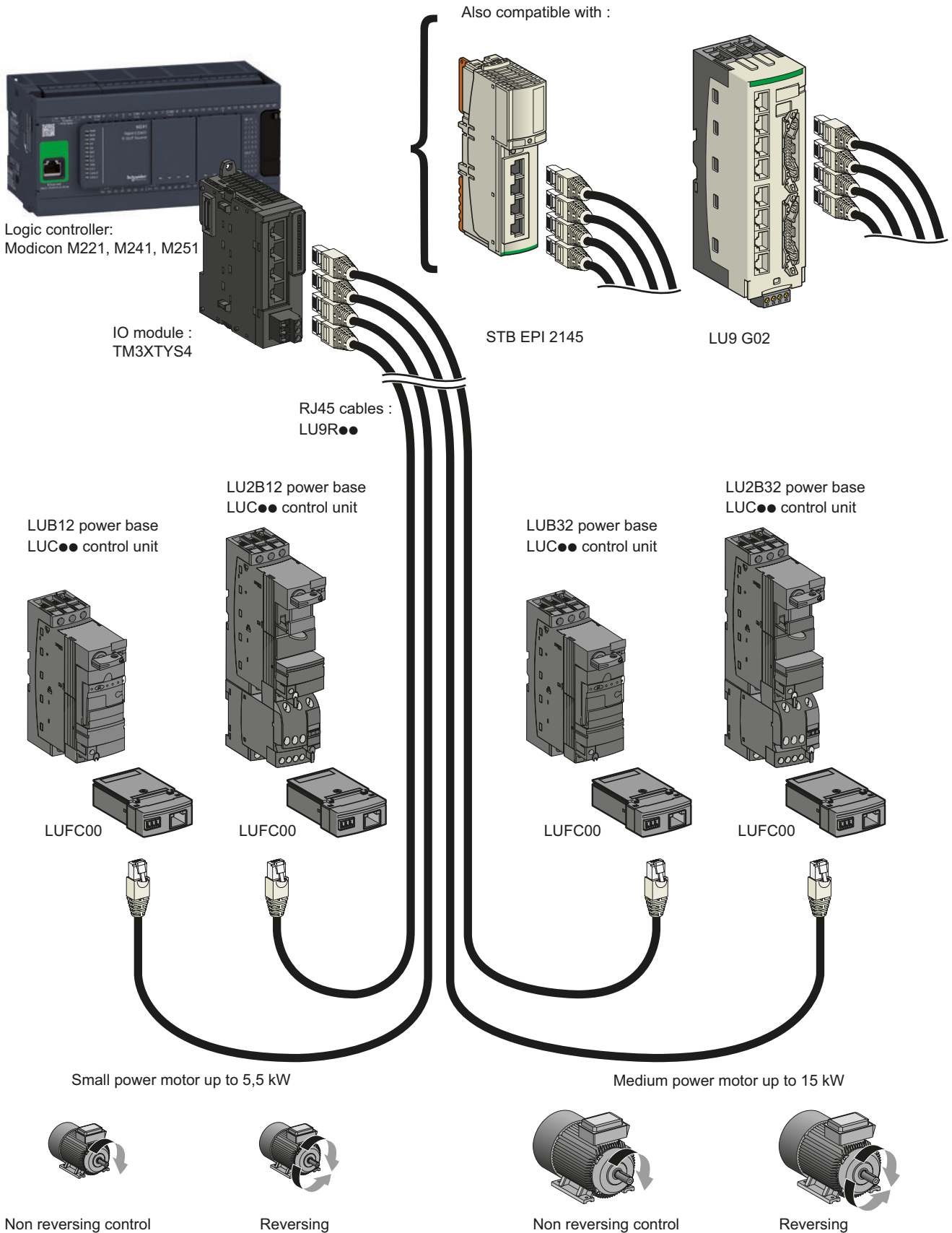
Ultra control wiring system

RJ45 wiring architecture

Description

DB433738_01gs

Wiring systems



"Plug and play", for single or reversing motor starters

The LUFC00 parallel connection module provides a simple and efficient solution for control and monitoring of a Ultra direct or reverse motor starter.

Compact, fast cabling

The connection to the Ultra power base is simply achieved by insertion of the module into it. The status and control signals are carried by a simple pre-connectorized RJ45 cable (LU9R●●) between an IO module or splitter box and Ultra motor starter.

Features

- On / OFF / Reverse control (functions non provided with LUB12, 32, 38 power bases).
- Handle position, power contacts position monitoring (function provided with all power bases).

Compatibility

12, 32 or 38 A direct motor starters: LUB12, LUB32 or LUB38 power base + LUC●● control unit (coil code BL), LUB120, LUB320 or LUB380 power base + LU9N11C connector + LUC●● control unit (coil code BL)

12, 32 or 38 A reversing motor starters: LU2B12, LU2B32 or LU2B38 power base + LU9MRC connector + LUC●● control unit (coil code BL).



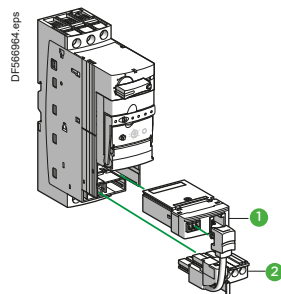
| Ultra RJ45 connection module | |
|--|----------------|
| Designation | Commercial ref |
| 1 Parallel wiring module | LUFC00 |
| Ultra coil connector | |
| Designation | Commercial ref |
| 2 Pre wired coil connector for LUB120, LUB320 or LUB380 power base | LU9BN11C |
| 3 Pre wired coil connector for LU2B12, LU2B32 or LU2B38 power base | LU9MRC |

Design / Installation

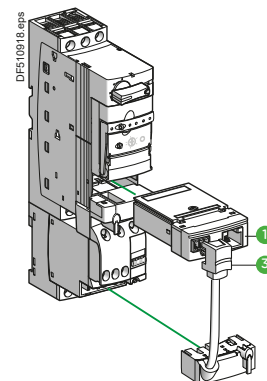
The LUFC00 parallel (RJ45) connection module acts as a connection interface for controlling the coil (except with LUB12, 32, 38) and the monitoring of the auxiliary contacts. As a necessary complement, a pre wired connector is needed for carrying the signal to the coil and collecting:

- the status of the protection device (OK / Alarm) with LU9BN11C,
- the electrical interlock contacts with LU9MRC.

As the "reversing" is higher than the "direct" power base, the LU9MRC link is longer than the LU9BN11C.



Direct motor starter (LUB120, 320, 380 power base).



Reversing motor starter (LU2B12, 32, 38 power base).


TeSys Control

Wiring systems for motor starters

Product references

Wiring
systems

| | |
|---------|-------------|
| GV1F03 | GV2GH7 |
| GV1G02 | LA9D92 |
| GV1G09 | LA9E07 |
| GV1G10 | LAD311 |
| GV2AF01 | LAD322 |
| GV2AF02 | LAD324 |
| GV2AF3 | LAD331 |
| GV2AF4 | LAD341 |
| GV2AF5 | LAD351 |
| GV2G05 | LAD352 |
| GV2G245 | LAD3B1 |
| GV2G254 | LU9BMRC |
| GV2G272 | LU9BN11C |
| GV2G345 | LU9G02 |
| GV2G354 | LU9G03 |
| GV2G445 | LUF00 |
| GV2G454 | STBEPI2145K |
| GV2G472 | TM3XTYS4 |
| GV2G554 | |

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

Contents

Power wiring systems for motor starter assemblies:

- > Dimensions (GV2 + LAD311 assembly)..... B2/12
- > Dimensions (GV2G●●● busbars) B2/13

IO module, splitter box, for motor starters control circuits

- > Dimensions B2/14

TeSys Control

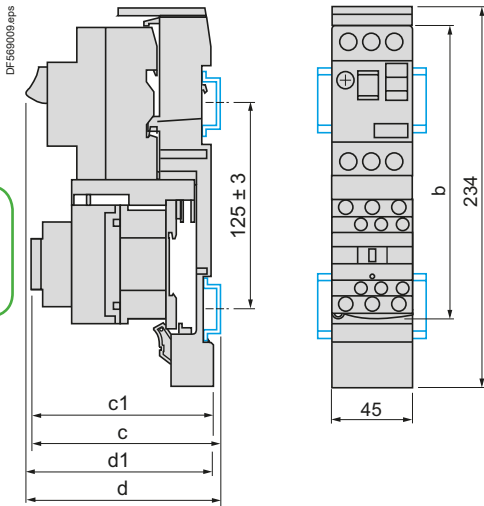
Power wiring system for motor starter assemblies

Dimensions

GV2AF4 + LAD311

Combination GV2ME + Deca contactor

Wiring systems



| GV2ME + | LC1D09...D18 | LC1D25 and D32 |
|-----------|--------------|----------------|
| b | 176.4 | 186.8 |
| c1 | 103.1 | 136.4 |
| c | 135.6 | 141.9 |
| d1 | 107 | 107 |
| d | 112.5 | 112.5 |

Ref.

7.5 mm height compensation plate GV1F03



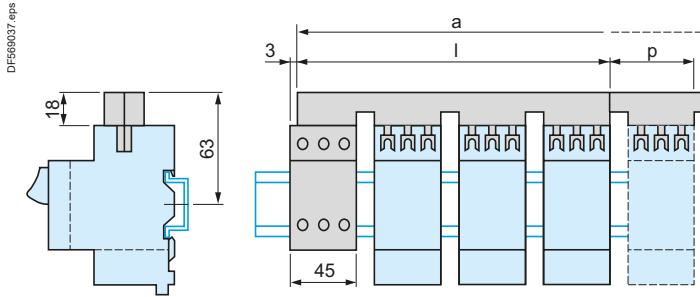
TeSys Control

Power wiring system for motor starter assemblies

Dimensions

Deca Frame 2 (GV2ME, GV2P, GV2L, GV2LE)

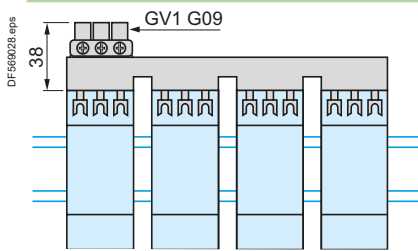
Sets of busbars GV2G445, GV2G454, GV2G472, with terminal block GV2G05



| | l | p |
|---------------------|-----|----|
| GV2G445 (4 x 45 mm) | 179 | 45 |
| GV2G454 (4 x 54 mm) | 206 | 54 |
| GV2G472 (4 x 72 mm) | 260 | 72 |

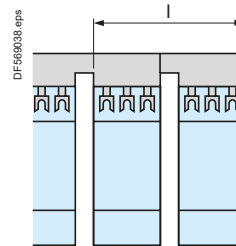
| Number of tap-offs | a | | | |
|--------------------|-----|-----|-----|-----|
| | 5 | 6 | 7 | 8 |
| GV2G445 | 224 | 269 | 314 | 359 |
| GV2G454 | 260 | 314 | 368 | 422 |
| GV2G472 | 332 | 404 | 476 | 548 |

Sets of busbars GV2G●●● with terminal block GV1G09

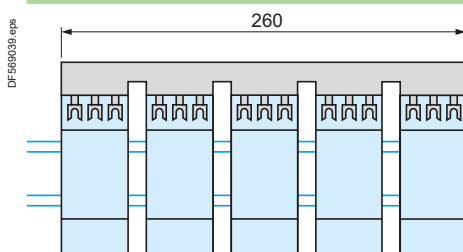


| | l |
|---------------------|-----|
| GV2G245 (2 x 45 mm) | 89 |
| GV2G254 (2 x 54 mm) | 98 |
| GV2G272 (2 x 72 mm) | 116 |

Sets of busbars GV2G245, GV2G254, GV2G272

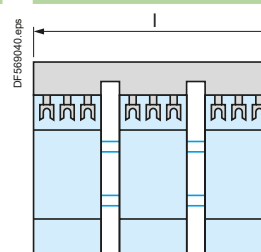


Sets of busbars GV2G554



| | l |
|---------------------|-----|
| GV2G345 (3 x 45 mm) | 134 |
| GV2G354 (3 x 54 mm) | 152 |

Sets of busbars GV2G345 and GV2G354

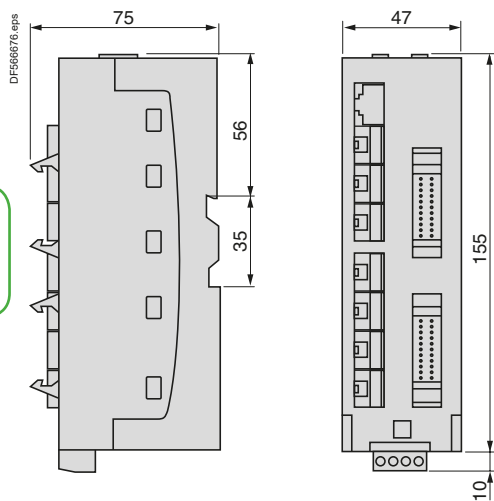


TeSys Control

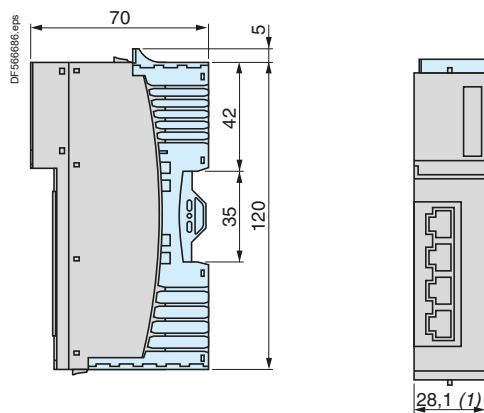
LU9G02 RJ45 splitter box

Dimensions

Parallel RJ45 wiring modules Splitter box LU9G02



Parallel wiring module Advantys STBEPI2145



(1) Dimension to be multiplied by the number of **STBEPI2145** modules present in the configuration.

| Door mounting isolation switch | | |
|--|------------------|-------|
| Type of product | Range | Pages |
| Switch-disconnectors | Up to 12 or 20 A | B3/2 |
| Switch-disconnectors, high performance applications | From 12 to 175 A | B3/6 |
| Accessories for switch-disconnectors | | B3/8 |
| Technical Data for Designers | | B3/17 |



Switch-
disconnectors



PE121282.eps

VCDN20

Switch-disconnectors



PE121283.eps

VCCDN20



PE119284.eps

VBDN20

Switch-disconnectors for standard applications

- 3-pole rotary switch-disconnectors, 12 to 20 A
- Marking on operator
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.

Main and Emergency stop switch-disconnectors for door mounting

| Operator | Front plate | Fixing | Ith | Reference |
|---|-------------------|--------|-----|-----------|
| Handle | mm | mm | A | |
| Red, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow 60 x 60 | Ø22.5 | 12 | VCDN12 |
| | | | 20 | VCDN20 |

Main and Emergency stop switch-disconnectors for mounting at back of an enclosure ⁽¹⁾

| Operator | Front plate | Fixing | Ith | Reference |
|---|-------------------|--------|-----|-----------|
| Handle | mm | mm | A | |
| Red, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow 60 x 60 | Ø22.5 | 12 | VCCDN12 |
| | | | 20 | VCCDN20 |

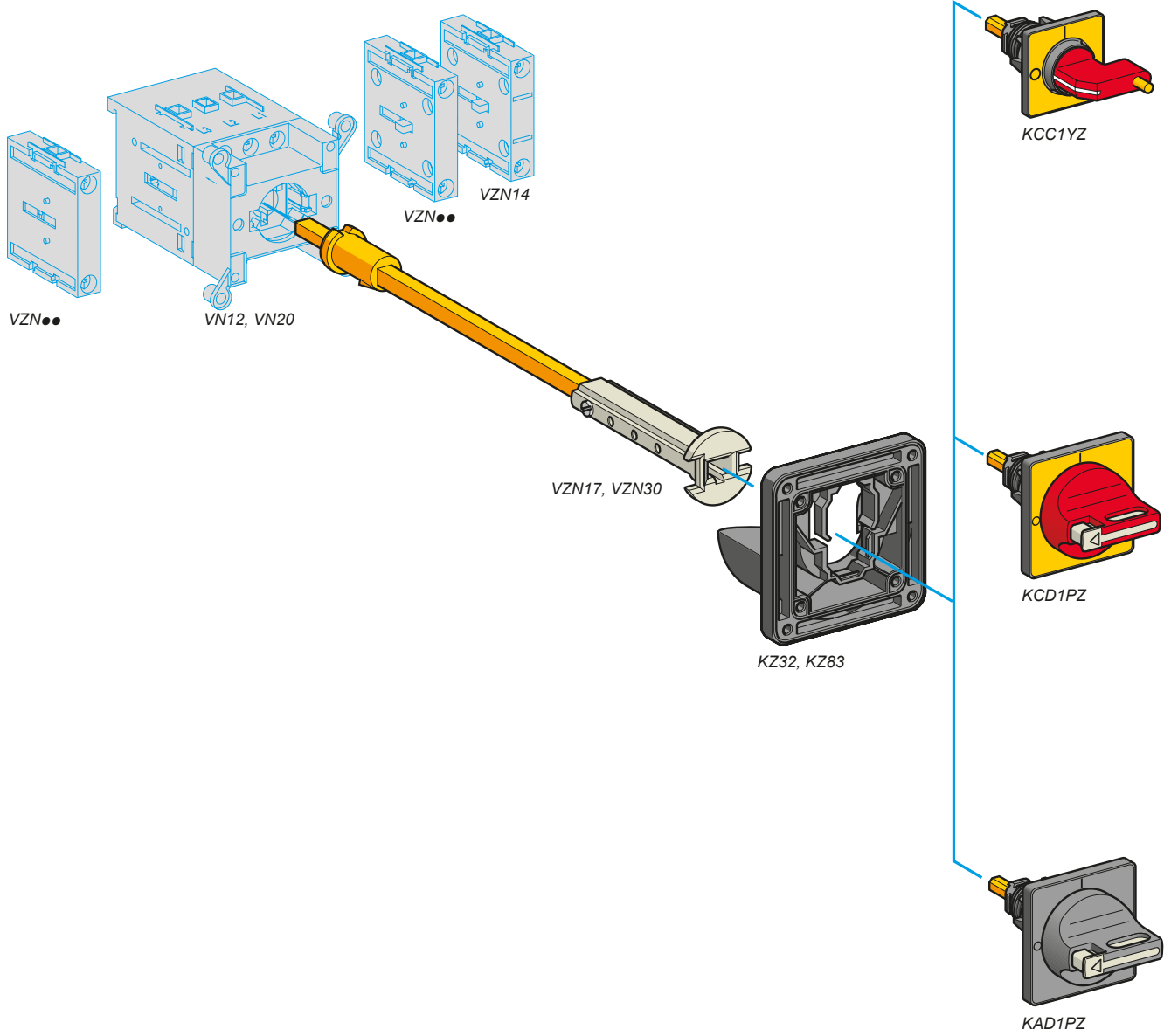
Main switch-disconnectors for door mounting

| Operator | Front plate | Fixing | Ith | Reference |
|---|------------------|--------|-----|-----------|
| Handle | mm | mm | A | |
| Black, padlockable with up to 3 padlocks (Ø4 to Ø8) | Black 60 x 60 | Ø22.5 | 12 | VBDN12 |
| | | | 20 | VBDN20 |


⁽¹⁾ Switches supplied with a shaft extension VZN17 and a door interlock plate KZ32 (see page B3/5).

DF590544.eps

Switch-disconnectors



Switch-disconnectors for standard applications

- Degree of protection IP 65.
- Marking on operator .
- Padlockable operating handle (padlocks not supplied).
- Operator fixing by 1 Ø22.5 hole; for other operators see pages B3/11 and B3/13.
- For other accessories and empty enclosures, see pages B3/14, B3/15 and chapter A1.

Operators for main and Emergency stop switch-disconnectors

| Handle | Front plate mm | Reference |
|---|-------------------|-----------|
| Red, padlockable with 1 padlock (Ø4 to Ø6) | Yellow 45 x 45 | KCC1YZ |
| Red, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow 60 x 60 | KCD1PZ |

Operators for main switch-disconnectors

| Handle | Front plate mm | Reference |
|---|------------------|-----------|
| Black, padlockable with up to 3 padlocks (Ø4 to Ø8) | Black 60 x 60 | KAD1PZ |

Accessories for door interlocking

For rear fixing switch-disconnectors mounted at the back of an enclosure, in addition to a direct operator

| Description | Front plate mm | Distance enclosure back/door mm | Sold in lots of | Unit reference |
|-------------------------|--------------------|---------------------------------|-----------------|----------------|
| Shaft extensions | – | 300...330 | 1 | VZN17 |
| | | 400...430 | 1 | VZN30 |
| Door interlock plate | 45 x 45 or 60 x 60 | – | 5 | KZ32 |
| Plate for door mounting | 45 x 45 or 60 x 60 | – | 5 | KZ83 |



Switch-disconnectors for high performance applications

- 3-pole rotary switch-disconnectors, 12 to 175 A
- Marking on operator $\text{O} \downarrow$
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.

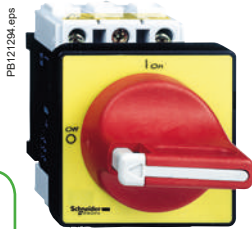
Main and Emergency stop switch-disconnectors for door mounting

| Handle | Front plate mm | Fixing | Rating A | Reference | Weight kg |
|---|----------------|----------|----------|-----------|-----------|
| Red, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow 60 x 60 | Ø22.5 | 12 | VCD02 | 0.215 |
| | | | 20 | VCD01 | 0.215 |
| | | | 25 | VCD0 | 0.215 |
| | | | 32 | VCD1 | 0.215 |
| | | | 40 | VCD2 | 0.215 |
| 4 screws | Yellow 60 x 60 | Ø22.5 | 12 | VCF02 | 0.250 |
| | | | 20 | VCF01 | 0.250 |
| | | | 25 | VCF0 | 0.250 |
| | | | 32 | VCF1 | 0.250 |
| | | | 40 | VCF2 | 0.250 |
| | | | 63 | VCF3 | 0.560 |
| | | | 80 | VCF4 | 0.560 |
| Red, long, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow 90 x 90 | 4 screws | 125 | VCF5 | 1.200 |
| | | | 175 | VCF6 | 1.200 |

Main and Emergency stop switch-disconnectors for mounting at back of an enclosure ⁽¹⁾

| Handle | Front plate mm | Fixing | Rating A | Reference | Weight kg |
|---|----------------|----------|----------|-----------|-----------|
| Red, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow 60 x 60 | Ø22.5 | 12 | VCCD02 | 0.392 |
| | | | 20 | VCCD01 | 0.392 |
| | | | 25 | VCCD0 | 0.392 |
| | | | 32 | VCCD1 | 0.392 |
| | | | 40 | VCCD2 | 0.392 |
| 4 screws | Yellow 60 x 60 | Ø22.5 | 12 | VCCF02 | 0.527 |
| | | | 20 | VCCF01 | 0.527 |
| | | | 25 | VCCF0 | 0.527 |
| | | | 32 | VCCF1 | 0.527 |
| | | | 40 | VCCF2 | 0.527 |
| | | | 63 | VCCF3 | 0.440 |
| | | | 80 | VCCF4 | 0.680 |
| Red, long, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow 90 x 90 | 4 screws | 125 | VCCF5 | 1.320 |
| | | | 175 | VCCF6 | 1.320 |

⁽¹⁾ Unit supplied with a shaft extension VZN17 or VZ18 and a door interlock plate KZ32 or KZ74 (see page B3/14).



VCF0



VCF5



VCCF0

Switch-disconnectors



Switch-disconnectors for high performance applications

- 3-pole rotary switch-disconnectors, 12 to 175 A
- Marking on operator $\circ \downarrow$.
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.



VBD01



VBF4



VVE1

Main switch-disconnectors for door mounting

| Handle | Front plate mm | Fixing | Rating A | Reference | Weight kg |
|---|----------------|----------|----------|-----------|-----------|
| Black, padlockable with up to 3 padlocks (Ø4 to Ø8) | Black 60 x 60 | Ø22.5 | 12 | VBD02 | 0.215 |
| | | | 20 | VBD01 | 0.215 |
| | | | 25 | VBD0 | 0.215 |
| | | | 32 | VBD1 | 0.215 |
| | | | 40 | VBD2 | 0.215 |
| Black, long, padlockable with up to 3 padlocks (Ø4 to Ø8) | Black 90 x 90 | 4 screws | 12 | VBF02 | 0.250 |
| | | | 20 | VBF01 | 0.250 |
| | | | 25 | VBF0 | 0.250 |
| | | | 32 | VBF1 | 0.250 |
| | | | 40 | VBF2 | 0.250 |
| | | | 63 | VBF3 | 0.560 |
| | | | 80 | VBF4 | 0.560 |
| Black, long, padlockable with up to 3 padlocks (Ø4 to Ø8) | Black 90 x 90 | 4 screws | 125 | VBF5 | 1.200 |
| | | | 175 | VBF6 | 1.200 |

Main and Emergency stop switch-disconnectors

For mounting in an enclosure or for modular distribution boards

| Handle | Front plate mm | Fixing | Rating A | Reference | Weight kg |
|--|----------------|----------|----------|-----------|-----------|
| Red, padlockable with 1 padlock (Ø4 to Ø6) | Yellow 45 x 45 | 4 screws | 25 | VVE0 | 0.250 |
| | | | 32 | VVE1 | 0.250 |
| | | | 40 | VVE2 | 0.250 |
| | | | 63 | VVE3 | 0.530 |
| | | | 80 | VVE4 | 0.530 |

Main switch-disconnectors

For mounting in an enclosure or for modular distribution boards

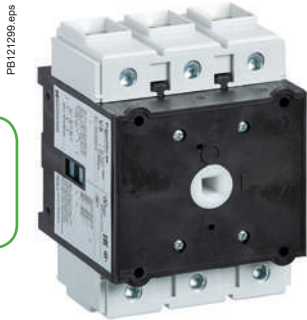
| Handle | Front plate mm | Fixing | Rating A | Reference | Weight kg |
|------------------------|----------------|----------|----------|-----------|-----------|
| Black, not padlockable | Black 45 x 45 | 4 screws | 25 | VVD0 | 0.250 |
| | | | 32 | VVD1 | 0.250 |
| | | | 40 | VVD2 | 0.250 |
| | | | 63 | VVD3 | 0.560 |
| | | | 80 | VVD4 | 0.560 |



Switch-disconnectors for high performance applications

Switch bodies

| Description | Rating A | Reference |
|--|----------|-----------|
| 3-pole switch-disconnectors ⁽¹⁾ | 12 | V02 |
| | 20 | V01 |
| | 25 | V0 |
| | 32 | V1 |
| | 40 | V2 |
| | 63 | V3 |
| | 80 | V4 |
| | 125 | V5 |
| | 175 | V6 |



V5

Switch-disconnectors



VZ0



VZ11



VZ15



VZ20

Add-on modules

| Description | Rating A | Reference |
|---|-------------|-----------|
| Main pole modules | 12 | VZ02 |
| | 20 | VZ01 |
| | 25 | VZ0 |
| | 32 | VZ1 |
| | 40 | VZ2 |
| | 63 | VZ3 |
| | 80 | VZ4 |
| Neutral pole modules with early make and late break contacts ⁽¹⁾ | 12 to 40 | VZ11 |
| | 63 to 80 | VZ12 |
| | 125 and 175 | VZ13 |
| Earthing modules | 12 to 40 | VZ14 |
| | 63 and 80 | VZ15 |
| | 125 and 175 | VZ16 |

Auxiliary contact block modules

| Description | Type | Reference |
|---|--------------------------|-----------|
| Auxiliary contact block modules with 2 auxiliary contacts | N/O + N/C ⁽²⁾ | VZ7 |
| | N/O + N/O | VZ20 |

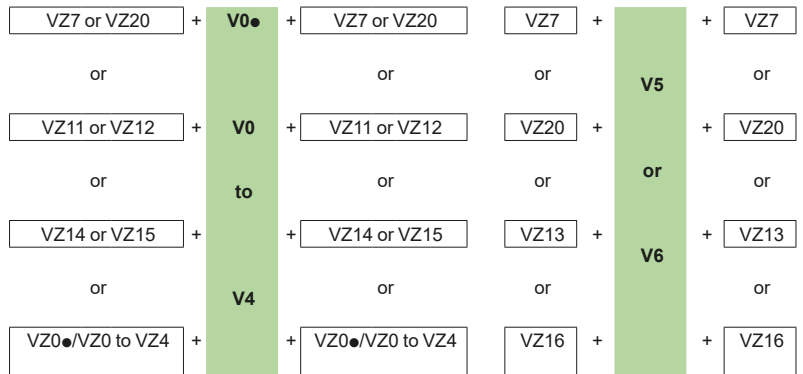
⁽¹⁾ Protection shrouds are available if required: see page B3/14.

⁽²⁾ Late make N/O, early break N/C contacts

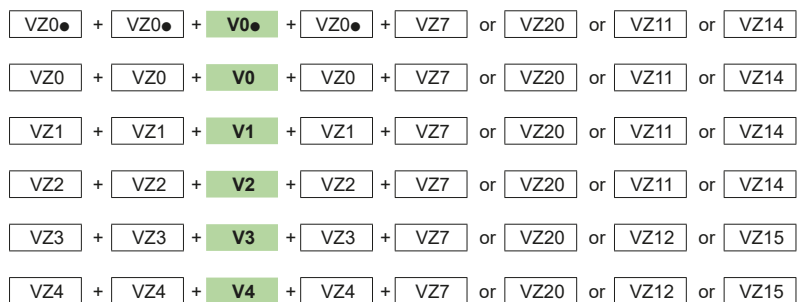
Switch-disconnectors for high performance applications

Maximum number of add-on modules that can be fitted on a switch body

1 add-on module on each side of the switch body

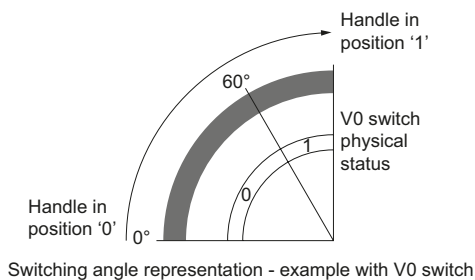


2 add-on modules on each side of the switch body



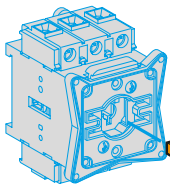
Note: The add-on modules mounted next to the switch body are main pole modules. Maximum of 3 main pole modules per switch body.

Auxiliary switch switching angles



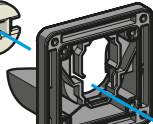
| | | 0: contact open 1: contact close | | | |
|--|--|----------------------------------|-----|-----|-----|
| | | Handle travel 0 > 1 | | | |
| | | 0° | 30° | 60° | 90° |
| 3-pole switch-disconnectors | | | | 60° | |
| V02 / V01 / V0 / V1 / V2 / V3 / V4 / V5 / V6 | | | 0 | 1 | |
| Main pole modules | | | | 60° | |
| VZ02 / VZ01 / VZ0 / VZ1 / VZ2 / VZ3 / VZ4 | | | 0 | 1 | |
| Neutral pole modules with early make and late break contacts | | | | 45° | |
| VZ11 / VZ12 / VZ13 | | | 0 | 1 | |
| Auxiliary contact block modules with 2 auxiliary contacts (N/0+N/C) VZ7 | | | | | 75° |
| Late make N0 and earlier break NC | | N/0 | 0 | | 1 |
| Early break N0 and late make NC for travel 1-0) | | N/C | 1 | 0 | |
| | | | | | 20° |
| Auxiliary contact block modules with 2 auxiliary contacts (N/0+N/C) VZ20 | | | | 60° | |
| | | | 0 | 1 | |
| | | | 0 | 1 | |
| | | | | 60° | |

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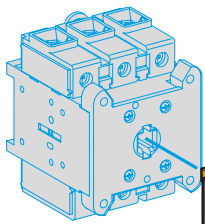


VN12, VN20
V02...V2

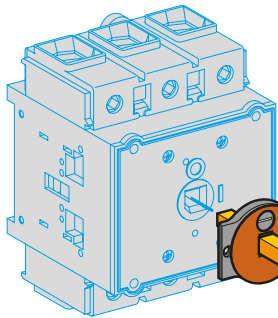
VZN17, VZN30



KZ32, KZ83

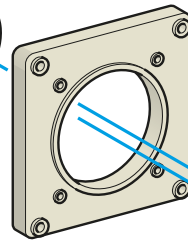


V3, V4



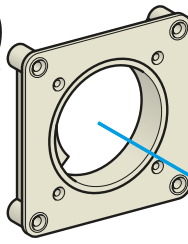
V5, V6

VZ18, VZ31



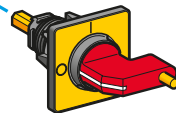
KZ81

VZ18, VZ31

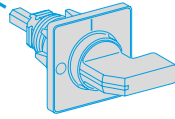


KZ74

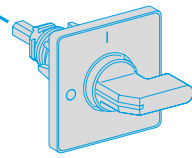
Switch-disconnectors



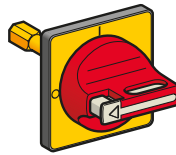
KC•1YZ



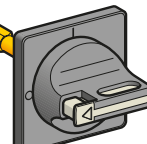
KC•1LZ



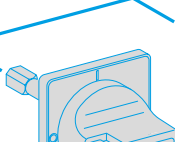
KA•1BZ



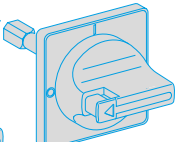
KC•1PZ



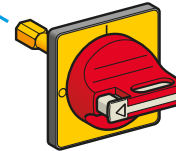
KA•1PZ



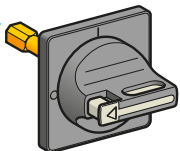
KD•1PZ



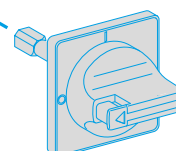
KB•1PZ



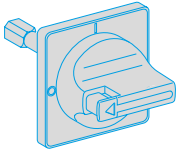
KCF2PZ



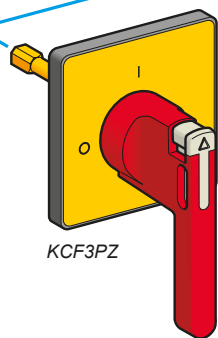
KAF2PZ



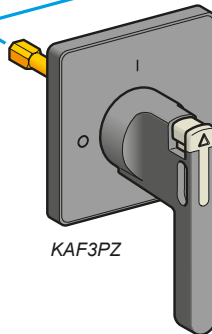
KDF2PZ



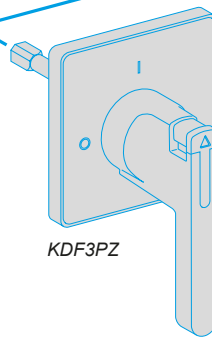
KBF2PZ



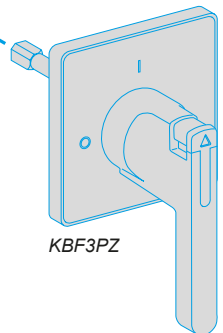
KCF3PZ



KAF3PZ



KDF3PZ



KBF3PZ

- Marking on operator $\circ \downarrow$.
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.

Handles and front plates for main and Emergency stop switch-disconnectors

| For switch body | Operator Handle | Front plate | | Reference |
|------------------------|---|-------------|----------|------------------------------|
| | | Dimensions | Fixing | |
| | | mm | | |
| VN12, VN20 V02...V2 | Red, padlockable with 1 padlock (Ø4 to Ø6) | Yellow | Ø22.5 | KCC1YZ |
| | | 45 x 45 | 4 screws | KCE1YZ |
| | Red, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow | Ø22.5 | KCD1PZ |
| | | 60 x 60 | 4 screws | KCF1PZ |
| V3 and V4 | Red, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow | 4 screws | KCF2PZ |
| V5 and V6 | Red, long, padlockable with up to 3 padlocks (Ø4 to Ø8) | Yellow | 4 screws | KCF3PZ ⁽¹⁾ |
| | | 90 x 90 | | |

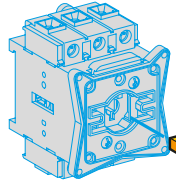
Handles and front plates for main switch-disconnectors

| For switch body | Operator Handle | Front plate | | Reference |
|------------------------|---|-------------|----------|------------------------------|
| | | Dimensions | Fixing | |
| | | mm | | |
| VN12, VN20 V02...V2 | Black, padlockable with up to 3 padlocks (Ø4 to Ø8) | Black | Ø22.5 | KAD1PZ |
| | | 60 x 60 | 4 screws | KAF1PZ |
| V3 and V4 | Black, padlockable with up to 3 padlocks (Ø4 to Ø8) | Black | 4 screws | KAF2PZ |
| V5 and V6 | Black, long, padlockable with up to 3 padlocks (Ø4 to Ø8) | Black | 4 screws | KAF3PZ ⁽¹⁾ |
| | | 90 x 90 | | |

⁽¹⁾ For door mounting of 63 and 80 A switch-disconnectors, adapter plate **KZ106** must be ordered separately (see page B3/14).

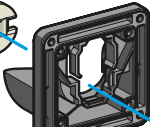


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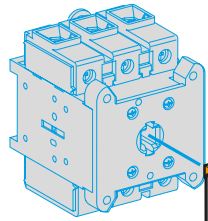


VN12, VN20
V02...V2

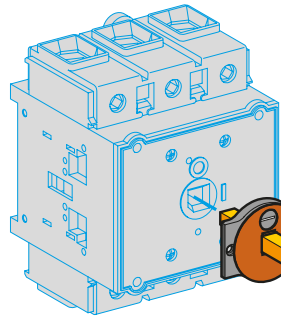
VZN17, VZN30



KZ32, KZ83

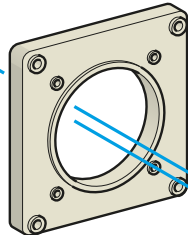


V3, V4



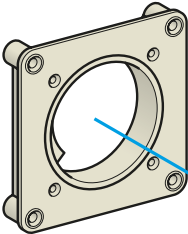
V5, V6

VZ18, VZ31



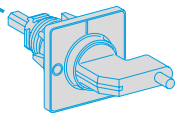
KZ81

VZ18, VZ31

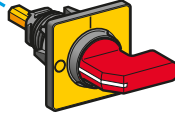


KZ74

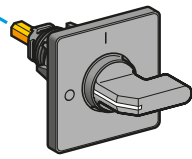
Switch-disconnectors



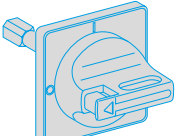
KC•1YZ



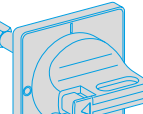
KC•1LZ



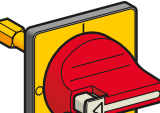
KA•1BZ



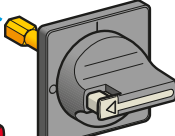
KC•1PZ



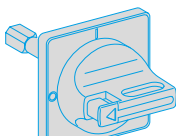
KA•1PZ



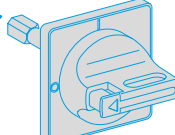
KD•1PZ



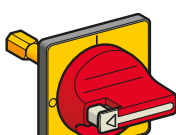
KB•1PZ



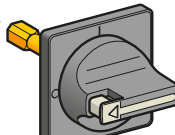
KCF2PZ



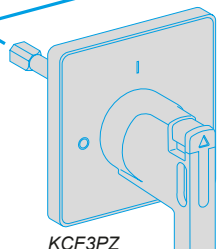
KAF2PZ



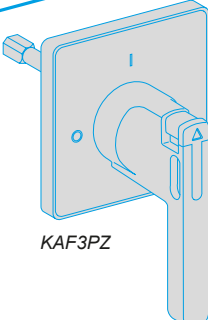
KDF2PZ



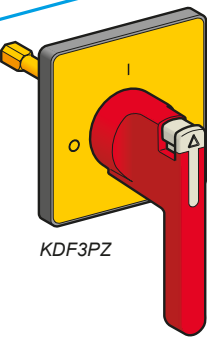
KBF2PZ



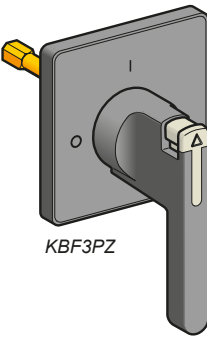
KCF3PZ



KAF3PZ



KDF3PZ



KBF3PZ

- Marking on operator $\circ \downarrow$.
- Degree of protection IP 65.

Handles and front plates for Emergency stop switch-disconnectors

| For switch body | Operator Handle | Front plate | | Reference |
|------------------------|----------------------------|-------------------|----------|------------------------------|
| | | Dimensions | Fixing | |
| VN12, VN20 V02...V2 | Red, not padlockable | Yellow | Ø22.5 | KCC1LZ |
| | | 45 x 45 | 4 screws | KCE1LZ |
| | | Yellow | Ø22.5 | KDD1PZ |
| | | 60 x 60 | 4 screws | KDF1PZ |
| V3 and V4 | Red, long, not padlockable | Yellow 60 x 60 | 4 screws | KDF2PZ |
| V5 and V6 | Red, long, not padlockable | Yellow 90 x 90 | 4 screws | KDF3PZ ⁽¹⁾ |

Handles and front plates for switch-disconnectors

| For switch body | Operator Handle | Front plate | | Reference |
|------------------------|------------------------|------------------|----------|------------------------------|
| | | Dimensions | Fixing | |
| VN12, VN20 V02...V2 | Black, not padlockable | Black | 4 screws | KAE1BZ |
| | | 45 x 45 | Ø22.5 | KBD1PZ |
| | | Black | 4 screws | KBF1PZ |
| | | 60 x 60 | | |
| V3 and V4 | Black, not padlockable | Black 60 x 60 | 4 screws | KBF2PZ |
| V5 and V6 | Black, not padlockable | Black 90 x 90 | 4 screws | KBF3PZ ⁽¹⁾ |

⁽¹⁾ For door mounting of 63 and 80 A switch-disconnectors, adapter plate **KZ106** must be ordered separately (see next page).



TeSys Control

Accessories for switch-disconnectors

Product references



VZ8



VZ26



VZ29

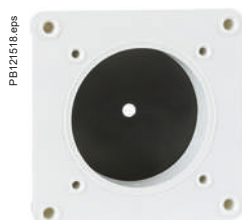
Switch-disconnectors



VZ31



KZ32



KZ81

Input terminal protection shrouds

| Description | For use on | Reference |
|--|------------------------|-------------|
| For switch bodies (3-pole shroud) | V02...V2 | VZ8 |
| | V3 and V4 | VZ9 |
| | V5 and V6 | VZ10 |
| For add-on pole modules (single-pole shroud) | VZ02...VZ2, VZ11, VZ14 | VZ26 |
| | VZ3, VZ4, VZ12, VZ15 | VZ27 |
| | VZ13, VZ16 | VZ28 |
| For contact blocks with 2 auxiliary contacts | – | VZ29 |

Components for door interlocking

For rear fixing switch-disconnectors mounted at the back of an enclosure, in addition to a direct operator

| Description | For use on | Distance enc. back/door mm | Sold in lots of | Unit reference |
|-----------------------|------------------------|----------------------------|-----------------|-----------------------------|
| Shaft extensions | VN12, VN20 V02...V2 | 300...330 | 1 | VZN17 ⁽¹⁾ |
| | | 400...430 | 1 | VZN30 ⁽¹⁾ |
| | V02...V2 | 300...330 | 1 | VZ17 |
| | | 400...430 | 1 | VZ30 |
| | V3 and V4 | 300...320 | 1 | VZ18 |
| | | 400...420 | 1 | VZ31 |
| V5 and V6 | 330...350 | 1 | VZ18 | |
| | 430...450 | 1 | VZ31 | |
| Door interlock plates | VN12, VN20 V02...V2 | – | 5 | KZ32 |
| | V3...V6 | – | 5 | KZ74 |

| Description | For use on | Front plate dimensions mm | Sold in lots of | Unit reference |
|---|------------------------|---------------------------|-----------------|----------------|
| Plates for door mounting of handles with 4 screw fixing | VN12, VN20 V02...V2 | 45 x 45 or 60 x 60 | 5 | KZ83 |
| | V3...V6 | 60 x 60 or 90 x 90 | 5 | KZ81 |
| Adapter plate for switch-disconnectors | V3 and V4 | 90 x 90 | 5 | KZ106 |

⁽¹⁾ Can be used with V02 to V2 switches.

TeSys Control

Accessories for switch-disconnectors

Product references



PB121519.eps

KZ15



PB121520.eps

KZ67



PB121521.eps

Z01

Accessories for operators

| Description | For use on | Front plate dimensions mm | Sold in lots of | Unit reference | |
|---|---------------------------------|------------------------------|-----------------|----------------|------|
| Legend holder with silver coloured blank legend plate | Front plate | 45 x 45 | 5 | KZ13 | |
| | | 60 x 60 | 5 | KZ15 | |
| | | 90 x 90 | 5 | KZ103 | |
| Legend holders without legend plate | Front plate | 45 x 45 | 20 | KZ14 | |
| | | 60 x 60 | 10 | KZ16 | |
| | | 90 x 90 | 5 | KZ101 | |
| Silver coloured blank legend plates for engraving by customer | KZ16 | – | 10 | KZ77 | |
| Seals | VN12, VN20 | 45 x 45 | 5 | KZ65 | |
| | | V02...V2 | 60 x 60 | 5 | KZ66 |
| | | V3 and V4 | 60 x 60 | 5 | KZ62 |
| | | V3...V6 | 90 x 90 | 5 | KZ67 |
| Tightening tool | For operators with Ø22.5 fixing | – | 5 | Z01 | |

Switch-disconnectors




TeSys Control

Switch-disconnectors

Product references

Switch-
disconnectors

| | | |
|---------|-----------|----------|
| KAD1PZ | VBF4GE | VCFN20GE |
| KAD1XZ | VBF5 | VCFN25GE |
| KAE1BZ | VBF5GEN | VCFN32GE |
| KAF1PZ | VBF6 | VCFN40GE |
| KAF2PZ | VBF6GEN | VCFXGE1 |
| KAF2XZ | VBFXGE1 | VCFXGE2 |
| KAF3PZ | VBFXGE2 | VCFXGE4 |
| KBD1PZ | VBFXGE4 | VCFXGE6 |
| KBF1PZ | VBFXGE6 | VGP1 |
| KBF2PZ | VC1GUN | VGPCLIP1 |
| KBF3PZ | VC2GUN | VN12 |
| KCC1LZ | VC3GUN | VN20 |
| KCC1YZ | VC4GUN | VVD0 |
| KCD1PZ | VC5GUN | VVD1 |
| KCD1YZ | VC6GUN | VVD2 |
| KCE1LZ | VCCD0 | VVD3 |
| KCE1YZ | VCCD01 | VVD4 |
| KCF1PZ | VCCD02 | VVE0 |
| KCF1YZ | VCCD1 | VVE1 |
| KCF2PZ | VCCD2 | VVE2 |
| KCF2YZ | VCCDN12 | VVE3 |
| KCF3PZ | VCCDN20 | VVE4 |
| KCG2YZ | VCCF0 | VZ0 |
| KDD1PZ | VCCF01 | VZ01 |
| KDF1PZ | VCCF02 | VZ02 |
| KDF2PZ | VCCF1 | VZ1 |
| KDF3PZ | VCCF2 | VZ10 |
| KZ32 | VCCF3 | VZ11 |
| KZ74 | VCCF4 | VZ12 |
| KZ80 | VCCF5 | VZ13 |
| KZ81 | VCCF6 | VZ14 |
| KZ82 | VCD0 | VZ15 |
| KZ83 | VCD01 | VZ16 |
| V0 | VCD02 | VZ17 |
| V01 | VCD1 | VZ17L127 |
| V02 | VCD2 | VZ17L69 |
| V1 | VCDN12 | VZ18 |
| V2 | VCDN20 | VZ2 |
| V3 | VCF0 | VZ20 |
| V4 | VCF01 | VZ26 |
| V5 | VCF01GE | VZ27 |
| V6 | VCF01GEGP | VZ28 |
| VBD0 | VCF02 | VZ29 |
| VBD01 | VCF02GE | VZ3 |
| VBD02 | VCF02GEGP | VZ30 |
| VBD1 | VCF0GE | VZ31 |
| VBD2 | VCF0GEGP | VZ4 |
| VBDN12 | VCF1 | VZ45 |
| VBDN20 | VCF1GE | VZ7 |
| VBF0 | VCF1GEGP | VZ8 |
| VBF01 | VCF1YZ | VZ9 |
| VBF01GE | VCF2 | VZN05 |
| VBF02 | VCF2GE | VZN06 |
| VBF02GE | VCF3 | VZN08 |
| VBF0GE | VCF3GE | VZN11 |
| VBF1 | VCF4 | VZN12 |
| VBF1GE | VCF4GE | VZN14 |
| VBF2 | VCF5 | VZN17 |
| VBF2GE | VCF5GEN | VZN19 |
| VBF3 | VCF6 | VZN20 |
| VBF3GE | VCF6GEN | VZN26 |
| VBF4 | VCFN12GE | VZN30 |

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

Contents

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> Dimensions B3/22 to B3/23

> Schemes B3/23

Switch-disconnectors for high performance applications:

> Dimensions B3/24 to B3/25

> Schemes B3/25

TeSys Control

Switch-disconnectors

Characteristics

Characteristics

Environment

| Switch type (bare type) | VN12 VZN12 | V02 VZ02 | VN20 VZN20 | V01 VZ01 | V0 | VZ0 | VVD0 VVE0 | V1 | VZ1 | VVD1 VVE1 | |
|--|--------------------------------------|--|------------------|--|----|-----|--------------|----|-----|--------------|--|
| Conforming to standards | IEC/EN 60947-3 and UL/CSA 60947-4-1 | | | | | | | | | | |
| Product certifications | UL, CSA, UKCA | UL, CSA, DNV-GL, CCC, IEC, UKCA | UL, CSA, UKCA | UL, CSA, DNV-GL, IEC, EAC, CCC ⁽¹⁾ , UKCA | | | | | | | |
| Degree of protection with protection shroud | IP 20 conforming to IEC 60529 | | | | | | | | | | |
| Ambient air temperature | ° C -20...+50 | | | | | | | | | | |
| Flame resistance | ° C 960 conforming to IEC 60695-2-11 | | | | | | | | | | |
| Shock resistance 1/2 sine wave = 11ms conforming to IEC60068-2-27 | gn | 15 | 30 | 15 | 30 | | | | | | |
| Vibration resistance 10...150 Hz conforming to IEC 60068-2-6 | gn | 5 | 1 | | | | | | | | |

Electrical characteristics, a.c. operation

| Switch type (bare type) | VN12 VZN12 | V02 VZ02 | VN20 VZN20 | V01 VZ01 | V0 | VZ0 | VVD0 VVE0 | V1 | VZ1 | VVD1 VVE1 | |
|--|---|-------------|---------------|-------------|----------|----------|--------------|----------|-----|--------------|--|
| Rated operational voltage (Ue) | V 690 | | | | | | | | | | |
| Rated impulse withstand voltage (Uimp) | kV 6 8 6 8 | | | | | | | | | | |
| Conventional thermal currents in free air (Ith) and rated uninterrupted (Iu) | A 12 20 25 32 | | | | | | | | | | |
| Conventional thermal current in enclosure (Ithe) | A 10 16 20 25 | | | | | | | | | | |
| Power dissipation per pole for the above operational currents | W AC-23A - 1.25 2 AC-21A - 3.2 5 | | | | | | | | | | |
| Rated operational power and current | AC-21A/22A | 230...690 V | A 12 20 25 32 | | | | | | | | |
| | AC-23A | 230 V | A/kW | 10.6/3 | 14/4 | 19.7/5.5 | | | | | |
| | | 240 V | A/kW | 10.6/3 | 14/4 | 19.9/5.5 | | 18.9/5.5 | | | |
| | | 400 V | A/kW | 8.1/4 | 11/5.5 | 14.5/7.5 | | 21.8/11 | | | |
| | | 415 V | A/kW | 8.1/4 | 11/5.5 | 14/7.5 | | 21/11 | | | |
| | | 500 V | A/kW | 8.9/5.5 | 11.9/7.5 | 16.7/11 | | | | | |
| | | 690 V | A/kW | 8.6/7.5 | 12.3/11 | 17.5/15 | | | | | |
| Rated operational power | AC -3 | 230/240 V | kW | 1.5 | 3 | 4 | | | | | |
| | | 400/415 V | kW | 3 | 4 | 5.5 | | 7.5 | | | |
| | | 500 V | kW | 4 | 5.5 | 7.5 | | | | | |
| | | 690 V | kW | 4 | 5.5 | 7.5 | 11 | | | | |
| Intermittent duty class | 30 | | | | | | | | | | |
| Characteristics in normal operating conditions | Rated making capacity AC-21A/22A/23A (I rms) | A/ 400 V | 120 | | 200 | 250 | | 320 | | | |
| | Rated breaking capacity AC-21A/22A/23A (I rms) | A/ 400 V | 120 | | 200 | 250 | | 320 | | | |
| Short-circuit characteristics | Permissible rms short time rating (Icw) | A/ 400V/1s | 140 | 300 | 140 | 300 | 384 | | | | |
| | Rated making capacity under short-circuit conditions (Icm) I peak | kA/ 400 V | 0.5 | 1 | 0.5 | 1 | | | | | |
| | Rated conditional short-circuit current (I rms) with aM/gG fuses | kA/ 400 V | 6 | 10 | 6 | 10 | | | | | |
| | | A | 12 | | 20 | 25 | | 35 | | | |

(1) CCC: except for VVD, VVE switches.

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Dimensions:
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page B3/23

B3/18

Life Is On

Schneider
Electric

Switch-
disconnectors

Ref.



| V2 VZ2 | VVD2 VVE2 | V3 VZ3 | VVD3 VVE3 | V4 VZ4 | VVD4 VVE4 | V5 | V6 | VZ7 VZ20 | VZN05 VZN06 |
|-------------------------------------|--------------|-----------|--------------|-----------|--------------|----|----|------------------------------------|----------------|
| IEC/EN 60947-3 and UL/CSA 60947-4-1 | | | | | | | | IEC/EN 60947-5-1, UL/CSA 60947-5-1 | |

UL, CSA, DNV-GL, IEC, EAC, CCC ⁽¹⁾, UKCA

IP 20 conforming to IEC 60529

-20...+50

960 conforming to IEC 60695-2-11

30

-

1

-

| V2 VZ2 | VVD2 VVE2 | V3 VZ3 | VVD3 VVE3 | V4 VZ4 | VVD4 VVE4 | V5 | V6 | VZ7 VZ20 | VZN05 VZN06 |
|-----------|--------------|-----------|--------------|-----------|--------------|----|----|-------------|----------------|
|-----------|--------------|-----------|--------------|-----------|--------------|----|----|-------------|----------------|

690

8

6

| | | | | | | |
|-----------|---------|-----------|---------|---------|----------|----|
| 40 | 63 | 80 | 125 | 175 | 12 | 12 |
| 32 | 50 | 63 | 100 | 140 | 10 | 10 |
| 2.4 | 4.2 | 5.1 | 7.5 | 11 | - | - |
| 5.4 | 6.4 | 12.5 | 15 | 25 | - | - |
| 40 | 63 | 80 | 125 | 160 | Ie/AC-15 | |
| 25.8/7.5 | 50.3/15 | 61.2/18.5 | 71.9/22 | 96.6/30 | 6 A | |
| 24.8/7.5 | 48.2/15 | 58.5/18.5 | 68/22 | 92.7/30 | 6 A | |
| 29/15 | 41.5/22 | 57/30 | 68.5/37 | 83/45 | 4 A | |
| 28/15 | 40/22 | 55/30 | 66/37 | 80/45 | 4 A | |
| 28.5/18.5 | 44/30 | 54/37 | 64.5/45 | 79/55 | 2 A | |
| 17.5/15 | 25/22 | 33/30 | 42/37 | 49/45 | 1 A | |
| 5.5 | 11 | 15 | 22 | 30 | - | |
| 11 | 18.5 | 22 | 30 | 37 | - | |
| 15 | 22 | 30 | 37 | 45 | - | |
| 11 | 18.5 | | 30 | 37 | - | |
| 30 | | | | | - | |
| 400 | 630 | 800 | 1250 | 1750 | - | |
| 320 | 500 | 640 | 1000 | 1400 | - | |
| 480 | 756 | 960 | 1500 | 2100 | - | |
| 1 | 2.1 | | 2.8 | | - | |
| 10 | | | | | 1 | |
| 50 | 63 | 80 | 125 | 200 | 16 | 16 |

(1) CCC: except for VVD, VVE switches.

References:
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Dimensions:
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Schemes:
page B3/23

Switch-
disconnectors

Ref.



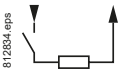
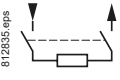
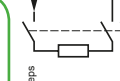

TeSys Control

Switch-disconnectors

Characteristics

Characteristics

Electrical characteristics, d.c. operation

| Switch type (bare type) | | | | VN12 VZN12 | V02 VZ02 | VN20 VZN20 | V01 VZ01 | V0 VZ0 | VVD0 VVE0 | V1 VZ1 | VVD1 VVE1 |
|--|--|------------|------------|---------------|-------------|---------------|-------------|--------|--------------|--------|--------------|
|    | Rated operational current DC-1 (L/R = 1ms) | 24 V | 1 contact | A | 12 | 20 | | 25 | | 32 | |
| | | | 2 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | | 3 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | 48 V | 1 contact | A | 12 | 20 | | 25 | | 32 | |
| | | | 2 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | | 3 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | 60 V | 1 contact | A | 12 | 20 | | 25 | | 32 | |
| | | | 2 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | | 3 contacts | A | 12 | 20 | | 25 | | 32 | |
| | 110 V | 1 contact | A | 1.5 | 2 | | 9 | | 10 | | |
| | | 2 contacts | A | 8 | 10 | | 12 | | 16 | | |
| | | 3 contacts | A | 12 | 20 | | 25 | | 32 | | |
| | 220 V | 1 contact | A | 1.5 | 2 | | 2.5 | | 3 | | |
| | | 2 contacts | A | 7 | 8 | | 10 | | 12 | | |
| | | 3 contacts | A | 10 | 14 | | 16 | | 20 | | |
| | 250 V | 1 contact | A | 0.6 | 0.7 | | 0.8 | | 1 | | |
| | | 2 contacts | A | 3 | 4 | | 6 | | 8 | | |
| | | 3 contacts | A | 8 | 10 | | 12 | | 16 | | |
| Ref.  | Rated operational current DC-2 to DC-5 (L/R = 1ms) | 24 V | 1 contact | A | 12 | 20 | | 25 | | 32 | |
| | | | 2 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | | 3 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | 48 V | 1 contact | A | 12 | 20 | | 25 | | 32 | |
| | | | 2 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | | 3 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | 60 V | 1 contact | A | 10 | 14 | | 16 | | 20 | |
| | | | 2 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | | 3 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | 110 V | 1 contact | A | 1.5 | 2 | | 2.5 | | 3 | |
| | | | 2 contacts | A | 3 | 4 | | 5 | | 6 | |
| | | | 3 contacts | A | 12 | 20 | | 25 | | 32 | |
| | | 220 V | 1 contact | A | 0.4 | 0.5 | | 0.5 | | 0.8 | |
| | | | 2 contacts | A | 1.4 | 1.5 | | 1.5 | | 2 | |
| | | | 3 contacts | A | 1 | 2 | | 3 | | 4 | |
| | | 250 V | 1 contact | A | 0.3 | 0.4 | | 0.5 | | 0.8 | |
| | | | 2 contacts | A | 0.4 | 0.6 | | 0.8 | | 1 | |
| | | | 3 contacts | A | 1.2 | 2.4 | | 1.6 | | 2 | |

Other characteristics

| Switch type (bare type) | | | | VN12 VZN12 | V02 VZ02 | VN20 VZN20 | V01 VZ01 | V0 VZ0 | VVD0 VVE0 | V1 VZ1 | VVD1 VVE1 |
|--|----------------------------|-----------------|-----|---------------|-------------|---------------|-------------|--------|--------------|--------|--------------|
| Mechanical durability (millions of operating cycles) | | | | 0.05 | 0.1 | 0.05 | 0.1 | | | | |
| Electrical durability in cat. AC-21 (millions of operating cycles) | | | | 0.05 | 0.1 | 0.05 | 0.1 | | | | |
| Electrical durability in cat. DC-1 to 5 (operating cycles) | | | | 30000 | | | | | | | |
| Suitable for isolation | | | | Yes | | | | | | | |
| Cabling | Flexible cable + cable end | mm ² | 4 | 6 | 4 | 6 | | | | | |
| | Solid cable | mm ² | 4 | 10 | 4 | 10 | | | | | |
| Tightening torque | | N.m | 0.7 | 2.1 | 0.7 | 2.1 | | | | | |

References:
page B3/3

Dimensions:
page B3/22

Schemes:
page B3/23

B3/20

Life Is On

Schneider
Electric

| V2 VZ2 | VVD2 VVE2 | V3 VZ3 | VVD3 VVE3 | V4 VZ4 | VVD4 VVE4 | V5 | V6 | VZ7 VZ20 | VZN05 VZN06 |
|-----------|--------------|-----------|--------------|-----------|--------------|------|-----|----------------|----------------|
| 40 | | 63 | | 80 | | 125 | 175 | 8 (le/DC-1) | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | 8 (le/DC-1) | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 35 | | 40 | | 50 | | 60 | 70 | 4 (le/DC-1) | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 12 | | 20 | | 25 | | 30 | 37 | 2 (le/DC-1) | |
| 20 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 4 | | 6 | | 8 | | 12 | 15 | 1 (le/DC-1) | |
| 14 | | 25 | | 30 | | 40 | 50 | – | |
| 25 | | 30 | | 40 | | 80 | 100 | – | |
| 2 | | 4 | | 5 | | 3 | 10 | 0.8 (le/DC-1) | |
| 12 | | 20 | | 25 | | 30 | 40 | – | |
| 20 | | 30 | | 40 | | 50 | 61 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 25 | | 40 | | 50 | | 60 | 70 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 40 | | 63 | | 80 | | 125 | 175 | – | |
| 5 | | 6 | | 8 | | 10 | 12 | – | |
| 8 | | 10 | | 20 | | 22 | 24 | – | |
| 40 | | 50 | | 63 | | 70 | 80 | – | |
| 1 | | 1.5 | | 2 | | 2.2 | 2.4 | – | |
| 3 | | 4 | | 6 | | 7 | 8 | – | |
| 7 | | 10 | | 15 | | 16 | 13 | – | |
| 1 | | 1.2 | | 1.5 | | 1.6 | 1.8 | – | |
| 2 | | 3 | | 6 | | 7 | 8 | – | |
| 6 | | 8 | | 10 | | 12 | 14 | – | |
| V2 VZ2 | VVD2 VVE2 | V3 VZ3 | VVD3 VVE3 | V4 VZ4 | VVD4 VVE4 | V5 | V6 | VZ7 VZ20 | VZN05 VZN06 |
| 0.1 | | 0.03 | | | | | | 0.1 | 0.05 |
| 0.1 | | 0.03 | | | | | | 0.1 (AC-15) | 0.05 |
| 30000 | | | | | | | | 30000 (DC-1) | |
| Yes | | | | | | | | – | |
| 6 | | 16 | | | | 70 | | 2 x 0.75...1.5 | |
| 10 | | 25 | | | | 95 | | 2 x 1...2.5 | |
| 2.1 | | 4 | | | | 22.6 | | 0.7 | |

Switch-disconnectors

Ref.



TeSys Control

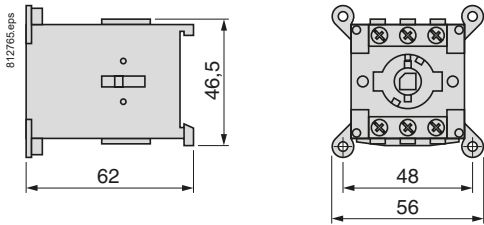
Switch-disconnectors for standard applications

Dimensions, mounting

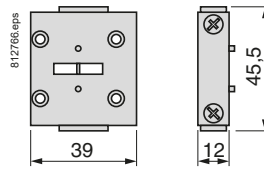
Dimensions

Switch-disconnectors

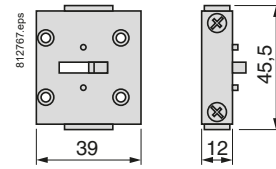
Switch bodies VN12, VN20



Add-on modules VZN12, VZN20



Add-on modules VZN11, VZN14 VZN05 and VZN06



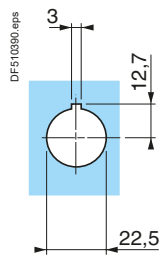
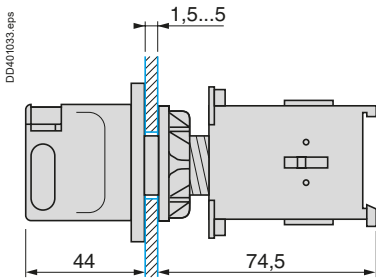
Switch-disconnectors

Mounting

Switch-disconnector mounted on enclosure door

VCDN12, VCDN20, VBDN12, VBDN20

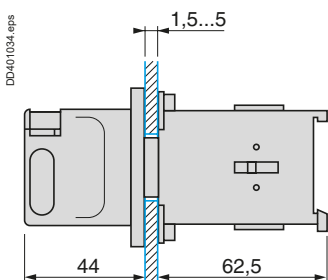
Single hole fixing



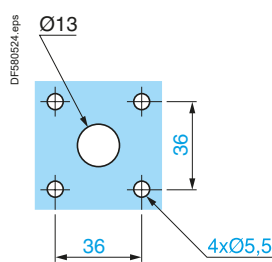
Ref.



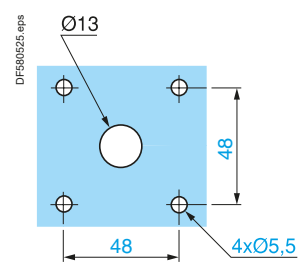
VN12, VN20
4 screw fixing



45 x 45 front plate



60 x 60 front plate



TeSys Control

Switch-disconnectors for standard applications

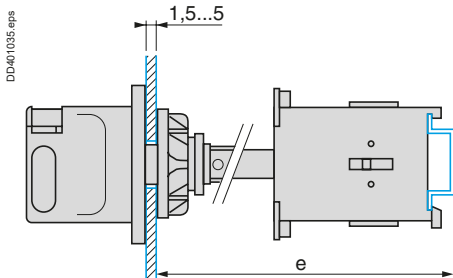
Mounting, schemes

Mounting (continued)

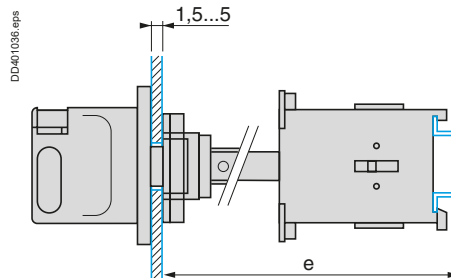
Switch-disconnector mounted at back of enclosure with shaft extension VZN17 or VZN30 (clip-on mounting on L rail)

VN12, VN20

Single hole fixing

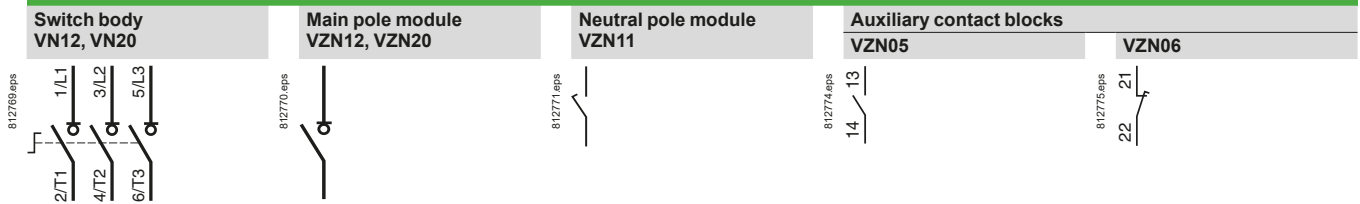


4 screw fixing



| | Shaft extension | Distance (e) enclosure back/door mm |
|------------|-----------------|---|
| VN12, VN20 | VZN17 | 300...330 |
| | VZN30 | 400...430 |

Schemes



Switch-disconnectors

Ref.



TeSys Control

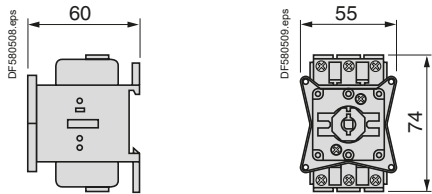
Switch-disconnectors for high performance applications

Dimensions, mounting

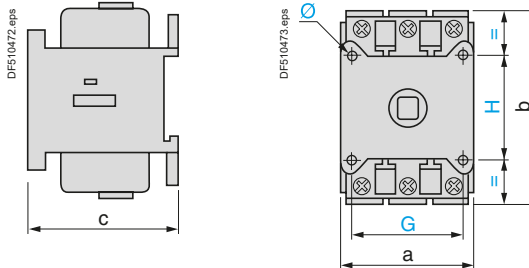
Dimensions

Switch-disconnectors

Switch bodies V0 \bullet , V0 to V2

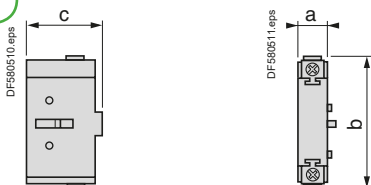


Switch bodies V3 to V6

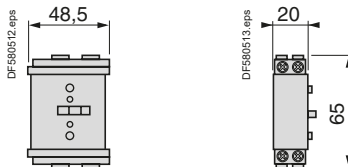


| | a | b | c | G | H | Ø |
|--------|----|-----|----|----|----|-----|
| V3, V4 | 60 | 83 | 65 | 48 | 48 | 5.5 |
| V5, V6 | 90 | 125 | 90 | 68 | 68 | 5.5 |

Add-on modules VZ02 to VZ4 and VZ11 to VZ16



Add-on modules VZ7, VZ20



Switch-disconnectors

Ref.

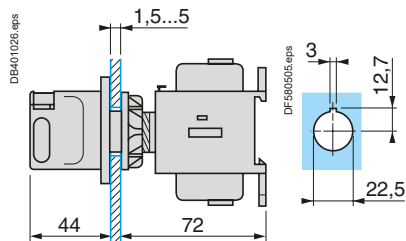


| | a | b | c |
|---------------------------------------|----|-----|----|
| VZ02 and VZ01, VZ0 to VZ2, VZ11, VZ14 | 16 | 74 | 35 |
| VZ3, VZ4, VZ12, VZ15 | 20 | 83 | 46 |
| VZ13, VZ16 | 30 | 125 | 63 |

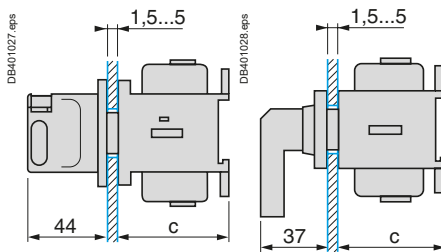
Mounting

Switch-disconnector mounted on enclosure door

Single hole fixing V0 \bullet , V0 to V2

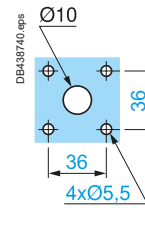


4 screw fixing V0 \bullet , V0 to V4

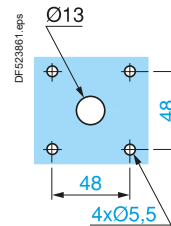


| | c |
|-------------------------|----|
| V0 \bullet , V0 to V2 | 60 |
| V3, V4 | 65 |

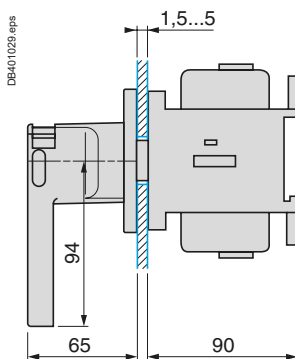
4 screw fixing 45 x 45 front plate V0 \bullet , V0 to V2



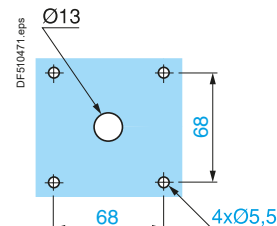
4 screw fixing 60 x 60 front plate V0 \bullet , V0 to V4



V5 and V6. 4 screw fixing



90 x 90 front plate



TeSys Control

Switch-disconnectors for high performance applications

Mounting, schemes

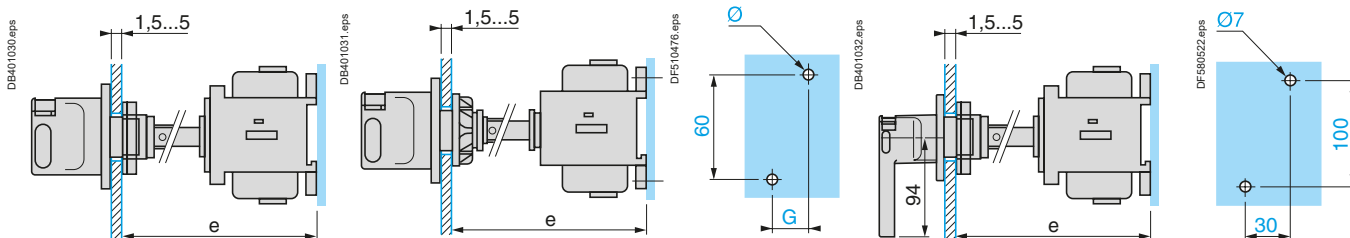
Mounting (continued)

Switch-disconnector mounted at back of enclosure

4 screw fixing
V0 \bullet , V0 to V2 with shaft extension VZ17 or VZ30 (clip-on mounting on \perp rail possible for V0 \bullet to V2)

Single hole fixing
V3 to V4 with shaft extension VZ18 or VZ31

V5 and V6 with shaft extension VZ18 or VZ31



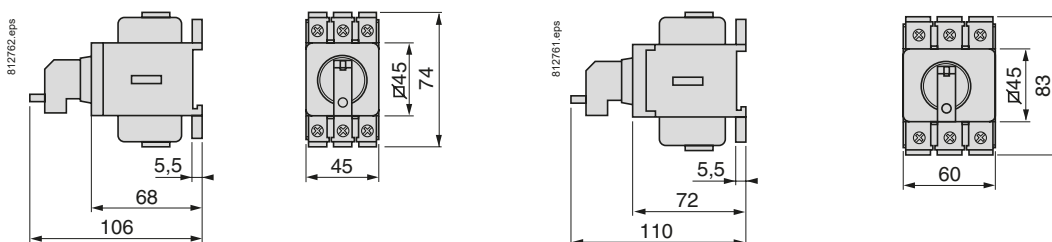
| | Shaft extension | Distance (e) enc.back/door mm | \varnothing | G |
|-------------------------|-----------------|-------------------------------|---------------|----|
| V02 and V01 V0 to V2 | VZ17 | 300...330 | 2 x 4.2 | 15 |
| | VZ30 | 400...430 | 2 x 4.2 | 15 |
| V3 and V4 | VZ18 | 300...320 | 2 x 5 | 20 |
| | VZ31 | 400...420 | 2 x 5 | 20 |

| | Shaft extension | Distance (e) enc.back/door mm |
|-----------|-----------------|-------------------------------|
| V5 and V6 | VZ18 | 300...350 |
| | VZ31 | 430...450 |

Switch-disconnectors for modular distribution boards

VV \bullet 0 to VV \bullet 2

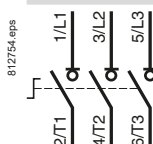
VV \bullet 3 to VV \bullet 4



Schemes

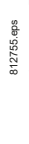
Switch body

V02 and V01
V0 to V6



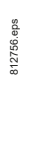
Main pole module

VZ02 and VZ01
VZ0 to VZ4



Neutral pole module

VZ11 to VZ13



Auxiliary contact blocks

VZ7



VZ20



| Fuse carriers | | |
|--|---------------------------|-------|
| Type of product | Range | Pages |
| Introduction | | B4/2 |
| For protection of control circuits or transformer | Up to 25, 32, 50 or 125 A | B4/3 |
| For protection of control circuits or transformer For North American market | Up to 30 A | B4/5 |
| For protection of motors or transformers | Up to 25, 32, 50 A | B4/6 |
| Technical Data for Designers | | B4/11 |



Fuse carriers

Operation: safety

The fuse carrier performs two basic functions:

- it isolates the downstream circuit by means of a visible break and wide opening contacts,
- it holds the cartridge fuses designed to protect the installation against short-circuits.

The type of cartridge fuse needed to protect the circuit must be determined before selecting the fuse carrier.

Cartridge fuse selection (type, rating, size)

Type

| | |
|--------------------|--|
| Application | <ul style="list-style-type: none"> ■ Motor protection. ■ Transformer protection. |
| Solution | <ul style="list-style-type: none"> ■ aM type fuses. These fuses are designed to withstand high current peaks of a very short duration. They must be combined with a thermal overload relay coupled with a contactor. |
| Application | <ul style="list-style-type: none"> ■ Lighting circuit protection. ■ Supply line protection. ■ Furnace protection. |
| Solution | <ul style="list-style-type: none"> ■ gG type fuses, which are more widely used but whose limiting capacity is weaker than that of aM type fuses. |

Rating

| | | | | | | | |
|-----------------|--|-----------|-----------------------------|-----------|------------------------------------|---------------|---------------------|
| gG fuses | See standard NF C 15-100. | | | | | | |
| aM fuses | Table 53 A paragraph 532-2-1 and table 52 C paragraph 523-1. | | | | | | |
| | Motors 3 x 220 V | | Motors 3 x 400 V | | Cartridge fuses type aM | | Fuse carrier |
| | P | in | P | in | Size | Rating | |
| | kW | A | kW | A | | A | |
| | 9 | 32 | 15 | 28.5 | 10 x 38 | 32 | LS1D32 |
| | 11 | 39 | 22 | 44 | 14 x 51 | 50 | GK1EK |
| | 22 | 75 | 37 | 73 | 22 x 58 | 80 | GK1FK |

Size

Use the "fuse characteristics" table opposite to select the correct fuse size according to:

- the nominal current of the circuit to be protected,
- the operational voltage.

Fuse carrier selection

| | |
|--------------------|---|
| Application | Isolation of a circuit for safety reasons only. |
| Solution | The fuse carrier may be fitted with links. The maximum permissible current is indicated in the "pole characteristics" table opposite. |
| Application | Isolation of a circuit and its protection against short-circuits. |
| Solution | Select a fuse carrier according to: <ul style="list-style-type: none"> ■ the type of cartridge fuse required, ■ the maximum permissible current in the fuse carrier poles (see "pole characteristics" table opposite). If the operational current is greater than the maximum permissible current in the poles of the fuse carrier corresponding to the cartridge fuse size selected, select the fuse carrier the next size up. <p>The safety provided by using a fuse carrier can be increased by adding a padlocking device with up to three padlocks.</p> |

Recommendations for use

The fuse carrier conforms to utilisation category AC-21A/22A of standard IEC 60947-3. It is therefore recommended that the fuse carrier early break auxiliary contacts always be inserted in the coil circuit of the contactor with which it is in series. If the fuse carrier is not associated with a contactor, it is essential to ensure that it will be operated off-load.

TeSys Power

Fuse carriers

Product references - DF type



DF101



DF141



DF221



DF101NV



DF141NV



DF221NV



DF103



DF143NC



DF223NC



DF103V



DF143VC



DF223VC

For protection of control circuits or transformers

Fuse carriers ⁽¹⁾

| Conventional thermal current (Ith) | Size of cartridge fuse or link | Composition | Sold in lots of | Unit reference |
|------------------------------------|--------------------------------|------------------------|-----------------|-----------------------|
| A | mm | | | |
| 25 | 8.5 x 32 | 1 P | 12 | DF81 |
| | | N | 12 | DF10N |
| | | 1 P + N ⁽²⁾ | 6 | DF81N |
| | | 2 P | 6 | DF82 |
| | | 3 P | 4 | DF83 |
| 3 P + N ⁽²⁾ | 3 | DF83N | | |
| 32 | 10 x 38 | 1 P | 12 | DF101 |
| | | N | 12 | DF10N |
| | | 1 P + N ⁽²⁾ | 6 | DF101N |
| | | 2 P | 6 | DF102 |
| | | 3 P | 4 | DF103 |
| 3 P + N ⁽²⁾ | 3 | DF103N | | |
| 50 | 14 x 51 | 1 P | 6 | DF141 |
| | | N | 6 | DF14N |
| | | 1 P + N ⁽²⁾ | 3 | DF141N |
| | | 2 P | 3 | DF142 |
| | | 3 P | 2 | DF143C ⁽³⁾ |
| 3 P + N ⁽²⁾ | 1 | DF143NC ⁽³⁾ | | |
| 125 | 22 x 58 | 1 P | 6 | DF221 |
| | | N | 6 | DF22N |
| | | 1 P + N ⁽²⁾ | 3 | DF221N |
| | | 2 P | 3 | DF222 |
| | | 3 P | 2 | DF223C ⁽³⁾ |
| 3 P + N ⁽²⁾ | 1 | DF223NC ⁽³⁾ | | |

Fuse carriers with "blown fuse" indicators (LED) ^{(1) (4)}

| Conventional thermal current (Ith) | Size of cartridge fuse or link | Composition | Sold in lots of | Unit reference |
|------------------------------------|--------------------------------|------------------------|-----------------|-------------------------|
| A | mm | | | |
| 25 | 8.5 x 32 | 1 P | 12 | DF81V |
| | | 1 P + N ⁽²⁾ | 6 | DF81NV |
| | | 2 P | 6 | DF82V |
| | | 3 P | 4 | DF83V |
| | | 3 P + N ⁽²⁾ | 3 | DF83NV |
| 32 | 10 x 38 | 1 P | 12 | DF101V |
| | | 1 P + N ⁽²⁾ | 6 | DF101NV |
| | | 2 P | 6 | DF102V |
| | | 3 P | 4 | DF103V |
| | | 3 P + N ⁽²⁾ | 3 | DF103NV |
| 50 | 14 x 51 | 1 P | 6 | DF141V |
| | | 1 P + N ⁽²⁾ | 3 | DF141NV |
| | | 2 P | 3 | DF142V |
| | | 3 P | 2 | DF143VC ⁽³⁾ |
| | | 3 P + N ⁽²⁾ | 1 | DF143NVC ⁽³⁾ |
| 125 | 22 x 58 | 1 P | 6 | DF221V |
| | | 1 P + N ⁽²⁾ | 3 | DF221NV |
| | | 2 P | 3 | DF222V |
| | | 3 P | 2 | DF223VC ⁽³⁾ |
| | | 3 P + N ⁽²⁾ | 1 | DF223NVC ⁽³⁾ |

⁽¹⁾ Each pole can be marked. A clip-in marker holder is provided for this purpose. Clip-in markers type AB1R● or AB1G● can also be used. DF8●●● and DF10●●● are pad lockable fuse carriers.

⁽²⁾ N: neutral pole fitted with a locked tubular link as standard.

⁽³⁾ A letter "C" in the reference indicates that the fuse carrier can be fitted with auxiliary early break, "blown fuse" signalling and "fuse present" signalling contacts.

⁽⁴⁾ Operational voltage of the blown fuse indicator: 110 V...690 V.

Introduction:
page B4/2

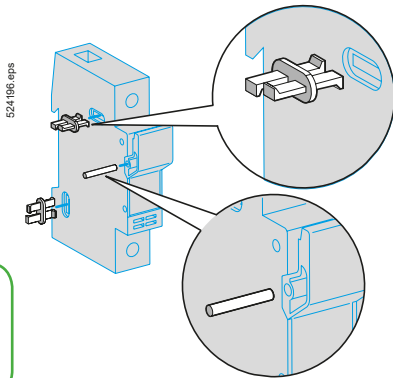
Characteristics:
page B4/12

Dimensions:
page B4/13

Schemes:
page B4/13

Fuse carriers





Detail of assembly clip and pin mounting

Fuse carriers



Accessories

Auxiliary early break and "blown fuse" signalling contacts ⁽¹⁾

| Fuse carriers to be equipped | Size of cartridge fuse or link | Number of contacts | Sold in lots of | Unit reference |
|------------------------------|--------------------------------|--------------------|-----------------|----------------|
| DF14 (3 P or 3 P + N) | 14 x 51 | 1 | 1 | DF14AM1 |
| | | 2 | 1 | DF14AM2 |
| DF22 (3 P or 3 P + N) | 22 X 58 | 1 | 1 | DF22AM1 |
| | | 2 | 1 | DF22AM2 |

Fuse carrier assembly kits ⁽²⁾

| Fuse carriers to be assembled | Size of cartridge fuse or link | Composition | Sold in lots of | Unit reference |
|-------------------------------|--------------------------------|-------------------|-----------------|----------------|
| DF8 | 8.5 x 32 | 1 pin, 2 clips | 12 | DF10AP |
| DF10 | 10 x 38 | | | |
| DF14 | 14 x 51 | 1 pin, 3 clips | 10 | DF14AP |
| DF22 | 22 x 58 | 1 pin, 3 clips | 10 | DF22AP |

Marking accessories

| Description | Composition | Marking | Sold in lots of | Unit reference |
|-----------------|--|----------------|-----------------|--|
| Clip-in markers | Strip of 10 identical numbers or letters | 0...9 A...Z | 25 | AB1R● ⁽³⁾ AB1G● ⁽³⁾ |

Substitution

Fuse carriers

| Old range | | | New range | |
|-----------|--------------------------------|-------------|-------------------------|--------------------------|
| Reference | Size of cartridge fuse or link | Composition | Reference w/o indicator | Reference with indicator |
| DF6AB08 | 8.5 x 32 | 1 P | DF81 | DF81V |
| DF6AB10 | 10 x 38 | 1 P | DF101 | DF101V |
| DF6N10 | 8.5 x 32 or 10 x 38 | 1 N | DF10N | – |
| GK1CC | 8.5 x 32 | 1 P + N | DF81N | DF81NV |
| GK1CD | 8.5 x 32 | 2 P | DF82 | DF82V |
| GK1CF | 8.5 x 32 | 3 P | DF83 | DF83V |
| GK1CH | 8.5 x 32 | 3 P + N | DF83N | DF83NV |
| GK1DC | 10 x 38 | 1 P + N | DF101N | DF101NV |
| GK1DD | 10 x 38 | 2 P | DF102 | DF102V |
| GK1DF | 10 x 38 | 3 P | DF103 | DF103V |
| GK1DH | 10 x 38 | 3 P + N | DF103N | DF103NV |
| GK1EB | 14 x 51 | 1 P | DF141 | DF141V |
| GK1EN | 14 x 51 | 1 N | DF14N | – |
| GK1EC | 14 x 51 | 1 P + N | DF141N | DF141NV |
| GK1ED | 14 x 51 | 2 P | DF142 | DF142V |
| GK1EF | 14 x 51 | 3 P | DF143C | DF143VC |
| GK1EH | 14 x 51 | 3 P + N | DF143NC | DF143NVC |
| GK1FB | 22 x 58 | 1 P | DF221 | DF221V |
| GK1FN | 22 x 58 | 1 N | DF22N | – |
| GK1FC | 22 x 58 | 1 P + N | DF221N | DF221NV |
| GK1FD | 22 x 58 | 2 P | DF222 | DF222V |
| GK1FF | 22 x 58 | 3 P | DF223C | DF223VC |
| GK1FH | 22 x 58 | 3 P + N | DF223NC | DF223NVC |

Fuse carrier assembly kits

| Old range | | New range |
|-----------|--------------------------------|-----------|
| Reference | Size of cartridge fuse or link | Reference |
| GK1AP2 | 8.5 x 32 or 10 x 38 | DF10AP |
| GK1AP3 | 8.5 x 32 or 10 x 38 | DF10AP |
| | 14 x 51 | DF14AP |
| GK1AP4 | 8.5 x 32 or 10 x 38 | DF10AP |
| | 22 x 58 | DF22AP |
| GK1AP5 | 14 x 51 | DF14AP |
| GK1AP6 | 14 x 51 | DF14AP |
| | 22 x 58 | DF22AP |
| GK1AP9 | 22 x 58 | DF22AP |

⁽¹⁾ These auxiliary contacts provide the following functions: early break, "blown fuse" signalling (if the fuse carrier is fitted with striker fuses) and "fuse present" signalling.

⁽²⁾ 1 pin and 2 clips are required to assemble two DF8 or DF10 fuse carriers together. 1 pin and 3 clips are required to assemble two DF14 or DF22 fuse carriers together.

⁽³⁾ When ordering, replace the ● in the reference with the number or letter required. Example: AB1-R1 or AB1-GA.

TeSys Power

Fuse carriers for North American market

Product references - DF type

For protection of control circuits or transformers

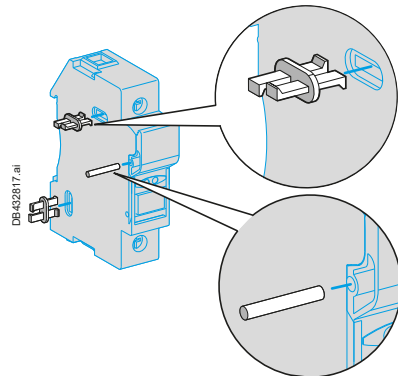
References



DFCC1



DFCC3V



Detail of assembly clip and pin mounting

Fuse carriers ⁽¹⁾

| Conventional thermal current (Ith) | Size of cartridge fuse or link | Composition | Sold in lots of | Unit reference |
|------------------------------------|--------------------------------|-------------|-----------------|----------------|
| A | | | | |
| 30 | Class CC | 1 P | 12 | DFCC1 |
| | | 2 P | 12 | DFCC2 |
| | | 3 P | 6 | DFCC3 |

Fuse carriers with "blown fuse" indicators (LED) ^{(1) (2)}

| Conventional thermal current (Ith) | Size of cartridge fuse or link | Composition | Sold in lots of | Unit reference |
|------------------------------------|--------------------------------|-------------|-----------------|----------------|
| A | | | | |
| 30 | Class CC | 1 P | 12 | DFCC1V |
| | | 2 P | 6 | DFCC2V |
| | | 3 P | 6 | DFCC3V |

Fuse carrier assembly kits ⁽³⁾

| Fuse carriers to be assembled | Size of cartridge fuse or link | Composition | Sold in lots of | Unit reference |
|-------------------------------|--------------------------------|----------------|-----------------|----------------|
| DFCC | Class CC | 1 pin, 2 clips | 12 | DF10AP |

Marking accessories

| Description | Composition | Marking | Sold in lots of | Unit reference |
|-----------------|---|---------|-----------------|----------------------|
| Clip-in markers | Strip of 10 identical numbers or letter | 0...9 | 25 | AB1R● ⁽⁴⁾ |
| | | A...Z | 25 | AB1G● ⁽⁴⁾ |

⁽¹⁾ Each pole can be marked. A clip-in marker holder is provided for this purpose.

Clip-in markers type AB1R● or AB1G● can also be used.

DFCC fuse holders are pad lockable.

⁽²⁾ Operational voltage of the blown fuse indicator: 230 V...690 V.

⁽³⁾ 1 pin and 2 clips are required to assemble two DFCC fuse carriers together.

⁽⁴⁾ When ordering, replace the p in the reference with the number or letter required.

Example: AB1R1 or AB1GA.

Fuse carriers





PE111831.eps

LS1D323



PE111830.eps

LS1D32



PE121302.eps

GK1EK



PE111830.eps

LS1D32



PE121303.eps

+ LA8D324

Fuse carriers



For protection of motors or transformers

3-pole basic blocks

Connection by spring terminals

| Rating | Cartridge fuse size | Number of early break contacts ⁽¹⁾ | Single-phase protection device ⁽²⁾ | Reference ⁽³⁾ | Weight kg |
|--------|---------------------|---|---|--------------------------|--------------|
| 25 A | 10 x 38 | – ⁽⁴⁾ | Without | LS1D323 | 0.270 |

Connection by screw clamp terminals or connectors

| | | | | | | |
|------|---------|------------------|---------|---------|-------|-------|
| 32 A | 10 x 38 | – ⁽⁴⁾ | Without | LS1D32 | 0.300 | |
| 50 A | 14 x 51 | 1 | Without | GK1EK | 0.430 | |
| | | | With | GK1EV | 0.470 | |
| | | | 2 | Without | GK1ES | 0.470 |
| | | | | With | GK1EW | 0.510 |

4-pole basic blocks

Connection by screw clamp terminals or connectors

| | | | | | | |
|------|---------|------------------|---------|---------------------------------|-------|-------|
| 32 A | 10 x 38 | – ⁽⁴⁾ | Without | LS1D32 + LA8D324 ⁽⁵⁾ | 0.300 | |
| 50 A | 14 x 51 | 1 | Without | GK1EM | 0.570 | |
| | | | With | GK1EY | 0.600 | |
| | | | 2 | Without | GK1ET | 0.610 |
| | | | | With | GK1EX | 0.650 |

Fuse carriers for the North American market

25 and 30 A basic blocks: please consult your Regional Sales Office.

- (1) With 1 or 2 early break contacts to be inserted in the contactor control circuit.
- (2) Fuse carriers with single-phase protection device must be fitted with striker fuses.
- (3) LS1D: clips directly onto a 35 mm rail or screw fixing.
GK1: clips directly onto a 35 mm rail or Telequick mounting plate.
- (4) Addition of add-on contact block, see page B4/7.
- (5) Can be mounted on left-hand or right-hand side of the basic block.

TeSys Power

Fuse carriers - Handles and accessories

Product references - for LS, GK type

PC112152.eps



GK1AP05

Add-on contact blocks

| Description | For use on | Mounting | Maximum number | Type of contacts | Sold in lots of | Unit reference |
|---|------------|----------|----------------|------------------|-----------------|----------------|
| Instantaneous auxiliary contacts (early break contacts) | LS1D32 | Front | 1 | N/O + N/C | 10 | GVAE11 |
| | | | | N/O + N/O | 10 | GVAE20 |
| | LS1D323 | Front | 1 | N/O + N/C | 10 | GVAE113 |
| | | | | N/O + N/O | 10 | GVAE203 |

Operators

| For fuse carrier | | For mounting on | Reference |
|---------------------|-----------------|-----------------|-----------|
| Rating | Number of poles | | |
| Side handles | | | |
| 125 A | 3 or 4 | Right-hand side | GK1AP07 |
| | | Left-hand side | GK1AP08 |

Front handles ⁽¹⁾

| | |
|-----------------|--------------------|
| 32 - 50 - 125 A | Fitted as standard |
|-----------------|--------------------|

External handles

| | | | |
|------|--------|------------------------|--------------------------|
| 32 A | 3 or 4 | Right-hand side (IP54) | LS1D32005 ⁽²⁾ |
| | | Left-hand side (IP54) | LS1D32006 |
| 50 A | 3 or 4 | Right-hand side | GK1AP05 |
| | | Left-hand side | GK1AP06 |

Padlocking devices ⁽³⁾

| For fuse carrier | | | Reference |
|------------------|-----------------|--------------------------------|-----------|
| Rating | Number of poles | Single-phase protection device | |
| 32 A | 3 or 4 | Without | integral |
| 50 A | 3 | Without | GK1AV07 |
| | | With | GK1AV08 |
| | 4 | Without | GK1AV08 |
| | | With | GK1AV09 |

Links

Tubular links

| For fuse carrier | | Sold in lots of | Unit reference |
|------------------|-----------------|-----------------|------------------------|
| Rating | Number of poles | | |
| 32 A | 3 or 4 | 10 | DK1CB92 ⁽⁴⁾ |
| 50 A | 3 or 4 | 10 | DK1EB92 ⁽⁵⁾ |
| 125 A | 3 or 4 | 10 | DK1FA92 ⁽⁵⁾ |

⁽¹⁾ Fitted as standard on 32, 50 and 125 A fuse carriers type GK1.

⁽²⁾ Reference LS1D32005 replaces reference DK1FB005.

⁽³⁾ For the 125 A rating, use side handles GK1AP07 or GK1AP08.

⁽⁴⁾ For use on a neutral circuit, the tubular link can be interlocked with special device LA8D25906 (sold in lots of 10).

⁽⁵⁾ 50 A fuse carriers type GK1 are fitted with an interlocked neutral tubular link as standard.

Fuse carriers





Accessories for LS1D32 (screw clamp terminals)

| Description | Application | Sold in lots of | Unit reference |
|--------------------|---|-----------------|----------------|
| Plate for mounting | LS1D32 and contactor LC1D09...D38 with front faces aligned | 1 | LAD311 |
| Combination blocks | Between LS1D32 and contactor LC1K or LP1K | 10 | GV2AF01 |
| | Between LS1D32 and contactor LC1D09...D38 | 10 | GV2AF3 |
| | Between LS1D32 mounted on LAD311 and contactor LC1D09...D38 | 10 | GV2AF4 |

| Description | Application | Pitch mm | Reference |
|-----------------------------|-------------|----------|-----------|
| Sets of 3-pole 63 A busbars | 2 tap-offs | 45 | GV2G245 |
| | | 54 | GV2G254 |
| | | 72 | GV2G272 |
| | 3 tap-offs | 45 | GV2G345 |
| | | 54 | GV2G354 |
| | 4 tap-offs | 45 | GV2G445 |
| | | 54 | GV2G454 |
| | | 72 | GV2G472 |
| | 5 tap-offs | 54 | GV2G554 |

| Description | Application | Sold in lots of | Unit reference |
|--|--|-----------------|----------------|
| Protective end cover | For unused busbar outlets | 5 | GV1G10 |
| Terminal block Connection from the top | For supply to one or more GV2G busbar sets | 1 | GV1G09 |
| Cover for terminal block | For mounting in modular panels | 10 | LA9E07 |
| Padlocking device | For use with up to 4 padlocks (not supplied) Ø6 mm shank max | 1 | GV2V03 |

Accessories for LS1D323 (spring terminals)

| Description | Application | Reference |
|--------------------|---|-----------|
| Plate for mounting | LS1D323 and contactor LC1D09...D38 with front faces aligned | LAD311 |

| Description | Extension by | Number of starters | Reference |
|--------------------------|--------------|--------------------|-----------|
| Power splitter box, 63 A | LAD32● | 2 | LAD322 |
| | | 4 | LAD324 |

| Description | Kit contents | Reference |
|--|---|-----------|
| Assembly and power connection kit for LS1D323 and LC1D093...D323 | 1 LAD311 plate for mounting LS1D323 2 LAD341 power connection modules - between LS1D323 and power splitter box - between LS1D323 and contactor | LAD352 |

| Description | Maximum capacity | Application | Sold in lots of | Unit reference |
|---------------------------|--------------------|--|-----------------|----------------|
| Upstream terminal block | 16 mm ² | Power supply to 1 or 2 power splitter boxes | 1 | LAD3B1 |
| Downstream terminal block | 16 mm ² | Connection of motor cables | 1 | LAD331 |
| Cable end reducer | – | For connection of conductors from 1 to 1.5 mm ² | 20 | LAD99 |


TeSys Power

Fuse carriers, handles and accessories

Product references

Fuse
carriers

| | |
|----------|-----------|
| DF101 | DF81N |
| DF101N | DF81NV |
| DF101NV | DF81V |
| DF101PV | DF82 |
| DF101V | DF82V |
| DF102 | DF83 |
| DF102V | DF83N |
| DF103 | DF83NV |
| DF103N | DF83V |
| DF103NV | DFCC1 |
| DF103V | DFCC1V |
| DF10AP | DFCC2 |
| DF10N | DFCC2V |
| DF141 | DFCC3 |
| DF141N | DFCC3V |
| DF141NV | DK1CB92 |
| DF141V | DK1EB92 |
| DF142 | DK1FA92 |
| DF142V | DK1HC92 |
| DF143C | DK1KC92 |
| DF143NC | GK1AP05 |
| DF143NVC | GK1AP06 |
| DF143VC | GK1AP07 |
| DF14AM1 | GK1AP08 |
| DF14AM2 | GK1AV07 |
| DF14AP | GK1AV08 |
| DF14N | GK1AV09 |
| DF221 | GK1EK |
| DF221N | GK1EM |
| DF221NV | GK1ES |
| DF221V | GK1ET |
| DF222 | GK1EV |
| DF222V | GK1EW |
| DF223C | GK1EX |
| DF223NC | GK1EY |
| DF223NVC | LA8D324 |
| DF223VC | LS1D30 |
| DF22AM1 | LS1D32 |
| DF22AM2 | LS1D32005 |
| DF22AP | LS1D32006 |
| DF22N | LS1D323 |
| DF81 | |

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

Contents

DF type:

- > Characteristics B4/12
- > Dimensions and schemes B4/13

DF type for the North American market:

- > Characteristics B4/14
- > Dimensions and schemes B4/15

LS, GK type:

- > Characteristics B4/16
- > Dimensions B4/17
- > Schemes B4/18

Environment characteristics

| Fuse carrier type | | DF8 | DF10 | DF14 | DF22 |
|-------------------------|---|--|---|--|------|
| Conforming to standards | | IEC/EN 60947-3, IEC/HD 60269-2 | IEC/EN 60947-3 ⁽¹⁾ , IEC/HD 60269-2, R22HL2, UL 4248-1 ⁽²⁾ , CSA C22.2 No 4248-1 ⁽²⁾ | IEC/EN 60947-3, UL 4248-1, CSA C22.2 No 4248-1 | |
| Product certification | | IEC, EAC, DNV-GL, CCC, UKCA | IEC, UL, CSA, EAC, DNV-GL, CCC, UKCA | IEC, UL, CSA, EAC, UKCA | |
| Degree of protection | Conforming to IEC 60529 | IP 20 | | | |
| Ambient air temperature | Storage | °C -40...+80 | | | |
| | For operation, with derating ⁽¹⁾ | °C -20...+60 | | | |
| Operating positions | | ± 23° in relation to normal mounting plane | | | |
| Flame resistance | Conforming to IEC 60695-2-1 | °C 960 | | | |

Pole characteristics

| Fuse size | mm | 8.5 x 32 | 10 x 38 | 14 x 51 | 22 x 58 | | | | |
|--|----------------------------------|-----------------|----------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------|
| Rated insulation voltage (Ui) with tubular links, a.c. or D.C. supply | V | 500 | 690 | 690 | 690 | | | | |
| Rated impulse withstand voltage (Uimp) | kV | 6 | 6 | 8 | 8 | | | | |
| Conventional thermal current (Ith) for ambient air temperature ≤ 20 °C ⁽³⁾ | | | | | | | | | |
| | With tubular links | A | 25 | 32 | 50 | 125 | | | |
| | With aM cartridge fuses | A | 25 | 32 | 50 | 125 | | | |
| | With gG cartridge fuses | A | 25 | 32 | 50 | 100 | | | |
| Rated conditional short-circuit current Conforming to IEC 60947-3 | | | | | | | | | |
| | 400 V | kA | 20 | 120 | 120 | 120 | | | |
| | 500 V | kA | – | 120 | 120 | 120 | | | |
| | 690 V | kA | – | – | 80 | 80 | | | |
| Peak withstand current (dynamic stress) Conforming to IEC 60269-1 | | | | | | | | | |
| | With tubular links | kA | 11 | 15 | 15 | 19 | | | |
| Cabling (number of conductors x c.s.a.) | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| | Solid cable | mm ² | 1 x 1.5 1 x 16 2 x 6 | 1 x 1.5 1 x 16 2 x 6 | 1 x 1.5 1 x 10 2 x 6 | 1 x 2.5 1 x 25 2 x 10 | 1 x 2.5 1 x 25 2 x 10 | 1 x 2.5 1 x 25 2 x 10 | 1 x 35 2 x 25 |
| | Flexible cable without cable end | mm ² | 1 x 1.5 1 x 10 2 x 6 | 1 x 1.5 1 x 10 2 x 6 | 1 x 1.5 1 x 10 2 x 6 | 1 x 2.5 1 x 25 2 x 10 | 1 x 2.5 1 x 25 2 x 10 | 1 x 2.5 1 x 25 2 x 10 | 1 x 35 2 x 16 |
| | Flexible cable with cable end | mm ² | 1 x 1.5 1 x 10 2 x 6 | 1 x 1.5 1 x 10 2 x 6 | 1 x 1.5 1 x 10 2 x 6 | 1 x 2.5 1 x 25 2 x 10 | 1 x 2.5 1 x 25 2 x 10 | 1 x 2.5 1 x 25 2 x 10 | 1 x 35 2 x 16 |
| Tightening torque | Nm | 2.2 | | | 3.5 | | 4 | | |

Characteristics of early break and signalling contacts DF14 AM and DF22 AM

| | | | | | | |
|--|-----------------|-------------------|------|-------|-------|-----|
| Rated insulation voltage (Ui) a.c. supply | V | 250 | | | | |
| Conventional thermal current (Ith) for ambient air temperature ≤ 20 °C ⁽¹⁾ | A | 5 | | | | |
| Rated operational current | | 24 V | 48 V | 127 V | 240 V | |
| | Category AC-15 | A | 4 | 4 | 3 | 2.5 |
| | Category DC-13 | A | 3 | 1 | 0.2 | 0.1 |
| Definition of rated characteristics Conforming to IEC 60947-5-1 | | B300 | | | | |
| Low load operating characteristics | Minimum voltage | V | 10 | | | |
| | Minimum current | mA | 30 | | | |
| Cabling | | Faston connectors | | | | |

⁽¹⁾ DF101PV excluded.

⁽²⁾ DF101PV add UL/CSA 4248-19.

⁽³⁾ For use in an installation with ambient temperature > 20 °C, apply a derating coefficient:

| Maximum temperature | 20 °C | 30 °C | 40 °C | 50 °C | 60 °C |
|------------------------------|-------|-------|-------|-------|-------|
| Max. relative humidity | 95 % | 90 % | 80 % | 50 % | 50 % |
| Current derating coefficient | 1 | 0.95 | 0.9 | 0.8 | 0.7 |

| Number of poles (each side) | 1 to 3 | 4 to 6 | ≥ 7 |
|------------------------------|--------|--------|-----|
| Current derating coefficient | 1 | 0.95 | 0.9 |

TeSys Power

Fuse carriers

Dimensions, schemes - DF type

Dimensions

Modular fuse carriers 25 A and 32 A

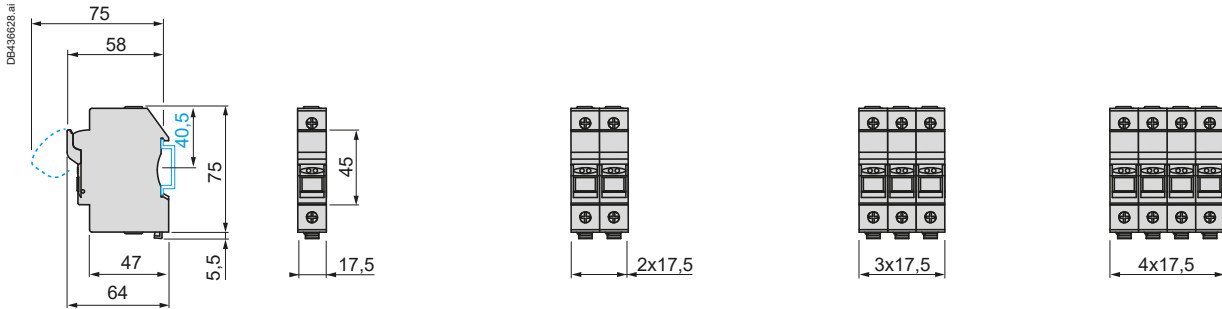
Mounting on 35 mm L rail

DF81 and DF81V
DF101 and DF101V
DF10N

DF81N and DF81NV
DF82 and DF82V
DF101N and DF101NV
DF102 and DF102V

DF83 and DF83V
DF103 and DF103V

DF83N and DF83NV
DF103N and DF103NV



Modular fuse carriers 50 A

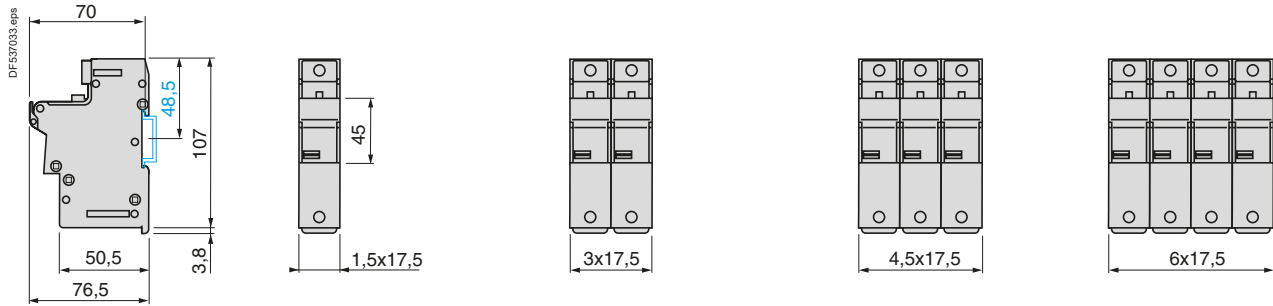
Mounting on 35 mm L rail

DF141 and DF141V
DF14N

DF141N and DF141NV
DF142 and DF142V

DF143C and DF143VC

DF143NC and DF143NVC



Modular fuse carriers 125 A

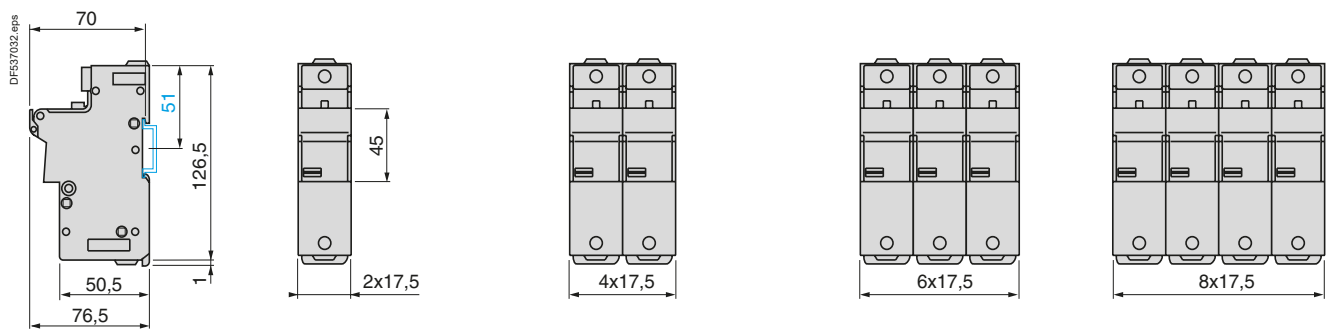
Mounting on 35 mm L rail

DF221 and DF221V
DF22N

DF221N and DF221NV
DF222 and DF222V

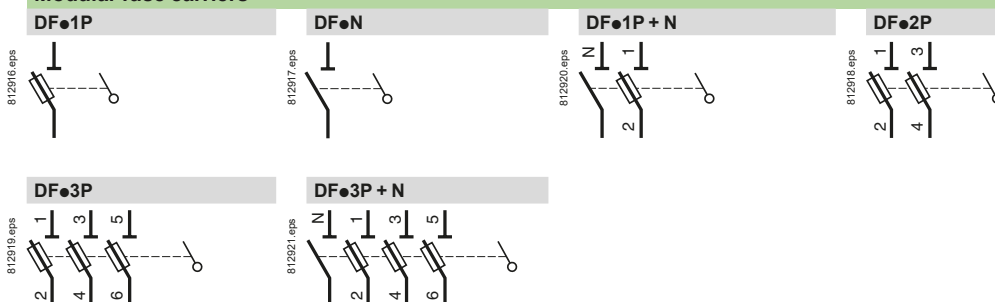
DF223C and DF223VC

DF223NC and DF223NVC



Schemes

Modular fuse carriers



TeSys Power

Fuse carriers for North American market

Characteristics - DF type

Fuse carriers



Ref.



| Environment characteristics | | | |
|--------------------------------|---|--|-----------|
| Fuse carrier type | | DFCC | |
| Conforming to standards | | UL 4248-1 & 4, CSA 22-2 No 4248-1 & 4 | |
| Product certification | | UL, CSA, CCC, UKCA | |
| Degree of protection | Conforming to IEC 60529 | IP 20 | |
| Ambient air temperature | Storage | °C | -40...+80 |
| | For operation, with derating ⁽¹⁾ | °C | -20...+60 |
| Operating positions | Without derating | ±23° in relation to normal vertical mounting plane | |
| Flame resistance | Conforming to IEC 60695-2-1 | °C | 960 |

| Pole characteristics | | | |
|--|----------------------------------|-----------------|------------------|
| Fuse carrier type | | DFCC | |
| Fuse size | | Class CC | |
| Rated insulation voltage (U_i) with tubular links, a.c. supply | V | 600 | |
| Rated impulse withstand voltage (U_{imp}) | kV | 6 | |
| Conventional thermal current (I_{th}) for ambient air temperature ≤ 40 °C ⁽¹⁾ | With tubular links | A | 30 |
| | With aM cartridge fuses | A | 30 |
| | With gG cartridge fuses | A | 30 |
| | | | |
| Short-circuit current withstand With UL 248-4 Class CC fuses | | | |
| Conforming to UL 512 at 600 V | kA | 200 | |
| Cabling (number of conductors x c.s.a.) | | Min. | Max. |
| | Solid cable | mm ² | 1 x 1.5 2 x 6 |
| | Flexible cable without cable end | mm ² | 1 x 1.5 2 x 6 |
| | Flexible cable with cable end | mm ² | 1 x 1.5 2 x 6 |
| Tightening torque | Nm | 2.2 | |

⁽¹⁾ For use in an installation with ambient temperature > 20 °C, apply a derating coefficient:

| Maximum temperature | 20 °C | 30 °C | 40 °C | 50 °C | 60 °C |
|------------------------------|-------|-------|-------|-------|-------|
| Max. relative humidity | 95 % | 90 % | 80 % | 50 % | 50 % |
| Current derating coefficient | 1 | 0.95 | 0.9 | 0.8 | 0.7 |


TeSys Power

Fuse carriers for North American market

Dimensions, schemes - DF type

Dimensions

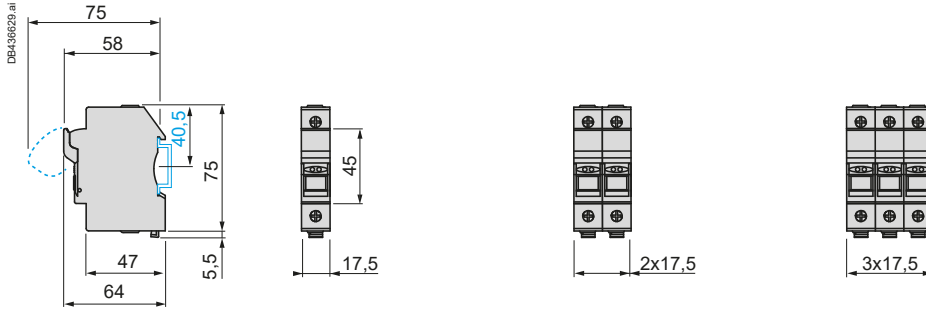
Modular fuse carriers 30 A

Mounting on 35 mm  rail

DFCC1 and DFCC1V

DFCC2 and DFCC2V

DFCC3 and DFCC3V



Schemes

Modular fuse carriers

DFCC1P

DFCC2P

DFCC3P



Fuse carriers



Environment

| Fuse carrier type | | LS1D32 | LS1D323 | GK1E● |
|---|---------------|-----------|---------|-----------|
| Conforming to standards | NF EN 60947-3 | ● | | ● |
| | IEC 60947-3 | ● | | ● |
| Product certifications | | BV, UR | | – |
| Ambient air temperature for operation with links without derating | °C | -50...+70 | | -50...+70 |
| Maximum tilt in relation to normal vertical mounting plane | | ±23° | | ±23° |

Pole characteristics

| Fuse size | | 10 x 38 | 10 x 38 | 14 x 51 |
|--|--------------------|--------------------------|------------------|---------------|
| Rated operational voltage with links, a.c. supply | V | 690 | 690 | 690 |
| Maximum continuous current at ambient temperature ≤ 40 °C ⁽¹⁾ (Min. cable Ø/le) | | | | |
| With tubular links | mm ² /A | 6/32 or 4/25 or 2.5/16 | 4/25 or 2.5/16 | 10/50 or 6/40 |
| With aM fuses | mm ² /A | 6/32 or 4/22 or 2.5/20 | 4/25 or 2.5/20 | 10/50 or 6/35 |
| With gG fuses | mm ² /A | 4/25 or 2.5/20 or 1.5/16 | 2.5/20 or 1.5/16 | 10/40 or 6/32 |

Early break contact characteristics

| | | | | | |
|------------------------------|---|---------------|---------------|-------|--------|
| Rated operational voltage | V | ~ 250. --- 60 | ~ 250. --- 60 | ~ 500 | --- 48 |
| Conventional thermal current | A | 2.5 | 2.5 | 6 | 3 |

Blow fuse contact characteristics 95/96-98

| | | | | | |
|------------------------------|---|---|---|-------|--------|
| Rated operational voltage | V | – | – | ~ 250 | --- 24 |
| Conventional thermal current | A | – | – | 6 | 3 |

Cartridge fuse characteristics

| Fuse size | | 10 x 38 | 10 x 38 | 14 x 51 | |
|----------------------------------|---------|---------|-------------------|---------|----|
| Type aM | ~ 400 V | A | 32 ⁽²⁾ | 25 | 50 |
| | ~ 500 V | A | 20 | 20 | 40 |
| | ~ 660 V | A | – | – | 25 |
| Type gG | ~ 400 V | A | 25 ⁽²⁾ | 25 | 40 |
| | ~ 500 V | A | 25 | 25 | 40 |
| | ~ 660 V | A | – | – | 25 |
| Maximum power dissipated by fuse | W | 3 | 3 | 8.5 | |

Cabling

Connection by screw clamp terminals or connectors

| Number and c.s.a. of conductors | | Min. | Max. | Min. | Max. | Min. | Max. |
|----------------------------------|-----------------|-----------------------|-------|------|------|-----------|--------|
| Solid cable | mm ² | 2 x 1 | 2 x 6 | – | – | 1 x 2.5 | 1 x 25 |
| Flexible cable without cable end | mm ² | 2 x 1.5 | 2 x 6 | – | – | 1 x 2.5 | 1 x 25 |
| Flexible cable with cable end | mm ² | 2 x 1 | 2 x 4 | – | – | 1 x 2.5 | 1 x 16 |
| Connection | | Screw clamp terminals | | – | – | Connector | |
| Tightening torque | Nm | 1.7 | | – | – | 2 | |

Connection by spring terminals

| Number and c.s.a. of conductors | | Min. | Max. | Min. | Max. | Min. | Max. |
|----------------------------------|-----------------|------|------|------------------------|-------|------|------|
| Solid cable | mm ² | – | – | 2 x 1 ⁽³⁾ | 2 x 4 | – | – |
| Flexible cable without cable end | mm ² | – | – | 2 x 1.5 ⁽¹⁾ | 2 x 4 | – | – |

(1) For use in an installation with ambient temperature > 55 °C, apply a derating coefficient equivalent to $\sqrt{\frac{120 - \text{ambient temperature}}{80}}$

(2) These values are for fuse carriers mounted side by side with a gap of 10 mm between them or mounted with sets of busbars GV2●54. If mounted side by side without a gap, use the following fuse sizes: aM fuse: 25 A and gG fuse: 20 A.

(3) For cross-sections 1 to 1.5 mm², the use of an LA9D99 cable end reducer is recommended.

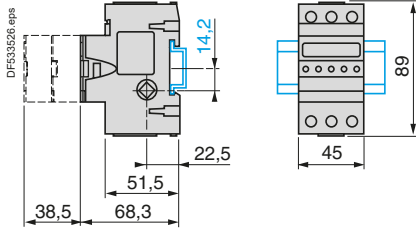
TeSys Power

Fuse carriers

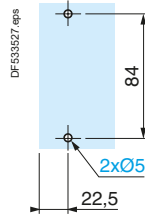
Dimensions, mounting - LS, GK type

LS1D32

Mounting on rail NSYDPR200BD



Panel mounting

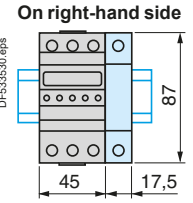
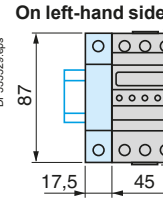


LS1D32 + LA8D324

Mounting on rail NSYDPR200BD

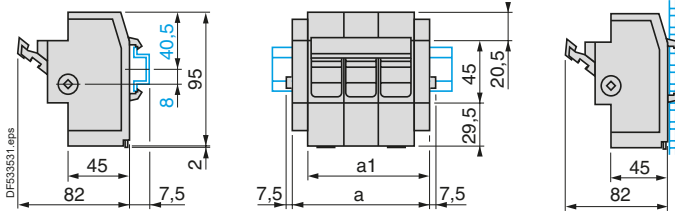


Mounting of 4th pole



GK1EK, EM, ES, ET, EV, EW, EX, EY

Mounting on rail NSYDPR200BD

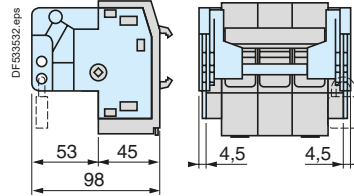


Mounting on pre-slotted plate AM1P

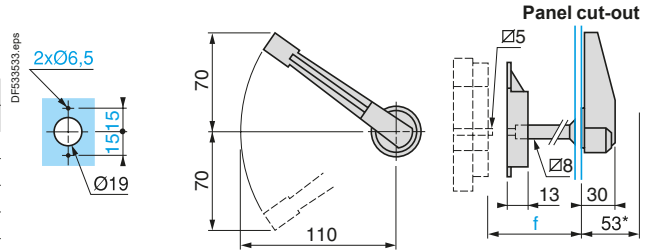
a: with single-phase protection device.
a1: without single-phase protection device.

| GK1 | a | | a1 | |
|-----|-----|-----|-----|-----|
| | 3 P | 4 P | 3 P | 4 P |
| EK | - | - | 88 | - |
| EM | - | - | - | 114 |
| ES | - | - | 97 | - |
| ET | - | - | - | 123 |
| EV | 106 | - | - | - |
| EW | 115 | - | - | - |
| EX | - | 141 | - | - |
| EY | - | 132 | - | - |

GK1E + GK1AV (padlocking device)



External operator GK1AP05 right-hand, GK1AP06 left-hand



| External operator, RH or LH side | f |
|----------------------------------|----------|
| GK1EK, EM, ES, ET | 29...114 |
| GK1EV, EW, EX, EY | 29...114 |

Fuse carriers



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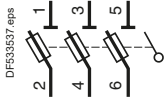
Fuse carriers

Schemes - LS, GK type

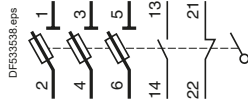
Fuse carriers without single-phase protection device

3-pole

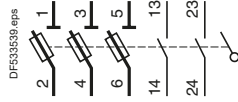
LS1D32, D323



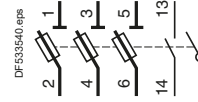
LS1D32, D323 + GVAE11●



LS1D32, D323 + GVAE20●

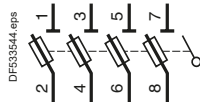


GK1EK

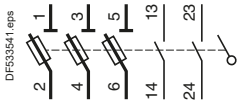


4-pole

LS1D32 + LA8D324

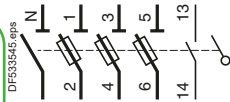


GK1ES

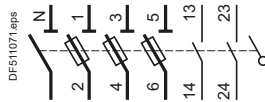


3-pole + Neutral

GK1EM



GK1ET

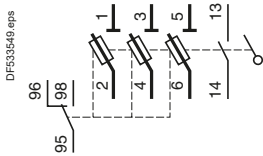


Fuse carriers

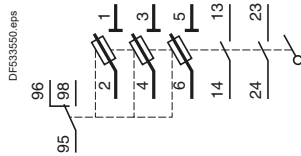
Fuse carriers with single-phase protection device

3-pole

GK1EV

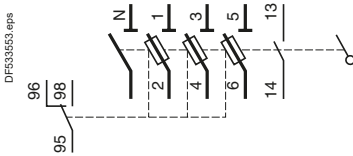


GK1EW

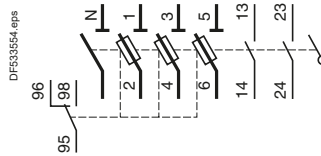


3-pole + Neutral

GK1EY



GK1EX



| Introduction | | B5/2 |
|--|--------------------|-------|
| Switch-disconnector fuses | | |
| Type of product | Range | Pages |
| IEC - Switch-disconnector fuses For NFC / DIN fuses | From 32 to 1250 A | B5/4 |
| IEC - Switch-disconnector fuses For BS fuses | From 32 to 1250 A | B5/6 |
| UL - Switch-disconnector fuses For CC / J fuses | From 30 to 800 A | B5/8 |
| NFC - Cartridge fuses Type aM, gG | From 0.16 to 125 A | B5/10 |
| DIN - Cartridge fuses Type aM, gG | From 10 to 1250 A | B5/11 |
| Auxiliary contacts for IEC and UL switch-disconnector fuses | From 32 to 1250 A | B5/12 |
| Handles | From 32 to 1250 A | B5/13 |
| Other accessories | From 32 to 1250 A | B5/14 |
| Technical Data for Designers | | B5/17 |

Switch-
disconnector
fuses

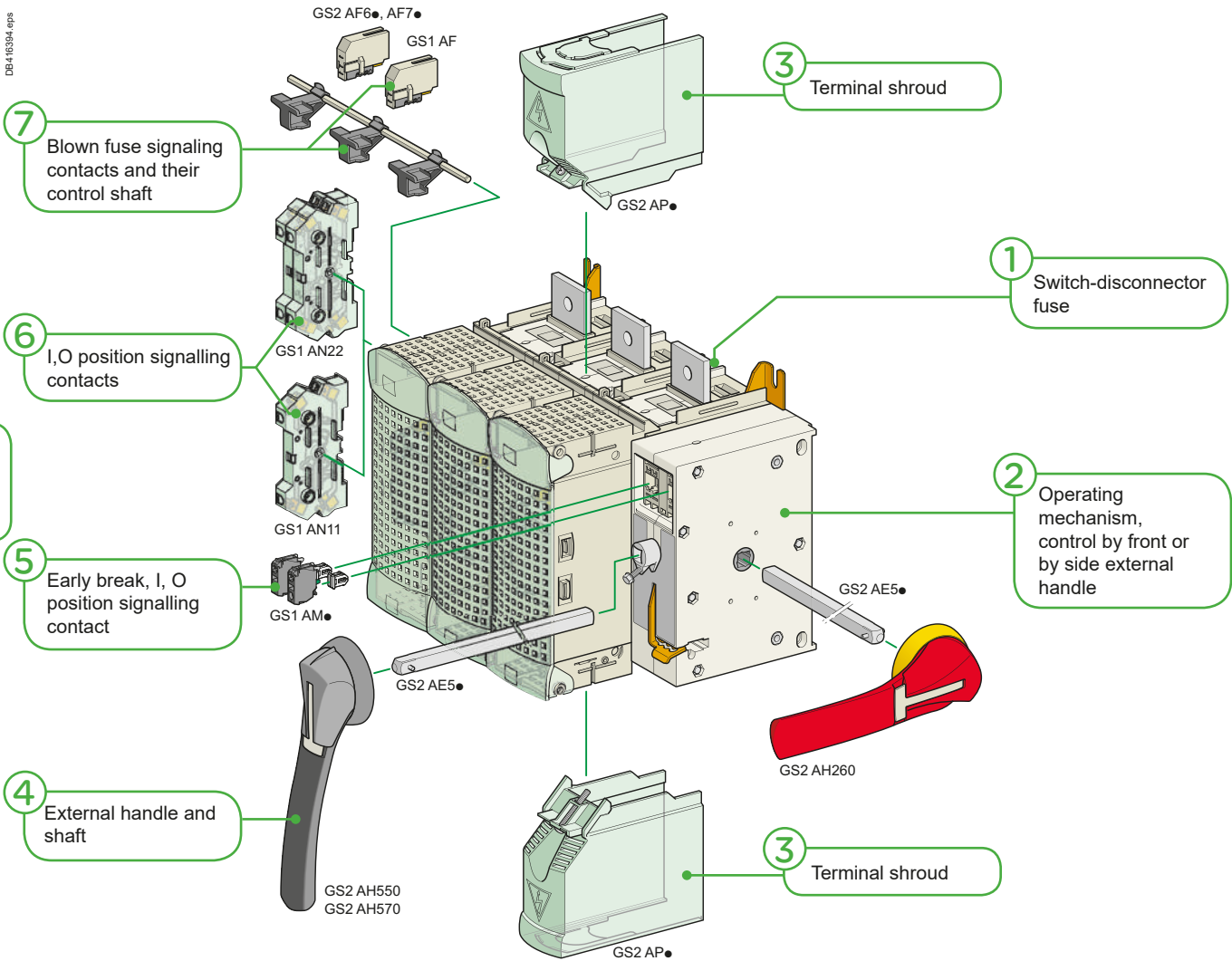
TeSys Power

Switch-disconnector fuses

Introduction

A customizable functional block

Whatever its rating, the switch-disconnector fuse fits the need: particular position of the handle, triggering of an automatic control before full opening, enhanced protection of terminals...



Customizable

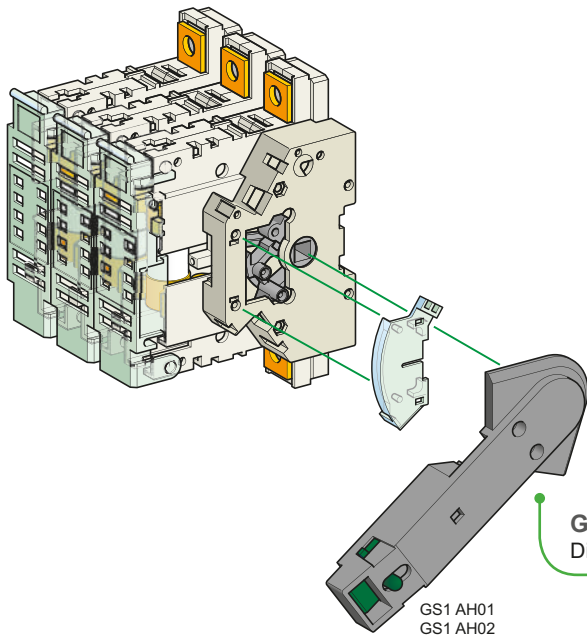
GS2630 A switch-disconnector fuse

- 1 Switch-disconnector fuse**
 - NFC/DIN or BS fuse compatible
 - Enhanced isolation between poles
 - On-load making/breaking with double break isolation of the power circuit
- 2 Operating mechanism**
 - For one front or side external handle, right or left side
 - Cavity for early-break contacts
- 3 Terminal shrouds**
 - For use when the switch-disconnector fuse is installed outside an enclosure or when the operating voltage is over 500 V AC
- 4 Operating handle**
 - Padlockable in open position
- 5 GS1AM●●● Early-break signalling contacts**
 - Activated before the poles are opened
- 6 GS1AN●● Position signalling contacts**
 - Synchronized with the poles operation
- 7 GS1AF●● Blown fuse signalling contacts**
 - A missing fuse is also indicated

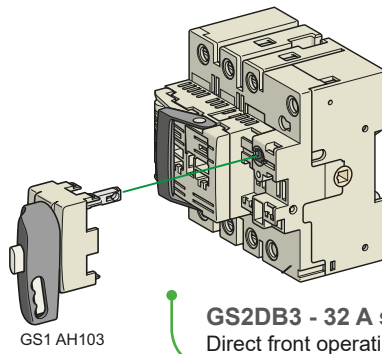
Simplicity of the direct operating

The mounting of an operating handle directly on the side of the switch-disconnector fuse is a simple operation. This handle will be for use by qualified personnel only. As the mechanical design is simplified, the manoeuvre will be immediately understood by the operator. Each handle can be padlocked in open position. Locking device for 3 padlocks.

DB416395.eps



DB416396.eps



GS2DB3 - 32 A switch-disconnector fuse
Direct front operating

GS1JD3 - 100 A switch-disconnector fuse
Direct lateral operating

GS1 AH01
GS1 AH02

Position of the handle, a free choice

Switch-disconnector fuses

Performance remote operating

Located on the front or side panel of an enclosure, the operating handle provide complementary features:

- simple (IP55) or reinforced (IP65) protection against dust
- intermediate "Test" position
- door interlock when the handle is in "Close" position, opening by mean of a special tool is needed for opening.
- optional key-operated handle lock

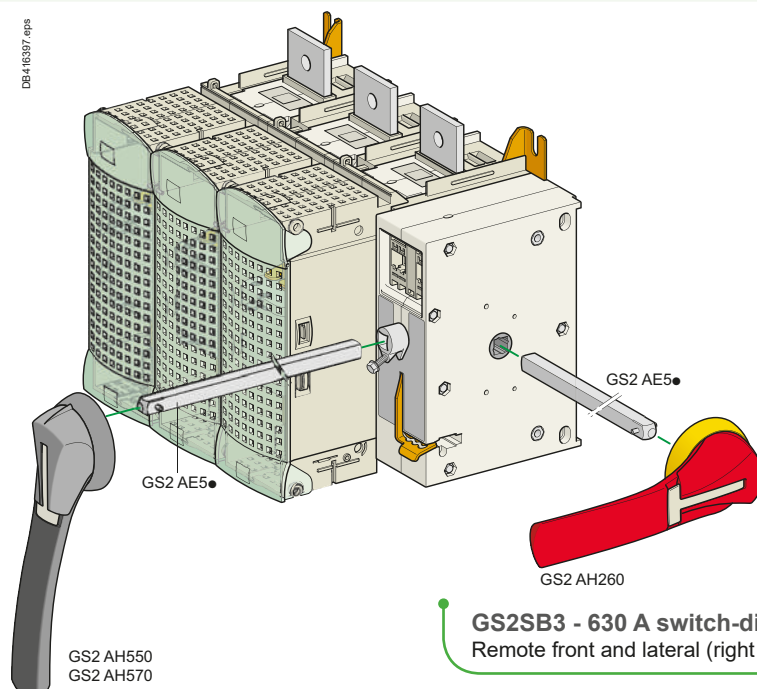


The handles are available in different lengths. They are chosen according the operating effort which depends on the rating of the switch-disconnector fuse.

The drive shaft can be cut to the ideal length.

The choice of a red and yellow handle (CNOMO standard) will identify an "Emergency Stop handle" among others handles, generally black and gray.

DB416397.eps



GS2 AH550
GS2 AH570

GS2SB3 - 630 A switch-disconnector fuse
Remote front and lateral (right only) operating

TeSys Power

Switch-disconnector fuses

Product references

IEC - For NFC / DIN fuses - From 32 to 1250 A



GS1DD3

GS1FD3

GS1KD4

| Rating | A | | 32 | | 50 | | 63 | | 100 | | 125 | |
|-----------------|---------|-----|---------|---|----------|---|---------|---|---------|---|-----|---|
| Number of poles | 3 | 3+N | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 |
| Fuse size | 10 x 38 | | 14 x 51 | | Size 000 | | 22 x 58 | | 22 x 58 | | | |

For direct operators

| Switch-disconnector fuses reference | GS1DD3 | GS1DD4 | GS1FD3 | GS1FD4 | GS1GD3 | GS1GD4 | GS1JD3 | GS1JD4 | GS1KD3 | GS1KD4 |
|-------------------------------------|-------------------|-----------|-----------------|---------------|--------|--------|---------|---------|---------|---------|
| Handle | Black | | Black | | Black | | Black | | Black | |
| Auxiliary contacts | O/I + Test | 1NO + 1NC | - | | - | | - | | - | |
| | O/I + early break | 2NO + 2NC | - | | - | | - | | - | |
| | | | GS1AM111 (1 OF) | GS1AM1 (1 OF) | | | | | | |
| | | | GS1AM211 (2 OF) | GS1AM2 (2 OF) | | | | | | |
| Blown fuse | - | | GS1AF1 | | - | | GS1AF23 | GS1AF24 | GS1AF23 | GS1AF24 |

For external left hand side-mounted operators

| Switch-disconnector fuses reference | GS1DD3 | GS1DD4 | GS2FG3 | GS2FG4 | GS2GG3 | GS2GG4 | GS2JG3 | GS2JG4 | GS2KG3 | GS2KG4 |
|-------------------------------------|-------------------|-----------|------------|--------|------------|--------|------------|---------|------------|---------|
| Handle | Black/Grey | IP65 | Black/Grey | IP65 | Black/Grey | IP65 | Black/Grey | IP65 | Black/Grey | IP65 |
| Auxiliary contacts | O/I + Test | 1NO + 1NC | - | | GS1AN11G | | - | | - | |
| | O/I + early break | 2NO + 2NC | - | | GS1AN22G | | - | | - | |
| | | | GS1AM110 | | | | | | | |
| Blown fuse | - | | GS1AM101 | | - | | GS1AF23 | GS1AF24 | GS1AF23 | GS1AF24 |

For external front-mounted and right-hand side-mounted operators

| Switch-disconnector fuses reference | GS1DD3 | GS1DD4 | GS2F3 | GS2F4 | GS2G3 | GS2G4 | GS2J3 | GS2J4 | GS2K3 | GS2K4 |
|--------------------------------------|--------------------------|------------------|------------|-------|------------|-------|------------|---------|------------|---------|
| Front-mounted handle | Black/Grey | IP55 | Black/Grey | IP55 | Black/Grey | IP55 | Black/Grey | IP55 | Black/Grey | IP55 |
| Front-mounted handle + Test position | Red/Yellow | IP65 | Red/Yellow | IP65 | Red/Yellow | IP65 | Red/Yellow | IP65 | Red/Yellow | IP65 |
| RH side-mounted handle | Black/Grey | IP65 | Black/Grey | IP65 | Black/Grey | IP65 | Black/Grey | IP65 | Black/Grey | IP65 |
| Auxiliary contacts | O/I + Test | 1NO + 1NC | - | | GS1AN11 | | - | | - | |
| | | 2NO + 2NC | - | | GS1AN22 | | - | | - | |
| | | 1NO + 1NC + test | - | | GS1ANT11 | | - | | - | |
| | | 2NO + 2NC + test | - | | GS1ANT22 | | - | | - | |
| | O/I + Test + early break | 1NO | - | | GS1AM110 | | - | | - | |
| | | 1NC | - | | GS1AM101 | | - | | - | |
| Blown fuse | - | | GS1AF1 | | - | | GS1AF23 | GS1AF24 | GS1AF23 | GS1AF24 |

Accessories

| | | | | |
|--------------------------------|-----|------------|---------|----------------------------|
| Shaft for external handle (mm) | 200 | GS2AE82 | GS2AE22 | |
| | 320 | GS2AE8 | GS2AE2 | |
| | 400 | GS2AE81 | GS2AE21 | |
| Terminal shroud | | Integrated | | GS1AP33 (3P), GS1AP34 (4P) |

Dimensions

| | | |
|--------------------------------|------------|------------|
| Direct front-mounted version | page B5/25 | page B5/26 |
| External front-mounted version | page B5/25 | page B5/27 |

Handles



See details on handles page B5/13.



GS1KKD3



GS1LLD4



GS1ND3

| 125 | | 160 | | 250 | | 400 | | 630 | | 1250 | |
|---------|---|---------|---|--------|---|--------|---|--------|---|--------|---|
| 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 |
| Size 00 | | Size 00 | | Size 0 | | Size 1 | | Size 2 | | Size 3 | |

| | | | | | | | | | | | | | |
|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------------|---------|----------|---------|
| GS1KKD3 | GS1KKD4 | GS1LLD3 | GS1LLD4 | GS1LD3 | GS1LD4 | GS1ND3 | GS1ND4 | GS1QQD3 | GS1QQD4 | GS2S3 | GS2S4 | GS2V3 | GS2V4 |
| GS1AH02 | | | | | | | | | | GS2AH104 | | GS2AH105 | |
| GS1AN11 | | | | | | | | | | | | | |
| GS1AN22 | | | | | | | | | | | | | |
| GS1AM1 (1 OF) | | | | | | | | | | GS1AM110 (1 NO) | | | |
| GS1AM2 (2 OF) | | | | | | | | | | GS1AM101 (1 NC) | | | |
| - | | | | GS1AF33 | GS1AF34 | GS1AF43 | GS1AF44 | GS1AF43 | GS1AF44 | GS2AF63 | GS2AF64 | GS2AF73 | GS2AF74 |

| | | | | | | | | | | | | | |
|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|----------|---------|
| GS2KKG3 | GS2KKG4 | GS2LLG3 | GS2LLG4 | GS2LG3 | GS2LG4 | GS2NG3 | GS2NG4 | GS2QQG3 | GS2QQG4 | GS2SG3 | GS2SG4 | GS2VG3 | |
| GS2AH330 | | | | | | | | | | GS2AH350 | | GS2AH360 | |
| GS2AH340 | | | | | | | | | | | | | |
| GS1AN11G | | | | | | | | | | | | | |
| GS1AN22G | | | | | | | | | | | | | |
| GS1AM110 | | | | | | | | | | | | | |
| GS1AM101 | | | | | | | | | | | | | |
| - | | | | GS1AF33 | GS1AF34 | GS1AF43 | GS1AF44 | GS1AF43 | GS1AF44 | GS2AF63 | GS2AF64 | GS2AF73 | GS2AF74 |

| | | | | | | | | | | | | | |
|-----------|--------|--------|--------|-------|-------|-------|-------|--------|--------|----------|-------|----------|-------|
| GS2KK3 | GS2KK4 | GS2LL3 | GS2LL4 | GS2L3 | GS2L4 | GS2N3 | GS2N4 | GS2QQ3 | GS2QQ4 | GS2S3 | GS2S4 | GS2V3 | GS2V4 |
| GS2AH535 | | | | | | | | | | - | | | |
| GS2AH530 | | | | | | | | | | GS2AH550 | | GS2AH570 | |
| GS2AH540 | | | | | | | | | | GS2AH560 | | GS2AH580 | |
| GS2AHT530 | | | | | | | | | | - | | | |
| GS2AHT540 | | | | | | | | | | - | | | |

| | | | | | | | | | | | | | |
|----------|--|--|--|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| GS2AH235 | | | | | | | | | | | | | |
| GS2AH230 | | | | | | | | | | | GS2AH250 | | |
| GS2AH240 | | | | | | | | | | | GS2AH260 | | |
| GS1AN11 | | | | | | | | | | | | | |
| GS1AN22 | | | | | | | | | | | | | |
| GS1ANT11 | | | | | | | | | | - | | | |
| GS1ANT22 | | | | | | | | | | - | | | |
| GS1AM110 | | | | | | | | | | - | | | |
| GS1AM101 | | | | | | | | | | - | | | |
| - | | | | GS1AF33 | GS1AF34 | GS1AF43 | GS1AF44 | GS1AF43 | GS1AF44 | GS2AF63 | GS2AF64 | GS2AF73 | GS2AF74 |

| | | | | | | | | | | | | | |
|----------------------------|--|--|--|--|--|--|--|----------------------------|--|---------|---------|---------|---------|
| GS2AE22 | | | | | | | | | | GS2AE52 | | | |
| GS2AE2 | | | | | | | | | | GS2AE5 | | | |
| GS2AE21 | | | | | | | | | | GS2AE51 | | | |
| GS1AP33 (3P), GS1AP34 (4P) | | | | | | | | GS1AP43 (3P), GS1AP44 (4P) | | GS2AP73 | GS2AP64 | GS2AP83 | GS2AP84 |

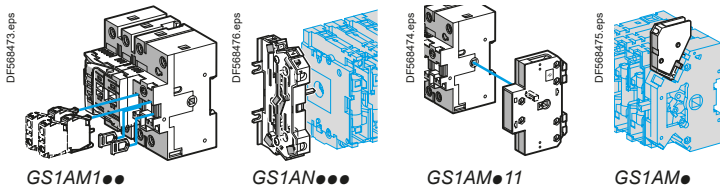
page B5/26

page B5/27

page B5/28

page B5/29

Auxiliary contacts



See details on auxiliary contacts, page B5/12.

Maximal number of auxiliary contacts

| Switch rating (A) | Standard configuration | With additional bracket | Reference of additional bracket |
|-------------------|------------------------|-------------------------|---------------------------------|
| 30...32 | 4 | 4 | GS1AD10 ⁽¹⁾ |
| 32...400 | 4 | 4 | GS2AD20 ⁽²⁾ |
| 200...400 | 8 | 8 | GS2AD20 ⁽²⁾ |
| 630...1250 | 8 | - | - |

⁽¹⁾ Only compatible with switch disconnecter fuses starting by GS1D...
⁽²⁾ Only compatible with switch disconnecter fuses starting by GS2...



Switch-disconnector fuses

IEC - For BS fuses - From 32 to 1250 A



GS1DDB3



GS2JB3

| Rating | A | 32 | 63 | 100 | 160 |
|-----------------|---|---------|-------|-------|-----------------|
| Number of poles | | 3 3+N | 3 4 | 3 4 | 3 4 3 4 |
| Fuse size | | A1 | A1 | A2-A3 | A4 A4 B1-B2 |

For direct operators

| Switch-disconnector fuses reference | GS1DDB3 | GS1DDB4 | - |
|-------------------------------------|------------|-----------------|---|
| Handle | Black | GS1AH103 | - |
| Auxiliary contacts | O/I + Test | 1NO + 1NC | - |
| | | 2NO + 2NC | - |
| O/I + early break | | GS1AM111 (1 OF) | - |
| | | GS1AM211 (2 OF) | - |

For external front-mounted and right-hand side-mounted operators

| Switch-disconnector fuses reference | GS1DDB3 | GS1DDB4 | GS2DDB3 | GS2DDB4 | GS2GB3 | GS2GB4 | GS2JB3 | GS2JB4 | GS2LLB3 | GS2LLB4 | GS2LB3 | GS2LB4 |
|--------------------------------------|------------------|---------|---------------------------|----------|--------|--------|-----------|--------|---------|---------|--------|--------|
| Front-mounted handle | Black/Grey | IP55 | GS2AH515 | | | | GS2AH535 | | | | | |
| | Black/Grey | IP65 | GS2AH510 | | | | GS2AH530 | | | | | |
| Front-mounted handle + Test position | Red/Yellow | IP65 | GS2AH520 | | | | GS2AH540 | | | | | |
| | Black/Grey | IP65 | GS2AHT510 | | | | GS2AHT530 | | | | | |
| RH side-mounted handle | Red/Yellow | IP65 | GS2AHT520 | | | | GS2AHT540 | | | | | |
| | Black/Grey | IP55 | GS2AH215 | | | | GS2AH235 | | | | | |
| Auxiliary contacts | Black/Grey | IP65 | GS2AH210 | | | | GS2AH230 | | | | | |
| | Red/Yellow | IP65 | GS2AH220 | | | | GS2AH240 | | | | | |
| O/I + Test | 1NO + 1NC | - | | GS1AN11 | | | | | | | | |
| | 2NO + 2NC | - | | GS1AN22 | | | | | | | | |
| | 1NO + 1NC + test | - | | GS1ANT11 | | | | | | | | |
| | 2NO + 2NC + test | - | | GS1ANT22 | | | | | | | | |
| O/I + Test + early break | 1NO | | GS1AM110 - max 4 contacts | | | | | | | | | |
| | 1NC | | GS1AM101 - max 4 contacts | | | | | | | | | |

Accessories

| | | | | | |
|--------------------------------|-----|------------|---------|----------------------------|--|
| Shaft for external handle (mm) | 200 | GS2AE82 | GS2AE22 | | |
| | 320 | GS2AE8 | GS2AE2 | | |
| | 400 | GS2AE81 | GS2AE21 | | |
| Terminal shroud | | Integrated | | GS1AP33 (3P), GS1AP34 (4P) | |

Dimensions

| | | | |
|------------------------------|--------------------------------|------------|------------|
| Direct front-mounted version | | page B5/25 | page B5/26 |
| | External front-mounted version | page B5/25 | page B5/27 |

UL - For CC and J fuses - From 32 to 800 A



GS1DU3



GS2GU3N

| Rating | 30 Compact | | 30 | | 60 | 100 |
|-----------------|------------|---|----|---|----|-----|
| Number of poles | 3 | | 3 | | 3 | 3 |
| Fuse size | CC | J | CC | J | J | J |

| For direct operators | | | | | | |
|--|------------|--------------------|--------|---|---|---|
| Switch-disconnector fuses reference | | GS1DDU3 | GS1DU3 | - | - | - |
| Handle | Black | GS1AH106 | - | - | - | - |
| Auxiliary contacts | O/I + Test | 1NO + 1NC | - | - | - | - |
| | | 2NO + 2NC | - | - | - | - |
| O/I + early break | 1NO | GS1AM110 + GS1AD10 | - | - | - | - |
| | 1NC | GS1AM101 + GS1AD10 | - | - | - | - |

| For external front-mounted operators | | | | | | | |
|--|------------------|--|--|-----------|---------|---------|---------|
| Switch-disconnector fuses reference | | GS1DDU3 | GS1DU3 | GS2EEU3 | GS2EU3N | GS2GU3N | GS2JU3N |
| Front-mounted handle | Black/Grey | 1,3R, 12 | GS2AH110 | GS2AH130 | - | - | - |
| | | 4, 4X | GS2AH410 | GS2AH430 | - | - | - |
| | Red/Yellow | 1,3R, 12 | GS2AH120 | GS2AH140 | - | - | - |
| | | 4, 4X | GS2AH420 | GS2AH440 | - | - | - |
| Front-mounted handle + Test position | Black/Grey | 1,3R, 12 | GS2AHT110 | GS2AHT130 | - | - | - |
| | | 4, 4X | GS2AHT410 | GS2AHT430 | - | - | - |
| | Red/Yellow | 1,3R, 12 | GS2AHT120 | GS2AHT140 | - | - | - |
| | | 4, 4X | GS2AHT420 | GS2AHT440 | - | - | - |
| Auxiliary contacts | O/I + Test | 1NO + 1NC | - | GS1AN11 | - | - | - |
| | | 2NO + 2NC | - | GS1AN22 | - | - | - |
| | 1NO + 1NC + test | | - | GS1ANT11 | - | - | - |
| | | | - | GS1ANT22 | - | - | - |
| O/I + Test + early break | 1NO | GS1AM110 - max 4 contacts ⁽¹⁾ | GS1AM110 - max 4 contacts ⁽¹⁾ | - | - | - | |
| | 1NC | GS1AM101 - max 4 contacts ⁽¹⁾ | GS1AM101 - max 4 contacts ⁽¹⁾ | - | - | - | |

| Accessories | | | | | | |
|--------------------------------|------------|---------|---------|---|---|---|
| Shaft for external handle (mm) | 320 | GS2AE8 | GS2AE2 | - | - | - |
| | 400 | GS2AE81 | GS2AE21 | - | - | - |
| Terminal shroud | Integrated | | | | | |

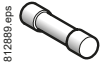
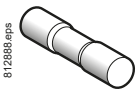
| Dimensions | | | | | | |
|------------|--------------------------------|------------|---|---|------------|---|
| | Direct front-mounted version | page B5/25 | - | - | page B5/26 | - |
| | External front-mounted version | page B5/25 | - | - | page B5/27 | - |

(1) 4 more contacts allowed with GS1AD10 additional bracket.

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Switch-disconnector fuses

Product references

| NFC Cartridge fuses - Type aM / gG - From 0.25 to 125 A | | | | | | | |
|--|---------------------------|---------|--|------------------------|-----------|-----------|---------|
| Fuse type | Maximum rated voltage | Rating | Sold in lots of | Fuses without striker | | | |
| | | | | Unit reference | | | |
| | V ~ | A | | aM | gG | | |
|  DF2CA●●●● DF2CN●● | Cylindrical 8.5 x 31.5 | 400 | 1 | 10 | - | DF2BN0100 | |
| | | | 2 | 10 | DF2BA0200 | DF2BN0200 | |
| | | | 4 | 10 | DF2BA0400 | DF2BN0400 | |
| | | | 6 | 10 | DF2BA0600 | DF2BN0600 | |
| | | | 8 | 10 | - | DF2BN0800 | |
| | | | 10 | 10 | - | DF2BN1000 | |
| | | | 12 | 10 | - | DF2BN1200 | |
| | | | 16 | 10 | - | DF2BN1600 | |
| | | | 20 | 10 | - | DF2BN2000 | |
| | | |  DF2EA●●●● DF2EN●● | Cylindrical 10 x 38 | 500 | 0.50 | 10 |
| 1 | 10 | DF2CA01 | | | | - | |
| 2 | 10 | DF2CA02 | | | | DF2CN02 | |
| 4 | 10 | DF2CA04 | | | | DF2CN04 | |
| 6 | 10 | DF2CA06 | | | | DF2CN06 | |
| 8 | 10 | DF2CA08 | | | | DF2CN08 | |
| 10 | 10 | DF2CA10 | | | | DF2CN10 | |
| 12 | 10 | DF2CA12 | | | | DF2CN12 | |
| 16 | 10 | DF2CA16 | | | | DF2CN16 | |
| 20 | 10 | - | | | | DF2CN20 | |
| 400 | 20 | 10 | | | | DF2CA20 | - |
| | 25 | 10 | | | | DF2CA25 | DF2CN25 |
| | 32 | 10 | | | | DF2CA32 | DF2CN32 |
| | 40 | 10 | - | - | | | |
| Cylindrical 14 x 51 | 690 | 0.25 | 10 | DF2EA002 | - | | |
| | | 0.50 | 10 | DF2EA005 | - | | |
| | 500 | 16 | 10 | DF2EA16 | - | | |
| | | 20 | 10 | DF2EA20 | - | | |
| | | 25 | 10 | DF2EA25 | DF2EN25 | | |
| | | 32 | 10 | DF2EA32 | DF2EN32 | | |
| 400 | 40 | 10 | DF2EA40 | DF2EN40 | | | |
| | 50 | 10 | DF2EA50 | DF2EN50 | | | |
| Cylindrical 22 x 58 | 690 | 10 | 10 | - | DF2FN10 | | |
| | | 20 | 10 | - | DF2FN20 | | |
| | | 25 | 10 | - | DF2FN25 | | |
| | | 32 | 10 | - | DF2FN32 | | |
| | | 40 | 10 | DF2FA40 | DF2FN40 | | |
| | 500 | 50 | 10 | DF2FA50 | DF2FN50 | | |
| | | 63 | 10 | DF2FA63 | DF2FN63 | | |
| | | 80 | 10 | DF2FA80 | DF2FN80 | | |
| | | 100 | 10 | DF2FA100 | DF2FN100 | | |
| | | 400 | 125 | 10 | DF2FA125 | - | |

Switch-disconnector fuses



For protection of equipment with current peaks
For protection of circuits without significant current peaks

TeSys Power

Switch-disconnector fuses

Product references

PB121654.eps



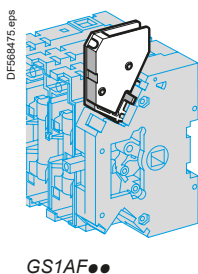
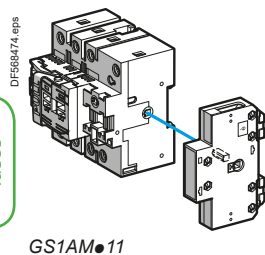
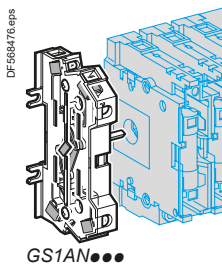
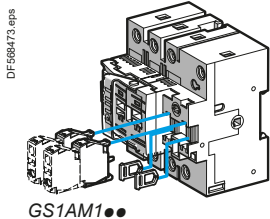
DF2HA1161

| DIN Cartridge fuses - Type aM /gG - From 10 to 1250 A | | | | | | | | |
|---|-----------------------|--------|-----------------|-----------|-----------------------|-----------|--------------------|----|
| Fuse type | Maximum rated voltage | Rating | Sold in lots of | | Fuses without striker | | Fuses with striker | |
| | | | aM | gG | Unit reference | | Unit reference | |
| | V ~ | A | aM | gG | aM | gG | aM | gG |
| Blade size 00 | 690 | 100 | 3 | 10 | - | DF2FGN100 | - | - |
| | | 125 | 3 | 10 | - | DF2FGN125 | - | - |
| | 500 | 160 | - | 10 | - | DF2FGN160 | - | - |
| Blade size 1 | 690 | 160 | 3 | 3 | DF2HA1161 | - | - | - |
| | | 200 | 3 | 3 | DF2HA1201 | DF2HN1201 | - | - |
| | 250 | 3 | - | DF2HA1251 | - | - | - | |
| | 500 | 250 | - | 3 | - | DF2HN1251 | - | - |

Switch-disconnector fuses



For protection of equipment with current peaks
For protection of circuits without significant current peaks



Auxiliary contacts for IEC and UL switch-disconnector fuses

Auxiliary early break and/or O, I and Test position signalling contacts ^{(1) (2) (3)}

| Switch rating | Contact type | Type of operator | Rated operating current I _e (A) | | Reference |
|---------------|------------------------|------------------|--|------------|----------------------|
| | | | < 24 V DC | < 240 V AC | |
| A (CEI) | A (UL) | | | | |
| 32...1250 | 30 Compact 30...800 | 1 N/O 1 N/C | 2.8 | 3 | GS1AM110 GS1AM101 |
| | | | 2.8 | 3 | |

Auxiliary O, I and Test position signalling contacts ^{(3) (5)}

| Switch rating | Contact type | Type of operator | Rated operating current I _e (A) | | Reference |
|---------------|--------------|-------------------------|--|------------|-----------|
| | | | < 24 V DC | < 240 V AC | |
| A (CEI) | A (UL) | | | | |
| 50...1250 | 30...800 | 1 N/C + 1 N/O Direct | – | 10 | GS1AN11 |
| | | External, LH side | – | 10 | GS1AN11G* |
| | | 2 N/C + 2 N/O Direct | – | 10 | GS1AN22 |
| | | External, LH side | – | 10 | GS1AN22G* |

Auxiliary O, I and Test position signalling contacts ⁽³⁾

| Switch rating | Contact type | Type of operator | Rated operating current I _e (A) | | Reference |
|---------------|--------------|--------------------------------|--|----|----------------------|
| | | | – | 10 | |
| 50...400 | 30...400 | 1 N/C + 1 N/O 2 N/C + 2 N/O | – | 10 | GS1ANT11 GS1ANT22 |
| | | External, front side-mounted | – | 10 | |
| | | External, front side-mounted | – | 10 | |

Auxiliary early break O and I position signalling contacts

| Switch rating | Contact type | Type of operator | Rated operating current I _e (A) | | Reference |
|---------------|----------------|------------------------------------|--|------------|------------------------|
| | | | < 24 V DC | < 240 V AC | |
| A (CEI) | | | | | |
| 32 | 1 C/O 2 C/O | – | 12 | 4 | GS1AM111* GS1AM211* |
| 50...400 | 1 C/O 2 C/O | Direct, RH side Direct, RH side | 12 | 4 | GS1AM1* GS1AM2* |

Auxiliary "blown fuse" signalling contacts for use with NF C and DIN fuses ⁽⁶⁾

| Contact type | Switch rating | Fuse size | Number of poles | Rated operating current I _e (A) | | Reference |
|---------------------|---------------|----------------------|-----------------|--|------------|-----------|
| | | | | < 24 V DC | < 240 V AC | |
| | A (CEI) | | | | | |
| 1 st C/O | 50 | 14 x 51 | 3 or 4 | 12 | 4 | GS1AF1* |
| | 100 and 125 | 22 x 58 | 3 | 12 | 4 | GS1AF23* |
| | | | 4 | 12 | 4 | GS1AF24* |
| | 160 | Size 0 | 3 | 12 | 4 | GS1AF33* |
| | | | 4 | 12 | 4 | GS1AF34* |
| | 250 and 400 | Size 1 and Size 2 | 3 | 12 | 4 | GS1AF43* |
| | | | 4 | 12 | 4 | GS1AF44* |
| | 630 | Size 3 | 3 | 12 | 4 | GS2AF63* |
| | | | 4 | 12 | 4 | GS2AF64* |
| | 1250 | Size 4 | 3 | 12 | 4 | GS2AF73* |
| | | | 4 | 12 | 4 | GS2AF74* |
| 2 nd C/O | 50...1250 | – | 3 or 4 | 12 | 4 | GS1AF* |

(* Not for UL switch-disconnector.)

(1) For 32 A (CEI), 30 (UL) switch-disconnector fuses, these auxiliary contacts allow:

- early break and O and I position signalling, - O and I position signalling,
- O, I and Test position signalling, - Test position signalling.

For 50 to 400 A (CEI), 30-400 A (UL) switch-disconnector fuses, they allow:

- early break, - O and I position signalling,
- O, I and Test position signalling, - Test position signalling.

For 630 and 1250 A (CEI), 630 and 800 A (UL) switch-disconnector fuses, they allow:

- early break and O and I position signalling,

(2) Maximum number of auxiliary contacts:

| Switch rating | Standard | With additional bracket | Reference of additional bracket |
|--------------------------|-----------------------|-------------------------|---------------------------------|
| A (CEI) | A (UL) | | |
| 32 ⁽⁷⁾ | 30 Compact CC J | 4 2 | GS1AD10 GS1AD10 |
| 32 ⁽⁸⁾ ...160 | 30...100 | 4 | GS2AD20 |
| 200...400 | 200 and 400 | 8 | GS2AD20 |
| 630...1250 | 600 and 800 | 8 | – |

(3) The Test position allows testing of the control circuits off-load. Auxiliary contacts GS1AM110, GS1AM101 and GS1ANT●● only allow the test function with external handles GS2AHT●●●.

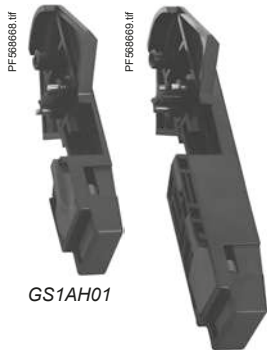
(4) These auxiliary contacts can also be used with 630, 800 and 1250 A switch-disconnector fuses fitted with a direct front-mounted operator.

(5) Reversible add-on attachments for converting an N/C contact to an N/O contact and vice versa.

(6) For striker fuses (BS fuses are not available with striker).

(7) For GS1DDB3 fuse switch disconnector only.

(8) For 32 A: for fuse switch disconnector GS2DB3 only.



GS1AH01

GS1AH02



GS2AH●10
GS2AH●20



GS2AH●30
GS2AH●40



GS2AH●50
GS2AH●60



GS2AH●70
GS2AH●80

Handles for IEC and UL switch-disconnector fuses

Handles for direct operators

| Switch rating A (CEI) | A (UL) | Type of operator | Handle colour | Reference |
|--|-------------|------------------|---------------|-----------|
| Handles for direct operators, padlockable | | | | |
| - | 30 Compact | Front-mounted | Black | GS2AH106 |
| 32 | - | Front | Black | GS1AH103 |
| 50 and 63 | - | RH side | Black | GS1AH01 |
| 100...400 | - | RH side | Black | GS1AH02 |
| - | 600 and 800 | Front-mounted | Black | GS2AH107 |
| 630 and 800 | - | Front | Black | GS2AH104 |
| 1250 | - | Front | Black | GS2AH105 |

Handles for external operator

| Switch rating A (CEI) | A (UL) | Handle colour | Degree of protection | Protection index Nema | Reference |
|---|-------------|---------------|----------------------|--------------------------|-----------|
| Handles for front-mounted external operators, padlockable and lockable in position O⁽¹⁾ | | | | | |
| Door interlock in I position⁽²⁾ | | | | | |
| 32...63 | - | Black/Grey | IP 65 | - | GS2AH510 |
| | | | IP55 | - | GS2AH515 |
| 100...400 | - | Black/Grey | IP 65 | - | GS2AH520 |
| | | | IP55 | - | GS2AH530 |
| 630 and 800 | - | Black/Grey | IP 65 | - | GS2AH535 |
| | | | IP65 | - | GS2AH540 |
| 1250 | - | Black/Grey | IP65 | - | GS2AH550 |
| | | | IP65 | - | GS2AH560 |
| - | 30 Compact | Black/Grey | IP65 | - | GS2AH570 |
| | | | IP65 | - | GS2AH580 |
| - | 30...400 | Black/Grey | - | 1, 3R, 12 | GS2AH110 |
| | | | - | 1, 3R, 12 | GS2AH120 |
| | | | - | 1, 3R, 4, 4X, 12 | GS2AH410 |
| | | | - | 1, 3R, 4, 4X, 12 | GS2AH420 |
| - | 30...400 | Red/Yellow | - | 1, 3R, 12 | GS2AH130 |
| | | | - | 1, 3R, 12 | GS2AH140 |
| | | | - | 1, 3R, 4, 4X, 12 | GS2AH430 |
| | | | - | 1, 3R, 4, 4X, 12 | GS2AH440 |
| - | 600 and 800 | Black/Grey | - | 1, 3R, 12 | GS2AH150 |
| | | | - | 1, 3R, 12 | GS2AH160 |

Handles for front-mounted external operators with test facility⁽³⁾, padlockable and lockable in "O" position⁽¹⁾. Door interlock in "I" position⁽²⁾

| | | | | | |
|-----------|------------|------------|-------|------------------|-----------|
| 32...63 | - | Black/Grey | IP 65 | - | GS2AHT510 |
| | | | IP65 | - | GS2AHT520 |
| 100...400 | - | Black/Grey | IP65 | - | GS2AHT530 |
| | | | IP65 | - | GS2AHT540 |
| - | 30 Compact | Black/Grey | - | 1, 3R, 12 | GS2AHT110 |
| | | | - | 1, 3R, 12 | GS2AHT120 |
| | | | - | 1, 3R, 4, 4X, 12 | GS2AHT410 |
| | | | - | 1, 3R, 4, 4X, 12 | GS2AHT420 |
| - | 30...400 | Black/Grey | - | 1, 3R, 12 | GS2AHT130 |
| | | | - | 1, 3R, 12 | GS2AHT140 |
| | | | - | 1, 3R, 4, 4X, 12 | GS2AHT430 |
| | | | - | 1, 3R, 4, 4X, 12 | GS2AHT440 |

Handles for external right-hand side-mounted operators, padlockable and lockable in "O" position⁽¹⁾

| | | | | | |
|------------|---|------------|-------|---|----------|
| 32...63 | - | Black/Grey | IP 65 | - | GS2AH210 |
| | | | IP55 | - | GS2AH215 |
| 100...400 | - | Black/Grey | IP65 | - | GS2AH220 |
| | | | IP55 | - | GS2AH235 |
| 630...1250 | - | Black/Grey | IP65 | - | GS2AH240 |
| | | | IP65 | - | GS2AH250 |
| - | - | Red/Yellow | IP65 | - | GS2AH260 |

Handles for external left-hand side-mounted operators, padlockable and lockable in "O" position⁽¹⁾

| | | | | | |
|------------|---|------------|-------|---|----------|
| 32...63 | - | Black/Grey | IP 65 | - | GS2AH310 |
| | | | IP65 | - | GS2AH320 |
| 100...400 | - | Black/Grey | IP65 | - | GS2AH330 |
| | | | IP65 | - | GS2AH340 |
| 630...1250 | - | Black/Grey | IP65 | - | GS2AH350 |
| | | | IP65 | - | GS2AH360 |

⁽¹⁾ Lockable with device GS2AX1, to be ordered separately.

⁽²⁾ Door interlock override by means of a tool.

⁽³⁾ The Test facility allows testing of the control circuits off-load, by using auxiliary contacts GS1AM110, GS1AM101 or GS1ANT●●. In the "Test" position, the enclosure door can be opened.

PB121455.eps



GS2AE5

PB121456.eps



GS2AE2 - GS2AE21

PB121457.tif



GS2AE8 - GS2AE81

Switch-disconnector fuses

Accessories for IEC and UL switch-disconnector fuses

Shafts for external operators

| Switch rating A (CEI) | A (UL) | Shaft length mm | Shaft cross section mm | Reference |
|--------------------------|-------------|--------------------|---------------------------|-----------|
| 32 | 30 Compact | 200 | 5 x 5 | GS2AE82 |
| | | 320 | 5 x 5 | GS2AE8 |
| | | 400 | 5 x 5 | GS2AE81 |
| 50...400 | 30...400 | 200 | 10 x 10 | GS2AE22 |
| | | 320 | 10 x 10 | GS2AE2 |
| | | 400 | 10 x 10 | GS2AE21 |
| 630...1250 | 600 and 800 | 200 | 12 x 12 | GS2AE52 |
| | | 320 | 12 x 12 | GS2AE5 |
| | | 40 | 12 x 12 | GS2AE51 |

Terminal protection shrouds for upstream or downstream connector plates

| Switch rating A (CEI) | A (UL) | Number of poles | Reference |
|--------------------------|--------------------------|-----------------|-----------|
| 50 and 63 | 30 Compact, 30...60 (3P) | 3 or 4 | (1) |
| 100...160 | 100 | 3 | GS1AP33 |
| | | 4 | GS1AP34 |
| 200...400 | 200 | 3 | GS1AP43 |
| | | 4 | GS1AP44 |
| - | 400 | 3 | GS1APU53 |
| | | 4 | GS1APU54 |
| 630...800 | 600 and 800 | 3 | GS2AP73 |
| | | 4 | GS2AP64 |
| 1250 | - | 3 | GS2AP83 |
| | | 4 | GS2AP84 |

Devices for locking fuse covers in "I" position (2)

| Switch rating A | Fuse size | Number of poles | Reference |
|--------------------|------------------|-----------------|-----------|
| 50 | 14 x 51 | 3 or 4 | (3) |
| 63 | Size 00C | 3 or 4 | GS1AV1 |
| 100...160 | 22 x 58, Size 00 | 3 or 4 | GS1AV2 |
| 160 | Size 0 | 3 | GS1AV33 |
| 250 | Size 1 | 3 | GS1AV53 |
| | | 4 | GS1AV54 |
| 400 | Size 2 | 3 | GS1AV73 |
| | | 4 | GS1AV74 |

Cage terminals for connection of bare cables (without lug)

| Switch rating A | Number of poles | Reference |
|--------------------|-----------------|-----------|
| 50 and 63 | 3 or 4 | (4) |
| 100...160 | 3 | GS1AW33 |
| | 4 | GS1AW34 |
| 200...250 | 3 | GS1AW43 |
| | 4 | GS1AW44 |

External handle locking device

| Switch rating A | Description | Reference |
|--------------------|--|-----------|
| 32...1250 | Device for RONIS EL11AP keylock (lock to be ordered separately). | GS2AX1 |

Flat mounting kit

| Switch rating A | Description | Reference |
|--------------------|---|-----------|
| 50...400 | The kit, for use with a front-mounted external handle, includes: ■ a 200 mm shaft, cross section 10 x 10 mm, ■ an adapter plate | GS2ADL2 |

(1) For these ratings, the switch-disconnector fuses are fitted with terminal covers as standard.

(2) For NF C and DIN switch-disconnector fuses fitted with right-hand mounted direct operator.

(3) For this rating, switch-disconnector fuses are fitted with a cover locking device as standard.

(4) For these ratings, switch-disconnector fuses are fitted with cage terminals as standard.

Switch-
disconnect
fuses


TeSys Power

Switch-disconnector fuses

Product references

| | | | |
|----------|---------------|-----------|----------|
| GS1AD010 | GS1DDB3 | GS2AH250 | GS2J4 |
| GS1AD10 | GS1DDB4 | GS2AH260 | GS2JB3 |
| GS1AE6 | GS1DDU3 | GS2AH310 | GS2JB4 |
| GS1AE7 | GS1DU3 | GS2AH320 | GS2JG3 |
| GS1AF | GS1FD3 | GS2AH330 | GS2JG4 |
| GS1AF1 | GS1FD4 | GS2AH340 | GS2JU3N |
| GS1AF23 | GS1GD3 | GS2AH350 | GS2K3 |
| GS1AF24 | GS1GD4 | GS2AH360 | GS2K4 |
| GS1AF33 | GS1JD3 | GS2AH36F | GS2KKG3 |
| GS1AF34 | GS1JD4 | GS2AH410 | GS2KKG4 |
| GS1AF43 | GS1KD3 | GS2AH420 | GS2KK3 |
| GS1AF44 | GS1KD4 | GS2AH430 | GS2KK4 |
| GS1AH01 | GS1KKD3 | GS2AH440 | GS2KKG3 |
| GS1AH02 | GS1KKD4 | GS2AH460F | GS2KKG4 |
| GS1AH101 | GS1LD3 | GS2AH510 | GS2L3 |
| GS1AH102 | GS1LD4 | GS2AH515 | GS2L4 |
| GS1AH103 | GS1LLD3 | GS2AH520 | GS2LB3 |
| GS1AH110 | GS1LLD4 | GS2AH530 | GS2LB4 |
| GS1AH130 | GS1ND3 | GS2AH535 | GS2LG3 |
| GS1AH160 | GS1ND4 | GS2AH540 | GS2LG4 |
| GS1AH220 | GS1QQD3 | GS2AH550 | GS2LL3 |
| GS1AH440 | GS1QQD4 | GS2AH560 | GS2LL4 |
| GS1AM1 | GS2AD030N | GS2AH570 | GS2LLB3 |
| GS1AM101 | GS2AD040N | GS2AH580 | GS2LLB4 |
| GS1AM110 | GS2AD20 | GS2AH60F | GS2LLG3 |
| GS1AM111 | GS2ADL2 | GS2AHT110 | GS2LLG4 |
| GS1AM2 | GS2AE2 | GS2AHT120 | GS2MLU3N |
| GS1AM211 | GS2AE21 | GS2AHT130 | GS2MMB3 |
| GS1AN11 | GS2AE22 | GS2AHT140 | GS2MMB4 |
| GS1AN11G | GS2AE23 | GS2AHT410 | GS2MU3N |
| GS1AN22 | GS2AE5 | GS2AHT420 | GS2N3 |
| GS1AN22G | GS2AE51 | GS2AHT430 | GS2N4 |
| GS1ANT11 | GS2AE52 | GS2AHT440 | GS2NB3 |
| GS1ANT22 | GS2AE61 | GS2AHT510 | GS2NB4 |
| GS1AP33 | GS2AE8 | GS2AHT520 | GS2NG3 |
| GS1AP34 | GS2AE81 | GS2AHT530 | GS2NG4 |
| GS1AP43 | GS2AE82 | GS2AHT540 | GS2PPB3 |
| GS1AP44 | GS2AEH12 | GS2AP43 | GS2PPB4 |
| GS1AP63 | GS2AESB | GS2AP53 | GS2QQ3 |
| GS1AP83 | GS2AF63 | GS2AP64 | GS2QQ4 |
| GS1AV1 | GS2AF64 | GS2AP73 | GS2QQB3 |
| GS1AV2 | GS2AF73 | GS2AP83 | GS2QQB4 |
| GS1AV33 | GS2AF74 | GS2AP84 | GS2QQG3 |
| GS1AV54 | GS2AH100TO200 | GS2AX1 | GS2QQG4 |
| GS1AV73 | GS2AH104 | GS2DB3 | GS2QU3N |
| GS1AW303 | GS2AH106 | GS2DB4 | GS2S3 |
| GS1AW306 | GS2AH110 | GS2EEU3 | GS2S4 |
| GS1AW33 | GS2AH120 | GS2EU3N | GS2SB3 |
| GS1AW34 | GS2AH130 | GS2F3 | GS2SB4 |
| GS1AW403 | GS2AH140 | GS2F4 | GS2SG3 |
| GS1AW406 | GS2AH150 | GS2FG3 | GS2SG4 |
| GS1AW43 | GS2AH160 | GS2FG4 | GS2SU3 |
| GS1AW44 | GS2AH170 | GS2G3 | GS2TB3 |
| GS1AW503 | GS2AH180 | GS2G4 | GS2TB4 |
| GS1AW506 | GS2AH210 | GS2GB3 | GS2TU3 |
| GS1AW603 | GS2AH215 | GS2GB4 | GS2V3 |
| GS1AW606 | GS2AH220 | GS2GG3 | GS2V4 |
| GS1AW903 | GS2AH230 | GS2GG4 | GS2VG3 |
| GS1DD3 | GS2AH235 | GS2GU3N | LC1BL |
| GS1DD4 | GS2AH240 | GS2J3 | |

Switch-disconnector fuses

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

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- > auxiliary contactsB5/24

Dimensions B5/25 to B5/33

SchemesB5/33

TeSys Power

Switch-disconnector fuses

Characteristics

IEC - For NFC / DIN fuses - From 32 to 1250 A

Switch-disconnector-fuse characteristics

| Type | | GS1DD | GS•F | GS•G | GS•J | |
|---|--|-----------------|-------------------------|----------|----------|--------------------|
| Environment | | | | | | |
| Conforming to standards | Switch-disconnector fuses | | IEC 60947-3 | | | |
| | Fuses | | IEC 60269-1 and 2 | | | |
| Product certifications | | | ASEFA/LOVAG, LROS, UKCA | | | |
| Degree of protection conforming to IEC 60529 | On front panel with terminal covers | | IP 20 | | | |
| Ambient air temperature around the device | Storage | °C | -40...+80 | | | |
| | Operation | °C | -20...+70 | | | |
| Flame resistance conforming to IEC 60695-2-1 | Body | °C | 960 | 960 | | |
| | Fuse cover | °C | – | 850 | | |
| Pole characteristics | | | | | | |
| Conventional thermal current (I _{th}) for ambient temperature ≤ 40 °C | | A | 32 | 50 | 63 | 100 |
| Fuse size | | | 10 x 38 | 14 x 51 | T00C | 22 x 58 |
| Rated insulation voltage (U _i) | | V | 800 | 750 | 750 | 750 |
| Rated impulse withstand voltage (U _{imp}) | | kV | 8 | 8 | 8 | 8 |
| Rated operational current (I _e) | Cat. AC-23A/B ⁽¹⁾ ~ 400 V | A | 32 | 50 | 63 | 100 |
| | ~ 500 V | A | 32 | 50 | 63 | 100 |
| | ~ 690 V | A | 32 | 50 | 63 | 100 ⁽³⁾ |
| | Cat. DC-23A/B ⁽¹⁾ ∴ 440 V ⁽²⁾ | A | 20 | 40 | 40 | 100 |
| Rated operational power | Cat. AC-23A/B ⁽¹⁾ ~ 400 V | kW | 15 | 25 | 30 | 51 |
| | ~ 500 V | kW | 18.5 | 33 | 40 | 63 |
| | ~ 690 V | kW | 25 | 45 | 55 | 90 |
| Rated conditional short-circuit current | I _{rms} at ~ 400 V with protection by gG (gl) fuses | kA | 100 | 100 | 100 | 100 |
| | Rating of associated fuses | A | 32 | 50 | 63 | 100 |
| Peak value of permissible current (dynamic short-circuit withstand) | Conforming to IEC 60269-1 ~ 400 V | kA | 5.5 | 7.6 | 10.6 | 20 |
| Rated making capacity | I _{rms} at 400 V Cat. AC-23B | A | 320 | 500 | 630 | 1000 |
| Rated breaking capacity | I _{rms} at 400 V Cat. AC-23B | A | 256 | 400 | 500 | 800 |
| Mechanical durability | Number of operating cycles | | 20000 | 10000 | 10000 | 10000 |
| Electrical durability | Number of operating cycles cat. AC/DC-23A/B ⁽¹⁾ | | 1500/300 | 1500/300 | 1500/300 | 1500/300 |
| Cabling | Cable (c.s.a. min/max) | mm ² | 2.5/16 | 6/25 | 10/25 | 25/95 |
| | Bars (max width) | mm | – | – | – | 20 |
| Tightening torque | | N.m | 3 | 3.2 | 3.2 | 12 |

⁽¹⁾ Category "A": frequent operating cycles, category "B": infrequent operating cycles.

⁽²⁾ 2 poles in series per phase.

⁽³⁾ With terminal covers.

⁽⁴⁾ Poles not juxtaposed.

| | GS●K | GS●KK | GS●LL | GS●L | GS●N | GS●QQ | GS2S | GS2V |
|--|-------------------------|--------------------|--------------------|--------------------|--------------------|------------------------|------------------------|-------------|
| | IEC 60947-3 | | | | | | | |
| | IEC 60269-1 and 2 | | | | | | | |
| | ASEFA/LOVAG, LROS, UKCA | | | | | | | |
| | IP 20 | | | | | | | |
| | -40...+80 | | | | | | | |
| | -20...+70 | | | | | | | |
| | 960 | | | | | | | |
| | 850 | | | | | | | |
| | 125 | 125 | 160 | 160 | 250 | 400 | 630 | 1250 |
| | 22 x 58 | T00 | T00 | T0 | T1 | T2 | T3 | T4 |
| | 750 | 750 | 750 | 750 | 750 | 800 | 1000 | 1000 |
| | 8 | 8 | 8 | 8 | 8 | 8 | 12 | 12 |
| | 125 | 125 | 160 | 160 | 250 | 400 | 630 | 1000 |
| | 125 | 125 | 160 | 160 | 250 | 315 | 500 | 800 |
| | 100 ⁽³⁾ | 100 ⁽³⁾ | 125 ⁽³⁾ | 125 ⁽³⁾ | 250 ⁽³⁾ | 250/315 | 315/400 | 630 |
| | 100 | 100 | 125 | 125 | 200 | 200/315 ⁽⁴⁾ | 400/630 ⁽⁴⁾ | 1000 |
| | 63 | 63 | 80 | 80 | 132 | 220 | 355 | 560 |
| | 90 | 90 | 110 | 110 | 160 | 220 | 355 | 560 |
| | 80 | 80 | 110 | 110 | 220 | 220/295 | 295/400 | 400/475 |
| | 100 | 100 | 100 (50) | 100 | 100 | 50 | 100 | 100 |
| | 125 | 125 | 125 (160) | 160 | 250 | 400 | 630 | 1250 |
| | 20 | 20 | 22.7 | 20 | 32.5 | 40 | 70 | 90 |
| | 1250 | 1250 | 1600 | 1600 | 2500 | 4000 | 6300 | 10 000 |
| | 1000 | 1000 | 1280 | 1280 | 2000 | 3200 | 5040 | 8000 |
| | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 8000 | 5000 |
| | 1000/200 | 1000/200 | 1000/200 | 1000/200 | 1000/200 | 1000/200 | 1000/200 | 500/100 |
| | 35/95 | 35/95 | 50/95 | 50/95 | 95/240 | 185/240 | 2 x 150 / 2 x 300 | - / 4 x 185 |
| | 20 | 20 | 20 | 20 | 32 | 45 | 63 | 80 |
| | 12 | 12 | 12 | 12 | 25 | 25 | 44 | 44 |

Ref.



Switch-disconnector fuses

TeSys Power

Switch-disconnector fuses

Characteristics

IEC - For BS fuses - From 32 to 1250 A

| Switch-disconnector-fuse characteristics | | GS1DDB | GS2DB | GS2GB | GS2JB | |
|---|--|-----------------------|-------------------------|----------|----------|--------------------|
| Environment | | | | | | |
| Conforming to standards | Switch-disconnector fuses | | IEC 60947-3 | | | |
| | Fuses | | IEC 60269-1 and 2 | | | |
| Product certifications | | | ASEFA/LOVAG, LROS, UKCA | | | |
| Degree of protection conforming to IEC 60529 | On Front panel, with terminal covers | | IP 20 | | | |
| Ambient air temperature around the device | Storage | °C | -40...+80 | | | |
| | Operation | °C | -20...+70 | | | |
| Flame resistance conforming to IEC 60695-2-1 | Body | °C | 960 | | | |
| | Fuse cover | °C | - | | 850 | |
| Pole characteristics | | | | | | |
| Conventional thermal current (I _{th}) for ambient temperature ≤ 40 °C | | A | 32 | 32 | 63 | 100 |
| Fuse size | | | A1 | A1 | A2-A3 | A4 Ø ≤ 31 mm |
| Rated insulation voltage (U _i) | | V | 800 | 750 | 750 | 750 |
| Rated impulse withstand voltage (U _{imp}) | | kV | 8 | 8 | 8 | 8 |
| Rated operational current (I _e) | Cat. AC-23A/B ⁽¹⁾ ~ 400 V | A | 32 | 32 | 63 | 100 |
| | ~ 500 V | A | 32 | 32 | 63 | 100 |
| | ~ 690 V | A | 32 | 32 | 63 | 100 ⁽⁴⁾ |
| | Cat. DC-23A/B ⁽¹⁾ ~ 440 V ⁽²⁾ | A | 20 | 20 | 40 | 100 |
| Rated operational power | Cat. AC-23A/B ⁽¹⁾ ~ 400 V | kW | 15 | 15 | 30 | 51 |
| | ~ 500 V | kW | 18.5 | 18.5 | 40 | 63 |
| | ~ 690 V | kW | 25 | 25 | 55 | 90 |
| Rated conditional short-circuit current | I rms at ~ 400 V with protection by gG (gl) fuses | kA | 80 | 80 | 80 | 80 |
| | Rating of associated fuses | A | 32 | 32 | 63 | 100 |
| Peak value of permissible current (dynamic short-circuit withstand) | Conforming to ~ 400 V IEC 60269-1 | kA | 5.5 | 9 | 10.6 | 20 |
| Rated making capacity | I rms at 400 V Cat. AC-23B | A | 320 | 320 | 630 | 1000 |
| Rated breaking capacity | I rms at 400 V Cat. AC-23B | A | 256 | 256 | 500 | 800 |
| Mechanical durability | Number of operating cycles | | 20000 | 10000 | 10000 | 10000 |
| Electrical durability | Number of operating cycles cat. AC/DC-23A/B ⁽¹⁾ | | 1500/300 | 1500/300 | 1500/300 | 1500/300 |
| Cabling | Cable (c.s.a. min/max) | mm² | 2.5/16 | 6/25 | 10/25 | 25/95 |
| | Bars (max width) | mm | - | - | - | 20 |
| Tightening torque | | N.m | 3 | 3.2 | 3.2 | 12 |

(1) Category "A": frequent operating cycles, category "B": infrequent operating cycles.

(2) 2 poles in series per phase.

(3) Fit switch-disconnector fuses **GS2LB** with B1 or B2 fuses and **GS2LLB** with A4 fuses.

(4) With terminal covers.

(5) Poles not juxtaposed.

| | GS2LB or LLB ⁽³⁾ | GS2MMB | GS2NB | GS2PPB | GS2QQB | GS2SB | GS2TB | GS2VB |
|--|-----------------------------|------------------------|--------------------|------------------------|------------------------|------------------------|-------------------|-------------|
| | IEC 60947-3 | | | | | | | |
| | IEC 60269-1 and 2 | | | | | | | |
| | ASEFA/LOVAG, LROS, UKCA | | | | | | | |
| | IP 20 | | | | | | | |
| | -40...+80 | | | | | | | |
| | -20...+70 | | | | | | | |
| | 960 | | | | | | | |
| | 850 | | | | | | | |
| | 160 | 200 | 250 | 315 | 400 | 630 | 800 | 1250 |
| | A4, B1-B2 ⁽³⁾ | B1-B2 | B1...B3 | B1...B3 | B1...B4 | C1-C2 | C1...C3 | D1 |
| | 750 | 750 | 750 | 800 | 800 | 1000 | 1000 | 1000 |
| | 8 | 8 | 8 | 8 | 8 | 12 | 12 | 12 |
| | 160 | 200 | 250 | 315 | 400 | 630 | 800 | 1000 |
| | 160 | 200 | 250 | 315 | 315 | 500 | 630 | 800 |
| | 125 ⁽⁴⁾ | 200/160 ⁽⁴⁾ | 250 ⁽⁴⁾ | 250/315 ⁽⁴⁾ | 250/315 | 315/400 | 630 | 630 |
| | 125 | 200 | 200 | 200 | 200/315 ⁽⁵⁾ | 400/630 ⁽⁵⁾ | 800 | 1000 |
| | 80 | 100 | 132 | 150 | 220 | 355 | 450 | 560 |
| | 110 | 140 | 160 | 220 | 220 | 355 | 450 | 560 |
| | 110 | 150/185 | 220 | 220/295 | 220/295 | 295/400 | 400 | 400/475 |
| | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| | 160 | 200 | 250 | 315 | 400 | 630 | 800 | 1250 |
| | 22.7 | 32.5 | 32.5 | 40 | 40 | 70 | 80 | 90 |
| | 1600 | 2000 | 2500 | 3150 | 4000 | 6300 | 8000 | 10 000 |
| | 1280 | 1600 | 2000 | 2520 | 3200 | 5040 | 6400 | 8000 |
| | 10000 | 10000 | 10000 | 10000 | 10000 | 8000 | 8000 | 5000 |
| | 1000/200 | 1000/200 | 1000/200 | 1000/200 | 1000/200 | 1000/200 | 500/100 | 500/100 |
| | 50/95 | 95/240 | 95/240 | 185/240 | 185/240 | 2 x 150 / 2 x 300 | 2 x 185 / 2 x 300 | - / 4 x 185 |
| | 20 | 32 | 32 | 45 | 45 | 63 | 63 | 80 |
| | 12 | 25 | 25 | 25 | 25 | 44 | 44 | 44 |

Ref.



Switch-disconnector fuses

TeSys Power

Switch-disconnector fuses

Characteristics

UL, CSA, IEC - For CC and J fuses - From 32 to 800 A

Switch-disconnector-fuse characteristics

| Type | | GS1DDU3 | GS1DU3 | GS2EEU3 | GS2EU3N | | |
|---|--|-----------------------------------|--------------|--|----------------|----------------|----------|
| Environment | | | | | | | |
| Conforming to standards | Switch-disconnector fuses | UL 489, CSA 22.2 n°5, IEC 60947-3 | | UL 98, UL 248, CSA 22.2 n°4, IEC 60947-3 | | | |
| | Fuses | UL 248 | | | | | |
| Degree of protection conforming to IEC 60529 | With terminal covers | IP 20 | | | | | |
| Ambient air temperature around the device | Storage | °C | -40...+80 | | | | |
| | Operation | °C | -20...+70 | | | | |
| Flame resistance conforming to IEC 60695-2-1 | Body | °C | 960 | 960 | 960 | | |
| | Fuse cover | °C | - | - | 850 | | |
| Pole characteristics | | | | | | | |
| Conventional thermal current (I _{th}) for ambient temperature ≤ 40 °C | | A | 30 | 30 | 30 | 30 | |
| Fuse size | | | CC | J | CC | J | |
| Rated insulation voltage (U _i) | | V | 800 | 800 | 750 | 750 | |
| Rated impulse withstand voltage (U _{imp}) | | kV | 8 | 8 | 8 | 8 | |
| Rated operational current (I _e) | Cat. AC-23A/B ⁽¹⁾ ~ 400 V | A | 32 | 32 | 32 | 32 | |
| | ~ 500 V | A | 32 | 32 | 32 | 32 | |
| | ~ 690 V | A | 32 | 32 | 32 | 32 | |
| Rated operational power | Cat. AC-23A/B ⁽¹⁾ ~ 400 V | kW | 15 | 15 | 15 | 15 | |
| | ~ 500 V | kW | 18.5 | 18.5 | 18.5 | 18.5 | |
| | ~ 690 V | kW | 25 | 25 | 25 | 25 | |
| Prospective short-circuit current withstand | Conforming to UL 98 / UL 489 | ~ 600 V | kA | 100 | 100 | 200 | 200 |
| Peak value of permissible current (dynamic short-circuit withstand) | Conforming to IEC 60269-1 | ~ 400 V | kA | 5.5 | 5.5 | 7.6 | 17.6 |
| Rated making capacity | I _{rms} at 400 V Cat. AC-23B | | A | 300 | 300 | 300 | 300 |
| Rated breaking capacity | I _{rms} at 400 V Cat. AC-23B | | A | 240 | 240 | 240 | 240 |
| Mechanical durability | Number of operating cycles | | | 10000 | 10000 | 10000 | 10000 |
| Electrical durability | Number of operating cycles Cat. AC/DC-23A/B ⁽¹⁾ | | | 1500/300 | 1500/300 | 1500/300 | 1500/300 |
| Cabling | Cable (c.s.a. min/max) | mm² | 2.5/6 | 2.5/6 | 2.5/6 | 2.5/16 | |
| | | AWG | #14/#10 | #14/#10 | #14/#10 | #14/#6 | |
| | Bars (max width) | mm | - | - | - | - | |
| Tightening torque | | N.m | 3 (for wire) | 4 (for wire) | 5.5 (for wire) | 3.5 (for wire) | |
| | | lb-in | 27 | 27 | 48 | 31 | |

(1) Category "A": frequent operating cycles, category "B": infrequent operating cycles.

| | GS2GU3N | GS2JU3N | GS2MU3N | GS2QU3N | GS2SU3 | GS2TU3 |
|--|-------------------------------------|--------------|--------------|--------------|--------------|--------------|
| | UL 98, CSA 22.2 n°4, IEC 60947-3 | | | | | |
| | UL 248 | | | | | |
| | IP 20 | | | | | |
| | -40...+80 | | | | | |
| | -20...+70 | | | | | |
| | 960 | | | | | |
| | 850 | | | | | |
| | 60 | 100 | 200 | 400 | 600 | 800 |
| | J | J | J | J | J | L |
| | 750 | 750 | 750 | 800 | 1000 | 1000 |
| | 8 | 8 | 8 | 8 | 12 | 12 |
| | 63 | 100 | 200 | 400 | 630 | 800 |
| | 63 | 100 | 200 | 315 | 630 | 630 |
| | 63 | 100 | 200 | 250 | 630 | 630 |
| | 30 | 51 | 100 | 220 | 355 | 450 |
| | 40 | 63 | 140 | 220 | 450 | 560 |
| | 55 | 90 | 185 | 220 | 600 | 600 |
| | 100 | 200 | 200 | 200 | 200 | 200 |
| | 17.6 | 22 | 32 | 36 | 80 | 80 |
| | 600 | 1000 | 2000 | 4000 | 6000 | 8000 |
| | 480 | 800 | 1600 | 3200 | 4800 | 6400 |
| | 10000 | 10000 | 8000 | 6000 | 5000 | 5000 |
| | 1500/300 | 1500/300 | 1000/200 | 1000/200 | 1000/200 | 500/100 |
| | 2.5/16 | 4/50 | 16/150 | 25/300 | 2 x 150 | - |
| | #14/#6 | #12/#1 | #6/300 Kcmil | #4/600 Kcmil | #2/600 Kcmil | - |
| | - | 20 | 32 | 45 | 100 | 100 |
| | 3.5 (for wire) | 4 (for wire) | 18 (for lug) | 35 (for lug) | 35 (for lug) | 35 (for lug) |
| | 31 | 35.4 | 160 | 310 | 310 | 310 |

Ref.

Switch-
disconnector
fuses

TeSys Power

Switch-disconnector fuses

Characteristics

Auxiliary contacts

GS1AM11, GS1AM1 and GS1AM2 early break and signalling contact characteristics

| | | | |
|---|----------------------------|-----------|--|
| Conventional thermal current (I _{th}) for ambient temperature ≤ 40 °C | | A | 16 |
| Rated operational current (I _e) | Cat. AC-15 | A | 127 V: 5 - 230 V: 4 - 400 /415 V: 3 - 440 V: 2 |
| | Cat. DC-13 | A | 24 V: 12 - 48 V: 2 - 110 V: 0.6 - 220 V: 0.4 |
| Durability | Number of operating cycles | | Mechanical: 1000000 Electrical: cat. AC-15: 30000 |
| Fuse protection | gG | A | 6 max |
| Cabling | | mm | Faston connectors: 1 x 6.35 or 2 x 2.8 |

GS1AN and GS1ANT signalling contact characteristics

| | | | |
|---|----------------------------|-----------------------|--|
| Conventional thermal current (I _{th}) for ambient temperature ≤ 40 °C | | A | 20 |
| Rated operational current (I _e) | Cat. AC-15 | A | 127 V: 12 - 230 V: 10 - 400/415 V: 8 - 440 V: 6 |
| | Cat. DC-13 | A | 48 V: 4 - 110 V: 1.2 - 220 V: 1 |
| Durability | Number of operating cycles | | Mechanical: 30000 Electrical: cat. AC-15: 30000 |
| Fuse protection | gG | A | 16 max |
| Cabling | Cable (c.s.a. min/max) | mm² | Min: 1.5 - max: 10 |

GS1AM110 and GS1AM101 early break and signalling contact characteristics

| | | | |
|---|----------------------------|-----------------------|---|
| Conventional thermal current (I _{th}) for ambient temperature ≤ 40 °C | | A | 10 |
| Rated operational current (I _e) | Cat. AC-15 | A | 120 V: 6 - 240 V: 3 - 400 V: 1.8 - 480 V: 1.5 |
| | Cat. DC-13 | A | 24 V: 2.8 - 48 V: 1.4 - 125 V: 0.55 - 250 V: 0.27 - 400 V: 0.15 |
| Durability | Number of operating cycles | | Mechanical: 5000000 Electrical: cat. AC-15: 1000000 |
| Cabling | Cable (c.s.a. min/max) | mm² | Min: 1 x 0.22 - max: 2 x 2.5 |

GS1AF "blown fuse" signalling contact characteristics

| | | | |
|---|----------------------------|-----------|--|
| Conventional thermal current (I _{th}) for ambient temperature ≤ 40 °C | | A | 16 |
| Rated operational current (I _e) | Cat. AC-15 | A | 230 V: 4 - 400 V: 3 |
| | Cat. DC-13 | A | 24 V: 12 - 48 V: 2 - 110 V: 0.6 - 220 V: 0.4 |
| Durability | Number of operating cycles | | Mechanical: 30000 Electrical: cat. AC-15: 30000 |
| Cabling | | mm | Faston connectors: 1 x 6.35 |

Ref.



Switch-disconnector fuses

TeSys Power

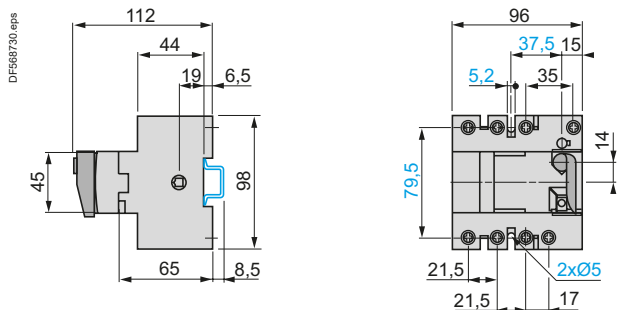
Switch-disconnector fuses

Dimensions

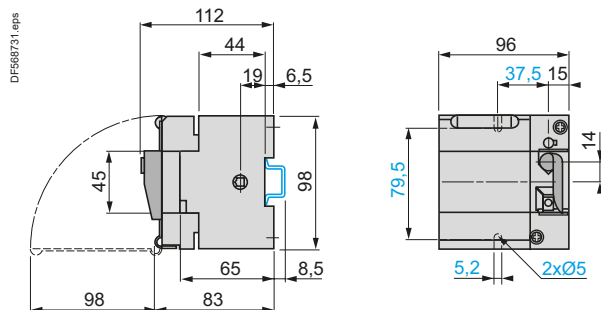
IEC - GS1●● (32 A) Switch-disconnector-fuse

Direct front-mounted operator

GS1DD

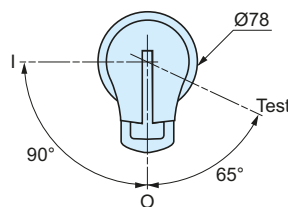
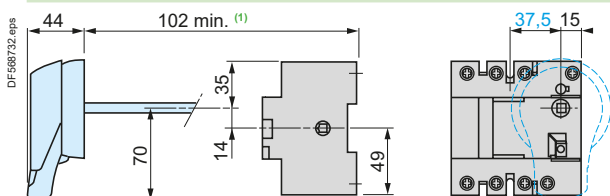


GS1DDB

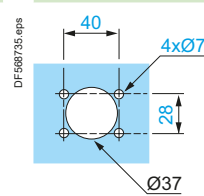


External front-mounted operator

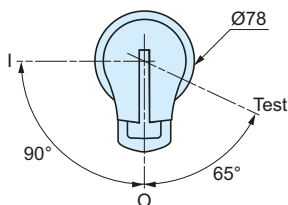
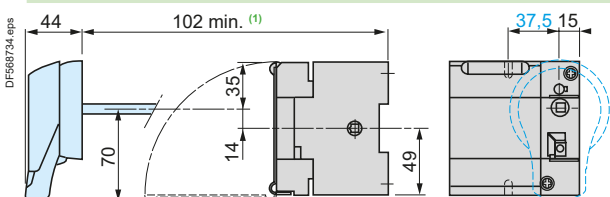
GS1DD



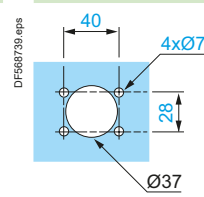
Door cut-out



GS1DDB



Door cut-out

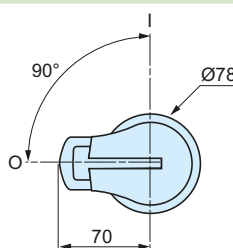
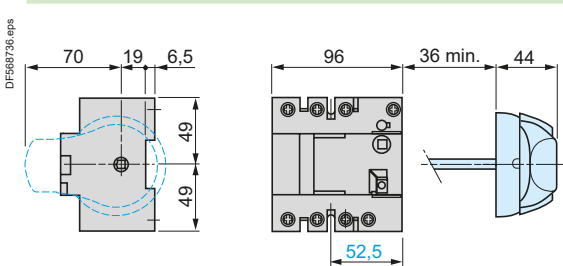


(1) With 1 or 2 auxiliary contacts GS1AM1●●: 130 mm.

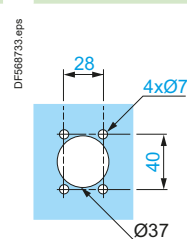
(2) With 3 or 4 auxiliary contacts GS1AM1●●: 155 mm.

External right-hand side-mounted operator

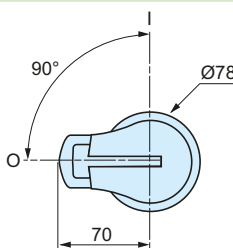
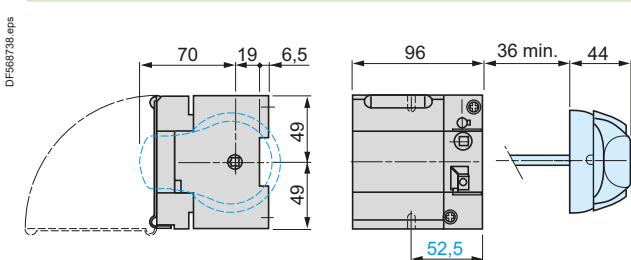
GS1DD



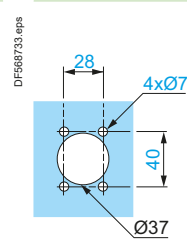
Door cut-out



GS1DDB



Door cut-out



TeSys Power

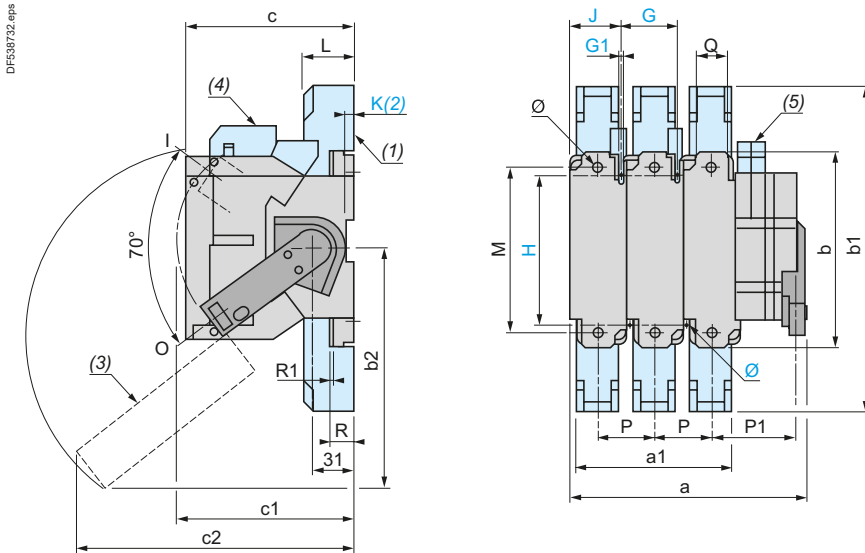
Switch-disconnector fuses

Dimensions

IEC - GS1●● (50...400 A) Switch-disconnector-fuse

Direct right-hand side-mounted operator

GS1FD (50 A), GD (63 A), JD (100 A), KD, KKD (125 A), LD, LLD (160 A), ND (250 A) and QQD (400 A)



Ref.



Switch-disconnector fuses

| GS1 | | a | a1 | b | b1 | b2 | c | c1 | c2 | G | G1 | H | J | K | Ø | L | M | P | P1 | Q | R | R1 | Ø |
|----------|----|-----|-----|-----|-----|-----|-------|-----|-----|----|-----|-----|----|-----|---|----|-----|----|------|----|------|-----|-----|
| FD | 3P | 118 | - | 118 | - | - | 87 | 134 | - | 27 | 5.4 | 106 | 31 | 6.5 | 5 | - | - | 27 | 33.5 | - | - | - | - |
| | 4P | 145 | - | 118 | - | - | 87 | 134 | - | 27 | 5.4 | 106 | 31 | 6.5 | 5 | - | - | 27 | 33.5 | - | - | - | - |
| GD | 3P | 133 | - | 118 | - | 159 | 116.5 | 134 | 145 | 32 | 5.4 | 106 | 36 | 6.5 | 5 | - | - | 32 | 36 | - | - | - | - |
| | 4P | 165 | - | 118 | - | 159 | 116.5 | 134 | 145 | 32 | 5.4 | 106 | 36 | 6.5 | 5 | - | - | 32 | 36 | - | - | - | - |
| JD, KD | 3P | 150 | 108 | 162 | 268 | - | 116 | 173 | - | 36 | 5.4 | 127 | 40 | - | 5 | 44 | 141 | 36 | 38 | 20 | 19.5 | 2.5 | 8.5 |
| | 4P | 186 | 144 | 162 | 268 | - | 116 | 173 | - | 36 | 5.4 | 127 | 40 | - | 5 | 44 | 141 | 36 | 38 | 20 | 19.5 | 2.5 | 8.5 |
| KKD, LLD | 3P | 150 | 108 | 162 | 268 | 141 | 126.5 | 173 | 193 | 36 | 5.4 | 127 | 40 | - | 5 | 44 | 141 | 36 | 38 | 20 | 19.5 | 2.5 | 8.5 |
| | 4P | 186 | 144 | 162 | 268 | 141 | 126.5 | 173 | 193 | 36 | 5.4 | 127 | 40 | - | 5 | 44 | 141 | 36 | 38 | 20 | 19.5 | 2.5 | 8.5 |
| LD | 3P | 192 | 136 | 162 | 268 | 174 | 136.5 | 173 | 229 | 50 | 5.4 | 140 | 54 | - | 5 | 44 | 141 | 50 | 45 | 20 | 19.5 | 2.5 | 8.5 |
| | 4P | 242 | 172 | 162 | 268 | 174 | 136.5 | 173 | 229 | 50 | 5.4 | 140 | 54 | - | 5 | 44 | 141 | 50 | 45 | 20 | 19.5 | 2.5 | 8.5 |
| ND | 3P | 253 | 180 | 195 | 345 | 185 | 146 | 173 | 251 | 60 | 6.4 | 162 | 64 | - | 6 | 65 | 166 | 60 | 81 | 32 | 19.5 | 2.5 | 11 |
| | 4P | 313 | 240 | 195 | 345 | 185 | 146 | 173 | 251 | 60 | 6.4 | 162 | 64 | - | 6 | 65 | 166 | 60 | 81 | 32 | 19.5 | 2.5 | 11 |
| QQD | 3P | 271 | 192 | 205 | 355 | 200 | 149 | 173 | 260 | 66 | 6.4 | 172 | 70 | - | 6 | 65 | 175 | 66 | 86 | 50 | 20 | 3 | 11 |
| | 4P | 337 | 258 | 205 | 355 | 200 | 149 | 173 | 260 | 66 | 6.4 | 172 | 70 | - | 6 | 65 | 175 | 66 | 86 | 50 | 20 | 3 | 11 |

(1) Terminal cover.

(2) Mounting on rail only for GS1FD and GS1GD (50 and 63 A).

(3) Protective screen, lockable in I position.

(4) 1 or 2 auxiliary contacts GS1AF●●.

(5) 1 or 2 auxiliary contacts GS1AM●.

TeSys Power

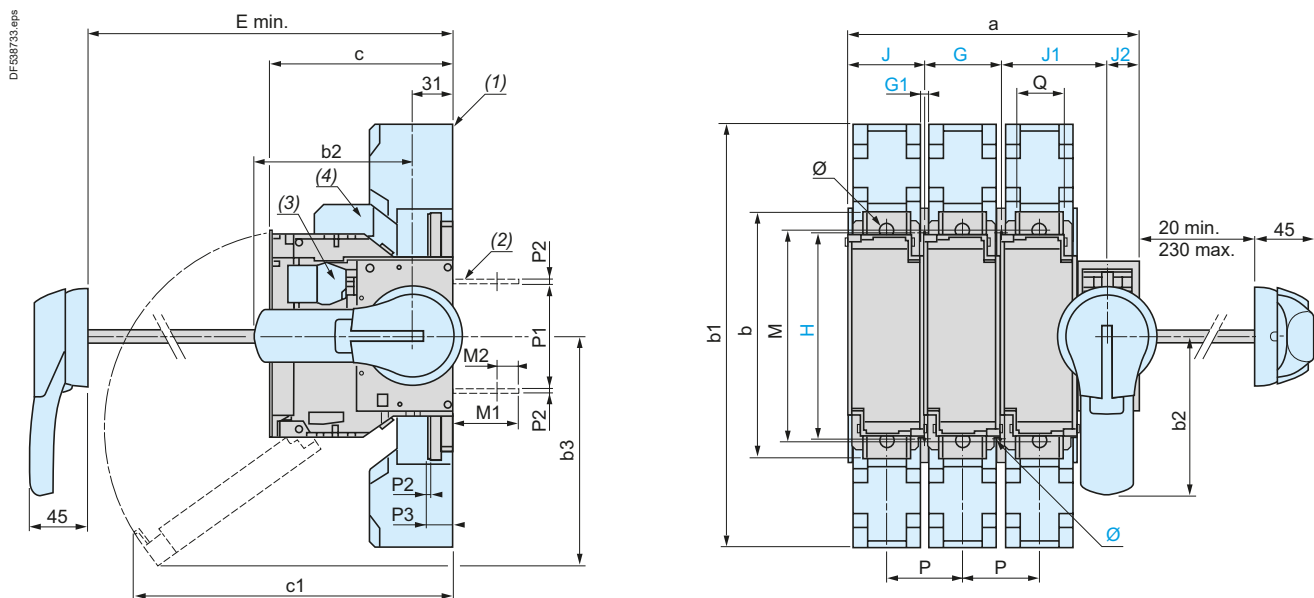
Switch-disconnector fuses

Dimensions

IEC - GS2●● (32...400 A) Switch-disconnector-fuse

External front and right-hand side-mounted operator

GS2DB (32 A), F (50 A), G, GB, JB (63 A), J (100 A), K, KK (125 A), L, LL, LB, LLB (160 A), MMB (200 A), N, NB (250 A), PPB (315 A), QQ and QQB (400 A)

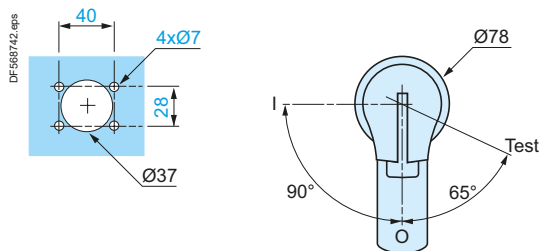


| GS2 | a | b | b1 | b2 | b3 | c | c1 | E min. | G | G1 | H | J | J1 | J2 | Ø | M | M1 | M2 | P | P1 | P2 | P3 | Q | Ø | |
|--------------|-----|-----|-----|-----|-----|-----|----------------------|--------|--------------------|-----|-----|-----|----|----|----|-----|-----|------|------|----|----|-----|------|----|-----|
| F, DB | 3P | 121 | 118 | - | 70 | 85 | 87 ⁽⁵⁾ | 153 | 100 ⁽⁵⁾ | 27 | 5.4 | 106 | 31 | 45 | 18 | 5 | - | 15 | 6 | 27 | 59 | 2 | - | 12 | - |
| | 4P | 148 | 118 | - | 70 | 85 | 87 ⁽⁵⁾ | 153 | 100 ⁽⁵⁾ | 27 | 5.4 | 106 | 31 | 45 | 18 | 5 | - | 15 | 6 | 27 | 59 | 2 | - | 12 | - |
| G, GB | 3P | 136 | 118 | - | 70 | 159 | 116.5 ⁽⁶⁾ | 145 | 125 | 32 | 5.4 | 106 | 36 | 50 | 18 | 5 | - | 15 | 6 | 32 | 59 | 2 | - | 12 | - |
| | 4P | 168 | 118 | - | 70 | 159 | 116.5 ⁽⁶⁾ | 145 | 125 | 32 | 5.4 | 106 | 36 | 50 | 18 | 5 | - | 15 | 6 | 32 | 59 | 2 | - | 12 | - |
| J, JB, K | 3P | 148 | 162 | 268 | 125 | 141 | 116 ⁽⁶⁾ | 187 | 135 | 36 | 5.4 | 127 | 40 | 54 | 18 | 5 | 141 | 41 | 8 | 36 | 62 | 2.5 | 19.5 | 20 | 8.5 |
| | 4P | 184 | 162 | 268 | 125 | 141 | 116 ⁽⁶⁾ | 187 | 135 | 36 | 5.4 | 127 | 40 | 54 | 18 | 5 | 141 | 41 | 8 | 36 | 62 | 2.5 | 19.5 | 20 | 8.5 |
| KK, LL | 3P | 148 | 162 | 268 | 125 | 141 | 126.5 ⁽⁶⁾ | 193 | 135 | 36 | 5.4 | 127 | 40 | 54 | 18 | 5 | 141 | 41 | 8 | 36 | 62 | 2.5 | 19.5 | 20 | 8.5 |
| | 4P | 184 | 162 | 268 | 125 | 141 | 126.5 ⁽⁶⁾ | 193 | 135 | 36 | 5.4 | 127 | 40 | 54 | 18 | 5 | 141 | 41 | 8 | 36 | 62 | 2.5 | 19.5 | 20 | 8.5 |
| L, LB, LLB | 3P | 190 | 162 | 268 | 125 | 174 | 136.5 | 229 | 145 | 50 | 5.4 | 140 | 54 | 64 | 18 | 5 | 141 | 41 | 8 | 50 | 62 | 2.5 | 19.5 | 20 | 8.5 |
| | 4P | 240 | 162 | 268 | 125 | 174 | 136.5 | 229 | 145 | 50 | 5.4 | 140 | 54 | 64 | 18 | 5 | 141 | 41 | 8 | 50 | 62 | 2.5 | 19.5 | 20 | 8.5 |
| MMB, NB, N | 3P | 234 | 195 | 345 | 125 | 185 | 146 | 251 | 154 | 60 | 6.4 | 162 | 64 | 86 | 25 | 6 | 166 | 52 | 17 | 60 | 84 | 2.5 | 19.5 | 32 | 11 |
| | 4P | 294 | 195 | 345 | 125 | 185 | 146 | 251 | 154 | 60 | 6.4 | 162 | 64 | 86 | 25 | 6 | 166 | 52 | 17 | 60 | 84 | 2.5 | 19.5 | 32 | 11 |
| PPB, QQB, QQ | 3P | 252 | 205 | 355 | 125 | 200 | 149 | 260 | 157 | 66 | 6.4 | 172 | 70 | 91 | 25 | 6 | 175 | 54 | 14.5 | 66 | 84 | 3 | 20 | 50 | 11 |
| 4P | 318 | 205 | 355 | 125 | 200 | 149 | 260 | 157 | 66 | 6.4 | 172 | 70 | 91 | 25 | 6 | 175 | 54 | 14.5 | 66 | 84 | 3 | 20 | 50 | 11 | |

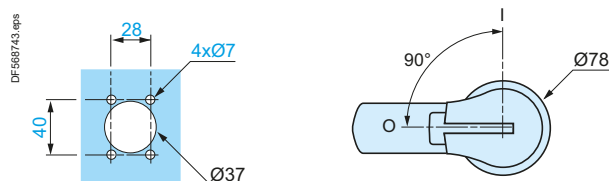
- (1) Terminal cover.
- (2) Rear access connector plates (option).
- (3) 1 to 8 auxiliary contacts GS1AM1●●.
- (4) 1 or 2 auxiliary contacts GS1AF●●.
- (5) 1 auxiliary contact GS1AM1●●: + 23.5 mm, 2 auxiliary contacts GS1AM1●●: + 47 mm.
- (6) 132 mm with 2 auxiliary contacts GS1AM1●●.

Door cut-out

For external front-mounted operator



For external right-hand side-mounted operator



TeSys Power

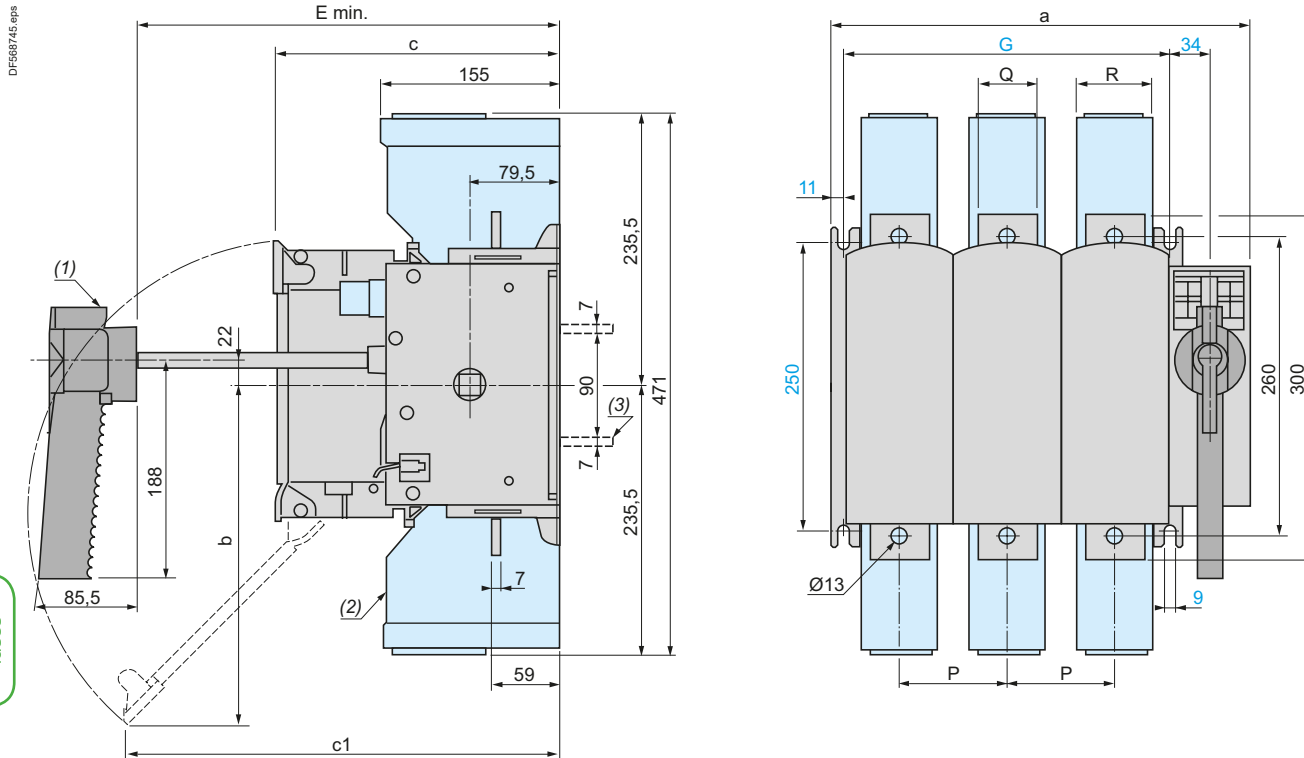
Switch-disconnector fuses

Dimensions

IEC - GS2●● (630...1250 A) Switch-disconnector-fuse

Direct front-mounted operator

GS2S, SB (630 A), TB (800 A), V and VB (1250 A)



| GS2 | | a | b | c | c1 | E min. | G | P | Q | R |
|-----------|----|-----|-----|-----|-----|--------|-----|-----|----|----|
| S, SB, TB | 3P | 364 | 300 | 250 | 380 | 265 | 284 | 94 | 51 | 65 |
| | 4P | 458 | 300 | 250 | 380 | 265 | 378 | 94 | 51 | 65 |
| V, VB | 3P | 442 | 355 | 289 | 295 | 304 | 362 | 120 | 77 | 88 |
| | 4P | 562 | 355 | 289 | 295 | 304 | 482 | 120 | 77 | 88 |

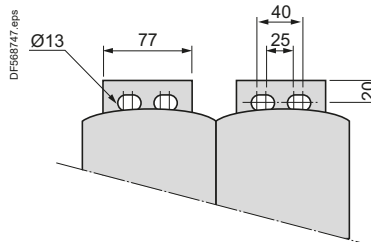
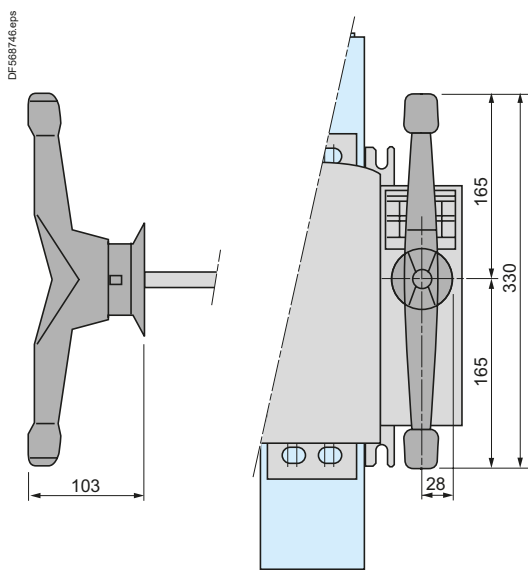
(1) Handle GS2AH104 for GS2S, GS2SB and GS2TB.

(2) Terminal cover.

(3) Rear access connector plates (GS2V and GS2VB).

Handle GS2AH105 for GS2V and GS2VB
(direct front-mounted operator)

Connector plates for GS2V and GS2VB



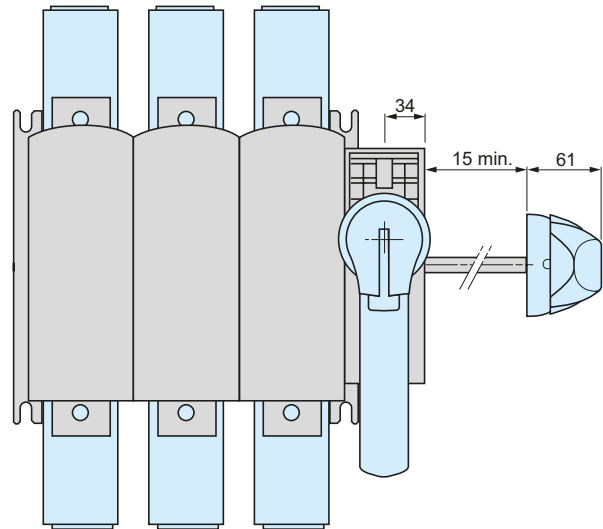
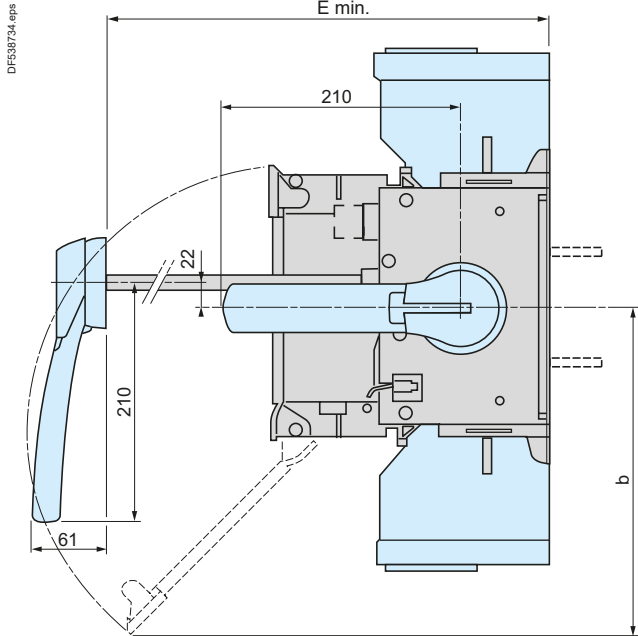
TeSys Power

Switch-disconnector fuses

Dimensions

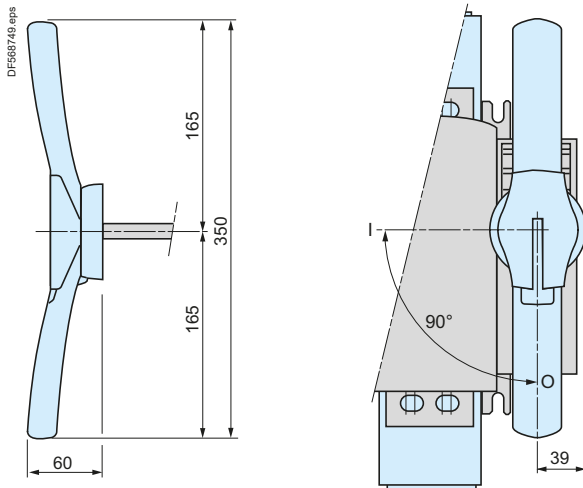
IEC - GS2●● (630...1250 A) Switch-disconnector-fuse

External front and right-hand side-mounted operator
GS2S, SB (630 A), TB (800 A), V and VB (1250 A)



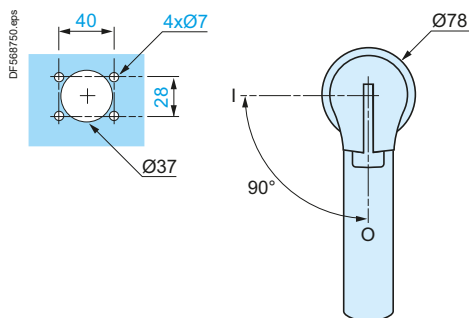
Handle GS2AH570 or GS2AH580 for GS2V and GS2VB (external front-mounted operator)

| GS2 | | b | E min. |
|-----------|----|-----|--------|
| S, SB, TB | 3P | 297 | 265 |
| | 4P | 297 | 265 |
| V, VB | 3P | 350 | 304 |
| | 4P | 350 | 304 |

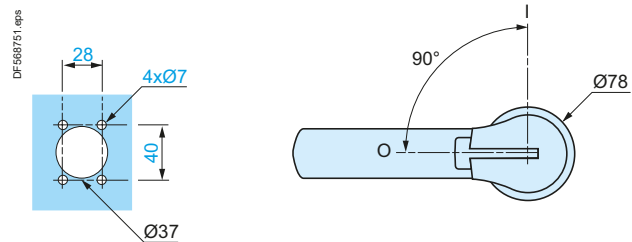


Door cut-out

For external front-mounted operator



For external right-hand side-mounted operator



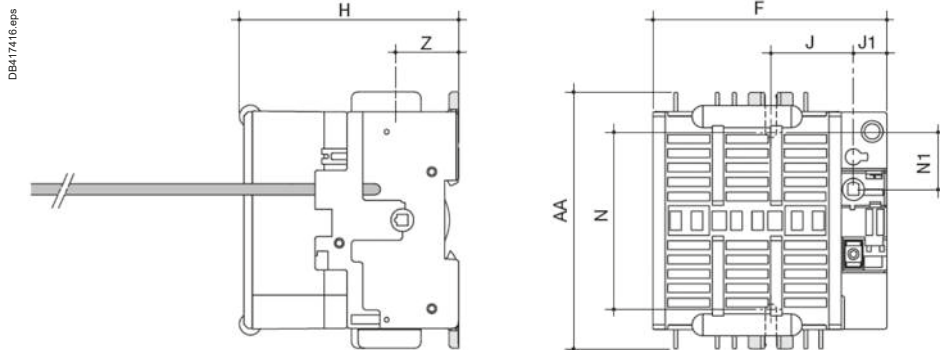
TeSys Power

Switch-disconnector fuses

Dimensions

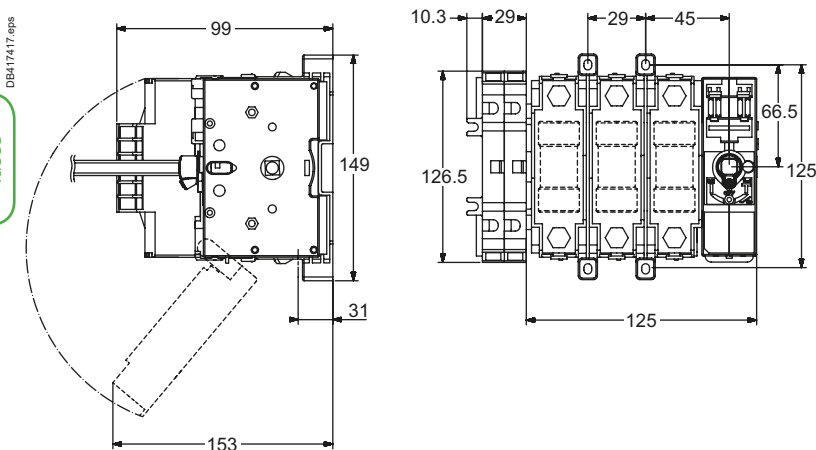
UL, CSA, IEC - GS1●● GS2●● Switch-disconnector fuses (30 and 60 A)

GS1DU3 (30 A) class CC fuses, GS1DDU3 (30 A) class J fuses

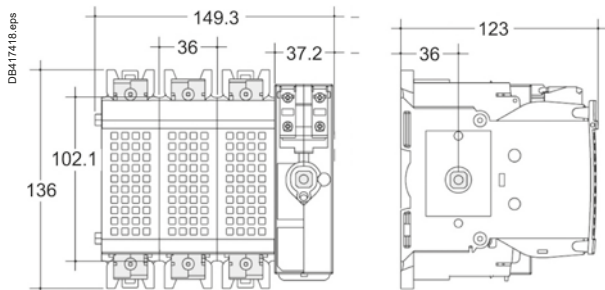


| Rating | F | H | J | J1 | N | N1 | AA | Z |
|---------|-----|------|------|----|------|------|-----|------|
| 30 / CC | 96 | 83.5 | 37.5 | 15 | 79.5 | 25.5 | 116 | 28.5 |
| 30 / J | 105 | 99 | 37.5 | 15 | 79.5 | 25.5 | 116 | 28.5 |

GS2EU3 (30 A) class CC fuses



GS2EU3N, GS2GU3N (60 A) class J fuses



Accessories

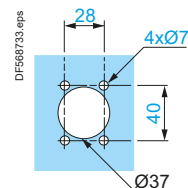
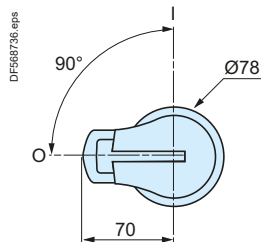
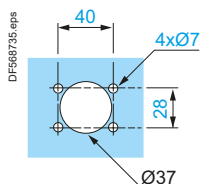
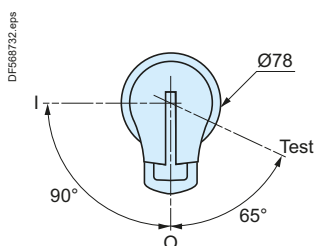
Handle for 30 and 60 A switch-disconnector fuses

External front handle

Door cut-out

External side handle

Door cut-out



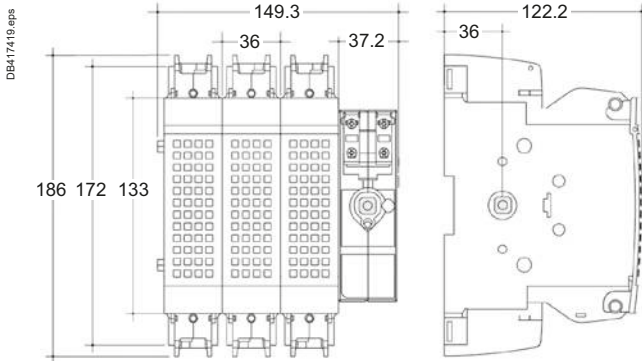
TeSys Power

Switch-disconnector fuses

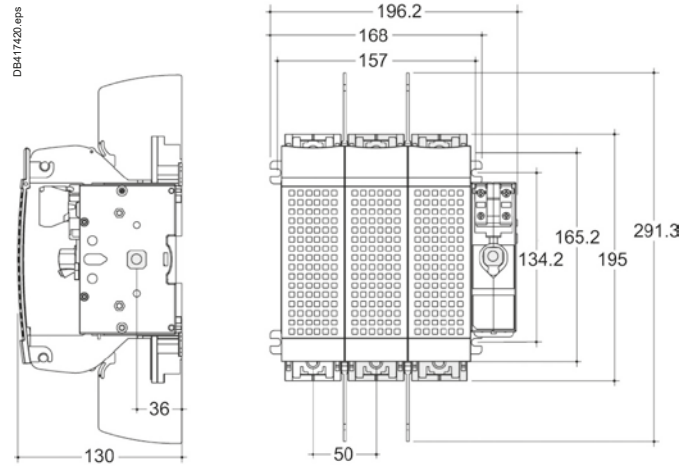
Dimensions

UL, CSA, IEC - GS2●● Switch-disconnector fuses (100 and 400 A)

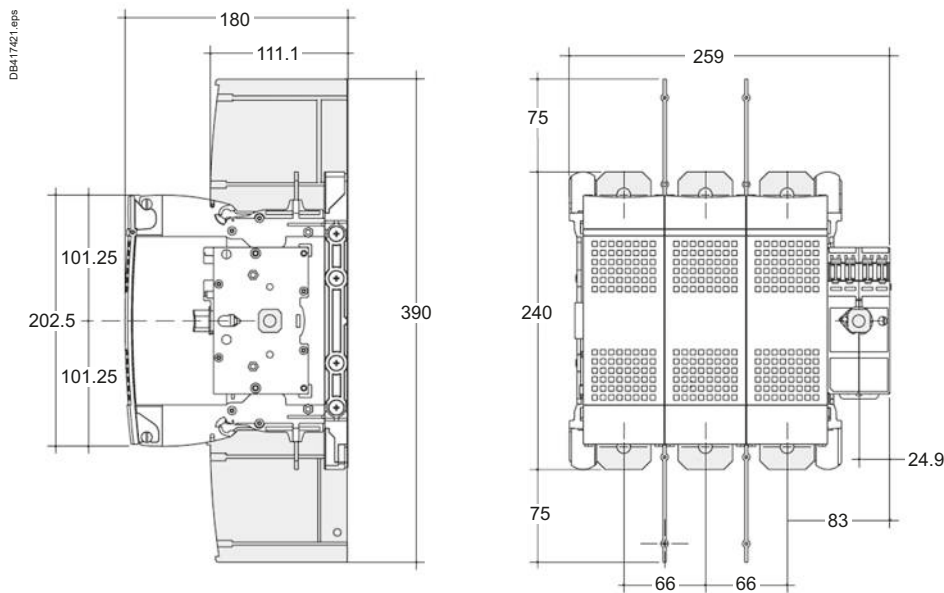
GS2JU3N (100 A) class J fuses



GS2MU3N (200 A) class J fuses

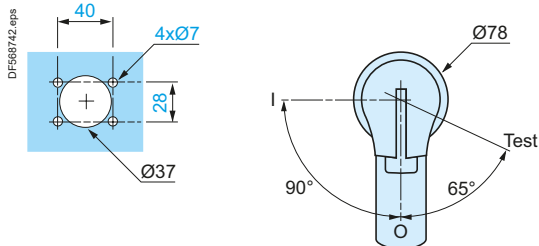


GS2QU3N (400 A) class CC fuses

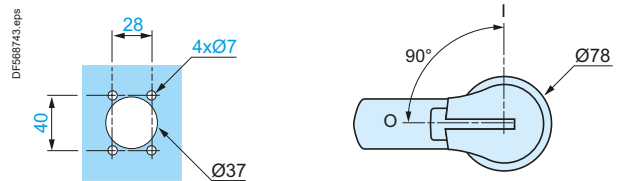


Accessories

Handle for 100, 200 and 400 A switch-disconnector fuses For external front-mounted operator



For external right-hand side-mounted operator



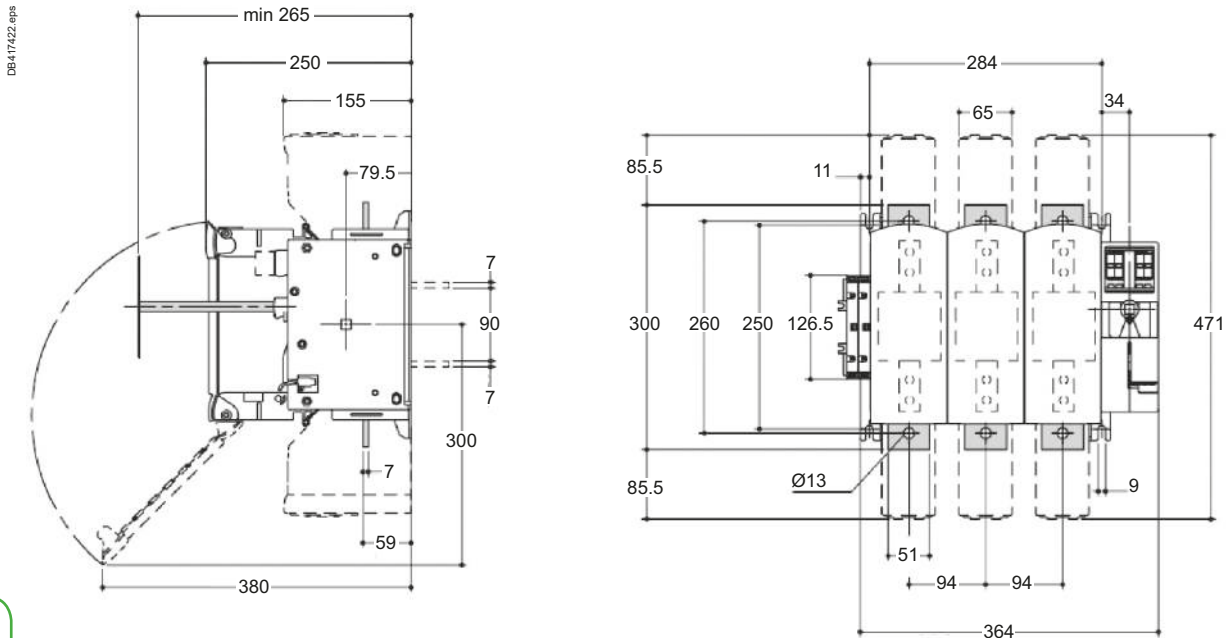
TeSys Power

Switch-disconnector fuses

Dimensions

UL, CSA, IEC - GS2●● Switch-disconnector fuses (600 and 800 A)

GS2SU3 (600 A), GS2TU3 (800 A) class J fuses



Ref.



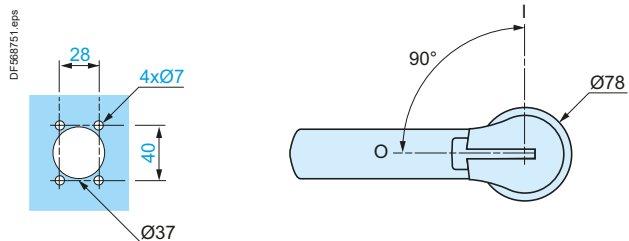
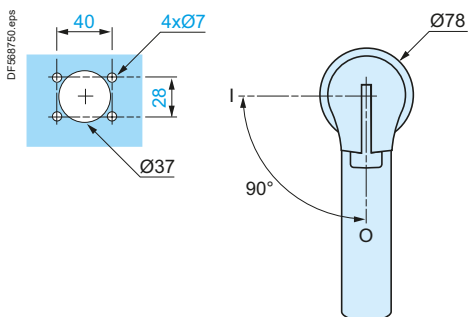
Switch-disconnector fuses

Accessories

Handle for 600 and 800 A switch-disconnector fuses

For external front-mounted operator

For external right-hand side-mounted operator



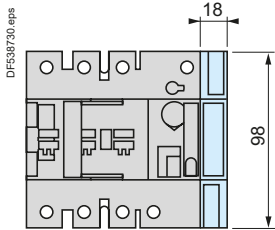
TeSys Power

Switch-disconnector fuses

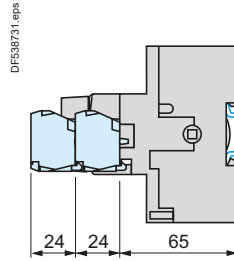
Dimensions, schemes

Auxiliary contacts

GS1AM111, GS1AM211

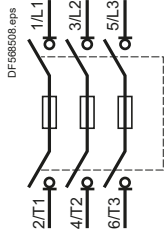


GS1AM110, GS1AM101

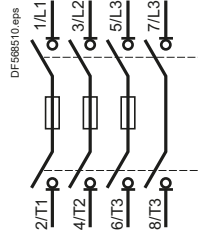


Schemes

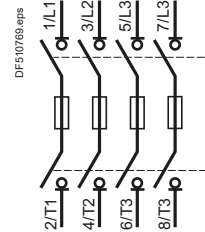
3-pole GS
32 to 1250 A



4-pole GS
32 A



50 to 1250 A



Auxiliary contacts

GS1AM110
1 N/O



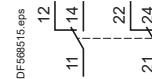
GS1AM101
1 N/C



GS1AM111 and GS1AM1
1 C/O



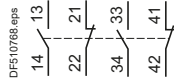
GS1AM211 and GS1AM2
2 C/O



GS1AN●●
1 N/C + 1 N/O



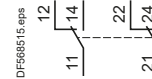
2 N/C + 2 N/O



GS1AF●
1 C/O



2 C/O



Switch-
disconnect
fuses

| TeSys Power - Deca, Giga Motor circuit breakers | | |
|---|-------------------------------|---|
| Type of product | Range (400/415 V AC) | Pages |
| Introduction | | B6/3 |
| TeSys Deca Size 2 - Motor circuit breakers Magnetic, Thermal magnetic (Product ref. GV2L, GV2LE, GV2P, GV2ME) | 0.06 or 15 kW |  B6/11 |
| TeSys Deca Size 2 - Motor circuit breakers - Thermal magnetic - delayed tripping - For high current peak motors or 3-phase transformers (Product ref. GV2RT) | 0.09 or 11 kW |  B6/18 |
| Add-on blocks, accessories (for TeSys Deca size 2 circuit breakers) | | |
| TeSys Deca Size 3 - Motor circuit breakers Magnetic, Thermal magnetic (Product ref. GV3L, GV3P) | 5.5 to 45 kW |  B6/25 |
| Add-on blocks, accessories (for TeSys Deca size 3 circuit breakers) | | |
| TeSys Deca Size 4 - Motor circuit breakers Magnetic, Thermal magnetic (Product ref. GV4L, GV4LE, GV4P, GV4PE, GV4PEM, GV4PB) | 0.25 to 55 kW 1/2 to 60 HP |  B6/31 |
| Add-on blocks, accessories (for TeSys Deca size 4 circuit breakers) | | |
| TeSys Giga Size 5, 6 - Motor circuit breakers Thermal magnetic (Product ref. GV5P, GV6P) | 55 to 250 kW |  B6/49 |
| Add-on blocks, accessories (for TeSys Giga size 5, 6 circuit breakers) | | |
| PowerLogic™ Energy measurement solutions | | |
| PowerTag Energy sensors can be used with TeSys Deca, Giga motor circuit breakers | |  B6/58 |
| PowerTag Energy Link Modbus TCP/IP concentrator for PowerTag Energy sensors | |  B6/62 |
| TeSys Power - Modular circuit breakers for auxiliary circuits | | |
| Modular circuit breakers Thermal magnetic (Product ref. GB) | 0.5 to 20 A |  B6/63 |

Motor
circuit
breakers

Motor
circuit
breakers

TeSys Power

Deca, Giga Motor circuit breakers

Introduction

Circuit breakers for motor protection and control

Deca, Giga motor circuit breakers provide compact, reliable and efficient solutions for:

- isolation,
- protection against short circuits and overloads,
- On-Off manual control of motors from 0.06 to 250 kW.

They are conforming to, depending of the versions, IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1 and UL 60497-4-1, CSA 22.2 n° 60497-4-1.

Deca, Giga protection technologies

Deca, Giga circuit breakers are carried with 3 variants:

- Magnetic detection: product references GV2LE, GV2L, GV3L, GV4L, GV4LE for protection against short-circuit.
- Thermal-magnetic: product references GV2ME⁽¹⁾, GV2P, GV3P, GV4P, GV4PE, GV5, GV6 for protection against short-circuits, overload, phase loss and phase unbalance.
- Advanced: product references GV4PEM combines GV4P protections and motor jam, long start, ground-fault protections.

With a magnetic circuit breaker, a thermal relay is frequently associated in order to have a short circuit protection and an overload protection.

TeSys Deca - Frame 2 circuit breakers: 45 mm width, for motors up to 15 kW

The most commonly used circuit breaker. with a choice of about 100 auxiliaries and accessories. TeSys Deca Frame 2 circuit breakers and TeSys K, Deca contactors can be easily assembled as a single block with one accessory.

The high Frame 2 electrical endurance (up to 100 000 operating cycles) makes it very suitable for direct manual motor control, especially ref. GV2ME⁽¹⁾ (thermal-magnetic c.b., Ith up to 32 A).

Enclosure mounting is well adapted to ref. GV2L and GV2P, with their possible extended rotary handle and visible trip indication.

TeSys Deca - Frame 3 circuit breakers: 55 mm width, for motors up to 45 kW

High performance breakers, high breaking capacity (Ics 100 kA/400 V for ratings up to 32 A, 50 kA up to 80 A).

Wide choice of auxiliaries / accessories, possible extended rotary handle. Visible tri indication.

Patented Everlink connectors provide everlasting connection (no re-tightening required).

Direct monoblock starter assembly with TeSys Deca contactors. No accessory required.

TeSys Deca - Frame 4 circuit breakers: 81 mm width, for motors up to 55 kW

State-of-the-art technology, TeSys Deca Frame 4 is compact and robust. Electronic core of ref. GV4P gives a great detection accuracy, with alarming and advanced protections for ref. GV4PEM, GV4PB.

Magnetic, electronic thermal-magnetic, or electronic thermal magnetic with advanced protections versions.

Ratings up to 115 A with breaking capacity Ics of 25 kA/400 V (B series), 50 kA/400 V (N series) or 100 kA/400 V (S series).

TeSys Giga - Frame 5: 105 mm width, for motors up to 110 kW / Frame 6: 140 mm width, for motors up to 250 kW

TeSys Giga - Frame 5 and 6 with advanced thermal-magnetic trip unit provide more effective protection to high power motors in the most demanding appliances.

They provide protection to motors against overloads with selection of a trip class (5, 10 or 20), short-circuits, phase unbalance or phase loss.

Adjustable over-load and short circuit current settings provide flexibility.

Wide choice of auxiliaries/accessories are available for indication, control and operation.

⁽¹⁾ Ref. GV2ME●●AP are specific GV2ME references for CEE zone.



Motor
circuit
breakers

TeSys Power

Deca, Giga Motor circuit breakers

Introduction

TeSys Deca, Giga circuit breakers - Range overview

Molded case circuit breakers for motor protection and control

Deca - Frame 2

| Product reference | Protection against | | | Range (kW / 415 V AC) | Control | Terminals | Dimensions (W x H x D) |
|----------------------|--------------------|----------|--|-----------------------|---------------|----------------------------|--|
| | Short-circuits | Overload | Jam, ground-fault, long start... (Multifunction - see page B6/6) | | | | |
| GV2L | ● | | | 0.09 to 15 | Rotary handle | Screw clamp | 44.5 x 89 x 97 (with rotary handle) |
| GV2LE | ● | | | 0.06 to 15 | Toggle | Screw clamp | 44.5 x 89 x 78.5 (with toggle) |
| GV2P | ● | ● | | 0.06 to 15 | Rotary handle | Screw clamp | 44.5 x 89 x 97 (with rotary handle) |
| GV2ME ⁽¹⁾ | ● | ● | | 0.06 to 11 | Push button | Screw clamp, lug or spring | 44.5 x 89 x 78.2 (with push button) ⁽²⁾ |
| GV2RT | ● | ● | | 0.09 to 11 | Toggle | Screw clamp | 44.5 x 89 x 78.5 (with toggle) |

Deca - Frame 3

| | | | | | | | |
|------|---|---|--|-----------|---------------|---------------------------|-------------------------------------|
| GV3L | ● | | | 11 to 45 | Rotary handle | Lug, EverLink (BTR screw) | 55 x 132 x 136 (with rotary handle) |
| GV3P | ● | ● | | 5.5 to 45 | | | |

Deca - Frame 4

| | | | | | | | |
|--------|---|---|---|---------------|---------------|---------------------------|-------------------------------------|
| GV4L | ● | | | 0.25 to 55 kW | Rotary handle | Lug, EverLink (BTR screw) | 81 x 156 x 116 (with toggle) |
| GV4LE | ● | | | | Toggle | | 81 x 156 x 165 (with rotary handle) |
| GV4P | ● | ● | | | Rotary handle | | |
| GV4PE | ● | ● | | | Toggle | | |
| GV4PEM | ● | ● | ● | | Toggle | | |
| GV4PB | ● | ● | ● | ½ to 60 HP | Toggle | | |

Giga - Frame 5

| | | | | | | | |
|----------|---|---|--|-----------|----------------------|------------------|--|
| GV5P150● | ● | ● | | 55 to 110 | Direct rotary handle | Lug, screw clamp | 105 x 161 x 155 ⁽³⁾ (with direct rotary handle) |
| GV5P220● | ● | ● | | | | | |

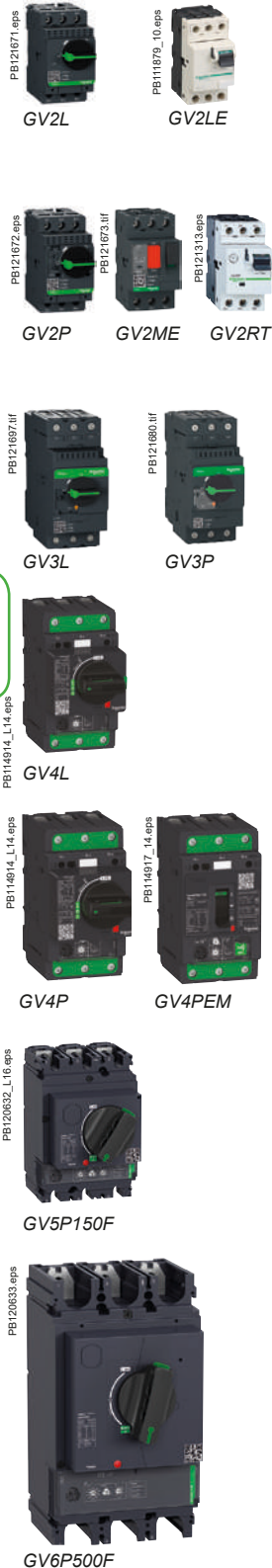
Giga - Frame 6

| | | | | | | | |
|----------|---|---|--|------------|----------------------|------------------|--|
| GV6P320● | ● | ● | | 132 to 250 | Direct rotary handle | Lug, screw clamp | 140 x 255 x 179 ⁽³⁾ (with direct rotary handle) |
| GV6P500● | ● | ● | | | | | |

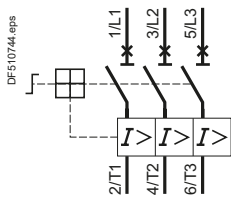
⁽¹⁾ Ref. GV2ME●●AP are specific GV2ME references for CEE zone.

⁽²⁾ 44.5 x 101 x 78.2 mm for GV2ME●●3.

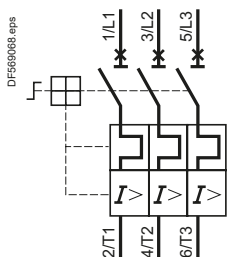
⁽³⁾ Depth without keylock.



Motor circuit breakers



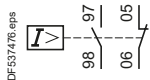
Thermal protection circuit breaker (with rotary control)



Thermal magnetic protection circuit breaker (with rotary control)



Voltage trip



Fault signalling



Motor circuit breakers versus fuse protection ?

Circuit breakers are a common solution for Powering motor against short circuits and overloads.

As a comparison, a fuse based solution can only provide a partial protection depending on the choice of the fuse type and rating. The thermal magnetic circuit breaker is adjustable and can be fine-tuned to the practical motor load.

The fuse based solution offers a very fast protection.

Basic functions

Short circuit protection (magnetic/thermal magnetic circuit breakers)

It provides a protection of the installation against short-circuit by an instantaneous trip of the circuit breaker. The tripping is obtained by means of a magnetic element incorporated in the motor circuit breaker or by an electronic detection (ref. GV4P, GV5 and GV6).

The magnetic tripping threshold is not adjustable, except on ref. GV4L, and is a fixed ratio of the maximum setting current I_n .

Overload protection (thermal magnetic circuit breakers)

It provides a protection of the motor against overload. When current drawn by the motor is above its rated current, this continuous overcurrent lead to increase of motor internal temperature and reduce motor life time. Use of suitable protective device shall avoid this damage to the motor. This is obtained by means of a thermal element incorporated in the motor circuit breaker, or by sensors for electronic products (ref. GV4P, GV5 and GV6).

An automatic compensation for ambient temperature variations is also provided. The rated operational current of the motor is displayed by turning a graduated knob.

Motor ON/OFF control

The circuit breaker provides a local manual control of the motor when used on its own (without contactor). The operation is possible by push buttons, toggle, or a single rotary handle.

Contacts position indication

Because they are suitable for isolation, the circuit breakers, in the open position, provide an adequate isolation distance and indicate the accurate position of the moving contacts by the position of the operators.

Additional functions

They are provided by additional modules.

Under voltage protection

Trips the circuit breaker in case of under voltage. The user is therefore protected against sudden starting of the machine when normal voltage is restored. Circuit breaker reset and/or start button "I" has to be pressed to restart the motor.

Remote off-power

Circuit breaker can be remotely tripped with the addition of a shunt trip.

Off-power locking

The operators on both open-mounted and enclosed motor circuit breakers can be locked in the off position "O" by up to 3 padlocks.

TeSys Power

Deca, Giga Motor circuit breakers

Introduction



PB114517 eps

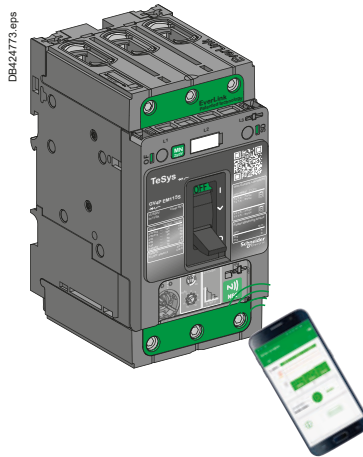
Advanced protections embedded on Deca - Frame 4 ref. GV4PEM, GV4PB (multifunction)

In addition to basic protections, ref. GV4PEM, GV4PB embed protections against:

- Long start (high inertia, resistive torque machines)
- Jam (overtorque, machine failure)
- Ground-fault (reduced isolation)
- Unbalanced (phase currents are not equal)
- Phase loss (1 or 2 phases missing).

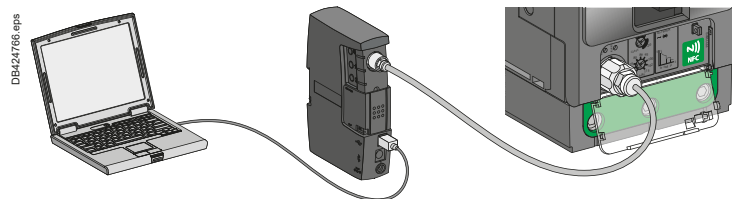
Fully configurable-advanced protections:

- wireless with 'EcoStruxure Power Device App' application for Android smartphone through NFC (near field communication).



DB424773 eps

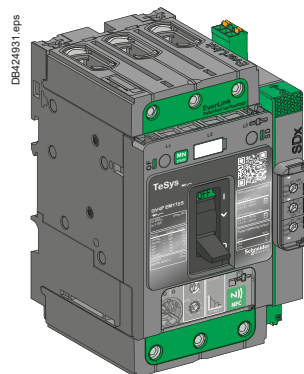
- with EcoStruxure Power Commission software on a computer connected to the test socket through a configuration and maintenance module.



DB424766 eps

Remote indications:

Ref. GV4PEM, GV4PB circuit breaker may be equipped with an SDx alarming / fault differentiation module to prevent to trip or to identify the type of fault after a trip (see page B6/44).



DB424831 eps

TeSys Power

Deca, Giga Motor circuit breakers

Introduction

EverLink technology for Frame 3 and 4

Frame 3 and 4 features a cable connection method with patented creep-compensating technology built directly into the terminal — EverLink:

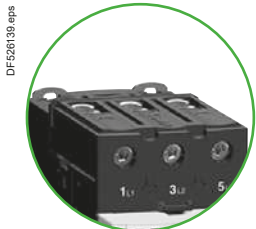
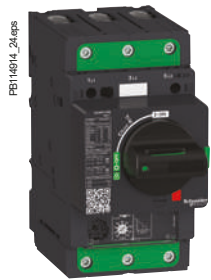
- With EverLink connectors, save space and time during panel assembly.
- Bare cable connections are as safe as compression lug ones.

No overheating connections - EverLink creep-compensated terminals for Frame 3, 4

The EverLink patented technology for terminals dramatically reduces the risk of loose bare cables due to copper creeping. Vibration withstand is improved and periodic re-tightening is no longer needed.

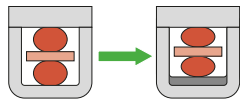


The clamp connectors which don't need re-tightening.



EverLink terminals, with BTR screws

Creeping phenomena

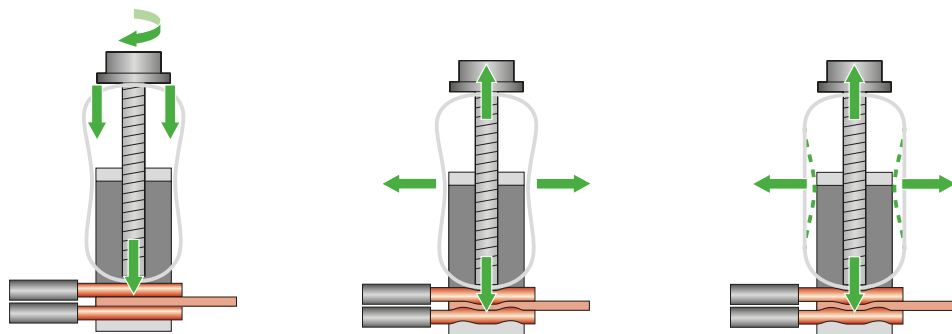


Copper conductors are subject to creep with the time, reducing the contact pressure in conventional clamps

During the tightening a force is applied on the conductors and on a spring.

Maintaining of cables assured by pressure of spring and crimping of conductor on the contact plate.

The spring compensates for cable conductor creep. Tightening force is assured.



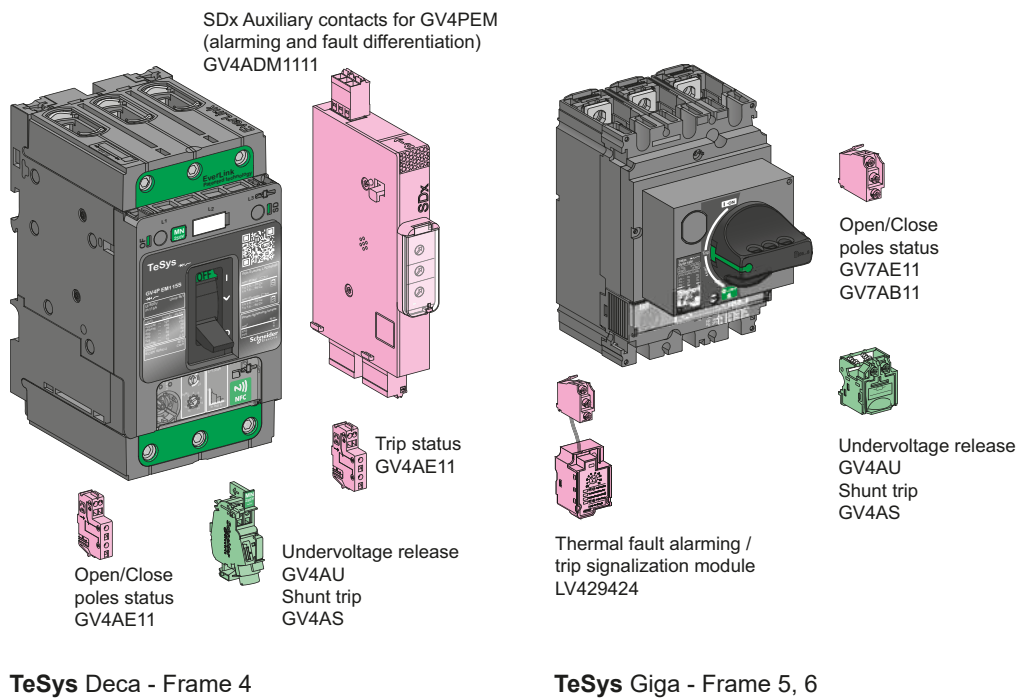
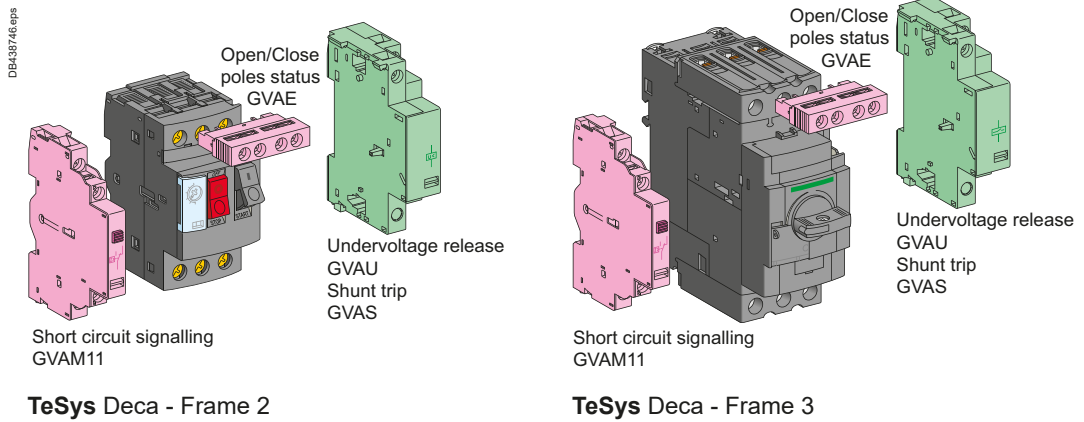
Motor circuit breakers

TeSys Power

Deca, Giga Motor circuit breakers

Introduction

Auxiliary functions provided by add-on blocks



Motor
circuit
breakers

- Auxiliary contacts add-on blocks**
For control, alarms, automatic actions:
- Instantaneous indication of the position of the circuit breaker contacts
 - Trip indication,
 - Alarming.
- Trip units**
For remote tripping of circuit breaker:
- Shunt trip / MX, trips the circuit breaker when powered
 - Undervoltage release / MN, trips the circuit breaker when voltage is loss.

TeSys Power

Deca, Giga Motor circuit breakers

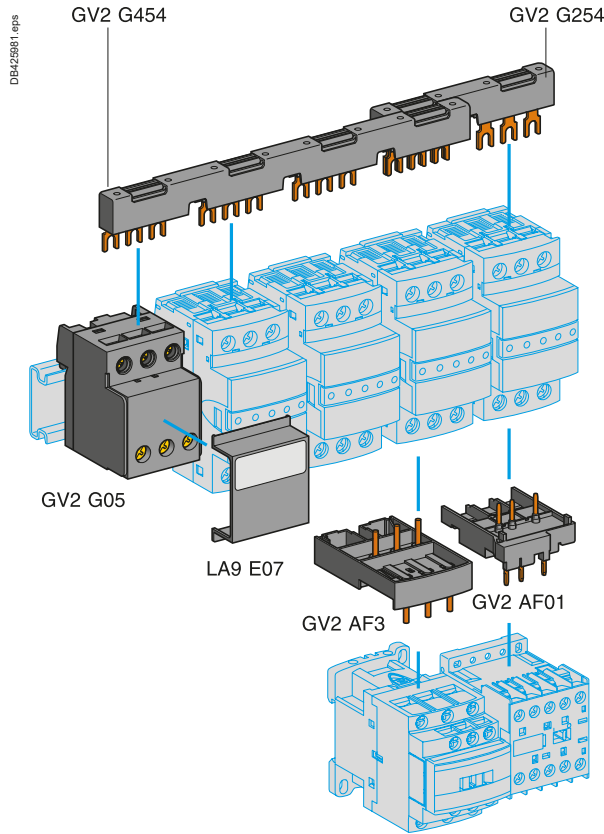
Introduction

Compact power circuits wiring with TeSys Deca circuit breakers (Frame 2) and Deca contactors ⁽¹⁾

Busbars and combination blocks

Power busbars and combinations blocks provide a compact solution for assembling a group of motor starters. They save wiring time and provide a clear finish aspect.

These solutions are available for Deca - Frame 2 circuit breakers + Deca contactors.



⁽¹⁾ Details on these solution in chapter B2 of catalogue.

Motor
circuit
breakers

TeSys Deca - Frame 2 0.06 to 15 kW



Motor
circuit
breakers

TeSys Power

Deca - Frame 2 Motor circuit breakers - Magnetic

Product references

PB121671,fr



GV2L16



Motor circuit breakers

Motor circuit breakers from 0.09 to 15 kW

Deca - Frame 2 (ref. GV2L): Control by rotary knob, connection by screw clamp terminals

Standard power ratings of 3-phase motors
50/60 Hz in category AC-3

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Magnetic protection rating | Tripping current Id ± 20 % | Use in association with thermal overload relay (class 10 A) | Reference |
|---|-----|--------------------|-------|-----|--------------------|-------|-----|--------------------|----------------------------|----------------------------|---|-----------|
| 400/415 V | | | 500 V | | | 690 V | | | | | | |
| P | Icu | Ics ⁽¹⁾ | P | Icu | Ics ⁽¹⁾ | P | Icu | Ics ⁽¹⁾ | A | A | | |
| kW | kA | | kW | kA | | kW | kA | | A | A | | |
| 0.09 | * | * | - | - | - | - | - | - | 0.4 | 5 | LRD03 | GV2L03 |
| 0.12 | * | * | - | - | - | 0.37 | * | * | 0.63 | 8 | LRD04 | GV2L04 |
| 0.18 | * | * | - | - | - | - | - | - | 0.63 | 8 | LRD04 | GV2L04 |
| - | - | - | - | - | - | 0.55 | * | * | 1 | 13 | LRD05 | GV2L05 |
| 0.25 | * | * | - | - | - | - | - | - | 1 | 13 | LRD05 | GV2L05 |
| - | - | - | - | - | - | 0.75 | * | * | 1 | 13 | LRD06 | GV2L05 |
| 0.37 | * | * | 0.37 | * | * | - | - | - | 1 | 13 | LRD06 | GV2L05 |
| 0.55 | * | * | 0.55 | * | * | 1.1 | * | * | 1.6 | 22.5 | LRD06 | GV2L06 |
| - | - | - | 0.75 | * | * | - | - | - | 1.6 | 22.5 | LRD06 | GV2L06 |
| 0.75 | * | * | 1.1 | * | * | 1.5 | 4 | 100 | 2.5 | 33.5 | LRD07 | GV2L07 |
| 1.1 | - | - | - | - | - | - | - | - | - | - | LRD08 | GV2L08 |
| 1.5 | * | * | 1.5 | * | * | 3 | 4 | 100 | 4 | 51 | LRD08 | GV2L08 |
| - | - | - | - | - | - | - | - | - | - | - | LRD08 | GV2L08 |
| 2.2 | * | * | 3 | * | * | 4 | 4 | 100 | 6.3 | 78 | LRD10 | GV2L10 |
| 3 | * | * | 4 | 10 | 100 | 5.5 | 4 | 100 | 10 | 138 | LRD12 | GV2L14 |
| 4 | - | - | - | - | - | - | - | - | - | - | LRD14 | GV2L14 |
| - | - | - | - | - | - | 7.5 | 4 | 100 | 10 | 138 | LRD14 | GV2L14 |
| - | - | - | - | - | - | 9 | 4 | 100 | 14 | 170 | LRD16 | GV2L16 |
| 5.5 | 50 | 50 | 7.5 | 10 | 75 | 11 | 4 | 100 | 14 | 170 | LRD16 | GV2L16 |
| 7.5 | 50 | 50 | 9 | 10 | 75 | 15 | 4 | 100 | 18 | 223 | LRD21 | GV2L20 |
| 9 | 50 | 50 | 11 | 10 | 75 | 18.5 | 4 | 100 | 25 | 327 | LRD22 | GV2L22 |
| 11 | 50 | 50 | 15 | 10 | 75 | - | - | - | 25 | 327 | LRD22 | GV2L22 |
| 15 | 50 | 50 | 18.5 | 10 | 75 | 22 | 4 | 100 | 32 | 416 | LRD32 | GV2L32 |

(1) As % of Icu. Associated current limiter or fuses, where required.
* > 100 kA.

TeSys Power

Deca - Frame 2 Motor circuit breakers - Magnetic

Product references

PB11679 eps



GV2LE

| Magnetic motor circuit breakers from 0.06 to 15 kW | | | | | | | | | | | | |
|---|-----------------|--------------------------------|-------|-----------------|--------------------------------|-------|-----------------|--------------------------------|----------------------------------|--|---|-----------|
| Deca - Frame 2 (ref. GV2LE): control by rocker lever, connection by screw clamp terminals | | | | | | | | | | | | |
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Magnetic protection rating | Tripping current I _d ± 20 % | Use in association with thermal overload relay | Reference |
| 400/415 V | | | 500 V | | | 690 V | | | | | | |
| P | I _{cu} | I _{cs} ⁽¹⁾ | P | I _{cu} | I _{cs} ⁽¹⁾ | P | I _{cu} | I _{cs} ⁽¹⁾ | A | A | | |
| kW | kA | | kW | kA | | kW | kA | | A | A | | |
| 0.06 | * | * | - | - | - | - | - | - | 0.4 | 5 | LR2K0302 | GV2LE03 |
| 0.09 | * | * | - | - | - | - | - | - | 0.4 | 5 | LR2K0304 | GV2LE03 |
| 0.12 | * | * | - | - | - | 0.37 | * | * | 0.63 | 8 | LR2K0304 | GV2LE04 |
| 0.18 | * | * | - | - | - | - | - | - | 0.63 | 8 | LR2K0305 | GV2LE04 |
| - | - | - | - | - | - | 0.55 | * | * | 1 | 13 | LR2K0305 | GV2LE05 |
| 0.25 | * | * | - | - | - | - | - | - | 1 | 13 | LR2K0306 | GV2LE05 |
| - | - | - | - | - | - | 0.75 | * | * | 1 | 13 | LR2K0306 | GV2LE05 |
| 0.37 | * | * | 0.37 | * | * | - | - | - | 1 | 13 | LR2K0306 | GV2LE05 |
| 0.55 | * | * | 0.55 | * | * | 1.1 | * | * | 1.6 | 22.5 | LR2K0307 | GV2LE06 |
| - | - | - | 0.75 | * | * | - | - | - | 1.6 | 22.5 | LR2K0307 | GV2LE06 |
| 0.75 | * | * | 1.1 | * | * | 1.5 | 3 | 75 | 2.5 | 33.5 | LR2K0308 | GV2LE07 |
| 1.1 | * | * | - | - | - | - | - | - | 2.5 | 33.5 | LR2K0308 | GV2LE07 |
| 1.5 | * | * | 1.5 | * | * | 3 | 3 | 75 | 4 | 51 | LR2K0310 | GV2LE08 |
| - | - | - | 2.2 | * | * | - | - | - | 4 | 51 | LR2K0312 | GV2LE08 |
| 2.2 | * | * | 3 | 50 | 100 | 4 | 3 | 75 | 6.3 | 78 | LR2K0312 | GV2LE10 |
| 3 | * | * | 4 | 10 | 100 | 5.5 | 3 | 75 | 10 | 138 | LR2K0314 | GV2LE14 |
| 4 | * | * | 5.5 | 10 | 100 | - | - | - | 10 | 138 | LR2K0316 | GV2LE14 |
| - | - | - | - | - | - | 7.5 | 3 | 75 | 10 | 138 | LRD14 | GV2LE14 |
| - | - | - | - | - | - | 9 | 3 | 75 | 14 | 170 | LRD16 | GV2LE16 |
| 5.5 | 15 | 50 | 7.5 | 6 | 75 | 11 | 3 | 75 | 14 | 170 | LR2K0321 | GV2LE16 |
| 7.5 | 15 | 50 | 9 | 6 | 75 | 15 | 3 | 75 | 18 | 223 | LRD21 | GV2LE20 |
| 9 | 15 | 40 | 11 | 4 | 75 | 18.5 | 3 | 75 | 25 | 327 | LRD22 | GV2LE22 |
| 11 | 15 | 40 | 15 | 4 | 75 | - | - | - | 25 | 327 | LRD22 | GV2LE22 |
| 15 | 10 | 50 | 18.5 | 4 | 75 | 22 | 3 | 75 | 32 | 416 | LRD32 | GV2LE32 |

⁽¹⁾ As % of I_{cu}.
* > 100 kA.



Motor
circuit
breakers



GV2ME

Motor circuit breakers from 0.06 to 15 kW / 400 V, with screw clamp terminals

Deca - Frame 2 (ref. GV2ME) with pushbutton control

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Setting range of thermal trips (2) | Magnetic tripping current Id ± 20 % | Reference |
|--|-----|---------|-------|-----|---------|-------|-----|---------|------------------------------------|-------------------------------------|-------------|
| 400/415 V | | | 500 V | | | 690 V | | | | | |
| P | Icu | Ics (1) | P | Icu | Ics (1) | P | Icu | Ics (1) | | | |
| kW | kA | % | kW | kA | % | kW | kA | % | A | A | |
| - | - | - | - | - | - | - | - | - | 0.1...0.16 | 1.5 | GV2ME01 |
| 0.06 | * | * | - | - | - | - | - | - | 0.16...0.25 | 2.4 | GV2ME02 |
| 0.09 | * | * | - | - | - | - | - | - | 0.25...0.40 | 5 | GV2ME03 |
| 0.12 | * | * | - | - | - | 0.37 | * | * | 0.40...0.63 | 8 | GV2ME04 |
| 0.18 | * | * | - | - | - | - | - | - | | | |
| 0.25 | * | * | - | - | - | 0.55 | * | * | 0.63...1 | 13 | GV2ME05 |
| 0.37 | * | * | 0.37 | * | * | - | - | - | 1...1.6 | 22.5 | GV2ME06 |
| 0.55 | * | * | 0.55 | * | * | 0.75 | * | * | | | |
| - | - | - | 0.75 | * | * | 1.1 | * | * | 1.6...2.5 | 33.5 | GV2ME07 |
| 0.75 | * | * | 1.1 | * | * | 1.5 | 3 | 75 | | | |
| 1.1 | * | * | 1.5 | * | * | 2.2 | 3 | 75 | 2.5...4 | 51 | GV2ME08 |
| 1.5 | * | * | 2.2 | * | * | 3 | 3 | 75 | | | |
| 2.2 | * | * | 3 | 50 | 100 | 4 | 3 | 75 | 4...6.3 | 78 | GV2ME10 |
| 3 | * | * | 4 | 10 | 100 | 5.5 | 3 | 75 | 6...10 | 138 | GV2ME14 |
| 4 | * | * | 5.5 | 10 | 100 | 7.5 | 3 | 75 | | | |
| 5.5 | 15 | 50 | 7.5 | 6 | 75 | 9 | 3 | 75 | 9...14 | 170 | GV2ME16 |
| - | - | - | - | - | - | 11 | 3 | 75 | | | |
| 7.5 | 15 | 50 | 9 | 6 | 75 | 15 | 3 | 75 | 13...18 | 223 | GV2ME20 |
| 9 | 15 | 40 | 11 | 4 | 75 | 18.5 | 3 | 75 | 17...23 | 327 | GV2ME21 |
| 11 | 15 | 40 | 15 | 4 | 75 | - | - | - | 20...25 | 327 | GV2ME22 (3) |
| 15 | 10 | 50 | 18.5 | 4 | 75 | 22 | 3 | 75 | 24...32 | 416 | GV2ME32 |

Motor circuit breakers from 0.06 to 15 kW / 400 V, with lugs

To order thermal magnetic circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above.

Example: ref. **GV2ME08** becomes **GV2ME086**.

Thermal magnetic circuit breakers GV2ME with built-in auxiliary contact block

With instantaneous auxiliary contact block (composition, see page B6/21):

- GVAE1, add suffix **AE1TQ** to the motor circuit breaker reference selected above.
Example: **GV2ME01AE1TQ**.
- GVAE11, add suffix **AE11TQ** to the motor circuit breaker reference selected above.
Example: **GV2ME01AE11TQ**.
- GVAN11, add suffix **AN11TQ** to the motor circuit breaker reference selected above.
Example: **GV2ME01AN11TQ**.

These circuit breakers with built-in contact block are sold in lots of 20 units in a single pack.

(1) As % of Icu.

(2) The thermal trip setting must be within the range marked on the graduated knob.

(3) Maximum rating which can be mounted in enclosures **GV2MC** or **MP**, please consult your Regional Sales Office.

* > 100 kA.



Motor circuit breakers

TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

Product references - UL applications

PB1216731R



GV2ME

| Motor circuit breakers from 3/4 to 20 HP / 460 V, with screw clamp terminals | | | | | | | | | | |
|--|----------------------------|-------|-------|-------------|-------|-------|-------|-------|--|-----------|
| Deca - Frame 2 (ref. GV2ME) with pushbutton control | | | | | | | | | | |
| Thermal setting (A) | Maximum Horsepower ratings | | | | | | | | Group Motor applications Max. Fuse or Circuit breaker (A) | Reference |
| | Single-Phase | | | Three-Phase | | | | | | |
| | 115 V | 200 V | 230 V | 115 V | 200 V | 230 V | 460 V | 575 V | | |
| 0.1...0.16 | - | - | - | - | - | - | - | - | 450 | GV2ME01 |
| 0.16...0.25 | - | - | - | - | - | - | - | - | 450 | GV2ME02 |
| 0.25...0.40 | - | - | - | - | - | - | - | - | 450 | GV2ME03 |
| 0.40...0.63 | - | - | - | - | - | - | - | - | 450 | GV2ME04 |
| 0.63...1 | - | - | - | - | - | - | - | 1/2 | 450 | GV2ME05 |
| 1...1.6 | - | - | 1/10 | - | - | - | 3/4 | 3/4 | 450 | GV2ME06 |
| 1.6...2.5 | - | 1/6 | 1/6 | - | 1/2 | 1/2 | 1 | 1.5 | 450 | GV2ME07 |
| 2.5...4 | 1/8 | 1/4 | 1/3 | - | 3/4 | 3/4 | 2 | 3 | 450 | GV2ME08 |
| 4...6.3 | 1/4 | 1/2 | 1/2 | 3/4 | 1 | 1.5 | 3 | 5 | 450 | GV2ME10 |
| 6...10 | 1/2 | 1 | 1.5 | 1 | 2 | 3 | 5 | 7.5 | 450 | GV2ME14 |
| 9...14 | 3/4 | 2 | 2 | 2 | 3 | 3 | 10 | 10 | 450 | GV2ME16 |
| 13...18 | 1 | 2 | 3 | 2 | 5 | 5 | 10 | 15 | 450 | GV2ME20 |
| 17...23 | 1.5 | 3 | 3 | 3 | 5 | 7.5 | 15 | 20 | 450 | GV2ME21 |
| 20...25 | 2 | - | - | - | 7.5 | 7.5 | 15 | 20 | 450 | GV2ME22 |
| 24...32 | 2 | 5 | 5 | 5 | 7.5 | 10 | 20 | 25 | 450 | GV2ME32 |



Motor circuit breakers

PB 12/088.eps

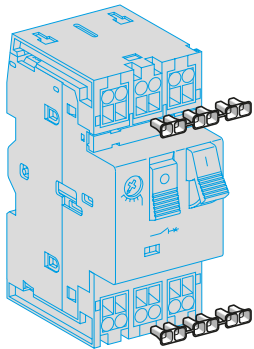


GV2ME●●3



Motor circuit breakers

DF 53/888.eps



LA9D99

Motor circuit breakers from 0.06 to 11 kW, with spring terminal connections

Deca - Frame 2 (ref. GV2ME) ⁽¹⁾ with pushbutton control

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Setting range of thermal trips ⁽³⁾ | Magnetic tripping current I _d ± 20 % | Reference |
|--|-----------------|--------------------------------|-------|-----------------|--------------------------------|---|---|-----------|
| 400/415 V | | | 500 V | | | | | |
| P | I _{cu} | I _{cs} ⁽²⁾ | P | I _{cu} | I _{cs} ⁽²⁾ | | | |
| kW | kA | % | kW | kA | % | A | A | |
| - | - | - | - | - | - | 0.1...0.16 | 1.5 | GV2ME013 |
| 0.06 | * | * | - | - | - | 0.16...0.25 | 2.4 | GV2ME023 |
| 0.09 | * | * | - | - | - | 0.25...0.40 | 5 | GV2ME033 |
| 0.12 | * | * | - | - | - | 0.40...0.63 | 8 | GV2ME043 |
| 0.18 | * | * | - | - | - | | | |
| 0.25 | * | * | 0.37 | * | * | 0.63...1 | 13 | GV2ME053 |
| 0.37 | * | * | | | | | | |
| 0.37 | * | * | 0.37 | * | * | 1...1.6 | 22.5 | GV2ME063 |
| 0.55 | * | * | 0.55 | * | * | | | |
| | | | 0.75 | * | * | | | |
| 0.75 | * | * | 1.1 | * | * | 1.6...2.5 | 33.5 | GV2ME073 |
| 1.1 | * | * | 1.5 | * | * | 2.5...4 | 51 | GV2ME083 |
| 1.5 | * | * | 2.2 | * | * | | | |
| 2.2 | * | * | 3 | 50 | 100 | 4...6.3 | 78 | GV2ME103 |
| 3 | * | * | 4 | 10 | 100 | 6...10 | 138 | GV2ME143 |
| 4 | * | * | 5.5 | 10 | 100 | | | |
| 5.5 | 15 | 50 | 7.5 | 6 | 75 | 9...14 | 170 | GV2ME163 |
| 7.5 | 15 | 50 | 9 | 6 | 75 | 13...18 | 223 | GV2ME203 |
| 9 | 15 | 40 | 11 | 4 | 75 | 17...23 | 327 | GV2ME213 |
| 11 | 15 | 40 | | | | | | |
| 11 | 15 | 40 | 15 | 4 | 75 | 20...25 | 327 | GV2ME223 |

Contact blocks

| Description | Mounting | Maximum number | Type of contacts | Sold in lots of | Unit reference |
|----------------------------------|----------|----------------|------------------|-----------------|----------------|
| Instantaneous auxiliary contacts | Front | 1 | N/O + N/C | 10 | GVAE113 |
| | | | N/O + N/O | 10 | GVAE203 |
| | LH side | 2 | N/O + N/C | 1 | GVAN113 |
| | | | N/O + N/O | 1 | GVAN203 |

Accessory

| Description | Application | Sold in lots of | Unit reference |
|-------------------|--|-----------------|----------------|
| Cable end reducer | For connection of conductors from 1 to 1.5 mm ² | 20 | LA9D99 |

⁽¹⁾ For connection of conductors from 1 to 1.5 mm², the use of an LA9D99 cable end reducer is recommended.

⁽²⁾ Maximum rating which can be mounted in enclosures GV2MC or MP, please consult your Regional Sales Office

⁽³⁾ The thermal trip setting must be within the range marked on the graduated knob.

* > 100 kA.

PB121672.fr



GV2P08

| Motor circuit breakers from 0.06 to 30 kW / 400 V | | | | | | | | | | | |
|---|-----------------|---------------------|-------|-----------------|---------------------|-------|-----------------|---------------------|--|--|-----------|
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Setting range of thermal trips (2) | Magnetic tripping current I _d ± 20 % | Reference |
| 400/415 V | | | 500 V | | | 690 V | | | | | |
| P | I _{cu} | I _{cs} (1) | P | I _{cu} | I _{cs} (1) | P | I _{cu} | I _{cs} (1) | A | A | |
| kW | kA | % | kW | kA | % | kW | kA | % | | | |
| Deca - Frame 2 (ref. GV2P): control by rotary knob | | | | | | | | | | | |
| Screw clamp terminals | | | | | | | | | | | |
| - | - | - | - | - | - | - | - | - | 0.1...0.16 | 1.5 | GV2P01 |
| 0.06 | * | * | - | - | - | - | - | - | 0.16...0.25 | 2.4 | GV2P02 |
| 0.09 | * | * | - | - | - | - | - | - | 0.25...0.40 | 5 | GV2P03 |
| 0.12 | * | * | - | - | - | 0.37 | * | * | 0.40...0.63 | 8 | GV2P04 |
| 0.18 | * | * | - | - | - | - | - | - | - | - | - |
| 0.25 | * | * | - | - | - | 0.55 | * | * | 0.63...1 | 13 | GV2P05 |
| 0.37 | * | * | 0.37 | * | * | - | - | - | 1...1.6 | 22.5 | GV2P06 |
| 0.55 | * | * | 0.55 | * | * | 0.75 | * | * | - | - | - |
| 0.75 | * | * | 1.1 | * | * | 1.5 | 8 | 100 | 1.6...2.5 | 33.5 | GV2P07 |
| 1.1 | * | * | 1.5 | * | * | 2.2 | 8 | 100 | 2.5...4 | 51 | GV2P08 |
| 2.2 | * | * | 3 | * | * | 4 | 6 | 100 | 4...6.3 | 78 | GV2P10 |
| 3 | * | * | 5 | 50 | 100 | 5.5 | 6 | 100 | 6...10 | 138 | GV2P14 |
| 5.5 | * | * | 7.5 | 42 | 75 | 9 | 6 | 100 | 9...14 | 170 | GV2P16 |
| - | - | - | - | - | - | 11 | 6 | 100 | - | - | - |
| 7.5 | 50 | 50 | 9 | 10 | 75 | 15 | 4 | 100 | 13...18 | 223 | GV2P20 |
| 9 | 50 | 50 | 11 | 10 | 75 | 18.5 | 4 | 100 | 17...23 | 327 | GV2P21 |
| 11 | 50 | 50 | 15 | 10 | 75 | - | - | - | 20...25 | 327 | GV2P22 |
| 15 | 50 | 50 | 18.5 | 10 | 75 | 22 | 4 | 100 | 24...32 | 416 | GV2P32 |

How to use the table : select your load operating voltage, then select its standard power value (below, in the same column). The appropriate circuit breaker is in the extreme right column, in the corresponding row.

Example: GV2P04 can protect 0.12 and 0.18 kW under 400/415 V, and 0.18 kW under 440 V, and 0,37 kW under 690 V. No 500 V standard power value can fit GV2P04.

Motor circuit breakers up to 50 HP / 600 V, UL 60947-4-1 type E

Deca - Frame 2 (ref. GV2P) (3)

To obtain a GV2P motor circuit breaker, UL 60947-4-1 type E, use the following with the circuit breaker:

- a "Large Spacing" adapter **GV2GH7**.

Motor circuit breakers from 3/4 to 20 HP / 460 V, with screw clamp terminals

Deca - Frame 2 (ref. GV2P) with rotary handle

| Thermal setting (A) | Maximum Horsepower ratings (4) | | | | | | | | | Group Motor applications Max. Fuse or Circuit breaker (A) | Reference |
|---------------------------|--------------------------------|-------|-------|-------------|-------|-------|-------|-------|-----|---|-----------|
| | Single-Phase | | | Three-Phase | | | | | | | |
| | 115 V | 200 V | 230 V | 115 V | 200 V | 230 V | 460 V | 575 V | | | |
| 0.1...0.16 | - | - | - | - | - | - | - | - | - | 450 | GV2P01 |
| 0.16...0.25 | - | - | - | - | - | - | - | - | - | 450 | GV2P02 |
| 0.25...0.40 | - | - | - | - | - | - | - | - | - | 450 | GV2P03 |
| 0.40...0.63 | - | - | - | - | - | - | - | - | - | 450 | GV2P04 |
| 0.63...1 | - | - | - | - | - | - | - | 1/2 | 1/2 | 450 | GV2P05 |
| 1...1.6 | - | - | 1/10 | - | - | - | 3/4 | 3/4 | 3/4 | 450 | GV2P06 |
| 1.6...2.5 | - | 1/6 | 1/6 | - | 1/2 | 1/2 | 1 | 1.5 | 1.5 | 450 | GV2P07 |
| 2.5...4 | 1/8 | 1/4 | 1/3 | - | 3/4 | 3/4 | 2 | 3 | 3 | 450 | GV2P08 |
| 4...6.3 | 1/4 | 1/2 | 1/2 | 3/4 | 1 | 1.5 | 3 | 5 | 5 | 450 | GV2P10 |
| 6...10 | 1/2 | 1 | 1.5 | 1 | 2 | 3 | 5 | 7.5 | 7.5 | 450 | GV2P14 |
| 9...14 | 3/4 | 2 | 2 | 2 | 3 | 3 | 10 | 10 | 10 | 450 | GV2P16 |
| 13...18 | 1 | 2 | 3 | 2 | 5 | 5 | 10 | 15 | 15 | 450 | GV2P20 |
| 17...23 | 1.5 | 3 | 3 | 3 | 5 | 7.5 | 15 | 20 | 20 | 450 | GV2P21 |
| 20...25 | 2 | - | - | - | 7.5 | 7.5 | 15 | 20 | 20 | 450 | GV2P22 |
| 24...32 | 2 | 5 | 5 | 5 | 7.5 | 10 | 20 | 25 | 25 | 450 | GV2P32 |

(1) As % of I_{cu}.

(2) The thermal trip setting must be within the range marked on the graduated knob.

(3) Accessory: see page B6/23.

(4) 3P FLA corresponding values: see page A6/58.

* > 100 kA.



PB1215/4eps



GV2RT



Motor circuit breakers

For motors with high current peak on starting

Deca - Frame 2 (ref. GV2RT) control by rocker lever

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | Setting range of thermal trips ⁽¹⁾ | Magnetic tripping current Id ± 20 % | Reference |
|--|--------------|--------------|----------------------|-------------|---|-------------------------------------|-----------|
| 220/230 V | 400/415 V | 440 V | 500 V | 690 V | | | |
| kW | kW | kW | kW | kW | A | A | |
| 0.06 | 0.09 | 0.09 0.12 | – | – | 0.25...0.40 | 8 | GV2RT03 |
| – | 0.12 0.18 | 0.18 | – | 0.37 | 0.40...0.63 | 13 | GV2RT04 |
| 0.09 0.12 | 0.25 0.37 | 0.25 0.37 | 0.37 | 0.55 | 0.63...1 | 22 | GV2RT05 |
| 0.18 0.25 | 0.37 0.55 | 0.37 0.55 | 0.37 0.55 0.75 | 0.75 1.1 | 1...1.6 | 33 | GV2RT06 |
| 0.37 | 0.75 | 0.75 1.1 | 1.1 | 1.5 | 1.6...2.5 | 51 | GV2RT07 |
| 0.55 0.75 | 1.1 1.5 | 1.5 | 1.5 2.2 | 2.2 3 | 2.5...4 | 78 | GV2RT08 |
| 1.1 | 2.2 | 2.2 3 | 3 | 4 | 4...6.3 | 138 | GV2RT10 |
| 1.5 2.2 | 3 4 | 4 | 4 5.5 | 5.5 7.5 | 6...10 | 200 | GV2RT14 |
| 2.2 3 | 5.5 | 5.5 7.5 | 7.5 | 9 11 | 9...14 | 280 | GV2RT16 |
| 4 | 7.5 | 7.5 9 | 9 | 15 | 13...18 | 400 | GV2RT20 |
| 5.5 | 9 11 | 11 | 11 | 18.5 | 17...23 | 400 | GV2RT21 |

⁽¹⁾ The thermal trip setting must be within the range marked on the graduated knob.

For primaries of 3-phase transformers

Deca - Frame 2 (ref. GV2RT) control by rocker lever

| Standard power ratings | | | | | Setting range of thermal trips ⁽²⁾ | Magnetic tripping current Id ± 20 % | Reference |
|------------------------|-----------|----------|------------|---------------|---|-------------------------------------|-----------|
| 230/240 V | 400/415 V | 440 V | 500 V | 690 V | | | |
| kVA | kVA | kVA | kVA | kVA | A | A | |
| – | – | – | – | – | 0.25...0.40 | 8 | GV2RT03 |
| – | – | – | – | – | 0.40...0.63 | 13 | GV2RT04 |
| – | – | 0.63 | 0.63 | 1 | 0.63...1 | 22 | GV2RT05 |
| 0.4 | 0.63 | 1 | 1 | – | 1...1.6 | 33 | GV2RT06 |
| 0.63 | 1 | – | 1.6 | 1.6 2 | 1.6...2.5 | 51 | GV2RT07 |
| 1 | 1.6 2 | 1.6 2 | 2 2.5 | 2.5 | 2.5...4 | 78 | GV2RT08 |
| 1.6 2 | 2.5 | 2.5 4 | 4 | 4 5 6.3 | 4...6.3 | 138 | GV2RT10 |
| 2.5 | 4 5 | 5 | 5 6.3 | – | 6...10 | 200 | GV2RT14 |
| 4 | 6.3 | 6.3 | – | 10 12.5 | 9...14 | 280 | GV2RT16 |
| 5 6.3 | 10 | 10 | 10 12.5 | 10 | 13...18 | 400 | GV2RT20 |

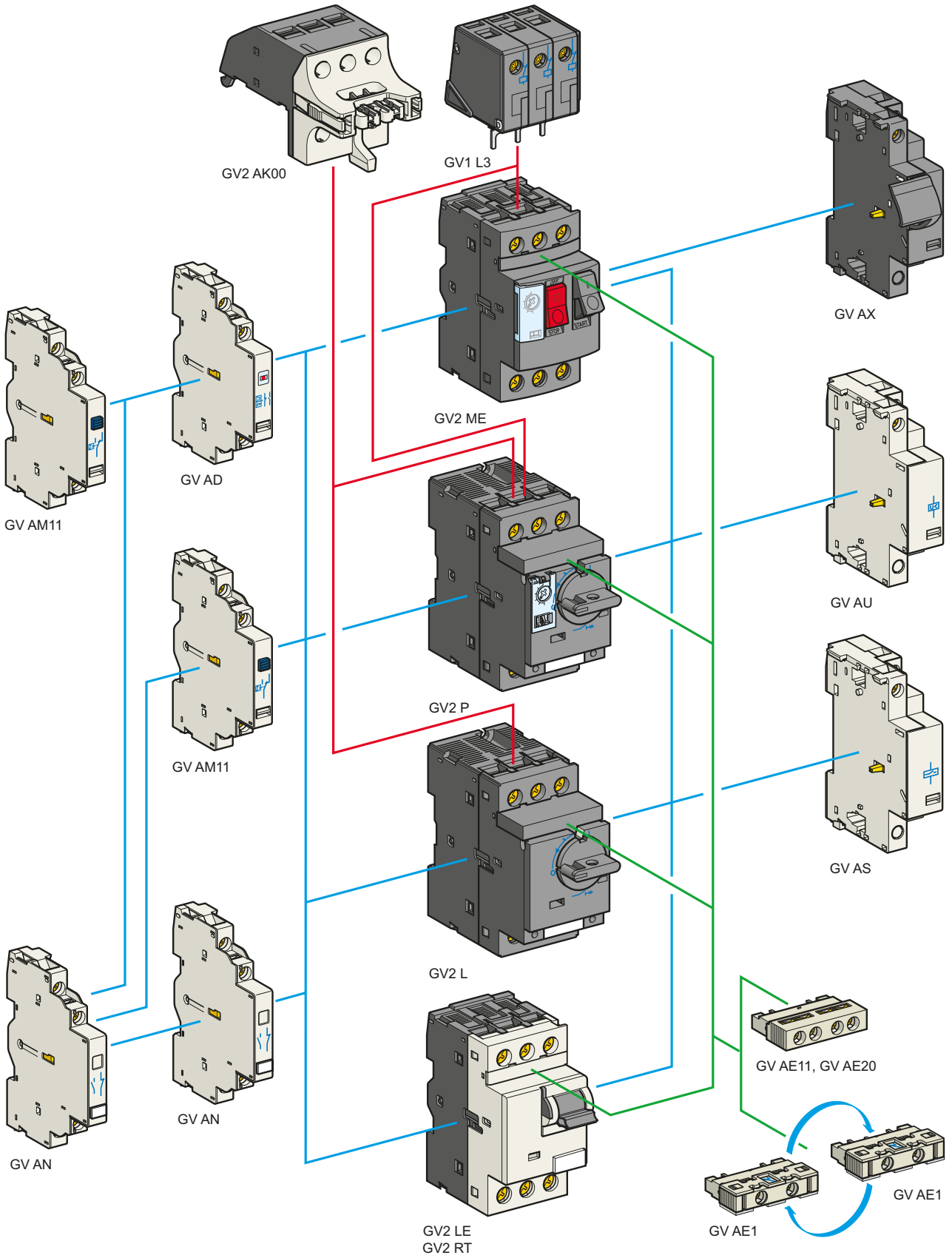
Accessory⁽³⁾

| Description | Reference |
|--|-----------|
| Padlockable external operator (IP 54) black handle, blue legend plate | GV2AP03 |

⁽²⁾ The thermal trip setting must be within the range marked on the graduated knob.

⁽³⁾ Other accessories such as mounting, cabling and marking accessories are identical to those used for GV2ME motor circuit breakers, see page B6/23.

Motor circuit breakers



Contact blocks

| Description | Mounting | Maximum number | Type of contacts | Sold in lots of | Unit reference | |
|--|--------------------------|----------------|---------------------------|-----------------|----------------|----------|
| Instantaneous auxiliary contacts | Front ⁽¹⁾ | 1 | N/O or N/C ⁽²⁾ | 10 | GVAE1 | |
| | | | N/O + N/C | 10 | GVAE11 | |
| | | | N/O + N/O | 10 | GVAE20 | |
| | Side (LH) | 2 | N/O + N/C | 1 | GVAN11 | |
| | | | N/O + N/O | 1 | GVAN20 | |
| Fault signalling contact + instantaneous auxiliary contact | Side ⁽³⁾ (LH) | 1 | N/O (fault) | + N/O | 1 | GVAD1010 |
| | | | | + N/C | 1 | GVAD1001 |
| | | | N/C (fault) | + N/O | 1 | GVAD0110 |
| | | | | + N/C | 1 | GVAD0101 |
| Short-circuit signalling contact | Side (LH) | 1 | C/O common point | 1 | GVAM11 | |

Electric trips

| Mounting | Voltage | | Reference |
|---|-------------|---------|-----------|
| Undervoltage or shunt trips ⁽⁴⁾ | | | |
| Side (1 block on RH side of circuit breaker) | 24 V | 50 Hz | GVA●025 |
| | | 60 Hz | GVA●026 |
| | 48 V | 50 Hz | GVA●055 |
| | | 60 Hz | GVA●056 |
| | 100 V | 50 Hz | GVA●107 |
| | | 60 Hz | GVA●107 |
| | 110...115 V | 50 Hz | GVA●115 |
| | | 60 Hz | GVA●116 |
| | 120...127 V | 50 Hz | GVA●125 |
| | | 60 Hz | GVA●115 |
| | 200 V | 50 Hz | GVA●207 |
| | | 60 Hz | GVA●207 |
| | 220...240 V | 50 Hz | GVA●225 |
| | | 60 Hz | GVA●226 |
| | 380...400 V | 50 Hz | GVA●385 |
| | | 60 Hz | GVA●386 |
| | 415...440 V | 50 Hz | GVA●415 |
| | | 60 Hz | GVA●416 |
| 440 V | 60 Hz | GVA●385 | |
| 480 V | 60 Hz | GVA●415 | |
| 500 V | 50 Hz | GVA●505 | |
| 600 V | 60 Hz | GVA●505 | |

Undervoltage trip, INRS (can only be mounted on GV2ME)

Safety device for dangerous machines conforming to INRS and VDE 0113

| | | | |
|---|-------------|-------|---------|
| Side (1 block on RH side of circuit breaker GV2ME) | 110...115 V | 50 Hz | GVAX115 |
| | | 60 Hz | GVAX116 |
| | 127 V | 60 Hz | GVAX115 |
| | | 50 Hz | GVAX225 |
| | 220...240 V | 60 Hz | GVAX226 |
| | | 50 Hz | GVAX385 |
| | 380...400 V | 60 Hz | GVAX386 |
| | | 50 Hz | GVAX415 |
| | 415...440 V | 50 Hz | GVAX415 |
| | 440 V | 60 Hz | GVAX385 |

Limiter blocks

| Description | Mounting | Maximum number | Reference |
|--|---|----------------|------------------------|
| Visible isolation block ⁽⁵⁾ | Front ⁽¹⁾ | 1 | GV2AK00 ⁽⁶⁾ |
| Limiters | At top (GV2ME and GV2P) for circuit breakers with screw clamp connections | 1 | GV1L3 |
| | Independent | 1 | LA9LB920 |

- (1) Mounting of a GVAE contact block or a GV2AK00 visible isolation block on GV2P and GV2L.
 (2) Choice of N/C or N/O contact operation, depending on which way round the reversible block is mounted.
 (3) The GVAD is always mounted next to the circuit breaker.
 (4) To order an undervoltage trip: replace the dot (●) in the reference with a U, example: GVAU025.
 To order a shunt trip: replace the dot (●) in the reference with an S, example: GVAS025.
 (5) Visible isolation of the 3 poles upstream of circuit breaker GV2P and GV2L.
 (6) Ie Max = 32 A.

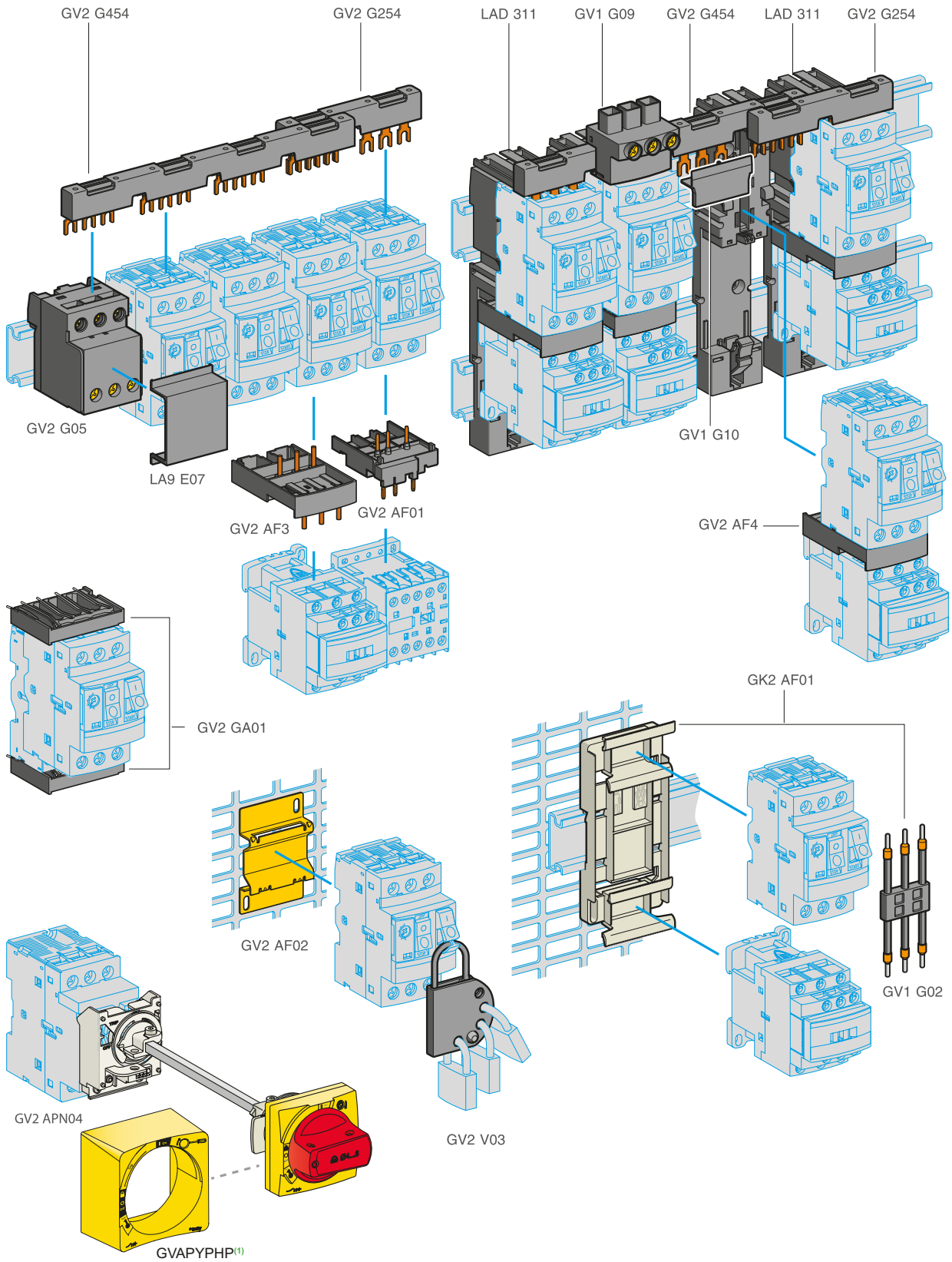


GV1L3



LA9LB920

Motor circuit breakers



(1) Standard front plate must be removed from the assembly and replaced by Protective front plate (GVAPYPHP).

TeSys Power

Deca - Frame 2 Motor circuit breakers - Accessories

Product references

Accessories for circuit breakers with screw clamp connections

| Description | Application | Sold in lots of | Unit reference |
|------------------------------------|--|-----------------|----------------|
| Adapter plates | For mounting a GV2 by screw fixing | 10 | GV2AF02 |
| | For mounting a GV2ME and contactor LC1D09...D38 with front faces aligned | 1 | LAD311 |
| Height compensation plate | 7.5 mm to align GV2ME-GV2LE and GV2P-GV2L and allow the use of a common GV2G●●● busbar | 10 | GV1F03 |
| Combination blocks | Between GV2 and contactor LC1K or LP1K | 10 | GV2AF01 |
| | Between GV2 and contactor LC1D09...D38 | 10 | GV2AF3 |
| | Between GV2 mounted on LAD311 and contactor LC1D09...D38 | 10 | GV2AF4 |
| Motor starter adapter plate | With 3-pole connection for mounting a GV2 and a contactor LC1D09...D25 | 1 | GK2AF01 |

| Description | Application | Pitch mm | Reference |
|---|-------------|-------------|----------------|
| Sets of 3-pole Ie = 63 A busbars | 2 tap-offs | 45 | GV2G245 |
| | | 54 | GV2G254 |
| | | 72 | GV2G272 |
| | 3 tap-offs | 45 | GV2G345 |
| | | 54 | GV2G354 |
| | 4 tap-offs | 45 | GV2G445 |
| | | 54 | GV2G454 |
| | | 72 | GV2G472 |
| | 5 tap-offs | 54 | GV2G554 |

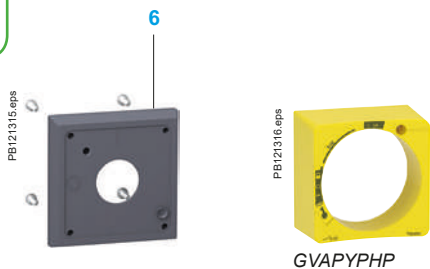
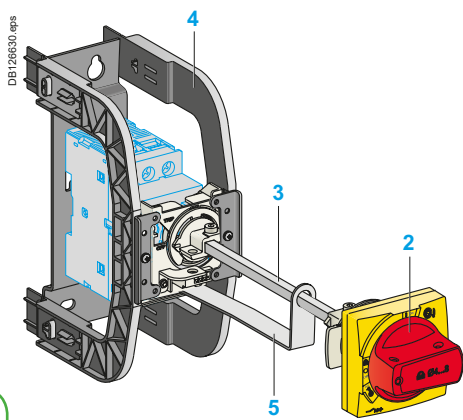
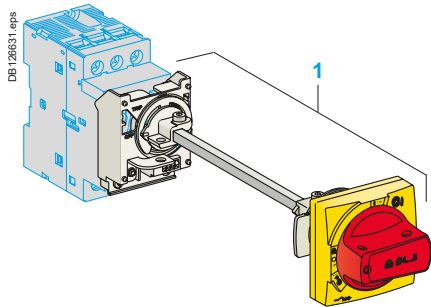
| Description | Ie A | Application | Sold in lots of | Unit reference |
|--|---------|---|-----------------|----------------|
| Protective end cover | - | For unused busbar outlets | 5 | GV1G10 |
| Terminal block for supply to one or more GV2G busbar sets | 63 | Connection from the top | 1 | GV1G09 |
| | 63 | Can be fitted with current limiter GV1L3 (GV2ME and GV2P) | 1 | GV2G05 |
| Cover for terminal block | - | For mounting in modular panels | 10 | LA9E07 |
| Flexible 3-pole connection for connecting a GV2 to a contactor LC1D09...D25 | 25 | Centre distance between mounting rails: 100...120 mm | 10 | GV1G02 |
| "Large Spacing" adapter UL 60947-4-1 type E | - | For GV2P●● (except 32 A) | 1 | GV2GH7 |
| Clip-in marker holders (supplied with each circuit breaker) | - | For GV2P, GV2L, GV2LE and GV2RT (8 x 22 mm) | 100 | LA9D92 |

PB 119241.eps



GV1G09

Motor
circuit
breakers



Motor circuit breakers

Extended Rotary Handle

Allows a circuit breaker or a starter-controller installed in back of an enclosure to be operated from the front of the enclosure.

A rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (Off) for red/yellow handle, in the O (Off) or I (On) for black handle, by means of up to 3 padlocks with a shank diameter of 4 to 8 mm. The extended shaft must be adjusted to use in different size enclosures. The IP54 rotary handle is fixed with a nut (Ø22) to make easier the assembling. The new Laser Square tool brings the accuracy to align the circuit breaker and the rotary handle.

Padlockable external operators for ref. GV2P and GV2L

Description

- 1 Kit handle + mounting system
- 2 Universal handle
- 3 Shaft
- 4 Bracket
- 5 Shaft support plate for deep enclosure
- 6 Retrofit accessory
- 7 Laser Square accessory

Kit handle + mounting system

| Description | Item | Reference |
|-------------|---|------------|
| For GV2P/L | Black handle, front plate, with trip status, IP 54 | 1 GV2APN01 |
| | Red handle, front plate, with trip status, IP 54 | 1 GV2APN02 |
| | Black handle, front plate, without trip status, IP 65 | 1 GV2APN03 |
| | Red handle, front plate, without trip status, IP 65 | 1 GV2APN04 |
| For GV2LE | Padlocking in "On" and "Off" position | - GV2AP03 |
| | Black handle, blue front plate, IP 54 | |

Universal handle

| | | |
|------------|---------------------------------------|-----------|
| For GV2P/L | Black handle, with trip status, IP54 | 2 GVAPB54 |
| | Red handle, with trip status, IP54 | 2 GVAPR54 |
| | Red handle, without trip status, IP65 | 2 GVAPR65 |

External handle protection frame

| | | |
|------------|--------------|------------|
| For GV2P/L | Yellow frame | 1 GVAPYPHP |
| | Black frame | 1 GVAPBPHP |

Shaft

| | | |
|------------|------------|----------|
| For GV2P/L | L = 315 mm | 3 GVAPA1 |
|------------|------------|----------|

Bracket

| | | |
|------------|--|-----------|
| For GV2P/L | | 4 GVAPH02 |
|------------|--|-----------|

Shaft support plate for deep enclosure

| | | |
|------------|----------------|-----------|
| For GV2P/L | Depth ≥ 250 mm | 5 GVAPK11 |
|------------|----------------|-----------|

Retrofit accessory

| | | |
|------------|--|----------|
| For GV2P/L | | 6 GVAPP1 |
|------------|--|----------|

Laser Square accessory

| | | |
|------------|--|-----------|
| For GV2P/L | | 7 GVAPL01 |
|------------|--|-----------|

Sticker

| | Sold in lots of | | |
|----------------|-----------------|---|---------|
| For German | 10 | - | GVAPSDE |
| For Chinese | 10 | - | GVAPSCN |
| For Portuguese | 10 | - | GVAPSPT |
| For Italian | 10 | - | GVAPSIT |

Padlocking device

| Description | | Reference |
|--------------------|---|-----------|
| For all GV2 device | For use with up to 4 padlocks, Ø6 mm shank max. (padlocks not included) | GV2V03 |

TeSys Deca - Frame 3 11 to 45 kW



Motor
circuit
breakers

TeSys Power

Deca - Frame 3 Motor circuit breakers - Magnetic

Product references

PE121697.fr



GV3L25



Motor circuit breakers

Motor circuit breakers from 11 to 45 kW

Deca - Frame 3 (ref. GV3L): control by rotary knob, connection by EverLink® BTR screw connectors

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Magnetic protection rating | Tripping current I _d ± 20 % | Use in association with thermal overload relay (class 10 A) | Reference |
|---|-----------------|--------------------------------|-----------|-----------------|--------------------------------|-----------|-----------------|--------------------------------|----------------------------------|--|--|-----------------------------|
| 400/415 V | | | 500 V | | | 690 V | | | | | | |
| P | I _{cu} | I _{cs} ⁽¹⁾ | P | I _{cu} | I _{cs} ⁽¹⁾ | P | I _{cu} | I _{cs} ⁽¹⁾ | | | | |
| kW | kA | | kW | kA | | kW | kA | | A | A | | |
| 11 | 100 | 100 | 15 | 12 | 50 | 18.5 | 6 | 50 | 25 | 350 | LRD325 | GV3L25 |
| 15 | 100 | 100 | 18.5 | 12 | 50 | 22 | 6 | 50 | 32 | 448 | LRD332 | GV3L32 |
| 18.5 | 50 | 100 | 22 | 12 | 50 | 37 | 6 | 50 | 40 | 560 | LRD340 | GV3L40 |
| 22 | 50 | 100 | 30 | 12 | 50 | 45 | 6 | 50 | 50 | 700 | LRD350 | GV3L50 |
| 30 | 50 | 100 | 37 | 12 | 50 | 55 | 6 | 50 | 65 | 910 | LRD365 | GV3L65 |
| 37 | 50 | 60 | 45 | 12 | 50 | 55 | 6 | 50 | 73 | 1120 | LRD380 | GV3L73 |
| 45 | 50 | 60 | 45 | 12 | 50 | 55 | 6 | 50 | 80 | 1120 | LRD380 | GV3L80⁽²⁾ |

Connection by lugs

To order these circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above.
Example: ref. **GV3L32** becomes **GV3L326**.

⁽¹⁾ As % of I_{cu}. Associated current limiter or fuses, where required.

⁽²⁾ 750 A Lock Rotor Current max.

* > 100 kA.



GV3P80



GV3P651



GV3P736

Motor circuit breakers up to 45 kW / 400 V

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Setting range of thermal trips (2) | Magnetic tripping current I _d ± 20 % | Reference |
|---|-----------------|---------------------|-------|-----------------|---------------------|-------|-----------------|---------------------|---|--|------------|
| 400/415 V | | | 500 V | | | 690 V | | | | | |
| P | I _{cu} | I _{cs} (1) | P | I _{cu} | I _{cs} (1) | P | I _{cu} | I _{cs} (1) | | | |
| kW | kA | % | kW | kA | % | kW | kA | % | A | A | |
| Deca - Frame 3 (ref. GV3P): control by rotary knob | | | | | | | | | | | |
| Connection by EverLink® BTR screw connectors (3) | | | | | | | | | | | |
| 5.5 | 100 | 100 | 7.5 | 12 | 50 | 11 | 6 | 50 | 9...13 | 182 | GV3P13 |
| 7.5 | 100 | 100 | 9 | 12 | 50 | 15 | 6 | 50 | 12...18 | 252 | GV3P18 |
| 11 | 100 | 100 | 15 | 12 | 50 | 18.5 | 6 | 50 | 17...25 | 350 | GV3P25 |
| 15 | 100 | 100 | 18.5 | 12 | 50 | 22 | 6 | 50 | 23...32 | 448 | GV3P32 |
| 18.5 | 50 | 100 | 22 | 12 | 50 | 37 | 6 | 50 | 30...40 | 560 | GV3P40 |
| 22 | 50 | 100 | 30 | 12 | 50 | 45 | 6 | 50 | 37...50 | 700 | GV3P50 |
| 30 | 50 | 100 | 45 | 12 | 50 | 55 | 6 | 50 | 48...65 | 910 | GV3P65 |
| 37 | 50 | 60 | 45 | 12 | 50 | 55 | 6 | 50 | 62...73 | 1120 | GV3P73 |
| 45 | 50 | 60 | 45 | 12 | 50 | 55 | 6 | 50 | 70...80 | 1120 | GV3P80 (4) |

Connection by EverLink® BTR screw connectors, for assembly with a contactor

To assemble a GV3P32 to P73 circuit breaker with an LC1D40A to D73A contactor, it is possible to use the circuit breaker supplied without downstream EverLink® power terminal block. To order this product, add the digit 1 to the end of the references selected above. Example: ref. GV3P73 becomes GV3P731. Do not use direct mounting between GV3P80 and LC1D80A because of potential overheating, use cable link.

Connection by lugs

To order thermal magnetic circuit breakers with connection by lugs, add the digit 6 to the end of reference selected above. Example: GV3P25 becomes GV3P256.

Motor circuit breakers up to 40 HP / 460 V, UL 60947-4-1 type E

Deca - Frame 3 - ref. GV3P13 (5) to GV3P65 (5)

To obtain a motor-circuit breaker GV3P, UL 60947-4-1 type E, use the following with the circuit breaker:

- a "Large Spacing" cover GV3G66,
- a short-circuit signalling contact GVAM11.

Motor circuit breakers from 7.5 to 50 HP / 460 V, with screw clamp terminals

Deca - Frame 3 (ref. GV3P) with rotary handle

| Thermal setting (A) | Maximum Horsepower ratings (6) | | | | | | Reference |
|---------------------------|--------------------------------|-------|-------|-------------|-------|-------|-----------|
| | Single-Phase | | | Three-Phase | | | |
| | 115 V | 230 V | 200 V | 230 V | 460 V | 575 V | |
| 9...13 | 1/2 | 1.5 | 3 | 3 | 7.5 | 10 | GV3P13 |
| 12...18 | 3/4 | 2 | 3 | 5 | 7.5 | 10 | GV3P18 |
| 17...25 | 1.5 | 3 | 5 | 7.5 | 15 | 20 | GV3P25 |
| 23...32 | 2 | 3 | 7.5 | 7.5 | 20 | 25 | GV3P32 |
| 30...40 | 3 | 5 | 10 | 10 | 25 | 30 | GV3P40 |
| 37...50 | 3 | 7.5 | 10 | 10 | 30 | 40 | GV3P50 |
| 48...65 | 3 | 10 | 15 | 15 | 40 | 50 | GV3P65 |
| 62...73 | 5 | 15 | 20 | 25 | 50 | 60 | GV3P73 |

Deca - Frame 3 - ref. GV3P13 to GV3P65 - with connection by lugs (6)

To obtain a motor-circuit breaker ref. GV3P, UL 60947-4-1 type E, with connection by lugs, add the digit 6 to the end of reference selected above and use the following with the circuit breaker:

- two IP 20 covers LAD96570,
- a short-circuit signalling contact GVAM11.

(1) As % of I_{cu}.

(2) The thermal trip setting must be within the range marked on the graduated knob.

(3) BTR screws: hexagon socket head. Require use of an insulated Allen key, in compliance with local wiring regulations.

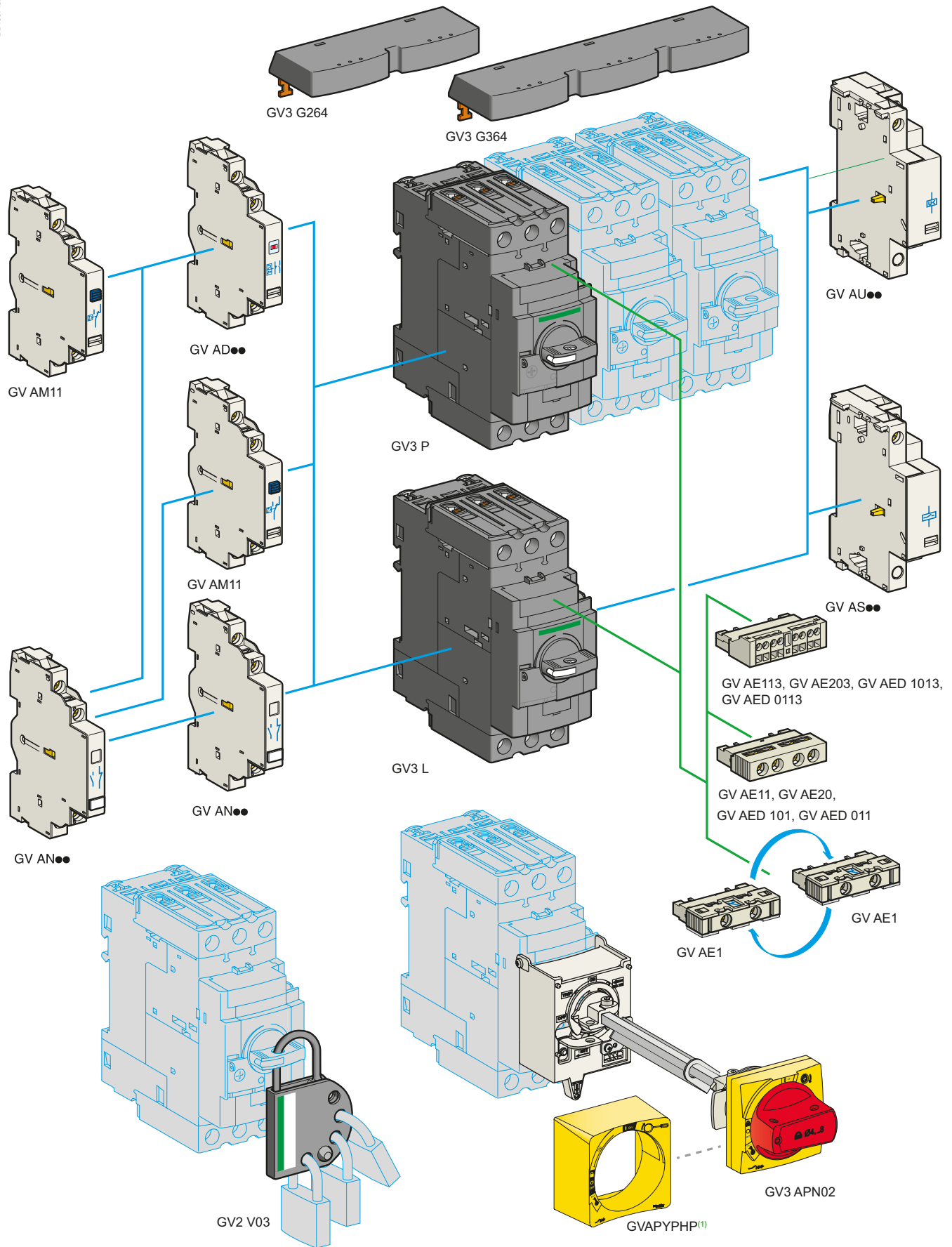
(4) For applications with stable full load current with maximum 80 A and Lock Rotor Current maximum 750 A.

(5) Accessories: see page B6/30.

(6) 3P FLA corresponding values: see page A6/58.



Motor circuit breakers



(1) Standard front plate must be removed from the assembly and replaced by Protective front plate (GVAPYPHP).

| Contact blocks | | | | | | |
|--|--------------------------|----------------|---------------------------|-------------------|-------------------------|----------|
| Description | Mounting | Maximum number | Type of contacts | Sold in lots of | Unit reference | |
| Instantaneous auxiliary contacts | Front | 1 | N/O or N/C ⁽¹⁾ | 10 | GVAE1 | |
| | | | N/O + N/C | 10 | GVAE11 ⁽²⁾ | |
| | | | N/O + N/O | 10 | GVAE20 ⁽²⁾ | |
| | Side (LH) | 2 | N/O + N/C | 1 | GVAN11 ⁽²⁾ | |
| | | | N/O + N/O | 1 | GVAN20 ⁽²⁾ | |
| Fault signalling contact + instantaneous auxiliary contact | Front | 1 | N/O (fault) + N/O | 1 | GVAED101 ⁽²⁾ | |
| | | | N/O (fault) + N/C | 1 | GVAED011 ⁽²⁾ | |
| | Side ⁽³⁾ (LH) | 1 | N/O (fault) | + N/O | 1 | GVAD1010 |
| | | | | + N/C | 1 | GVAD1001 |
| | | | | N/C (fault) + N/O | 1 | GVAD0110 |
| | | | + N/C | 1 | GVAD0101 | |
| Short-circuit signalling contact | Side (LH) | 1 | C/O common point | 1 | GVAM11 | |

| Electric trips - undervoltage or shunt ⁽⁴⁾ | | | |
|---|-------------|---------|-----------|
| Mounting | Voltage | | Reference |
| Side (1 block on RH side of circuit breaker) | 24 V | 50 Hz | GVA●025 |
| | | 60 Hz | GVA●026 |
| | 48 V | 50 Hz | GVA●055 |
| | | 60 Hz | GVA●056 |
| | 100 | 50 Hz | GVA●107 |
| | 100...110 V | 60 Hz | GVA●107 |
| | 110...115 V | 50 Hz | GVA●115 |
| | | 60 Hz | GVA●116 |
| | 120...127 V | 50 Hz | GVA●125 |
| | 127 V | 60 Hz | GVA●115 |
| | 200 V | 50 Hz | GVA●207 |
| | | 60 Hz | GVA●207 |
| | 220...240 V | 50 Hz | GVA●225 |
| | | 60 Hz | GVA●226 |
| | 380...400 V | 50 Hz | GVA●385 |
| | | 60 Hz | GVA●386 |
| | 415...440 V | 50 Hz | GVA●415 |
| | | 60 Hz | GVA●416 |
| | 440 V | 60 Hz | GVA●385 |
| | 480 V | 60 Hz | GVA●415 |
| 500 V | 50 Hz | GVA●505 | |
| 600 V | 60 Hz | GVA●505 | |

| Accessories | | | |
|---|-----------|-------------------|-----------|
| Description | | | Reference |
| Set of 3-pole busbars I _e = 115 A Pitch: 64 mm | 2 tap-off | GV3P●● and GV3L●● | GV3G264 |
| | 3 tap-off | GV3P●● and GV3L●● | GV3G364 |
| Cover "Large Spacing" UL 60947-4-1 type E (Only one cover required on supply side) | | GV3P●● | GV3G66 |

- (1) Choice of N/C or N/O contact operation, depending on which way round the reversible block is mounted.
 (2) Contact blocks available in version with spring terminal connections. Add a figure 3 at the end of the references selected above.
 Example: **GVAED101** becomes **GVAED1013**.
 (3) The **GVAD●●** is always mounted next to the circuit breaker.
 (4) To order an undervoltage trip: replace the dot (●) in the reference with a **U**, example: **GVAU025**.
 To order a shunt trip: replace the dot (●) in the reference with an **S**, example: **GVAS025**.

| Torque limiting breakaway bits | | | |
|--------------------------------|--|-----------------|-----------|
| Description | | Sold in lots of | Reference |
| 5 N.m Yellow | | 6 | LV426992 |
| 9 N.m Green | | 6 | LV426990 |

PB108366.eps



GV3G66

PB121324.eps



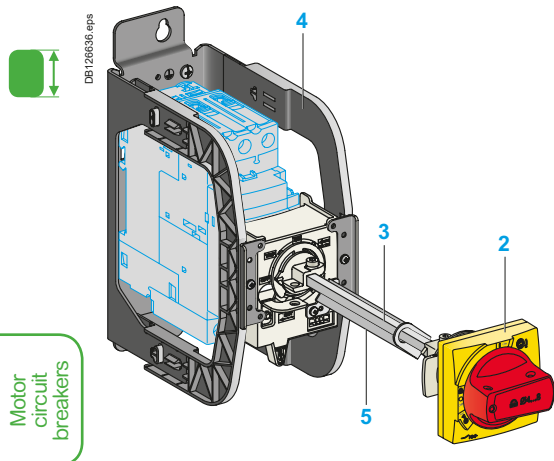
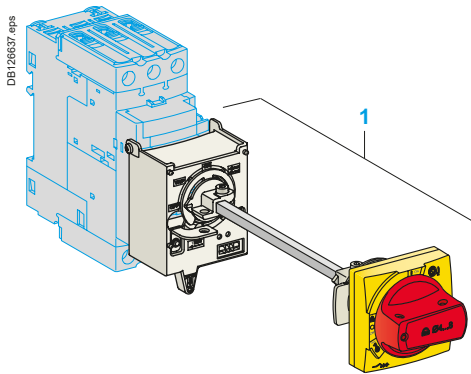
LV426992



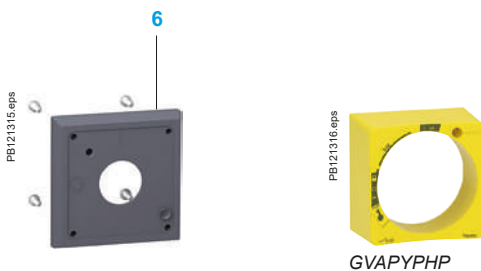
LV426990

Limited torque throwaway bits





Motor circuit breakers



GVAPYPHP



Extended Rotary Handle

Allows a circuit breaker or a starter-controller installed in back of an enclosure to be operated from the front of the enclosure.

A rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (Off) or I (On) position (depending of the type of rotary handle) by means of up to 3 padlocks with a shank diameter of 4 to 8 mm. The extended shaft must be adjusted to use in different size enclosures. The IP54 rotary handle is fixed with a nut ($\varnothing 22$) to make easier the assembling. The new Laser Square tool brings the accuracy to align the circuit breaker and the rotary handle.

Padlockable external operators for Deca - Frame 3

Description

- 1 Kit handle + mounting system
- 2 Universal handle
- 3 Shaft
- 4 Bracket
- 5 Shaft support plate for deep enclosure
- 6 Retrofit accessory
- 7 Laser Square accessory

Kit handle + mounting system

| Description | Item | Reference |
|---|------|-----------|
| For GV3P/L Black handle, front plate, with trip status, IP 54 | 1 | GV3APN01 |
| Red handle, front plate, with trip status, IP 54 | 1 | GV3APN02 |
| Black handle, front plate, without trip status, IP65 | 1 | GV3APN03 |
| Red handle, front plate, without trip status, IP 65 | 1 | GV3APN04 |

Universal handle

| | | |
|---|---|---------|
| For GV3P/L Black handle, with trip status, IP54 | 2 | GVAPB54 |
| Red handle, with trip status, IP54 | 2 | GVAPR54 |
| Red handle, without trip status IP65 | 2 | GVAPR65 |

External handle protection frame

| | | |
|-------------------------|---|----------|
| For GV2P/L Yellow frame | 1 | GVAPYPHP |
| Black frame | 1 | GVAPBPHP |

Shaft

| | | |
|-----------------------|---|--------|
| For GV3P/L L = 315 mm | 3 | GVAPA1 |
|-----------------------|---|--------|

Shaft support plate for deep enclosure

| | | |
|--------------------------------|---|---------|
| For GV3P/L Depth ≥ 300 mm | 5 | GVAPK12 |
|--------------------------------|---|---------|

Retrofit accessory

| | | |
|------------|---|--------|
| For GV3P/L | 6 | GVAPP1 |
|------------|---|--------|

Laser Square accessory

| | | |
|------------|---|---------|
| For GV3P/L | 7 | GVAPL01 |
|------------|---|---------|

Sticker Sold in lots of

| | | | | |
|---------------|----------------|----|---|---------|
| Warning label | For German | 10 | - | GVAPSDE |
| | For Chinese | 10 | - | GVAPSCN |
| | For Portuguese | 10 | - | GVAPSPT |
| | For Italian | 10 | - | GVAPSIT |

TeSys Deca - Frame 4

0.25 to 55 kW - 1/2 to 60 HP



Motor
circuit
breakers

TeSys Power

Deca - Frame 4 Motor circuit breakers

Introduction

Protection

TeSys Deca - Frame 4 motor circuit breakers covers motor protection from 0.25 to 55 kW at 415 V AC (from 0.8 to 115 A) in one frame and are available in 3 breaking capacities: 25, 50 and 100 kA at 415 V AC IEC (15, 35, 65 kA at 480 V UL).

TeSys Deca - Frame 4 motor circuit breakers are available with 3 types of protection:

- Magnetic ref. GV4L: to be used with an overload relay or a drive
- Thermal magnetic ref. GV4P: electronic protection with wide range setting, dual class (10 & 20)
- Multifunction motor protection ref. GV4PEM: ref. GV4P with adjustable advanced protections and possibility to have a side module SDx for alarming and motor functional fault differentiation.

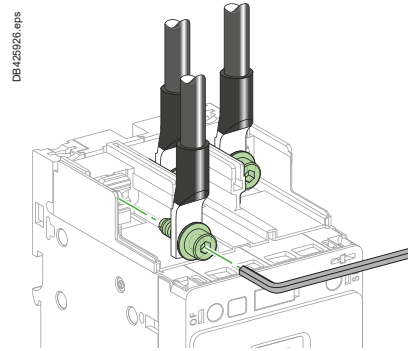
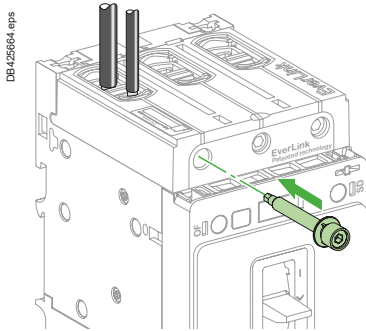
Power connection

TeSys Deca - Frame 4 motor circuit breaker come in standard with 2-holes EverLink™ power connectors with creep ⁽¹⁾ compensation for bare copper cables. This Schneider Electric patented technique makes it possible to achieve accurate and durable tightening torque in order to avoid cable creep.

Products may be delivered with connectors for bars or cables with compression lugs (except ref. GV4PB).

Whatever, the connectors are field interchangeable and can be removed for the installation of one of both.

And to tight at the right torque power connections particularly in the field, torque limiting breakaway bits may be used.



Mounting

TeSys Deca - Frame 4 motor circuit breaker can be mounted on a backplate or on a DIN rail (35 or 75 mm).

Handle

TeSys Deca - Frame 4 motor circuit breaker can be ordered with a toggle or a direct rotary handle (except for ref. GV4P Multifunction).

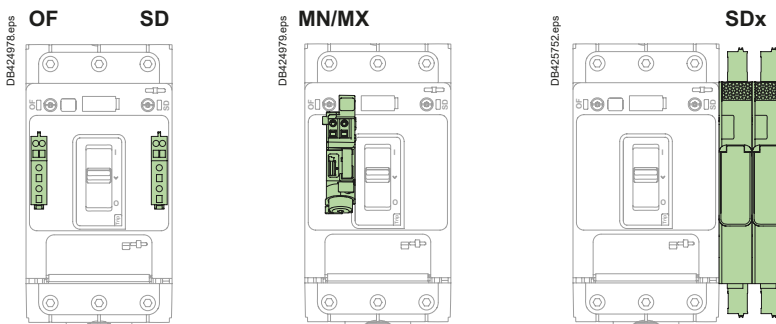
It is also possible to equip a toggle one with a direct rotary handle, or a front extended one, or a side one.

Auxiliaries

TeSys Deca - Frame 4 circuit breakers can be equipped with an open/close (OF) contact and a trip indication (SD) contact. These contacts are common point changeover type, with a normally open (NO) and a normally closed (NC) contact. TeSys Deca - Frame 4 motor circuit breaker may be equipped too with an MN (undervoltage release) or MX (shunt trip) coil.

Ref. GV4P Multifunction circuit breakers can be equipped with 1 or 2 SDx module(s) in order to have alarming and motor functional fault differentiation (SDx - See page B6/44)

Auxiliaries have spring connections for cables up to 1.5 mm².

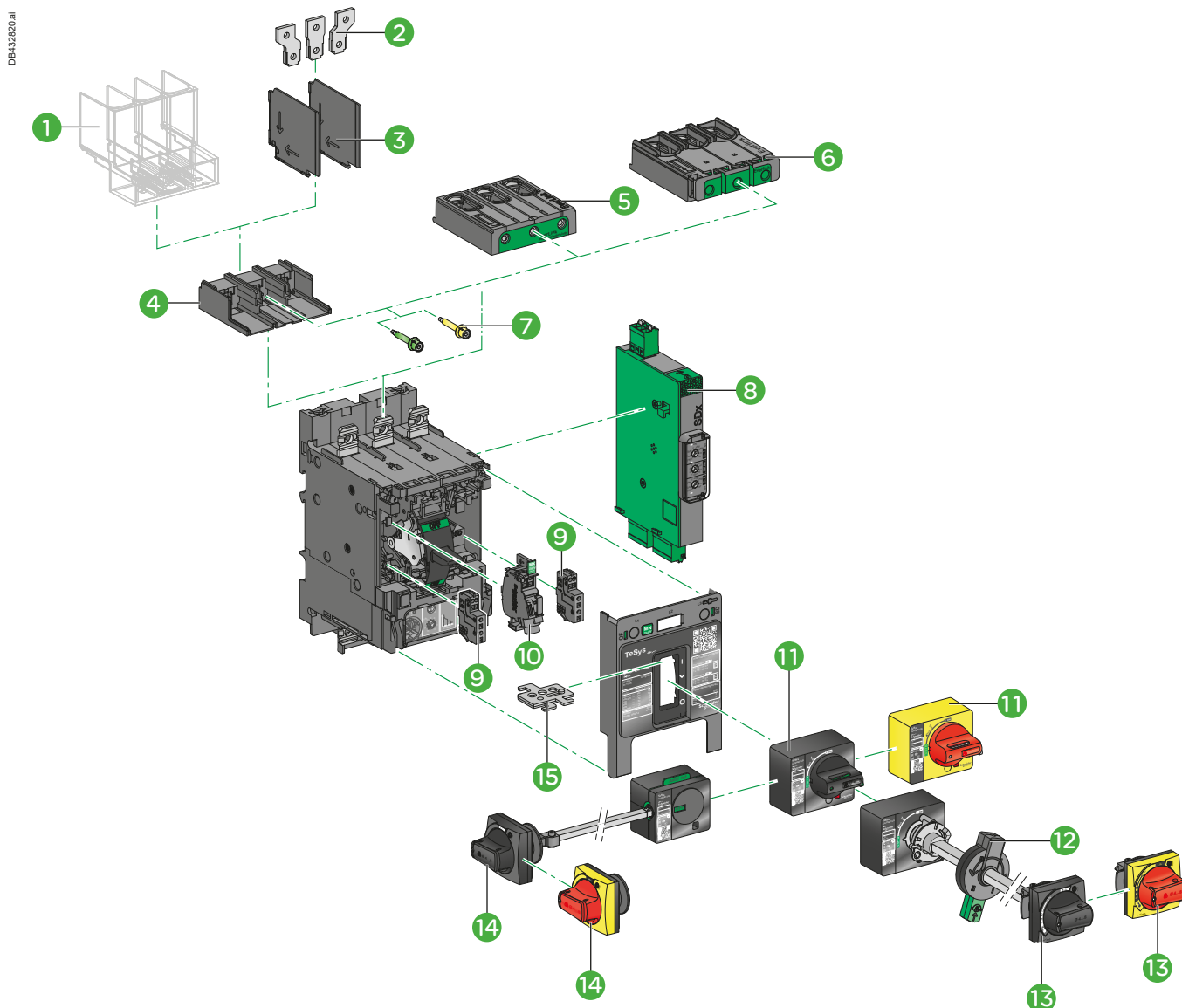


⁽¹⁾ Creep: normal crushing phenomenon of conductors, that is accentuated over time.

TeSys Power

Deca - Frame 4 Motor circuit breakers

Introduction

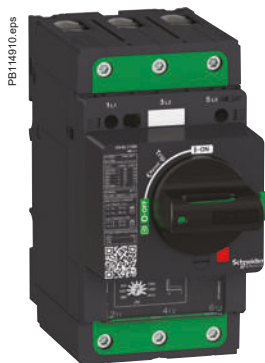


- 1 Long terminal shield **LAD96590**
- 2 Terminal spreaders **LV426940**
- 3 Interphases barriers **LV426920**
- 4 Crimp lug connector **GV4LUG**
- 5 EverLink® connector **LAD96595**
- 6 Everlink® terminals and large spacing cover **GV4G66 + LAD96595**
- 7 Torque limiting breakaway bits **LV42699●**
- 8 SDx alarming/fault differentiation module **GV4ADM1111** (only with GV4PEM)
- 9 Auxiliary contact block for OF or SD function **GV4AE11**
- 10 - MN undervoltage release **GV4AU●●**
- MX shunt trip **GV4AS●●**
- 11 Direct mounting black or red on yellow bezel rotary handle **GV4ADN01/ GV4ADN02**
- 12 Open door shaft operator (for front extended rotary handle) **LV426937**
- 13 Front extended rotary handle kit with red handle on yellow bezel or black handle **GV4APN01/ GV4APN02 /GV4APN04**
- 14 Side rotary handle kit with red handle on yellow bezel or black handle **LV426935/LV426936**.
- 15 Toggle locking device **29370**

TeSys Power

Deca - Frame 4 Motor circuit breakers - Magnetic

Introduction



PB114910.eps

GV4L

Standard version

Protection

Setting is made using dial.

Trip class (class)

Ref. GV4L can be used with class 5, 10 or 20 relay.

Short circuit protection (Ii)

Protection with an adjustable pick-up $I_i = 6$ to $14 I_n$. Settings are made in amperes.

Standards and certifications

IEC/EN 60947-1, IEC/EN 60947-2, CCC, EAC.



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GV4LE

Ref.



Motor
circuit
breakers

| Magnetic motor circuit breakers from 0.25 to 55 kW | | | | | | | | | | | | | |
|---|--------|----------------------|-------------|--------|----------------------|-------------|--------|----------------------|------|-----------------------------|--|-----------------------------------|--------------------|
| Standard power ratings of 3-phase motors - 50 / 60 Hz | | | | | | | | | In | Magnetic setting range (ii) | Use in association with overload relay Class 10 or 20 | Reference with EverLink terminals | |
| 400/415 V | | | 500 V | | | 690 V | | | | | | with toggle | with rotary handle |
| P kW | Icu kA | Ics ⁽¹⁾ % | P kW | Icu kA | Ics ⁽¹⁾ % | P kW | Icu kA | Ics ⁽¹⁾ % | A | A | | | |
| 0.25... 0.75 | 25 | 100 | 0.37... 1.1 | 10 | 100 | 0.55... 1.5 | - | - | 2 | 12... 28 | LRD05 (0.63... 1A) LRD06 (1... 1.6A) LRD07 (1.6... 2.5A) | - | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | | | GV4LE02N | GV4L02N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | | | GV4LE02S | - |
| 0.55... 1.5 | 25 | 100 | 0.75... 1.5 | 10 | 100 | 1.1... 2.2 | - | - | 3,5 | 21... 49 | LRD07 (1.6... 2.5A) LRD08 (2.5... 4A) | - | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | | | GV4LE03N | GV4L03N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | | | GV4LE03S | - |
| 1.5... 3 | 25 | 100 | 2.2... 4 | 10 | 100 | 3... 7.5 | - | - | 7 | 42... 98 | LRD08 (2.5... 4A) LRD10 (4... 6A) | - | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | | | GV4LE07N | GV4L07N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | | | GV4LE07S | - |
| 3... 5.5 | 25 | 100 | 3... 7.5 | 10 | 100 | 5.5... 11 | - | - | 12,5 | 75... 175 | LRD12 (5.5... 8A) LRD14 (7... 10A) LRD313 (9... 13A) | - | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | | | GV4LE12N | GV4L12N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | | | GV4LE12S | - |
| 5.5... 11 | 25 | 100 | 7.5... 15 | 10 | 100 | 7.5... 18.5 | - | - | 25 | 150... 350 | LRD318 (12... 18A) LRD325 (17... 25A) | GV4LE25B | GV4L25B |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | | | GV4LE25N | GV4L25N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | | | GV4LE25S | - |
| 11... 22 | 25 | 100 | 15... 30 | 10 | 100 | 18.5... 45 | - | - | 50 | 300... 700 | LRD332 (23... 32A) LRD340 (30... 40A) LRD350 (37... 50A) | GV4LE50B | GV4L50B |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | | | GV4LE50N | GV4L50N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | | | GV4LE50S | - |
| 18.5... 37 | 25 | 100 | 22... 55 | 10 | 100 | 30... 55 | - | - | 80 | 480... 1120 | LRD365 (48... 65A) LRD363 (63... 80A) | GV4LE80B | GV4L80B |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | | | GV4LE80N | GV4L80N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | | | GV4LE80S | GV4L80S |
| 30... 55 | 25 | 100 | 30... 75 | 10 | 100 | 45... 90 | - | - | 115 | 690... 1610 | LR9D5567 (60... 100A) LR9F5367 (60... 100A) LR9D5369 (90... 150A) LR9F5369 (90... 150A) | GV4LE115B | GV4L115B |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | | | GV4LE115N | GV4L115N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | | | GV4LE115S | GV4L115S |

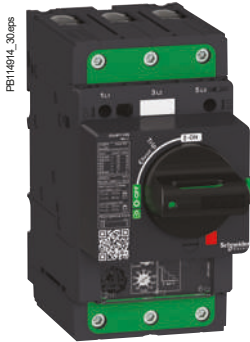


Motor circuit breakers

Connection by lugs

To order circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: ref. **GV4LE02N** becomes **GV4LE02N6**.

⁽¹⁾ As % of Icu.



GV4P



GV4PE

Ref.



Motor circuit breakers

Standard version

Protection

Settings are made using dials.

Overload or thermal protection (I_r)

Inverse-time thermal protection against overloads with adjustable pick-up I_r. Wide range setting made in amperes.

The tripping curve for the thermal protection, which indicates the time delay t_r before tripping, is defined by the selected trip class.

Trip class (class)

The class is selected as a function of the normal motor starting time.

- Class 10: starting time less than 10 s.

- Class 20: starting time less than 20 s.

For a given class, it is necessary to check that all motor-feeder components are sized to carry the 7.2 I_r starting current without excessive temperature rise during the time corresponding to the class.

Short time delay protection (I_{sd})

Short time delay protection (around 100 ms) to let through motor starting currents, but to protect cables and motor starter devices and allow not to oversize them (particularly usefull for wide range settings circuit breakers).

Fixed pick-up I_{sd} = 13 I_r.

Short-circuit protection (I_i)

Instantaneous protection with non-adjustable pick-up I_i=17 I_n.

Phase unbalance or phase loss (I_{unbal}, t_{unbal})

This function opens the circuit breaker if a phase unbalance occurs:

- that is greater than the 30 % of I_{rms} (fixed pick-up): **I_{unbal}**

- following the non-adjustable time delay (**t_{unbal}**) equal to:

- 0.7 s during starting

- 4 s during normal operation.

Phase loss is an extreme case of phase unbalance and leads to tripping under the same conditions.

Ground-fault protection (I_g, t_g)

Residual type ground-fault protection:

- fixed pick-up I_g = I_n

- fixed time delay t_g = 0.1 s.

Indications

Front indications

- Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of an abnormal deviation in engine operating conditions.

- Red alarm LED: goes ON when the thermal image of the motor is greater than 95 % of the permissible temperature rise.

Standards and certifications

IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL 60497-4-1, CSA 22.2 n° 60497-4-1, CCC, EAC, CSA (cCSAus).

| Thermal magnetic motor circuit breakers from 0.25 to 55 kW | | | | | | | | | | Thermal setting range (I _r) A | Reference with EverLink terminals | |
|--|--------------------|---------------------|-------------|--------------------|---------------------|-------------|--------------------|---------------------|-------------|--|-----------------------------------|--------------------|
| Standard power ratings of 3-phase motors - 50 / 60 Hz in category AC-3 | | | | | | | | | with toggle | | with rotary handle | |
| 400/415 V | | | 500 V | | | 690 V | | | | P kW | | I _{cu} kA |
| P kW | I _{cu} kA | I _{cs} (%) | P kW | I _{cu} kA | I _{cs} (%) | P kW | I _{cu} kA | I _{cs} (%) | | | | |
| 0.25... 0.75 | 25 | 100 | 0.37... 1.1 | 10 | 100 | 0.55... 1.5 | - | - | 0.8... 2 | - | - | |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PE02N | GV4P02N | |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PE02S | - | |
| 0.55... 1.5 | 25 | 100 | 0.75... 1.5 | 10 | 100 | 1.1... 2.2 | - | - | 1.4... 3.5 | - | - | |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PE03N | GV4P03N | |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PE03S | - | |
| 1.5... 3 | 25 | 100 | 2.2... 4 | 10 | 100 | 3... 7.5 | - | - | 2.9... 7 | - | - | |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PE07N | GV4P07N | |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PE07S | - | |
| 3... 5.5 | 25 | 100 | 3... 7.5 | 10 | 100 | 5.5... 11 | - | - | 5... 12.5 | - | - | |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PE12N | GV4P12N | |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PE12S | - | |
| 5.5... 11 | 25 | 100 | 7.5... 15 | 10 | 100 | 7.5... 18.5 | - | - | 10... 25 | GV4PE25B | GV4P25B | |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PE25N | GV4P25N | |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PE25S | - | |
| 11... 22 | 25 | 100 | 15... 30 | 10 | 100 | 18.5... 45 | - | - | 20... 50 | GV4PE50B | GV4P50B | |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PE50N | GV4P50N | |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PE50S | - | |
| 22... 37 | 25 | 100 | 30... 55 | 10 | 100 | 37... 55 | - | - | 40... 80 | GV4PE80B | GV4P80B | |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PE80N | GV4P80N | |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PE80S | GV4P80S | |
| 37... 55 | 25 | 100 | 45... 75 | 10 | 100 | 75... 90 | - | - | 65... 115 | GV4PE115B | GV4P115B | |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PE115N | GV4P115N | |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PE115S | GV4P115S | |

| Thermal magnetic motor circuit breakers from 3/4 to 75 HP / 480 V | | | | | | | | | | | | Rating A | Reference with EverLink terminals | |
|---|----------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|-----------------------------------|--------------------|
| Single-Phase 120 V | | | | 3-Phase | | | | | | | | | with toggle | with rotary handle |
| Power HP | FLA A | Power Hp | FLA A | Power Hp | FLA A | Power Hp | FLA A | Power Hp | FLA A | Power Hp | FLA A | | | |
| - | - | 1/10 | 1.5 | - | - | - | - | 3/4 | 1.6 | 1 | 1.7 | 2 | - | - |
| | | | | | | | | | | | | | GV4PE02N | GV4P02N |
| | | | | | | | | | | | | | GV4PE02S | - |
| 1/10 | 3 | 1/4 | 2.9 | 1/2 | 2.4 | 3/4 | 3.2 | 2 | 3.4 | 2 | 2.7 | 3.5 | - | - |
| | | | | | | | | | | | | | GV4PE03N | GV4P03N |
| | | | | | | | | | | | | | GV4PE03S | - |
| 1/4 | 5.8 | 3/4 | 6.9 | 1-1/2 | 6.6 | 2 | 6.8 | 3 | 4.8 | 5 | 6.1 | 7 | - | - |
| | | | | | | | | | | | | | GV4PE07N | GV4P07N |
| | | | | | | | | | | | | | GV4PE07S | - |
| 1/2 | 9.8 | 1-1/2 | 10 | 3 | 10.6 | 3 | 9.6 | 7-1/2 | 11 | 10 | 11 | 12.5 | - | - |
| | | | | | | | | | | | | | GV4PE12N | GV4P12N |
| | | | | | | | | | | | | | GV4PE12S | - |
| 1-1/2 | 20 | 3 | 17 | 5 | 16.7 | 7-1/2 | 22 | 15 | 21 | 20 | 22 | 25 | GV4PE25B | GV4P25B |
| | | | | | | | | | | | | | GV4PE25N | GV4P25N |
| | | | | | | | | | | | | | GV4PE25S | - |
| 3 | 34 | 7-1/2 | 40 | 10 | 30.8 | 15 | 42 | 30 | 40 | 40 | 41 | 50 | GV4PE50B | GV4P50B |
| | | | | | | | | | | | | | GV4PE50N | GV4P50N |
| | | | | | | | | | | | | | GV4PE50S | - |
| 7-1/2 | 80 | 15 | 68 | 25 | 74.8 | 30 | 80 | 60 | 77 | 75 | 77 | 80 | GV4PE80B | GV4P80B |
| | | | | | | | | | | | | | GV4PE80N | GV4P80N |
| | | | | | | | | | | | | | GV4PE80S | GV4P80S |
| 10 | 100 | 20 | 88 | 30 | 88 | 40 | 104 | 75 | 96 | 100 | 99 | 115 | GV4PE115B | GV4P115B |
| | | | | | | | | | | | | | GV4PE115N | GV4P115N |
| | | | | | | | | | | | | | GV4PE115S | GV4P115S |

Connection by lugs
 To order circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: GV4PE02N becomes **GV4PE02N6**.

(1) As % of I_{cu}.

Characteristics:
pages B6/120 to B6/123

Curves:
pages B6/129 to B6/131

Dimensions, schemes:
pages B6/134, B6/135, B6/137



Motor circuit breakers



GV4PEM

Advanced version

Basic protection

Settings are made using dials.

Overloads or thermal protection (I_r)

Inverse-time thermal protection against overloads with adjustable pick-up I_r .

Wide range setting made in amperes.

The tripping curve for the thermal protection, which indicates the time delay t_r before tripping, is defined by the selected trip class.

Trip class (class)

The class is selected as a function of the normal motor starting time.

■ Class 10: starting time less than 10 s.

■ Class 20: starting time less than 20 s.

For a given class, it is necessary to check that all motor-feeder components are sized to carry the $7.2 I_r$ starting current without excessive temperature rise during the time corresponding to the class.

Short-circuit protection (I_i)

Instantaneous protection with non-adjustable pick-up $I_i = 17 I_n$.

Advanced protection

Settings are made with an Android smartphone with dedicated application and using wireless NFC (Near Field Communication), or a computer with EcoStruxure Power Commission software and the configuration/maintenance tool kit ("Maintenance case" TRV00910).

The LV434206 pocket battery allows the GV4PEM controller to be powered for adjustments and tests when no internal source is available.

Short time delay protection (I_{sd})

Short time delay protection (around 100 ms) to let through motor starting currents, but to protect cables and motor starter devices and allow not to oversize them (particularly usefull for wide range settings circuit breakers).

Adjustable pick-up $I_{sd} = 5...13 I_r$ (13 by default).

Phase unbalance or phase loss (I_{unbal} , t_{unbal})

This function opens the circuit breaker if a phase unbalance occurs:

■ that is greater than the 10...40 % of I_{rms} (30% by default): I_{unbal}

■ following a time delay (t_{unbal}) equal to:

□ 0.7 s during starting (non adjustable)

□ 1...10 s during normal operation (4 s by default).

Phase loss is an extreme case of phase unbalance and leads to tripping under the same conditions.

Ground-fault protection (I_g , t_g)

Residual type ground-fault protection, with OFF position:

■ adjustable pick-up I_g :

□ 0.7...1 I_n for products with nominal current from 2 to 50 A

□ 0.4...1 I_n for products with nominal current from 80 to 115 A

■ adjustable time delay t_g 0.1...0.4 s.

Jam (I_{jam} , t_{jam})

This function detects locking of the motor shaft caused by the load, with OFF position (OFF by default). During motor starting the function is disabled.

During normal operation, it causes tripping:

■ above the I_{jam} pick-up that can be fine-adjusted from 1.5 to 8 I_r

■ in conjunction with the t_{jam} time delay that can be adjusted from 1 to 30 s.

Long start (I_{long} , t_{long})

This protection supplements thermal protection (class). It is used to optimize the protection according to the starting parameters, with OFF position (OFF by default).

It detects abnormal motor starting i.e. when the starting current remains too high or too low with respect to a pick-up value and a time delay.

It causes tripping:

■ in relation with a I_{long} pick-up that can be fine-adjusted from 1.5 to 8 I_r

■ in conjunction with the t_{long} time delay that can be adjusted from 1 to 200 s.

Indications

Front indications

■ Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of an abnormal deviation in engine operating conditions.

■ Red alarm LED: goes ON when the thermal image of the motor is greater than 95 % of the permissible temperature rise.

Remote indications via SDx module

See description on page B6/44.

Standards and certifications

IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL 60497-4-1, CSA 22.2 n° 60497-4-1, CCC, EAC, CSA (cCSAus).

| Advanced thermal magnetic motor circuit breakers from 0.25 to 55 kW | | | | | | | | | | |
|--|--------------------|----------------------------------|-------------|--------------------|----------------------------------|-------------|--------------------|----------------------------------|---|---|
| Standard power ratings of 3-phase motors - 50 / 60 Hz in category AC-3 | | | | | | | | | Thermal setting range (I _r) | "Reference with EverLink terminals" with toggle |
| 400/415 V | | | 500 V | | | 690 V | | | | |
| P kW | I _{cu} kA | I _{cs} ⁽¹⁾ % | P kW | I _{cu} kA | I _{cs} ⁽¹⁾ % | P kW | I _{cu} kA | I _{cs} ⁽¹⁾ % | A | |
| 0.25... 0.75 | 25 | 100 | 0.37... 1.1 | 10 | 100 | 0.55... 1.5 | - | - | 0.8... 2 | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PEM02N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PEM02S |
| 0.55... 1.5 | 25 | 100 | 0.75... 1.5 | 10 | 100 | 1.1... 2.2 | - | - | 1.4... 3.5 | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PEM03N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PEM03S |
| 1.5... 3 | 25 | 100 | 2.2... 4 | 10 | 100 | 3... 7.5 | - | - | 2.9... 7 | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PEM07N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PEM07S |
| 3... 5.5 | 25 | 100 | 3... 7.5 | 10 | 100 | 5.5... 11 | - | - | 5... 12.5 | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PEM12N |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PEM12S |
| 5.5... 11 | 25 | 100 | 7.5... 15 | 10 | 100 | 7.5... 18.5 | - | - | 10... 25 | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PEM25B |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PEM25N GV4PEM25S |
| 11... 22 | 25 | 100 | 15... 30 | 10 | 100 | 18.5... 45 | - | - | 20... 50 | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PEM50B |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PEM50N GV4PEM50S |
| 22... 37 | 25 | 100 | 30... 55 | 10 | 100 | 37... 55 | - | - | 40... 80 | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PEM80B |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PEM80N GV4PEM80S |
| 37... 55 | 25 | 100 | 45... 75 | 10 | 100 | 75... 90 | - | - | 65... 115 | - |
| | 50 | 100 | | 25 | 100 | | 8 | 25 | | GV4PEM115B |
| | 100 | 100 | | 30 | 100 | | 10 | 25 | | GV4PEM115N GV4PEM115S |



Motor circuit breakers

Connection by lugs
 To order circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV4PE02N** becomes **GV4PE02N6**.

(1) As % of I_{cu}.



GV4PB

Advanced version

Ref. GV4PB is based on GV4PEM with specific tripping curve to follow UL489 SH supplement. It is designed with a large space connector in order to increase creepage and clearance distance.

Basic protection

Settings are made using dials.

Overloads or thermal protection (Ir)

Inverse-time thermal protection against overloads with adjustable pick-up Ir. Wide range setting made in amperes.

The tripping curve for the thermal protection, which indicates the time delay tr before tripping, is defined by the selected trip class.

Trip class (class)

The class is selected as a function of the normal motor starting time. It corresponds to the value of the tripping time delay for a current of 600 % of the rated tripping current according to UL489, SH supplement.

The rated tripping current is selected as 125 % of the dial value.

■ Class 10: starting time less than 10 s.

■ Class 20: starting time less than 20 s.

For a given class, it is necessary to check that all motor-feeder components are sized to withstand the 7.5 Ir starting current without excessive temperature rise during the time corresponding to the class.

Short-circuit protection (Ii)

Instantaneous protection with non-adjustable pick-up Ii=17 In.

Advanced protection (same as ref. GV4PEM)

Settings are made with:

■ Android smartphone using wireless NFC (Near Field Communication), or EcoStruxure Power Device App. computer + EcoStruxure Power Commission software and configuration/maintenance tool kit TRV00910

■ LV434206 pocket battery, allows the GV4PB controller to be powered for adjustment and test. LV434206 pocket battery needs to be connected to the GV4PB controller to set the advanced protection.

Short time delay protection (I_{sd})

Short time delay protection (around 100 ms) to let through motor starting currents, but to protect cables and motor starter devices and allow not to oversize them (particularly usefull for wide range settings circuit breakers).

Adjustable pick-up I_{sd} = 5...13 Ir (13 by default).

Phase unbalance or phase loss (I_{unbal}, I_{tunbal})

This function opens the circuit breaker if a phase unbalance occurs:

■ that is greater than the 10...40 % of I_{rms} (30 % by default): I_{unbal}

■ following a time delay (I_{tunbal}) equal to:

□ 0.7 s during starting (non adjustable)

□ 1...10 s during normal operation (4 s by default).

Phase loss is an extreme case of phase unbalance and leads to tripping under the same conditions.

Ground-fault protection (I_g, t_g)

Residual type ground-fault protection, with OFF position:

■ adjustable pick-up I_g:

□ 0.7...1 In for products with nominal current from 2 to 50 A

□ 0.4...1 In for products with nominal current from 80 to 115 A

■ adjustable time delay t_g 0.1...0.4 s.

Jam (I_{jam}, t_{jam})

This function detects locking of the motor shaft caused by the load, with OFF position (OFF by default). During motor starting the function is disabled.

During normal operation, it causes tripping:

■ above the I_{jam} pick-up that can be fine-adjusted from 1.5 to 8 Ir

■ in conjunction with the t_{jam} time delay that can be adjusted from 1 to 30 s.

Long start (I_{long}, t_{long})

This protection supplements thermal protection (class). It is used to optimize the protection according to the starting parameters, with OFF position (OFF by default). It detects abnormal motor starting i.e. when the starting current remains too high or too low with respect to a pick-up value and a time delay.

It causes tripping:

■ in relation with a I_{long} pick-up that can be fine-adjusted from 1.5 to 8 Ir

■ in conjunction with the t_{long} time delay that can be adjusted from 1 to 200 s.

Indications

Front indications

■ Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of an abnormal deviation in engine operating conditions.

■ Red alarm LED: goes ON when the thermal image of the motor is greater than 95 % of the permissible temperature rise

Remote indications via SDx module

See description on page B6/44.

Conforming to standards:

IEC/EN 60947-2, IEC/EN 60947-4-1

Product certifications:

UL 489, CSA C22.2 n°5.

TeSys Power

Deca - Frame 4 Motor circuit breakers - Thermal-magnetic

Product references - UL applications

| GV4PB - selection according to Short Circuit Current Rating (SCCR) | | | |
|--|-----------------------------|-----------------------------|--------------------------|
| 240 V AC SCCR kA | 480Y/277 V AC SCCR kA | 600Y/347 V AC SCCR kA | Reference |
| 35 | 18 | 14 | GV4PB●●●B ⁽¹⁾ |
| 65 | 35 | 18 | GV4PB●●●N |
| 100 | 65 | 25 | GV4PB●●●S |

(1) Example: GV4PB07S, GV4PB115S.

| GV4PB thermal magnetic motor circuit breakers - selection according to FLA | | | | | | | |
|--|-------------------------|-------------------------|------------|-----------------|-----------|-----------|-----------|
| 3P 200 V FLA A | 3P 230 V FLA A | 3P 460 V FLA A | Rated % | Dial range A | Reference | | |
| - | - | 1.6 | 100 | 0.8 to 2 | | GV4PB02N | GV4PB02S |
| 2.5 | 2.2 | 3 | 100 | 1.4 to 3.5 | | GV4PB03N | GV4PB03S |
| 4.8 | 4.2 | 4.8 | 100 | 2.9 to 7 | | GV4PB07N | GV4PB07S |
| 7.8 | 9.6 | 7.6 | 100 | 5 to 12.5 | | GV4PB12N | GV4PB12S |
| 17.5 | 22 | 21 | 100 | 10 to 25 | GV4PB25B | GV4PB25N | GV4PB25S |
| 48 | 42 | 40 | 100 | 20 to 50 | GV4PB50B | GV4PB50N | GV4PB50S |
| 62 | 54 | 52 | 80 | 40 to 80 | GV4PB80B | GV4PB80N | GV4PB80S |
| 92 | 80 | 77 | 80 | 65 to 115 | GV4PB115B | GV4PB115N | GV4PB115S |

Connection by lugs

Please order GV4LUG accessory and LV426920 interphase barriers or LAD96590 terminal shield.



Motor
circuit
breakers

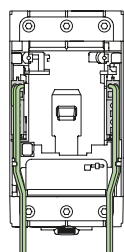
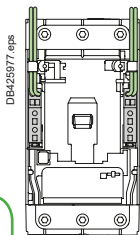
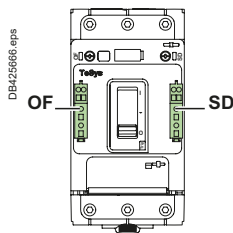
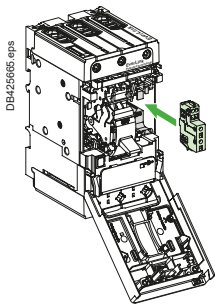
TeSys Power

Deca - Frame 4 Motor circuit breakers - Auxiliary contact block

Product references

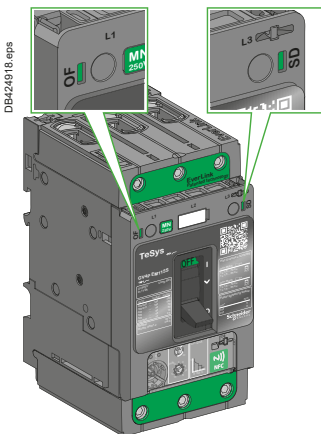


GV4AE11 auxiliary contact block



Motor circuit breakers

Pluggable auxiliary contact - OF or SD is dependent on cavity. Multiple internal wiring possibilities, even with long terminal shields



Visible presence of auxiliary contact block in OF or SD cavity

Auxiliary contact blocks

Auxiliary contacts give an indication of the circuit breaker status.

They can be used for remote visual signaling, alarming, electrical locking, relay activation, etc...

An auxiliary contact block provides one changeover contact with common point for OF or SD function, depending on the breaker cavity where it is inserted.

Auxiliary contact - Open/Close OF function

Indicates Open/Closed position of the circuit breaker contacts.

Auxiliary contact - Trip alarm SD function

■ Indicates that the circuit breaker has tripped due to:

- Electrical fault (overload, short circuit, ...)
- shunt trip
- undervoltage release
- "push-to-trip" button.

■ Resets when circuit breaker is reset.

Electrical characteristic

Characteristics

| | | | | | |
|---|---------------------------|-------------|-------------|-------------|-------------|
| Rated thermal current (A) | 5 | | | | |
| Minimum load | 2 mA at 17 V DC | | | | |
| Utilization cat. (IEC 60947-5-1) | AC12 | AC15 | DC12 | DC13 | DC14 |
| Operational current (A) | 24 V AC/DC | 5 | 5 | 5 | 2.5 |
| | 48 V AC/DC | 5 | 5 | 2.5 | 1.2 |
| | 110...127 V AC / 110 V DC | 5 | 4 | 0.6 | 0.35 |
| | 220/240 V AC | 5 | 3 | - | - |
| | 250 V DC | - | - | 0.3 | 0.05 |
| | 380/440 V AC | 5 | 2.5 | - | - |
| | 660/690 V AC | 5 | 0.11 | - | - |

Pilot duty B600 according UL508 and CSA 22.2 n°14.

Installation and connection

■ Auxiliary contact blocks snap into left (for OF function) and right (for SD function) cavities behind the front accessory cover of the circuit breaker and their presence is visible on the front face through green flags.

■ One model serves for all indication functions depending on where it is fitted in the circuit breaker.

■ Each NO and NC spring terminal may be connected by one 0.5...1.5 mm² flexible copper wire and by two for the common point.

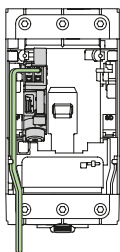
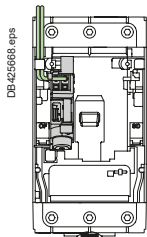
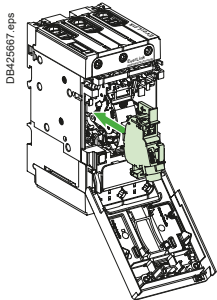
■ Wires can be exited out of any of the four corners of the breaker under the accessory cover.

| Description | Maximum number | Mounting | Type of contacts | Sold in lots of | Reference |
|---|-----------------|------------------|------------------|-----------------|-----------|
| Auxiliary contact block for OF or SD indication | 2 (1 OF + 1 SD) | Internal plug-in | NO + NC | 1 | GV4AE11 |

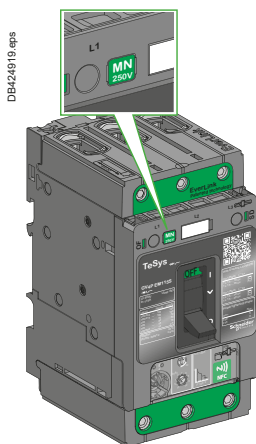
TeSys Power

Deca - Frame 4 Motor circuit breakers - MX and MN trips

Product references



MN or MX plugged into cavity. Multiple internal wiring possibilities, even with long terminal shields



Visible presence of MN undervoltage release in circuit breaker cavity, visible rated voltage through the window.

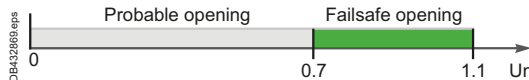
MX shunt trip, MN undervoltage release

MX and MN trip the circuit breaker on a control signal. They are mainly used for remote and emergency-off commands.

It is advised to test the system every six months.

MX shunt trip

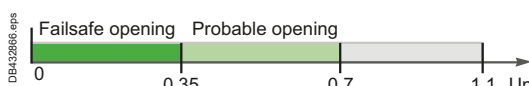
- Trips the circuit breaker when the control voltage rises above 70 % of its rated voltage (U_n).
- Impulse type ≥ 20 ms or maintained control signals.
- Shunt trip 110...130 V AC is suitable for ground-fault protection when combined with a Class I ground-fault sensing element.
- Continuous duty rated coil ⁽¹⁾.



Opening conditions of the MX release.

MN undervoltage release

- Trips the circuit breaker when the control voltage drops below 35 % of its rated voltage.
- Between 35 % and 70 % of the rated voltage opening is only probable.
- Above 70 % of the rated voltage, opening does not take place.
- Continuous duty rated coil.
- Circuit breaker closing is possible only if the voltage exceeds 85 % of the rated voltage. If an undervoltage condition exists, operation of the closing mechanism of the circuit breaker will not permit the main contacts to touch, even momentarily. This is commonly called "Kiss Free".



Opening conditions of the MN release.



Closing conditions of the MN release.

Installation, connection

Accessories snap into cavities under the circuit breaker front accessory cover. Spring-type terminals in order to insure a fast and reliable connection to 0.5...1.5 mm² flexible copper wire (one per terminal).

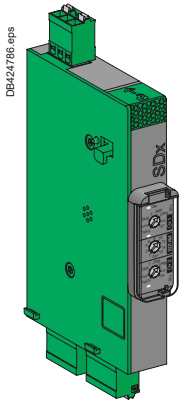
Operation

Circuit breaker must be locally reset after trip by shunt trip (MX) or undervoltage release (MN). Tripping by MX or MN has priority over manual closing; in the presence of a standing trip order such an action does not result in main contacts closing, even temporarily.

| Description | Maximum number | Mounting | Voltage | Reference |
|-------------------------|----------------|-------------------|---|-----------|
| MX Shunt trip | 1 | Internal, plug-in | 24 V~ 50/60 Hz, 24 V--- | GV4AS027 |
| | | | 48 V~ 50/60 Hz, 48 V--- | GV4AS057 |
| | | | 110-130 V~ 50/60 Hz 125 V--- | GV4AS137 |
| | | | 220-240 V~ 50 Hz, 208-240 V~ 60 Hz, 277 V 60 Hz | GV4AS287 |
| | | | 380-415 V~ 50 Hz, 440-480 V~ 60 Hz | GV4AS487 |
| MN undervoltage release | 1 | Internal, plug-in | 24 V~ 50/60 Hz, 24 V--- | GV4AU027 |
| | | | 48 V~ 50/60 Hz, 48 V--- | GV4AU057 |
| | | | 110-130 V~ 50/60 Hz 125 V--- | GV4AU137 |
| | | | 220-240 V~ 50 Hz, 208-240 V~ 60 Hz | GV4AU247 |
| | | | 277 V~ 60 hZ | GV4AU286 |
| | | | 380-415 V~ 50 Hz | GV4AU415 |
| | | | 440-480 V~ 60 Hz | GV4AU486 |

⁽¹⁾ Except for MX 24 V AC/DC (in case of continuous activation, may generate some minor perturbation in sensitive environment).





GV4ADM1111 SDx contact module



SDx contact module for GV4PEM, GV4PB (Multifunction)

The SDx provides alarming and functional fault differentiation for GV4PEM, GV4PB (Multifunction) circuit breaker. This module has 2 NO/NC outputs dry contacts which can be assigned with one of the 8 following SD status:

- **SDT95%** overload alarm: thermal image of the motor is greater than 95 % of the permissible temperature rise.
- **SDTxxs** overload alarm: circuit breaker will trip in xx seconds with the same load. xx is adjustable between 10 to 40 seconds (default 20 seconds) on the circuit breaker itself through NFC or a computer with EcoStruxure Power Commission software and an interface module (TRV00911).
- **SDTAM** overload alarm just before tripping: in the event of a phase unbalance, overload, or on a jam fault, this output is activated to open the contactor and avoid circuit breaker tripping. In that case, contact can be manually or automatically reseted after an adjustable cooling time from 1 to 15 minutes. If after a 400 ms delay the motor is not stopped, the circuit breaker will trip.
- **SDT** overload trip indication: circuit breaker has tripped due to an overload fault
- **SDJAM** jam trip indication: circuit breaker has tripped due to a jam fault
- **SDUNB** phase unbalance trip indication: circuit breaker has tripped due to an unbalance fault
- **SDLS** long start trip indication: circuit breaker has tripped due to a long start fault
- **SDGF** ground-fault trip indication: circuit breaker has tripped due to a ground-fault.

Outputs are automatically reseted either when alarm disappears or when the circuit breaker is restarted.

Output characteristics

- 2 NO/NC dry contacts
- 24...250 V AC/DC
- Minimum load: 2 mA under 24 V DC
- Max load: 5 A
- AC15 (230 V max - 400 VA)
- DC13 (24 V - 50 W)

Power characteristics

- 24...240 V AC/DC

Contact rating (per UL/CSA B300 & R300)

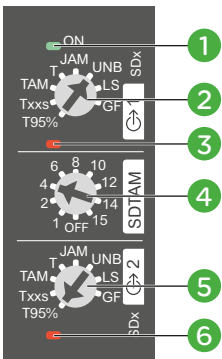
| Standard | Rated Voltage Ue | Operational Current Ie | Make | Break | Ithe |
|----------|------------------|------------------------|------|-------|------|
| | | | VA | VA | A |
| B300 | 120 V AC | 3 | 3600 | 360 | 5 |
| | 240 V AC | 1.5 | | | |
| R300 | 125 V DC | 0.22 | 28 | 28 | 1 |
| | 250 V DC | 0.1 | | | |

The rated operational current I_e (A), the rated operational voltage U_e (V) and the break apparent power B (V.A) are correlated by the formula $B = U_e \cdot I_e$; with $I_e \leq I_{th}$.

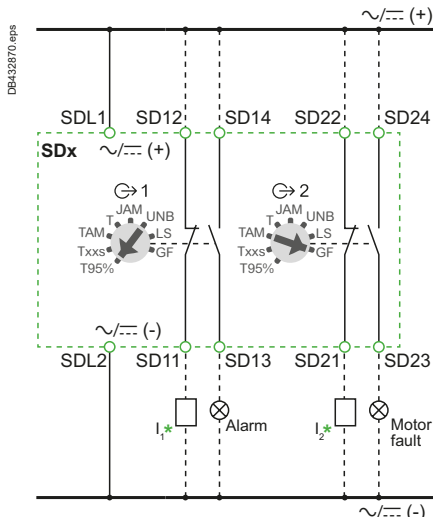
Installation, connection, settings and indication

The SDx module is clipped on the right side of the circuit breaker. Each removable spring terminal can be connected by one 0.5... 1.5 mm² copper wire. Settings and indications are available on the front face.

Motor circuit breakers

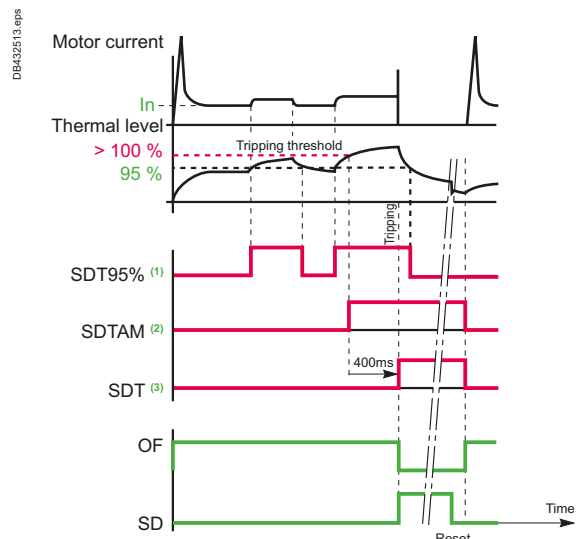


- 1 Green led lighted when the module is powered.
- 2 Output 1: SD status assignment.
- 3 Red led lighted when output 1 is activated.
- 4 Cooling time setting before automatic restart (OFF – 1...15 min).
- 5 Output 2: SD status assignment.
- 6 Red led lighted when output 2 is activated.



* I1, I2: PLC digital inputs - used as alarm inputs, as an example.

SDx wiring diagram



- GV4PEM curves
- SDx modules curves
- Aux. contacts curves

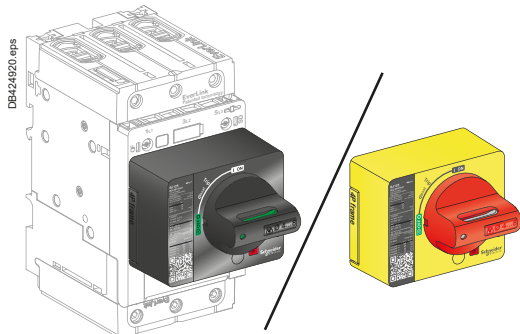
- (1) SDT95% (= 95% overload)
- (2) SDTAM (overload tripping pre alarm) here not connected to any contactor coil
- (3) SDT (= tripping on thermal fault)

| Description | Mounting | Maximum number | Type of contacts | Unit reference |
|--|----------|----------------|------------------|----------------|
| SDx: alarming / fault differentiation module | Side | 2 | N/O / N/C | GV4ADM1111 |

TeSys Power

Ref. GV4PE, GV4PEM, GV4PB Motor circuit breakers - Handles

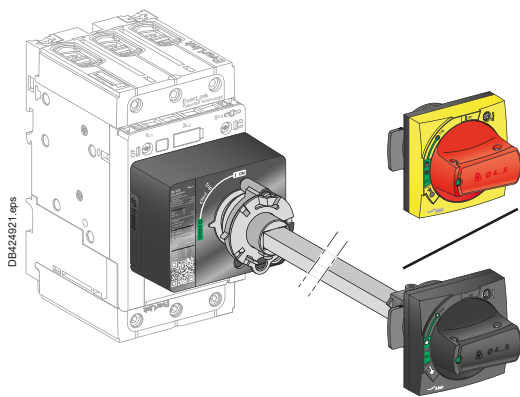
Product references



Direct mounting rotary handle



GV4ADN02 direct mounting rotary handle



Front extended rotary handle (door-mounting)



GV4APN01 front extended rotary handle kit



GVAPL01 laser tool

Dimensions:
pages B6/134 to B6/136

Direct mounting rotary handles

Installation

The direct mounting rotary handle has to be mounted by 3 screws on the front accessory cover.

Operation

The direct mounting rotary handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I) and tripped (Trip)
- access to the "push-to-trip" button
- visibility and access to the trip unit.

Device padlocking

The circuit breaker may be locked in the OFF position by using one to three padlocks (not supplied) or in ON position after customer modification of the rotary handle before installation, padlock shackle Ø4-8 mm. Locking in the ON position does not prevent the circuit breaker from tripping if a circuit or motor malfunction occurs. In this case, the handle remains in the ON position after the circuit breaker trips. Unlocking is required for the handle to go to the tripped then the OFF position.

Variations: door locking

Door locking built-in functionality can be activated by the customer to prevent opening the door when the circuit breaker is ON or in trip position. For exceptional situations, door locking can be temporarily disabled with a tool by qualified personnel to open the door when the circuit breaker is closed.

| Description | Type | Degree of protection | Reference |
|-------------------------------|--|----------------------|-----------|
| Direct mounting rotary handle | Black handle | IP40 | GV4ADN01 |
| | Red handle on yellow bezel (VDE standard, for machine control) | IP40 | GV4ADN02 |

Front extended rotary handles

Installation

The door-mounted (extended) rotary handle is made up of:

- a unit that has to be screwed on the front accessory cover of the circuit breaker
- an assembly (handle mechanism and front plate) on the door that is always secured in the same position, whether the circuit breaker is installed vertically or horizontally
- an adjustable extension shaft.

The handle mechanism is fixed with a nut (Ø22 mm) to make assembly easier. The Laser Square tool (GVAPL01) can be used to accurately align the hole on the door with the circuit breaker.

Operation when door is closed

The door mounted handle makes it possible to operate a circuit breaker installed in an enclosure from the front. The door mounted operating handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I) and tripped (Trip)
- visibility and access to trip unit when the door is open
- degree of protection of the handle on the door: IP54 or IP65 as per IEC 60529.

Mechanical door locking when device closed

A standard feature of the extended rotary handle is a locking function, built into the shaft, that disables door opening when the circuit breaker is in the ON or tripped positions.

Door locking can be temporarily disabled with a tool by qualified personnel to open the door without opening the circuit breaker. This operation is not possible if the handle is locked by a padlock.

Device and door padlocking

Padlocking locks the circuit breaker handle and disables door opening:

- standard situation, in the OFF position, using 1 to 3 padlocks, shackle Ø4-8 mm, padlocks are not supplied
- for the black handle, with a voluntary modification of the door handle (to be done by the customer during installation), in the ON and OFF positions. Locking in the ON position does not prevent the circuit breaker from tripping if a circuit or motor malfunction occurs. In this case, the handle remains in the ON position after the circuit breaker trips. Unlocking is required for the handle to go to the tripped then the OFF position.

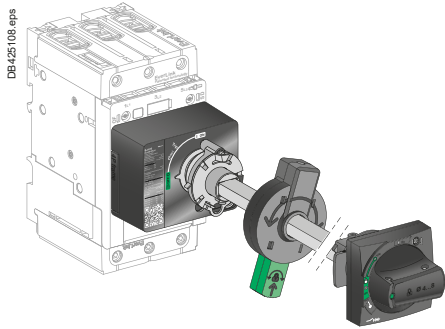
Shaft length

The shaft length is the distance between the back of the circuit breaker and the door:

- minimum shaft length is 214 mm
- maximum shaft length is 627 mm
- shaft length must be adjusted.



Motor circuit breakers



Open door shaft operator mounted on front extended rotary handle assembly



GV4APN01
Front extended rotary handle kit

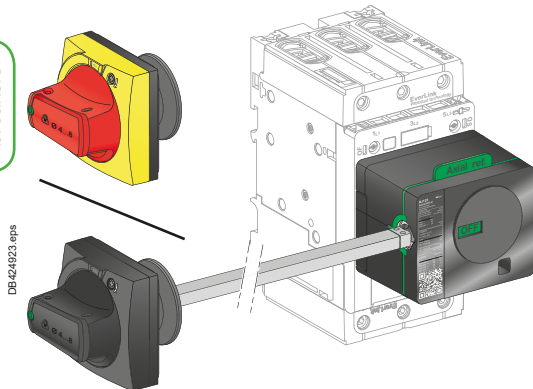


LV426937
Open door shaft operator



GVAPL01 - Laser tool

Motor circuit breakers



Side extended rotary handle (cover mounting)



LV426936 - Side rotary handle kit



LV426998, LV426997 - Universal handles

Front extended rotary handles (cont.)

Operation when door is opened

An open door shaft operator can be used to operate the circuit breaker when door is opened. This accessory complies with UL508 A.

The indication of the three positions OFF (O), ON (I) and tripped (Trip) is visible on the circuit breaker.

The circuit breaker itself may be locked in OFF position when the door is opened by 1 padlock / lockout hasp, shackle Ø4-8 mm.

| Description | Type | Degree of protection | Reference |
|---|----------------------------|----------------------|-----------|
| Front extended rotary handle kit | Black handle | IP54 | GV4APN01 |
| | Red handle on yellow bezel | IP54 | GV4APN02 |
| | | IP65 | GV4APN04 |
| Open door shaft operator | | | LV426937 |
| Laser tool | | | GVAPL01 |
| Spare part: GV4 universal handle (for replacement of front, ext. or side rotary handle) | Black handle | IP54 | LV426997 |
| | Red handle on yellow bezel | IP54 | LV426998 |
| | | IP65 | LV426999 |

Side rotary handles (left or right)

Installation

The side-mounted rotary handle is made up of:

- a unit that has to be screwed on the front accessory cover of the circuit breaker
- an assembly (handle and front plate) on the side (left or right) of the enclosure
- an adjustable extension shaft

The handle mechanism is fixed with a nut (Ø22 mm) to make assembly easier.

Operation

The side mounted rotary handle makes it possible to operate circuit breakers installed in enclosure from the side. The side mounted rotary handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I) and tripped (Trip). Moreover, the position is visible on the circuit breaker itself
- visibility and access to trip unit when the door is open
- degree of protection of the handle on the side: IP54 or IP65 as per IEC 529.

Device padlocking

The circuit breaker may be locked in the OFF position, or, for the black rotary handle only, in ON position after voluntary modification of the side handle (to be done by the customer during installation), by using one to three padlocks, padlock shackle Ø4-8 mm ; padlocks are not supplied.

Locking in the ON position does not prevent free circuit breaker from tripping if a circuit or motor malfunction occurs. In this case, the handle remains in the ON position after the circuit breaker tripping. Unlocking is required to go to the tripped then the OFF position.

Shaft length

The shaft length is the distance between the side of the circuit breaker and the side of the enclosure:

- minimum shaft length is 45 mm
- maximum shaft length is 480 mm
- shaft length must be adjusted.

| Description | Type | Degree of protection | Reference |
|---|--|----------------------|-----------|
| Side rotary handle kit | Black handle | IP54 | LV426935 |
| | Red handle on yellow bezel (VDE standard, for machine control) | IP54 ⁽¹⁾ | LV426936 |
| Spare part: GV4 universal handle (for replacement of front, ext. or side rotary handle) | Black handle | IP54 | LV426997 |
| | Red handle on yellow bezel | IP54 | LV426998 |
| | | IP65 | LV426999 |

⁽¹⁾ IP65 possible with LV426935 kit (Black handle not used) + LV426999 Red handle on yellow bezel universal handle.

Handle padlocking devices

Padlocking systems can receive up to three padlocks with diameters of 5-8 mm (4-8 mm for rotary handles); padlocks not supplied. Locking in the OFF position guarantees isolation as per IEC 60947-2.

Direct rotary handle padlocking

By padlock – No accessory required.

- Lock in OFF position.
- Lock in ON position with simple mechanism modification.

Front Extended /Side rotary handle padlocking

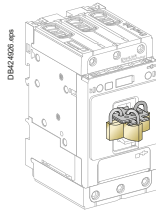
By padlock – No accessory required.

- Lock in OFF position.
- Lock in ON position with simple mechanism modification (black handle only).
Door opening prevented.

Toggle handle padlocking

By padlock – removable toggle locking device required **29370**.

- Lock in OFF position.



3 padlocks mounted on 29370 toggle locking device



29370 removable toggle locking device

| Description | Reference |
|---|--------------|
| Removable toggle locking device for 1 to 3 padlocks | 29370 |

Sealing devices

| Control type | ■ Front removal. ■ Access to auxiliaries. | ■ Access to settings and test connector. |
|--------------|--|--|
|--------------|--|--|

| | | |
|---------------|--|--|
| Toggle | | |
| Rotary handle | | |

| Description | Reference |
|--|-----------------|
| Bag of 6 leads + 6 sealing accessories | LV429375 |



LV429375 leads + sealing accessories

TeSys Power

Deca - Frame 4 Motor circuit breakers - Accessories

Product references



EverLink power connection

| Description | Reference |
|--------------------|-----------------|
| EverLink connector | LAD96595 |

Crimp lug/busbar connection

| Description | Sold in lots of | Reference |
|---|-------------------------------------|-----------------|
| Crimped lug connector + screws | 1 | GV4LUG |
| Transparent terminal shield for crimped lug connector | 1 | LAD96590 |
| Interphase barriers | 6 | LV426920 |
| Spreader 3-pole | To increase the pitch to 35 mm 1 | LV426940 |

Limited torque throwaway bits

| Description | Sold in lots of | Reference |
|----------------|-----------------|-----------------|
| Green - 9 N.m | 6 | LV426990 |
| Yellow - 5 N.m | 6 | LV426992 |

Note: torque limiting breakaway bits may be used, particularly in the field, to tighten at the right torque EverLink™ or compression lug power connections.

Test tool, software, demo for GV4PEM

Test tool

| | |
|--|-----------------|
| Pocket battery | LV434206 |
| Allows the ref. GV4PEM or GV4PB controller to be powered for adjustments and tests when no internal source is available. | |

| | |
|------------------|-----------------|
| Maintenance case | TRV00910 |
| Comprising: | |

- USB maintenance interface
- Power supply
- GV4PEM cord
- USB cord
- RJ45/RJ45 male cord

| | |
|---------------------------------|-----------------|
| Spare USB maintenance interface | TRV00911 |
|---------------------------------|-----------------|

| | |
|--|-----------------|
| USB interface spare power supply, 110-240 V AC, with 4 different socket adapters | TRV00915 |
|--|-----------------|

| | |
|---|-----------------|
| Spare cord for connecting GV4PEM to USB maintenance interface | TRV00917 |
|---|-----------------|

Software

| | |
|---|----------------------|
| Configuration and setting software EcoStruxure Power Commission | Free download |
|---|----------------------|

TeSys Giga - Frame 5, 6 55 to 250 kW



Motor
circuit
breakers

PB 120638 eps



GV5P220F

Thermal-magnetic circuit breakers Frame 5 with screw clamp terminals up to 110 kW ⁽¹⁾

Control by direct rotary handle

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Thermal setting range (lr) | Reference | Weight |
|--|-----------------|--------------------------------|---------|-----------------|--------------------------------|-----------|-----------------|--------------------------------|----------------------------|-----------|--------|
| 400/415 V | | | 500 V | | | 660/690 V | | | | | |
| P | I _{cu} | I _{cs} ⁽²⁾ | P | I _{cu} | I _{cs} ⁽²⁾ | P | I _{cu} | I _{cs} ⁽²⁾ | A | | kg |
| kW | kA | % | kW | kA | % | kW | kA | % | | | |
| 55...75 | 36 | 100 | 75...90 | 30 | 100 | 90...110 | 8 | 100 | 70...150 | GV5P150F | 2.4 |
| | 70 | 100 | | 50 | 100 | | 10 | 100 | | GV5P150H | |
| 90...110 | 36 | 100 | 110 | 30 | 100 | 110...132 | 8 | 100 | 100...220 | GV5P220F | 2.6 |
| | 70 | 100 | | 50 | 100 | | 10 | 100 | | GV5P220H | |

⁽¹⁾ Breakers have to be used with suitable rating of contactors, as defined in section A6.

⁽²⁾ As % of I_{cu}.

PB 120633 eps



GV6P320F

Thermal-magnetic circuit breakers Frame 6 with screw clamp terminals up to 250 kW ⁽¹⁾

Control by direct rotary handle

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | | | | Thermal setting range (lr) | Reference | Weight |
|--|-----------------|--------------------------------|-----------|-----------------|--------------------------------|-----------|-----------------|--------------------------------|----------------------------|-----------|--------|
| 400/415 V | | | 500 V | | | 660/690 V | | | | | |
| P | I _{cu} | I _{cs} ⁽²⁾ | P | I _{cu} | I _{cs} ⁽²⁾ | P | I _{cu} | I _{cs} ⁽²⁾ | A | | kg |
| kW | kA | % | kW | kA | % | kW | kA | % | | | |
| 132...160 | 36 | 100 | 160...200 | 25 | 100 | 200...250 | 10 | 100 | 160...320 | GV6P320F | 6.5 |
| | 70 | 100 | | 50 | 100 | | 10 | 100 | | GV6P320H | |
| 200...250 | 36 | 100 | 250...315 | 25 | 100 | 315...400 | 10 | 100 | 250...500 | GV6P500F | 6.7 |
| | 70 | 100 | | 50 | 100 | | 10 | 100 | | GV6P500H | |

⁽¹⁾ Breakers have to be used with suitable rating of contactors, as defined in section A6.

⁽²⁾ As % of I_{cu}.

Thermal-magnetic circuit breakers Frame 5/6 with screw clamp terminals ⁽¹⁾

Control by direct rotary handle

| Thermal setting | 3-Phase | | | Standard breaking capacity | High breaking capacity |
|-----------------|---------|-------|-------|----------------------------|------------------------|
| | 230 V | 460 V | 575 V | | |
| A | HP | HP | HP | Reference | Reference |
| 90...150 | 50 | 100 | 150 | GV5P150F | GV5P150H |
| 133...220 | 75 | 150 | 200 | GV5P220F | GV5P220H |
| 160...320 | 125 | 250 | 300 | GV6P320F | GV6P320H |
| 250...500 | 150 | 350 | 500 | GV6P500F | GV6P500H |

⁽¹⁾ Breakers have to be used with suitable rating of contactors, as defined in section A6.

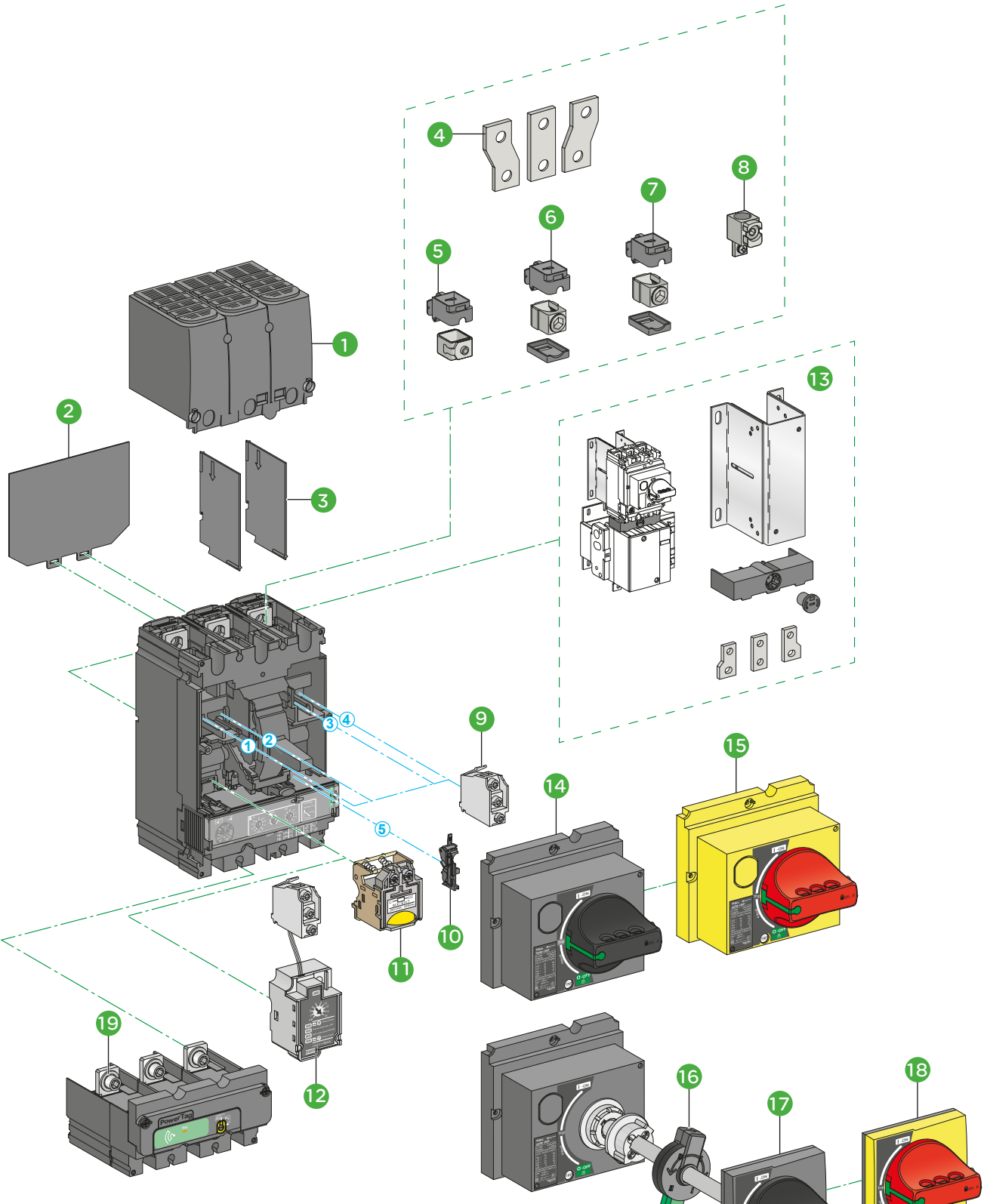


Motor circuit breakers

Frame 5 Motor circuit breaker - Add-on blocks and accessories

DE432613.ai

Motor circuit breakers

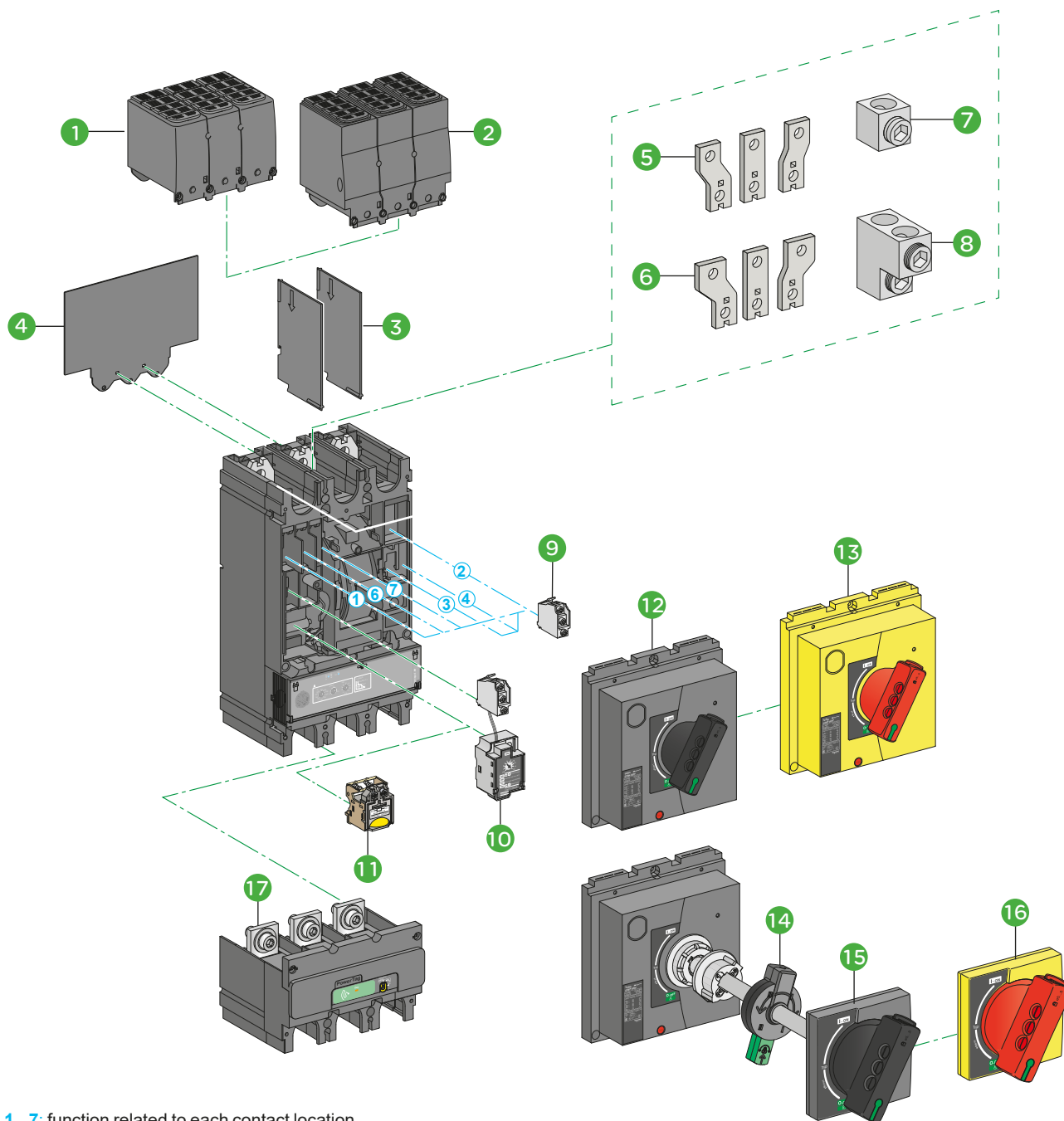


1...5: function related to each contact location, please refer to B6/54.

- ① Terminal shield **GV7AC01**
- ② Insulating screen **GV7AC05**
- ③ Interphase barriers **GV7AC04**
- ④ Spreaders 45 mm **GV7AC03**
- ⑤ Steel connector **GV7AC021** (1.5-95 mm²)
- ⑥ Aluminum connector **LV429227** (25-95 mm²)
- ⑦ Aluminum connector **GV7AC022** (120-185 mm²)
- ⑧ Aluminum connector **LV429244** (120-240 mm²)
- ⑨ OF, SD, or SDE indication contacts **GV7AE11** (standard) / **GV7AB11** (for low level)
- ⑩ SDE adapter **LV429451**
- ⑪ AU (UVR) or AS (SHT) voltage release **GV7AU●●●/ GV7AS●●●**
- ⑫ SDTAM thermal fault module **LV429424**
- ⑬ Combination kit for contactor **GV7AC06/GV7AC08**

- ⑭ Direct rotary handle black **GV5AP03** (shipped with the device)
- ⑮ Direct rotary handle red on yellow bezel **GV7AP04**
- ⑯ Open door shaft operator **LV426937**
- ⑰ Extended rotary handle black **GV7AP01**
- ⑱ Extended rotary handle red on yellow bezel **GV7AP02**
- ⑲ PowerTag M250 wireless energy sensor **LV434020**

DE-432814.ai



Motor circuit breakers

1...7: function related to each contact location, please refer to B6/54.

- 1 Terminal shield 45 mm **LV432593**
- 2 Terminal shield 52.5 mm **LV432595**
- 3 Interphase barriers **LV432570**
- 4 Insulating screen **LV432578**
- 5 Spreader 52.5 mm **LV432490**
- 6 Spreader 70 mm **LV432492**
- 7 Aluminum connector **LV432479** (1 x 35-300 mm²)
- 8 Aluminum connector **LV432481** (2 x 35-300 mm²)
- 9 OF, SD, or SDE indication contacts **GV7AE11** (standard) / **GV7AB11** (for low level)
- 10 SDTAM thermal fault module **LV429424**
- 11 AU (UVR) or AS (SHT) voltage releases **GV7AU●●●** / **GV7AUS●●●**
- 12 Direct rotary handle black **GV6AP03** (shipped with the device)
- 13 Direct rotary handle red on yellow bezel **LV432599**
- 14 Open door shaft operator **LV426937**
- 15 Extended rotary handle black **LV432598**
- 16 Extended rotary handle red on yellow bezel **LV432600**
- 17 PowerTag M630 wireless energy sensor **LV434022**

Add-on auxiliary contacts - OF contacts

These allow remote indication of the circuit breaker contact states. They can be used for signalling, electrical locking, relaying, etc. They are available in two versions: standard and low level. They include a terminal block and the auxiliary circuits leave the circuit breaker through a hole provided for this purpose.

They perform the following functions, depending on where they are located in the circuit breaker:

| Location | Function | Application |
|--|---|--|
| 1 and/or 4 (GV5) 1 and/or 4, 6, 7 (GV6) | C/O contact | Indicates the position of the circuit breaker poles. |
| 2 | Trip indication | Indicates that the circuit breaker has tripped due to an overload, a short-circuit, a differential fault or the operation of a voltage trip (undervoltage or shunt trip), or of the "push to trip" test button. It resets when the circuit breaker is reset. |
| 3 | Electrical fault indication | Indicates that the circuit breaker has tripped due to an overload, a short-circuit or a differential fault. It resets when the circuit breaker is reset. |
| 5 | Adapter for electrical fault indication | This accessory is mandatory for GV5 to provide electrical fault indication. |

| Type | Reference |
|---|-----------|
| Standard | GV7AE11 |
| Low level | GV7AB11 |
| Adapter for electrical fault indication | LV429451 |

Thermal fault module - SDTAM

GV5/ GV6 can be equipped with thermal fault module. This module have:

- a contact to indicate overload fault in the circuit-breaker
- a contact to open the contactor. In the event of overload or phase unbalance, this output is activated 400 ms before circuit-breaker tripping to open the contactor and avoid circuit breaker tripping.

| Voltage | Reference |
|------------------|-------------------------|
| 24...415 V AC/DC | LV429424 ⁽¹⁾ |

Electric trips

These allow the circuit breaker to be tripped via an electrical control signal.

- Undervoltage release (UVR) - GV7AU
- Trips the circuit breaker when the control voltage drops below 35 % of its rated voltage.
- Between 35 % and 70 % of the rated voltage opening is possible but not guaranteed.
- Above 70 % of the rated voltage, opening does not take place.
- Continuous duty rated coil.
- Circuit breaker closing is possible only if the voltage exceeds 85 % of the rated voltage.
- Shunt trip (SHT) - GV7AS
- Trips the circuit breaker when the control voltage rises above 0.7 times the rated voltage.
- Impulse type ≥ 20 ms or maintained control signals.
- Operation (GV7AU or GV7AS)
- When the circuit breaker has been tripped by a GV7 AU or AS, it must be reset either locally.
- Tripping has priority over manual closing: if a tripping order is present, manual action does not result in closing, even temporarily, of the contacts.
- Durability: 50 % of the mechanical durability of the circuit breaker.

| Type | Voltage | Reference |
|-------------------|-----------------------|-----------|
| Undervoltage trip | 200...240 V, 50/60 Hz | GV7AU207 |
| Shunt trip | 110...130 V, 50/60 Hz | GV7AS107 |
| | 200...240 V, 50/60 Hz | GV7AS207 |

(1) LV429429 takes the place of the AU/AS electric trip coil and an auxiliary contact (C/O contact 1).



Product references



PB 120641.eps
LV432479



PB 120642.eps
LV432490



PB 120643.eps
LV432593



PB 120644.eps
GV7AC04



PB 120640.eps
GV6AP03



PB 120645.eps
LV432599



PB 120646.eps
GV7AP02

Cabling accessories

Cable connectors: The connectors for Frame 5 snap directly on to the device terminals or are secured by clips to right-angle and straight terminal extensions as well as spreaders. Frame 6 connectors are screwed directly to the device terminals.

Spreaders: Spreaders may be used to increase the pitch from 35 mm to 45 mm for Frame 5. The 45 mm pitch can be increased to 52.5 or 70 mm for Frame 6.

Long terminal shields: They are used for front connection with cables or insulated bars. They comprise two parts assembled with captive screws, forming an IP40 cover. The top part is equipped with sliding grids with break marks for precise adaptation to cables or insulated bars. The rear part completely blocks off the connection zone. Partially cut squares can be removed to adapt to all types of connection for cables with lugs or copper bars. Long terminal shields may be mounted upstream and downstream of the breaker.

Phase barriers: These interphase barriers are used for maximum insulation at the power-connection points.

Insulating screens: These are fitted at the rear of the device which provides insulation. Their use is mandatory for devices with spreaders, installed on backplates, when terminal shields are not used.

Frame 5 Combination kits: These kits allow link between the circuit breaker and the contactor. The cover provides protection against direct finger contact. The kit comprises links, a protective shield and a depth adjustable metal bracket for the breaker.

| Description | Application | Sold in lots of | Unit reference GV5 | Unit reference GV6 |
|---|---|-----------------|--------------------|--------------------|
| Steel connectors (set of 3) | 1.5...95 mm ² ≤ 150 A | 1 | GV7AC021 | – |
| Aluminium connectors (set of 3) | 25...95 mm ² ≤ 220 A | 1 | LV429227 | |
| | 120...185 mm ² ≤ 220 A | 1 | GV7AC022 | |
| | 120...240 mm ² ≤ 220 A | 1 | LV429244 | |
| | 35...300 mm ² | 1 | | LV432479 |
| Spreader 3-pole ⁽¹⁾ | 2 x 35...300 mm ² | 1 | | LV432481 |
| | 35...45 mm pole pitch | 1 | GV7AC03 | |
| | 52.5 mm pole pitch | 1 | | LV432490 |
| Long terminal shield (IP40) ⁽¹⁾ | 70 mm pole pitch | 1 | | LV432492 |
| | 35 mm pole pitch | 1 | GV7AC01 | |
| | 45 mm pole pitch | 1 | | LV432593 |
| Phase barriers (set of 6) | 52.5 mm pole pitch | 1 | | LV432595 |
| | | 1 | GV7AC04 | LV432570 |
| Insulating screens (set of 2) | 45 mm | 1 | GV7AC05 | |
| | 70 mm | | | LV432578 |
| Combination Kits ⁽²⁾ | | | | |
| For contactor LC1F115...F185 | Connection kits between breaker and contactor | 1 | GV7AC06 | |
| For contactor LC1D115 and D150 | | 1 | GV7AC08 | |

Direct rotary handle

The circuit breaker is always supplied direct rotary handle (black handle, black plate) as standard and it provides IP40 protection. The other type handles can be used by replacing this direct rotary handle. It includes a device for locking the circuit breaker in the O (Off) position by means of up to 3 padlocks with a shackle diameter of 5 to 8 mm (padlocks not included). A MCC conversion accessory allows the direct rotary handle to be mounted on the enclosure door. In this case, the door cannot be opened if the circuit breaker is in the "ON" position. Circuit breaker closing is inhibited if the enclosure door is open and prevents the device from being closed if the door is open.

| Description | Type | Sold in lots of | Unit reference GV5 | Unit reference GV6 |
|---------------------------------|--|-----------------|--------------------|--------------------|
| Direct rotary handle | Black handle, black legend plate | 1 | GV5AP03 | GV6AP03 |
| | Red handle, yellow legend plate | 1 | GV7AP04 | LV432599 |
| MCC conversion accessory | Four mounting direct rotary handle on enclosure door | 1 | GV7AP05 | LV432606 |

Extended rotary handle

Allows to operate a circuit breaker from the front of the switch board, which's installed in the back of an enclosure, which provides IP55 protection. It comprises:

- a unit which is screwed onto the front accessory cover of the circuit breaker,
- an assembly (handle mechanism and front plate) to be fitted on the enclosure door,
- an extension shaft which must be adjusted.
- The distance minimum and maximum distances between the mounting surface and the door are
 - 185...600 mm for Frame 5
 - 209...600 mm for Frame 6

It includes a device for locking the circuit breaker in the O (Off) position by means of up to 3 padlocks with a shackle diameter of 5 to 8 mm (padlocks not included) and disables opening enclosure door.

| Description | Type | Sold in lots of | Unit reference GV5 | Unit reference GV6 |
|-------------------------------|----------------------------------|-----------------|--------------------|--------------------|
| Extended rotary handle | Black handle, black legend plate | 1 | GV7AP01 | LV432598 |
| | Red handle, yellow legend plate | 1 | GV7AP02 | LV432600 |

(1) Terminal shields cannot be used together with spreaders.

(2) The kit comprises links, a protective shield and a depth adjustable metal bracket for the breaker.

Front extended rotary handles (cont.)

Operation when door is opened

An open door shaft operator can be used to operate the circuit breaker when door is opened. This accessory complies with UL508 A.

The indication of the three positions OFF (O), ON (I) and tripped (Trip) is visible on the circuit breaker.

The circuit breaker itself may be locked in OFF position when the door is opened by 1 padlock / lockout hasp, shackle Ø4-8 mm.



LV426937
Open door shaft operator

| Description | Reference |
|--------------------------|-----------|
| Open door shaft operator | LV426937 |
| Laser tool | GVAPL01 |



GVAPL01 Laser tool

Other accessories

Bag of 6 tamper seals + 6 cover caps (1 large, 5 small) for screw heads

LV429375



LVA429375
Sealing accessories

PowerTag Measurement module

Wireless-communication module

PowerTag is directly mounted on the bottom side of the circuit breaker.

It provides capability to measure energy, monitor voltage loss, and trigger alarms.

It then delivers useful data to a concentrator for monitoring and diagnosis of the associated circuit breaker.

In addition to monitoring and alarming, PowerTag solution provides a complete knowledge of real time electrical values with a rich and accurate data transfer every 5 seconds.

PowerTag energy sensors can be quickly and easily installed in new or existing panels at any time. Compared to traditional metering solutions, installation time and commissioning are much shorter with no wiring, hence an error proof high density solution and a built-in class 1 accuracy.

Functions

PowerTag energy sensor measures the following values in accordance with the IEC 61557-12 standard:

- Energy (4 quadrants):
 - Active energy (Wh): total and partial, delivered and received
 - Active energy per phase (Wh): total
 - Reactive energy (VARh): partial, delivered and received
- Power:
 - Active power (W): total and per phase
 - Reactive power (VAR): total
 - Apparent power (VA): total
- Voltages (V): phase-to-phase (U12, U23, U31) and phase-to-neutral (V1N, V2N, V3N)
- Currents (A): per phase (I1, I2, I3)
- Frequency
- Power factor
- Voltage loss alarm:
 - PowerTag energy sensor sends a "voltage loss" alarm and the current-per-phase value before being de-energized
 - At "voltage loss", PowerTag adds an overload alarm if the current is higher than the rated current of the associated protective device.

Note: functions listed above depend on concentrators/gateways.

| Description | Reference |
|--|-----------|
| PowerTag M250 3P: suitable for Frame 5 up to 220 A | LV434020 |
| PowerTag M630 3P: suitable for Frame 6 up to 500 A | LV434022 |

PowerLogic™ Energy measurement solutions



Motor
circuit
breakers

PowerLogic™ Energy measurement solutions

PowerTag™ Energy sensors

Presentation

PowerTag Energy

It is a wireless-communication energy sensor dedicated to:

- Energy Management
- Load Monitoring
- Power Availability applications.

It provides a class 1 solution to monitor energy at any level of a distribution panel, from load to main incomer.

Thanks to the wireless communication between PowerTag Energy Sensors and PowerTag Energy Link gateway, the solution can be quickly and easily installed in new or existing panels.

Main features

Real time measurement (saved in the sensors):

- U, V, I (up to 2000 A)
- P, PF and energy values
- Diagnostics, alarming.

PowerTag Energy - Main components

Measurement - PowerTag Energy sensors

Voltages and currents are measured and processed by a sensor:

- 1 PowerTag Energy Monoconnect: directly mounted on the device terminals, upstream (Acti9, Multi9 only) or downstream (Acti9, Multi9, TeSys Deca - Frame 5, 6 circuit breakers)
- 2 PowerTag Energy Phase Neutral: sensor is crossed by the conductors, voltage pickup connector mounted on device terminals
- 3 PowerTag Energy Flex: sensor is crossed by the conductors
- 4 PowerTag Energy Rope: fixed on bar conductors.

Processing and communication – PowerTag Energy Link

The system works with a concentrator or a gateway:

- to collect data from the sensors
- to process data
- to provide additional alarms
- and make them available via Ethernet.



Motor circuit breakers



Connection (voltage and current)

Upstream

Downstream

Preferred installation to take full benefit of voltage loss alarming in diagnosing the load

Features

- Energy management: consumption in kWh
- Load monitoring: real-time measurements
- Energy management: consumption in kWh
- Load monitoring: real-time measurements
- Power availability: voltage loss alarming

Note:

In combination with a contactor, Variable Speed Drive or motor starter: PowerTag Energy can ONLY be installed UPSTREAM of these devices. Select the PowerTag Energy devices, check the possible mounting positions in the PowerLogic – PowerTag Energy - Selection guide.



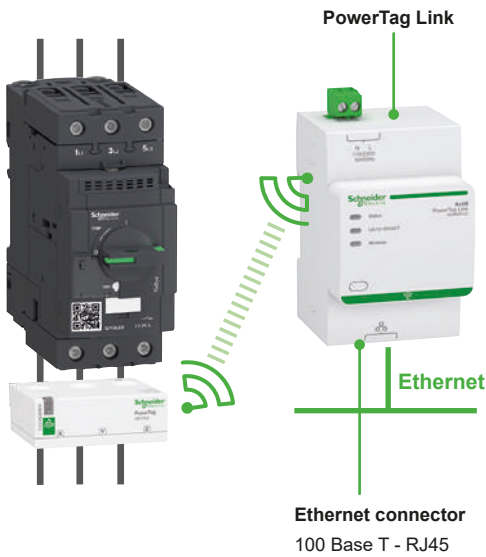
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> PowerLogic - PowerTag Energy - Selection guide

PowerLogic™ Energy measurement solutions

PowerTag™ Energy Flex 63 A

Use with TeSys Deca - Frame 2, 3 Motor circuit breakers



Communication between PowerTag Energy Flex 63 A and PowerTag Link ref. A9XMWD20

Energy measurement – PowerLogic

PowerTag Energy Flex 63 A (F63)

As per IEC 61557-12 PMD-II/DD/K55/1 standard:
with its flex design this PowerTag Energy can be used below a **Deca Motor circuit breakers Frame 2, 3-type (ref. GV2●●●, GV3●●●)** up to 63 A on 3P or 3P + N networks. The voltage picking is done by mean of 3 (3P) or 4 (3P + N) terminals. The shapes for brackets allow to mount and maintain it where needed in a panel.

Main characteristics

PowerTag Energy measures the following values in accordance with the IEC 61557-12 standard PMD-I/DD/K55/1.

Energy:

- Active energy (kWh): total and partial, delivered and received.

Real-time measurement values:

- Voltages (V): phase-to-phase and phase-to-neutral
- Currents (A): per phase.
- Power:
 - Active power (W): total and per phase
 - Apparent power (VA): total
- Power factor.

Voltage loss alarms:

- PowerTag Energy sends a 'voltage loss' alarm and the current-per-phase value before being de-energized
- At 'voltage loss', PowerTag Energy adds an overload alarm if the current is higher than the rated current of the associated protective device.

Note: functions listed above depends on Concentrator/Gateway.

| Description | Reference |
|--------------------------------|------------------|
| PowerTag Energy Flex 63 A 3P | A9MEM1573 |
| PowerTag Energy Flex 63 A 3P+N | A9MEM1570 |

Installation

Neutral picking shall be connected to have phase-to-neutral voltages, energy per phase and power per phase provided.

The existing PowerTag cable ends have been designed for screw terminals for 16 mm².

To adapt PowerTag F63 to the different types of product terminals, it is possible to replace the PowerTag Energy voltage measurement terminals by other cable ends for WG22/0.33 mm² wire.



A9MEM1573
A9MEM1570
PowerTag Flex 63 A (terminals are for voltage measurement)



Motor circuit breakers



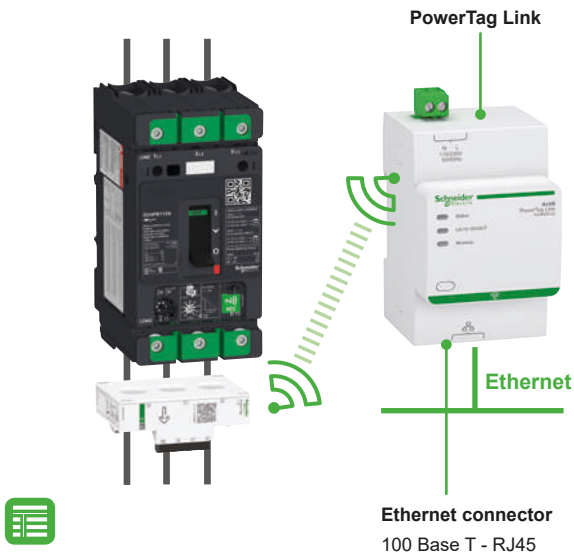
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> PowerLogic - PowerTag Energy - Selection guide

PowerLogic™ Energy measurement solutions

PowerTag™ Energy Flex 160 A

Use with TeSys Deca - Frame 4 Motor circuit breakers



Communication between PowerTag Energy Flex 160 A and PowerTag Link ref. A9XMWD20

Motor circuit breakers

Energy measurement – PowerLogic

PowerTag Energy Flex 160 A (F160)

As per IEC 61557-12 PMD-II/DD/K70/1 standard: with its flex design this PowerTag Energy Flex can be used below a **Deca motor circuit breaker Frame 4 - type (ref GV4●●●●)** up to 160 A on 3P or 3P + N networks. Its removable spring connector for voltage picking facilitates its installation, and shapes for brackets allows to mount and maintain it where needed in a panel.

Main characteristics

PowerTag Energy Flex 160 A measures the following values in accordance with the IEC 61557-12 standard PMD-II/DD/K70/1.

- Energy (4 quadrants):
 - Active energy (kWh): total and partial, delivered and received
 - Active energy per phase (kWh): total and partial, delivered and received
 - Reactive energy (kVARh): total and partial, delivered and received
 - Reactive energy per phase (kVARh): total and partial, delivered and received
 - Apparent energy (kVAh): total and partial
 - Apparent energy per phase (kVAh): total and partial.
- Real-time measurement values:
 - Voltages (V): phase-to-phase (U12, U23, U31) and phase-to-neutral (V1N, V2N, V3N)
 - Currents (A): per phase (I1, I2, I3), calculated neutral current when connected (IN)
 - Power:
 - Active power (W): total and per phase
 - Reactive power (VAR): total and per phase
 - Apparent power (VA): total and per phase
 - Frequency (Hz).
 - Power factor: total and per phase.
- Voltage loss alarms:
 - PowerTag Energy Flex sensor sends a 'voltage loss' alarm and the current-per phase value before being de-energized.
 - At 'voltage loss', PowerTag Energy Flex adds an overload alarm if the current is higher than the rated current of the associated protective device.

Note: functions listed above depends on Concentrator/Gateway.

| Description | Reference |
|--------------------------------------|-----------|
| PowerTag Energy Flex 160 A 3P / 3P+N | A9MEM1580 |

Installation

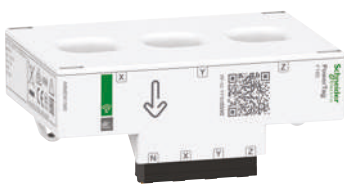
PowerTag Energy Flex 160 A can be installed in a panel directly on cables or busbars, associated to a product or not. Voltage pickings removable spring terminal has to be wired by 1 copper wire per phase with following characteristics:

Wire range


| Solid | Stranded | Stranded with terminals ends |
|---------------------------|---------------------------|------------------------------|
| 0.2...1.5 mm ² | 0.2...2.5 mm ² | 0.25...1.5 mm ² |
| 24...16 AWG | 24...14 AWG | 24...16 AWG |

If phase-to-neutral voltages, energy per phase and power per phase are needed, then a Neutral picking cable must be connected between the spring-type connector of the PowerTag Energy Flex and a Neutral in the control panel.

PowerTag Energy Flex 160 A is mainly advised for ComPact NSXm, ComPact INS160, Acti9 NG125, Acti9 C120, PowerPact B, TeSys Deca - Frame 4 - type circuit breaker, and all other devices with a rating between 63 A and 160 A.



PowerTag Energy Flex 160 A
Ref. A9MEM1580



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[> PowerLogic - PowerTag Energy - Selection guide](#)

PowerLogic™ Energy measurement solutions

PowerTag™ Energy Monoconnect

Use with TeSys Deca - Frame 5, 6 Motor circuit breakers



Communication between PowerTag Monoconnect M630 and PowerTag Link ref. A9XMWD20

Energy measurement – PowerLogic

PowerTag Energy Monoconnect 250 A (M250) PowerTag Energy Monoconnect 630 A (M630)

As per IEC 61557-12 PMD-II/DD/K70/1 standard:

PowerTag Energy Monoconnect is directly mounted on the bottom side of a **TeSys Deca - Frame 4 or 5 circuit breaker**, for 3P and 3P+N electrical networks.

Thanks to its integrated design, it does not require any specific wiring, and is compatible with the same connection accessories than the device it is mounted on. In addition to monitoring and alarming, PowerTag solution provides a complete knowledge of real time electrical values with a rich and accurate data transfer every 5 seconds.

PowerTag Energy sensors can be quickly and easily installed in new or existing panels at any time. Compared to traditional metering solutions, installation time and commissioning are much shorter with no wiring, hence an error proof high density solution and a built-in class 1 accuracy.

Functions

PowerTag Energy sensor measures the following values in accordance with the IEC 61557-12 standard.

- Energy (4 quadrants):
 - Active energy (kWh): total and partial, delivered and received
 - Active energy per phase (kWh): total
 - Reactive energy (kVARh): partial, delivered and received.
- Real-time measurement values:
 - Voltages (V): phase-to-phase (U12, U23, U31) and phase-to-neutral (V1N, V2N, V3N)
 - Currents (A): per phase (I1, I2, I3).
- Power:
 - Active power (W): total and per phase
 - Reactive power (VAR): total
 - Apparent power (VA): total.
- Frequency (Hz)
- Power factor
- Voltage loss alarm:
 - PowerTag Energy sends a "voltage loss" alarm and the current-per-phase value before being de-energized
 - At 'voltage loss', PowerTag adds an overload alarm if the current is higher than the rated current of the associated protective device.

Note: functions listed above depends on Concentrators/Gateways.

| Description | Reference |
|---|-----------------|
| PowerTag Monoconnect M250 3P: suitable for GV5 up to 220 A | LV434020 |
| PowerTag Monoconnect M630 3P: suitable for GV6 up to 500 A | LV434022 |

Installation

The module is self-powered and is installed for fixed devices directly on the bottom side of the circuit breaker or Vigi add-on terminals. For plug-in devices, it has to be installed on the base itself, top or bottom.

PowerTag Energy M250/M630 3P has to be used with 3P devices, and an external neutral voltage tap is provided in case of the installation has a neutral to provide phase-to-neutral voltages, active energy per phase and power per phase.

PowerTag Energy M250/M630 3P + N has to be used with 4P devices and with ComPact INS/INV switches.

In case of retrofit, following points have to be checked:

- Clearance to be able to add PowerTag Energy module and to respect bending radius of cables.
- Condition of power connectors: to be replaced if damaged.
- Tightening torques depending on the connector used.



LV434020



LV434022



Motor circuit breakers



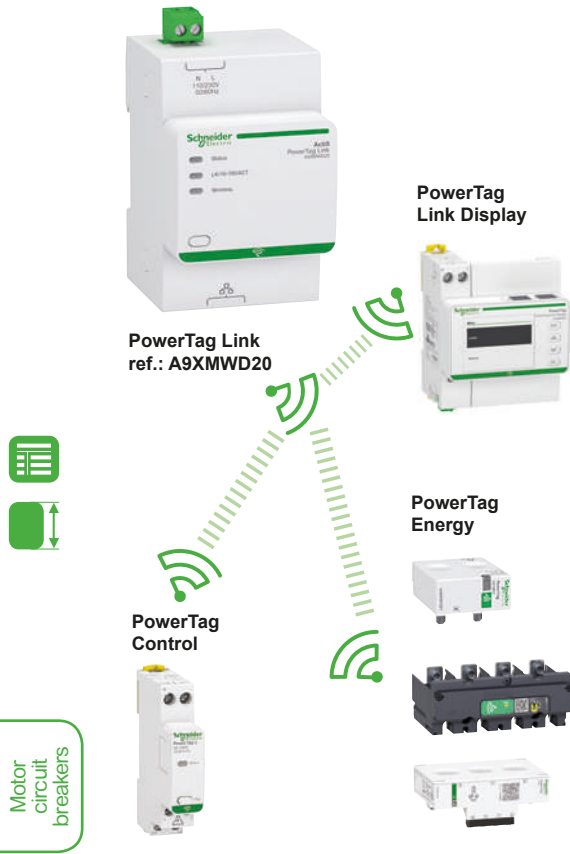
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> PowerLogic - PowerTag Energy - Selection guide

PowerLogic™ Energy measurement solutions

PowerTag™ Link

Ethernet Connection Concentrator for PowerTag Energy sensors



Energy measurement – PowerLogic

PowerTag Link

Ethernet connection concentrator (Modbus TCP/IP) for wireless devices with data display web pages.

The associated PowerTag Energy sensors allow alarms to be managed via email for terminal loads, and energy, power, current and voltage to be measured accurately in real time.

The associated PowerTag Control modules are designed to monitor and control a circuit and notify wirelessly to the concentrator the information status of a contact (OF, SD, CT or TL position indication...).

The associated PowerTag Link Display allows user to visualize data from energy sensors connected to the gateway.

The entire system can easily be installed in existing LV equipments using Multi9/Acti9/Compact NSX type circuit breakers, TeSys and competitor's devices.

Data transmitted:

- Total and partial energy
- Active, apparent and reactive power, phase-to-phase and phase-to-neutral voltage
- Currents I1, I2, I3
- Power factor (cos φ)
- Voltage loss and overload information
- Control order to a circuit
- Information status of a contact.

Functions

PowerTag Link permits:

- Concentration of PowerTag Energy wireless sensor data
- Ethernet connection via the RJ45 port
- Load monitoring:
 - alarm sent by the energy sensor in the event of a voltage loss,
 - pre-alarms on predefined thresholds (50 %, 80 %) or customized thresholds (thresholds on currents, power, voltages and cumulative energies),
 - load running time counter,
 - power synthesis (kW),
 - Alarm management on current/voltage/load level thresholds by e-mail,
 - Send control orders to PowerTag Control output to operate a load remotely and get load status thanks to feedback loop on associated input,
 - Collect status of contact from PowerTag Control input,
 - Display of alarms and pre-alarms on PowerTag Link embedded web pages,
 - Easy integration into system with Com'X 200, Com'X 510 and other Schneider Electric software and third-party Building Management Systems (BMS) thanks to EcoStruxure Power Commission report in pdf format. This report provides dynamically all the Modbus registers and associated meanings for an easy integration into the system,
 - Remote metering capability using the PowerTag Link monitoring page,
 - Send measured data and alarms to the PowerTag Link Display that can be installed locally.

Commissioning software: EcoStruxure Power Commission ⁽¹⁾

- Configuration and communication test of wireless devices
- Editing of a complete test report (pdf) with the Modbus communication registers for easy integration into a supervision system
- Windows XP, Windows 7, Windows 8 and Windows 10 compatible
- Downloadable from:
https://www.schneider-electric.com/ww/en/download/document/Ecoreach_Installer

(1) new name of Ecoreach software.

| Description | Reference |
|---------------|-----------|
| PowerTag Link | A9XMWD2 |

Installation

- On DIN rail (width 54 mm).
- 230 V AC power supply.

Testing and start-up

Pairing of wireless devices must be performed via the EcoStruxure Power Commission software, freely available by downloading.

- The software makes it possible, in particular, to attribute to each circuit a name, a use and the current rating (useful for alarms).



Scan or Click to download:

> PowerLogic - PowerTag Energy - Selection guide

TeSys Modular circuit breakers

0.5 to 20 A

(for equipment and control circuits)



Motor
circuit
breakers

TeSys Power

Modular circuit breakers for auxiliary circuits - Thermal-magnetic

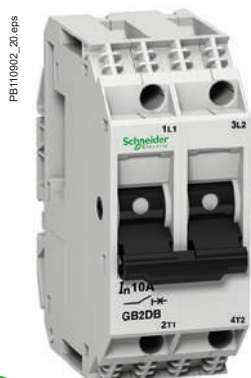
Introduction



GB2CB



GB2CD



GB2DB



GB2CS

Motor
circuit
breakers

Introduction

Modular thermal-magnetic circuit breakers protect and isolate the control circuits of industrial equipment with contactor coils, transformers....

They protect and isolate single-phase auxiliary circuits such as solenoid valves, electro-brakes, battery chargers, supplied from the control circuit voltage.

Ref. GB2CB, GB2CD, GB2DB

12 ratings are available, from 0.5 to 20 A, in single-pole (GB2CB), single-pole + neutral (GB2CD) and 2-pole (GB2DB) versions.

They have a magnetic tripping threshold set at between 12 and 16 I_n to withstand the current peaks generated by many industrial components.

Ref. GB2CS

2 ratings are available, 0.5 and 1 A, in single-pole version.

The magnetic tripping threshold is set between 5 and 7 I_n .

Functions, installation

Clip-on fixing onto all types of 35 mm \perp rails, on \perp rails and on Telequick mounting plates.

Upstream and downstream marking by means of AB1 clip-in markers.

Clear indication of "I" and "O" positions on the operator.

Tamper-proof device which requires no special maintenance (fixed magnetic and thermal tripping thresholds).

Selection for the protection of circuits supplied by transformers

Single-phase transformers.

Magnetising peak: 20 I_n .

Operation of magnetic trips: 13 I_n .

| Power VA | Primary ⁽¹⁾ | | Secondary | | | |
|-------------|------------------------|-----------|-----------|---------|---------|---------|
| | 220/240 V | 380/415 V | 24 V | 48 V | 110 V | 220 V |
| 40 | GB2DB05 | GB2DB05 | GB2CD07 | GB2CD06 | GB2CD05 | GB2CD05 |
| 63 | GB2DB05 | GB2DB05 | GB2CD08 | GB2CD07 | GB2CD06 | GB2CD05 |
| 100 | GB2DB06 | GB2DB05 | GB2CD10 | GB2CD07 | GB2CD06 | GB2CD05 |
| 160 | GB2DB07 | GB2DB06 | GB2CD14 | GB2CD09 | GB2CD07 | GB2CD06 |
| 250 | GB2DB07 | GB2DB06 | GB2CD16 | GB2CD12 | GB2CD08 | GB2CD07 |
| 400 | GB2DB08 | GB2DB07 | GB2CD22 | GB2CD14 | GB2CD09 | GB2CD07 |
| 630 | GB2DB10 | GB2DB08 | – | GB2CD21 | GB2CD12 | GB2CD08 |
| 1000 | GB2DB14 | GB2DB09 | – | – | GB2CD16 | GB2CD10 |
| 1600 | GB2DB20 | GB2DB14 | – | – | – | GB2CD14 |
| 2000 | GB2DB21 | GB2DB14 | – | – | GB2CD22 | GB2CD16 |
| 2500 | GB2DB22 | GB2DB20 | – | – | – | GB2CD20 |
| 3000 | GB2DB22 | GB2DB20 | – | – | – | GB2CD21 |
| 4000 | – | GB2DB21 | – | – | – | GB2CD22 |
| 5000 | – | GB2DB22 | – | – | – | – |

⁽¹⁾ If the breaking capacity of the GB2 is insufficient, use a GV2RT with 2 poles connected in series.

TeSys Power

Modular circuit breakers for auxiliary circuits - Thermal-magnetic

Product references

PB110899_20.eps



GB2CB●●

PB110901_20.eps



GB2CD●●

PB110902_20.eps



GB2DB●●

Circuit breakers with magnetic tripping threshold: 12 to 16 In

Single-pole

| Conventional rated thermal current Ith ⁽¹⁾ | Magnetic tripping current Id ± 20 % | Sold in lots of | Unit reference |
|---|-------------------------------------|-----------------|----------------|
| A | A | | |
| 0.5 | 6.6 | 6 | GB2CB05 |
| 1 | 14 | 6 | GB2CB06 |
| 2 | 26 | 6 | GB2CB07 |
| 3 | 40 | 6 | GB2CB08 |
| 4 | 52 | 6 | GB2CB09 |
| 5 | 66 | 6 | GB2CB10 |
| 6 | 83 | 6 | GB2CB12 |
| 8 | 108 | 6 | GB2CB14 |
| 10 | 138 | 6 | GB2CB16 |
| 12 | 165 | 6 | GB2CB20 |
| 16 | 220 | 6 | GB2CB21 |
| 20 | 270 | 6 | GB2CB22 |

Single-pole + neutral

| Conventional rated thermal current Ith ⁽¹⁾ | Magnetic tripping current Id ± 20 % | Sold in lots of | Unit reference |
|---|-------------------------------------|-----------------|----------------|
| A | A | | |
| 0.5 | 6.6 | 6 | GB2CD05 |
| 1 | 14 | 6 | GB2CD06 |
| 2 | 26 | 6 | GB2CD07 |
| 3 | 40 | 6 | GB2CD08 |
| 4 | 52 | 6 | GB2CD09 |
| 5 | 66 | 6 | GB2CD10 |
| 6 | 83 | 6 | GB2CD12 |
| 8 | 108 | 6 | GB2CD14 |
| 10 | 138 | 6 | GB2CD16 |
| 12 | 165 | 6 | GB2CD20 |
| 16 | 220 | 6 | GB2CD21 |
| 20 | 270 | 6 | GB2CD22 |

2-pole

| Conventional rated thermal current Ith ⁽¹⁾ | Magnetic tripping current Id ± 20 % | Sold in lots of | Unit reference |
|---|-------------------------------------|-----------------|----------------|
| A | A | | |
| 0.5 | 6.6 | 3 | GB2DB05 |
| 1 | 14 | 3 | GB2DB06 |
| 2 | 26 | 3 | GB2DB07 |
| 3 | 40 | 3 | GB2DB08 |
| 4 | 50 | 3 | GB2DB09 |
| 5 | 66 | 3 | GB2DB10 |
| 6 | 83 | 3 | GB2DB12 |
| 8 | 108 | 3 | GB2DB14 |
| 10 | 138 | 3 | GB2DB16 |
| 12 | 165 | 3 | GB2DB20 |
| 16 | 220 | 3 | GB2DB21 |
| 20 | 270 | 3 | GB2DB22 |

(1) Conforming to IEC 60947-1.



Motor circuit breakers

TeSys Power

Modular circuit breakers for auxiliary circuits - Thermal-magnetic

Product references

Circuit breakers with magnetic tripping threshold: 5 to 7 In



GB2CS●●

| Single-pole | | | |
|---|-------------------------------------|-----------------|----------------|
| Conventional rated thermal current Ith ⁽¹⁾ | Magnetic tripping current Id ± 20 % | Sold in lots of | Unit reference |
| A | A | | |
| 0.5 | 3.3 | 6 | GB2CS05 |
| 1 | 6 | 6 | GB2CS06 |

⁽¹⁾ Conforming to IEC 60947-1.

Accessories for circuit breakers ref. GB2-CB, DB and CS



GB2G210

| Description | Sold in lots of | Unit reference |
|---|-----------------|----------------|
| Busbar set for supply to 10 GB2 DB or 20 GB2CB or GB2CS with 2 connectors | 1 | GB2G210 |

Motor
circuit
breakers


TeSys Power

Deca, Giga and Modular Motor circuit breakers

Product references

| | | | |
|----------|-----------|-----------|------------|
| GB2CB05 | GV2L22 | GV2ME32AP | GV3PC01 |
| GB2CB06 | GV2L32 | GV2P01 | GV3PC02 |
| GB2CB07 | GV2LE03 | GV2P02 | GV4ADM1111 |
| GB2CB08 | GV2LE04 | GV2P03 | GV4ADN01 |
| GB2CB09 | GV2LE05 | GV2P04 | GV4ADN02 |
| GB2CB10 | GV2LE06 | GV2P05 | GV4AE11 |
| GB2CB12 | GV2LE07 | GV2P06 | GV4APN01 |
| GB2CB14 | GV2LE08 | GV2P07 | GV4APN02 |
| GB2CB16 | GV2LE10 | GV2P08 | GV4APN04 |
| GB2CB20 | GV2LE14 | GV2P10 | GV4AS027 |
| GB2CB21 | GV2LE16 | GV2P14 | GV4AS057 |
| GB2CB22 | GV2LE20 | GV2P16 | GV4AS137 |
| GB2CD05 | GV2LE22 | GV2P20 | GV4AS287 |
| GB2CD06 | GV2LE32 | GV2P21 | GV4AS487 |
| GB2CD07 | GV2ME01 | GV2P22 | GV4AU027 |
| GB2CD08 | GV2ME013 | GV2P32 | GV4AU057 |
| GB2CD09 | GV2ME016 | GV2PC01 | GV4AU137 |
| GB2CD10 | GV2ME01AP | GV2PC02 | GV4AU247 |
| GB2CD12 | GV2ME02 | GV2RT03 | GV4AU286 |
| GB2CD14 | GV2ME023 | GV2RT04 | GV4AU415 |
| GB2CD16 | GV2ME02AP | GV2RT05 | GV4AU486 |
| GB2CD20 | GV2ME03 | GV2RT053 | GV4G66 |
| GB2CD21 | GV2ME033 | GV2RT06 | GV4L02N |
| GB2CD22 | GV2ME036 | GV2RT07 | GV4L02N6 |
| GB2CS05 | GV2ME03AP | GV2RT073 | GV4L03N |
| GB2CS06 | GV2ME04 | GV2RT08 | GV4L03N6 |
| GB2DB05 | GV2ME043 | GV2RT10 | GV4L07N |
| GB2DB06 | GV2ME046 | GV2RT14 | GV4L07N6 |
| GB2DB07 | GV2ME04AP | GV2RT16 | GV4L115B |
| GB2DB08 | GV2ME05 | GV2RT20 | GV4L115B6 |
| GB2DB09 | GV2ME053 | GV2RT21 | GV4L115N |
| GB2DB10 | GV2ME056 | GV2SN14 | GV4L115N6 |
| GB2DB12 | GV2ME05AP | GV2SN15 | GV4L115S |
| GB2DB14 | GV2ME06 | GV2SN17 | GV4L12N |
| GB2DB16 | GV2ME063 | GV2SN35 | GV4L12N6 |
| GB2DB20 | GV2ME066 | GV2SN37 | GV4L25B |
| GB2DB21 | GV2ME06AP | GV2V03 | GV4L25B6 |
| GB2DB22 | GV2ME07 | GV3A02 | GV4L25N |
| GB2G210 | GV2ME073 | GV3A03 | GV4L25N6 |
| GK2AF01 | GV2ME076 | GV3A08 | GV4L50B |
| GK2AX50 | GV2ME07AP | GV3A09 | GV4L50B6 |
| GV1F03 | GV2ME08 | GV3APK01 | GV4L50N |
| GV1G02 | GV2ME083 | GV3APN01 | GV4L50N6 |
| GV1L3 | GV2ME086 | GV3D22 | GV4L80B |
| GV1V02 | GV2ME08AP | GV3G66 | GV4L80B6 |
| GV2AF01 | GV2ME10 | GV3L25 | GV4L80N |
| GV2AF02 | GV2ME103 | GV3L32 | GV4L80N6 |
| GV2AF3 | GV2ME106 | GV3L326 | GV4L80S |
| GV2AF4 | GV2ME10AP | GV3L40 | GV4LE02N |
| GV2AF5 | GV2ME14 | GV3L50 | GV4LE02N6 |
| GV2AK00 | GV2ME143 | GV3L65 | GV4LE02S |
| GV2AP01 | GV2ME146 | GV3L73 | GV4LE02S6 |
| GV2AP02 | GV2ME14AP | GV3L80 | GV4LE03N |
| GV2AP03 | GV2ME16 | GV3P13 | GV4LE03N6 |
| GV2AP04 | GV2ME163 | GV3P18 | GV4LE03S |
| GV2APK01 | GV2ME166 | GV3P25 | GV4LE03S6 |
| GV2APN01 | GV2ME16AP | GV3P256 | GV4LE07N |
| GV2APN02 | GV2ME20 | GV3P32 | GV4LE07N6 |
| GV2APN03 | GV2ME203 | GV3P321 | GV4LE07S |
| GV2APN04 | GV2ME206 | GV3P40 | GV4LE07S6 |
| GV2CP21 | GV2ME20AP | GV3P401 | GV4LE115B |
| GV2GH7 | GV2ME21 | GV3P406 | GV4LE115B6 |
| GV2L03 | GV2ME213 | GV3P50 | GV4LE115N |
| GV2L04 | GV2ME216 | GV3P501 | GV4LE115N6 |
| GV2L05 | GV2ME21AP | GV3P506 | GV4LE115S |
| GV2L06 | GV2ME22 | GV3P65 | GV4LE115S6 |
| GV2L07 | GV2ME223 | GV3P651 | GV4LE12N |
| GV2L08 | GV2ME226 | GV3P656 | GV4LE12N6 |
| GV2L10 | GV2ME22AP | GV3P73 | GV4LE12S |
| GV2L14 | GV2ME32 | GV3P731 | GV4LE12S6 |
| GV2L16 | GV2ME323S | GV3P736 | GV4LE25B |
| GV2L20 | GV2ME326 | GV3P80 | GV4LE25B6 |

Motor
circuit
breakers

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If your product variant is no longer available, please consult your distributor or regional sales office.


TeSys Power

Deca, Giga and Modular Motor circuit breakers

Product references

| | | | |
|-----------|------------|-------------|-----------|
| GV4LE25N | GV4PB50N | GV4PEM115B6 | GVAE1 |
| GV4LE25N6 | GV4PB50S | GV4PEM115N | GVAE11 |
| GV4LE25S | GV4PB80B | GV4PEM115N6 | GVAE113 |
| GV4LE25S6 | GV4PB80N | GV4PEM115S | GVAE20 |
| GV4LE50B | GV4PB80S | GV4PEM115S6 | GVAE203 |
| GV4LE50B6 | GV4PE02N | GV4PEM12N | GVAED011 |
| GV4LE50N | GV4PE02N6 | GV4PEM12N6 | GVAED0113 |
| GV4LE50N6 | GV4PE02S | GV4PEM12S | GVAED101 |
| GV4LE50S | GV4PE02S6 | GV4PEM12S6 | GVAED1013 |
| GV4LE50S6 | GV4PE03N | GV4PEM25B | GVAM11 |
| GV4LE80B | GV4PE03N6 | GV4PEM25B6 | GVAN11 |
| GV4LE80B6 | GV4PE03S | GV4PEM25N | GVAN113 |
| GV4LE80N | GV4PE03S6 | GV4PEM25N6 | GVAN20 |
| GV4LE80N6 | GV4PE07N | GV4PEM25S | GVAN203 |
| GV4LE80S | GV4PE07N6 | GV4PEM25S6 | GVAPA2 |
| GV4LE80S6 | GV4PE07S | GV4PEM50B | GVAPBPHP |
| GV4LUG | GV4PE07S6 | GV4PEM50B6 | GVAPH02 |
| GV4P02N | GV4PE115B | GV4PEM50N | GVAPK11 |
| GV4P02N6 | GV4PE115B6 | GV4PEM50N6 | GVAPYPHP |
| GV4P03N | GV4PE115N | GV4PEM50S | GVAS025 |
| GV4P03N6 | GV4PE115N6 | GV4PEM50S6 | GVAS026 |
| GV4P07N | GV4PE115S | GV4PEM80B | GVAS055 |
| GV4P07N6 | GV4PE115S6 | GV4PEM80B6 | GVAS115 |
| GV4P115B | GV4PE12N | GV4PEM80N | GVAS116 |
| GV4P115B6 | GV4PE12N6 | GV4PEM80N6 | GVAS207 |
| GV4P115N | GV4PE12S | GV4PEM80S | GVAS225 |
| GV4P115N6 | GV4PE12S6 | GV4PEM80S6 | GVAS226 |
| GV4P115S | GV4PE25B | GV5AP03 | GVAS385 |
| GV4P12N | GV4PE25B6 | GV5P150F | GVAS415 |
| GV4P12N6 | GV4PE25N | GV5P150H | GVAU025 |
| GV4P25B | GV4PE25N6 | GV5P220F | GVAU055 |
| GV4P25B6 | GV4PE25S | GV5P220H | GVAU115 |
| GV4P25N | GV4PE25S6 | GV6AP03 | GVAU116 |
| GV4P25N6 | GV4PE50B | GV6P320F | GVAU125 |
| GV4P50B | GV4PE50B6 | GV6P320H | GVAU207 |
| GV4P50B6 | GV4PE50N | GV6P500F | GVAU225 |
| GV4P50N | GV4PE50N6 | GV6P500H | GVAU226 |
| GV4P50N6 | GV4PE50S | GV7AB11 | GVAU385 |
| GV4P80B | GV4PE50S6 | GV7AC01 | GVAU386 |
| GV4P80B6 | GV4PE80B | GV7AC021 | GVAU415 |
| GV4P80N | GV4PE80B6 | GV7AC022 | GVAU416 |
| GV4P80N6 | GV4PE80N | GV7AC03 | GVAU505 |
| GV4P80S | GV4PE80N6 | GV7AC04 | GVAX115 |
| GV4PB02N | GV4PE80S | GV7AC05 | GVAX116 |
| GV4PB02S | GV4PE80S6 | GV7AC06 | GVAX225 |
| GV4PB03N | GV4PEM02N | GV7AC08 | GVAX226 |
| GV4PB03S | GV4PEM02N6 | GV7AE11 | GVAX385 |
| GV4PB07N | GV4PEM02S | GV7AP01 | GVAX386 |
| GV4PB07S | GV4PEM02S6 | GV7AP02 | GVAX415 |
| GV4PB115B | GV4PEM03N | GV7AP04 | LA9E07 |
| GV4PB115N | GV4PEM03N6 | GV7AP05 | LAD311 |
| GV4PB115S | GV4PEM03S | GV7AS107 | LAD96590 |
| GV4PB12N | GV4PEM03S6 | GV7AS207 | LAD96595 |
| GV4PB12S | GV4PEM07N | GV7AU207 | |
| GV4PB25B | GV4PEM07N6 | GVAD0101 | |
| GV4PB25N | GV4PEM07S | GVAD0110 | |
| GV4PB25S | GV4PEM07S6 | GVAD1001 | |
| GV4PB50B | GV4PEM115B | GVAD1010 | |

Motor
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Technical Data for Designers

Deca - Frame 2:

- > characteristicsB6/72 to B6/76
- > curvesB6/77 to B6/86
- > characteristics - accessoriesB6/87 to B6/89
- > dimensions, schemesB6/90 to B6/99

Deca - Frame 3:

- > characteristicsB6/102 to B6/105
- > curvesB6/106 to B6/111
- > characteristics - accessoriesB6/112 to B6/114
- > dimensions, schemesB6/115 to B6/117

Deca - Frame 4:

- > characteristicsB6/120 to B6/123
- > curvesB6/124 to B6/131
- > characteristics - accessoriesB6/132 to B6/133
- > dimensions, schemesB6/134 to B6/137

Giga - Frame 5 - Frame 6:

- > characteristics B6/140
- > curvesB6/141 to B6/143
- > characteristics - accessoriesB6/144 to B6/145
- > dimensions, schemesB6/146 to B6/152

PowerTag Energy sensors:

- > PowerTag Energy Flex 63 A B6/154
- > PowerTag Energy Flex 160 A B6/155
- > PowerTag Energy Monoconnect 250 A B6/156
- > PowerTag Energy Link B6/157

Modular:

- > characteristicsB6/160 to B6/162
- > dimensions, schemes B6/163

TeSys Deca - Frame 2 0.06 to 15 kW



Motor
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Deca - Frame 2 Motor circuit breakers

Characteristics

| Environment | | | GV2L | GV2LE | GV2ME | GV2P | GV2RT | |
|-----------------------------------|-----------------------------------|------------------------------|---|--|---|---|--|--|
| Circuit breaker type | | | IEC/EN 60947-4-1, IEC/EN 60947-2 | | | | | |
| Conforming to standards | | | CSA C22.2 n°60947-4-1 ⁽¹⁾ , UL 60947-4-1 | | | | | |
| Product certifications | | | CCC, EAC, BV, LROS, DNV-GL, RINA, UL ⁽¹⁾ , CSA, UKCA | CCC, EAC, BV, RINA, UL ⁽¹⁾ , UKCA | CCC, UL, CSA, EAC, ATEX, BV, LROS, UKCA, DNV-GL, RINA | CCC, UL, CSA, EAC, ATEX, BV, LROS, DNV-GL, RINA, UKCA | CCC, UL, CSA, EAC, BV, LROS, UKCA | |
| Climatic withstand | | | According to IACS E10 | | | | | |
| Degree of protection (front face) | Conforming to IEC 60529 | Open mounted In enclosure | Against direct finger contact: IP20 | | | | | |
| Shock resistance | Conforming to IEC 60068-2-27 | | 30 gn - 11 ms | | | | | |
| Vibration resistance | Conforming to IEC 60068-2-6 | | 5 gn (5 to 150 Hz) | | | | | |
| Ambient air temperature | Storage | | °C -40...+80 | | | | | |
| | Operation | Open mounted | °C -20...+60 | | | | | |
| | | In enclosure | °C -20...+40 | | | | | |
| Temperature compensation | | Open mounted | °C -20...+60 | | | | | |
| | | In enclosure | °C -20...+40 | | | | | |
| Flame resistance | Conforming to IEC 60695-2-11 | | °C 960 | | | | | |
| Maximum operating altitude | | | m 2000 | | | | | |
| Suitable for isolation | Conforming to IEC 60947-1 § 7-1-6 | | Yes | | | | | |
| Resistance to mechanical impact | | | J | 0.5 IK04 | | | | |
| Sensitivity to phase failure | | | Yes, conforming to IEC 60947-4-1 § 8-2-1-5-2 for GV2ME & GV2P | | | | | |

| Technical characteristics | | | GV2L | GV2LE | GV2ME | GV2P | GV2RT | |
|---|--|--|-----------------|----------|----------|-----------|-----------|-----------|
| Circuit breaker type | | | | | | | | |
| Utilisation category | Conforming to IEC 60947-2 | | A | | | | | |
| | Conforming to IEC 60947-4-1 | | AC-3 | | | | | |
| Rated operational voltage (Ue) | Conforming to IEC 60947-2 | | V 690 | | | | | |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-2 | | V 690 | | | | | |
| Rated voltage | Conforming to UL 60947-4-1 | | V - | | | | | |
| | CSA C 22.2 n° 60947-4-1 | | 480 | 480 | 600 | 600 | 600 | |
| Rated operational frequency | Conforming to IEC 60947-4-1 UL, CSA | | Hz 50/60 | | | | | |
| Rated impulse withstand voltage (U imp) | Conforming to IEC 60947-2 | | kV 6 | | | | | |
| Total power dissipated per pole | | | W 1.8 | | 2.5 | | | |
| Mechanical durability (C.O.: Closing, Opening) | | | C.O. 100 000 | | | | | |
| Electrical durability for AC-3/415V duty (C.O.: Closing, Opening) | 415 V In | | C.O. 100 000 | | | | | |
| Duty class (maximum operating rate) | | | C.O./h 40 | | 25 | | | |
| Maximum conventional rated thermal current (Ith) | Conforming to IEC 60947-4-1 | | A | 0.4...32 | 0.4...32 | 0.16...32 | 0.16...32 | 0.40...23 |
| Rated duty | Conforming to IEC 60947-4-1 | | Continuous duty | | | | | |

(1) GV2L03 to GV2L22, GV2LE03 to GV2LE22.

(2) UL 60947-4-1 type E for GV2P●● (except 32A).

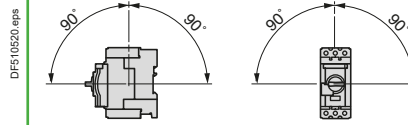
TeSys Power

Deca - Frame 2 Motor circuit breakers

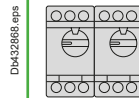
Characteristics

Mounting characteristics

Operating position
Without derating, in relation to normal vertical mounting plane ⁽¹⁾



Products side by side



When several products **GV2ME●●**, **GV2P●●**, **GV2RT●●** are mounted side by side, the thermal trip setting I_r maybe need to be adjusted up to $1.1 \times I_n$.

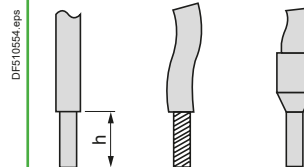
Do not exceed the maximum thermal setting I_r .

E.g: **GV2ME14**, thermal setting range: 6...10, do not adjust I_r above 10 A.

Connection characteristics

Connection to screw clamp terminals or spring terminals

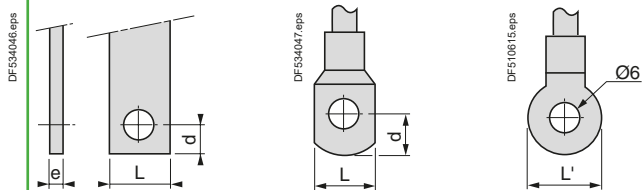
Bare cables



| Circuit breaker type | | | GV2L | | GV2LE | | GV2ME | | GV2P | | GV2RT | |
|---|--|-----------------|---------|-------|---------|-------|------------------------|-------|---------|-------|---------|-------|
| Connection to screw clamp terminals (Max. number of conductors x c.s.a.) | | mm ² | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| Solid cable | | mm ² | 2 x 1 | 2 x 6 | 2 x 1 | 2 x 6 | 2 x 1 | 2 x 6 | 2 x 1 | 2 x 6 | 2 x 1 | 2 x 6 |
| Flexible cable without cable end | | mm ² | 2 x 1.5 | 2 x 6 | 2 x 1.5 | 2 x 6 | 2 x 1.5 | 2 x 6 | 2 x 1.5 | 2 x 6 | 2 x 1.5 | 2 x 6 |
| Flexible cable with cable end | | mm ² | 2 x 1 | 2 x 4 | 2 x 1 | 2 x 4 | 2 x 1 | 2 x 4 | 2 x 1 | 2 x 4 | 2 x 1 | 2 x 4 |
| Tightening torque | | N.m | 1.7 | | | | | | | | | |
| Connection to spring terminals | | mm ² | - | - | - | - | 2 x 1 ⁽²⁾ | 2 x 6 | - | - | - | - |
| Number of conductors x c.s.a. | | mm ² | - | - | - | - | 2 x 1.5 ⁽²⁾ | 2 x 4 | - | - | - | - |

Connection by bars or lugs

Bars or lugs



| Circuit breaker type | | | GV2ME●●6 | |
|---|-------------------|-----------------|----------|--|
| Pitch | Without spreaders | mm | 13.5 | |
| | With spreaders | mm | - | |
| Bars or cables with lugs | e | mm | ≤ 6 | |
| | L | mm | ≤ 9.5 | |
| | L' | mm | ≤ 9.5 | |
| | d | mm | ≤ 10 | |
| Screws | | | M4 | |
| | Tightening torque | N.m | 1.7 | |
| Bare cables (copper or aluminium) with connectors | Height (h) | mm | - | |
| | C.s.a. | mm ² | - | |
| | Tightening torque | N.m | - | |

⁽¹⁾ When mounting on a vertical rail, fit a stop to prevent any slippage.

⁽²⁾ For cross-sections 1 to 1.5 mm², the use of an **LA9D99** cable end reducer is recommended.

TeSys Power

Deca - Frame 2 Motor circuit breakers - Magnetic

Characteristics

| Breaking capacity of GV2L and GV2LE | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------------------|----------------------|-----------|------------|-----|-----|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------|-----|-----|-----|-----|-----|----------------|----------------|----------------|
| Circuit breaker type | | | | GV2LE | | | | | | | | | | GV2L | | | | | | | | | |
| | | | | 03 to 06 | 07 | 08 | 10 | 14 | 16 | 20 | 22 | 32 | 03 to 05 | 06 & 07 | 08 | 10 | 14 | 16 | 20 | 22 | 32 | | |
| Rating | | | A | 0.4 to 1.6 | 2.5 | 4 | 6.3 | 10 | 14 | 16 | 18 | 25 | 32 | 0.4 to 1 | 1.6 to 2.5 | 4 | 6.3 | 10 | 14 | 16 | 18 | 25 | 32 |
| Breaking capacity conforming to IEC 60947-2 | 230/240 V | Icu | kA | * | * | * | * | * | * | * | * | 50 | 50 | * | * | * | * | * | * | * | * | 50 | 50 |
| | | Ics % ⁽¹⁾ | | * | * | * | * | * | * | * | * | 100 | 100 | * | * | * | * | * | * | * | * | 100 | 100 |
| 400/415 V | Icu | kA | * | * | * | * | * | 15 | 15 | 15 | 10 | 10 | 10 | * | * | * | * | * | 50 | 50 | 50 | 50 | 50 |
| | Ics % ⁽¹⁾ | | * | * | * | * | * | 50 | 50 | 40 | 50 | 50 | 50 | * | * | * | * | * | 50 | 50 | 50 | 50 | 50 |
| 440 V | Icu | kA | * | * | * | 50 | 15 | 8 | 8 | 6 | 6 | 6 | 6 | * | * | * | * | * | 20 | 20 | 20 | 20 | 20 |
| | Ics % ⁽¹⁾ | | * | * | * | 100 | 100 | 50 | 50 | 50 | 50 | 50 | 50 | * | * | * | * | * | 75 | 75 | 75 | 75 | 75 |
| 500 V | Icu | kA | * | * | * | 50 | 10 | 6 | 6 | 4 | 4 | 4 | 4 | * | * | * | * | * | 10 | 10 | 10 | 10 | 10 |
| | Ics % ⁽¹⁾ | | * | * | * | 100 | 100 | 75 | 75 | 75 | 75 | 75 | 75 | * | * | * | * | * | 100 | 75 | 75 | 75 | 75 |
| 690 V | Icu | kA | * | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | * | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | Ics % ⁽¹⁾ | | * | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | * | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Associated fuses (if required) if Ics > breaking capacity Icu conforming to IEC 60947-2 amendment 1 | 230/240 V | aM | A | * | * | * | * | * | * | * | * | 80 | 80 | * | * | * | * | * | * | * | * | 100 | 100 |
| | | gG | A | * | * | * | * | * | * | * | * | 100 | 100 | * | * | * | * | * | * | * | * | * | 125 |
| 400/415 V | aM | A | * | * | * | * | * | 63 | 63 | 80 | 80 | 80 | 80 | * | * | * | * | * | * | 80 | 100 | 100 | 100 |
| | gG | A | * | * | * | * | * | 80 | 80 | 100 | 100 | 100 | 100 | * | * | * | * | * | * | 100 | 125 | 125 | 125 |
| 440 V | aM | A | * | * | * | 50 | 50 | 50 | 50 | 63 | 63 | 63 | 63 | * | * | * | * | * | 50 | 63 | 80 | 80 | 80 |
| | gG | A | * | * | * | 63 | 63 | 63 | 63 | 80 | 80 | 80 | 80 | * | * | * | * | * | 63 | 80 | 100 | 100 | 100 |
| 500 V | aM | A | * | * | * | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | * | * | * | * | * | 50 | 50 | 50 | 50 | 50 |
| | gG | A | * | * | * | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | * | * | * | * | * | 63 | 63 | 63 | 63 | 63 |
| 690 V | aM | A | * | 16 | 25 | 32 | 32 | 40 | 40 | 40 | 40 | 40 | 40 | * | 20 | 25 | 40 | 40 | 50 | 50 | 50 | 50 | 50 |
| | gG | A | * | 20 | 32 | 40 | 40 | 50 | 50 | 50 | 50 | 50 | 50 | * | 25 | 32 | 50 | 50 | 63 | 63 | 63 | 63 | 63 |
| Cable protection against thermal stress in the event of short-circuit (PVC insulated copper cables) Minimum c.s.a. protected at 40 °C and at Isc max. | 1 mm ² | kA | ● | ● | ● | ≤10 | ≤6 | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ | ● | ● | ● | ● | ● | ≤10 | ≤6 | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ |
| | 1.5 mm ² | kA | ● | ● | ● | ≤20 | ≤10 | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ | ● | ● | ● | ● | ● | ≤20 | ≤10 | ⁽²⁾ | ⁽²⁾ | ⁽²⁾ |
| | 2.5 mm ² | kA | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ⁽²⁾ | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | 4...6 mm ² | kA | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

* > 100 kA.
 ● Cable c.s.a. protected.
 (1) As % of Icu.
 (2) Cable c.s.a. not protected.

Ref.



Motor circuit breakers

TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

Characteristics

| Breaking capacity of GV2ME, GV2RT and GV2P | | | | | | | | | | | | | | | | | | | | | | |
|---|----------------------|----------------------|-----------------|-----|----|-----|-----|----|----|---------|---------|----------|------------|-----|-----|-----|-----|-----|---------|-----|---------|----|
| Circuit breaker type | | | GV2ME and GV2RT | | | | | | | | | | GV2P | | | | | | | | | |
| | | | 01 to 06 | 07 | 08 | 10 | 14 | 16 | 20 | 21 & 22 | 32 | 01 to 06 | 07 | 08 | 10 | 14 | 16 | 20 | 21 & 22 | 32 | | |
| Rating | A | kA | 0.1 to 1.6 | 2.5 | 4 | 6.3 | 10 | 14 | 16 | 18 | 23 & 25 | 32 | 0.1 to 1.6 | 2.5 | 4 | 6.3 | 10 | 14 | 16 | 18 | 23 & 25 | 32 |
| Breaking capacity conforming to IEC 60947-2 | 230/240 V | Icu | kA | * | * | * | * | * | * | * | 50 | 50 | * | * | * | * | * | * | * | * | * | * |
| | | Ics % ⁽¹⁾ | | * | * | * | * | * | * | * | 100 | 100 | * | * | * | * | * | * | * | * | * | * |
| 400/415 V | Icu | kA | * | * | * | * | * | 15 | 15 | 15 | 10 | * | * | * | * | * | * | * | 50 | 50 | 50 | |
| | Ics % ⁽¹⁾ | | * | * | * | * | * | 50 | 50 | 40 | 50 | * | * | * | * | * | * | * | 50 | 50 | 50 | |
| 440 V | Icu | kA | * | * | * | 50 | 15 | 8 | 8 | 6 | 6 | * | * | * | * | * | * | 50 | 20 | 20 | 20 | |
| | Ics % ⁽¹⁾ | | * | * | * | 100 | 100 | 50 | 50 | 50 | 50 | * | * | * | * | * | * | 75 | 75 | 75 | 75 | |
| 500 V | Icu | kA | * | * | * | 50 | 10 | 6 | 6 | 4 | 4 | * | * | * | * | * | 50 | 42 | 10 | 10 | 10 | |
| | Ics % ⁽¹⁾ | | * | * | * | 100 | 100 | 75 | 75 | 75 | 75 | * | * | * | * | * | 100 | 75 | 75 | 75 | 75 | |
| 690 V | Icu | kA | * | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | * | 8 | 8 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | |
| | Ics % ⁽¹⁾ | | * | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | * | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| Associated fuses (if required) if Ics > breaking capacity Icu conforming to IEC 60947-2 | 230/240 V | aM | A | * | * | * | * | * | * | * | 80 | 80 | * | * | * | * | * | * | * | * | * | |
| | | gG | A | * | * | * | * | * | * | * | 100 | 100 | * | * | * | * | * | * | * | * | * | * |
| 400/415 V | aM | A | * | * | * | * | * | 63 | 63 | 80 | 80 | * | * | * | * | * | * | * | 100 | 100 | 100 | |
| | gG | A | * | * | * | * | * | 80 | 80 | 100 | 100 | * | * | * | * | * | * | * | 125 | 125 | 125 | |
| 440 V | aM | A | * | * | * | 50 | 50 | 50 | 50 | 63 | 63 | * | * | * | * | * | * | 50 | 63 | 80 | 80 | |
| | gG | A | * | * | * | 63 | 63 | 63 | 63 | 80 | 80 | * | * | * | * | * | * | 63 | 80 | 100 | 100 | |
| 500 V | aM | A | * | * | * | 50 | 50 | 50 | 50 | 50 | 50 | * | * | * | * | * | 50 | 50 | 50 | 50 | 50 | |
| | gG | A | * | * | * | 63 | 63 | 63 | 63 | 63 | 63 | * | * | * | * | * | 63 | 63 | 63 | 63 | 63 | |
| 690 V | aM | A | * | 16 | 25 | 32 | 32 | 40 | 40 | 40 | 40 | * | 20 | 25 | 40 | 40 | 50 | 50 | 50 | 50 | 50 | |
| | gG | A | * | 20 | 32 | 40 | 40 | 50 | 50 | 50 | 50 | * | 25 | 32 | 50 | 50 | 63 | 63 | 63 | 63 | 63 | |

* > 100 kA.
 (1) As % of Icu.



Motor circuit breakers

TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

Characteristics

| Breaking capacity of GV2ME, GV2RT and GV2P (used in association with current limiter GV1L3) | | | | | | | | | | | | | |
|---|-----------|----------------------|-----------------|------------------------|-----------|---------|-----------|----------|----------|----------|----------|----------|----------|
| Circuit breaker type | | | GV2ME and GV2RT | | | | | | | | | | |
| Rating | | | A | 01 to 06 0.1 to 1.6 | 07 2.5 | 08 4 | 10 6.3 | 14 10 | 16 14 | 20 18 | 21 23 | 22 25 | 32 32 |
| Breaking capacity conforming to IEC 60947-2 | 230/240 V | Icu | kA | * | * | * | * | * | * | * | * | * | * |
| | | Ics % ⁽¹⁾ | | * | * | * | * | * | * | * | * | * | * |
| | 400/415 V | Icu | kA | * | * | * | * | * | 100 | 100 | 100 | 100 | 100 |
| | | Ics % ⁽¹⁾ | | * | * | * | * | * | 50 | 50 | 40 | 40 | 40 |
| | 440 V | Icu | kA | * | * | * | * | * | 50 | 20 | 20 | 20 | 20 |
| | | Ics % ⁽¹⁾ | | * | * | * | * | * | 75 | 75 | 75 | 75 | 75 |
| | 500 V | Icu | kA | * | * | * | * | 50 | 42 | 10 | 10 | 10 | 10 |
| | | Ics % ⁽¹⁾ | | * | * | * | * | 100 | 100 | 75 | 75 | 75 | 75 |

| GV2P | | | | | | | | | | | | | |
|---|----------------------|----------------------|----|------------------------|-----------|---------|-----------|----------|----------|----------|----------|----------|----------|
| Circuit breaker type | | | A | 01 to 06 0.1 to 1.6 | 07 2.5 | 08 4 | 10 6.3 | 14 10 | 16 14 | 20 18 | 21 23 | 22 25 | 32 32 |
| Breaking capacity conforming to IEC 60947-2 | 230/240 V | Icu | kA | * | * | * | * | * | * | * | * | * | * |
| | | Ics % ⁽¹⁾ | | * | * | * | * | * | * | * | * | * | * |
| | 400/415 V | Icu | kA | * | * | * | * | * | * | * | * | * | * |
| | | Ics % ⁽¹⁾ | | * | * | * | * | * | * | * | * | * | * |
| | 440 V | Icu | kA | * | * | * | * | * | 100 | 100 | 100 | 100 | 100 |
| | | Ics % ⁽¹⁾ | | * | * | * | * | * | 50 | 50 | 50 | 50 | 50 |
| | 500 V | Icu | kA | * | * | * | * | 100 | 100 | 100 | 100 | 100 | 100 |
| | | Ics % ⁽¹⁾ | | * | * | * | * | 50 | 50 | 50 | 50 | 50 | 50 |
| | 690 V ⁽³⁾ | Icu = Ics | kA | * | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |

| GV2ME | | | | | | | | | | | | | | |
|---|---|-----------------------|---|------------------------|-----------|---------|-----------|----------|----------|----------|----------|----------|----------|-----|
| Circuit breaker type | | | A | 01 to 06 0.1 to 1.6 | 07 2.5 | 08 4 | 10 6.3 | 14 10 | 16 14 | 20 18 | 21 23 | 22 25 | 32 32 | |
| Cable protection against thermal stress in the event of short-circuit (PVC insulated copper cables) | Minimum c.s.a. protected at 40 °C at Isc max. | 1 mm ² | | ● | ● | ● | ≤ 10 kA | ≤ 6 kA | (2) | (2) | (2) | (2) | (2) | |
| | | 1.5 mm ² | | ● | ● | ● | ≤ 20 kA | ≤ 10 kA | (2) | (2) | (2) | (2) | (2) | |
| | | 2.5 mm ² | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (2) |
| | | 4...6 mm ² | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

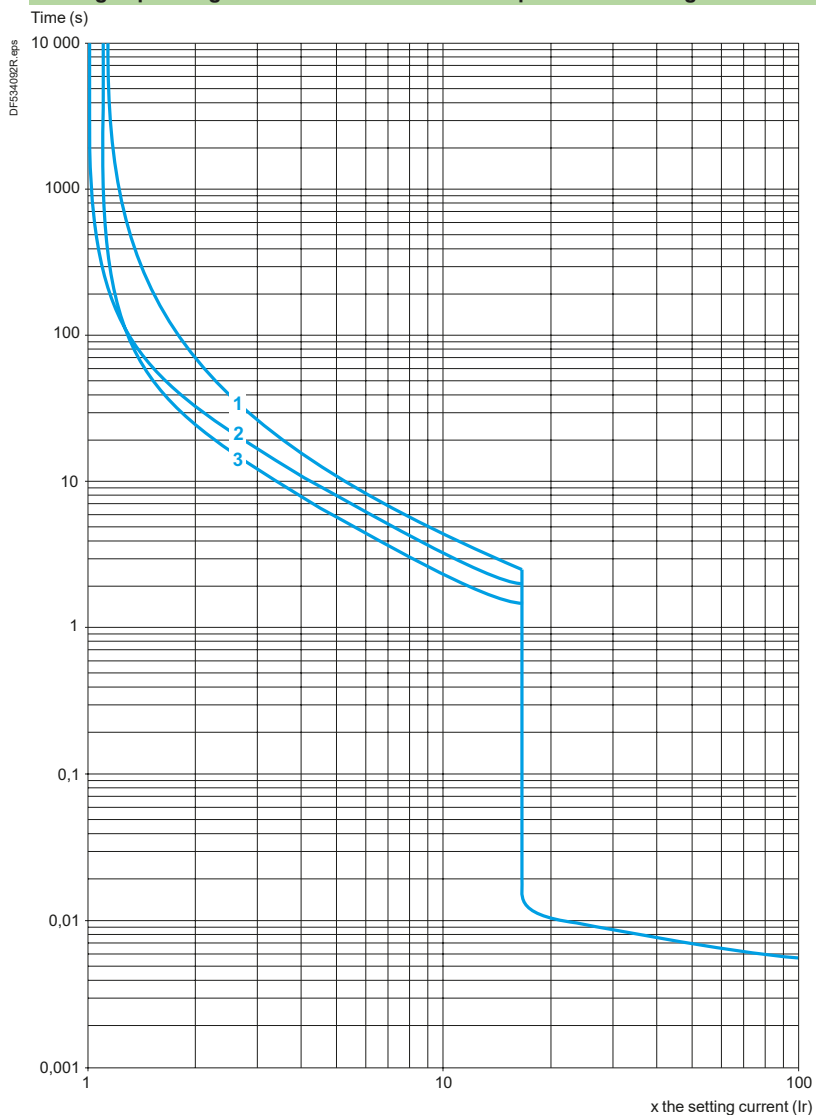
* > 100 kA.
 ● Cable c.s.a. protected.
 (1) As % of Icu.
 (2) Cable c.s.a. not protected.
 (3) With limiter LA9LB920.

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Deca - Frame 2 Motor circuit breakers - Magnetic Curves

Tripping curves for GV2L or LE combined with thermal overload relay LRD or LR2K

Average operating times at 20 °C related to multiples of the setting current



- 1 3 poles from cold state
- 2 2 poles from cold state
- 3 3 poles from hot state



Motor circuit breakers

TeSys Power

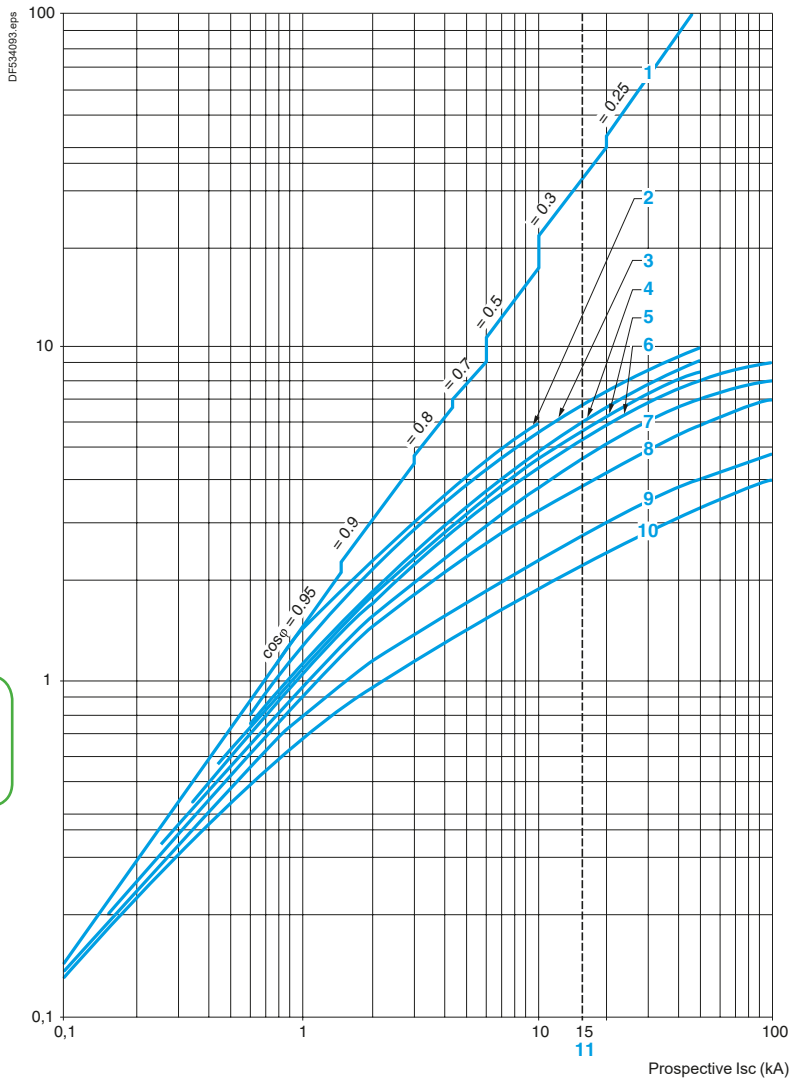
Deca - Frame 2 Motor circuit breakers - Magnetic Curves

Current limitation on short-circuit for GV2L and GV2LE only (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



1 Maximum peak current

2 32 A

3 25 A

4 18 A

5 14 A

6 10 A

7 6.3 A

8 4 A

9 2.5 A

10 1.6 A

11 Limit of rated ultimate breaking capacity on short-circuit of GV2LE (14, 18, 23 and 25 A ratings).

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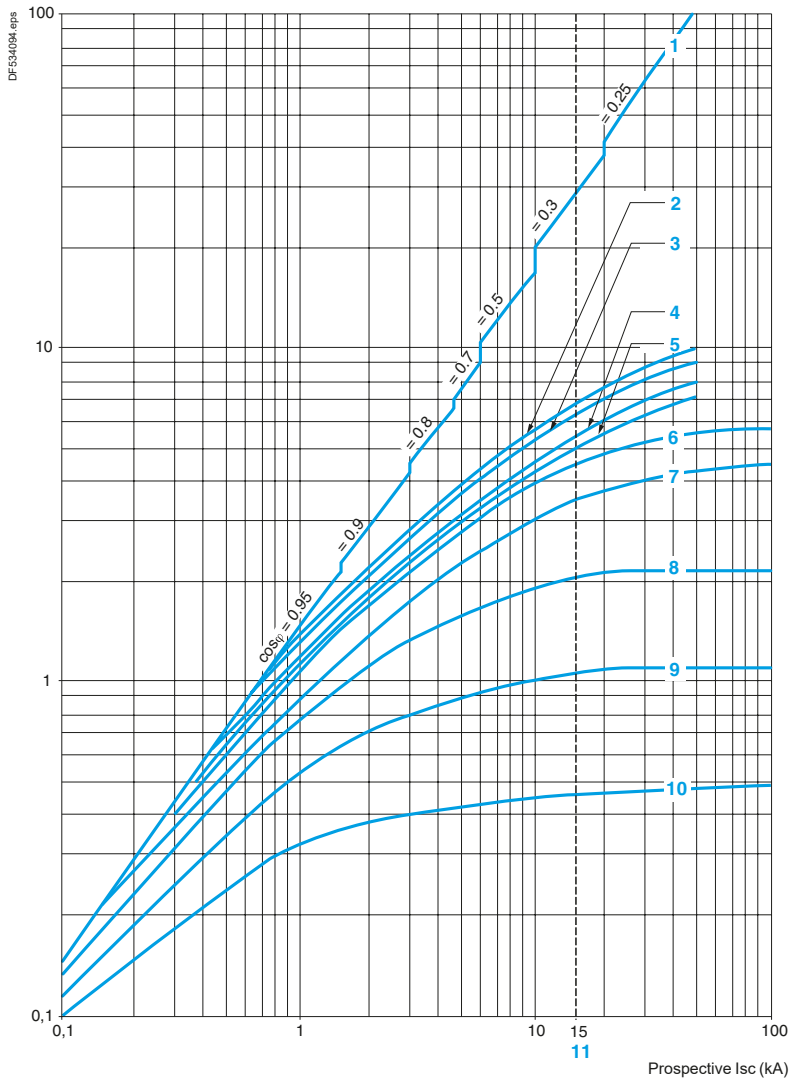
Deca - Frame 2 Motor circuit breakers - Magnetic Curves

Current limitation on short-circuit for GV2L and GV2LE + thermal overload relay LRD or LR2K (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



1 Maximum peak current

2 32 A

3 25 A

4 18 A

5 14 A

6 10 A

7 6.3 A

8 4 A

9 2.5 A

10 1.6 A

11 Limit of rated ultimate breaking capacity on short-circuit of GV2LE (14, 18, 23 and 25 A ratings).

TeSys Power

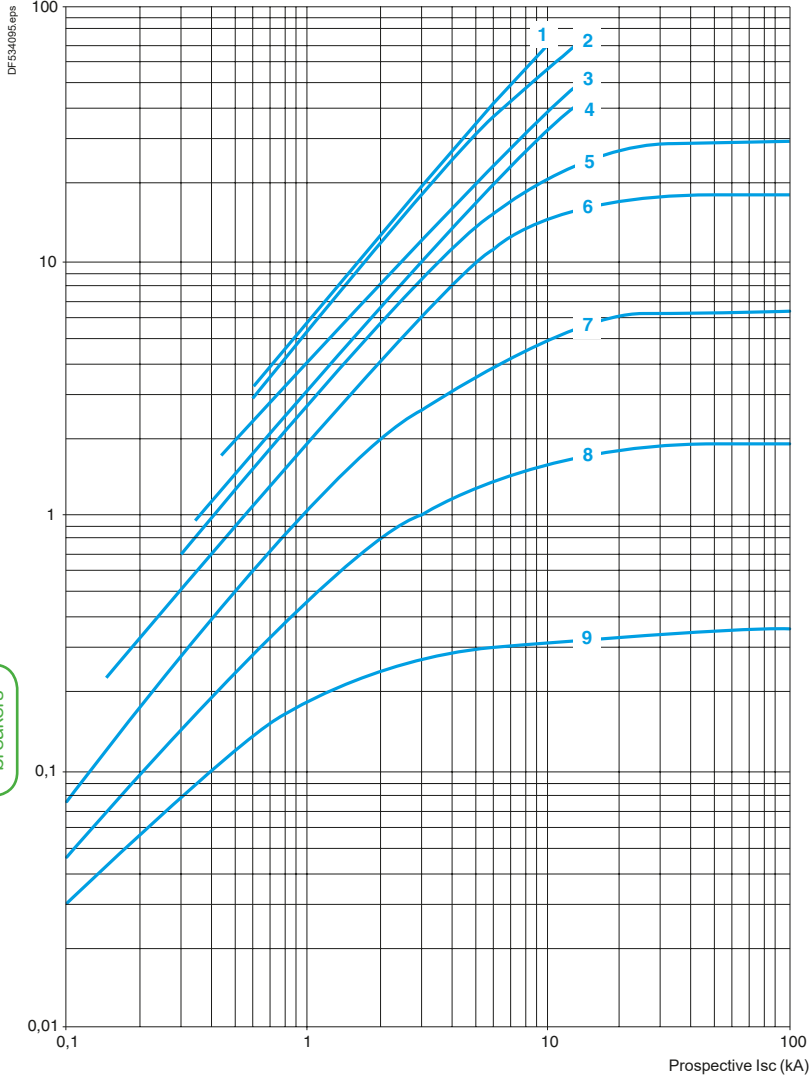
Deca - Frame 2 Motor circuit breakers - Magnetic Curves

Thermal limit on short-circuit for GV2LE only

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective I_{sc}) at 1.05 U_e = 435 V

Sum of I²dt (kA²s)



- 1 32 A
- 2 25 A
- 3 18 A
- 4 14 A
- 5 10 A
- 6 6.3 A
- 7 4 A
- 8 2.5 A
- 9 1.6 A

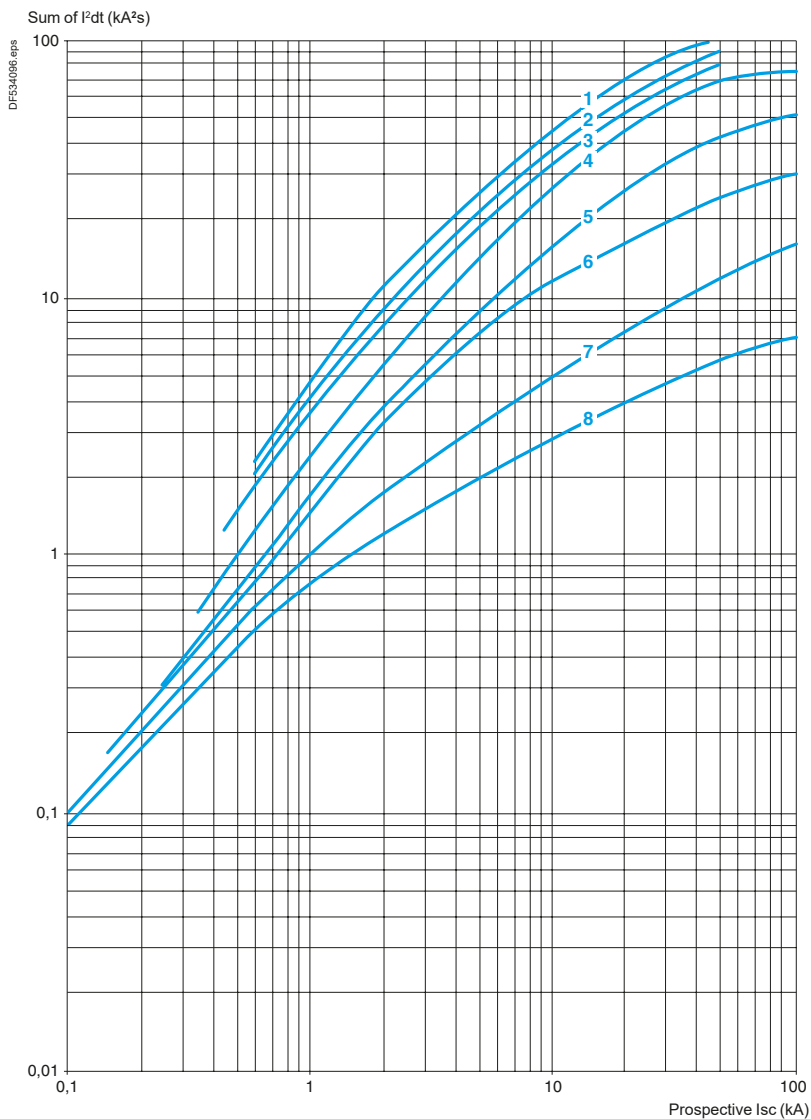
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Deca - Frame 2 Motor circuit breakers - Magnetic Curves

Thermal limit on short-circuit for GV2L only

Thermal limit in kA^2s in the magnetic operating zone

Sum of $I^2dt = f$ (prospective I_{sc}) at $1.05 U_e = 435 V$



- 1 25 A and 32 A
- 2 18 A
- 3 14 A
- 4 10 A
- 5 6.3 A
- 6 4 A
- 7 2.5 A
- 8 1.6 A

Ref.



Motor
circuit
breakers

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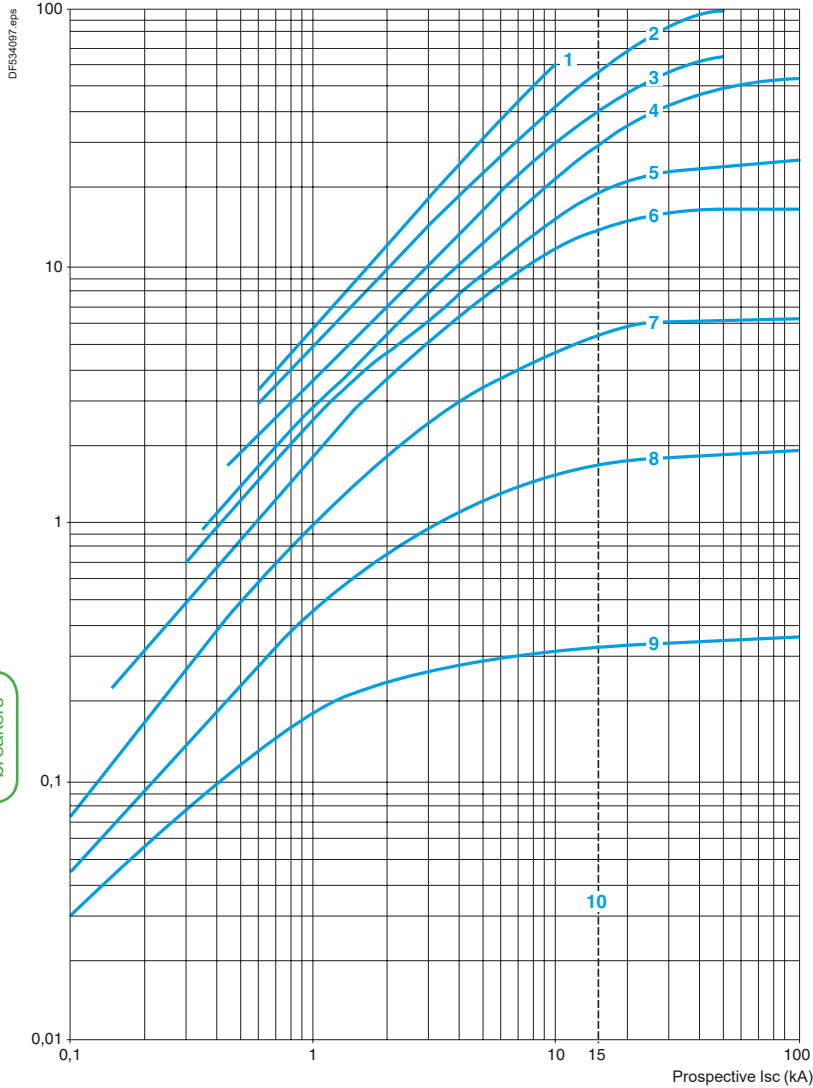
Deca - Frame 2 Motor circuit breakers - Magnetic Curves

Thermal limit on short-circuit for GV2L and GV2LE + thermal overload relay LRD or LR2K

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective I_{sc}) at 1.05 U_e = 435 V

Sum of I²dt (kA²s)



- 1 32 A (GV2LE32)
- 2 25 A and 32 A (GV2L32)
- 3 18 A
- 4 14 A
- 5 10 A
- 6 6.3 A
- 7 4 A
- 8 2.5 A
- 9 1.6 A
- 10 Limit of rated ultimate breaking capacity on short-circuit of GV2LE (14, 18, 23 and 25 A ratings).

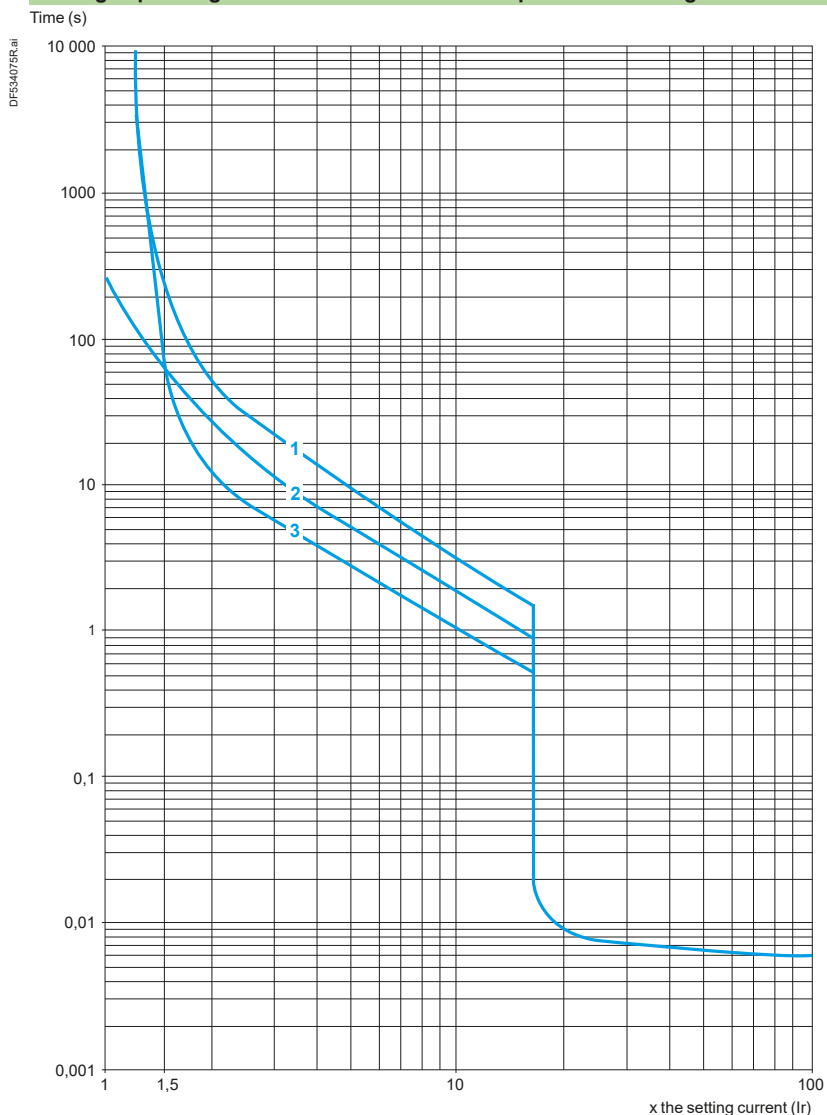
TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

Curves

Thermal-magnetic tripping curves for GV2ME, GV2RT and GV2P

Average operating times at 20 °C related to multiples of the setting current



- 1 3 poles from cold state
- 2 2 poles from cold state
- 3 3 poles from hot state

Ref.



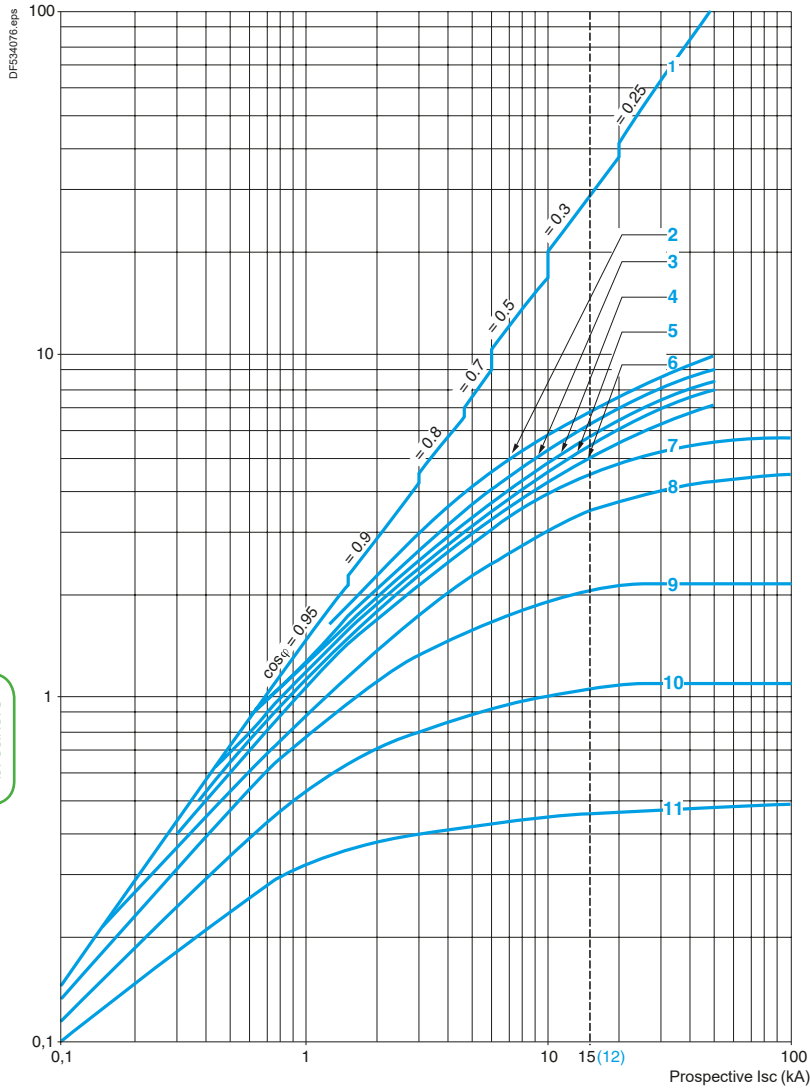
Motor
circuit
breakers

Current limitation on short-circuit for GV2ME, GV2RT and GV2P (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



1 Maximum peak current

2 24 - 32 A

3 20 - 25 A

4 17 - 23 A

5 13 - 18 A

6 9 - 14 A

7 6 - 10 A

8 4 - 6.3 A

9 2.5 - 4 A

10 1.6 - 2.5 A

11 1 - 1.6 A

12 Limit of rated ultimate breaking capacity on short-circuit of GV2ME (14, 18, 23 and 25 A ratings)

TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

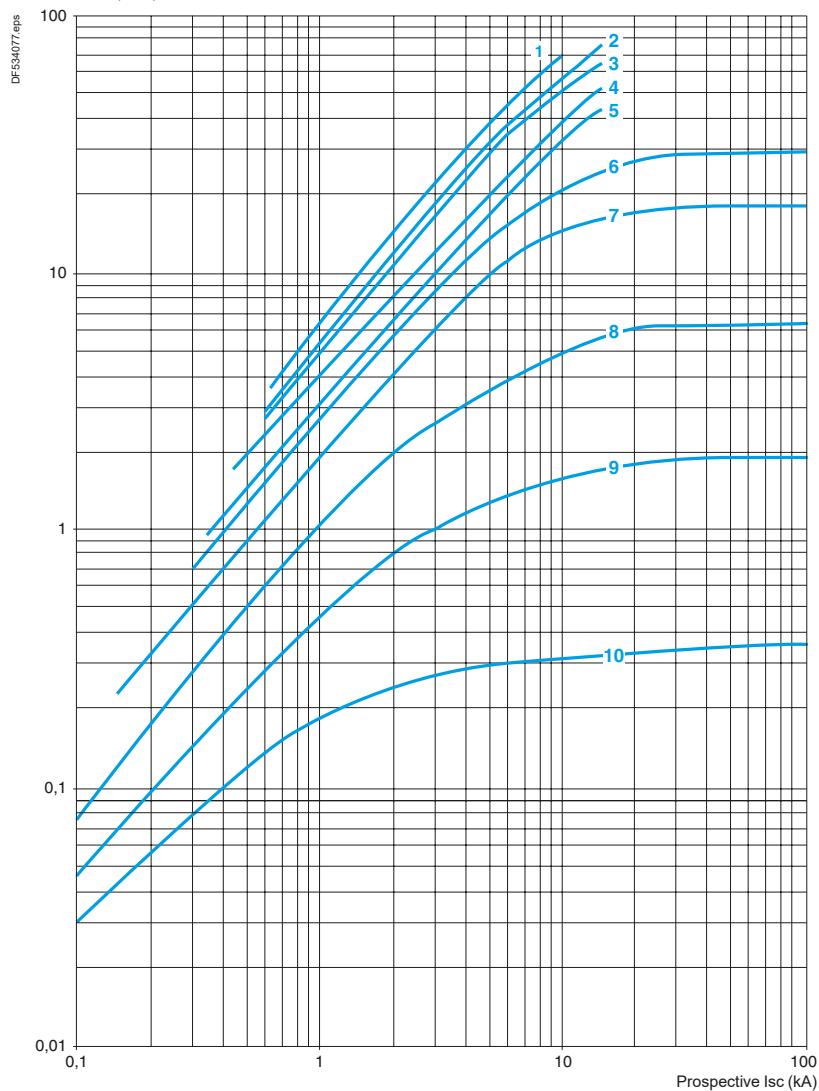
Curves

Thermal limit on short-circuit for GV2ME and GV2RT

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective I_{sc}) at 1.05 U_e = 435 V

Sum of I²dt (kA²s)

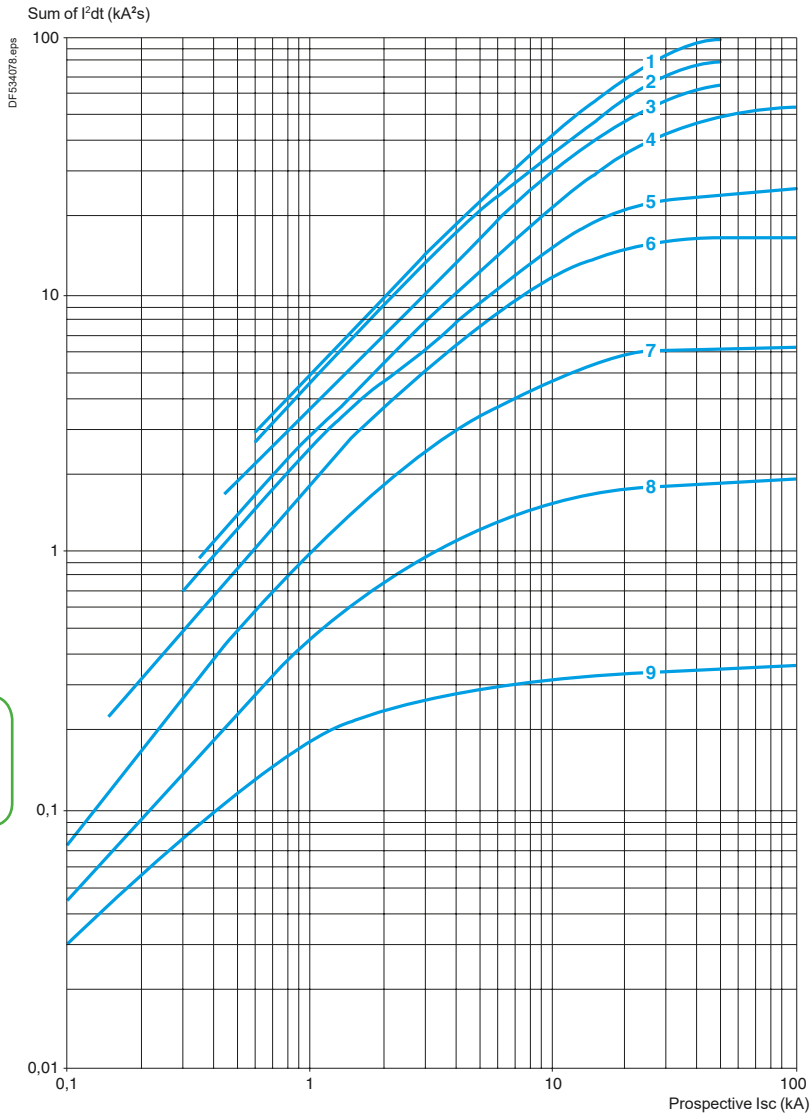


- 1 24 - 32 A
- 2 20 - 25 A
- 3 17 - 23 A
- 4 13 - 18 A
- 5 9 - 14 A
- 6 6 - 10 A
- 7 4 - 6.3 A
- 8 2.5 - 4 A
- 9 1.6 - 2.5 A
- 10 1 - 1.6 A

Thermal limit on short-circuit for GV2P

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective I_{sc}) at 1.05 U_e = 435 V



- 1 20 - 25 A, 24 - 32 A
- 2 17 - 23 A
- 3 13 - 18 A
- 4 9 - 14 A
- 5 6 - 10 A
- 6 4 - 6.3 A
- 7 2.5 - 4 A
- 8 1.6 - 2.5 A
- 9 1 - 1.6 A

TeSys Power

Electric trips for Deca - Frame 2 Motor circuit breakers

Characteristics

| Characteristics of GV2 electric trips | | | | | |
|---|--|------------------------|--|--|--------------------------|
| Type of trip | | | GVAU●●● MN undervoltage trip | GVAX●●● MN undervoltage trip for GV2ME - safety device for dangerous machines | GVAS●●● MX shunt trip |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | 690 | 500 | 690 |
| | Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1 | V | 600 | - | 600 |
| Operational voltage (Ue) | Conforming to IEC 60947-1 | V | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.7...1.1 Uc |
| Drop-out voltage | | V | 0.7...0.35 Uc | 0.7...0.35 Uc | 0.75...0.2 Uc |
| Inrush consumption | ~ | VA | 12 | 12 | 14 |
| Sealed consumption | ~ | VA | 3.5 | 3.5 | 5 |
| Operating time | Conforming to IEC 60947-1 | ms | From the moment the voltage reaches its operational value until opening of the circuit breaker. 10...15 | | |
| On-load factor | | | 100 % | | |
| Cabling (screw clamp connection) | Number of conductors | | 2 or 4 | | |
| | Solid cable | mm ² | 1...2.5 | | |
| | Flexible cable without cable end | mm ² AWG | 0.75...2.5 | | |
| | Flexible cable with cable end | mm ² | 0.75...2.5 | | |
| Tightening torque | | N.m | 1.4 max | | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 30000 (GV2ME and GV2P) | | |

Ref.



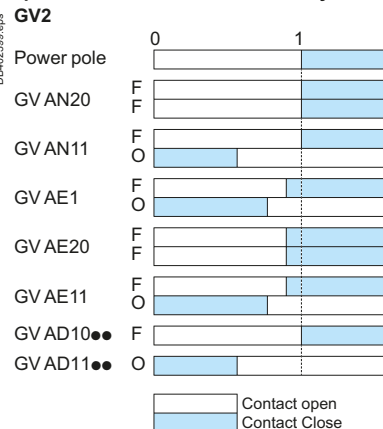
Motor
circuit
breakers

| Type of contacts | | | Instantaneous auxiliary GVAN, GVAD | | | | | | | Fault signalling GVAD, GVAM11 ⁽¹⁾ | | | | Instantaneous auxiliary GVAE | | | |
|---|--|----------------------------------|---|----------------------------|-----|------------|-----|-----|-----|--|-----|------------|------------------------------------|---------------------------------------|------|------|-----|
| Rated insulation voltage (Ui) (associated insulation coordination) | Conforming to IEC 60947-1 | V | 690 | | | | | | | 690 | | | | 250 (690 in relation to main circuit) | | | |
| | Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1 | V | 600 | | | | | | | 300 | | | | 300 | | | |
| Conventional thermal current (Ith) | Conforming to IEC 60947-5-1 | A | 6 | | | | | | | 2.5 | | | | 2.5 | | | |
| | Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1 | A | 5 | | | | | | | 1 | | | | 1 | | | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 100 000 | | | | | | | 1000 | | | | 100 000 | | | |
| Operational power and current conforming to IEC 60947-5-1. a.c. operation | | | AC-15/100 000 C.O. | | | | | | | AC-14/1000 C.O. | | | | AC-15/100 000 C.O. | | | |
| | Rated operational voltage (Ue) | V | 48 | 110 | 230 | 380 | 440 | 500 | 690 | 24 | 48 | 110 | 230 | 24 | 48 | 110 | 230 |
| Operation | Operational power, normal conditions | VA | 300 | 500 | 720 | 850 | 650 | 500 | 414 | 36 | 48 | 72 | 72 | 48 | 60 | 120 | 120 |
| | Occasional breaking and making capacities, abnormal conditions | kVA | 3 | 7 | 13 | 15 | 13 | 12 | 9 | 0.22 | 0.3 | 0.45 | 0.45 | 0.48 | 0.6 | 1.27 | 2.4 |
| | Rated operational current (Ie) | A | 6 | 4.5 | 3.3 | 2.2 | 1.5 | 1 | 0.6 | 1.5 | 1 | 0.5 | 0.3 | 2 | 1.25 | 1 | 0.5 |
| Operational power and current conforming to IEC 60947-5-1. d.c. | | | DC-13/100 000 C.O. | | | | | | | DC-13/1000 C.O. | | | | DC-13/100 000 C.O. | | | |
| | Rated operational voltage (Ue) | V | 24 | 48 | 60 | 110 | 240 | - | - | 24 | 48 | 60 | - | 24 | 48 | 60 | - |
| Operation | Operational power, normal conditions | W | 140 | 240 | 180 | 140 | 120 | - | - | 24 | 15 | 9 | - | 24 | 15 | 9 | - |
| | Occasional breaking and making capacities, abnormal conditions | W | 240 | 360 | 240 | 210 | 180 | - | - | 100 | 50 | 50 | - | 100 | 50 | 50 | - |
| | Rated operational current (Ie) | A | 6 | 5 | 3 | 1.3 | 0.5 | - | - | 1 | 0.3 | 0.15 | - | 1 | 0.3 | 0.15 | - |
| Low power switching reliability of contact | | | GVAE: Number of failures for "n" million operating cycles (17 V-5 mA): = 10 ⁻⁶ | | | | | | | | | | | | | | |
| Minimum operational conditions | | V | 17 | | | | | | | | | | | | | | |
| | | mA | 5 | | | | | | | | | | | | | | |
| Short-circuit protection | | | By GB2CB●● circuit breaker (rating according to operational current for Ue ≤ 415 V) or by gG fuse 10 A max | | | | | | | | | | GB2CB06 or gG fuse 10 A max | | | | |
| Cabling, screw clamp terminals | Number of conductors | | 1 | | | 2 | | | | | | | | | | | |
| | Solid cable | | mm ² 1...2.5 | | | 1...2.5 | | | | | | | | | | | |
| | Flexible cable without cable end | | mm ² 0.75...2.5 | | | 0.75...2.5 | | | | | | | | | | | |
| | Flexible cable with cable end | | mm ² 0.75...1.5 | | | 0.75...1.5 | | | | | | | | | | | |
| | Tightening torque | | N.m 1.4 max | | | 1.4 max | | | | | | | | | | | |
| Cabling, spring terminal connections | | Flexible cable without cable end | | mm ² 0.75...2.5 | | 0.75...2.5 | | - | | | | 0.75...1.5 | | | | | |

Ref.

Motor circuit breakers

Operation of instantaneous auxiliary contacts



Operation of fault signalling contacts

GVAM11
Change of state following tripping on short-circuit.

GVAD10●● and GVAD01●●
Change of state following tripping on short-circuit, overload or undervoltage.

(1) For application example of fault signalling contact and short-circuit signalling contact.
 (2) Add an RC circuit type **LA4D** to the load terminals.

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Accessories for Deca - Frame 2 Motor circuit breakers

Characteristics

| Characteristics of 3-pole busbars GV2G●●● | | | | | | |
|---|----------------------------------|-------------|---------------------------------|---------------------------------|--------------------|---------------------|
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | GV2G●●● 690 | | | |
| Conventional thermal current (Ith) | Conforming to IEC 60439-1 | A | 63 | | | |
| Rated operational current (Ie) | | A | 63 | | | |
| Permissible peak current (I peak) | | kA | 11 | | | |
| Permissible thermal limit (I²t) | | kA²s | 104 | | | |
| Degree of protection | Conforming to IEC 60529 | | IP 20 | | | |
| Terminal block | | | Yes | | | |
| Characteristics of terminal blocks GV2G05 and GV1G09 (for GV2ME and GV2P) | | | | | | |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | 690 | | | |
| Conventional thermal current (Ith) | Conforming to IEC 60439-1 | A | 63 | | | |
| Rated operational current (Ie) | | A | 63 115 | | | |
| Degree of protection | Conforming to IEC 60529 | | IP 20 | | | |
| Connection | Solid cable | mm² | 1 x 1.5 to 25 or 2 x 1.5 to 6 | | | |
| | Flexible cable without cable end | mm² | 1 x 1.5 to 16 or 2 x 1.5 to 4 | | | |
| | Flexible cable with cable end | mm² | 1 x 1.5 to 16 or 2 x 1.5 to 4 | | | |
| | Flexible or solid cable AWG | | 1 AWG 4 | | | |
| Tightening torque | Connector | N.m | 2.2 | | | |
| | Screw clamp terminals | N.m | 1.7 | | | |
| Characteristics of current limiters (GV2ME and GV2P) | | | | | | |
| Type | | | GV1L3 | LA9LB920 | | |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | 690 | 690 | | |
| Conventional thermal current (Ith) | Conforming to IEC 60947-1 | A | 63 | 63 | | |
| Rated operational current (Ie) | | A | 32 | 32 | | |
| Operating threshold | rms current | A | 1500 (non adjustable threshold) | 1000 (non adjustable threshold) | | |
| Connection | | | 1 conductor | 2 conductors | 1 conductor | 2 conductors |
| | Solid cable | mm² | 1.5...25 | 1.5...10 | 1.5...25 | 1.5...10 |
| | Flexible cable without cable end | mm² | 1.5...25 | 2.5...10 | 1.5...25 | 1.5...10 |
| | Flexible cable with cable end | mm² | 1.5...16 | 1.5... 4 | 1.5...16 | 1.5... 4 |
| Tightening torque | | N.m | 2.2 | | | |

Ref.



Motor circuit breakers

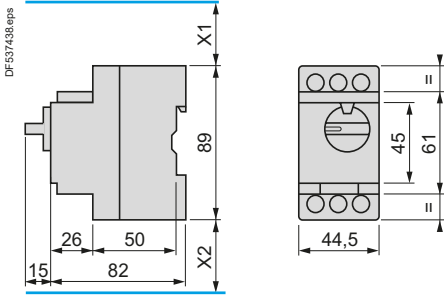
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Deca - Frame 2 Motor circuit breakers - Magnetic

Dimensions and mounting

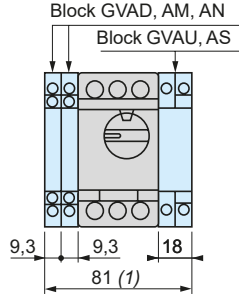
GV2L

Dimensions



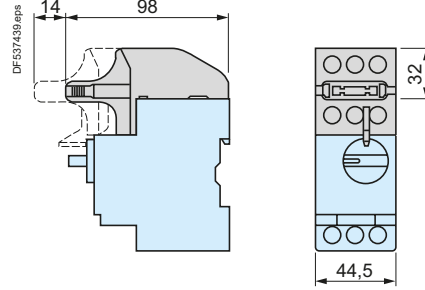
X1 Electrical clearance = 40 mm for $U_e \leq 415$ V, or 80 mm for $U_e = 440$ V, or 120 mm for $U_e = 500$ and 690 V.
X2 = 40 mm.

GVAD, AM, AN, AU, AS



(1) Maximum.

GV2AK00



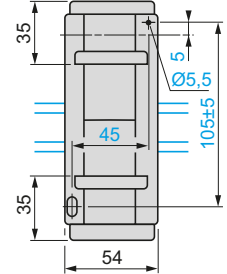
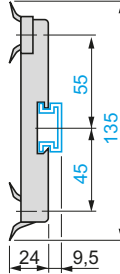
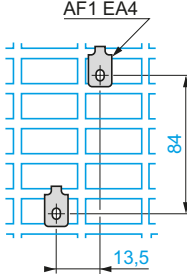
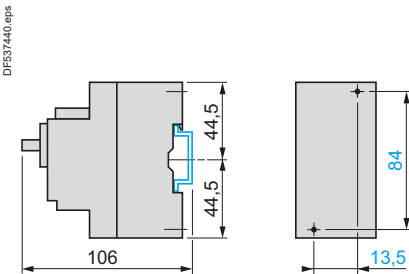
Mounting

On rail AM1DE200, AM1ED200 (35 x 15)

Panel mounted

On pre-slotted mounting plate AM1PA

Adapter plate GK2AF01

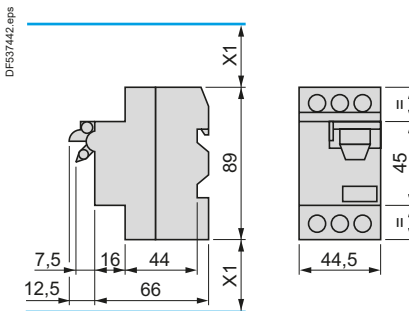


7.5 mm height compensation plate GV1F03



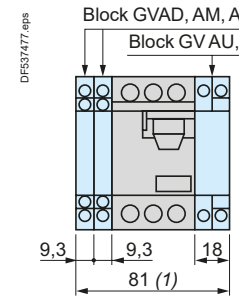
GV2LE

Dimensions



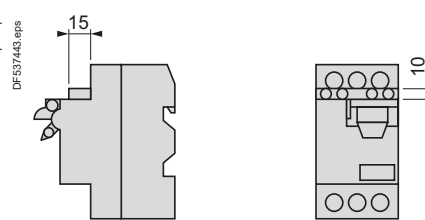
X1 Electrical clearance = 40 mm for $U_e \leq 690$ V.

GVAD, AM, AN, AU, AS



(1) Maximum.

GVAE



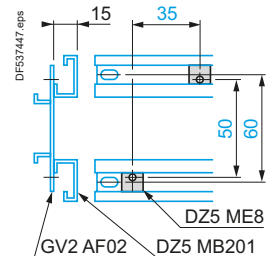
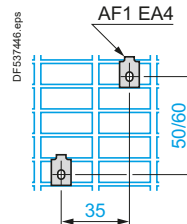
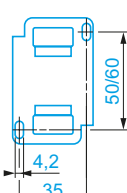
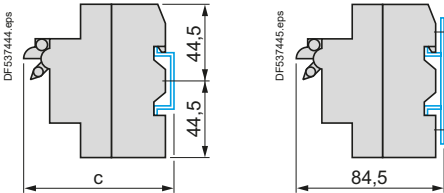
Mounting

On 35 mm rail

On panel with adapter plate GV2AF02

On pre-slotted plate AM1PA

On rails DZ5MB201



c = 80 on AM1DP200 (35 x 7.5) and 88 on AM1DE200, ED200 (35 x 15)



Motor circuit breakers

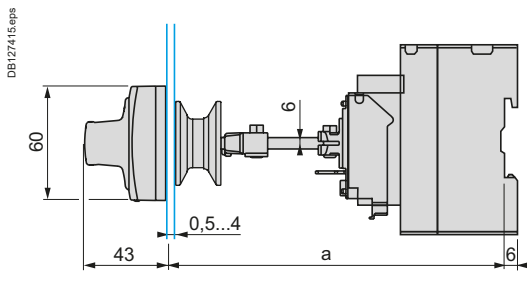
TeSys Power

Deca - Frame 2 Motor circuit breakers - Magnetic

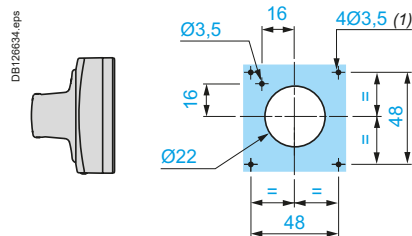
Dimensions and mounting

Mounting

Mounting of external operator GV2APN01, GV2APN02 or GV2APN04 for motor circuit breakers GV2L

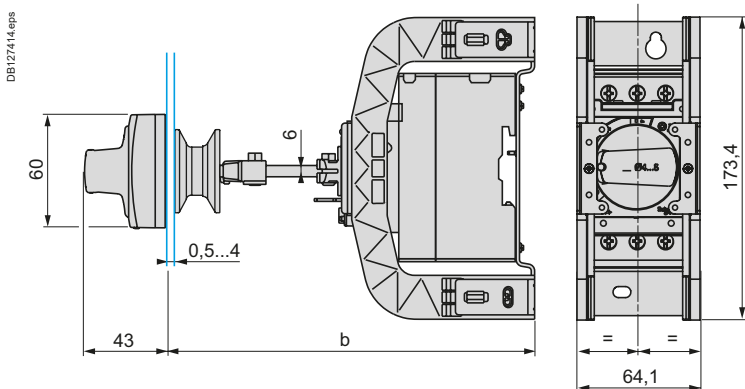


Door cut-out

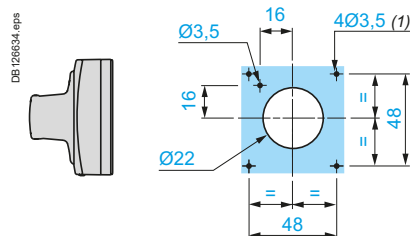


(1) For IP65 only.

Mounting of external operator GVAPH02 for motor circuit breakers GV2L



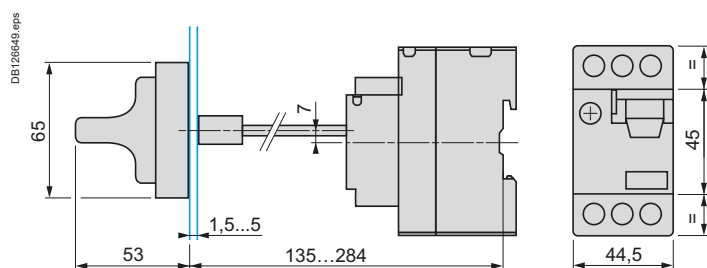
Door cut-out



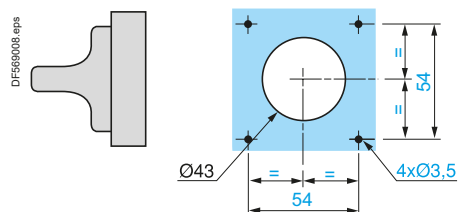
(1) For IP65 only.

| | a | | b | |
|------------------------------|------|------|------|------|
| | Mini | Maxi | Mini | Maxi |
| GV2APN●● | 140 | 250 | | |
| GV2APN●● + GVAPH02 | | | 151 | 250 |
| GV2APN●● + GVAPK11 | 250 | 434 | - | - |
| GV2APN●● + GVAPH02 + GVAPK11 | - | - | 250 | 445 |

Mounting of external operator GV2AP03 for GV2LE



Door cut-out



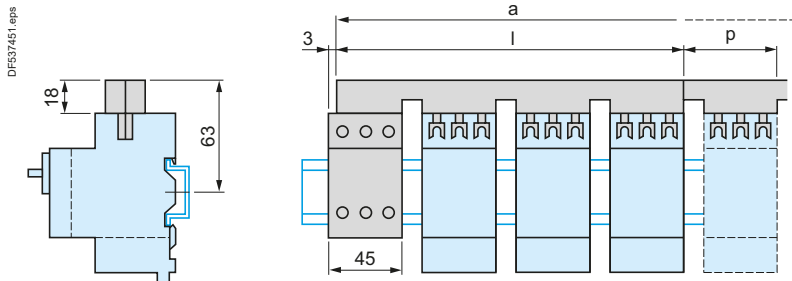
TeSys Power

Deca - Frame 2 Motor circuit breakers - Magnetic

Dimensions and mounting

GV2LE

Sets of busbars GV2G445, GV2G454, GV2G472, with terminal block GV2G05



| | l | p |
|---------------------|-----|----|
| GV2G445 (4 x 45 mm) | 179 | 45 |
| GV2G454 (4 x 54 mm) | 206 | 54 |
| GV2G472 (4 x 72 mm) | 260 | 72 |

Ref.



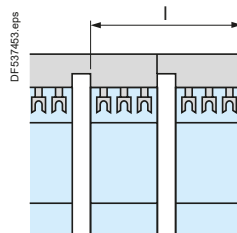
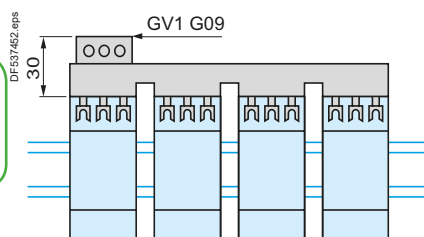
| | a | | | |
|--------------------|-----|-----|-----|-----|
| Number of tap-offs | 5 | 6 | 7 | 8 |
| GV2G445 | 224 | 269 | 314 | 359 |
| GV2G454 | 260 | 314 | 368 | 422 |
| GV2G472 | 332 | 404 | 476 | 548 |

Sets of busbars GV2LE

Sets of busbars GV2G●●● with term. block GV1G09

Sets of busbars GV2G245, GV2G254, GV2GR272

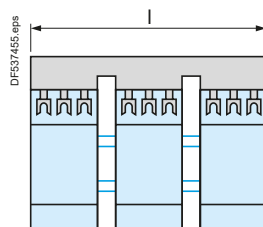
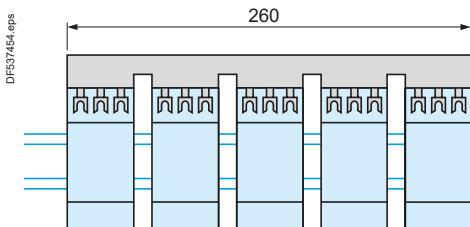
Motor circuit breakers



| | l |
|---------------------|-----|
| GV2G245 (2 x 45 mm) | 89 |
| GV2G254 (2 x 54 mm) | 98 |
| GV2G272 (2 x 72 mm) | 116 |

Set of busbars GV2G554

Sets of busbars GV2G345 and GV2G354



| | l |
|---------------------|-----|
| GV2G345 (3 x 45 mm) | 134 |
| GV2G354 (3 x 54 mm) | 152 |

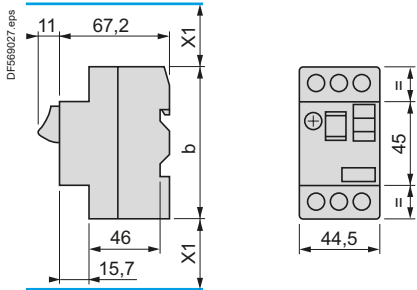
TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

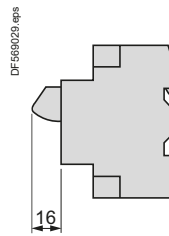
Dimensions and mounting

Dimensions

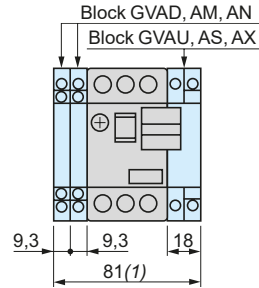
GV2ME



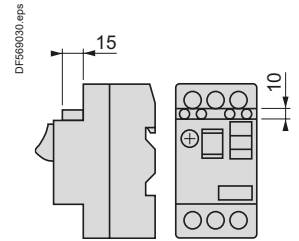
GVAX



GVAD, AM, AN, AU, AS, AX



GVAE



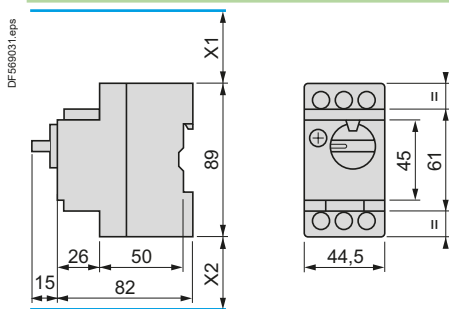
b

| | |
|----------|-----|
| GV2ME●● | 89 |
| GV2ME●●3 | 101 |

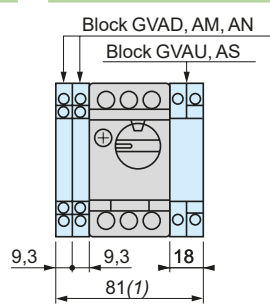
(1) Maximum.

X1 Electrical clearance = 40 mm for $U_e \leq 690$ V

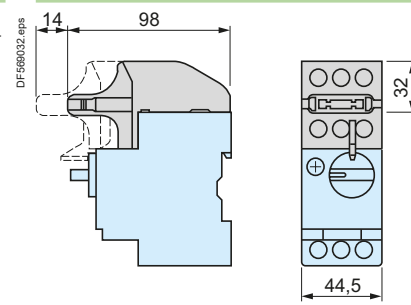
GV2P



GVAD, AM, AN, AU, AS



GV2AK00

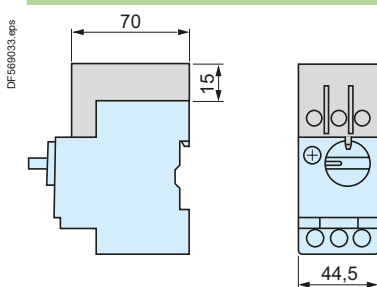


(1) Maximum.

X1 Electrical clearance = 40 mm for $U_e \leq 415$ V, or 80 mm for $U_e = 440$ V, or 120 mm for $U_e = 500$ and 690 V

X2 = 40 mm

GV2GH7




TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

Dimensions and mounting

Mounting

GV2ME

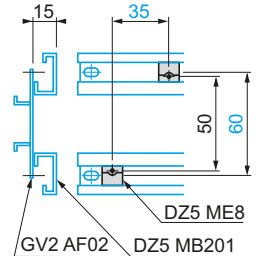
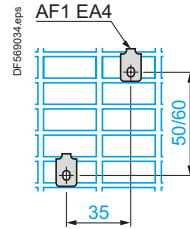
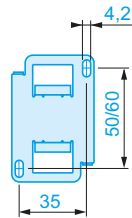
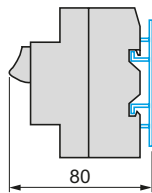
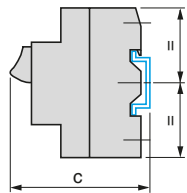
On 35 mm  rail

On panel with adapter plate GV2AF02

On pre-slotted plate AM1PA

On rails DZ5MB201

DF-569012.eps



$c = 78.5$ on AM1 DP200 (35 x 7.5)
 $c = 86$ on AM1 DE200, ED200 (35 x 15)

GV2P

On rail AM1DE200, ED200 (35 x 15)

Panel mounted

On pre-slotted plate AM1PA

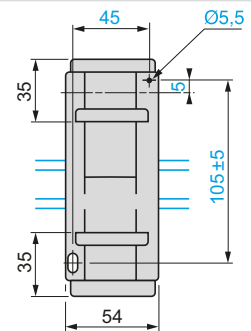
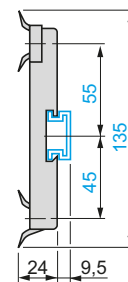
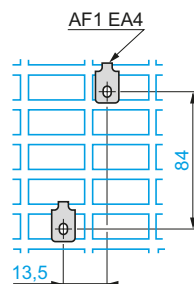
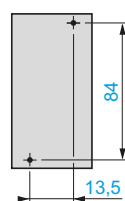
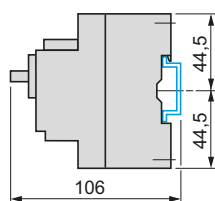
Adapter plate GK2AF01

Ref.



Motor circuit breakers

DF-569013.eps



Dimensions

GV2AF01

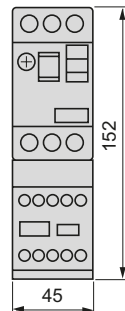
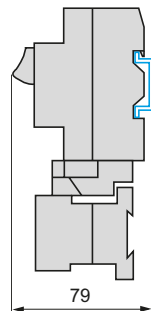
Combination GV2ME + k contactor

GV2AF3

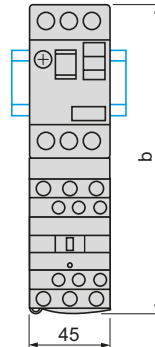
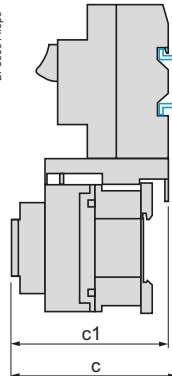
Combination GV2ME + d contactor

Combination GV2P + d contactor

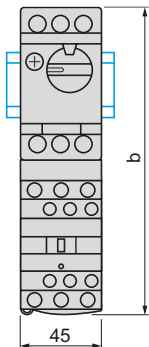
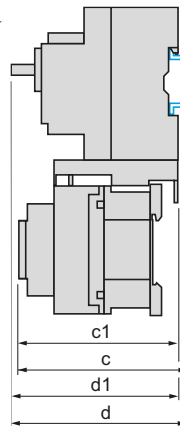
DF-569035.eps



DF-569014.eps



DF-569036.eps



| GV2ME + | LC1D09 ...D18 | LC1D25 and D32 |
|---------|---------------|----------------|
| b | 176.4 | 186.8 |
| c1 | 94.1 | 100.4 |
| c | 99.6 | 105.9 |

| GV2P + | LC1D09 ...D18 | LC1D25 and D32 |
|--------|---------------|----------------|
| b | 176.4 | 186.8 |
| c1 | 100.1 | 106.4 |
| c | 105.6 | 111.9 |
| d1 | 95 | 95 |
| d | 100.5 | 100.5 |

TeSys Power

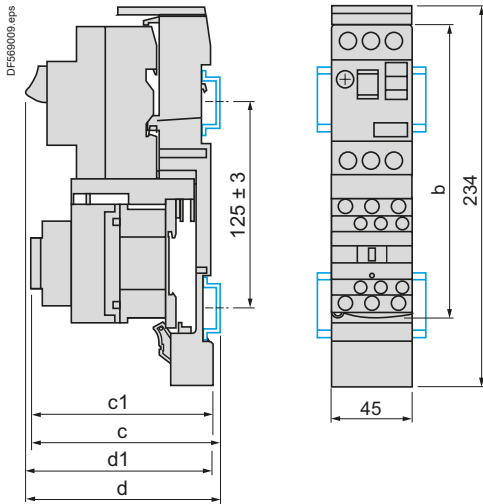
Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

Dimensions and mounting

Dimensions

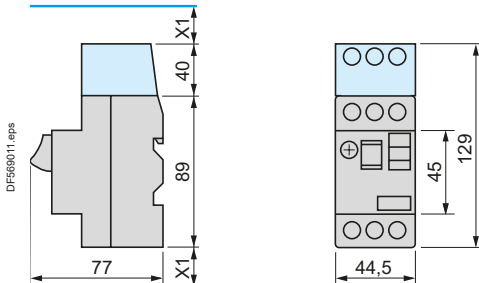
GV2AF4 + LAD311

Combination GV2ME + d contactor



| GV2ME + | LC1D09...D18 | LC1D25 and D32 |
|-----------|--------------|----------------|
| b | 176.4 | 186.8 |
| c1 | 130.1 | 136.4 |
| c | 135.6 | 141.9 |
| d1 | 107 | 107 |
| d | 112.5 | 112.5 |

GV2ME + GV1L3 (current limiter)



X1 = 10 mm for $U_e = 230\text{ V}$
or 30 mm for $230\text{ V} < U_e \leq 690\text{ V}$

7.5 mm height compensation plate GV1F03



Ref.



Motor
circuit
breakers

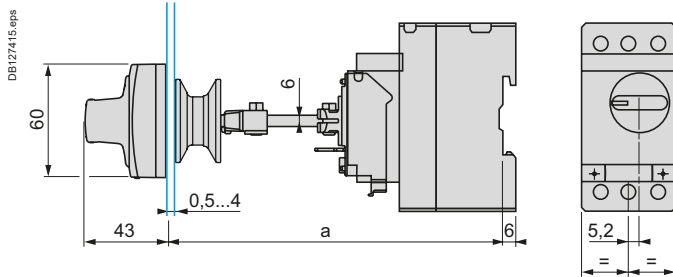
TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

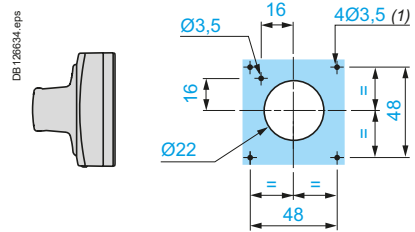
Dimensions and mounting

Mounting

Mounting of external operator GV2APN01, GV2APN02 or GV2APN04 for motor circuit breakers GV2P

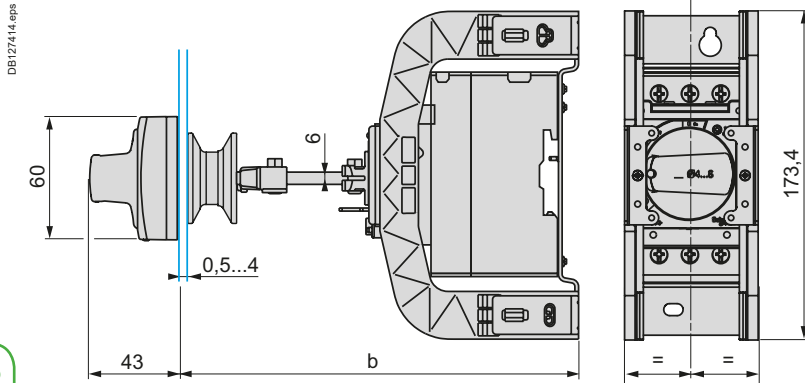


Door cut-out

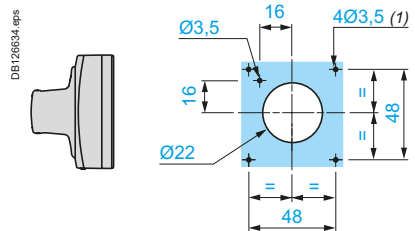


(1) For IP65 only.

Mounting of external operator GVAPH02 for motor circuit breakers GV2P



Door cut-out



(1) For IP65 only.

Ref.

Motor circuit breakers

| | a | | b | |
|------------------------------|------|------|------|------|
| | Mini | Maxi | Mini | Maxi |
| GV2APN●● | 140 | 250 | | |
| GV2APN●● + GVAPH02 | | | 151 | 250 |
| GV2APN●● + GVAPK11 | 250 | 434 | - | - |
| GV2APN●● + GVAPH02 + GVAPK11 | - | - | 250 | 445 |

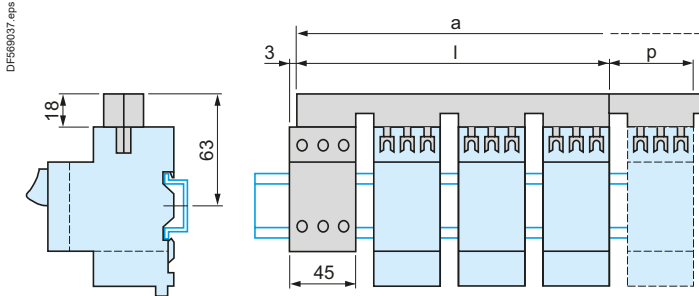
TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

Dimensions and mounting

GV2ME, GV2P

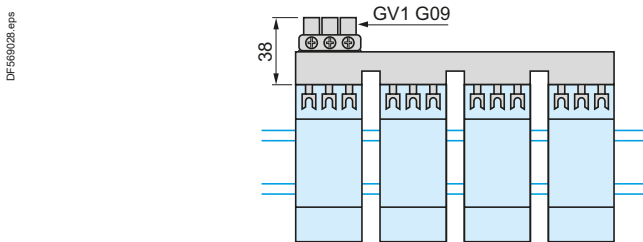
Sets of busbars GV2G445, GV2G454, GV2G472, with terminal block GV2G05



| | l | p |
|---------------------|-----|----|
| GV2G445 (4 x 45 mm) | 179 | 45 |
| GV2G454 (4 x 54 mm) | 206 | 54 |
| GV2G472 (4 x 72 mm) | 260 | 72 |

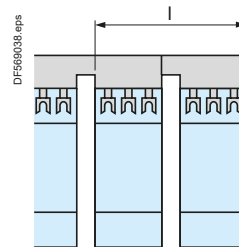
| Number of tap-offs | a | | | |
|--------------------|-----|-----|-----|-----|
| | 5 | 6 | 7 | 8 |
| GV2G445 | 224 | 269 | 314 | 359 |
| GV2G454 | 260 | 314 | 368 | 422 |
| GV2G472 | 332 | 404 | 476 | 548 |

Sets of busbars GV2G●●● with terminal block GV1G09

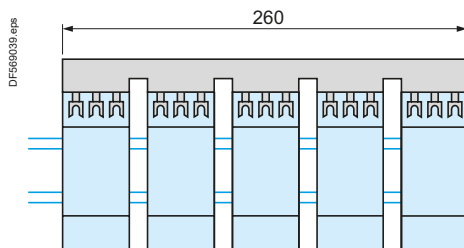


| | l |
|---------------------|-----|
| GV2G245 (2 x 45 mm) | 89 |
| GV2G254 (2 x 54 mm) | 98 |
| GV2G272 (2 x 72 mm) | 116 |

Sets of busbars GV2G245, GV2G254, GV2G272

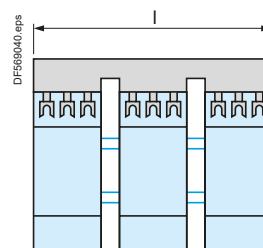


Sets of busbars GV2G554



| | l |
|---------------------|-----|
| GV2G345 (3 x 45 mm) | 134 |
| GV2G354 (3 x 54 mm) | 152 |

Sets of busbars GV2G345 and GV2G354



Ref.

Motor circuit breakers

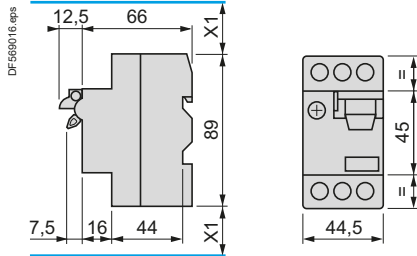
TeSys Power

Deca - Frame 2 Motor circuit breakers - Thermal-magnetic

Dimensions and mounting

GV2RT

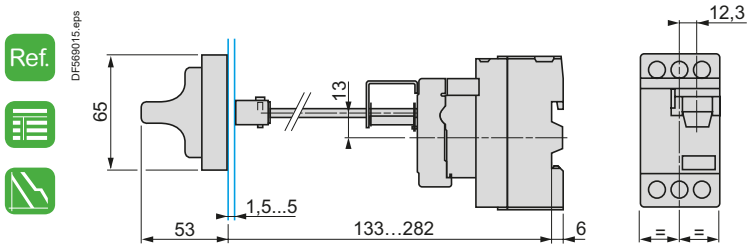
Dimensions



X1: Electrical clearance = 40 mm for $U_e < 690$ V

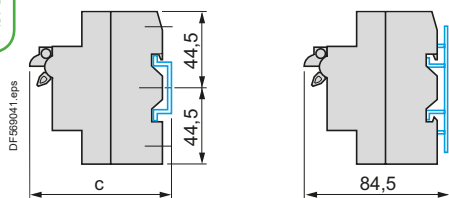
Mounting

Mounting of external operator GV2AP03

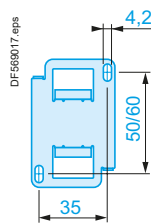


Motor circuit breakers

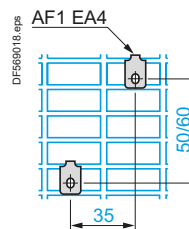
On 35 mm rail



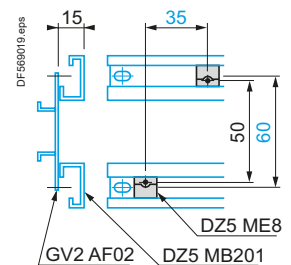
On panel with adapter plate GV2AF02



On pre-slotted plate AM1PA



On rails DZ5MB



c = 80 on AM1DP200 (35 x 7.5)
c = 88 on AM1DE200, ED200 (35 x 15)

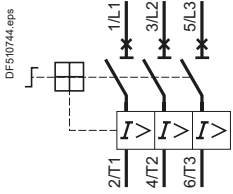
TeSys Power

Deca - Frame 2 Motor circuit breakers

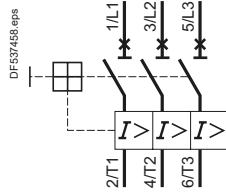
Schemes

Schemes

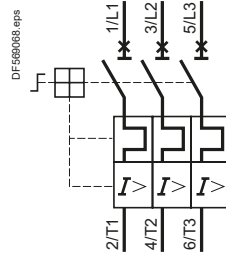
GV2L●●



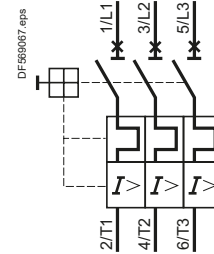
GV2LE●●



GV2P●●



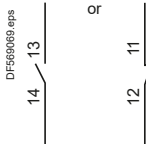
GV2ME●● and GV2RT



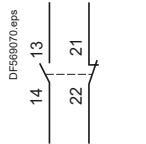
Front mounting add-on contact blocks

Instantaneous auxiliary contacts

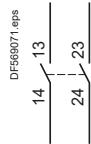
GVAE1



GVAE11



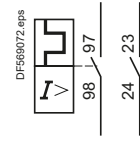
GVAE20



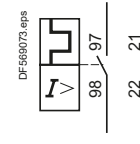
Front mounting add-on contact blocks

Instantaneous auxiliary contacts and fault signalling contacts

GVAE101



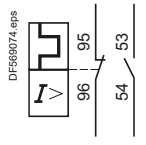
GVAE011



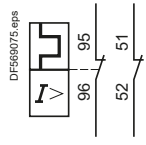
Side mounting add-on contact blocks

Instantaneous auxiliary contacts and fault signalling contacts

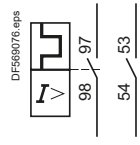
GVAD0110



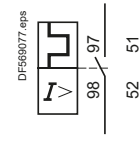
GVAD0101



GVAD1010

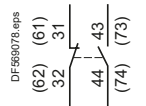


GVAD1001

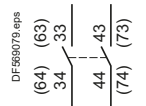


Instantaneous auxiliary contacts

GVAN11

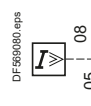


GVAN20



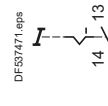
Short-circuit signalling contacts

GVAM11

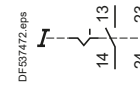


Start-Stop signalling contact blocks

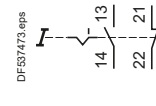
GK2AX10



GK2AX20

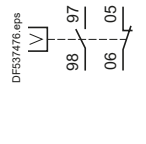


GK2AX50



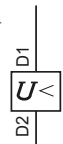
Fault signalling contact blocks

GK2AX52



Voltage trips

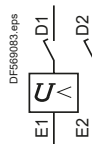
GVAU●●●



GVAS●●●

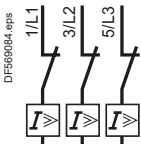


GVAX●●●

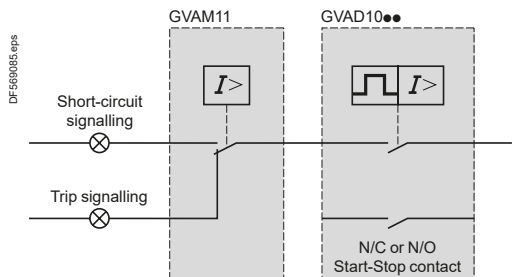


Current limiter

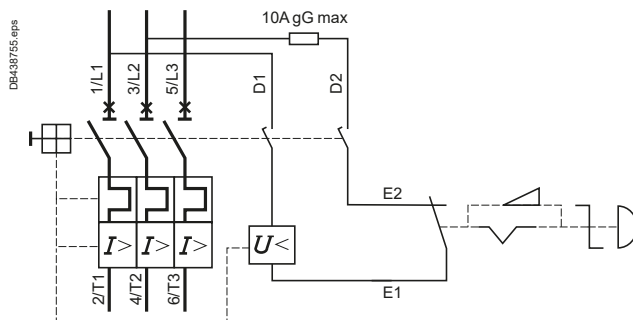
GV1L3



Use of fault signalling contact and short-circuit signalling contact



Connection of undervoltage trip for dangerous machines (conforming to INRS) on GV2ME only



TeSys Deca - Frame 3 5 to 45 kW



Motor
circuit
breakers

TeSys Power

Deca - Frame 3 Motor circuit breakers

Characteristics

| Environment | | | | |
|---|--|--------------|--|--|
| Circuit breaker type | | | GV3L | GV3P |
| Conforming to standards | | | IEC/EN 60947-4-1 IEC/EN 60947-2 UL 60947-4-1 CSA C22.2 n° 60947-4-1 | IEC/EN 60947-4-1 IEC/EN 60947-2 UL 60947-4-1 CSA C22.2 n° 60947-4-1 |
| Product certifications | | | CCC, EAC, BV, LROS, DNV-GL, ABS, UL ⁽¹⁾ , CSA ⁽²⁾ , UKCA | CCC, UL, CSA, EAC, ATEX, BV, LROS, DNV-GL, ABS, UKCA |
| Climatic withstand | | | According to IACS E10 | |
| Degree of protection (front face) | Conforming to IEC 60529 | Open mounted | Against direct finger contact: IP20 | |
| | | In enclosure | - | GV3PC01 and GV3PC02 : IP55 |
| Shock resistance | Conforming to IEC 60068-2-27 | | On: 15 gn -11 ms (On: 5 gn -11 ms for GV3L73, GV3L80, GV3P73, GV3P80) Off: 30 gn -11 ms | |
| Vibration resistance ⁽³⁾ | Conforming to IEC 60068-2-6 | | 4 gn (5...300 Hz) | |
| Ambient air temperature | Storage | | °C | -40...+80 |
| | Operation | Open mounted | °C | -20...+60 ⁽³⁾ |
| Temperature compensation | | Open mounted | In enclosure | °C |
| | In enclosure | | °C | -20...+60 |
| Flame resistance | Conforming to IEC 60695-2-11 | | °C | 960 |
| | | | m | 3000 |
| Maximum operating altitude | | | | |
| Suitable for isolation | Conforming to IEC 60947-1 § 7-1-6 | | | Yes |
| Resistance to mechanical impact | | | J | - |
| | | | | 10 IK09 (in enclosure) |
| Sensitivity to phase failure | | | | Yes, conforming to IEC 60947-4-1 § 8-2-1-5-2 for GV3P |
| Technical characteristics | | | | |
| Circuit breaker type | | | GV3L | GV3P |
| Utilisation category | Conforming to IEC 60947-2 | | A | - |
| | Conforming to IEC 60947-4-1 | | - | AC-3 |
| Rated operational voltage (U _e) | Conforming to IEC 60947-2 | V | 690 | |
| Rated insulation voltage (U _i) | Conforming to IEC 60947-2 | V | 690 | |
| Rated voltage | Conforming to UL 60947-4-1, CSA C 22.2 n° 60947-4-1 | V | | 600 |
| Rated operational frequency | Conforming to IEC 60947-4-1 UL, CSA | Hz | 50/60 | |
| Rated impulse withstand voltage (U _{imp}) | Conforming to IEC 60947-2 | kV | 6 | |
| Total power dissipated per pole | | W | 8 | |
| Mechanical durability (C.O.: Close, Open) | | C.O. | 50 000 | |
| Electrical durability for AC-3 duty | 415 V In | C.O. | 50 000 (20 000 for GV3L73, GV3P73, GV3L80, GV3P80) | |
| Duty class (maximum operating rate) | | C.O./h | 25 | |
| Maximum conventional rated thermal current (I _{th}) | Conforming to IEC 60947-4-1 | A | - | 13 to 80 |
| Rated duty | Conforming to IEC 60947-4-1 | | | Continuous duty |
| Operating threshold of magnetic trips | | | 14 I max | |

⁽¹⁾ For GV3L25 to 73, may be followed by 6 or 1.

⁽²⁾ For GV3L, GV3L25 to GV3L73 may be followed by 6 or 1 for use in conjunction with certified overload relay.

⁽³⁾ Leave a space of 9 mm between 2 circuit breakers: either an empty space, or side mounting add-on contact blocks. Side by side mounting is possible up to 40 °C.



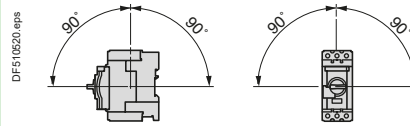
TeSys Power

Deca - Frame 3 Motor circuit breakers

Characteristics

Mounting characteristics

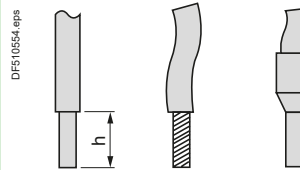
Operating position
Without derating, in relation to normal vertical mounting plane ⁽¹⁾



Connection characteristics

Connection to screw clamp terminals or spring terminals

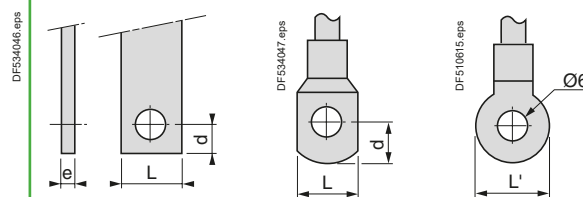
Bare cables



| Circuit breaker type | | | GV3L | | GV3P | |
|--|----------------------------------|-----------------|-------|--|-------|--|
| Connection to screw clamp terminals ⁽²⁾ (Max. number of conductors x c.s.a.) | | | Min. | Max. | Min. | Max. |
| | Solid cable | mm ² | 2 x 1 | 1 x 25 and 1 x 35 | 2 x 1 | 1 x 25 and 1 x 35 |
| | Flexible cable without cable end | mm ² | 2 x 1 | 1 x 25 and 1 x 35 | 2 x 1 | 1 x 25 and 1 x 35 |
| | Flexible cable with cable end | mm ² | 2 x 1 | 1 x 25 and 1 x 35 | 2 x 1 | 1 x 25 and 1 x 35 |
| | Tightening torque | N.m | 5 | 5: 25 mm ² 8: 35 mm ² | 5 | 5: 25 mm ² 8: 35 mm ² |

Connection by bars or lugs

Bars or lugs



| Circuit breaker type | | | GV3L●●6 | | GV3P●●6 | |
|---|-------------------|-----------------|---------|--|---------|--|
| Pitch | Without spreaders | mm | 17.5 | | | |
| | With spreaders | mm | - | | | |
| Bars or cables with lugs | e | mm | ≤ 6 | | | |
| | L | mm | ≤ 13.5 | | | |
| | L' | mm | ≤ 16.5 | | | |
| | d | mm | ≤ 10 | | | |
| Screws | | | M6 | | | |
| | Tightening torque | N.m | 6 | | | |
| Bare cables (copper or aluminium) with connectors | Height (h) | mm | - | | | |
| | C.s.a. | mm ² | - | | | |
| | Tightening torque | N.m | - | | | |

- (1) When mounting on a vertical rail, fit a stop to prevent any slippage.
- (2) For motor circuit breakers **GV3P**: BTR hexagon socket head screws, **EverLink**® system. Require use of an insulated Allen key, in compliance with local electrical wiring regulations.
- (3) For cross-sections 1 to 1.5 mm², the use of an **LA9D99** cable end reducer is recommended.

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Deca - Frame 3 Motor circuit breakers - Magnetic

Characteristics

Breaking capacity of GV3L

| Type | | | GV3L25 | GV3L32 | GV3L40 | GV3L50 | GV3L65 | GV3L73 | GV3L80 | |
|---|----------------------|----------------------|---|--------|--------|--------|--------|------------------|------------------|-----|
| Breaking capacity of the circuit-breaker only or of the circuit-breaker combined with a thermal overload relay | 230/240 V | Icu | kA | 100 | 100 | 100 | 100 | 100 | 65 | 65 |
| | | Ics % ⁽¹⁾ | | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415 V | Icu | kA | 100 | 100 | 50 | 50 | 50 | 50 | 50 | |
| | Ics % ⁽¹⁾ | | 100 | 100 | 100 | 100 | 100 | 60 | 60 | |
| 440 V | Icu | kA | 50 | 50 | 50 | 50 | 50 | 50 | 50 | |
| | Ics % ⁽¹⁾ | | 100 | 100 | 100 | 100 | 100 | 60 | 60 | |
| 500 V | Icu | kA | 12 | 12 | 12 | 12 | 12 | 12 | 12 | |
| | Ics % ⁽¹⁾ | | 50 | 50 | 50 | 50 | 50 | 50 | 50 | |
| 690 V | Icu | kA | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | Ics % ⁽¹⁾ | | 50 | 50 | 50 | 50 | 50 | 50 | 50 | |
| Associated fuses (if required) for use with circuit breaker only or circuit breaker combined with a thermal overload relay if Isc > breaking capacity | 230/240 V | aM | A | * | * | * | * | * | * | |
| | | gG | A | * | * | * | * | * | * | |
| 415 V | aM | A | * | * | * | * | 125 | 125 | 125 | |
| | gG | A | * | * | * | * | 160 | 160 | 160 | |
| 440 V | aM | A | 63 | 80 | 125 | 125 | 125 | 125 | 125 | |
| | gG | A | 80 | 100 | 160 | 160 | 160 | 160 | 160 | |
| 500 V | aM | A | 63 | 63 | 63 | 63 | 80 | 80 | 80 | |
| | gG | A | 80 | 80 | 80 | 80 | 100 | 100 | 100 | |
| 690 V | aM | A | 50 | 50 | 50 | 50 | 63 | 63 | 63 | |
| | gG | A | 63 | 63 | 63 | 63 | 80 | 80 | 80 | |
| Use of circuit breakers without fuses | | | Minimum cable length (in metres) limiting the maximum short-circuit current to 35 kA maximum. | | | | | | | |
| Cable c.s.a. | | mm ² | ≤ 25 | 35 | 50 | 70 | 95 | - ⁽²⁾ | - ⁽²⁾ | |
| Isc (rms) 3-phase, incoming (Ue = 415 V) | 50 kA | m | 5 | 6 | 8 | 10 | 13 | - ⁽²⁾ | - ⁽²⁾ | |
| | 45 kA | m | 5 | 5 | 7 | 8 | 10 | - ⁽²⁾ | - ⁽²⁾ | |
| | 40 kA | m | 5 | 5 | 5 | 5 | 8 | - ⁽²⁾ | - ⁽²⁾ | |
| | 37 kA | m | 5 | 5 | 5 | 5 | 5 | - ⁽²⁾ | - ⁽²⁾ | |

* Fuse not required: breaking capacity $I_{cn} > I_{sc}$.

⁽¹⁾ As % of Icu.

⁽²⁾ Please consult your Regional Sales Office.

Ref.



Motor circuit breakers

TeSys Power

Deca - Frame 3 Motor circuit breakers - Thermal-magnetic

Characteristics

| Breaking capacity of GV3P | | | | | | | | | | | | |
|---|--|--------------|------|-----|-----|-----|-----|-----|-----|-----|-----|---|
| Motor circuit breaker type | | | GV3P | | | | | | | | | |
| | | A | 13 | 18 | 25 | 32 | 40 | 50 | 65 | 73 | 80 | |
| Rating | | A | 13 | 18 | 25 | 32 | 40 | 50 | 65 | 73 | 80 | |
| Breaking capacity conforming to IEC 60947-2 | 230/240 V Icu | kA | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| | Ics % ⁽¹⁾ | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| | 400/415 V Icu | kA | 100 | 100 | 100 | 100 | 50 | 50 | 50 | 50 | 50 | |
| | Ics % ⁽¹⁾ | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 60 | 60 | |
| | 440 V Icu | kA | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | |
| | Ics % ⁽¹⁾ | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 60 | 60 | |
| | 500 V Icu | kA | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | |
| | Ics % ⁽¹⁾ | | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | |
| | 690 V Icu | kA | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | Ics % ⁽¹⁾ | | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | |
| | Associated fuses, if required if Isc > breaking capacity Icu | 230/240 V aM | A | * | * | * | * | * | * | * | * | * |
| | | gG | A | * | * | * | * | * | * | * | * | * |
| 415 V aM | | A | * | * | * | * | 125 | 125 | 125 | 125 | 125 | |
| gG | | A | * | * | * | * | 160 | 160 | 160 | 160 | 160 | |
| 440 V aM | | A | 63 | 80 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | |
| gG | | A | 80 | 100 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | |
| 500 V aM | | A | 63 | 63 | 63 | 63 | 80 | 80 | 80 | 80 | 80 | |
| gG | | A | 80 | 80 | 80 | 80 | 100 | 100 | 100 | 100 | 100 | |
| 690 V aM | | A | 50 | 50 | 50 | 50 | 63 | 63 | 63 | 63 | 63 | |
| gG | | A | 63 | 63 | 63 | 63 | 80 | 80 | 80 | 80 | 80 | |

* Fuse not required: breaking capacity Icn > Isc.
 (1) As % of Icu.



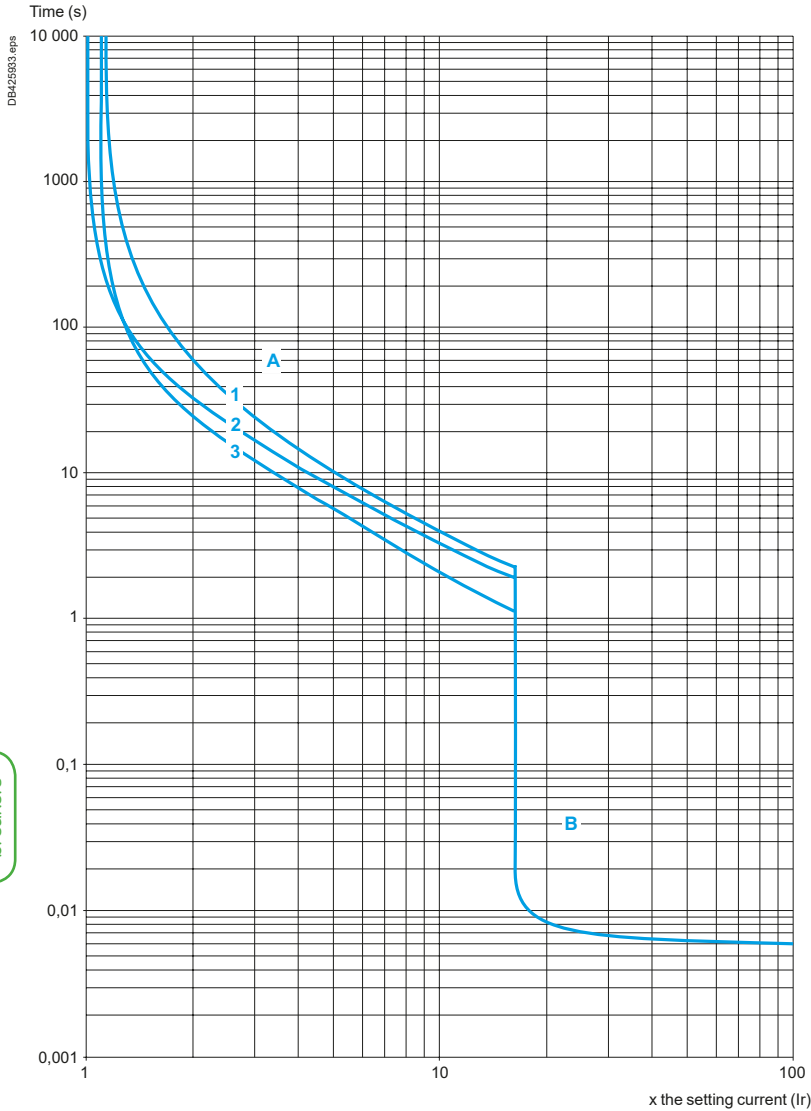
Motor circuit breakers

TeSys Power

Deca - Frame 3 Motor circuit breakers - Magnetic Curves

Tripping curves for GV3L combined with thermal overload relay LRD33

Average operating time at 20 °C without prior current flow



- 1 3 poles from cold state
- 2 2 poles from cold state
- 3 3 poles from hot state

- A Thermal overload relay protection zone
- B GV3L protection zone

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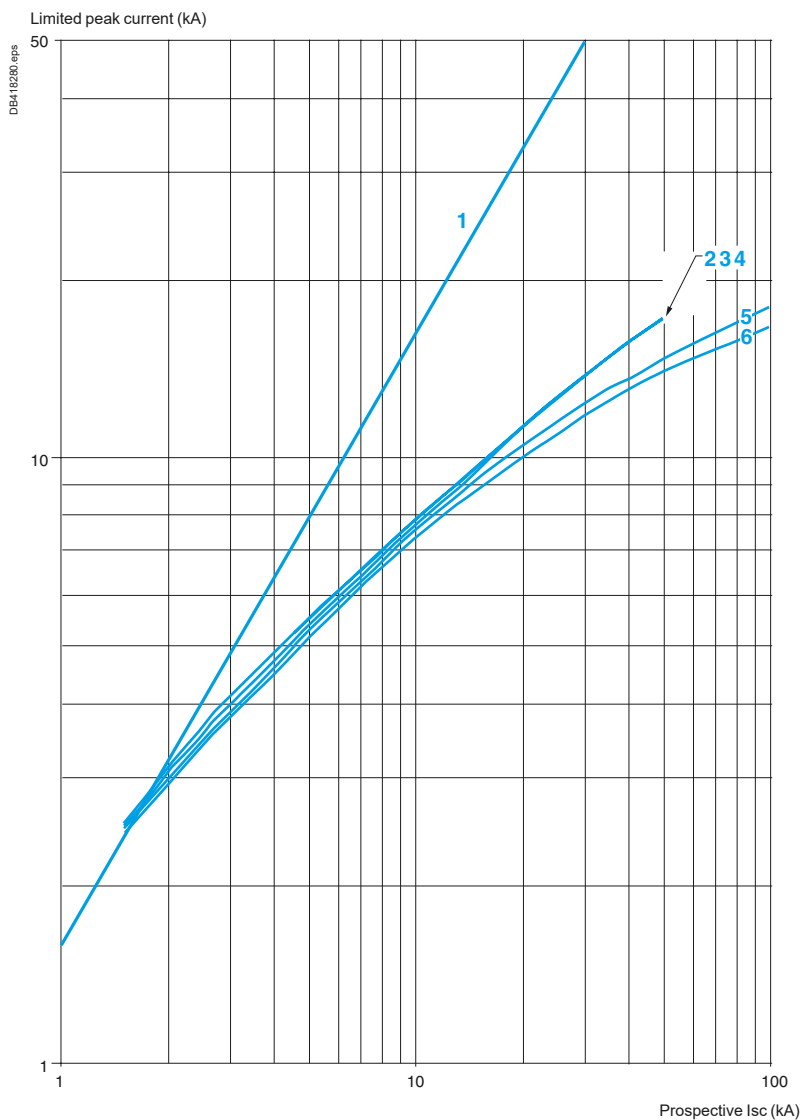
Deca - Frame 3 Motor circuit breakers - Magnetic

Curves

Current limitation on short-circuit for GV3L (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$



- 1 Maximum peak current
- 2 GV3L80 - GV3L73 - GV3L65
- 3 GV3L50
- 4 GV3L40
- 5 GV3L32
- 6 GV3L25

Ref.



Motor
circuit
breakers

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Deca - Frame 3 Motor circuit breakers - Magnetic

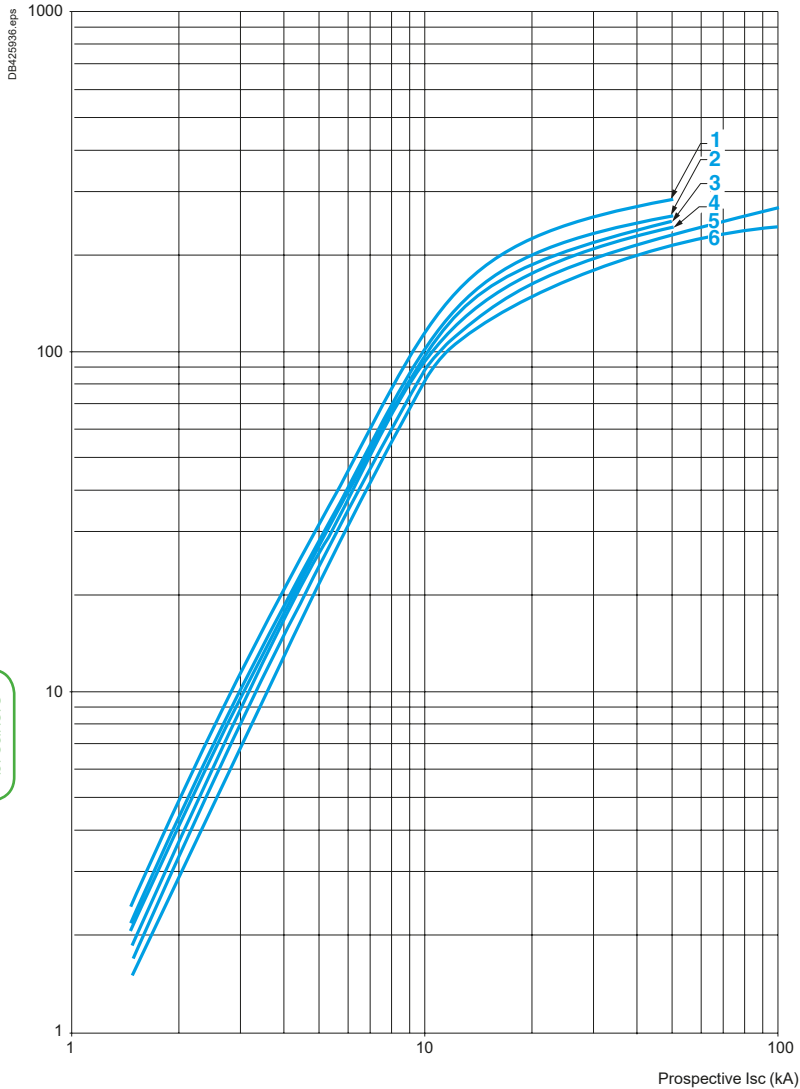
Curves

Thermal limit on short-circuit for GV3L

Thermal limit in kA^2S

Sum of $I^2dt = f$ (prospective I_{sc}) at $1.05 U_e = 435 \text{ V}$

Sum of I^2dt (kA^2S)



- 1 GV3L73 - GV3L80
- 2 GV3L65
- 3 GV3L50
- 4 GV3L40
- 5 GV3L32
- 6 GV3L25

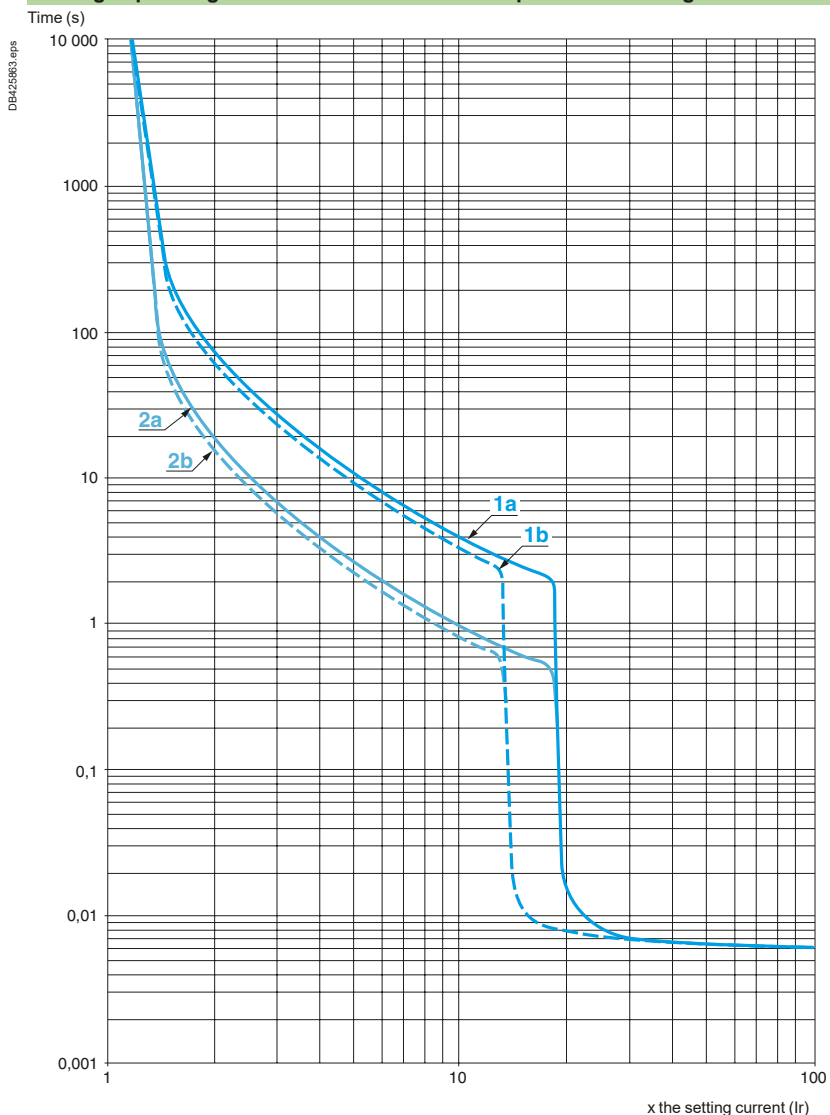
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Deca - Frame 3 Motor circuit breakers - Thermal-magnetic

Curves

Thermal-magnetic tripping curves for GV3P

Average operating times at 20 °C related to multiples of the setting current



- 1a 3 poles from cold state (Ir mini.): GV3P
- 1b 3 poles from cold state (Ir maxi.): GV3P
- 2a 3 poles from hot state (Ir mini.): GV3P
- 2b 3 poles from hot state (Ir maxi.): GV3P

Ref.



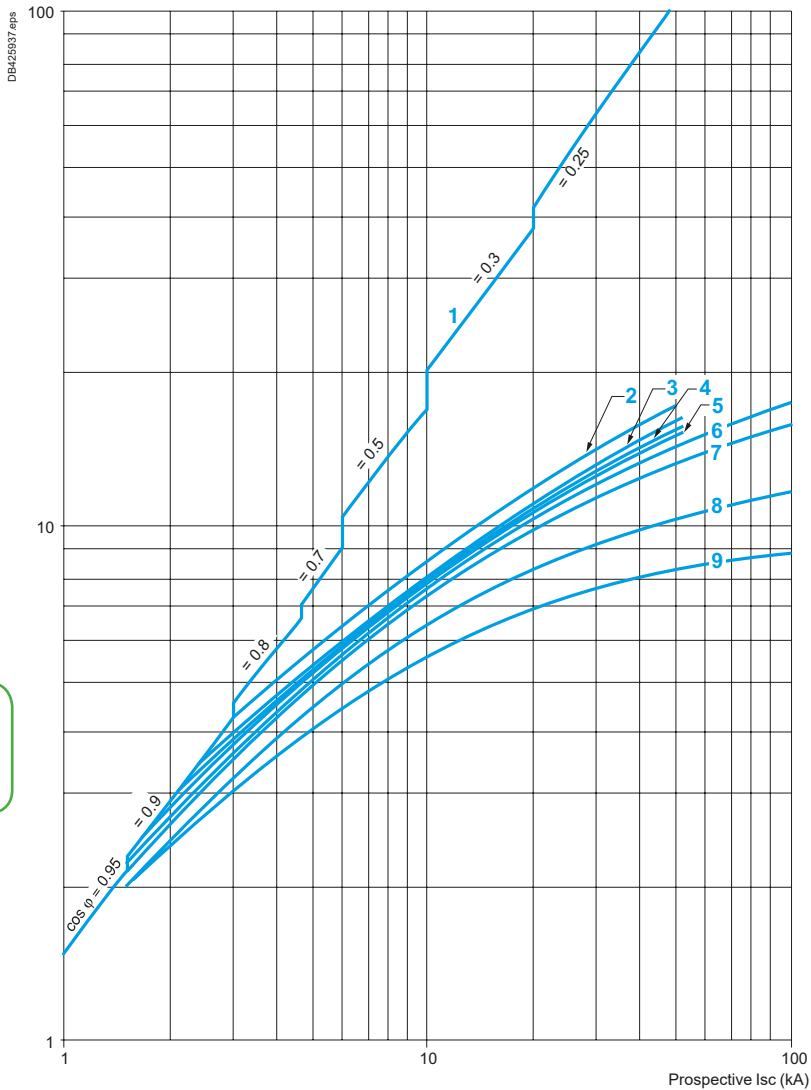
Motor
circuit
breakers

Current limitation on short-circuit for GV3P (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



- 1 Maximum peak current
- 2 70-80 A (GV3P80); 62-73 A (GV3P73)
- 3 48-65 A (GV3P65)
- 4 37-50 A (GV3P50)
- 5 30-40 A (GV3P40)
- 6 23-32 A (GV3P32)
- 7 17-25 A (GV3P25)
- 8 12-18 A (GV3P18)
- 9 9-13 A (GV3P13)

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Deca - Frame 3 Motor circuit breakers - Thermal-magnetic

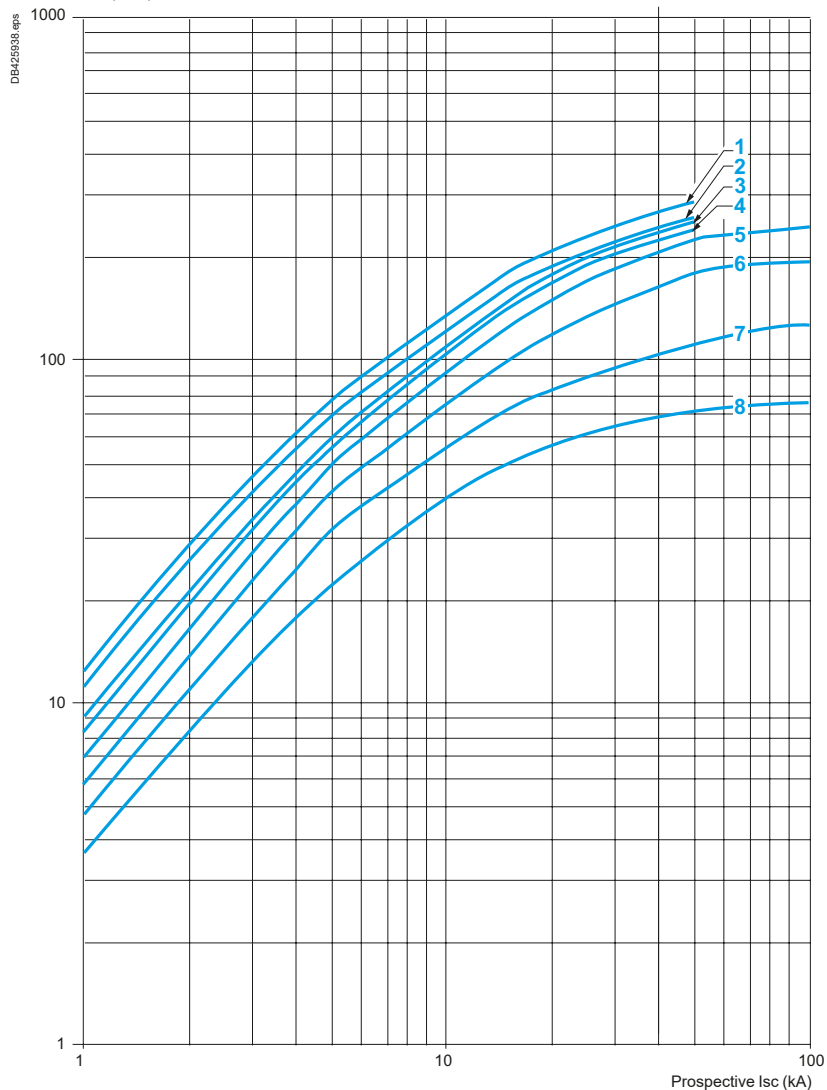
Curves

Maximum thermal limit on short-circuit for GV3P

Thermal limit in kA^2s in the magnetic operating zone

Sum of $I^2dt = f$ (prospective I_{sc}) at $1.05 U_e = 435 \text{ V}$

Sum of I^2dt (kA^2s)



- 1 70-80 (GV3P80) - 62-73 (GV3P73)
- 2 48-65 A (GV3P65)
- 3 37-50 A (GV3P50)
- 4 30-40 A (GV3P40)
- 5 23-32 A (GV3P32)
- 6 17-25 A (GV3P25)
- 7 12-18 A (GV3P18)
- 8 9-13 A (GV3P13)

Ref.



Motor
circuit
breakers

| Characteristics of GV3 electric trips | | | | |
|--|--------------------------------------|------------------------|--|---------------------------|
| Type of trip | | | GVAU●●● MN undervoltage trip | GVAS●●● MX shunt trip |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | 690 | 690 |
| | Conforming to CSA C22-2 n°14, UL 508 | V | 600 | 600 |
| Operational voltage (Ue) | Conforming to IEC 60947-1 | V | 0.85...1.1 U _c | 0.7...1.1 U _c |
| Drop-out voltage | | V | 0.7...0.35 U _c | 0.75...0.2 U _c |
| Inrush consumption | ~ ≡ | VA | 12 | 14 |
| Sealed consumption | ~ ≡ | VA | 3.5 | 5 |
| Operating time | Conforming to IEC 60947-1 | ms | From the moment the voltage reaches its operational value until opening of the circuit breaker. 10...15 | |
| On-load factor | | | 100 % | |
| Cabling (spring connection) | Number of conductors | | 2 or 4 | |
| | Solid cable | mm ² | 1...2.5 | |
| | Flexible cable without cable end | mm ² AWG | 0.75...2.5 | |
| | Flexible cable with cable end | mm ² | 0.75...2.5 | |
| Tightening torque | | N.m | 1.4 max | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 10000 (GV3P and GV3L) | |

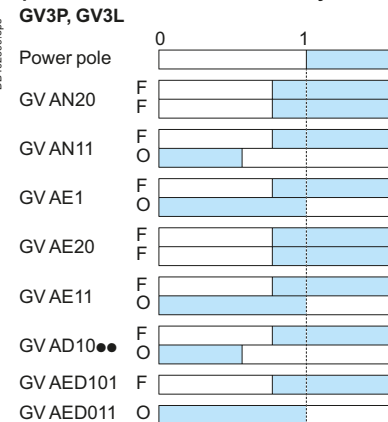
Ref.



Motor
circuit
breakers

| Type of contacts | | | Instantaneous auxiliary GVAN, GVAD | | | | | | | Fault signalling GVAD, GVAM11 ⁽¹⁾ | | | | Instantaneous auxiliary GVAE | | | |
|---|--|-----------------|--|-----|-----|------------|-----|-----|-----|--|-----|------|-----------------------------|---------------------------------------|------|------|-----|
| Rated insulation voltage (Ui) (associated insulation coordination) | Conforming to IEC 60947-1 | V | 690 | | | | | | | 690 | | | | 250 (690 in relation to main circuit) | | | |
| | Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1 | V | 600 | | | | | | | 300 | | | | 300 | | | |
| Conventional thermal current (Ith) | Conforming to IEC 60947-5-1 | A | 6 | | | | | | | 2.5 | | | | 2.5 | | | |
| | Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1 | A | 5 | | | | | | | 1 | | | | 1 | | | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 100 000 | | | | | | | 1000 | | | | 100 000 | | | |
| Operational power and current conforming to IEC 60947-5-1. a.c. operation | | | AC-15/100 000 C.O. | | | | | | | AC-14/1000 C.O. | | | | AC-15/100 000 C.O. | | | |
| | Rated operational voltage (Ue) | V | 48 | 110 | 230 | 380 | 440 | 500 | 690 | 24 | 48 | 110 | 230 | 24 | 48 | 110 | 230 |
| Operation | Operational power, normal conditions | VA | 300 | 500 | 720 | 850 | 650 | 500 | 400 | 36 | 48 | 72 | 72 | 48 | 60 | 120 | 120 |
| | Occasional breaking and making capacities, abnormal conditions | kVA | 3 | 7 | 13 | 15 | 13 | 12 | 9 | 0.22 | 0.3 | 0.45 | 0.45 | 0.48 | 0.6 | 1.27 | 2.4 |
| | Rated operational current (Ie) | A | 6 | 4.5 | 3.3 | 2.2 | 1.5 | 1 | 0.6 | 1.5 | 1 | 0.5 | 0.3 | 2 | 1.25 | 1 | 0.5 |
| Operational power and current conforming to IEC 60947-5-1. d.c. operation | | | DC-13/100 000 C.O. | | | | | | | DC-13/1000 C.O. | | | | DC-13/100 000 C.O. | | | |
| | Rated operational voltage (Ue) | V | 24 | 48 | 60 | 110 | 240 | - | - | 24 | 48 | 60 | - | 24 | 48 | 60 | - |
| Operation | Operational power, normal conditions | W | 140 | 240 | 180 | 140 | 120 | - | - | 24 | 15 | 9 | - | 24 | 15 | 9 | - |
| | Occasional breaking and making capacities, abnormal conditions | W | 240 | 360 | 240 | 210 | 180 | - | - | 100 | 50 | 50 | - | 100 | 50 | 50 | - |
| | Rated operational current (Ie) | A | 6 | 5 | 3 | 1.3 | 0.5 | - | - | 1 | 0.3 | 0.15 | - | 1 | 0.3 | 0.15 | - |
| Low power switching reliability of contact | | | GVAE: Number of failures for "n" million operating cycles (17 V-5 mA): = 10 ⁻⁶ | | | | | | | | | | | | | | |
| Minimum operational conditions d.c. operation | | V | 17 | | | | | | | | | | | | | | |
| | | mA | 5 | | | | | | | | | | | | | | |
| Short-circuit protection | | | By GB2CB●● circuit breaker (rating according to operational current for Ue ≤ 415 V) or by gG fuse 10 A max | | | | | | | | | | GB2CB06 or gG fuse 10 A max | | | | |
| Cabling, screw clamp terminals | Number of conductors | | 1 | | | 2 | | | | | | | | | | | |
| | Solid cable | mm ² | 1...2.5 | | | 1...2.5 | | | | | | | | | | | |
| | Flexible cable without cable end | mm ² | 0.75...2.5 | | | 0.75...2.5 | | | | | | | | | | | |
| | Flexible cable with cable end | mm ² | 0.75...1.5 | | | 0.75...1.5 | | | | | | | | | | | |
| | Tightening torque | N.m | 1.4 max | | | 1.4 max | | | | | | | | | | | |
| Cabling, spring terminal connections | | | GVAN only | | | | | | | | | | | | | | |
| | Flexible cable without cable end | mm ² | 0.75...2.5 | | | 0.75...2.5 | | | | - | | | | 0.75...1.5 | | | |

Operation of instantaneous auxiliary contacts



Operation of fault signalling contacts

GVAM11

Change of state following tripping on short-circuit.

GVAD10●● and GVAD01●●

Change of state following tripping on short-circuit, overload or undervoltage.

(1) For application example of fault signalling contact and short-circuit signalling contact.

(2) Add an RC circuit type LA4D to the load terminals.

TeSys Power

3-pole busbar for Deca - Frame 3 Motor circuit breakers

Characteristics

| Characteristics of 3-pole busbars GV3G●●● | | | |
|--|---------------------------|-------------------|---------|
| | | | GV3G●64 |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | 690 |
| Conventional thermal current (Ith) | Conforming to IEC 60439-1 | A | 115 |
| Rated operational current (Ie) | | A | 115 |
| Permissible peak current (I peak) | | kA | 20 |
| Permissible thermal limit (I ² t) | | kA ² s | 300 |
| Degree of protection | Conforming to IEC 60529 | | IP 20 |
| Terminal block | | | — |

Ref.



Motor
circuit
breakers

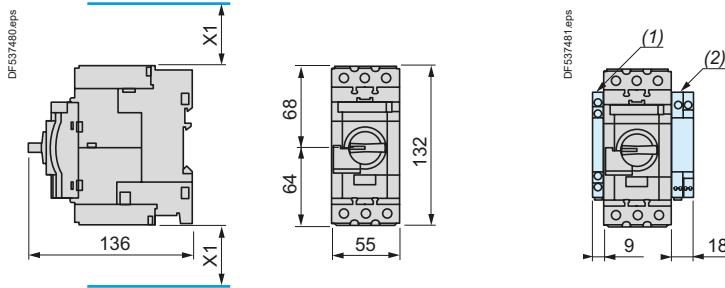
TeSys Power

Deca - Frame 3 Motor circuit breakers

Dimensions and mounting

GV3L, GV3P

Dimensions



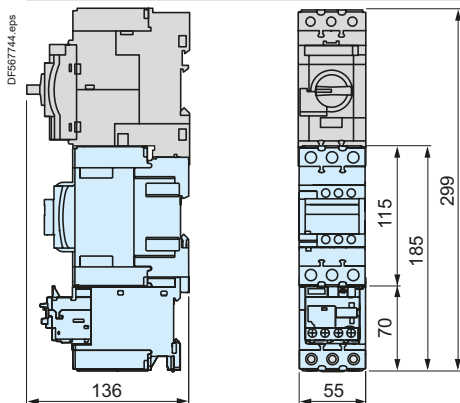
X1 = Electrical clearance (ISC max)
40 mm for $U_e \leq 500$ V, 50 mm for $U_e \leq 690$ V

(1) Blocks **GVAN●●**, **GVAD●●** and **GVAM11**.
(2) Blocks **GV3AU●●** and **GV3AS●●**.

Note: Leave a space of 9 mm between 2 circuit breakers: either an empty space or side-mounting add-on contact blocks.
Side by side mounting is possible up to 40 °C.

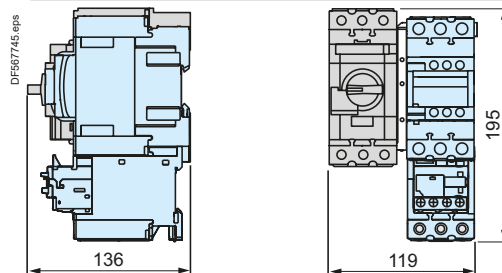
Mounting

Mounting with contactor LC1D40A...D80A and relay LR3D313...380 ^{(1) (2) (3)}

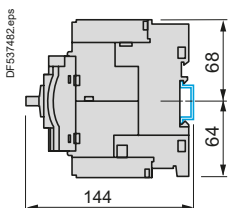


- (1) Mountings with c.b. up to **GV3L73**, **GV3P73**.
- (2) For **GV3L80**, **GV3P80** use cable between components for dissipating heat. Consult online datasheets for values
- (3) S-shape busbar system suitable up to 73 A.

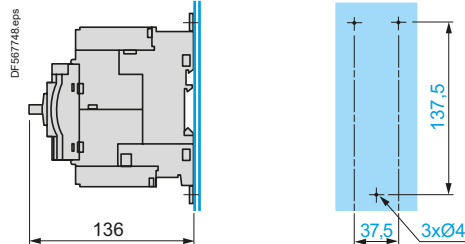
Side by side mounting with contactor LC1D40A...D73A (S-shape busbar system GV3S ⁽¹⁾)



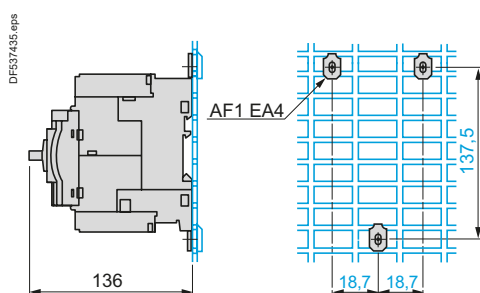
Mounting on rail AM1DE200 or AM1ED201



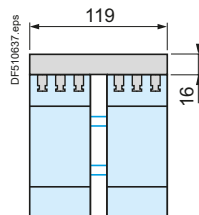
Panel mounting, using M4 screws



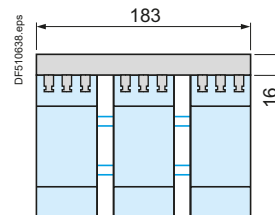
Mounting on pre-slotted plate AM1PA



Set of busbars GV3G264



Set of busbars GV3G364



References:
pages B6/26 and B6/27

Characteristics:
pages B6/102 to B6/105

Curves:
pages B6/106 to B6/111

Schemes:
page B6/117

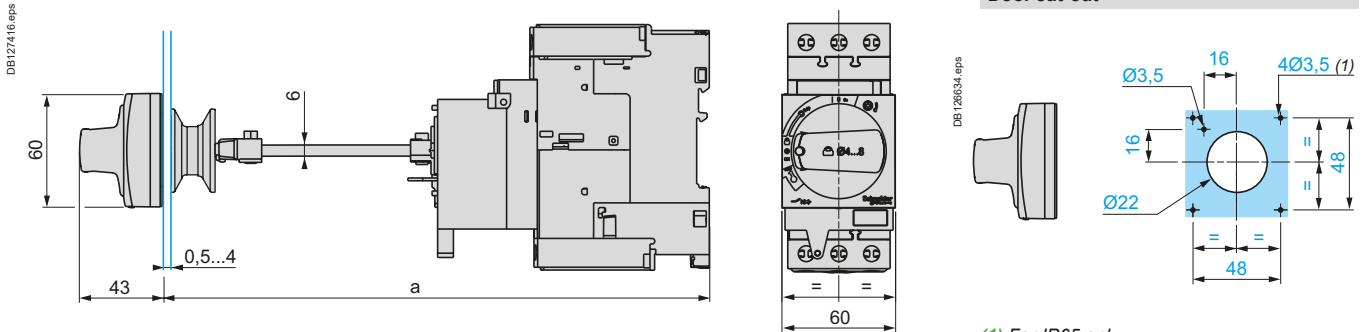
TeSys Power

Deca - Frame 3 Motor circuit breakers

Dimensions and mounting

Mounting

Mounting of external operator GV3APN01, GV3APN02 or GV3APN04 for motor circuit breakers GV3L



| | a | | b | |
|--------------------|------|------|------|------|
| | Mini | Maxi | Mini | Maxi |
| GV3APN●● | 189 | 300 | - | - |
| GV3APN●● + GVAPK12 | 300 | 481 | | |

Ref.

Motor circuit breakers

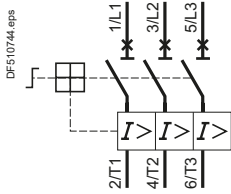
TeSys Power

Deca - Frame 3 Motor circuit breakers

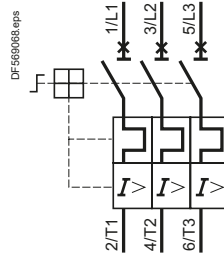
Schemes

Schemes

GV3L●●



GV3P●●



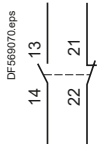
Front mounting add-on contact blocks

Instantaneous auxiliary contacts

GVAE1



GVAE11



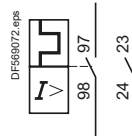
GVAE20



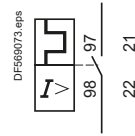
Front mounting add-on contact blocks

Instantaneous auxiliary contacts and fault signalling contacts

GVAED101



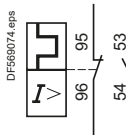
GVAED011



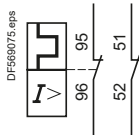
Side mounting add-on contact blocks

Instantaneous auxiliary contacts and fault signalling contacts

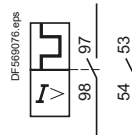
GVAD0110



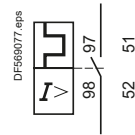
GVAD0101



GVAD1010

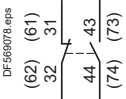


GVAD1001

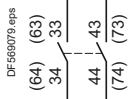


Instantaneous auxiliary contacts

GVAN11

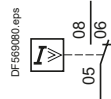


GVAN20



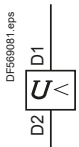
Short-circuit signalling contacts

GVAM11

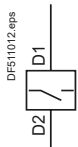


Voltage trips

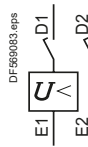
GVAU●●●



GVAS●●●

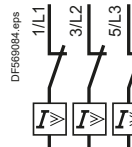


GVAX●●●

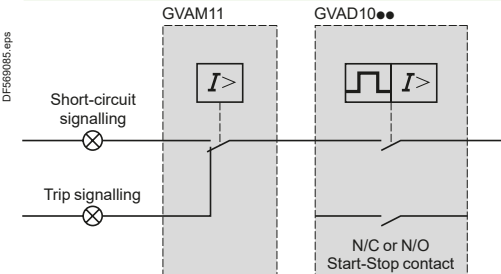


Current limiter

GV1L3

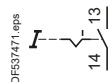


Use of fault signalling contact and short-circuit signalling contact

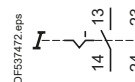


Start-Stop signalling contact blocks

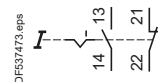
GK2AX10



GK2AX20

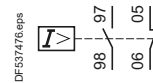


GK2AX50



Fault signalling contact blocks

GK2AX52



Motor
circuit
breakers

TeSys Deca - Frame 4

0.25 to 55 kW - 1/2 to 60 HP



Motor
circuit
breakers

TeSys Power

Deca - Frame 4 Motor circuit breakers

Characteristics

| Environment | | | | | | | |
|---|---|--|---|---|-------------|--------|----------------------------------|
| Circuit breaker type | | GV4L | GV4LE | GV4P | GV4PE | GV4PEM | GV4PB |
| Conforming to standards | | IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1 | | IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL 60497-4-1, CSA 22.2 n° 60497-4-1 | | | IEC/EN 60947-2, IEC/EN 60947-4-1 |
| Product certifications | | CCC, EAC, BV, EU-RO MR ⁽¹⁾ , UKCA | | CCC, EAC, CSA (cCSAus), ATEX, BV, EU-RO MR ⁽¹⁾ , UKCA | | | UL 489, CSA C22.2 n°5, UKCA |
| Climatic withstand | | According to IACS E10 | | | | | |
| Degree of protection (front face) | Conforming to IEC 60529 | Open mounted | IP 40 front face except on connection area. Connection area: - IP20 with EverLink connector - IP40 with crimp lug connector and terminal shield. | | | | |
| | | In enclosure ⁽²⁾ | DRH = IP40 ERH = IP54 or IP65 | | | | |
| Shock resistance | Conforming to IEC 60068-2-27 | | 15g - 11 ms | | 15g - 11 ms | | |
| Vibration resistance | Conforming to IEC 60068-2-6 | | 2.0 to 13.2 Hz and amplitude ±1 mm 13.2 to 100 Hz acceleration 0.7 g | | | | |
| Ambient air temperature | Storage | | °C | -50...+85 | | | |
| | Operation | | °C | -25...+70 | | | |
| Temperature compensation | | | °C | Non applicable | | | -25...+60 ⁽³⁾ |
| Flame resistance | Conforming to IEC 60695-2-11 | | °C | 960 | | | |
| Maximum operating altitude | | | m | 2000 without derating. Up to 5000 with derating | | | |
| Suitable for isolation | Conforming to IEC 60947-1 § 7-1-6 | | | Yes | | | |
| Resistance to mechanical impact | | | J | IK07 (2J) | | | |
| Sensitivity to phase failure | | | | No | | | Yes |
| Technical characteristics | | | | | | | |
| Utilisation category | Conforming to IEC 60947-2 | | | A | | | A |
| | Conforming to IEC 60947-4-1 | | | AC-3 ⁽⁴⁾ | | | |
| Rated operational voltage (U _e) | Conforming to IEC 60947-2 | | V | 690 | | | |
| Rated insulation voltage (U _i) | Conforming to IEC 60947-2 | | V | 800 | | | |
| Rated voltage | Conforming to CSA C22-2 n°1, UL 60947-4-1 | | V | Non applicable | | 600 | |
| Rated operational frequency | Conforming to IEC 60947-4-1, UL, CSA | | Hz | 50/60 | | | |
| Rated impulse withstand voltage (U _{imp}) | Conforming to IEC 60947-2 | | kV | 8 | | | |
| Total power dissipated per pole | | | W | 6.1 | | 4.6 | |
| Mechanical durability (C.O.: Closing, Opening) | | | C.O. | 40000 | | | |
| Electrical durability for AC-3/415V duty (C.O.: Closing, Opening) | 415 V In | | C.O. | 5 000 | | | |
| Duty class (maximum operating rate) | | | C.O./h | 25 | | | |
| Maximum conventional rated thermal current (I _{th}) | Conforming to IEC 60947-4-1 | | A | 115 | | | |
| Rated duty | Conforming to IEC 60947-4-1 | | | Continuous duty | | | |

⁽¹⁾ Refer to chapter on page A6/70 for details on Marine Classification Societies.

⁽²⁾ DRH = with Direct Rotary Handle
ERH = with Extended Rotary Handle.

⁽³⁾ For operation up to 70 °C, please consult your regional sales office.

⁽⁴⁾ Up to 100 A.

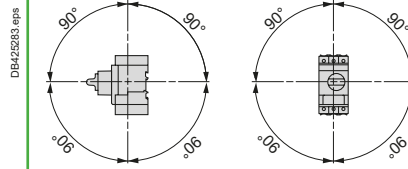
TeSys Power

Deca - Frame 4 Motor circuit breakers

Characteristics

Mounting characteristics

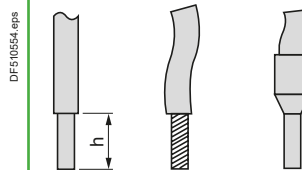
Operating position
Without derating, in relation to normal vertical mounting plane ⁽¹⁾



Power connection characteristics

Power connection by bare cables (EverLink connector)

Bare cables



Connection to screw clamp terminals (Max. number of conductors x c.s.a.)

Solid cable

Min.

Cu 1 x 1.5 + 1 x 2.5
Cu 2 x 14

Max.

Cu 1 x 70 + 1 x 95
Cu 1 x 2/0 + 1 x 3/0

Flexible cable without cable end

mm²

Cu 1 x 1.5 + 1 x 2.5

mm²

Cu 1 x 50 + 1 x 70

Flexible cable with cable end

mm²

Cu 1 x 1.5 + 1 x 2.5

mm²

Cu 1 x 50 + 1 x 70

AWG

Cu 2 x 6

AWG

Cu 1 x 1/0 + 1 x 2/0

Tightening torque

N.m

5 ≤ 10 mm² / 8 AWG

9 ≥ 16 mm² / 6 AWG

Stripping length (h)

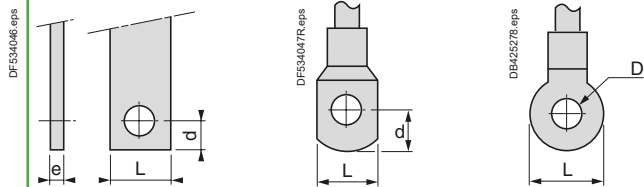
Solid cable

mm

20

Power connection by bars or lugs

Bars or lugs



Pitch

Without spreaders

mm

27

With spreaders

mm

35

Bars or cables with lugs

e

mm

≤ 8

L

mm

≤ 20

d

mm

≤ 7

D

mm

6.4

M6 Screws

Tightening torque

N.m

5 ≤ 10 mm² / 8 AWG

9 ≥ 16 mm² / 6 AWG

(1) When mounting on a vertical rail, fit a stop to prevent any slippage.

TeSys Power

Deca - Frame 4 Motor circuit breakers - Magnetic Characteristics

| Breaking capacity of GV4L and GV4LE | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------|----------------------|-----------------------|-----|----|----|-----------------------|-----|-----|---|------|----|----|----|-----------|-----|-----|---|------|----|----|----|-----|
| Circuit breaker type | | | GV4L●●●B GV4LE●●●B | | | | GV4L●●●N GV4LE●●●N | | | | | | | | GV4LE●●●S | | | | | | | | |
| Rating | | | A | 25 | 50 | 80 | 115 | 2 | 3.5 | 7 | 12.5 | 25 | 50 | 80 | 115 | 2 | 3.5 | 7 | 12.5 | 25 | 50 | 80 | 115 |
| Breaking capacity conforming to IEC 60947-2 | 230/240 V | lcu | kA | 50 | | | | 100 | | | | | | | | 120 | | | | | | | |
| | | ics % ⁽¹⁾ | | 100 | | | | 100 | | | | | | | | 100 | | | | | | | |
| | 400/415 V | lcu | kA | 25 | | | | 50 | | | | | | | | 100 | | | | | | | |
| | | ics % ⁽¹⁾ | | 100 | | | | 100 | | | | | | | | 100 | | | | | | | |
| | 440 V | lcu | kA | 20 | | | | 50 | | | | | | | | 70 | | | | | | | |
| | | ics % ⁽¹⁾ | | 100 | | | | 100 | | | | | | | | 100 | | | | | | | |
| | 500 V | lcu | kA | 10 | | | | 25 | | | | | | | | 30 | | | | | | | |
| | | ics % ⁽¹⁾ | | 100 | | | | 100 | | | | | | | | 100 | | | | | | | |
| | 525 V | lcu | kA | - | | | | 15 | | | | | | | | 18 | | | | | | | |
| | | ics % ⁽¹⁾ | | - | | | | 100 | | | | | | | | 100 | | | | | | | |
| | 690 V | lcu | kA | - | | | | 8 | | | | | | | | 10 | | | | | | | |
| | | ics % ⁽¹⁾ | | - | | | | 25 | | | | | | | | 25 | | | | | | | |

(1) As % of lcu.

Ref.



Motor circuit breakers

TeSys Power

Deca - Frame 4 Motor circuit breakers - Thermal-magnetic

Characteristics

| Breaking capacity of GV4P, GV4PE, GV4PB●●●B | | | | | | | | | | | | | | | | | | | |
|--|----------------------|--|----|----------------------|-----|--|-----|-----|------|----|--|----|-----|---|-----|---|------|----|----|
| Circuit breaker type | A | GV4P●●●B GV4PE●●●B GV4PEM●●●B GV4PB●●●B | | | | GV4P●●●N GV4PE●●●N GV4PEM●●●N GV4PB●●●N | | | | | GV4P●●●S GV4PE●●●S GV4PEM●●●S GV4PB●●●S | | | | | | | | |
| | | 25 | 50 | 80 | 115 | 2 | 3.5 | 7 | 12.5 | 25 | 50 | 80 | 115 | 2 | 3.5 | 7 | 12.5 | 25 | 50 |
| Breaking capacity conforming to IEC 60947-2 | 230/240 V | Icu | kA | 50 | | | | 100 | | | | | 120 | | | | | | |
| | | | | Ics % ⁽¹⁾ | | | | 100 | | | | | 100 | | | | | | |
| | 400/415 V | Icu | kA | 25 | | | | 50 | | | | | 100 | | | | | | |
| | | | | Ics % ⁽¹⁾ | | | | 100 | | | | | 100 | | | | | | |
| | 440 V | Icu | kA | 20 | | | | 50 | | | | | 70 | | | | | | |
| | | | | Ics % ⁽¹⁾ | | | | 100 | | | | | 100 | | | | | | |
| | 500 V | Icu | kA | 10 | | | | 25 | | | | | 30 | | | | | | |
| | | | | Ics % ⁽¹⁾ | | | | 100 | | | | | 100 | | | | | | |
| | 525 V | Icu | kA | - | | | | 15 | | | | | 18 | | | | | | |
| | | | | Ics % ⁽¹⁾ | | | | 100 | | | | | 100 | | | | | | |
| | 690 V | Icu | kA | - | | | | 8 | | | | | 10 | | | | | | |
| | | | | Ics % ⁽¹⁾ | | | | 25 | | | | | 25 | | | | | | |
| Breaking capacity conforming to UL 60947-4-1 and CSA 22.2 n° 60947-4-1 | 120 V | Icu | kA | 35 | | | | 65 | | | | | 100 | | | | | | |
| | 208 V | Icu | kA | 35 | | | | 65 | | | | | 100 | | | | | | |
| | 240 V | Icu | kA | 35 | | | | 65 | | | | | 100 | | | | | | |
| | 480Y / 277 V | Icu | kA | 18 | | | | 35 | | | | | 65 | | | | | | |
| | 480 V ⁽²⁾ | Icu | kA | 18 | | | | 35 | | | | | 65 | | | | | | |
| | 600Y / 347 V | Icu | kA | 14 | | | | 18 | | | | | 25 | | | | | | |
| | 600 V ⁽²⁾ | Icu | kA | 14 | | | | 18 | | | | | 25 | | | | | | |

(1) As % of Icu.

(2) Except for MCC suitable for TAP conductor protection, in motor group installation and GV4PB.

Ref.



Motor circuit breakers

TeSys Power

Deca - Frame 4 Motor circuit breakers - Magnetic

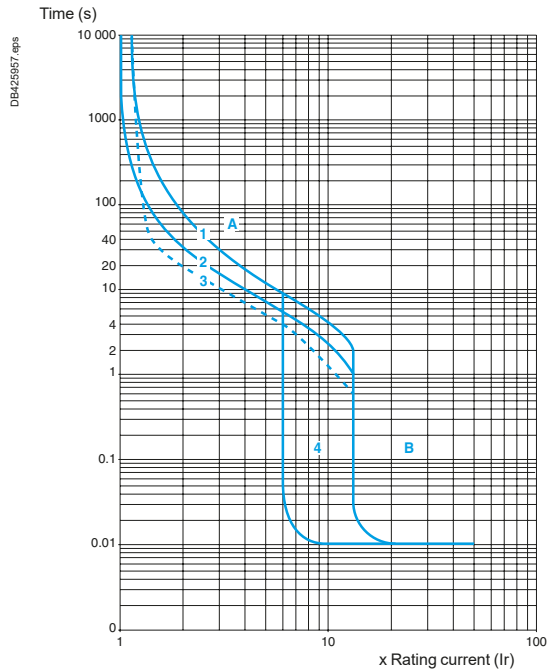
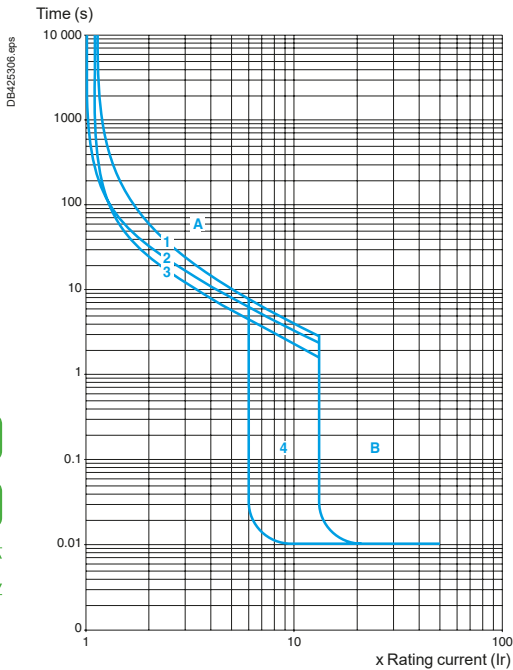
Curves

Tripping curves for GV4L and GV4LE combined with thermal overload relay LRD or LR9

Average operating times at 20 ° C related to multiples of the setting current

GV4L02 and GV4LE02 to 12 with LRD05 to LRD14,
GV4L80 and GV4LE80 with LRD3363

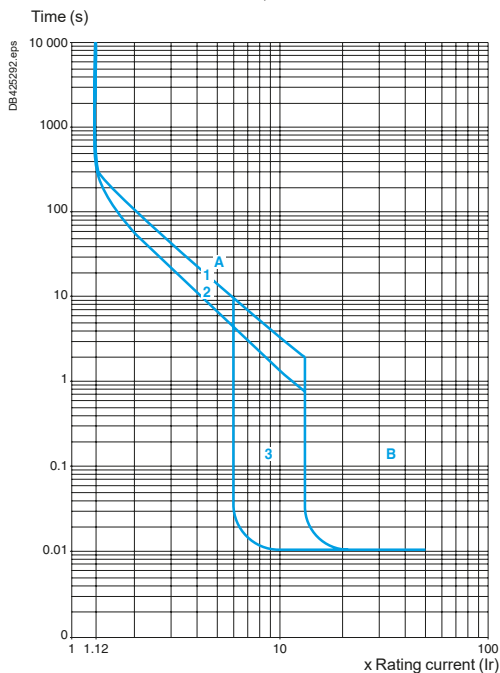
GV4L25 AND GV4LE25 with LRD318, LRD325
GV4L50 AND GV4LE50 with LRD332, LRD340, LRD350



- 1 3 poles from cold state
 - 2 2 poles from cold state
 - 3 3 poles from hot state
 - 4 6 ...14 Ir
- A Thermal overload relay protection zone
 - B GV4L protection zone

- 1 3 poles from cold state
 - 2 2 poles from cold state
 - 3 3 poles from hot state
 - 4 6 ...14 Ir
- A Thermal overload relay protection zone
 - B GV4L protection zone

GV4L115 and GV4LE115 with class 10 LR9F5367, LR9D5369
and class 20 LR9D5567, LR9F5569



- 1 Cold state curve
- 2 Hot state curve
- 3 6 ...14 Ir



Motor circuit breakers

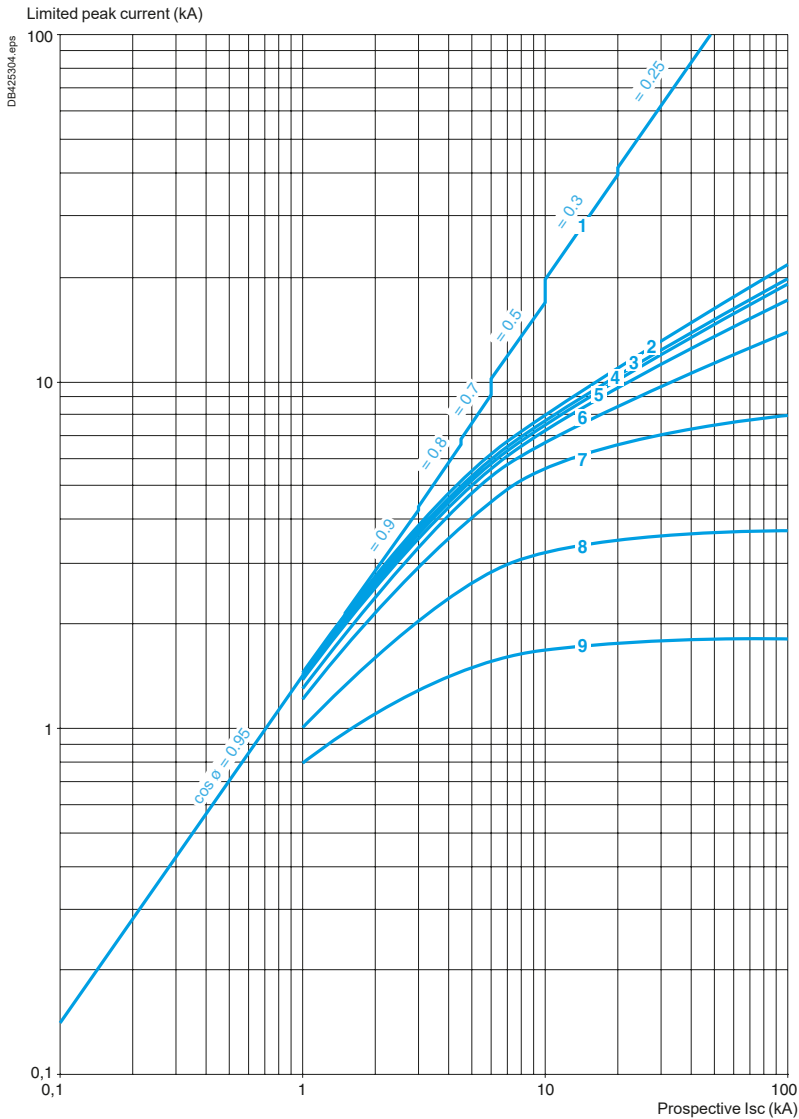
TeSys Power

Deca - Frame 4 Motor circuit breakers - Magnetic Curves

Current limitation on short-circuit for GV4L, GV4LE (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$



- 1 Maximum peak current
- 2 GV4L115
- 3 GV4L80
- 4 GV4L50
- 5 GV4L25
- 6 GV4L12
- 7 GV4L07
- 8 GV4L03
- 9 GV4L02

TeSys Power

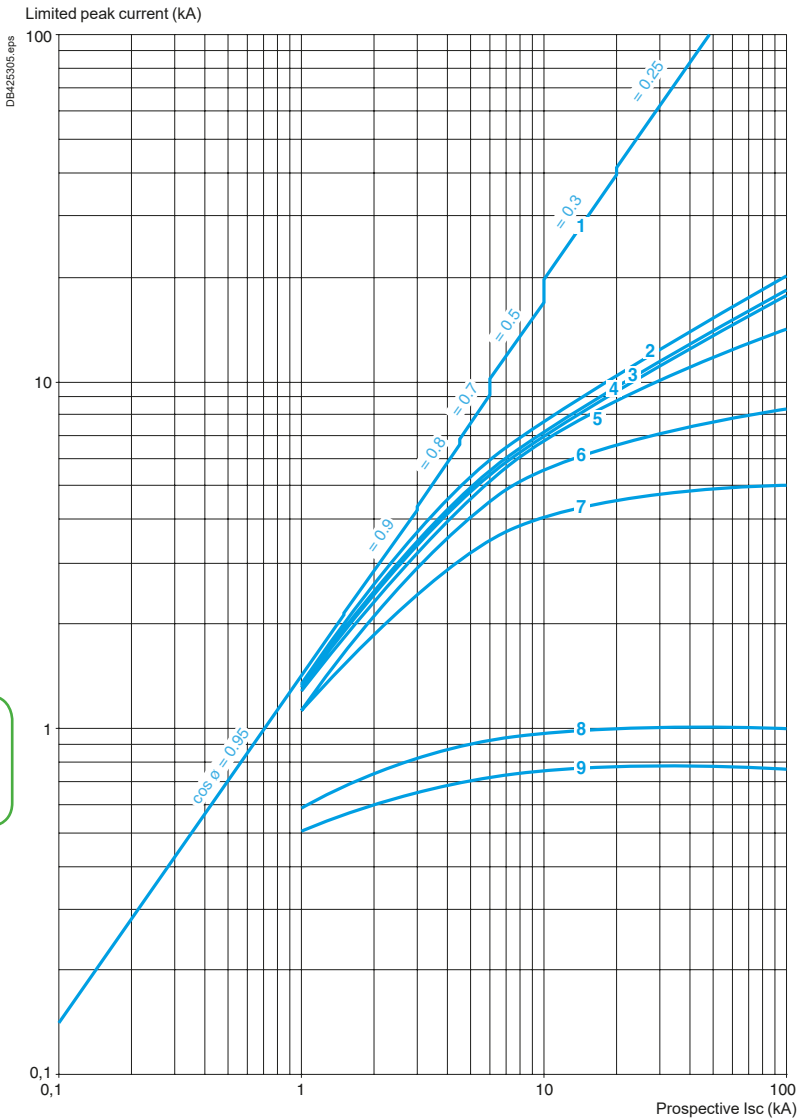
Deca - Frame 4 Motor circuit breakers - Magnetic

Curves

Current limitation on short-circuit for GV4L, GV4LE + thermal overload relay LRD or LR9 (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc})$ at $1.05 U_e = 435 V$



- 1 Maximum peak current
- 2 GV4L115 + LR9D5367 or LR9F5367
- 3 GV4L80 + LRD3361
- 4 GV4L50 + LRD340
- 5 GV4L25 + LRD325
- 6 GV4L12 + LRD313
- 7 GV4L07 + LRD12
- 8 GV4L03 + LRD07
- 9 GV4L02 + LRD07

TeSys Power

Deca - Frame 4 Motor circuit breakers - Magnetic

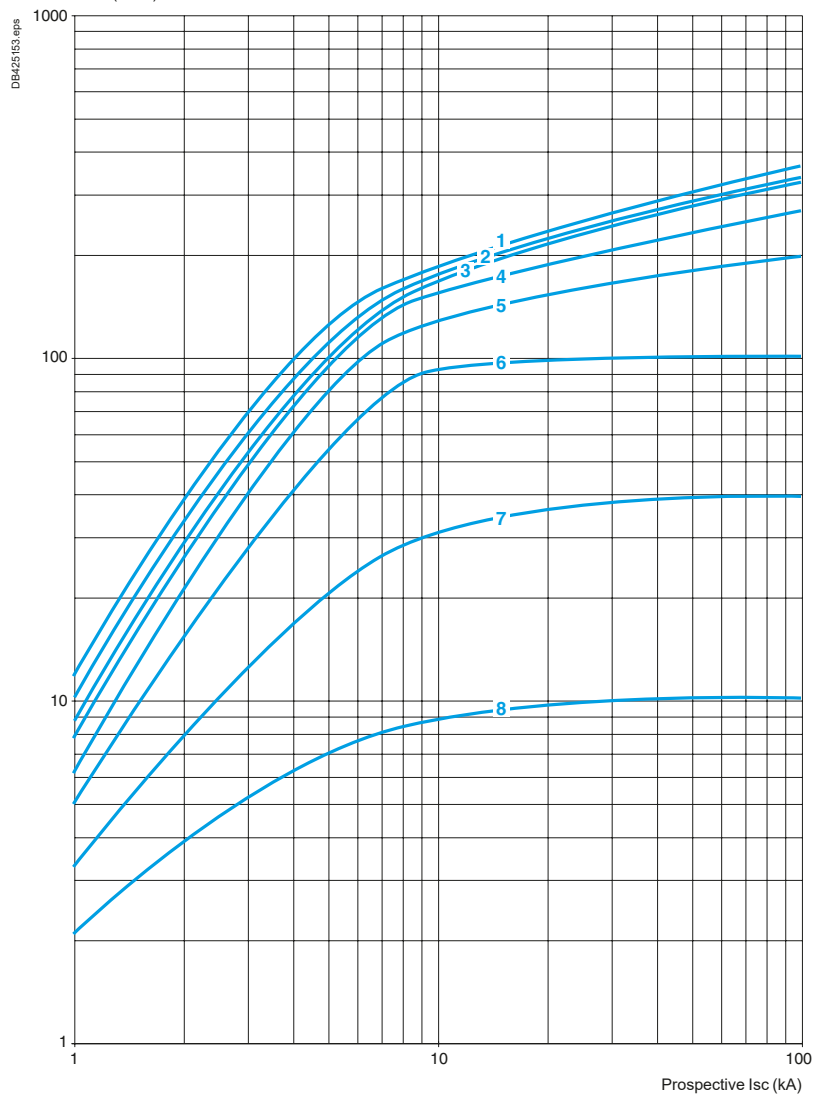
Curves

Thermal limit on short-circuit for GV4L, GV4LE

Thermal limit in kA^2S

Sum of $kA^2S = f(\text{prospective } I_{sc})$ at $1.05 U_e = 435 V$

Sum of I^2dt (kA^2S)



- 1 GV4L115
- 2 GV4L80
- 3 GV4L50
- 4 GV4L25
- 5 GV4L12
- 6 GV4L07
- 7 GV4L03
- 8 GV4L02

Ref.



Motor
circuit
breakers

TeSys Power

Deca - Frame 4 Motor circuit breakers - Magnetic

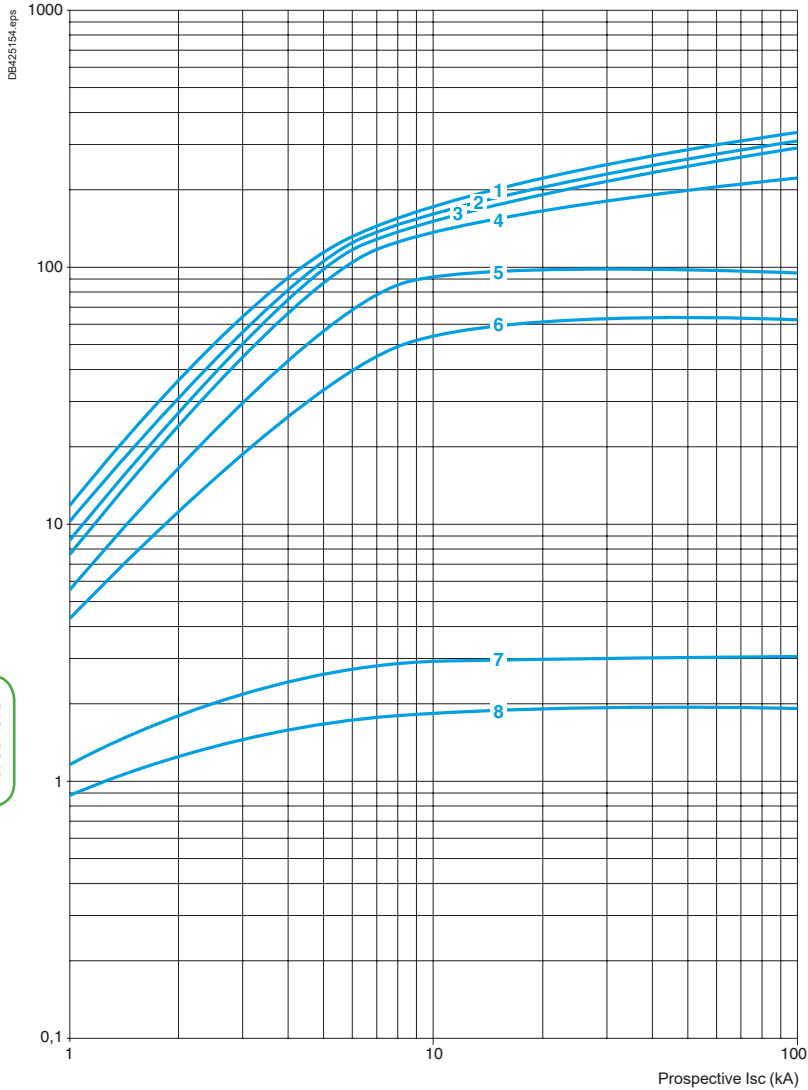
Curves

Thermal limit on short-circuit for GV4L, GV4LE + thermal overload relay LRD or LR9

Thermal limit in kA^2S in the magnetic operating zone

Sum of $kA^2S = f(\text{prospective } I_{sc})$ at $1.05 U_e = 435 V$

Sum of I^2dt (kA^2S)



- 1 GV4L115 + LR9D5367 or LR9F5367
- 2 GV4L80 + LRD3361
- 3 GV4L50 + LRD340
- 4 GV4L25 + LRD325
- 5 GV4L12 + LRD313
- 6 GV4L07+ LRD12
- 7 GV4L03+ LRD07
- 8 GV4L02 + LRD07

TeSys Power

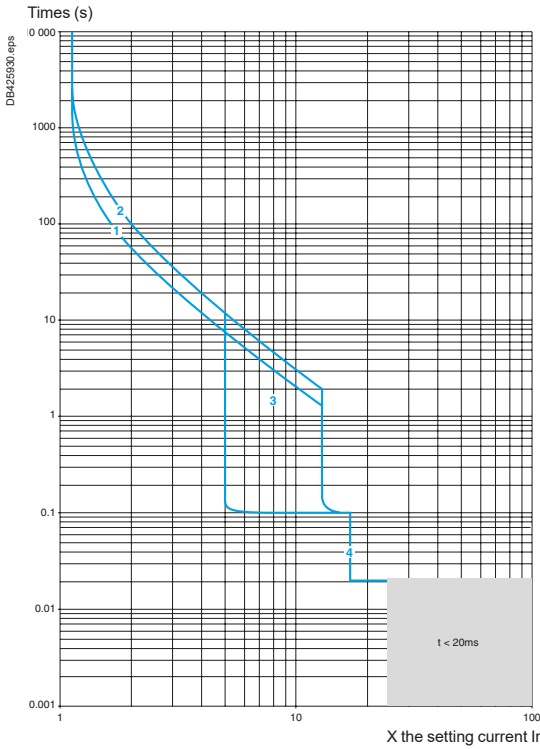
Deca - Frame 4 Motor circuit breakers - Thermal-magnetic

Curves

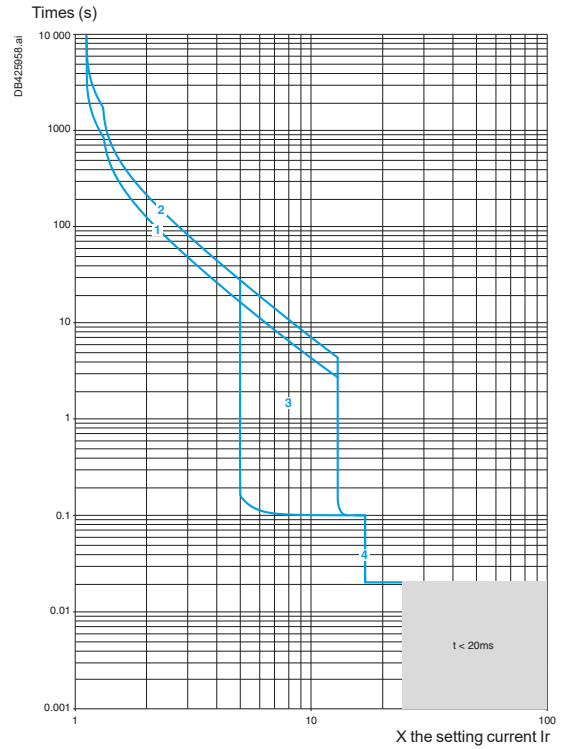
Thermal-magnetic tripping curves for GV4P, GV4PE, GV4PEM, GV4PB

Average operating times at 20 °C related to multiples of the setting current

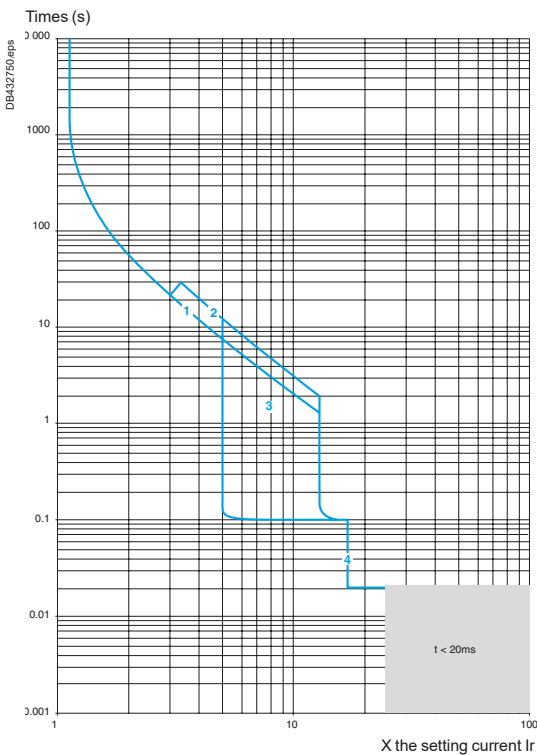
GV4P, GV4PE, GV4PEM



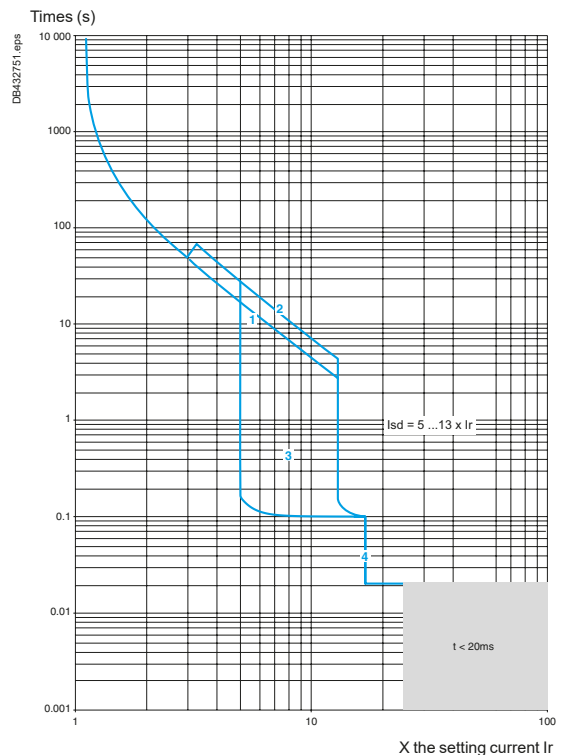
GV4P, GV4PE, GV4PEM



GV4PB



GV4PB



Hot state

- 1 Class 10
- 2 Class 20
- 3 Isd = 13 x Ir (GV4P - GV4PE); Isd = 5...13 x Ir (GV4PEM - GV4PB)
- 4 Ii = 17 In

Cold state

- 1 Class 10
- 2 Class 20
- 3 Isd = 13 x Ir (GV4P - GV4PE); Isd = 5...13 x Ir (GV4PEM - GV4PB)
- 4 Ii = 17 In

References:
pages B6/37 to B6/41

Characteristics:
pages B6/120 to B6/123

Dimensions, schemes:
pages B6/134 to B6/137

Ref.



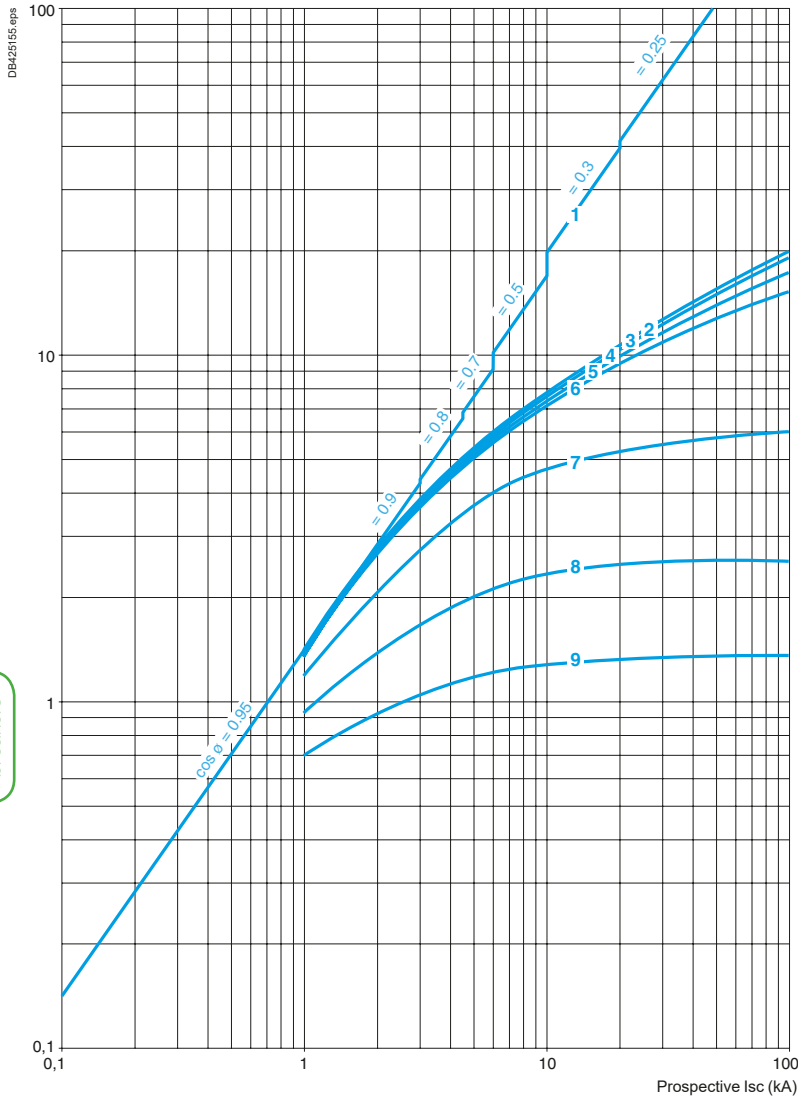
Motor
circuit
breakers

Current limitation on short-circuit for GV4P, GV4PE, GV4PEM, GV4PB (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



- 1 Maximum peak current
- 2 GV4P115
- 3 GV4P80
- 4 GV4P50
- 5 GV4P25
- 6 GV4P12
- 7 GV4P07
- 8 GV4P03
- 9 GV4P02

TeSys Power

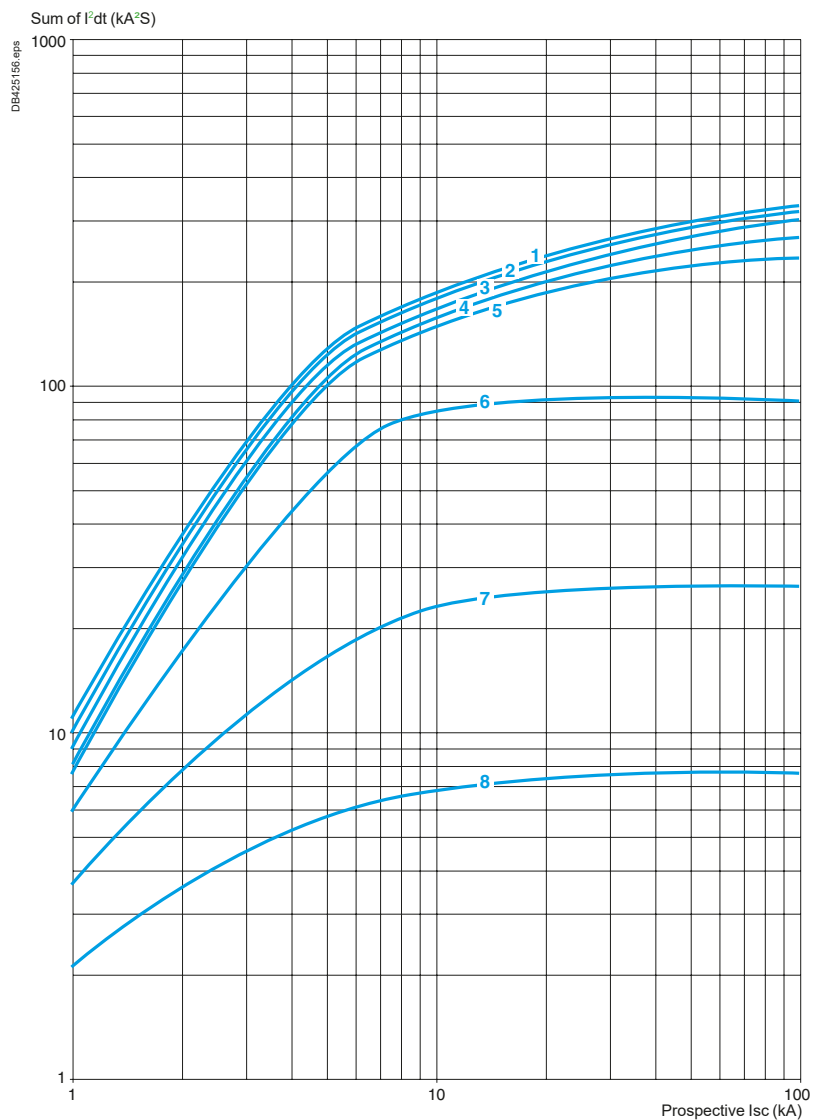
Deca - Frame 4 Motor circuit breakers - Thermal-magnetic

Curves

Thermal limit on short-circuit for GV4P, GV4PE, GV4PEM, GV4PB

Thermal limit in kA²s in the magnetic operating zone

Sum of $I^2dt = f$ (prospective I_{sc}) at $1.05 U_e = 435 V$



- 1 GV4P115
- 2 GV4P80
- 3 GV4P50
- 4 GV4P25
- 5 GV4P12
- 6 GV4P07
- 7 GV4P03
- 8 GV4P02

| Characteristics of electric trips | | | | | | | | |
|---|----------------------------------|------------------------------------|--|--------------------------|------------------------------------|----------------|-----------------|-----------------|
| Type of trip | | GV4AU●●● MN (undervoltage release) | | | | | | |
| Rated insulation voltage (Ui) Conforming to IEC 60947-1 | V | = Ue | | | | | | |
| Operational voltage (Ue) Conforming to IEC 60947-1 | V | 24 V AC/DC | 48 V AC/DC | 110-130 V AC 125 V DC | 208-240 V 60 Hz 220-240 V 50 Hz | 277 V 60 Hz | 380-415 V 60 Hz | 440-480 V 60 Hz |
| Inrush consumption | VA | < 7 VA < 2 W | < 7 VA < 2 W | < 7 VA < 2 W | < 7 VA | < 7 VA | < 7 VA | < 7 VA |
| Sealed consumption | VA | < 7 VA < 2 W | < 7 VA < 2 W | < 7 VA < 2 W | < 7 VA | < 7 VA | < 7 VA | < 7 VA |
| Operating time Conforming to IEC 60947-1 | ms | < 50 | | | | | | |
| On-load factor | | 100 % | | | | | | |
| Cabling (spring connection) | Number of conductors | 1 per terminal | | | | | | |
| | Solid cable | mm ² | No solid cable allowed | | | | | |
| | Flexible cable without cable end | mm ² AWG | Cu 0.5 mm ² to 1.5 mm ² Cu 20AWG to 16AWG | | | | | |
| | Flexible cable with cable end | mm ² | No cable with cable end allowed | | | | | |
| Tightening torque | N.m | NA | | | | | | |
| Mechanical durability (C.O.: Close - Open) | C.O. | 20000 | | | | | | |

Ref.

| Characteristics of electric trips | | | | | | |
|---|----------------------------------|--------------------------|--|--------------------------|------------------------------------|------------------------------------|
| Type of trip | | GV4AS●●● MX (Shunt trip) | | | | |
| Rated insulation voltage (Ui) Conforming to IEC 60947-1 | V | = Ue | | | | |
| Operational voltage (Ue) Conforming to IEC 60947-1 | V | 24 V AC/DC | 48 V AC/DC | 110-130 V AC 125 V DC | 208-240 V 60 Hz 220-240 V 50 Hz | 380-415 V 50 Hz 440-480 V 60 Hz |
| Inrush consumption | VA | < 6 VA < 10 W | < 6 VA < 10 W | < 6 VA < 10 W | < 6 VA | < 6 VA |
| Sealed consumption | VA | < 4 VA < 1 W | < 4 VA < 1 W | < 4 VA < 1 W | < 4 VA | < 4 VA |
| Operating time Conforming to IEC 60947-1 | ms | < 50 | | | | |
| On-load factor | | 100 % | | | | |
| Cabling (spring connection) | Number of conductors | 1 per terminal | | | | |
| | Solid cable | mm ² | No solid cable allowed | | | |
| | Flexible cable without cable end | mm ² AWG | Cu 0.5 mm ² to 1.5 mm ² Cu 20AWG to 16AWG | | | |
| | Flexible cable with cable end | mm ² | No cable with cable end allowed | | | |
| Tightening torque | N.m | NA | | | | |
| Mechanical durability (C.O.: Close - Open) | C.O. | 20000 | | | | |

Motor circuit breakers

| Auxiliary contact characteristics | | | | | | | | | | | | | | |
|--|---|-----------------|---|------|---------|---------|---------|---------|---|-----|---------|---------|------|------|
| Type of contacts | | | Auxiliary contact block GV4AE11 | | | | | | SDx contact module for GV4PEM , GV4PB, GV4ADM1111 | | | | | |
| Rated insulation voltage(Ui) | Conforming to IEC 60947-1 | V | 690 | | | | | | 250 | | | | | |
| | Conforming to CSA C22-2 n°14 UL 508 | V | - | | | | | | - | | | | | |
| Conventional thermal current (Ith) | Conforming to IEC 60947-5-1 | A | 5 | | | | | | 5 | | | | | |
| | Conforming to CSA C22-2 n°14 UL 508 | A | 5 | | | | | | 5 | | | | | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 40 000 | | | | | | 100 000 | | | | | |
| Operational power and current conforming to IEC 60947-5-1 a.c. operation | Rated operational voltage (Ue) | V | 24 | 48 | 110/127 | 230/240 | 380/440 | 660/690 | 48 | 110 | 230/240 | 380/415 | 440 | 690 |
| | Operational power (AC12) | VA | 120 | 240 | 635 | 1200 | 2200 | 3450 | | | 400 | | | |
| | Occasional breaking and making capacities | kVA | 1.2 | 2.4 | 6.35 | 12 | 22 | 34.5 | | | | | | |
| | Operational current (Ie) | AC-12 | A | 5 | 5 | 5 | 5 | 5 | 5 | | | | | |
| | | AC-15 | A | 5 | 5 | 4 | 3 | 2.5 | 0.1 | | 3 | 1.5 | | |
| Operational power and current conforming to IEC 60947-5-1 d.c. operation | Rated operational voltage (Ue) | V | 24 | 48 | 110 | 250 | | | 24 | 48 | 60 | 110 | 250 | |
| | Operational power (DC12) | W | 120 | 120 | 66 | 75 | | | 50 | | | | | |
| | Occasional breaking and making capacities | W | 1200 | 1200 | 660 | 750 | | | | | | | | |
| | Rated operational current (Ie) | DC-12 | A | 5 | 2.5 | 0.6 | 0.3 | | | | | | | |
| | | DC-13 | A | 2.5 | 1.2 | 0.35 | 0.05 | | | 2 | | | 0.22 | 0.11 |
| DC-14 | | A | 1 | 0.2 | 0.05 | 0.03 | | | | | | | | |
| Low power switching reliability of contact | | | 10 ⁻⁶ at 17 V / 2 mA | | | | | | | | | | | |
| Minimum operational conditions d.c. operation | | V | 17 | | | | | | | | | | | |
| | | mA | 2 | | | | | | | | | | | |
| Short-circuit protection | | | 5 A fuse gG conforming to IEC 60947-5-1 | | | | | | | | | | | |
| Spring terminals cabling | Number of conductors | | 1 per hole | | | | | | | | | | | |
| | Solid cable | mm ² | - | | | | | | 0.2 to 1.5 | | | | | |
| | Flexible cable without cable end | mm ² | 0.5 to 1.5 | | | | | | 0.2 to 2.5 | | | | | |
| | Flexible cable with cable end | mm ² | - | | | | | | 0.25 to 1.5 | | | | | |

Ref.

Motor circuit breakers

TeSys Power

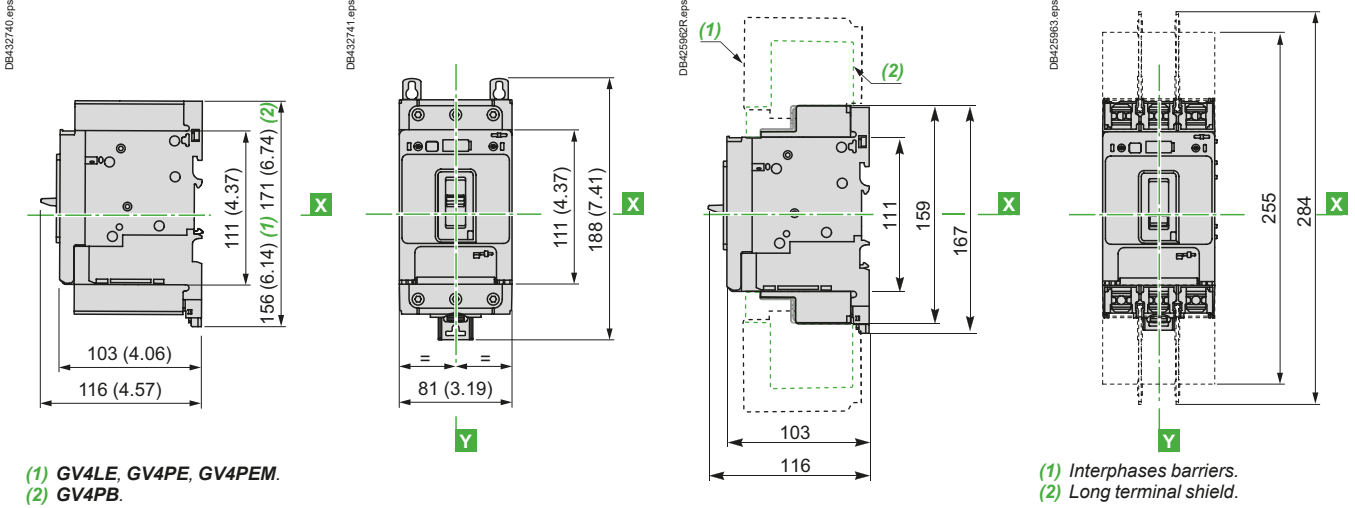
Deca - Frame 4 Motor circuit breakers

Dimensions and mounting

GV4 with toggle: GV4LE, GV4PE, GV4PEM, GV4PB

With EverLink® connector

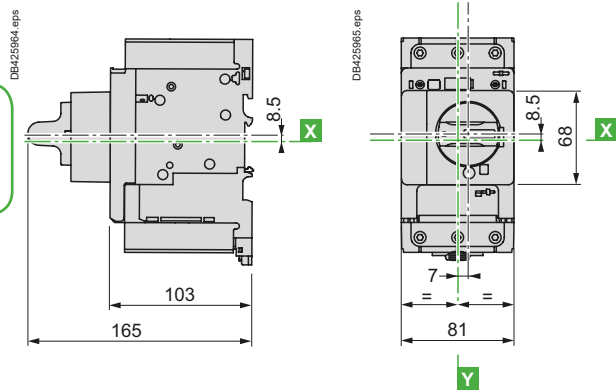
With crimp lug connector



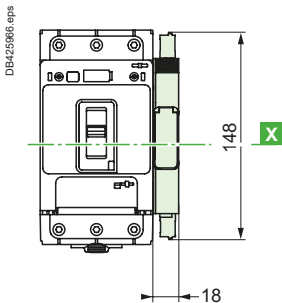
GV4 with rotary handle: GV4L, GV4P, or GV4LE, GV4PE, GV4PEM, GV4PB with GV4ADN01, GV4ADN02 direct mounting rotary handle

Dimensions

Motor circuit breakers



SDx module



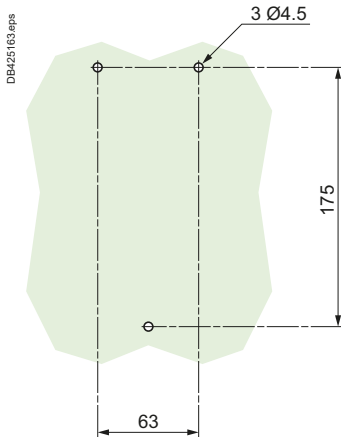
TeSys Power

Deca - Frame 4 Motor circuit breakers

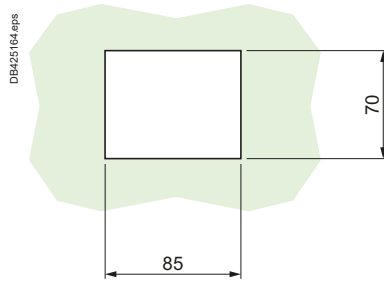
Dimensions and mounting

GV4L, GV4P, GV4LE, GV4PE, GV4PEM, GV4PB

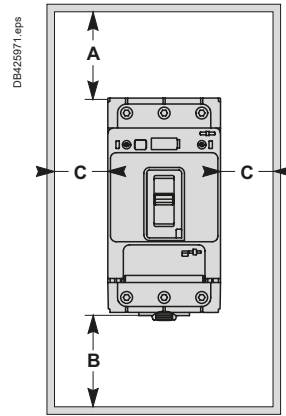
Panel mounting with M4 screws



Door cut-out for rotary handle



Minimum safety clearance



Toggle-type, rotary handle-type:
identical clearance values.

Safety clearance (mm)

| | Painted sheet metal | | | Bare sheet metal | | |
|----------------------|---------------------|---|---|------------------|---|---|
| | A | B | C | A | B | C |
| No accessory | 30 | 0 | 0 | 40 | 0 | 5 |
| Interphase barriers | 0 | 0 | 0 | 0 | 0 | 5 |
| Long terminal shield | 0 | 0 | 0 | 0 | 0 | 5 |



Motor
circuit
breakers

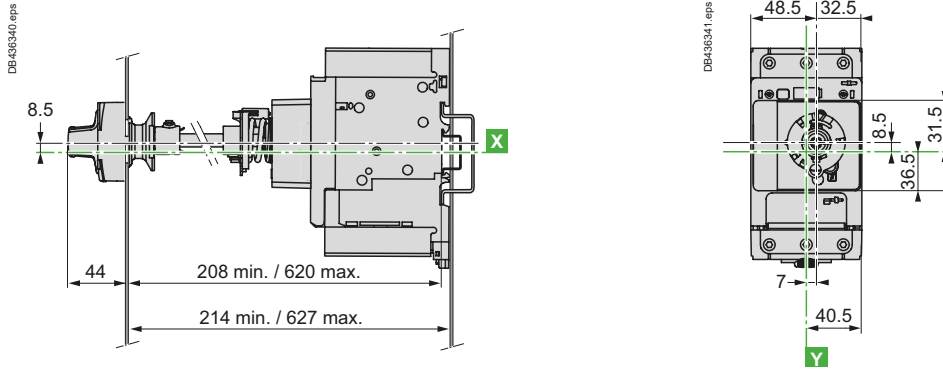
TeSys Power

Deca - Frame 4 Motor circuit breakers

Dimensions and mounting

GV4 with extended rotary handle

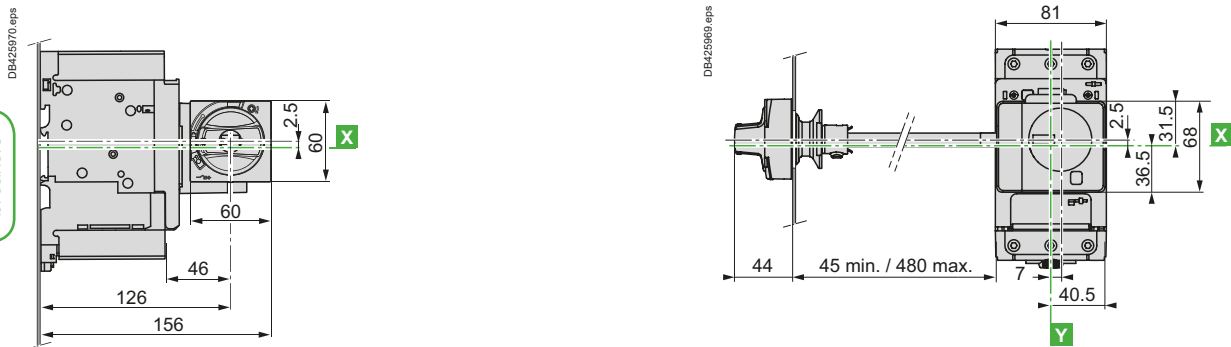
Front extended rotary handle GV4APN01, GV4APN02, GV4APN04



Ref.

Side (left or right) extended rotary handle LV426935, LV426936

Motor circuit breakers

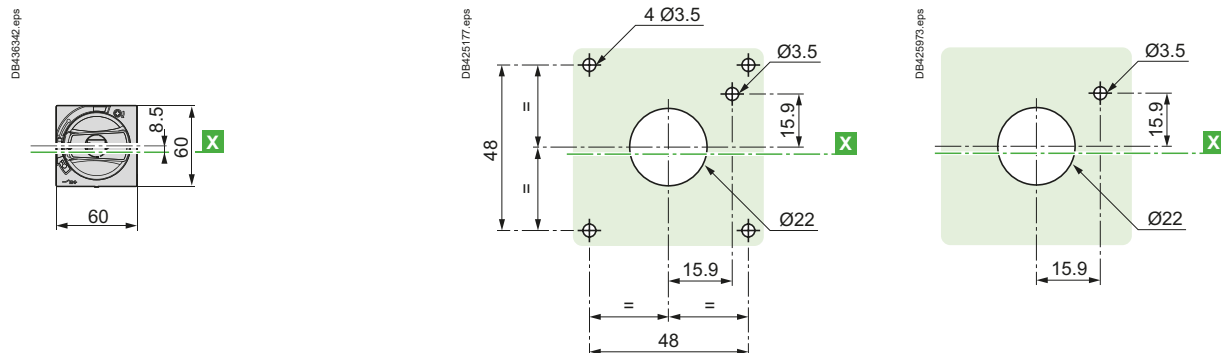


Front and side extended rotary handle, door/side panel cut-out

Front and side extended rotary handle

IP65, door panel cut-out

IP54, door/side panel cut-out



References:
pages B6/45 to B6/47

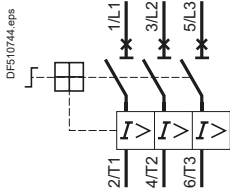
TeSys Power

Deca - Frame 4 Motor circuit breakers

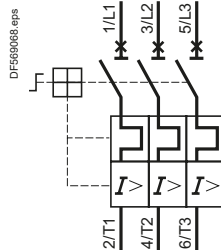
Schemes

Magnetic motor circuit breakers

GV4L, GV4LE



GV4P, GV4PE, GV4PEM, GV4PB



Accessories

Electrical trips

MN GV4AU●●●



MX GV4AS●●●



GV4AE11 auxiliary contacts

Used as OF contact

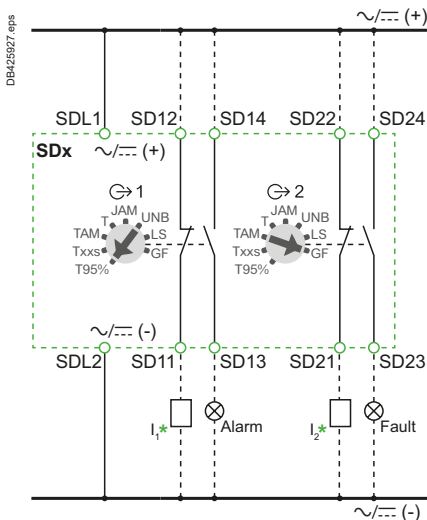


Used as SD contact



Side mounting add-on contact blocks

Instantaneous auxiliary contacts and fault signalling contacts



* I1, I2: PLC digital inputs - used as alarm inputs, as an example.

Ref.

Motor circuit breakers

TeSys Giga - Frame 5, 6 55 to 250 kW



Motor
circuit
breakers

| Environment | | | |
|-----------------------------------|-----------------------------------|--|---|
| Circuit breaker type | | GV5P/ GV6P | |
| Conforming to standards | | IEC/EN 60947-4-1 IEC/EN 60947-2 UL 60947-4-1 CSA C22.2 n° 60947-4-1 | |
| Product certifications | | CB, UKCA, UL, CSA, EAC, DNV-GL ⁽¹⁾ | |
| Climatic withstand | | According to IACS E10 | |
| Degree of protection (front face) | Conforming to IEC 60529 | Bare circuit breaker with terminal shields Installed in switchboard | IP40 with direct rotary handle IP40 with direct rotary handle / IP43 with MCC conversion accessory/ IP55 with extended rotary handle |
| Shock resistance | Conforming to IEC 60068-2-27 | | 15 gn -11 ms |
| Vibration resistance | Conforming to IEC 60068-2-6 | | 2.5 gn (25 Hz) |
| Ambient air temperature | Storage in packing | | °C -50...+85 |
| | Operation | Open mounted | °C -25... +70 |
| | | In enclosure | °C -25...+70 |
| Flame resistance | Conforming to IEC 60695-2-11 | | °C 960 |
| Maximum operating altitude | | | m 2000 |
| Suitable for isolation | Conforming to IEC 60947-1 § 7-1-6 | | Yes |
| Resistance to mechanical impact | | | J 0.5 |
| Sensitivity to phase failure | | | Yes |

| Technical characteristics | | | | | | |
|--|--|----------------|-----------------|----------------|----------------|-----------|
| Circuit breaker type | | GV5P150 | GV5P220 | GV6P320 | GV6P500 | |
| Utilisation category | Conforming to IEC 60947-2 | | A | | | |
| | Conforming to IEC 60947-4-1 | | AC-3 | | | |
| Rated operational voltage (Ue) | Conforming to IEC 60947-2 | | V 690 | | | |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-2 | | V 800 | | | |
| Rated voltage | Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1 | | V 600 | | | |
| Rated operational frequency | Conforming to IEC 60947-4-1 UL, CSA | | Hz 50/60 | | | |
| Rated impulse withstand voltage (U imp) | Conforming to IEC 60947-2 | | kV 8 | | | |
| Total power dissipated per pole | | | W 9.2 | 17.6 | 19.2 | 39.7 |
| Mechanical durability (C.O.: Close, Open) | | | C.O. 40 000 | 20 000 | 15 000 | 15 000 |
| | Electrical durability for AC-3 duty | 400/415 V (In) | C.O. 20 000 | 10 000 | 6 000 | 4 000 |
| Duty class (maximum operating rate) | | | C.O./h 25 | | | |
| Maximum conventional rated thermal current (Ith) | Conforming to IEC 60947-4-1 | | A 70...150 | 100...220 | 160...320 | 250...500 |
| Rated duty | Conforming to IEC 60947-4-1 | | Continuous duty | | | |

(1) EAC & DNV-GL certifications are in progress. Please check with your nearest sales office for more details.

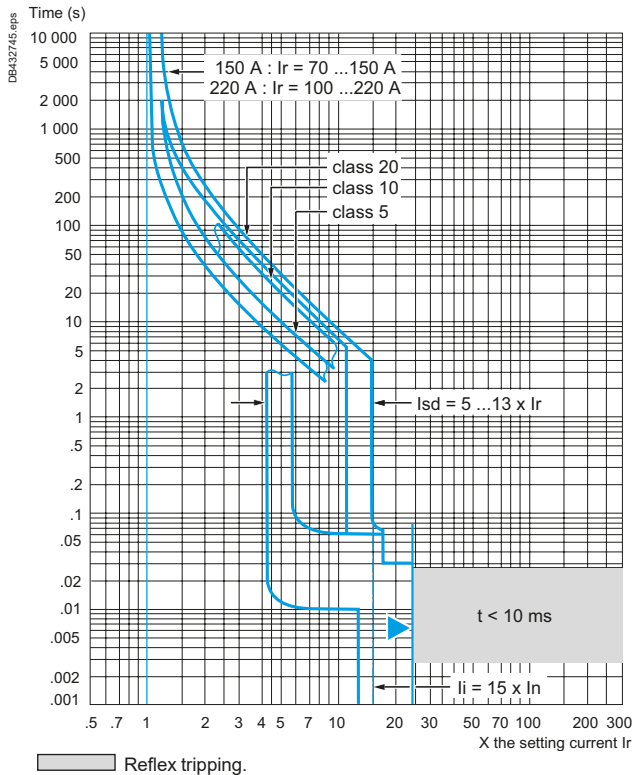
Ref.



Motor circuit breakers

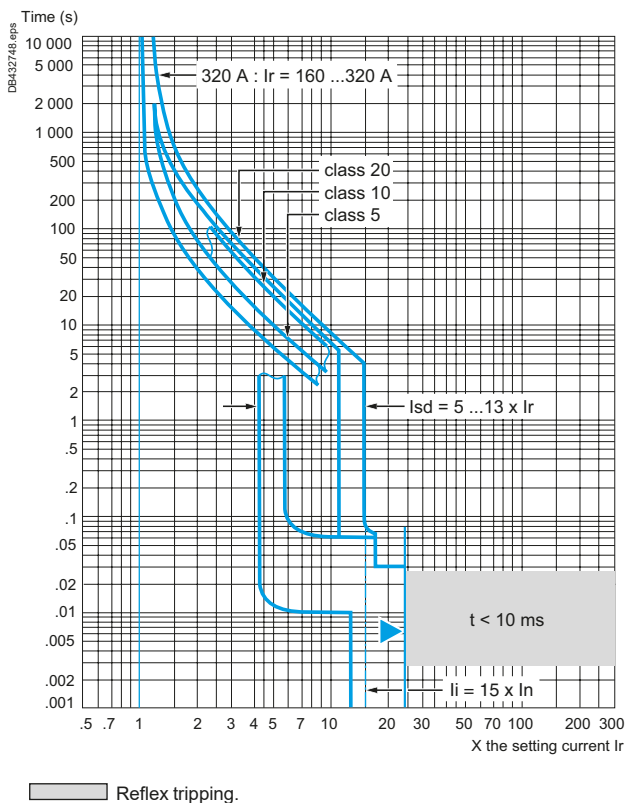
Thermal-magnetic tripping curves for GV5P

MicroLogic 2.2 M - 150/220 A

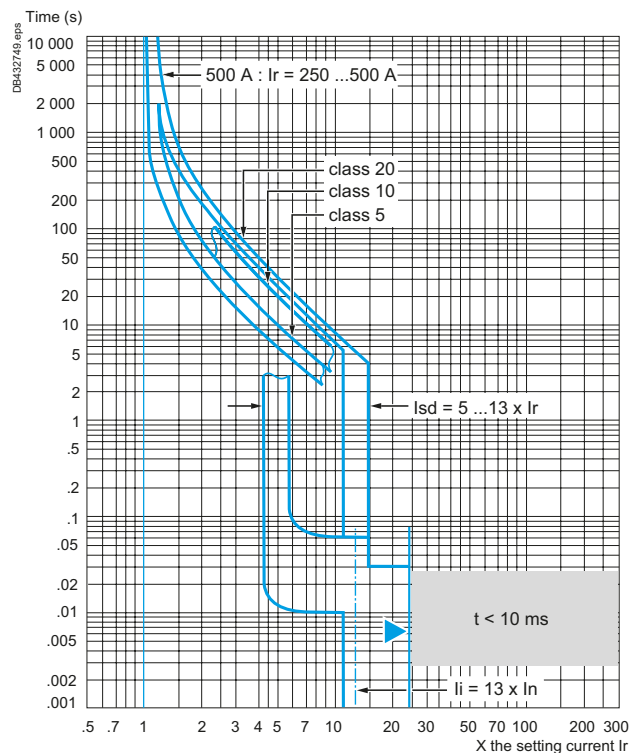


Thermal-magnetic tripping curves for GV6P

MicroLogic 2.3 M - 320 A



MicroLogic 2.3 M - 500 A



TeSys Power

Giga - Frame 5 - Frame 6 Motor circuit breakers - Thermal-magnetic

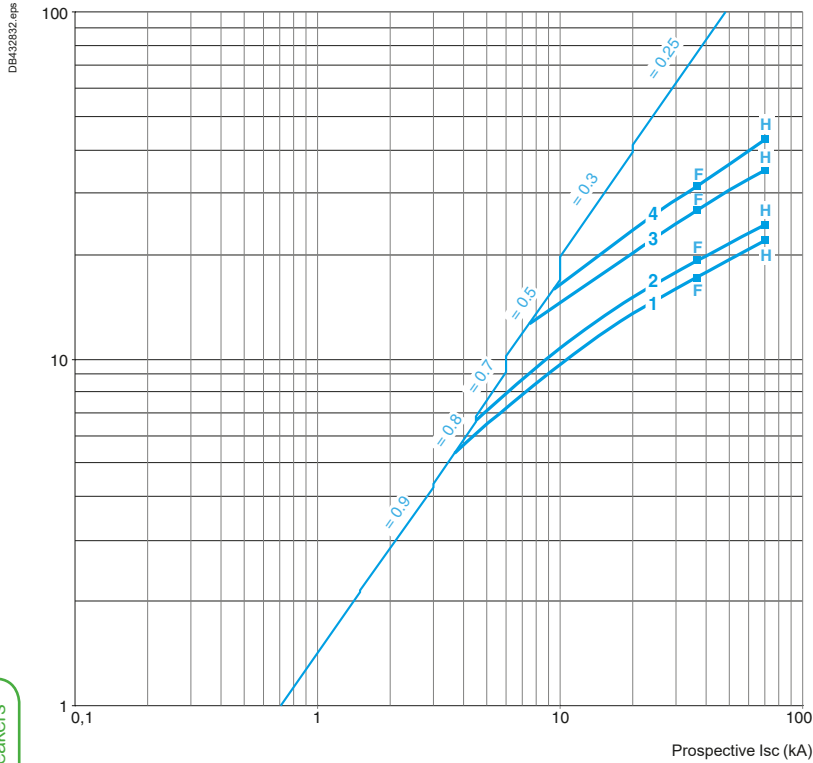
Curves

Current limitation on short-circuit (3-phase 400 - 415 V)

Dynamic stress

For GV5P/6P●●●F/H type

Limited peak current (kA)



- 1 GV5P150F/H
- 2 GV5P220F/H
- 3 GV6P320F/H
- 4 GV6P500F/H

Ref.



Motor
circuit
breakers

TeSys Power

Giga - Frame 5 - Frame 6 Motor circuit breakers - Thermal-magnetic

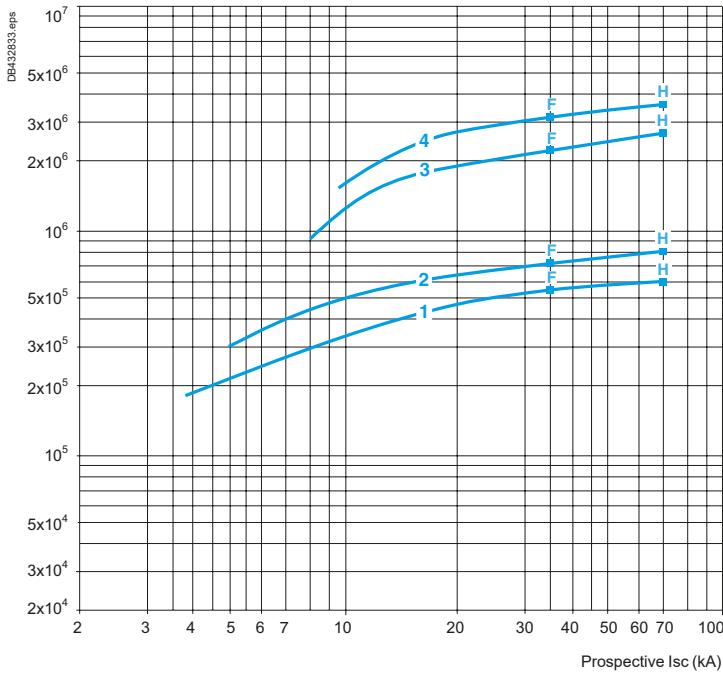
Curves

Maximum thermal limit on short-circuit

Thermal limit in kA^2s in the magnetic operating zone

Sum of $I^2dt = f$ (prospective I_{sc}) at $1.05 U_e = 435 \text{ V}$

Sum of I^2dt (A^2s)



- 1 GV5P150F/H
- 2 GV5P220F/H
- 3 GV6P320F/H
- 4 GV6P500F/H



Motor circuit breakers

Characteristics of GV5P/GV6P electric trips

| Type of trip | | | GV7AU●●● undervoltage trip | GV7AS●●● shunt trip |
|--|--------------------------------------|-----------------|---|------------------------|
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | 690 | 690 |
| | Conforming to CSA C22-2 n°14, UL 508 | V | 600 | 600 |
| Operational voltage (Ue) | Conforming to IEC 60947-1 | V | 0.85...1.1 Uc | 0.7...1.1 Uc |
| Drop-out voltage | | V | 0.7...0.35 Uc | 0.7...0.35 Uc |
| Inrush consumption | ~ | VA | < 10 | |
| Sealed consumption | ~ | VA | < 5 | |
| Operating time | Conforming to IEC 60947-1 | ms | From the moment the voltage reaches its operational value until opening of the circuit breaker. < 50 | |
| On-load factor | | | 100 % | |
| Cabling | Number of conductors | | 1 | |
| | Solid cable | mm ² | 1.5 | |
| | Flexible cable without cable end | mm ² | 1.5 | |
| | Flexible cable with cable end | mm ² | 1 | |
| Tightening torque | | N.m | 1.2 | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 50 % of the mechanical durability of the circuit breaker. | |

Characteristics of GV5P/GV6P thermal fault module

| Type of trip | | | LV429424 ⁽¹⁾ |
|------------------------------------|-----------------------------|---|-------------------------|
| Operational voltage (Ue) | Conforming to IEC 60947-1 | V | 24 to 415 V AC/ DC |
| Conventional thermal current (Ith) | Conforming to IEC 60947-5-1 | A | 80 mA max. |

(1) LV429424 takes the place of the AU/AS electric trip coil and an auxiliary contact.

Ref.



Motor
circuit
breakers

| Auxiliary contact characteristics | | | | | | | | | | | | | |
|---|-----------------------------------|-----------------|---|-----|------|-------------|-----------------------------|-----|-----------------------------|------|-----|-------------|----------|
| Type of contacts | | | GV7AE11 | | | | | | GV7AB11 | | | | |
| Rated insulation voltage(Ui) (associated insulation coordination) | Conforming to IEC 60947-1 | V | 690 | | | | | | 690 | | | | |
| Conventional thermal current (Ith) | Conforming to IEC 60947-5-1 | A | 6 | | | | | | 5 | | | | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 50 000 | | | | | | 50 000 | | | | |
| Operational current conforming to IEC 60947-5-1 a.c. operation | Rated operational voltage (Ue) | V | AC-12 or AC-15. 50 000 C.O. | | | | | | AC-12 or AC-15. 50 000 C.O. | | | | |
| | | A | 24 | 48 | 110 | 220/ 240 | 380/ 440 | 690 | 24 | 48 | 110 | 230/ 240 | 380/ 415 |
| | | A | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 |
| Rated operational current (Ie) | AC-12 | A | 6 | 6 | 5 | 4 | 2 | 0.1 | 3 | 3 | 2.5 | 2 | 1.5 |
| | AC-15 | A | 6 | 6 | 5 | 4 | 2 | 0.1 | 3 | 3 | 2.5 | 2 | 1.5 |
| Operational current conforming to IEC 60947-5-1 d.c. operation | Rated operational voltage (Ue) | V | DC-12 or DC-14. 50 000 C.O. | | | | DC-12 or DC-14. 50 000 C.O. | | | | | | |
| | | A | 24 | 48 | 110 | 250 | 24 | 48 | 110 | 250 | | | |
| | | A | 6 | 2.5 | 0.6 | 0.3 | 5 | 2.5 | 0.6 | 0.3 | | | |
| Rated operational current (Ie) | DC-12 | A | 6 | 2.5 | 0.6 | 0.3 | 5 | 2.5 | 0.6 | 0.3 | | | |
| | DC-14 | A | 1 | 0.2 | 0.05 | 0.03 | 1 | 0.2 | 0.05 | 0.03 | | | |
| Minimum operational conditions d.c. operation | V | | 24 | | | | | | 4 | | | | |
| | mA | | 100 | | | | | | 1 | | | | |
| Short-circuit protection | | | By GB2CB●● circuit breaker (rating according to operational current for Ue ≤ 415 V) or gG fuse, 10 A max. | | | | | | | | | | |
| Cabling | Solid cable | mm ² | 1 x 1.5 conductor | | | | | | 1 x 1.5 conductor | | | | |
| | Flexible cable without cable end | mm ² | 1 x 1.5 conductor | | | | | | 1 x 1.5 conductor | | | | |
| | Flexible cable with cable end | mm ² | 1 x 1.5 conductor | | | | | | 1 x 1.5 conductor | | | | |



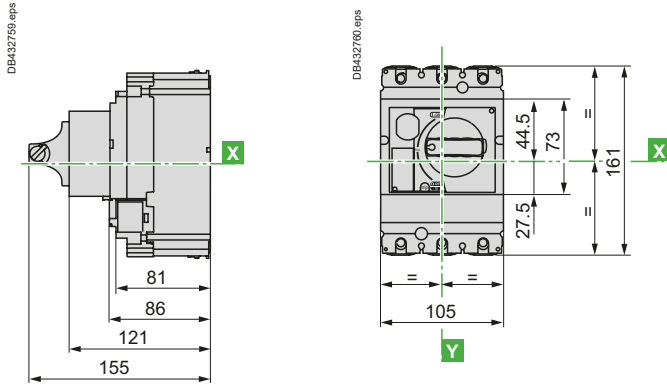
Motor
circuit
breakers

TeSys Power

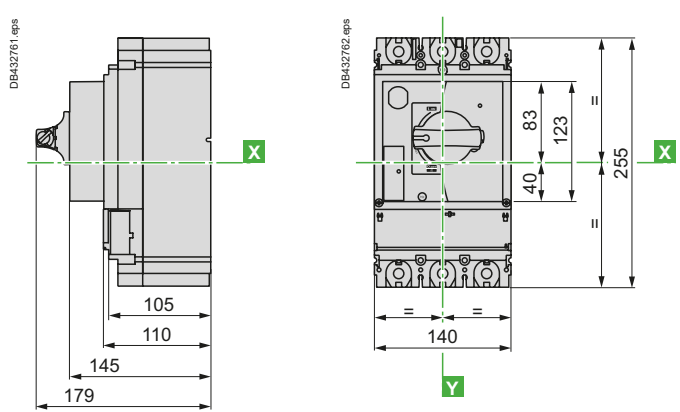
Giga - Frame 5 - Frame 6 Motor circuit breakers

Dimensions and mounting

GV5P Dimensions



GV6P Dimensions



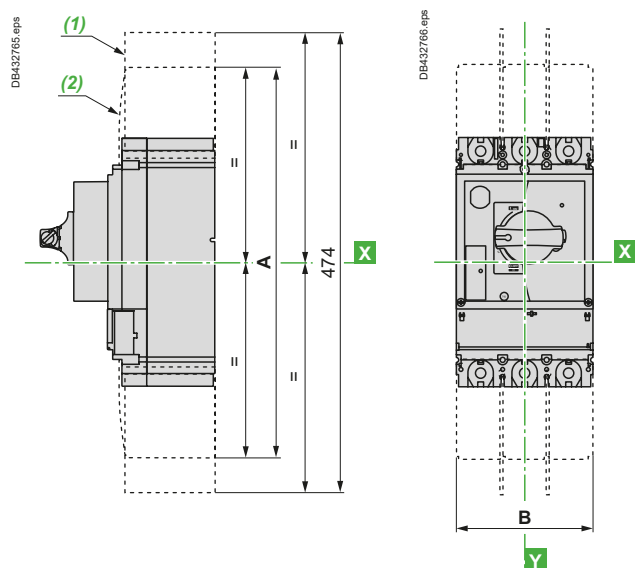
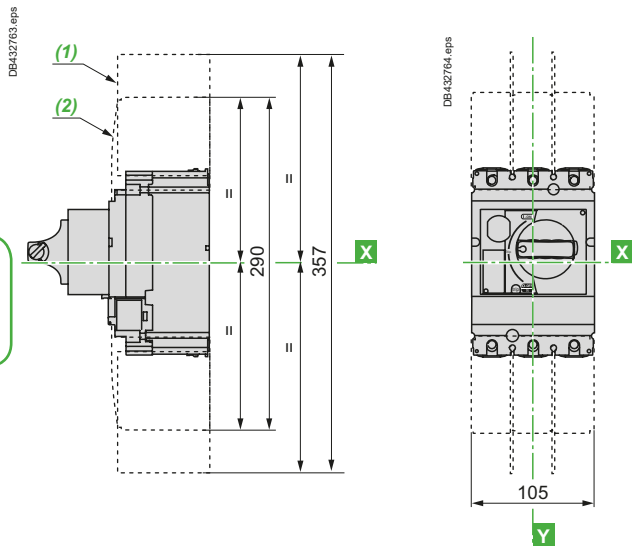
With long terminal shields or interphases barriers GV5P + GV7AC04/GV7AC01

GV6P + LV432593 / LV432595 / LV432570

Ref.



Motor circuit breakers

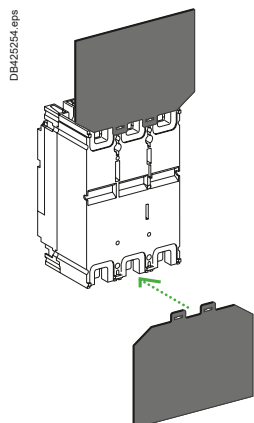


(1) Interphases barriers: **GV7AC04**.
(2) Terminal shield: **GV7AC01**.

(1) Interphases barriers: **LV432570**.
(2) Terminal shield: **LV432593 (45mm) / LV432595 (52.5mm)**.

| | A | B |
|-----------------|-----|-------|
| LV432593 | 400 | 140 |
| LV432595 | 480 | 157.5 |

Insulating screen



| Motor circuit breaker | GV5P + GV7AC05 | GV6P + LV432578 |
|---------------------------|----------------|-----------------|
| 3P W x H x thickness (mm) | 140 x 105 x 1 | 203 x 175 x 1.5 |

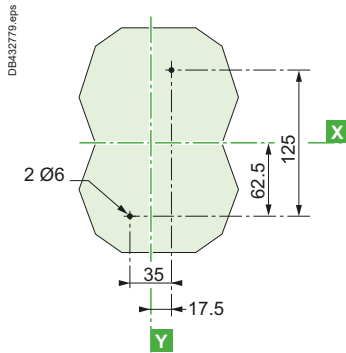
TeSys Power

Giga - Frame 5 - Frame 6 Motor circuit breakers

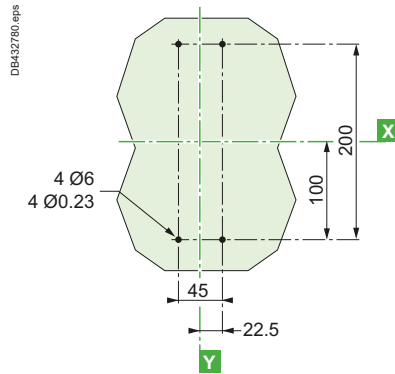
Dimensions and mounting

GV5P/GV6P

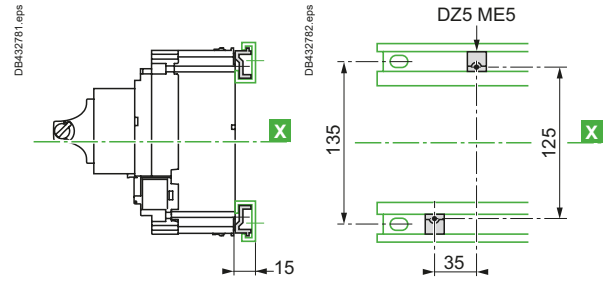
Panel mounting - GV5P



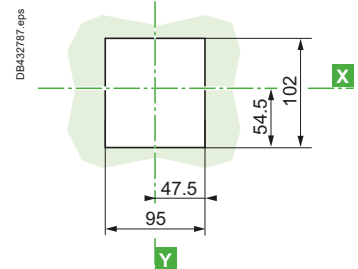
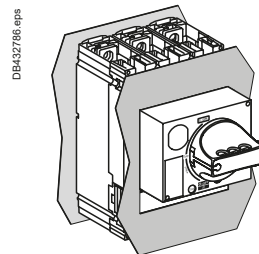
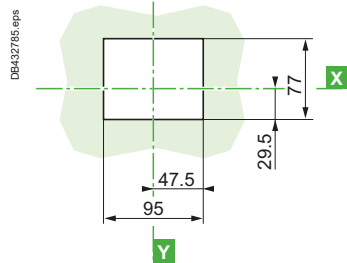
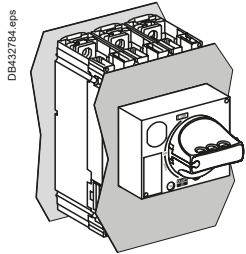
Panel mounting - GV6P



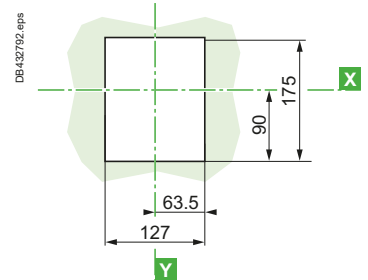
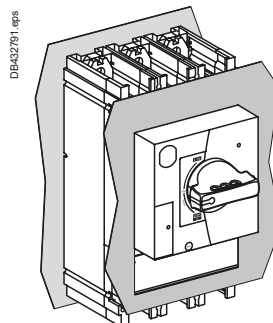
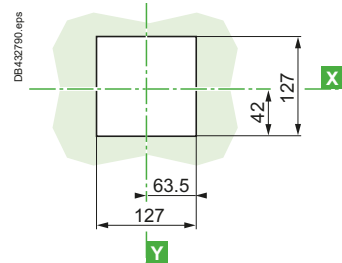
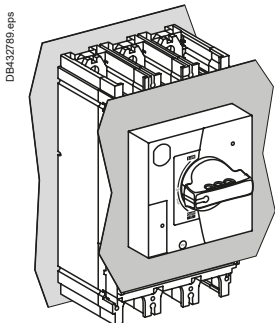
Mounting on 2 mounting rails for GV5P only



Door cut-out mounting GV5P



Door cut-out mounting GV6P



Motor circuit breakers

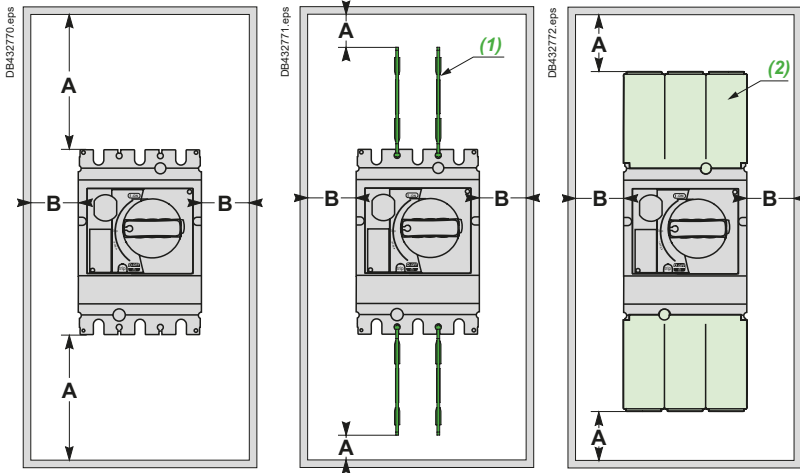
TeSys Power

Giga - Frame 5 - Frame 6 Motor circuit breakers

Dimensions and mounting

GV5P

Minimum electrical clearance

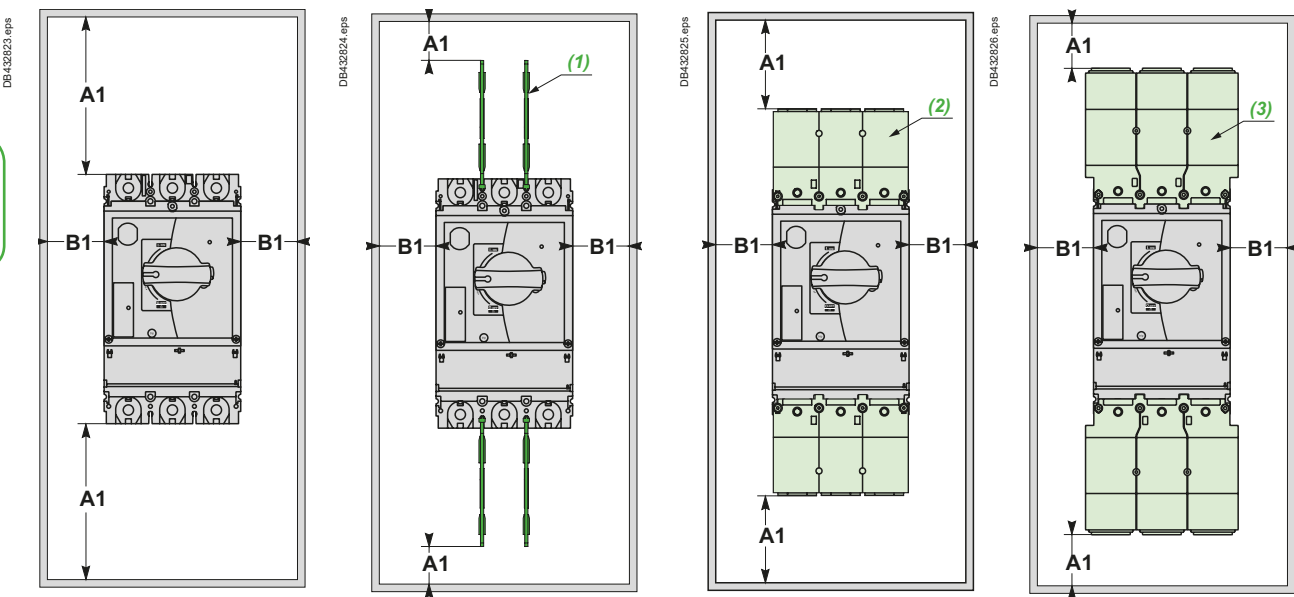


Clearance in mm

| | | Painted sheet metal | | Bare metal plate | |
|-------------------------------------|--------------------|---------------------|----|------------------|----|
| | | A | B | A | B |
| No accessories | $V \leq 500 V\sim$ | 30 | 0 | 40 | 20 |
| | $V > 500 V\sim$ | - | - | - | - |
| Interphases barriers ⁽¹⁾ | $V \leq 500 V\sim$ | 0 | 0 | 10 | 20 |
| | $V > 500 V\sim$ | - | - | - | - |
| Terminal shield ⁽²⁾ | $V \leq 500 V\sim$ | 0 | 0 | 10 | 10 |
| | $V > 500 V\sim$ | 30 | 10 | 40 | 20 |

GV6P

Minimum electrical clearance



Clearance in mm

| | | Painted sheet metal | | Bare sheet metal | |
|--|--------------------|---------------------|----|------------------|----|
| | | A1 | B1 | A1 | B1 |
| No accessories | $V \leq 500 V\sim$ | 30 | 0 | 40 | 20 |
| | $V > 500 V\sim$ | - | - | - | - |
| Interphase barriers ⁽¹⁾ | $V \leq 500 V\sim$ | 0 | 0 | 10 | 20 |
| | $V > 500 V\sim$ | - | - | - | - |
| Long terminal shield (LV432593) ⁽²⁾ | $V \leq 500 V\sim$ | 30 | 0 | 40 | 10 |
| | $V > 500 V\sim$ | 50 | 0 | 50 | 20 |
| Long terminal shield (LV432595) ⁽³⁾ | $V \leq 500 V\sim$ | 0 | 0 | 10 | 10 |
| | $V > 500 V\sim$ | 30 | 0 | 30 | 20 |

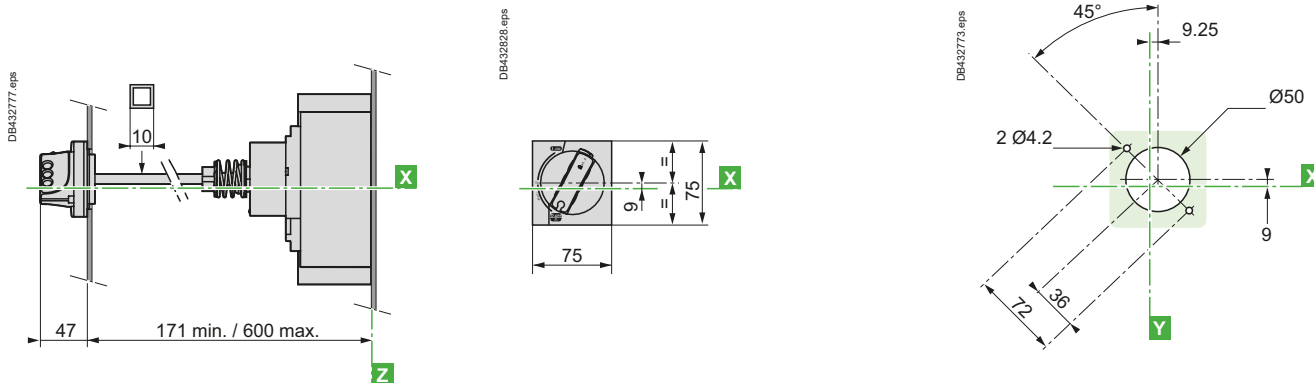
TeSys Power

Giga - Frame 5 - Frame 6 Motor circuit breakers

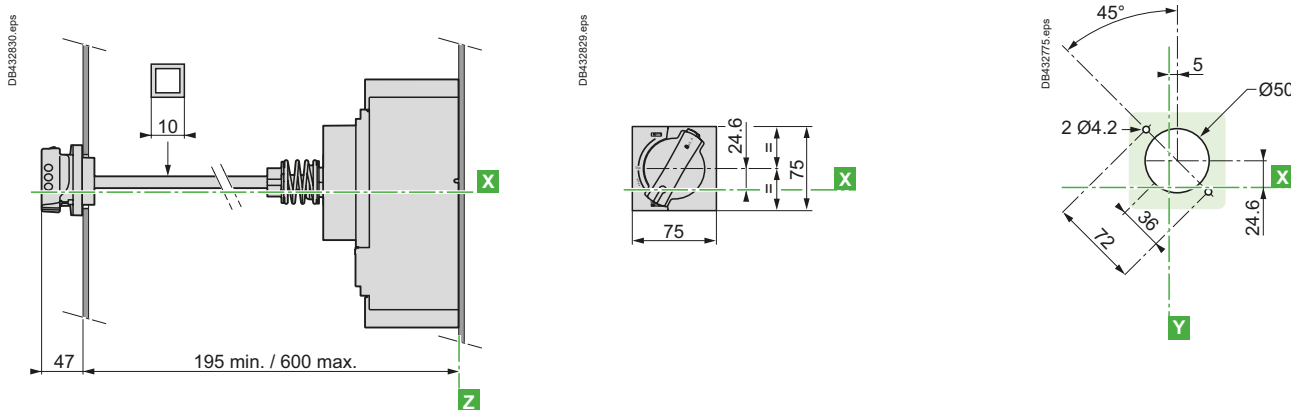
Dimensions and mounting

GV5P/GV6P

GV5 with extended rotary handle GV7AP01/ GV7AP02

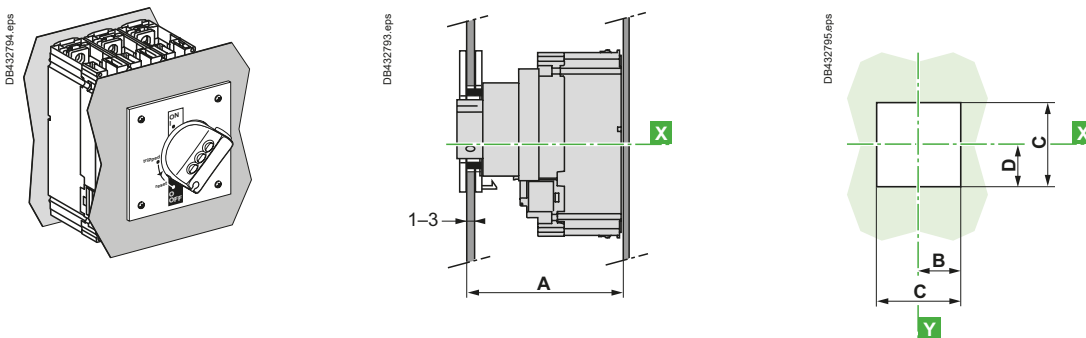


GV6 with extended rotary handle LV432598/ LV432600



GV5P/GV6P

MCC type direct rotary handle



| | A | B | C | D |
|-----------|--------|------|-----|----|
| 150/220 A | 125 ±2 | 50 | 100 | 41 |
| 320/500 A | 149 ±2 | 72.5 | 145 | 51 |

Ref.

Ref.

Ref.

Ref.

Motor circuit breakers

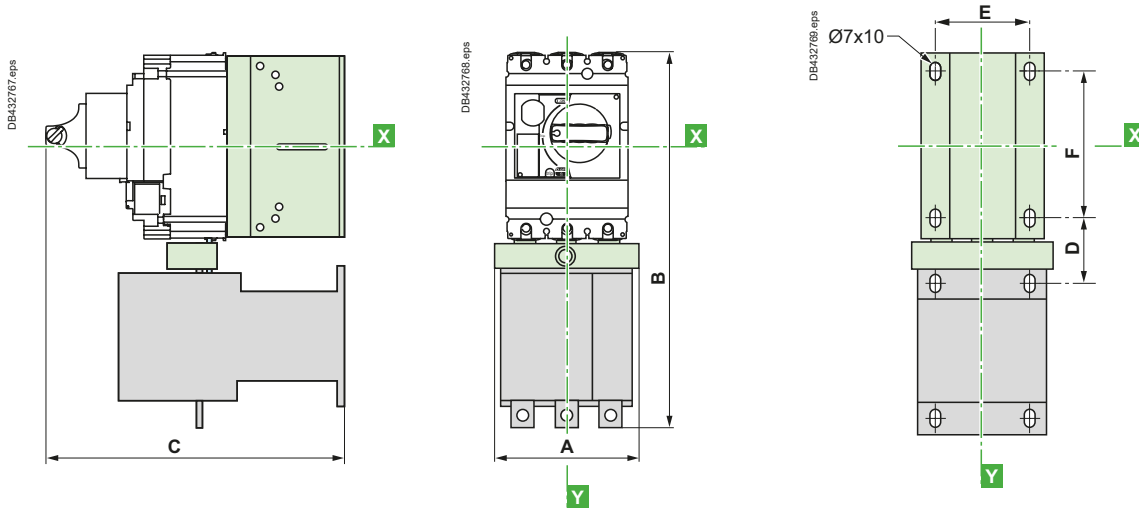
TeSys Power

Giga - Frame 5 - Frame 6 Motor circuit breakers

Dimensions and mounting

GV5P

Combination of GV5P and contactor LC1F●●●/LC1D●●● with kit GV7AC0●



| | A | B | C | D | E | F |
|--------------------------|-----|-----|-----|----|----|-----|
| GV5P + LC1F115 + GV7AC06 | 119 | 334 | 243 | 44 | 85 | 120 |
| GV5P + LC1F150 + GV7AC06 | 119 | 334 | 243 | 46 | 85 | 120 |
| GV5P + LC1F185 + GV7AC06 | 119 | 338 | 249 | 48 | 85 | 120 |
| GV5P + LC1D115 + GV7AC08 | 120 | 332 | 205 | 48 | 85 | 120 |
| GV5P + LC1D150 + GV7AC08 | 120 | 332 | 205 | 48 | 85 | 120 |

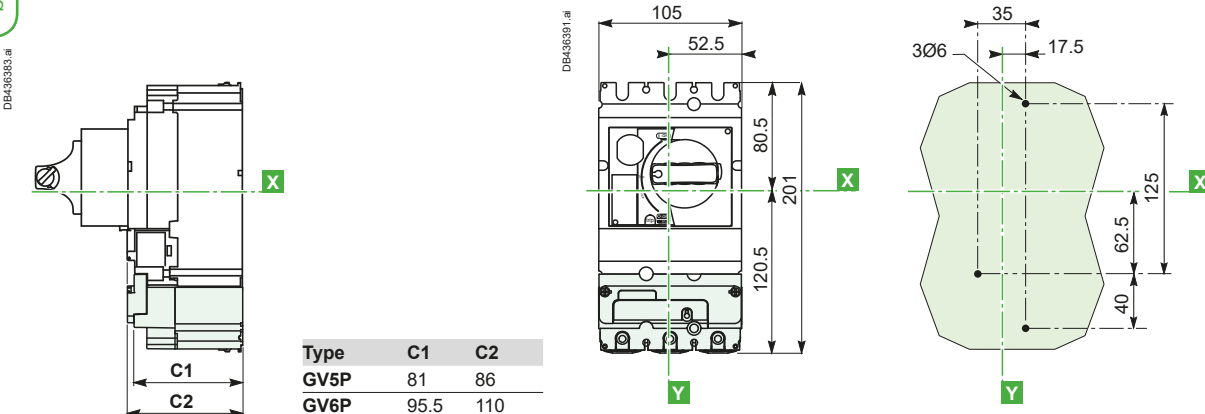
Minimum distance between 2 circuit breakers mounted side by side = 0

Motor circuit breakers

GV5P/GV6P

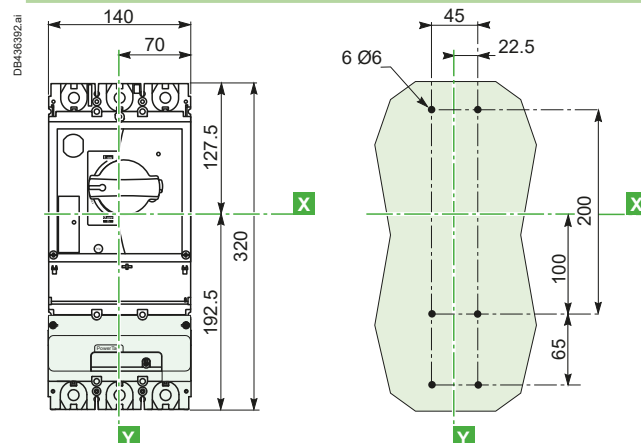
With additional PowerTag

GV5P with LV434020 / Panel mounting



| Type | C1 | C2 |
|------|------|-----|
| GV5P | 81 | 86 |
| GV6P | 95.5 | 110 |

GV6P with LV434022 / Panel mounting



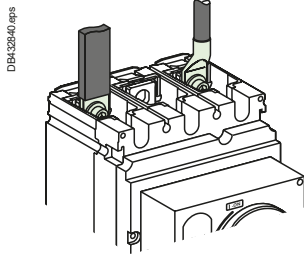
TeSys Power

Giga - Frame 5 - Frame 6 Motor circuit breakers

Dimensions and mounting

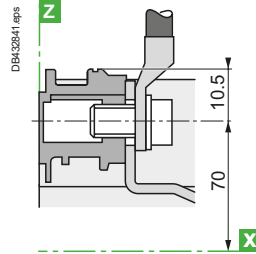
GV5P/GV6P

Front connection without accessories



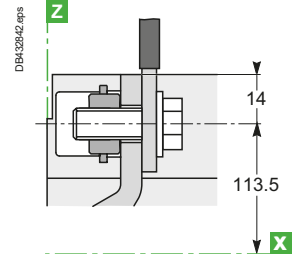
GV5P

Cables with lugs bars



GV6P

Bars/cables with lugs

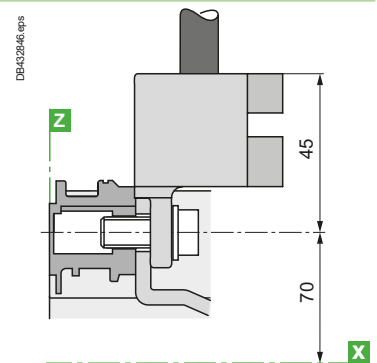
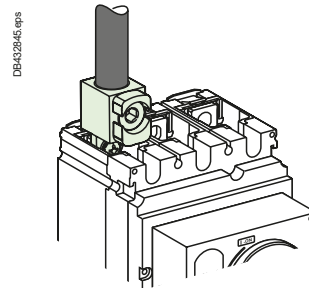
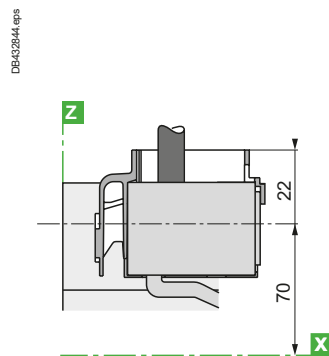
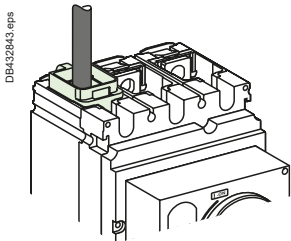


GV5P

Bare-cables connectors

GV7AC021/LV429227/GV7AC022

LV429244

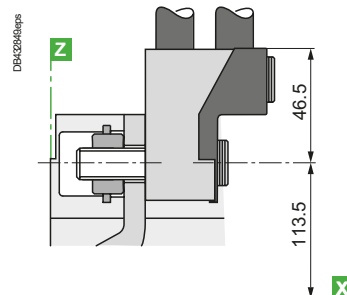
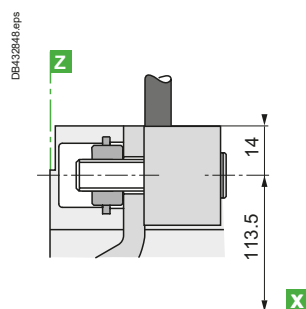
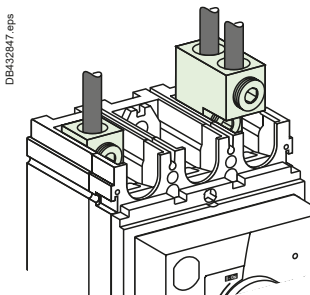


GV6P

Bare-cables connectors

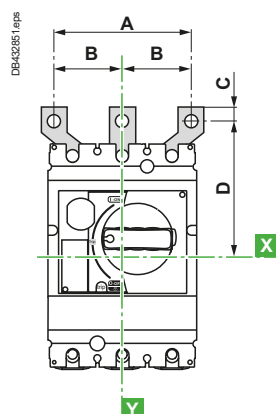
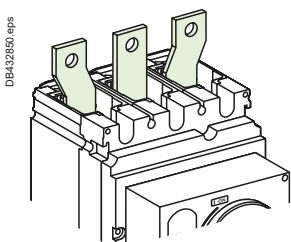
LV432479

LV432481



GV5P/GV6P

Spreaders



| Type | A | B | C | D |
|--------------------------|-----|------|----|-------|
| GV5P/ Spreaders GV7AC03 | 114 | 45 | 11 | 100 |
| GV6P/ Spreaders LV432490 | 135 | 52.5 | 15 | 152.5 |
| GV6P/ Spreaders LV432492 | 170 | 70 | 15 | 166 |

Motor circuit breakers

TeSys Power

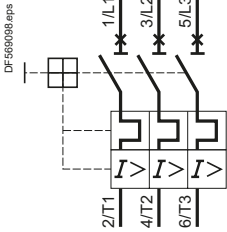
Giga - Frame 5 - Frame 6 Motors circuit breakers

Schemes

Schemes

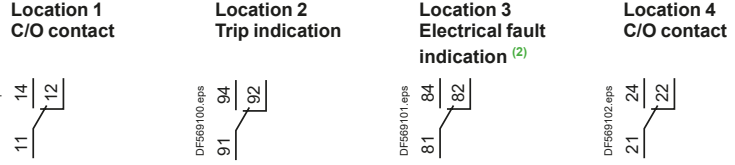
Motor circuit breakers

GV5P/ 6P



Add-on auxiliary contacts according to their location ⁽¹⁾

GV7AE11, GV7AB11



A self-adhesive label, supplied with the contact, can be affixed to the front face of the circuit-breaker to allow personalised marking according to the function of the contact or contacts.

(1) See pages B6/52 to B6/54.

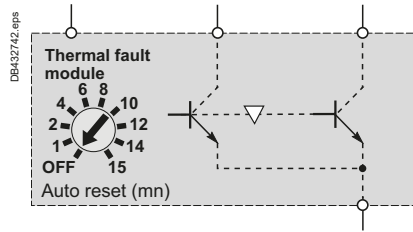
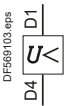
(2) Adapter LV429451 is mandatory for electrical trip indication in GV5.

Electric trips

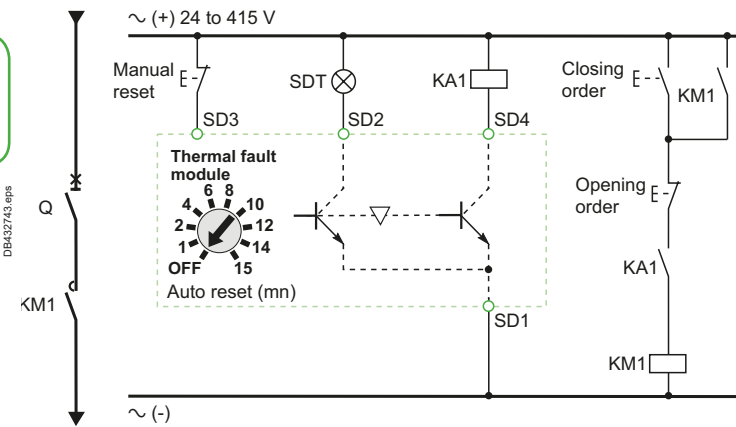
GV7AU●●●

GV7AS●●●

Thermal fault module LV429424



Recommended application schemes for LV429424



- SD1, SD3:** thermal fault module input power supply
 - SD2:** over-load fault signal output. This output will stay-put until reset
 - SD4:** contactor control output
 - SD2 and SD4:** Static outputs: 24 to 415 V AC / V DC; 80 mA max
 - KM1:** LC1D or LC1F contactor
 - KA1:** CA2 or CAD type control relays
- Terminals shown in green **○** must be connected by customer.

PowerLogic™ Energy measurement solutions



Motor
circuit
breakers

PowerLogic™ Energy measurement solutions

PowerTag™ Energy Flex

Characteristics

Energy measurement – PowerLogic

PowerTag Energy Flex 63 A (F63)

Main characteristics

| | | | | | |
|---------------------|------|------------------|------------------|----|------------------------|
| Rated voltage | 3P | Un | Phase-to-phase | V | 380... 415 V AC ± 20 % |
| | 3P+N | Un | Phase-to-neutral | V | 220... 240 V AC ± 20 % |
| | | | Phase-to-phase | V | 380... 415 V AC ± 20 % |
| Frequency | | | | Hz | 50/60 |
| Maximum current | | I _{max} | | A | 63 |
| Basic current | | I _b | | A | 10 |
| Saturation current | | | | A | 130 |
| Maximum consumption | | | 3P/3P+N | VA | ≤ 2 |
| Starting current | | I _{st} | | mA | 40 |

Additional characteristics

| | | | |
|-----------------------|-------------|------------------------|------------|
| Operating temperature | | °C | -25 to +60 |
| Storage temperature | | °C | -40 to +85 |
| Overvoltage category | | As per IEC 61010-1 | Cat. III |
| Measuring category | | As per IEC 61010-2-030 | Cat. III |
| Pollution degree | | | 3 |
| Altitude | | m | ≤ 2000 |
| Degree of protection | Device only | | IP20 |
| | IK | | 05 |

Radio-frequency communication

| | | | |
|---------------------------|----------------------|-----|---------------|
| ISM band 2.4 GHz | | GHz | 2.4 to 2.4835 |
| Channels | As per IEEE 802.15.4 | | 11 to 26 |
| Isotropic Radiated Power | Equivalent (EIRP) | dBm | 0 |
| Maximum transmission time | | ms | < 5 |
| Channel occupancy | Messages sent every | s | 5 minimum |

Characteristics of measuring functions

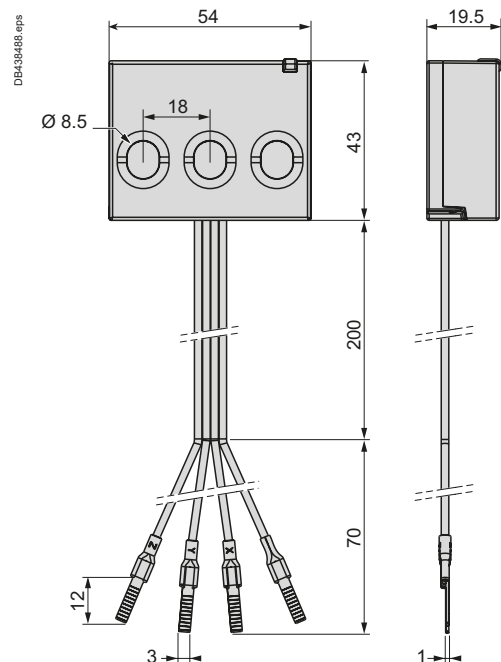
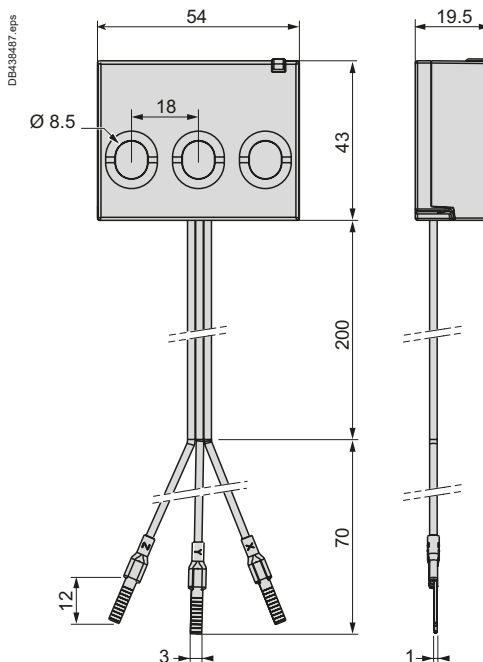
| Function | Symbol | Performance category as per IEC 61557-12 (PMD-I/DD/K55/1) | Measuring range |
|---------------|----------------|---|---------------------------------------|
| | | Class | |
| Active power | P | 1 | 9 W to 63 kW |
| Active energy | E _a | 1 | Total and partial 0 to 99999999.9 kWh |
| Current | I | 1 | 40 mA to 63 A |
| Voltage | U | 0.5 | U _n ± 20 % |
| Power factor | PFA | 1 | 0 to 1 |

Dimensions

A9MEM1573

3P

3P + N



A9MEM1570



References:
page B6/59

B6/154

Life Is On

Schneider Electric

Ref.

Motor circuit breakers

PowerLogic™ Energy measurement solutions

PowerTag™ Energy Flex

Characteristics

Energy measurement – PowerLogic

PowerTag Energy Flex 160 A (F160)

Main characteristics (as per IEC 61557-12)

| | | | | |
|---------------------------|------------------|------------------|----|------------------------|
| Rated voltage | Un | Phase-to-neutral | V | 100...277 V AC ± 20 % |
| | | Phase-to-phase | | 173...480 V AC ± 20 % |
| Frequency | | | Hz | 50/60 |
| Maximum current | I _{max} | | A | 160 |
| Maximum operating current | | | | 1.2 x I _{max} |
| Saturation current | | | | 2 x I _{max} |
| Maximum consumption | | | VA | 3 |
| Starting current | I _{st} | | mA | 100 |
| Basic current | I _b | | A | 25 |

Additional characteristic

| | | | |
|-----------------------------|------------------------|----|--|
| Operating temperature | | °C | -25 to +70 |
| Storage temperature | | °C | -40 to +85 |
| Overvoltage category | As per IEC 61010-1 | | Cat. IV |
| Measuring category | As per IEC 61010-2-030 | | Cat. IV |
| Pollution degree | | | 3 |
| Altitude | | m | Up to 2000 without derating ⁽¹⁾ |
| Degree of protection device | | | IP20 IK05 |

Radio-frequency communication

| | | | |
|---------------------------|----------------------|-----|-----------------------|
| ISM band 2.4 GHz | | GHz | 2.4 to 2.4835 |
| Channels | As per IEEE 802.15.4 | | 11 to 26 |
| Isotropic Radiated Power | Equivalent (EIRP) | dBm | 0 |
| Maximum transmission time | | ms | < 5 |
| Channel occupancy | For 1 device | s | messages sent every 5 |

Characteristics of measuring functions

| Function | Symbol | Performance category as per IEC 61557-12 (PMD-II/DD/K70/1) | | Measuring range |
|--|------------------|--|--------------------------------------|--------------------------------|
| | | Class | Measuring range | |
| Total active power (Active power per phase) | P | 1 | 2.5 to 160 A | 24 W (8 W) to 192 kW |
| Total reactive power (Reactive power per phase) | Q _A | 2 | | 30 VAR (10 VAR) to 192 kVAR |
| Total apparent power (Apparent power per phase) | S _A | 2 | | 38 VA (13 VA) to 192 kVA |
| Active Energy: per phase, total, partial, delivered and received | E _a | 1 | | 0 to 281.10 ⁹ kWh |
| Reactive energy: per phase, total, partial, delivered and received | E _{rA} | 2 | | 0 to 281.10 ⁹ kVARh |
| Apparent energy: per phase, total, partial | E _{apA} | 2 | | 0 to 281.10 ⁹ kVAh |
| Frequency | f | 1 | 50 / 60 Hz ± 2 % | 45 to 65 Hz |
| Phase current | I | 1 | 5 to 160 A | 100 mA to 320 A |
| Neutral current | I _{NC} | 2 | | |
| Voltages (Line to Line) | U | 0.5 | Un ± 20 % | 138 to 576 V AC |
| Power factor (per phase, total) | PF _A | 1 | From 0.5 inductive to 0.8 capacitive | -1 to 1 |

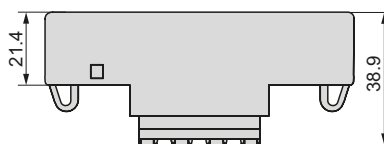
⁽¹⁾ Above 2000 m, please consult us.

Dimensions

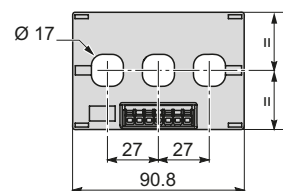
PowerTag Energy Flex 160 A



DB438489.eps



DB438490.eps



References:
page B6/60

PowerLogic™ Energy measurement solutions

PowerTag™ Energy Monoconnect 250 A, 630 A

Characteristics

Energy measurement – PowerLogic

PowerTag Energy Monoconnect 250 A, 630 A

Main characteristics

| | | | | |
|---------------------------|------------------|------------------|----|------------------------|
| Rated voltage | Un | Phase-to-neutral | V | 230 V AC ± 20 % |
| | | Phase-to-phase | V | 400 V AC ± 20 % |
| Frequency | | | Hz | 50/60 |
| Maximum current | I _{max} | | A | 250/630 |
| Maximum operating current | | | | 1.2 x I _{max} |
| Saturation current | | | | 2 x I _{max} |
| Maximum consumption | | | VA | 3.7 |
| Starting current | I _{st} | | mA | 160/400 |
| Basic current | I _b | | A | 40/100 |

Additional characteristic

| | | | |
|-----------------------------|------------------------|----|--|
| Operating temperature | | °C | -25 to +70 |
| Storage temperature | | °C | -50 to +85 |
| Overvoltage category | As per IEC 61010-1 | | Cat. IV |
| Measuring category | As per IEC 61010-2-030 | | Cat. III |
| Pollution degree | | | 3 |
| Altitude | | | Up to 2000 m without derating ⁽¹⁾ |
| Degree of protection device | | | IP20 IK07 |

Ref.

Radio-frequency communication

| | | | |
|---------------------------|----------------------|-----|-----------------------|
| ISM band 2.4 GHz | | GHz | 2.4 to 2.4835 |
| Channels | As per IEEE 802.15.4 | | 11 to 26 |
| Isotropic Radiated Power | Equivalent (EIRP) | dBm | 0 |
| Maximum transmission time | | ms | < 5 |
| Channel occupancy | For 1 device | s | messages sent every 5 |

Characteristics of measuring functions

| Function | Symbol | Performance category as per IEC 61557-12 (PMD-II/DD/K70/1) | | Measuring range (250 A / 630 A) |
|--|-----------------|--|--------------------------------------|---|
| | | Class | Measuring range | |
| Total active power (Active power per phase) | P | 1 | 4 to 250 A / 10 to 630 A | 88 W (29 W) to 416 kW / 222 W (74 W) to 1048 kW |
| Total reactive power (Reactive power per phase) | Q _A | 2 | | 88 VAR to 416 kVAR / 221 VAR to 1048 kVAR |
| Total apparent power (Apparent power per phase) | S _A | 2 | | 88 VA to 416 kVA / 221 VA to 1048 kVA |
| Active Energy: per phase, total, partial, delivered and received | E _a | 1 | | 0 to 281.109 kWh |
| Reactive energy: per phase, total, partial, delivered and received | E _{rA} | 2 | | 0 to 281.109 kVARh |
| Frequency | f | 1 | 45 to 55 Hz | 45 to 65 Hz |
| Phase current | I | 1 | 8 to 250 A / 20 to 630 A | 160 mA to 500 A / 400 mA to 1260 A |
| Voltages (Line to Line) | U | 0.5 | Un ± 20 % | 320 to 480 V AC |
| Power factor | PF _A | 1 | From 0.5 inductive to 0.8 capacitive | -1 to 1 |

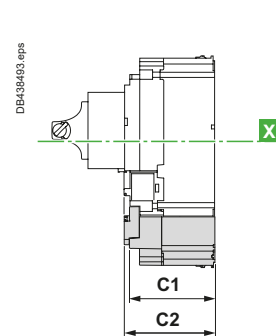
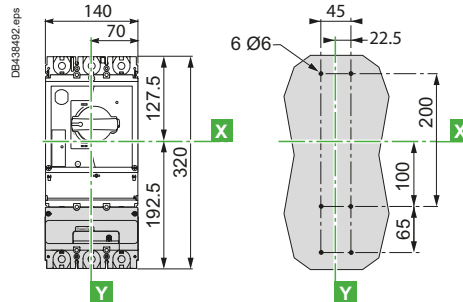
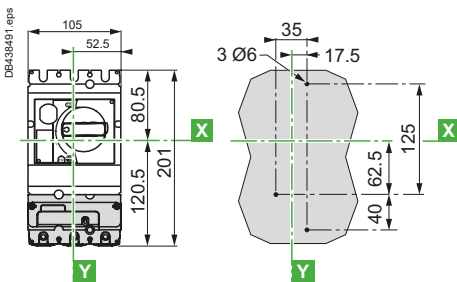
⁽¹⁾ Above 2000 m, please consult us.

Dimensions

GV5P with LV434020 / Panel mounting

GV6P with LV434022 / Panel mounting

With additional PowerTag



| Type | C1 | C2 |
|------|------|-----|
| GV5P | 81 | 86 |
| GV6P | 95.5 | 110 |

References:
page B6/61

B6/156

Life Is On

Schneider
Electric

PowerLogic™ Energy measurement solutions

PowerTag™ Link

Characteristics

Energy measurement – PowerLogic

PowerTag Link

Main characteristics

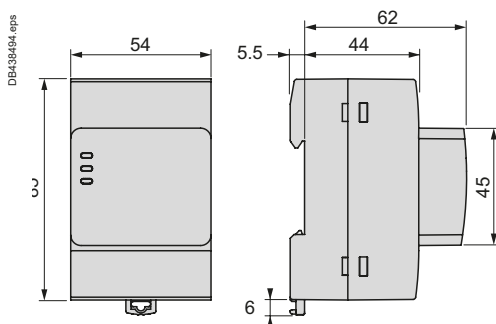
| | | | |
|-------------------------------------|-----------------------------|------------|--|
| Supply voltage | Us | V | 110/230 V AC ± 20 %, 2 A |
| Frequency | | Hz | 50/60 |
| Power consumption | | VA | 5 |
| Communication interface | | | Ethernet 10/100 BASE-T, Cable length ≤ 100 m Cat.6 STP |
| Wireless communication | | | Up to 20 or 100 PowerTag Energy sensors |
| Integrated connection type | | | DHCP client (Ethernet port) |
| Local indication | Product state | | Green, orange and red LED |
| | Ethernet state (LAN ST) | | Green, orange and red LED |
| Overvoltage category | | | III |
| Radio-frequency communication | ISM band 2.4 GHz | GHz | 2.4 to 2.4835 |
| Degree of protection (IEC 60529) | Device only | | IP20 |
| | Device in modular enclosure | | IP40 |
| Fire resistance | | | Insulation class II 650 °C, 30 s |
| Environment | | | In compliance with the RoHS directive REACH Regulations |

Additional characteristics

| | | | |
|----------------------------------|---|-----------|--|
| Operating temperature | | °C | -25 to +60 |
| Storage temperature | | °C | -40 to +85 |
| Pollution degree | | | 2 |
| Tropicalization (IEC 60068-2-30) | | | Treatment 2 (relative humidity of 93 % at 40°C) |
| Operating altitude | | m | 0 to 2000 |
| Electromagnetic compatibility | Reference standards | | |
| | Immunity | | EN 55035 |
| | Emissions | | EN 55032 |
| | Electromagnetic compatibility and Radio spectrum Matters (ERM) | | EN 300328 EN 301489-1 EN 301489-17 |

Dimensions

PowerTag Link



Ref.

Motor
circuit
breakers

TeSys Modular circuit breakers

0.5 to 20 A

(for equipment and control circuits)



Motor
circuit
breakers



Motor circuit breakers

| Environment | | | GB2CB | GB2CD | GB2DB | GB2CS | | | | | |
|--|--|-----------------|---|-----------------------|----------------|--------------------|------------|------|----------|------|------|
| Circuit breaker type | | | IEC 60947-1, 947-2, EN 60947-1, 60947-2 | | | | | | | | |
| Conforming to standards | | | IEC 60947-1, 947-2, EN 60947-1, 60947-2 | | | | | | | | |
| Product certifications | | | cCSAus ⁽¹⁾ | cCSAus ⁽¹⁾ | – | – | | | | | |
| Degree of protection | Conforming to IEC 60529 | | IP 20 | | | | | | | | |
| Shock resistance | Conforming to IEC 60068-2-27 | | 22 gn for 20 ms | | | | | | | | |
| Vibration resistance | Conforming to IEC 60068-2-6 | | 5 gn (5...110 Hz) | | | | | | | | |
| Ambient air temperature around the device | Storage | °C | -40...+80 | | | | | | | | |
| | Operation | °C | -20...+60 | | | | | | | | |
| Flame resistance | Conforming to IEC 60695-2-11 | °C | 960 | | | | | | | | |
| Maximum operating altitude | | m | 3000 | | | | | | | | |
| Operating position | In relation to normal vertical mounting plane | | | | | | | | | | |
| Cabling | Solid cable | mm ² | Minimum c.s.a. | | Maximum c.s.a. | | | | | | |
| | Flexible cable with cable end | mm ² | 1 x 0.75 | | 1 x 6 or 2 x 4 | | | | | | |
| Tightening torque | | N.m | 1.2 | | | | | | | | |
| Technical characteristics | | | | | | | | | | | |
| Utilisation category | Conforming to IEC 60947-2 | | A | A | A | A | | | | | |
| Rated operational voltage (Ue) | Conforming to IEC 60947-2 | V | 250 ⁽²⁾ | 250 | 415 | 250 ⁽²⁾ | | | | | |
| | Conforming to CSA C22-2 Nr 14 and UL 1077 | V | 277 | 277 | – | – | | | | | |
| Rated operational frequency | Conforming to IEC 60947-2 | Hz | 50/60 | 50/60 | 50/60 | 50/60 | | | | | |
| Rated impulse withstand voltage (Uimp) | Conforming to IEC 60947-2 | kV | 4 | 4 | 4 | 4 | | | | | |
| Total power dissipated per pole | | W | 2 | 2 | 2 | 1.9 | | | | | |
| Mechanical and electrical durability | C.O.: Closing - Opening | C.O. | 8000 | 8000 | 8000 | 8000 | | | | | |
| Operational current correction coefficient (a or --) | According to the permissible ambient temperature | °C | -20 | -10 | 0 | +10 | +20 | +30 | +40 | +50 | +60 |
| | Correction coefficient | | 1.2 | 1.15 | 1.1 | 1.05 | 1 | 0.95 | 0.90 | 0.85 | 0.80 |
| Tripping threshold | Of the magnetic trips | | 12...16 In | | 12...16 In | | 12...16 In | | 5...7 In | | |

(1) Except for GB2CB16, GB2CB22, GB2CD16, GB2CD22.

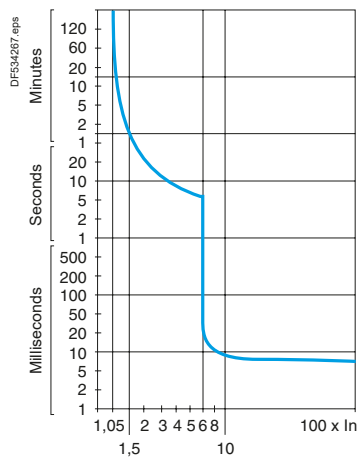
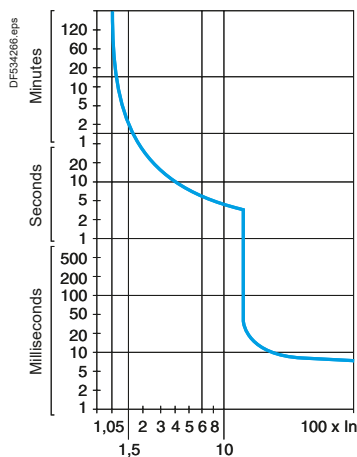
(2) Ue = 415 V when a GB2 circuit breaker is fitted on every live conductor.

Tripping curves

Average operating time at 20 °C without prior current flow (cold state)

GB2CB, GB2CD, GB2 DB

GB2CS



TeSys Power

Modular circuit breakers for auxiliary circuits - Thermal-magnetic

Characteristics

| Circuit breaker type | | | GB2 | | | | | | | | | | | | |
|--|-----------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| | | | CB05 | CB06 | CB07 | CB08 | CB09 | CB10 | CB12 | CB14 | CB16 | CB20 | CB21 | CB22 | |
| Rating | | A | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 | |
| Breaking capacity conforming to IEC 60947-2 ~ 50/60 Hz | 110 V | Icu | kA | 50 | 50 | 15 | 10 | 6 | 3 | 3 | 2 | 2 | 2 | 2 | |
| | | Ics % ⁽¹⁾ | | 100 | 50 | 50 | 50 | 50 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| | 230/240 V | Icu | kA | 50 | 50 | 15 | 3 | 3 | 2 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| | | Ics % ⁽¹⁾ | | 25 | 25 | 25 | 50 | 50 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC 60947-2 | 110 V | aM | A | * | * | 20 | 25 | 25 | 40 | 40 | 50 | 50 | 63 | 63 | |
| | | gG | A | * | * | 25 | 32 | 32 | 50 | 50 | 63 | 63 | 80 | 80 | |
| | 230/240 V | aM | A | * | * | 16 | 20 | 20 | 32 | 32 | 40 | 40 | 50 | 50 | |
| | | gG | A | * | * | 25 | 32 | 32 | 40 | 40 | 50 | 50 | 63 | 63 | |

| Circuit breaker type | | | GB2 | | | | | | | | | | | | |
|--|-----------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| | | | CD05 | CD06 | CD07 | CD08 | CD09 | CD10 | CD12 | CD14 | CD16 | CD20 | CD21 | CD22 | |
| Rating | | A | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 | |
| Breaking capacity conforming to IEC 60947-2 ~ 50/60 Hz | 110 V | Icu | kA | 50 | 50 | 15 | 10 | 6 | 3 | 3 | 2 | 2 | 2 | 2 | |
| | | Ics % ⁽¹⁾ | | 100 | 50 | 50 | 50 | 50 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| | 230/240 V | Icu | kA | 50 | 50 | 15 | 3 | 3 | 2 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| | | Ics % ⁽¹⁾ | | 25 | 25 | 25 | 50 | 50 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC 60947-2 | 110 V | aM | A | * | * | 20 | 25 | 25 | 40 | 40 | 50 | 50 | 63 | 63 | |
| | | gG | A | * | * | 25 | 32 | 32 | 50 | 50 | 63 | 63 | 80 | 80 | |
| | 230/240 V | aM | A | * | * | 16 | 20 | 20 | 32 | 32 | 40 | 40 | 50 | 50 | |
| | | gG | A | * | * | 25 | 32 | 32 | 40 | 40 | 50 | 50 | 63 | 63 | |

| Circuit breaker type | | | GB2 | | | | | | | | | | | | |
|--|-----------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| | | | DB05 | DB06 | DB07 | DB08 | DB09 | DB10 | DB12 | DB14 | DB16 | DB20 | DB21 | DB22 | |
| Rating | | A | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 | |
| Breaking capacity conforming to IEC 60947-2 ~ 50/60 Hz | 110 V | Icu | kA | 50 | 50 | 15 | 10 | 6 | 3 | 3 | 2 | 2 | 2 | 2 | |
| | | Ics % ⁽¹⁾ | | 100 | 50 | 50 | 50 | 50 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| | 230/240 V | Icu | kA | 50 | 50 | 15 | 3 | 3 | 2 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| | | Ics % ⁽¹⁾ | | 25 | 25 | 25 | 50 | 50 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| | 400/415 V | Icu | kA | 50 | 50 | 15 | 3 | 3 | 2 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| | | Ics % ⁽¹⁾ | | 25 | 25 | 25 | 50 | 50 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC 60947-2 | 110 V | aM | A | * | * | 20 | 25 | 25 | 40 | 40 | 50 | 50 | 63 | 63 | |
| | | gG | A | * | * | 25 | 32 | 32 | 50 | 50 | 63 | 63 | 80 | 80 | |
| | 230/240 V | aM | A | * | * | 16 | 20 | 20 | 32 | 32 | 40 | 40 | 50 | 50 | |
| | | gG | A | * | * | 25 | 32 | 32 | 40 | 40 | 50 | 50 | 63 | 63 | |
| | 400/415 V | aM | A | * | * | 16 | 20 | 20 | 32 | 32 | 40 | 40 | 50 | 50 | |
| | | gG | A | * | * | 25 | 32 | 32 | 40 | 40 | 50 | 50 | 63 | 63 | |

(1) As % of Icu.

* Fuse not required. Breaking capacity Icu > Isc.



Motor circuit breakers

| Circuit breaker type | | | | GB2 | | | | | | | | | | | |
|---|-------------------------------|----------------------|----------------------|----------------|----------------|----------------|----------------|----------------|------|------|------|------|------|------|------|
| | | | | ●●05 | ●●06 | ●●07 | ●●08 | ●●09 | ●●10 | ●●12 | ●●14 | ●●16 | ●●20 | ●●21 | ●●22 |
| Breaking capacity (Icu) conforming to IEC 60947-2 ... | 24 V | kA | | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| | 48 V | kA | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | — | — | — | — |
| Operational current conforming to IEC 60947-5-1 ... | DC-12 | 24 V | A | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | 48 V | A | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| | DC-13 | 24 V | A | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | 48 V | A | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | — | — | — | — |
| Circuit breaker type | | | | GB2 | | | | | | | | | | | |
| | | | | CS05 | | | | | | CS06 | | | | | |
| Rating | | A | | 0.5 | | | | | | 1 | | | | | |
| Breaking capacity conforming to IEC 60947-2 ~ 50/60 Hz | 110 V | Icu | kA | 50 | | | | | | 50 | | | | | |
| | | Ics % ⁽¹⁾ | | 100 | | | | | | 100 | | | | | |
| | 230/240 V | Icu | kA | 50 | | | | | | 50 | | | | | |
| | | Ics % ⁽¹⁾ | | 25 | | | | | | 25 | | | | | |
| | 400/415 V ⁽²⁾ | Icu | kA | 50 | | | | | | 50 | | | | | |
| | | Ics % ⁽¹⁾ | | 25 | | | | | | 25 | | | | | |
| Breaking capacity (Icu) conforming to IEC 60947-2 ... | 24 V | kA | | 1.5 | | | | | | 1.5 | | | | | |
| | 48 V | kA | | 1 | | | | | | 1 | | | | | |
| Operational current conforming to IEC 60947-5-1 ... | DC-12 | 24 V | A | 0.5 | | | | | | 1 | | | | | |
| | | 48 V | A | 0.5 | | | | | | 1 | | | | | |
| | DC-13 | 24 V | A | 0.5 | | | | | | 1 | | | | | |
| | | 48 V | A | 0.5 | | | | | | 1 | | | | | |
| Maximum permissible line length for star-delta starting (length of cable containing 2 or more conductors) | With contactors LC●D09 ...D18 | Operational voltage | V | 48 | 110 | 230 | 48 | 110 | 230 | | | | | | |
| | | C.s.a. | 0.60 mm ² | m | ⁽³⁾ | 31 | 365 | 6 | 85 | 230 | | | | | |
| | | 0.75 mm ² | m | ⁽³⁾ | 39 | 460 | 8 | 110 | 290 | | | | | | |
| | | 1 mm ² | m | ⁽³⁾ | 52 | 610 | 10 | 145 | 380 | | | | | | |
| | | 1.5 mm ² | m | ⁽³⁾ | 78 | 910 | 15 | 220 | 570 | | | | | | |
| | | 2.5 mm ² | m | ⁽³⁾ | 130 | 1520 | 26 | 360 | 950 | | | | | | |
| | | 4 mm ² | m | ⁽³⁾ | 200 | 2400 | 41 | 580 | 1500 | | | | | | |
| | With contactors LC●D25 ...D32 | Operational voltage | V | 48 | 110 | 230 | 48 | 110 | 230 | | | | | | |
| | | C.s.a. | 0.60 mm ² | m | ⁽³⁾ | ⁽³⁾ | 230 | ⁽³⁾ | 56 | 230 | | | | | |
| | | 0.75 mm ² | m | ⁽³⁾ | ⁽³⁾ | 290 | ⁽³⁾ | 70 | 290 | | | | | | |
| | | 1 mm ² | m | ⁽³⁾ | ⁽³⁾ | 390 | ⁽³⁾ | 95 | 380 | | | | | | |
| | | 1.5 mm ² | m | ⁽³⁾ | ⁽³⁾ | 580 | ⁽³⁾ | 140 | 570 | | | | | | |
| | | 2.5 mm ² | m | ⁽³⁾ | ⁽³⁾ | 970 | ⁽³⁾ | 230 | 950 | | | | | | |
| | | 4 mm ² | m | ⁽³⁾ | ⁽³⁾ | 1500 | ⁽³⁾ | 375 | 1500 | | | | | | |
| | With contactors LC●D40 ...D80 | Operational voltage | V | 48 | 110 | 230 | 48 | 110 | 230 | | | | | | |
| | | C.s.a. | 0.60 mm ² | m | ⁽³⁾ | ⁽³⁾ | 46 | ⁽³⁾ | 13 | 100 | | | | | |
| | | 0.75 mm ² | m | ⁽³⁾ | ⁽³⁾ | 60 | ⁽³⁾ | 17 | 130 | | | | | | |
| | | 1 mm ² | m | ⁽³⁾ | ⁽³⁾ | 80 | ⁽³⁾ | 22 | 170 | | | | | | |
| | | 1.5 mm ² | m | ⁽³⁾ | ⁽³⁾ | 120 | ⁽³⁾ | 34 | 250 | | | | | | |
| | | 2.5 mm ² | m | ⁽³⁾ | ⁽³⁾ | 190 | ⁽³⁾ | 56 | 420 | | | | | | |
| | | 4 mm ² | m | ⁽³⁾ | ⁽³⁾ | 310 | ⁽³⁾ | 90 | 680 | | | | | | |

(1) As % of Icu.

(2) One GB2CS circuit breaker on each live conductor.

(3) Use relays.



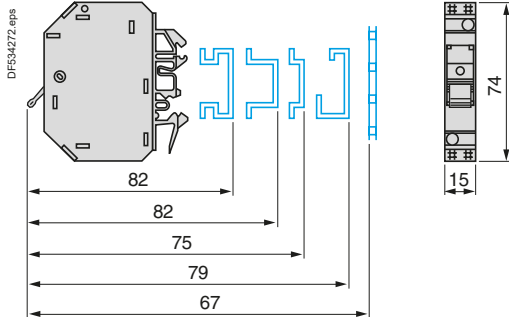
TeSys Power

Modular circuit breakers for auxiliary circuits - Thermal-magnetic

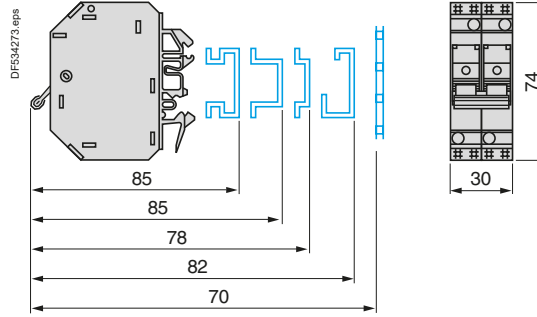
Dimensions and schemes

Dimensions

GB2CB●●, GB2CD●●, GB2CS●●



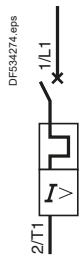
GB2DB●●



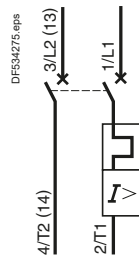
Marking: up to twelve AB1 R clip-in markers.

Schemes

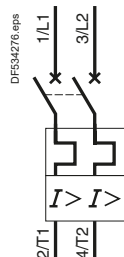
GB2CB●●



GB2CD●●



GB2DB●●








GB2CS●●



Ref.



Motor
circuit
breakers

| TeSys SK, K Relays | | |
|--|---|-------|
| Product | | Pages |
| Mini relays - 2 contacts, simultaneous action TeSys SK, SKE |  | B7/2 |
| Relays - 4 contacts, simultaneous action TeSys K |  | B7/4 |
| Auxiliary contact blocks, accessories TeSys K |  | B7/6 |
| TeSys Deca Relays | | |
| Relays 5 contacts, simultaneous action |  | B7/8 |
| TeSys Deca Accessories |  | B7/10 |
| Technical Data for Designers | | B7/13 |

Control
relays

TeSys Control

SK, SKE Mini control relays

Product references

PB121522.tif



CA2SK11●●

Mini control relays

- Width of mini control relays 27 mm.
- Mounting on 35 mm rail.
- Connection by connectors.

| Control circuit supply | Auxiliary contacts | | Basic reference, to be completed by adding the voltage code ⁽¹⁾ |
|------------------------|--------------------|---|--|
| a.c. supply | 2 | – | CA2SK20●● |
| | 1 | 1 | CA2SK11●● |
| d.c. supply | 2 | – | CA3SK20●● |
| | 1 | 1 | CA3SK11●● |

Mini control relay with alternating contacts

This mini control relay with alternating contacts (see function diagram page B7/17) makes it possible to automatically split the operating time between 2 circuits of a redundant system. By regularly energising the “safety circuits”, this device makes it possible to ensure that they are operating correctly.

- Width of mini control relay 45 mm.
- Fixing by Ø4 screws.
- Connection by connectors.
- Cannot be fitted with front-mounted auxiliary contact block.
- Cannot be fitted with coil suppressor module.

PB121523.eps



CA2SKE20●●

| Control circuit supply | Auxiliary contacts | | Basic reference, to be completed by adding the voltage code ⁽¹⁾ |
|------------------------|--------------------|---|--|
| a.c. supply | 2 | – | CA2SKE20●● |

⁽¹⁾ Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Mini control relays CA2SK and CA2SKE

| Volts ~ 50/60 Hz | 24 | 48 | 110 | 120 | 220 | 230 | 240 | 380 | 400 |
|---------------------|----|----|-----|-----|-----|-----|-----|-----|-----|
| Code | B7 | E7 | F7 | G7 | M7 | P7 | U7 | Q7 | V7 |

Mini control relays CA3SK

| Volts – | 12 | 24 | 36 | 48 | 72 |
|---------|----|----|----|----|----|
| Code | JD | BD | CD | ED | SD |

Control relays

TeSys Control

SK, SKE Mini control relays - Contact block - Suppressor





Product references



LA1SK●●

Instantaneous auxiliary contact blocks

Clip-on front mounting

| For use on control relays | Maximum number of blocks per contactor | Composition | | Reference |
|---------------------------|--|---|---|-----------|
| CA2SK20 | 1 |  |  | LA1SK20 |
| | | - | | LA1SK02 |
| | |  |  | LA1SK11 |



LA4SK●1●

Suppressor modules

Connection without need for tools by clipping onto right-hand side of contactor

| For use on control relays | Type | For voltages | Sold in lots of | Unit reference |
|---------------------------|-----------------|-----------------------|-----------------|----------------|
| CA2SK and CA3SK | Varistor (1) | ~ and ≍ 24 V...48 V | 10 | LA4SKE1E |
| | | ~ and ≍ 110 V...250 V | 10 | LA4SKE1U |
| | Diode (2) | ≍ 24 V...250 V | 10 | LA4SKC1U |

- (1) Protection provided by limiting the transient voltage to $2 U_c$ max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
- (2) No overvoltage or oscillating frequency.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).



Control relays

TeSys Control

K Control relays

Product references

PB121524.eps



CA2KN22●●

PB121526.eps



CA2KN●●5●●

PB121543.eps



CA3KN●●3●●

PB121525.eps



CA3KN●●7●●



Control relays

Control relays for a.c. control circuit

- Mounting on 35 mm rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

| Control circuit Consumption | Auxiliary contacts | Basic reference, to be completed by adding the voltage code ⁽¹⁾ |
|-----------------------------|--------------------|--|
| | | |

| Screw clamp connections | | |
|-------------------------|-----|-----------|
| 4.5 VA | 4 – | CA2KN40●● |
| | 3 1 | CA2KN31●● |
| | 2 2 | CA2KN22●● |

| Spring terminal connections | | |
|-----------------------------|-----|------------|
| 4.5 VA | 4 – | CA2KN403●● |
| | 3 1 | CA2KN313●● |
| | 2 2 | CA2KN223●● |

| Faston connectors, 1 x 6.35 or 2 x 2.8 | | |
|--|-----|------------|
| 4.5 VA | 4 – | CA2KN407●● |
| | 3 1 | CA2KN317●● |
| | 2 2 | CA2KN227●● |

| Solder pins for printed circuit boards | | |
|--|-----|------------|
| 4.5 VA | 4 – | CA2KN405●● |
| | 3 1 | CA2KN315●● |
| | 2 2 | CA2KN225●● |

Control relays for d.c. control circuit

- Mounting on 35 mm rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

| Screw clamp connections | | |
|-------------------------|-----|-----------|
| 3 W | 4 – | CA3KN40●● |
| | 3 1 | CA3KN31●● |
| | 2 2 | CA3KN22●● |

| Spring terminal connections | | |
|-----------------------------|-----|------------|
| 3 W | 4 – | CA3KN403●● |
| | 3 1 | CA3KN313●● |
| | 2 2 | CA3KN223●● |

| Faston connectors, 1 x 6.35 or 2 x 2.8 | | |
|--|-----|------------|
| 3 W | 4 – | CA3KN407●● |
| | 3 1 | CA3KN317●● |
| | 2 2 | CA3KN227●● |

| Solder pins for printed circuit boards | | |
|--|-----|------------|
| 3 W | 4 – | CA3KN405●● |
| | 3 1 | CA3KN315●● |
| | 2 2 | CA3KN225●● |

(1) Please check the availability of your variant in the index page B7/12. The SEARCH function of your viewer can be used. Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

| Control relays CA2K (0.8...1.15 Uc) (0.85...1.1 Uc) | | | | | | | | | | | | | | | | | | |
|---|----|----|-------------------|----|----|----|-----|-----|-----|---------|-----|---------|---------|-----|---------|-----|-----|---------|
| Volts ~ | 12 | 20 | 24 ⁽²⁾ | 36 | 42 | 48 | 110 | 115 | 127 | 220/230 | 230 | 230/240 | 380/400 | 400 | 400/415 | 440 | 500 | 660/690 |
| Code | J7 | Z7 | B7 | C7 | D7 | E7 | F7 | FE7 | FC7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | S7 | Y7 |

Up to and including 240 V, coil with integral suppression device available: add 2 to the code required. Example: J72

| Control relays CA3K (0.8...1.15 Uc) | | | | | | | | | | | | | | | |
|-------------------------------------|----|----|-------------------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| Volts ∴ | 12 | 20 | 24 ⁽²⁾ | 36 | 48 | 60 | 72 | 100 | 110 | 125 | 200 | 220 | 230 | 240 | 250 |
| Code | JD | ZD | BD | CD | ED | ND | SD | KD | FD | GD | LD | MD | MPD | MUD | UD |

Coil with integral suppression device available: add 3 to the code required. Example: JD3.

(2) When connecting an electronic sensor or timer in series with the coil of the control relay, select a 20 V coil (~ code Z7, ∴ code ZD) so as to compensate for the incurred voltage drop.

TeSys Control

K Control relays

Product references

PB12/1527 eps



CA4KN40●●●

Low consumption control relays d.c. control circuit

- Mounting on 35 mm rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

| Control circuit Consumption | Auxiliary contacts | Basic reference, to be completed by adding the voltage code ⁽¹⁾ |
|---|--------------------|--|
| Screw clamp connections | | |
| 1.8 W | 4 – | CA4KN40●● |
| | 3 1 | CA4KN31●● |
| | 2 2 | CA4KN22●● |
| Spring terminal connections | | |
| 1.8 W | 4 – | CA4KN403●● |
| | 3 1 | CA4KN313●● |
| | 2 2 | CA4KN223●● |
| Faston connectors, 1 x 6.35 or 2 x 2.8 | | |
| 1.8 W | 4 – | CA4KN407●● |
| | 3 1 | CA4KN317●● |
| | 2 2 | CA4KN227●● |
| Solder pins for printed circuit boards | | |
| 1.8 W | 4 – | CA4KN405●● |
| | 3 1 | CA4KN315●● |
| | 2 2 | CA4KN225●● |

(1) Please check the availability of your variant in the index page B7/12. The SEARCH function of your viewer can be used. Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Control relays CA4K (Wide range coil: 0.7...1.3 Uc)

| Volts ~ | 12 | 20 | 24 | 48 | 72 | 110 | 120 |
|---------|-----|-----|-----|-----|-----|-----|-----|
| Code | JW3 | ZW3 | BW3 | EW3 | SW3 | FW3 | GW3 |

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.



Control relays

TeSys Control

K Contact blocks - Time delays

Product references



LA1KN22



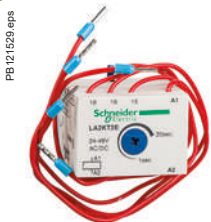
LA1KN003



LA1KN007





Control relays



LA2KT2E

Instantaneous auxiliary contact blocks


Clip-on front mounting, 1 per control relay

| Connection | Composition | | Reference |
|--|---|---|-------------------------|
| |  |  | |
| Screw clamp terminals | 2 | – | LA1KN20 |
| | – | 2 | LA1KN02 |
| | 1 | 1 | LA1KN11 |
| | 4 | – | LA1KN40 ⁽¹⁾ |
| | 3 | 1 | LA1KN31 ⁽¹⁾ |
| | 2 | 2 | LA1KN22 ⁽¹⁾ |
| | 1 | 3 | LA1KN13 ⁽¹⁾ |
| Spring terminals | – | 4 | LA1KN04 ⁽¹⁾ |
| | 2 | – | LA1KN203 |
| | – | 2 | LA1KN023 |
| | 1 | 1 | LA1KN113 |
| | 4 | – | LA1KN403 ⁽¹⁾ |
| | 3 | 1 | LA1KN313 ⁽¹⁾ |
| | 2 | 2 | LA1KN223 ⁽¹⁾ |
| Faston connectors 1 x 6.35 or 2 x 2.8 | 1 | 3 | LA1KN133 ⁽¹⁾ |
| | – | 4 | LA1KN043 ⁽¹⁾ |
| | 2 | – | LA1KN207 |
| | 4 | – | LA1KN407 ⁽¹⁾ |
| | 3 | 1 | LA1KN317 ⁽¹⁾ |

Electronic time delay contact blocks

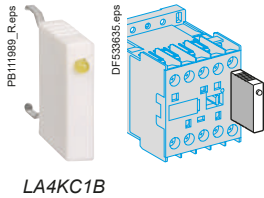
- Relay output with common point changeover contact, \sim or \equiv 240 V, 2 A maximum
- Control voltage 0.85...1.1 Uc
- Maximum switching capacity 250 VA or 150 W
- Operating temperature -10...+ 60 °C
- Reset time: 1.5 s during the time delay period 0.5 s after the time delay period

Clip-on front mounting, 1 per control relay

| Voltage | Type | Timing range | Composition | Reference |
|----------------------------|----------|--------------|---|-----------|
| V | | s |  | |
| \sim or \equiv 24...48 | On-delay | 1...30 | 1 | LA2KT2E |
| \sim 110...240 | On-delay | 1...30 | 1 | LA2KT2U |

Other versions Electronic timers type RE4.
Please consult your Regional Sales Office.

⁽¹⁾ Block of 4 contacts for use on CA2K and CA3K.



Suppressor modules incorporating LED indicator

| Mounting and connection | Type | For voltages | Sold in lots of | Unit reference |
|---|------------------------------------|--------------------------|-----------------|----------------|
| Clips onto front of relay with locating device. No tools required. | Varistor ⁽¹⁾ | ~ and --- 12...24 V | 5 | LA4KE1B |
| | | ~ and --- 32...48 V | 5 | LA4KE1E |
| | | ~ and --- 50...129 V | 5 | LA4KE1FC |
| | | ~ and --- 130...250 V | 5 | LA4KE1UG |
| | Diode + Zener diode ⁽²⁾ | --- 12...24 V | 5 | LA4KC1B |
| | | --- 32...48 V | 5 | LA4KC1E |
| | RC ⁽³⁾ | ~ 110...250 V | 5 | LA4KA1U |

Mounting accessories

| Description | Application | | Sold in lots of | Unit reference |
|-----------------|---------------------------|---------------------------|-----------------|----------------|
| Mounting plates | On 2 U _r rails | 110/120 mm fixing centres | 10 | DX1AP25 |

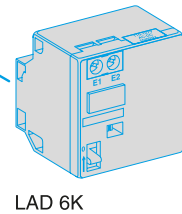
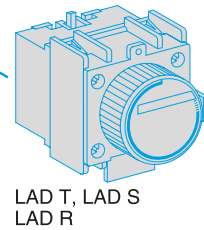
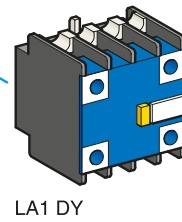
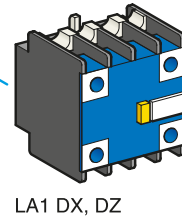
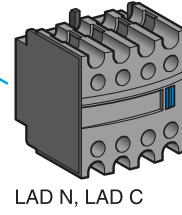
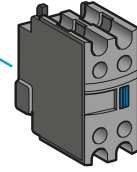
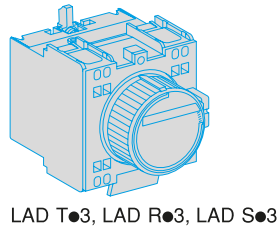
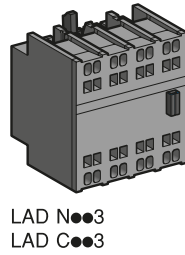
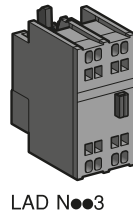
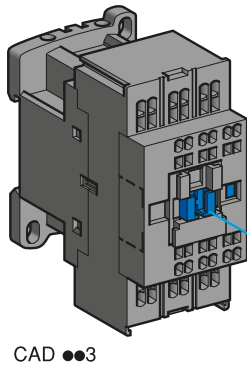
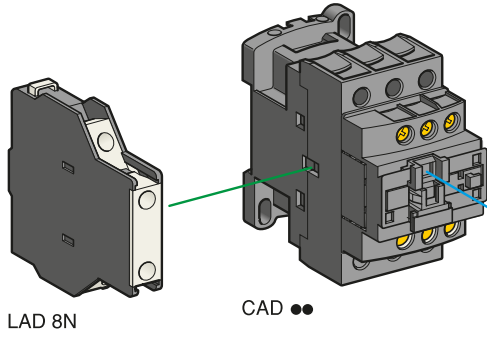
Marking accessories

| Description | Application | | Sold in lots of | Unit reference |
|-----------------|------------------------------|---|-----------------|----------------------|
| Marker holder | Clip-on fixing on front face | – | 100 | LA9D90 |
| Clip-in markers | 4 maximum per relay | Strips of 10 identical numbers 0 to 9 | 25 | AB1R● ⁽⁴⁾ |
| | | Strips of 10 identical capital letters A to Z | 25 | AB1G● ⁽⁴⁾ |



- (1)** Protection provided by limiting the transient voltage to 2 U_c max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
- (2)** No overvoltage or oscillating frequency.
Polarised component.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
- (3)** Protection by limiting the transient voltage to 3 U_c max. and limitation of the oscillating frequency.
Slight increase in drop-out time (1.2 to 2 times the normal time).
- (4)** Complete the reference by replacing the dot with the required character.





Control relays

See page opposite for mounting possibilities according to control relay type and rating



CAD50●●



CAD503●●



LADN22



LA1DY20

Control relays for connection by screw clamp terminals

| Type | Number of contacts | Composition | Basic reference, to be completed by adding the control voltage code ⁽¹⁾ |
|---------------|--------------------|-------------|--|
| Instantaneous | 5 | 5 — | CAD50●● ⁽³⁾ |
| | | 3 2 | CAD32●● ⁽³⁾ |

Control relays for connection by spring terminals

| | | | |
|---------------|---|-----|----------|
| Instantaneous | 5 | 5 — | CAD503●● |
| | | 3 2 | CAD323●● |

Instantaneous auxiliary contact blocks for connection by screw clamp terminals

For use in normal operating environments

| Number of contacts | Maximum number per relay | | Composition | Reference |
|--------------------|--------------------------|--------------|-------------|-------------------------------|
| | Clip-on mounting front | side | | |
| 2 | 1 | — | 1 1 | LADN11 |
| | — | 1 on LH side | 1 1 | LAD8N11 ⁽⁶⁾ |
| | 1 | — | 2 — | LADN20 |
| | — | 1 on LH side | 2 — | LAD8N20 ⁽⁶⁾ |
| | 1 | — | — 2 | LADN02 |
| 4 ⁽⁴⁾ | — | 1 on LH side | — 2 | LAD8N02 ⁽⁶⁾ |
| | 1 | — | 2 2 | LADN22 LADN22S ⁽⁷⁾ |
| | — | — | 1 3 | LADN13 |
| | — | — | 4 — | LADN40 |
| | — | — | — 4 | LADN04 |
| 4 ⁽⁴⁾ | 1 | — | 3 1 | LADN31 |
| | | | 2 2 | LADC22 |

Including 1 N/O and 1 N/C make before break.

With dust and damp protected contacts, for use in particularly harsh industrial environments

| Number of contacts | Maximum number per relay | Composition | | Reference |
|--------------------|--------------------------|---|---------------|------------------------|
| | | Front mounting protected ⁽⁵⁾ | not protected | |
| 2 | 1 | 2 — — | — — | LA1DX20 |
| | | — 2 — | — — | LA1DX02 |
| | | 2 — 2 | — — | LA1DY20 ⁽⁸⁾ |
| 4 ⁽⁴⁾ | 1 | 2 — — | 2 — | LA1DZ40 |
| | | 2 — — | 1 1 | LA1DZ31 |

Instantaneous auxiliary contact blocks for connection by spring terminals

This type of connection is not possible for contact blocks LAD 8 and blocks with dust and damp protected contacts.

For all other instantaneous auxiliary contact blocks, add the digit 3 to the end of the references selected above.

Example: LADN11 becomes LADN113.

⁽¹⁾ Please check the availability of your variant in the index page B7/12. The SEARCH function of your viewer can be used. Standard control circuit voltages (for other voltages, please consult your Regional Sales Office).

a.c. supply

| | | | | | | | | | | | | |
|----------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Volts ~ | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 |
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |

d.c. supply (coils with integral suppression device fitted as standard)

| | | | | | | | | | | | |
|-----------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| Volts — | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 |
| U from 0.7 to 1.25 U _c | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |

Low consumption (coils with integral suppression device fitted as standard)

| | | | | | | | | |
|---------|----|----|----|----|----|-----|-----|-----|
| Volts — | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 |
| Code | AL | JL | ZL | BL | EL | FL | ML | UL |

⁽²⁾ LC: low consumption.

⁽³⁾ To order control relays with connection by lugs, add the digit 6 to the end of the selected reference.

Example: CAD50●● becomes CAD506●●.

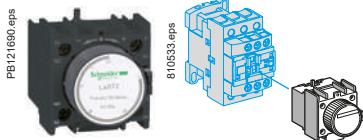
⁽⁴⁾ Blocks with 4 auxiliary contacts cannot be used on low consumption control relays.

⁽⁵⁾ Product fitted with 4 earth screen continuity terminals.

⁽⁶⁾ These contact blocks are allowed with AC coil control relay only.

⁽⁷⁾ With red front face - for safety chain indication.

⁽⁸⁾ With 2 earth screen continuity poles.



LADT2

Time delay auxiliary contact blocks for connection by screw clamp terminals ⁽¹⁾

| Number and type of contacts | Maximum number per relay Front mounting | Time delay | | Reference |
|-----------------------------|--|------------|--------------------------|-----------|
| | | Type | Range | |
| 1 N/C and 1 N/O | 1 | On-delay | 0.3...3 s ⁽²⁾ | LADT0 |
| | | | 1...30 s | LADT2 |
| | | | 10...180 s | LADT4 |
| | | Off-delay | 1...30 s ⁽³⁾ | LADS2 |
| | | | 0.3...3 s ⁽²⁾ | LADR0 |
| | | | 1...30 s | LADR2 |
| | | | 10...180 s | LADR4 |

(Sealing cover: see page B8/42)

Time delay auxiliary contact blocks for connection by spring terminals

Add the digit 3 to the references selected above. Example: LADT0 becomes LADT03.

Mechanical latch blocks ⁽⁴⁾

| Unlatching control | Maximum number per relay Front mounting | Basic reference to be completed ⁽⁵⁾ |
|--------------------|--|--|
| Manual or electric | 1 | LAD6K10● |

Suppressor modules

These modules clip onto the top of the control relay and the electrical connection is instantly made. Fitting of an input module is still possible.

RC circuits (Resistor-Capacitor)

- Effective protection for circuits highly sensitive to "high frequency" interference.
- Voltage limited to 3 Uc maximum and oscillating frequency limited to 400 Hz maximum.
- Slight time delay on drop-out (1.2 to 2 times the normal time).

| For mounting on | Operational voltage | Reference |
|-----------------|---------------------|-----------|
| CAD ~ | ~ 24...48 V | LAD4RCE |
| | ~ 50...127 V | LAD4RCG |
| | ~ 110...250 V | LAD4RCU |

Varistors (peak limiting)

- Protection provided by limiting the transient voltage value to 2Uc maximum.
- Maximum reduction of transient voltage peaks.
- Slight time delay on drop-out (1.1 to 1.5 times the normal time).

| CAD ~ | Operational voltage | Reference |
|-------|---------------------|-----------|
| ~ | ~ 24...48 V | LAD4VE |
| | ~ 50...127 V | LAD4VG |
| | ~ 110...250 V | LAD4VU |

Freewheel diode

- No overvoltage or oscillating frequency.
- Increase in drop-out time (6 to 10 times the normal time).
- Polarised component.

| CAD --- | Operational voltage | Reference |
|---------|---------------------|-----------|
| --- | --- 5...600 V | LAD4DDL |

Bidirectional peak limiting diode ⁽⁶⁾

- Protection provided by limiting the transient overvoltage value to 2Uc maximum.
- Maximum reduction of transient voltage peaks.

| CAD ~ | Operational voltage | Reference |
|-------|---------------------|-----------|
| ~ | ~ 24 V | LAD4TB |
| | ~ 72 V | LAD4TS |
| --- | --- 24 V | LAD4TBDL |
| | --- 72 V | LAD4TSDL |
| | --- 125 V | LAD4TGD |
| | --- 250 V | LAD4TUDL |
| | --- | --- |

⁽¹⁾ These contact blocks cannot be used on low consumption control relays.

⁽²⁾ With extended scale from 0.1 to 0.6 s.

⁽³⁾ With switching time of 40 ms ±15 ms between opening of the N/C contact and closing of the N/O contact.

⁽⁴⁾ Power should not be simultaneously applied or maintained to the mechanical latching block of the CADN. The duration of the control signal to the mechanical latching block and the CADN should be ≥ 100 ms.

⁽⁵⁾ Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

| Volts ~ and --- | 24 | 32/36 | 42/48 | 60/72 | 100 | 110/127 | 220/240 | 256/277 | 380/415 |
|-----------------|----|-------|-------|-------|-----|---------|---------|---------|---------|
| Code | B | C | E | EN | K | F | M | U | Q |

⁽⁶⁾ CAD●●--- and low consumption control relays are fitted with a built-in bi-directional peak limiting diode suppressor as standard. On control relays produced after 15th July 2004, this diode is removable. It can therefore be replaced by the user (see references LAD4T●●● above). It can also be replaced by a freewheel diode LAD4DDL.



LAD6K10



LAD4RCU



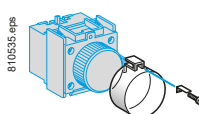
LAD4DDL



Control relays



LA9D901



LAD9ET1S

Accessories (to be ordered separately)

| Description | For mounting on | Sold in lots of | Unit reference |
|--|---|-----------------|----------------|
| For marking | | | |
| Sheet of 64 blank legends, self-adhesive, 8 x 33 mm | CAD, LAD (4 contacts) | 10 | LAD21 |
| Sheet of 112 blank legends, self-adhesive, 8 x 12 mm | LAD (2 contacts), LADT | | LAD22 |
| "SIS Label" labelling software for legends LAD21 and LAD22, supplied on CD-Rom | Multi-language version: English, French, German, Italian, Spanish | 1 | XYB2U |
| Legend holder, snap-in, 8 x 18 mm | LC1D09...38 LC1DT20...40 LADN (4 contacts) LADT, LADR | 100 | LAD90 |
| For protection | | | |
| Sealing cover | LADT, LADR | 1 | LA9D901 |
| Safety cover preventing access to the moving contact carrier | CAD | 1 | LAD9ET1 |
| Red cover (for safety chain indication) | CAD | 1 | LAD9ET1S |

Spare parts: coils

Specifications

- Average consumption at 20 °C:
 - inrush ($\cos \varphi = 0.75$) 50/60 Hz: 70 VA at 50 Hz,
 - sealed ($\cos \varphi = 0.3$) 50/60 Hz: 8 VA at 60 Hz,
- Operating range ($\theta < 60$ °C): 0.85 to 1.1 U_c

| Control circuit voltage U_c | Average resistance at 20 °C ± 10 % | Inductance of closed circuit | Reference ⁽¹⁾ |
|-------------------------------|--|------------------------------|--------------------------|
| V | Ω | H | |
| 50/60 Hz | | | |
| 12 | 1.33 | 0.05 | LXD1J7 |
| 24 | 5.37 | 0.22 | LXD1B7 |
| 32 | 10.1 | 0.39 | LXD1C7 |
| 42 | 17 | 0.67 | LXD1D7 |
| 48 | 21.7 | 0.87 | LXD1E7 |
| 110 | 124.1 | 4.6 | LXD1F7 |
| 115 | 129.8 | 5 | LXD1FE7 |
| 120 | 150.6 | 5.4 | LXD1G7 ⁽²⁾ |
| 200 | 410.7 | 15 | LXD1L7 |
| 208 | 430.4 | 16 | LXD1LE7 ⁽²⁾ |
| 220 | 515.4 | 18 | LXD1M7 ⁽³⁾ |
| 230 | 538.6 | 20 | LXD1P7 |
| 240 | 562.3 | 22 | LXD1U7 |
| 277 | 800.7 | 29 | LXD1W7 ⁽²⁾ |
| 380 | 1551 | 55 | LXD1Q7 ⁽⁴⁾ |
| 400 | 1633 | 60 | LXD1V7 |
| 415 | 1694 | 65 | LXD1N7 |
| 440 | 1993 | 73 | LXD1R7 |
| 480 | 2398 | 87 | LXD1T7 ⁽²⁾ |
| 500 | 2499 | 95 | LXD1S7 |
| 575 | 3294 | 125 | LXD1SC7 |
| 600 | 3810 | 136 | LXD1X7 |
| 660 | 4656 | 165 | LXD1YC7 |
| 690 | 5020 | 180 | LXD1Y7 |

(1) The last 2 digits in the reference represent the voltage code.

(2) Coil for use only on 60 Hz.

(3) Suitable for use on 230 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see pages B8/82 and B8/84).

(4) Suitable for use on 400 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see pages B8/82 and B8/84).

Control relays


TeSys Control

SK, K, Deca Control relays

Product references

| | | | |
|-------------|-------------|-------------|-----------|
| CA2KN223B7 | CA2SK20E7 | CA3SK11BD | CAD32GD |
| CA2KN223F7 | CA2SK20F7 | CA3SK20BD | CAD32JD |
| CA2KN223P7 | CA2SK20G7 | CA3SK20JD | CAD32JL |
| CA2KN223P72 | CA2SK20M7 | CA4KN223BW3 | CAD32L7 |
| CA2KN22B7 | CA2SK20P7 | CA4KN225BW3 | CAD32M7 |
| CA2KN22B72 | CA2SK20Q7 | CA4KN22BW3 | CAD32MD |
| CA2KN22D7 | CA2SK20T7 | CA4KN22EW3 | CAD32N7 |
| CA2KN22E7 | CA2SK20U7 | CA4KN22FW3 | CAD32P7 |
| CA2KN22F7 | CA2SK20UE7 | CA4KN22SW3 | CAD32Q7 |
| CA2KN22F72 | CA2SKE20B7 | CA4KN313BW3 | CAD32R7 |
| CA2KN22FC7 | CA2SKE20G7 | CA4KN31BW3 | CAD32SD |
| CA2KN22FE7 | CA2SKE20M7 | CA4KN31FW3 | CAD32T7 |
| CA2KN22G7 | CA2SKE20P7 | CA4KN31SW3 | CAD32U7 |
| CA2KN22G72 | CA2SKE20Q7 | CA4KN403BW3 | CAD32UD |
| CA2KN22L7 | CA2SKE20T7 | CA4KN40BW3 | CAD32V7 |
| CA2KN22M7 | CA2SKE20U7 | CA4KN40EW3 | CAD32X7 |
| CA2KN22M72 | CA3KN223BD | CA4KN40FW3 | CAD32XD |
| CA2KN22N7 | CA3KN223BD3 | CAD323B7 | CAD32Y7 |
| CA2KN22P7 | CA3KN22BD | CAD323BD | CAD503BD |
| CA2KN22P72 | CA3KN22BD3 | CAD323BL | CAD503BL |
| CA2KN22Q7 | CA3KN22ED | CAD323E7 | CAD503FD |
| CA2KN22R7 | CA3KN22ED3 | CAD323F7 | CAD503FE7 |
| CA2KN22T7 | CA3KN22FD | CAD323FE7 | CAD503P7 |
| CA2KN22U7 | CA3KN22FD3 | CAD323G7 | CAD506B7 |
| CA2KN22V7 | CA3KN22GD | CAD323JD | CAD506BD |
| CA2KN313P72 | CA3KN22GD3 | CAD323P7 | CAD506ED |
| CA2KN315F7 | CA3KN22JD | CAD326B7 | CAD506F7 |
| CA2KN31B7 | CA3KN22MD | CAD326BD | CAD506FD |
| CA2KN31D7 | CA3KN22MD3 | CAD326BL | CAD506KD |
| CA2KN31E7 | CA3KN22ND | CAD326CD | CAD506M7 |
| CA2KN31F7 | CA3KN22SD | CAD326E7 | CAD506MD |
| CA2KN31G7 | CA3KN313BD | CAD326F7 | CAD506P7 |
| CA2KN31K7 | CA3KN313BD3 | CAD326FD | CAD506R7 |
| CA2KN31M7 | CA3KN315BD | CAD326G7 | CAD50B7 |
| CA2KN31M72 | CA3KN317SD | CAD326GD | CAD50BD |
| CA2KN31P7 | CA3KN31BD | CAD326K7 | CAD50BL |
| CA2KN31P72 | CA3KN31BD3 | CAD326KD | CAD50D7 |
| CA2KN31U7 | CA3KN31ED | CAD326L7 | CAD50E7 |
| CA2KN31V7 | CA3KN31ED3 | CAD326M7 | CAD50ED |
| CA2KN40B7 | CA3KN31FD | CAD326MD | CAD50F7 |
| CA2KN40B72 | CA3KN31FD3 | CAD326P7 | CAD50FD |
| CA2KN40E7 | CA3KN31GD | CAD326Q7 | CAD50FE7 |
| CA2KN40F7 | CA3KN31GD3 | CAD326R7 | CAD50G7 |
| CA2KN40FC72 | CA3KN31JD | CAD326SD | CAD50GD |
| CA2KN40G7 | CA3KN31MD | CAD326SL | CAD50K7 |
| CA2KN40M7 | CA3KN31MD3 | CAD326U7 | CAD50L7 |
| CA2KN40N7 | CA3KN31ND3 | CAD326V7 | CAD50M7 |
| CA2KN40P7 | CA3KN31UD | CAD326VD | CAD50MD |
| CA2KN40T7 | CA3KN403BD | CAD32B7 | CAD50N7 |
| CA2KN40U7 | CA3KN403BD3 | CAD32BD | CAD50P7 |
| CA2SK11B7 | CA3KN407ED | CAD32BL | CAD50Q7 |
| CA2SK11E7 | CA3KN40BD | CAD32CD | CAD50R7 |
| CA2SK11F7 | CA3KN40BD3 | CAD32D7 | CAD50SD |
| CA2SK11G7 | CA3KN40ED | CAD32E7 | CAD50U7 |
| CA2SK11M7 | CA3KN40ED3 | CAD32ED | CAD50UD |
| CA2SK11P7 | CA3KN40EPD | CAD32EL | CAD50Y7 |
| CA2SK11T7 | CA3KN40FD | CAD32F7 | |
| CA2SK11U7 | CA3KN40FD3 | CAD32FC7 | |
| CA2SK11UE7 | CA3KN40GD | CAD32FD | |
| CA2SK11V7 | CA3KN40GD3 | CAD32FE7 | |
| CA2SK20B7 | CA3KN40MD | CAD32FL | |
| CA2SK20D7 | CA3KN40MD3 | CAD32G7 | |

Control
relays

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

Contents

TeSys SK Mini control relays:

- > characteristics B7/14 and B7/15
- > dimensions B7/16
- > schemes B7/17

TeSys K Control relays:

- > characteristics B7/18 and B7/19
- > dimensions B7/20
- > schemes B7/21

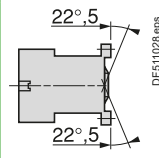
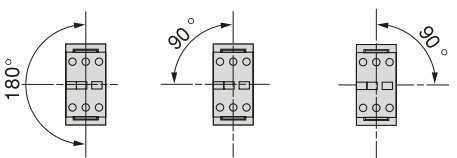
Deca Control relays:

- > characteristics B7/22 to B7/24
- > curves B7/25
- > dimensions B7/26
- > schemes B7/27

TeSys Control

SK, SKE Mini control relays

Characteristics

| Environment | | | | | |
|---|--|---|--|---------------|---------------|
| Rated insulation voltage (Ui) | Conforming to IEC 60947, CSA 22-2 n° 14, UL 508 | V | 690 | | |
| Conforming to standards | | | IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5 | | |
| Approvals | | | cULus, CCC, EAC, UKCA, CB certification | | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP2X | | |
| Ambient air temperature around the device | Storage | °C | -50...+70 | | |
| | Operation | °C | -20...+50 | | |
| Maximum operating altitude | Without derating | m | 2000 | | |
| Operating position | | Vertical axis  Without derating | Horizontal axis  Without derating | | |
| Connection by connectors | Solid cable | mm² | Min. 1 x 1.5 or 2 x 1.5 | | |
| | Flexible cable without cable end | mm² | Max. 1 x 6 or 2 x 4 | | |
| | Flexible cable with cable end | mm² | 1 x 6 or 2 x 2.5 | | |
| Tightening torque | Pozidriv n° 1 head | N.m | 0.8 | | |
| Terminal referencing | Conforming to standards EN 50005 and EN 50011 | | Up to 4 contacts | | |
| Control circuit characteristics | | | | | |
| Control relay | | V | CA2SK | CA2SKE | CA3SK |
| Rated control circuit voltage (Uc) | | V | ~ 24...400 | | ~ 12...72 |
| Control voltage limits (≤ 50 °C) | For operation | | 0.85...1.1 Uc | | 0.85...1.1 Uc |
| | For drop-out | | ≤ 0.20 Uc | | ≤ 0.10 Uc |
| Average consumption at 20 °C and at Uc | Inrush | | 16 VA | 23 VA | 2.2 W |
| | Sealed | | 4.2 VA | 4.9 VA | 2.2 W |
| Heat dissipation | | W | 1.4 | 1.5 | 2.2 |
| Operating time at 20 °C and at Uc | Between coil energisation and opening of the N/C contacts | ms | 8...16 | | 10...18 |
| | | ms | 7...14 | | 8...12 |
| | Between coil de-energisation and opening of the N/O contacts | ms | 6...8 | | 4...6 |
| | | ms | 8...10 | | 6...8 |
| Maximum operating rate | In operating cycles per hour | | 1200 | | 1200 |
| Mechanical durability at Uc in millions of operating cycles | 50/60 Hz coil | | 10 | | – |
| | Standard ~ coil | | – | | 10 |

Ref.



Control relays

TeSys Control

SK, SKE Mini control relays

Characteristics

Auxiliary contact characteristics of mini control relays and instantaneous contact blocks

| | | | |
|---|----------------------------------|-----------|-----------|
| Rated operational voltage (U _e) | | V | Up to 690 |
| Rated insulation voltage (U _i) | Conforming to IEC 96047 | V | 690 |
| Conventional rated thermal current (I _{th}) | For ambient temperature ≤ 55 °C | A | 10 |
| Frequency of the operational current | | Hz | Up to 400 |
| Short-circuit protection | Conforming to IEC 60947, gI fuse | A | 10 |

Operational power of contacts conforming to IEC 60947

| | a.c. supply, category AC-15 | | | | | | d.c. supply, category DC-13 | | | | | | |
|---|-----------------------------|------|------|-------------|-------------|-------------|---|----------|-----|-----|-----|-----|-----|
| | V | 24 | 48 | 110/ 127 | 220/ 230 | 380/ 400 | 440 | V | 24 | 48 | 110 | 220 | 440 |
| Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4). | | | | | | | Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load. | | | | | | |
| 1 million operating cycles | VA | 48 | 96 | 240 | 440 | 800 | 880 | W | 120 | 80 | 60 | 52 | 51 |
| 3 million operating cycles | VA | 17 | 34 | 86 | 158 | 288 | 317 | W | 55 | 38 | 30 | 28 | 26 |
| 10 million operating cycles | VA | 7 | 14 | 36 | 66 | 120 | 132 | W | 15 | 11 | 9 | 8 | 7 |
| Occasional making capacity | VA | 1000 | 2050 | 5000 | 10000 | 14000 | 13 000 | W | 720 | 600 | 400 | 300 | 230 |

Ref.



Control relays

TeSys Control

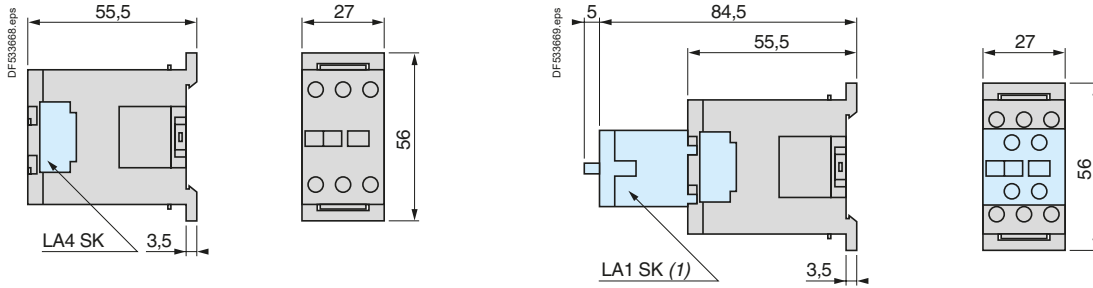
SK, SKE Mini control relays

Dimensions and mounting

Dimensions

Mini control relays

CA2SK and CA3SK



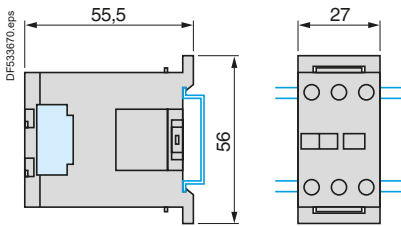
(1) Only on CA2SK20.

Mounting

Mini control relays

CA2SK and CA3SK

On mounting rail NSYDR200BD or NSYDR200 (└ 35 mm)

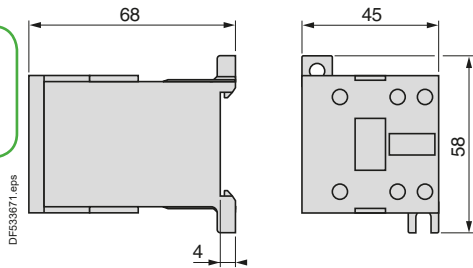


Ref.



Dimensions

CA2SKE



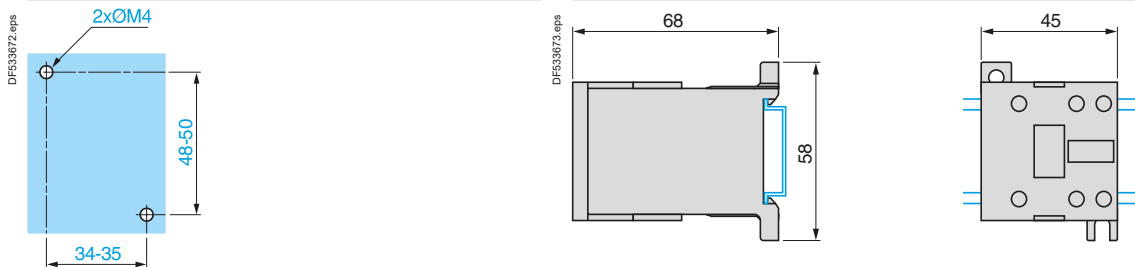
Control relays

Mounting

CA2SKE

On panel

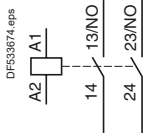
On mounting rail NSYDR200BD or NSYDR200 (└ 35 mm)



Schemes

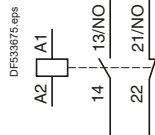
CA2SK20, CA3SK20

2 N/O



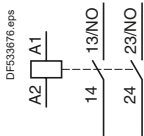
CA2SK11, CA3SK11

1 N/O + 1 N/C



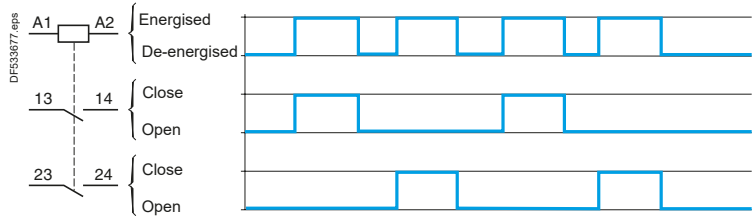
CA2SKE

2 N/O



CA2SKE

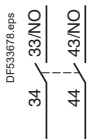
Function diagram



Instantaneous auxiliary contacts

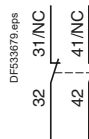
2 N/O

LA1SK20



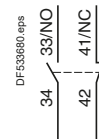
2 N/C

LA1SK02



1 N/O + 1 N/C

LA1SK11



Ref.



Control relays

TeSys Control

K Control relays

Characteristics

Environment

| | | | | | |
|---|---|---|--|--------------------------|-------------------|
| Conforming to standards | | IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5 | | | |
| Product certifications | | UL, CSA, CCC, EAC, UKCA, CB certification | | | |
| Operating positions | | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Vertical axis</p> <p>Without derating</p> </div> <div style="text-align: center;"> <p>Horizontal axis</p> <p>Without derating</p> </div> <div style="text-align: center;"> <p>Possible positions for CA2K only, with derating, please consult your Regional Sales Office.</p> </div> </div> | | | |
| Connection | | Min. | Max. | Max. to IEC 60947 | |
| Screw clamp connections | Solid cable | mm² | 1 x 1.5 | 2 x 4 | 1 x 4 + 1 x 2.5 |
| | Flexible cable without cable end | mm² | 1 x 0.75 | 2 x 4 | 2 x 2.5 |
| | Flexible cable with cable end | mm² | 1 x 0.34 | 1 x 1.5 + 1 x 2.5 | 1 x 1.5 + 1 x 2.5 |
| Spring terminals | Solid cable | mm² | 1 x 0.75 | 1 x 1.5 | 2 x 1.5 |
| | Flexible cable without cable end | mm² | 1 x 0.75 | 1 x 1.5 | 2 x 1.5 |
| Faston connectors | Clip | mm | 2 x 2.8 or 1 x 6.35 | | |
| Solder pins for printed circuit board | With locating device between power and control circuits | | 4 mm x 35 microns | | |
| Tightening torque | Philips head n° 2 and Ø6 | N.m | 0.8 | | |
| Terminal referencing | Conforming to standards EN 50005 and EN 50011 | | Up to 8 contacts | | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP2x (devices with screw clamp terminals or pins for printed circuit board) | | |
| Ambient air temperature around the device | Storage | °C | -50...+80 | | |
| | Operation | °C | -25...+50 | | |
| Maximum operating altitude | Without derating | m | 2000 | | |
| Vibration resistance 5...300 Hz | Control relay open | | 2 gn | | |
| | Control relay closed | | 4 gn | | |
| Conforming to IEC/EN 60068-2-27 | | | | | |
| Flame resistance | Conforming to IEC 60695-2-11 | | 850 °C | | |
| Shock resistance (1/2 sine wave, 11 ms) | Control relay open | | 10 gn | | |
| | Control relay closed | | 15 gn | | |
| Conforming to IEC/EN 60068-2-27 | | | | | |

Control circuit characteristics

| Control relay type | | | CA2K | CA3K | CA4K |
|---|--|-----------|---------------|---------------|--------------|
| Rated control circuit voltage (Uc) | | V | ~ 12...690 | ~ 12...250 | ~ 12...120 |
| Control voltage limits (y 50 °C) single voltage coil | For operation | | 0.8...1.15 Uc | 0.8...1.15 Uc | 0.7...1.3 Uc |
| | For drop-out | | ≤ 0.2 Uc | ≤ 0.1 Uc | ≤ 0.1 Uc |
| Mechanical durability at Uc In millions of operating cycles | 50/60 Hz coil | | 10 | – | – |
| | Standard ~ coil | | – | 20 | – |
| | Wide range, low consumption ~ coil | | – | – | 30 |
| Maximum operating rate | In operating cycles per hour | | 10 000 | 10 000 | 6000 |
| Average consumption at 20 °C and at Uc | Inrush | | 30 VA | 3 W | 1.8 W |
| | Sealed | | 4.5 VA | 3 W | 1.8 W |
| Heat dissipation | | W | 1.3 | 3 | 1.8 |
| Operating time at 20 °C and at Uc | Between coil energisation and opening of the N/C contacts | ms | 5...15 | 25...35 | 25...35 |
| | | ms | 10...20 | 30...40 | 30...40 |
| | Between coil de-energisation and opening of the N/O contacts | ms | 10...20 | 10 | 10...20 |
| | | ms | 15...25 | 15 | 15...25 |
| Maximum immunity to microbreaks | | ms | 2 | 2 | 2 |

TeSys Control

K Control relays & contact blocks

Characteristics

Contact characteristics of control relays and instantaneous contact blocks

| | | | |
|--------------------------------------|---|-----------|---|
| Number of auxiliary contacts | On CA●K On LA1K | | 4 2 or 4 for CA2K and CA3K , 2 for CA4K |
| Rated operational voltage (Ue) | Up to | V | 690 |
| Rated insulation voltage (Ui) | Conforming to IEC 60947 | V | 690 |
| | Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1 | V | 600 |
| Conventional thermal current (Ith) | For ambient temperature ≤ 50 °C | A | 10 |
| Frequency of the operational current | | Hz | Up to 400 |
| Minimum switching capacity | U min | V | 17 |
| | I min | mA | 5 |
| Short-circuit protection | Conforming to IEC 60947, gG fuse | A | 10 |
| Rated making capacity | Conforming to IEC 60947 | | |
| Short-time rating | Permissible for | | |
| | | 1 s | A 80 |
| | | 500 ms | A 90 |
| | | 100 ms | A 110 |
| Insulation resistance | | MΩ | > 10 |
| Non-overlap distance | CA●K and LA1K: linked contacts conforming to INRS, BIA and CNA specifications | mm | 0.5 (see schemes page B7/21) |

Operational power of contacts conforming to IEC 60947

a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \varphi 0.7$) = 10 times the power broken ($\cos \varphi 0.4$)

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

| | a.c. supply, category AC-15 | | | | | | | d.c. supply, category DC-13 | | | | | | | |
|-----------------------------|-----------------------------|------|------|-------------|-------------|-------------|--------------------|-----------------------------|----|-----|-----|-----|-----|-----|-----|
| | V | 24 | 48 | 110/ 127 | 220/ 230 | 380/ 400 | 440 600/ 690 | V | 24 | 48 | 110 | 220 | 440 | 600 | |
| 1 million operating cycles | VA | 48 | 96 | 240 | 440 | 800 | 880 | 1200 | W | 120 | 80 | 60 | 52 | 51 | 50 |
| 3 million operating cycles | VA | 17 | 34 | 86 | 158 | 288 | 317 | 500 | W | 55 | 38 | 30 | 28 | 26 | 25 |
| 10 million operating cycles | VA | 7 | 14 | 36 | 66 | 120 | 132 | 200 | W | 15 | 11 | 9 | 8 | 7 | 6 |
| Occasional making capacity | VA | 1000 | 2050 | 5000 | 10000 | 14000 | 13000 | 9000 | W | 720 | 600 | 400 | 300 | 230 | 200 |

1 Breaking limit of contacts valid for:

- maximum of 50 operating cycles at 10 s intervals (power broken = making current x $\cos \varphi 0.7$).

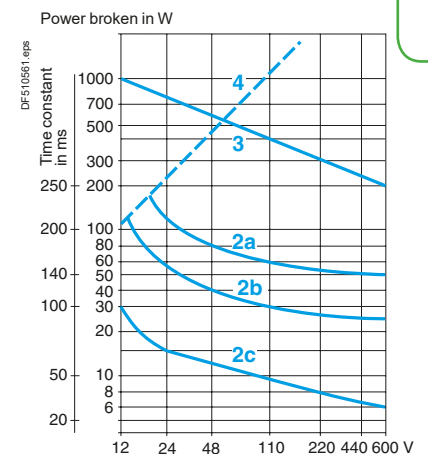
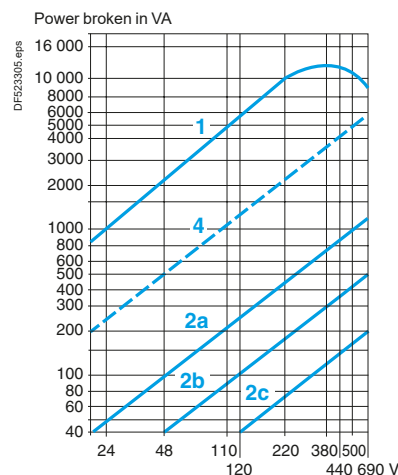
2 Electrical durability of contacts for:

- 1 million operating cycles (2a)
- 3 million operating cycles (2b)
- 10 million operating cycles (2c).

3 Breaking limit of contacts valid for:

- maximum of 20 operating cycles at 10 s intervals with current passing for 0.5 s per operating cycle.

4 Thermal limit



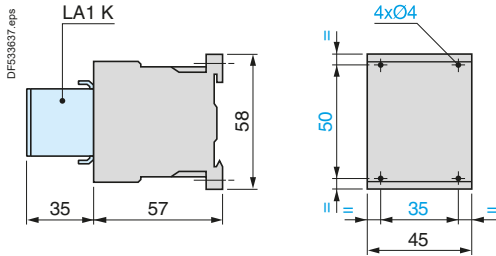
TeSys Control K Control relays

Dimensions and mounting

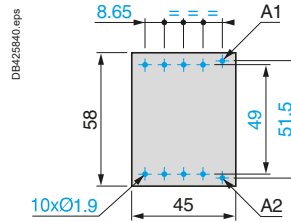
Control relays

CA2K, CA3K, CA4K

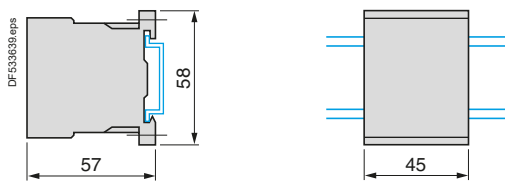
On panel



On printed circuit board



On mounting rail NSYDR200BD or NSYDR200 (L 35 mm)



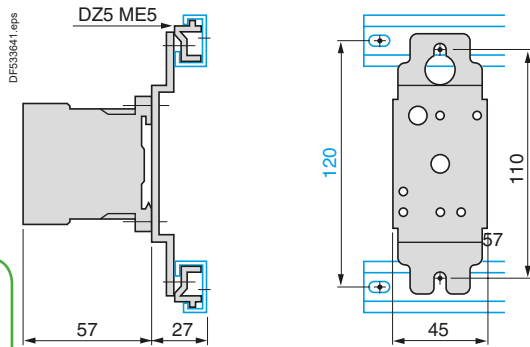
DX1AP25

On asymmetrical rail with clip-on mounting plates

Ref.



Control relays

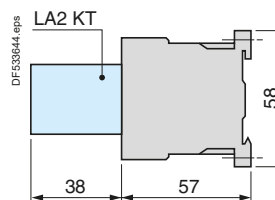


Electronic time delay contact blocks

LA2KT

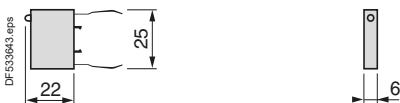


On control relay

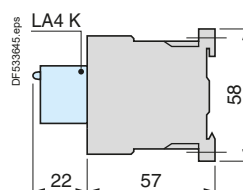


Suppressor modules

LA4K



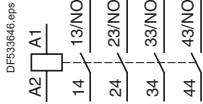
On control relay



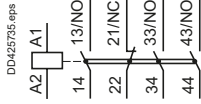
Control relays

CA2K, CA3K, CA4K

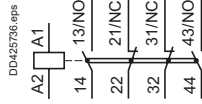
4 N/O



3 N/O + 1 N/C

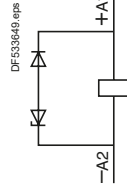


2 N/O + 2 N/C

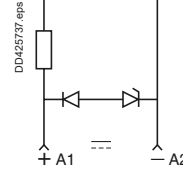


With integral suppression device

CA3K



CA4K

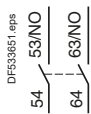


Instantaneous auxiliary contact blocks LA1K

For CA2K, CA3K, CA4K

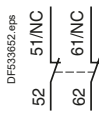
2 N/O

LA1KN20, LA1 KN207



2 N/C

LA1KN02, LA1 KN027



1 N/O + 1 N/C

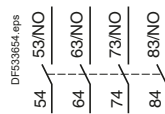
LA1KN11, LA1 KN117



For CA2K, CA3K

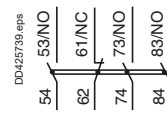
4 N/O

LA1KN40, LA1 KN407



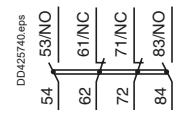
3 N/O + 1 N/C

LA1KN31, LA1 KN317



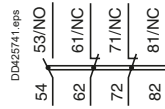
2 N/O + 2 N/C

LA1KN22



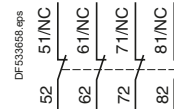
1 N/O + 3 N/C

LA1KN13



4 N/C

LA1KN04

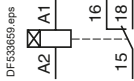


Electronic time delay contact blocks LA2KT

For CA2K, CA3K, CA4K

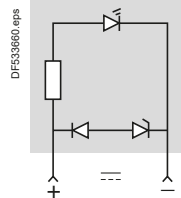
1 C/O

LA2KT2

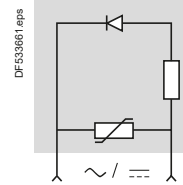


Suppressor modules

LA4KC



LA4KE

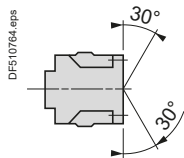
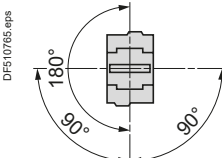
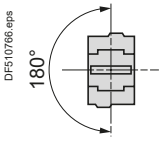




TeSys Control

Deca Control relays

Characteristics

Environment

| Control relay type | | CAD ~ | CAD ∴ | CAD ∴ low consumption | |
|--|--|-----------------------|--|---|---------|
| Rated insulation voltage (Ui) | Conforming to IEC 60947-5-1 Overvoltage category III and degree of pollution 3 | V | 690 | 690 | |
| | Conforming to UL, CSA | V | 600 | 600 | |
| Rated impulse withstand voltage (Uimp) | Conforming to IEC 60947 | kV | 6 | 6 | |
| Separation of electrical circuits | Conforming to IEC 60536 | | Reinforced insulation up to 400 V | | |
| Conforming to standards | | | IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5 | | |
| Product certifications | | | UL, CSA, CCC, EAC, UKCA, CB certification, EU-MR-RO by DNV-GL | | |
| Degree of protection | Conforming to IEC 60529 | | Front face protected against direct finger contact IP 2X | Protection against direct finger contact IP 2X | |
| Ambient air temperature around the device | Storage | °C | -60...+80 | | |
| | Operation ⁽¹⁾ | °C | -40...+60 | | |
| | Allowed ⁽¹⁾ | °C | +60...+70 at Uc to 1, ●● x Uc | | |
| Maximum operating altitude | Without derating | m | 3000 | 3000 | |
| Operating positions | Without derating in the following positions | |  |  | |
| | | |  | | |
| | Positions that are not allowed | |  |  | |
| Shock resistance ⁽²⁾ half sine wave for 11ms | Control relay open | | 10 gn | 10 gn | |
| | Control relay closed | | 15 gn | 15 gn | |
| Vibration resistance ⁽²⁾ 5...300 Hz | Control relay open | | 2 gn | 2 gn | |
| | Control relay closed | | 4 gn | 4 gn | |
| Screw clamp connections | Flexible conductor without cable end | 1 conductor | mm² | 1...4 | 1...4 |
| | | 2 conductors | mm² | 1...4 | 1...4 |
| | Flexible conductor with cable end | 1 conductor | mm² | 1...4 | 1...4 |
| | | 2 conductors | mm² | 1...2.5 | 1...2.5 |
| | Solid conductor without cable end | 1 conductor | mm² | 1...4 | 1...4 |
| | | 2 conductors | mm² | 1...4 | 1...4 |
| | Tightening torque | | N.m | 1.7 | 1.7 |
| Spring terminal connections | 1 or 2 flexible or rigid conductors without cable end | mm² | 1...2.5 | 1...2.5 | |

(1) As per IEC60947-1, operating time and drop out voltage given and tested for -5...+40 °C.
(2) In the least favourable direction, without change of contact state, with coil supplied at Uc.

TeSys Control

Deca Control relays

Characteristics

| Control circuit characteristics | | | | | |
|--|--|-----------------------|------------------------|-------------------------|--|
| Control relay type | | | CAD ~ | CAD --- | CAD low consumption |
| Rated control circuit voltage (Uc) | | V | 12...690 | 12...440 | --- 5...72 |
| Control voltage limits | | | | | |
| Operation | With coil 50/60 Hz | | 0.8...1.1 Uc at 50 Hz | – | – |
| | | | 0.85...1.1 Uc at 60 Hz | – | – |
| | With standard coil, wide range | | – | 0.7...1.25 Uc | 0.7...1.25 Uc |
| Drop-out | | | 0.3...0.6 Uc | 0.1...0.25 Uc | 0.1...0.25 Uc |
| Average consumption at 20 °C and at Uc | | ~ 50/60 Hz (at 50 Hz) | VA | Inrush: 70 sealed: 8 | – |
| | With standard coil | | W | – | Inrush or sealed: 5.4 Inrush or sealed: 2.4 |
| Operating time (at rated control circuit voltage and at 20 °C) | Between coil energisation and - opening of the N/C contacts | | ms | 4...19 | 55 ± 15 % |
| | - closing of the N/O contacts | | ms | 12...22 | 63 ± 15 % |
| | Between coil de-energisation and - opening of the N/O contacts | | ms | 4...12 | 20 ± 20 % |
| | - closing of the N/C contacts | | ms | 6...17 | 25 ± 20 % |
| Short supply failure | Maximum duration without affecting hold-in of the device | | ms | 2 | 2 |
| Maximum operating rate | In operating cycles per second | | | 3 | 3 |
| Mechanical durability In millions of operating cycles | With coil 50/60 Hz (at 50 Hz) | | | 30 | – |
| | With standard coil --- wide range | | | – | 30 |
| Time constant L/R | | | ms | – | 28 |

Ref.



Control relays

Characteristics of instantaneous contacts incorporated in the control relay

| | | | |
|--------------------------------------|---|------------|---|
| Number of contacts | | | 5 |
| Rated operational voltage (Ue) | Up to | V | 690 |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-5-1 | V | 690 |
| | Conforming to UL, CSA | V | 600 |
| Conventional thermal current (Ith) | For ambient temperature ≤ 60 °C | A | 10 |
| Frequency of the operational current | | Hz | 25...400 |
| Minimum switching capacity | U min | V | 17 |
| | I min | mA | 5 |
| Short-circuit protection | Conforming to IEC 60947-5-1 | | gG fuse: 10 A |
| Rated making capacity | Conforming to IEC 60947-5-1 | I rms | ~ 140, --- 250 |
| Short-time rating | Permissible for | 1 s | A 100 |
| | | 500 ms | A 120 |
| | | 100 ms | A 140 |
| Insulation resistance | | MΩ | > 10 |
| Non-overlap time | Guaranteed between N/C and N/O contacts | ms | 1.5 (on energisation and on de-energisation) |
| Tightening torque | Philips head n° 2 and Ø6 | N.m | 1.7 |
| Non-overlap distance | | | Linked contacts in association with auxiliary contacts LADN |
| Mechanically linked contacts | Conforming to IEC 60947-5-1 | | The 3 N/O contacts and the 2 N/C contacts of CAD N32 are linked mechanically by one mobile contact carrier. |

Ref.



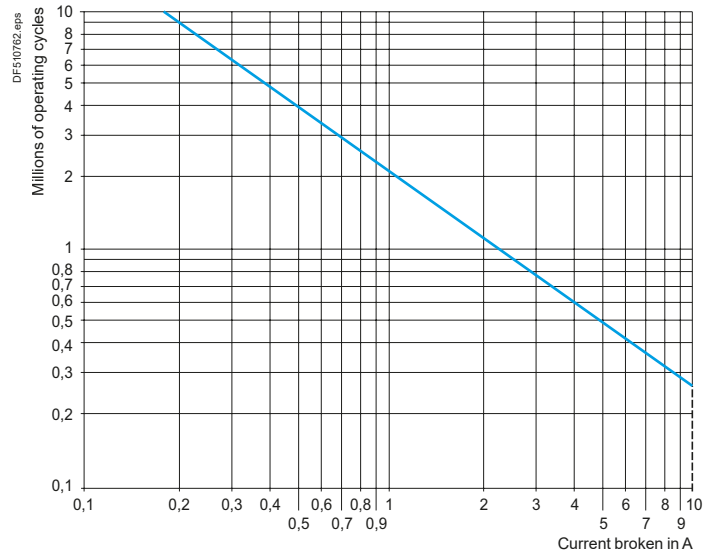
Control relays

Rated operational power of contacts (conforming to IEC 60947-5-1)

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet:
making current ($\cos \phi 0.7$) = 10 times the power broken ($\cos \phi 0.4$).

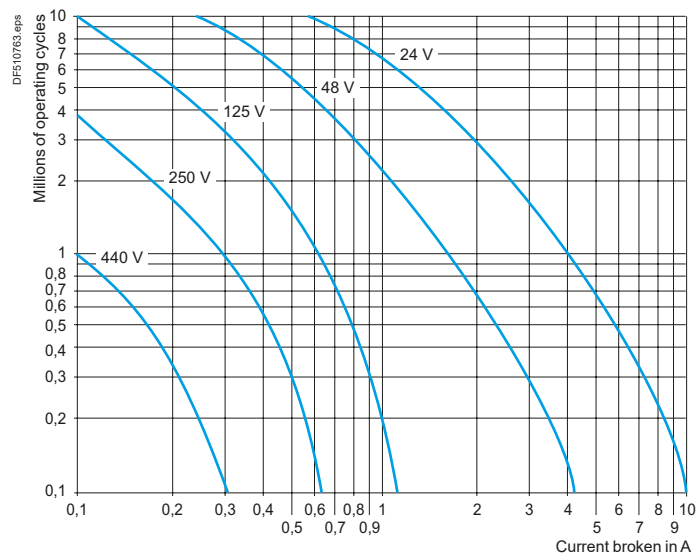
| | V | 24 | 48 | 115 | 230 | 400 | 440 | 600 |
|-----------------------------|----|----|-----|-----|-----|-----|------|------|
| 1 million operating cycles | VA | 60 | 120 | 280 | 560 | 960 | 1050 | 1440 |
| 3 million operating cycles | VA | 16 | 32 | 80 | 160 | 280 | 300 | 420 |
| 10 million operating cycles | VA | 4 | 8 | 20 | 40 | 70 | 80 | 100 |



d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the power.

| Operating cycles | V | 24 | 48 | 125 | 250 | 440 |
|------------------|---|----|----|-----|-----|-----|
| 1 million | W | 96 | 76 | 76 | 76 | 44 |
| 3 million | W | 48 | 38 | 38 | 32 | – |
| 10 million | W | 14 | 12 | 12 | – | – |



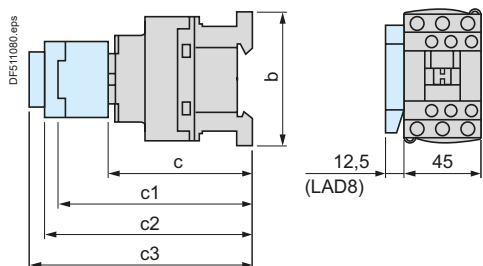
TeSys Control

Deca Control relays

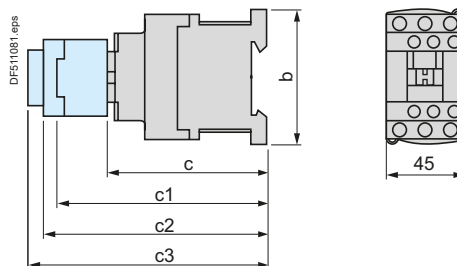
Dimensions and mounting

Dimensions

CAD ~



CAD --- or LC (low consumption)



| CAD | 32 | 323 |
|-------------------------------------|-----|-----|
| b | 50 | 503 |
| c without cover or add-on blocks | 84 | 84 |
| with cover, without add-on blocks | 86 | 86 |
| c1 with LADN or C (2 or 4 contacts) | 117 | 117 |
| c2 with LAD6K10 | 129 | 129 |
| c3 with LADT, R, S | 137 | 137 |
| with LADT, R, S and sealing cover | 141 | 141 |

| CAD | 32 | 323 |
|-------------------------------------|-----|-----|
| b | 50 | 503 |
| c without cover or add-on blocks | 93 | 93 |
| with cover, without add-on blocks | 95 | 95 |
| c1 with LADN or C (2 or 4 contacts) | 126 | 126 |
| c2 with LAD6K10 | 138 | 138 |
| c3 with LADT, R, S | 146 | 146 |
| with LADT, R, S and sealing cover | 150 | 150 |

| Operating cycles | V | 24 | 48 | 125 | 250 | 440 |
|------------------|---|-----|----|-----|-----|-----|
| 1 million | W | 120 | 90 | 75 | 68 | 61 |
| 3 million | W | 70 | 50 | 38 | 33 | 28 |
| 10 million | W | 25 | 18 | 14 | 12 | 10 |

Ref.

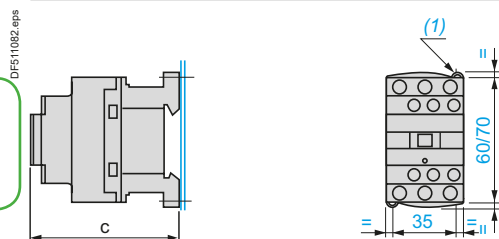


Control relays

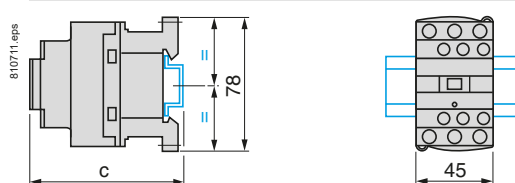
Mounting

CAD

Panel mounted



Mounted on rail NSYDR200BD or NSYDR200



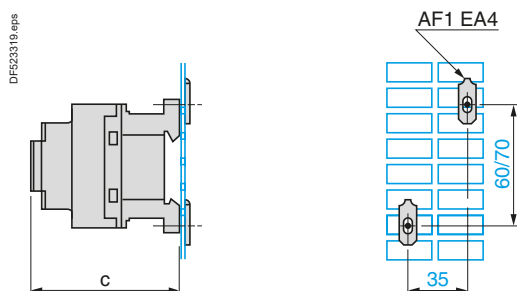
| | CAD ~ | CAD --- or LC |
|--------------|-------|---------------|
| c with cover | 86 | 95 |

| | CAD ~ | CAD --- or LC |
|--------------------|-------|---------------|
| c (NSYDR200BD) (2) | 88 | 97 |
| c (NSYDR200BD) (2) | 96 | 105 |

(1) 2 elongated holes 4.5 x 9.

(2) With cover.

Mounted on plate AM1P



| | CAD ~ | CAD --- or LC |
|--------------|-------|---------------|
| c with cover | 86 | 95 |

| TeSys SK, K contactors | | | |
|---|--|---|--|
| Type of product | Range | | Pages |
| Contactors 27 and 45 mm width for use in modular panels TeSys SK | From 12 to 20 A |  | B8/2 |
| Contactors TeSys K | From 6 to 16 A |  | B8/4 |
| Contactors reversing pre-assembled contactors TeSys K | From 6 to 16 A |  | B8/8 |
| Auxiliary contact blocks - accessories | | | B8/13 |
|  | TeSys S207 series contactors for railways applications. Click on image to download. |  | TeSys S335 series contactors for electrodomestic application. Click on image to download. |
| TeSys Deca contactors | | | |
| AC-3, AC-1, UL CSA applications- TeSys Deca green contactors (with AC/DC compatible coil) | From 9 to 80 A | | B8/16 |
| AC-3 applications - 3-pole, 4-pole TeSys Deca contactors | From 9 to 150 A |  | B8/22 |
| AC-1 applications - 3-pole, 4-pole TeSys Deca contactors | From 25 to 200 A | | B8/23 |
| UL CSA application - 3-pole TeSys Deca contactors | From 25 to 200 A | | B8/28 |
| Reversing, changeover pre-assembled TeSys Deca contactors | From 9 to 150 A |  | B8/29 |
| Reversing contactors TeSys Deca green contactors (with AC/DC compatible coil) | From 9 to 80 A | | B8/33 |
| Contactors for switching capacitor banks | From 12.5 to 60 kVAR |  | B8/34 |
| Auxiliary contact blocks – accessories – spare coils for TeSys Deca | | | B8/36 |
| Modular contactors | | | |
| Modular contactors | From 16 to 100 A |  | B8/51 |
| Modular Dual tariff contactors | 16, 25, 40 or 100 A |  | B8/52 |
| Modular Impulse relay | Up to 16 A |  | B8/53 |
| Auxiliary contact blocks - accessories | | | B8/54 |

TeSys Control

SK Contactors

Product references

- Width of contactor 27 mm.
- Mounting on 35 mm rail.
- Screw clamp terminals.

LC1SK contactors can be fitted with an add-on block or auxiliary contact block, LP1SK and LC1SKGC contactors can't.



LC1SK0600●●

Mini-contactors for motor in category AC-3

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 ⁽¹⁾ | | | Rated operational voltage in AC-3 up to 400 V | Number of poles | Instantaneous auxiliary contacts | Basic reference. Complete with code indicating control circuit voltage ⁽²⁾⁽³⁾ |
|---|-------|-------|---|-----------------|----------------------------------|--|
| 220 V | 380 V | 660 V | — | 2 | — | LC1SK0600●● |
| 230 V | 415 V | 690 V | | | | |
| kW | kW | kW | A | | | |
| 1.1 | 2.2 | 2.2 | 6 | 2 | — | — |

Mini-contactors for motor in category AC-1

| Non inductive loads maximum current ($\theta \leq 55^\circ\text{C}$) utilisation category AC-1 | Control circuit supply | Number of poles | Instantaneous auxiliary contacts | Basic reference. Complete with code indicating control circuit voltage ⁽²⁾⁽³⁾ |
|--|------------------------|-----------------|----------------------------------|--|
| A | a.c. | 2 | — | LC1SK0600●● |
| | d.c. | 2 | — | LP1SK0600●● |

(1) For use in AC-3 category and 3-phase circuits, an LA1SK●● auxiliary contact block should be ordered separately for mounting on the contactor.

(2) Standard control circuit voltages (variable delivery times, please consult your Regional Sales Office):

Mini-contactors LC1SK

| Volts ~ 50/60 Hz | 24 | 48 | 110 | 120 | 220 | 230 | 240 | 380 | 400 |
|------------------|----|----|-----|-----|-----|-----|-----|-----|-----|
| Code | B7 | E7 | F7 | G7 | M7 | P7 | U7 | Q7 | V7 |

Mini-contactors LP1SK

| Volts --- | 12 | 24 | 36 | 48 | 72 |
|-----------|----|----|----|----|----|
| Code | JD | BD | CD | ED | SD |

(3) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

Add-on power pole (for 3-phase circuits) with aux. contact

| For use on contactor LC1SK0600●● with 1 NO power pole (6 A AC-3, 10 A AC-1) and with 1 NC aux. contact (Ith 10 A). Ue 690 V AC 50/60 Hz for both contacts | Number of poles | Instantaneous auxiliary contacts | Reference |
|---|-----------------|----------------------------------|-----------|
| Clip-on front mounting | 1 | — 1 | LA1SK01 |

Instantaneous auxiliary contact blocks

| For use on contactor LC1SK0600●●. Aux. contacts: Ith 10 A. Ue: 690 V AC 50/60 Hz | Maximum number of blocks per contactor | Composition | Reference |
|--|--|-------------|-----------|
| Clip-on front mounting | 1 | 2 — | LA1SK20 |
| | | — 2 | LA1SK02 |
| | | 1 1 | LA1SK11 |

Coil suppressor modules

Clip-on fixing and electrical connection on right-hand side, without use of tools

| For use on contactors | Type | For voltages | Sold in lots of | Unit reference |
|-----------------------|-------------------------|-------------------------|-----------------|----------------|
| LC1SK0600●● | Varistor ⁽¹⁾ | ~ and --- 24 V...48 V | 10 | LA4SKE1E |
| LP1SK0600●●, LC1SKGC | Diode ⁽²⁾ | ~ and --- 110 V...250 V | 10 | LA4SKE1U |
| | | --- 24 V...250 V | 10 | LA4SKC1U |

(1) Protection provided by limiting the transient voltage to 2 Uc max. Maximum reduction of transient voltage peaks. Slight increase in drop-out time (1.1 to 1.5 times the normal time).

(2) No overvoltage or oscillating frequency. Slight increase in drop-out time (1.1 to 1.5 times the normal time).



LA1SK01



LA4SK●1●

TeSys Control

SKGC Contactors

Product references

Mini-contactors 25 and 47 mm pitch for use in modular panels.

■ Mounting on 35 mm rail or fixing by four Ø4 screws, except for LC1SKGC200.

■ Connection by connectors.

■ Mini-contactor fitted with transparent, sealable protective cover to prevent front face access.



LC1SKGC200

Mini-contactors, width 27 mm

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | Rated operational current in AC-3 up to 400 V | Non inductive loads category AC-1 maximum current $\theta \leq 50^\circ\text{C}$ | No. of poles | | | Basic reference, to be completed by adding the voltage code ⁽¹⁾⁽²⁾ |
|--|-------|-------|---|--|--------------|---|---|---|
| 220 V | 380 V | 660 V | | | 1 | 2 | 3 | |
| 230 V | 415 V | 690 V | | | | | | |
| kW | kW | kW | A | A | | | | |
| - | - | - | 5 | 20 | 2 | - | - | LC1SKGC200●● |



LC1SKGC300

Mini-contactors, width 45 mm

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | Rated operational current in AC-3 up to 400 V | Non inductive loads category AC-1 maximum current $\theta \leq 50^\circ\text{C}$ | No. of poles | | | Basic reference, to be completed by adding the voltage code ⁽¹⁾⁽²⁾ |
|--|-------|-------|---|--|--------------|---|---|---|
| 220 V | 380 V | 660 V | | | 1 | 2 | 3 | |
| 230 V | 415 V | 690 V | | | | | | |
| kW | kW | kW | A | A | | | | |
| 1.1 | 4 | 4 | 9 | 20 | 3 | 1 | - | LC1SKGC310●● |
| | | | | | 3 | - | 1 | LC1SKGC301●● |

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

| Volts ~ 50/60 Hz | 24 | 48 | 110 | 120 | 220 | 230 | 240 | 380 | 400 |
|------------------|----|----|-----|-----|-----|-----|-----|-----|-----|
| Code | B7 | E7 | F7 | G7 | M7 | P7 | U7 | Q7 | V7 |

(2) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.



Contactors

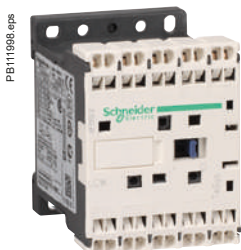
TeSys Control

K Contactors

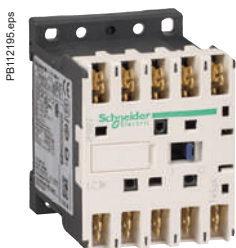
Product references



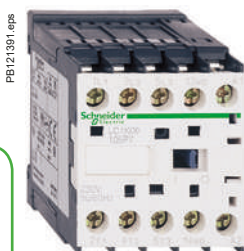
LC1K0910●●



LC1K09103●●



LC1K09107●●



LC1K09105●●



LC7K0910●●

Mounting on 35 mm rail or Ø4 screw fixing.
Screws in the open "ready-to-tighten" position.
Add-on auxiliary contact blocks and accessories, see pages B8/13 to B8/15.

3-pole contactors - Motor control 6 to 16 A in categories AC-3 AC-4 - a.c. coil

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Rated operational current in category AC-3 440 V up to | Instantaneous auxiliary contacts | Basic reference, to be completed by adding the voltage code ^{(1) (2)} |
|--|----------------|------------------------|--|--------------------------------------|--|
| 220 V 230 V | 380 V 415 V | 440/500 V 660/690 V | | | |
| kW | kW | kW | A | | |
| Screw clamp connections | | | | | |
| 1.5 | 2.2 | 3 | 6 | 1 - | LC1K0610●● |
| | | | | - 1 | LC1K0601●● |
| 2.2 | 4 | 4 | 9 | 1 - | LC1K0910●● |
| | | | | - 1 | LC1K0901●● |
| 3 | 5.5 | 4 (> 440) 5.5 (440) | 12 | 1 - | LC1K1210●● |
| | | | | - 1 | LC1K1201●● |
| 4 | 7.5 | 4 (> 440) 5.5 (440) | 16 | 1 - | LC1K1610●● |
| | | | | - 1 | LC1K1601●● |

Spring terminal connections⁽³⁾

For 6 to 12 A ratings only, in the references selected above, insert a figure 3 before the voltage code.
Example: LC1K0610●● becomes LC1K06103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

For 6 to 16 A ratings, in the references selected above, insert a figure 7 before the voltage code.
Example: LC1K0610●● becomes LC1K06107●●.

Solder pins for printed circuit boards

For 6 to 16 A ratings, in the references selected above, insert a figure 5 before the voltage code.
Example: LC1K0610●● becomes LC1K06105●●.

3-pole silent contactors

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.
Coil with rectifier incorporated, suppressor fitted as standard.

Screw clamp connections

| | | | | | |
|-----|-----|------------------------|----|-----|------------|
| 1.5 | 2.2 | 3 | 6 | 1 - | LC7K0610●● |
| | | | | - 1 | LC7K0601●● |
| 2.2 | 4 | 4 | 9 | 1 - | LC7K0910●● |
| | | | | - 1 | LC7K0901●● |
| 3 | 5.5 | 4 (> 440) 5.5 (440) | 12 | 1 - | LC7K1210●● |
| | | | | - 1 | LC7K1201●● |

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.
Example: LC7K0610●● becomes LC7K06107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.
Example: LC7K0610●● becomes LC7K06105●●.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - a.c.⁽⁴⁾

Contactors LC1K (0.8...1.15 Uc) (0.85...1.1 Uc)

| Volts | 12 | 20 | 24 ⁽¹⁾ | 36 | 42 | 48 | 110 | 115 | 120 | 127 | 200/208 | 220/230 | 230 | 230/240 |
|----------------------|-----|-----|-------------------|-----|---------|-----|-----|-----|-----|-----|---------|---------|-----|---------|
| 50 Hz ⁽⁵⁾ | | | B5 | | D5 | E5 | | | | | | | P5 | |
| 50/60 Hz | J7 | Z7 | B7 | C7 | D7 | E7 | F7 | FE7 | G7 | FC7 | L7 | M7 | P7 | U7 |
| Volts | 256 | 277 | 380/400 | 400 | 400/415 | 440 | 480 | 500 | 575 | 600 | 660/690 | | | |
| 50/60 Hz | W7 | UE7 | Q7 | - | V7 | N7 | R7 | T7 | S7 | SC7 | X7 | Y7 | - | - |

Up to and including 240 V, coil with integral suppression device available: add 2 to the code required. Example: J72.

Contactors LC7K (0.85...1.1 Uc)

| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230/240 |
|----------|----|----|----|-----|-----|-----|---------|
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | U7 |

(1) For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module LA4KE1FC (50...129 V) or LA4KE1UG (130...250 V), see page B8/14.

(2) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(3) For LC●K●●●●3 / LP●K●●●●3 with spring terminal, lth max = 10 A.

(4) (0.8...1.15 Uc) for single voltage coil; (0.85...1.1 Uc) for dual voltage coil, example 200/208 V AC.

(5) Only available for 'screw clamp terminals' versions.

TeSys Control K Contactors

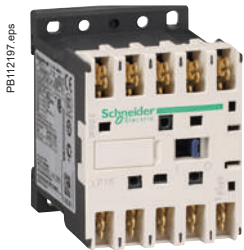
Product references



LP1K0910●●



LP1K09103●●



LP1K09107●●



LP1K09105●●



LP4K0910●●


Contacteur selection according to utilisation category, see pages A6/34 to A6/39 and A6/42 to A6/45.

Mounting on 35 mm rail or Ø4 screw fixing.

Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/13 to B8/15.

3-pole contactors - Motor control 6 to 12 A in categories AC-3 AC-4 - d.c. coil

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Rated operational current in category AC-3 440 V up to | Instan- taneous auxiliary contacts  | Basic reference, to be completed by adding the voltage code (1) (2) |
|--|----------------|------------------------|--|--|--|
| 220 V 230 V | 380 V 415 V | 440/500 V 660/690 V | | | |
| kW | kW | kW | A | | |
| Screw clamp connections | | | | | |
| 1.5 | 2.2 | 3 | 6 | 1 - | LP1K0610●● |
| | | | | - 1 | LP1K0601●● |
| 2.2 | 4 | 4 | 9 | 1 - | LP1K0910●● |
| | | | | - 1 | LP1K0901●● |
| 3 | 5.5 | 4 (> 440) 5.5 (440) | 12 | 1 - | LP1K1210●● |
| | | | | - 1 | LP1K1201●● |

Spring terminal connections (3)

In the references selected above, insert a figure 3 before the voltage code.

Example: LP1K0610●● becomes LP1K06103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LP1K0610●● becomes LP1K06107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LP1K0610●● becomes LP1K06105●●.

3-pole low consumption contactors

Compatible with programmable controller outputs.

Wide range coil (0.7...1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

Screw clamp connections

| | | | | | |
|-----|-----|------------------------|----|-----|------------|
| 1.5 | 2.2 | 3 | 6 | 1 - | LP4K0610●● |
| | | | | - 1 | LP4K0601●● |
| 2.2 | 4 | 4 | 9 | 1 - | LP4K0910●● |
| | | | | - 1 | LP4K0901●● |
| 3 | 5.5 | 4 (> 440) 5.5 (440) | 12 | 1 - | LP4K1210●● |
| | | | | - 1 | LP4K1201●● |

Spring terminal connections

In the references selected above, insert a figure 3 before the voltage code.

Example: LP4K0610●● becomes LP4K06103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LP4K0610●● becomes LP4K06107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LP4K0610●● becomes LP4K06105●●.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

| d.c. supply (contactors LP1K: 0.8...1.15 Uc) | 12 | 20 | 24 ⁽¹⁾ | 36 | 48 | 60 | 72 | 100 | 110 | 125 | 155 | 174 | 200 | 220 | 230 | 240 | 250 |
|--|----|----|-------------------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | JD | ZD | BD | CD | ED | ND | SD | KD | FD | GD | PD | QD | LD | MD | MPD | MUD | UD |

Coil with integral suppression device available: add 3 to the code required. Example: JD3

Low consumption (contactors LP4K: 0.7...1.3 Uc)

| Volts | 12 | 20 | 24 | 48 | 72 | 110 | 120 |
|-------|-----|-----|-----|-----|-----|-----|-----|
| Code | JW3 | ZW3 | BW3 | EW3 | SW3 | FW3 | GW3 |

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

(1) For LP1K only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (~ control circuit voltage code Z7, ∞ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.

(2) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(3) For LC●K●●●●3 / LP●K●●●●3 with spring terminal), I_{th} max = 10 A.

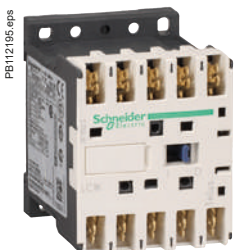
Contactor selection according to utilisation category, see pages A6/40 and A6/41.
 Mounting on 35 mm rail or Ø4 screw fixing.
 Screws in the open "ready-to-tighten" position.
 Add-on auxiliary contact blocks and accessories, see pages B8/13 to B8/15.



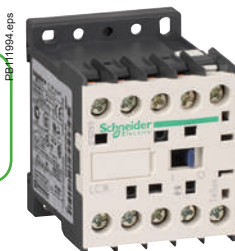
LC1K09004●●



LC1K09103●●



LC1K09107●●



LC7K09100●●

3 or 4-pole contactors - Load control up to 20 A in category AC-1 - a.c. coil ⁽¹⁾

| Non-inductive loads Category AC-1 Maximum current at $\theta \leq 50^\circ\text{C}$ | Number of poles | Instantaneous auxiliary contacts | Basic reference, to be completed by adding the voltage code ⁽²⁾⁽³⁾ |
|--|--------------------|-------------------------------------|---|
| | | | |

| Screw clamp connections | | | | | |
|-------------------------|---|---|---|---|-------------------------------|
| 20 | 3 | - | 1 | - | LC1K0910●● or LC1K1210●● |
| | 3 | - | - | 1 | LC1K0901●● or LC1K1201●● |
| | 4 | - | - | - | LC1K09004●● or LC1K12004●● |
| | 2 | 2 | - | - | LC1K09008●● |

Spring terminal connections ⁽⁴⁾

In the references selected above, insert a figure 3 before the voltage code.
 Example: LC1K0910●● becomes LC1K09103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.
 Example: LC1K0910●● becomes LC1K09107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.
 Example: LC1K0910●● becomes LC1K09105●●.

3 or 4-pole silent contactors ⁽¹⁾

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.
 Coil with rectifier incorporated, suppressor fitted as standard.

Screw clamp connections

| | | | | | |
|----|---|---|---|---|-------------------------------|
| 20 | 3 | - | 1 | - | LC7K0910●● or LC7K1210●● |
| | 3 | - | - | 1 | LC7K0901●● or LC7K1201●● |
| | 4 | - | - | - | LC7K09004●● or LC7K12004●● |
| | 2 | 2 | - | - | LC7K09008●● |

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.
 Example: LC7K0910●● becomes LC7K09107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.
 Example: LC7K0910●● becomes LC7K09105●●.

⁽¹⁾ Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - a.c. ⁽⁵⁾

Contactors LC1K (0.8...1.15 Uc) (0.85...1.1 Uc)

| Volts | 12 | 20 | 24 ⁽²⁾ | 36 | 42 | 48 | 110 | 115 | 120 | 127 | 200/208 | 220/230 | 230 | 230/240 |
|----------------------|-----|-----|-------------------|----|-----|---------|-----|-----|-----|-----|---------|---------|-----|---------|
| 50 Hz ⁽⁶⁾ | | | B5 | | D5 | E5 | | | | | | | P5 | |
| 50/60 Hz | J7 | Z7 | B7 | C7 | D7 | E7 | F7 | FE7 | G7 | FC7 | L7 | M7 | P7 | U7 |
| Volts | 256 | 277 | 380/400 | | 400 | 400/415 | 440 | 480 | 500 | 575 | 600 | 660/690 | | |
| 50/60 Hz | W7 | UE7 | Q7 | | V7 | N7 | | R7 | T7 | S7 | SC7 | X7 | Y7 | |

Up to and including 240 V, coil with integral suppression device available: add 2 to the code required. Example: J72.

Contactors LC7K (0.8...1.1 Uc)

| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230/240 |
|----------|----|----|----|-----|-----|-----|---------|
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | U7 |

⁽²⁾ For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module LA4KE1FC (50...129 V) or LA4KE1UG (130...250 V), see page B8/14.

⁽³⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

⁽⁴⁾ For LC●K●●●●●3 / LP●K●●●●●3 with spring terminal, I_{th} max = 10 A.

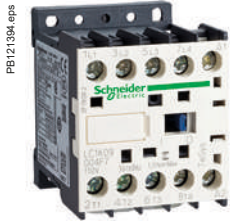
⁽⁵⁾ (0.8...1.15 Uc) for single voltage coil; (0.85...1.1 Uc) for dual voltage coil, exemple 200/208 V AC.

⁽⁶⁾ Only available for 'screw clamp terminals' versions.

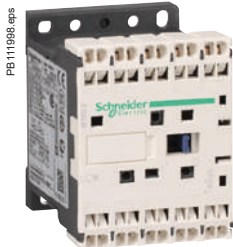
TeSys Control K Contactors

Product references

Contactor selection according to utilisation category, see pages A6/40 and A6/41.
Mounting on 35 mm rail or Ø4 screw fixing.
Screws in the open "ready-to-tighten" position.
Add-on auxiliary contact blocks and accessories, see pages B8/13 to B8/15.



LP1K09004●●



LP1K09103●●





LP1K09105●●



LP4K910●●

3 and 4-pole contactors - Load control - 20 A in category AC-1 - d.c. coil ⁽¹⁾

| Non-inductive loads Category AC-1 Maximum current at $\theta \leq 50^\circ\text{C}$ | Number of poles  | Instantaneous auxiliary contacts  | Basic reference, to be completed by adding the voltage code ⁽²⁾⁽³⁾ | | |
|--|---|--|---|---|-------------------------------|
| A | | | | | |
| Screw clamp connections | | | | | |
| 20 | 3 | - | 1 | - | LP1K0910●● or LP1K1210●● |
| | 3 | - | - | 1 | LP1K0901●● or LP1K1201●● |
| | 4 | - | - | - | LP1K09004●● or LP1K12004●● |
| | 2 | 2 | - | - | LP1K09008●● |

Spring terminal connections ⁽⁴⁾

In the references selected above, insert a figure **3** before the voltage code.
Example: LP1K0910●● becomes LP1K09103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.
Example: LP1K0910●● becomes LP1K09107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.
Example: LP1K0910●● becomes LP1K09105●●.

3 or 4-pole 20 A / AC-1 - d.c. low consumption coil ⁽¹⁾

Compatible with programmable controller outputs.
Wide range coil (0.7...1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

| Screw clamp connections | | | | | |
|--------------------------------|---|---|---|---|---------------------------------|
| 20 | 3 | - | 1 | - | LP4K0910●●● or LP4K1210●●● |
| | 3 | - | - | 1 | LP4K0901●●● or LP4K1201●●● |
| | 4 | - | - | - | LP4K09004●●● or LP4K12004●●● |
| | 2 | 2 | - | - | LP4K09008●●● |

Spring terminal connections

In the references selected above, insert a figure **3** before the voltage code.
Example: LP4K0910●● becomes LP4K09103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.
Example: LP4K0910●● becomes LP4K09107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.
Example: LP4K0910●● becomes LP4K09105●●.

⁽¹⁾ Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

| Coil voltage codes - d.c. (contactors LP1K: 0.8...1.15 Uc) | | | | | | | | | | | | | | | | | |
|---|----|----|-------------------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Volts ∴ | 12 | 20 | 24 ⁽²⁾ | 36 | 48 | 60 | 72 | 100 | 110 | 125 | 155 | 174 | 200 | 220 | 230 | 240 | 250 |
| Code | JD | ZD | BD | CD | ED | ND | SD | KD | FD | GD | PD | QD | LD | MD | MPD | MUD | UD |

Coil with integral suppression device available: add **3** to the code required. Example: **JD3**.

| Coil voltage codes - low consumption d.c. (contactors LP4K: 0.7...1.3 Uc) | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|
| Volts ∴ | 12 | 20 | 24 | 48 | 72 | 110 | 120 |
| Code | JW3 | ZW3 | BW3 | EW3 | SW3 | FW3 | GW3 |

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

⁽²⁾ For LP1K only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (~ control circuit voltage code Z7, ∴ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.

⁽³⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

⁽⁴⁾ For LC●K●●●●3 / LP●K●●●●3 with spring terminal, lth max = 10 A.

TeSys Control

K Reversing contactors

Product references

Reversing contactor selection according to utilisation category, see pages A6/34 to A6/39 and A6/42 to A6/45. Integral mechanical interlock.

It is essential to link the contacts of the electrical interlock.

Pre-wired power circuit connections as standard on screw clamp versions.

Mounting on 35 mm rail or Ø4 screw fixing. Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/13 to B8/15.



LC2K0910●●



LC2K09105●●

3-pole reversing contactors - Motor control 6 to 16 A in categories AC-3 AC-4 - a.c. coil

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | Rated operational current in category AC-3 440 V up to | Instantaneous auxiliary contacts per contactor | Basic reference, to be completed by adding the voltage code ^{(1) (2)} |
|--|----------------|------------------------|--|--|--|
| 220 V 230 V | 380 V 415 V | 440/500 V 660/690 V | | | |
| kW | kW | kW | A | | |

| Screw clamp connections | | | | | |
|-------------------------|-----|------------------------|----|-----|------------|
| 1.5 | 2.2 | 3 | 6 | 1 - | LC2K0610●● |
| | | | | - 1 | LC2K0601●● |
| 2.2 | 4 | 4 | 9 | 1 - | LC2K0910●● |
| | | | | - 1 | LC2K0901●● |
| 3 | 5.5 | 4 (> 440) 5.5 (440) | 12 | 1 - | LC2K1210●● |
| | | | | - 1 | LC2K1201●● |
| 4 | 7.5 | 4 (> 440) 5.5 (440) | 16 | 1 - | LC2K1610●● |
| | | | | - 1 | LC2K1601●● |

Spring terminal connections ⁽³⁾

For 6 to 12 A ratings only, in the references selected above, insert a figure 3 before the voltage code.

Example: LC2K0610●● becomes LC2K06103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

For 6 to 16 A ratings, in the references selected above, insert a figure 7 before the voltage code.

Example: LC2K0610●● becomes LC2K06107●●.

Solder pins for printed circuit boards

For 6 to 16 A ratings, in the references selected above, insert a figure 5 before the voltage code.

Example: LC2K0610●● becomes LC2K06105●●.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - a.c. ⁽⁴⁾

Reversing contactors LC2K (0.8...1.15 Uc) (0.85...1.1 Uc)

| Volts | 12 | 20 | 24 ⁽¹⁾ | 36 | 42 | 48 | 110 | 115 | 120 | 127 | 200/208 | 220/230 | 230 | 230/240 |
|----------|-----|-----|-------------------|-----|---------|-----|-----|-----|-----|-----|---------|---------|-----|---------|
| 50/60 Hz | J7 | Z7 | B7 | C7 | D7 | E7 | F7 | FE7 | G7 | FC7 | L7 | M7 | P7 | U7 |
| Volts | 256 | 277 | 380/400 | 400 | 400/415 | 440 | 480 | 500 | 575 | 600 | 660/690 | | | |
| 50/60 Hz | W7 | UE7 | Q7 | | V7 | N7 | | R7 | T7 | S7 | SC7 | X7 | Y7 | |

Up to and including 240 V, coil with integral suppression device available: add 2 to the code required. Example: J72.

(1) For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module LA4KE1FC (50...129 V) or LA4KE1UG (130...250 V), see page B8/14.

(2) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(3) For LC●K●●●●3 / LP●K●●●●3 with spring terminal, I_{th} max = 10 A.

(4) (0.8...1.15 Uc) for single voltage coil; (0.85...1.1 Uc) for dual voltage coil, exemple 200/208 V AC.



Reversing contactor selection according to utilisation category, see pages A6/34 to A6/39 and A6/42 to A6/45.
Integral mechanical interlock.
It is essential to link the contacts of the electrical interlock.
Pre-wired power circuit connections as standard on screw clamp versions.
Mounting on 35 mm rail or Ø4 screw fixing.
Screws in the open "ready-to-tighten" position.
Add-on auxiliary contact blocks and accessories, see pages B8/13 to B8/15.

3-pole reversing contactors - Motor control 6 to 12 A in categories AC-3 AC-4 - d.c. coil

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | Rated operational current in category AC-3 440 V up to | Instantaneous auxiliary contacts per contactor | Basic reference, to be completed by adding the voltage code ⁽¹⁾⁽²⁾ |
|--|-------|-----------|--|--|---|
| 220 V | 380 V | 440/500 V | | | |
| kW | kW | kW | A | | |
| 230 V | 415 V | 660/690 V | | | |
| Screw clamp connections | | | | | |
| 1.5 | 2.2 | 3 | 6 | 1 – | LP2K0610●● |
| | | | | – 1 | LP2K0601●● |
| 2.2 | 4 | 4 | 9 | 1 – | LP2K0910●● |
| | | | | – 1 | LP2K0901●● |
| 3 | 5.5 | 4 (> 440) | 12 | 1 – | LP2K1210●● |
| | | 5.5 (440) | | – 1 | LP2K1201●● |

Spring terminal connections⁽³⁾

In the references selected above, insert a figure 3 before the voltage code.
Example: LP2K0610●● becomes LP2K06103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.
Example: LC2K0610●● becomes LC2K06107●●.

Solder pins for printed circuit boards

For 6 to 16 A ratings, in the references selected above, insert a figure 5 before the voltage code.
Example: LC2K0610●● becomes LC2K06105●●.

3-pole low consumption reversing contactors

Compatible with programmable controller outputs.
Wide range coil (0.7...1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

Screw clamp connections

| 1.5 | 2.2 | 3 | 6 | 1 – | LP5K0610●● |
|-----|-----|-----------|----|-----|------------|
| | | | | – 1 | LP5K0601●● |
| 2.2 | 4 | 4 | 9 | 1 – | LP5K0910●● |
| | | | | – 1 | LP5K0901●● |
| 3 | 5.5 | 4 (> 440) | 12 | 1 – | LP5K1210●● |
| | | 5.5 (440) | | – 1 | LP5K1201●● |

Spring terminal connections

In the references selected above, insert a figure 3 before the voltage code.
Example: LP5K0610●● becomes LP5K06103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.
Example: LP5K0610●● becomes LP5K06107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.
Example: LP5K0610●● becomes LP5K06105●●.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - d.c.

Reversing contactors LP2K (0.8...1.15 Uc)

| Volts | 12 | 20 | 24 ⁽¹⁾ | 36 | 48 | 60 | 72 | 100 | 110 | 125 | 155 | 174 | 200 | 220 | 230 | 240 | 250 |
|-------|----|----|-------------------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | JD | ZD | BD | CD | ED | ND | SD | KD | FD | GD | PD | QD | LD | MD | MPD | MUD | UD |

Coil with integral suppression device available: add 3 to the code required. Example: JD3.

Coil voltage codes - low consumption d.c.

Reversing contactors LP5K (0.7...1.3 Uc)

| Volts | 12 | 20 | 24 | 48 | 72 | 110 | 120 |
|-------|-----|-----|-----|-----|-----|-----|-----|
| Code | JW3 | ZW3 | BW3 | EW3 | SW3 | FW3 | GW3 |

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

(1) For LP2K only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (~ control circuit voltage code Z7, --- control circuit voltage code ZD) so as to compensate for the incurred voltage drop.

(2) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(3) For LC●K●●●●3 / LP●K●●●●3 with spring terminal, lth max = 10 A.

TeSys Control

K Reversing contactors

Product references

Warning: reversing contactors LC2K0910●● and LC2K0901●● are pre-wired for reverse motor operation as standard.

Reversing contactor selection according to utilisation category, see pages A6/40 and A6/41.
Integral mechanical interlock.

It is essential to link the contacts of the electrical interlock.

Mounting on 35 mm rail or Ø4 screw fixing.

Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/13 to B8/15.



LC2K0910●●



LC2K09105●●

3 or 4-pole reversing contactors - Load control - 20 A in category AC-1 - a.c. coil ⁽¹⁾

| Non-inductive loads Category AC-1 Maximum current at $\theta \leq 50^\circ\text{C}$ | Number of poles | Instantaneous auxiliary contacts per contactor | Basic reference, to be completed by adding the voltage code ⁽²⁾⁽³⁾ |
|--|--------------------|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

| A | | | | | |
|-------------------------|---|---|---|---|----------------------------------|
| Screw clamp connections | | | | | |
| 20 | 3 | - | 1 | - | LC2K0910●● or LC2K1210●● |
| | 3 | - | - | 1 | LC2K0901●● or LC2K1201●● |
| | 4 | - | - | - | LC2K09004●● or LC2K12004●● |

Spring terminal connections ⁽⁴⁾

In the references selected above, insert a figure 3 before the voltage code.
Example: LC2K0910●● becomes LC2K09103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.
Example: LC2K0910●● becomes LC2K09107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.
Example: LC2K0910●● becomes LC2K09105●●.

⁽¹⁾ Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - a.c. ⁽⁵⁾

| Reversing contactors LC2K (0.8...1.15 Uc) (0.85...1.1 Uc) | | | | | | | | | | | | | | |
|---|-----|-----|-------------------|-----|---------|-----|-----|-----|-----|-----|---------|---------|-----|---------|
| Volts | 12 | 20 | 24 ⁽²⁾ | 36 | 42 | 48 | 110 | 115 | 120 | 127 | 200/208 | 220/230 | 230 | 230/240 |
| 50/60 Hz | J7 | Z7 | B7 | C7 | D7 | E7 | F7 | FE7 | G7 | FC7 | L7 | M7 | P7 | U7 |
| Volts | 256 | 277 | 380/400 | 400 | 400/415 | 440 | 480 | 500 | 575 | 600 | 660/690 | | | |
| 50/60 Hz | W7 | UE7 | Q7 | V7 | N7 | R7 | T7 | S7 | SC7 | X7 | Y7 | | | |

Up to and including 240 V, coil with integral suppression device available: add 2 to the code required. Example: J72.

⁽²⁾ For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module LA4KE1FC (50...129 V) or LA4KE1UG (130...250 V), see page B8/14.

⁽³⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

⁽⁴⁾ For LC●K●●●●3 / LP●K●●●●3 with spring terminal, I_{th} max = 10 A.

⁽⁵⁾ (0.8...1.15 Uc) for single voltage coil; (0.85...1.1 Uc) for dual voltage coil, exemple 200/208 V AC.



Warning: reversing contactors LP2K0910●● and LP2K0901●● are pre-wired for reverse motor operation as standard.

Reversing contactor selection according to utilisation category, see pages A6/40 and A6/41.

Integral mechanical interlock.

It is essential to link the contacts of the electrical interlock.

Mounting on 35 mm rail or Ø4 screw fixing.

Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/13 to B8/15.

3 or 4-pole reversing contactors - Load control - 20 A in category AC-1 - d.c. coil ⁽¹⁾

| Non-inductive loads Category AC-1 Maximum current at $\theta \leq 50^\circ\text{C}$ | Number of poles | Instantaneous auxiliary contacts per contactor | | Basic reference, to be completed by adding the voltage code ^{(2) (3)} |
|--|--------------------|---|--|--|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Spring terminal connections ⁽⁴⁾

In the references selected above, insert a figure 3 before the voltage code.

Example: LP2K0910●● becomes LP2K09103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LP2K0910●● becomes LP2K09107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LP2K0910●● becomes LP2K09105●●.

3 or 4-pole reversing contactors - 20 A / AC-1 - d.c. low consumption coil ⁽¹⁾

Compatible with programmable controller outputs.

Wide range coil (0.7...1.30 U_c), suppressor fitted as standard, consumption 1.8 W.

Screw clamp connections

| | | | | | |
|----|---|---|---|---|-----------------|
| 20 | 3 | - | 1 | - | LP5K0910●●● |
| | | | | | or LP5K1210●●● |
| | 3 | - | - | 1 | LP5K0901●●● |
| | | | | | or LP5K1201●●● |
| | 4 | - | - | - | LP5K09004●●● |
| | | | | | or LP5K12004●●● |

Spring terminal connections

In the references selected above, insert a figure 3 before the voltage code.

Example: LP5K0910●● becomes LP5K09103●●.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LP5K0910●● becomes LP5K09107●●.

Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LP5K0910●● becomes LP5K09105●●.

⁽¹⁾ Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - d.c. (reversing contactors LP2K: 0.8...1.15 U_c)

| Volts ∴ | 12 | 20 | 24 ⁽²⁾ | 36 | 48 | 60 | 72 | 100 | 110 | 125 | 155 | 174 | 200 | 220 | 230 | 240 | 250 |
|---------|----|----|-------------------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | JD | ZD | BD | CD | ED | ND | SD | KD | FD | GD | PD | QD | LD | MD | MPD | MUD | UD |

Coil with integral suppression device available: add 3 to the code required. Example: JD3.

Coil voltage codes - low consumption d.c. (reversing contactors LP5K: 0.7...1.3 U_c)

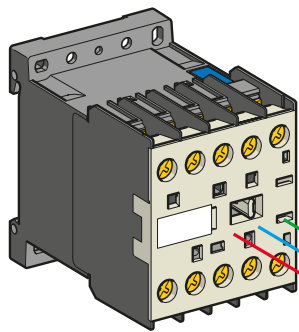
| Volts ∴ | 12 | 20 | 24 | 48 | 72 | 110 | 120 |
|---------|-----|-----|-----|-----|-----|-----|-----|
| Code | JW3 | ZW3 | BW3 | EW3 | SW3 | FW3 | GW3 |

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

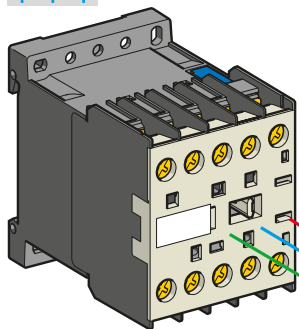
⁽²⁾ For LP2K only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (∴ control circuit voltage code Z7, ∴ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.

⁽³⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

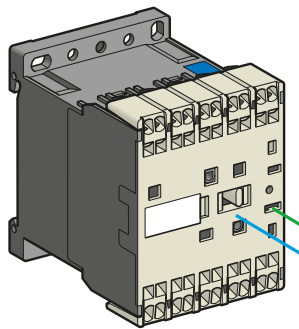
⁽⁴⁾ For LC●K●●●●3 / LP●K●●●●3 with spring terminal, I_{th} max = 10 A.



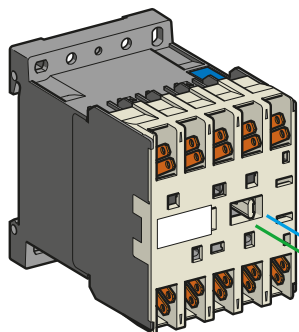
LC1, LC7, LP1 K



LC1, LC7, LP1 K



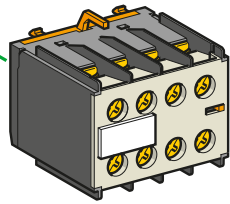
LC1, LP1 K



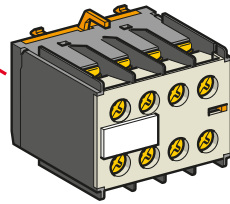
LC1, LC7, LP1 K



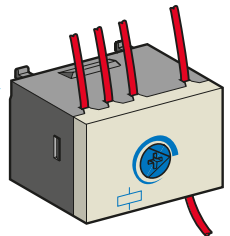
Contactors



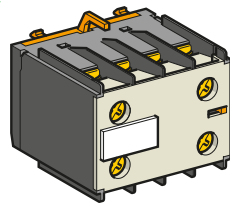
LA1 KN...M



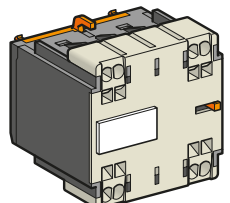
LA1 KN...



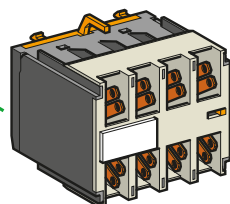
LA2 KT2...



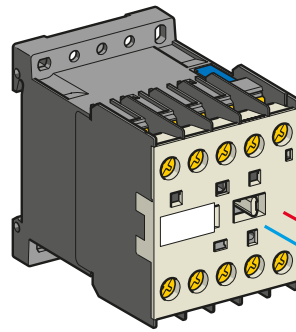
LA1 KN...P



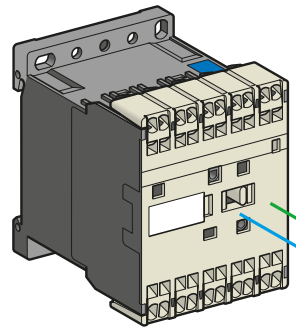
LA1 KN...3



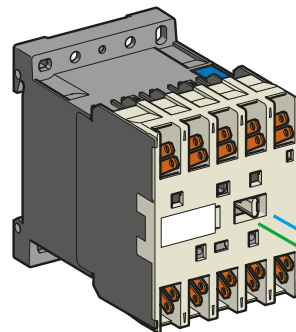
LA1 KN...7



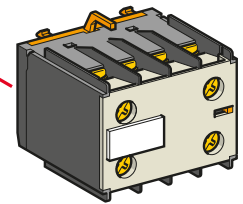
LP4



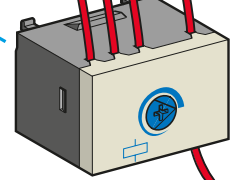
LP4



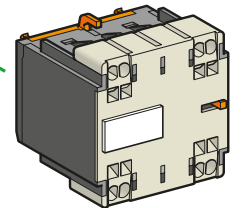
LP4



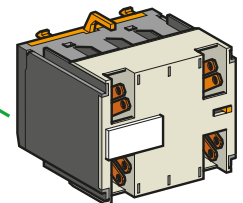
LA1 KN...



LA2 KT2...



LA1 KN...3



LA1 KN...7

TeSys Control

K Contactors - Auxiliary contacts blocks

Product references



LA1KN22



LA1KN223



LA1KN407

Instantaneous auxiliary contact blocks

Recommended for standard applications. Clip-on front mounting, 1 block per contactor

| Connection | For use on contactors | Composition | Reference |
|--|--|-------------|-----------|
| Screw clamp terminals | All products with screw clamp terminals | 2 – | LA1KN20 |
| | | – 2 | LA1KN02 |
| | | 1 1 | LA1KN11 |
| | | 4 – | LA1KN40 |
| | All products with screw clamp terminals except low consumption | 3 1 | LA1KN31 |
| | | 2 2 | LA1KN22 |
| | | 1 3 | LA1KN13 |
| | | – 4 | LA1KN04 |
| Spring terminals | All products with spring terminals | 2 – | LA1KN203 |
| | | – 2 | LA1KN023 |
| | | 1 1 | LA1KN113 |
| | | 4 – | LA1KN403 |
| | All products with spring terminals except low consumption | 3 1 | LA1KN313 |
| | | 2 2 | LA1KN223 |
| | | 1 3 | LA1KN133 |
| | | – 4 | LA1KN043 |
| Faston connectors, 1 x 6.35 or 2 x 2.8 | All products with Faston connectors | 2 – | LA1KN207 |
| | | 4 – | LA1KN407 |
| | All products with Faston connectors except low consumption | 3 1 | LA1KN317 |

With terminal referencing to standard EN 50012. Clip-on front mounting, 1 block per contactor

| | | | |
|--|--|-----|----------|
| Screw clamp terminals with referencing conforming to standard EN 50012 | All 3-pole + N/O products with screw clamp terminals except LP4 and LP5K12 | – 2 | LA1KN02M |
| | | 1 1 | LA1KN11M |
| | All 3-pole + N/O products with screw clamp terminals except LP4 or LP5K06, K09 and K12 | 3 1 | LA1KN31M |
| | | 2 2 | LA1KN22M |

Electronic time delay auxiliary contact blocks

Relay output with common point changeover contact, \sim or $\overline{\sim}$ 240 V, 2 A maximum.

Control voltage 0.85...1.1 U_c .

Maximum switching capacity 250 VA or 150 W.

Operating temperature -10...+60 °C.

Reset time: 1.5 s during the time delay period, 0.5 s after the time delay period.

Clip-on front mounting, 1 block per contactor

| Voltage | Type | Timing range | Composition | Reference |
|--|----------|--------------|-------------|-----------|
| \sim or $\overline{\sim}$ 24...48 | On-delay | 1...30 | 1 | LA2KT2E |
| \sim 110...240 | On-delay | 1...30 | 1 | LA2KT2U |



TeSys Control

K Contactors - Suppressor modules

Product references



LA4K...

References

| Mounting and connection | Type | For voltages | Sold in lots of | Unit reference |
|--|------------------------------------|---------------------|-----------------|----------------|
| Clip-on fixing on the front of contactors LC1 and LP1, with locating device. No tools required. | Varistor ⁽¹⁾ | ~ and ≍ 12...24 V | 5 | LA4KE1B |
| | | ~ and ≍ 32...48 V | 5 | LA4KE1E |
| | | ~ and ≍ 50...129 V | 5 | LA4KE1FC |
| | | ~ and ≍ 130...250 V | 5 | LA4KE1UG |
| | Diode + Zener diode ⁽²⁾ | ≍ 12...24 V | 5 | LA4KC1B |
| | | ≍ 32...48 V | 5 | LA4KC1E |
| | RC ⁽³⁾ | ~ 110...250 V | 5 | LA4KA1U |

(1) Protection provided by limiting the transient voltage to 2 Uc max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).

(2) No overvoltage or oscillating frequency.

Polarised component.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).

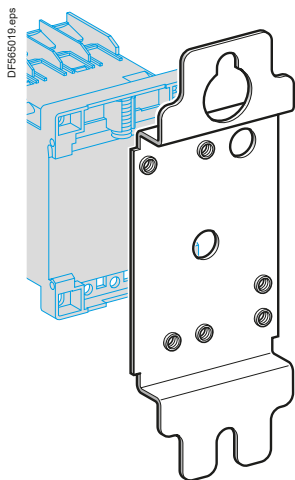
(3) Protection by limiting the transient voltage to 3 Uc max. and limitation of the oscillating frequency.
Slight increase in drop-out time (1.2 to 2 times the normal time).



TeSys Control

K Contactors - Accessories

Product references



DX1AP25



LA9E01

Mounting and marking accessories

| Description | Application | | Sold in lots of | Unit reference |
|--------------------------------|-------------------------|--------------------------------------|-----------------|----------------------|
| Mounting plates ⁽¹⁾ | For fixing on 2 U rails | 110/120 mm fixing centres | 10 | DX1AP25 |
| Marker holder | Clip-on | Onto front of contactor | 100 | LA9D90 |
| Clip-in markers | 4 maximum per contactor | Strips of 10 identical numbers 0...9 | 25 | AB1R● ⁽²⁾ |
| | | Strips of 10 identical letters A...Z | 25 | AB1G● ⁽²⁾ |

Connection accessories

| Description | Application | | Sold in lots of | Unit preference |
|----------------------------|---|---|-----------------|-----------------|
| Paralleling links | For 2 poles | With screw clamps | 4 | LA9E01 |
| | For 4 poles | With screw clamps | 2 | LA9E02 |
| Set of 6 power connections | For 3-pole reversing contactors for motor control | For contactors with screw clamp terminals | 100 | LA9K0969 |

⁽¹⁾ Order 1 mounting plate for fixing a contactor and 2 mounting plates for fixing a reversing contactor.

⁽²⁾ Complete the reference by replacing the dot with the required character.



Contactors



Control Panel Technical Guide:

Mounting and wiring accessories for TeSys K, Deca, F - Star Delta, reverser, low-high speed control motor starters and changeover applications - Product references and details on all kits and wiring accessories.

> Ref. Document: CPTG011_EN



> Click on QR code to download

Deca green, enriching Deca family

Deca conventional contactors 9 to 150 A, for motor control and other applications.

Deca green delivers a consistent low consumption range of contactors from 9 A to 80 A, covering control voltage from 24 to 250 V, with same coils for AC and DC.



When implemented with other Schneider Electric products*, Deca green contactors are part of a comprehensive solution that is ideal for all types of industrial machines and processes.



Deca Overload relay

By combining a Deca green contactor with our new Deca electronic overload relay, you will have less heat generation, and further reduce energy consumption.



* such as PLC I/O type M580, M340, M221 or M241 or extended I/O type Advantys STB range, or in association with Deca electronic overload relays or Tera Motor management system.

TeSys Control Deca Contactors Introduction



Highly competitive coil consumption

Small changes can generate big savings. The new Deca green contactor is equipped with an innovative electronic coil. These electronic-coil contactors require **up to 80 % less energy** than electro-mechanical contactors. This innovation results in concrete values: for example, large plants can noticeably reduce their energy bills and heat dissipation in cabinet.

Available in



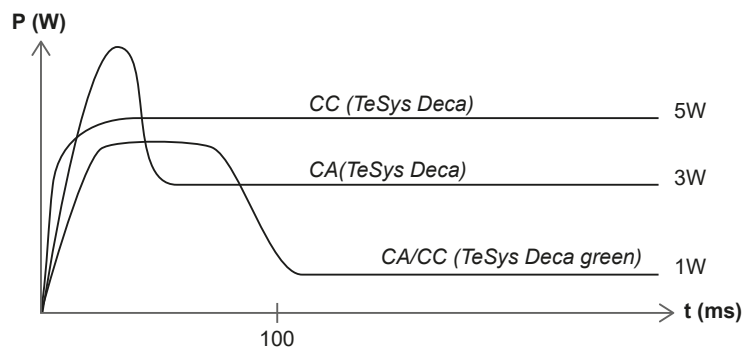
09-12-18 A

25-32-38 A

40-50-65-80 A

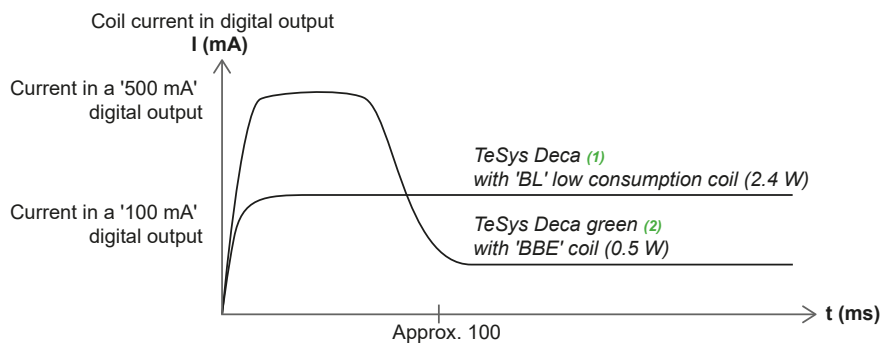
Coil currents comparison

Deca green contactors (AC/DC coil) vs Deca contactors (AC, DC coils)



Deca green brings a significant reduction of energy consumption.

Deca green contactors ("BBE" coil) vs Deca contactors (low consumption "BL" coil)



(1) Up to 38 A.
(2) 40 to 80 A.

Deca green contactor is well adapted to direct control by PLC static outputs, even in its high ratings.

TeSys Control

Deca green Contactors

Product references

PE 12/708.fr



LC1D09●●●

PE121710.fr



LC1D40A●●●

Deca green contactors have a dark grey casing and a 3-character code voltage.

3-pole contactors - Motor control up to 37 kW / 400 V - Category AC-3

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ($\theta \leq 60^\circ\text{C}$) | | | | | | Rated operational current in AC-3 440 V up to | Instan- taneous auxiliary contacts | Basic reference, to be completed by adding the control voltage code ⁽¹⁾ Fixing ⁽²⁾ | Weight |
|---|----------------|-------|-------|-------|----------------|--|---|---|--------|
| 220 V 230 V | 380 V 400 V | 415 V | 440 V | 500 V | 660 V 690 V | | | | |
| kW | kW | kW | kW | kW | kW | A | | | kg |

Connection by screw clamp terminals

| | | | | | | | | | | |
|-----|------|------|------|------|------|----|---|---|-----------|-------|
| 2.2 | 4 | 4 | 4 | 5.5 | 5.5 | 9 | 1 | 1 | LC1D09●●● | 0.368 |
| 3 | 5.5 | 5.5 | 5.5 | 7.5 | 7.5 | 12 | 1 | 1 | LC1D12●●● | 0.373 |
| 4 | 7.5 | 9 | 9 | 10 | 10 | 18 | 1 | 1 | LC1D18●●● | 0.378 |
| 5.5 | 11 | 11 | 11 | 15 | 15 | 25 | 1 | 1 | LC1D25●●● | 0.433 |
| 7.5 | 15 | 15 | 15 | 18.5 | 18.5 | 32 | 1 | 1 | LC1D32●●● | 0.438 |
| 9 | 18.5 | 18.5 | 18.5 | 18.5 | 18.5 | 38 | 1 | 1 | LC1D38●●● | 0.442 |

Power connections by EverLink® BTR ⁽³⁾ screw connectors and control by screw clamp terminal

| | | | | | | | | | | |
|------|------|----|----|----|----|----|---|---|------------|-------|
| 11 | 18.5 | 22 | 22 | 22 | 30 | 40 | 1 | 1 | LC1D40A●●● | 0.992 |
| 15 | 22 | 25 | 30 | 30 | 33 | 50 | 1 | 1 | LC1D50A●●● | 0.997 |
| 18.5 | 30 | 37 | 37 | 37 | 37 | 65 | 1 | 1 | LC1D65A●●● | 1.002 |
| 22 | 37 | 37 | 37 | 37 | 37 | 66 | 1 | 1 | LC1D80A●●● | 1.002 |

Connection for lugs or bars

For LC1D40A to LC1D80A, insert a figure 6 before the voltage code.

Example: LC1D40A●●● becomes LC1D40A6●●●

Auxiliary contact blocks and add-on modules

See pages B8/36 to B8/42.

Control voltage codes

AC/DC or 24 V DC supply

| Volts | 24 (DC only) | 24-60 | 48-130 | 100-250 |
|-------|--------------|-------|--------|---------|
|-------|--------------|-------|--------|---------|

LC1D09 ... D38,
LC1D40A ... D80A

| | | | | |
|-----------------|--|-----|-----|-----|
| U 0.85...1.1 Uc | | BNE | EHE | KUE |
|-----------------|--|-----|-----|-----|

LC1D09 ... D38

| | | | | |
|------------------|-----|--|--|--|
| U 0.8 ... 1.2 Uc | BNE | | | |
|------------------|-----|--|--|--|

LC1D40A ... D80A

| | | | | |
|----------------|-----|--|--|--|
| U 0.8...1.2 Uc | BBE | | | |
|----------------|-----|--|--|--|

⁽¹⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

⁽²⁾ LC1D09 to D80A: clip-on mounting on 35 mm rail NSYSR or screw fixing.

⁽³⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see B8/42).



PB121708.tif



LC1D09●●●

PB121710.tif



LC1D40A●●●

PB121712.eps



LC1DT60A●●●

Deca green contactors have a dark grey casing and a 3-character code voltage.

3-pole contactors - Load control from 25 to 80 A - Category AC-1

| Non inductive loads maximum current ($\theta \leq 60^\circ\text{C}$) utilisation category AC-1 | Number of poles | Instantaneous auxiliary contacts | | Partial reference, to be completed by adding the control voltage code ⁽¹⁾ | Weight |
|--|-----------------|----------------------------------|---|--|-------------------------|
| | | | | Fixing ⁽²⁾ | |
| | | | | | kg |
| Connection by screw clamp terminals | | | | | |
| 25 | 3 | 1 | 1 | LC1D09●●● or LC1D12●●● | 0.368 0.373 |
| 32 | 3 | 1 | 1 | LC1D18●●● | 0.378 |
| 40 | 3 | 1 | 1 | LC1D25●●● | 0.433 |
| 50 | 3 | 1 | 1 | LC1D32●●● or LC1D38●●● | 0.438 0.442 |
| Connection by EverLink®, BTR screw connectors ⁽³⁾ | | | | | |
| 60 | 3 | 1 | 1 | LC1D40A●●● | 0.992 |
| 80 | 3 | 1 | 1 | LC1D50A●●● or LC1D65A●●● ⁽⁴⁾ or LC1D80A●●● ⁽⁴⁾ | 0.997 1.002 1.002 |

Connection for lugs or bars

For LC1D40A to LC1D80A, insert a figure 6 before the voltage code.
Example: LC1D40A●●● becomes LC1D40A6●●●

4-pole contactors

Connection by EverLink®, BTR ⁽³⁾ screw connectors

| | | | | | |
|----|---|---|---|-------------|-------|
| 60 | 4 | 1 | 1 | LC1DT60A●●● | 1.230 |
| 80 | 4 | 1 | 1 | LC1DT80A●●● | 1.290 |

Connection for lugs or bars

For LC1DT60A to LC1DT80A, insert a figure 6 before the voltage code.
Example: LC1DT60A●●● becomes LC1DT60A6●●●

4-pole changeover contactors

Connection by EverLink®, BTR ⁽³⁾ screw connectors

| | | | | | |
|----|---|---|---|-------------|-------|
| 60 | 4 | 1 | 1 | LC2DT60A●●● | 2.460 |
| 80 | 4 | 1 | 1 | LC2DT80A●●● | 2.580 |

Control voltage codes

AC/DC 24 V DC supply

| Volts | 24 (DC only) | 24-60 | 48-130 | 100-250 |
|--|--------------|-------|--------|---------|
| LC1D09...D80A and LC●DT60A...DT80A | | | | |
| U 0.85 1.1 Uc | | BNE | EHE | KUE |
| LC1D09 D38 | | | | |
| U 0.8 1.2 Uc | BNE | | | |
| LC1D40 to LC1D80A, LC●DT60A to LC●DT80A | | | | |
| U 0.8...1.2 Uc | BBE | | | |

⁽¹⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

⁽²⁾ LC1D09 to D80A, LC●DT60A and LC●DT80A: clip-on mounting on 35 mm \perp rail NSYSDR or screw fixing.

⁽³⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).

⁽⁴⁾ Coordination tables according to the number of operation cycles, consult online datasheets for values.



TeSys Control

Deca green Contactors

Product references

PE121708.fr



LC1D09●●●

PE121710.fr



LC1D40A●●●



Contactors

Deca green contactors have a dark grey casing and a 3-character code voltage.

3-pole contactors conforming to UL and CSA standards (North American market) - 25 to 80 A

| Standard power ratings of motors 50/60 Hz | | | | | | Associated cable type 75 °C-Cu | Continuous current | Type of contactor required Partial reference, to be completed by adding the control voltage code ⁽¹⁾ Fixing, connection ⁽²⁾ |
|---|-------|----------------|-------|-------|-------|--------------------------------|--------------------|---|
| Single-phase 1 Ø | | 3-phase 3 Ø | | | | | | |
| 115 V | 230 V | 200 V | 230 V | 460 V | 575 V | | | |
| | 240 V | 208 V | 240 V | 480 V | 600 V | | | |
| HP | HP | HP | HP | HP | HP | | A | |

Connection by screw clamp terminals

| | | | | | | | | |
|-----|---|-----|-----|-----|-----|-------------|----|-----------|
| 1/3 | 1 | 2 | 2 | 5 | 7.5 | AWG 18 - 10 | 25 | LC1D09●●● |
| 0.5 | 2 | 3 | 3 | 7.5 | 10 | AWG 18 - 10 | 25 | LC1D12●●● |
| 1 | 3 | 5 | 5 | 10 | 15 | AWG 18 - 8 | 32 | LC1D18●●● |
| 2 | 3 | 7.5 | 7.5 | 15 | 20 | AWG 14 - 6 | 40 | LC1D25●●● |
| 2 | 5 | 10 | 10 | 20 | 25 | AWG 14 - 6 | 50 | LC1D32●●● |

Power connections by EverLink® BTR ⁽³⁾ screw connectors and control by spring terminals

| | | | | | | | | |
|---|-----|----|----|----|----|------------|----|------------|
| 3 | 5 | 10 | 10 | 30 | 30 | AWG 16 - 2 | 60 | LC1D40A●●● |
| 3 | 7.5 | 15 | 15 | 40 | 40 | AWG 16 - 2 | 70 | LC1D50A●●● |
| 5 | 10 | 20 | 20 | 40 | 50 | AWG 16 - 2 | 80 | LC1D65A●●● |
| 5 | 10 | 20 | 20 | 40 | 50 | AWG 16 - 2 | 80 | LC1D80A●●● |

Connection for lugs or bars

For LC1D40A to LC1D80A, insert a figure 6 before the voltage code.

Example: LC1D40A●●● becomes LC1D40A6●●●

Applications with High-Fault Short-Circuit Current ratings

High-fault short-circuit current ratings are: 100 kA at 600 V with Class J fuses and 85 kA (D09-38), 100 kA (D40A-65A) at 480 V and 50 kA at 600 V with circuit breakers.

Control voltage codes

AC/DC 24 V DC supply

| Volts | 24 (DC only) | 24-60 | 48-130 | 100-250 |
|---|--------------|-------|--------|---------|
| LC1D09 ... D32, LC1D40A ... D80A | | | | |
| U 0.85 ... 1.1 Uc | | BNE | EHE | KUE |
| LC1D09 ... D38 | | | | |
| U 0.8 ... 1.2 Uc | | BNE | | |
| LC1D40A ... D80A | | | | |
| U 0.8...1.2 Uc | | BBE | | |

(1) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(2) LC1D09 to D80: clip-on mounting on 35 mm rail NSYS DR or screw fixing.

(3) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).

Deca green contactors - Coordination with PLC output modules (static/relay/triac)

Selection of PLC coordinated contactors

Laboratory tests have been carried out in order to validate trouble free contactor closings and openings with different PLC output modules. The coil must be defined according to the contactor rating range and output module. See selection table below.

| The PLC your are using | | | | >>> | Compatible contactors ⁽¹⁾ | Coil code |
|------------------------|----------------------------------|------------------------------|---|-----|---|---|
| PLC type | Output type | Output I (A) | Output module commercial reference | | | |
| M221 / M241 / M251 | Static output: 24 V DC | 0.5 | TM3DQ8●●● and Q16●●● (T, TG, U, UG) | >>> | LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●● | BL, BNE BBE |
| | | 0.3 (sealed) 0.8 (inrush) | TM3XTYS4 | >>> | LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●● | BBE, BD, BNE |
| | | 0.1 | TM3DQ16●● and Q32●● (TK, UK) | >>> | LC1D09●● to LC1D38●● | BL |
| | Relay output: 24 V DC / 230 V AC | 2 | TM3DQ8 and DQ16 (R,RG), TM3DM8 and DM24 (R,RG) | >>> | LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●● | Code of any DC coil up to 24 V or any AC coil up to 230 V |
| M340 / M580 | Static output: 24 V DC | 0.5 | BMXDDO1602 and DM16022 | >>> | LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●● | BL, BNE BBE |
| | | 0.1 | BMXDDO3202, BMXDDM3202K, BMXDDO6402K | >>> | LC1D09●● to LC1D38●● | BL |
| | Relay output: 24 V DC / 230 V AC | 2 | BMXDRA0805 and DM16025 | >>> | LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●● | Code of any DC coil up to 24 V or any AC coil up to 230 V |
| | Triac output: 230 V AC | 0.6 | BMXDAO1605 | >>> | LC1D09●● to LC1D38●●, LC1D40●●● to LC1D80A●●●, LC1DT60A●●● to LC1DT80A●●● | Code of any AC coil up to 230 V (P7 code = 230 V) |
| ADVANTYS | Static output: 24 V DC | 0.5 | STBDDO3200 | >>> | LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●● | BL, BNE BBE |
| | Triac output: 230 V AC | 2 | STBDAO8210 | >>> | LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●● | Code of any AC coil up to 230 V (P7 code = 230 V AC) |

Coils consumption characteristics

| Coil type | Uc DC - min -max | Average consumption at UC DC / 20 °C | |
|-----------|-------------------------|--------------------------------------|----------------|
| | | Inrush | Sealed |
| BL | 24 V - 0.8 Uc to 1.1 Uc | 2.4 W - 2.4 VA | 2.4 W - 2.4 VA |
| BNE | | 14 W - 14 VA | 0.7 W - 0.7 VA |
| BBE | | 11 W - 11 VA | 0.5 W - 0.5 VA |

(1) Replace dot by coil code. Ex LC1D09●● becomes LC1D09BL.

TeSys Control

Deca Contactors

Product references



LC1D09●●



LC1D25●●



LC1D80A●●



LC1D95●●



LC1D115●●

3-pole contactors - Motor control up to 75 kW at 400 V, in category AC-3

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ($\theta \leq 60^\circ\text{C}$) | | | | | | | Rated operational current in AC-3 440 V up to | Instan- taneous auxiliary contacts | Basic reference, to be completed by adding the control voltage code ⁽¹⁾ | Weight ⁽³⁾ |
|---|-------|-------|-------|-------|-------|--------|--|---|--|--------------------------|
| 220 V | 380 V | 415 V | 440 V | 500 V | 660 V | 1000 V | 440 V | | Fixing ⁽²⁾ | |
| 230 V | 400 V | | | | 690 V | | | | | |

| kW | kW | kW | kW | kW | kW | kW | A | | | | kg |
|----|----|----|----|----|----|----|---|--|--|--|----|
|----|----|----|----|----|----|----|---|--|--|--|----|

Connection by screw clamp terminals

| | | | | | | | | | | | |
|-----|------|------|------|------|------|---|----|---|---|----------|-------|
| 2.2 | 4 | 4 | 4 | 5.5 | 5.5 | - | 9 | 1 | 1 | LC1D09●● | 0.320 |
| 3 | 5.5 | 5.5 | 5.5 | 7.5 | 7.5 | - | 12 | 1 | 1 | LC1D12●● | 0.325 |
| 4 | 7.5 | 9 | 9 | 10 | 10 | - | 18 | 1 | 1 | LC1D18●● | 0.330 |
| 5.5 | 11 | 11 | 11 | 15 | 15 | - | 25 | 1 | 1 | LC1D25●● | 0.370 |
| 7.5 | 15 | 15 | 15 | 18.5 | 18.5 | - | 32 | 1 | 1 | LC1D32●● | 0.375 |
| 9 | 18.5 | 18.5 | 18.5 | 18.5 | 18.5 | - | 38 | 1 | 1 | LC1D38●● | 0.380 |

Power connections by EverLink® BTR screw connectors ⁽⁴⁾ and control by screw clamp terminal

| | | | | | | | | | | | |
|------|------|----|----|----|----|---|----|---|---|-----------|-------|
| 11 | 18.5 | 22 | 22 | 22 | 30 | - | 40 | 1 | 1 | LC1D40A●● | 0.850 |
| 15 | 22 | 25 | 30 | 30 | 33 | - | 50 | 1 | 1 | LC1D50A●● | 0.855 |
| 18.5 | 30 | 37 | 37 | 37 | 37 | - | 65 | 1 | 1 | LC1D65A●● | 0.860 |
| 22 | 37 | 37 | 37 | 37 | 37 | - | 66 | 1 | 1 | LC1D80A●● | 0.860 |

Connection by screw clamp terminals or connectors

| | | | | | | | | | | | |
|----|----|----|----|----|-----|----|-----|---|---|-----------|-------|
| 22 | 37 | 45 | 45 | 55 | 45 | 45 | 80 | 1 | 1 | LC1D80●● | 1.590 |
| 25 | 45 | 45 | 45 | 55 | 45 | 45 | 95 | 1 | 1 | LC1D95●● | 1.610 |
| 30 | 55 | 59 | 59 | 75 | 80 | 65 | 115 | 1 | 1 | LC1D115●● | 2.500 |
| 40 | 75 | 80 | 80 | 90 | 100 | 75 | 150 | 1 | 1 | LC1D150●● | 2.500 |

Connection by lugs or bars

In the references selected above, insert a figure **6** before the voltage code.

Example: LC1D09●● becomes LC1D096●●.

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/36 to B8/42.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply

| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
|---|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LC1D09...D150 (D115 and D150 coils with built-in suppression as standard, by bi-directional peak limiting diode). | | | | | | | | | | | | | |
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | S7 |
| LC1D09...D65 (not available with "connection for lugs or bars") | | | | | | | | | | | | | |
| 50 Hz | B5 | D5 | E5 | | | | P5 | | | | | | |
| LC1D80...D115 | | | | | | | | | | | | | |
| 50 Hz | B5 | D5 | E5 | F5 | FE5 | M5 | P5 | U5 | Q5 | V5 | N5 | R5 | S5 |
| 60 Hz | B6 | - | E6 | F6 | - | M6 | - | U6 | Q6 | - | - | R6 | - |

d.c. supply

| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 |
|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LC1D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | |
| U 0.7...1.25 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |
| LC1D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | |
| U 0.75...1.25 Uc | JD | (5) | (5) | (5) | (5) | (5) | (5) | (5) | (5) | (5) | RD |
| LC1D80...D95 | | | | | | | | | | | |
| U 0.85...1.1 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |
| U 0.75...1.2 Uc | JW | BW | CW | EW | - | SW | FW | - | MW | - | - |
| LC1D115 and D150 (coil with built-in suppression device as standard) | | | | | | | | | | | |
| U 0.75...1.2 Uc | - | BD | - | ED | ND | SD | FD | GD | MD | UD | RD |

Low consumption DC (for low consumption AC/DC: Deca green contactors, page B8/18)

| Volts | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 |
|---|----|----|----|----|----|-----|-----|-----|
| LC1D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | |
| U 0.8...1.25 Uc | AL | JL | ZL | BL | EL | FL | ML | UL |

For other voltages between 5 and 690 V, see pages B8/45 to B8/48.

(1) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(2) LC1D09 to D80A: clip-on mounting on 35 mm rail NSYSR or screw fixing.
LC1D80 to D95 ~: clip-on mounting on 35 mm rail NSYSR or 75 mm rail AM1DL or screw fixing.
LC1D80 to D95 -: clip-on mounting on 75 mm rail AM1DL or screw fixing.

(3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1D09 to D38, 0.075 kg from LC1D40A to D80A and 1 kg for LC1D80 and D95.

(4) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).

(5) For these coil voltages, choose from Deca green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Example: LC1D40ABBE.

TeSys Control

Deca Contactors

Product references

PE121713.tif



LC1D123●●

PE121720.eps



LC1D80A3●●

3-pole contactors - Motor control up to 30 kW at 400 V, in category AC-3

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ($\theta \leq 60^\circ\text{C}$) | Rated operational current in AC-3 440 V up to | Instan- taneous auxiliary contacts | Basic reference, to be completed by adding the control voltage code ⁽¹⁾ |
|---|---|---|--|
| 220 V 380 V 415 V 440 V 500 V 660 V 1000 V 230 V 400 V | | | Fixing ⁽²⁾ |

| kW | kW | kW | kW | kW | kW | kW | A | | | |
|-----|-----|-----|-----|------|------|----|-------------------|---|---|-----------|
| 2.2 | 4 | 4 | 4 | 5.5 | 5.5 | | 9 | 1 | 1 | LC1D093●● |
| 3 | 5.5 | 5.5 | 5.5 | 7.5 | 7.5 | | 12 | 1 | 1 | LC1D123●● |
| 4 | 7.5 | 9 | 9 | 10 | 10 | | 18 | 1 | 1 | LC1D183●● |
| 5.5 | 11 | 11 | 11 | 15 | 15 | | 25 | 1 | 1 | LC1D253●● |
| 7.5 | 15 | 15 | 15 | 18.5 | 18.5 | | 32 ⁽³⁾ | 1 | 1 | LC1D323●● |

Power connections by EverLink® BTR screw connectors ⁽⁴⁾ and control by spring terminals

| | | | | | | | | | | |
|------|------|----|----|----|----|----|----|---|---|------------|
| 11 | 18.5 | 22 | 22 | 22 | 30 | 30 | 40 | 1 | 1 | LC1D40A3●● |
| 15 | 22 | 25 | 30 | 30 | 33 | 33 | 50 | 1 | 1 | LC1D50A3●● |
| 18.5 | 30 | 37 | 37 | 37 | 37 | 37 | 65 | 1 | 1 | LC1D65A3●● |
| 22 | 37 | 37 | 37 | 37 | 37 | 37 | 66 | 1 | 1 | LC1D80A3●● |

Connection by Faston connectors

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil and auxiliary terminals.

For contactors LC1D09 and LC1D12 only, replace the figure **3** with a **9** in the references selected above.

Example: LC1D093●● becomes LC1D099●●.

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/36 to B8/42.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

| a.c. supply | | | | | | | | | | | | | |
|---|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | |
| LC1D09...D80A | | | | | | | | | | | | | |
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | |
| d.c. supply | | | | | | | | | | | | | |
| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 | | |
| LC1D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | |
| U 0.7...1.25 U _c | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD | | |
| LC1D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | |
| U 0.75...1.25 U _c | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD | | |
| Low consumption | | | | | | | | | | | | | |
| Volts $\overline{\text{---}}$ | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 | | | | | |
| LC1D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | |
| U 0.8...1.25 U _c | AL | JL | ZL | BL | EL | FL | ML | UL | | | | | |

For other voltages between 5 and 690 V, see pages B8/45 to B8/48.

⁽¹⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

⁽²⁾ LC1D09 to D32: clip-on mounting on 35 mm $\overline{\text{---}}$ rail NSYS DR or screw fixing.

⁽³⁾ Must be wired with 2 x 4 mm² cables in parallel on the upstream side. On the downstream side, outgoing terminal block LAD331 may be used (Quickfit technology, see page B1/18). When wired with a single cable, the product is limited to 25 A (11 kW/400 V motors).

⁽⁴⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).



TeSys Control

Deca Contactors

Product references



LC1D09●●



LC1D80A●●



Contactors

For other voltages between 5 and 690 V, see pages B8/45 to B8/48.

- (1) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.
- (2) **LC1D09 to D80A**: clip-on mounting on 35 mm rail NSYSR or screw fixing.
LC1D80 and D95: clip-on mounting on 35 mm rail NSYSR or 75 mm rail AM1DL or screw fixing.
LC1 or **LP1D80 to D95**: clip-on mounting on 75 mm rail AM1DL or screw fixing.
LC1D115 and D150: clip-on mounting on 2 x 35 mm rails NSYSR or screw fixing.
- (3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from **LC1D09 to D38**, 0.075 kg from **LC1D40A to D80A** and 1 kg for **LC1D80 and D95**.
- (4) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).
- (5) Coordination tables according to the number of operating cycles, see AC-1 curve, page A6/40.
- (6) 32 A with 2 x 4 mm² cables connected in parallel.
- (7) For these coil voltages, choose from Deca green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60 V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Exemple: **LC1D40ABBE**.

3-pole contactors - Load control from 25 to 200 A in category AC-1

| Non inductive loads maximum current ($\theta \leq 60^\circ\text{C}$) utilisation category AC-1 | Number of poles | Instantaneous auxiliary contacts | Basic reference, to be completed by adding the control voltage code ⁽¹⁾ | Weight ⁽³⁾ |
|--|-----------------|----------------------------------|--|---|
| | | | Fixing ⁽²⁾ | |
| A | | | | kg |
| Connection by screw clamp terminals | | | | |
| 25 | 3 | 1 | 1 | LC1D09●● 0.320 or LC1D12●● 0.325 |
| 32 | 3 | 1 | 1 | LC1D18●● 0.330 |
| 40 | 3 | 1 | 1 | LC1D25●● 0.370 |
| 50 | 3 | 1 | 1 | LC1D32●● 0.375 or LC1D38●● 0.380 |
| Connection by EverLink®, BTR screw connectors ⁽⁴⁾ | | | | |
| 60 | 3 | 1 | 1 | LC1D40A●● 0.850 |
| 80 | 3 | 1 | 1 | LC1D50A●● 0.855 or LC1D65A●● ⁽⁵⁾ 0.860 or LC1D80A●● ⁽⁵⁾ 0.860 |
| Connection by screw clamp terminals or connectors | | | | |
| 125 | 3 | 1 | 1 | LC1D80●● 1.590 or LC1D95●● ⁽⁵⁾ 1.610 |
| 200 | 3 | 1 | 1 | LC1D115●● 2.500 or LC1D150●● ⁽⁶⁾ 2.500 |

3-pole contactors for connection by lugs

In the references selected above, insert a figure **6** before the voltage code.
 Example: **LC1D09●●** becomes **LC1D096●●**.

Standard control circuit voltages

(for other voltages, please consult your Regional Sales Office)

a.c. supply

| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
|---|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LC1D09...D150 (LC1D115 and D150 coils with built-in suppression device as standard) | | | | | | | | | | | | | |
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | S7 |
| LC1D09...D65 (not available with "connection for lugs or bars") | | | | | | | | | | | | | |
| 50 Hz | B5 | D5 | E5 | | | | P5 | | | | | | |
| LC1D80...D150 | | | | | | | | | | | | | |
| 50 Hz | B5 | D5 | E5 | F5 | FE5 | M5 | P5 | U5 | Q5 | V5 | N5 | R5 | S5 |
| 60 Hz | B6 | - | E6 | F6 | - | M6 | - | U6 | Q6 | - | - | R6 | - |

d.c. supply

| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 | | |
|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| LC1D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | |
| U 0.7...1.25 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD | | |
| LC1D40A ...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | |
| U 0.75...1.25 Uc | JD | (7) | (7) | (7) | (7) | (7) | (7) | (7) | (7) | (7) | RD | | |
| LC1 or LP1D80 and D95 | | | | | | | | | | | | | |
| U 0.85...1.1 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD | | |
| U 0.75...1.2 Uc | JW | BW | CW | EW | - | SW | FW | - | MW | - | - | | |
| LC1D115 and D150 (coils with built-in suppression device fitted as standard) | | | | | | | | | | | | | |
| U 0.75...1.2 Uc | - | BD | - | ED | ND | SD | FD | GD | MD | UD | RD | | |
| Low consumption | | | | | | | | | | | | | |
| Volts | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 | | | | | |
| LC1D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | |
| U 0.8...1.25 Uc | AL | JL | ZL | BL | EL | FL | ML | UL | | | | | |



LC1D123●●



LC1D80A3●●

3-pole contactors - Load control from 16 to 80 A in category AC-1

| Non inductive loads maximum current ($\theta \leq 60^\circ\text{C}$) utilisation category AC-1 | Number of poles | Instantaneous auxiliary contacts | Basic reference, to be completed by adding the control voltage code ⁽¹⁾ | Weight ⁽³⁾ |
|--|-----------------|----------------------------------|--|-----------------------|
| | | | Fixing ⁽²⁾ | |

| A | Connection by spring terminals | | | kg | |
|----|--------------------------------|---|---|--|-------------------------|
| 16 | 3 | 1 | 1 | LC1D093●● ⁽⁴⁾ or LC1D123●● ⁽⁴⁾ | 0.320 0.325 |
| 25 | 3 | 1 | 1 | LC1D183●● ⁽⁵⁾ or LC1D253●● ⁽⁶⁾ or LC1D323●● ⁽⁶⁾ | 0.335 0.325 0.325 |

Power connections by EverLink® BTR screw connectors ⁽⁷⁾ and control by spring terminals

| | | | | | |
|----|---|---|---|---|-------------------------|
| 60 | 3 | 1 | 1 | LC1D40A3●● | 0.850 |
| 80 | 3 | 1 | 1 | LC1D50A3●● ⁽⁸⁾ or LC1D65A3●● ⁽⁸⁾ or LC1D80A3●● ⁽⁸⁾ | 0.855 0.860 0.860 |

3-pole contactors for connection by Faston connectors

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil terminals. For contactors LC1D09 and LC1D12 only, in the references selected from the previous page, insert a figure **9** before the voltage code. Example: **LC1D09●●** becomes **LC1D099●●**.

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/36 to B8/42.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

| a.c. supply | | | | | | | | | | | | | |
|--|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
| LC1D09...D80A | | | | | | | | | | | | | |
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | S7 |
| d.c. supply | | | | | | | | | | | | | |
| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 | | |
| LC1D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | |
| U 0.7...1.25 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD | | |
| LC1D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | |
| U 0.75...1.25 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD | | |
| Low consumption | | | | | | | | | | | | | |
| Volts | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 | | | | | |
| LC1D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | |
| U 0.8...1.25 Uc | AL | JL | ZL | BL | EL | FL | ML | UL | | | | | |

For other voltages between 5 and 690 V, see pages B8/45 to B8/48.

- (1) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.
- (2) LC1D09 to D80A: clip-on mounting on 35 mm rail NSYS DR or screw fixing.
- (3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1D09 to D38 and 0.075 kg from LC1D40A to D80A.
- (4) 20 A with 2 x 2.5 mm² cables connected in parallel.
- (5) 32 A with 2 x 4 mm² cables connected in parallel.
- (6) 40 A with 2 x 4 mm² cables connected in parallel.
- (7) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).
- (8) Coordination tables according to the number of operating cycles, see AC-1 curve, page A6/40.

TeSys Control

Deca Contactors

Product references

PB121714.fr



LC1DT20●●

PB121715.fr



LC1DT80A●●

PB108321.eps



LC1D65008●●



Contactors

4-pole contactors - Load control, 20 to 200 A in category AC-1

| Non inductive loads maximum current ($\theta \leq 60^\circ\text{C}$) utilisation category AC-1 | Number of poles | Instantaneous auxiliary contacts | Basic reference, to be completed by adding the control voltage code ⁽¹⁾ Fixing ⁽²⁾ | Weight ⁽³⁾ |
|--|-----------------|----------------------------------|--|-----------------------|
| | | | | |

A kg

Connection by screw clamp terminals

| | | | | | | |
|----|---|---|---|---|-----------|-------|
| 20 | 4 | – | 1 | 1 | LC1DT20●● | 0.365 |
| | 2 | 2 | 1 | 1 | LC1D098●● | 0.365 |
| 25 | 4 | – | 1 | 1 | LC1DT25●● | 0.365 |
| | 2 | 2 | 1 | 1 | LC1D128●● | 0.365 |
| 32 | 4 | – | 1 | 1 | LC1DT32●● | 0.425 |
| | 2 | 2 | 1 | 1 | LC1D188●● | 0.425 |
| 40 | 4 | – | 1 | 1 | LC1DT40●● | 0.425 |
| | 2 | 2 | 1 | 1 | LC1D258●● | 0.425 |

Connection by EverLink®, BTR screw connectors

| | | | | | | |
|----|---|---|---|---|------------|-------|
| 60 | 4 | – | 1 | 1 | LC1DT60A●● | 1.090 |
| 80 | 4 | – | 1 | 1 | LC1DT80A●● | 1.150 |

Connection by screw clamp terminals or connectors

| | | | | | | |
|-----|---|---|---|---|----------------|-------|
| 60 | 2 | 2 | – | – | LC1D40008●● | 1.440 |
| | | | | | or LP1D40008●● | 2.210 |
| 80 | 2 | 2 | – | – | LC1D65008●● | 1.450 |
| | | | | | or LP1D65008●● | 2.220 |
| 125 | 4 | – | – | – | LC1D80004●● | 1.760 |
| | | | | | or LP1D80004●● | 2.685 |
| | 2 | 2 | – | – | LC1D80008●● | 1.840 |
| | | | | | or LP1D80008●● | 2.910 |
| 200 | 4 | – | – | – | LC1D115004●● | 2.860 |

4-pole contactors for connection by lugs or bars

In the references selected above, insert a figure 6 before the voltage code.

Example: LC1DT20●● becomes LC1DT206●●.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply

| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
|---|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LC1D09...D150 and LC1DT20...DT80A (LC1D115 and D150 coils with built-in suppression device as standard) | | | | | | | | | | | | | |
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | – |
| LC1D80...D115 | | | | | | | | | | | | | |
| 50 Hz | B5 | D5 | E5 | F5 | FE5 | M5 | P5 | U5 | Q5 | V5 | N5 | R5 | S5 |
| 60 Hz | B6 | – | E6 | F6 | – | M6 | – | U6 | Q6 | – | – | R6 | – |

d.c. supply

| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 |
|--|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | |
| U 0.75...1.25 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |
| LC1DT60A ...DT80A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | |
| U 0.75...1.25 Uc | JD | (4) | (4) | (4) | (4) | (4) | (4) | (4) | (4) | (4) | RD |
| LP1D40...D80 | | | | | | | | | | | |
| U 0.85...1.1 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |
| U 0.75...1.2 Uc | JW | BW | CW | EW | – | SW | FW | – | MW | – | – |
| LC1D115 (coil with built-in suppression device as standard) | | | | | | | | | | | |
| U 0.75...1.2 Uc | – | BD | – | ED | ND | SD | FD | GD | MD | UD | RD |

Low consumption

| Volts | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 |
|--|----|----|----|----|----|-----|-----|-----|
| LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | |
| U 0.8...1.25 Uc | AL | JL | ZL | BL | EL | FL | ML | UL |

For other voltages between 5 and 690 V, see pages B8/45 to B8/48.

(1) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(2) LC1D09 to D38 and LC1DT20 to DT80A: clip-on mounting on 35 mm rail NSYSR or screw fixing.

LC1D80 ~: clip-on mounting on 35 mm rail NSYSR or 75 mm rail AM1DL or screw fixing.

LC1 or LP1D80 ~: clip-on mounting on 75 mm rail AM1DL or screw fixing.

LC1D115 and D150: clip-on mounting on 2 x 35 mm rails NSYSR or screw fixing.

(3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1D09 to D38, 0.075 kg from LC1DT60A and D80A and 1 kg for LC1D80.

(4) For these coil voltages, choose from Deca green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60 V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Example: LC1DT60ABBE.

TeSys Control

Deca Contactors

Product references



LC1DT253●●



LC1DT80A3●●

4-pole contactors - Load control, 20 to 80 A in category AC-1

| Non inductive loads maximum current ($\theta \leq 60^\circ\text{C}$) utilisation category AC-1 | Number of poles | Instantaneous auxiliary contacts | Basic reference, to be completed by adding the voltage code ⁽¹⁾ | Weight ⁽³⁾ |
|--|-----------------|----------------------------------|--|-----------------------|
| | | | Fixing ⁽²⁾ | |

A **kg**

| Connection by spring terminals | | | | | | |
|--------------------------------|---|---|---|---|------------|-------|
| 20 | 4 | – | 1 | 1 | LC1DT203●● | 0.380 |
| | 2 | 2 | 1 | 1 | LC1D0983●● | 0.380 |
| 25 | 4 | – | 1 | 1 | LC1DT253●● | 0.380 |
| | 2 | 2 | 1 | 1 | LC1D1283●● | 0.380 |
| 32 | 4 | – | 1 | 1 | LC1DT323●● | 0.425 |
| | 2 | 2 | 1 | 1 | LC1D1883●● | 0.425 |
| 40 | 4 | – | 1 | 1 | LC1DT403●● | 0.425 |
| | 2 | 2 | 1 | 1 | LC1D2583●● | 0.425 |

Connection by EverLink®, BTR screw connectors and control circuit by spring terminals

| | | | | | | |
|----|---|---|---|---|-------------|-------|
| 60 | 4 | – | 1 | 1 | LC1DT60A3●● | 1.090 |
| 80 | 4 | – | 1 | 1 | LC1DT80A3●● | 1.150 |

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/36 to B8/42.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

| a.c. supply | Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
|-------------|-------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|-------------|-------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

LC1D09...D25 and LC1DT20...DT80A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

| | | | | | | | | | | | | | |
|----------|----|----|----|----|-----|----|----|----|----|----|----|----|---|
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | – |
|----------|----|----|----|----|-----|----|----|----|----|----|----|----|---|

d.c. supply

| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 |
|-------|----|----|----|----|----|----|-----|-----|-----|-----|-----|
|-------|----|----|----|----|----|----|-----|-----|-----|-----|-----|

LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

| | | | | | | | | | | | |
|-----------------|----|----|----|----|----|----|----|----|----|----|----|
| U 0.7...1.25 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |
|-----------------|----|----|----|----|----|----|----|----|----|----|----|

LC1DT60A...80A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

| | | | | | | | | | | | |
|------------------|----|----|----|----|----|----|----|----|----|----|----|
| U 0.75...1.25 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |
|------------------|----|----|----|----|----|----|----|----|----|----|----|

Low consumption

| Volts | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 |
|-------|---|----|----|----|----|-----|-----|-----|
|-------|---|----|----|----|----|-----|-----|-----|

LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

| | | | | | | | | |
|-----------------|----|----|----|----|----|----|----|----|
| U 0.8...1.25 Uc | AL | JL | ZL | BL | EL | FL | ML | UL |
|-----------------|----|----|----|----|----|----|----|----|

For other voltages between 5 and 690 V, see pages B8/45 to B8/48.

(1) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(2) LC1D09 to D38 and LC1DT20 to DT80A: clip-on mounting on 35 mm U_L rail NSYS DR or screw fixing.

(3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1D09 to D38, 0.075 kg for LC1DT60A and DT80A.



LC1D09●●



LC1D25●●



LC1D80A●●



LC1D95●●

Contactors conforming to UL and CSA standards (North American market) - 25 to 160 A

| Standard power ratings of motors 50/60 Hz | | | | | | Associated cable type 75 °C-Cu | UL continuous current | Type of contactor required Basic reference, to be completed by adding the control voltage code ⁽¹⁾ Fixing, connection ⁽²⁾ |
|---|-------|-------------|-------|-------|-------|--------------------------------|-----------------------|---|
| Single-phase 1 Ø | | 3-phase 3 Ø | | | | | | |
| 120 V | 240 V | 208 V | 240 V | 480 V | 600 V | | | |
| HP | HP | HP | HP | HP | HP | | A | |

| Connection by screw clamp terminals | | | | | | | | |
|-------------------------------------|---|-----|-----|-----|-----|-------------|----|-------------------------|
| 1/3 | 1 | 2 | 2 | 5 | 7.5 | AWG 18 - 10 | 25 | LC1D09●● |
| 0.5 | 2 | 3 | 3 | 7.5 | 10 | AWG 18 - 10 | 25 | LC1D12●● |
| 1 | 3 | 5 | 5 | 10 | 15 | AWG 18 - 8 | 32 | LC1D18●● |
| 2 | 3 | 7.5 | 7.5 | 15 | 20 | AWG 14 - 6 | 40 | LC1D25●● |
| 2 | 5 | 10 | 10 | 20 | 25 | AWG 14 - 6 | 50 | LC1D32●● ⁽³⁾ |
| 2 | 5 | 10 | 10 | 20 | 25 | AWG 14 - 6 | 50 | LC1D38●● ⁽³⁾ |

| Power connections by EverLink® BTR screw connectors and control by spring terminals | | | | | | | | |
|---|-----|----|----|----|----|------------|----|-----------|
| 3 | 5 | 10 | 10 | 30 | 30 | AWG 16 - 2 | 60 | LC1D40A●● |
| 3 | 7.5 | 15 | 15 | 40 | 40 | AWG 16 - 2 | 70 | LC1D50A●● |
| 5 | 10 | 20 | 20 | 40 | 50 | AWG 16 - 2 | 80 | LC1D65A●● |
| 5 | 10 | 20 | 20 | 40 | 50 | AWG 16 - 2 | 80 | LC1D80A●● |

| Connection by screw clamp terminals or connectors | | | | | | | | |
|---|----|----|----|-----|-----|------------|-----|-----------|
| 7.5 | 15 | 25 | 30 | 60 | 60 | AWG 10 - 2 | 110 | LC1D80●● |
| 7.5 | 15 | 25 | 30 | 60 | 60 | AWG 10 - 2 | 110 | LC1D95●● |
| - | - | 30 | 40 | 75 | 100 | AWG 8-1/0 | 160 | LC1D115●● |
| - | - | 40 | 50 | 100 | 125 | AWG 8-1/0 | 160 | LC1D150●● |

Applications with High-Fault Short-Circuit ratings

High-fault short-circuit current ratings are: 100 kA (D09-80, D115-150) at 600 V with Class J fuses and 85 kA (D09-38), 100 kA (D40A-80, D115-150) at 480 V and 50 kA (D09-80, D115-150) at 600 V with circuit breakers.

Application example

For a 15 HP-230 V motor

Select a contactor type **LC1D50A**.

Information: the contactor rating selected corresponds to "size 2", the associated cable is type AWG3 75 °C-Cu.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

| a.c. supply | | | | | | | | | | | | | | | | |
|---|----|----|----|-----|-----|-------------------|--------------------|-----|-----|-----|-----|-----|-----|-------------------|-----|-----|
| Volts | 24 | 42 | 48 | 110 | 115 | 120 | 208 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 480 | 500 |
| LC1D09...D150 (D115 and D150 coils with built-in suppression device as standard) | | | | | | | | | | | | | | | | |
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | G7 ⁽⁴⁾ | LE7 ⁽⁴⁾ | M7 | P7 | Q7 | V7 | N7 | R7 | T7 ⁽⁴⁾ | S7 | |
| LC1D09...D65 (not available with "connection for lugs or bars") | | | | | | | | | | | | | | | | |
| 50 Hz | B5 | D5 | E5 | | | | | | P5 | | | | | | | |
| LC1D80...D115 | | | | | | | | | | | | | | | | |
| 50 Hz | B5 | D5 | E5 | F5 | FE5 | G5 | - | M5 | P5 | U5 | Q5 | V5 | N5 | R5 | - | S5 |
| 60 Hz | B6 | - | E6 | F6 | - | G6 | L6 | M6 | - | U6 | Q6 | - | - | R6 | T6 | - |

| d.c. supply | | | | | | | | | | | | | | | | |
|--|----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|--|--|--|--|--|
| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 | | | | | |
| LC1D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | | | | |
| U 0.7...1.25 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD | | | | | |
| LC1D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | | | | | | |
| U 0.75...1.25 Uc | JD | ⁽⁵⁾ | ⁽⁵⁾ | ⁽⁵⁾ | ⁽⁵⁾ | ⁽⁵⁾ | ⁽⁵⁾ | ⁽⁵⁾ | ⁽⁵⁾ | ⁽⁵⁾ | RD | | | | | |
| LC1D80 and D95 | | | | | | | | | | | | | | | | |
| U 0.85...1.1 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD | | | | | |
| U 0.75...1.2 Uc | JW | BW | CW | EW | - | SW | FW | - | MW | - | - | | | | | |
| LC1D115 and D150 (coils with built-in suppression device as standard) | | | | | | | | | | | | | | | | |
| U 0.75...1.2 Uc | - | BD | - | ED | ND | SD | FD | GD | MD | UD | RD | | | | | |

| Low consumption | | | | | | | | | | | |
|--|----|----|----|----|----|----|-----|-----|-----|--|--|
| Volts ~ | 5 | 12 | 20 | 24 | 48 | 72 | 110 | 220 | 250 | | |
| LC1D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | |
| U 0.8...1.25 Uc | AL | JL | ZL | BL | EL | SL | FL | ML | UL | | |

- (1) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.
- (2) LC1D09 to D65A: clip-on mounting on 35 mm L rail NSYSR or screw fixing.
LC1D80 and LC1D95: clip-on mounting on 35 mm L rail NSYSR or 75 mm L rail AM1DL or screw fixing.
- (3) Versions with spring terminals LC1D323 and LC1D383 are not certified UL/CSA.
- (4) Contactors LC1D40A, 50A, 65A, 80A: for this coil voltage use is only on 60 Hz.
- (5) For these coil voltages, choose from Deca green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60 V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Example: LC1D40ABBE.

TeSys Control

Deca Reversing contactors

Product references



LC2D12●●



LC2D65A●●



LC2D115●●

3-pole reversing contactors - Motors up to 75 kW / 400 V in category AC-3

Horizontally mounted - Pre-wired power connections.

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ($\theta \leq 60^\circ\text{C}$) | | | | | | | | Rated opera- tional current in AC-3 440 V up to | Instan- taneous auxiliary contacts per contactor | Contactors supplied with coil Basic reference, to be completed by adding the control voltage code ⁽¹⁾ | | Weight ⁽³⁾ |
|---|-------|-------|-------|-------|-------|--------|-----------------------|---|---|--|--|--------------------------|
| 220 V | 380 V | 415 V | 440 V | 500 V | 660 V | 1000 V | Fixing ⁽²⁾ | | | | | |
| 230 V | 400 V | | | | 690 V | | | | | | | |
| kW | kW | kW | kW | kW | kW | kW | A | | | | | kg |

With mechanical interlock, without electrical interlocking, for connection by screw clamp terminals or connectors

| | | | | | | | | | | | |
|------|------|------|------|------|------|---|----|---|---|-------------------------|-------|
| 2.2 | 4 | 4 | 4 | 5.5 | 5.5 | - | 9 | 1 | 1 | LC2D09●● ⁽⁴⁾ | 0.687 |
| 3 | 5.5 | 5.5 | 5.5 | 7.5 | 7.5 | - | 12 | 1 | 1 | LC2D12●● ⁽⁴⁾ | 0.697 |
| 4 | 7.5 | 9 | 9 | 10 | 10 | - | 18 | 1 | 1 | LC2D18●● ⁽⁴⁾ | 0.707 |
| 5.5 | 11 | 11 | 11 | 15 | 15 | - | 25 | 1 | 1 | LC2D25●● ⁽⁴⁾ | 0.787 |
| 7.5 | 15 | 15 | 15 | 18.5 | 18.5 | - | 32 | 1 | 1 | LC2D32●● ⁽⁴⁾ | 0.797 |
| 9 | 18.5 | 18.5 | 18.5 | 18.5 | 18.5 | - | 38 | 1 | 1 | LC2D38●● ⁽⁴⁾ | 0.807 |
| 11 | 18.5 | 22 | 22 | 22 | 30 | - | 40 | 1 | 1 | LC2D40A●● | 1.870 |
| 15 | 22 | 25 | 30 | 30 | 33 | - | 50 | 1 | 1 | LC2D50A●● | 1.880 |
| 18.5 | 30 | 37 | 37 | 37 | 37 | - | 65 | 1 | 1 | LC2D65A●● | 1.890 |
| 22 | 37 | 45 | 45 | 55 | 45 | - | 80 | 1 | 1 | LC2D80●● | 3.200 |
| 25 | 45 | 45 | 45 | 55 | 45 | - | 95 | 1 | 1 | LC2D95●● | 3.200 |

With mechanical interlock and electrical interlocking, for connection by screw clamp terminals or connectors

| | | | | | | | | | | | |
|----|----|----|----|----|-----|----|-----|---|---|-----------|-------|
| 30 | 55 | 59 | 59 | 75 | 80 | 65 | 115 | 1 | 1 | LC2D115●● | 6.350 |
| 40 | 75 | 80 | 80 | 90 | 100 | 75 | 150 | 1 | 1 | LC2D150●● | 6.400 |

Connection by lugs or bars

For reversing contactors LC2D09 to LC2D38, LC2D115 and LC2D150, in the references selected above, insert a figure **6** before the voltage code. Example: **LC2D09●●** becomes **LC2D096●●**.

To build a 40 to 65 A reversing contactor, for connection by lugs, order 2 contactors **LC1D●●A6** and mechanical interlock **LAD4CM** (see page B8/43).

Component parts

Auxiliary contact blocks and add-on modules: see pages B8/36 to B8/42.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply

| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
|--|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LC2D09...D150 (D115 and D150 coils with built-in suppression device as standard) | | | | | | | | | | | | | |
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | S7 |
| LC2D80...D115 | | | | | | | | | | | | | |
| 50 Hz | B5 | D5 | E5 | F5 | FE5 | M5 | P5 | U5 | Q5 | V5 | N5 | R5 | S5 |
| 60 Hz | B6 | - | E6 | F6 | - | M6 | - | U6 | Q6 | - | - | R6 | - |

d.c. supply

| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 |
|---|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| LC2D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | |
| U 0.7...1.25 U _c | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |
| LC2D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | |
| U 0.75...1.25 U _c | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |

Low consumption

| Volts --- | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 |
|---|----|----|----|----|----|-----|-----|-----|
| LC2D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | |
| U 0.8...1.25 U _c | AL | JL | ZL | BL | EL | FL | ML | UL |

For other voltages between 5 and 690 V, see pages B8/45 to B8/48.

(1) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(2) LC2D09 to D65A: clip-on mounting on 35 mm rail NSYSR or screw fixing.

LC2D80 and D95: clip-on mounting on 35 mm rail NSYSR or 75 mm rail AM1DL or screw fixing.

LC2D115 and D150: clip-on mounting on 35 mm rail NSYSR or screw fixing.

(3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.330 kg for LC2D09 to D38, 0.150 kg for LC1D40A to D65A.

(4) For reversing contactors with electrical interlocking pre-wired at the factory, add suffix V to the references selected above. Example: LC2D09B7 becomes LC2D09B7V.

Note: when assembling a reversing contactor, it is good practice to incorporate a 50 ms time delay.



TeSys Control

Deca Reversing contactors

Product references



LC2D123●●

3-pole reversing contactors - Motors up to 15 kW / 400 V in category AC-3

Pre-wired power connections.

Mechanical interlock without electrical interlocking.

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ($\theta \leq 60^\circ\text{C}$) | | Rated operational current in AC-3 440 V up to | Instantaneous auxiliary contacts per contactor | Contactors supplied with coil Basic reference, to be completed by adding the voltage code ⁽¹⁾ | Weight ⁽³⁾ |
|---|----------------|---|--|---|-----------------------|
| 220 V 230 V | 380 V 400 V | 415 V 440 V | 500 V 690 V | | Fixing ⁽²⁾ |
| kW | kW | kW | kW | | |

For connection by spring terminals

| | | | | | | | | | | |
|-----|-----|-----|-----|------|------|-------------------|---|---|-----------|-------|
| 2.2 | 4 | 4 | 4 | 5.5 | 5.5 | 9 | 1 | 1 | LC2D093●● | 0.687 |
| 3 | 5.5 | 5.5 | 5.5 | 7.5 | 7.5 | 12 | 1 | 1 | LC2D123●● | 0.697 |
| 4 | 7.5 | 9 | 9 | 10 | 10 | 18 | 1 | 1 | LC2D183●● | 0.707 |
| 5.5 | 11 | 11 | 11 | 15 | 15 | 25 | 1 | 1 | LC2D253●● | 0.787 |
| 7.5 | 15 | 15 | 15 | 18.5 | 18.5 | 32 ⁽⁴⁾ | 1 | 1 | LC2D323●● | 0.797 |

Power connection by EverLink[®], BTR screw connectors ⁽⁵⁾ and control by spring terminals

| | | | | | | | | | | |
|------|------|----|----|----|----|----|---|---|------------|-------|
| 11 | 18.5 | 22 | 22 | 22 | 30 | 40 | 1 | 1 | LC2D40A3●● | 1.870 |
| 15 | 22 | 25 | 30 | 30 | 33 | 50 | 1 | 1 | LC2D50A3●● | 1.880 |
| 18.5 | 30 | 37 | 37 | 37 | 37 | 65 | 1 | 1 | LC2D65A3●● | 1.890 |

For connection by Faston connectors

All power connections are to be made by the customer.

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil terminals.

For reversing contactors LC2D09 and LC2D12 only, in the references selected above, replace the figure 3 before the voltage code with a figure 9.

Example: LC2D093●● becomes LC2D099●●.

Component parts

Auxiliary contact blocks and add-on modules: see pages B8/36 to B8/42.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply

| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
|---------------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LC2D09...D65A | | | | | | | | | | | | | |
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | S7 |

d.c. supply

| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 |
|---|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| LC2D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | |
| U 0.7...1.25 U _c | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |
| LC2D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | | | | |
| U 0.75...1.25 U _c | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |

Low consumption

| Volts --- | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 |
|---|----|----|----|----|----|-----|-----|-----|
| LC2D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode) | | | | | | | | |
| U 0.8...1.25 U _c | AL | JL | ZL | BL | EL | FL | ML | UL |

For other voltages between 5 and 690 V, see pages B8/45 to B8/48.

⁽¹⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

⁽²⁾ LC2D09 to D32: clip-on mounting on 35 mm rail NSYSDR or screw fixing.

⁽³⁾ The weights indicated are for reversing contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.330 kg for LC2D09 to D32, 0.150 kg for LC2D40A to D65A.

⁽⁴⁾ Must be wired with 2 x 4 mm² cables in parallel on the upstream side. On the downstream side, outgoing terminal block LAD331 may be used (Quickfit technology, see page B1/18). When wired with a single cable, the product is limited to 25 A (11 kW/400 V motors).

⁽⁵⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).

TeSys Control

Deca Changeover contactors

Product references



LC2DT20●●



LC2D115004●●

4-pole changeover contactor pairs - 20 to 200 A in category AC-1

Pre-assembled. Pre-wired power connections

LC2DT20 to LC2DT40: mechanical interlock without electrical interlocking.

LC2D80004: order separately 2 auxiliary contact blocks LADN●1 to obtain electrical interlocking between the 2 contactors (see page B8/36).

For electrical interlocking incorporated in the mechanical interlock, please consult your Regional Sales Office.

LC2D115004: mechanical interlock with integral, pre-wired electrical interlocking.

For connection by screw clamp terminals or connectors

| Utilisation category AC-1 Non-inductive loads Maximum rated operational current ($\theta \leq 60^\circ\text{C}$) | Instantaneous auxiliary contacts per contactor | | Contactors supplied with coil | Weight kg |
|--|---|---|---|--------------|
| | | | Basic reference, to be completed by adding the voltage code ⁽¹⁾⁽²⁾ Fixing ⁽³⁾ | |
| 20 | 1 | 1 | LC2DT20●● | 0.730 |
| 25 | 1 | 1 | LC2DT25●● | 0.730 |
| 32 | 1 | 1 | LC2DT32●● | 0.850 |
| 40 | 1 | 1 | LC2DT40●● | 0.850 |
| 125 | – | – | LC2D80004●● | 3.200 |
| 200 | – | – | LC2D115004●● | 7.400 |

For connection by lugs or bars

| | | | | |
|----|---|---|------------|-------|
| 20 | 1 | 1 | LC2DT206●● | 0.730 |
| 25 | 1 | 1 | LC2DT256●● | 0.730 |
| 32 | 1 | 1 | LC2DT326●● | 0.850 |
| 40 | 1 | 1 | LC2DT406●● | 0.850 |

For customer assembly

For connection by screw clamp terminals or connectors

| | | | | |
|----|---|---|---------------------------|---|
| 60 | 1 | 1 | LC1DT60A●● ⁽⁴⁾ | – |
| 80 | 1 | 1 | LC1DT80A●● ⁽⁴⁾ | – |

For connection by lugs or bars

| | | | | |
|----|---|---|----------------------------|---|
| 60 | 1 | 1 | LC1DT60A6●● ⁽⁴⁾ | – |
| 80 | 1 | 1 | LC1DT80A6●● ⁽⁴⁾ | – |

Auxiliary contact blocks and add-on modules: see pages B8/36 to B8/42.

Note: when assembling changeover contactor pairs, it is good practice to incorporate a 50 ms time delay.

⁽¹⁾ See note ⁽²⁾ on next page.

⁽²⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

⁽³⁾ LC2DT20 to LC2DT80: clip-on mounting on 35 mm \perp rail NSYS DR or screw fixing.
LC2D80: clip-on mounting on 35 mm \perp rail NSYS DR or 75 mm \perp rail AM1 DL or screw fixing.

LC2D115: clip-on mounting on 2 x 35 mm \perp rails NSYS DR or screw fixing.

⁽⁴⁾ For these operational currents, order 2 identical contactors and a mechanical interlock LAD4 CM (see page B8/43).





Example of necessary components for customer assembly:
2 x LC1DT80A3 contactors + LAD4CM mechanical interlock

4-pole changeover contactor pairs for 20 to 80 A control in category AC-1

Pre-assembled, for customer assembly

Pre-wired power connections, for connection by spring terminals.

| Utilisation category AC-1 Non-inductive loads Maximum rated operational current ($\theta \leq 60^\circ\text{C}$) | Instantaneous auxiliary contacts per contactor | Contactors supplied with coil |
|--|---|---|
| | | Basic reference, to be completed by adding the control voltage code ⁽¹⁾ |
| | | Fixing ⁽²⁾ |

| A | | | |
|----|---|---|------------|
| 20 | 1 | 1 | LC2DT203●● |

Power connection by EverLink®, BTR screw connectors ⁽³⁾ and control by spring terminals

| | | | |
|----|---|---|----------------------------|
| 60 | 1 | 1 | LC1DT60A3●● ⁽⁴⁾ |
| 80 | 1 | 1 | LC1DT80A3●● ⁽⁴⁾ |

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/19 to B8/19.

Standard control circuit voltages

(for other voltages, please consult your Regional Sales Office)

a.c. supply

| Volts | 24 | 42 | 48 | 110 | 115 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
|-------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|-------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

LC2DT20...DT40, LC2DT60A...DT80A

| | | | | | | | | | | | | | |
|----------|----|----|----|----|-----|----|----|----|----|----|----|----|---|
| 50/60 Hz | B7 | D7 | E7 | F7 | FE7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 | - |
|----------|----|----|----|----|-----|----|----|----|----|----|----|----|---|

LC2D80004...D115004

| | | | | | | | | | | | | | |
|-------|----|----|----|----|-----|----|----|----|----|----|----|----|----|
| 50 Hz | B5 | D5 | E5 | F5 | FE5 | M5 | P5 | U5 | Q5 | V5 | N5 | R5 | S5 |
|-------|----|----|----|----|-----|----|----|----|----|----|----|----|----|

| | | | | | | | | | | | | | |
|-------|----|---|----|----|---|----|---|----|----|---|---|----|---|
| 60 Hz | B6 | - | E6 | F6 | - | M6 | - | U6 | Q6 | - | - | R6 | - |
|-------|----|---|----|----|---|----|---|----|----|---|---|----|---|

d.c. supply

| Volts | 12 | 24 | 36 | 48 | 60 | 72 | 110 | 125 | 220 | 250 | 440 |
|-------|----|----|----|----|----|----|-----|-----|-----|-----|-----|
|-------|----|----|----|----|----|----|-----|-----|-----|-----|-----|

LC2DT20...DT40, LC1DT60...DT80 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

| | | | | | | | | | | | |
|-----------------|----|----|----|----|----|----|----|----|----|----|----|
| U 0.7...1.25 Uc | JD | BD | CD | ED | ND | SD | FD | GD | MD | UD | RD |
|-----------------|----|----|----|----|----|----|----|----|----|----|----|

Low consumption

| Volts --- | 5 | 12 | 20 | 24 | 48 | 110 | 220 | 250 |
|-----------|---|----|----|----|----|-----|-----|-----|
|-----------|---|----|----|----|----|-----|-----|-----|

LC2DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

| | | | | | | | | |
|-----------------|----|----|----|----|----|----|----|----|
| U 0.8...1.25 Uc | AL | JL | ZL | BL | EL | FL | ML | UL |
|-----------------|----|----|----|----|----|----|----|----|

For other voltages between 5 and 690 V, see pages B8/19 to B8/19.

⁽¹⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

⁽²⁾ Clip-on mounting on 35 mm rail NSYSR or screw fixing.

⁽³⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/19).

⁽⁴⁾ For these operational currents, order 2 identical contactors and a mechanical interlock LAD4CM (see page B8/19).



TeSys Control

Deca green Reversing contactors

Product references

PE121720.fr



LC2D09●●●

PE121721.fr



LC2D40●●●

Deca green contactors have a dark grey casing and a 3-character code voltage.

3-pole reversing contactors - Motors up to 37 kW / 400 V in category AC-3

Pre-wired power connections

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ($\theta \leq 60^\circ\text{C}$) | | | | | | | Rated operational current in AC-3 440 V up to | Instantaneous auxiliary contacts per contactor | Contactors supplied with coil Partial reference, to be completed by adding the control voltage code ⁽¹⁾ | Weight |
|---|-------|-------|-------|-------|-------|-------|---|--|--|--------|
| 220 V | 380 V | 415 V | 440 V | 500 V | 660 V | 690 V | | | | |
| 230 V | 400 V | | | | | | | | Fixing ⁽²⁾ | |
| kW | kW | kW | kW | kW | kW | kW | A | | | kg |

With mechanical interlock, without electrical interlocking, for connection by screw clamp terminals or Everlink BTR screw connectors ^{(3) (4)}

| | | | | | | | | | | |
|------|------|------|------|------|------|----|---|---|---------------------------|-------|
| 2.2 | 4 | 4 | 4 | 5.5 | 5.5 | 9 | 1 | 1 | LC2D09●●● | 0.783 |
| 3 | 5.5 | 5.5 | 5.5 | 7.5 | 7.5 | 12 | 1 | 1 | LC2D12●●● | 0.793 |
| 4 | 7.5 | 9 | 9 | 10 | 10 | 18 | 1 | 1 | LC2D18●●● | 0.803 |
| 5.5 | 11 | 11 | 11 | 15 | 15 | 25 | 1 | 1 | LC2D25●●● | 0.913 |
| 7.5 | 15 | 15 | 15 | 18.5 | 18.5 | 32 | 1 | 1 | LC2D32●●● | 0.923 |
| 9 | 18.5 | 18.5 | 18.5 | 18.5 | 18.5 | 38 | 1 | 1 | LC2D38●●● | 0.933 |
| 11 | 18.5 | 22 | 22 | 22 | 30 | 40 | 1 | 1 | LC2D40A●●● ⁽³⁾ | 2.154 |
| 15 | 22 | 25 | 30 | 30 | 33 | 50 | 1 | 1 | LC2D50A●●● ⁽³⁾ | 2.164 |
| 18.5 | 30 | 37 | 37 | 37 | 37 | 65 | 1 | 1 | LC2D65A●●● ⁽³⁾ | 2.174 |
| 22 | 37 | 37 | 37 | 37 | 37 | 66 | 1 | 1 | LC2D80A●●● ⁽³⁾ | 2.174 |

Auxiliary contact blocks and add-on modules

See pages B8/36 to B8/42.

Coil voltage codes

AC/DC 24 V DC supply

| Volts | 24 (DC only) | 24-60 | 48-130 | 100-250 |
|-------------------------|--------------|-------|--------|---------|
| LC2D09...D32, | | | | |
| LC2D40A ... D80A | | | | |
| U 0.85...1.1 Uc | | BNE | EHE | KUE |
| LC2D09...D38 | | | | |
| U 0.8...1.2 Uc | | BNE | | |
| LC2D40A ...D80A | | | | |
| U 0.8...1.2 Uc | | BBE | | |

(1) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(2) LC2D09 to D80A: clip-on mounting on 35 mm rail NSYSR or screw fixing.

(3) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).

(4) Electrical interlocking is recommended when 2 orders (direct and reverse) could appeared in the same time.



Contactors

TeSys Control

Deca Contactors for switching capacitor banks

Product references



LC1DGK●●, LC1DLK●●, LC1DMK●●



LC1DWK12●●



Contactors

Contactors for switching 3-phase capacitor banks (power factor correction)

Special contactors **LC1D●K** are designed for switching 3-phase, single or multiple-step capacitor banks (up to 6 steps). Over 6 steps, it is recommended to use chokes in order to limit the inrush current and thus improve the lifetime of the installation. The contactors conform to standards IEC 60070 and 60831, UL and CSA.

Contactor applications

Specification

Contactors fitted with a block of early make poles and damping resistors, limiting the value of the current on closing to 60 In max.

This current limitation increases the life of all the components of the installation, in particular that of the fuses and capacitors.

Operating conditions

Short-circuit protection must be provided by gI type fuses rated at 1.7...2 In.

It will ensure the service continuity of the whole installation in case of a capacitor contactor end of life

Maximum operational power

The power values given in the selection table below are for the following operating conditions:

| | | |
|---------------------------------------|-----------------------|--------------------------------|
| Prospective peak current at switch-on | LC1D●K | 200 In |
| Maximum operating rate | LC1DFK, DGK, DLK, DMK | 240 operating cycles/hour |
| | LC1DPK, DTK, DWK | 240 operating cycles/hour |
| Electrical durability at nominal load | All contactor ratings | 400 V 300 000 operating cycles |
| | | 690 V 200 000 operating cycles |

| Operational power at 50/60 Hz ⁽¹⁾ θ ≤ 60 °C ⁽²⁾ | | | | Instantaneous auxiliary contacts | | Tightening torque on cable end | Basic reference, to be completed by adding the voltage code ^{(3) (4)} | Weight |
|--|-------|-------|-------|----------------------------------|-----|--------------------------------|--|--------|
| 230 V | 400 V | 440 V | 690 V | N/O | N/C | N.m | | kg |
| kVAR | kVAR | kVAR | kVAR | | | | LC1DFK●● | 0.430 |
| 7 | 12.5 | 12.5 | 21 | 1 | 2 | 1.7 | LC1DGK●● | 0.450 |
| 9.5 | 16.7 | 16.7 | 28.5 | 1 | 2 | 2.5 | LC1DLK●● | 0.600 |
| 11 | 20 | 21 | 33 | 1 | 2 | 2.5 | LC1DMK●● | 0.630 |
| 14 | 25 | 27 | 42 | 1 | 2 | 2.5 | LC1DPK●● | 1.300 |
| 17 | 30 | 32 | 50 | 1 | 2 | 5 | LC1DTK●● | 1.300 |
| 22 | 40 | 43 | 67 | 1 | 2 | 5 | LC1DWK12●● | 1.650 |
| 35 | 63 | 67 | 104 | 1 | 2 | 9 | | |

Switching of multiple-step capacitor banks (with equal or different power ratings)

The correct contactor for each step is selected from the above table, according to the power rating of the step to be switched.

Example: 50 kVAR 3-step capacitor bank. Temperature: 50 °C and U = 400 V or 440 V.

One 25 kVAR step: contactor LC1DMK, one 15 kVAR step: contactor LC1DGK, and one 10 kVAR step: contactor LC1DFK.

⁽¹⁾ Operational power of the contactor according to the scheme on the page opposite.

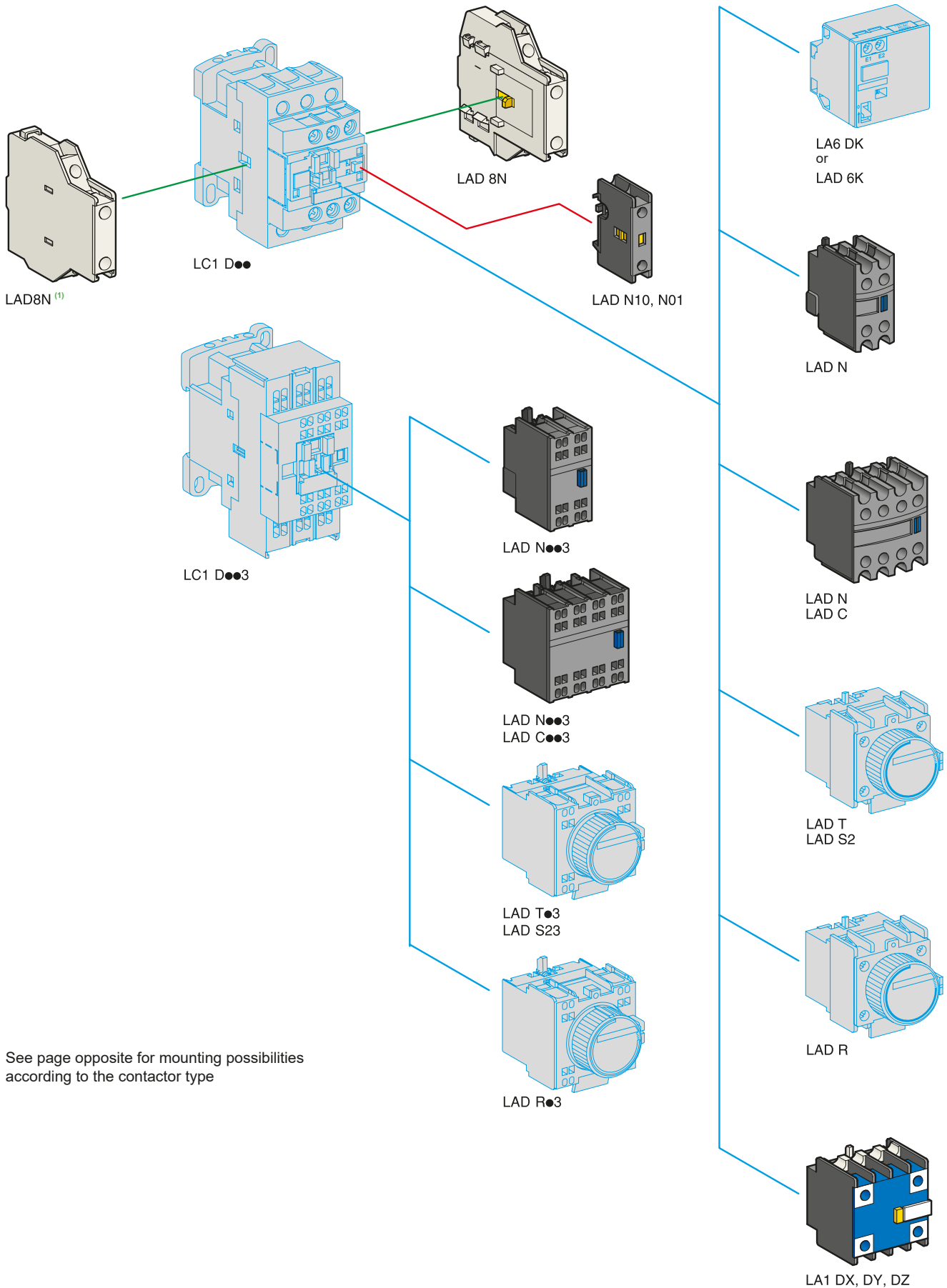
⁽²⁾ The average temperature over a 24-hour period, in accordance with standards IEC 60070 and 60831 is 45 °C.

⁽³⁾ Standard control circuit voltages (the delivery time is variable, please consult your Regional Sales Office):

| Volts | 24 | 48 | 110 | 120 | 220 | 230 | 240 | 380 | 400 | 415 | 440 |
|----------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 50/60 Hz | B7 | E7 | F7 | G7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |

⁽⁴⁾ Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.





See page opposite for mounting possibilities according to the contactor type

(1) No left side mounting on Deca green contactors.

TeSys Control

Deca Contactors - Auxilliary contact blocks

Product references



LADN22



LAD8N11



LA1DX●●, LA1DZ●●

Instantaneous auxiliary contact blocks for connection by screw clamp terminals

For use in normal operating environments

| Clip-on mounting | Number of contacts per block | Composition | | | | | Reference |
|--|------------------------------|-------------|---|---|---|---|-----------|
| | | | | | | | |
| Front | 1 | - | - | - | 1 | - | LADN10 |
| | | - | - | - | - | 1 | LADN01 |
| | 2 | - | - | - | 1 | 1 | LADN11 |
| | | - | - | - | 2 | - | LADN20 |
| | 4 | - | - | - | - | 2 | LADN02 |
| | | - | - | - | 1 | 3 | LADN13 |
| | | - | - | - | 4 | - | LADN40 |
| | | - | - | - | 4 | - | LADN04 |
| | | - | - | - | 3 | 1 | LADN31 |
| | | - | - | - | 2 | 2 | LADC22 |
| Side (contact blocks compatible with AC coil contactors only) | 2 | - | - | - | 1 | 1 | LAD8N11 |
| | | - | - | - | 2 | - | LAD8N20 |
| | | - | - | - | - | 2 | LAD8N02 |

For terminal referencing conforming to EN 50012

| | | | | | | | |
|---|---|---|---|---|---|---|---------|
| Front on 3P contactors and 4P contactors 20 to 80 A | 2 | - | - | - | 1 | 1 | LADN11G |
| Front on 4P contactors 125 to 200 A | 4 | - | - | - | 2 | 2 | LADN22G |
| | 2 | - | - | - | 1 | 1 | LADN11P |
| | 4 | - | - | - | 2 | 2 | LADN22P |

With dust and damp protected contacts, for use in particularly harsh industrial environments

| | | | | | | | |
|-------|---|---|---|---|---|---|------------------------|
| Front | 2 | - | 2 | - | - | - | LA1DX20 |
| | | 1 | 1 | - | - | - | LA1DX11 |
| | | 2 | - | - | - | - | LA1DX02 |
| | 4 | - | 2 | 2 | - | - | LA1DY20 ⁽²⁾ |
| | | - | 2 | - | 2 | - | LA1DZ40 |
| | | - | 2 | - | 1 | 1 | LA1DZ31 |

Instantaneous auxiliary contact blocks for connection by lugs

This type of connection is not possible for blocks with 1 contact or blocks with dust and damp protected contacts. For all other instantaneous auxiliary contact blocks, add the figure 6 to the end of the references selected above. Example: LADN11 becomes LADN116.

Instantaneous auxiliary contact blocks for connection by spring terminals

This type of connection is not possible for LAD8, LADN with 1 contact or blocks with dust and damp protected contacts. For all other contact blocks, add the figure 3 to the end of the references selected above. Example: LADN11 becomes LADN113.

Maximum number of auxiliary contacts that can be fitted:

| Contactors | Type | Number of poles and size | Instantaneous auxiliary contacts | | | | Time delay Front mounted | |
|-----------------------|------|------------------------------|--|-------------------------|------------|------------|--------------------------|------|
| | | | Side mounted | Front mounted | | | | |
| | | | | 1 contact | 2 contacts | 4 contacts | | |
| AC | 3P | LC1D09...D38 | 1 on LH or 1 on RH side ⁽³⁾ | and - | 1 | or 1 | or 1 | |
| | | LC1D40A...D80A | 1 on LH or 1 on RH side | and - | 1 | or 1 | or 1 | |
| | | LC1D80 and D95 (50/60 Hz) | 1 on each side | or 2 | and 1 | or 1 | or 1 | |
| | | LC1D80 and D95 (50 or 60 Hz) | 1 on each side | and 2 | and 1 | or 1 | or 1 | |
| | | LC1D115 and D150 | 1 on LH side | and - | 1 | or 1 | or 1 | |
| | | 4P | LC1DT20...DT40 | 1 on LH side | and - | 1 | or 1 | or 1 |
| | | | LC1DT60A and DT80A | 1 on LH or 1 on RH side | and - | 1 | or 1 | or 1 |
| | | | LC1D40008, D65008 and D80 | 1 on each side | or 1 | or 1 | or 1 | or 1 |
| | | | LC1D115 | 1 on each side | and 1 | or 1 | or 1 | or 1 |
| | | | LC1D115 | 1 on each side | and 1 | or 1 | or 1 | or 1 |
| DC | 3P | LC1D09...D38 | - | - | 1 | or 1 | or 1 | |
| | | LC1D40A...D80A | - | - | 1 | or 1 | or 1 | |
| | | LC1D80 and D95 | - | 1 | or 1 | or 1 | or 1 | |
| | | LC1D115 and D150 | 1 on LH side | and - | 1 | or 1 | or 1 | |
| | | LC1DT20...DT40 | - | - | 1 | or 1 | or 1 | |
| | 4P | LC1DT60A and DT80A | - | - | 1 | or 1 | or 1 | |
| | | LC1D40008, D65008 and D80 | - | 2 | and 1 | or 1 | or 1 | |
| | | LC1D115 | 1 on each side | - | and 1 | or 1 | or 1 | |
| | | LC1D115 | 1 on each side | - | and 1 | or 1 | or 1 | |
| | | LC1D115 | 1 on each side | - | and 1 | or 1 | or 1 | |
| LC ⁽⁴⁾ (5) | 3P | LC1D09...D38 | - | - | 1 | - | - | |
| | | 4P | LC1DT20...DT40 | - | - | 1 | - | - |

(1) With red front face - for safety chain indication.

(2) Device fitted with 4 earth screen continuity terminals.

(3) 1 on LH side for AC coils - 1 on RH side for AC/DC coils.

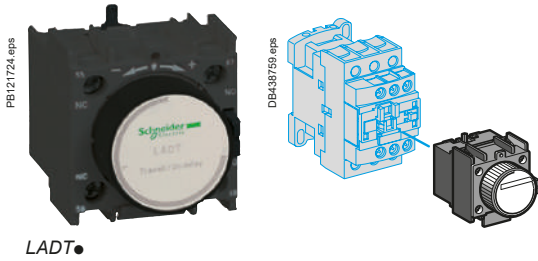
(4) LC: low consumption.

(5) LA1D●●● dust & damp proof auxiliary contact blocks not allowed.

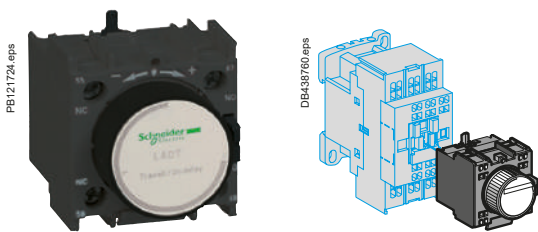
TeSys Control

Deca Contactors - Time delay auxiliary contact blocks

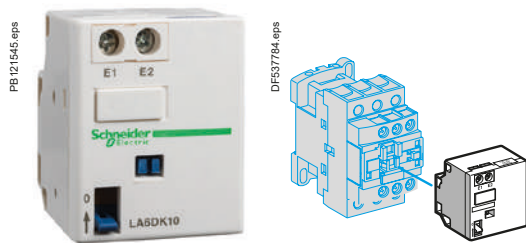
Product references



LADT0●



LADT0.3



LAD6K10●

Time delay auxiliary contact blocks for connection by screw clamp terminals

Maximum number of auxiliary contact blocks that can be fitted per contactor, see page B8/36.
Sealing cover to be ordered separately, see page B8/42.
LADS2: with switching time of 40 ms ± 15 ms between opening of the N/C contact and closing of the N/O contact.

| Clip-on mounting | Number of contacts | Time delay | | Reference |
|------------------|--------------------|------------|---------------|-----------|
| | | Type | Setting range | |
| Front | 1 N/O + 1 N/C | On-delay | 0.3...3 s | LADT0 |
| | | | 1...30 s | LADT2 |
| | | | 10...180 s | LADT4 |
| | | Off-delay | 1...30 s | LADS2 |
| | | | 0.3...3 s | LADR0 |
| | | | 1...30 s | LADR2 |
| | | 10...180 s | LADR4 | |

Time delay auxiliary contact blocks for connection by lugs

Add the figure 6 to the end of the references selected above. Example: LADT0 becomes LADT06.

Time delay auxiliary contact blocks for connection by spring terminals

Add the figure 3 to the end of the references selected above. Example: LADT0 becomes LADT03.

Time delay auxiliary contact blocks for connection by Faston connectors

Add the figure 9 to the end of the references selected above. Example: LADT0 becomes LADT09.

Mechanical latch blocks ⁽¹⁾

| Clip-on mounting | Unlatching control | For use on contactor | Basic reference, to be completed by adding the control voltage code ^{(2) (3)} |
|------------------|--------------------|--------------------------------------|--|
| Front | Manual or electric | LC1D09...D38 (∩ or ∴) ⁽⁴⁾ | LAD6K10● |
| | | LC1DT20...DT40 (∩ or ∴) | |
| | | LC1D40A...D80A (3 P ∩ or ∴) | LA6DK10● |
| | | LC1DT60A and DT80A (4 P ∩ or ∴) | |
| | | LC1D80...D150 (3 P ∩) | LA6DK20● |
| | | LC1D80 and D150 (3 P ∴) | |
| | | LC1D80 (4 P ∩) | |
| | | LC1D80 and D115 (4 P ∩) | |
| | | LP1D80 and LC1D115 (4 P ∴) | |

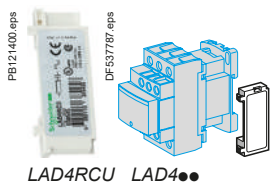
- (1) The mechanical latch block must not be powered up at the same time as the contactor. The duration of the control signal for the mechanical latch block and the contactor should be: ≥ 100 ms for a contactor operating on an a.c. supply, ≥ 250 ms for a contactor operating on a d.c. supply. Maximum impulse duration for the LAD6K10● mechanical latch block: 10 seconds.
- (2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

| Volts | 50/60 Hz | 24 | 32/36 | 42/48 | 60/72 | 100 | 110/127 | 220/240 | 256/277 | 380/415 |
|-------|----------|----|-------|-------|-------|-----|---------|---------|---------|---------|
| ∴ | | | | | | | | | | |
| Code | | B | C | E | EN | K | F | M | U | Q |

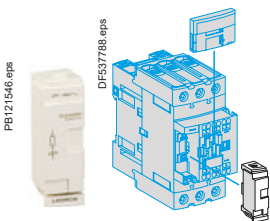
(3) Please check the availability of your variant in the index page B8/55. The SEARCH function of your viewer can be used.

(4) The DC, low consumption contactors (coil code ●L) are not compatible with the mechanical latch blocks LAD6K10●.

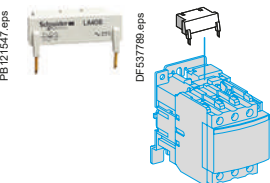




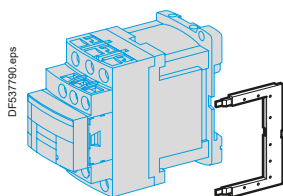
LAD4RCU LAD4RC3



LAD4RC3U, LAD4V3, LAD4D3U, LAD4T3



LA4DC3U



LAD4DDL or LAD4TDL



LAD4DDL

RC circuits (Resistor-Capacitor)

Effective protection for circuits highly sensitive to "high frequency" interference. For use only in cases where the voltage is virtually sinusoidal, i.e. less than 5 % total harmonic distortion. Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max. Slight increase in drop-out time (1.2 to 2 times the normal time).

| Mounting | For use with contactor ⁽¹⁾ Rating | Type | | Reference |
|--|---|-----------|-------|-----------|
| | | V ~ | V --- | |
| Clip-on side mounting ⁽³⁾⁽⁵⁾ | D09...D38 (3P) DT20...DT40 | 24...48 | – | LAD4RCE |
| | | 50...127 | – | LAD4RCG |
| | | 110...250 | – | LAD4RCU |
| Clip-on front mounting ⁽³⁾⁽⁵⁾ | D40A...D65A (3P) DT60A...DT80A (4P) | 24...48 | – | LAD4RC3E |
| | | 50...127 | – | LAD4RC3G |
| | | 110...240 | – | LAD4RC3U |
| | | 380...415 | – | LAD4RC3N |
| Screw fixing ⁽⁴⁾ | D80...D150 (3P) D40...D115 (4P) | 24...48 | – | LA4DA2E |
| | | 50...127 | – | LA4DA2G |
| | | 110...240 | – | LA4DA2U |
| | | 380...415 | – | LA4DA2N |
| | | – | – | – |

Varistors (peak limiting)

Protection provided by limiting the transient voltage to 2 Uc max. Maximum reduction of transient voltage peaks. Slight increase in drop-out time (1.1 to 1.5 times the normal time).

| | | | | |
|--|--|-----------|-----------|---------|
| Clip-on side mounting ⁽³⁾⁽⁵⁾ | D09...D38 (3P) DT20...DT40 | 24...48 | – | LAD4VE |
| | | 50...127 | – | LAD4VG |
| | | 110...250 | – | LAD4VU |
| Clip-on front mounting ⁽³⁾⁽⁵⁾ | D40A...D65A (3P) DT60A...DT80A (4P) | 24...48 | 24...48 | LAD4V3E |
| | | 50...127 | 50...127 | LAD4V3G |
| | | 110...250 | 110...250 | LAD4V3U |
| Screw fixing ⁽⁴⁾ | D80...D115 (3P) D80...D115 (4P) | 24...48 | – | LA4DE2E |
| | | 50...127 | – | LA4DE2G |
| | | 110...250 | – | LA4DE2U |
| | | – | 24...48 | LA4DE3E |
| | | – | 110...250 | LA4DE3U |

Flywheel diodes

No overvoltage or oscillating frequency. Increase in drop-out time (6 to 10 times the normal time). Polarised component.

| | | | | |
|---------------------------------------|--------------------------------------|---|----------|---------|
| Clip-on side mounting ⁽⁵⁾ | D09...D38 (3P), DT20...DT40 | – | 5...600 | LAD4DDL |
| Clip-on front mounting ⁽⁵⁾ | D40A...D65A (3P), DT60A...DT80A (4P) | – | 24...250 | LAD4D3U |
| Screw fixing ⁽⁴⁾ | D80 and D95 (3P), D40...D80 (4P) | – | 24...250 | LA4DC3U |

Bidirectional peak limiting diodes

Protection provided by limiting the transient voltage to 2 Uc max. Maximum reduction of transient voltage peaks.

| | | | | |
|---------------------------------------|---|-----------|-----------|----------|
| Clip-on side mounting ⁽³⁾ | D09...D38 (3P) DT20...DT40 (4P) ⁽²⁾ | 24 | – | LAD4TB |
| | | – | 24 | LAD4TBDL |
| | | 72 | – | LAD4TS |
| | | – | 72 | LAD4TSDL |
| | | – | 125 | LAD4TGDL |
| Clip-on front mounting ⁽³⁾ | D40A...D65A (3P) DT60A...DT80A (4P) ⁽²⁾ | – | 250 | LAD4TUDL |
| | | 12...24 | 12...24 | LAD4T3B |
| | | 25...72 | 25...72 | LAD4T3S |
| | | 73...125 | 73...125 | LAD4T3G |
| | | 126...250 | 126...250 | LAD4T3U |
| Screw fixing ⁽⁴⁾ | D80 and D95 (3P), D40...D80 (4P) | 251...440 | 251...440 | LAD4T3R |
| | | – | 24 | LA4DB3B |
| | | – | 72 | LA4DB3S |

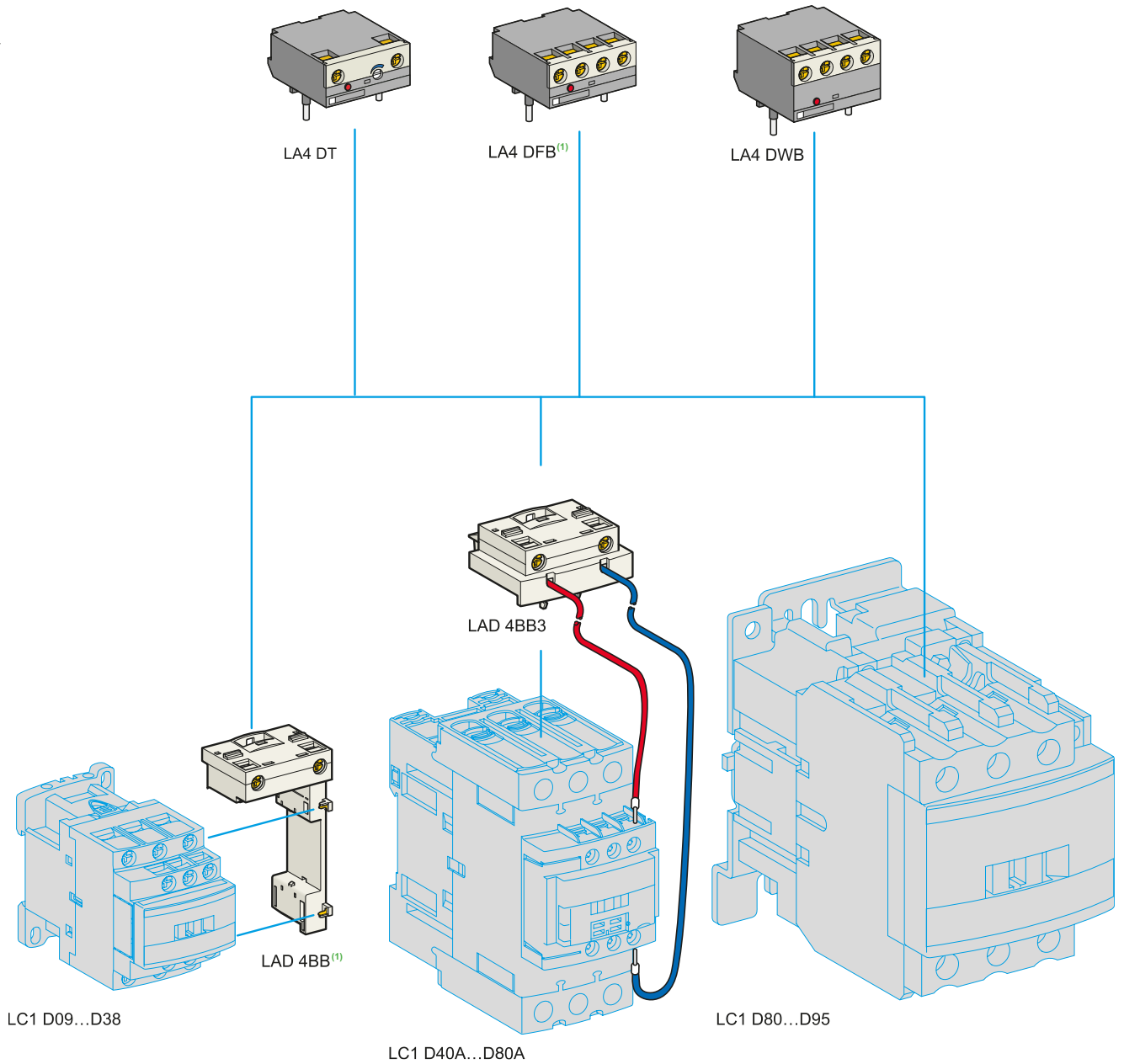
⁽¹⁾ For satisfactory protection, a suppressor module must be fitted across the coil of each contactor except for Deca green (●●E coil), as surge protection is already embedded.

⁽²⁾ From D09 to D65A and from LC1DT20 to DT80A, d.c., low consumption are fitted with a built-in bidirectional peak limiting diode suppressor as standard. This bidirectional peak limiting diode is removable and can therefore be replaced by the user. (See reference above).

⁽³⁾ Clipping-on makes the electrical connection. The overall size of the contactor remains unchanged.

⁽⁴⁾ Mounting at the top of the contactor on coil terminals A1 and A2.

⁽⁵⁾ In order to install these accessories, the existing suppression device must first be removed.



Contactors

See page opposite for mounting possibilities according to the contactor type.

(1) For Deca contactor with AC coil only.



LA4DT●●



LA4DFB



LA4DBL



LAD4BBVU



Electronic serial timer modules ⁽¹⁾

- 3-pole contactors LC1D09 to D38: mounted using adapter LAD4BB, to be ordered separately, see below.
- 3-pole contactors LC1D40A to D65A: mounted using adapter LAD4BB3, to be ordered separately, see below.
- 3-pole contactors LC1D80 to D150 and 4-pole contactors LC1D40 to D115: mounted directly across terminals A1 and A2 of the contactor.

On-delay type

| Operational voltage ~ | | Time delay | Reference |
|-----------------------|--------------------|------------|-----------|
| 24...250 V | 100...250 V | | |
| LC1D09...D80A (3P) | LC1D80...D150 (3P) | 0.1...2 s | LA4DT0U |
| | | 1.5...30 s | LA4DT2U |
| | | 25...500 s | LA4DT4U |

Interface modules

- 3-pole contactors LC1D09 to D38: mounted using adapter LAD4BB, to be ordered separately, see below.
- 3-pole contactors LC1D40A to D80A: mounted using adapter LAD4BB3, to be ordered separately, see below.

Relay interface

| Operational voltage ~ | | Supply voltage E1-E2 (---) | Reference |
|-----------------------|--|----------------------------|-----------|
| 24...250 V | | | |
| LC1D09...D150 (3P) | | 24 V | LA4DFB |

Static relay interface

| Operational voltage ~ | | Supply voltage E1-E2 (---) | Reference |
|-----------------------|--------------------|----------------------------|-----------|
| 24...250 V | 100...250 V | | |
| LC1D09...D80A (3P) | LC1D80...D115 (3P) | 24 V | LA4DWB |

Adapter kit for low control signal

| For use on contactors | Composition | Reference |
|------------------------------------|--|-----------|
| LC1D40A...D80A (3P) ⁽²⁾ | <ul style="list-style-type: none"> ■ 1 LAD4BB3 coil wiring adapter ■ 1 LA4DFB relay interface module | LA4DBL |

Wiring adapters for coil retrofit of 3 pole contactors

For adapting existing wiring to a new product

| For use on contactors | | Reference | |
|-----------------------|--------------------------|-----------------------|----------|
| LC1D09...D38 | Without coil suppression | LAD4BB ⁽³⁾ | |
| | With coil suppression | ~ 24...48 V | LAD4BBVE |
| | | ~ 50...127 V | LAD4BBVG |
| LC1D40A...80A | Without coil suppression | ~ 110...250 V | LAD4BBVU |
| | | | LAD4BB3 |

⁽¹⁾ For 24 V operation, the contactor must be fitted with a 21 V coil (code Z). See pages B8/45 to B8/48.

⁽²⁾ The kit is compatible with a coil voltage of ~ 24 V to ~ 250 V (B7 to U7) and --- 24 V to --- 250 V (BD to UD).

⁽³⁾ LAD4BB can not be used with 4 poles contactors.

TeSys Control

Deca Contactors - Accessories

Product references



LA9D3260



LA9D11560



LA9D115503



LA9D96570



LA9D11570



LA9D80962



LA9D11567

Accessories for main pole and control connections

| Description | | For use with contactors LC1 | | Sold in lots of | Unit reference |
|--|---|-----------------------------|-----------------|------------------------|---------------------------|
| | | ~ | ... | | |
| Connectors for cable, size (1 connector) | 4-pole 10 mm ² | DT20, DT25 | DT20, DT25 | 1 | LA9D92560 |
| | 3-pole 25 mm ² | D09...D38 | D09...D38 | 1 | LA9D3260 |
| EverLink® terminal block | 3-pole | D40A...D80A | D40A...D80A | 1 | LA9D96560 |
| Connectors for cables (2 connectors) | 3-pole 120 mm ² | D115, D150 | D115, D150 | 1 | LA9D115603 |
| | 4-pole 120 mm ² | D115 | D115 | 1 | LA9D115604 |
| Connectors for lug type terminals (2 connectors) | 3-pole | D1156, D1506 | D1156, D1506 | 1 | LA9D115503 |
| | Protective covers for connectors for lug type terminals | 3-pole | D40A6...D80A6 | D40A6...D80A6 | 1 |
| IP 20 covers for lug type terminals (for mounting with circuit breakers GV3 P●●6 and GV3 L●●6) | | D1156, D1506 | D1156, D1506 | 1 | LA9D115703 ⁽¹⁾ |
| | 4-pole | D60A6...D80A6 | D60A6...D80A6 | 1 | LA9D96580 |
| | | D1156, D1506 | D1156, D1506 | 1 | LA9D115704 |
| Links for parallel connection of | 2 poles | D40A6...D80A6 | D40A6...D80A6 | 1 | LA9D96575 |
| | | D09...D38 | D09...D38 | 10 | LA9D2561 |
| | | DT32, DT40 (4P) | DT32, DT40 (4P) | 10 | LA9D96061 |
| | 3 poles | D40A...D80A | D40A...D80A | 1 | LA9D9P32 |
| | | D80, D95 | D80, D95 | 2 | LA9D80961 |
| 4 poles | D09...D38 | D09...D38 | 10 | LA9D9P3 ⁽²⁾ | |
| | D40A...D80A | D40A...D80A | 1 | LA9D9P33 | |
| | D80, D95 | D80, D95 | 1 | LA9D80962 | |
| Staggered coil connection | DT20, DT25 | DT20, DT25 | 2 | LA9D1263 | |
| | D80 | D80 | 2 | LA9D80963 | |
| Control circuit take-off from main pole | – | D80 | 10 | LA9D09966 | |
| | D80, D95 | D80, D95 | 10 | LA9D8067 | |
| | D115, D150 | D115, D150 | 10 | LA9D11567 | |
| Spreaders for increasing the pole pitch to 45 mm | D115, D150 | D115, D150 | 3 | GV7AC03 | |

(1) For 3-pole contactors: 1 set of 6 covers, for 4-pole contactors: 1 set of 8 covers.

(2) Separate connecting bar for connecting 2 poles in parallel.



Control Panel Technical Guide:

Mounting and wiring accessories for Deca, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications - Product references and details on all kits and wiring accessories.

> Ref. Document: CPTG011_EN



> Click on QR code to download



GV2G245



GV1G09

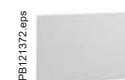
GV3S



LAD9ET1



LAD9ET1S



LAD21...22



LAD90



LAD7X3

Sets of contacts and arc chambers

| Description | For contactor | | Reference |
|------------------|---------------|------------|-------------|
| Sets of contacts | 3-pole | LC1D115 | LA5D1158031 |
| | | LC1D150 | LA5D150803 |
| | 4-pole | LC1D115004 | LA5D115804 |
| Arc chambers | 3-pole | LC1D115 | LA5D11550 |

Power connection accessories

| | | | |
|---|---|--|------------------------|
| Terminal block | For supply to one or more GV2G busbar sets | | GV1G09 |
| Set of 63 A busbars for parallelling of contactors | 2 contactors LC1D09...D18 or D25...D38 | | GV2G245 |
| | 4 contactors LC1D09...D18 or D25...D38 | | GV2G445 |
| Set of 115 A busbars for parallelling of contactors | 2 contactors LC1D40A...D80A | | GV3G264 |
| | 3 contactors LC1D40A...D80A | | GV3G364 ⁽¹⁾ |
| Set of S-shape busbars | For circuit breakers GV3P●● and GV3L●● ⁽³⁾ and contactors LC1D40A...D73A | | GV3S |

Protection accessories

| Description | Use | Sold in lots of | Reference |
|--|---|-----------------|-----------|
| Sealing cover | For LADT, LADR | 1 | LA9D901 |
| Safety cover preventing access to the moving contact carrier | LC1D09...D80A and DT20...DT80A | 1 | LAD9ET1 |
| | Red cover (for safety chain indication) | 1 | LAD9ET1S |
| | Red cover (for safety chain indication) | 1 | LAD9ET3S |
| | LC1D115 and D150 | 1 | LAD9ET4 |
| | Red cover (for safety chain indication) | 1 | LAD9ET4S |

Marking accessories

| Description | Use | Sold in lots of | Unit reference |
|---|--|-----------------|----------------|
| Sheet of 64 blank legends, self-adhesive, 8 x 33 mm ⁽²⁾ | Contactors (except 4P) LC1D80...D115, LADN (4 contacts), LA6DK | 10 | LAD21 |
| Sheet of 112 blank legends, self-adhesive, 8 x 12 mm ⁽²⁾ | LADN (2 contacts), LADT, LADR, LRD | 10 | LAD22 |
| Marker holder snap-in, 8 x 22 mm | 4-pole contactors, LC1D80...D115, LA6DK | 100 | LA9D92 |
| Marker holder snap-in, 8 x 18 mm | LC1D09...D65A, LC1DT20...DT80A, LADN (4 contacts), LADT, LADR | 100 | LAD90 |
| Bag of 300 blank legends self-adhesive, 7 x 21 mm | On holder LA9D92 | 1 | LA9D93 |

Mounting accessories

| | | | |
|-------------------------------------|---|---|-----------|
| Retrofit plate for screw fixing | For replacement of LC1D40 to D80 with LC1D40A to D80A | 1 | LAD7X3 |
| Mounting plate | For replacement of LC1F115 or F150 with LC1D115 or D150 | 1 | LA9D730 |
| Size 4 Allen key, insulated, 1000 V | For use on contactors LC1D40A to LC1D150 | 5 | LADALLEN4 |

⁽¹⁾ With this set of busbars, any one contactor can be supplied directly by its EverLink® double cage power terminal block. The other two contactors are supplied by the busbar set. The 115 A limitation is therefore applied to these two contactors. Example: 1 LC1D65A supplied directly + 1 contactor LC1D65A and 1 contactor LC1D50A supplied via the busbar set = 115 A. This combination is compatible with busbar set GV3G364.

⁽²⁾ These legends are for sticking onto the safety cover of the contactors or add-on block, if fitted.

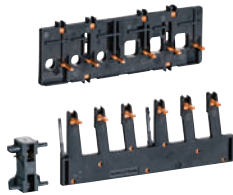
⁽³⁾ With 73 A current limit for GV3L73, GV3P73.

TeSys Control

Deca Contactors - Assembly kits

Product references

PB121375.eps



LAD9R1

PB121376.eps



LAD9R3

PB121377.eps



LA9D8069

PB114205.eps

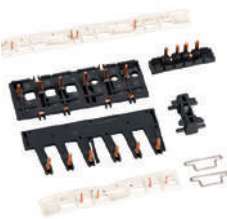


LAD91217

[Discover in video](#)



PB121378.eps



LAD91218

[Discover in video](#)



For 3-pole reversing contactors for motor control

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

| Description | For contactors ⁽¹⁾ (2 identical contactors) | Reference |
|--|---|----------------|
| Kits for assembly of reversing contactors | | |
| Kit comprising: ■ a mechanical interlock LAD9V2 with electrical interlocking LAD9V1 ■ a set of power connections LAD9V5 (parallel) and LAD9V6 (reversing). | LC1D09 to D38 | LAD9R1V |
| Kit comprising: ■ a mechanical interlock LAD9V2 without electrical interlocking ■ a set of power connections LAD9V5 (parallel) and LAD9V6 (reversing). | LC1D09 to D38 | LAD9R1 |
| Kit comprising: ■ a mechanical interlock LAD4CM ■ a set of power connections LA9D65A69 . | LC1D40A to D80A | LAD9R3 |

Mechanical interlocks

| | | |
|--|----------------------|------------------|
| Mechanical interlock with integral electrical interlocking | LC1D80 and D95 (~) | LA9D4002 |
| | LC1D80 and D95 (---) | LA9D8002 |
| | LC1D115 and D150 | LA9D11502 |
| Mechanical interlock without integral electrical interlocking | LC1D09 to D38 | LAD9V2 |
| | LC1D40A to D80A | LAD4CM |
| | LC1D80 and D95 (~) | LA9D50978 |
| | LC1D80 and D95 (---) | LA9D80978 |

Sets of power connections

| | | |
|--|---|---|
| Comprising: ■ a set of parallel bars ■ a set of reverser bars. | LC1D09 to D38 with screw clamp terminals or connectors | LAD9V5 + LAD9V6 |
| | LC1D09...D32 with spring terminal connections | LAD9V12 + LAD9V13 ⁽²⁾ |
| | LC1D40A to D80A | LA9D65A69 |
| | LC1D80 and D95 (~) | LA9D8069 |
| | LC1D80 and D95 (---) | LA9D8069 |
| | LC1D115 and D150 | LA9D11569 |

For star-delta starter

| Description | For contactors | Reference | Without timer LADS2 |
|---|------------------------------|------------------|---------------------|
| Mounting kit comprising: ■ 1 time delay contact block LADS2 (LC1D09...D80) , ■ power circuit connections (LC1D09...D80), ■ hardware required for fixing the contactors onto the mounting plate (LC1D80). | LC1D09 to D38 ⁽³⁾ | LAD91217 | LAD91218 |
| | LC1D25 to D38 ⁽⁴⁾ | LAD93217 | LAD93218 |
| | LC1D40A to D80A | LAD9SD3 | - |
| Equipment mounting plates | LC1D80 | LA9D8017 | - |
| | LC1D09 to D38 | LA9D12974 | |
| | LC1D40A to D80A | - | |
| | LC1D80 | LA9D80973 | |

⁽¹⁾ To order the 2 contactors: see pages B8/23 and B8/29.

⁽²⁾ To assemble a reversing contactor with spring terminal connections, the following components must be ordered:

- 1 mechanical interlock **LAD9V2**,

- 1 upstream power connection kit and 1 downstream power connection kit.

Upstream power connection kit **LAD9V10**: installed in the Quickfit system with power connection module **LAD34**.

(If module **LAD34** is not used, replace **LAD9V10** with **LAD9V12**).

Downstream power connection kit **LAD9V11**: installed in the Quickfit system with outgoing terminal block **LAD331**.

(If **LAD331** is not used, replace **LAD9V11** with **LAD9V13**).

⁽³⁾ For assembly of 3 contactors of the same physical size (depth).

⁽⁴⁾ For assembly of Main + Delta contactors **LC1D25** to **LC1D38** with Star contactor **LC1D09** to **LC1D18**.



Control Panel Technical Guide:

Mounting and wiring accessories for TeSys K, Deca, F - Star Delta, reverser, low-high speed control motor starters and changeover applications - Product references and details on all kits and wiring accessories.

> Ref. Document: CPTG011_EN



> Click on QR code to download



TeSys Control

Deca Contactors - Assembly kits

Product references

PB121379.eps



LADT9R1V

PB121381.eps



LA9D50978

PB121380.eps



LA9D8070

PB121382.eps



LAD9R3S

For 4-pole changeover contactor pairs (3-phase distribution + neutral)

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

| Description | For contactors ⁽¹⁾ (2 identical contactors) | Reference |
|-------------|---|-----------|
|-------------|---|-----------|

Kits for assembly of changeover contactor pairs

| | | |
|--|---|----------|
| Kit comprising: ■ a mechanical interlock LAD9V2 with electrical interlocking LAD9V1, ■ a set of power connections (changeover) LAD9V7. | LC1DT20 to DT40 with screw clamps or connectors | LADT9R1V |
|--|---|----------|

| | | |
|--|---|---------|
| Kit comprising: ■ a mechanical interlock LAD9V2 without electrical interlocking, ■ a set of power connections (changeover) LAD9V7. | LC1DT20 to DT40 with screw clamps or connectors | LADT9R1 |
|--|---|---------|

Mechanical interlocks

| | | |
|--|---|-----------------------|
| With integral electrical interlocking | LC1D80004 | LA9D4002 |
| | LP1D80004 | LA9D8002 |
| | LC1D115004 | LA9D11502 |
| Without integral electrical interlocking | LC1DT20 to DT40 with screw clamps or connectors | LAD9V2 ⁽²⁾ |
| | LC1DT203 to DT403 with spring terminals | LAD9V2 ⁽²⁾ |
| | LC1DT60A and DT80A | LAD4CM |
| | LC1D80004 | LA9D50978 |
| | LP1D80004 | LA9D80978 |

Sets of power connections

| | | |
|-----------------------------------|------------|-------------------------|
| Comprising a set of parallel bars | LC1D80004 | LA9D8070 |
| | LP1D80004 | LA9D8070 |
| | LC1D115004 | LA9D11570 |
| | LC1D80004 | LA9D8070 ⁽²⁾ |
| | LP1D80004 | LA9D8070 ⁽²⁾ |

For 3-pole changeover contactor pairs

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

| Description | For contactors ⁽¹⁾ (2 identical contactors) | Reference |
|-------------|---|-----------|
|-------------|---|-----------|

Kits for assembly of changeover contactor pairs

| | | |
|---|----------------|---------|
| Kit comprising: ■ a mechanical interlock LAD4CM ■ a set of parallel bars LA9D65A6 | LC1D40A...D80A | LAD9R3S |
|---|----------------|---------|

Mechanical interlocks

| | | |
|--|------------------|-----------|
| Without integral electrical interlocking | LC1D40A...D80A | LAD4CM |
| With integral electrical interlocking | LC1D115 and D150 | LA9D11502 |

Sets of power connections

| | | |
|-----------------------------------|------------------|-----------|
| Comprising a set of parallel bars | LC1D40A...D80A | LA9D65A6 |
| | LC1D115 and D150 | LA9D11571 |

(1) To order the 2 contactors: see pages B8/23 and B8/29.

(2) Order 2 contact blocks LADN●1 to build the electrical interlock, see page B8/36.

Contactor



Control Panel Technical Guide:

Mounting and wiring accessories for TeSys K, Deca, F - Star Delta, reverser, low-high speed control motor starters and changeover applications - Product references and details on all kits and wiring accessories.

> Ref. Document: CPTG011_EN



> Click on QR code to download



PG121383.eps

LXD1●●

a.c coils for ~ contactors LC1D09...D38 and LC1DT20...DT40

Specifications

Average consumption at 20 °C:

■ inrush ($\cos \phi = 0.75$) 70 VA,

■ sealed ($\cos \phi = 0.3$) 50 Hz: 7 VA, 60 Hz: 7.5 VA.

Operating range ($\theta \leq 60$ °C): 50 Hz: 0.8...1.1 Uc, 60 Hz: 0.85...1.1 Uc.

| Control circuit voltage Uc | Average resistance at 20 °C ± 10 % | Inductance of closed circuit | Reference ⁽¹⁾ |
|-------------------------------|--|------------------------------|--------------------------|
| V | Ω | H | |
| | | | 50/60 Hz |
| 12 | 1.33 | 0.05 | LXD1J7 |
| 24 | 5.37 | 0.22 | LXD1B7 |
| 32 | 10.1 | 0.39 | LXD1C7 |
| 42 | 17 | 0.67 | LXD1D7 |
| 48 | 21.7 | 0.87 | LXD1E7 |
| 110 | 124.1 | 4.6 | LXD1F7 |
| 115 | 129.8 | 5 | LXD1FE7 |
| 120 | 150.6 | 5.4 | LXD1G7 ⁽²⁾ |
| 200 | 410.7 | 15 | LXD1L7 |
| 208 | 430.4 | 16 | LXD1LE7 ⁽²⁾ |
| 220 | 515.4 | 18 | LXD1M7 ⁽³⁾ |
| 230 | 538.6 | 20 | LXD1P7 |
| 240 | 562.3 | 22 | LXD1U7 |
| 277 | 800.7 | 29 | LXD1W7 ⁽²⁾ |
| 380 | 1551 | 55 | LXD1Q7 ⁽⁴⁾ |
| 400 | 1633 | 60 | LXD1V7 |
| 415 | 1694 | 65 | LXD1N7 |
| 440 | 1993 | 73 | LXD1R7 |
| 480 | 2398 | 87 | LXD1T7 ⁽²⁾ |
| 500 | 2499 | 95 | LXD1S7 |
| 575 | 3294 | 125 | LXD1SC7 |
| 600 | 3810 | 136 | LXD1X7 |
| 660 | 4656 | 165 | LXD1YC7 |
| 690 | 5020 | 180 | LXD1Y7 |

⁽¹⁾ The last 2 digits in the reference represent the voltage code.

⁽²⁾ Coil for use only on 60 Hz.

⁽³⁾ Suitable for use on 230 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see pages B8/82 and B8/84).

⁽⁴⁾ Suitable for use on 400 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see pages B8/82 and B8/84).



PB121384.eps

LXD3●●

a.c coils for ~ contactors LC1D40A...D80A, LC1DT60A and LC1DT80A

Specifications

Average consumption at 20 °C:

- inrush ($\cos \phi = 0.75$) 160 VA,
- sealed ($\cos \phi = 0.3$) 50 Hz: 15 VA, 60 Hz: 15 VA.

Operating range ($\theta \leq 60$ °C): 50 Hz: 0.8...1.1 Uc, 60 Hz: 0.85...1.1 Uc.

| Control circuit voltage Uc | Average resistance at 20 °C $\pm 10\%$ | Inductance of closed circuit | Reference ⁽¹⁾ |
|----------------------------|--|------------------------------|-------------------------------|
| V | Ω | H | |
| | | | 50/60 Hz |
| 24 | 1.98 | 0.12 | LXD3B7 |
| 42 | 6.18 | 0.37 | LXD3D7 |
| 48 | 7.97 | 0.48 | LXD3E7 |
| 110 | 42.28 | 2.50 | LXD3F7 |
| 115 | 48.76 | 2.74 | LXD3FE7 |
| 120 | 37.63 | 2.07 | LXD3G7 ⁽²⁾ |
| 208 | 105 | 6.22 | LXD3LE7 ⁽²⁾ |
| 220 | 182 | 10 | LXD3M7 ⁽³⁾ |
| 230 | 192 | 10.9 | LXD3P7 |
| 240 | 202 | 11.9 | LXD3U7 |
| 380 | 512 | 29.9 | LXD3Q7 ⁽⁴⁾ |
| 400 | 607 | 33.1 | LXD3V7 |
| 415 | 635 | 35.6 | LXD3N7 |
| 440 | 682 | 40.1 | LXD3R7 |
| 480 | 607 | 33.1 | LXD3T7 ⁽²⁾ |
| 575 | 1238 | 68.4 | LXD3SC7 |
| 600 | 1304 | 74.5 | LXD3X7 |

⁽¹⁾ The last 2 digits in the reference represent the voltage code.

⁽²⁾ This coil can only be used on 60 Hz.

⁽³⁾ Suitable for use on 230 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/82 and B8/84).

⁽⁴⁾ Suitable for use on 400 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/82 and B8/84).

PB121385.eps



LX1D6●●

a.c coils for 3 or 4-pole contactors LC1D40, D50, D65, D80, D95

Specifications

Average consumption at 20 °C:

■ inrush ($\cos \phi = 0.75$) 50 Hz: 200 VA, 60 Hz: 220 VA

■ sealed ($\cos \phi = 0.3$) 50 Hz: 20 VA, 60 Hz: 22 VA.

Operating range ($\theta \leq 55$ °C): 0.85... 1.1 Uc.

| Control circuit voltage Uc | Average resistance at 20 °C ± 10 % | Inductance of closed circuit | Reference ⁽¹⁾ | Average resistance at 20 °C ± 10 % | | Inductance of closed circuit | Reference ⁽¹⁾ | |
|----------------------------|--|------------------------------|--------------------------|--|------|------------------------------|--------------------------|----------|
| | | | | Ω | H | | | Ω |
| | | | | 50 Hz | | | 60 Hz | |
| 24 | 1.4 | 0.09 | LX1D6B5 | 1.05 | 0.06 | | LX1D6B6 | |
| 110 | 31 | 1.9 | LX1D6F5 | 22 | 1.2 | | | |
| 115 | 31 | 1.9 | LX1D6FE5 | – | – | | – | |
| 208 | – | – | – | 86 | 4.3 | | LX1D6L6 | |
| 220 | – | – | – | 98 | 4.8 | | LX1D6M6 | |
| 220/230 | 127 | 7.5 | LX1D6M5 | – | – | | – | |
| 240 | 152 | 8.7 | LX1D6U5 | 120 | 5.7 | | LX1D6U6 | |
| 380 | – | – | – | 300 | 14 | | LX1D6Q6 | |
| 440 | 513 | 30 | LX1D6R5 | 392 | 19 | | | |
| 480 | – | – | – | 480 | 23 | | LX1D6T6 | |

Specifications

Average consumption at 20 °C:

■ inrush ($\cos \phi = 0.75$) 50/60 Hz: 245 VA at 50 Hz

■ sealed ($\cos \phi = 0.3$) 50/60 Hz: 26 VA at 50 Hz.

Operating range ($\theta \leq 55$ °C): 0.85... 1.1 Uc.

| | | | | 50/60 Hz | | |
|------------------------|---|---|---|----------|------|---------|
| 24 | – | – | – | 1.22 | 0.08 | LX1D6B7 |
| 48 | – | – | – | 5 | 0.32 | LX1D6E7 |
| 110 | – | – | – | 26 | 1.7 | LX1D6F7 |
| 120 | – | – | – | 32 | 2 | LX1D6G7 |
| 220/230 ⁽²⁾ | – | – | – | 102 | 6.7 | LX1D6M7 |
| 230 | – | – | – | 115 | 7.7 | LX1D6P7 |
| 230/240 ⁽³⁾ | – | – | – | 131 | 8.3 | LX1D6U7 |
| 380/400 ⁽⁴⁾ | – | – | – | 310 | 20 | LX1D6Q7 |
| 400 | – | – | – | 349 | 23 | LX1D6V7 |
| 415 | – | – | – | 390 | 24 | LX1D6N7 |
| 440 | – | – | – | 410 | 27 | LX1D6R7 |

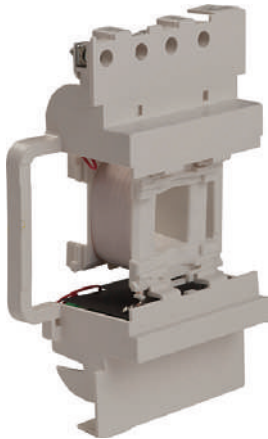
⁽¹⁾ The last 2 digits in the reference represent the voltage code.

⁽²⁾ For use on 230 V / 50 Hz, apply a coefficient of 0.6 to the mechanical durability of the contactor, see page B8/82 and B8/84. This coil can be used on 240 V at 60 Hz.

⁽³⁾ This coil can be used on 220/240 V at 50 Hz and on 240 V only at 60 Hz.

⁽⁴⁾ For use on 400 V / 50 Hz, apply a coefficient of 0.6 to the mechanical durability of the contactor, see page B8/82 and B8/84.

PE121366.eps



LX1D8●●

a.c coils for 3 or 4-pole contactors LC1D115

Specifications

Average consumption at 20 °C:

■ inrush ($\cos \phi = 0.8$) 50 or 60 Hz: 300 VA

■ sealed ($\cos \phi = 0.3$) 50 or 60 Hz: 22 VA.

Operating range ($\theta \leq 55$ °C): 0.85...1.1 Uc.

| Control circuit voltage Uc | Average resistance at 20 °C ± 10 % | Inductance of closed circuit | Reference ⁽¹⁾ | Average resistance at 20 °C ± 10 % | Inductance of closed circuit | Reference ⁽¹⁾ |
|----------------------------|--|------------------------------|--------------------------|--|------------------------------|--------------------------|
| V | Ω | H | | Ω | H | |
| | | | 50 Hz | | | |
| 24 | – | – | – | 0.87 | 0.07 | LX1D8B6 |
| 32 | 2.14 | 0.17 | LX1D8C5 | – | – | – |
| 42 | 3.91 | 0.28 | LX1D8D5 | – | – | – |
| 48 | – | – | – | 3.91 | 0.28 | LX1D8E6 |
| 127 | 32.75 | 2.44 | LX1D8FC5 | – | – | – |
| 208 | – | – | – | 67.92 | 5.06 | LX1D8L6 |
| 220 | 104.77 | 7.65 | LX1D8M5 | – | – | – |
| 380 | 338.51 | 22.26 | LX1D8Q5 | 243.07 | 17.04 | LX1D8Q6 |
| 440 | 441.56 | 30.34 | LX1D8R5 | 338.51 | 22.26 | LX1D8R6 |
| 500 | 566.62 | 38.12 | LX1D8S5 | – | – | – |

a.c coils for 3 or 4-pole contactors LC1D115, LC1D150

Specifications

Average consumption at 20 °C:

■ inrush: $\cos \phi = 0.9$ - 280 to 350 VA

■ sealed: $\cos \phi = 0.9$ - 2 to 18 VA.

Operating range ($\theta \leq 55$ °C): 0.8...1.15 Uc.

Coils with integral suppression device fitted as standard, class B.

| Control circuit voltage Uc | Average resistance at 20 °C ± 10 % | Inductance of closed circuit | Reference ⁽¹⁾ | Average resistance at 20 °C ± 10 % | Inductance of closed circuit | Reference ⁽¹⁾ |
|----------------------------|--|------------------------------|--------------------------|--|------------------------------|--------------------------|
| V | Ω | H | | Ω | H | |
| 50/60 Hz | | | | | | |
| 24 | – | – | – | 147 | 3.03 | LX1D8B7 |
| 32 | – | – | – | 301 | 8.28 | LX1D8C7 |
| 48 | – | – | – | 1061 | 24.19 | LX1D8E7 |
| 110 | – | – | – | 4377 | 109.69 | LX1D8F7 |
| 115 | – | – | – | 4377 | 109.69 | LX1D8FE7 |
| 120 | – | – | – | 4377 | 109.69 | LX1D8G7 |
| 208 | – | – | – | 10 895 | 260.15 | LX1D8LE7 |
| 220 | – | – | – | 9895 | 210.72 | LX1D8M7 |
| 230 | – | – | – | 9895 | 210.72 | LX1D8P7 |
| 240 | – | – | – | 9895 | 210.72 | LX1D8U7 |
| 277 | – | – | – | 21 988 | 533.17 | LX1D8UE7 |
| 380 | – | – | – | 21 011 | 482.42 | LX1D8Q7 |
| 400 | – | – | – | 21 011 | 482.42 | LX1D8V7 |
| 415 | – | – | – | 21 011 | 482.42 | LX1D8N7 |
| 440 | – | – | – | 21 501 | 507.47 | LX1D8R7 |
| 480 | – | – | – | 32 249 | 938.41 | LX1D8T7 |

⁽¹⁾ The last 2 digits in the reference represent the voltage code.

d.c. coils for 3-pole contactors LC1D80 or 4-pole contactors LP1D80

Specifications

Average consumption: 22 W.

Operating range: 0.85...1.1 Uc.

| Control circuit voltage Uc | Average resistance at 20 °C ± 10% | Inductance of closed circuit | Reference ⁽¹⁾ | Weight |
|-------------------------------|--------------------------------------|---------------------------------|--------------------------|--------|
| V | Ω | H | | kg |
| 12 | 6.6 | 0.46 | LX4D7JD | 0.680 |
| 24 | 27 | 1.89 | LX4D7BD | 0.680 |

⁽¹⁾ The last 2 digits in the reference represent the voltage code.

PB121387.jpg



LX4D7JD

d.c. coils for contactors LC1D115, D150

Specifications

Consumption: inrush 270 to 365 W, sealed 2.4 to 5.1 W.

Operating range: 0.75...1.2 Uc.

Coils with integral suppression device fitted as standard, class B.



LX4D8●D

| Control circuit voltage Uc | Average resistance at 20 °C ± 10 % | Inductance of closed circuit | Reference ⁽¹⁾ | Weight |
|-------------------------------|---------------------------------------|---------------------------------|--------------------------|--------|
| V | Ω | H | | kg |
| 24 | 147 | 3.03 | LX4D8BD | 0.300 |
| 60 | 1673 | 38.44 | LX4D8ND | 0.300 |
| 220 | 9895 | 210.72 | LX4D8MD | 0.300 |
| 250 | 18 022 | 345.40 | LX4D8UD | 0.300 |

⁽¹⁾ The last 2 digits in the reference represent the voltage code.

TeSys Control Modular Contactors

Product references



GC2520



GC4040



GC10020

| Modular Contactors - 17.5 mm pitch for modular panels | | | | | | | | |
|---|---------------------------|--|----------|----------|-----------|-----------|-----------------|-----------------|
| No. of poles | Number of 17.5 mm modules | Commercial reference 50 Hz coil - different voltages | | | | | Sold in lots of | |
| | | 12 V | 24 V | 48 V | 110 V | 220/240 V | | |
| Maximum current rating category AC-7a - 16 A | | | | | | | | |
| 1 | – | 1 | – | – | GC1610E5 | – | GC1610M5 | ★ 12 |
| 1 | 1 | 1 | – | – | GC1611B5 | – | GC1611F5 | GC1611M5 ★ 12 |
| 2 | – | 1 | – | – | GC1620B5 | – | GC1620F5 | ★ GC1620M5 ★ 12 |
| 2 | 2 | 2 | – | – | – | – | GC1622F5 | ★ GC1622M5 6 |
| 3 | – | 2 | – | – | – | – | – | GC1630M5 ★ 6 |
| 4 | – | 2 | – | – | – | – | GC1640F5 | ★ GC1640M5 ★ 6 |
| Maximum current rating category AC-7a - 25 A | | | | | | | | |
| – | 2 | 1 | – | – | GC2502B5 | GC2502E5 | ★ | GC2502M5 ★ 12 |
| – | 4 | 2 | – | – | GC2504B5 | GC2504E5 | ★ | GC2504M5 ★ 6 |
| 1 | – | 1 | – | – | GC2510B5 | – | – | GC2510M5 ★ 12 |
| 1 | 1 | 1 | – | – | – | – | – | GC2511M5 ★ 12 |
| 2 | – | 1 | GC2520J5 | GC2520B5 | – | – | – | ★ GC2520M5 ★ 12 |
| 2 | 2 | 2 | – | – | GC2522B5 | – | – | ★ GC2522M5 ★ 6 |
| 3 | – | 2 | – | – | – | – | GC2530F5 | ★ GC2530M5 ★ 6 |
| 3 | 1 | 2 | – | – | – | – | – | GC2531M5 6 |
| 4 | – | 2 | – | – | – | GC2540E5 | GC2540F5 | ★ GC2540M5 ★ 6 |
| Maximum current rating category AC-7a - 40 A | | | | | | | | |
| – | 2 | 2 | – | – | – | – | – | GC4002M5 ★ 6 |
| – | 4 | 3 | – | – | – | – | – | GC4004M5 4 |
| 1 | 1 | 2 | – | – | – | – | – | GC4011M5 ★ 6 |
| 2 | – | 2 | – | – | – | – | GC4020F5 | ★ GC4020M5 ★ 6 |
| 2 | 2 | 3 | – | – | – | – | – | GC4022M5 4 |
| 3 | – | 3 | – | – | – | – | – | GC4030M5 ★ 4 |
| 4 | – | 3 | – | – | – | – | – | GC4040M5 ★ 4 |
| Maximum current rating category AC-7a - 63 A | | | | | | | | |
| – | 2 | 2 | – | – | – | – | – | GC6302M5 6 |
| – | 4 | 3 | – | – | GC6304B5 | – | – | GC6304M5 4 |
| 2 | – | 2 | – | – | – | – | – | GC6320M5 6 |
| 3 | – | 3 | – | – | – | – | – | GC6330M5 ★ 4 |
| 4 | – | 3 | – | – | GC6340B5 | GC6340E5 | – | ★ GC6340M5 ★ 4 |
| Maximum current rating category AC-7a - 100 A | | | | | | | | |
| 2 | – | 3 | – | – | – | – | – | GC10020M5 4 |
| 4 | – | 6 | – | – | GC10040B5 | – | – | ★ GC10040M5 ★ 2 |

★ for 60 Hz coil replace last figure 5 by 6.



Contactors

TeSys Control

Modular "Dual tariff" contactors

Product references



GY2520M5



GY6340M5

| Modular "dual tariff" contactors - 17.5 mm pitch for modular panels | | | | | | | |
|---|---------------------------|--|----------|------|-------|------------|-----------------|
| No. of poles | Number of 17.5 mm modules | Commercial reference 50 Hz coil - different voltages | | | | | Sold in lots of |
| | | 12 V | 24 V | 48 V | 110 V | 220/240 V | |
| Maximum current rating category AC-7a - 16 A | | | | | | | |
| 2 | 1 | – | GY1620B5 | – | – | GY1620M5 | 12 |
| 4 | 2 | – | – | – | – | GY1640M5 | 6 |
| Maximum current rating category AC-7a - 25 A | | | | | | | |
| 2 | 1 | – | – | – | – | GY2520M5 ★ | 12 |
| 4 | 2 | – | – | – | – | GY2540M5 | 6 |
| Maximum current rating category AC-7a - 40 A | | | | | | | |
| 2 | 2 | – | – | – | – | GY4020M5 | 6 |
| 4 | 3 | – | – | – | – | GY4040M5 | 4 |
| Maximum current rating category AC-7a - 63 A | | | | | | | |
| 2 | 2 | – | – | – | – | GY6320M5 | 6 |
| 4 | 3 | – | GY6340B5 | – | – | GY6340M5 | 4 |

★ for 60 Hz coil replace last figure 5 by 6.



TeSys Control

Modular Impulse relays

Product references

D043251.eps



GF1620B7

Modular impulse relays - 17.5 mm pitch for modular panels

| Maximum current rating category AC-1 | Composition | Coil voltages | | Sold in lots of | Unit reference | |
|---|-------------|---------------|---------|-----------------|----------------|----------|
| | | ~ 50/60 Hz | DC | | | |
| 16 | 2 - | V | V | 12 | GF1620J7 | |
| | | 12 | 6 | | | |
| | | 24 | 12 | | | |
| | | 110 | 48 | | | |
| | 1 1 | 1 1 | 230/240 | 110 | 12 | GF1620U7 |
| | | | 12 | 6 | 12 | GF1611J7 |
| | | | 24 | 12 | 12 | GF1611B7 |
| | | | 220 | - | 12 | GF1611M7 |
| | | 230/240 | 110 | 12 | GF1611U7 | |



Contactors

TeSys Control

Modular Contactors - Accessories

Product references



GAP23

| Instantaneous auxiliary contact blocks | | | | | |
|--|-----------------|---|---------|-----------|--|
| Number of contacts | Number of poles | | | Reference | |
| 2 | | | | | |
| | 1 | 1 | - | GAC0521 | |
| | - | 2 | - | GAC0531 | |
| - | - | 1 | GAC0511 | | |



GAC5

| Accessories | | | | | |
|---|----------------------|-------------------|--------------------------|-----------------|----------------|
| Description | For use on contactor | Number of modules | Operational voltage in V | Sold in lots of | Unit reference |
| Coil suppression blocks comprising 2 RC circuits | - | 1 | 12...48 | 1 | GAP21 |
| | - | - | 110...240 | 1 | GAP23 |
| Ventilation 1/2 module clips onto rail | - | 1/2 | - | 10 | GAC5 |
| Set of screw shields (10 top parts + 10 bottom parts) | 40 or 63 A | 2 | - | 1 | A9A15922 |
| | 40 or 63 A | 3 | - | 1 | A9A15923 |



A9A15922



A9A15923



| | | | | | |
|-----------|------------|-------------|-----------|-----------|-----------|
| DPE09P7 | GF1611M7 | LA4DA2U | LA9D32974 | LAD6K10B | LADC223 |
| DPE12P7 | GF1611U7 | LA4DB3B | LA9D4002 | LAD6K10E | LADC226 |
| DPE1801P7 | GF1620B7 | LA4DB3S | LA9D40961 | LAD6K10F | LADN01 |
| DPE18P7 | GF1620F7 | LA4DBL | LA9D40963 | LAD6K10J | LADN02 |
| DPE2501P7 | GF1620U7 | LA4DC1U | LA9D5017 | LAD6K10K | LADN023 |
| DPE25P7 | GS2AH4120F | LA4DC3U | LA9D50978 | LAD6K10M | LADN026 |
| DPE32B7 | GV1G09 | LA4DE1E | LA9D511 | LAD7X3 | LADN04 |
| DPE32P7 | GV2G05 | LA4DE1G | LA9D6567 | LAD8N02 | LADN043 |
| GAC0511 | GV2G245 | LA4DE1U | LA9D6569 | LAD8N026 | LADN046 |
| GAC0521 | GV2G254 | LA4DE2E | LA9D65A6 | LAD8N11 | LADN10 |
| GAC0531 | GV2G272 | LA4DE2G | LA9D65A69 | LAD8N116 | LADN11 |
| GAC5 | GV2G345 | LA4DE2U | LA9D730 | LAD8N11G | LADN113 |
| GAP21 | GV2G354 | LA4DE3E | LA9D8002 | LAD8N20 | LADN113G |
| GAP23 | GV2G445 | LA4DE3U | LA9D8017 | LAD8N206 | LADN113P |
| GC10020M5 | GV2G454 | LA4DFB | LA9D8018 | LAD90 | LADN116 |
| GC10040M5 | GV2G472 | LA4DT0U | LA9D8067 | LAD901 | LADN11G |
| GC1610M5 | GV2G554 | LA4DT2U | LA9D8069 | LAD9011 | LADN11P |
| GC1611B5 | GV3G264 | LA4DT4U | LA9D80691 | LAD903 | LADN13 |
| GC1611F5 | GV3G364 | LA4DWB | LA9D8070 | LAD904 | LADN133 |
| GC1611M5 | GV3S | LA4KA1U | LA9D8079 | LAD91209 | LADN136 |
| GC1620B5 | GY1620B5 | LA4KC1B | LA9D80961 | LAD91217 | LADN13G |
| GC1620D7 | GY1620M5 | LA4KC1E | LA9D80962 | LAD91218 | LADN13P |
| GC1620F5 | GY2520M5 | LA4KC2B | LA9D80963 | LAD912GV | LADN20 |
| GC1620M5 | GY2520M6 | LA4KE1B | LA9D80973 | LAD92560 | LADN203 |
| GC1620M6 | GY2540M5 | LA4KE1E | LA9D80978 | LAD93217 | LADN206 |
| GC1622F5 | GY4020M5 | LA4KE1FC | LA9D894 | LAD93218 | LADN22 |
| GC1622M5 | GY4040M5 | LA4KE1UG | LA9D898 | LAD96061 | LADN223 |
| GC1630M5 | GY6320M5 | LA4SKC1U | LA9D90 | LAD96560 | LADN223G |
| GC1640F5 | GY6340M5 | LA4SKE1E | LA9D901 | LAD96566 | LADN226 |
| GC1640M5 | LA1DX02 | LA4SKE1U | LA9D92 | LAD96570 | LADN22G |
| GC2502B5 | LA1DX11 | LA5D11550 | LA9D93 | LAD96575 | LADN22P |
| GC2502E5 | LA1DX20 | LA5D1158031 | LA9D99 | LAD96580 | LADN22S |
| GC2502M5 | LA1DY20 | LA5D115804 | LA9E01 | LAD9722 | LADN31 |
| GC2504B5 | LA1DZ31 | LA5D150803 | LA9E02 | LAD9723 | LADN313 |
| GC2504M5 | LA1DZ40 | LA6DK10C | LA9K0969 | LAD9744 | LADN313G |
| GC2510B5 | LA1KN02 | LA6DK10J | LA9K105I | LAD9BB18 | LADN316 |
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| GC2520J5 | LA1KN11 | LA6DK20J | LAD4BB | LAD9ET2 | LADN403G |
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| GC2530M6 | LA1KN207 | LA9D09981 | LAD4DDL | LAD9R1 | LADR23 |
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| LC2K09013P7 | LC3D18AB7 | LP1K0601ND | LP1K120043BD3 | LP4K0610EW3 | LX1D8F7 |
| LC2K09015D7 | LC3D18AF7 | LP1K0601SD | LP1K12004BD | LP4K0610FW3 | LX1D8FE7 |
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| LC2K09015F7 | LC3D320AG7 | LP1K06103BD3 | LP1K12004JD | LP4K090085BW3 | LX1D8L7 |
| LC2K09015P7 | LC3D320AP7 | LP1K06103ED | LP1K12013BD3 | LP4K090087BW3 | LX1D8M5 |
| LC2K0901B7 | LC3D32AB7 | LP1K06105BD | LP1K12015BD | LP4K09008BW3 | LX1D8M7 |
| LC2K0901D7 | LC3D32AF7 | LP1K06106BD | LP1K12015MD | LP4K09008EW3 | LX1D8N7 |
| LC2K0901E7 | LC3D32AP7 | LP1K0610BD | LP1K12015MDS35 | LP4K09008SW3 | LX1D8P7 |
| LC2K0901F7 | LC3D80B7 | LP1K0610BD3 | LP1K1201BD | LP4K09013BW3 | LX1D8Q5 |
| LC2K0901F72 | LC3D80B7A64 | LP1K0610ED | LP1K1201BD3 | LP4K09015BW3 | LX1D8Q7 |
| LC2K0901G7 | LC3D80E7A64 | LP1K0610FD | LP1K1201ED | LP4K0901BW3 | LX1D8R7 |
| LC2K0901M7 | LC3D80F7 | LP1K0610FD3 | LP1K1201FD | LP4K0901FW3 | LX1D8T7 |
| LC2K0901P7 | LC3D80F7A64 | LP1K0610JD | LP1K1201MD | LP4K09103BW3 | LX1D8U7 |
| LC2K0901U7 | LC3D80M7 | LP1K0610MD | LP1K12103BD | LP4K09105BW3 | LX1D8V7 |
| LC2K0901V7 | LC3D80P7 | LP1K0610MPD | LP1K12103BD3 | LP4K09106BW3S16 | LX4D2UD |
| LC2K09103B7 | LC3D80P7A64 | LP1K090043BD | LP1K12105BD | LP4K09107BW3 | LX4D7BD |
| LC2K09103E7 | LC3D80U7A64 | LP1K090045BD | LP1K1210BD | LP4K09103BW3 | LX4D7JD |
| LC2K09105B7 | LC3K09P7 | LP1K090045ND | LP1K1210BD3 | LP4K0910FW3 | LX4D8BD |
| LC2K09105E7 | LC7K0601M7 | LP1K09004BD | LP1K1210ED | LP4K0910JW3 | LX4D8MD |
| LC2K09105M7 | LC7K0610M7 | LP1K09004BD3 | LP1K1210FD | LP4K12004BW3 | LXD1B7 |
| LC2K09107B7 | LC7K09004B7 | LP1K09004ED | LP1K1210JD | LP4K12015BW3 | LXD1C7 |
| LC2K0910B7 | LC7K09004M7 | LP1K09004FD | LP1K1210MD | LP4K12016BW3S16 | LXD1D7 |
| LC2K0910D7 | LC7K09015M7 | LP1K09004GD | LP1K1210SD3 | LP4K1201BW3 | LXD1E7 |
| LC2K0910D72 | LC7K0901M7 | LP1K09004JD | LP1SK0600BD | LP4K1201EW3 | LXD1F7 |
| LC2K0910E7 | LC7K0910B7 | LP1K09004MD | LP1SK0600ED | LP4K12103BW3 | LXD1FE7 |
| LC2K0910F7 | LC7K0910M7 | LP1K090085BD | LP1SK0600JD | LP4K12106BW3S16 | LXD1G7 |
| LC2K0910M7 | LC7K1201E7 | LP1K090085MD | LP2K06013BD | LP4K1210BW3 | LXD1J7 |
| LC2K0910P7 | LC7K1201F7 | LP1K090085MDS35 | LP2K06015BD | LP4K1210SW3 | LXD1L7 |
| LC2K0910U7 | LC7K1201M7 | LP1K09008BD | LP2K06015BD3 | LP5K06015BW3 | LXD1LE7 |
| LC2K12004F7 | LC7K1210F7 | LP1K09008BD3 | LP2K0601BD | LP5K0601BW3 | LXD1M7 |
| LC2K1201B7 | LP1D400086SW | LP1K09008ED | LP2K0601BD3 | LP5K0610BW3 | LXD1N7 |
| LC2K1201B72 | LP1D40008BD | LP1K09008FD | LP2K0601ED | LP5K09004BW3 | LXD1P7 |
| LC2K1201E7 | LP1D40008ED | LP1K09008JD | LP2K0601JD | LP5K09013BW3 | LXD1Q7 |
| LC2K1201F7 | LP1D40008FD | LP1K09008MD | LP2K06103BD3 | LP5K0901BW3 | LXD1R7 |
| LC2K1201G7 | LP1D40008GD | LP1K09008ND | LP2K0610BD | LP5K0910BW3 | LXD1S7 |
| LC2K1201M7 | LP1D40008MD | LP1K09013BD | LP2K0610BD3 | LP5K12004BW3 | LXD1SC7 |
| LC2K1201P7 | LP1D40008MW | LP1K09013BD3 | LP2K0610JD | LP5K12015BW3 | LXD1T7 |
| LC2K1201U7 | LP1D40008ND | LP1K09015BD | LP2K09004BD3 | LP5K1201BW3 | LXD1U7 |
| LC2K12105B7 | LP1D65008BD | LP1K09015UD | LP2K09013BD | LP5K1201SW3 | LXD1V7 |
| LC2K12105F7 | LP1D65008FD | LP1K0901BD | LP2K09015BD | LP5K1210BW3 | LXD1W7 |
| LC2K12107B7 | LP1D800046SW | LP1K0901BD3 | LP2K0901BD | LX1D6B5 | LXD1X7 |
| LC2K1210B7 | LP1D80004BD | LP1K0901ED | LP2K0901BD3 | LX1D6B6 | LXD1Y7 |
| LC2K1210D7 | LP1D80004BW | LP1K0901ED3 | LP2K0901ED | LX1D6B7 | LXD3B7 |
| LC2K1210E7 | LP1D80004ED | LP1K0901FD | LP2K0901JD | LX1D6E7 | LXD3D7 |
| LC2K1210F7 | LP1D80004FD | LP1K0901GD | LP2K0901ND | LX1D6F5 | LXD3E7 |
| LC2K1210G7 | LP1D800086SW | LP1K0901JD | LP2K09105BD | LX1D6F7 | LXD3F7 |
| LC2K1210K7 | LP1D80008BD | LP1K0901MD | LP2K0910BD | LX1D6G7 | LXD3FE7 |
| LC2K1210L7 | LP1D80008BW | LP1K0901ND | LP2K0910BD3 | LX1D6L6 | LXD3G7 |
| LC2K1210M7 | LP1D80008ED | LP1K0901SD3 | LP2K0910ED | LX1D6M5 | LXD3LE7 |
| LC2K1210P7 | LP1D80008FD | LP1K09103BD | LP2K1201BD | LX1D6M6 | LXD3M7 |
| LC2K1601K7 | LP1D80008MD | LP1K09103BD3 | LP2K1201BD3 | LX1D6M7 | LXD3N7 |
| LC2K1610B7 | LP1D80008MW | LP1K09105BD | LP2K12105BD | LX1D6N7 | LXD3P7 |
| LC2K1610F7 | LP1K06013BD | LP1K09105BD3 | LP2K1210BD | LX1D6P7 | LXD3Q7 |
| LC2K1610P7 | LP1K06013BD3 | LP1K0910BD | LP2K1210BD3 | LX1D6Q7 | LXD3R7 |
| LC3D115F7A64 | LP1K06013MD3 | LP1K0910BD3 | LP2K1210JD | LX1D6R7 | LXD3T7 |
| LC3D115M7A64 | LP1K06015BD | LP1K0910ED | LP4K06013BW3 | LX1D6T6 | LXD3U7 |
| LC3D115P7 | LP1K06016BD | LP1K0910ED3 | LP4K06016BW3S16 | LX1D6U5 | LXD3V7 |
| LC3D115P7A64 | LP1K0601BD | LP1K0910FD | LP4K0601BW3 | LX1D6U6 | LXD3X7 |
| LC3D150M7A64 | LP1K0601BD3 | LP1K0910GD | LP4K0601SW3 | LX1D6U7 | |
| LC3D150P7 | LP1K0601ED | LP1K0910JD | LP4K06103BW3 | LX1D6V7 | |
| LC3D150P7A64 | LP1K0601FD | LP1K0910MD | LP4K06105BW3 | LX1D8B7 | |
| LC3D180AB7 | LP1K0601MD | LP1K0910SD | LP4K0610BW3 | LX1D8E7 | |

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet). If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

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- > dimensions..... B8/66

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- > characteristics.....B8/72 to B8/75
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Deca green, Deca contactors:

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Modular Contactors:

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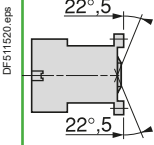
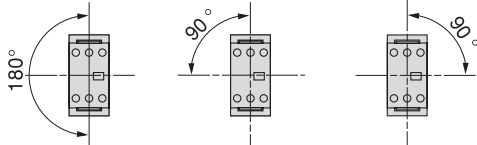
Standard IEC tests - Contactors
conforming to UL/CSA.....B8/128

TeSys Control

SK Contactors

Characteristics

Environment

| | | | | |
|---|----------------------------------|-----------------------|---|--|
| Rated insulation voltage (Ui) | Conforming to 60947 | V | 690 | |
| Conforming to standards | | | IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1 | |
| Approvals | | | cULus, CCC, EAC, UKCA, CB certification | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP2x | |
| Ambient air temperature around the device | Storage | °C | -50...+70 | |
| | Operation | °C | -20...+50 | |
| Maximum operating altitude | Without derating | m | 2000 | |
| Operating position | | | <p>Vertical axis</p>  <p>Without derating</p> | <p>Horizontal axis</p>  <p>Without derating</p> |
| Cabling, screw clamp terminals | | | Min | Max |
| | Solid conductor | mm² | 1 x 1.5 or 2 x 1.5 | 1 x 6 or 2 x 4 |
| | Flexible cable without cable end | mm² | 1 x 0.5 or 2 x 0.35 | 1 x 6 or 2 x 2.5 |
| | Flexible cable with cable end | mm² | 1 x 0.35 or 2 x 0.35 | 1 x 6 or 2 x 1.5 |
| Tightening torque | Pozidriv n° 1 head | N.m | 0.8 | |
| Terminal referencing | | | Conforming to standards En 50005 | |

Ref.



TeSys Control

SK Contactors

Characteristics

| Pole characteristics | | | |
|---|---|----|-----------|
| Conventional thermal current (I _{th}) | For ambient temperature ≤ 55 °C | A | 12 |
| Rated operational frequency | | Hz | 50/60 |
| Frequency limits of the operational current | | Hz | Up to 400 |
| Rated operational voltage (U _e) | | V | 690 |
| Rated making capacity | I _{rms} conforming to IEC 60947-1 | A | 66 |
| Rated breaking capacity (for U _e ≤ 400 V) | Conforming to IEC 60947-1 | A | 52 |
| Short time rating | In free air for a time "t" from cold state (θ ≤ 55 °C) | A | 50 |
| Short-circuit protection | gl fuse U ≤ 440 V | A | 16 |
| Average impedance per pole | At I _{th} and 50 Hz | mΩ | 4 |
| Maximum rated operational current | | | |
| For a temperature ≤ 55 °C | AC-3 ⁽¹⁾ (U _e ≤ 400 V) | A | 6 |
| | AC-1 | A | 12 |
| Utilisation in category AC-1 resistive circuits, heating, lighting (U _e ≤ 440 V) | Increase in operational current by paralleling of poles | A | 20 |

| Auxiliary contact characteristics of add-on blocks | | | |
|--|--|----|-----------|
| Rated operational voltage (U _e) | Up to | V | 690 |
| Rated insulation voltage (U _i) | Conforming to IEC 60947, IEC 60947-1 | V | 690 |
| Conventional thermal current (I _{th}) | For ambient temperature ≤ 55 °C | A | 10 |
| Frequency of operational current | | Hz | Up to 400 |
| Short-circuit protection | Conforming to IEC 60947 and IEC 60947-1, gl fuse | A | 10 |

Operational power of contacts conforming to IEC 60947 a.c. supply, category AC-15

Electrical durability (valid up to 3600 operating cycles per hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the breaking current (cos φ 0.4).

| | V | 24 | 48 | 110/127 | 220/230 | 380/400 | 440 |
|-----------------------------|----|------|------|---------|---------|---------|-------|
| 1 million operating cycles | VA | 48 | 96 | 240 | 440 | 800 | 880 |
| 3 million operating cycles | VA | 17 | 34 | 86 | 158 | 288 | 317 |
| 10 million operating cycles | VA | 7 | 14 | 36 | 66 | 120 | 132 |
| Occasional making capacity | VA | 1000 | 2050 | 5000 | 10000 | 14000 | 13000 |

d.c. supply, category DC-13

Electrical durability (valid up to 1200 operating cycles per hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

| | V | 24 | 48 | 110 | 220 | 440 | 440 |
|-----------------------------|---|-----|-----|-----|-----|-----|-------|
| 1 million operating cycles | W | 120 | 80 | 60 | 52 | 51 | 880 |
| 3 million operating cycles | W | 55 | 38 | 30 | 28 | 26 | 317 |
| 10 million operating cycles | W | 15 | 11 | 9 | 8 | 7 | 132 |
| Occasional making capacity | W | 720 | 600 | 400 | 300 | 230 | 13000 |

(1) For LC1 contactors.

TeSys Control

SK Contactors

Characteristics

| Control circuit characteristics | | | | |
|--|-------------------------------------|-----------------------------|---------------|---------------|
| Type | | | LC1SK06 | LP1SK06 |
| Rated control circuit voltage (Uc) | | V | ~ 24...400 | ~ 12...72 |
| Control voltage limits (q ≤ 50 °C) | For operation | | 0.85...1.1 Uc | 0.85...1.1 Uc |
| | For drop-out | | ≥ 0.20 Uc | ≥ 0.10 Uc |
| Average coil consumption at 20 °C and at Uc | Inrush | | 16 VA | 2.2 W |
| | Sealed | | 4.2 VA | 2.2 W |
| Heat dissipation | | W | 1.4 | 2.2 |
| Operating time at 20 °C and at Uc | Between coil energisation and | opening of the N/C contacts | ms | 8...16 |
| | | closing of the N/O contacts | ms | 7...14 |
| | Between coil de-energisation and | opening of the N/O contacts | ms | 6...8 |
| | | closing of the N/C contacts | ms | 8...10 |
| Maximum operating rate | In operating cycles per hour | | 1200 | 1200 |
| Mechanical durability at Uc In millions of operating cycles | 50/60 Hz coil | | 10 | – |
| | ~ coil | | – | 10 |

Ref.

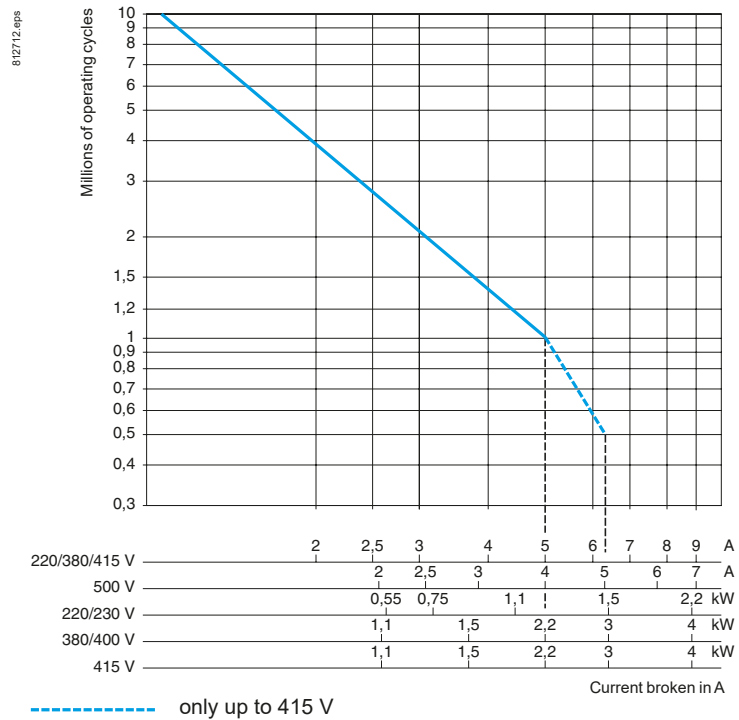


Contactors

Use in category AC-3 ($U_e \leq 440\text{ V}$)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

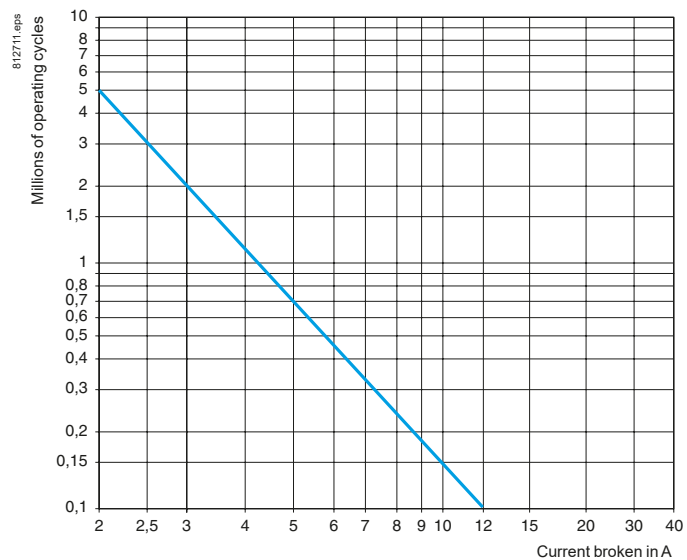
The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.



Use in category AC-1 ($U_e \leq 440\text{ V}$)

Control of resistive circuits ($\cos \varphi \geq 0.95$).

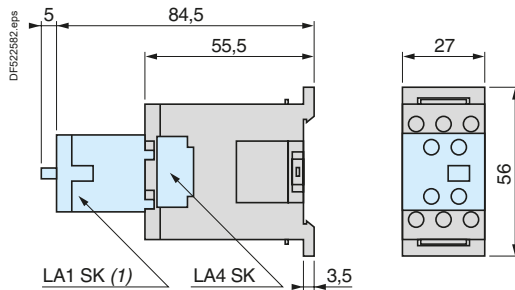
The current broken (I_c) in category AC-1 is equal to the current (I_e) normally drawn by the load.



Dimensions

Mini-contactors

LC1 and LP1SK06



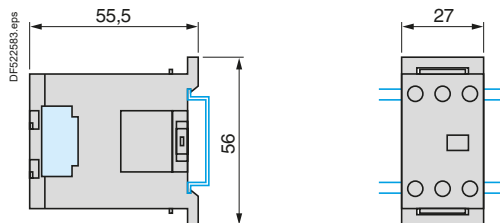
(1) Only on LC1SK06.

Mounting

Mini-contactors

LC1 and LP1SK06

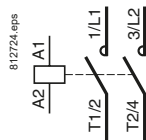
On mounting rail NSYSR200BD or NSYSR200 (L 35 mm)



Schemes

2-pole mini-contactors

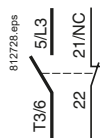
LC1 and LP1SK06



Add-on power pole block

1 pole + 1 "N/C" aux.

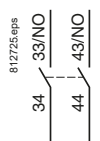
LA1SK01



Instantaneous auxiliary contacts

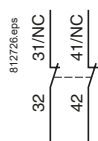
2 "N/O"

LA1SK20



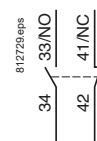
2 "N/C"

LA1SK02



1 "N/O" + 1 "N/C"

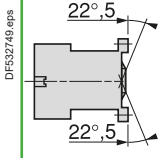
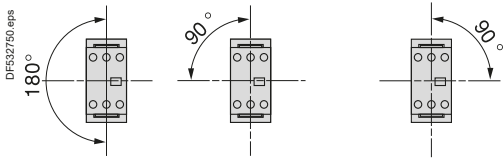
LA1SK11



TeSys Control

SKGC Contactors

Characteristics

| Environment | | | |
|---|----------------------------------|-----------------------|--|
| Rated insulation voltage (Ui) | Conforming to IEC 60947 | V | 690 |
| Conforming to standards | | | IEC 60947, UL 60947-4-1, CSA C22.2 n° 60947-4-1 |
| Approvals | | | cULus, UKCA |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact |
| Ambient air temperature around the device | | | |
| | Storage | °C | -50...+70 |
| | Operation | °C | -20...+50 |
| Maximum operating altitude | Without derating | m | 2000 |
| Operating position | | | <p>Vertical axis</p>  <p>Without derating</p> <p>Horizontal axis</p>  <p>Without derating</p> |
| Cabling, connectors | | | |
| | Solid conductor | mm² | Min. 1 x 1.5 or 2 x 1.5 Max. 1 x 6 or 2 x 4 |
| | Flexible cable without cable end | mm² | 1 x 0.5 or 2 x 0.35 1 x 6 or 2 x 2.5 |
| | Flexible cable with cable end | mm² | 1 x 0.35 or 2 x 0.35 1 x 6 or 2 x 1.5 |
| Tightening torque | Pozidriv n° 1 head | N.m | 0.8 |
| Terminal referencing | | | Conforming to standards EN 50005 |

Ref.



Contactors

Ref.



Contactors

| Pole characteristics | | | | | |
|---|---|-------------------------------|-----------|-----------------------|----|
| Mini-contactor type | | | LC1SKGC2 | LC1SKGC3 and LC1SKGC4 | |
| Conventional thermal current (I _{th}) | For ambient temperature ≤ 55 °C | A | 20 | 20 | |
| Rated operational frequency | | Hz | 50/60 | | |
| Frequency limit of the operational current | | Hz | up to 400 | | |
| Rated operational voltage (U _e) | | V | 690 | | |
| Rated making capacity | I rms conforming to IEC 60947 | A | 50 | 85 | |
| Rated breaking capacity (for U _e ≤ 400 V) | Conforming to IEC 60947 (I rms) | A | 40 | 68 | |
| Permissible short time rating | In free air for a time "t" from cold state (θ ≤ 55 °C) | A | 40 | 60 | |
| Short-circuit protection | gl fuse U ≤ 440 V | A | 20 | 20 | |
| Average impedance per pole | At I _{th} and 50 Hz | mΩ | 4 | 4 | |
| Maximum rated operational current | For temperature ≤ 55 °C | AC-3 (U _e ≤ 400 V) | A | 5 | 9 |
| | | AC-1 | A | 20 | 20 |
| Use in category AC-1 resistive circuits, heating, lighting (U _e ≤ 440 V) | Increase in rated operational current by paralleling of 2 poles | A | 32 | 32 | |

| Auxiliary contact characteristics of mini-contactors | | | |
|--|----------------------------------|----|-----------|
| Rated operational voltage (U _e) | Up to | V | 690 |
| Rated insulation voltage (U _i) | Conforming to IEC 60947 | V | 690 |
| Conventional thermal current (I _{th}) | For ambient temperature ≤ 55 °C | A | 10 |
| Frequency of the operational current | | Hz | Up to 400 |
| Short-circuit protection | Conforming to IEC 60947, gl fuse | A | 10 |

Operational power of contacts conforming to IEC 60947

a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

| | V | 24 | 48 | 110/ 127 | 220/ 230 | 380/ 400 | 440 |
|-----------------------------|----|------|------|-------------|-------------|-------------|-------|
| 1 million operating cycles | VA | 48 | 96 | 240 | 440 | 800 | 880 |
| 3 million operating cycles | VA | 17 | 34 | 86 | 158 | 288 | 317 |
| 10 million operating cycles | VA | 7 | 14 | 36 | 66 | 120 | 132 |
| Occasional making capacity | VA | 1000 | 2050 | 5000 | 10000 | 14000 | 13000 |

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

| | V | 24 | 48 | 110 | 220 | 440 | 440 |
|-----------------------------|---|-----|-----|-----|-----|-----|-------|
| 1 million operating cycles | W | 120 | 80 | 60 | 52 | 51 | 880 |
| 3 million operating cycles | W | 55 | 38 | 30 | 28 | 26 | 317 |
| 10 million operating cycles | W | 15 | 11 | 9 | 8 | 7 | 132 |
| Occasional making capacity | W | 720 | 600 | 400 | 300 | 230 | 13000 |

TeSys Control

SKGC Contactors

Characteristics

| Control circuit characteristics | | | |
|--|---|-----------------------------|-----------------------|
| Mini-contactor type | | LC1SKGC2 | LC1SKGC3 and LC1SKGC4 |
| Rated control circuit voltage (Uc) | V | ~ 24...400 | |
| Control voltage limits ($\theta \leq 55\text{ }^{\circ}\text{C}$) | Operation | 0.85...1.1 Uc | |
| | For drop-out | ≥ 0.20 Uc | |
| Average coil consumption at 20 °C and at Uc | Inrush | VA 16 | 23 |
| | Sealed | VA 4.2 | 4.9 |
| Heat dissipation | W | 1.4 | 1.5 |
| Operating time at 20 °C and at Uc | Between coil energisation and | opening of the N/C contacts | ms 8...16 |
| | | closing of the N/O contacts | ms 7...14 |
| | Between coil de-energisation and | opening of the N/O contacts | ms 6...8 |
| | | closing of the N/C contacts | ms 8...10 |
| Maximum operating rate | In operating cycles per hour | 1200 | |
| Mechanical durability at Uc | 50/60 Hz coil in millions of operating cycles | 10 | |

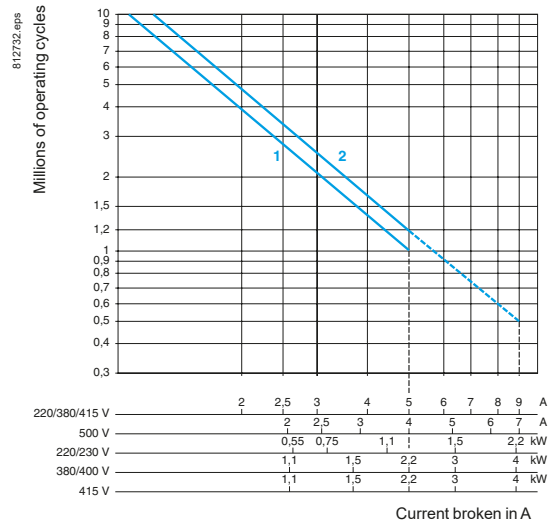
Ref.



Contactors

Use in category AC-3 ($U_e \leq 440\text{ V}$)

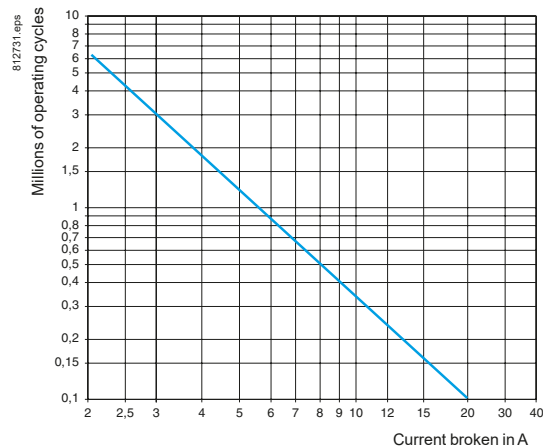
Control of 3-phase asynchronous squirrel cage motors with breaking whilst running. The current broken (I_c) in category AC-3 is equal to the rated operational current of the motor.



1. LC1SKGC2
 2. LC1SKGC3 and SKGC4
- only up to 415 V

Use in category AC-1 ($U_e \leq 440\text{ V}$)

Control of resistive circuits ($\cos \varphi \geq 0.95$). The current broken (I_c) in category AC-1 is equal to the current (I_e) normally drawn by the load.



Ref.



Contactors

TeSys Control SKGC Contactors

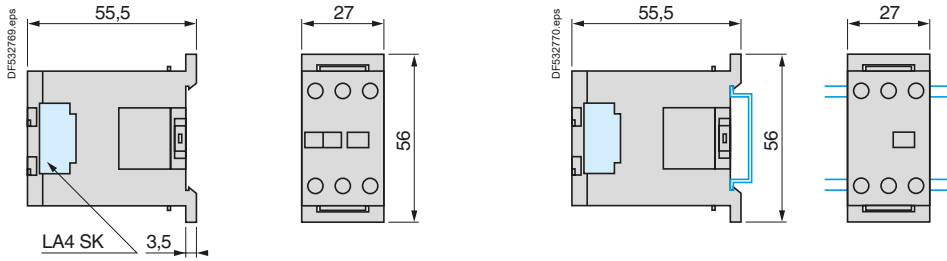
Dimensions, mounting and schemes

Dimensions

Mini-contactors LC1SKGC2

Mounting

On mounting rail NSYSR200BD or NSYSR200 (└ 35 mm)



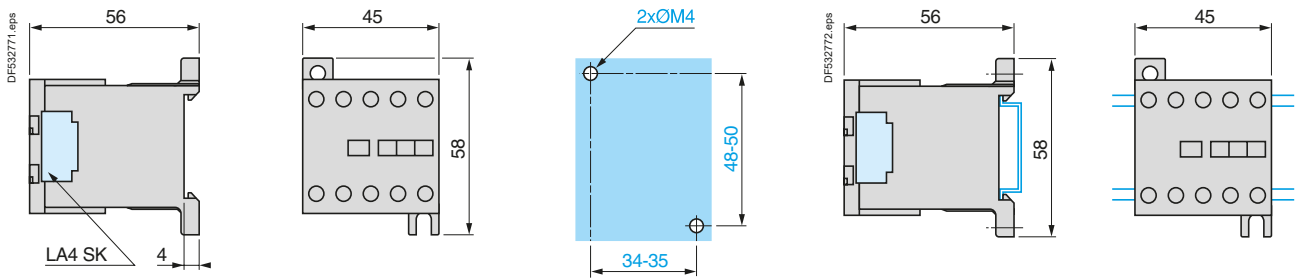
Dimensions

Mini-contactors LC1SKGC3 and SKGC4

Mounting

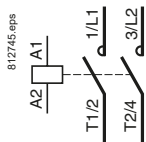
On panel

On mounting rail NSYSR200BD or NSYSR200 (└ 35 mm)



2-pole mini-contactors

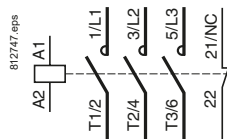
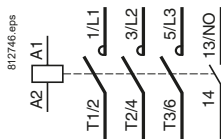
LC1SKGC2



3-pole mini-contactors

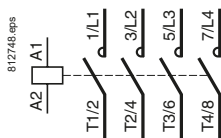
LC1SKGC310

LC1SKGC301



4-pole mini-contactors

LC1SKGC400



TeSys Control

K Contactors and reversing contactors

Characteristics

| Environment characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------------------------|---|--|--|------|------|-------------------|-----------------------|-----------------|---------|-------|--------------------------------------|----------|-------|-----------------------------------|----------|-------------------|------------------|-----------------|----------|---------|--------------------------------------|----------|---------|-------------------|------|---------------------|--|---------------------------------------|--|--|--|
| Conforming to standards | | | IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Product certifications | | LC● and LP●K06 to K12 LC● and LP●K16 | UL, CSA, CCC, EAC, UKCA, CB certification UKCA, CB certification, CCC, EA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating positions | | | <p>Vertical axis Horizontal axis</p> <p><i>Without derating</i> <i>Without derating</i> <i>Possible positions for LC●K only. Contactor pull-in voltage: 0.85 Uc</i></p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Connection | | | <table border="1"> <thead> <tr> <th></th> <th>Min.</th> <th>Max.</th> <th>Max. to IEC 60947</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Screw clamp terminals</td> <td>Solid conductor</td> <td>1 x 1.5</td> <td>2 x 4</td> </tr> <tr> <td>Flexible conductor without cable end</td> <td>1 x 0.75</td> <td>2 x 4</td> </tr> <tr> <td>Flexible conductor with cable end</td> <td>1 x 0.34</td> <td>1 x 1.5 + 1 x 2.5</td> </tr> <tr> <td rowspan="2">Spring terminals</td> <td>Solid conductor</td> <td>1 x 0.75</td> <td>1 x 1.5</td> </tr> <tr> <td>Flexible conductor without cable end</td> <td>1 x 0.75</td> <td>1 x 1.5</td> </tr> <tr> <td>Faston connectors</td> <td>Clip</td> <td colspan="2">2 x 2.8 or 1 x 6.35</td> </tr> <tr> <td colspan="2">Solder pins for printed circuit board</td> <td></td> <td>With locating device between power and control circuits pins length 5 mm Recommended minimum width and thickness layer for power printed circuit board track : 4mm x 35 microns</td> </tr> </tbody> </table> | | Min. | Max. | Max. to IEC 60947 | Screw clamp terminals | Solid conductor | 1 x 1.5 | 2 x 4 | Flexible conductor without cable end | 1 x 0.75 | 2 x 4 | Flexible conductor with cable end | 1 x 0.34 | 1 x 1.5 + 1 x 2.5 | Spring terminals | Solid conductor | 1 x 0.75 | 1 x 1.5 | Flexible conductor without cable end | 1 x 0.75 | 1 x 1.5 | Faston connectors | Clip | 2 x 2.8 or 1 x 6.35 | | Solder pins for printed circuit board | | | With locating device between power and control circuits pins length 5 mm Recommended minimum width and thickness layer for power printed circuit board track : 4mm x 35 microns |
| | Min. | Max. | Max. to IEC 60947 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Screw clamp terminals | Solid conductor | 1 x 1.5 | 2 x 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Flexible conductor without cable end | 1 x 0.75 | 2 x 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Flexible conductor with cable end | 1 x 0.34 | 1 x 1.5 + 1 x 2.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spring terminals | Solid conductor | 1 x 0.75 | 1 x 1.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Flexible conductor without cable end | 1 x 0.75 | 1 x 1.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Faston connectors | Clip | 2 x 2.8 or 1 x 6.35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Solder pins for printed circuit board | | | With locating device between power and control circuits pins length 5 mm Recommended minimum width and thickness layer for power printed circuit board track : 4mm x 35 microns | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tightening torque | | of screw-clamp terminals only Philips head n° 2 and Ø6 | N.m 0.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Terminal referencing | | Conforming to standards EN 50005 and EN 50012 | Up to 5 contacts, depending on model | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated insulation voltage (Ui) | | Conforming to IEC 60947-4-1 | V 690 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Conforming to CSA 22-2 n° 60947-4-1, UL 60947-4-1 | V 600 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated impulse withstand voltage (Uimp) | | | kV 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Degree of protection | | Conforming to IEC 60529 | Protection against direct finger contact IP2x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ambient air temperature around the device | | Storage | °C -50...+80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Operation | °C -25...+50 in AC3, -25...+60 in AC1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maximum operating altitude | | Without derating | m 2000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vibration resistance | | 5 ... 300 Hz | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Contactors open | 2 gn | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Contactors closed | 4 gn | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flame resistance | | according to IEC 60695-2-10 | °C 850 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shock resistance (1/2 sine wave, 11 ms) | | Contactors open | On X axis: 6 gn On Y and Z axes: 10 gn | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Contactors closed | On X axis: 10 gn On Y and Z axes: 15 gn | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Ref.



Contactors

TeSys Control

K Contactors and reversing contactors

Characteristics

| Pole characteristics | | | | | | | | |
|---|--|---|-------------------------------|--|--------------|-------------|-------------|------|
| Type | LC● or LP● | | | K06 | K09 | K12 | K16 | |
| Conventional thermal current (I _{th}) | For ambient temperature ≤ 60 °C | | A | 20 ⁽¹⁾ | | | | |
| Rated operational frequency | | | Hz | 50/60 | | | | |
| Frequency limits of the operational current | | | Hz | Up to 400 | | | | |
| Rated operational voltage (U _e) | | | V | 690 | | | | |
| Rated making capacity | I rms conforming to IEC 60947 | | A | 110 | 110 | 144 | 160 | |
| Rated breaking capacity | I rms conforming to IEC 60947 | 220/230 V | A | 110 | 110 | – | – | |
| | | 380/400 V | A | 110 | 110 | – | – | |
| | | 415 V | A | 110 | 110 | – | – | |
| | | 440 V | A | 110 | 110 | 110 | 110 | |
| | | 500 V | A | 80 | 80 | 80 | 80 | |
| | | 660/690 V | A | 70 | 70 | 70 | 70 | |
| Permissible short time rating | In free air for a time "t" from cold state (θ ≤ 50 °C) | 1 s | A | 90 | 90 | 115 | 115 | |
| | | 5 s | A | 85 | 85 | 105 | 105 | |
| | | 10 s | A | 80 | 80 | 100 | 100 | |
| | | 30 s | A | 60 | 60 | 75 | 75 | |
| | | 1 min | A | 45 | 45 | 55 | 55 | |
| | | 3 min | A | 40 | 40 | 50 | 50 | |
| | | ≥ 15 min | A | 20 | 20 | 25 | 25 | |
| Short-circuit protection | gG fuse U ≤ 440 V (aM fuse, see page 22009/2) | | A | 25 | | | | |
| Average impedance per pole | At I _{th} and 50 Hz | | mΩ | 3 | | | | |
| Use in category AC-1 resistive circuits, heating, lighting (U _e ≤ 440 V) | Maximum rated operational current for a temperature ≤ 50 °C | | A | 20 | | | | |
| | Maximum rated operational current for a temperature ≤ 70 °C | | A | 16 for U _e only | | | | |
| | Rated operational current limits in relation to the on-load factor and operating frequency | | | On-load factor | | 90 % | 60 % | 30 % |
| | | | A | 300 operating cycles/hour | | 13 | 15 | 18 |
| | | | A | 120 operating cycles/hour | | 15 | 18 | 19 |
| | | | A | 30 operating cycles/hour | | 19 | 20 | 20 |
| | Increase in rated operational current by paralleling of poles | | | Apply the following coefficients to the above currents; these coefficients take into account an often unbalanced distribution of current between the poles | | | | |
| | | | 2 poles in parallel: K = 1.60 | | | | | |
| | | | 3 poles in parallel: K = 2.25 | | | | | |
| | | | 4 poles in parallel: K = 2.80 | | | | | |
| Use in category AC-3 squirrel cage motors | Operational power according to the voltage. Voltage 50 or 60 Hz | 115 V single-ph. | kW | 0.37 | 0.55 | – | – | |
| | | 220 V single-ph. | kW | 0.75 | 1.1 | – | – | |
| | | 220/230 V 3-ph. | kW | 1.5 | 2.2 | 3 | 4 | |
| | | 380/415 V 3-ph. | kW | 2.2 | 4 | 5.5 | 7.5 | |
| | | 440/480 V 3-ph. | kW | 3 | 4 | 5.5/4 (480) | 5.5/4 (480) | |
| | | 500/600 V 3-ph. | kW | 3 | 4 | 4 | 4 | |
| | | 660/690 V 3-ph. | kW | 3 | 4 | 4 | 4 | |
| | | Maximum operating rate (in operating cycles/hour in relation to % of rated power) | | | Op. cycles/h | 600 | 900 | 1200 |
| | | | | Power | 100 % | 75 % | 50 % | |

(1) For LC●K●●●●●3 / LP●K●●●●●3 with spring terminal, I_{th} max = 10 A.

TeSys Control

K Contactors and reversing contactors

Characteristics

| Control circuit characteristics | | | | | | | | | |
|--|-------------------------------------|------------------------------|---------|---------------------------|---------|---------------------------|---------|---------------|---------|
| Type | | LC1 | LC2 | LC7 | LC8 | LP1 | LP2 | LP4 | LP5 |
| Rated control circuit voltage (Uc) | V | ~ 12...690 ⁽¹⁾ | | ~ 24...240 ⁽¹⁾ | | ~ 12...250 ⁽¹⁾ | | ~ 12...120 | |
| Control voltage limits (≤ 50 °C) single voltage coil | Operation | 0.8...1.15 Uc ⁽²⁾ | | 0.85...1.1 Uc | | 0.8...1.15 Uc | | 0.7...1.30 Uc | |
| | Drop-out | ≥ 0.20 Uc | | ≥ 0.10 Uc | | ≥ 0.10 Uc | | ≥ 0.10 Uc | |
| Average consumption at 20 °C and at Uc | Inrush | 30 VA | | 3 VA | | 3 W | | 1.8 W | |
| | Sealed | 4.5 VA | | 3 VA | | 3 W | | 1.8 W | |
| Heat dissipation | W | 1.3 | | 3 | | 3 | | 1.8 | |
| Operating time at 20 °C and at Uc | | | | | | | | | |
| Between coil energisation and: | - opening of the N/C contacts | ms | 5...15 | | 25...35 | | 25...35 | | 25...35 |
| | - closing of the N/O contacts | ms | 10...20 | | 30...40 | | 30...40 | | 30...40 |
| Between coil de-energisation and: | - opening of the N/O contacts | ms | 10...20 | | 30 | | 10 | | 10...20 |
| | - closing of the N/C contacts | ms | 15...25 | | 40 | | 15 | | 15...25 |
| Maximum immunity to microbreaks | ms | 2 | | 2 | | 2 | | 2 | |
| Maximum operating rate | In operating cycles per hour | 3600 | | 3600 | | 3600 | | 3600 | |
| Mechanical durability at Uc In millions of operating cycles | 50/60 Hz coil | 10 | 5 | 10 | 5 | - | - | - | - |
| | --- coil | - | - | - | - | 10 | 5 | - | - |
| | Wide range coil, Low consumption | - | - | - | - | - | - | 30 | 5 |

(1) For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50...129 V) or **LA4KE1UG** (130...250 V), see page B8/14.

(2) **LC1K12, LC1K16...** : 0.85...1.15 Uc.

Ref.

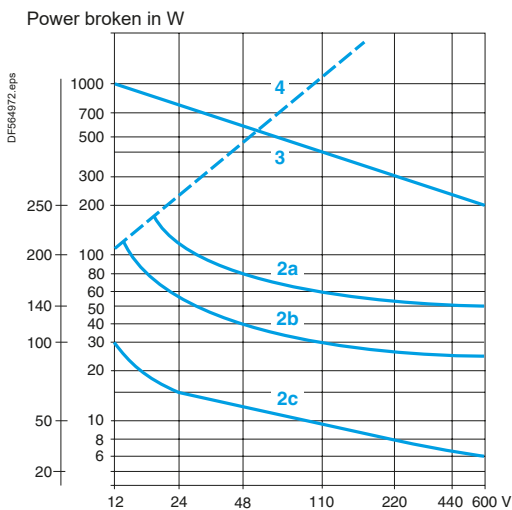
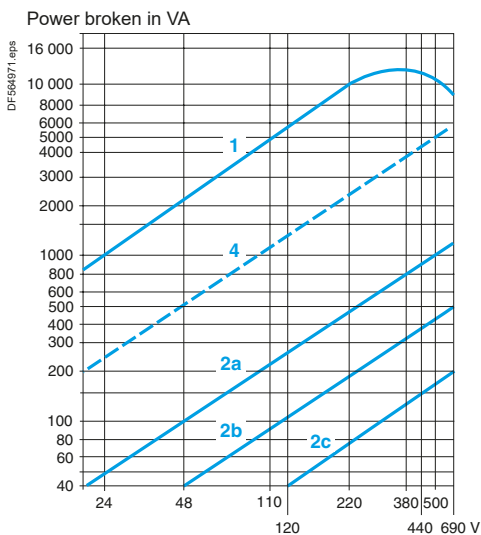


TeSys Control

K Contactors and reversing contactors

Characteristics and durability curves

| Auxiliary contact characteristics of contactors and instantaneous contact blocks | | | | |
|--|--|--------|-----------|---|
| Number of auxiliary contacts | On LC●K or LP●K 3-pole | | | 1 |
| | On LA1K | | | 2 or 4 |
| Rated operational voltage (U _e) | Up to | | V | 690 |
| Rated insulation voltage (U _i) | Conforming to IEC 60947 | | V | 690 |
| | Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1 | | V | 600 |
| Conventional thermal current (I _{th}) | For ambient temperature ≤ 50 °C | | A | 10 |
| Frequency of the operational current | | | Hz | Up to 400 |
| Minimum switching capacity | U min | | V | 17 |
| | I min | | mA | 5 |
| Short-circuit protection | Conforming to IEC 60947, gG fuse | | A | 10 |
| Rated making capacity | Conforming to IEC 60947 | I rms | A | 110 |
| Short-time rating | Permissible for | 1 s | A | 80 |
| | | 500 ms | A | 90 |
| | | 100 ms | A | 110 |
| Insulation resistance | | | MΩ | > 10 |
| Non-overlap distance | LA1K: linked contacts conforming to INRS, BIA and CNA specifications | | mm | 0.5 (see schemes pages B8/77 and B8/79) |



Operational power of contacts conforming to IEC 60947 a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \varphi 0.7$) = 10 times the power broken ($\cos \varphi 0.4$).

| Operating cycles | V | Power broken (VA) | | | | | | |
|-----------------------------|-----------|-------------------|------|---------|---------|---------|-------|---------|
| | | 24 | 48 | 110/127 | 220/230 | 380/400 | 440 | 600/690 |
| 1 million operating cycles | VA | 48 | 96 | 240 | 440 | 800 | 880 | 1200 |
| 3 million operating cycles | VA | 17 | 34 | 86 | 158 | 288 | 317 | 500 |
| 10 million operating cycles | VA | 7 | 14 | 36 | 66 | 120 | 132 | 200 |
| Occasional making capacity | VA | 1000 | 2050 | 5000 | 10000 | 14000 | 13000 | 9000 |

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

| Operating cycles | V | Power broken (W) | | | | | |
|-----------------------------|----------|------------------|-----|-----|-----|-----|-----|
| | | 24 | 48 | 110 | 220 | 440 | 600 |
| 1 million operating cycles | W | 120 | 80 | 60 | 52 | 51 | 50 |
| 3 million operating cycles | W | 55 | 38 | 30 | 28 | 26 | 25 |
| 10 million operating cycles | W | 15 | 11 | 9 | 8 | 7 | 6 |
| Occasional making capacity | W | 720 | 600 | 400 | 300 | 230 | 200 |

- Breaking limit of contacts valid for:
 - maximum of 50 operating cycles at 10 s intervals (power broken = making current x $\cos \varphi 0.7$).
- Electrical durability of contacts for:
 - 1 million operating cycles (2a)
 - 3 million operating cycles (2b)
 - 10 million operating cycles (2c).
- Breaking limit of contacts valid for:
 - maximum of 20 operating cycles at 10 s intervals with current passing for 0.5 s per operating cycle.
- Thermal limit.

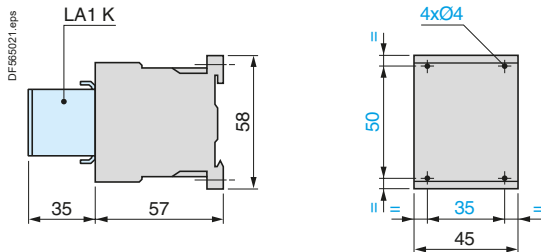
TeSys Control K Contactors

Dimensions and mounting

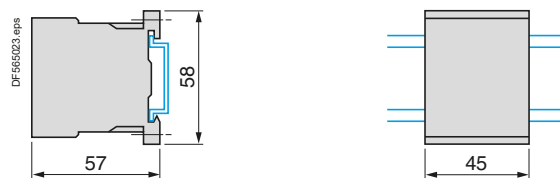
Contactors

LC1K, LC7K, LP1K, LP4K

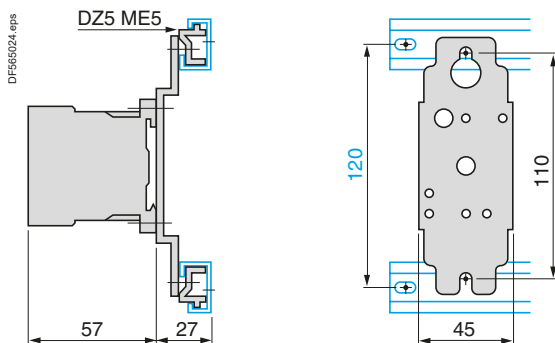
On panel



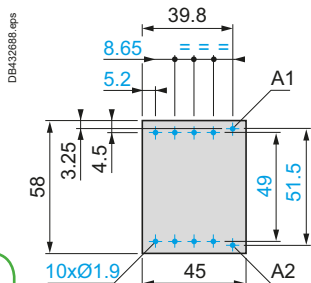
On mounting rail NSYSR200BD or NSYSR200 (≥ 35 mm)



DX1AP25



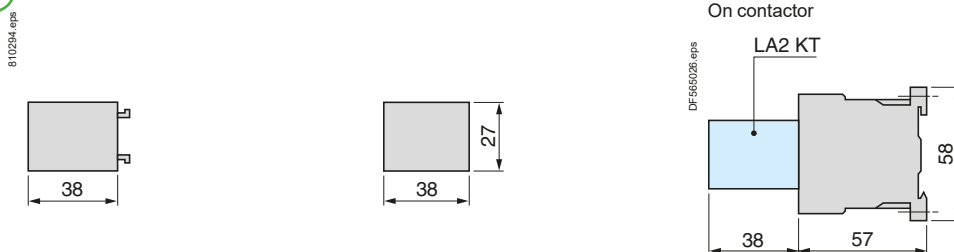
On printed circuit board



Electronic time delay contact blocks

LA2KT

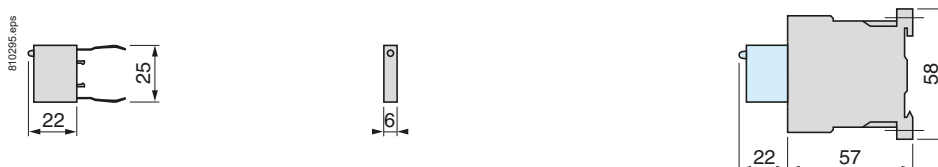
On contactor



Suppressor modules

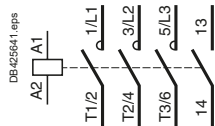
LA4K●

On contactor LC1K or LP1K

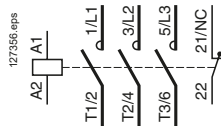


3-pole contactors

3 P + N/O

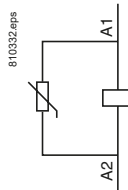


3 P + N/C

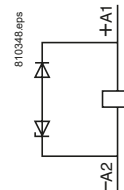


With integral suppression device

LC7K

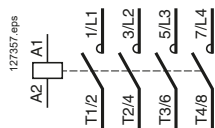


LP4K

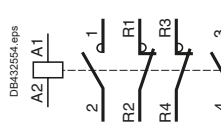


4-pole contactors

4 P

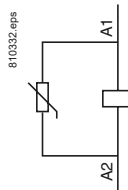


2 P N/O + 2 P N/C

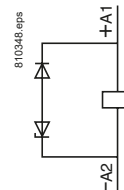


With integral suppression device

LC7K



LP4K



Instantaneous auxiliary contacts LA1K

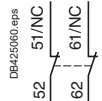
LA1KN20, KN207, KN203

2 N/O



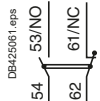
LA1KN02, KN027, KN023

2 N/C



LA1KN11, KN117, KN113

1 N/O + 1 N/C



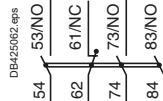
LA1KN40, KN407, KN403

4 N/O



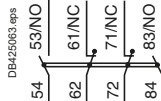
LA1KN31, KN317, KN313

3 N/O + 1 N/C



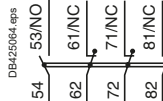
LA1KN22, KN227, KN223

2 N/O + 2 N/C



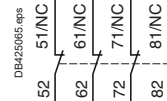
LA1KN13, KN137, KN133

1 N/O + 3 N/C



LA1KN04, KN047, KN043

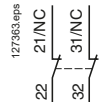
4 N/C



Terminal referencing conforming to standard EN 50012

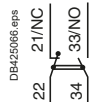
LA1KN02M

2 N/C



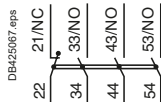
LA1KN11M

1 N/O + 1 N/C



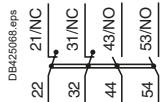
LA1KN31M

3 N/O + 1 N/C



LA1KN22M

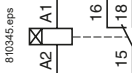
2 N/O + 2 N/C



Electronic time delay contact blocks

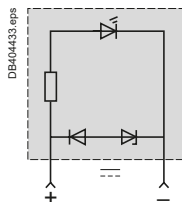
LA2KT

1 C/O

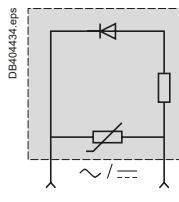


Suppressor modules

LA4KC



LA4KE



TeSys Control

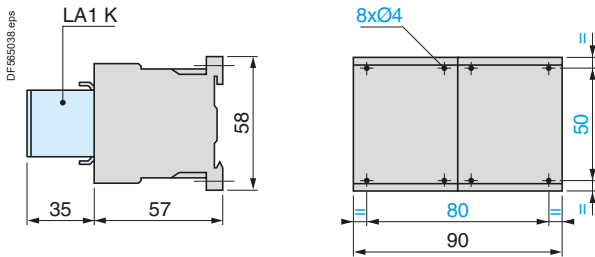
K Reversing contactors

Dimensions and mounting

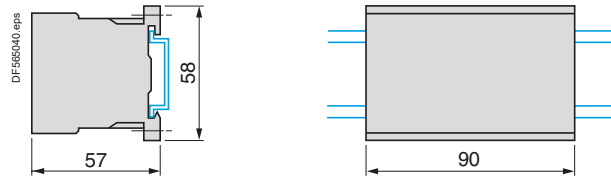
Reversing contactors

LC2K, LC8K, LP2K, LP5K

On panel

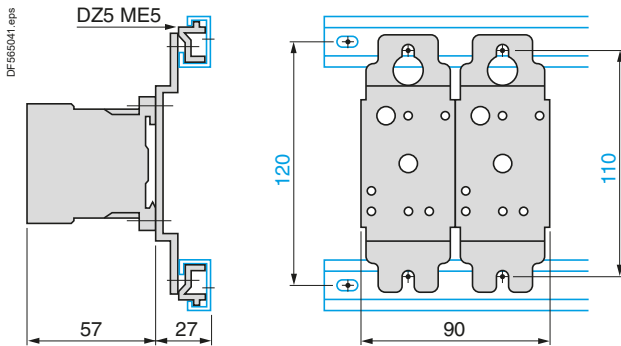


On mounting rail NSYSDR200BD or NSYSDR200 (≥ 35 mm)

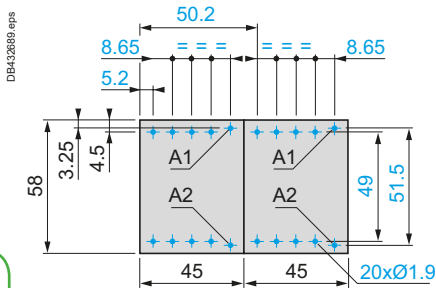


2 x DX1AP25

On one asymmetrical mounting rail DZ5MB on 2 mounting plates DX1AP25.



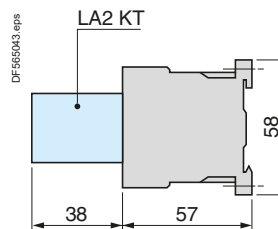
On printed circuit board for reversing contactors or 2 contactors mounted side by side.



Electronic time delay contact blocks

LA2KT

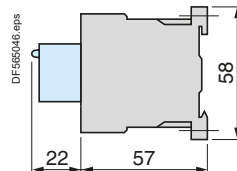
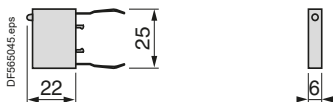
On reversing contactors



Suppressor modules

LA4K●

On reversing contactors LC2K or LP2 K



TeSys Control

K Reversing contactors

Schemes

3-pole reversing contactors

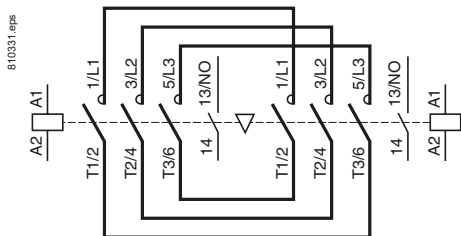
With screw clamp connections

With integral suppression device

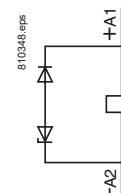
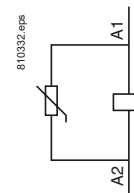
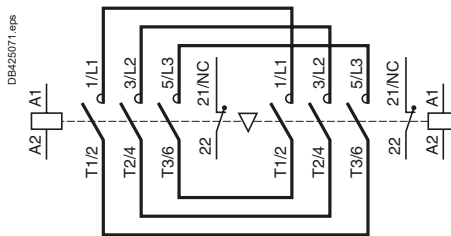
LC8K

LP5K

3 P + N/O

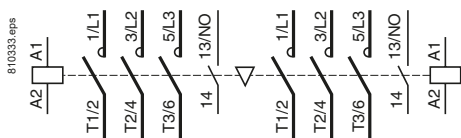


3 P + N/C

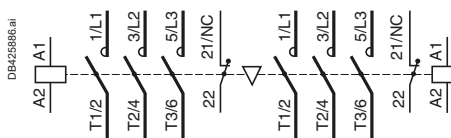


With Faston connectors or solder pins (printed circuit board)

3 P + N/O



3 P + N/C



4-pole reversing contactors

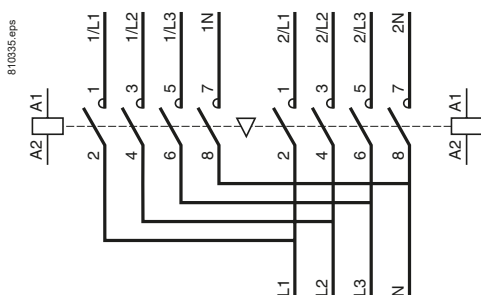
With screw clamp connections

Integral suppression device

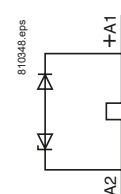
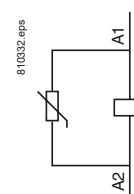
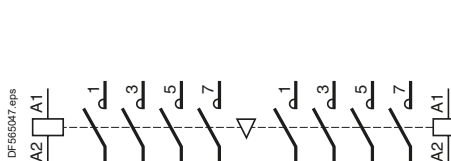
LC8K

LP5K

4 P



4 P



Instantaneous auxiliary contacts LA1K

Terminal referencing conforming to standard EN 50012

LA1KN20, KN207, KN203

LA1KN02, KN027, KN023

LA1KN11, KN117, KN113

LAKN02M

LA1KN11M

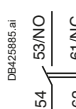
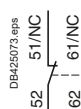
2 N/O

2 N/C

1 N/O + 1 N/C

2 N/C

1 N/O + 1 N/C



LA1KN40, KN407, KN403

LA1KN31, KN317, KN313

LA1KN22, KN227, KN223

LAKN13, KN137, KN133

LA1KN04, KN047, KN043

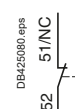
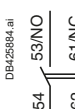
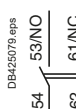
4 N/O

3 N/O + 1 N/C

2 N/O + 2 N/C

1 N/O + 3 N/C

4 N/C



Electronic time delay contact blocks

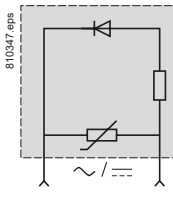
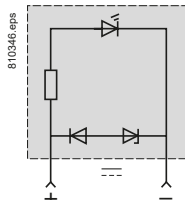
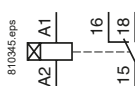
LA2KT

Suppressor modules

LA4KC

LA4KE

1 C/O



References:
pages B8/8 to B8/11

Characteristics:
pages B8/72 to B8/75

Dimensions:
page B8/78

TeSys Control

Deca green, Deca Contactors

Characteristics

| Environment | | | D09...D18 DT20 and DT25 | D25...D38 DT32 and DT40 | D40A...D80A DT60A and DT80A | D80...D95 ⁽¹⁾ | D115 and D150 | |
|---|---|----|--|-------------------------------|-----------------------------------|---|-----------------------|--|
| Rated insulation voltage (Ui) | Conforming to IEC 60947-4-1, overvoltage category III, degree of pollution: 3 | V | 690 | | | | 1000 | |
| | Conforming to UL, CSA | V | 600 | | | | | |
| Rated impulse withstand voltage (Uimp) | Conforming to IEC 60947 | kV | 6 | | | | 8 | |
| Conforming to standards | | | IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4 | | | | | |
| Product certifications ⁽¹⁾ | | | UL, CSA, CCC, EAC, UKCA, CB certification, EU-MR-RO by DNV-GL | | | UL, CSA, CCC, EAC, UKCA, CB certification, DNV-GL, RINA, BV, LRoS | | |
| Degree of protection ⁽²⁾ (front face) | Conforming to IEC 60529 | | | | | | | |
| | Power circuit connections | | Protection against direct finger contact IP20 | | | | | |
| | Coil connection | | Protection against direct finger contact IP20 | | | | | |
| Climatic withstand | | | According to IACS E10 and IEC 60947-1 Annex Q category D | | | | According to IACS E10 | |
| Ambient air temperature around the device | Storage | °C | -60...+80 | | | | | |
| | Operation ⁽³⁾ | °C | -40...+60 | | | | | |
| | Allowed with derating ⁽³⁾⁽⁴⁾ | °C | +60...+70 at U _c to 1.●● x U _c | | | | | |
| Maximum operating altitude | Without derating | m | 3000 | | | | | |
| Operating positions ⁽⁵⁾ | Without derating in the following positions | | AC and DC coils AC/DC and "BBE" coils | | AC coils AC/DC and "BBE" coils | | DC coils | |
| | | | | | | | | |
| | Positions that are not allowed | | For --- contactors LC1D09 to LC1D150. | | | | | |
| | | | | | | | | |
| Flame resistance | Conforming to IEC 60695-2-11 | °C | 850 | | | | | |
| Shock resistance ⁽⁶⁾ 1/2 sine wave = 11 ms Conforming to IEC/EN 60068-2-27 | Contactor open | | 10 gn | 8 gn | 10 gn | 8 gn | 6 gn | |
| | Contactor closed | | 15 gn | 15 gn | 15 gn | 10 gn | 15 gn | |
| Vibration resistance ⁽⁶⁾ 5...300 Hz Conforming to IEC/EN 60068-2-6 | Contactor open | | 2 gn | | | | | |
| | Contactor closed | | 4 gn | 4 gn | 4 gn | 3 gn | 4 gn | |

⁽¹⁾ Contactor **LC1D95** with d.c. coil is not UL/CSA certified.

⁽²⁾ Protection provided for the cabling c.s.a.'s indicated on the next page and for connection by cable. For lug type: add a protective cover.

⁽³⁾ As per IEC60947-4-1, operating time and drop out voltage given and tested for -5...+40 °C.

⁽⁴⁾ Refer to operational current in AC1 (page A6/40).

⁽⁵⁾ When mounting on a vertical rail, use a stop.

⁽⁶⁾ Without modifying the power contact states, in the most unfavourable direction (coil energised at U_e).
In case of vibration, it is recommended to mount the devices separately by screws on metal plate.

Pole characteristics Deca, Deca green contactors

| Contactor type | | LC1 | D09 (3P) | DT20 D098 | D12 (3P) | DT25 D128 | D18 (3P) | DT32 D188 | D25 (3P) | DT40 D258 |
|--|---|--------|---|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Rated operational current (Ie) (Ue ≤ 440 V) | In AC-3, θ ≤ 60 °C | A | 9 | | 12 | | 18 | | 25 | |
| | In AC-1, θ ≤ 60 °C | A | 25 ⁽¹⁾ | 20 | 25 ⁽¹⁾ | 25 | 32 ⁽¹⁾ | 32 | 40 ⁽¹⁾ | 40 |
| Rated operational voltage (Ue) | Up to | V | 690 | | 690 | | 690 | | 690 | |
| Frequency limits | Of the operational current | Hz | 25...400 | | 25...400 | | 25...400 | | 25...400 | |
| Conventional thermal current (Ith) | θ ≤ 60 °C | A | 25 ⁽¹⁾ | 20 | 25 ⁽¹⁾ | 25 | 32 ⁽¹⁾ | 32 | 40 ⁽¹⁾ | 40 |
| Rated making capacity (440 V) | Conforming to IEC 60947 | A | 250 | | 250 | | 300 | | 450 | |
| Rated breaking capacity (440 V) | Conforming to IEC 60947 | A | 250 | | 250 | | 300 | | 450 | |
| Permissible short time rating No current flowing for preceding 15 minutes with θ ≤ 40 °C | For 1 s | A | 210 | | 210 | | 240 | | 380 | |
| | For 10 s | A | 105 | | 105 | | 145 | | 240 | |
| | For 1 min | A | 61 | | 61 | | 84 | | 120 | |
| | For 10 min | A | 30 | | 30 | | 40 | | 50 | |
| Fuse protection against short-circuits (U ≤ 690 V) | Without thermal overload relay, gG fuse | type 1 | A | 25 | | 40 | | 50 | | 63 |
| | | type 2 | A | 20 | | 25 | | 35 | | 40 |
| | With thermal overload relay | A | See pages B11/4 and B11/5, for aM or gG fuse ratings corresponding to the associated thermal overload relay | | | | | | | |
| Average impedance per pole | At Ith and 50 Hz | mΩ | 2.5 | | 2.5 | | 2.5 | | 2 | |
| Power dissipation per pole for the above operational currents | AC-3 | W | 0.20 | | 0.36 | | 0.8 | | 1.25 | |
| | AC-1 | W | 1.56 | | 1.56 | | 2.5 | | 3.2 | |

Control circuit characteristics, a.c. supply Deca contactors

| | | | | | |
|--|------------------------------|---------------|---|------|-----|
| Rated control circuit voltage (Uc) | 50/60 Hz | V | 12...690 | | |
| Control voltage limits | 50 or 60 Hz coils | Operation | – | | |
| | | Drop-out | – | | |
| | 50/60 Hz coils | Operation | 0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C | | |
| | | Drop-out | 0.3...0.6 Uc at 60 °C | | |
| Average consumption at 20 °C and at Uc | ~ 50 Hz Inrush | 50 Hz coil | VA | – | |
| | | Cos φ | | 0.75 | |
| | | 50/60 Hz coil | VA | 70 | |
| | | Sealed | 50 Hz coil | VA | – |
| | | | Cos φ | | 0.3 |
| | | 50/60 Hz coil | VA | 7 | |
| | ~ 60 Hz Inrush | 60 Hz coil | VA | – | |
| | | Cos φ | | 0.75 | |
| | | 50/60 Hz coil | VA | 70 | |
| | | Sealed | 60 Hz coil | VA | – |
| | | | Cos φ | | 0.3 |
| | | 50/60 Hz coil | VA | 7.5 | |
| Heat dissipation | 50/60 Hz | W | 2...3 | | |
| Operating time ⁽²⁾ | Closing "C" | ms | 12...22 | | |
| | Opening "O" | ms | 4...19 | | |
| Mechanical durability in millions of operating cycles | 50 or 60 Hz coil | | – | | |
| | 50/60 Hz coil on 50 Hz | | 15 | | |
| Maximum operating rate at ambient temperature ≤ 60 °C | In operating cycles per hour | | 3600 | | |

(1) Versions with spring terminal connections:

16 A for LC1D093 and LC1D123 (20 A possible with 2 x 2.5 mm² in parallel),

25 A for LC1D183 to LC1D323 (32 A possible for LC1D183 connected with 2 x 4 mm² cables in parallel; 40 A possible for LC1D253 and LC1D323 connected with 2 x 4 mm² in parallel).

(2) The closing time "C" is measured from the moment the coil supply is switched on to closure of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

(3) The opening time is 40...75 ms for LX1D8•7 coils and 6...20 ms for LX1D8•5 and LX1D8•6 coils.

(4) 2400 for LX1D8•5 and LX1D8•6 coils and 1200 for LX1D8•7 coils (refer to page B8/48 for list of coil references).

| D32 | D38 | D40A | DT60A | D50A | D65A | D80A | DT80A | D80 | D95 | D115 | D150 |
|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 32 | 38 | 40 | – | 50 | 65 | 66 | – | 80 | 95 | 115 | 150 |
| 50 ⁽¹⁾ | 50 | 60 | 60 | 80 | 80 | 80 | 80 | 125 | 125 | 200 | 200 |
| 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 1000 | 1000 | 1000 | 1000 |
| 25...400 | 25...400 | 25...400 | 25...400 | 25...400 | 25...400 | 25...400 | 25...400 | 25...400 | 25...400 | 25...400 | 25...400 |
| 50 | 50 | 60 | 60 | 80 | 80 | 80 | 80 | 125 | 125 | 200 | 200 |
| 550 | 550 | 800 | 800 | 900 | 1000 | 1000 | 1000 | 1100 | 1100 | 1260 | 1660 |
| 550 | 550 | 800 | 800 | 900 | 1000 | 1000 | 1000 | 1100 | 1100 | 1100 | 1400 |
| 430 | 430 | 720 | 720 | 810 | 900 | 900 | 900 | 1100 | 1100 | 1100 | 1400 |
| 260 | 310 | 320 | 320 | 400 | 640 | 640 | 640 | 640 | 800 | 950 | 1200 |
| 138 | 150 | 165 | 165 | 208 | 260 | 260 | 260 | 320 | 400 | 550 | 580 |
| 60 | 60 | 72 | 72 | 84 | 110 | 110 | 110 | 135 | 135 | 250 | 250 |
| 63 | 63 | 80 | 80 | 100 | 125 | 125 | 125 | 200 | 200 | 250 | 315 |
| 63 | 63 | 80 | 80 | 100 | 125 | 125 | 125 | 160 | 160 | 200 | 250 |

See pages B11/4 and B11/5 for aM or gG fuse ratings corresponding to the associated thermal overload relay

| | | | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|------|------|------|-----|------|
| 2 | 2 | 1.5 | 1.6 | 1.5 | 1.5 | 1.5 | 1.6 | 0.8 | 0.8 | 0.6 | 0.6 |
| 2 | 3 | 2.4 | – | 3.7 | 6.3 | 6.3 | – | 5.1 | 7.2 | 7.9 | 13.5 |
| 5 | 5 | 5.4 | 5.8 | 9.6 | 9.6 | 9.6 | 10.2 | 12.5 | 12.5 | 24 | 24 |

| 12...690 | 12...690 | | | | | | | 24...500 | | |
|---|--|---------|---------|---------|---------|---------|---------|--|--|-----------|
| – | – | | | | | | | 0.85...1.1 Uc at 55 °C | | |
| – | – | | | | | | | 0.3...0.6 Uc at 55 °C | 0.3...0.5 Uc at 55 °C | |
| 0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C | 0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C | | | | | | | 0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 55 °C | 0.8...1.15 Uc on 50/60 Hz at 55 °C | |
| 0.3...0.6 Uc at 60 °C | 0.3...0.6 Uc at 60 °C | | | | | | | 0.3...0.6 Uc at 55 °C | 0.3...0.5 Uc at 55 °C | |
| – | – | | | | | | | 200 | 300 | – |
| 0.75 | 0.75 | | | | | | | 0.75 | 0.8 | 0.9 |
| 70 | 160 | | | | | | | 245 | 280...350 | 280...350 |
| – | – | | | | | | | 20 | 22 | – |
| 0.3 | 0.3 | | | | | | | 0.3 | 0.3 | 0.9 |
| 7 | 15 | | | | | | | 26 | 2...18 | 2...18 |
| – | – | | | | | | | 220 | 300 | – |
| 0.75 | 0.75 | | | | | | | 0.75 | 0.8 | 0.9 |
| 70 | 140 | | | | | | | 245 | 280...350 | 280...350 |
| – | – | | | | | | | 22 | 22 | – |
| 0.3 | 0.3 | | | | | | | 0.3 | 0.3 | 0.9 |
| 7.5 | 13 | | | | | | | 26 | 2...18 | 2...18 |
| 2...3 | 4...5 | | | | | | | 6...10 | 3...8 | 3...4.5 |
| 12...22 | 12...26 | 12...26 | 12...26 | 12...26 | 12...26 | 12...26 | 20...35 | 20...35 | 20...50 | 20...35 |
| 4...19 | 4...19 | 4...19 | 4...19 | 4...19 | 4...19 | 4...19 | 6...20 | 6...20 | 6...20 ⁽³⁾ | 40...75 |
| – | – | – | – | – | – | – | 10 | 10 | 8 | – |
| 15 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 8 | 8 |
| 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 2400 ⁽⁴⁾ | 1200 |

Ref.



Contactors

TeSys Control

Deca Contactors

Characteristics

| d.c. control circuit characteristics Deca contactors | | | | | | | |
|---|---|-----------------|---|---|---------------------------|---------------------------|-----------|
| Contactor type | | | LC1D09...D38 LC1DT20...DT40 | LC1D40A...D80A LC1DT60A and DT80A | LC1 or LP1D80 LC1D95 | LC1D115 and LC1D150 | |
| Rated control circuit voltage (Uc) $\overline{\text{---}}$ | | V | 12...440 | 12...440 | | 24...440 | |
| Rated insulation voltage | Conforming to IEC 60947-1 | V | 690 | | | | |
| | Conforming to UL, CSA | V | 600 | | | | |
| Control voltage limits | Operation | Standard coil | 0.7...1.25 Uc at 60 °C | 0.75...1.25 Uc at 60 °C | 0.85...1.1 Uc at 55 °C | 0.75...1.2 Uc at 55 °C | |
| | | Wide range coil | – | – | 0.75...1.2 Uc at 55 °C | – | |
| | Drop-out | | 0.1...0.25 Uc at 60 °C | 0.1...0.3 Uc at 60 °C | 0.1...0.3 Uc at 55 °C | 0.15...0.4 Uc at 55 °C | |
| Average consumption at 20 °C and at Uc | $\overline{\text{---}}$ | Inrush | W | 5.4 | 19 | 22 | 270...365 |
| | | Sealed | W | 5.4 | 7.4 | 22 | 2.4...5.1 |
| Operating time ⁽¹⁾ average at Uc | Closing | "C" | ms | 63 ±15 % | 50 ±15% | 95...130 | 20...35 |
| | Opening | "O" | ms | 20 ±20 % | 20 ±20% | 20...35 | 40...75 |
| | | | <i>Note: The arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.</i> | | | | |
| Time constant (L/R) | | ms | 28 | 34 | 75 | 25 | |
| Mechanical durability at Uc | In millions of operating cycles | | 30 | 10 | 10 | 8 | |
| Maximum operating rate at ambient temperature ≤ 60 °C | In operating cycles per hour | | 3600 | 3600 | 3600 | 1200 | |
| Low consumption control circuit characteristics Deca contactors | | | | | | | |
| Rated insulation voltage | Conforming to IEC 60947-1 | V | 690 | – | | | |
| | Conforming to UL, CSA | V | 600. | – | | | |
| Maximum voltage | Of the control circuit on $\overline{\text{---}}$ | V | 250 | – | | | |
| Average consumption d.c. at 20 °C and at Uc | Wide range coil (0.8...1.25 Uc) | Inrush | W | 2.4 | – | | |
| | | Sealed | W | 2.4 | – | | |
| Operating time ⁽¹⁾ at Uc and at 20 °C | Closing | "C" | ms | 77 ±15 % | – | | |
| | Opening | "O" | ms | 25 ±20 % | – | | |
| Voltage limits ($\theta \leq 60$ °C) of the control circuit | Operation | | | 0.8 to 1.25 Uc | – | | |
| | Drop-out | | | 0.1...0.3 Uc | – | | |
| Time constant (L/R) | | ms | 40 | – | | | |
| Mechanical durability | In millions of operating cycles | | 30 | – | | | |
| Maximum operating rate at ambient temperature ≤ 60 °C | In operating cycles per hour | | 3600 | – | | | |

(1) The operating times depend on the type of contactor electromagnet and its control mode.
The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.
The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

Wide band Deca green contactors AC/DC coil circuit characteristics

| | | | | | | | | | |
|---|----------------------|---|------------|------------|---|------------|------------|------------|-----|
| Rated control circuit voltage (Uc) | V | AC/DC 24...250 | | | | | | | |
| Operation | V | 0.85 Uc mini...1.1 Uc maxi at 60 °C in AC or DC (BNE coil: 0.8 Uc mini at 24 VDC, 0.85 Uc mini in AC). | | | | | | | |
| Drop-out | V | 0.1 Uc maxi (e.g. 100 to 250 V = 25 V at 60 °C) | | | | | | | |
| Contactor type | | LC1D09...D38 | | | LC1D40A...D80A, LC1DT60A, LC1DT80A | | | | |
| Coil code | | BNE | EHE | KUE | BBE | BNE | EHE | KUE | |
| Rated control circuit voltage (Uc) | | 24-60 | 48-130 | 100-250 | 24 DC | 24-60 | 48-130 | 100-250 | |
| AC supply at 20°C | Consumption inrush | VA | 15 | 25 | 25 | - | 15 | 23 | 18 |
| | Consumption sealed | VA | 0.9 | 1.3 | 1.6 | - | 1 | 1.4 | 1.8 |
| | Consumption sealed | mA | 28 | 15 | 9 | - | 35 | 17 | 9.5 |
| | Heat dissipation | W | 0.6 | 0.8 | 1.1 | - | 0.8 | 0.9 | 1.3 |
| DC supply at 20°C | Consumption inrush | W | 14 | 24 | 18 | 11 | 16 | 19 | 14 |
| | Consumption sealed | mA | 23 | 13 | 7 | 20 | 30 | 15 | 7.7 |
| | Heat dissipation | W | 0.6 | 0.8 | 1.1 | 0.5 | 0.7 | 0.9 | 1.2 |
| Max operating time ⁽²⁾ | Closing "C" | ms | 50 ±5 ms | | | 60 ±5 ms | | | |
| | Opening "O" | ms | 20...90 ms | | | 20...80 ms | | | |
| EMC immunity | | Meets IEC 60947-4-1 standard, table 14 | | | | | | | |
| EMC emission | IEC 60947-4-1 §9.4.3 | Environment A ⁽¹⁾ | | | | | | | |
| Maximum operating rate at ambient temperature ≤ 60°C | cycle/h | 3600 | | | | | | | |
| Mechanical durability at Uc In millions of operating cycles | | 15 | | | 6 | | | | |

⁽¹⁾ Use of this product in EMC environment B may require mitigation measures to avoid unwanted disturbance.

⁽²⁾ The closing time "C" is measured from the moment the coil supply is switched on to closure of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separates.

Ref.



Contactors

TeSys Control

Deca green, Deca Contactors

Characteristics

Power circuit connections

Screw clamp terminal connections Deca, Deca green contactors

| Contactor type | LC1 | D09 and D12 DT20 and DT25 | D18 (3P) | D25 (3P) | D32 | D38 | D18 and D25 (4P) DT32 and DT40 | D40A to D80A DT60A and DT80A ⁽¹⁾ | D80 and D95 | D115 and D150 |
|----------------------------------|--------------------|---------------------------|----------|----------|----------|-----|--------------------------------|--|-------------------|--------------------|
| Tightening | | Screw clamp terminals | | | | | Connector 2 inputs | Screw clamp terminals | Connector 1 input | Connector 2 inputs |
| Flexible cable without cable end | 1 conductor | mm ² | 1...4 | 1.5...6 | 2.5...10 | | 2.5...10 | 1...35 | 4...50 | 10...120 |
| | 2 conductors | mm ² | 1...4 | 1.5...6 | 2.5...10 | | 2.5...10 | 1...25 and 1...35 | 4...25 | 10...120 + 10...50 |
| Flexible cable with cable end | 1 conductor | mm ² | 1...4 | 1...6 | 1...10 | | 2.5...10 | 1...35 | 4...50 | 10...120 |
| | 2 conductors | mm ² | 1...2.5 | 1...4 | 1.5...6 | | 2.5...10 | 1...25 and 1...35 | 4...16 | 10...120 + 10...50 |
| Solid cable without cable end | 1 conductor | mm ² | 1...4 | 1.5...6 | 1.5...10 | | 2.5...16 | 1...35 | 4...50 | 10...120 |
| | 2 conductors | mm ² | 1...4 | 1.5...6 | 2.5...10 | | 2.5...16 | 1...25 and 1...35 | 6...25 | 10...120 + 10...50 |
| Screwdriver | Philips | | N° 2 | N° 2 | N° 2 | | N° 2 | – | – | – |
| | Flat screwdriver Ø | | Ø6 | Ø6 | Ø6 | | Ø6 | – | Ø6...Ø8 | – |
| Hexagonal key | | | – | – | – | | – | 4 | 4 | 4 |
| Tightening torque | | N.m | 1.7 | 1.7 | 2.5 | | 1.8 | 5: ≤ 25 mm ² 8: 35 mm ² | 12 | 12 |

Spring terminal connections ⁽²⁾ Deca contactors

| | | | | | | | | | | |
|----------------------------------|--------------|-----------------|-------------------|---|---|---|---|----|---|---|
| Flexible cable without cable end | 1 conductor | mm ² | 2.5 (4: DT25) | 4 | 4 | 4 | – | 10 | – | – |
| | 2 conductors | mm ² | 2.5 (except DT25) | 4 | 4 | 4 | – | – | – | – |

Connection by bars or lugs Deca contactors

| | | | | | | | | | | |
|--------------------------------|--------------------|------|------|------|------|------|------|----|--------|--------|
| Bar c.s.a. | | | – | – | – | – | – | – | 3 x 16 | 5 x 25 |
| Lug external Ø | mm | 8 | 8 | 10 | 10 | 8 | 16.5 | 17 | 17 | 25 |
| Ø of screw | mm | M3.5 | M3.5 | M4 | M4 | M3.5 | M6 | M6 | M6 | M8 |
| Screwdriver | Pozidriv | | N° 2 | N° 2 | N° 2 | N° 2 | N° 2 | – | – | – |
| | Flat screwdriver Ø | | Ø6 | Ø6 | Ø6 | Ø6 | Ø6 | – | Ø8 | – |
| Key for hexagonal headed screw | | | – | – | – | – | – | 10 | 10 | 13 |
| Tightening torque | | N.m | 1.7 | 1.7 | 2.5 | 2.5 | 1.8 | 6 | 9 | 12 |

Control circuit connections

Connection by cable (tightening via screw clamps) Deca, Deca green contactors

| | | | | | | | | | | |
|----------------------------------|--------------------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Flexible cable without cable end | 1 conductor | mm ² | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...2.5 |
| | 2 conductors | mm ² | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...2.5 |
| Flexible cable with cable end | 1 conductor | mm ² | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...2.5 | 1...2.5 |
| | 2 conductors | mm ² | 1...2.5 | 1...2.5 | 1...2.5 | 1...2.5 | 1...2.5 | 1...2.5 | 1...2.5 | 1...2.5 |
| Solid cable without cable end | 1 conductor | mm ² | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...2.5 |
| | 2 conductors | mm ² | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...4 | 1...2.5 |
| Screwdriver | Philips | | N° 2 | N° 2 | N° 2 | N° 2 | N° 2 | N° 2 | N° 2 | N° 2 |
| | Flat screwdriver Ø | | Ø6 | Ø6 | Ø6 | Ø6 | Ø6 | Ø6 | Ø6 | Ø6 |
| Tightening torque | | N.m | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.2 | 1.2 |

Spring terminal connections ⁽²⁾ Deca contactors

| | | | | | | | | | | |
|----------------------------------|--------------|-----------------|-----|-----|-----|-----|---|-----|------------|---|
| Flexible cable without cable end | 1 conductor | mm ² | 2.5 | 2.5 | 2.5 | 2.5 | – | 2.5 | 0.75...2.5 | – |
| | 2 conductors | mm ² | 2.5 | 2.5 | 2.5 | 2.5 | – | 2.5 | 0.75...2.5 | – |

Connection by bars or lugs Deca contactors

| | | | | | | | | | | |
|-------------------|--|------|------|------|------|------|------|------|------|------|
| Lug external Ø | mm | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Ø of screw | mm | M3.5 | M3.5 | M3.5 | M3.5 | M3.5 | M3.5 | M3.5 | M3.5 | M3.5 |
| Screwdriver | Pozidriv (except for D80-95 / D115-150: Philips) | | N° 2 | N° 2 | N° 2 | N° 2 | N° 2 | N° 2 | N° 2 | N° 2 |
| | Flat screwdriver Ø | | Ø6 | Ø6 | Ø6 | Ø6 | Ø6 | Ø6 | Ø6 | Ø6 |
| Tightening torque | | N.m | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.2 | 1.2 |

⁽¹⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/42).

⁽²⁾ If cable ends are used, choose the next size down (example: for 2.5 mm², use 1.5 mm²) and square crimp the cable ends using a special tool.

References:
pages B8/18 to B8/28

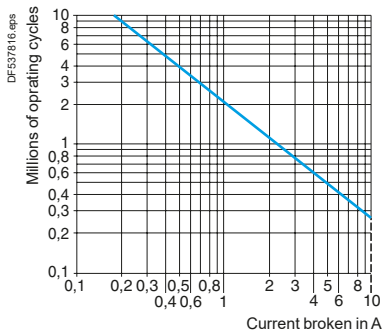
Dimensions:
pages B8/94 to B8/100

Schemes:
pages B8/101 and B8/102

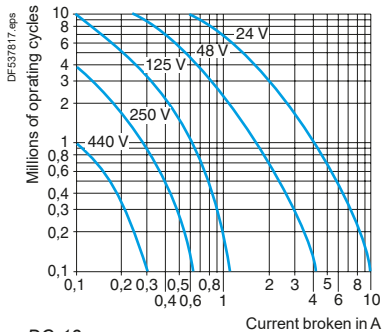


Characteristics of auxiliary contacts incorporated in the contactor

| | | | |
|--|---|-----------------------------|---|
| Mechanically linked contacts | Conforming to IEC 60947-5-1 | | Each contactor has 2 N/O and N/C contacts mechanically linked on the same movable contact holder |
| Mirror contact | Conforming to IEC 60947-4-1 | | The N/C contact on each contactor represents the state of the power contacts and can be connected to a PREVENTA safety module |
| Rated operational voltage (Ue) | Up to | V | 690 |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | 690 |
| | Conforming to UL, CSA | V | 600 |
| Conventional thermal current (Ith) | For ambient temperature $\leq 60\text{ }^{\circ}\text{C}$ | A | 10 |
| Frequency of the operational current | | Hz | 25...400 |
| Minimum switching capacity $\lambda = 10^{-8}$ | U min | V | 17 |
| | I min | mA | 5 |
| Short-circuit protection | Conforming to IEC 60947-5-1 | | gG fuse: 10 A |
| Rated making capacity | Conforming to IEC 60947-5-1, I rms | A | \sim : 140, --- : 250 |
| Short-time rating | Permissible for | 1 s | A 100 |
| | | 500 ms | A 120 |
| | | 100 ms | A 140 |
| Insulation resistance | | MΩ | > 10 |
| Non-overlap time | Guaranteed between N/C and N/O contacts | ms | 1.5 (on energisation and on de-energisation) |
| Tightening torque | Pozidriv / Philips head n° 2 and $\text{\O}6$ | N.m | 1.7 |



AC-15



DC-13

Operational power of contacts conforming to IEC 60947-5-1

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \phi 0.7$) = 10 times the power broken ($\cos \phi 0.4$).

| Operating cycles | V | 24 | 48 | 115 | 230 | 400 | 440 | 600 |
|------------------|-----------|----|-----|-----|-----|-----|------|------|
| 1 million | VA | 60 | 120 | 280 | 560 | 960 | 1050 | 1440 |
| 3 million | VA | 16 | 32 | 80 | 160 | 280 | 300 | 420 |
| 10 million | VA | 4 | 8 | 20 | 40 | 70 | 80 | 100 |

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

| Operating cycles | V | 24 | 48 | 125 | 250 | 440 |
|------------------|----------|----|----|-----|-----|-----|
| 1 million | W | 96 | 76 | 76 | 76 | 44 |
| 3 million | W | 48 | 38 | 38 | 32 | — |
| 10 million | W | 14 | 12 | 12 | — | — |

| Environment | | | | | | |
|--|---|----|--|---------------|------|------|
| Contact block type (not dust/damp protected) | | | LADN or LADC | LADT and LADS | LADR | LAD8 |
| Conforming to standards | | | IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5 | | | |
| Product certifications | | | UL, CSA, CCC, EAC, UKCA, CB certification | | | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP 2X | | | |
| Ambient air temperature around the device | Storage | °C | -60...+80 | | | |
| | Operation | °C | -5...+60 | | | |
| Maximum operating altitude | Without derating | | m | | | |
| Connection by cable | Phillips n° 2 and Ø6 mm | | mm ² | | | |
| | Flexible or solid cable with or without cable end | | | | | |
| Tightening torque | | | N.m | | | |
| Spring terminal connections | Flexible or solid cable without cable end | | mm ² | | | |
| Instantaneous and time delay contact characteristics | | | | | | |
| Number of contacts | | | 1, 2 or 4 | 2 | 2 | 2 |
| Rated operational voltage (U _e) | Up to | | V | | | |
| Rated insulation voltage (U _i) | Conforming to IEC 60947-5-1 | | V | | | |
| | Conforming to UL, CSA | | V | | | |
| Conventional thermal current (I _{th}) | For ambient temperature ≤ 60 °C | | A | | | |
| Frequency of the operational current | | | Hz | | | |
| Minimum switching capacity | U min | | V | | | |
| | I min | | mA | | | |
| Short-circuit protection | Conforming to IEC 60947-5-1 gG fuse | | A | | | |
| Rated making capacity | Conforming to IEC 60947-5-1 I rms | | A | | | |
| Short-time rating | Permissible for 1 s | | A | | | |
| | 500 ms | | A | | | |
| | 100 ms | | A | | | |
| Insulation resistance | | | MΩ | | | |
| Non-overlap time | Guaranteed between N/C and N/O contacts | | ms | | | |
| Overlap time | Guaranteed between N/C and N/O contacts on LADC22 | | ms | | | |
| Time delay (LADT, R and S contact blocks) Accuracy only valid for setting range indicated on the front face | Ambient air temperature for operation | | °C | | | |
| | Repeat accuracy | | % | | | |
| | Drift up to 0.5 million operating cycles | | % | | | |
| | Drift depending on ambient air temperature | | % | | | |
| Mechanical durability | In millions of operating cycles | | 30 | | | |
| Operational power of contacts | | | See page B8/90 | | | |

Ref.



Contactors

| Environment | | | | | | | |
|--|---|--------|--|---|---------------------------|-----------|---|
| Contact block type (dust/damp protected) | | | LA1DX | LA1DZ (4 contacts: 2 protected + 2 non protected) | | LA1DY | |
| | | | Protected | Protected | Non protected | Protected | |
| Conforming to standards | | | IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5 | | | | |
| Product certifications | | | UL, CSA, CCC, EAC, UKCA, CB certification | | | | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP 2X | | | | |
| Ambient air temperature | Storage and operation | | °C | -25...+70 | | | |
| Cabling | Phillips n° 2 and Ø6 mm Flexible or solid conductor with or without cable end | | mm ² | Min: 1 x 1; max: 2 x 2.5 | | | |
| Tightening torque | | | N.m | 1.7 | | | |
| Number of contacts | | | | 2 | 2 | 2 | |
| Contact characteristics | | | | | | | |
| Rated operational voltage (Ue) | Up to | | Vac | 125 | 125 | 690 | 125 |
| | | | Vdc | 30 | 30 | | 30 |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-5-1 Conforming to UL, CSA | | V | 250 | 250 | 690 | 250 |
| | | | V | – | – | 600 | – |
| Conventional thermal current (Ith) | For ambient temperature ≤ 40 °C | | A | – | – | 10 | – |
| Maximum operational current (Ie) | | | mA | 100 | 100 | – | 100 |
| Frequency of the operational current | | | Hz | – | – | 25...400 | – |
| Minimum switching capacity | | U min | V | 5 | 5 | 17 | 5 |
| | | I min | mA | 1 | 1 | 5 | 1 |
| Short-circuit protection | Conforming to IEC 60947-5-1 gG fuse | | A | – | – | 10 | – |
| Rated making capacity | Conforming to IEC 60947-5-1 | | I rms | A | – | – | ~:140; ---: 250 |
| Short-time rating | Permissible for | 1 s | A | – | – | 100 | – |
| | | 500 ms | A | – | – | 120 | – |
| | | 100 ms | A | – | – | 140 | – |
| Insulation resistance | | | MΩ | > 10 | > 10 | > 10 | > 10 |
| Mechanical durability | In millions of operating cycles | | | 5 | 5 | 30 | 5 |
| Materials and technology used for dust and damp protected contacts | | | | Gold alloy - Single break | Gold alloy - Single break | – | Gold alloy - Single break with crossed bars |



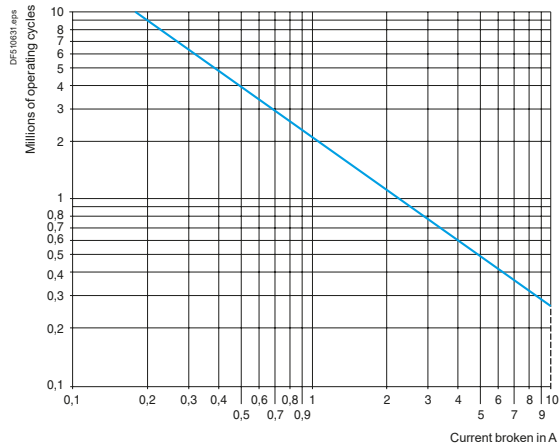

Contactors

Rated operational power of not dust/damp protected contacts (conforming to IEC 60947-5-1)

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \varphi 0.7$) = 10 times the power broken ($\cos \varphi 0.4$).

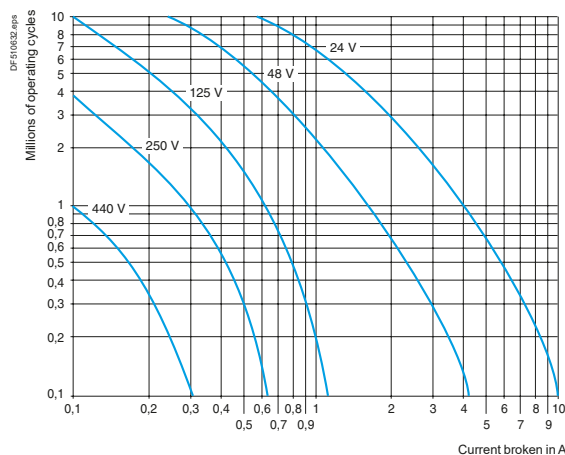
| Operating cycles | V | 24 | 48 | 115 | 230 | 400 | 440 | 600 |
|------------------|----|----|-----|-----|-----|-----|------|------|
| 1 million | VA | 60 | 120 | 280 | 560 | 960 | 1050 | 1440 |
| 3 million | VA | 16 | 32 | 80 | 160 | 280 | 300 | 420 |
| 10 million | VA | 4 | 8 | 20 | 40 | 70 | 80 | 100 |



d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

| Operating cycles | V | 24 | 48 | 125 | 250 | 440 |
|------------------|---|----|----|-----|-----|-----|
| 1 million | W | 96 | 76 | 76 | 76 | 44 |
| 3 million | W | 48 | 38 | 38 | 32 | — |
| 10 million | W | 14 | 12 | 12 | — | — |



Ref.



Contactors

Characteristics

| Environment | | | |
|---|---------------------------------|----|--|
| Conforming to standards | | | IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5 |
| Product certifications | | | UL, CSA |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP 2X |
| Ambient air temperature around the device | Storage | °C | -40...+80 |
| | Operation | °C | -25...+55 |
| | Permissible for operation at Uc | °C | -25...+70 |

| Suppressor modules Deca contactors | | | | | |
|------------------------------------|-----------|------------------------|-----------------------------------|---------------|----------------------|
| Module type | | LA4DA, LAD4RC, LAD4RC3 | LA4DB, LAD4T, LAD4T3 | LA4DC, LAD4D3 | LA4DE, LAD4V, LAD4V3 |
| Type of protection | | RC circuit | Bidirectional peak limiting diode | Diode | Varistor |
| Rated control circuit voltage (Uc) | V | ~ 24...415 | ~ or --- 24...440 | --- 12...250 | ~ or --- 24...250 |
| Maximum peak voltage | | 3 Uc | 2 Uc | Uc | 2 Uc |
| Natural RC frequency | 24/48 V | Hz | 400 | – | – |
| | 50/127 V | Hz | 200 | – | – |
| | 110/240 V | Hz | 100 | – | – |
| | 380/415 V | Hz | 150 | – | – |

| Mechanical latch blocks ⁽¹⁾ Deca, Deca green contactors | | | | | |
|--|---------------------------------|-------------------------------|----------|-------------------------------------|--|
| Mechanical latch block type | | LAD6K10 | | LA6DK20 | |
| For use on contactor | | LC1D09...D80A DT20...DT80A | | LC1D80...D150 LP1D80 and LC1D115 | |
| Product certifications | | UL, CSA | | UL, CSA | |
| Rated insulation voltage | Conforming to IEC 60947-5-1 | V | 690 | 690 | |
| Rated control circuit voltage | ~ 50/60 Hz and --- | V | 24...415 | 24...415 | |
| Power required | For unlatching | ~ | VA | 25 | |
| | | --- | W | 30 | |
| Maximum operating rate | In operating cycles/hour | | 1200 | 1200 | |
| On-load factor | | | 10 % | 10 % | |
| Mechanical durability at Uc | In millions of operating cycles | | 0.5 | 0.5 | |

⁽¹⁾ Unlatching can be manually operated or electrically controlled (pulsed).
 The LA6DK or LAD6K latch coil and the LC1D operating coil must not be energised simultaneously.
 The duration of the LA6DK or LAD6K and LC1D control signals must be ≥ 100 ms.

Ref.



Contactors

| Environment Deca, Deca green contactors | | | |
|--|---|--|--------------------------|
| Module type | | LA4DT (On-delay) | |
| Conforming to standards | | IEC 60255-5 | |
| Product certifications | | UL, CSA | |
| Degree of protection | Conforming to IEC 60529 | Protection against direct finger contact IP 2X | |
| Ambient air temperature around the device | Storage | °C | -40...+80 |
| | Operation | °C | -25...+55 |
| | For operation at U _c | °C | -25...+70 |
| Rated insulation voltage (U _i) | Conforming to IEC 60947-1 | V | 250 |
| Cabling | Phillips n° 2 and Ø6 mm Flexible or solid conductor with or without cable end | mm ² | Min: 1 x 1; max: 2 x 2.5 |
| Tightening torque | | N.m | 1.7 |

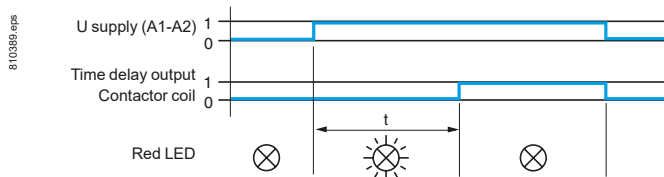
| Control circuit characteristics | | | |
|---|-----------------------------|-------------|----------------------------|
| Built-in protection | Of the input | By varistor | |
| | Contactors coil suppression | By varistor | |
| Rated control circuit voltage (U _c) | | V | ~ or ≡: 24...250 |
| Permissible variation | | | 0.8...1.1 U _c |
| Type of control | | | By mechanical contact only |

| Timing characteristics | | | |
|--------------------------------|--------------------------|----|--------------------------------------|
| Timing ranges | | s | 0.1...2; 1.5...30; 25...500 |
| Repeat accuracy | 0...40 °C | | ±3 % (10 ms minimum) |
| Reset time | During time delay period | ms | 150 |
| | After time delay period | ms | 50 |
| Immunity to microbreaks | During time delay period | ms | 10 |
| | After time delay period | ms | 2 |
| Minimum control pulse duration | | ms | – |
| Time delay signalling | By LED | | Illuminates during time delay period |

| Switching characteristics (solid state type) | | | |
|--|---------------------------------|----|-----------------|
| Maximum power dissipated | | W | 2 |
| Leakage current | | mA | < 5 |
| Residual voltage | | V | 3.3 |
| Overvoltage protection | | | 3 kV; 0.5 joule |
| Electrical durability | In millions of operating cycles | | 30 |

Function diagram

Electronic on-delay timer LA4DT



TeSys Control

Deca green, Deca Contactors - Interface modules

Characteristics

| Environment Deca, Deca green contactors | | | |
|---|---------------------------------|----|--|
| Conforming to standards | | | IEC 60255-5 |
| Product certifications | | | UL, CSA |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP 2X |
| Ambient air temperature around the device | Storage | °C | -40...+80 |
| | Operation | °C | -25...+55 |
| | Permissible for operation at Uc | °C | -25...+70 |

Other characteristics

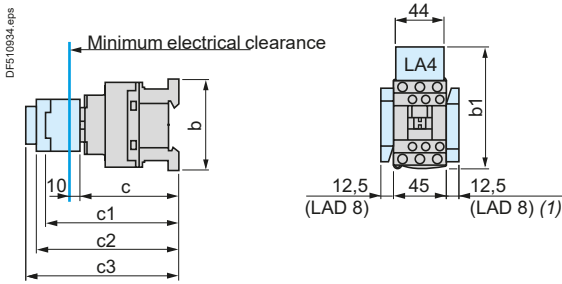
| Module type | | LA4DFB for Deca contactors With relay | LA4DWB for Deca, Deca green contactors Solid state |
|---|---|--|---|
| Conventional thermal current (I _{th}) | For ambient temperature ≤ 50 °C | A | 8 |
| Rated insulation voltage | Conforming to IEC 60947-5-1 | V | 250 |
| Rated operational voltage | Conforming to IEC 60947-5-1 | V | 250 |
| Indication of input state | | By integral LED which illuminates when the contactor coil is energised | |
| Input signals | Control voltage (E1-E2) | V | ~ 24 |
| | Permissible variation | V | 17...30 |
| | Current consumption at 20 °C | mA | 25 |
| | State "0" guaranteed for U | V | < 2.4 |
| | I | mA | < 2 |
| | State "1" guaranteed for U | V | 17 |
| Built-in protection | Against reversed polarity | | By diode |
| | Of the input | | By diode |
| Electrical durability at 220 A/240 V | In millions of operating cycles | | 10 |
| Maximum immunity to microbreaks | | ms | 4 |
| Power dissipated | At 20 °C | W | 0.6 |
| Direct mounting on contactor | With coil | | ~ 24...250 V |
| | | | ~ 100...250 V |
| | | | ~ 380...415 V |
| Mounting with cabling adapter LAD4BB | With coil | | ~ 24...250 V |
| | | | ~ 380...415 V |
| Mounting with cabling adapter LAD4BB3 | With coil | | ~ 24...250 V |
| | | | ~ 380...415 V |
| Total operating time at Uc (of the contactor) | The operating times depend on the type of contactor electromagnet and its control mode. The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate. | | |
| | | | |
| Cabling | Phillips n° 2 and Ø6 mm Flexible or solid cable with or without cable end | mm² | Min: 1 x 1; max: 2 x 2.5 |
| | Tightening torque | N.m | 1.7 |

TeSys Control

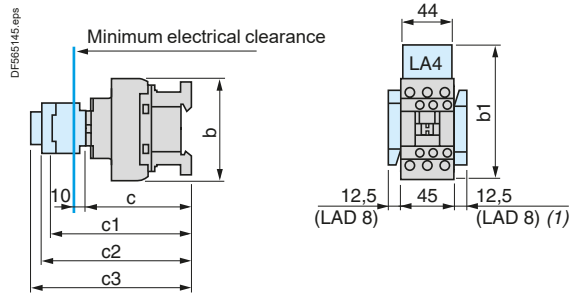
Deca Contactors - a.c. coil

Dimensions

LC1D09...D18 (3-pole)



LC1D25...D38 (3-pole), LC1DT20...DT40 (4-pole)

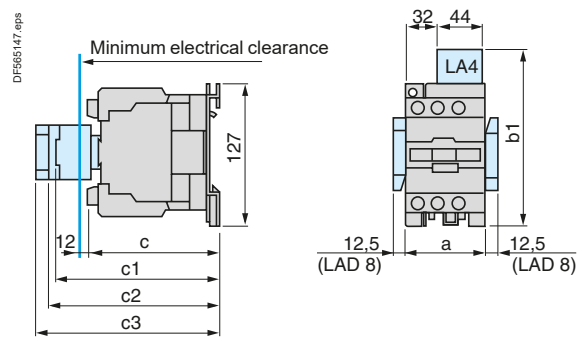
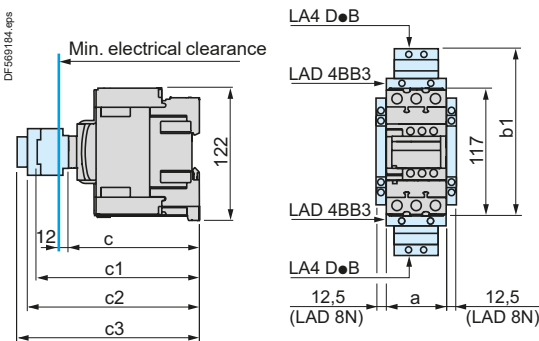


| LC1 | D09...D18 | D093... D123 | D099... D129 | D25... D38 | D183... D323 | D098, D128, DT20 and DT25 | DT203 and DT253 | DT32 and DT40 | D188, D258, DT323 and DT403 |
|-------------------------------------|--------------------|--------------------|----------------------|--------------------|--------------------|------------------------------|--------------------|------------------|--------------------------------|
| b without add-on blocks | 77 | 99 | 80 | 85 | 99 | 85 | 99 | 91 | 105 |
| b1 with LAD4BB | 94 | 107 | 95,5 | 98 | 107 | 98 | - | - | - |
| with LA4D●2 | 110 ⁽¹⁾ | 123 ⁽¹⁾ | 111,5 ⁽¹⁾ | 114 ⁽¹⁾ | 123 ⁽¹⁾ | 114 | - | - | - |
| with LA4DF, DT | 119 ⁽¹⁾ | 132 ⁽¹⁾ | 120,5 ⁽¹⁾ | 123 ⁽¹⁾ | 132 ⁽¹⁾ | 129 | - | - | - |
| with LA4DW, DL | 126 ⁽¹⁾ | 139 ⁽¹⁾ | 127,5 ⁽¹⁾ | 130 ⁽¹⁾ | 139 ⁽¹⁾ | 190 | - | - | - |
| c without cover or add-on blocks | 84 | 84 | 84 | 90 | 90 | 90 | 90 | 97 | 97 |
| with cover, without add-on blocks | 86 | 86 | 86 | 92 | 92 | 92 | 92 | 99 | 99 |
| c1 with LADN or C (2 or 4 contacts) | 117 | 117 | 117 | 123 | 123 | 123 | 123 | 131 | 131 |
| c2 with LA6DK10, LAD6K10 | 129 | 129 | 129 | 135 | 135 | 135 | 135 | 143 | 143 |
| c3 with LADT, R, S | 137 | 137 | 137 | 143 | 143 | 143 | 143 | 151 | 151 |
| with LADT, R, S and sealing cover | 141 | 141 | 141 | 147 | 147 | 147 | 147 | 155 | 155 |

(1) Including LAD4BB.

LC1D40A...D80A (3-pole), LC1DT60A...DT80A (4-pole)

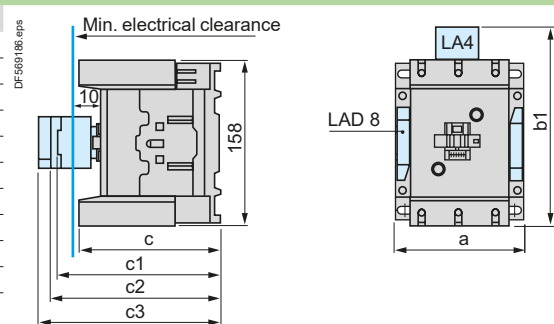
LC1D80 and D95 (3-pole), LC1D80004 and D80008 (4-pole), D40008 and D65008 (4-pole)



| LC1 | D40A...D80A | DT60A...DT80A | D40008 | D80 | D95, D65008 | D80004 | D80008 |
|-----------------------------------|-------------|---------------|--------|-----|-------------|--------|--------|
| a | 55 | 70 | 85 | 85 | 85 | 96 | 96 |
| b1 with LA4D●2 | - | - | 135 | 135 | 135 | 135 | 135 |
| with LA4DB3 or LAD4BB3 | 136 | - | - | 135 | - | - | - |
| with LA4DF, DT | 157 | - | 142 | 142 | 142 | 142 | 142 |
| with LA4DM, DW, DL | 166 | - | 150 | 150 | 150 | 150 | 150 |
| c without cover or add-on blocks | 118 | 118 | 125 | 125 | 125 | 125 | 140 |
| with cover, without add-on blocks | 120 | 120 | - | 130 | 130 | - | - |
| c1 with LADN (1 contact) | - | - | 139 | 150 | 150 | 150 | 150 |
| with LADN or C (2 or 4 contacts) | 150 | 150 | 147 | 158 | 158 | 158 | 158 |
| c2 with LAD6K10 or LA6DK | 163 | 163 | 159 | 170 | 170 | 170 | 170 |
| c3 with LADT, R, S | 171 | 171 | 167 | 178 | 178 | 178 | 178 |
| with LADT, R, S and sealing cover | 175 | 175 | 171 | 182 | 182 | 182 | 182 |

LC1D115 and D150 (3-pole), LC1D115004 (4-pole)

| LC1 | D115, D150 | D115004 | D1150046 |
|-------------------------------------|------------|---------|----------|
| a | 120 | 150 | 155 |
| b1 with LA4DA2 | 174 | 174 | 174 |
| with LA4DF, DT | 185 | 185 | 185 |
| with LA4DM, DL | 188 | 188 | 188 |
| with LA4DW | 188 | 188 | 188 |
| c without cover or add-on blocks | 132 | 132 | 115 |
| with cover, without add-on blocks | 136 | - | - |
| c1 with LADN or C (2 or 4 contacts) | 150 | 150 | 150 |
| c2 with LA6DK20 | 155 | 155 | 155 |
| c3 with LADT, R, S | 168 | 168 | 168 |
| with LADT, R, S and sealing cover | 172 | 172 | 172 |



References:
pages B8/22 to B8/28

Characteristics:
pages B8/80 to B8/87

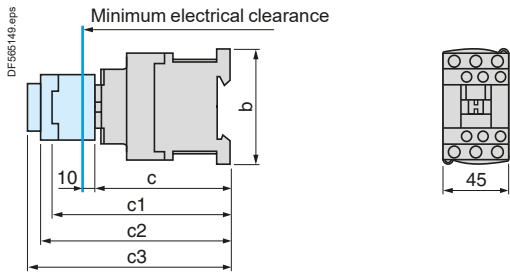
Schemes:
pages B8/101 and B8/102

TeSys Control

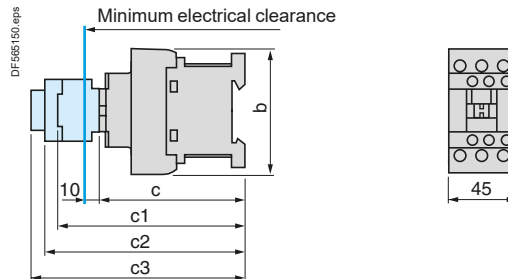
Deca Contactors - d.c. / low consumption coil

Dimensions

LC1D09...D18 (3-pole)

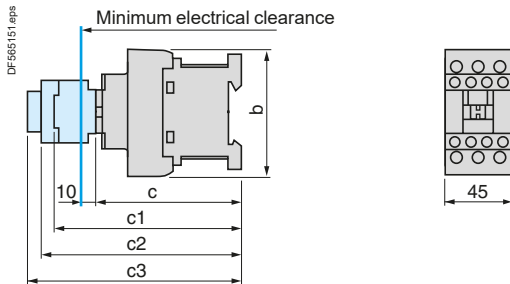


LC1D25...D38 (3-pole)



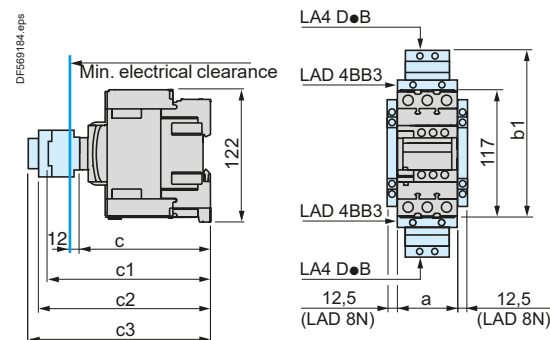
| LC1 | D09...D18 | D093...D123 | D099...D129 | D25...D38 | D183...D323 |
|-------------------------------------|-----------|-------------|-------------|-----------|-------------|
| b | 77 | 99 | 80 | 85 | 99 |
| c without cover or add-on blocks | 93 | 93 | 93 | 99 | 99 |
| with cover, without add-on blocks | 95 | 95 | 95 | 101 | 101 |
| c1 with LADN or C (2 or 4 contacts) | 126 | 126 | 126 | 132 | 132 |
| c2 with LA6DK10 | 138 | 138 | 138 | 144 | 144 |
| c3 with LADT, R, S | 146 | 146 | 146 | 152 | 152 |
| with LADT, R, S and sealing cover | 150 | 150 | 150 | 156 | 156 |

LC1DT20...DT40 (4-pole)

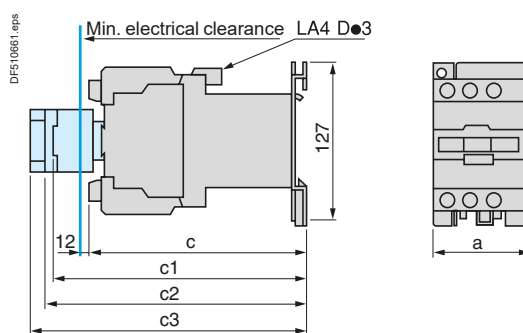


| LC1 | DT20 and DT25 D098 and D128 | DT203 and DT253 D0983 and D1283 | DT32 and DT40 D188...D258 | DT323 and DT403 D1883 and D2583 |
|-------------------------------------|--------------------------------|------------------------------------|------------------------------|------------------------------------|
| b | 85 | 99 | 91 | 105 |
| c with cover | 102 | 102 | 107 | 107 |
| c1 with LADN or C (2 or 4 contacts) | 123 | 123 | 131 | 131 |
| c2 with LA6DK10 | 135 | 135 | 143 | 143 |
| c3 with LADT, R, S | 143 | 143 | 151 | 151 |
| with LADT, R, S and sealing cover | 147 | 147 | 155 | 155 |

LC1D40A...D80A (3-pole), LC1DT60A...DT80A (4-pole)



LC1D80 and D95 (3-pole), LP1D80004, LP1D80008 (4-pole), LP1D40008 and D65008 (4-pole)



| | LC1D40A ... D80A | LC1 DT60A...DT80A | LP1D40008 and D65008 | LC1 D80 and D95 | LP1D80004 | LP1D80008 |
|-----------------------------------|---------------------|----------------------|-------------------------|--------------------|-----------|-----------|
| a | 55 | 72 | 85 | 85 | 96 | 96 |
| b1 with LAD4BB3 | 136 | 136 | - | - | - | - |
| with LA4DF, DT | 157 | 157 | - | - | - | - |
| c without cover or add-on blocks | 118 | 118 | 182 | 181 | 181 | 196 |
| with cover, without add-on blocks | 120 | 120 | - | 186 | - | - |
| c1 with LADN (1 contact) | - | - | 196 | 204 | 204 | 204 |
| with LADN or C (2 or 4 contacts) | 150 | 150 | 202 | 210 | 210 | 210 |
| c2 with LA6DK10 | 163 | 163 | 213 | 221 | 221 | 221 |
| c3 with LADT, R, S | 171 | 171 | 221 | 229 | 229 | 229 |
| with LADT, R, S and sealing cover | 175 | 175 | 225 | 233 | 233 | 233 |

LC1D115●●● and LC1D150●●● with coil: see page B8/94.

References:
pages B8/22 to B8/28

Characteristics:
pages B8/80 to B8/87

Schemes:
pages B8/101 and B8/102

Ref.



Contactors

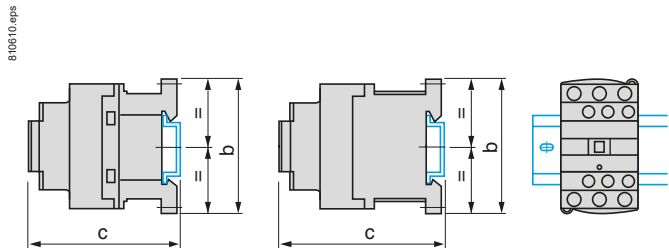
TeSys Control

Deca Contactors

Mounting

LC1D09...D38, DT20...DT40

On mounting rail NSYSR200BD, NSYSR200BD or NSYSR200 (width 35 mm)



Control circuit: a.c.

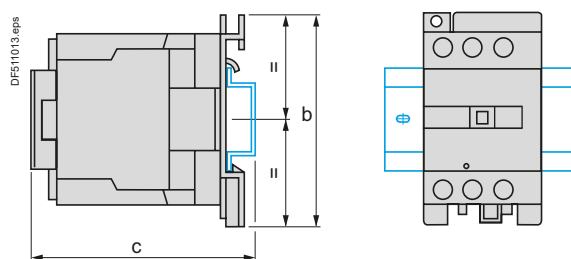
| LC1 | D09... D18 | D25... D38 | DT20 and DT25 | DT32 and DT40 |
|---|---------------|---------------|------------------|------------------|
| b | 77 | 85 | 85 | 100 |
| c (NSYSR200BD or NSYSR200BD) ⁽¹⁾ | 88 | 94 | 94 | 109 |
| c (NSYSR200) ⁽¹⁾ | 96 | 102 | 102 | 117 |

Control circuit: d.c.

| LC1 | D09... D18 | D25... D38 | DT20 and DT25 | DT32 and DT40 |
|---|---------------|---------------|------------------|------------------|
| b | 77 | 85 | 94 | 109 |
| c (NSYSR200BD or NSYSR200BD) ⁽¹⁾ | 97 | 103 | 103 | 118 |
| c (NSYSR200) ⁽¹⁾ | 105 | 110 | 111 | 126 |

LC1D40A...D80A, LC1DT60A and DT80A, LC1D80 and D95, LC1D40008 and D65008

On mounting rail AM1DL201 (width 75 mm)⁽²⁾
On mounting rail NSSDPR●● or NSYSR200 (width 35 mm)



Control circuit: a.c.

| LC1 | D40A...D80A DT60A...DT80A | D80 and D95 | D40008 and D65008 |
|---|------------------------------|----------------|----------------------|
| b | 122 | 127 | 127 |
| c | – | 147 | 143 |
| c (AM1DL201) ⁽¹⁾ | – | 137 | 133 |
| c (NSSDPR●● or NSYSR200) ⁽¹⁾ | 128 | 137 | 133 |

Control circuit: d.c.

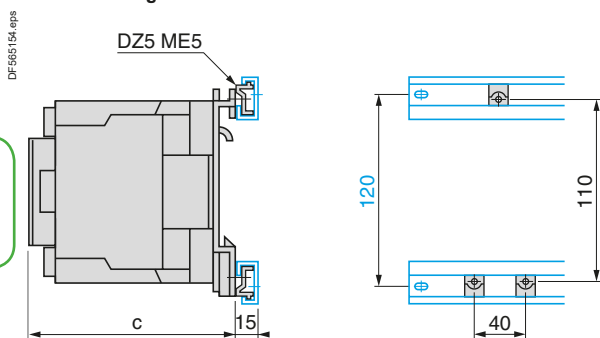
| LC1 | D40A...D80A DT60A...DT80A | D80 and D95 | D40008 and D65008 |
|---|------------------------------|----------------|----------------------|
| b | – | 205 | 200 |
| c (AM1DL201) ⁽¹⁾ | – | 195 | 190 |
| c (NSSDPR●● or NSYSR200) ⁽¹⁾ | 128 | – | 190 |

⁽¹⁾ With safety cover.

⁽²⁾ Except for LC1D40A...D80A, LC1DT60A and DT80A.

LC1D80 and D95, LP1D80

On 2 mounting rails DZ5MB on 120 mm centres



Control circuit: a.c.

| LC1 | D80 and D95 |
|--------------|-------------|
| c with cover | 130 |

Control circuit: d.c.⁽³⁾

| LC1 | D80 and D95 |
|--------------|-------------|
| c with cover | 186 |

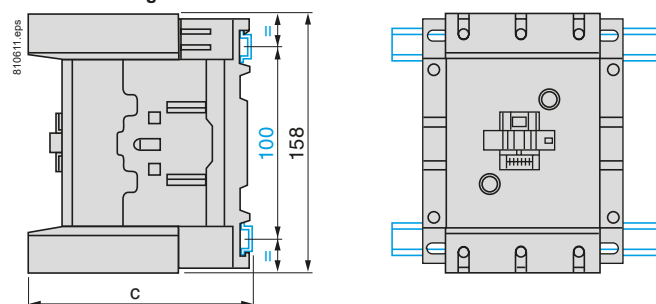
LP1

| D80 | |
|-----|-----|
| c | 181 |

⁽³⁾ Leave a 9 mm gap between 2 contactors if left on for more than 4 hours.

LC1D115, D150

On 2 mounting rails DZ5MB on 120 mm centres



Control circuit: a.c. or d.c.

| LC1 | D115 and D150 | D1156 and D1506 |
|------------------------------|---------------|-----------------|
| c (NSYSR200BD or NSYSR200BD) | 134.5 | 117.5 |
| c (NSYSR200 or ED●●●) | 142.5 | 125.5 |

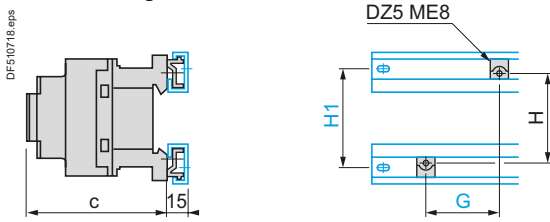
TeSys Control

Deca Contactors

Mounting

LC1D09...D38 and LC1DT20...DT40

On 2 mounting rails DZ5MB



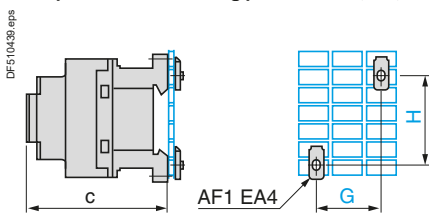
| Control circuit: | a.c. | | d.c. | |
|------------------|-----------|-----------|-----------|-----------|
| | D09...D18 | D25...D38 | D09...D18 | D25...D38 |
| LC1 | | | | |
| c with cover | 86 | 92 | 95 | 101 |
| G | 35 | 35 | 35 | 35 |
| H | 60 | 60 | 70 | 70 |
| H1 | 70 | 70 | 70 | 70 |

4-pole contactors

| LC1 | DT20 and DT25 | DT32 and DT40 | DT20 and DT25 | DT32 and DT40 |
|-----|---------------|---------------|---------------|---------------|
| | c with cover | 92 | 100 | 101 |
| G | 35 | 35 | 35 | 35 |
| H | 60 | 60 | 70 | 70 |
| H1 | 70 | 70 | 70 | 70 |

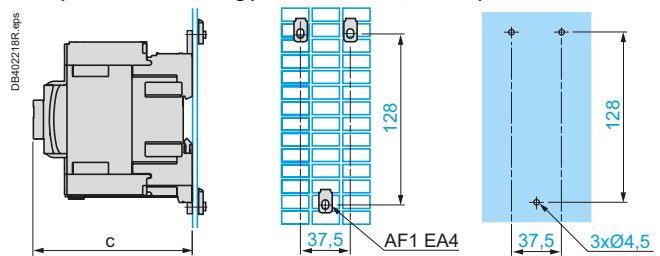
LC1D09...D38 and LC1DT20...DT40

On pre-slotted mounting plate AM1 PA, PB, PC



LC1D40A...D80A, LC1DT60A...DT80A

On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted

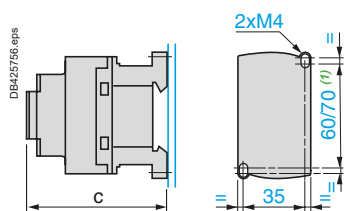


| Control circuit: | a.c. | | d.c. | |
|------------------|---------------|---------------|---------------|---------------|
| | D09...D18 | D25...D38 | D09...D18 | D25...D38 |
| LC1 | | | | |
| c with cover | 86 | 92 | 95 | 101 |
| G | 35 | 35 | 35 | 35 |
| H | 60/70 | 60/70 | 70 | 70 |
| LC1 | DT20 and DT25 | DT32 and DT40 | DT20 and DT25 | DT32 and DT40 |
| c with cover | 80 | 93 | 118 | 132 |
| G | 35 | 35 | 35 | 35 |
| H | 60 | 60 | 70 | 70 |

| Control circuit: | a.c. | | d.c. | |
|------------------|----------------------------|--|---------------------------|--|
| | D40A...D80A, DT60A...DT80A | | D40A...65A, DT60A...DT80A | |
| LC1 | | | | |
| c with cover | 120 | | 120 | |

LC1D09...D38, LC1DT20...DT40

Panel mounted

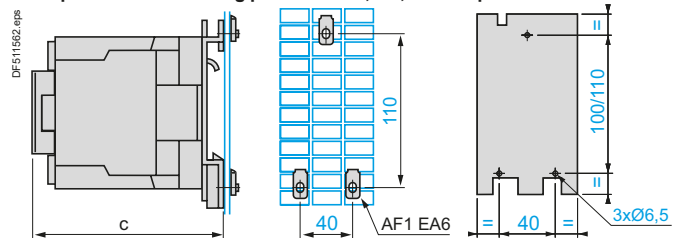


(1) for DC coil: 70 mm only.

| Control circuit: | a.c. | | d.c. | |
|-------------------|---------------|---------------|---------------|---------------|
| | D09...D18 | D25...D38 | D09...D18 | D25...D38 |
| LC1 | | | | |
| c with cover | 86 | 92 | 95 | 101 |
| 4-pole contactors | | | | |
| LC1 | DT20 and DT25 | DT32 and DT40 | DT20 and DT25 | DT32 and DT40 |
| c with cover | 90 | 98 | 90 | 98 |

LC1D80 and D95, LC1D40008 and D65008, LP1D80

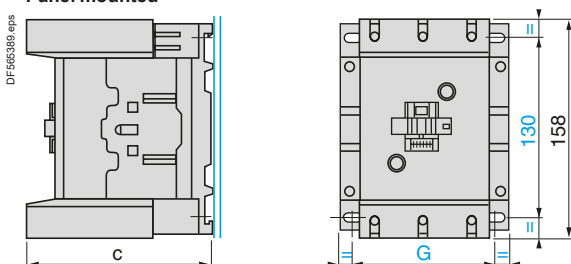
On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted



| Control circuit: | a.c. | | d.c. | |
|------------------|--------------------------------|---|--------------------------------|--|
| | D80 and D95, D40008 and D65008 | | D80 and D95, D40008 and D65008 | |
| LC1 | | | | |
| c with cover | 130 | | 186 | |
| LP1 | – | – | D80 | |
| c without cover | – | – | 181 | |

LC1D115, D150

Panel mounted



| LC1 | D115 | D1156 | D150 | D1506 |
|------------|---------|---------|--------|--------|
| c | 132 | 115 | 132 | 115 |
| G (3-pole) | 96/110 | 96/110 | 96/110 | 96/110 |
| G (4-pole) | 130/144 | 130/144 | – | – |

References:
pages B8/22 to B8/28

Characteristics:
pages B8/80 to B8/87

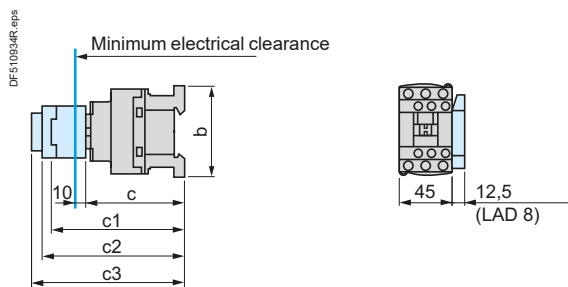
Schemes:
pages B8/101 and B8/102

TeSys Control

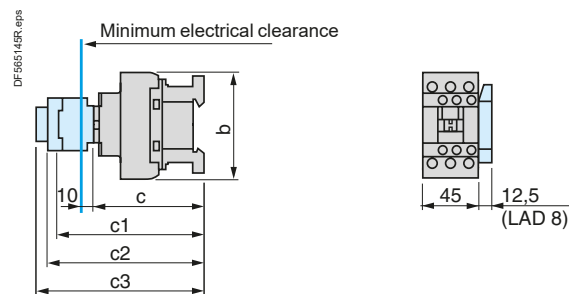
Deca green Contactors

Dimensions

LC1D09...D18 (3-pole), with AC/DC compatible coil

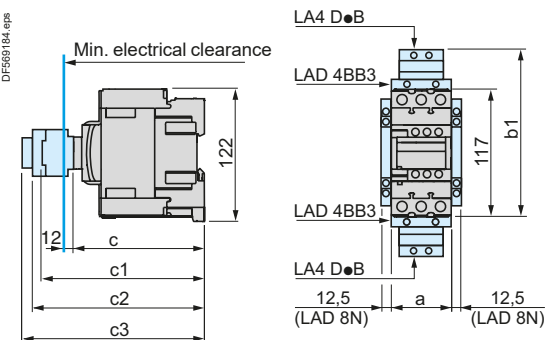


LC1D25...D38 (3-pole), with AC/DC compatible coil



| LC1 | D09...D18 | D25...D38 |
|-------------------------------------|-----------|-----------|
| b without add-on blocks | 77 | 85 |
| c without cover or add-on blocks | 84 | 90 |
| with cover, without add-on blocks | 86 | 92 |
| c1 with LADN or C (2 or 4 contacts) | 117 | 123 |
| c2 with LA6DK10 | 129 | 135 |
| c3 with LADT, R, S | 137 | 143 |
| with LADT, R, S and sealing cover | 141 | 147 |

LC1D40A...D80A (3-pole), LC1DT60A...DT80A (4-pole), with AC/DC compatible coil



| LC1 | D40A...D80A | DT60A...DT80A |
|-----------------------------------|-------------|---------------|
| a | 55 | 70 |
| b1 LAD4BB3 | 136 | - |
| with LAD4DWB | 166 | - |
| c without cover or add-on blocks | 118 | 118 |
| with cover, without add-on blocks | 120 | 120 |
| c1 with LADN (1 contact) | - | - |
| with LADN or C (2 or 4 contacts) | 150 | 150 |
| c2 with LAD6K10 | 163 | 163 |
| c3 with LADT, R, S | 171 | 171 |
| with LADT, R, S and sealing cover | 175 | 175 |

Ref.



Contactors

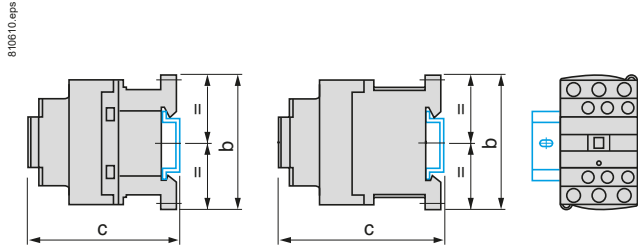
TeSys Control

Deca green Contactors

Mounting

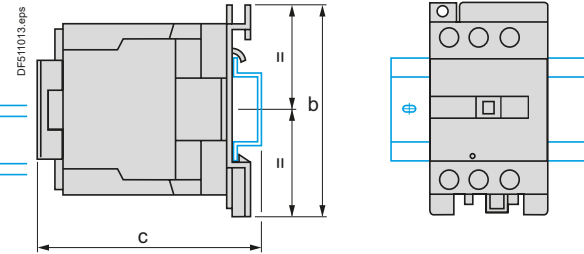
LC1D09...D38 (3-pole),
with AC/DC compatible coil

On mounting rail **NSYSR200BD**, **NSYSR200BD** or **NSYSR200** (width 35 mm)



LC1D40A...D80A (3-pole), **LC1DT60A** and **DT80A** (4-pole),
with AC/DC compatible coil

On mounting rail **AM1DL201** (width 75 mm) ⁽²⁾
On mounting rail **NSSDPR●●** or **NSYSR200** (width 35 mm)



| LC1 | D09...D18 | D25...D38 |
|------------------------------|-----------|-----------|
| b | 77 | 85 |
| c (NSYSR200BD or NSYSR200BD) | 88 | 94 |
| c (NSYSR200) | 96 | 102 |

| LC1 | D40A...D80A DT60A...DT80A |
|--------------------------|------------------------------|
| b | 122 |
| c | – |
| c (AM1DL201) | – |
| c (NSSDPR●● or NSYSR200) | 128 |

Ref.



Contactors

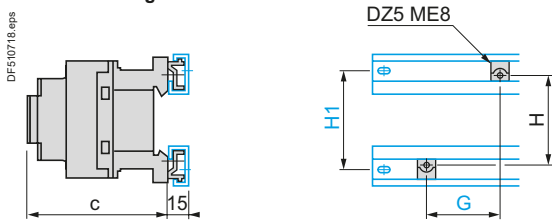
TeSys Control

Deca green Contactors

Mounting

LC1D09...D38 (3-pole), with AC/DC compatible coil

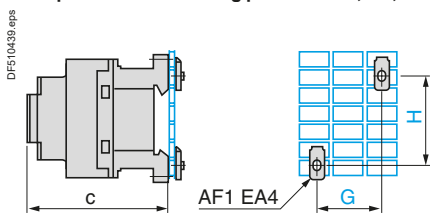
On 2 mounting rails DZ5MB



| LC1 | D09...D18 | D25...D38 |
|--------------|-----------|-----------|
| c with cover | 86 | 92 |
| G | 35 | 35 |
| H | 60 | 60 |
| H1 | 70 | 70 |

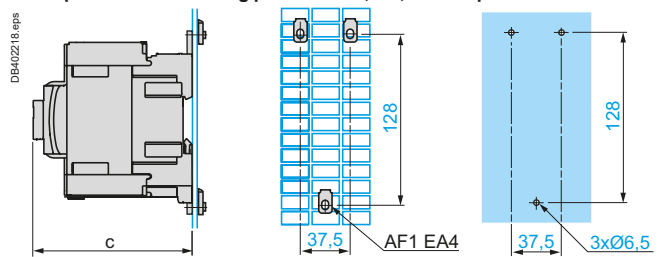
LC1D09...D38 (3-pole), with AC/DC compatible coil

On pre-slotted mounting plate AM1PA, PB, PC



LC1D40A...D80A (3-pole), LC1DT60A...DT80A (4-pole), with AC/DC compatible coil

On pre-slotted mounting plate AM1PA, PB, PC and panel mounted



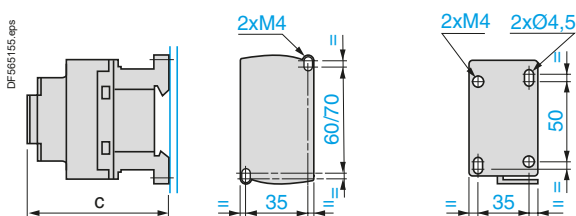
| LC1 | D40A...D80A, DT60A...DT80A |
|--------------|----------------------------|
| c with cover | 120 |

Ref.

| LC1 | D09...D18 | D25...D38 |
|--------------|-----------|-----------|
| c with cover | 86 | 92 |
| G | 35 | 35 |
| H | 60/70 | 60/70 |

LC1D09...D38 (3-pole), with AC/DC compatible coil

Panel mounted



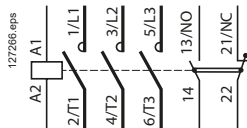
| LC1 | D09...D18 | D25...D38 |
|--------------|-----------|-----------|
| c with cover | 86 | 92 |

Contactors

Contactors

Deca, Deca green 3-pole contactors (References: pages B8/22 to B8/25)

LC1D09 to D150



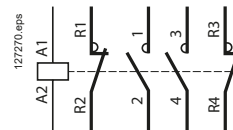
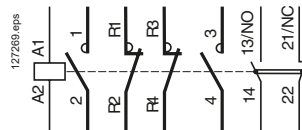
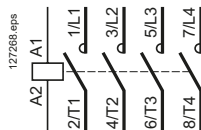
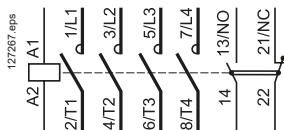
Deca 4-pole contactors (References: pages B8/26 and B8/27)

LC1DT20 to DT80A

LC1D115004

LC1D098 to D258

LC1 and LP1D40008 to D80008



Front mounting add-on contact blocks

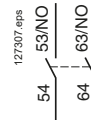
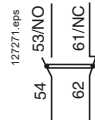
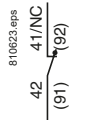
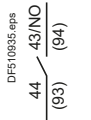
Instantaneous auxiliary contacts for Deca, Deca green contactors (References: page B8/36)

1 N/O LADN10 ⁽¹⁾

1 N/C LADN01 ⁽¹⁾

1 N/O + 1 N/C LADN11

2 N/O LADN20

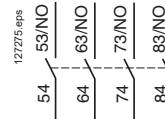
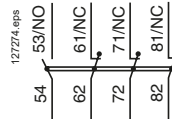
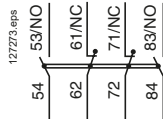


2 N/C LADN02

2 N/O + 2 N/C LADN22

1 N/O + 3 N/C LADN13

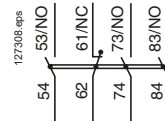
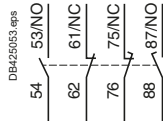
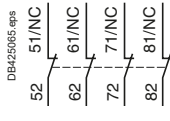
4 N/O LADN40



4 N/C LADN04

2 N/O + 2 N/C including 1 N/O + 1 N/C make before break LADC22

3 N/O + 1 N/C LADN31



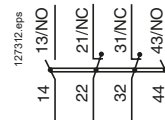
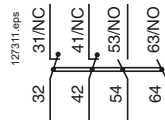
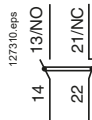
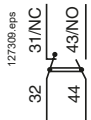
Instantaneous auxiliary contacts conforming to standard EN 50012 for Deca, Deca green contactors (References: page B8/36)

1 N/O + 1 N/C LADN11G

1 N/O + 1 N/C LADN11P

2 N/O + 2 N/C LADN22G

2 N/O + 2 N/C LADN22P

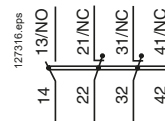
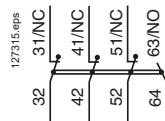
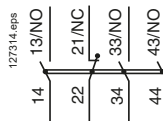
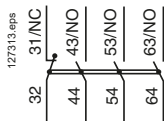


3 N/O + 1 N/C LADN31G

3 N/O + 1 N/C LADN31P

1 N/O + 3 N/C LADN13G

1 N/O + 3 N/C LADN13P

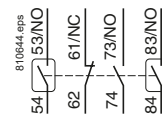
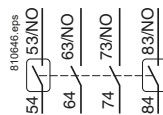
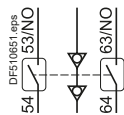
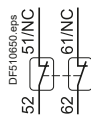
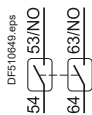


(1) Items in brackets refer to blocks mounted on right-hand side of contactor.

Front mounting add-on contact blocks for Deca, Deca green contactors

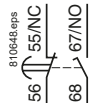
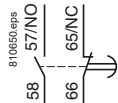
Dust and damp protected instantaneous auxiliary contacts (References: page B8/36)

| | | | | |
|-----------------|-----------------|---|---|---|
| 2 N/O (24-50 V) | 2 N/C (24-50 V) | 2 N/O (5-24V) with 2 cable screen terminals | 2 N/O protected (24-50 V) 2 N/O standard | 2 N/O protected (24-50 V) + 1 N/O + 1 N/C standard |
| LA1DX20 | LA1DX02 | LA1DY20 | LA1DZ40 | LA1DZ31 |



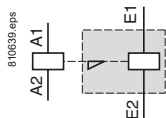
Time delay auxiliary contacts (References: page B8/37)

| | | |
|--------------------------------|---------------------------------|--|
| On-delay 1 N/O + 1 N/C LADT | Off-delay 1 N/O + 1 N/C LADR | On-delay 1 N/C + 1 N/O break before make LADS |
|--------------------------------|---------------------------------|--|



Mechanical latch blocks for Deca, Deca green contactors (References: page B8/37)

LAD6K10 and LA6DK20

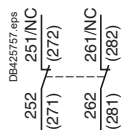
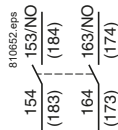
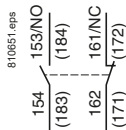


Ref.

Side mounting add-on contact blocks for Deca, Deca green contactors

Instantaneous auxiliary contacts (References: page B8/36)

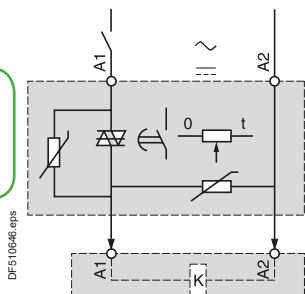
| | | |
|--------------------------------------|------------------------------|------------------------------|
| 1 N/O + 1 N/C LAD8N11 ⁽¹⁾ | 2 N/O LAD8N20 ⁽¹⁾ | 2 N/C LAD8N02 ⁽¹⁾ |
|--------------------------------------|------------------------------|------------------------------|



⁽¹⁾ Items in brackets refer to blocks mounted on right-hand side of contactor.

Electronic serial timer modules for Deca, Deca green contactors

On-delay LA4DTeU

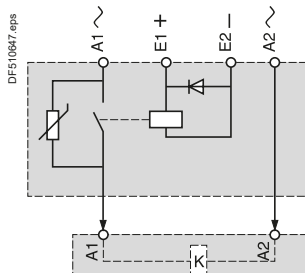


Contactors

Interface modules

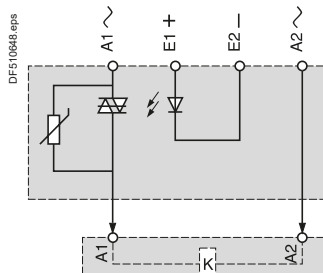
Relay output for Deca contactors

LA4DFB



Solid state for Deca, Deca green contactors

LA4DWB



References: page B8/85.

References: pages B8/36 to B8/40

Characteristics: pages B8/88 to B8/92

Dimensions: pages B8/94 and B8/95, B8/98

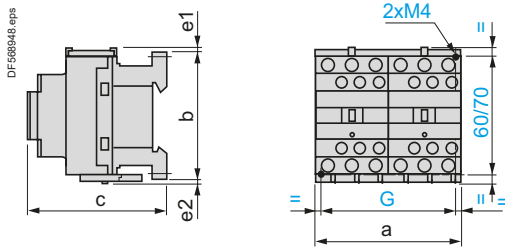
TeSys Control

Deca green, Deca Reversing and changeover contactors

Dimensions

LC2D09 to D38 Deca, Deca green contactors

2 x LC1D09 to D38



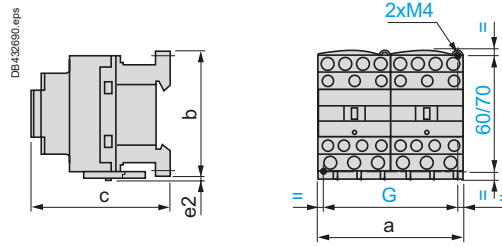
| LC2 or 2 x LC1 | a | b | c ⁽¹⁾ | e1 | e2 | G |
|----------------------|----|----|------------------|----|-----|----|
| D09 to D18 AC, AC/DC | 90 | 77 | 86 | 4 | 1.5 | 80 |
| D093 to D123 AC | 90 | 99 | 86 | – | – | 80 |
| D09 to D18 DC | 90 | 77 | 95 | 4 | 1.5 | 80 |
| D093 to D123 DC | 90 | 99 | 95 | – | – | 80 |
| D25 to D38 AC, AC/DC | 90 | 85 | 92 | 9 | 5 | 80 |
| D183 to D383 AC | 90 | 99 | 92 | – | – | 80 |
| D25 to D32 DC | 90 | 85 | 101 | 9 | 5 | 80 |
| D183 to D383 DC | 90 | 99 | 101 | – | – | 80 |

e1 and e2: including cabling.

(1) With safety cover, without add-on block.

LC2DT20 to DT40 Deca contactors

2 x LC1DT20 to DT40

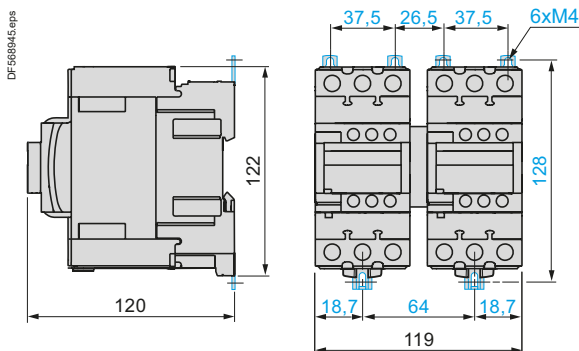


| LC2 or 2 x LC1 | a | b | c | G | e2 |
|------------------|----|----|-----|----|----|
| DT20 and DT25 AC | 90 | 85 | 92 | 80 | 20 |
| DT32 and DT40 AC | 90 | 91 | 99 | 80 | 22 |
| DT20 and DT25 DC | 90 | 85 | 102 | 80 | 20 |
| DT32 and DT40 DC | 90 | 91 | 109 | 80 | 22 |

c, e: including cabling.

LC2D40A to D80A for Deca, Deca green contactors

2 x LC1D40A to D80A



Ref.



Contactors

TeSys Control

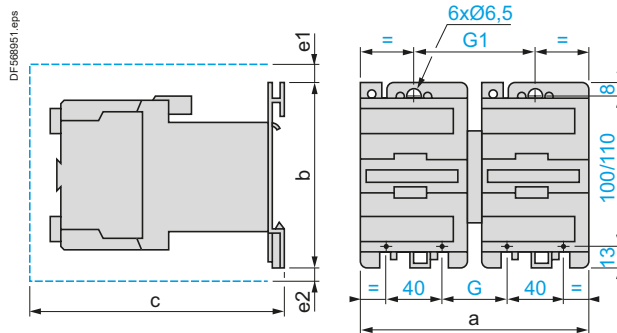
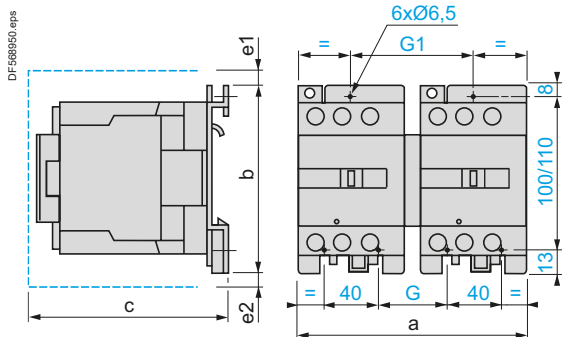
Deca Reversing and changeover contactors

Dimensions

LC2D80 and D95

2 x LC1D80 and D95 ~

2 x LC1D80 and D95 ...



| LC2 or 2 x LC1 | a | b | c | e1 | e2 | G | G1 |
|----------------|-----|-----|-----|----|----|----|-----|
| D80 and D95 ~ | 182 | 127 | 158 | 13 | - | 56 | 96 |
| D80004 ~ | 207 | 127 | 158 | - | 20 | 71 | 111 |

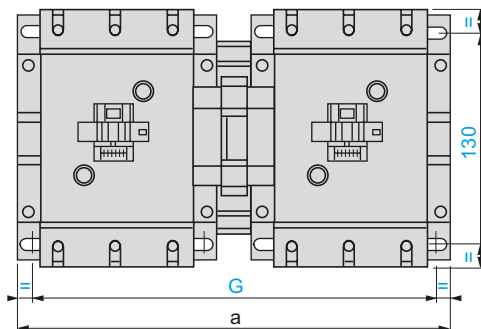
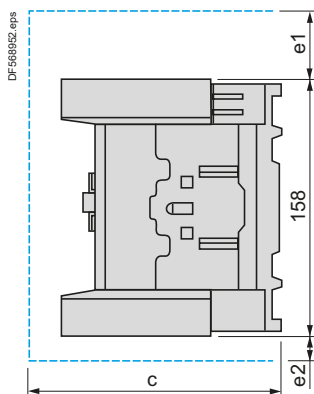
| 2 x LC1 | a | b | c | e1 | e2 | G | G1 |
|-------------|-----|-----|-----|----|----|----|----|
| D80 and D95 | 182 | 127 | 215 | 13 | 20 | 56 | 96 |

c, e1 and e2: including cabling.

c, e1 and e2: including cabling.

LC2D115 and D150

2 x LC1D115 and D150



| LC2 or 2 x LC1 | a | c | e1 | e2 | G |
|----------------|-----|-----|----|----|---------|
| D115 and D150 | 266 | 148 | 56 | 18 | 242/256 |
| D115004 | 334 | 148 | - | 60 | 310/324 |

c, e1 and e2: including cabling.

Ref.



Contactors

TeSys Control

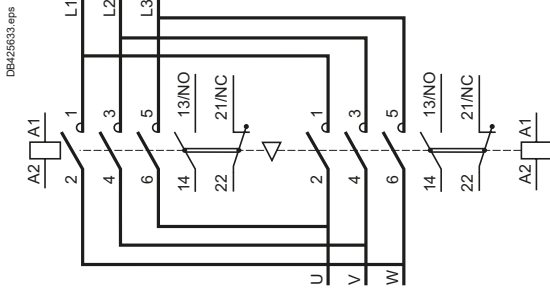
Deca green, Deca Reversing and changeover contactors

Schemes

Reversing contactors for motor control

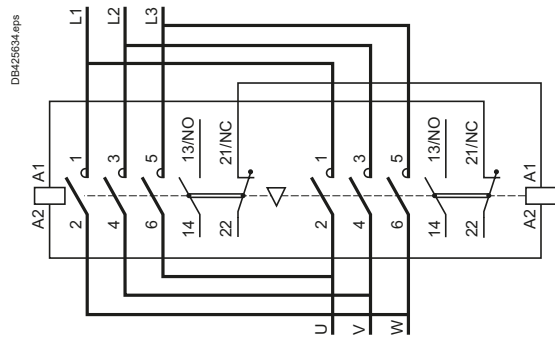
LC2D09...D80A Deca, Deca green contactors LC2D80...D150 Deca contactor

Horizontally mounted



LAD9R1V D, Deca green contactors

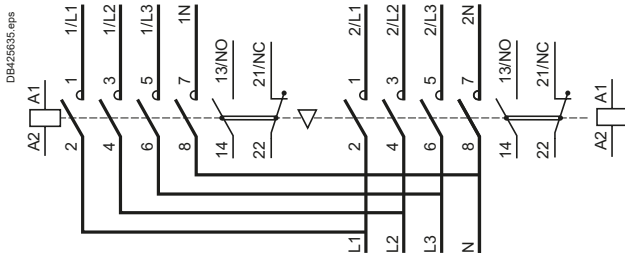
With integral electrical interlocking



Changeover contactor pairs Deca contactors

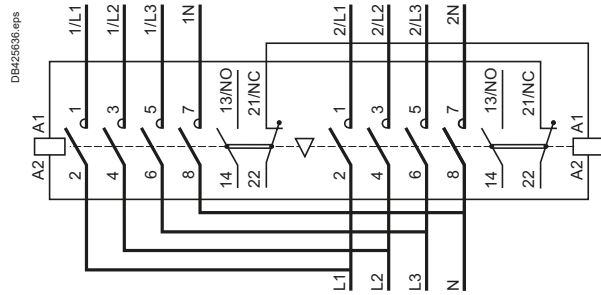
LC2DT20...DT40

Horizontally mounted



LADT9R1V

With integral electrical interlocking



Ref.



Contactors

TeSys Control

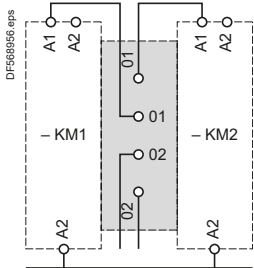
Deca green, Deca Reversing and changeover contactors

Schemes

Electrical interlocking of Deca, Deca green reversing contactors fitted with:

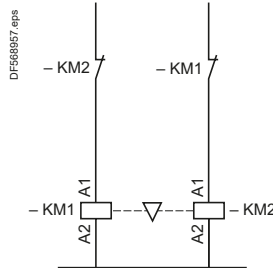
Mechanical interlock with integral electrical contacts

LA9D4002, LA9D8002 and LA9D11502

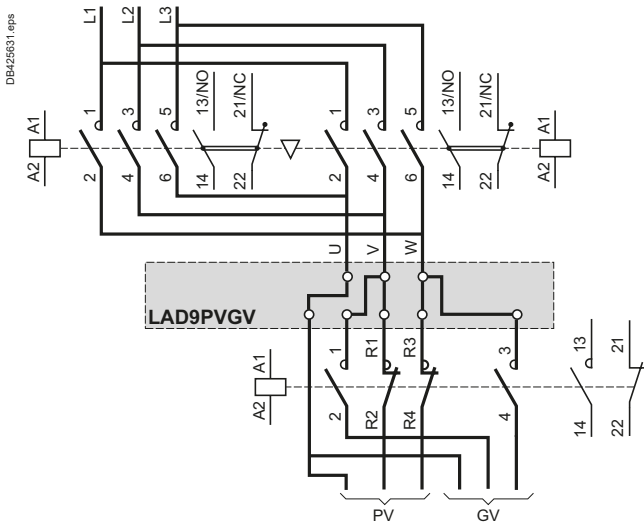


Mechanical interlock without integral electrical contacts

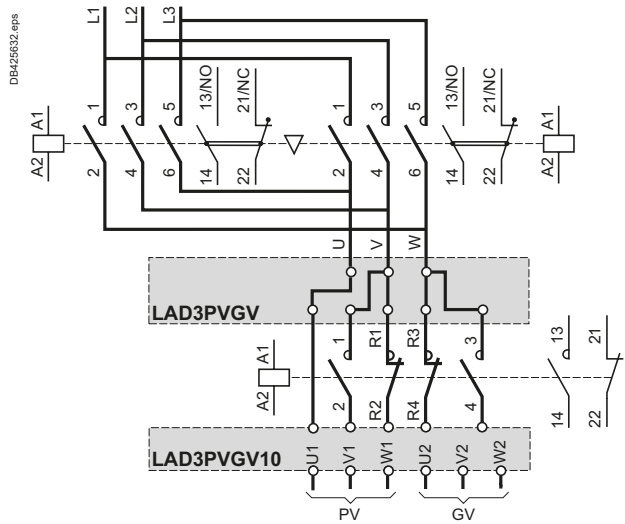
LAD9V2, LAD4CM, LA9D50978 and LA9D80978



Low speed - High speed cabling kit, screw clamp terminals for LC1D09... D38 contactors (Deca, Deca green)



Low speed - High speed cabling kit, spring terminals for LC1D09... D38 contactors (Deca)



Ref.



Contactors

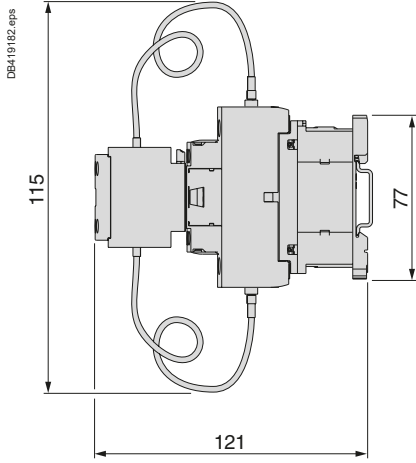
TeSys Control

Deca Contactors for 3-phase capacitor bank switching

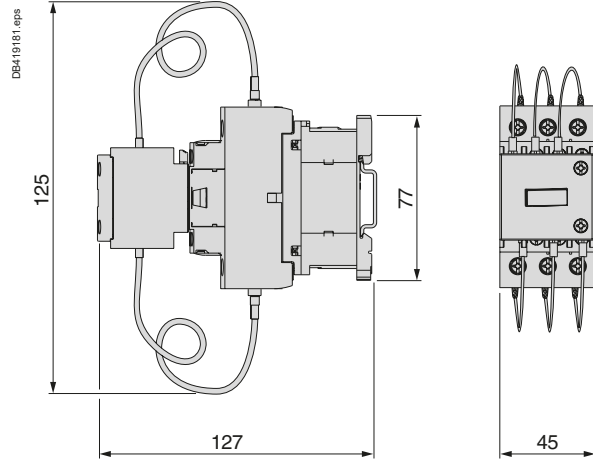
Dimensions and scheme

Dimensions

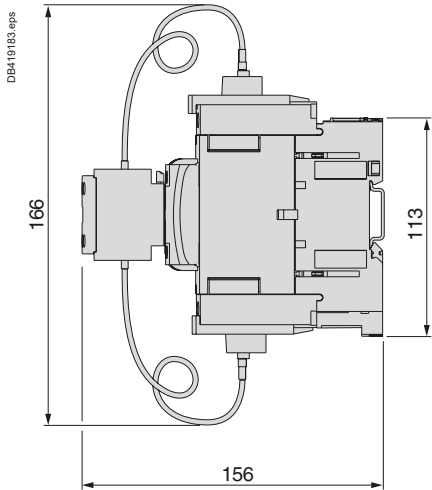
LC1DFK



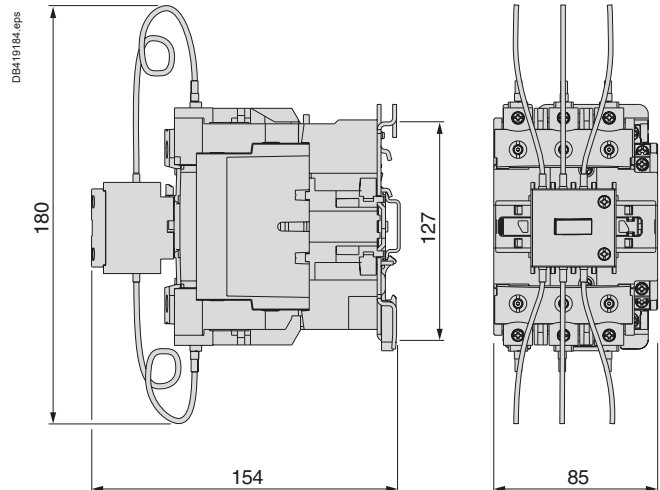
LC1DGK, DLK, DMK



LC1DPK, DTK



LC1DWK

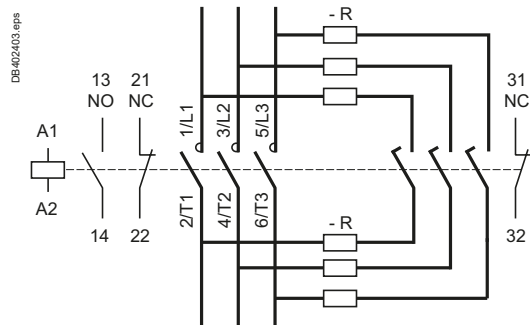


Ref.

Contactors

Scheme

LC1D•K



R = Pre-wired resistor connections.

TeSys Control

Modular Contactors

Characteristics



GC25

Modular contactors are designed for use in modular panels and enclosures.

These contactors feature:

■ **Easy installation:**

- quick clip-on fixing and locking onto 35 mm omega rail
- easy connection by means of ready-to-tighten, captive, pozidrive screw terminals.

■ **Compact size:**

All units have a common depth of 60 mm and width in modules of 17.5 mm (width of one module: 17.5 mm).

■ **User safety:**

- use of materials conforming to strictest fire safety standards
- live parts protected against direct finger contact
- completely safe operation
- state indication on front panel.

Standards

This range of modular contactors has been designed taking into account the requirements of international standard IEC 61095.

This standard is specific to "Electromagnetic contactors for domestic and similar use".

It has very strict requirements, meeting the expectations of users, with regard to the safety of equipment and persons in "premises and areas accessible to the public".

Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

Applications

Modular contactors are designed for switching all single-phase, 3-phase or 4-phase loads up to 100 A.

Power switching

These contactors have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific supply is required:

- lighting
- heating
- ventilation
- motorised shutters or gates.

Ref.



Contactors

TeSys Control

Modular Contactors

Characteristics

| Environment | | | | GC16 | GC25 | GC40 | GC63 | GC100 |
|--|-------------------------|----|---|------|------|------|------|-------|
| Contactor type | | | | | | | | |
| Rated insulation voltage (Ui) | Conforming to IEC 61095 | V | 500 | | | | | |
| | Conforming to VDE 0110 | V | 500 | | | | | |
| Rated impulse withstand voltage (Uimp) | | kV | 4 in enclosure | | | | | |
| Conforming to standards | | | IEC 61095 and IEC 60947-5-1 for auxiliary contacts | | | | | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact (IP 20 open, IP 40 in enclosure) | | | | | |
| Ambient air temperature around the device | Storage | °C | -40...+70 | | | | | |
| | Operation | °C | -5...+50 (0.85...1.1 Uc) | | | | | |
| Maximum operating altitude | Without derating | m | 3000 | | | | | |
| Operating positions | Without derating | | ±30° in relation to normal vertical mounting plane | | | | | |
| Shock resistance 1/2 sine wave = 10 ms Conforming to IEC/EN 60068-2-27 | Contactor open | | 10 gn | | | | | |
| | Contactor closed | | 15 gn | | | | | |
| Vibration resistance 5...300 Hz Conforming to IEC/EN 60068-2-6 | Contactor open | | 2 gn | | | | | |
| | Contactor closed | | 3 gn | | | | | |
| Flame resistance | | | Conforming to IEC 61095 | | | | | |

| Pole characteristics | | | | | | | | |
|--|--|--------------|---|--------|--------|--------|-------|----|
| Number of poles | | | 2, 3 or 4 | | | | | |
| Rated operational current (Ie) (Ue ≤ 440 V) | In AC-7a (heating) | A | 16 | 25 | 40 | 63 | 100 | |
| | In AC-7b (motor control) | A | 5 | 8.5 | 15 | 25 | – | |
| Contactor rating | 40 °C | A | 16 | 25 | 40 | 63 | 100 | |
| | 50 °C | A | 14 | 22 | 36 | 57 | 87 | |
| | 60 °C ⁽¹⁾ | A | 13 | 20 | 32 | 50 | 80 | |
| Rated operational voltage (Ue) | Up to | V | 250 two-pole contactors, 415 three and four-pole contactors | | | | | |
| Frequency limits | Of the operating current | Hz | 400 | | | | | |
| Conventional thermal current (Ith) | θ ≤ 50 °C | A | 16 | 25 | 40 | 63 | 100 | |
| Rated breaking and making capacity | Conforming to IEC 61095 (AC-7b) I rms 400 V 3-phase | A | 40 | 68 | 120 | 200 | – | |
| Permissible short time rating no current flowing for preceding 15 minutes with q ≤ 40 °C | For 10 s | A | 128 | 200 | 320 | 504 | 800 | |
| | For 30 s | A | 40 | 62 | 100 | 157 | 250 | |
| Short-circuit protection by fuse or circuit breaker U ≤ 440 V | gl fuse | A | 16 | 25 | 40 | 63 | 100 | |
| | Circuit breaker I ^{2t} (at 3 kA rms prospective) | 230 V | A ^{2s} | 5000 | 10000 | 16000 | 18000 | – |
| | | 400 V | A ^{2s} | 9000 | 14000 | 17500 | 20000 | – |
| Electrical durability in operating cycles | AC-7a, AC-7b | | 100000 | 100000 | 100000 | 100000 | 30000 | |
| Average impedance per pole | At Ith and 50 Hz | mΩ | 2.5 | 2.5 | 2 | 2 | 1 | |
| Power dissipated per pole | For the above operational currents | W | 0.65 | 1.6 | 3.2 | 8 | 10 | |
| Maximum cabling c.s.a. | Flexible cable without cable end | 1 conductor | mm ² | 6 | 6 | 25 | 25 | 35 |
| | | 2 conductors | mm ² | 4 | 4 | 16 | 16 | – |
| | Flexible cable with cable end | 1 conductor | mm ² | 6 | 6 | 16 | 16 | 35 |
| | | 2 conductors | mm ² | 1.5 | 1.5 | 4 | 4 | – |
| | Solid cable without cable end | 1 conductor | mm ² | 6 | 6 | 25 | 25 | 35 |
| | | 2 conductors | mm ² | 4 | 4 | 6 | 6 | 10 |
| Tightening torque | Power circuit connections | N.m | 0.8 | 0.8 | 3.5 | 3.5 | 3.5 | |

(1) Ventilation 1/2 module must be fitted.

| Control circuit characteristics | | | | GC16, GC25 single or 2-pole | GC16, GC25 3 or 4-pole GC40, GC63 2-pole | GC40, GC63 3 or 4-pole GC100 2-pole | GC100 4-pole |
|--|--|-------------------------------------|---|--------------------------------|---|--|-----------------|
| Rated control circuit voltage (Uc) | 50 or 60 Hz | V | 12...240 V, for other voltages, please consult your Regional Sales Office | | | | |
| Control voltage limits ($\theta \leq 50\text{ }^{\circ}\text{C}$) | 50 Hz coils | Operational | 0.85...1.1 Uc | | | | |
| | | Drop-out | 0.2...0.75 Uc | | | | |
| Average coil consumption at 20 °C and at Uc | ~ 50 Hz | Inrush | VA | 15 | 34 | 53 | 106 |
| | | Sealed | VA | 3.8 | 4.6 | 6.5 | 13 |
| Maximum heat dissipation | 50/60 Hz | W | 1.3 | 1.6 | 2.1 | 4.2 | |
| Operating time | Closing "C" | ms | 10...30 | | | | |
| | Opening "O" | ms | 10...25 | | | | |
| Mechanical durability | In operating cycles | | 10 ⁶ | | | | |
| Maximum operating rate at ambient temperature $\leq 50\text{ }^{\circ}\text{C}$ | In operating cycles per hour | | 300 | | | | |
| Maximum cabling c.s.a. | Flexible cable without cable end | 1 or 2 conductors | mm² | 2.5 | | | |
| | | 1 conductor | mm² | 2.5 | | | |
| | Flexible cable with cable end | 2 conductors | mm² | 1.5 | | | |
| | | Solid cable without cable end | 1 or 2 conductors | mm² | 1.5 | | |
| Tightening torque | | N.m | 0.8 | | | | |

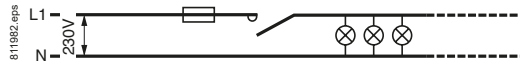
| Instantaneous auxiliary contact characteristics | | | |
|---|--|-----------------------|-----------------|
| Rated operational voltage (Ue) | Up to | V | 250 |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-5 | V | 500 |
| | Conforming to VDE 0110 | V | 500 |
| Conventional thermal current (Ith) | For ambient $\theta \leq 50\text{ }^{\circ}\text{C}$ | A | 5 |
| Mechanical durability | Operating cycles | | 10 ⁶ |
| Maximum cabling c.s.a. | Flexible or solid conductor | mm² | 2.5 |
| Tightening torque | | N.m | 0.8 |

Ref.

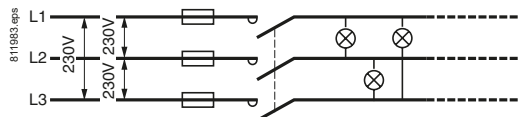


Lighting (Maximum number of lamps depending on the power of each unit) Introduction of installations according to type of supply

■ Single-phase circuit, 230 V

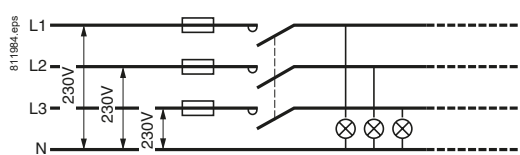


■ 3-phase circuit, 230 V



The maximum number of lamps which can be operated per phase is equal to the number of lamps in the "single phase 230 V" table divided by $\sqrt{3}$.

■ 3-phase circuit, 400 V (with neutral)



The maximum number of lamps which can be operated per phase is equal to the total number of lamps in the "single-phase 230 V" table.

Contactor rating for a single-phase 230 V circuit (single-pole)

Fluorescent lamps with starter

| Single fitting | Non corrected | | | | | With parallel correction | | | | | Contactor rating |
|----------------|---------------|--------------------|--------|-------------------------|--------|--------------------------|--------------------|--------|-------------------------|----|------------------|
| | P (W) | I _B (A) | C (μF) | Maximum number of lamps | | P (W) | I _B (A) | C (μF) | Maximum number of lamps | | |
| Twin fitting | 20 | 0.39 | - | 22 | 30 | 20 | 0.19 | 5 | 15 | 15 | 16 A |
| | 40 | 0.43 | - | 20 | 28 | 40 | 0.29 | 5 | 20 | 20 | 25 A |
| | 50 | 0.70 | - | 13 | 17 | 58 | 0.46 | 7 | 10 | 15 | 40 A |
| | 80 | 0.80 | - | 10 | 15 | 80 | 0.57 | 7 | 10 | 7 | 63 A |
| Twin fitting | 110 | 1.2 | - | 7 | 10 | 110 | 0.79 | 16 | 5 | 5 | 16 A |
| | 2 x 18 | 0.44 | - | 2 x 18 | 2 x 16 | 2 x 36 | 0.26 | 3.5 | 30 | 17 | 16 A |
| | 2 x 58 | 0.82 | - | 2 x 58 | 2 x 8 | 2 x 58 | 0.48 | 4.5 | 10 | 10 | 25 A |
| | 2 x 80 | 1.34 | - | 2 x 80 | 2 x 6 | 2 x 80 | 0.78 | 7 | 9 | 6 | 40 A |
| Twin fitting | 2 x 140 | 2.2 | - | 2 x 140 | 2 x 10 | 2 x 140 | 1.3 | 18 | 16 | 16 | 63 A |
| | 2 x 18 | 0.44 | - | 2 x 18 | 2 x 16 | 2 x 36 | 0.26 | 3.5 | 30 | 17 | 16 A |
| | 2 x 58 | 0.82 | - | 2 x 58 | 2 x 8 | 2 x 58 | 0.48 | 4.5 | 10 | 10 | 25 A |
| | 2 x 80 | 1.34 | - | 2 x 80 | 2 x 6 | 2 x 80 | 0.78 | 7 | 9 | 6 | 40 A |

High pressure mercury vapour lamps

| | Non corrected | | | | | | With parallel correction | | | | | | Contactor rating |
|-------|--------------------|--------|-------------------------|----|----|-------|--------------------------|--------|-------------------------|---|---|------|------------------|
| P (W) | I _B (A) | C (μF) | Maximum number of lamps | | | P (W) | I _B (A) | C (μF) | Maximum number of lamps | | | | |
| 50 | 0.6 | - | 15 | 20 | 25 | 50 | 0.35 | 7 | 10 | 9 | 4 | 16 A | |
| 80 | 0.8 | - | 10 | 15 | 10 | 80 | 0.50 | 8 | 9 | 4 | 3 | 25 A | |
| 125 | 1.15 | - | 8 | 10 | 6 | 125 | 0.7 | 10 | 6 | 4 | 2 | 40 A | |
| 250 | 2.15 | - | 4 | 6 | 4 | 250 | 1.5 | 18 | 6 | 4 | 2 | 63 A | |
| 400 | 3.25 | - | 2 | 4 | 2 | 400 | 2.4 | 25 | 4 | 2 | 1 | | |
| 700 | 5.4 | - | 1 | 2 | 1 | 700 | 4 | 40 | 2 | 1 | 1 | | |
| 1000 | - | - | - | - | - | 1000 | 5.7 | 60 | - | - | - | | |

I_B: value of current drawn by each lamp at its rated voltage.

C: unit capacitance for each lamp.

I_B and C correspond to values normally quoted by lamp manufacturers

**Contactor rating for a single-phase 230 V circuit
(single-pole) (continued)**

Low pressure sodium vapour lamps

| | Non corrected | | | | | | With parallel correction | | | | | | Contactor rating |
|-------------------------|---------------|-----|-----|-----|-----|-----|--------------------------|-----|-----|-----|-----|-----|------------------|
| P (W) | 18 | 35 | 55 | 90 | 135 | 180 | 18 | 35 | 55 | 90 | 135 | 180 | – |
| I _B (A) | 0.35 | 1.4 | 1.4 | 2.1 | 3.1 | 3.1 | 0.35 | 0.6 | 0.6 | 0.9 | 0.9 | 0.9 | – |
| C (µF) | – | – | – | – | – | – | 5 | 20 | 20 | 26 | 45 | 40 | – |
| Maximum number of lamps | 18 | 4 | 5 | 3 | 2 | 2 | 14 | 3 | 3 | 2 | 1 | 1 | 16 A |
| | 34 | 9 | 9 | 6 | 4 | 4 | 21 | 5 | 5 | 4 | 2 | 2 | 25 A |
| | 57 | 14 | 14 | 9 | 6 | 6 | 40 | 10 | 10 | 8 | 4 | 5 | 40 A |
| | 91 | 24 | 24 | 19 | 10 | 10 | 60 | 15 | 15 | 11 | 6 | 7 | 63 A |

High pressure sodium vapour lamps

| | Non corrected | | | | | With parallel correction | | | | | Contactor rating |
|-------------------------|---------------|-----|-----|-----|------|--------------------------|-----|-----|-----|------|------------------|
| P (W) | 70 | 150 | 250 | 400 | 1000 | 70 | 150 | 250 | 400 | 1000 | – |
| I _B (A) | 1 | 1.8 | 3 | 4.4 | 10.3 | 0.6 | 0.7 | 1.5 | 2.5 | 6 | – |
| C (µF) | – | – | – | – | – | 12 | 20 | 32 | 45 | 100 | – |
| Maximum number of lamps | 8 | 4 | 2 | 1 | – | 6 | 6 | 2 | 2 | 1 | 16 A |
| | 12 | 7 | 4 | 3 | 1 | 9 | 9 | 3 | 4 | 2 | 25 A |
| | 20 | 13 | 8 | 5 | 2 | 18 | 18 | 6 | 8 | 4 | 40 A |
| | 32 | 18 | 11 | 8 | 3 | 25 | 25 | 9 | 12 | 6 | 63 A |

Metal iodine or halogen vapour lamps

| | Non corrected | | | | | | With parallel correction | | | | | | Contactor rating | |
|--------------------|---------------|-----|-----|-----|-----|------|--------------------------|-----|-----|-----|-----|------|------------------|---|
| P (W) | 35 | 70 | 150 | 250 | 400 | 1000 | 39 | 70 | 150 | 250 | 400 | 1000 | 2000 | – |
| I _B (A) | 0.3 | 0.5 | 1 | 1.5 | 2.5 | 6 | 0.3 | 0.5 | 1 | 1.5 | 2.5 | 6 | 5.5 | – |
| C (µF) | – | – | – | – | – | – | 6 | 12 | 20 | 32 | 45 | 85 | 60 | – |

| | | | | | | | | | | | | | | |
|-------------------------|-----|----|----|----|----|---|----|----|----|----|---|---|---|-------------|
| Maximum number of lamps | 27 | 16 | 8 | 5 | 3 | 1 | 12 | 6 | 4 | 3 | 2 | – | 1 | 16 A |
| | 40 | 24 | 12 | 8 | 5 | 2 | 18 | 9 | 6 | 4 | 3 | 1 | 2 | 25 A |
| | 68 | 42 | 20 | 14 | 8 | 4 | 31 | 16 | 10 | 7 | 5 | 3 | 3 | 40 A |
| | 106 | 64 | 32 | 21 | 13 | 5 | 50 | 25 | 15 | 10 | 7 | 4 | 5 | 63 A |

Incandescent and halogen lamps

| | | | | | | | | | | Contactor rating |
|-------------------------|------|------|------|------|------|-----|------|------|-------------|------------------|
| P (W) | 60 | 75 | 100 | 150 | 200 | 300 | 500 | 1000 | – | |
| I _B (A) | 0.26 | 0.32 | 0.44 | 0.65 | 0.87 | 1.3 | 2.17 | 4.4 | – | |
| Maximum number of lamps | 30 | 25 | 19 | 12 | 10 | 7 | 4 | 2 | 16 A | |
| | 45 | 38 | 28 | 18 | 14 | 10 | 6 | 3 | 25 A | |
| | 85 | 70 | 50 | 35 | 26 | 18 | 10 | 6 | 40 A | |
| | 125 | 100 | 73 | 50 | 37 | 25 | 15 | 8 | 63 A | |

Halogen lamps used with transformer

| | | | | | Contactor rating |
|-------------------------|------|------|------|------|------------------|
| P (W) | 60 | 80 | 105 | 150 | – |
| I _B (A) | 0.26 | 0.35 | 0.45 | 0.65 | – |
| Maximum number of lamps | 9 | 8 | 6 | 4 | 16 A |
| | 14 | 12 | 9 | 6 | 25 A |
| | 27 | 23 | 18 | 13 | 40 A |
| | 40 | 35 | 27 | 19 | 63 A |

I_B: value of current drawn by each lamp at its rated voltage.

C: unit capacitance for each lamp.

I_B and C correspond to values normally quoted by lamp manufacturers

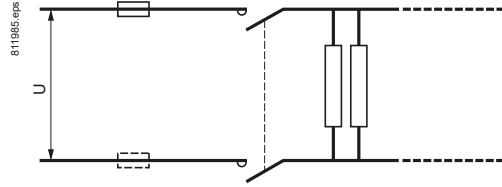
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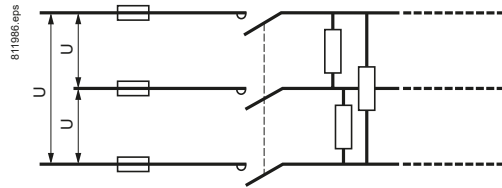
Contactors

Heating (AC-7a)

Single-phase, 2-pole switching



3-phase switching



Heating by resistive elements or by infra-red radiators, convectors or radiators, heating ducts, industrial furnaces. The current peak between the hot and cold states must not exceed 2 to 3 I_n at the moment of switch-on.

Contactor selection according to power and required electrical life

| Electrical durability (in operating cycles) | Maximum power (kW) | | | | | Contactor rating |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------|------------------|
| | 100 x 10 ³ | 150 x 10 ³ | 200 x 10 ³ | 500 x 10 ³ | 10 ⁶ | |
| Single-phase switching 230 V (2-pole) | 3.5 | 3 | 2.2 | 1 | 0.8 | 16 A |
| | 5.4 | 4.6 | 3.5 | 1.6 | 1.2 | 25 A |
| | 8.6 | 7.4 | 5.6 | 2.6 | 1.9 | 40 A |
| | 13.6 | 11.6 | 8.8 | 4 | 3 | 63 A |
| | 21.6 | 18.4 | 14 | 6.4 | 4.8 | 100 A |
| 3-phase switching 400 V (3-pole) | 10 | 9 | 6.5 | 3.2 | 2.2 | 16 A |
| | 16 | 14 | 10 | 5 | 3.5 | 25 A |
| | 26 | 22 | 17 | 7.5 | 6 | 40 A |
| | 41 | 35 | 26.5 | 12 | 9 | 63 A |
| | 64.8 | 55.2 | 42 | 19.2 | 14.4 | 100 A |

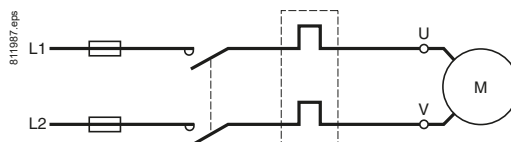
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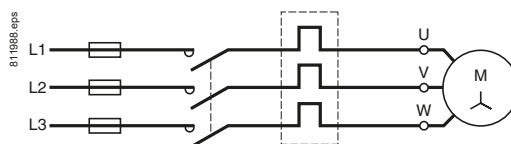
Contactors

Motor control (AC-7b)

Single-phase circuit, 230 V



3-phase circuit, 400 V



Contactor selection according to maximum power in kW

| 230 V single-phase capacitor motor (2-pole) | 400 V 3-phase motor | Contactor rating (Ith) |
|---|---------------------|------------------------|
| 0.55 | 2.2 | 16 A |
| 1.1 | 4 | 25 A |
| 2.2 | 7.5 | 40 A |
| 4 | 11 | 63 A |

Ref.



TeSys Control Modular Contactors

Dimensions

Dimensions

Contactors

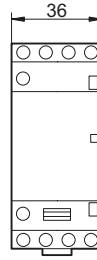
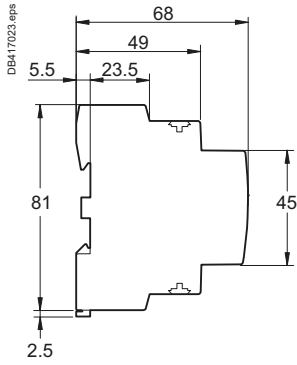
Common side view

GC1610, 1611, 1620
GC2502, 2510, 2511, 2520

1 module

GC1622, 1640
GC2504, 2522, 2530, 2540

2 modules



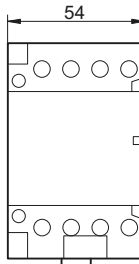
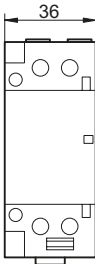
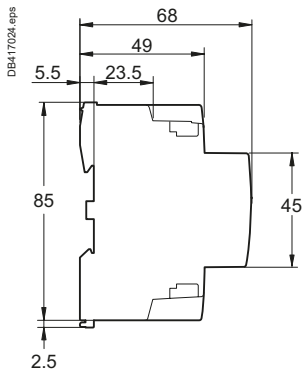
Common side view

GC4002, 4011, 4020
GC6302, 6311, 6320

2 modules

GC4004, 4022, 4030, 4040
GC6304, 6322, 6330, 6340

3 modules



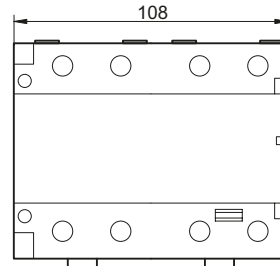
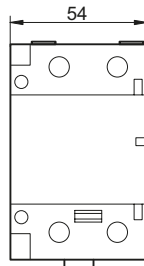
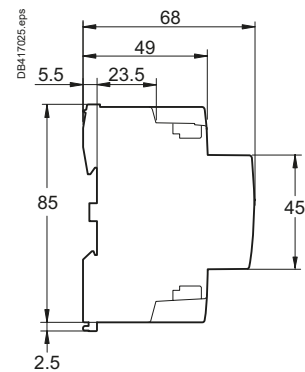
Common side view

GC10020

3 modules

GC10040

6 modules



Ref.



Contactors

TeSys Control

Modular Contactors

Dimensions and mounting

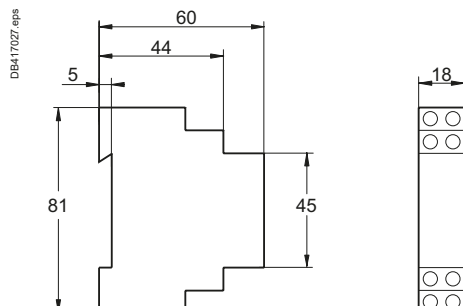
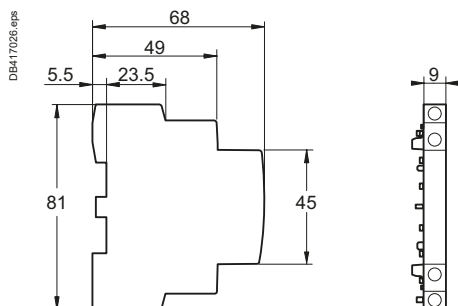
Dimensions

Auxiliary contacts

GAC0511, 0531 and 0521

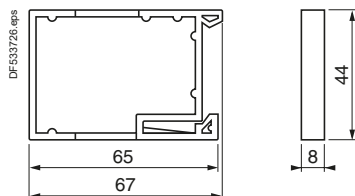
Coil suppression blocks

GAP21 and 23



Clip-on ventilation 1/2 module

GAC5



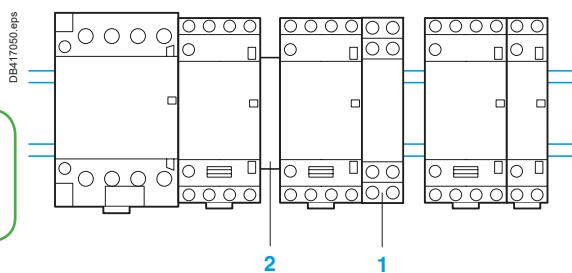
Ref.



Mounting

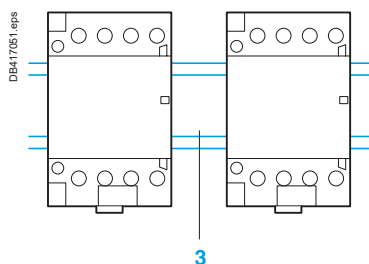
Setting-up precautions

The contactor controls must be bounce free. If not, connect a coil suppression block **1** (GAP21 or 23) across the coil terminals y 250 V. When several contactors which operate at the same time are mounted side by side, a GAC 5 ventilation 1/2 module **2** must be fitted every 2 contactors.



Contactors

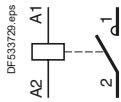
It is advisable to mount electronic units at the bottom of the modular panel and to separate them from electromechanical units by a space **3** equal to one module, or by 2 ventilation 1/2 modules (GAC 5).



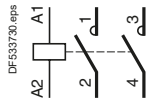
Schemes

Contactors

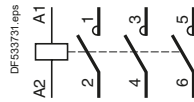
GC●●10



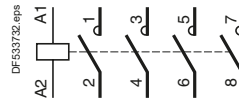
GC●●20



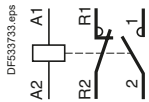
GC●●30



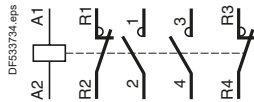
GC●●40



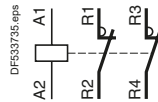
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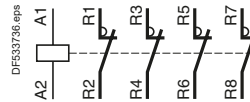
GC●●22



GC●●02

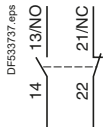


GC●●04



Auxiliary contacts

GAC0521



GAC0531



GAC0511



TeSys Control

Modular "Dual tariff" contactors

Characteristics



GY25

Modular "dual tariff" contactors are designed for use in modular panels and enclosures.

These contactors feature:

■ **Easy installation:**

- quick clip-on fixing and locking onto 35 mm omega rail
- easy connection by means of ready-to-tighten captive, pozidrive screw terminals.

■ **Compact size**

All units have a common depth of 60 mm and width in modules of 17.5 mm (width of one module: 17.5 mm).

■ **User safety:**

- use of materials conforming to strictest fire safety standards
- live parts protected against direct finger contact
- completely safe operation
- state indication on front panel.

"Dual tariff" contactors are designed for use with Electricity Supply Authority dual tariffs.

They have a 4-position selector switch on the front panel:

| | |
|--|--|
| "Stop" (O) | For switching off the load, e.g. for prolonged periods of absence. |
| "Off peak" Automatic start (A) | The contactor switches automatically during "off peak" hours as set by the Supply Authority remote control and thus supplies the load, (washing machine, dishwasher, convector heater, water heater) during this period, at an economy rate to the user. |
| "Peak time" Manual start (I) | In this position, the contactor supplies the load to cater for additional requirements for hot water, heating, etc., but at the standard rate. The contactor returns automatically to the "off-peak" position at the start of the "off-peak" period. |
| "Peak time" Manual override with lock | Facility for setting the contactor to continuous manual operation, ignoring the automation system and the Supply Authority control; setting and locking is achieved by means of a tool, with manual return to the "AUTO" position. |

Standards

This range of modular contactors has been designed taking into account the requirements of international standard IEC 61095.

This standard is specific to "Electromagnetic contactors for domestic and similar use".

It has very strict requirements, meeting the expectations of users, with regard to the safety of equipment and persons in "premises and areas accessible to the public". Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

"Dual tariff" modular contactors are designed for switching all single-phase, 3-phase or 4-phase loads up to 63 A.

Modular contactors have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific supply is required:

- lighting,
- heating, ventilation,
- motorised shutters or gates.

Ref.



Contactors

TeSys Control

Modular "Dual tariff" contactors

Characteristics

| Environment | | | | | | |
|---|-------------------------|----|---|------|------|------|
| Type | | | GY16 | GY25 | GY40 | GY63 |
| Rated insulation voltage (Ui) | Conforming to IEC 61095 | V | 500 | | | |
| | Conforming to VDE 0110 | V | 500 | | | |
| Rated impulse withstand voltage (Uimp) | | kV | 4 in enclosure | | | |
| Conforming to standards | | | IEC 61095 and IEC 60947-5-1 for auxiliary contacts | | | |
| Product certifications | | | NF-USE, VDE, CEBEC, ÖVE | | | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP 20 open, IP 40 in enclosure | | | |
| Ambient air temperature around the device | Storage | °C | -40...+70 | | | |
| | Operation | °C | -5...+50 (0.85...1.1 Uc) | | | |
| Maximum operating altitude | Without derating | m | 3000 | | | |
| Operating positions | Without derating | | ±30° in relation to normal vertical mounting plane | | | |
| Shock resistance 1/2 sine wave = 11 ms Conforming to IEC/EN 60068-2-27 | Contacteur open | | 10 gn | | | |
| | Contacteur closed | | 15 gn | | | |
| Vibration resistance 5...300 Hz Conforming to IEC/EN 60068-2-6 | Contacteur open | | 2 gn | | | |
| | Contacteur closed | | 3 gn | | | |
| Flame resistance | | | Conforming to IEC 61095 | | | |

| Pole characteristics | | | | | | | |
|---|--|------------------|--|--------|--------|--------|----|
| Number of poles | | | 2, 3 or 4 | | | | |
| Rated operational current (Ie) (Ue ≤ 440 V) | In AC-7a (heating) | A | 16 | 25 | 40 | 63 | |
| | In AC-7b (motor control) | A | 5 | 8.5 | 15 | 25 | |
| Contactor rating | 40 °C | | 16 | 25 | 40 | 63 | |
| | 50 °C | | 14 | 22 | 36 | 57 | |
| | 60 °C ⁽¹⁾ | | 13 | 20 | 32 | 50 | |
| Rated operational voltage (Ue) | Up to | V | 250 - 2-pole contactors, 415 - 3 and 4-pole contactors | | | | |
| Frequency limits | Of the operating current | Hz | 400 | | | | |
| Conventional thermal current (Ith) | θ ≤ 50 °C | A | 16 | 25 | 40 | 63 | |
| Rated breaking and making capacity | Conforming to IEC 61095 (AC-7b) I rms 400 V 3-phase | A | 40 | 68 | 120 | 200 | |
| Short time rating with no current flow for the previous 15 minutes with θ ≤ 40 °C | For 10 s | A | 128 | 200 | 320 | 504 | |
| | For 30 s | A | 40 | 62 | 100 | 157 | |
| Short-circuit protection by fuse or circuit breaker U ≤ 440 V | gl fuse | A | 16 | 25 | 40 | 63 | |
| | Circuit breaker I ² t (at 3 kA rms prospective) 230V | A ² s | 5000 | 10000 | 16000 | 18000 | |
| | 400V | A ² s | 9000 | 14000 | 17500 | 20000 | |
| Electrical durability in operating cycles | AC-7a, AC-7b | | 100000 | 100000 | 100000 | 100000 | |
| Average impedance per pole | At Ith and 50 Hz | mΩ | 2.5 | 2.5 | 2 | 2 | |
| Power dissipated per pole | For the above operational currents | W | 0.65 | 1.6 | 3.2 | 8 | |
| Maximum cabling c.s.a. | Flexible cable without cable end | 1 conductor | mm ² | 6 | 6 | 25 | 25 |
| | | 2 conductors | mm ² | 4 | 4 | 16 | 16 |
| | Flexible cable with cable end | 1 conductor | mm ² | 6 | 6 | 16 | 16 |
| | | 2 conductors | mm ² | 1.5 | 1.5 | 4 | 4 |
| | Solid cable without cable end | 1 conductor | mm ² | 6 | 6 | 25 | 25 |
| | | 2 conductors | mm ² | 4 | 4 | 6 | 6 |
| Tightening torque | Power circuit connections | N.m | 0.8 | 0.8 | 3.5 | 3.5 | |

(1) Ventilation 1/2 module must be fitted.

References:
page B8/52

Dimensions and schemes:
pages B8/121 and B8/122

TeSys Control

Modular "Dual tariff" contactors

Characteristics

| Control circuit characteristics | | | | | |
|--|---------------------------------|-----------------|---|---|---------------------------|
| Type | | | GY16, GY25 single or 2-pole | GY16, GY25 3 or 4-pole GY40, GY63 2-pole | GY40, GY63 3 or 4-pole |
| Rated control circuit voltage (Uc) | 50 or 60 Hz | V | 12...240 V, for other voltages, please consult your Regional Sales Office | | |
| Control voltage limits ($\theta \leq 50$ °C) | | | | | |
| 50 Hz coils | Operational | | 0.85...1.1 Uc | | |
| | Drop-out | | 0.2...0.75 Uc | | |
| Average consumption at 20 °C and at Uc | | | | | |
| ~ 50 Hz | Inrush | VA | 15 | 34 | 53 |
| | Sealed | VA | 3.8 | 4.6 | 6.5 |
| Heat dissipation | 50/60 Hz | W | 1.3 | 1.6 | 2.1 |
| Operating time | | | | | |
| | Closing "C" | ms | 10 ... 30 | | |
| | Opening "O" | ms | 10 ... 25 | | |
| Mechanical durability | In operating cycles | | 10 ⁶ | | |
| Maximum operating rate at ambient temperature ≤ 50 °C | In operating cycles per hour | | 300 | | |
| Maximum cabling c.s.a. | | | | | |
| Flexible cable without cable end | 1 or 2 conductors | mm ² | 2.5 | | |
| | 1 conductor | mm ² | 2.5 | | |
| Flexible cable with cable end | 2 conductors | mm ² | 1.5 | | |
| | 1 or 2 conductors | mm ² | 1.5 | | |
| Solid cable without cable end | 1 or 2 conductors | mm ² | 1.5 | | |
| Tightening torque | | N.m | 0.8 | | |
| Instantaneous auxiliary contact characteristics | | | | | |
| Rated operational voltage (Ue) | Up to | V | 250 | | |
| Rated insulation voltage (Ui) | | | | | |
| | Conforming to IEC 60947-5 | V | 500 | | |
| | Conforming to VDE 0110 | V | 500 | | |
| Conventional thermal current (Ith) | For ambient $\theta \leq 50$ °C | A | 5 | | |
| Mechanical durability | In operating cycles | | 10 ⁶ | | |
| Maximum cabling c.s.a. | Flexible or solid conductor | mm ² | 2.5 | | |
| Tightening torque | | N.m | 0.8 | | |

Ref.

Contactors

TeSys Control

Modular "Dual tariff" contactors

Dimensions

Dimensions

"Dual tariff" contactors

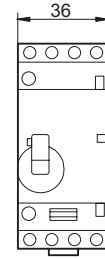
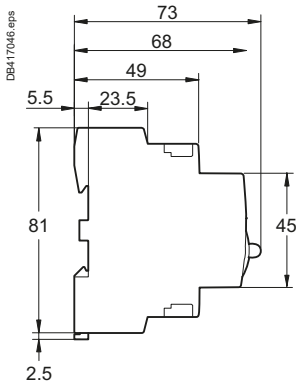
Common side view

**GY1620
GY2520**

1 module

GY2530, 2540

2 modules



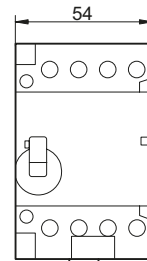
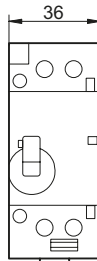
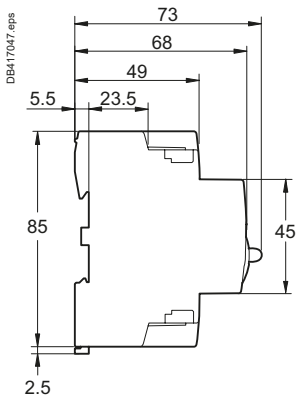
Common side view

**GY4020
GY6320**

2 modules

**GY4030, 4040
GY6330, 6340**

3 modules

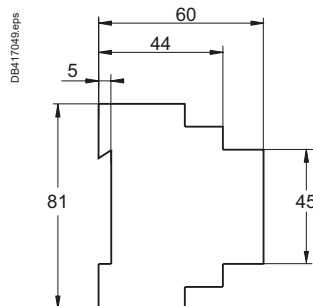
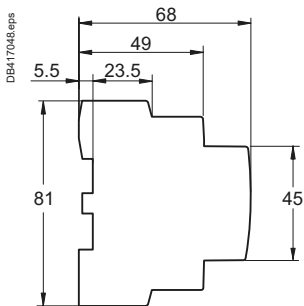


Auxiliary contacts

GAC0511, 0531 and 0521

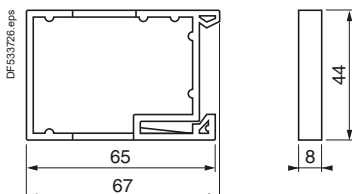
Coil suppression block

GAP21 and 23



Clip-on ventilation 1/2 module

GAC5



References:
page B8/52

Characteristics:
pages B8/118 to B8/120

Ref.



Contactors

TeSys Control

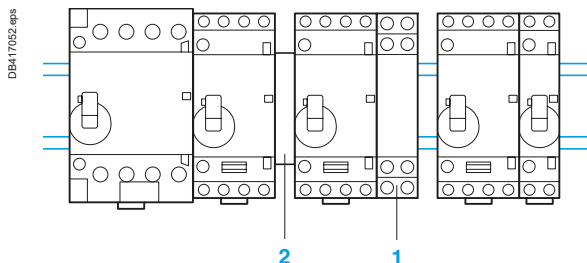
Modular “Dual tariff” contactors

Mounting and schemes

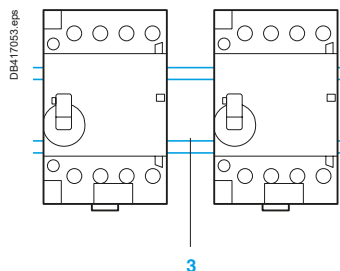
Mounting

Setting-up precautions

The contactor controls must be bounce free. If not, connect a coil suppression block **1** (GAP 21 or 23) across the coil terminals ≤ 250 V. When several contactors which operate at the same time are mounted side by side, a GAC5 ventilation 1/2 module **2** must be fitted every 2 contactors.



It is advisable to mount electronic units at the bottom of the modular panel and to separate them from electromechanical units by a space equal to one module **3** or by 2 ventilation 1/2 modules GAC5.



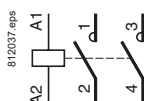
Ref.



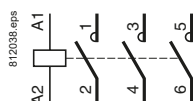
Schemes

Contactors

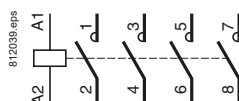
GY●●20



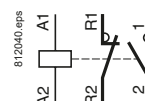
GY●●30



GY●●40

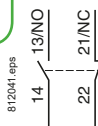


GY●●11

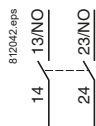


Auxiliary contacts

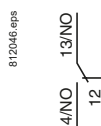
GAC0521



GAC0531



GAC0511



Contactors

TeSys Control

Modular Impulse relay

Characteristics



GF1611M7

Modular impulse relays are designed for use in modular enclosures.

They feature:

■ **Easy installation:**

- quick clip-on fixing and locking onto 35 mm omega rail
- easy connection by means of ready-to-tighten captive, pozidrive screw terminals.

■ **Compact size**

Units have a common depth of 60 mm and width of 18 mm.

■ **User safety:**

- live parts protected against direct finger contact
- completely safe operation
- state indication on front panel.

Standards

This range of modular impulse relays has been designed taking into account the requirements of international standard IEC 60669-2.

This standard is specific to "Impulse relays".

Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

Functions

Modular impulse relays are designed for opening and closing of circuits which are remotely controlled by impulses. The position is mechanically maintained.

These impulse relays are used in lighting circuits when there are more than two switching points.

Power switching

Modular impulse relays have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific lighting supply is required.

Ref.



Contactors

TeSys Control

Modular Impulse relay

Characteristics

| Environment | | | | | | | |
|--|--|------------------|---|------|-----|------|---|
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1-5 | V | 400 | | | | |
| | Conforming to VDE 0110 | V | 400 | | | | |
| Rated impulse withstand voltage (Uimp) | | kV | 4 in enclosure | | | | |
| Conforming to standards | | | IEC 60669-1 and 60669-2 | | | | |
| Product certifications | | | NF-USE, CEBC, ASE, KEMA, N, S, D, FI, VDE | | | | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP 20 open, IP 40 in enclosure | | | | |
| Ambient air temperature around the device | Storage | °C | -40...+80 | | | | |
| | Operation | °C | -20...+50 | | | | |
| Maximum operating altitude | Without derating | m | 2000 | | | | |
| Operating positions | Without derating | | ±90° in relation to normal vertical mounting plane | | | | |
| Shock resistance 1/2 sine wave = 10 ms Conforming to IEC/EN 60068-2-27 | Impulse relay open | | Please consult your Regional Sales Office | | | | |
| | Impulse relay closed | | Please consult your Regional Sales Office | | | | |
| Vibration resistance 5...300 Hz Conforming to IEC/EN 60068-2-6 | Impulse relay open | | 4 gn | | | | |
| | Impulse relay closed | | 4 gn | | | | |
| Pole characteristics | | | | | | | |
| Number of poles | | | 1 or 2 | | | | |
| Rated operational current (Ie) (Ue ≤ 250 V) | In AC-7a (heating) | A | 16 | | | | |
| Rated operational voltage | | V | 250 | | | | |
| Conventional thermal current (Ith) | θ ≤ 50 °C | A | 16 | | | | |
| Permissible short time rating no current flowing for preceding 15 minutes with θ ≤ 40 °C | For 1 s | A | 320 | | | | |
| | For 10 s | A | 96 | | | | |
| | For 30 s | A | 48 | | | | |
| Short-circuit protection by fuse or circuit breaker | gl fuse | A | 16 | | | | |
| | Circuit breaker I ² t (at 3 kA rms prospective) | A ² s | 5000 | | | | |
| Average impedance per pole | At Ith and 50 Hz | mΩ | 4 | | | | |
| Power dissipated per pole | | W | 1 | | | | |
| Maximum cabling c.s.a. | Flexible cable without cable end | 1 conductor | mm ² | Min. | 0.5 | Max. | 6 |
| | | 2 conductors | mm ² | 0.5 | 4 | | |
| | Flexible cable with cable end | 1 conductor | mm ² | 0.5 | 6 | | |
| | | 2 conductors | mm ² | 0.5 | 4 | | |
| | Solid cable without cable end | 1 conductor | mm ² | 0.5 | 6 | | |
| | | 2 conductors | mm ² | 0.5 | 4 | | |
| Tightening torque | Power circuit connections | N.m | 0.8 | | | | |

Ref.



Contactors

TeSys Control

Modular Impulse relay

Characteristics

| Control circuit characteristics | | | |
|---|---|-------------------|---|
| Rated control circuit voltage (Uc) | | V | 12...240 V, for other voltages, please consult your Regional Sales Office |
| Control voltage limits ($\theta < 50\text{ }^{\circ}\text{C}$) | Operating threshold, dual frequency 50/60 Hz | V | 0.85...1.1 Uc |
| Average consumption at 20 °C and at Uc | Inrush at 50 Hz | VA | 19 |
| Operating time | Closing "C" | ms | 70 |
| | Opening "O" | ms | 70 |
| Minimum impulse time | | ms | 70 |
| Mechanical durability | | | 10 ⁶ operating cycles |
| Electrical durability | AC-21 | | 200000 operating cycles |
| | AC-22 | | 100000 operating cycles |
| Maximum operating rate | Operating cycles per hour | | 900 |
| Maximum cabling c.s.a. | Flexible cable without cable end | 1 or 2 conductors | mm² 2.5 |
| | Flexible cable with cable end | 1 conductor | mm² 2.5 |
| | | 2 conductors | mm² 1.5 |
| | Solid cable without cable end | 1 or 2 conductors | mm² 1.5 |
| Tightening torque | | N.m | 0.8 |

Ref.



Contactors

Lighting circuits

Fluorescent lamps with starter

| Single fitting | Non corrected | | | With parallel correction | | |
|-----------------|---------------|----|----|--------------------------|----|----|
| | 18 | 36 | 58 | 18 | 36 | 58 |
| Power in W | 18 | 36 | 58 | 18 | 36 | 58 |
| Number of lamps | 70 | 35 | 21 | 50 | 25 | 16 |

| Twin fitting | With series correction | | |
|-----------------|------------------------|--------|--------|
| | 2 x 18 | 2 x 36 | 2 x 58 |
| Power in W | 2 x 18 | 2 x 36 | 2 x 58 |
| Number of lamps | 56 | 28 | 17 |

Incandescent lamps: filament lamps

| | | | | | |
|-----------------|----|----|----|-----|-----|
| Power in W | 40 | 60 | 75 | 100 | 200 |
| Number of lamps | 40 | 25 | 20 | 16 | 8 |

Incandescent lamps: halogen lamps

| | | | | |
|-----------------|-----|-----|------|------|
| Power in W | 300 | 500 | 1000 | 1500 |
| Number of lamps | 5 | 3 | 1 | 1 |

Incandescent lamps: very low voltage halogen lamps

| | | | | |
|-----------------|----|----|----|-----|
| Power in W | 20 | 50 | 75 | 100 |
| Number of lamps | 70 | 28 | 19 | 4 |

Low pressure sodium vapour lamps

| | Non corrected | | | |
|-----------------|---------------|----|----|-----|
| | Power in W | 55 | 90 | 135 |
| Number of lamps | 24 | 15 | 10 | 7 |

High pressure sodium vapour lamps

| | Non corrected | | |
|-----------------|---------------|-----|-----|
| | Power in W | 250 | 400 |
| Number of lamps | 5 | 3 | 1 |

Heating circuits

Single-phase 230 V, 2-pole

| | |
|-------------|-----|
| Power in kW | 3.6 |
|-------------|-----|

Ref.



Contactors

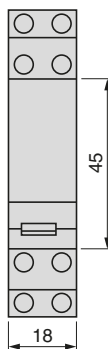
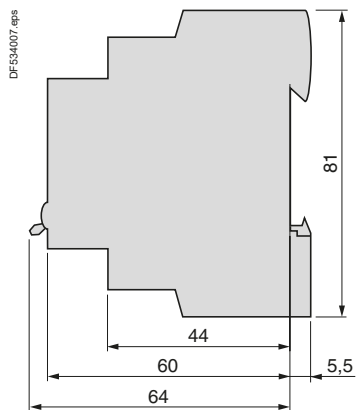
TeSys Control

Modular Impulse relay

Dimensions and schemes

Dimensions

GF1610, GF1611, GF1620

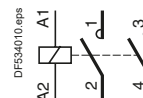
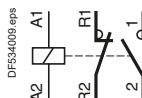
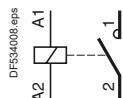


Schemes

GF1610

GF1611

GF1620



Ref.



Contactors

Test conditions according to IEC utilization categories

Contactor characteristics are established following tests and utilization categories whose are conforming IEC 60947-4-1 and 5-1 standards.

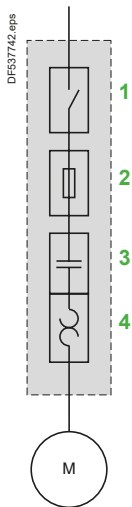
| Contactors | | | | | | | | | | | | | |
|--|----------------------|--|----|--------------------|----------|---------|--------------------|--|---------|--------------------|----------|---------|--------------------|
| | | Electrical durability: making and breaking conditions | | | | | | Occasional duty: making and breaking conditions | | | | | |
| a.c. supply | | | | | | | | | | | | | |
| Typical applications | Utilisation category | Making | | | Breaking | | | Making | | | Breaking | | |
| | | I | U | cos φ | I | U | cos φ | I | U | cos φ | I | U | cos φ |
| Resistors, non inductive or slightly inductive loads | AC-1 | 1e | Ue | 0.95 | 1e | Ue | 0.95 | 1.5 1e | 1.05 Ue | 0.8 | 1.5 1e | 1.05 Ue | 0.8 |
| Motors | | | | | | | | | | | | | |
| Slip ring motors: starting, breaking. | AC-2 | 2.5 1e | Ue | 0.65 | 2.5 1e | Ue | 0.65 | 4 1e | 1.05 Ue | 0.65 | 4 1e | 1.05 Ue | 0.65 |
| Squirrel cage motors: starting, breaking whilst motor running. | AC-3 | 1e ≤ ⁽¹⁾ | Ue | 0.65 | 1 1e | 0.17 Ue | 0.65 | 10 1e | 1.05 Ue | 0.45 | 8 1e | 1.05 Ue | 0.45 |
| | | 1e > ⁽²⁾ | Ue | 0.35 | 1 1e | 0.17 Ue | 0.35 | 10 1e | 1.05 Ue | 0.35 | 8 1e | 1.05 Ue | 0.35 |
| Squirrel cage motors: starting, reversing, inching | AC-4 | 1e ≤ ⁽¹⁾ | Ue | 0.65 | 6 1e | Ue | 0.65 | 12 1e | 1.05 Ue | 0.45 | 10 1e | 1.05 Ue | 0.45 |
| | | 1e > ⁽²⁾ | Ue | 0.35 | 6 1e | Ue | 0.35 | 12 1e | 1.05 Ue | 0.35 | 10 1e | 1.05 Ue | 0.35 |
| d.c. supply | | | | | | | | | | | | | |
| Typical applications | Utilisation category | Making | | | Breaking | | | Making | | | Breaking | | |
| | | I | U | L/R (ms) | I | U | L/R (ms) | I | U | L/R (ms) | I | U | L/R (ms) |
| Resistors, non inductive or slightly inductive loads | DC-1 | 1e | Ue | 1 | 1e | Ue | 1 | 1.5 1e | 1.05 Ue | 1 | 1.5 1e | 1.05 Ue | 1 |
| Shunt wound motors: starting, reversing, inching | DC-3 | 2.5 1e | Ue | 2 | 2.5 1e | Ue | 2 | 4 1e | 1.05 Ue | 2.5 | 4 1e | 1.05 Ue | 2.5 |
| Series wound motors: starting, reversing, inching | DC-5 | 2.5 1e | Ue | 7.5 | 2.5 1e | Ue | 7.5 | 4 1e | 1.05 Ue | 15 | 4 1e | 1.05 Ue | 15 |
| Control relays and auxiliary contacts | | | | | | | | | | | | | |
| | | Electrical durability: making and breaking conditions | | | | | | Occasional duty: making and breaking conditions | | | | | |
| a.c. supply | | | | | | | | | | | | | |
| Typical applications | Utilisation category | Making | | | Breaking | | | Making | | | Breaking | | |
| | | I | U | cos φ | I | U | cos φ | I | U | cos φ | I | U | cos φ |
| Electromagnets | | | | | | | | | | | | | |
| ≤ 72 VA | AC-14 | - | - | - | - | - | - | 6 1e | 1.1 Ue | 0.7 | 6 1e | 1.1 Ue | 0.7 |
| > 72 VA | AC-15 | 10 1e | Ue | 0.7 | 1e | Ue | 0.4 | 10 1e | 1.1 Ue | 0.3 | 10 1e | 1.1 Ue | 0.3 |
| d.c. supply | | | | | | | | | | | | | |
| Typical applications | Utilisation category | Making | | | Breaking | | | Making | | | Breaking | | |
| | | I | U | L/R (ms) | I | U | L/R (ms) | I | U | L/R (ms) | I | U | L/R (ms) |
| Electromagnets | DC-13 | 1e | Ue | 6 P ⁽³⁾ | 1e | Ue | 6 P ⁽³⁾ | 1.1 1e | 1.1 Ue | 6 P ⁽³⁾ | 1.1 1e | 1.1 Ue | 6 P ⁽³⁾ |

⁽¹⁾ 1e ≤ 17 A for electrical durability, 1e ≤ 100 A for occasional duty.

⁽²⁾ 1e > 17 A for electrical durability, 1e > 100 A for occasional duty.

⁽³⁾ The value 6 P (in watts) is based on practical observations and is considered to represent the majority of d.c. magnetic loads up to the maximum limit of P = 50 W i.e. 6 P = 300 ms = L/R.

Above this, the loads are made up of smaller loads in parallel. The value 300 ms is therefore a maximum limit whatever the value of current drawn.



- 1 Motor Disconnect (Disconnect switch)
- 2 Motor Branch Circuit Protection (Short-circuit protection)
- 3 Motor Controller (Contactor)
- 4 Motor Overload Protection (Thermal overload relay)

Starters for the North American market

In recent years, the North American market has started to harmonise UL, CSA and ANCE standards, as well as the industrial installation codes provided by national regulations (NEC for the United States, CEC for Canada and MEC for Mexico). ⁽¹⁾ Major improvements, carried out by the Canena ⁽²⁾ are aimed at harmonising product requirements based on IEC ⁽³⁾ standards. However, the North American codes use specific terminology for defining the functions of a starter. These functions can be fulfilled by standard IEC products, accompanied by appropriate certifications.

Combination Starters

Combination Starters are the most common type of packaged motor starter. They are called "Combination" because of their structure and their combined functions. The figure opposite shows the four combined functions that constitute a complete motor starter circuit, defined as a "Motor branch circuit" by the NEC (US National Electric Code) in article 430. Standard UL508 currently gives different types of combination starter that meet the requirements of a "Motor branch circuit".

Type E, called "**self-protected combination starter**", covers all these functions and can be controlled manually (thermal-magnetic circuit breaker) or remotely (starter-controller). Type E starters withstand faults within their declared nominal rating without sustaining damage, after which they can be put back into service. In addition, they can withstand more severe short-circuit and durability performance tests without welding or excessive wear of the contact tips.

Type F, called "**Combination motor starter**", consists of a type E manual starter (thermal-magnetic circuit breaker) combined with a contactor. These starters are evaluated by means of basic short-circuit tests, but are not considered as "self-protected".

For this combination, the type E starter must be marked "Combination Motor Controller when used with ...", followed by the reference of the load side contactor.

⁽¹⁾ **UL**: Underwriters Laboratories, **CSA**: Canadian Standards Association, **ACNE**: Association of Standardization and Certification, **NEC**: National Electric Code, **CEC**: Canadian Electrical Code, **MEC**: Mexican Electrical Code.
⁽²⁾ **Canena**: Council for Harmonization of Electrotechnical Standardization of North America.
⁽³⁾ **IEC**: International Electrotechnical Commission.

Control panels

To help users properly coordinate their motor control equipment with their distribution system in the event of a fault, article 409 of the 2005 NEC requires panel builders to list the short-circuit withstand rating of their motor control panels. According to standard UL508A, manufacturers must use the short-circuit withstand value of the lowest rated device as the nominal withstand rating of the panel, unless the devices have been tested together for a higher coordinated rating. The minimum “**short-circuit current rating**” (SCCR), on motor control components for horsepower ratings of 50 hp or below is 5000 A.

Using a **type E** or **type F** combination starter eliminates the coordination problems of using individual components for the “motor branch circuit protection”, “motor controller” and “motor overload protection” functions.

The panel builder uses the declared short-circuit current rating for the combination starter. This value is generally higher than 5000 A.

This makes it easier to list the short-circuit current ratings and to check the compatibility of a UL508A motor control panel within a given distribution system.

Group protection

Article 430.53 of the NEC allows a single short-circuit protection device to be used for more than one motor circuit if the components used are marked and listed for such use.

Components suitable for use in group protection, known as “**motor group installations**”, can be marked in one of the following two ways:

Case n° 1

The contactor and the motor overload relay are both listed as suitable for group installation.

An inverse time circuit breaker can be used as the short-circuit protection device if it is also listed as suitable for group installation.

The panel builder must therefore make sure that the short-circuit protection device selected (fuses or inverse time circuit breaker) does not exceed the value allowed by article 430.40 for the smallest overload relay used in the circuit.

Once these conditions have been met, the panel builder can reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one third of the size of the upstream circuit conductor supplying the protection device.

The panel builder must limit the length of the motor starter conductor (connecting the short-circuit protection device to the motor contactor/overload relay) to a maximum of 7.6 m (25 feet).

Case n° 2

The motor contactor and overload relay are listed as suitable for “**tap conductor protection**” in group installations.

This category allows the panel designer to reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one tenth of the size of the upstream circuit conductor supplying the protection device.

The designer must limit the length of this conductor to a maximum of 3.05 m (10 feet).

In both cases, the supply circuits must not be less than 125 % of the connected motor FLA (Full Load Amps) rating.

For panel builders, using **type F** combination starters in group installations simplifies group motor considerations.

Each starter is a fully coordinated motor branch circuit.

The panel builder follows the same NEC requirements for sizing the supply conductors as those required for single motor branch circuits.

The size of the supply conductors can be reduced in accordance with the specifications of article 430.28.

This allows the same flexibility in conductor sizing as that offered in article 430.53 (D), without a requirement to check the short-circuit protection rating marked on the components and the overload relay limit.

A UL508A panel does not need a short-circuit protection device when each motor starter installed is a **type F**.

The upstream short-circuit protection device supplying the starter protects the panel. The panel builder only has to consider the panel/enclosure disconnect requirements specified by the NEC or local codes.

| TeSys F, V, FG, CR1F Contactors | | |
|--|--|--|
| Type of product | Range | Pages |
| TeSys F Contactors for AC-3 applications | From 115 to 1000 A |  B9/2 |
| TeSys F Contactors for AC-1 applications | From 200 to 2600 A |  B9/3 |
| TeSys V Vacuum contactors – 1500 V | From 160 to 610 A - AC-3 From 160 to 630 A - AC-1 |  B9/4 |
| TeSys FG Shockproof contactors | From 150 to 630 A - AC-3 |  B9/6 |
| TeSys CR1F Magnetic latching contactors | From 150 to 630 A - AC-3 |  B9/7 |
| TeSys F Reversing pre-assembled contactors for AC-3 applications | From 115 to 265 A - AC-3 |  B9/8 |
| TeSys F Changeover pre-assembled contactor pairs for AC-1 applications | From 200 to 350 A - AC-1 |  B9/9 |
| TeSys F Auxiliary contact blocks Accessories – spare parts - delayed opening devices | | B9/10 |
| TeSys F Coils | | B9/17 |
| Accessories, coils for shockproof and magnetic latching contactors TeSys FG, TeSys CR1F | | B9/27 |
| Accessories for reversing and changeover contactor assemblies TeSys LA9F | | B9/34 |

High power
contactors

Technical Data for Designers B9/43

TeSys Control

F High power contactors

Product references

PB11858.eps



LC1F115...500

PB111800.eps



LC1F630...800

COORD.



PB112306.eps



LC1F780

PB121451.eps



LC1F1000

High power contactors

3-pole contactors - Motors 115 to 1000 A / 440 V Category AC-3 - a.c. or d.c. coils

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | | Rated operational current in AC-3 | Basic reference, to be completed by adding the voltage code ⁽¹⁾ Screw fixing, cabling ⁽²⁾ | Weight |
|--|-------|-------|-----|-----|-------------|-----|------|-----------------------------------|--|--------|
| 220 V | 380 V | 660 V | | | 440 V up to | | | | | |
| kW | kW | kW | kW | kW | kW | kW | A | | kg | |
| 30 | 55 | 59 | 59 | 75 | 80 | - | 115 | LC1F115●● | 3.430 | |
| 40 | 75 | 80 | 80 | 90 | 100 | - | 150 | LC1F150●● | 3.430 | |
| 55 | 90 | 100 | 100 | 110 | 110 | - | 185 | LC1F185●● | 4.650 | |
| 63 | 110 | 110 | 110 | 129 | 129 | - | 225 | LC1F225●● | 4.750 | |
| 75 | 132 | 140 | 140 | 160 | 160 | - | 265 | LC1F265●● | 7.440 | |
| 100 | 160 | 180 | 200 | 200 | 220 | 160 | 330 | LC1F330●● | 8.600 | |
| 110 | 200 | 220 | 250 | 257 | 280 | 185 | 400 | LC1F400●● | 9.100 | |
| 147 | 250 | 280 | 295 | 355 | 335 | - | 500 | LC1F500●● | 11.350 | |
| 200 | 335 | 375 | 400 | 400 | 450 | 450 | 630 | LC1F630●● | 18.600 | |
| 220 | 400 | 425 | 425 | 450 | 475 | 450 | 780 | LC1F780●● | 39.500 | |
| 250 | 450 | 450 | 450 | 450 | 475 | 450 | 800 | LC1F800●● | 18.750 | |
| 315 | 560 | 630 | 670 | - | - | - | 1000 | LC1F1000●● | 31.000 | |

Note: auxiliary contact blocks, modules and accessories: see pages B9/10 to B9/27.

(1) Please check the availability of your variant in the index page B9/41. The SEARCH function of your viewer can be used.

(2) Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately, except on contactors LC1F780 (see page B9/14).

| Volts ~ | 24 | 48 | 110 | 115 | 120 | 208 | 220 | 230 | 240 | 380 | 400 | 415 | 440 |
|---|----|----|-----|-----|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| LC1F115...F225 | | | | | | | | | | | | | |
| 40...400 Hz (coil LX9) | - | E7 | F7 | FE7 | G7 | L7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |
| LC1F265...F330 | | | | | | | | | | | | | |
| 40...400 Hz (coil LX1) | B7 | E7 | F7 | FE7 | G7 | L7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |
| LC1F400...F630, F1250 | | | | | | | | | | | | | |
| 40...400 Hz (coil LX1) | - | E7 | F7 | FE7 | G7 ⁽³⁾ | L7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |
| LC1F780 | | | | | | | | | | | | | |
| 40...400 Hz (coil LX1) | - | - | F7 | FE7 | F7 | L7 | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |
| LC1F800 | | | | | | | | | | | | | |
| 40...400 Hz (coil LX4) ⁽⁴⁾ | - | - | FW | FW | FW | - | MW | MW | MW | QW | QW | QW | - |
| LC1F1000, F1400, F1700, F2100, F2600 | | | | | | | | | | | | | |
| 40...400 Hz (coil LX1F) | - | - | F7 | - | G7 | - | M7 | P7 | U7 | Q7 | V7 | N7 | R7 |

| Volts --- | 24 | 48 | 110 | 125 | 220 | 230 | 250 | 400 | 440 |
|--|----|----|-----|-----|-----|-----|-----|-----|-----|
| LC1F115...F330 | | | | | | | | | |
| (coil LX4F) | BD | ED | FD | GD | MD | MD | UD | - | RD |
| LC1F400...F630, F1250 | | | | | | | | | |
| (coil LX4F) | - | ED | FD | GD | MD | - | UD | - | RD |
| LC1F780, LC1F1000, F1400, F1700, F2100, F2600 | | | | | | | | | |
| (coil LX4F) | - | - | FD | GD | MD | - | UD | - | RD |
| LC1F800 | | | | | | | | | |
| (coil LX4F) | - | - | FW | FW | MW | MW | - | QW | - |

(3) F7 for LC1F630.

(4) Coil LX4F8●● + rectifier DR5TE●●.

TeSys Control

F High power contactors

Product references



LC1F1854...3304



LC1F4004...5004



LC1F6304



LC1F1250



LC1F1700...2100



LC1F2600

Coordination tables:
pages A6/36 to A6/56

Characteristics:
pages B9/44 to B9/53

Dimensions:
pages B9/54 to B9/57

Schemes:
pages B9/61 and B9/62

2, 3 or 4-pole contactors - Loads 200 to 2600 A / 440 V Category AC-1 - a.c. or d.c. coils

| Maximum current in AC-1 ($\theta \leq 40^\circ\text{C}$) | Number of poles | Basic reference, to be completed by adding the voltage code ⁽¹⁾ Screw fixing, cabling ⁽²⁾ | Weight |
|--|-----------------|--|--------|
| A | | | kg |
| 200 | 3 | LC1F115●● | 3.430 |
| | 4 | LC1F1154●● | 3.830 |
| 250 | 3 | LC1F150●● | 3.430 |
| | 4 | LC1F1504●● | 3.830 |
| 275 | 3 | LC1F185●● | 4.390 |
| | 4 | LC1F1854●● | 5.450 |
| 315 | 3 | LC1F225●● | 4.750 |
| | 4 | LC1F2254●● | 5.550 |
| 350 | 3 | LC1F265●● | 7.440 |
| | 4 | LC1F2654●● | 8.540 |
| 400 | 3 | LC1F330●● | 8.600 |
| | 4 | LC1F3304●● | 9.500 |
| 500 | 2 | LC1F4002●● | 8.000 |
| | 3 | LC1F400●● | 9.100 |
| | 4 | LC1F4004●● | 10.200 |
| | 4 | LC1F5004●● | 12.950 |
| 700 | 2 | LC1F5002●● | 9.750 |
| | 3 | LC1F500●● | 11.350 |
| | 4 | LC1F5004●● | 12.950 |
| 1000 | 2 | LC1F6302●● | 15.500 |
| | 3 | LC1F630●● | 18.600 |
| | 4 | LC1F6304●● | 21.500 |
| 1200 | 3 | LC1SF1200KUE | 13.400 |
| 1260 | 3 | LC1F1250●● | 19.000 |
| 1400 | 3 | LC1F1400●● | 29.000 |
| 1600 | 3 | LC1F780●● | 39.500 |
| | 4 | LC1F7804●● | 48.000 |
| 1700 | 3 | LC1F1700●● | 30.000 |
| 2100 ⁽³⁾ | 3 | LC1F2100●● | 31.000 |
| 2600 ⁽⁴⁾ | 3 | LC1F2600●● | 36.000 |

Note: auxiliary contact blocks, modules and accessories: see pages B9/10 to B9/27.

(1) Please check the availability of your variant in the index page B9/41. The SEARCH function of your viewer can be used.

(2) Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately (except LC1F780, LC1F1250, LC1F1400, LC1F1700 and LC1F2100), see page "contactors", page B9/14.

(3) With set of right-angled connectors LA9F2100 (see page B9/13).

(4) With set of right-angled connectors LA9F2600 (see page B9/13).

COORD.



High power contactors

TeSys Control

V High power vacuum contactors

Product references



LC1V320

PB12/4/1.epa

| Vacuum contactors - Motors 160 to 610 A / 400 V - a.c. coils | | | | | | | | | | | |
|--|-------|-------|-------|--------|---------------------------------------|------|---|---|---|-----------------------------------|--------|
| Standard power ratings 50/60 Hz in category AC-3 | | | | | Rated operational current le | | Instan- taneous auxiliary contacts | | Control circuit voltage (50/60 Hz) | Basic reference ⁽¹⁾ | Weight |
| 230 V | 400 V | 525 V | 690 V | 1000 V | AC-3 400 V up to | AC-1 | | | | | |
| kW | kW | kW | kW | kW | A | A | | | | | |
| 45 | 75 | 110 | 150 | 200 | 160 | 160 | 2 | 1 | ⁽¹⁾ | LC1V160●● | 3.800 |
| 90 | 160 | 220 | 280 | 400 | 320 | 320 | 1 | 1 | ⁽¹⁾ | LC1V320●● | 10.500 |
| 160 | 300 | 400 | 560 | 800 | 610 | 630 | 1 | 1 | ⁽¹⁾ | LC1V610●● | 13.000 |

Reversing vacuum contactors

The reversing contactor range comprises :

- for 160 A rating, a kit with set of power connections allowing assembly of the starter
- for 320 and 610 A ratings, a complete starter, ready for use.

⁽¹⁾ Basic reference; add code indicating control circuit voltage.

Standard control circuit voltages:

| Volts 50/60 Hz | 110...120 | 220...240 | 380...415 | 440...480 | 550...600 |
|----------------|-----------|-----------|-----------|-----------|-----------|
| Item | FE7 | P7 | V7 | R7 | X7 |

Please check the availability of your variant in the index page B9/41. The SEARCH function of your viewer can be used.



High power contactors

TeSys Control

V High power contactors - Contact blocks and a.c. coils

Product references

PB12/1408.eps



LA1VN11

| Instantaneous auxiliary contact blocks ⁽¹⁾ | | | | |
|---|--|--------------------|---|-------------------------|
| Number of contacts | Maximum number of blocks per contactor | Auxiliary contacts | | Reference |
| 2 | 4 | | | |
| | | 1 | 1 | LA1VN11 |
| | | 2 | – | LA1VN20 |
| | | 1 | 1 | LA1VN11X ⁽²⁾ |

PB12/1409.eps



LX1V320●●

| 50/60 Hz coils | | |
|-------------------------------|--------------|-----------|
| Rated voltage | Voltage code | Reference |
| V | | |
| For contactors LC1V160 | | |
| 380...415 | V7 | LX1V160V7 |
| 440...480 | R7 | LX1V160R7 |
| 550...600 | X7 | LX1V160X7 |
| For contactors LC1V320 | | |
| 440...480 | R7 | LX1V320R7 |
| For contactors LC1V610 | | |
| 220...240 | P7 | LX1V610P7 |
| 380...415 | V7 | LX1V610V7 |
| 440...480 | R7 | LX1V610R7 |

⁽¹⁾ **LC1V160**: auxiliary contact blocks mounted at the top of the contactor, with no change to the overall dimensions.

LC1V320 or **LC1V610**: 2 auxiliary contact blocks mounted on the RH and LH side of the contactor, with no change to the overall dimensions.

⁽²⁾ For **LC1V160**: 1 N/C contact for the coil + 1 N/O contact.

TeSys Control

FG High power shockproof contactors

Product references



LC1FG150



LC1FG185



LC1FG265

Important notice: LC1FG range is planned for discontinuation without replacement. Before ordering, please consult your regional sales office for availability.

3-pole shockproof contactors - Motors 150 to 630 A / 440 V AC-3, loads 250 to 1000 A / 440 V / AC-1 - a.c. coil

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | | Rated operational current in cat. AC-3, 440 V/AC-1 up to | Basic reference, to be completed by adding the voltage code ⁽¹⁾ Screw fixing, cabling ⁽²⁾ | Weight |
|--|----------------|-------|-------|-------|----------------|--------|----------|--|--|--------|
| 220 V 230 V | 380 V 400 V | 415 V | 440 V | 500 V | 660 V 690 V | 1000 V | A | | | |
| 40 | 75 | 80 | 80 | 90 | 100 | 65 | 150/250 | LC1FG150●● | 3.430 | |
| 55 | 90 | 100 | 100 | 110 | 110 | 100 | 185/275 | LC1FG185●● | 4.650 | |
| 75 | 132 | 140 | 140 | 160 | 160 | 147 | 265/350 | LC1FG265●● | 7.440 | |
| 110 | 200 | 220 | 250 | 257 | 280 | 185 | 400/500 | LC1FG400●● | 9.100 | |
| 147 | 250 | 280 | 295 | 355 | 335 | 335 | 500/700 | LC1FG500●● | 11.350 | |
| 200 | 335 | 375 | 400 | 400 | 450 | 450 | 630/1000 | LC1FG630●● | 18.600 | |

Note: these contactors have instantaneous auxiliary contact blocks with 2 N/O contacts, 1 N/C contact and one coil maintaining contact.

(1) Please check the availability of your variant in the index page B9/41. The SEARCH function of your viewer can be used.

(2) Power terminals can, if required, be protected against direct finger contact by the addition of shrouds, to be ordered separately. See page B9/14.



High power contactors

TeSys Control

CR1F High power magnetic latching contactors

Product references





CR1F1854



CR1F500

3, 4 pole - Motors 150 to 630 A / 440 V / AC-3, loads 250 to 1000 A / 440 V AC-1 - a.c. or d.c. coils

| Maximum thermal current in category AC-1 40 °C | Rated operational current in category AC-3 (440 V max) | Number of poles | Instantaneous auxiliary contacts | | Basic reference, to be completed by adding the voltage code ⁽¹⁾ | Weight |
|--|--|-----------------|---|---|--|--------|
| A | A | |  |  | | kg |
| 250 | 150 | 3 | – | – | CR1F150●● | 3.500 |
| | | 4 | – | – | CR1F1504●● | 3.800 |
| 275 | 185 | 3 | – | – | CR1F185●● | 4.600 |
| | | 4 | – | – | CR1F1854●● | 5.400 |
| 350 | 265 | 3 | – | – | CR1F265●● | 7.400 |
| | | 4 | – | – | CR1F2654●● | 8.500 |
| 500 | 400 | 3 | – | – | CR1F400●● | 9.100 |
| | | 4 | – | – | CR1F4004●● | 10.200 |
| 700 | 500 | 3 | – | – | CR1F500●● | 11.300 |
| | | 4 | – | – | CR1F5004●● | 12.900 |
| 1000 | 630 | 3 | – | – | CR1F630●● | 18.600 |
| | | 4 | – | – | CR1F6304●● | 21.500 |

Note: accessories, replacement parts and spare coils, see pages B9/31 to B9/33.

(1) Standard control circuit voltages: see page B9/32. Please check the availability of your variant in the index page B9/41. The SEARCH function of your viewer can be used.



High power contactors

TeSys Control

F High power reversing contactors

Product references



LC2F115



LA9F701...703



High power contactors

3-pole reversing contactors - Motors 115 to 265 A / 440 V / AC-3 - a.c. or d.c. coils

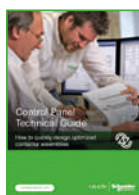
Pre-wired power connections (horizontally mounted) ⁽¹⁾

| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | | | | | Operational current in AC-3 | Maximum operational voltage | Contactors supplied without coil ⁽²⁾ Complete reference Fixing, cabling ⁽³⁾ | Weight |
|--|-------|-------|-------|-------|-------|-----------------------------|-----------------------------|---|--------|
| 220 V | 380 V | 400 V | 415 V | 440 V | 660 V | | | | |
| | | | | | | 440 V up to | | | |
| kW | kW | kW | kW | kW | kW | A | V | | kg |
| 30 | 55 | 59 | 59 | 75 | 80 | 115 | 690 | LC2F115 | 7.560 |
| 40 | 75 | 80 | 80 | 90 | 100 | 150 | 690 | LC2F150 | 7.560 |
| 55 | 90 | 100 | 100 | 110 | 110 | 185 | 690 | LC2F185 | 10.100 |
| 63 | 110 | 110 | 110 | 129 | 129 | 225 | 690 | LC2F225 | 14.200 |
| 75 | 132 | 140 | 140 | 160 | 160 | 265 | 690 | LC2F265 | 16.480 |

Accessories (to be ordered separately)

| Description | For reversing contactors | Quantity required | Reference |
|---|--------------------------|-------------------|--------------------------|
| Power terminal protection shrouds | LC2F115 | 2 | LA9F701 |
| | LC2F150, F185 | 2 | LA9F702 |
| | LC2F225, F265 | 2 | LA9F703 |
| Auxiliary contact blocks and add-on modules | – | – | See pages B9/10 to B9/14 |

- (1)** Fitted with a mechanical interlock without electrical interlocking. Order separately 2 auxiliary contact blocks **LADN•1** to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.
- (2)** Coils to be ordered separately:
 - a.c. supply, see pages B9/2, B9/17 and B9/18,
 - d.c. supply, see pages B9/2 and B9/23.
- (3)** Screw fixing.
 Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately, see above.



Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN



> Click on QR code to download

TeSys Control

F High power changeover contactors

Product references

PB112360.eps



LC2F1854

PB115922.eps



LA9F706...708

4-pole changeover contactor pairs - Loads 200 to 350 A AC-1 - a.c. or d.c. coils

Pre-wired power connections (horizontally mounted) ⁽¹⁾

| Utilisation category AC-1 Non inductive loads Maximum operational current $\theta < 40\text{ }^\circ\text{C}$ | Maximum operational voltage | Contactors supplied without coil ⁽²⁾ Complete reference Fixing, cabling ⁽³⁾ | Weight |
|--|-----------------------------------|--|--------|
| A | V | | kg |
| 200 | 690 | LC2F1154 | 8.860 |
| 250 | 690 | LC2F1504 | 8.860 |
| 275 | 690 | LC2F1854 | 12.100 |
| 315 | 690 | LC2F2254 | 15.200 |
| 350 | 1000 | LC2F2654 | 19.480 |

Accessories (to be ordered separately)

| Description | For changeover pairs | Quantity required | Reference |
|--|-------------------------|----------------------|-----------------------------|
| Power terminal protection shrouds | LC2F1154 | 2 | LA9F706 |
| | LC2F1504, F1854 | 2 | LA9F707 |
| | LC2F2254, F2654 | 2 | LA9F708 |
| Auxiliary contact blocks – and add-on modules | – | – | See pages B9/10 to B9/14 |

⁽¹⁾ Fitted with a mechanical interlock without electrical interlocking. Order separately 2 auxiliary contact blocks **LADN•1** to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.

⁽²⁾ Coils to be ordered separately:
- a.c. supply, B9/2, B9/17 and B9/18,
- d.c. supply, see pages B9/2 and B9/23.

⁽³⁾ Screw fixing.
Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately, see above.



High power
contactors



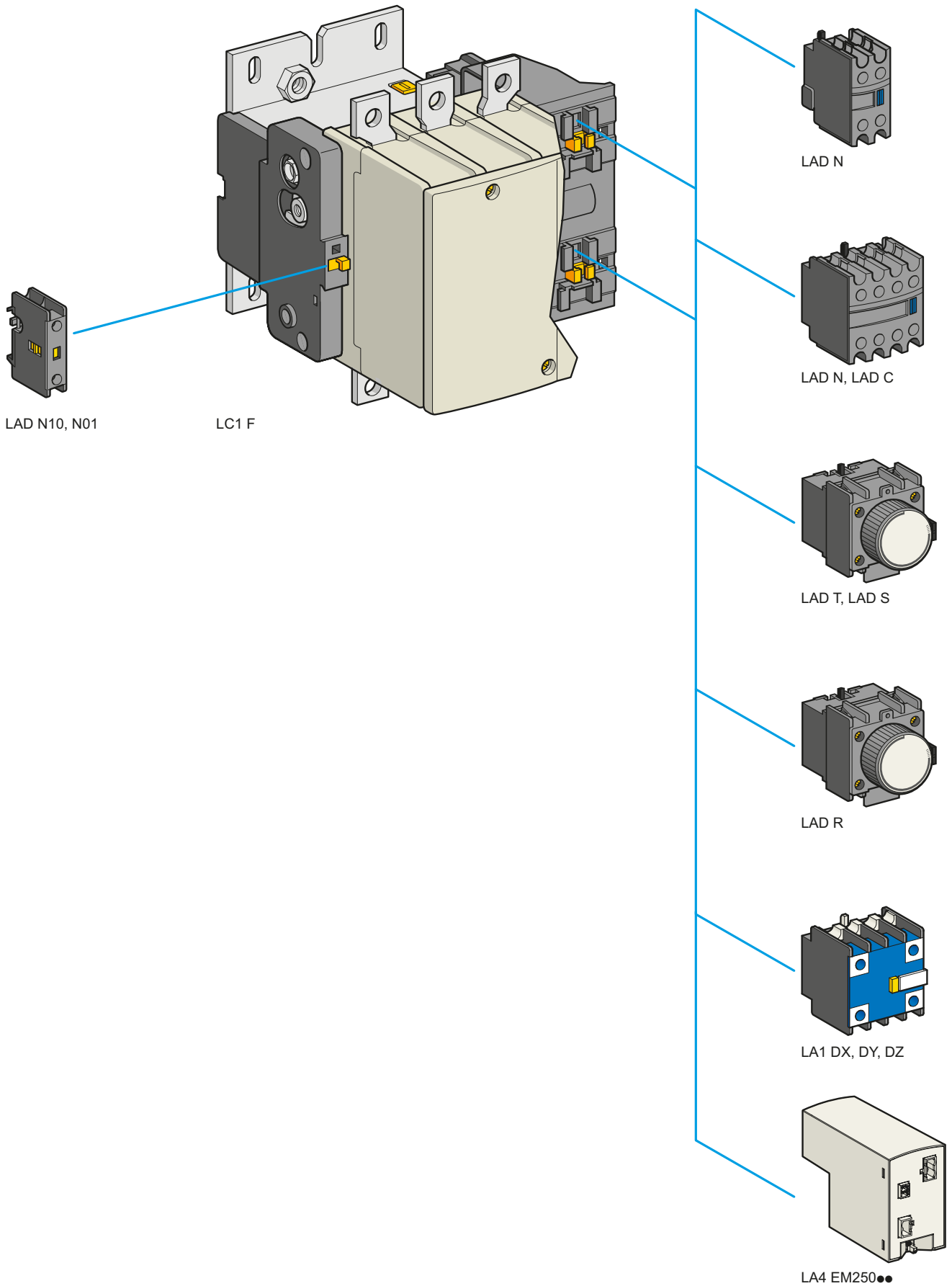
Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN







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High power contactors

Instantaneous auxiliary contact blocks

For use in normal operating environments

| Number of contacts | Maximum number of blocks per contactor Clip-on mounting | Composition | | | | Reference |
|--------------------|--|---|---|---|---|-----------|
| | |  |  |  |  | |
| 1 | 1 | - | - | 1 | - | LADN10 |
| | | - | - | - | 1 | LADN01 |
| 2 | 2 | - | - | 1 | 1 | LADN11 |
| | | - | - | 2 | - | LADN20 |
| | | - | - | - | 2 | LADN02 |
| 4 | 2 | - | - | 2 | 2 | LADN22 |
| | | - | - | 1 | 3 | LADN13 |
| | | - | - | 4 | - | LADN40 |
| | | - | - | - | 4 | LADN04 |
| | | - | - | 3 | 1 | LADN31 |
| | | - | - | 2 | 2 ⁽¹⁾ | LADC22 |

With terminal referencing conforming to EN 50012





| | | | | | | |
|---|---|---|---|---|---|---------|
| 2 | 2 | - | - | 1 | 1 | LADN11P |
| | | - | - | 1 | 1 | LADN11G |
| 4 | 2 | - | - | 2 | 2 | LADN22P |
| | | - | - | 2 | 2 | LADN22G |

Instantaneous auxiliary contact blocks for connection by lugs

This type of connection is not possible for blocks with 1 contact or blocks with dust and damp protected contacts. For all other instantaneous auxiliary contact blocks, add the figure 6 to the end of the references selected above. Example: LADN11 becomes LADN116.

Instantaneous auxiliary contact blocks with dust and damp protected contacts

Recommended for use in particularly harsh industrial environments

| Number of contacts | Maximum number of blocks per contactor Clip-on mounting | Composition | | | | Reference |
|--------------------|--|---|---|---|---|-----------|
| | |  |  |  |  | |
| 2 | 2 | 2 | - | - | - | LA1DX20 |
| | | 2 | 2 ⁽²⁾ | - | - | LA1DY20 |
| 4 | 2 | 2 | - | 2 | - | LA1DZ40 |
| | | 2 | - | 1 | 1 | LA1DZ31 |

Time delay auxiliary contact blocks

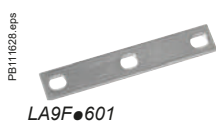
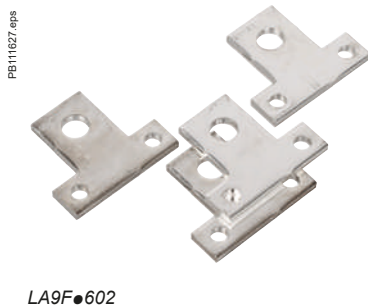
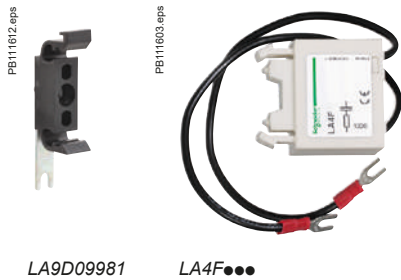
| Number of contacts | Maximum number of blocks per contactor Clip-on mounting | Time delay | | Reference |
|--------------------|--|------------|-----------------------|-----------|
| | | Type | Range s | |
| 1 N/O + | 2 | On-delay | 0...3 ⁽³⁾ | LADT0 |
| | | | 1...30 | LADT2 |
| 1 N/C | 2 | Off-delay | 10...180 | LADT4 |
| | | | 1...30 ⁽⁴⁾ | LADS2 |
| | | | 0...3 ⁽³⁾ | LADR0 |
| | | | 1...30 | LADR2 |
| | | | 10...180 | LADR4 |

(1) Including 1 N/O + 1 N/C make before break.

(2) Device fitted with 4 earth screen continuity terminals.

(3) With extended scale from 0.1 to 0.6 s.

(4) With switching time of 40 ms ± 15 ms between opening of the N/C contact and closing of the N/O contact.



High power contactors

Suppressor blocks ⁽¹⁾

RC circuits (resistor-capacitor)

- Effective protection for circuits highly sensitive to "high frequency" interference. For use only in cases where the voltage is virtually sinusoidal, i.e. less than 5 % total harmonic distortion.
- Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max.
- Slight increase in drop-out time (1.1 to 1.3 times the normal time).

| Mounting | Uc | | Reference |
|---|----|-------------|-----------|
| Clip-on mounting on all ratings and all a.c. coils. | ~ | 24...48 V | LA4FRCE |
| | | 50...110 V | LA4FRCF |
| | | 127...240 V | LA4FRCP |
| | | 265...415 V | LA4FRCV |
| Suppressor block bracket | | | LA9D09981 |

Varistors (peak limiting)

- Protection provided by limiting the transient voltage to 2 Uc max.
- Maximum reduction of transient voltage peaks.

| Mounting | Uc | | Reference |
|--|----------|-------------|-----------|
| Clip-on mounting on all ratings and all coils. | ~ or --- | 24...48 V | LA4FVE |
| | | 50...110 V | LA4FVF |
| | | 127...240 V | LA4FVP |
| | | 265...415 V | LA4FVV |

Diodes

- No overvoltage or oscillating frequencies.
- Increase in drop-out time (3 to 4 times the normal time).
- Polarised component.

| Mounting | Uc | | Reference |
|---|-----|-------------|-----------|
| Clip-on mounting on all ratings and all d.c. coils. | --- | 24...48 V | LA4FDE |
| | | 55...110 V | LA4FDF |
| | | 280...440 V | LA4FDV |

Bidirectional peak limiting diodes (transil)

- Protection provided by limiting the transient voltage to between 2 and 2.5 times Uc max.
- Maximum reduction of transient voltage peaks.

| Mounting | Uc | | Reference |
|--|----------|-------------|-----------|
| Clip-on mounting on all ratings and all coils. | ~ or --- | 24...48 V | LA4FTE |
| | | 50...110 V | LA4FTF |
| | | 127...240 V | LA4FTP |
| | | 265...415 V | LA4FTV |

Connection accessories

| For use on 4-pole contactors | Set of 4 links | Weight |
|------------------------------|----------------|--------|
| | Set reference | |

Links for parallel connection of poles (in pairs)

| | | |
|-------------------------------|----------|-------|
| LC1F2254, F2654, F3304, F4004 | LA9FH602 | 1.000 |
| LC1F5004 | LA9FK602 | 1.750 |

Links for "star" connection of 3 poles

| | | |
|---------------------------|----------|-------|
| LC1F115 | LA9FF601 | 0.035 |
| LC1F150, F185 | LA9FG601 | 0.050 |
| LC1F225, F265, F330, F400 | LA9FH601 | 0.120 |

Control circuit voltage take-off from power terminals

| For use with contactors | Mounted on bolt size | Sold in lots of | Unit reference |
|-------------------------|----------------------|-----------------|----------------|
| LC1F115 | M6 | 10 | DZ3FA3 |
| LC1F150, F185 | M8 | 10 | DZ3GA3 |
| LC1F225...F500 | M10 | 10 | DZ3HA3 |
| LC1F630, F800 | M12 | 10 | DZ3JA3 |

⁽¹⁾ Order 2 x LA4F... for F780, F1000, F1400, F1700, F2100 & F2600 contactors and connect one suppressor block across each coil.
For example, for a LC1F400P7 (230 V AC coil) contactor, use 2 x LA4FRCF (110 V) as RC type surge suppressors.

TeSys Control

F High power contactors - Connection accessories

Product references

PB111625.eps



LA9F981 (set of 3)

PB111626.eps



LA9F979 (set of 3)

PB111624.eps



LA9FL980 (set of 3)

PB107576.eps



LA9F2100 (set of 6)

PB114813.eps



LA9F2600 (set of 6)

PB115983.eps



LA7F404 (set of 3)

Right-angled connectors

For contactors or thermal overload relays

| For use with | | With connector plates | | Set of 3 connectors | |
|-------------------------------|--|-----------------------|--------------------|---------------------|-----------|
| Contactors | Thermal overload relays ⁽¹⁾ | Width | Type | Set reference | Weight kg |
| LC1F115 | LR9F5●67, LR9F67 | 15 mm | Rear | LA9FF981 | 0.060 |
| LC1F150, F185 | LR9F5●69, F5●71, LR9F69, F71 | 20 mm | Side | LA9FG979 | 0.350 |
| | | | Large surface area | LA9FG980 | 0.200 |
| LC1F225, F265, F330, F400 | LR9F7●75, LR9F75 | 25 mm | Large surface area | LA9FJ980 | 0.490 |
| LC1F630, F800 | LR9F7●81 | 40 mm | Large surface area | LA9FL980 | 3.190 |
| For use with | | With connector plates | | Set of 6 connectors | |
| Contactors | Thermal overload relays ⁽¹⁾ | Width | Type | Set reference | Weight kg |
| LC1F1000, F1400, F1700, F2100 | | 60 mm | Rear | LA9F2100 | 9.550 |
| | | | 100 mm | Rear | LA9F2600 |

Connection accessories

For reversing contactors or "star-delta" contactors combined with a thermal overload relay

| For use with | | Width of connector plates | Set of 3 busbars |
|------------------|--|--------------------------------|------------------|
| Contactors | Thermal overload relays ⁽¹⁾ | | Set reference |
| LC1F185 | LR9F5●71, LR9F71 | 25 mm | LA7F407 |
| LC1F225 and F265 | LR9F5●71, LR9F71 | 25 mm | LA7F403 |
| | | LR9F7●75, F7●79 LR9F75, F79 | 25 mm |
| LC1F330 and F400 | LR9F7●75, F7●79 LR9F75, F79 | 25 mm | LA7F404 |
| LC1F400 | LR9F7●81 | 25 mm | LA7F404 |
| LC1F630 | LR9F7●81 | 40 mm | LA7F406 |

⁽¹⁾ For protection relays class 10, replace the ● with a 3 and for class 20, replace the ● with a 5.



High power contactors

TeSys Control

F High power contactors - Accessories

Product references



PB11017.eps

LA9F103



PB11592.eps

LA9F701



PB12130.eps

LA9F801



PB121429.eps

LA4EM250FK

High power contactors

Insulated terminal blocks

| For use on 3-pole contactors | Connection | Tightening tool | Set of 2 blocks Set reference |
|------------------------------|---|---------------------------|-------------------------------|
| LC1F115, F150, F185 | 1 x 16...150 mm ² or 2 x 16...95 mm ² | 4 mm hexagonal socket key | LA9F103 |

Power terminal protection shrouds

| For use on 2, 3 and 4-pole contactors | Number of shrouds per set | Set reference |
|---|---------------------------|---------------|
| LC1F115 | 6 | LA9F701 |
| LC1F150, F185 | 6 | LA9F702 |
| LC1F225, F265, F330, F400 and F4002 F500 and F5002 | 6 | LA9F703 |
| LC1F630, F6302 and F800 | 6 | LA9F704 |
| LC1F1154 | 8 | LA9F706 |
| LC1F1504 and F1854 | 8 | LA9F707 |
| LC1F2254, F2654, F3304, F4004, F5004 | 8 | LA9F708 |
| LC1F6304 | 8 | LA9F709 |

Phase separators

| For use on 3-pole contactors | No. of barriers per set | Set reference |
|------------------------------------|-------------------------|---------------|
| LC1F1400, F1700 F2100 and F2600 | 4 | LA9F801 |

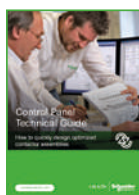
Electronic Control Module (ECM) ⁽¹⁾

| For use on 2, 3 and 4-pole contactors | With coil reference | ECM reference |
|---------------------------------------|---------------------|---------------------------|
| LC1F115, F150 | LXEFF250 | LA4EM250FF |
| LC1F185, F225 | LXEFG250 | LA4EM250FG |
| LC1F265, F330 | LXEFH250 | LA4EM250FH |
| LC1F400 | LXEFJ250 | LA4EM250FJ |
| LC1F500 | LXEFK250 | LA4EM250FK ⁽²⁾ |
| LC1F630 | LXEFL250 | LA4EM250FL ⁽²⁾ |
| LC1F800 | LXEFW250 | LA4EM250FW |
| LC1SF1200 | LXEFK250 | LA4EM250FK |
| LC1F1250 | LXEFL250 | LA4EM250FL ⁽²⁾ |

⁽¹⁾ ECM enables wider coil operating voltage for the F range of contactors.

⁽²⁾ These ECM references + LXE coils will be available for ordering by end of June 2020.

Note: Refer to page numbers B9/52, B9/53 for detailed technical information.



Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN



> Click on QR code to download

TeSys Control

F High power contactors - Accessories

Product references

PG 121428 eps



LA5FG431

PB111607 eps



LA5F185450

PB112341 eps



LA5F400450

Sets of contacts

Per pole: 2 fixed contacts, 1 moving contact, 2 deflectors, 1 back-plate, clamping screws and washers.

| For contactor | Type | Replacement for | Reference | Weight kg |
|---------------|-----------------|-----------------|---------------------------|------------|
| 2-pole | LC1F4002 | 2 poles | LA5F400802 | 1.350 |
| 3-pole | LC1F115. F150 | 3 poles | LA5FF431 | 0.270 |
| | LC1F185. F225 | 3 poles | LA5FG431 | 0.350 |
| | LC1F265 | 3 poles | LA5FH431 | 0.660 |
| | LC1F330. F400 | 3 poles | LA5F400803 | 2.000 |
| | LC1F500 | 3 poles | LA5F500803 | 2.950 |
| | LC1F630 | 3 poles | LA5F630803 | 6.100 |
| | LC1F780 | 1 pole | LA5F780801 ⁽¹⁾ | 4.700 |
| | | 3 poles | LA5F780803 | 13.200 |
| | LC1F800 | 3 poles | LA5F800803 | 6.100 |
| 4-pole | LC1F1504. F1154 | 4 poles | LA5FF441 | 0.360 |
| | LC1F1854. F2254 | 4 poles | LA5FG441 | 0.465 |
| | LC1F2654 | 4 poles | LA5FH441 | 0.880 |
| | LC1F3304. F4004 | 4 poles | LA5F400804 | 2.700 |
| | LC1F5004 | 4 poles | LA5F500804 | 3.900 |
| | LC1F6304 | 4 poles | LA5F630804 | 8.150 |
| | LC1F7804 | 1 pole | LA5F780801 ⁽¹⁾ | 4.700 |
| | | | 4 poles | LA5F780804 |

Arc chambers

| For contactor | Type | Replacement for | Reference | Weight kg |
|---------------|----------|-----------------|---------------------------|-----------|
| 2-pole | LC1F5002 | 2 poles | LA5F500250 | 1.250 |
| | LC1F6302 | 2 poles | LA5F630250 | 2.100 |
| 4-pole | LC1F1154 | 4 poles | LA5F115450 | 0.660 |
| | LC1F1504 | 4 poles | LA5F150450 | 0.660 |
| | LC1F1854 | 4 poles | LA5F185450 | 0.910 |
| | LC1F2254 | 4 poles | LA5F225450 | 1.000 |
| | LC1F3304 | 4 poles | LA5F330450 | 1.740 |
| | LC1F4004 | 4 poles | LA5F400450 ⁽²⁾ | 1.740 |

⁽¹⁾ Comprising 2 identical items per pole.

⁽²⁾ Comprising two 2-pole arc chambers.

TeSys Control

F High power contactors - Delayed opening device

Product references

PB112314.eps



LAZR90FM



High power contactors

Capacitive delayed opening device

These devices prevent inadvertent opening of a contactor in the event of a brief volt drop or momentary supply failure.

For contactors with d.c. coil supply

| For use with contactor | | Corresponding delayed opening device | | |
|--------------------------|----------------------|--------------------------------------|--|--------------------|
| Type | With coil | Supply voltage 50/60 Hz | Non-adjustable delay time (Tr) ±10 % | Reference |
| | | V | s | |
| LC1F115 or LC1F150 | LX4FF220 LX4FF375 | 220 380...415 | 1.5...5 2...5 | LAZR90M LAZR90Q |
| LC1F185 or LC1F225 | LX4FG220 LX4FG375 | 220 380...415 | 2...5 2...5 | LAZR90M LAZR90Q |
| LC1F265 or LC1F330 | LX4FH220 LX4FH375 | 220 380...415 | 2...5 2...5 | LAZR90M LAZR90Q |
| LC1F400 | LX4FJ220 | 220 | 1...2 | LAZR90M |
| | LX4FJ250 | 240 | 1...2 | LAZR90M |
| | LX4FJ375 | 380 | 1...2 | LAZR90Q |
| LC1F500 | LX4FK220 | 220 | 1...2 | LAZR90M |
| | LX4FK375 | 380 | 1...2 | LAZR90Q |
| | LX4FK400 | 415 | 1...2 | LAZR90Q |
| LC1F630 | LX4FL220 | 220 | 1...2 | LAZR90M |
| | LX4FL375 | 380 | 1...2 | LAZR90Q |
| | LX4FL400 | 415 | 1...2 | LAZR90Q |

Add-on blocks for delayed opening devices

| Application | For use with delayed opening device | Operational voltage | Non-adjustable delay time | Reference |
|--------------------------------|--|------------------------|------------------------------|-----------|
| | | V | s | |
| To double the delay time | LAZR90M | 220...240 | Tr x 2 | LAZR91M |

Other versions

Delayed opening devices for use with other types of contactor. Please consult your Regional Sales Office.

PB112332.eps



LX9FF●●●

PB121427.eps



LX9FG●●●

PB121426.eps



LXEFK250

Specifications

Average consumption at 20 °C; 50 Hz/ 60 Hz;
cos φ = 0.5:

- inrush: 550 VA
- sealed: 8 VA.

Heat dissipation: 5 W.

Operating time at Uc: closing = 40...80 ms,
opening = 10...40 ms.

Operating cycles/hour (θ ≤ 55 °C): 1200.

Embedded PLC input according IEC 61131-2 type 2:

- Off state: 0...5 V DC
- On state: 11...30 V DC.

Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.

High tolerance to inrush voltage drops.

Immune to micro-breaks (mains supply or contact chain).

Operate on networks with harmonic numbers ≤ 7.

| Control circuit voltage Uc | Average resistance at 20 °C ±10 % | | Inductance of closed circuit | Voltage code | Reference |
|---|-----------------------------------|--------|------------------------------|--------------|-----------|
| | Inrush | Sealed | | | |
| V | Ω | Ω | H | | |
| For contactors LC1F115 and LC1F150 | | | | | |
| 24 | 0.97 | 26.3 | 0.15 | B7 | LX9FF024 |
| 42 | 2.51 | 64.5 | 0.3 | D7 | LX9FF042 |
| 48 | 3.03 | 80.2 | 0.3 | E7 | LX9FF048 |
| 110 | 14.8 | 579 | 2.08 | F7 | LX9FF110 |
| 115 | 14.8 | 579 | 2.08 | FE7 | LX9FF110 |
| 120/127 | 19 | 746 | 2.65 | G7 | LX9FF127 |
| 220 | 59.4 | 2190 | 7.7 | M7 | LX9FF220 |
| 230 | 59.4 | 2190 | 7.7 | P7 | LX9FF220 |
| 240 | 73.5 | 2750 | 9.68 | U7 | LX9FF240 |
| 380 | 173 | 6540 | 23 | Q7 | LX9FF380 |
| 400 | 173 | 6540 | 23 | V7 | LX9FF380 |
| 415 | 218 | 8460 | 30 | N7 | LX9FF415 |
| 440 | 218 | 8460 | 30 | R7 | LX9FF415 |
| 500 | 262 | 10300 | 36 | S7 | LX9FF500 |
| 600 | 501 | 29674 | 43.58 | X7 | LX9FF600 |

Specifications

Average consumption at 20 °C: inrush: 690...855 VA, sealed: 6.6...8.1 VA.

Heat dissipation: 5.9...7.2 W.

Operating cycles/hour (θ ≤ 55 °C): < 2400 (1200 cycles/hour for 600 V coils).

Operating time at Uc: closing = 35 ms, opening = 130 ms.

For contactors LC1F185 and LC1F225

| | | | | | |
|---------|------|-------|------|-----|----------|
| 24 | 0.56 | 34 | 0.13 | B7 | LX9FG024 |
| 48 | 2.2 | 60 | 0.23 | E7 | LX9FG048 |
| 110 | 10.4 | 411 | 1.46 | F7 | LX9FG110 |
| 115 | 10.4 | 411 | 1.46 | FE7 | LX9FG110 |
| 120/127 | 13 | 520 | 1.85 | G7 | LX9FG127 |
| 220 | 42.1 | 1680 | 5.84 | M7 | LX9FG220 |
| 230 | 42.1 | 1680 | 5.84 | P7 | LX9FG220 |
| 240 | 50.6 | 2060 | 7.22 | U7 | LX9FG240 |
| 380 | 128 | 4730 | 16.4 | Q7 | LX9FG380 |
| 400 | 128 | 4730 | 16.4 | V7 | LX9FG380 |
| 415 | 157 | 5930 | 20.6 | N7 | LX9FG415 |
| 440 | 157 | 5930 | 20.6 | R7 | LX9FG415 |
| 500 | 194 | 7550 | 26.3 | S7 | LX9FG500 |
| 600 | 406 | 19550 | 36.1 | X7 | LX9FG600 |

Specifications

Average consumption at 20 °C: inrush: 950...1180 VA, sealed: 8.9...10.9 VA.

Heat dissipation: 8...9.8 W.

Operating cycles/hour (θ ≤ 55 °C): < 2400.

Operating time at Uc: closing = 35 ms, opening = 130 ms.

For contactor LC1SF1200

| | | | | | |
|-----------|------|-----|------|-----|----------|
| 100...250 | 8 | 8 | 0.16 | KUE | LXEFK250 |
| 200 | 35.5 | 915 | 4.55 | M7 | LX1FK220 |
| 230 | 35.5 | 915 | 4.55 | P7 | LX1FK220 |

High power contactors

Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.

Operate on networks with harmonic numbers ≤ 7 .

PB121425.eps



LX1FH●●●2

| Control circuit voltage Uc | Average resistance at 20 °C ±10 % | | Inductance of closed circuit | Voltage code | Reference |
|---|-----------------------------------|--------|------------------------------|--------------|------------|
| | Inrush | Sealed | | | |
| V | Ω | Ω | H | | |
| For contactors LC1F265 and LC1F330 | | | | | |
| 24 | 0.8 | 20 | (1) | B7 | LX1FH0242 |
| 48 | 2.96 | 67 | (1) | E7 | LX1FH0482 |
| 110 | 18.7 | 440 | (1) | F7 | LX1FH1102 |
| 115 | 18.7 | 440 | (1) | FE7 | LX1FH1102 |
| 120/127 | 22.9 | 536 | (1) | G7 | LX1FH1272 |
| 200/208 | 58.4 | 1366 | (1) | L7 | LX1FH2002 |
| 220 | 70.6 | 1578 | (1) | M7 | LX1FH2202 |
| 230 | 70.6 | 1578 | (1) | P7 | LX1FH2202 |
| 240 | 87.94 | 1968 | (1) | U7 | LX1FH2402 |
| 277 | 113 | 2444 | (1) | W7 | LX1FH2772 |
| 380 | 217 | 4631 | (1) | Q7 | LX1FH3802 |
| 400 | 217 | 4631 | (1) | V7 | LX1FH3802 |
| 415 | 217 | 4631 | (1) | N7 | LX1FH3802 |
| 440 | 265 | 6731 | (1) | R7 | LX1FH4402 |
| 480/500 | 329 | 8543 | (1) | S7 | LX1FH5002 |
| 600/660 | 296 | 10245 | (1) | X7 | LX1FH6002 |
| 1000 | 696 | 25880 | (1) | – | LX1FH10002 |

Specifications

Average consumption at 20 °C for 50 or 60 Hz and $\cos \varphi = 0.9$:

■ inrush: 600...700 VA

■ sealed: 8...10 VA.

Heat dissipation: 8 W.

Operating time at U_c: closing = 40...65 ms, opening = 100...170 ms.

Operating cycles/hour ($\theta \leq 55$ °C): ≤ 2400 .

PB121432.eps



LX1FJ●●●

| For contactor LC1F400 | | | | | |
|------------------------------|------|------|------|-----|----------|
| 48 | 1.6 | 29.5 | 0.18 | E7 | LX1FJ048 |
| 110/120 | 9.8 | 230 | 1.35 | F7 | LX1FJ110 |
| 115 | 9.8 | 230 | 1.35 | FE7 | LX1FJ110 |
| 200/208 | 30 | 815 | 4.1 | L7 | LX1FJ200 |
| 220 | 37 | 1030 | 5.1 | M7 | LX1FJ220 |
| 230 | 37 | 1030 | 5.1 | P7 | LX1FJ220 |
| 240 | 47.5 | 1320 | 6.4 | U7 | LX1FJ240 |
| 265/277 | 61 | 1700 | 8.1 | W7 | LX1FJ280 |
| 380 | 120 | 3310 | 15.8 | Q7 | LX1FJ380 |
| 400 | 120 | 3310 | 15.8 | V7 | LX1FJ380 |
| 415 | 145 | 4070 | 19.4 | N7 | LX1FJ415 |
| 440 | 145 | 4070 | 19.4 | R7 | LX1FJ415 |

Specifications

Average consumption at 20 °C for 50 or 60 Hz and $\cos \varphi = 0.9$:

■ inrush: 1000...1150 VA

■ sealed: 12...18 VA.

Heat dissipation: 14 W.

Operating time at U_c: closing = 40...75 ms, opening = 100...170 ms.

Operating cycles/hour ($\theta \leq 55$ °C): ≤ 2400 .

(1) Please consult your Regional Sales Office.

PB121423.eps



LX1FK●●●

Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.

Operate on networks with harmonic numbers ≤ 7 .

| Control circuit voltage Uc | Average resistance at 20 °C $\pm 10\%$ | | Inductance of closed circuit H | Voltage code | Reference | Weight kg |
|--|--|----------|-----------------------------------|--------------|-----------|--------------|
| | Inrush | Sealed | | | | |
| V | Ω | Ω | H | | | kg |
| For contactor LC1F500 / SF1200 ⁽¹⁾ | | | | | | |
| 48 | 1.9 | 33.5 | 0.19 | E7 | LX1FK048 | 1.150 |
| 110/120 | 9.55 | 260 | 1.25 | F7 | LX1FK110 | 1.150 |
| 115 | 9.55 | 260 | 1.25 | FE7 | LX1FK110 | 1.150 |
| 220 | 35.5 | 915 | 4.55 | M7 | LX1FK220 | 1.150 |
| 230 | 35.5 | 915 | 4.55 | P7 | LX1FK220 | 1.150 |
| 240 | 44.5 | 1160 | 5.75 | U7 | LX1FK240 | 1.150 |
| 265/277 | 56.5 | 1490 | 7.3 | W7 | LX1FK280 | 1.150 |
| 380 | 112 | 2980 | 14.7 | Q7 | LX1FK380 | 1.150 |
| 400 | 112 | 2980 | 14.7 | V7 | LX1FK380 | 1.150 |
| 415 | 143 | 3730 | 18.4 | N7 | LX1FK415 | 1.150 |
| 440 | 143 | 3730 | 18.4 | R7 | LX1FK415 | 1.150 |

⁽¹⁾ Only 220 V and 230 V coils are available for LC1SF1200.

Specifications

Average consumption at 20 °C for 50 or 60 Hz, $\cos \varphi = 0.9$:

■ inrush: 1050...1150 VA,

■ sealed: 16...20 VA.

Operating cycles/hour ($\theta \leq 55$ °C): ≤ 2400 .

Heat dissipation: 18 W.

Operating time at Uc: closing = 40...75 ms, opening = 100...170 ms.

PB121424.eps



LX1FL●●●

For contactors LC1F630 and LC1F1250

| | | | | | | |
|---------|------|------|------|-----|----------|-------|
| 110/120 | 6.45 | 165 | 1.85 | F7 | LX1FL110 | 1.500 |
| 115 | 6.45 | 165 | 1.85 | FE7 | LX1FL110 | 1.500 |
| 200/208 | 20.5 | 605 | 2.65 | L7 | LX1FL200 | 1.500 |
| 220 | 25.5 | 730 | 3.35 | M7 | LX1FL220 | 1.500 |
| 230 | 25.5 | 730 | 3.35 | P7 | LX1FL220 | 1.500 |
| 240 | 25.5 | 730 | 3.35 | U7 | LX1FL220 | 1.500 |
| 265/277 | 31 | 900 | 4.1 | W7 | LX1FL260 | 1.500 |
| 380 | 78 | 2360 | 10.5 | Q7 | LX1FL380 | 1.500 |
| 400 | 78 | 2360 | 10.5 | V7 | LX1FL380 | 1.500 |
| 415 | 96 | 2960 | 13 | N7 | LX1FL415 | 1.500 |
| 440 | 96 | 2960 | 13 | R7 | LX1FL415 | 1.500 |

Specifications

Average consumption at 20 °C for 50 or 60 Hz, $\cos \varphi = 0.9$:

■ inrush: 1500...1730 VA,

■ sealed: 20...25 VA.

Operating cycles/hour ($\theta \leq 55$ °C): 1200.

Heat dissipation: 20 W.

Operating time at Uc: closing = 40...80 ms, opening = 100...200 ms.

TeSys Control

F High power contactors - Coils

Product references

Specifications

Average consumption at 20 °C for 50 or 60 Hz, $\cos \varphi = 0.9$:
 ■ inrush: 1900...2300 VA, sealed: 44...55 VA.
 Operating cycles/hour ($\theta \leq 55$ °C): 600.
 Heat dissipation: 2 x 22 W.
 Operating time at U_c : closing = 40...80 ms, opening = 130...230 ms.

PB121231.eps



LX1FX●●●

Specifications

Operating cycles/hour ($\theta \leq 55$ °C): 600.
 Average consumption at 20 °C for 50 or 60 Hz, $\cos \varphi = 0.8$:
 ■ inrush: 1700 VA, sealed: 12 VA.
 Operating time at U_c : closing = 60...80 ms, opening = 160...180 ms.

Specifications

Average consumption at 20 °C for 50 or 60 Hz, $\cos \varphi = 0.9$:
 ■ inrush: 1600...2400 VA, sealed: 29...37 VA.
 Operating cycles/hour ($\theta \leq 55$ °C): 600.
 Heat dissipation: 2 x 18 W.
 Operating time at U_c : closing = 40...75 ms, opening = 100...170 ms.

PB121422.eps



LX1FK●●●

Specifications

Average consumption at 20 °C for 50 or 60 Hz, $\cos \varphi = 0.9$:
 ■ inrush: 2200...2700 VA, sealed: 37.4...50.6 VA.
 Operating cycles/hour ($\theta \leq 55$ °C): 600.
 Heat dissipation: 2 x 25 W.
 Operating time at U_c : closing = 40...80 ms, opening = 100...200 ms.

PB121421.eps



LX1FL●●●

(1) Reference of set of 2 identical coils, to be connected in series.
 (2) Value for the 2 coils in series.
 (3) Order 2 coils and connect them in series.

Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.
 Operate on networks with harmonic numbers ≤ 7 .

| Control circuit voltage U_c | Average resistance at 20 °C ± 10 % | | Inductance of closed circuit | Voltage code | Reference | Weight |
|-------------------------------|--|---------------------|------------------------------|--------------|-------------------------|--------|
| | Inrush | Sealed | | | | |
| V | Ω | Ω | H | | | kg |
| For contactor LC1F780 | | | | | | |
| 110/120 | 4.95 ⁽²⁾ | 230 ⁽²⁾ | 0.21 | F7 | LX1FX110 ⁽¹⁾ | 3.000 |
| 115 | 4.95 ⁽²⁾ | 230 ⁽²⁾ | 0.21 | FE7 | LX1FX110 ⁽¹⁾ | 3.000 |
| 220 | 19.5 ⁽²⁾ | 920 ⁽²⁾ | 0.82 | M7 | LX1FX220 ⁽¹⁾ | 3.000 |
| 230 | 19.5 ⁽²⁾ | 920 ⁽²⁾ | 0.82 | P7 | LX1FX220 ⁽¹⁾ | 3.000 |
| 240 | 19.5 ⁽²⁾ | 920 ⁽²⁾ | 0.82 | U7 | LX1FX220 ⁽¹⁾ | 3.000 |
| 265/277 | 29.8 ⁽²⁾ | 1330 ⁽²⁾ | 1.25 | W7 | LX1FX280 ⁽¹⁾ | 3.000 |
| 415/480 | 74.3 ⁽²⁾ | 3340 ⁽²⁾ | 2.8 | N7 | LX1FX415 ⁽¹⁾ | 3.000 |
| 440 | 74.3 ⁽²⁾ | 3340 ⁽²⁾ | 2.8 | R7 | LX1FX415 ⁽¹⁾ | 3.000 |

| Control circuit voltage U_c | Voltage code | Rectifier Reference | Coil Reference | Weight |
|-------------------------------|--------------|---------------------|----------------|--------|
| V | | | | kg |
| For contactor LC1F800 | | | | |
| 110/127 | FW | DR5TE4U | LX4F8FW | 1.650 |
| 220/240 | MW | DR5TE4U | LX4F8MW | 1.650 |
| 380/400 | QW | DR5TE4S | LX4F8QW | 1.650 |

| Control circuit voltage U_c | Average resistance at 20 °C ± 10 % | | Inductance of closed circuit | Voltage code | Reference | Weight |
|---|--|----------|------------------------------|--------------|-------------------------|--------|
| | Inrush | Sealed | | | | |
| V | Ω | Ω | H | | | kg |
| For contactor LC1F1000 | | | | | | |
| 110 | 4.718 | 98.4 | 0.63 | F7 | LX1FK055 ⁽³⁾ | 1.150 |
| For contactors LC1F1400, LC1F1700 and LC1F2100 | | | | | | |
| 120 | 5.92 | 106 | 0.72 | G7 | LX1FK070 ⁽³⁾ | 1.150 |
| For contactors LC1F1000, LC1F1400, LC1F1700 and LC1F2100 | | | | | | |
| 220 | 9.55 | 260 | 1.25 | M7 | LX1FK110 ⁽³⁾ | 1.150 |
| 230 | 9.55 | 260 | 1.25 | P7 | LX1FK110 ⁽³⁾ | 1.150 |
| 277 | 16.5 | 420 | 2.25 | W7 | LX1FK140 ⁽³⁾ | 1.150 |
| 415 | 35.5 | 915 | 4.55 | N7 | LX1FK220 ⁽³⁾ | 1.150 |
| 440 | 35.5 | 915 | 4.55 | R7 | LX1FK220 ⁽³⁾ | 1.150 |
| 500 | 44.5 | 1160 | 5.75 | S7 | LX1FK240 ⁽³⁾ | 1.150 |

| Control circuit voltage U_c | Average resistance at 20 °C ± 10 % | | Inductance of closed circuit | Voltage code | Reference | Weight |
|--------------------------------|--|----------|------------------------------|--------------|-------------------------|--------|
| | Inrush | Sealed | | | | |
| V | Ω | Ω | H | | | kg |
| For contactors LC1F2600 | | | | | | |
| 110 | 2.05 | 41 | 0.18 | F7 | LX1FL065 ⁽³⁾ | 1.150 |
| 120 | 2.05 | 41 | 0.18 | G7 | LX1FL065 ⁽³⁾ | 1.150 |
| 220 | 6.45 | 165 | 0.76 | M7 | LX1FL110 ⁽³⁾ | 1.150 |
| 230 | 6.45 | 165 | 0.76 | P7 | LX1FL110 ⁽³⁾ | 1.150 |
| 277 | 10.2 | 317 | 1.45 | W7 | LX1FL140 ⁽³⁾ | 1.150 |
| 380 | 20.5 | 605 | 2.65 | Q7 | LX1FL200 ⁽³⁾ | 1.150 |
| 400 | 20.5 | 605 | 2.65 | V7 | LX1FL200 ⁽³⁾ | 1.150 |
| 415 | 25.5 | 730 | 3.35 | N7 | LX1FL220 ⁽³⁾ | 1.150 |
| 440 | 25.5 | 730 | 3.35 | R7 | LX1FL220 ⁽³⁾ | 1.150 |
| 500 | 30.8 | 901 | 4.13 | S7 | LX1FL260 ⁽³⁾ | 1.150 |

High power contactors

Coils for specific applications ⁽¹⁾
a.c., 40...400 Hz control voltage

Low sealed consumption.
 High tolerance to inrush voltage drops.
 Immune to micro-breaks (mains supply or contact chain).
 Operate on networks with harmonic numbers ≤ 7 .

| Control circuit voltage U_c | Average resistance at 20 °C ± 10 % | | Inductance of closed circuit | Voltage code | Reference |
|---|--|----------|------------------------------|--------------|------------------|
| | Inrush | Sealed | | | |
| V | Ω | Ω | H | | |
| For contactors LC1F265 and LC1F330 | | | | | |
| 110/115 | 18.7 | 415 | ⁽²⁾ | – | LX9FH1102 |
| 220/230 | 71.6 | 1621 | ⁽²⁾ | – | LX9FH2202 |
| 380/415 | 222 | 5075 | ⁽²⁾ | – | LX9FH3802 |

Specifications

Average consumption at 20 °C: inrush: 560...660 VA, sealed: 8...10 VA.
 Heat dissipation: 8.4...10.4 W.
 Operating cycles/hour ($\theta \leq 55$ °C): < 3600.
 Operating time at U_c : closing = 45 ms, opening = 25 ms.

- ⁽¹⁾ Application examples: hoisting (inching, high operating rates), Main-Standby (unstable mains supplies). These coils are particularly suited for use at higher operating temperatures (mounting in non-ventilated compartments, enclosures, etc.).
- ⁽²⁾ Please consult your Regional Sales Office.



Coils for specific applications a.c., 40...400 Hz control voltage

These coils are particularly suited for use at higher operating temperatures (mounting in non-ventilated compartments, enclosures, etc).
Application examples: hoisting (inching, high operating rates), Main-Standby (unstable mains supplies).

Coils with short operating times (at U_c):

- Closing: 60 ms
- Opening: 50 ms (\sim side); 20 ms ($\overline{\sim}$ side).

Coils with high operating rates ($\theta \leq 70^\circ\text{C}$):

- 3600 operating cycles/hour
- 1800 for LC1F630.

Coils with low inrush consumption.

| Control circuit voltage U_c | Average resistance at $20^\circ\text{C} \pm 10\%$ | | Inductance of closed circuit | Rectifier Reference ⁽¹⁾ | Coil Reference | Weight |
|-------------------------------|---|----------|------------------------------|------------------------------------|----------------|--------|
| | Inrush | Sealed | | | | |
| V | Ω | Ω | H | | | kg |
| For contactor LC1F400 | | | | | | |
| 110 | 25.7 | 246 | 1.3 | DR5TE4U | LX9FJ925 | 0.970 |
| 127 | 32.3 | 302 | 1.7 | DR5TE4U | LX9FJ926 | 0.970 |
| 220/230 | 99.5 | 919 | 5 | DR5TE4U | LX9FJ931 | 0.970 |
| 380/415 | 311 | 3011 | 15 | DR5TE4S | LX9FJ936 | 0.970 |
| 500 | 478 | 4380 | 23 | DR5TE4S | LX9FJ938 | 0.970 |

Specifications

Average consumption:

- inrush: 500 VA
- sealed: 23 VA.

Heat dissipation: 11.4...13.9 W.

| | | | | | | |
|------------------------------|------|------|-----|---------|----------|-------|
| For contactor LC1F500 | | | | | | |
| 110 | 24 | 204 | 1.1 | DR5TE4U | LX9FK925 | 1.080 |
| 127 | 29.8 | 250 | 1.4 | DR5TE4U | LX9FK926 | 1.080 |
| 220/230 | 89.9 | 770 | 4 | DR5TE4U | LX9FK931 | 1.080 |
| 440 | 361 | 3060 | 16 | DR5TE4S | LX9FK937 | 1.080 |
| 500 | 448 | 3750 | 19 | DR5TE4S | LX9FK938 | 1.080 |

Specifications

Average consumption:

- inrush: 550 VA
- sealed: 31 VA.

Heat dissipation: 15...18.3 W.

| | | | | | | |
|------------------------------|------|------|------|---------|----------|-------|
| For contactor LC1F630 | | | | | | |
| 110 | 13.5 | 114 | 0.77 | DR5TE4U | LX9FL924 | 1.450 |
| 220/240 | 64.5 | 518 | 3.6 | DR5TE4U | LX9FL931 | 1.450 |
| 500 | 312 | 2510 | 17 | DR5TE4S | LX9FL938 | 1.450 |

Specifications

Average consumption:

- inrush: 830 VA
- sealed: 47 VA.

Heat dissipation: 22.8...27.8 W.

⁽¹⁾ Rectifier to be ordered separately: 0.100 kg.



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LX9FJ...



PB112336.eps

LX9FK...

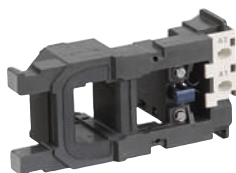


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LX9FL...

High power contactors

PB112324.eps



LX4FF●●●

Coils for d.c. control voltage

Low sealed consumption.

| Control circuit voltage Uc | Average resistance at 20 °C ±10 % | | Inductance of closed circuit | Voltage code | Reference |
|---|-----------------------------------|--------|------------------------------|--------------|-----------|
| | Inrush | Sealed | | | |
| V | Ω | Ω | H | | |
| For contactors LC1F115 and LC1F150 | | | | | |
| 24 | 1.12 | 177 | 11 | BD | LX4FF024 |
| 110 | 21.7 | 2940 | 179 | FD | LX4FF110 |
| 220/230 | 84 | 11100 | 704 | MD | LX4FF220 |

Specifications

Average consumption:

- inrush: 543...665 W,
- sealed: 3.94...4.83 W.

Operating time at Uc: closing = 30...40 ms, opening = 30...50 ms.

Operating cycles/hour ($\theta \leq 55\text{ °C}$): ≤ 2400 .

| | | | | | |
|---|------|-------|------|----|----------|
| For contactors LC1F185 and LC1F225 | | | | | |
| 24 | 0.79 | 169 | 14.9 | BD | LX4FG024 |
| 110 | 14.9 | 2810 | 241 | FD | LX4FG110 |
| 125 | 19 | 3320 | 289 | GD | LX4FG125 |
| 220/230 | 57.7 | 10200 | 890 | MD | LX4FG220 |

Specifications

Average consumption:

- inrush: 737...902 W,
- sealed: 4.13...5.07 W.

Operating time at Uc: closing = 30...40 ms, opening = 30...50 ms.

Operating cycles/hour ($\theta \leq 55\text{ °C}$): ≤ 2400 .

| | | | | | |
|---|------|-------|------|----|----------|
| For contactors LC1F265 and LC1F330 | | | | | |
| 24 | 0.9 | 192 | 26.3 | BD | LX4FH024 |
| 110 | 16.8 | 3180 | 424 | FD | LX4FH110 |
| 220/230 | 65.7 | 11500 | 1590 | MD | LX4FH220 |

Specifications

Average consumption:

- inrush: 655...803 W,
- sealed: 3.68...4.53 W.

Operating time at Uc: closing = 40...50 ms, opening = 40...65 ms.

Operating cycles/hour ($\theta \leq 55\text{ °C}$): ≤ 2400 .

| | | | | | |
|------------------------------|------|-------|------|----|----------|
| For contactor LC1F400 | | | | | |
| 110 | 12.7 | 2660 | 270 | FD | LX4FJ110 |
| 220 | 47 | 8820 | 910 | MD | LX4FJ220 |
| 250 | 61 | 10500 | 1200 | UD | LX4FJ250 |

Specifications

Average consumption:

- inrush: 920...1140 W,
- sealed: 4...7.5 W.

Operating time at Uc: closing = 50...60 ms, opening = 45...60 ms.

Operating cycles/hour ($\theta \leq 55\text{ °C}$): ≤ 2400 .

PB112326.eps



LX4FH●●●

TeSys Control

F High power contactors - Coils

Product references

PB11222_40.eps



LX4FK●●●

LX4FK specifications

Average consumption:

- inrush: 990...1220 W,
- sealed: 4.54...8 W.

Operating cycles/hour ($\theta \leq 55^\circ\text{C}$): 2400.

Operating time at U_c : closing = 50...60 ms, opening = 45...60 ms.

LXE specifications

Average consumption:

- inrush 50/60 Hz: 280...730 VA rms
DC: 270...680 W,
- sealed: 50/60 Hz: 4.5...10 VA rms
DC: 2.5...5.5 W.

Heat Dissipation: 2.5...5.5 W

Operating cycles/hour ($\theta \leq 55^\circ\text{C}$): < 2400.

Operating time at U_c : closing = 40...80 ms, opening = 6...54 ms.

Embedded PLC input according IEC 61131-2 type 2:

- Off state: 0...5 V DC
- On state: 11...30 V DC.

LX4FL specifications

Average consumption:

- inrush: 1420...1920 W,
- sealed: 6.5...12.5 W.

Operating cycles/hour ($\theta \leq 55^\circ\text{C}$): 1200.

Operating time at U_c : closing = 60...70 ms, opening = 40...50 ms.

LX4FX specifications

Average consumption:

- inrush: 1960...2420 W
- sealed: 42...52 W.

Operating cycles/hour ($\theta \leq 55^\circ\text{C}$): 600.

Operating time at U_c : closing = 70...80 ms, opening = 100...130 ms.

LX4F8 specifications

Heat dissipation: 25 W.

Operating time at U_c : closing = 60...80 ms, opening = 40...50 ms.

LX4FK specifications

with LC1F1000, 1400, 1700, 2100

Average consumption:

- inrush: 2000...2200 W,
- sealed: 8...10 W.

Operating cycles/hour ($\theta \leq 55^\circ\text{C}$): 600.

Operating time at U_c : closing = 50...60 ms, opening = 45...60 ms.

LX4FL specifications with LC1F2600

Average consumption:

- inrush: 2130...2880 W
- sealed: 13...25 W.

Operating cycles/hour ($\theta \leq 55^\circ\text{C}$): 600.

Operating time at U_c : closing = 60...70 ms, opening = 40...50 ms.

Coils for d.c. control voltage

Low sealed consumption.

| Control circuit voltage U_c | Average resistance at $20^\circ\text{C} \pm 10\%$ | | Inductance of closed circuit | Voltage code | Reference | Weight |
|---|---|----------|------------------------------|--------------|-----------|--------|
| | Inrush | Sealed | | | | |
| V | Ω | Ω | H | | | kg |
| For contactor LC1F500 / LC1SF1200 ⁽¹⁾ | | | | | | |
| 110 | 11.5 | 2450 | 280 | FD | LX4FK110 | 1.080 |
| 220 | 44 | 8150 | 1080 | MD | LX4FK220 | 1.080 |

For contactors LC1F500 to LC1F1250 ⁽²⁾

For contactors LC1F115 and LC1F150

| | | | | | | |
|------------------------|------|---|---|-----|----------|-------|
| 100...250 \sim | 8.66 | — | — | KUE | LXEFF250 | 1.100 |
| 100...380 --- | | | | | | |

For contactors LC1F185 and LC1F225

| | | | | | | |
|------------------------|------|---|---|-----|----------|-------|
| 100...250 \sim | 9.06 | — | — | KUE | LXEFG250 | 1.100 |
| 100...380 --- | | | | | | |

For contactors LC1F265 and LC1F330

| | | | | | | |
|------------------------|------|---|---|-----|----------|-------|
| 100...250 \sim | 7.62 | — | — | KUE | LXEFH250 | 1.100 |
| 100...380 --- | | | | | | |

For contactor LC1F400

| | | | | | | |
|------------------------|-----|---|---|-----|----------|-------|
| 100...250 \sim | 7.8 | — | — | KUE | LXEFJ250 | 1.100 |
| 100...380 --- | | | | | | |

For contactors LC1F500 and LC1SF1200

| | | | | | | |
|------------------------|---|---|---|-----|----------|-------|
| 100...250 \sim | 8 | — | — | KUE | LXEFK250 | 1.100 |
| 100...380 --- | | | | | | |

For contactors LC1F630 and LC1F1250

| | | | | | | |
|------------------------|------|---|---|-----|----------|-------|
| 100...250 \sim | 4.78 | — | — | KUE | LXEFL250 | 1.100 |
| 100...380 --- | | | | | | |

For contactor LC1F800

| | | | | | | |
|------------------|------|---|---|-----|----------|-------|
| 100...250 \sim | 4.78 | — | — | KUE | LXEFW250 | 1.100 |
|------------------|------|---|---|-----|----------|-------|

For contactors LC1F630 and LC1F1250

| | | | | | | |
|-----|-----|------|-----|----|-------------------------|-------|
| 110 | 8.1 | 1680 | 180 | FD | LX4FL110 | 1.450 |
| 125 | 10 | 2110 | 230 | GD | LX4FL125 ⁽³⁾ | 1.450 |
| 220 | 31 | 5160 | 650 | MD | LX4FL220 | 1.450 |

For contactor LC1F780

| | | | | | | |
|-----|---------------------|---------------------|------|----|-------------------------|-------|
| 110 | 6.1 ⁽⁵⁾ | 280 ⁽⁵⁾ | 0.26 | FD | LX4FX110 ⁽⁴⁾ | 3.000 |
| 125 | 7.7 ⁽⁵⁾ | 410 ⁽⁵⁾ | 0.33 | GD | LX4FX125 ⁽⁴⁾ | 3.000 |
| 250 | 29.8 ⁽⁵⁾ | 1330 ⁽⁵⁾ | 1.25 | UD | LX4FX250 ⁽⁴⁾ | 3.000 |
| 440 | 92 ⁽⁵⁾ | 4180 ⁽⁵⁾ | 3.5 | RD | LX4FX440 ⁽⁴⁾ | 3.000 |

For contactor LC1F800

| | | | | | | |
|---------|---|---|---|----|---------|-------|
| 110/120 | — | — | — | FW | LX4F8FW | 1.650 |
| 220/240 | — | — | — | MW | LX4F8MW | 1.650 |
| 380/400 | — | — | — | QW | LX4F8QW | 1.650 |

For contactors LC1F1000, LC1F1400, LC1F1700 and LC1F2100

| | | | | | | |
|-----|------|------|------|----|-------------------------|-------|
| 125 | 3.73 | 916 | 122 | GD | LX4FK065 ⁽⁶⁾ | 1.080 |
| 220 | 11.5 | 2450 | 280 | MD | LX4FK110 ⁽⁶⁾ | 1.080 |
| 440 | 44 | 8150 | 1080 | RD | LX4FK220 ⁽⁶⁾ | 1.080 |

For contactor LC1F2600

| | | | | | | |
|-----|------|------|------|----|-------------------------|-------|
| 110 | 2.05 | 481 | 64 | FD | LX4FL055 ⁽⁶⁾ | 1.080 |
| 125 | 2.53 | 603 | 80 | GD | LX4FL065 ⁽⁶⁾ | 1.080 |
| 220 | 11.5 | 2450 | 280 | MD | LX4FL110 ⁽⁶⁾ | 1.080 |
| 250 | 15 | 2930 | 400 | UD | LX4FL125 ⁽⁶⁾ | 1.080 |
| 440 | 44 | 8150 | 1080 | RD | LX4FL220 ⁽⁶⁾ | 1.080 |

⁽¹⁾ Only 110 V and 220 V DC coil is available for LC1SF1200.

⁽²⁾ LXE coil to be used along with suitable Electronic Control Module (ECM) Ref. LA4EM●●●●●.

For details, please refer to page B9/14.

⁽³⁾ Incompatible with LC1F1250.

⁽⁴⁾ Reference of set of 2 identical coils, to be connected in series.

⁽⁵⁾ Value for the 2 coils in series.

⁽⁶⁾ Order 2 coils and connect them in series.

High power contactors

Coils for d.c. control voltage

Coils with short operating times (at U_c):

- Opening: 60 ms
- Closing: 20 ms.

Coils with high operating rates ($\theta \leq 70^\circ\text{C}$):

- 3600 operating cycles/hour
- 1800 for LC1F630.

Coils with low inrush consumption.

| Control circuit voltage U_c | Average resistance at $20^\circ\text{C} \pm 10\%$ | | Inductance of closed circuit | Resistor ⁽¹⁾ Qty required | Coil | | Weight |
|-------------------------------|---|----------|------------------------------|--------------------------------------|-----------|-----------|--------|
| | Inrush | Sealed | | | Reference | Reference | |
| V | Ω | Ω | H | | | | kg |
| For contactor LC1F400 | | | | | | | |
| 440/460 | 478 | 9080 | 23 | 1 | DR2SC4700 | LX9FJ938 | 0.970 |

Specifications

Average consumption:

- inrush: 430 W
- sealed: 22 W.

| | | | | | | | |
|------------------------------|------|------|------|---|-----------|----------|-------|
| For contactor LC1F500 | | | | | | | |
| 48 | 4.67 | 76.7 | 0.22 | 1 | DR2SC0039 | – | 1.080 |
| 110 | 29.8 | 470 | 1.4 | 1 | – | LX9FK926 | 1.080 |
| 125 | 37.4 | 637 | 1.7 | 1 | – | LX9FK927 | 1.080 |
| 440/460 | 448 | 7050 | 19 | 1 | – | LX9FK938 | 1.080 |

Specifications

Average consumption:

- inrush: 470 W
- sealed: 29 W.

| | | | | | | | |
|------------------------------|------|------|------|---|-----------|----------|-------|
| For contactor LC1F630 | | | | | | | |
| 48 | 3.43 | 52.9 | 0.20 | 2 | – | LX9FL918 | 1.450 |
| 220 | 64.5 | 1018 | 3.6 | 2 | – | LX9FL931 | 1.450 |
| 440/460 | 260 | 4010 | 14 | 2 | DR2SC3900 | – | 1.450 |

Specifications

Average consumption:

- inrush: 733 W
- sealed: 48 W.

⁽¹⁾ Resistor to be ordered separately, weight of resistor: 0.030 kg.

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LX9FJ●●●

PB112356.eps



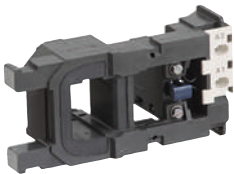
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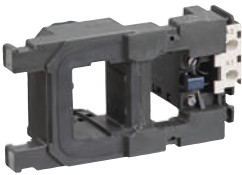
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LX4FF●●●

PB112326.eps



LX4FH●●●

High power contactors

Coils for wide range d.c. control voltage

Wide range coils: 0.7...1.25 Uc.

Operating cycles/hour: ≤ 60 ⁽¹⁾.

Ambient temperature (operation): -55 to + 70 °C.

| Control circuit voltage Uc | Average resistance at 20 °C ±10 % | | Inductance of closed circuit H | Reference |
|---|-----------------------------------|-------------|-----------------------------------|-----------|
| | Inrush Ω | Sealed Ω | | |
| V | | | | |
| For contactors LC1F115 and LC1F150 | | | | |
| 72 | 7.05 | 1055 | 66 | LX4FF060 |
| 110 | 13.2 | 1970 | 121 | LX4FF090 |
| 125 | 16.9 | 2340 | 149 | LX4FF100 |

Specifications

Average consumption:

- inrush: 415...1300 W
- sealed: 3...9 W.

| For contactors LC1F185 and LC1F225 | | | | |
|---|------|------|-----|----------|
| 72 | 5.07 | 984 | 85 | LX4FG060 |
| 110 | 9.66 | 1840 | 157 | LX4FG090 |
| 125 | 12 | 2230 | 196 | LX4FG100 |

Specifications

Average consumption:

- inrush: 580...1820 W
- sealed: 3.1...9.5 W.

| For contactors LC1F265 and LC1F330 | | | | |
|---|------|------|------|----------|
| 48 | 2.19 | 400 | 59.5 | LX4FH040 |
| 110 | 11 | 2120 | 287 | LX4FH090 |
| 125 | 13.8 | 2520 | 353 | LX4FH100 |

Specifications

Average consumption:

- inrush: 515...1600 W
- sealed: 2.7...8.5 W.

| Operational voltage V | Average resistance at 20 °C ±10 % Ω | Inductance of closed circuit H | Coil | | Economy resistor Resistors in // | | Reference of the assembly ⁽²⁾ |
|------------------------------|--|-----------------------------------|-----------|-------|----------------------------------|----------|--|
| | | | Reference | No. Ω | Reference | | |
| For contactor LC1F400 | | | | | | | |
| 24 | 1.05 | 0.049 | LX2FJW11 | 3 56 | DR2SC0056 | LX5FJW11 | |
| 48 | 4.8 | 0.22 | LX2FJW18 | 3 220 | DR2SC0220 | LX5FJW18 | |
| 72 | 9.6 | 0.44 | LX2FJW21 | 3 470 | DR2SC0470 | LX5FJW21 | |

Specifications

Average consumption:

- inrush: 290...860 W
- sealed: 16...47 W.

⁽¹⁾ The mechanical durability of the contactor is limited to 1 million operating cycles.

⁽²⁾ The set comprises: 1 coil LX2FJ and 3 resistors DR2SC.



LADN●●

Auxiliary contact blocks for LC1FG 3-pole shockproof contactors

Instantaneous auxiliary contact blocks

For use in normal operating environments

| Number of contacts | Max. number of blocks per contactor Clip-on mounting | Composition | | | | Reference | |
|--------------------|---|-------------|---|---|---|-----------|-----|
| | | | | | | | |
| 1 | 1 | - | - | 1 | - | LADN10 | (1) |
| | | - | - | - | 1 | LADN01 | (1) |
| 4 | 1 | - | - | 2 | 2 | LADN22 | (1) |
| | | - | - | 4 | - | LADN40 | (1) |
| | | - | - | - | 4 | LADN04 | (1) |
| | | - | - | 3 | 1 | LADN31 | (1) |

Time delay auxiliary contact blocks

| Number of contacts | Max. number of blocks per contactor Clip-on mounting | Time delay | | Reference | |
|---------------------|---|------------|------------|-----------|-----|
| | | Type | Range | | |
| 1 N/O + 1 N/C | 1 | On-delay | 0...3 (2) | LADT0 | |
| | | | 1...30 | LADT2 | (1) |
| | | | 10...180 | LADT4 | |
| | | Off-delay | 1...30 (3) | LADS2 | |
| | | | 0...3 (2) | LADR0 | |
| | | | 1...30 | LADR2 | (1) |
| | | 10...180 | LADR4 | | |

(1) Device approved by the DCN (French naval shipyard department) and authorised for on-board use.

(2) With extended scale from 0.1 to 0.6 s.

(3) With switching time of 40 ms ±15 ms between opening of the N/C contact and closing of the N/O contact.



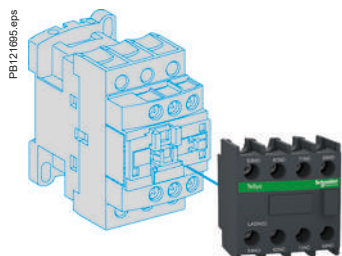
LADT●



TeSys Control

F Magnetic latching High power contactors - Accessories

Product references



LADN



LA9F103



LA9F70●

Accessories for contactors CR1F

| Description | Number of contacts or shrouds | For use on | Reference |
|--|--|----------------------------------|--|
| Instantaneous auxiliary contacts | (1) | CR1F | LADN●●, LADX●●, LADY●●, LADZ●● (1) |
| Time delay auxiliary contacts | (1) | CR1F | LADT●, LADS●, LADR● (1) |
| Contact blocks with protected terminals for 3-pole contactors (for mounting on contactors with closed arc chamber) | Set of 2 blocks | CR1F150 and CR1F185 | LA9F103 |
| Power terminal protection shrouds | Set of 6 shrouds for 3-pole contactors | CR1F150 and CR1F185 | LA9F702 |
| | | CR1F265 to CR1F500 CR1F630 | LA9F703 LA9F704 |
| | Set of 8 shrouds for 4-pole contactors | CR1F1504 and CR1F1854 | LA9F707 |
| | | CR1F2654 to CR1F5004 CR1F6304 | LA9F708 LA9F709 |

| Description | Application | Reference |
|--|---|---------------------------|
| Mechanical interlock and power connections | For assembly of reversing contactors and changeover contactor pairs | See pages B9/29 and B9/30 |

(1) For maximum number per contactor and complete reference, see page B9/11.

High power contactors



Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN



> Click on QR code to download

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F High power contactors - Assembling components

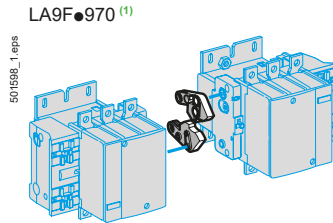
Product references

Reversing and changeover assemblies with CR1F magnetic latching contactors

Horizontally mounted

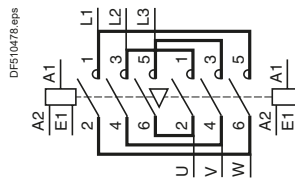
Mechanical interlocks

Reversers assembled using 2 contactors of identical rating, type:
CR1F150
CR1F185
CR1F265
CR1F400
CR1F500
CR1F630

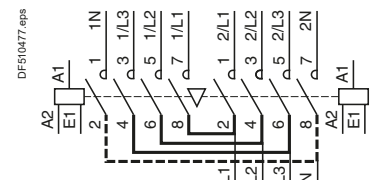


Sets of power connections

Reversing contactors
 LA9F●976 (1)



3 or 4-pole changeover contactor pairs
 LA9F●977 (1) or LA9F●982 (1)



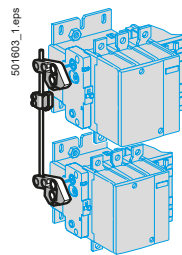
Vertically mounted

Mechanical interlocks

Reversers assembled using 2 contactors of identical rating, type:
CR1F150
CR1F185
CR1F265
CR1F400
CR1F500
CR1F630

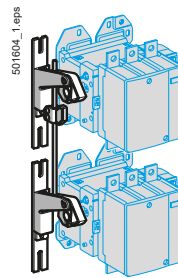
LA9FF4F
 LA9FG4G

Assembly A



LA9FH4H
 LA9FJ4J
 LA9FL4L

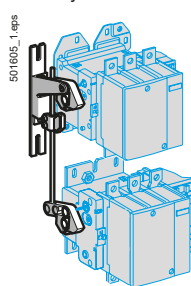
Assembly C



Reversers assembled using 2 contactors of different ratings, type:
CR1F150
CR1F185
CR1F265
CR1F400
CR1F500
CR1F630

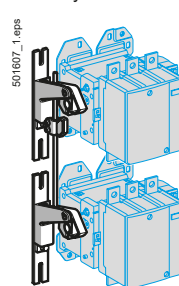
LA9FH4F
 LA9FJ4F
 LA9FH4G
 LA9FJ4G
 LA9FL4G

Assembly B



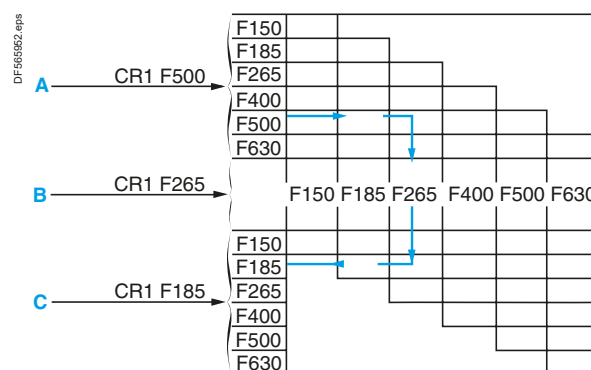
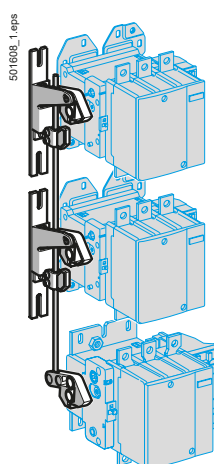
LA9FJ4H
 LA9FK4H
 LA9FL4H
 LA9FK4J
 LA9FL4J

Assembly C



Reversers assembled using 3 contactors of identical or different ratings

LA9F●4●4● (2)



Warning: the contactor ratings must be in decreasing size from top to bottom.

High power contactors

(1) Complete references: see page B9/35.

(2) Complete references: see pages B9/38 and B9/39.

Reversing and changeover assemblies with CR1F magnetic latching contactors.

Reversers assembled using 2 contactors of identical rating

| Contactor type | Set of power connections | | Mechanical interlock | |
|---|--------------------------|-----------|----------------------|-----------|
| | 3-pole Reference | Weight kg | Kit reference | Weight kg |
| For assembly of 3-pole reversing contactors for motor control ⁽¹⁾ | | | | |
| Horizontally mounted | | | | |
| CR1F150 | LA9FF976 | 0.600 | LA9FF970 | 0.060 |
| CR1F185 | LA9FG976 | 0.780 | LA9FG970 | 0.060 |
| CR1F265 | LA9FH976 | 1.500 | LA9FJ970 | 0.140 |
| CR1F400 | LA9FJ976 | 2.100 | LA9FJ970 | 0.140 |
| CR1F500 | LA9FK976 | 2.350 | LA9FJ970 | 0.140 |
| CR1F630 | LA9FL976 | 3.800 | LA9FL970 | 0.150 |
| Vertically mounted | | | | |
| CR1F150 | ⁽²⁾ | – | LA9FF4F | 0.345 |
| CR1F185 | ⁽²⁾ | – | LA9FG4G | 0.350 |
| CR1F265 | ⁽²⁾ | – | LA9FH4H | 1.060 |
| CR1F400 | ⁽²⁾ | – | LA9FJ4J | 1.200 |
| CR1F630 | ⁽²⁾ | – | LA9FL4L | 1.220 |

For assembly of 4-pole changeover contactor pairs

| Horizontally mounted | | | | |
|-----------------------------|----------------|-------|----------|-------|
| CR1F2654 | LA9FH982 | 1.200 | LA9FJ970 | 0.140 |
| CR1F4004 | LA9FJ982 | 1.800 | LA9FJ970 | 0.140 |
| CR1F5004 | LA9FK982 | 2.300 | LA9FJ970 | 0.140 |
| Vertically mounted | | | | |
| CR1F1504 | ⁽²⁾ | – | LA9FF4F | 0.345 |
| CR1F1854 | ⁽²⁾ | – | LA9FG4G | 0.350 |
| CR1F2654 | ⁽²⁾ | – | LA9FH4H | 1.060 |
| CR1F4004 | ⁽²⁾ | – | LA9FJ4J | 1.200 |
| CR1F6304 | ⁽²⁾ | – | LA9FL4L | 1.220 |

Reversers assembled using 2 contactors of different ratings

| Contactor type | Set of power connections | | Mechanical interlock | |
|---|--------------------------|--------|----------------------|-----------|
| | At bottom | At top | Kit reference | Weight kg |
| For assembly of 3 or 4-pole changeover contactor pairs | | | | |
| Vertically mounted ⁽³⁾ | | | | |
| CR1F150 or F1504 | CR1F265 or F2654 | | LA9FH4F | 0.870 |
| | CR1F400 or F4004 | | LA9FJ4F | 0.930 |
| CR1F185 or F1854 | CR1F265 or F2654 | | LA9FH4G | 0.860 |
| | CR1F400 or F4004 | | LA9FJ4G | 0.940 |
| | CR1F630 or F6304 | | LA9FL4G | 0.950 |
| CR1F265 or F2654 | CR1F400 or F4004 | | LA9FJ4H | 1.130 |
| | CR1F500 or F5004 | | LA9FK4H | 1.130 |
| | CR1F630 or F6304 | | LA9FL4H | 1.140 |
| CR1F400 or F4004 | CR1F500 or F5004 | | LA9FK4J | 1.200 |
| | CR1F630 or F6304 | | LA9FL4J | 1.210 |

For assembly of 3 or 4-pole reversing contactors ⁽⁴⁾

| Using 3 contactors (vertically mounted) of identical or different ratings | | Mechanical interlock Kit reference ⁽⁵⁾ |
|---|--|---|
| The contactor ratings must be in decreasing size from top to bottom. | | LA9F●4●4● |

| Contactors | CR1F150 | CR1F185 | CR1F265 | CR1F400 | CR1F500 | CR1F630 |
|------------|---------|---------|---------|---------|---------|---------|
| Code | F | G | H | J | K | L |

Example: mechanical interlock for reversing contactor made up of 3 different contactors: CR1F500 top, CR1F265 middle and CR1F185 bottom: **LA9FK4H4G**.

- (1) A 3-pole reversing contactor for motor control can be converted into a 3-pole changeover contactor pair by removing the upper connecting links.
- (2) All power connections are to be made by the customer.
- (3) With identical or different number of poles. Power connections to be made by the customer.
- (4) Closing of one of the 3 contactors prevents closing of the other 2 contactors.
- (5) Complete the reference by replacing the first dot with the code for the upper contactor, the second dot with the code for the middle contactor and the third dot with the code for the bottom contactor.



TeSys Control

F Magnetic latching High power contactors - Spare parts

Product references

PB121414.eps



LA5FG431

PB11607.eps



LA5F150450

| References | | | | |
|---|---------------|----------|-------------------|-----------|
| Description | For contactor | | Reference | Weight kg |
| Complete sets of contacts for 3 or 4 poles ⁽¹⁾ | 3-pole | CR1F150 | LA5FF431 | 0.270 |
| | | CR1F185 | LA5FG431 | 0.350 |
| | | CR1F265 | LA5FH431 | 0.660 |
| | | CR1F400 | LA5F400803 | 0.660 |
| | | CR1F500 | LA5F500803 | 0.660 |
| | | CR1F630 | LA5F630803 | 0.660 |
| | 4-pole | CR1F1504 | LA5FF441 | 0.360 |
| | | CR1F1854 | LA5FG441 | 0.465 |
| | | CR1F2654 | LA5FH441 | 0.880 |
| | | CR1F4004 | LA5F400804 | 0.465 |
| | | CR1F5004 | LA5F500804 | 0.465 |
| | | CR1F6304 | LA5F630804 | 0.465 |
| Arc chambers | 4-pole | CR1F1504 | LA5F150450 | 0.660 |
| | | CR1F1854 | LA5F185450 | 0.910 |
| | | CR1F4004 | LA5F400450 | 1.740 |

⁽¹⁾ Set containing the following (per pole): 2 fixed contacts, 1 moving contact, 2 deflectors, 1 back-plate, clamping screws and washers.

TeSys Control

F Magnetic latching High power contactors - Coils

Product references

PB121413.eps



LX0FH007

PB121412.eps



LX0FK007

| Standard coils for a.c. or d.c. control voltage | | | | | | |
|---|---------|--|------------|-----------|--------------|--------|
| Usual voltages | | Resistance of winding at $\theta = 20\text{ }^{\circ}\text{C}$ | | Reference | Voltage code | Weight |
| 50...400 Hz 50 Hz, 60 Hz or --- | | Latching | Unlatching | | | |
| V | V | Ω | Ω | | | kg |
| For contactors CR1F150 | | | | | | |
| 48 | – | 1.98 | 230.8 | LX0FF005 | E7 | 0.440 |
| 127 | – | 11.61 | 1788 | LX0FF007 | G7 | 0.440 |
| – | 415 | 139.50 | 16 717 | LX0FF011 | N7 | 0.440 |
| For contactors CR1F185 | | | | | | |
| 48 | – | 1.42 | 220 | LX0FG005 | E7 | 0.560 |
| 208 | – | 21.30 | 3169 | LX0FG020 | L7 | 0.560 |
| – | 415 | 102.30 | 14 305 | LX0FG011 | N7 | 0.560 |
| For contactors CR1F265 | | | | | | |
| 48 | – | 1.34 | 183.4 | LX0FH005 | E7 | 0.780 |
| 127 | – | 8.56 | 1325 | LX0FH007 | G7 | 0.780 |
| 208 | – | 20.20 | 2654 | LX0FH020 | L7 | 0.780 |
| – | 380/400 | 78.39 | 11 803 | LX0FH010 | Q7 | 0.780 |
| – | 415 | 102.9 | 15 006 | LX0FH011 | N7 | 0.780 |
| For contactors CR1F400 | | | | | | |
| 208 | – | 24.40 | 2643 | LX0FJ020 | L7 | 1.120 |
| – | 380/400 | 94.80 | 9380 | LX0FJ010 | Q7 | 1.120 |
| – | 415 | 121.10 | 11 763 | LX0FJ011 | N7 | 1.120 |
| For contactors CR1F500 | | | | | | |
| 48 | – | 1.57 | 166 | LX0FK005 | E7 | 1.220 |
| 127 | – | 9.56 | 1159 | LX0FK007 | G7 | 1.220 |
| 208 | – | 23.60 | 2981 | LX0FK020 | L7 | 1.220 |
| – | 415 | 112.06 | 13 256 | LX0FK011 | N7 | 1.220 |
| For contactors CR1F630 | | | | | | |
| 48 | – | 0.87 | 204 | LX0FL005 | E7 | 1.460 |
| 127 | – | 6.45 | 1830 | LX0FL007 | G7 | 1.460 |
| 208 | – | 20.20 | 2961 | LX0FL020 | L7 | 1.460 |
| – | 415 | 77.97 | 13 003 | LX0FL011 | N7 | 1.460 |

High power contactors

TeSys Control

F Magnetic latching High power contactors - Coils

Product references

PB121483.eps



LX0FG●●●

Special coils for a.c. or d.c. control voltage

Coils with two windings with common point, allowing the use of two separate power sources for latching and unlatching.

| Coil voltages at 50 Hz, 60 Hz, 400 Hz or --- | | Resistance of winding at $\theta = 20\text{ }^{\circ}\text{C}$ | | Reference | Voltage code | Weight |
|--|------------|--|------------|-----------|--------------|--------|
| Latching | Unlatching | Latching | Unlatching | | | |
| V | V | Ω | Ω | | | kg |

For contactors CR1F150

| | | | | | | |
|-----|----|------|------|----------|-----|-------|
| 220 | 24 | 29.5 | 39.5 | LX0FF224 | MB7 | 0.440 |
|-----|----|------|------|----------|-----|-------|

For contactors CR1F185

| | | | | | | |
|-----|----|------|----|----------|-----|-------|
| 220 | 24 | 26.5 | 19 | LX0FG224 | MB7 | 0.560 |
|-----|----|------|----|----------|-----|-------|

For contactors CR1F265

| | | | | | | |
|-----|----|----|------|----------|-----|-------|
| 220 | 24 | 26 | 29.5 | LX0FH224 | MB7 | 0.780 |
|-----|----|----|------|----------|-----|-------|

For contactors CR1F400

| | | | | | | |
|-----|----|----|----|----------|-----|-------|
| 220 | 24 | 30 | 23 | LX0FJ224 | MB7 | 1.120 |
|-----|----|----|----|----------|-----|-------|

For contactors CR1F500

| | | | | | | |
|-----|----|----|----|----------|-----|-------|
| 220 | 24 | 29 | 26 | LX0FK224 | MB7 | 1.220 |
|-----|----|----|----|----------|-----|-------|

For contactors CR1F630

| | | | | | | |
|-----|----|----|----|----------|-----|-------|
| 220 | 24 | 26 | 41 | LX0FL224 | MB7 | 1.460 |
|-----|----|----|----|----------|-----|-------|

Coils with low inrush consumption for d.c. control voltage

| Usual voltages --- | Resistance of winding at $\theta = 20\text{ }^{\circ}\text{C}$ | | Reference | Voltage code | Weight |
|-----------------------|--|------------|-----------|--------------|--------|
| | Latching | Unlatching | | | |
| V | Ω | Ω | | | kg |

For contactors CR1F150

| | | | | | |
|-----|-------|---------|----------|-----|-------|
| 48 | 4.56 | 140.56 | LX0FF055 | EZ7 | 0.440 |
| 220 | 89.85 | 3342.51 | LX0FF058 | MZ7 | 0.440 |

For contactors CR1F185

| | | | | | |
|-----|-------|--------|----------|-----|-------|
| 48 | 5.19 | 106.54 | LX0FG055 | EZ7 | 0.570 |
| 127 | 32.75 | 732.64 | LX0FG057 | GZ7 | 0.570 |

For contactors CR1F265

| | | | | | |
|-----|-------|---------|----------|-----|-------|
| 110 | 25 | 364.61 | LX0FH056 | FZ7 | 0.800 |
| 220 | 97.89 | 1344.46 | LX0FH058 | MZ7 | 0.800 |

For contactors CR1F400

| | | | | | |
|-----|-------|--------|----------|-----|-------|
| 127 | 31.86 | 221.20 | LX0FJ057 | GZ7 | 1.150 |
| 220 | 98.19 | 648.79 | LX0FJ058 | MZ7 | 1.150 |

For contactors CR1F630

| | | | | | |
|-----|-------|--------|----------|-----|-------|
| 48 | 3.94 | 59.17 | LX0FL055 | EZ7 | 1.500 |
| 110 | 19.36 | 365.33 | LX0FL056 | FZ7 | 1.500 |

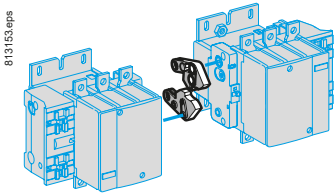
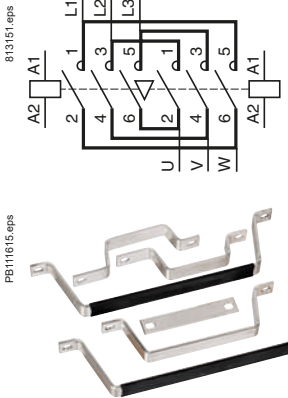
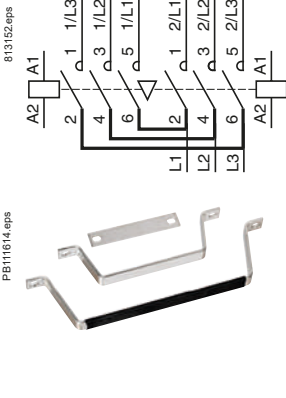
High power contactors

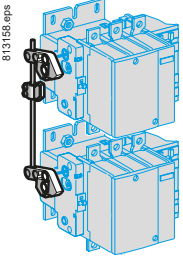
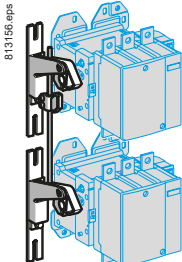
TeSys Control

F High power contactors - Assembling components

Product references

Components for reversing and changeover assemblies of LC1F contactors - 3-pole

| Horizontally mounted | Mechanical interlocks | Sets of power connections | |
|--|---|---|--|
| <p>Reversers assembled using 2 contactors of identical rating, type :</p> <p>LC1F115 LC1F150 LC1F185 LC1F225 LC1F265 LC1F330 LC1F400 LC1F500 LC1F630 LC1F800</p> | <p>LA9F●970 ⁽²⁾</p>  | <p>Reversing contactors</p> <p>LA9F●●76 ⁽²⁾</p>  | <p>3-pole changeover contactor pairs ⁽¹⁾</p> <p>LA9F●●82 ⁽²⁾</p>  |

| Vertically mounted | Mechanical interlocks | |
|---|--|---|
| <p>Reversers assembled using 2 contactors of identical rating, type :</p> <p>LC1F115 LC1F150 LC1F185 LC1F225 LC1F265 LC1F330 LC1F400 LC1F500 LC1F630 LC1F800</p> <p>Reversers assembled using 2 contactors of different ratings, see page B9/36</p> | <p>LA9FF4F LA9FG4G</p>  | <p>LA9FH4H LA9FJ4J LA9FL4L</p>  |

(1) For 4-pole changeover contactor pairs, see pages B9/36 and B9/37.
 (2) Complete references: see page B9/35.

Ref.

High power contactors



Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN



> Click on QR code to download

Components for reversing and changeover assemblies of LC1F contactors - 3-pole

Reversers assembled using 2 contactors of identical rating

| Contactor type ⁽¹⁾ | Set of power connections | | Mechanical interlock | |
|--|--------------------------|-----------|----------------------|-----------|
| | Reference | Weight kg | Kit reference | Weight kg |
| For assembly of 3-pole reversing contactors for motor control | | | | |
| Horizontally mounted | | | | |
| LC1F115 | LA9FF976 | 0.600 | LA9FF970 | 0.060 |
| LC1F150 | LA9F15076 | 0.600 | LA9FF970 | 0.060 |
| LC1F185 | LA9FG976 | 0.780 | LA9FG970 | 0.060 |
| LC1F225 | LA9F22576 | 1.500 | LA9FG970 | 0.060 |
| LC1F265 | LA9FH976 | 1.500 | LA9FJ970 | 0.140 |
| LC1F330 | LA9FJ976 | 2.100 | LA9FJ970 | 0.140 |
| LC1F400 | LA9FJ976 | 2.100 | LA9FJ970 | 0.140 |
| LC1F500 | LA9FK976 | 2.350 | LA9FJ970 | 0.140 |
| LC1F630 or F800 | LA9FL976 | 3.800 | LA9FL970 | 0.150 |
| Vertically mounted | | | | |
| LC1F115 or F150 | ⁽²⁾ | – | LA9FF4F | 0.345 |
| LC1F185 | ⁽²⁾ | – | LA9FG4G | 0.350 |
| LC1F225 | ⁽²⁾ | – | LA9FG4G | 0.350 |
| LC1F265 or F330 | ⁽²⁾ | – | LA9FH4H | 1.060 |
| LC1F400 | ⁽²⁾ | – | LA9FJ4J | 1.200 |
| LC1F630 or F800 | ⁽²⁾ | – | LA9FL4L | 1.220 |

For assembly of 3-pole changeover contactor pairs ⁽³⁾

| | | | | |
|-----------------------------|----------------|-------|----------|-------|
| Horizontally mounted | | | | |
| LC1F225 | LA9F22582 | 1.200 | LA9FG970 | 0.060 |
| LC1F265 | LA9FH982 | 1.200 | LA9FJ970 | 0.140 |
| LC1F330 | LA9FJ982 | 1.800 | LA9FJ970 | 0.140 |
| LC1F400 | LA9FJ982 | 1.800 | LA9FJ970 | 0.140 |
| LC1F500 | LA9FK982 | 2.300 | LA9FJ970 | 0.140 |
| Vertically mounted | | | | |
| LC1F115 or F150 | ⁽²⁾ | – | LA9FF4F | 0.345 |
| LC1F185 | ⁽²⁾ | – | LA9FG4G | 0.350 |
| LC1F225 | ⁽²⁾ | – | LA9FG4G | 0.350 |
| LC1F265 or F330 | ⁽²⁾ | – | LA9FH4H | 1.060 |
| LC1F400 | ⁽²⁾ | – | LA9FJ4J | 1.200 |
| LC1F630 or F800 | ⁽²⁾ | – | LA9FL4L | 1.220 |

⁽¹⁾ To order the 2 contactors: see pages B9/2 and B9/3. For the 2 auxiliary contact blocks LADN●1 required to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.

⁽²⁾ All power connections are to be made by the customer.

⁽³⁾ For assembly of 4-pole changeover contactor pairs, see pages B9/36 and B9/37.



TeSys Control

F High power contactors - Assembling components

Product references

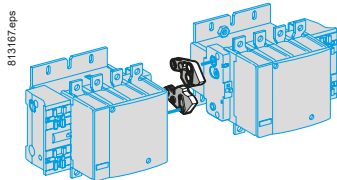
Components for reversing and changeover assemblies of LC1F contactors - 3-pole, 4-pole

Horizontally mounted Mechanical interlocks Sets of power connections

Contactor pairs assembled using 2 contactors of identical rating, type :

- LC1F1154
- LC1F1504
- LC1F1854
- LC1F2254
- LC1F2654
- LC1F3304
- LC1F4004
- LC1F5004
- LC1F6304

LA9F●970 (2)



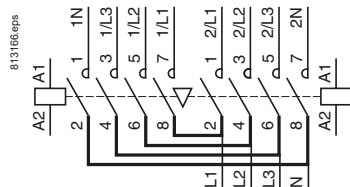
813167.eps

4-pole changeover contactor pairs (1)

LA9F●●●77 (2)



PB11614.eps



813166.eps

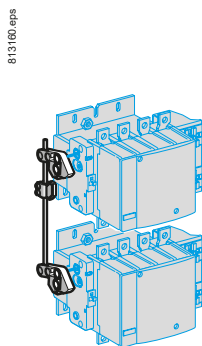
Vertically mounted Mechanical interlocks

Contactor pairs assembled using 2 contactors of identical rating, type :

- LC1F1154
- LC1F1504
- LC1F1854
- LC1F2254
- LC1F2654
- LC1F3304
- LC1F4004
- LC1F5004
- LC1F6304

Assembly A

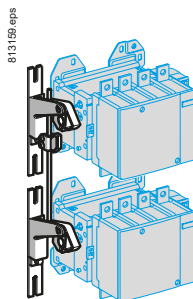
LA9FF4F
LA9FG4G



813160.eps

Assembly B

LA9FH4H
LA9FJ4J
LA9FL4L



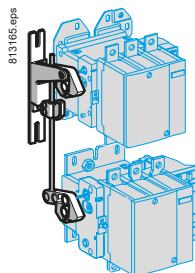
813159.eps

Contactor pairs assembled using 2 contactors of different ratings, type :

- LC1F115 or F1154
- LC1F150 or F1504
- LC1F185 or F1854
- LC1F225 or F2254
- LC1F265 or F2654
- LC1F330 or F3304
- LC1F400 or F4004
- LC1F500 or F5004
- LC1F630 or F6304
- LC1F800

Assembly B

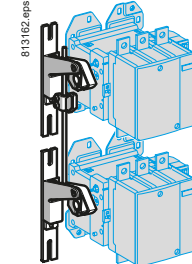
LA9FH4F, LA9FH4G
LA9FJ4F, LA9FJ4G
LA9FL4G



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Assembly C

LA9FJ4H
LA9FK4H, LA9FK4J
LA9FL4H, LA9FL4J

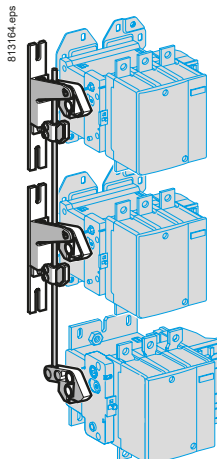


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Contactor pairs assembled using 3 contactors of identical or different ratings, type :

- LC1F115 or F1154
- LC1F150 or F1504
- LC1F185 or F1854
- LC1F225 or F2254
- LC1F265 or F2654
- LC1F330 or F3304
- LC1F400 or F4004
- LC1F500 or F5004
- LC1F630 or F6304
- LC1F800

LA9F●4●4● : see pages B9/38 and B9/39.



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High power contactors



Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN



> Click on QR code to download

Important: the contactor ratings must be in decreasing size from top to bottom.

(1) For 3-pole changeover contactor pairs, see pages B9/34 and B9/35.

(2) Complete references: see page B9/37.

Components for reversing and changeover assemblies of LC1F contactors
3-pole, 4-pole.

Contactors pairs assembled using 2 contactors of identical rating

For assembly of 4-pole changeover contactor pairs ⁽¹⁾

| Contactor type ⁽²⁾ | Set of power connections | | Mechanical interlock | |
|----------------------------------|--------------------------|--------------|----------------------|--------------|
| | Reference | Weight kg | Kit reference | Weight kg |
| Vertically mounted | | | | |
| LC1F1154 or F1504 | ⁽³⁾ | – | LA9FF4F | 0.345 |
| LC1F1854 | ⁽³⁾ | – | LA9FG4G | 0.350 |
| LC1F2254 | ⁽³⁾ | – | LA9FG4G | 0.350 |
| LC1F2654 or F3304 | ⁽³⁾ | – | LA9FH4H | 1.060 |
| LC1F4004 | ⁽³⁾ | – | LA9FJ4J | 1.200 |
| LC1F6304 | ⁽³⁾ | – | LA9FL4L | 1.220 |

Contactors pairs assembled using 2 contactors of different ratings

For assembly of 3 or 4-pole changeover contactor pairs

| Contactor type ⁽¹⁾ | | | Mechanical interlock | |
|-------------------------------|--------------------------|--------|----------------------|--------------|
| | At bottom | At top | Kit reference | Weight kg |
| Vertically mounted | | | | |
| LC1F115 or F1154 | LC1F265 or F2654 | | LA9FH4F | 0.870 |
| or | LC1F330 or F3304 | | LA9FH4F | 0.870 |
| LC1F150 or F1504 | LC1F400 or F4004 | | LA9FJ4F | 0.930 |
| LC1F185 or F1854 | LC1F265 or F2654 | | LA9FH4G | 0.860 |
| or | LC1F330 or F3304 | | LA9FH4G | 0.860 |
| LC1F225 or F2254 | LC1F400 or F4004 | | LA9FJ4G | 0.940 |
| | LC1F630, F6304 or F800 | | LA9FL4G | 0.950 |
| LC1F265 or F2654 | LC1F400 or F4004 | | LA9FJ4H | 1.130 |
| or | LC1F500 or F5004 | | LA9FK4H | 1.130 |
| LC1F330 or F3304 | LC1F630, F6304 or F800 | | LA9FL4H | 1.140 |
| LC1F400 or F4004 | LC1F500 or F5004 | | LA9FK4J | 1.200 |
| | LC1F630 or F6304 or F800 | | LA9FL4J | 1.210 |

For assembly of reversers using 3 contactors, vertically mounted

See pages B9/38 and B9/39.

⁽¹⁾ For assembly of 3-pole changeover contactor pairs, see pages B9/34 and B9/35.

⁽²⁾ To order the 2 contactors: see pages B9/2 and B9/3. For the 2 auxiliary contact blocks **LADN•1** required to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.

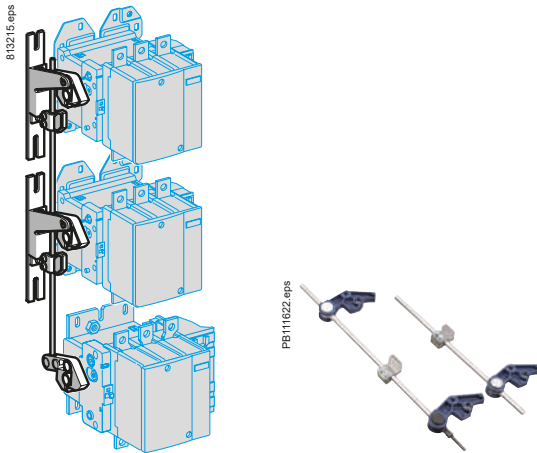
⁽³⁾ All power connections are to be made by the customer.



TeSys Control

F High power contactors - Assembling components

Product references



Example of assembly using LA9FH4H4G kit (2 right-angled mounting brackets included)

LA9FF4●● to LA9FG4●●

Components for reversing and changeover assemblies of 3 LC1F contactors - 3-pole, 4-pole.
Closing of one of the 3 contactors prevents closing of the other 2.

Mechanical interlock kits

Vertically mounted

| Contactor type ⁽¹⁾ | Mechanical interlock ⁽²⁾ | | | Weight kg | |
|--|-------------------------------------|-------------------------------|-------------------------------|-----------|------------------------------|
| | Top | Middle | Bottom | | Kit reference ⁽³⁾ |
| LC1F185, F225, F1854 or F2254 | LC1F115, F150, F1154 or F1504 | LC1F115, F150, F1154 or F1504 | LA9FG4F4F | 0.559 | |
| | | LC1F185, F225, F1854 or F2254 | LA9FG4G4F | 0.559 | |
| LC1F265, F330, F2654 or F3304 | LC1F115, F150, F1154 or F1504 | LC1F115, F150, F1154 or F1504 | LA9FH4F4F | 1.350 | |
| | | LC1F185, F225, F1854 or F2254 | LA9FH4G4F | 1.375 | |
| | | LC1F185, F225, F1854 or F2254 | LA9FH4G4G | 1.375 | |
| | | LC1F265, F330, F2654 or F3304 | LA9FH4H4F | 1.524 | |
| LC1F400, F4002 or F4004 | LC1F115, F150, F1154 or F1504 | LC1F115, F150, F1154 or F1504 | LA9FJ4F4F | 1.421 | |
| | | LC1F185, F225, F1854 or F2254 | LA9FJ4G4F | 1.424 | |
| | LC1F265, F330, F2654 or F3304 | LC1F185, F225, F1854 or F2254 | LA9FJ4G4G | 1.428 | |
| | | LC1F115, F150, F1154 or F1504 | LA9FJ4H4F | 1.595 | |
| | | LC1F185, F225, F1854 or F2254 | LA9FJ4H4G | 1.598 | |
| | | LC1F265, F330, F2654 or F3304 | LA9FJ4H4H | 1.755 | |
| | LC1F400, F4002 or F4004 | LC1F115, F150, F1154 or F1504 | LC1F115, F150, F1154 or F1504 | LA9FJ4J4F | 1.666 |
| | | | LC1F185, F225, F1854 or F2254 | LA9FJ4J4G | 1.669 |
| | | LC1F265, F330, F2654 or F3304 | LC1F265, F330, F2654 or F3304 | LA9FJ4J4H | 1.829 |
| | | | LC1-F400, F4002 or F4004 | LA9FJ4J4J | 1.890 |
| LC1F500, F5002 or F5004 (continued on page B9/39) | LC1F115, F150, F1154 or F1504 | LC1F115, F150, F1154 or F1504 | LA9FK4F4F | 1.421 | |
| | | LC1F185, F225, F1854 or F2254 | LA9FK4G4F | 1.424 | |
| | LC1F265, F330, F2654 or F3304 | LC1F185, F225, F1854 or F2254 | LA9FK4G4G | 1.428 | |
| | | LC1F115, F150, F1154 or F1504 | LA9FK4H4F | 1.595 | |
| | | LC1F185, F225, F1854 or F2254 | LA9FK4H4G | 1.598 | |
| | | LC1F265, F330, F2654 or F3304 | LA9FK4H4H | 1.755 | |
| | LC1F400, F4002 or F4004 | LC1F115, F150, F1154 or F1504 | LC1F115, F150, F1154 or F1504 | LA9FK4J4F | 1.666 |
| | | | LC1F185, F225, F2654 or F3304 | LA9FK4J4G | 1.669 |
| | | LC1F265, F330, F2654 or F3304 | LC1F265, F330, F2654 or F3304 | LA9FK4J4H | 1.829 |
| | | | LC1F400, F4002 or F4004 | LA9FK4J4J | 1.896 |
| LC1F500, F5002 or F5004 | LC1F115, F150, F1154 or F1504 | LC1F115, F150, F1154 or F1504 | LA9FK4K4F | 1.666 | |

(1) To order the 3 contactors, see pages B9/2 and B9/3. For auxiliary contact blocks LADN02 used for electrical locking, see page B9/11. For accessories, see pages B9/12 to B9/14.

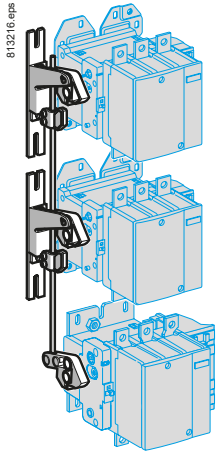
(2) Minimum distances between contactors, see page B9/39.

(3) The kit contains the lever arms, the 2 x Ø8 mm rods and all parts required for assembly. 1 right-angled mounting bracket included per driven contactor LC1F265 to 5004.

TeSys Control

F High power contactors - Assembling components

Product references



Example of assembly using LA9FL4J4J kit (2 right-angled mounting brackets included)



LA9FL4G4F

Components for reversing and changeover assemblies of 3 LC1F contactors - 3-pole, 4-pole.

Mechanical interlock kits (continued)

Vertically mounted

| Contactor type ⁽¹⁾ | | | Mechanical interlock ⁽²⁾ | |
|--|-------------------------------|--------------------------------|-------------------------------------|-----------|
| Top | Middle | Bottom | Kit reference ⁽³⁾ | Weight kg |
| LC1F500, F5002 or F5004 (continued) | LC1F500, F5002 or F5004 | LC1F185, F225, F1854 or F2254 | LA9FK4K4G | 1.669 |
| | | LC1F265, F330, F2654 or F3304 | LA9FK4K4H | 1.825 |
| | | LC1F400, F4002 or F4004 | LA9FK4K4J | 1.896 |
| | | LC1-F500, F5002 or F5004 | LA9FK4K4K | 1.896 |
| LC1F630, F800, F6302 or F6304 | LC1F115, F150, F1154 or F1504 | LC1F115, F150, F1154 or F1504 | LA9FL4F4F | 1.428 |
| | | LC1F185, F225, F1854 or F2254 | LA9FL4G4F | 1.431 |
| | | LC1F185, F225, F1854 or F2254 | LA9FL4G4G | 1.436 |
| | | LC1F265, F330, F2654 or F3304 | LA9FL4H4F | 1.602 |
| | | LC1F185, F225, F1854 or F2254 | LA9FL4H4G | 1.606 |
| | | LC1F265, F330, F2654 or F3304 | LA9FL4H4H | 1.751 |
| | | LC1F400, F4002 or F4004 | LA9FL4J4F | 1.673 |
| | | LC1F185, F225, F1854 or F2254 | LA9FL4J4G | 1.676 |
| | | LC1F265, F330, F2654 or F3304 | LA9FL4J4H | 1.832 |
| | | LC1F400, F4002 or F4004 | LA9FL4J4J | 1.903 |
| | | LC1-F500, F5002 or F5004 | LA9FK4K4F | 1.666 |
| | | LC1F185, F225, F1854 or F2254 | LA9FK4K4G | 1.669 |
| LC1F265, F330, F2654 or F3304 | LA9FK4K4H | 1.825 | | |
| LC1F400, F4002 or F4004 | LA9FK4K4J | 1.896 | | |
| LC1-F500, F5002 or F5004 | LA9FK4K4K | 1.896 | | |
| LC1F630, F800, F6302 or F6304 | LC1F115, F150, F1154 or F1504 | LC1F115, F150, F1154 or F1504 | LA9FL4L4F | 1.680 |
| | | LC1F185, F225, F1854 or F2254 | LA9FL4L4G | 1.683 |
| | | LC1F265, F330, F2654 or F3304 | LA9FL4L4H | 1.910 |
| | | LC1F400, F4002 or F4004 | LA9FL4L4J | 1.896 |
| | | LC1F500, F5002 or F5004 | LA9FL4L4K | 1.896 |
| | | LC1F630, F800, F6302, or F6304 | LA9FL4L4L | 1.920 |

⁽¹⁾ To order the 3 contactors, see pages B9/2 and B9/3. For auxiliary contact blocks LADN02 used for electrical locking, see page B9/11. For accessories, see pages B9/12 to B9/14.

⁽²⁾ Minimum distances between contactors.

This is the distance, in mm, between the centres of two adjacent contactors (between the top and middle contactors or between the middle and bottom contactors).

Contactor

| Bottom or top | Middle | | | | | |
|-----------------|-----------------|-----------------|-----------------|---------|---------|-----------------|
| | LC1F115 or F150 | LC1F185 or F225 | LC1F265 or F330 | LC1F400 | LC1F500 | LC1F630 or F800 |
| LC1F115 or F150 | 200 | 210 | 240 | 250 | 270 | 320 |
| LC1F185 or F225 | 210 | 220 | 250 | 250 | 270 | 330 |
| LC1F265 or F330 | 240 | 250 | 250 | 260 | 280 | 350 |
| LC1F400 | 250 | 250 | 260 | 260 | 280 | 320 |
| LC1F500 | 270 | 270 | 280 | 280 | 300 | 340 |
| LC1F630 or F800 | 320 | 330 | 350 | 320 | 340 | 380 |

⁽³⁾ The kit contains the lever arms, the 2 x Ø8 mm rods and all parts required for assembly. 1 right-angled mounting bracket included per driven contactor LC1F265 to 8004.

High power contactors

3-pole, 4-pole electrical distribution - changeover application

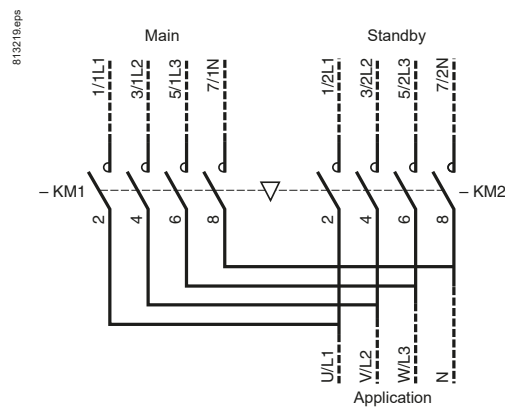
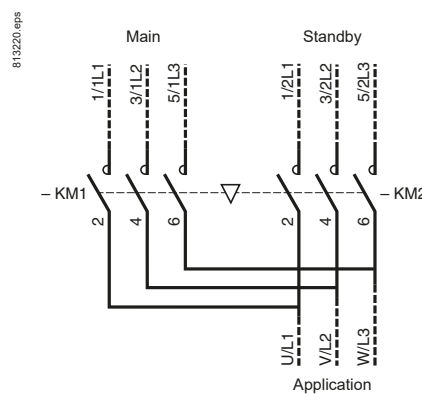
A changeover contactor pair ensures continuity of operation of an installation and energy management.

It switches between:

- a power supply source M (main) which normally supplies the installation
- and a power supply source S (standby) which may be an incoming line from an additional network or a generating set.

The supply sources may be 3-phase or 3-phase + neutral.

Supply - 3-phase



The 2 contactors must be mechanically and electrically interlocked to prevent any paralleling, even transitory, of the two supplies.



TeSys Control

F High power contactors

Product references

| | | | | |
|-----------------|------------|--------------|---------------|----------------|
| CR1F150F7 | LA4FRCV | LA9FG970 | LC1F115MD | LC1F185BD |
| CR1F150M7 | LA4FTE | LA9FG976 | LC1F115N7 | LC1F185BDS121 |
| CR1F150U7 | LA4FTF | LA9FG979 | LC1F115P5 | LC1F185E7 |
| CR1F185F7 | LA4FTP | LA9FG980 | LC1F115P7 | LC1F185ED |
| CR1F185G7 | LA4FVE | LA9FH4F | LC1F115Q5 | LC1F185F7 |
| CR1F185M7 | LA4VVF | LA9FH4G | LC1F115Q7 | LC1F185FD |
| CR1F185Q7 | LA4FVP | LA9FH4H | LC1F115R7 | LC1F185FE7 |
| CR1F185U7 | LA4FVV | LA9FH4H4F | LC1F115S057 | LC1F185G622L |
| CR1F2654F7 | LA5D11550 | LA9FH4H4H | LC1F115S7 | LC1F185G7 |
| CR1F265F7 | LA5F400802 | LA9FH601 | LC1F115U7 | LC1F185G722L |
| CR1F265G7 | LA5F400803 | LA9FH602 | LC1F115V7 | LC1F185KUE |
| CR1F265GD31S003 | LA5F400804 | LA9FH610 | LC1F115X622L | LC1F185L7 |
| CR1F265M7 | LA5F500803 | LA9FH976 | LC1F115X7 | LC1F185M7 |
| CR1F265U7 | LA5F500804 | LA9FH982 | LC1F1250 | LC1F185M722L |
| CR1F4004MZ7 | LA5F630803 | LA9FJ4G | LC1F1250F7 | LC1F185M7DN11P |
| CR1F400F7 | LA5F630804 | LA9FJ4H | LC1F1250KUE | LC1F185MD |
| CR1F400FZ7 | LA5F780801 | LA9FJ4J | LC1F1250M7 | LC1F185N7 |
| CR1F400M7 | LA5F780803 | LA9FJ4J4J | LC1F1250MD | LC1F185P7 |
| CR1F400Q7 | LA5F780804 | LA9FJ610 | LC1F1250P7 | LC1F185Q7 |
| CR1F500F7 | LA5F800803 | LA9FJ970 | LC1F1250Y | LC1F185R7 |
| CR1F500GD31S003 | LA5FF431 | LA9FJ974 | LC1F1400 | LC1F185S7 |
| CR1F500M7 | LA5FF441 | LA9FJ976 | LC1F1400MD | LC1F185U7 |
| CR1F500Q7 | LA5FG431 | LA9FJ980 | LC1F1400P7 | LC1F185V7 |
| CR1F630F7 | LA5FG441 | LA9FJ982 | LC1F150 | LC1F185X7 |
| CR1F630M7 | LA5FH431 | LA9FK4H | LC1F1504 | LC1F2100 |
| CR1F630MZ7 | LA5FH441 | LA9FK4J | LC1F1504B7 | LC1F2100F7 |
| DR2SC0047 | LA5FJ431 | LA9FK4K | LC1F1504BD | LC1F2100LD |
| DR2SC0150 | LA5FK431 | LA9FK4K4K | LC1F1504M7 | LC1F2100LDBR |
| DR2SC0180 | LA5FL431 | LA9FK976 | LC1F1504P7 | LC1F2100M7 |
| DR2SC0220 | LA7F403 | LA9FK982 | LC1F1504Q7 | LC1F2100MD |
| DR2SC0330 | LA7F404 | LA9FL4G | LC1F1504U7 | LC1F2100P7 |
| DR2SC0680 | LA7F406 | LA9FL4H | LC1F1504X7 | LC1F2100V7 |
| DR2SC1000 | LA7F407 | LA9FL4J | LC1F150B5 | LC1F225 |
| DR2SC1200 | LA7F701 | LA9FL4L | LC1F150B6 | LC1F2254 |
| DR5TE4S | LA7F702 | LA9FL970 | LC1F150B7 | LC1F2254B7 |
| DR5TE4U | LA7F703 | LA9FL976 | LC1F150BD | LC1F2254BD |
| DR5TX5S | LA7F901 | LA9FL980 | LC1F150E7 | LC1F2254FD |
| DX1RA1 | LA7F902 | LA9FX990M | LC1F150ED | LC1F2254G7 |
| DZ2FF1 | LA9D11517 | LA9FX991F | LC1F150F7 | LC1F2254M7 |
| DZ2FF6 | LA9D115604 | LA9FX991Q | LC1F150F7S219 | LC1F2254P7 |
| DZ2FG1 | LA9D115692 | LC1D115004L6 | LC1F150FD | LC1F2254Q7 |
| DZ2FG6 | LA9D11570 | LC1F1000 | LC1F150G7 | LC1F2254X7 |
| DZ2FJ1 | LA9D115704 | LC1F1000F7 | LC1F150GDS003 | LC1F225B5 |
| DZ2FJ6 | LA9D730 | LC1F1000M7 | LC1F150KUE | LC1F225B7 |
| DZ2FK1 | LA9F100 | LC1F1000P7 | LC1F150M7 | LC1F225BD |
| DZ2FK6 | LA9F103 | LC1F1000U7 | LC1F150MD | LC1F225E5 |
| DZ2FL1 | LA9F15076 | LC1F1000V7 | LC1F150N7 | LC1F225E7 |
| DZ2FL2 | LA9F18517 | LC1F115 | LC1F150P5 | LC1F225ED |
| DZ2FL3 | LA9F2100 | LC1F1154 | LC1F150P7 | LC1F225F7 |
| DZ2FL6 | LA9F22576 | LC1F1154B7 | LC1F150Q7 | LC1F225F7S219 |
| DZ2FR1 | LA9F22582 | LC1F1154BD | LC1F150Q7S219 | LC1F225FD |
| DZ2FX1 | LA9F2600 | LC1F1154F7 | LC1F150R7 | LC1F225FE7 |
| DZ2FX6 | LA9F701 | LC1F1154G7 | LC1F150U7 | LC1F225FWS14 |
| DZ3FA3 | LA9F702 | LC1F1154M7 | LC1F150V7 | LC1F225G622L |
| DZ3GA3 | LA9F703 | LC1F1154MD | LC1F150X7 | LC1F225G7 |
| DZ3HA3 | LA9F704 | LC1F1154P7 | LC1F1700 | LC1F225GDS219 |
| DZ3JA3 | LA9F705 | LC1F1154Q7 | LC1F1700F7 | LC1F225KUE |
| LA1VN11 | LA9F706 | LC1F1154U7 | LC1F1700M7 | LC1F225L7 |
| LA1VN11X | LA9F707 | LC1F1154X7 | LC1F1700MD | LC1F225M7 |
| LA1VN20 | LA9F708 | LC1F115B5 | LC1F1700P7 | LC1F225MD |
| LA4EM250FF | LA9F709 | LC1F115B6 | LC1F185 | LC1F225N7 |
| LA4EM250FG | LA9F801 | LC1F115B7 | LC1F1854 | LC1F225P7 |
| LA4EM250FH | LA9F980 | LC1F115BD | LC1F1854B7 | LC1F225Q7 |
| LA4EM250FJ | LA9FF4F | LC1F115E7 | LC1F1854BD | LC1F225R7 |
| LA4EM250FK | LA9FF601 | LC1F115ED | LC1F1854E7 | LC1F225S207 |
| LA4EM250FL | LA9FF970 | LC1F115F7 | LC1F1854M7 | LC1F225S7 |
| LA4EM250FW | LA9FF976 | LC1F115G622L | LC1F1854MD | LC1F225U7 |
| LA4FDE | LA9FF981 | LC1F115G7 | LC1F1854P7 | LC1F225V7 |
| LA4FDF | LA9FG4F4F | LC1F115KUE | LC1F1854Q7 | LC1F225X7 |
| LA4FRCE | LA9FG4G | LC1F115L622L | LC1F1854X7 | LC1F2600 |
| LA4FRCF | LA9FG601 | LC1F115M622L | LC1F185B5 | LC1F2600MD |
| LA4FRCP | LA9FG610 | LC1F115M7 | LC1F185B7 | LC1F2600P7 |

High power contactors

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TeSys Control

F High power contactors

Product references

| | | | | |
|-----------------|-----------------|--------------|--------------|-----------|
| LC1F265 | LC1F400ED | LC1F630V7 | LX1FH5002 | LX4FL110 |
| LC1F2654 | LC1F400F7 | LC1F780 | LX1FH6002 | LX4FL125 |
| LC1F2654F7 | LC1F400F722L | LC1F7804 | LX1FJ048 | LX4FL220 |
| LC1F2654FD | LC1F400FD | LC1F7804F7 | LX1FJ110 | LX4FX110 |
| LC1F2654M7 | LC1F400FE7 | LC1F7804M7 | LX1FJ127 | LX5FJW11 |
| LC1F2654P7 | LC1F400G7 | LC1F7804MD | LX1FJ200 | LX5FJW18 |
| LC1F2654Q7 | LC1F400G722L | LC1F7804P7 | LX1FJ220 | LX5FJW21 |
| LC1F2654U7 | LC1F400GD | LC1F780F7 | LX1FJ2206 | LX5FJW24 |
| LC1F2654V7 | LC1F400KUE | LC1F780FE7 | LX1FJ240 | LX5FJW25 |
| LC1F265B7 | LC1F400L7 | LC1F780G7 | LX1FJ280 | LX5FKW11 |
| LC1F265BD | LC1F400M7 | LC1F780M7 | LX1FJ380 | LX5FKW21 |
| LC1F265E7 | LC1F400MD | LC1F780P7 | LX1FJ415 | LX5FKW24 |
| LC1F265ED | LC1F400N7 | LC1F780Q7 | LX1FJ500 | LX5FKW25 |
| LC1F265F7 | LC1F400P7 | LC1F800 | LX1FK048 | LX5FLW23 |
| LC1F265F722L | LC1F400Q7 | LC1F800FW | LX1FK055 | LX5FLW24 |
| LC1F265FD | LC1F400R7 | LC1F800KUE | LX1FK070 | LX9FF024 |
| LC1F265FE7 | LC1F400U7 | LC1F800MW | LX1FK110 | LX9FF042 |
| LC1F265G7 | LC1F400V7 | LC1F800QW | LX1FK127 | LX9FF048 |
| LC1F265G722L | LC1F400X7 | LC1FG265R7 | LX1FK200 | LX9FF110 |
| LC1F265GD | LC1F500 | LC1FG500N7 | LX1FK220 | LX9FF127 |
| LC1F265KUE | LC1F5002 | LC1SF1200KUE | LX1FK2206 | LX9FF200 |
| LC1F265L7 | LC1F5002M7 | LC1SF1200M7 | LX1FK240 | LX9FF220 |
| LC1F265M7 | LC1F5004 | LC1SF1200P7 | LX1FK380 | LX9FF240 |
| LC1F265MD | LC1F5004F7 | LC1V160FE7 | LX1FK415 | LX9FF380 |
| LC1F265N7 | LC1F5004FD | LC1V160P7 | LX1FL110 | LX9FF415 |
| LC1F265P7 | LC1F5004M7 | LC1V160P7SC | LX1FL200 | LX9FF500 |
| LC1F265Q7 | LC1F5004P7 | LC1V320FE7 | LX1FL220 | LX9FF600 |
| LC1F265R7 | LC1F5004S225 | LC1V320P7 | LX1FL2206 | LX9FG024 |
| LC1F265S7 | LC1F5004V7 | LC1V610FE7 | LX1FL260 | LX9FG048 |
| LC1F265U7 | LC1F5007M7 | LC1V610P7 | LX1FL380 | LX9FG100 |
| LC1F265V7 | LC1F500E7 | LC2F115 | LX1FL415 | LX9FG110 |
| LC1F265X7 | LC1F500ED | LC2F1154 | LX1FX110 | LX9FG127 |
| LC1F330 | LC1F500F7 | LC2F115M7 | LX1FX220 | LX9FG200 |
| LC1F3304 | LC1F500F722L | LC2F150 | LX1FX415 | LX9FG220 |
| LC1F3304BD | LC1F500FD | LC2F1504 | LX1V610P7 | LX9FG240 |
| LC1F3304FD | LC1F500FE7 | LC2F150M7 | LX2FJW25 | LX9FG380 |
| LC1F3304GD | LC1F500G7 | LC2F185 | LX2FKW11 | LX9FG415 |
| LC1F3304M7 | LC1F500G722L | LC2F1854 | LX2FKW21 | LX9FG500 |
| LC1F3304P7 | LC1F500GD31S003 | LC2F185F7 | LX2FXW42 | LX9FG550 |
| LC1F3304Q7 | LC1F500KUE | LC2F185G622L | LX2FXW52 | LX9FG600 |
| LC1F330B7 | LC1F500L7 | LC2F185M7 | LX2FXW54 | LX9FH0242 |
| LC1F330BD | LC1F500M7 | LC2F225 | LX4D8MD | LX9FH1102 |
| LC1F330E7 | LC1F500MD | LC2F2254 | LX4F8FW | LX9FH1272 |
| LC1F330F7 | LC1F500N7 | LC2F225M7 | LX4F8MW | LX9FH2202 |
| LC1F330FD | LC1F500P7 | LC2F265 | LX4F8QW | LX9FH3802 |
| LC1F330FE7 | LC1F500Q7 | LC2F2654 | LX4FF024 | LX9FJ925 |
| LC1F330G7 | LC1F500R7 | LC2F265F722L | LX4FF060 | LX9FJ931 |
| LC1F330G722L | LC1F500U7 | LC2F265M7 | LX4FF090 | LX9FJ936 |
| LC1F330KUE | LC1F500V7 | LC3F185M7 | LX4FF110 | LX9FK910 |
| LC1F330L7 | LC1F630 | LC3F225M7 | LX4FF220 | LX9FK912 |
| LC1F330M7 | LC1F6302 | LX1D8FE7 | LX4FG024 | LX9FK925 |
| LC1F330M7+FI | LC1F6304 | LX1D8L7 | LX4FG060 | LX9FK931 |
| LC1F330M722L | LC1F6304F7 | LX1D8N7 | LX4FG090 | LX9FL924 |
| LC1F330MD | LC1F6304M7 | LX1D8R7 | LX4FG096S124 | LX9FL930 |
| LC1F330N7 | LC1F6304P7 | LX1D8V7 | LX4FG110 | LX9FL931 |
| LC1F330P7 | LC1F6304U7 | LX1FF024 | LX4FG125 | LX9FL935 |
| LC1F330Q7 | LC1F6304V7 | LX1FF040 | LX4FG220 | LXEFF250 |
| LC1F330R7 | LC1F630E7 | LX1FF1106 | LX4FH024 | LXEFF250 |
| LC1F330S7 | LC1F630F7 | LX1FG024 | LX4FH040 | LXEFH250 |
| LC1F330U7 | LC1F630F722L | LX1FH0242 | LX4FH070 | LXEFJ250 |
| LC1F330V7 | LC1F630FD | LX1FH0422 | LX4FH090 | LXEFK250 |
| LC1F400 | LC1F630FE7 | LX1FH0482 | LX4FH096S124 | LXEFL250 |
| LC1F4002 | LC1F630G7 | LX1FH1102 | LX4FH110 | LXEFW250 |
| LC1F4004 | LC1F630GD | LX1FH11062 | LX4FH220 | PA1LB75 |
| LC1F4004F7 | LC1F630KUE | LX1FH1272 | LX4FJ024 | PA1LB80 |
| LC1F4004M7 | LC1F630M7 | LX1FH2002 | LX4FJ090 | PA1LB89 |
| LC1F4004P7 | LC1F630MD | LX1FH2202 | LX4FJ110 | PA2FB80 |
| LC1F4004Q7 | LC1F630N7 | LX1FH22062 | LX4FJ220 | |
| LC1F4004U7 | LC1F630P7 | LX1FH2402 | LX4FJ250 | |
| LC1F4004V7 | LC1F630Q7 | LX1FH2772 | LX4FK100 | |
| LC1F400BD11S121 | LC1F630R7 | LX1FH3802 | LX4FK110 | |
| LC1F400E7 | LC1F630U7 | LX1FH4402 | LX4FK220 | |

High power contactors

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Technical Data for Designers

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- > schemes B9/61 and B9/62

V vacuum contactors:

- > characteristics B9/64 and B9/65
- > dimensions B9/66 and B9/67
- > schemes B9/66 to B9/69

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- > dimensions
and schemes B9/86 and B9/87

CR1F magnetic latching contactors:

- > characteristics B9/88 to B9/97
- > dimensions B9/98 to B9/101

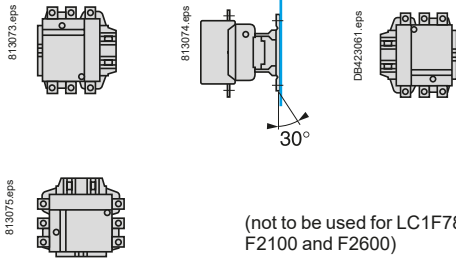
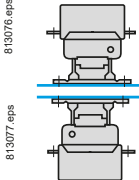
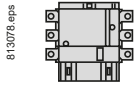
F - reversing and changeover contactors:

- > dimensions B9/102 to B9/105
- > schemes B9/106

TeSys Control

F High power contactors

Characteristics

| Environment | | | LC1F115 | LC1F150 | LC1F185 |
|---|---|-----------|--|---------|---------|
| Rated insulation voltage (Ui) | Conforming to IEC 60947-4-1. Overvoltage category III, degree of pollution: 3 | V | 1000 | 1000 | 1000 |
| Rated impulse withstand voltage (Uimp) | Coil not connected to the power circuit | kV | 8 | 8 | 8 |
| Conforming to standards | | | IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, JIS C 8201-4-1 | | |
| Product certifications | | | UL, CSA, CCC, UKCA, CB certification, EAC, ABS, BV, DNV-GL, LRoS, RINA, RMRoS | | |
| Degree of protection | Conforming to IEC 60529 | | IP 2X front face with shrouds LA9F | | |
| Climatic withstand | | | According to IACS E10 | | |
| Ambient air temperature around the device | Storage | °C | -60...+80 | | |
| | Operation | °C | -5...+55 | | |
| | Permissible at Uc ⁽¹⁾ | °C | -40...+70 | | |
| Maximum operating altitude | Without derating | m | 3000 | | |
| Operating positions | Without derating | |  <p>(not to be used for LC1F780, F1000, F1400, F1700, F2100 and F2600)</p> | | |
| | With derating | |  <p>Apply the following derating coefficients: 0.75 on the pull-in voltage, 0.9 on the drop-out voltage and 0.8 on the operational current in AC-1.</p> <p>Apply the following derating coefficients: 1.15 on the pull-in voltage, 1.1 on the drop-out voltage and 0.8 on the operational current in AC-1.</p> <p>In either case: neither the making and breaking capacities nor the electrical and mechanical durabilities can be assured.</p> | | |
| Not to be used | | |  | | |
| Shock resistance ⁽²⁾ 1/2 sine wave = 11 ms Conforming to IEC/EN 60068-2-27 | Contactors open | | 9 gn | 9 gn | 7 gn |
| | Contactors closed ⁽³⁾ | | 15 gn | 15 gn | 15 gn |
| Vibration resistance ⁽²⁾ 5...300 Hz Conforming to IEC/EN 60068-2-6 | Contactors open | | 2 gn | 2 gn | 2 gn |
| | Contactors closed | | 6 gn | 6 gn | 5 gn |

(1) In these conditions, it is recommended that LX9F coils be used for contactor sizes F115 to F225.

(2) In the least favourable direction, without change of contact state (coil at Uc). Where higher resistance to mechanical shock is required, select shock-proof contactors. Please consult your Regional Sales Office.

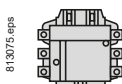
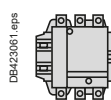
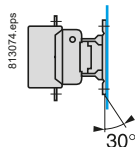
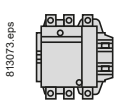
(3) 12 gn for F115-F1250 contactors when used with Electronic control module (LA4EM) & LXE coils.

TeSys Control

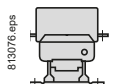
F High power contactors

Characteristics

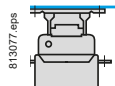
| LC1F225 | LC1F265 | LC1F330 | LC1F400 | LC1F500 | LC1F630 | LC1F780 | LC1F800 | LC1 F1000 | LC1 SF1200 | LC1 F1250 | LC1 F1400 | LC1 F1700 | LC1 F2100 | LC1 F2600 |
|--|---------|---------|---------|---------|---------|----------|-----------|------------------------------------|--------------|-----------|------------------|-----------|-----------|-----------|
| 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| EN 60947-1, EN 60947-4-1, IEC 60947-1, IEC 60947-4-1, JIS C 8201-4-1 (except for LC1F1000 & LC1SF1200) | | | | | | | | | | | | | | |
| UL, CSA, CCC, CB certification, EAC, ABS, BV, DNV-GL, LRoS, RINA, RMRoS | | | | | | | | CB, CSA, UL, CCC, LRoS, ABS, RMRoS | CB, CSA, CCC | CB, CCC | CB, CSA, CCC, UL | | | |
| IP 20 front face with shrouds LA9F | | | | | | | | - | - | - | | | | |
| According to IACS E10 | | | | | | | | | | | | | | |
| -60...+80 | | | | | | | | | | | | | | |
| -5...+55 | | | | | | | | -5...+40 | -5...+60 | -5...+40 | | | | |
| -40...+70 | | | | | | -5...+55 | -40...+60 | -40...+70 | -40...+60 | | | | | |
| 3000 | | | | | | | | | | | | | | |



(not to be used for LC1F780, F1000, F1400, F1700, F2100 and F2600)



Apply the following derating coefficients: 0.75 on the pull-in voltage, 0.9 on the drop-out voltage and 0.8 on the operational current in AC-1.



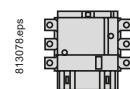
Apply the following derating coefficients: 1.15 on the pull-in voltage, 1.1 on the drop-out voltage and 0.8 on the operational current in AC-1.

In either case: neither the making and breaking capacities nor the electrical and mechanical durabilities can be assured.

Not to be used

Possible positions with derating (see corresponding paragraph on left, same line)

Not to be used



| | | | | | | | | | | | | | | |
|-------|-------|-------|--------|-------|-------|--------|-------|-------|---------------------|-------|-------|-------|-------|-------|
| 7 gn | 6 gn | 6 gn | 6 gn | 9 gn | 6 gn | 5 gn | 6 gn | 6 gn | 6 gn | 6 gn | 6 gn | 6 gn | 6 gn | 6 gn |
| 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn | 15 gn |
| 2 gn | 2 gn | 2 gn | 1.5 gn | 2 gn | 2 gn | 2.5 gn | 2 gn | 2 gn | 2 gn | 2 gn | 2 gn | 2 gn | 2 gn | 2 gn |
| 5 gn | 5 gn | 5 gn | 5 gn | 4 gn | 4 gn | 5.5 gn | 4 gn | 4 gn | 4 gn ⁽¹⁾ | 4 gn | 4 gn | 4 gn | 4 gn | 4 gn |

(1) Vibration resistance 5...30 Hz, when used with Electronic Control Module (ECM).

High power contactors

TeSys Control

F High power contactors

Characteristics

Pole characteristics

| Contactor type | | | LC1F115 | LC1F150 | LC1F185 | LC1F225 | LC1F265 | |
|--|---|----------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------|
| Number of poles | | | 3 or 4 | 3 or 4 | 3 or 4 | 3 or 4 | 3 or 4 | |
| Rated operational current (Ie) (Ue ≤ 440 V) | In AC-3, θ ≤ 55 °C | A | 115 | 150 | 185 | 225 | 265 | |
| | In AC-1, θ ≤ 40 °C | A | 200 | 250 | 275 | 315 | 350 | |
| Rated operational voltage (Ue) | Up to | V | 690 | 690 | 690 | 690 | 1000 ⁽⁵⁾ | |
| Frequency limits | Of the operational current ⁽¹⁾ | Hz | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | |
| Conventional thermal current | θ ≤ 40 °C | A | 200 | 250 | 275 | 315 | 350 | |
| Rated making capacity | I rms conforming to IEC 60947-4-1 | A | Making current: 10 x I in AC-3 or 12 x I in AC-4 | | | | | |
| Rated breaking capacity | I rms conforming to IEC 60947-4-1 | A | Making and breaking current: 8 x I in AC-3 or 10 x I in AC-4 | | | | | |
| Maximum permissible current No current flowing for previous 60 minutes, at θ ≤ 40 °C | For 10 s | A | 1100 | 1200 | 1500 | 1800 | 2200 | |
| | For 30 s | A | 640 | 700 | 920 | 1000 | 1230 | |
| | For 1 min | A | 520 | 600 | 740 | 850 | 950 | |
| | For 3 min | A | 400 | 450 | 500 | 560 | 620 | |
| | For 10 min | A | 320 | 350 | 400 | 440 | 480 | |
| Short-circuit protection by fuses U ≤ 440 V | Motor circuit (type aM) | A | 125 | 160 | 200 | 250 | 315 | |
| | With thermal overload relay (type gG) | A | 200 | 200 | 315 | 315 | 500 | |
| | gG fuses | A | 200 | 250 | 315 | 315 | 400 | |
| Average impedance per pole | At Ith and 50 Hz | mΩ | 0.37 | 0.35 | 0.33 | 0.32 | 0.3 | |
| Power dissipation per pole for the above operational currents | AC-3 | W | 5 | 8 | 12 | 16 | 21 | |
| | AC-1 | W | 15 | 22 | 25 | 32 | 37 | |
| Connection | | | Maximum c.s.a. | | | | | |
| | Bar | Number of bars | | 2 | 2 | 2 | 2 | 2 |
| | | Bar | mm | 20 x 3 | 25 x 3 | 25 x 3 | 32 x 4 | 32 x 4 |
| | Cable with lug | | mm² | 95 | 120 | 150 | 185 | 240 |
| | Cable with connector | | mm² | 95 | 120 | 150 | 185 | 240 |
| Bolt diameter | | mm | Ø6 | Ø8 | Ø8 | Ø10 | Ø10 | |
| Tightening torque | Power circuit connections | N.m | 10 | 18 | 18 | 35 | 35 | |

(1) Sine wave without interference. Above these values, contactors can be used only for AC-1 application.

(2) With set of right-angled connectors **LA9F2100** (see page B9/13).

(3) Paralleling of poles must be carried out only in accordance with the fuse manufacturer's recommendations.

(4) θ ≤ 60 °C with set of right-angled connectors **LA9F2600** (see page B9/13).

(5) Ue ≤ 690 V in AC-3; Ue ≤ 1000 V in AC-1.

(6) Ue = 1000 V, with set of right angled connectors **LA9F2100** (see page B9/13).

TeSys Control

F High power contactors

Characteristics

| LC1F330 | LC1F400 | LC1F500 | LC1F630 | LC1F780 | LC1F800 | LC1F1000 | LC1SF1200 | LC1F1250 | LC1F1400 | LC1F1700 | LC1F2100 | LC1F2600 |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|--|--------------------------|--|--------------------------|--------------------------|--|
| 3 or 4 | 2, 3 or 4 | 2, 3 or 4 | 2, 3 or 4 | 3 or 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 330 | 400 | 500 | 630 | 780 | 800 | 1000 | - | - | - | - | - | - |
| 400 | 500 | 700 | 1000 | 1600 | 1000 | 1250 | 1200 | 1260 | 1400 | 1700 | 2100 ⁽²⁾ | 2600 ⁽⁴⁾ |
| 1000 | 1000 | 1000 ⁽⁵⁾ | 1000 | 1000 | 1000 | 440 | 690 | 690 | 1000 | 1000 | 1000 ⁽⁶⁾ | 1000 |
| 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 | 16 ^{2/3} ...200 |
| 400 | 500 | 700 | 1000 | 1600 | 1000 | 1250 | 1200 | 1260 | 1400 | 1700 | 2100 ⁽²⁾ | 2600 ⁽⁴⁾ |
| Making current: 10 x I in AC-3 or 12 x I in AC-4 | | | | | | 10 x I in AC-3 | Making current: 1.5 x I in AC-1 | | | | | |
| Making and breaking current: 8 x I in AC-3 or 10 x I in AC-4 | | | | | | 8 x I in AC-3 | Making and breaking current: 1.5 x I in AC-1 | | | | | |
| 2650 | 3600 | 4200 | 5050 | 6250 | 5500 | 10000 | 8000 | 8000 | 8000 | 10000 | 10000 | 12000 |
| 1800 | 2400 | 3200 | 4400 | 5600 | 4600 | 7500 | 5200 | 5200 | 6000 | 7500 | 7500 | 9000 |
| 1300 | 1700 | 2400 | 3400 | 4600 | 3600 | 5500 | 4000 | 4000 | 4500 | 5500 | 5500 | 7000 |
| 900 | 1200 | 1500 | 2200 | 3000 | 2600 | 4200 | 3000 | 3000 | 4000 | 4200 | 4200 | 6000 |
| 750 | 1000 | 1200 | 1600 | 2200 | 1700 | 3000 | 2000 | 2000 | 2600 | 3000 | 3000 | 4000 |
| 400 | 400 | 500 | 630 | 800 | 800 | 1000 | - | - | - | - | - | - |
| 500 | 630 | 800 | 800 | 1000 | 1000 | 1000 | - | - | - | - | - | - |
| 500 | 500 | 800 | 1000 | 2 x 800 ⁽³⁾ | 1000 | 1000 | 1400 | 1400 | 2 x 800 ⁽³⁾ | 2 x 800 ⁽³⁾ | 2 x 1000 ⁽³⁾ | 2 x 1250 ⁽³⁾ |
| 0.28 | 0.26 | 0.18 | 0.12 | 0.10 | 0.12 | 0.12 | 0.10 | 0.12 | 0.10 | 0.10 | 0.10 | 0.10 |
| 31 | 42 | 45 | 48 | 60 | 77 | 100 | - | - | - | - | - | - |
| 44 | 65 | 88 | 120 | 250 | 120 | 120 | 120 | 120 | 150 | 200 | 200 | 250 |
| Maximum c.s.a. | | | | | | | | | | | | |
| 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 4 | 3 |
| 30 x 5 | 30 x 5 | 40 x 5 | 60 x 5 | 100 x 5 | 60 x 5 | 100 x 5 | 50x8 | 100 x 5 | 100 x 5 | 100 x 5 | 100 x 5 | 100 x 10 |
| 240 | 2 x 150 | 2 x 240 | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ø10 | Ø10 | Ø10 | Ø12 | 2 x Ø12 | Ø12 | 4 x Ø12 (Ø11.5 with set of right-angled connectors LA9F2100) | 3 x Ø12 | 3 x Ø12 | 4 x Ø12 (Ø11.5 with set of right-angled connectors LA9F2100) | | | 4 x Ø12 (Ø11.5 with set of right-angled connectors LA9F2600) |
| 35 | 35 | 35 | 58 | 58 | 58 | 58 (35 with set of right-angled connectors LA9F2100) | 58 | 58 | 58 (35 with set of right-angled connectors LA9F2100) | | | 58 (35 with set of right-angled connectors LA9F2600) |

TeSys Control

F High power contactors

Characteristics

| a.c. control circuit characteristics with LX1 / LX9 coil | | | | | | | | | |
|---|-------------------------------|---------------------------------|--|---------------------|---------------------|---------------------|---------------------|----------------|-----------|
| Contactor type | | | LC1F115 | LC1F150 | LC1F185 | LC1F225 | LC1F265 | LC1F330 | |
| Rated control circuit voltage (Uc) | | | V | 24 ... 600 | | | 24...1000 | 24...1000 | |
| Control voltage limits ($\theta \leq 55^\circ\text{C}$) | 40...400 Hz coils | Operation | | 0.85...1.1 Uc | | | 0.85...1.1 Uc | 0.85...1.1 Uc | |
| | | Drop-out | | 0.2...0.55 Uc | | | 0.35...0.55 Uc | 0.35...0.55 Uc | |
| Average consumption at 20 °C and at Uc | Inrush | 40...400 Hz coil | VA | 690...855 | 690...855 | 950...1180 | 950...1180 | 600...700 | 600...700 |
| | | Cos φ | | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| | Sealed | 40...400 Hz coil | VA | 6.6...8.1 | 6.6...8.1 | 8.9...10.9 | 8.9...10.9 | 8...10 | 8...10 |
| | | Cos φ | | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Heat dissipation | | | W | 5.9...7.2 | 5.9...7.2 | 8...9.8 | 8...9.8 | 8 | 8 |
| Operating time ⁽²⁾ | Closing "C" | | ms | 35 | 35 | 35 | 35 | 40...65 | 40...65 |
| | Opening "O" | | ms | 130 | 130 | 130 | 130 | 100...170 | 100...170 |
| Mechanical durability at Uc | | In millions of operating cycles | | 10 | 10 | 10 | 10 | 10 | 10 |
| Maximum operating rate at ambient temperature $\leq 55^\circ\text{C}$ | | In operating cycles per hour | | 2400 ⁽³⁾ | 2400 ⁽³⁾ | 2400 ⁽³⁾ | 2400 ⁽³⁾ | 2400 | 2400 |
| Connection | | | | Min/max c.s.a. | | | | | |
| Flexible cable without cable end | 1 or 2 conductors | | mm ² | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| | Flexible cable with cable end | 1 conductor | mm ² | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| 2 conductors | | mm ² | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | |
| Solid cable without cable end | | 1 or 2 conductors | mm ² | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| Tightening torque | | | N.m | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| Mechanical latching | | | Mechanical latch blocks LA6DK must not be fitted on LC1F contactors. For similar type of operation, use magnetic latching contactors CR1F. See pages B9/28 to B9/33. | | | | | | |

(1) Equipped with 2 coils.

(2) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

(3) 1200 cycles/hour for 600 V coils.

COORD.

Ref.



High power contactors

TeSys Control

F High power contactors

Characteristics

| LC1 F400 | LC1 F500 | LC1 F630 | LC1 F780 ⁽¹⁾ | LC1 F800 | LC1 F1000 ⁽¹⁾ | LC1 SF1200 | LC1 F1250 | LC1 F1400 ⁽¹⁾ | LC1 F1700 | LC1 F2100 ⁽¹⁾ | LC1 F2600 ⁽¹⁾ |
|----------------|-------------|---------------|-------------------------|---------------|--------------------------|---------------|---------------|--------------------------|---------------|--------------------------|--------------------------|
| 48...1000 | | 48...1000 | 110...500 | 110...400 | 110...500 | 220...230 | 110...600 | 110...500 | 110...500 | 110...500 | 110...500 |
| 0.85...1.1 Uc | | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc |
| 0.3...0.5 Uc | | 0.25...0.5 Uc | 0.2...0.4 Uc | 0.3...0.5 Uc | 0.3...0.5 Uc | 0.25...0.5 Uc | 0.25...0.5 Uc | 0.3...0.5 Uc | 0.3...0.5 Uc | 0.3...0.5 Uc | 0.3...0.5 Uc |
| 1000...1150 | 1050...1150 | 1500...1730 | 1900...2300 | 1700 | 1600...2400 | 1050...1150 | 1500...1730 | 1600...2400 | 1600...2400 | 1600...2400 | 2200...2700 |
| 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| 12...18 | 16...20 | 20...25 | 44...55 | 12 | 29...37 | 16...20 | 20...25 | 29...37 | 29...37 | 29...37 | 37.4...50.6 |
| 0.9 | 0.9 | 0.9 | 0.9 | – | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| 14 | 18 | 20 | 2 x 22 | 25 | 2 x 18 | 18 | 20 | 2 x 18 | 2 x 18 | 2 x 18 | 2 x 25 |
| 40...75 | 40...75 | 40...80 | 40...80 | 60...80 | 40...75 | 40...75 | 40...80 | 40...75 | 40...75 | 40...75 | 40...80 |
| 100...170 | 100...170 | 100...200 | 130...230 | 160...180 | 100...170 | 100...170 | 100...200 | 100...170 | 100...170 | 100...170 | 100...200 |
| 10 | 10 | 5 | 5 | 5 | 0.5 | 10 | 1 | 0.5 | 0.5 | 0.5 | 0.5 |
| 2400 | 2400 | 1200 | 600 | 600 | 600 | 2400 | 1200 | 600 | 600 | 600 | 600 |
| Min/max c.s.a. | | | | | | | | | | | |
| 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 |
| 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |

Mechanical latch blocks LA6DK must not be fitted on LC1F contactors.
 For similar type of operation, use magnetic latching contactors CR1F.
 See pages B9/28 to B9/33.

TeSys Control

F High power contactors

Characteristics

| d.c. control circuit characteristics with LX4 coil | | | | | | | | |
|--|---------------------------------|--|---|---------------|---------------|---------------|---------------|-------------|
| Contactor type | | | LC1F115 | LC1F150 | LC1F185 | LC1F225 | LC1F265 | |
| Rated control circuit voltage (Uc) ⁻⁻⁻ | | V | 24...460 | 24...460 | 24...460 | 24...460 | 24...460 | |
| Control voltage limits (θ ≤ 55 °C) | Operation | | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | |
| | Drop-out | | 0.15...0.2 Uc | 0.15...0.2 Uc | 0.15...0.2 Uc | 0.15...0.2 Uc | 0.15...0.2 Uc | |
| Average consumption at 20 °C and at Uc | ⁻⁻⁻ | Inrush | W | 543...665 | 543...665 | 737...902 | 737...902 | 655...803 |
| | | Sealed | W | 3.94...4.83 | 3.94...4.83 | 4.13...5.07 | 4.13...5.07 | 3.68...4.53 |
| Average operating time at Uc ⁽¹⁾ | Closing "C" | ms | 30...40 | 30...40 | 30...40 | 30...40 | 40...50 | |
| | Opening "O" | ms | 30...50 | 30...50 | 30...50 | 30...50 | 40...65 | |
| | | | <i>Note: the arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.</i> | | | | | |
| Mechanical durability at Uc | In millions of operating cycles | | 10 | 10 | 10 | 10 | 10 | |
| Maximum operating rate at ambient temperature ≤ 55 °C | In operating cycles per hour | | 2400 | 2400 | 2400 | 2400 | 2400 | |
| Cabling | | | Min/max c.s.a. | | | | | |
| Flexible cable without cable end | 1 conductor | mm ² | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | |
| | 2 conductors | mm ² | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | |
| Flexible cable with cable end | 1 conductor | mm ² | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | |
| | 2 conductors | mm ² | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | |
| Solid cable without cable end | 1 conductor | mm ² | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | |
| | 2 conductors | mm ² | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | |
| Tightening torque | | N.m | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | |
| Mechanical latching | | Mechanical latch blocks LA6DK must not be fitted on LC1F contactors. For similar type of operation, use magnetic latching contactors CR1F. See pages B9/28 to B9/33. | | | | | | |

⁽¹⁾ The operating times depend on the type of contactor electromagnet and its control mode.
The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

COORD.

Ref.



High power contactors

TeSys Control

F High power contactors

Characteristics

| LC1F330 | LC1F400 | LC1F500 / LC1SF1200 (1) | LC1F630 | LC1F780 | LC1F800 | LC1F1000 | LC1F1250 | LC1F1400 | LC1F1700 | LC1F2100 | LC1F2600 |
|------------------|------------------|-------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 24...460 | 48...440 | 48...440 | 48...440 | 110...440 | 110...400 | 110...440 | 48...250 | 110...440 | 110...440 | 110...440 | 110...440 |
| 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc |
| 0.15...0.2 Uc | 0.2...0.35 Uc | 0.2...0.35 Uc | 0.2...0.35 Uc | 0.2...0.4 Uc | 0.3...0.5 Uc | 0.2...0.35 Uc | 0.2...0.35 Uc | 0.2...0.35 Uc | 0.2...0.35 Uc | 0.2...0.35 Uc | 0.2...0.35 Uc |
| 655...803 | 920...1140 | 990...1220 | 1420...1920 | 1960...2420 | 1900 | 2000...2200 | 1420...1920 | 2000...2200 | 2000...2200 | 2000...2200 | 2130...2880 |
| 3.68...4.53 | 4...7.5 | 4.54...8 | 6.5...12.5 | 42...52 | 12 | 8...10 | 6.5...12.5 | 8...10 | 8...10 | 8...10 | 13...25 |
| 40...50 | 50...60 | 50...60 | 60...70 | 70...80 | 60...80 | 50...60 | 60...70 | 50...60 | 50...60 | 50...60 | 60...70 |
| 40...65 | 45...60 | 45...60 | 40...50 | 100...130 | 40...50 | 45...60 | 40...50 | 45...60 | 45...60 | 45...60 | 40...50 |

Note: the arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.

| | | | | | | | | | | | |
|----------------|-------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 10 | 10 | 10/1 | 5 | 5 | 5 | 0.5 | 1 | 0.5 | 0.5 | 0.5 | 0.5 |
| 2400 | 2400 | 2400/1200 | 1200 | 600 | 600 | 600 | 1200 | 600 | 600 | 600 | 600 |
| Min/max c.s.a. | | | | | | | | | | | |
| 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 |
| 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 | 1/4 |
| 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |

Mechanical latch blocks LA6DK must not be fitted on LC1F contactors.
For similar type of operation, use magnetic latching contactors CR1F.
See pages B9/28 to B9/33.

(1) LC1SF1200KUE, LC1SF1200MD are available.

TeSys Control

F High power contactors

Characteristics

| a.c. or d.c. control circuit characteristics with LXE coil ⁽¹⁾ | | | | | | | |
|---|----------------------------------|-------------|---------------|---------------|---------------|-----------|-----------|
| Contactor type | | | LC1F115, F150 | LC1F185, F225 | LC1F265, F330 | | |
| ECM ⁽²⁾ reference | | | LA4EM250FF | LA4EM250FG | LA4EM250FH | | |
| Coil reference | | | LXEFF250 | LXEFG250 | LXEFH250 | | |
| Rated control circuit voltage (Uc) | 50/60 Hz | V | 100...250 | | | | |
| | --- | V | 100...380 | | | | |
| Control voltage limits (< 55 °C) 50/60 Hz | Operation | V | 85...275 | | | | |
| | | V | < 60 | | | | |
| | Drop-out | V | 85...418 | | | | |
| | | V | < 45 | | | | |
| Average consumption at 20 °C and at Uc | Inrush | 50/60 Hz | VA rms | 280...310 | 280...310 | 300...350 | |
| | | Cos φ | | 0.5...0.6 | | | |
| | --- | Sealed | 50/60 Hz | W | 270...320 | 270...320 | 300...310 |
| | | | Cos φ | | 0.5...0.6 | | |
| | --- | --- | 50/60 Hz | VA | 4.5...7.0 | 4.5...7.0 | 4.5...7.0 |
| | | | Cos φ | | 0.5...0.6 | | |
| | --- | --- | --- | W | 2.5...4.0 | 2.5...4.0 | 2.5...4.0 |
| | | | --- | | 2.5...4.0 | | |
| Embedded PLC ⁽⁴⁾ input according IEC 61131-2 type 2 | Off state | V DC | 0...5 | | | | |
| | On state | | 11...30 | | | | |
| Heat dissipation | | W | 2.2...5.5 | | | | |
| Operating time | Closing "C" | ms | 40...80 | | | | |
| | Opening "O" | ms | 6...54 | | | | |
| Mechanical durability at Uc | In millions of operating cycles | | 10 | | | | |
| Maximum operating rate at ambient temperature ≤ 55 °C | In operating cycles per hour | | 2400 | | | | |
| Connection ⁽⁵⁾ | Flexible cable without cable end | 1 conductor | | 0.2/2.5 | | | |
| | Flexible cable with cable end | 1 conductor | | 0.25/2.5 | | | |
| | Solid cable without cable end | 1 conductor | | 0.2/2.5 | | | |
| Tightening torque | | N.m | 0.6 | | | | |

(1) LXE coil shall be always used along with Electronic Control Module (ECM) LA4EM250●●.

(2) Electronic Control Module enables wider coil operating voltage for the F range of contactors. ECM LA4EM250●● shall be always used along with suitable type of LXE●●250 coils.

(3) LC1SF1200KUE is supplied with LA4EM250FK & LXEFK250.

(4) PLC control connectors shall be provided by customer (Type MC 1.5/2-ST-3.81).

(5) Connection input is made to Electronic control module (ECM).

TeSys Control

F High power contactors

Characteristics

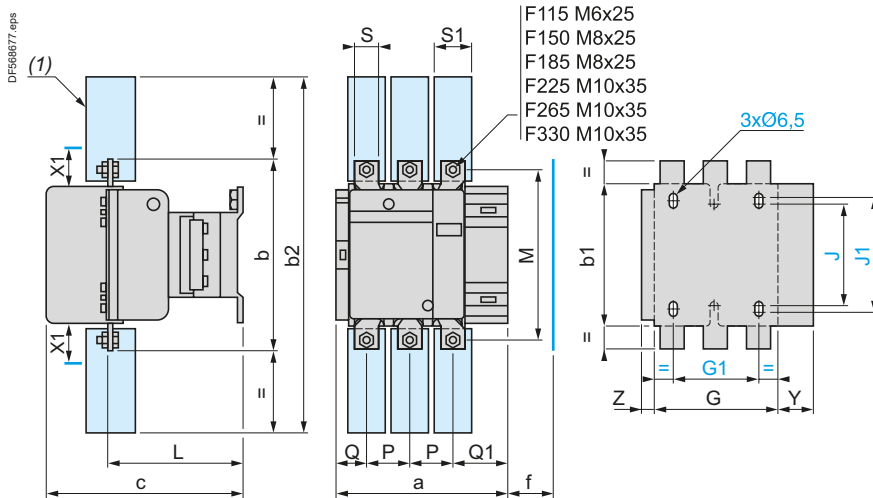
| LC1F400 | LC1SF500, LC1SF1200 ⁽³⁾ | LC1SF630, LC1F1250 | LC1F800 |
|------------|------------------------------------|--------------------|------------|
| LA4EM250FJ | LA4EM250FK | LA4EM250FL | LA4EM250FW |
| LXEFJ250 | LXEFK250 | LXEFL250 | LXEFW250 |
| 100...250 | | | |
| 100...380 | | | – |
| 85...275 | | | |
| < 60 | | | |
| 85...418 | | | |
| < 45 | | | |
| 360...470 | 360...550 | 460...730 | 460...730 |
| 0.5...0.6 | | | |
| 410...450 | 410...500 | 500...680 | – |
| 4.5...7.0 | 5.0...8.0 | 7...10 | 7...10 |
| 0.5...0.6 | | | |
| 2.5...4.0 | 2.7...5.0 | 4.0...5.5 | – |
| 0...5 | | | |
| 11...30 | | | |
| 2.2...5.5 | | | |
| 40...80 | | | |
| 6...54 | | | |
| 10 | 10/1 | 5/1 | 5 |
| 2400 | 2400/1200 | 1200 | 600 |
| 0.2/2.5 | | | |
| 0.25/2.5 | | | |
| 0.2/2.5 | | | |
| 0.6 | | | |

TeSys Control

F High power contactors

Dimensions

LC1F115 to F330



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

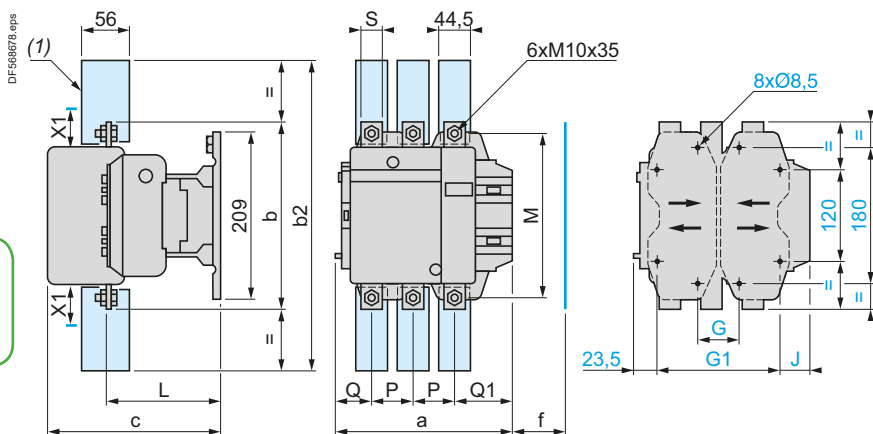
| LC1 | 200...500 V | 600...1000 V |
|------------|-------------|--------------|
| F115, F150 | 10 | 15 |
| F185 | 10 | 15 |
| F225, F265 | 10 | 15 |
| F330 | 10 | 15 |

(1) Power terminal protection shroud (see page B9/14).

| LC1 | | a | b | b1 | b2 | c | f | G | G1 | J | J1 | L | M | P | Q | Q1 | S | S1 | Y | Z |
|------|----|-------|-----|-----|-----|-----|-----|-------|----|-----|-----|-------|-----|----|------|------|----|------|----|------|
| F115 | 3P | 163.5 | 162 | 137 | 265 | 171 | 131 | 106 | 80 | 106 | 120 | 107 | 147 | 37 | 29.5 | 60 | 20 | 26 | 44 | 13.5 |
| | 4P | 200.5 | 162 | 137 | 265 | 171 | 131 | 143 | 80 | 106 | 120 | 107 | 147 | 37 | 29.5 | 60 | 20 | 26 | 44 | 13.5 |
| F150 | 3P | 163.5 | 170 | 137 | 301 | 171 | 131 | 106 | 80 | 106 | 120 | 107 | 150 | 40 | 26 | 57.5 | 20 | 34 | 44 | 13.5 |
| | 4P | 200.5 | 170 | 137 | 301 | 171 | 131 | 143 | 80 | 106 | 120 | 107 | 150 | 40 | 26 | 55.5 | 20 | 34 | 44 | 13.5 |
| F185 | 3P | 168.5 | 174 | 137 | 305 | 181 | 130 | 111 | 80 | 106 | 120 | 113.5 | 154 | 40 | 29 | 59.5 | 20 | 34 | 44 | 13.5 |
| | 4P | 208.5 | 174 | 137 | 305 | 181 | 130 | 151 | 80 | 106 | 120 | 113.5 | 154 | 40 | 29 | 59.5 | 20 | 34 | 44 | 13.5 |
| F225 | 3P | 168.5 | 197 | 137 | 364 | 181 | 130 | 111 | 80 | 106 | 120 | 113.5 | 172 | 48 | 21 | 51.5 | 25 | 44.5 | 44 | 13.5 |
| | 4P | 208.5 | 197 | 137 | 364 | 181 | 130 | 151 | 80 | 106 | 120 | 113.5 | 172 | 48 | 17 | 47.5 | 25 | 44.5 | 44 | 13.5 |
| F265 | 3P | 201.5 | 203 | 145 | 375 | 213 | 147 | 142 | 96 | 106 | 120 | 141 | 178 | 48 | 39 | 66.5 | 25 | 44.5 | 38 | 21.5 |
| | 4P | 244.5 | 203 | 145 | 375 | 213 | 147 | 190 | 96 | 106 | 120 | 141 | 178 | 48 | 34 | 66.5 | 25 | 44.5 | 38 | 16.5 |
| F330 | 3P | 213 | 206 | 145 | 375 | 219 | 147 | 154.5 | 96 | 106 | 120 | 145 | 181 | 48 | 43 | 74 | 25 | 44.5 | 38 | 20.5 |
| | 4P | 261 | 206 | 145 | 375 | 219 | 147 | 202.5 | 96 | 106 | 120 | 145 | 181 | 48 | 43 | 74 | 25 | 44.5 | 38 | 20.5 |

f = minimum distance required for coil removal.

LC1F400 and F500



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

| LC1 | 200...500 V | 600...1000 V |
|------|-------------|--------------|
| F400 | 15 | 20 |
| F500 | 15 | 20 |

(1) Power terminal protection shroud (see page B9/14).

| LC1 | | a | b | b2 | c | f | G | G | G | G1 | G1 | G1 | J | L | M | P | Q | Q1 | S |
|------|----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|------|-----|-----|----|----|-----|----|
| F400 | 2P | 213 | 206 | 375 | 219 | 146 | 80 | 66 | 102 | 170 | 156 | 192 | 19.5 | 145 | 181 | 48 | 69 | 96 | 25 |
| | 3P | 213 | 206 | 375 | 219 | 146 | 80 | 66 | 102 | 170 | 156 | 192 | 19.5 | 145 | 181 | 48 | 43 | 74 | 25 |
| | 4P | 261 | 206 | 375 | 219 | 146 | 80 | 66 | 150 | 170 | 156 | 240 | 67.5 | 145 | 181 | 48 | 43 | 74 | 25 |
| F500 | 2P | 233 | 238 | 400 | 232 | 150 | 80 | 66 | 120 | 170 | 156 | 210 | 39.5 | 146 | 208 | 55 | 76 | 102 | 30 |
| | 3P | 233 | 238 | 400 | 232 | 150 | 80 | 66 | 120 | 170 | 156 | 210 | 39.5 | 146 | 208 | 55 | 46 | 77 | 30 |
| | 4P | 288 | 238 | 400 | 232 | 150 | 140 | 66 | 175 | 230 | 156 | 265 | 34.5 | 146 | 208 | 55 | 46 | 77 | 30 |

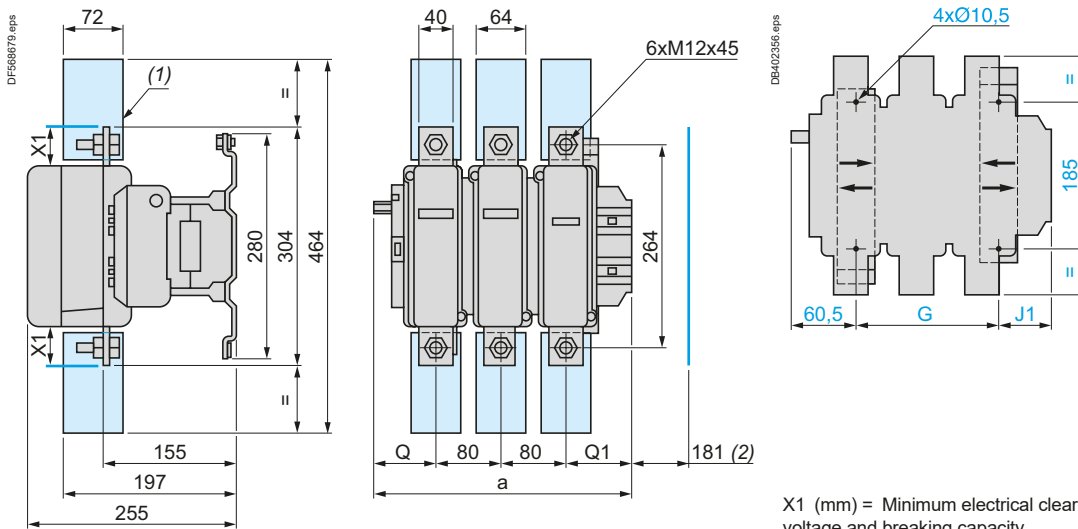
f = minimum distance required for coil removal.

TeSys Control

F High power contactors

Dimensions

LC1F630 and F800



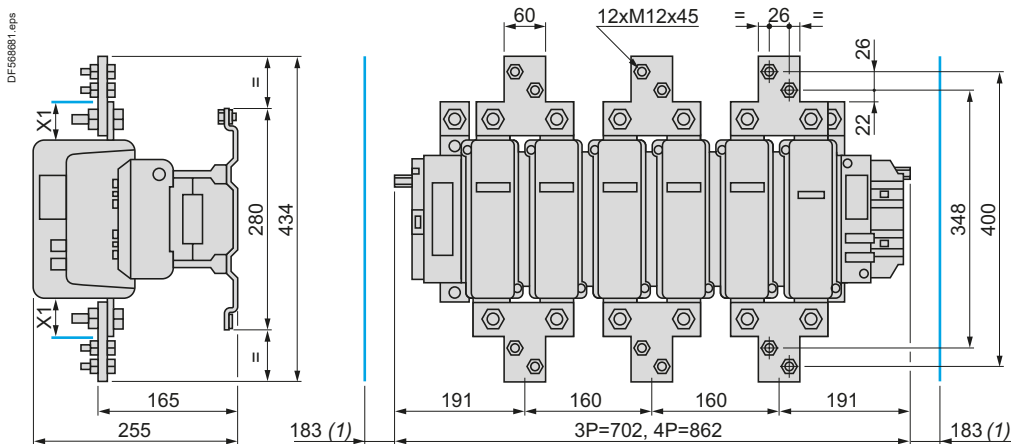
| LC1 | | a | G supplied | G min. | G max. | J1 | Q | Q1 |
|------------|----|-----|---------------|-----------|-----------|------|-----|-----|
| F630 | 2P | 309 | 180 | 100 | 195 | 68.5 | 102 | 127 |
| F630, F800 | 3P | 309 | 180 | 100 | 195 | 68.5 | 60 | 89 |
| F630 | 4P | 389 | 240 | 150 | 275 | 88.5 | 60 | 89 |

X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

| Voltage | 200...500 V | 690...1000 V | 200...690 V | 1000 V |
|---------|-------------|--------------|-------------|--------|
| LC1F630 | 20 | 30 | - | - |
| LC1F800 | - | - | 10 | 20 |

- (1) Power terminal protection shroud (see page B9/14).
- (2) Minimum distance required for coil removal.

LC1F780

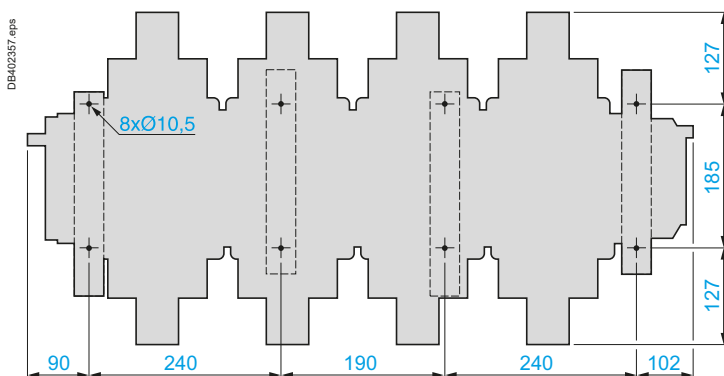


X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

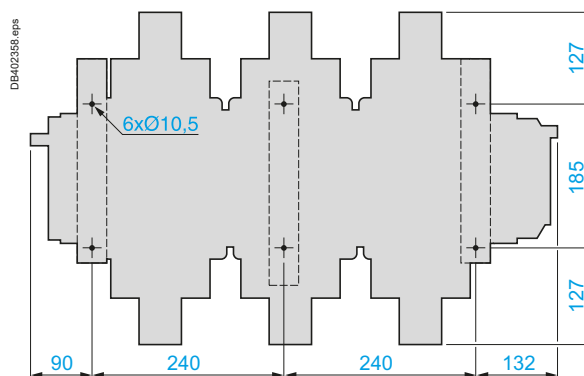
| Voltage | 200...500 V | 690...1000 V |
|---------|-------------|--------------|
| X1 (mm) | 30 | 35 |

(1) Minimum distance required for coil removal.

Fixing centres of LC1F804



Fixing centres of LC1F780

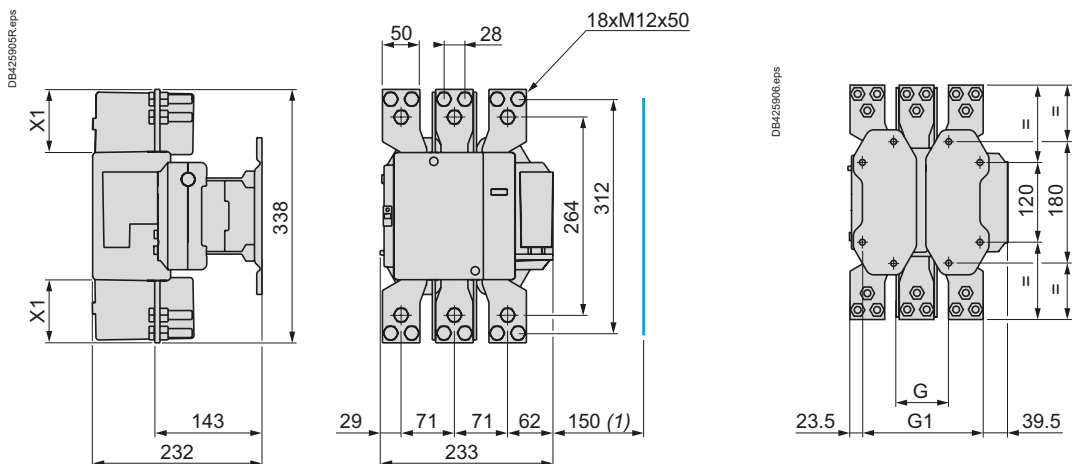


TeSys Control

F High power contactors

Dimensions

LC1SF1200



(1) Minimum distance required for coil removal.

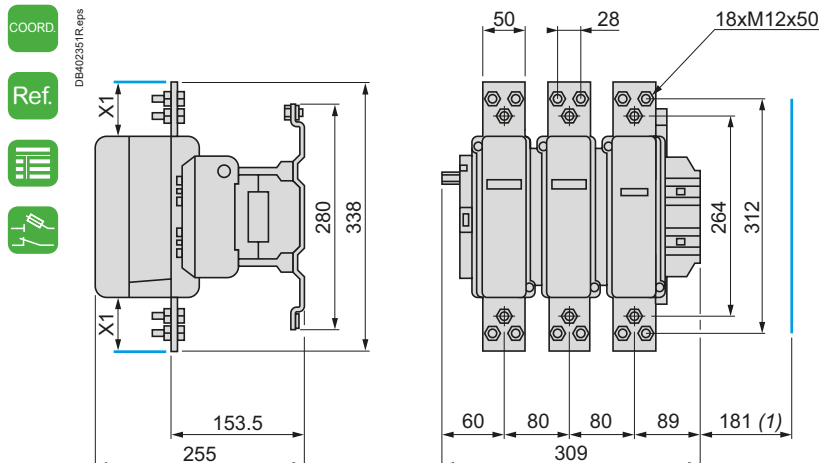
X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

| Voltage | 200...500 V | ≤ 690 V |
|---------|-------------|---------|
| X1 (mm) | 20 | 30 |

| G (2) | Gmin | Gmax | G1 (2) | Gmin | Gmax |
|-------|------|------|--------|------|------|
| 80 | 66 | 120 | 170 | 156 | 210 |

(2) Factory setting.

LC1F1250

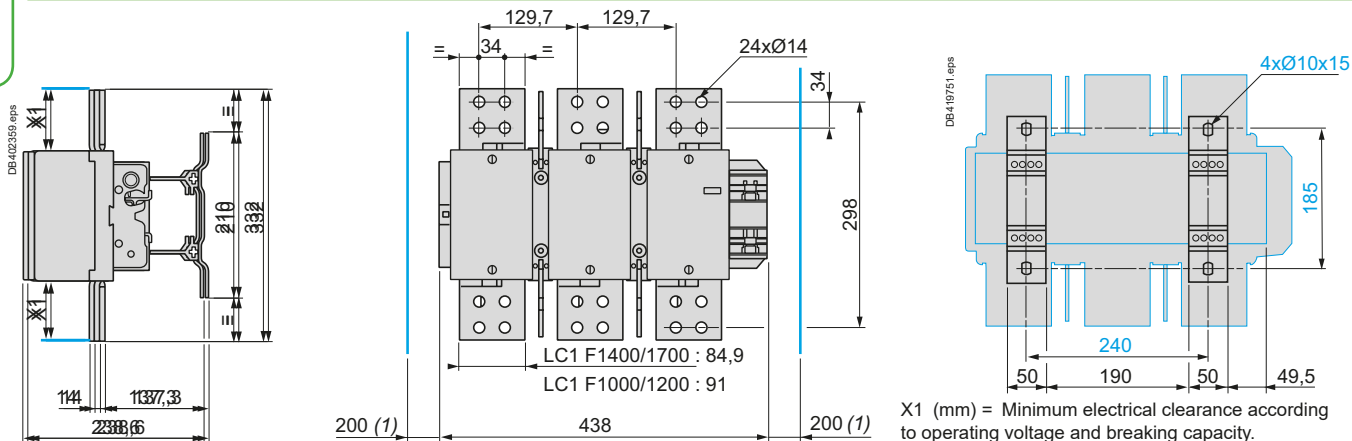


(1) Minimum distance required for coil removal.

X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

| Voltage | 200...500 V | 690...1000 V |
|---------|-------------|--------------|
| X1 (mm) | 20 | 30 |

LC1F1000, LC1F1400, LC1F1700 and LC1F2100



(1) Minimum distance required for coil removal.

X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

| Voltage | 200...500 V | 690...1000 V |
|---------|-------------|--------------|
| X1 (mm) | 90 | 100 |

Coordination tables:
pages A6/36 to A6/45

References:
pages B9/2 to B9/9

Characteristics:
pages B9/44 to B9/51

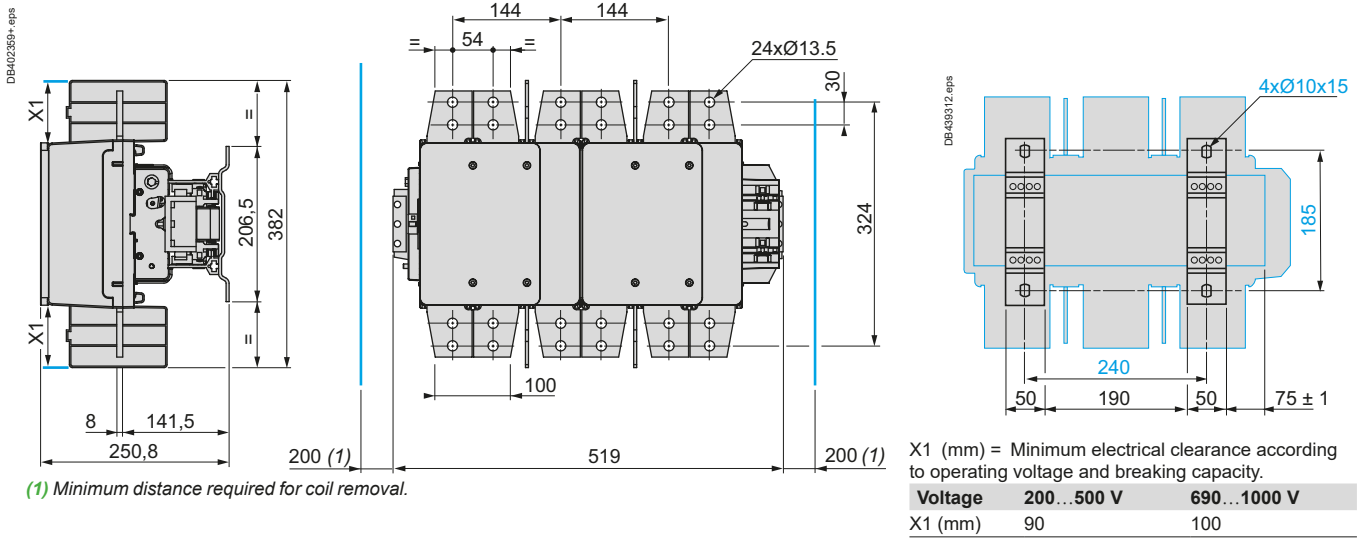
Schemes:
page B9/62

TeSys Control

F High power contactors

Dimensions

LC1F2600

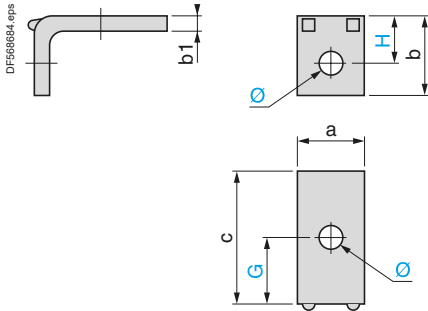


TeSys Control

F High power contactors - Accessories

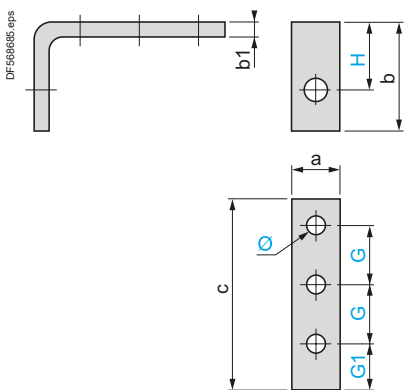
Dimensions

Right-angled connectors LA9F●981 (set of 3) for rear connection



| LA9 | FF981 | FG981 | FJ981 | FK981 | FL981 |
|-----|-------|-------|-------|-------|-------|
| a | 15 | 20 | 25 | 30 | 40 |
| b | 18 | 23 | 29 | 35 | 48 |
| b1 | 3 | 3 | 4 | 5 | 8 |
| c | 42 | 45 | 55 | 52 | 86 |
| G | 24 | 26 | 32.5 | 26 | 45 |
| H | 10.5 | 13 | 16.5 | 20 | 28 |
| Ø | 6.5 | 9 | 11 | 11 | 13 |

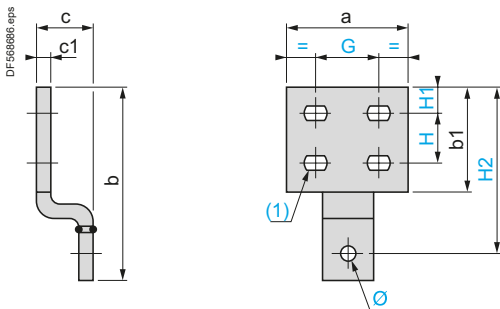
Right-angled connectors LA9F●979 (set of 3) for side connection



| LA9 | FF979 | FG979 | FJ979 | FK979 | FL979 |
|-----|-------|-------|-------|-------|-------|
| a | 15 | 20 | 25 | 30 | 40 |
| b | 54 | 58 | 63.5 | 68 | 117 |
| b1 | 5 | 5 | 6 | 6 | 10 |
| c | 80 | 92 | 120 | 120 | 130 |
| G | 24 | 28 | 37 | 37 | 37.5 |
| G1 | 20 | 22 | 29 | 29 | 35 |
| H | 36 | 39 | 41 | 42 | 76 |
| Ø | 6.5 | 9 | 11 | 11 | 13 |

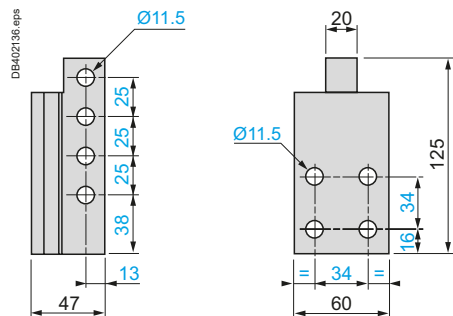
Ref.

Right-angled connectors LA9F●980 with large surface area (set of 3)

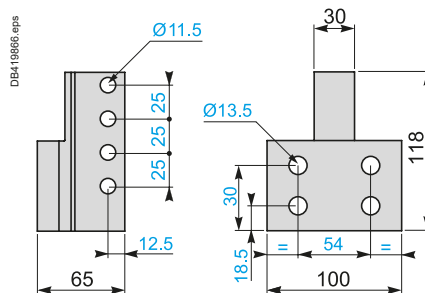


| LA9 | FF980 | FG980 | FJ980 | FK980 | FL980 |
|-----|---------|---------|----------|------------|------------|
| a | 35 | 40 | 50 | 60 | 100 |
| b | 70.5 | 82.5 | 98.5 | 114 | 154 |
| b1 | 40 | 45 | 55 | 65 | 85 |
| c | 29 | 29 | 33 | 33 | 43 |
| c1 | 3 | 3 | 5 | 5 | 10 |
| G | 18 | 20 | 25 | 29 | 53 |
| H | 18 | 20 | 22 | 26 | 40 |
| H1 | 10 | 12 | 14 | 17 | 20 |
| H2 | 60.5 | 72.5 | 84.5 | 97 | 132 |
| Ø | 6.5 | 9 | 11 | 11 | 13 |
| (1) | Ø7 x 10 | Ø9 x 12 | Ø11 x 14 | Ø12.5 x 15 | Ø12.5 x 15 |

Right-angled connectors LA9F2100 (set of 6) for rear connection



Right-angled connectors LA9F2600 (set of 6) for rear connection



High power contactors

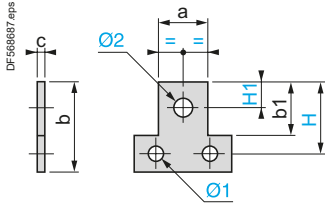
TeSys Control

F High power contactors - Accessories

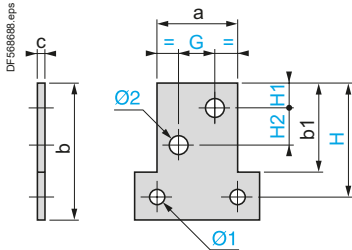
Dimensions

Paralleling links (set of 4)

LA9FG602, FH602



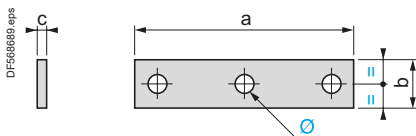
LA9FK602, FL602



| LA9 | FF602 | FG602 | FH602 | FK602 | FL602 |
|-----|-------|-------|-------|-------|-------|
| a | 25 | 30 | 40 | 50 | 60 |
| b | 45 | 55 | 60 | 85 | 100 |
| b1 | 30 | 35 | 40 | 55 | 65 |
| c | 4 | 5 | 8 | 10 | 10 |
| G | – | – | – | 22 | 26 |
| H | 37.5 | 45 | 52.5 | 70 | 85 |
| H1 | 12.5 | 15 | 15 | 14 | 17 |
| H2 | – | – | – | 22 | 26 |
| Ø1 | 6.5 | 9 | 11 | 11 | 13 |
| Ø2 | 11 | 11 | 13 | 11 | 14 |

Links for "star" connection of 3 poles

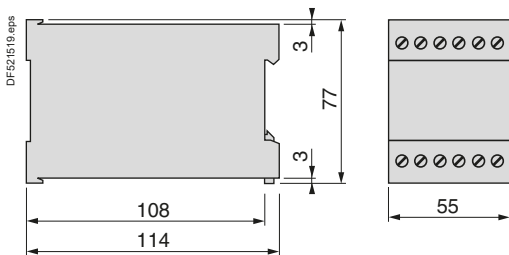
LA9F601



| LA9 | FF601 | FG601 | FH601 | FK601 | FL601 |
|-----|-----------|------------|-----------|-------|-------|
| a | 69 | 100 | 121 | 140 | 200 |
| b | 15 | 20 | 20 | 30 | 40 |
| c | 3 | 3 | 5 | 5 | 8 |
| Ø | 6.5 x 8.5 | 8.5 x 10.5 | 10.5 x 13 | 11 | 13 |

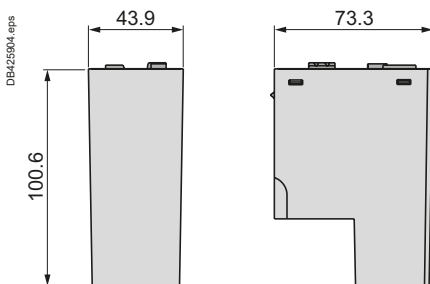
Capacitive delayed opening devices for F contactors

LAZR900



Electronic Control Module for LXE00250 coils

LA4EM25000



References:
pages B9/12 and B9/13

Ref.

High power
contactors

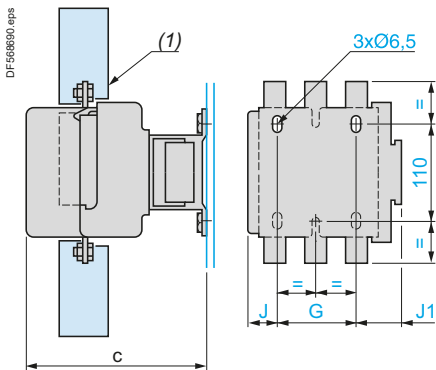
TeSys Control

F High power contactors

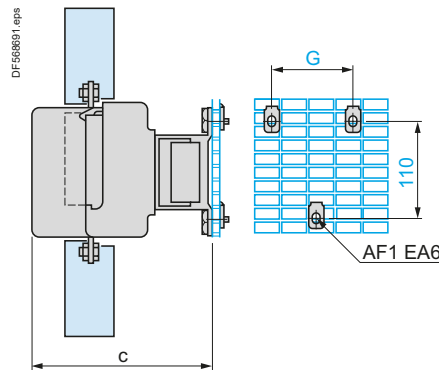
Mounting

LC1F115 to F330

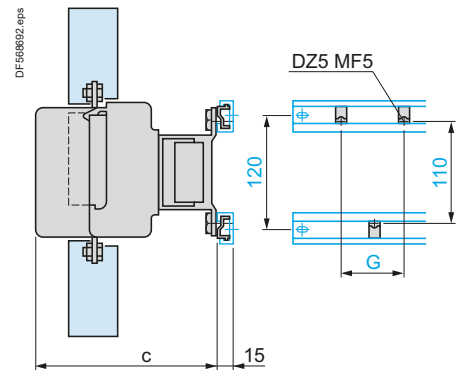
On panel



On pre-slotted mounting plate AM1PA, PB, PC



On rails DZ5MB on 120 mm centres



| LC1 | F115 F150 | F185 F225 | F265 | F330 |
|------------------|--------------|--------------|------|------|
| c ⁽²⁾ | 3P 171 | 181 | 213 | 219 |
| | 4P 171 | 181 | 213 | 219 |
| G | 3P 80 | 80 | 96 | 96 |
| | 4P 80 | 80 | 96 | 96 |
| J | 3P 26.5 | 29 | 44.5 | 44.5 |
| | 4P 45 | 49 | 68.5 | 68.5 |
| J1 | 3P 57 | 59.5 | 61.5 | 61.5 |
| | 4P 75.5 | 79.5 | 85.5 | 85.5 |

| LC1 | F115 F150 | F185 F225 | F265 | F330 |
|------------------|--------------|--------------|------|------|
| c ⁽²⁾ | 3P 171 | 181 | 213 | 219 |
| | 4P 171 | 181 | 213 | 219 |
| G | 3P 80 | 80 | 96 | 96 |
| | 4P 80 | 80 | 96 | 96 |

| LC1 | F115 F150 | F185 F225 | F265 | F330 |
|------------------|--------------|--------------|------|------|
| c ⁽²⁾ | 3P 171 | 181 | 213 | 219 |
| | 4P 171 | 181 | 213 | 219 |
| G | 3P 80 | 80 | 96 | 96 |
| | 4P 80 | 80 | 96 | 96 |

COORD.

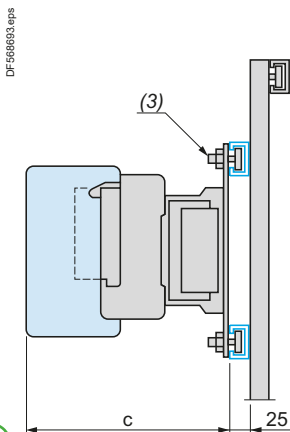
Ref.

High power contactors

High power contactors

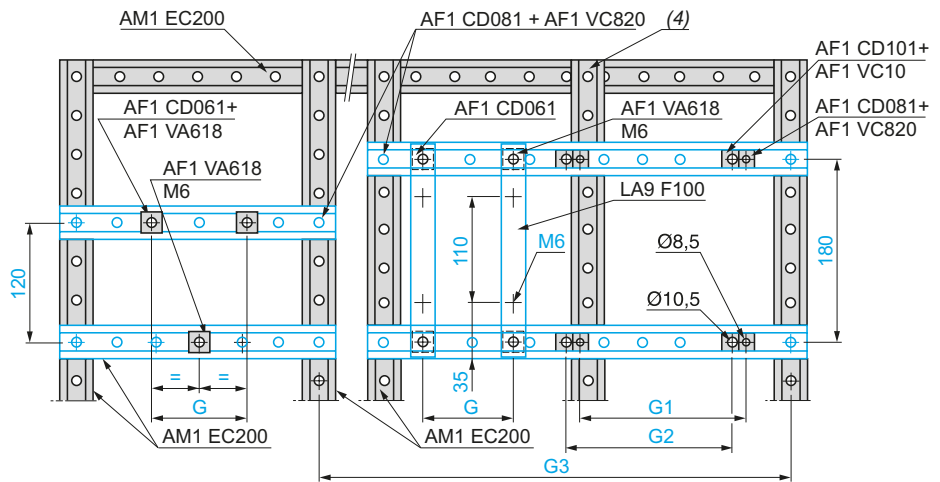
LC1F

On 2 notched rails AM1EC●●●



LC1F115 to F330

LC1F400 to F800



| LC1 | F115, F150 | F185, F225 | F265 | F330 | F400 | F500 | F630 | F780 | F800 |
|-------------|-----------------------|------------|------|------|------|------|------|----------------|------|
| c | 3P 165 ⁽⁵⁾ | 176 | 207 | 213 | 219 | 232 | 255 | 255 | 255 |
| | 4P 165 ⁽⁵⁾ | 176 | 207 | 213 | 219 | 232 | 255 | 255 | - |
| G (M6) | 3P 80 | 80 | 96 | 96 | - | - | - | - | - |
| | 4P 80 | 80 | 96 | 96 | - | - | - | - | - |
| G1 (Ø 8.5) | 3P - | - | - | - | 80 | 80 | - | - | - |
| | 4P - | - | - | - | 80 | 140 | - | - | - |
| G2 (Ø 10.5) | 3P - | - | - | - | - | - | 180 | See page B9/55 | 180 |
| | 4P - | - | - | - | - | - | 240 | See page B9/55 | - |

(1) Power terminal protection shroud (see page B9/14).

(2) See X1 (minimum electrical clearance) pages B9/54 and B9/55.

(3) AF1CD●●● and AF1VA●●●.

(4) This AM1EC200 upright is required when G2 or G3 is greater than 700 mm (please consult your Regional Sales Office).

(5) + 6 mm with time-delay block on LC1F.

TeSys Control

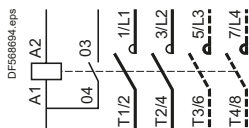
F High power contactors

Schemes

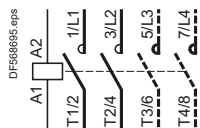
Contactors

2, 3 and 4-pole contactors

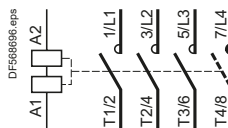
LC1F115 to F630, F1250
(coil LX1F ~)



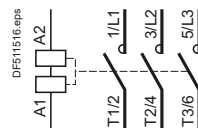
LC1F115 to F630, F1250 (coil LX4F ~)
LC1F115 to F265 (coil LX9F ~)
LC1F800 (coil LX8 F ~ / ~)



LC1F780 ~ or ~



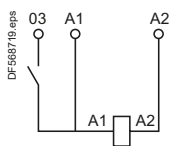
LC1F1000
LC1F1400 ~ or ~, LC1F1700 ~ or ~
LC1F2100 ~ or ~, LC1F2600 ~ or ~



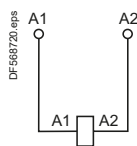
Coils

Standard ~ coils

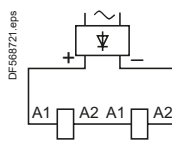
LX1FJ...FL
LX1FH0422...FH3802



LX1FH0202...FH0362
LX1FH4402...FH10002
LX1F8

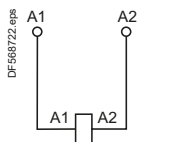


LX1FX
Rectifier supplied and fixed on the contactor



Standard ~ coils

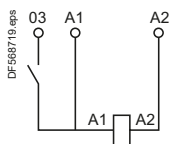
LX4FF, FG, FH, FJ, FK, FL, FX (1), LX4F8



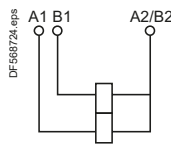
(1) 2 coils in series.

Special ~ coils

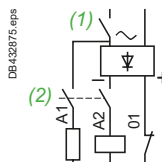
LX9FF, FG



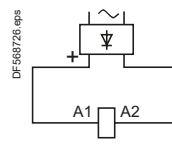
LX9FH...2



LX9FJ, FK, FL



LX4F8

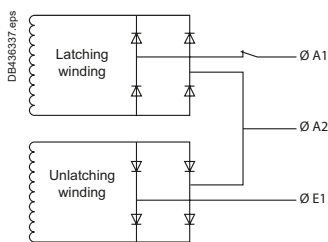


(1) Breaking on ~ side. Drop-out time 50 ms.

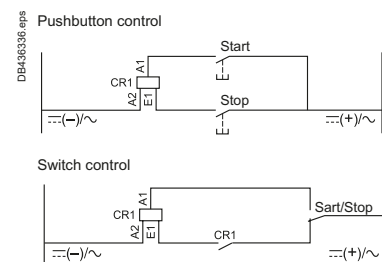
(2) Breaking on ~ side. Drop-out time 20 ms.

Specific wiring diagrams for CR1F contactors

Internal latching/unlatching diagram

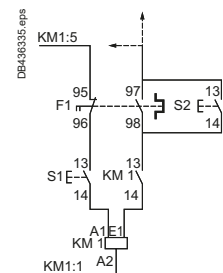
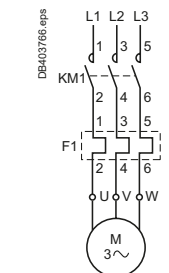


Control diagrams



Warning: terminal A2 is common to both windings in all cases.

Contactors CR1F with thermal overload relay



Coordination tables:
pages A6/36 to A6/45

References:
pages B9/2 to B9/9

Characteristics:
pages B9/44 to B9/51

Dimensions:
pages B9/54 to B9/56

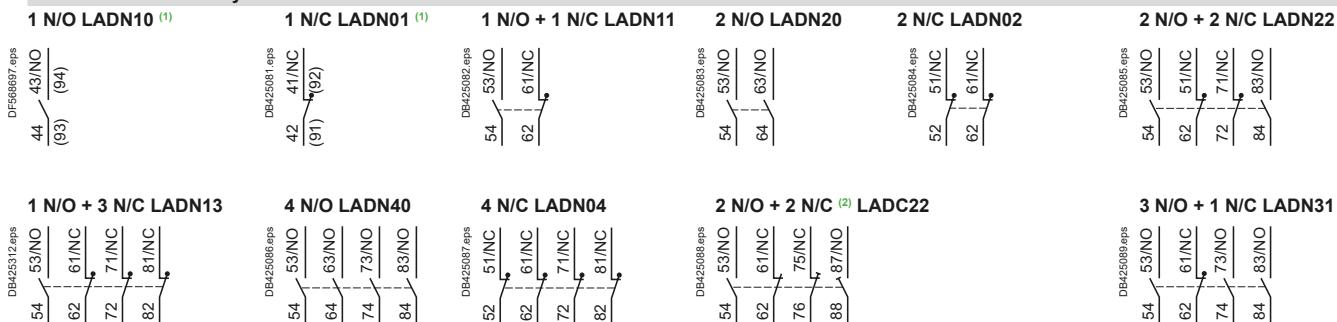
TeSys Control

F High power contactors

Schemes

Add-on blocks

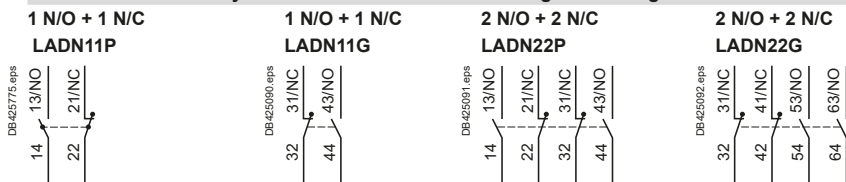
Instantaneous auxiliary contacts



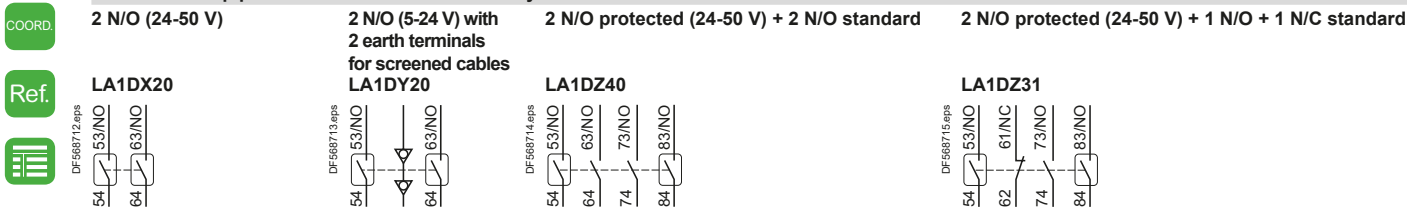
⁽¹⁾ Items in brackets: See "D contactors".

⁽²⁾ 1 N/O + 1 N/C make before break.

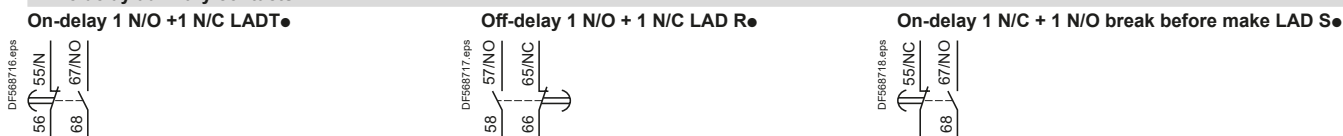
Instantaneous auxiliary contacts with terminal referencing conforming to standard EN 50012 (References: pages B9/10 and B9/11)



Dust and damp protected instantaneous auxiliary contacts

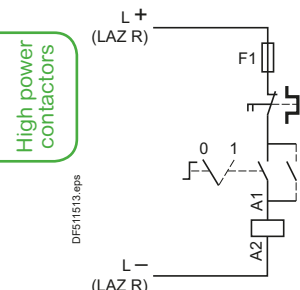


Time delay auxiliary contacts



Capacitive delayed opening devices for F contactors

LAZR9●● + LC1F



TeSys Control

V Vacuum high power contactors

Characteristics

| Selection | | | | | |
|--|--------------------|---------|---------|---------|--|
| Contactor size | | LC1V160 | LC1V320 | LC1V610 | |
| For utilisation category AC-3 | | | | | |
| Maximum operational current in AC-3 | A | 160 | 320 | 610 | |
| Rated operational power P (standard power ratings of motors) | 230 V kW | 45 | 90 | 160 | |
| | 400 V kW | 75 | 160 | 300 | |
| | 525 V kW | 110 | 220 | 400 | |
| | 690 V kW | 150 | 280 | 560 | |
| | 1000 V kW | 200 | 400 | 800 | |
| | 1500 V kW | 280 | 600 | 930 | |
| For 3-phase motors conforming to CSA standards | | | | | |
| Rated operational power P (standard power ratings of 3-phase CSA motors) | 200 V hp | 50 | 100 | 150 | |
| | 240 V hp | 60 | 125 | 200 | |
| | 380 V hp | 100 | 200 | 300 | |
| | 480 V hp | 125 | 250 | 400 | |
| | 600 V hp | 150 | 300 | 500 | |
| | 800 V hp | 200 | 400 | 700 | |
| | 1000 V hp | 250 | 500 | 1000 | |
| | 1500 V hp | 400 | 800 | 1300 | |
| For switching 3-phase capacitors | | | | | |
| Rated operational power P | 240 V kVAR | 47 | 94 | 176 | |
| | 480 V kVAR | 95 | 190 | 356 | |
| | 600 V kVAR | 100 | 200 | 400 | |
| | 1500 V kVAR | 250 | 500 | 1000 | |
| For switching the primaries of 3-phase transformers (LV/LV) | | | | | |
| Rated operational power P | 208 V kVA | 20 | 41 | 81 | |
| | 240 V kVA | 23 | 47 | 94 | |
| | 480 V kVA | 47 | 94 | 188 | |
| | 600 V kVA | 59 | 117 | 234 | |

Environment characteristics

| Contactor type | | | | LC1V160 | LC1V320 | LC1V610 |
|---|---------------------------------|-------------------------|-----------|-----------|-----------|-----------|
| Shock resistance (1/2 sine wave = 11 ms) Conforming to IEC/EN 60068-2-27 | Contacts closed | | | 10 gn | 10 gn | 10 gn |
| | Contacts open | | | 10 gn | 10 gn | 10 gn |
| Vibration resistance Conforming to IEC/EN 60068-2-6 | | 10...500 Hz | | 2 gn | 2 gn | 2 gn |
| Operating altitude | Above sea level | Maximum | m | 3600 | 3600 | 3600 |
| | Below sea level | Minimum | m | 2500 | 4500 | 4500 |
| Ambient air temperature around the device | Storage | | °C | -40...+80 | -40...+80 | -40...+80 |
| | Operation 0.8... 1.1 Uc | | °C | -5...+55 | -5...+55 | -5...+55 |
| | Permissible for operation at Uc | | °C | -10...+75 | -10...+75 | -10...+75 |
| Degree of protection | | Conforming to IEC 60529 | | IP 00 | IP 00 | IP 00 |
| Operating position | | | | Any | Any | Any |
| Cabling | Cable c.s.a. | mm² | | 70 | 185 | 2 x 185 |
| | Key for hex. screws | mm | | Allen 4 | 20 | 20 |
| | Tightening torque | N.m | | 14 | 39 | 39 |

Control circuit characteristics

| | | | | | |
|-------------------------------------|----------|-----------|--------------|--------------|--------------|
| Rated insulation voltage (Ui) | To earth | V | 2000 | 2000 | 2000 |
| Consumption | Inrush | VA | 300 | 600 | 1700 |
| | Sealed | VA | 30 | 20 | 28 |
| Permissible control circuit voltage | | | 0.8...1.1 Uc | 0.8...1.1 Uc | 0.8...1.1 Uc |
| Closing time ⁽¹⁾ | | ms | 18...22 | 24...32 | 24...32 |
| Opening time ⁽¹⁾ | | ms | 95...115 | 95...115 | 95...115 |

(1) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.



TeSys Control

V Vacuum high power contactors

Characteristics

| Main pole characteristics | | | | | |
|--|--------------------------------------|------------------------------|---------|---------|------|
| Contactor type | | LC1V160 | LC1V320 | LC1V610 | |
| Rated insulation voltage (Ui) | V | 1500 | 1500 | 1500 | |
| Rated impulse withstand voltage (Uimp) | kV | 8 | 8 | 8 | |
| Conforming to standards | | EN 60947-4-1 - IEC 60947-4-1 | | | |
| Conventional rated thermal current (Ith) | A | 160 | 320 | 630 | |
| Rated operational current (Ie) | $\theta \leq 40$ °C AC-1 | A | 160 | 320 | 630 |
| | $\theta \leq 55$ °C AC-3 | A | 160 | 320 | 610 |
| | $\theta \leq 55$ °C AC-4 | A | 130 | 270 | 540 |
| Electrical durability in millions of operating cycles (400 V at I max) | AC-1 | | 1.2 | 1 | 1 |
| | AC-3 | | 1.6 | 1.5 | 1.5 |
| | AC-4 | | 0.18 | 0.15 | 0.12 |
| Mechanical durability | In millions of operating cycles | | 5 | 2.5 | 2 |
| Maximum operating rate in operating cycles per hour | Mechanical | | 1200 | 1200 | 1200 |
| | AC-1 | | 900 | 900 | 900 |
| | AC-3 | | 900 | 900 | 900 |
| | AC-4 | | 450 | 450 | 450 |
| Maximum making capacity (I _{ms}) | U _e = 1500 V To IEC 60947 | A | 1900 | 3800 | 7300 |
| Maximum breaking capacity (I _{ms}) | U _e = 1500 V To IEC 60947 | A | 1600 | 3200 | 6100 |
| Maximum permissible current | For 1 s | A | 2400 | 4500 | 9000 |
| | For 2 s | A | 2000 | 3750 | 7580 |
| | For 10 s | A | 1600 | 3200 | 6100 |
| | For 30 s | A | 960 | 1920 | 3600 |
| Short-circuit protection at I _e in cat. AC-3 max. | aM fuse | A | 160 | 400 | 630 |

| Auxiliary contact characteristics | | | | |
|--|--------------|-----------------|------|--|
| Rated insulation voltage (Ui) | V | 690 | | |
| Conventional rated thermal current (Ith) | A | 10 | | |
| Rated operational current (Ie) | AC-15, 230 V | A | 0.78 | |
| | AC-15, 400 V | A | 0.45 | |
| | AC-15, 500 V | A | 0.35 | |
| | DC-13, 24 V | A | 1.1 | |
| | DC-13, 110 V | A | 0.24 | |
| | DC-13, 220 V | A | 0.12 | |
| Cabling | Cable c.s.a. | mm ² | 2.5 | |
| Short-circuit protection | gG fuse | A | 10 | |
| Operating time ⁽¹⁾ (at 100 % of U _c) | "C" | ms | ±5 | |
| | "O" | ms | ±5 | |

(1) Operating time in relation to the main contacts.

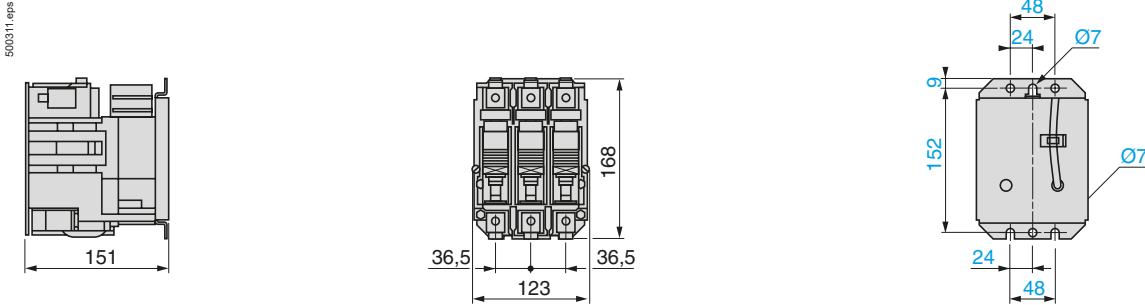
TeSys Control

V Vacuum high power contactors

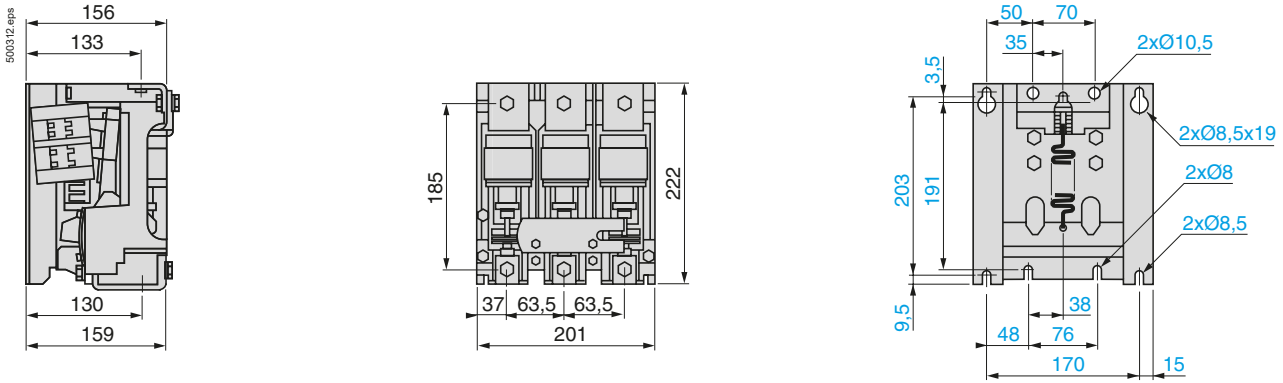
Dimensions, mounting, schemes

Dimensions, mounting

LC1V160

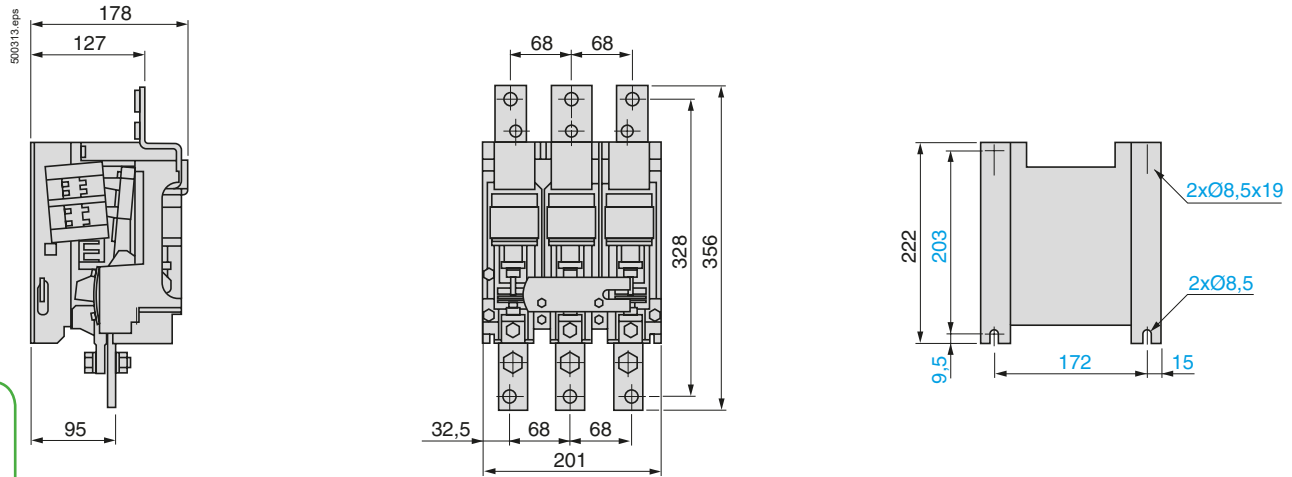


LC1V320



Ref.

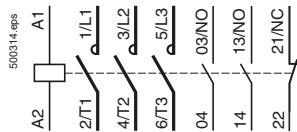
LC1V610



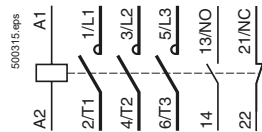
High power contactors

Schemes

LC1V160

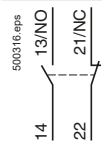


LC1V320, V610



Auxiliary contact blocks

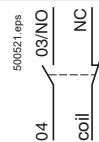
LA1VN11 1 N/O & 1 N/C



LA1VN20 2 N/O



LA1VN11X 1 N/O



References:
page B9/4

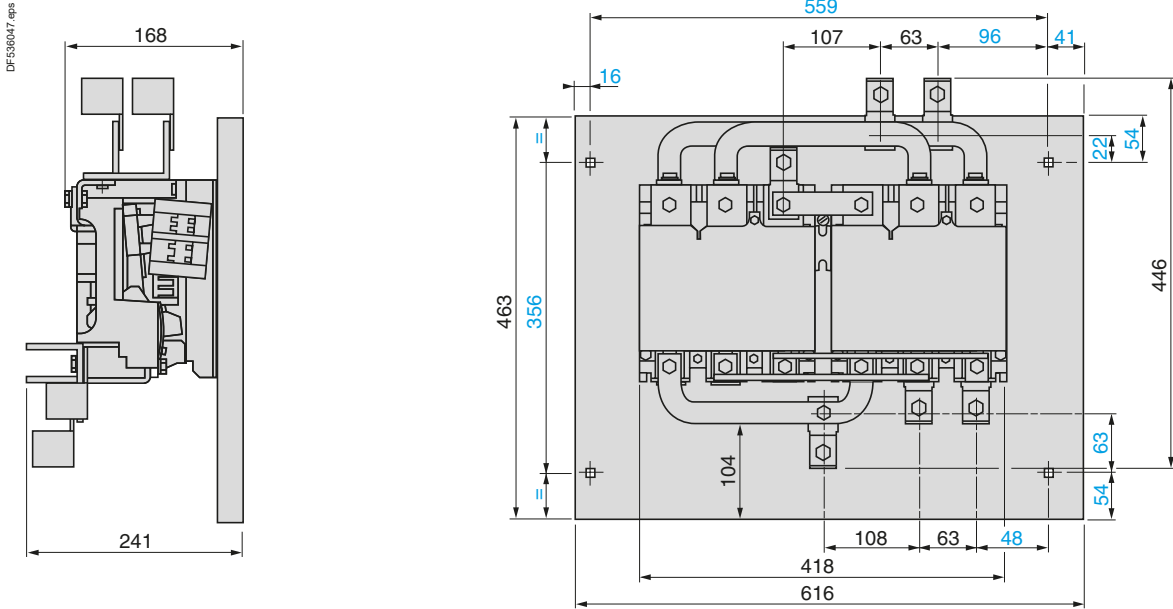
TeSys Control

V Vacuum high power reversing contactors

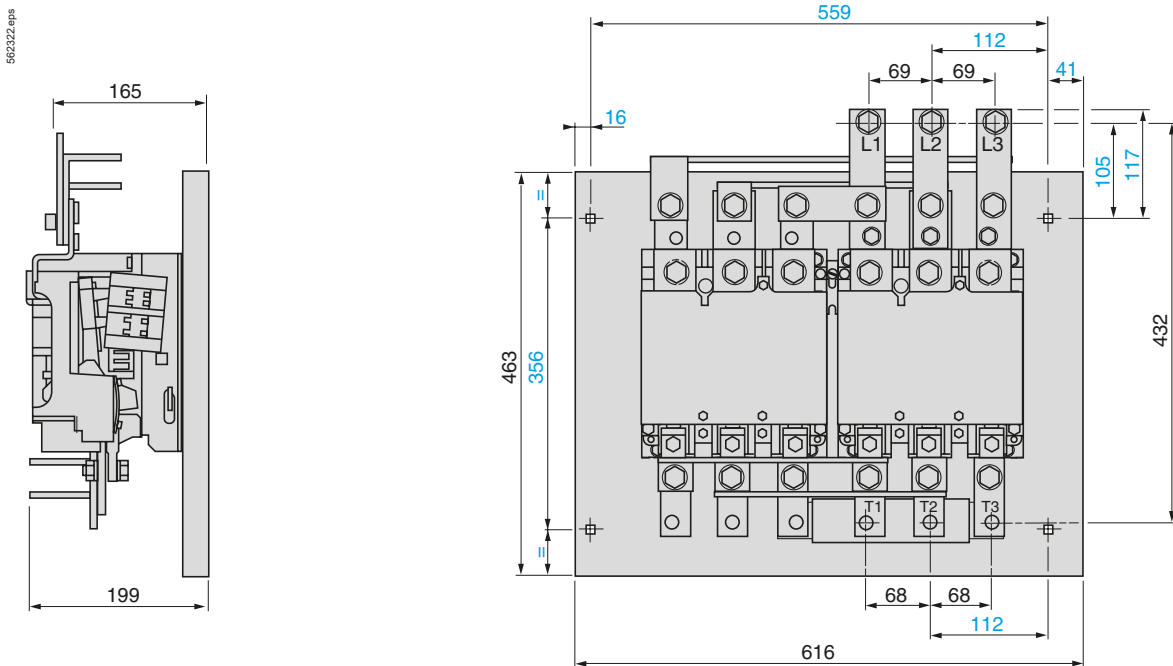
Dimensions, mounting

Dimensions, mounting

LC2V320



LC2V610



Ref.



High power contactors

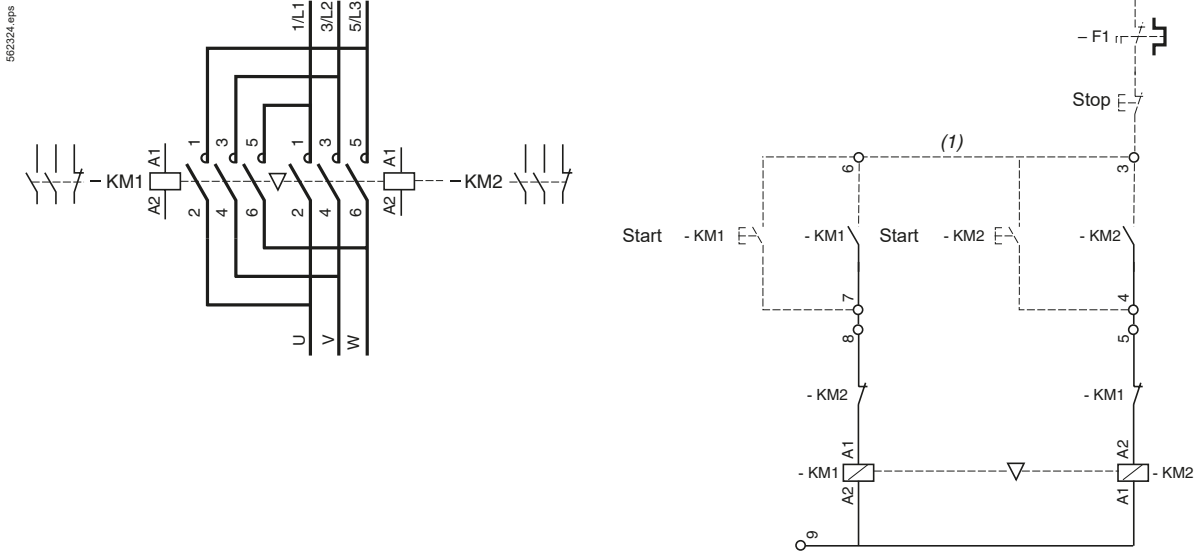
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V Vacuum high power reversing contactors

Schemes

Schemes

LC2V320



Ref.

(1) Dotted line indicates wiring to be installed by the customer.



High power
contactors

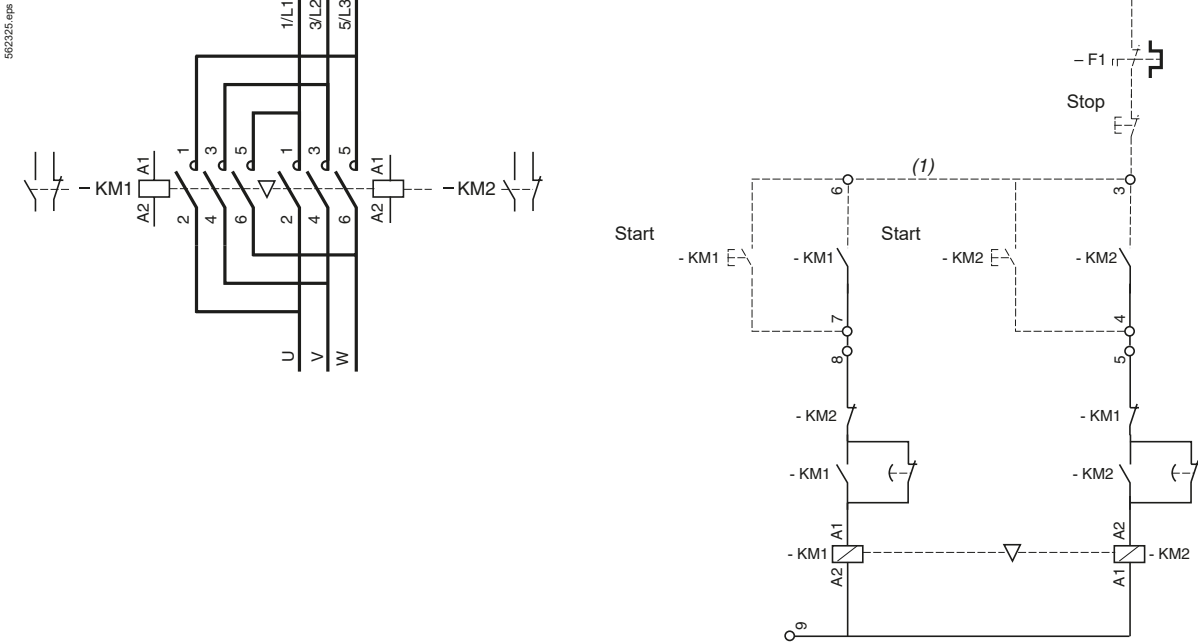
TeSys Control

V Vacuum high power reversing contactors

Schemes

Schemes

LC2V610



(1) Dotted line indicates wiring to be installed by the customer.

Ref.



High power
contactors

TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics



LC1FG150



LC1FG265

Ref.



High power
contactors

Shockproof contactor specificity

In an environment subject to severe mechanical shocks, unwanted closing of a contactor's poles and the serious consequences of this, is not permissible.

Shockproof contactors **LC1FG150** to **FG630** are equipped with an auxiliary electromechanical device which ensures that the contactor is mechanically locked in the "open" position when it's main electromagnet is not energised.

If the contactor is subjected to mechanical impact, from back to front or from front to back, accidental closing of the poles is then impossible.

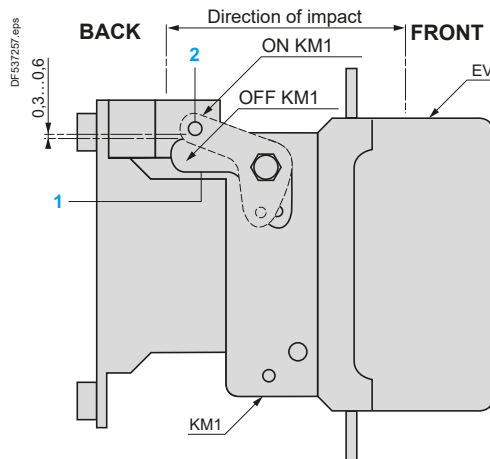
In addition, accidental opening of the poles (when the contactor is in the "on" position), is virtually impossible due to the significant pull-in force characteristic of these contactors.

Applications

- **Marine:** on-board equipment, windlasses, capstans, winches, etc...
- **Military equipment:** land, sea, launching silos.
- **Heavy mechanical handling systems:** travelling cranes, cranes, gantries.
- **Conveying and handling:** lifts, hoists, conveyors.
- **Equipment for power stations.**
- **Distribution boards.**

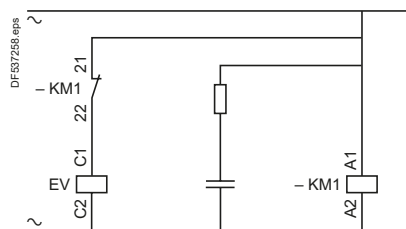
Description of shockproof device

- Shockproof contactors **LC1FG●●●** are equipped with:
- a lever **1** that is rotated by the core of the contactor's electromagnet.
 - an auxiliary electromagnet (EV) for the locking function.
 - an RC circuit (Resistor-Capacitor) to limit overvoltage.



Operation

- In the 'off' position (contactor open and not energised) the core **2** of the electromagnet (EV) locks the lever **1** and therefore the contactor.
 - The coils (KM1) and (EV) are energised simultaneously, the core **2** releases the lever **1** and allows the contactor to close.
 - De-energisation of the locking electromagnet (EV) is achieved by an auxiliary contact within the contactor.
- The core **2** rests freely in lever **1**.
- On de-energisation of coil KM1, the moving contact drops out. Core **2**, under spring pressure, once again locks lever **1**.



Ref.



High power contactors

TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics - Durability (AC)

Use in category AC-3 ($U_e \leq 440$ V)

Operational current and power ($\theta \leq 55$ °C)

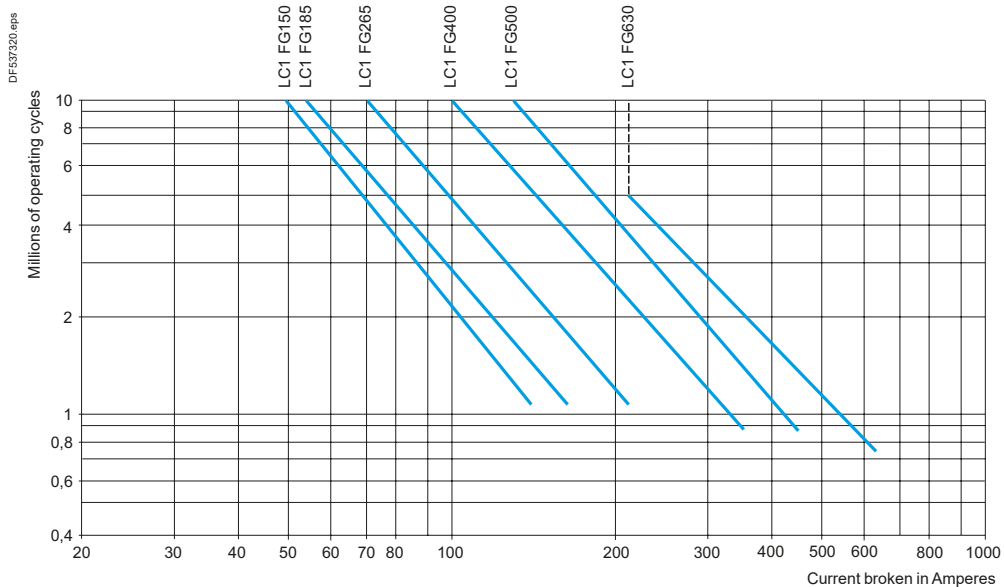
| Contactors | | | LC1FG150 | LC1FG185 | LC1FG265 | LC1FG400 | LC1FG500 | LC1FG630 |
|---|-----------|-----------|----------|----------|----------|----------|----------|----------|
| Operational current | | A | 150 | 185 | 265 | 400 | 500 | 630 |
| Operational power Standard power ratings of motors) | 220/230 V | kW | 40 | 55 | 75 | 110 | 147 | 200 |
| | | hp | 54 | 75 | 100 | 150 | 200 | 270 |
| | 380/400 V | kW | 75 | 90 | 132 | 200 | 250 | 335 |
| | | hp | 100 | 185 | 180 | 270 | 340 | 450 |
| | 415 V | kW | 80 | 100 | 140 | 220 | 280 | 375 |
| | | hp | 110 | 136 | 180 | 300 | 380 | 500 |
| | 440 V | kW | 80 | 100 | 140 | 250 | 295 | 400 |
| | | hp | 110 | 136 | 190 | 340 | 400 | 545 |
| | 500 V | kW | 90 | 110 | 160 | 257 | 355 | 400 |
| | | hp | 125 | 150 | 220 | 350 | 480 | 545 |
| | 660/690 V | kW | 100 | 110 | 160 | 280 | 335 | 450 |
| | | hp | 136 | 150 | 220 | 380 | 450 | 600 |
| | 1000 V | kW | 65 | 100 | 147 | 185 | 335 | 450 |
| | | hp | 85 | 136 | 200 | 250 | 450 | 610 |

Maximum operating rate (operating cycles/hour) ⁽¹⁾

| On-load factor | Operational power | LC1FG150 | LC1FG185 | LC1FG265 | LC1FG400 | LC1FG500 | LC1FG630 |
|----------------|-------------------|----------|----------|----------|----------|----------|----------|
| ≤ 85 % | P | 750 | 750 | 750 | 500 | 500 | 500 |
| ≤ 85 % | 0.5 P | 2000 | 2000 | 2000 | 1200 | 1200 | 1200 |
| ≤ 25 % | P | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 |

(1) Depending on the operational power and the on-load factor ($\theta \leq 55$ °C).

Electrical durability in utilisation category AC-3 ($U_e \leq 440$ V)



Control of 3-phase asynchronous squirrel cage motors with breaking whilst running. The current broken (I_e) in category AC-3 is equal to the rated operational current of the motor.

Example:

Asynchronous motor with $P = 55$ kW - $U_e = 380$ V - $I_e = 105$ A

4 million operating cycles required.

The above selection curves show the contactor rating needed: **LC1FG265**.



TeSys Control

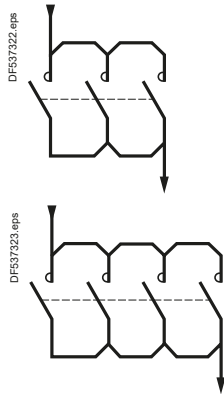
FG Shockproof high power 3-pole contactors

Characteristics - Durability (AC)

| Use in category AC-1 ($U_e \leq 440$ V) | | | | | | | | | | | |
|---|-------|--------|-----------------|-----------------------------|----------|----------|----------|----------|----------|-----|------|
| Contactors | | | | LC1FG150 | LC1FG185 | LC1FG265 | LC1FG400 | LC1FG500 | LC1FG630 | | |
| Connection | Cable | C.s.a. | mm ² | 120 | 150 | 240 | – | – | – | | |
| | Bar | Number | | – | – | – | 2 | 2 | 2 | | |
| | | C.s.a. | mm | – | – | – | 30 x 5 | 40 x 5 | 60 x 5 | | |
| Maximum operating rate in operating cycles/hour | | | | 600 | 600 | 600 | 600 | 600 | 600 | | |
| Operational current AC-1 | | | | ≤ 40 °C | A | 250 | 270 | 350 | 500 | 700 | 1000 |
| | | | | ≤ 55 °C | A | 220 | 240 | 300 | 430 | 580 | 850 |
| | | | | ≤ 70 °C ⁽¹⁾ | A | 170 | 180 | 250 | 340 | 500 | 700 |

(1) Only for operation with coil supplied at U_c .

Increase in operational current by parallel connection of poles



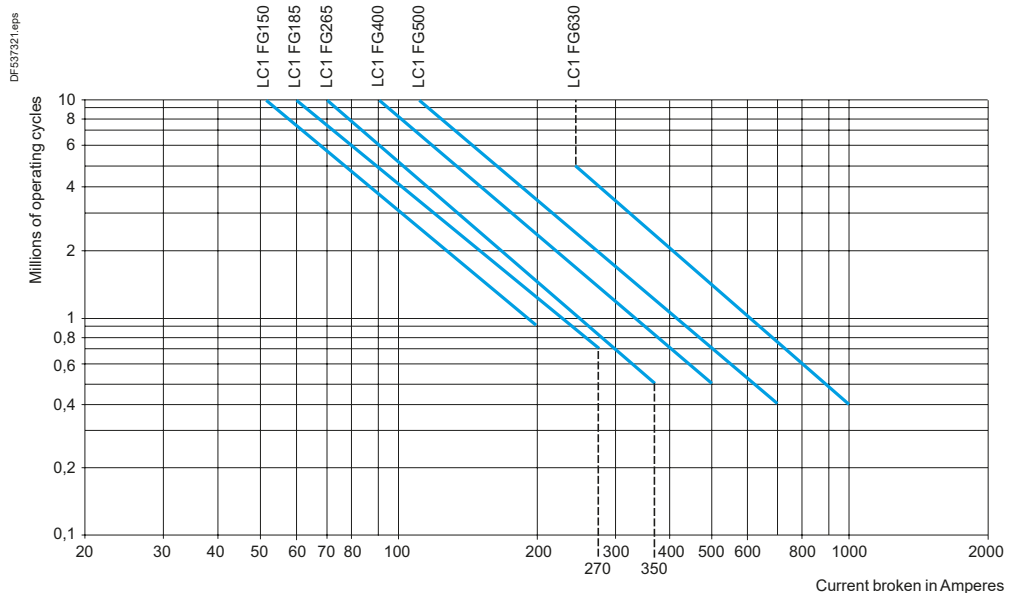
Apply the following multiplying factors to the current values given above.

The factors take into account the often unbalanced current distribution between the 2 poles:

- 2 poles in parallel: $K = 1.6$
- 3 poles in parallel: $K = 2.25$
- 4 poles in parallel: $K = 2.8$.

Recommended connection scheme to equalise the currents in each pole (see opposite).

Electrical durability in utilisation category AC-1 ($U_e \leq 440$ V)



Example:

Control of resistive circuits ($\cos \varphi \geq 0.95$).

The current broken (I_c) in category AC-1 is equal to the current (I_e) normally drawn by the load.

$U_e = 220$ V - $I_c = I_e = 300$ A - $\theta = 40$ °C.

1 million operating cycles required.

The above selection curves show the contactor rating needed: **LC1FG400**.

TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics - Durability (AC)

| Thermal limits in utilisation categories AC-2/AC-4 | | | | | | | |
|--|---|--|-----------|-----------|-----------|-----------|-----------|
| Contactors | | LC1 FG150 | LC1 FG185 | LC1 FG265 | LC1 FG400 | LC1 FG500 | LC1 FG630 |
| Thermal limit zone | Operating cycles/hour ⁽¹⁾ and on-load factor | Maximum current broken according to the duty requirements (thermal limit, ambient temperature ≤ 55 °C) | | | | | |
| A | From 150 and 15 % to 300 and 10 % | 310 | 380 | 560 | 780 | 1100 | 1400 |
| B | From 150 and 20 % to 600 and 10 % | 280 | 350 | 500 | 700 | 950 | 1250 |
| C | From 150 and 30 % to 1200 and 10 % | 240 | 300 | 400 | 600 | 750 | 950 |
| D | From 150 and 55 % to 2400 and 10 % | 190 | 240 | 320 | 450 | 600 | 720 |
| E | From 150 and 85 % to 3600 and 10 % | 145 | 170 | 230 | 350 | 500 | 660 |

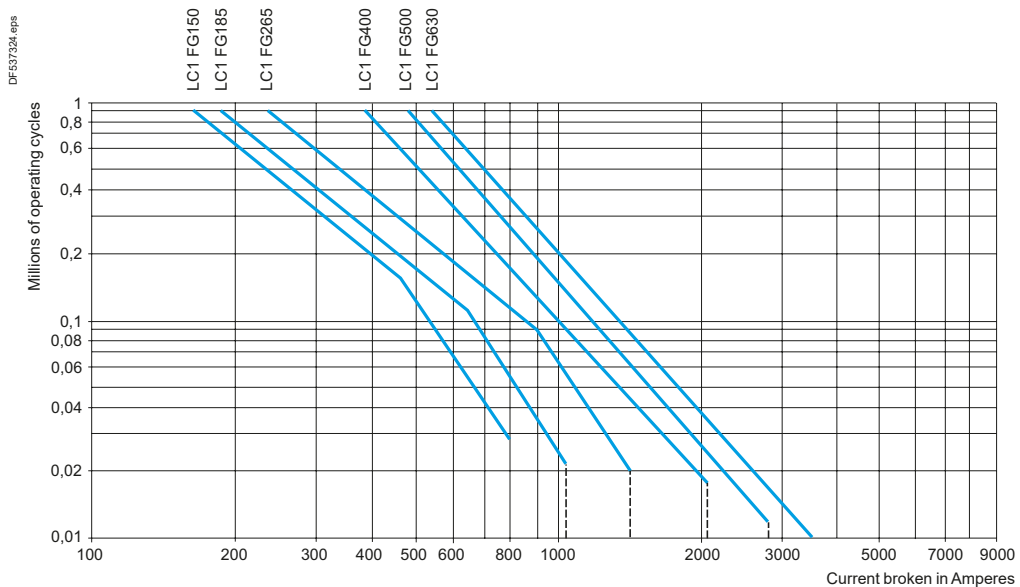
(1) Do not exceed the maximum limit for the mechanical operating cycles.

Counter current braking (plugging)

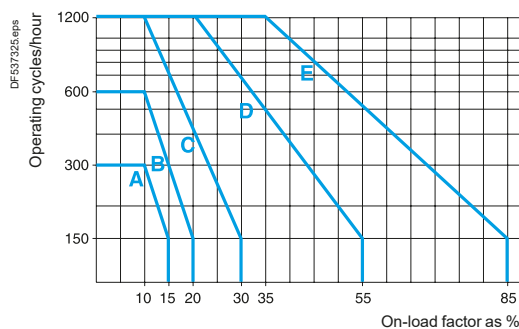
The current varies from the maximum plug-braking current to the rated motor current. The current made must be compatible with the making and breaking capacities of the contactor.

In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

Electrical durability in utilisation categories AC-2/AC-4 ($U_e \leq 440$ V)



Example: Contactor selection



For an on-load factor of 10 % at 400 operating cycles per hour, the curve on the left indicates zone B. If the current broken is 600 A, the above table leads to selection of an **LC1FG400** contactor. Referring to the electrical durability curves, it can be seen that the contactor will be able to perform 350 000 operating cycles. Where a higher value of electrical durability is required, 1 million operating cycles for example, an **LC1FG630** contactor would be recommended.

Ref.



High power contactors

Switching 3-phase capacitors

Capacitors, together with the circuits to which they are connected, form oscillatory circuits which can, at the moment of switch-on, give rise to high transient currents (> 180 I_n) at high frequencies (1 to 15 kHz).

The contactors are used for direct switching. The values of peak current at switch-on must not exceed the values indicated below.

An inductor or an early break resistor may be inserted in each of the three phases supplying the capacitors to reduce the peak current, if necessary. This must be done when switching multiple step capacitor banks.

Inductance values are determined according to the selected operating temperature: please refer to our "Motor starter solutions - Control and protection components" catalogue.

In addition, in accordance with standards IEC 60070, NF C 54 100, VDE 0560, the switching contactor must be able to withstand a continuous current of 1.43 times the rated current of the capacitor bank step being switched. The rated operational powers given in table the below take this overload into account.

Short-circuit protection is normally provided by g1 fuses rated at 1.3 to 1.6 I_n.

Maximum operational power of contactors

Maximum operating rate: 120 operating cycles/hour.

Electrical durability at maximum load: 100 000 operations.

With choke inductors connected, where necessary.

| Operational power at 50/60 Hz | | | | | | Maximum peak current | Contactor to be used |
|-------------------------------|-------|-------|-----------|-------|-------|----------------------|----------------------|
| θ ≤ 40 °C | | | θ ≤ 55 °C | | | | |
| 220 V | 400 V | 600 V | 220 V | 400 V | 600 V | A | |
| 240 V | 440 V | 660 V | 240 V | 440 V | 660 V | | |
| kvar | kvar | kvar | kvar | kvar | kvar | | |
| 60 | 100 | 135 | 40 | 85 | 90 | 3200 | LC1FG150 |
| 70 | 125 | 160 | 50 | 100 | 100 | 3500 | LC1FG185 |
| 90 | 160 | 225 | 75 | 125 | 125 | 5000 | LC1FG265 |
| 125 | 220 | 300 | 100 | 160 | 200 | 8000 | LC1FG400 |
| 180 | 300 | 400 | 125 | 220 | 300 | 10 000 | LC1FG500 |
| 250 | 400 | 600 | 190 | 350 | 500 | 12 000 | LC1FG630 |

Switching the primaries of 3-phase transformers (LV/LV)

When a transformer is switched on, there is generally an initial current surge which can reach 20 to 40 times the rated current for the power ratings shown below.

This current reaches its peak value almost instantaneously and then decreases in a largely exponential manner, quickly dropping back down to its steady state value.

Contactor selection

Operating rate less than 120 operating cycles/hour.

Maximum operational voltages: 690/1000 V 50/60 Hz ⁽²⁾.

The value of the peak magnetising current must be lower than the values indicated below.

Maximum ambient temperature: 55 °C.

| Contactor | | LC1FG150 | LC1FG185 | LC1FG265 | LC1FG400 | LC1FG500 | LC1FG630 |
|---|-----------|----------|----------|----------|----------|----------|----------|
| Maximum permissible current peak at switch-on | A | 1700 | 2800 | 3500 | 5500 | 6800 | 9000 |
| Maximum operational power ⁽¹⁾ | 220 V | kVA | 25 | 40 | 50 | 75 | 100 |
| | 380 V | kVA | 50 | 75 | 90 | 130 | 170 |
| | 415/440 V | kVA | 55 | 80 | 100 | 140 | 190 |
| | 500 V | kVA | 65 | 95 | 110 | 170 | 225 |
| | 660 V | kVA | 80 | 120 | 140 | 200 | 270 |
| | 1000 V | kVA | 100 | 150 | 200 | 250 | 375 |

⁽¹⁾ Maximum operational power corresponding to a current peak at switch-on of 30 I_n.

⁽²⁾ Refer to page B9/80 and B9/81 for details on operational voltage.

TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics (DC)

Ref.



High power contactors

Use in category DC-1 (resistive loads; time constant L/R ≤ 1 ms)

| Rated operational current I _e | | | | | | | |
|--|---------------------------------------|------------|-----------|-----------|-----------|-----------|-----------|
| Operational voltage (U _e) | Number of poles to be wired in series | Contactors | | | | | |
| | | LC1 FG150 | LC1 FG185 | LC1 FG265 | LC1 FG400 | LC1 FG500 | LC1 FG630 |
| V | | A | A | A | A | A | A |
| 24 | 1 | 160 | 220 | 300 | 400 | 600 | 850 |
| | 2 | 160 | 220 | 300 | 400 | 600 | 850 |
| | 3 | 160 | 220 | 300 | 400 | 600 | 850 |
| | 4 | 160 | 220 | 300 | 400 | 600 | 850 |
| 48/75 | 1 | 160 | 220 | 300 | 400 | 600 | 850 |
| | 2 | 160 | 220 | 300 | 400 | 600 | 850 |
| | 3 | 160 | 220 | 300 | 400 | 600 | 850 |
| | 4 | 160 | 220 | 300 | 400 | 600 | 850 |
| 125 | 1 | – | – | – | – | – | – |
| | 2 | 130 | 170 | 300 | 400 | 550 | 850 |
| | 3 | 130 | 170 | 300 | 400 | 600 | 850 |
| | 4 | 130 | 170 | 300 | 400 | 600 | 850 |
| 225 | 1 | – | – | – | – | – | – |
| | 2 | 100 | 150 | 250 | 350 | 450 | 700 |
| | 3 | 130 | 170 | 300 | 400 | 600 | 850 |
| | 4 | 130 | 170 | 300 | 400 | 600 | 850 |
| 300 | 3 | 100 | 150 | 250 | 350 | 450 | 700 |
| | 4 | 130 | 170 | 300 | 400 | 600 | 850 |
| 460 | 4 | 100 | 150 | 250 | 350 | 450 | 700 |

Use in category DC-2 to DC-5 (inductive loads; time constant L/R ≤ 15 ms)

| Rated operational current I _e | | | | | | | |
|--|---------------------------------------|------------|-----------|-----------|-----------|-----------|-----------|
| Operational voltage (U _e) | Number of poles to be wired in series | Contactors | | | | | |
| | | LC1 FG150 | LC1 FG185 | LC1 FG265 | LC1 FG400 | LC1 FG500 | LC1 FG630 |
| V | | A | A | A | A | A | A |
| 24 | 1 | 140 | 180 | 280 | 350 | 550 | 850 |
| | 2 | 140 | 180 | 280 | 350 | 550 | 850 |
| | 3 | 140 | 180 | 280 | 350 | 550 | 850 |
| | 4 | 140 | 180 | 280 | 350 | 550 | 850 |
| 48/75 | 1 | 140 | 180 | 280 | 350 | 550 | 850 |
| | 2 | 140 | 180 | 280 | 350 | 550 | 850 |
| | 3 | 140 | 180 | 280 | 350 | 550 | 850 |
| | 4 | 140 | 180 | 280 | 350 | 550 | 850 |
| 125 | 1 | – | – | – | – | – | – |
| | 2 | 100 | 140 | 250 | 350 | 550 | 850 |
| | 3 | 120 | 160 | 280 | 350 | 550 | 850 |
| | 4 | 120 | 160 | 280 | 350 | 550 | 850 |
| 225 | 1 | – | – | – | – | – | – |
| | 2 | 80 | 100 | 200 | 280 | 450 | 700 |
| | 3 | 100 | 140 | 250 | 350 | 550 | 850 |
| | 4 | 120 | 160 | 280 | 350 | 550 | 850 |
| 300 | 3 | 80 | 100 | 200 | 280 | 450 | 700 |
| | 4 | 120 | 160 | 280 | 350 | 550 | 850 |
| 460 | 4 | 80 | 100 | 200 | 280 | 450 | 700 |

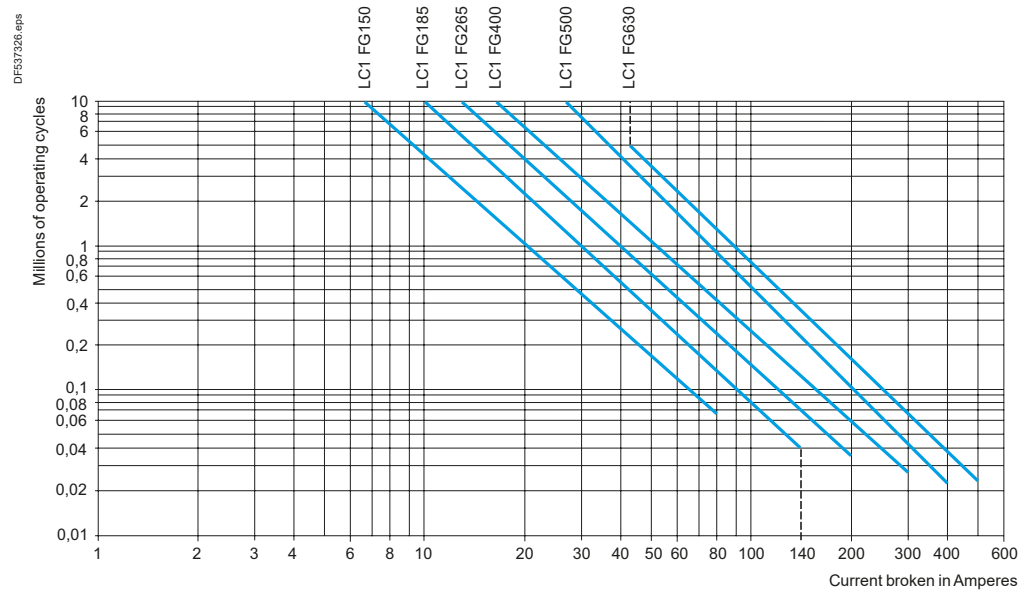
TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics - Durability (DC)

Electrical durability

Utilisation categories DC-1 to DC-5



Determining the electrical durability

The electrical durability can be read directly from the curve above, having previously calculated the power broken P_c . The following table gives, for each utilisation category, the value of P_c according to the operational current I_e and the operational voltage U_e .

| Utilisation categories | P_c (Power broken) |
|--|--------------------------------|
| DC-1 Non-inductive loads | $P_c = U_e \times I_e$ |
| DC-2 Shunt motors, breaking whilst running | $P_c = 0.1 U_e \times I_e$ |
| DC-3 Shunt motors, reversing | $P_c = U_e \times 2.5 I_e$ |
| DC-4 Series wound motors, breaking whilst running | $P_c = 0.3 U_e \times I_e$ |
| DC-5 Series wound motors, reversing | $P_c = U_e \times 2.5 I_e$ |
| Counter current braking (plugging) | $P_c = 1.5 U_e \times 1.5 I_e$ |

Example:

Series wound motor, breaking whilst motor running, category DC-4.

$P = 50 \text{ kW}$, $U_e = 200 \text{ V}$, $I_e = 250 \text{ A}$.

Select contactor **LC1FG265** with 3 poles in series.

The power broken is: $P_c = 0.3 U_e \times I_e = 0.3 \times 200 \times 250 = 15 \text{ kW}$.

The electrical durability read from the curve is 8 million operating cycles.

Maximum operating rate

The following operating rate used at I_e must not be exceeded: 120 operating cycles/hour.

Use of poles in parallel

The electrical durability is equal to the number of operating cycles performed by a pole, multiplied by the number of poles in parallel, multiplied by a coefficient of 0.70.

TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics

| Environment | | | LC1FG150 | LC1FG185 |
|--|---|----|--|----------|
| Rated insulation voltage (Ui) | Conforming to IEC 60947-4-1 | V | 1000 | |
| Rated impulse withstand voltage (Uimp) | Coil not connected to the power circuit | kV | 8 | |
| Conforming to standards | | | IEC/EN 60947-4-1 | |
| Product certifications | | | N.A.T.O. | |
| Degree of protection | Conforming to IEC 60529 | | IP 20 front face with shrouds LA9F | |
| Ambient air temperature around the device | Storage | °C | -60...+80 | |
| | Operation | °C | -5...+55 | |
| | Permissible at Uc ⁽¹⁾ | °C | -40...+70 | |
| Maximum operating altitude | Without derating | m | 3000 | |
| Operating positions | Without derating | | | |
| | | | | |
| | Not to be used | | | |
| Shock resistance ⁽²⁾ Conforming to IEC/EN 60068-2-27 | | | 12 g, 50 ms on the three axes: X, Y, Z | |
| | | | 15 g, 11 ms on the three axes: X, Y, Z | |

⁽¹⁾ In these conditions, it is recommended that coils LX9F be used for contactor sizes FG150 to FG265.

⁽²⁾ In the least favourable direction, without change of contact state (coil at Uc).

⁽³⁾ Horizontal fixing:

- the operational current AC-1 is equivalent to 80 % of the value indicated in the catalogue
- breaking and making capacities not guaranteed
- mechanical and electrical durabilities not guaranteed.

Derating of pull-in and drop-out voltage

| Contactors LC1 | | FG150 | FG185 | FG265 | FG400 | FG500 | FG630 |
|----------------|----------|-------|-------|-------|-------|-------|-------|
| Fixing A | Pull-in | 75 % | 75 % | 75 % | 80 % | 80 % | 80 % |
| | Drop-out | 105 % | 105 % | 105 % | 110 % | 110 % | 110 % |
| Fixing B | Pull-in | 115 % | 115 % | 115 % | 120 % | 120 % | 120 % |
| | Drop-out | 90 % | 90 % | 90 % | 95 % | 95 % | 95 % |



TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics

| LC1FG265 | LC1FG400 | LC1FG500 | LC1FG630 |
|--|----------|----------|----------|
| 1000 | | | |
| 8 | | | |
| IEC/EN 60947-4-1 | | | |
| N.A.T.O. | | | |
| IP 20 front face with shrouds LA9F | | | |
| -60...+80 | | | |
| -5...+55 | | | |
| -40...+70 | | | |
| 3000 | | | |
| | | | |
| <p>A</p> <p>B</p> | | | |
| 12 g, 50 ms on the three axes: X, Y, Z | | | |
| 15 g, 11 ms on the three axes: X, Y, Z | | | |

High power contactors

TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics

| Pole characteristics | | | | |
|--|---|---------------------------|---|-----------|
| Contactor type | | | LC1FG150 | LC1FG185 |
| Number of poles | | | 3 | 3 |
| Rated operational current (Ie) (Ue ≤ 440 V) | In AC-3, θ ≤ 70 °C | A | 150/150 | 185/180 |
| | In AC-1, θ ≤ 70 °C | A | 220/170 | 240/180 |
| Rated operational voltage (Ue) | Up to | V | 690 | 690 |
| Frequency limits | Of the operational current ⁽¹⁾ | Hz | 25 to 200 | 25 to 200 |
| Conventional thermal current | θ ≤ 40 | °C | 250 | 275 |
| Rated making capacity | I rms conforming to IEC 60947-4-1 | A | Making current: 10 x I in AC-3 | |
| Rated breaking capacity | I rms conforming to IEC 60947-4-1 | A | Making and breaking current: 8 x I in cat. AC-3 | |
| Permissible short time rating No current flowing for preceding 60 minutes with θ ≤ 40 °C | For 1.5 or 10 s | A | 1200 | 1500 |
| | For 30 s | A | 700 | 920 |
| | For 1 mn | A | 600 | 740 |
| | For 3 mn | A | 450 | 500 |
| | For 10 mn | A | 350 | 400 |
| Fuse protection against short-circuits (U ≤ 440 V) | Motor circuit (type aM) | A | 160 | 200 |
| | With thermal overload relay (type gG) | A | 200 | 315 |
| | gG fuses | A | 250 | 315 |
| Average impedance per pole | At Ith and 50 Hz | mΩ | 0.35 | 0.33 |
| Power dissipation per pole for the above operational currents | AC-3 | W | 8 | 12 |
| | AC-1 | W | 22 | 25 |
| Cabling Minimum c.s.a. | Bar | No. of bars | 2 | 2 |
| | | Bar | mm | 25 x 3 |
| | Cable with lug | mm² | 120 | 150 |
| | Cable with connector | mm² | 120 | 150 |
| | Bolt diameter | mm | Ø8 | Ø8 |
| | Tightening torque | Power circuit connections | N.m | 18 |

(1) Sine wave without interference. Above these values, please consult your Regional Sales Office.
 (2) Ue ≤ 690 V in AC-3; Ue ≤ 1000 V in AC-1.

Ref.



High power
contactors

TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics

| LC1FG265 | LC1FG400 | LC1FG500 | LC1FG630 |
|--|-----------|---------------------|-----------|
| 3 | 3 | 3 | 3 |
| 265/250 | 400/340 | 500/500 | 630/630 |
| 300/250 | 430/340 | 580/500 | 850/700 |
| 1000 ⁽²⁾ | 1000 | 1000 ⁽²⁾ | 1000 |
| 25 to 200 | 25 to 200 | 25 to 200 | 25 to 200 |
| 350 | 500 | 700 | 1000 |
| Making current: 10 x I in AC-3 | | | |
| Making and breaking current: 8 x I in AC-3 | | | |
| 2200 | 3600 | 4200 | 5050 |
| 1230 | 2400 | 3200 | 4400 |
| 950 | 1700 | 2400 | 3400 |
| 620 | 1200 | 1500 | 2200 |
| 480 | 1000 | 1200 | 1600 |
| 315 | 400 | 500 | 630 |
| 500 | 630 | 800 | 800 |
| 400 | 500 | 800 | 1000 |
| 0.3 | 0.26 | 0.18 | 0.12 |
| 21 | 42 | 45 | 48 |
| 37 | 65 | 88 | 120 |
| 2 | 2 | 2 | 2 |
| 32 x 4 | 30 x 5 | 40 x 5 | 60 x 5 |
| 240 | 2 x 150 | 2 x 240 | – |
| 240 | – | – | – |
| Ø10 | Ø10 | Ø10 | Ø12 |
| 35 | 35 | 35 | 58 |

TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics

| a.c. control circuit characteristics with LX1/LX9 coil | | | | | | |
|--|----------------------------------|-------------------|------------------|----------------------------|-----------|------------|
| Contactor type | | | | LC1FG150 | LC1FG185 | |
| Rated control circuit voltage (U _c) | 50 or 60 Hz | | V | 48...440 | | |
| Control voltage limits (θ ≤ 55 °C) | 40...400 Hz coils | Operation | | 0.85...1.1 U _c | | |
| | | Drop-out | | 0.20...0.55 U _c | | |
| Average consumption at 20 °C and at U _c | ~ 50 Hz | Inrush | 40...400 Hz coil | VA | 690...855 | 950...1180 |
| | | | | Cos φ | 0.9 | 0.9 |
| | | Sealed | 40...400 Hz coil | VA | 6.6...8.1 | 8.9...10.9 |
| | | | | Cos φ | 0.9 | 0.9 |
| Heat dissipation | | | W | 5.9...7.2 | 8...9.8 | |
| Operating time ⁽¹⁾ | Closing "C" | | ms | 35 | 35 | |
| | | Opening "O" | ms | 130 | 130 | |
| Mechanical durability at U _c | In millions of operating cycles | | | 10 | 10 | |
| Maximum operating rate at ambient temperature ≤ 55 °C | In operating cycles per hour | | | 2400 | 2400 | |
| Cabling Min/max c.s.a. | Flexible cable without cable end | 1 or 2 conductors | mm ² | 1/4 | 1/4 | |
| | | 1 conductor | mm ² | 1/4 | 1/4 | |
| | Flexible cable with cable end | 2 conductors | mm ² | 1/2.5 | 1/2.5 | |
| | | 1 or 2 conductors | mm ² | 1/4 | 1/4 | |
| Tightening torque | | | N.m | 1.2 | 1.2 | |

Ref.



Characteristics of the locking electromagnet (shockproof device)

| Contactor type | | | | LC1FG150 | LC1FG185 |
|---|---------------------------------|--|----|---------------------|---------------------|
| Control circuit voltage | 40...400 Hz | | V | 48...440 | 48...440 |
| Inrush consumption | | | VA | 100 | 100 |
| Maximum energisation time at U _c | | | ms | 20 | 20 |
| Maximum operating rate | In operating cycles per hour | | | 2400 | 2400 |
| Mechanical durability at U _c | In millions of operating cycles | | | 1 x 10 ⁶ | 1 x 10 ⁶ |

(1) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.
The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

High power contactors

TeSys Control

FG Shockproof high power 3-pole contactors

Characteristics

| LC1FG265 | LC1FG400 | LC1FG500 | LC1FG630 |
|----------------|---------------|---------------|---------------|
| 48...440 | 110...440 | 110...440 | 110...440 |
| 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc | 0.85...1.1 Uc |
| 0.35...0.55 Uc | 0.3...0.5 Uc | 0.3...0.5 Uc | 0.25...0.5 Uc |
| 650 | 1075 | 1100 | 1650 |
| 0.9 | 0.9 | 0.9 | 0.9 |
| 10 | 15 | 18 | 22 |
| 0.9 | 0.9 | 0.9 | 0.9 |
| 8 | 14 | 18 | 20 |
| 40...65 | 40...75 | 40...75 | 40...80 |
| 100...170 | 100...170 | 100...170 | 100...200 |
| 10 | 10 | 10 | 10 |
| 2400 | 2400 | 2400 | 1200 |
| 1/4 | 1/4 | 1/4 | 1/4 |
| 1/4 | 1/4 | 1/4 | 1/4 |
| 1/2.5 | 1/2.5 | 1/2.5 | 1/2.5 |
| 1/4 | 1/4 | 1/4 | 1/4 |
| 1.2 | 1.2 | 1.2 | 1.2 |

| LC1FG265 | LC1FG400 | LC1FG500 | LC1FG630 |
|---------------------|---------------------|---------------------|---------------------|
| 48...440 | 110...440 | 110...440 | 110...440 |
| 100 | 100 | 100 | 100 |
| 20 | 20 | 20 | 20 |
| 2400 | 2400 | 2400 | 1200 |
| 1 x 10 ⁶ | 1 x 10 ⁶ | 1 x 10 ⁶ | 1 x 10 ⁶ |

TeSys Control

Contact blocks for FG contactors

Characteristics

| Environment | | | | | |
|---|--|-----------------|---|---------------|------|
| Contact block type | | | LADN | LADT and LADS | LADR |
| Conforming to standards | | | IEC 60947-5-1, EN 60947-5-1 | | |
| Product certifications | | | UL, CSA | | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact IP2X | | |
| Ambient air temperature around the device | Storage | °C | -60...+80 | | |
| | Operation | °C | -5...+60 | | |
| | Permissible for operation at Uc | °C | -40...+70 | | |
| Maximum operating altitude | Without derating | m | 3000 | | |
| Cabling | Phillips n° 2 and Ø6 mm. Flexible or solid cable with or without cable end | mm ² | Min: 1 x 1; max: 2 x 2.5 | | |

Ref.



High power contactors

TeSys Control

Contact blocks for FG contactors

Characteristics

| Instantaneous and time delay contact characteristics | | | | | | | | | | |
|--|--|---------------------------------|--|------|------|---------------|---------|---------------|--------|------|
| Contact block type | | LADN | LADT and LADS | | | | LADR | | | |
| Number of contacts | | | 1 or 4 | | 2 | | 2 | | | |
| Rated operational voltage Up to (U _e) | | V | 660 | | | | | | | |
| Rated insulation voltage (U _i) | Conforming to IEC 60947-5-1 | V | 690 | | | | | | | |
| | Conforming to UL, CSA | V | 600 | | | | | | | |
| Conventional thermal current (I _{th}) | | A | 10 | | | | | | | |
| Frequency of the operational current | | Hz | 25...400 | | | | | | | |
| Minimum switching capacity | U min | V | 17 | | | | | | | |
| | I min | mA | 5 | | | | | | | |
| Short-circuit protection | | A | 10 | | | | | | | |
| Rated making capacity | | A | ~ 140; --- 250 | | | | | | | |
| Short-time rating | Permissible for | 1 s | A | 100 | | | | | | |
| | | 500 ms | A | 120 | | | | | | |
| | | 100 ms | A | 140 | | | | | | |
| Insulation resistance | | MΩ | > 10 | | | | | | | |
| Non-overlap time | | ms | 1.5 (on energisation and on de-energisation) | | | | | | | |
| Time delay (LADT, R and S contact blocks) Accuracy only valid for setting range indicated on the front face | Ambient air temperature for operation | | °C | - | | -40...+70 | | -40...+70 | | |
| | Repeat accuracy | | | - | | ±2 % | | ±2 % | | |
| | Drift up to 0.5 million operating cycles | | | - | | +15 % | | +15 % | | |
| | Drift depending on ambient air temperature | | | - | | 0.25 % per °C | | 0.25 % per °C | | |
| Mechanical durability | | In millions of operating cycles | | 30 | | 5 | | 5 | | |
| Rated operational power of contacts Conforming to IEC 60947-5-1 | | | V | 24 | 48 | 110/127 | 220/230 | 380/400 | 440 | 600 |
| | 1 million operating cycles | | VA | 150 | 300 | 400 | 480 | 500 | 500 | 500 |
| | 3 million operating cycles | | VA | 80 | 170 | 250 | 290 | 320 | 320 | 320 |
| | 10 million operating cycles | | VA | 30 | 65 | 90 | 120 | 130 | 130 | 130 |
| | Occasional making capacity | | VA | 1200 | 2600 | 7000 | 13 000 | 15 000 | 13 000 | 9000 |

Ref.



High power contactors

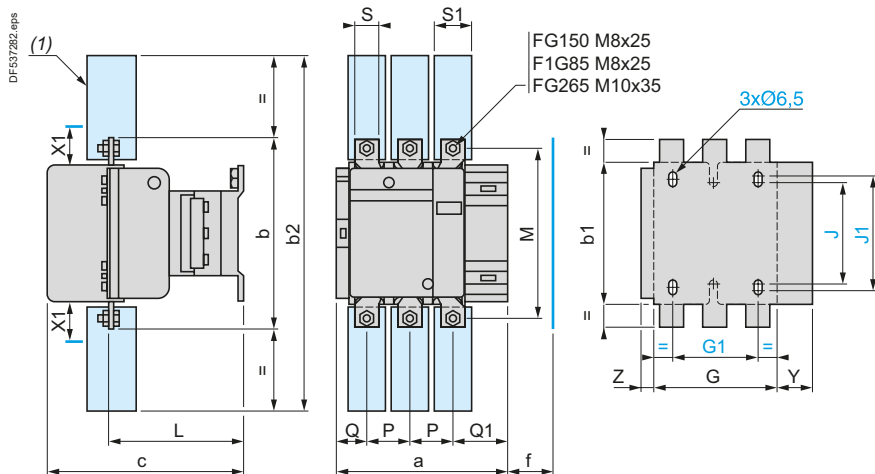
TeSys Control

FG Shockproof high power 3-pole contactors

Dimensions

Dimensions

LC1FG150, FG185 and FG265



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

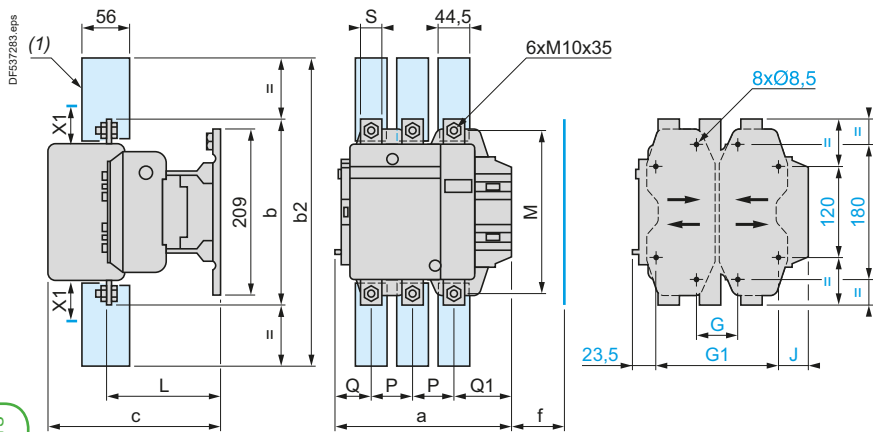
| LC1 | 200...500 V | 600...1000 V |
|-------|-------------|--------------|
| FG150 | 10 | 15 |
| FG185 | 10 | 15 |
| FG265 | 10 | 15 |

(1) Power terminal protection shroud (see page B9/14).

| LC1 | a | b | b1 | b2 | c | f | G | G1 | J | J1 | L | M | P | Q | Q1 | S | S1 | Y | Z |
|-------|-------|-----|-----|-----|-----|-----|-----|----|-----|-----|-------|-----|----|----|------|----|------|----|------|
| FG150 | 181 | 170 | 137 | 301 | 180 | 131 | 106 | 80 | 106 | 120 | 116 | 150 | 40 | 26 | 57.5 | 20 | 34 | 44 | 13.5 |
| FG185 | 183.5 | 174 | 137 | 305 | 190 | 130 | 111 | 80 | 106 | 120 | 122.5 | 154 | 40 | 29 | 59.5 | 20 | 34 | 44 | 13.5 |
| FG265 | 217.5 | 203 | 145 | 375 | 222 | 147 | 142 | 96 | 106 | 120 | 150 | 178 | 48 | 39 | 66.5 | 25 | 44.5 | 38 | 21.5 |

f = minimum distance required for coil removal.

LC1FG400 and FG500



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

| LC1 | 200...500 V | 600...1000 V |
|-------|-------------|--------------|
| FG400 | 15 | 20 |
| FG500 | 15 | 20 |

(1) Power terminal protection shroud (see page B9/14).

| LC1 | a | b | b2 | c | f | G | G supplied | G min. | G max. | G1 supplied | G1 min. | G1 max. | J | L | M | P | Q | Q1 | S |
|-------|-----|-----|-----|-----|-----|----|------------|--------|--------|-------------|---------|---------|-----|-----|----|----|----|----|---|
| FG400 | 237 | 206 | 375 | 234 | 146 | 80 | 66 | 102 | 223 | 156 | 192 | 19.5 | 160 | 181 | 48 | 75 | 74 | 25 | |
| FG500 | 257 | 238 | 400 | 247 | 150 | 80 | 66 | 120 | 223 | 156 | 210 | 39.5 | 181 | 208 | 55 | 78 | 77 | 30 | |

f = minimum distance required for coil removal.

Ref.



High power contactors

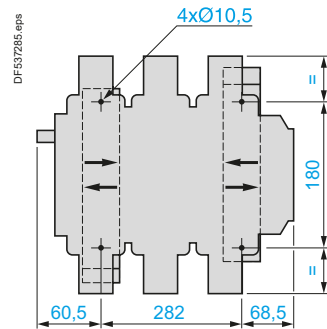
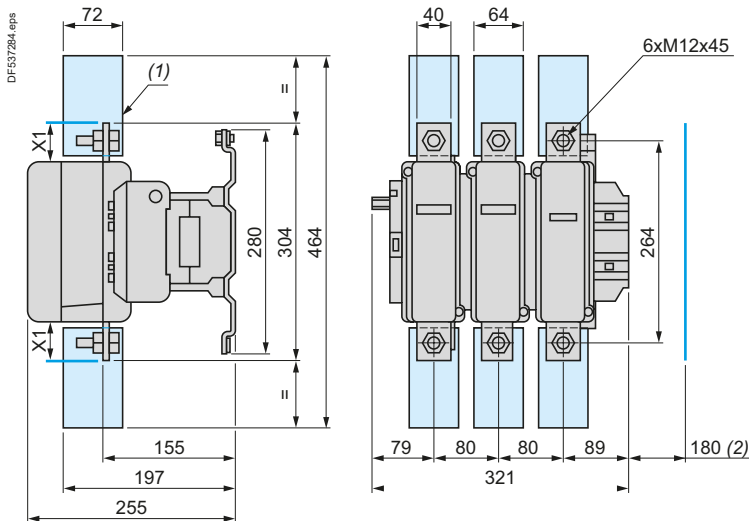
TeSys Control

FG Shockproof high power 3-pole contactors

Dimensions and schemes

Dimensions

LC1FG630



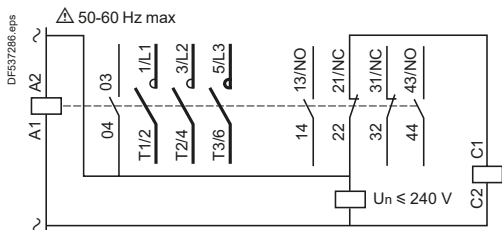
X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

| LC1 | 200...500 V | 690...1000 V |
|-------|-------------|--------------|
| FG630 | 20 | 30 |

- (1) Power terminal protection shroud (see page B9/14).
- (2) Minimum distance required for coil removal.

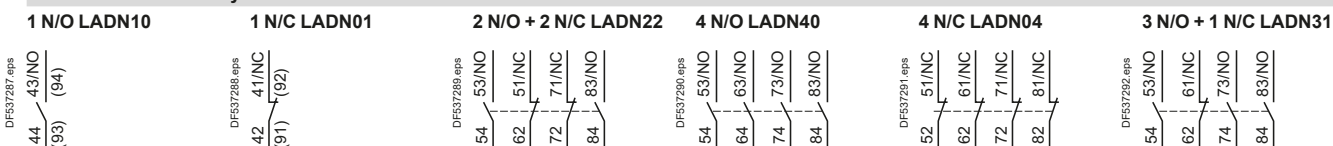
Schemes

Contactors LC1-FG150 to FG630

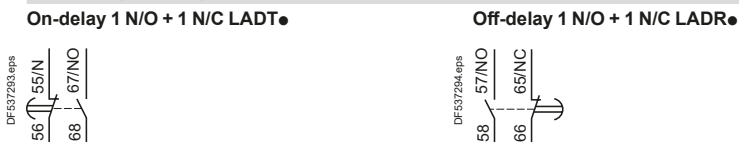


Add-on blocks

Instantaneous auxiliary contacts

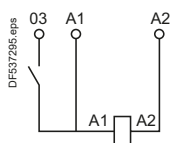


Time delay auxiliary contacts



Coils ~

LX1FH, FJ, FK and FL



References:
pages B9/6, B9/28 and B9/29

Characteristics:
pages B9/70 to B9/85

Ref.



High power
contactors

TeSys Control

CR1F Magnetic latching high power contactors

Characteristics

PB 106370.eps



CR1F500

Ref.



High power
contactors

Magnetic latching contactors

Magnetic latching contactors of both block and bar mounted types are fitted with a special electromagnet which enables them to remain in the "On" position when the coil is no longer energised.

Applications

The special properties of magnetic latching contactors make them suitable for a large number of applications.

Properties

- Retention of the sequence memory in automatic control equipment in the event of loss of control voltage.
- Energy saving, since the source of supply to the coil does not need to supply current when the contactor is latched in the closed state.
- Change of state from "Closed" to "Open" by current signal through the coil.
- Unaffected by mains interference.
- Utilisation of contactors beyond their breaking capacity, as operations are performed off-load.
- Contactors are silent in the latched position.

Applications

- Refineries, power stations, excitation circuits.
 - Contactors remaining in the closed state for long periods.
- Examples: refineries, power supplies, low voltage distribution.
- Selective opening control.
 - No unwanted opening and closing of the main power poles.
 - Current carrying at voltages up to 1000 Volts.

Operation of the electromagnet

CR1F block contactors

CR1F magnetic latching contactors are fitted with a double coil with 3 terminals comprising a latching winding and an unlatching winding. The 2 windings have a common point which can necessitate special wiring precautions when the latching supply is separate from the unlatching supply.

The power supplies may be a.c. or d.c. For d.c. operation, the polarities indicated must be complied with.

Operating precautions:

- the 2 windings must not be supplied simultaneously
- a winding must not be supplied continuously
- supply to the coils must be via pulsed contacts.

Manual opening:

if the control voltage is not present, the contactor can be unlatched manually.

Latching is obtained by direct supply of the coil in one direction of current flow.

Unlatching is obtained by a reverse current, adjusted by resistors.

TeSys Control

CR1F Magnetic latching high power contactors

Characteristics - Squirrel cage motor

| CR1F selection - Squirrel cage motor Direct On Line starter | | | | | | | | | | | | | | | | | |
|--|-----|-----|----------------|-----|-----|-------|-----|-----|-------|-----|-----|------------------|--|------------|---------------|------|-------|
| Continuous or intermittent duty up to 30 operating cycles/hour | | | | | | | | | | | | | | | | | |
| Motor ⁽¹⁾ | | | | | | | | | | | | 3-pole contactor | 3-pole differential thermal overload relay | | 3 fuses Type | | |
| 220 V 230 V | | | 380 V 400 V | | | 415 V | | | 440 V | | | | ⁽²⁾ | Reference | Setting range | aM | BS-88 |
| P | In | | P | In | | P | In | | P | In | | Reference | | | | | |
| kW | HP | A | kW | HP | A | kW | HP | A | kW | HP | A | | | | | | |
| 25 | 35 | 85 | - | - | - | - | - | - | - | - | - | CR1F150 | LR9F5367 | 60...100 | 100 | 125 | |
| 30 | 40 | 103 | 51 | 70 | 98 | 55 | 75 | 100 | 59 | 80 | 97 | CR1F150 | LR9F5369 | 90...150 | 100 | 160 | |
| 33 | 45 | 113 | 55 | 75 | 105 | - | - | - | - | - | - | CR1F150 | LR9F5369 | 90...150 | 125 | 160 | |
| - | - | - | 59 | 80 | 112 | 59 | 80 | 105 | 63 | 85 | 109 | CR1F150 | LR9F5369 | 90...150 | 125 | 160 | |
| - | - | - | 63 | 85 | 117 | 63 | 85 | 115 | - | - | - | CR1F150 | LR9F5369 | 90...150 | 160 | 200 | |
| 37 | 50 | 126 | 75 | 100 | 138 | 75 | 100 | 135 | 75 | 100 | 125 | CR1F150 | LR9F5369 | 90...150 | 160 | 200 | |
| 40 | 54 | 134 | - | - | - | - | - | - | 80 | 110 | 131 | CR1F185 | LR9F5369 | 90...150 | 160 | 200 | |
| 45 | 60 | 150 | 80 | 110 | 147 | 80 | 110 | 138 | 90 | 125 | 146 | CR1F185 | LR9F5369 | 90...150 | 160 | 200 | |
| 51 | 70 | 170 | 90 | 125 | 170 | 90 | 125 | 165 | 100 | 136 | 162 | CR1F185 | LR9F5371 | 132...220 | 200 | 250 | |
| 55 | 75 | 182 | - | - | - | 100 | 136 | 182 | - | - | - | CR1F265 | LR9F5371 | 132...220 | 250 | 315 | |
| 59 | 80 | 195 | 100 | 138 | 188 | 110 | 150 | 200 | 110 | 150 | 178 | CR1F265 | LR9F5371 | 132...220 | 250 | 315 | |
| 63 | 85 | 203 | 110 | 150 | 205 | - | - | - | 129 | 175 | 209 | CR1F265 | LR9F7375 | 200...330 | 250 | 315 | |
| 75 | 100 | 240 | 129 | 175 | 242 | 129 | 175 | 230 | 132 | 180 | 215 | CR1F265 | LR9F7375 | 200...330 | 250 | 315 | |
| - | - | - | 132 | 180 | 245 | 132 | 180 | 240 | - | - | - | CR1F265 | LR9F7375 | 200...330 | 315 | 400 | |
| - | - | - | - | - | - | 140 | 190 | 250 | 140 | 190 | 227 | CR1F400 | LR9F7375 | 200...330 | 315 | 400 | |
| 80 | 110 | 260 | 140 | 190 | 260 | 147 | 200 | 260 | 147 | 200 | 236 | CR1F400 | LR9F7375 | 200...330 | 315 | 400 | |
| - | - | - | 147 | 200 | 273 | 150 | 205 | 270 | 150 | 205 | 246 | CR1F400 | LR9F7375 | 200...330 | 315 | 400 | |
| - | - | - | 150 | 205 | 280 | 160 | 220 | 280 | 160 | 220 | 256 | CR1F400 | LR9F7375 | 200...330 | 315 | 400 | |
| 90 | 125 | 295 | 160 | 220 | 300 | - | - | - | 180 | 245 | 289 | CR1F400 | LR9F7375 | 200...330 | 315 | 400 | |
| - | - | - | - | - | - | - | - | - | 185 | 250 | 295 | CR1F400 | LR9F7375 | 200...330 | 315 | 400 | |
| 100 | 136 | 325 | 180 | 245 | 333 | 180 | 245 | 320 | 200 | 270 | 321 | CR1F400 | LR9F7379 | 300...500 | 400 | 500 | |
| 110 | 150 | 356 | 185 | 250 | 342 | 185 | 250 | 325 | 220 | 300 | 353 | CR1F400 | LR9F7379 | 300...500 | 400 | 500 | |
| - | - | - | 200 | 270 | 370 | 200 | 270 | 340 | 250 | 340 | 401 | CR1F400 | LR9F7379 | 300...500 | 400 | 500 | |
| - | - | - | - | - | - | 220 | 300 | 385 | - | - | - | CR1F500 | LR9F7379 | 300...500 | 500 | 630 | |
| 129 | 175 | 420 | 220 | 300 | 408 | - | - | - | 257 | 350 | 412 | CR1F500 | LR9F7379 | 380...630 | 500 | 630 | |
| 132 | 180 | 425 | 250 | 340 | 460 | 250 | 340 | 425 | 280 | 380 | 450 | CR1F500 | LR9F7381 | 380...630 | 500 | 630 | |
| 140 | 190 | 450 | - | - | - | 257 | 350 | 450 | - | - | - | CR1F500 | LR9F7381 | 380...630 | 500 | 630 | |
| 147 | 200 | 472 | - | - | - | - | - | - | 295 | 400 | 473 | CR1F500 | LR9F7381 | 380...630 | 500 | 630 | |
| - | - | - | 257 | 350 | 475 | 280 | 380 | 475 | 300 | 410 | 481 | CR1F630 | LR9F7381 | 380...630 | 500 | 630 | |
| - | - | - | - | - | - | 295 | 400 | 500 | - | - | - | CR1F630 | LR9F7381 | 380...630 | 630 | 800 | |
| 150 | 205 | 483 | 280 | 380 | 510 | 300 | 410 | 510 | 315 | 430 | 505 | CR1F630 | LR9F7381 | 380...630 | 630 | 800 | |
| 160 | 220 | 520 | 295 | 400 | 546 | 315 | 430 | 535 | 335 | 450 | 518 | CR1F630 | LR9F7381 | 380...630 | 630 | 800 | |
| 180 | 245 | 578 | 300 | 410 | 565 | 335 | 450 | 550 | 355 | 480 | 549 | CR1F630 | LR9F7381 | 380...630 | 630 | 800 | |
| 185 | 250 | 595 | 315 | 430 | 584 | 355 | 480 | 580 | 375 | 500 | 575 | CR1F630 | LR9F7381 | 380...630 | 630 | 800 | |
| 200 | 270 | 626 | 335 | 450 | 620 | 375 | 500 | 610 | 400 | 454 | 611 | CR1F630 | LR9F7381 | 380...630 | 800 | 1000 | |
| 220 | * | 700 | 355 | * | 635 | 400 | * | 650 | 425 | * | 650 | CR1BL33 | LR9F7381 | 500...800 | 800 | 1000 | |
| - | - | - | 375 | * | 670 | 425 | * | 690 | 445 | * | 680 | CR1BL33 | LR9F7381 | 500...800 | 800 | 1000 | |
| - | - | - | 400 | * | 710 | 445 | * | 730 | 450 | * | 690 | CR1BL33 | LR9F7381 | 500...800 | 800 | 1000 | |
| - | - | - | - | - | - | 450 | * | 740 | 475 | * | 730 | CR1BL33 | LR9F7381 | 500...800 | 800 | 1000 | |
| 250 | * | 800 | 425 | * | 760 | 475 | * | 780 | 500 | * | 780 | CR1BM33 | LR9F7381 | 500...800 | 800 | 1000 | |
| 257 | * | 826 | 445 | * | 790 | 500 | * | 820 | 530 | * | 825 | CR1BM33 | LR9F7381 | 630...1000 | 1000 | 1250 | |
| 280 | * | 900 | 450 | * | 800 | 530 | * | 870 | 560 | * | 870 | CR1BM33 | LR9F7381 | 630...1000 | 1000 | 1250 | |
| 295 | * | 948 | 475 | * | 850 | 560 | * | 920 | 600 | * | 920 | CR1BM33 | LR9F7381 | 630...1000 | 1000 | 1250 | |
| 300 | * | 980 | 500 | * | 900 | 600 | * | 978 | 630 | * | 965 | CR1BM33 | LR9F7381 | 630...1000 | 1000 | 1250 | |
| 315 | * | 990 | 530 | * | 950 | 630 | * | 978 | 630 | * | 965 | CR1BM33 | LR9F7381 | 630...1000 | 1000 | 1250 | |

(1) The ratings are for standard 220/230 V, 380/400 V, 415 or 440 V motors. The overload relays should preferably be set to the motor full-load current shown on the motor rating plate. For other power ratings, select the overload relay with the appropriate range; the associated contactor and fuses must have ratings equal to or immediately greater than In.

(2) Reference to be completed, see page B9/79.

* There are no standard power ratings for these motors.

TeSys Control

CR1F Magnetic latching high power contactors

Characteristics - AC

Rated operational current in AC-3 ($\theta \leq 55^\circ\text{C}$)

| Contactor size | | CR1F 150 | CR1 F185 | CR1F 265 | CR1F 400 | CR1 F500 | CR1F 630 | CR1 BL | CR1 BM | CR1 BP | CR1 BR |
|----------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-----------|-----------|-----------|-----------|
| 440 V | A | 150 | 185 | 265 | 400 | 500 | 630 | 750 | 1000 | 1500 | 1800 |
| 500 V | A | 135 | 175 | 245 | 385 | 500 | 540 | 750 | 900 | 1200 | 1500 |
| 660/690 V | A | 130 | 140 | 230 | 365 | 435 | 470 | 700 | 800 | 900 | 1100 |
| 1000 V | A | 47 | 73 | 95 | 135 | 270 | 330 | 400 | 400 | 500 | 600 |

Rated operational power (standard motor power ratings)

| | | | | | | | | | | | |
|-------------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| 220...240 V | kW | 40 | 55 | 75 | 110 | 147 | 200 | 220 | 280 | 425 | 500 |
| | HP | 54 | 75 | 100 | 150 | 200 | 270 | 300 | 380 | 580 | 680 |
| 380...400 V | kW | 75 | 90 | 132 | 200 | 250 | 335 | 400 | 500 | 750 | 900 |
| | HP | 100 | 185 | 180 | 270 | 340 | 450 | 545 | 680 | 1000 | 1220 |
| 415 V | kW | 80 | 100 | 140 | 220 | 280 | 375 | 425 | 530 | 800 | 900 |
| | HP | 110 | 136 | 180 | 300 | 380 | 500 | 580 | 720 | 1100 | 1220 |
| 440 V | kW | 80 | 100 | 140 | 250 | 295 | 400 | 450 | 560 | 800 | 900 |
| | HP | 110 | 136 | 190 | 340 | 400 | 545 | 610 | 760 | 1100 | 1220 |
| 500 V | kW | 90 | 110 | 160 | 257 | 355 | 400 | 500 | 600 | 750 | 900 |
| | HP | 125 | 150 | 220 | 350 | 480 | 545 | 680 | 810 | 1000 | 1220 |
| 660/690 V | kW | 100 | 110 | 160 | 280 | 335 | 450 | 560 | 670 | 750 | 900 |
| | HP | – | – | – | – | – | 610 | 760 | 910 | 1000 | 1220 |
| 1000 V | kW | 65 | 100 | 147 | 185 | 335 | 450 | 530 | 530 | 670 | 750 |
| | HP | – | 136 | 200 | 250 | – | 610 | 720 | 720 | 910 | 1000 |

Maximum operating rate in operating cycles/hour, at rated operational power with an on-load factor = 85 %: 750 for CR1F 150 to F265, 500 for CR1F 400 to F630 and 120 for CR1 B.

Ref.



High power
contactors

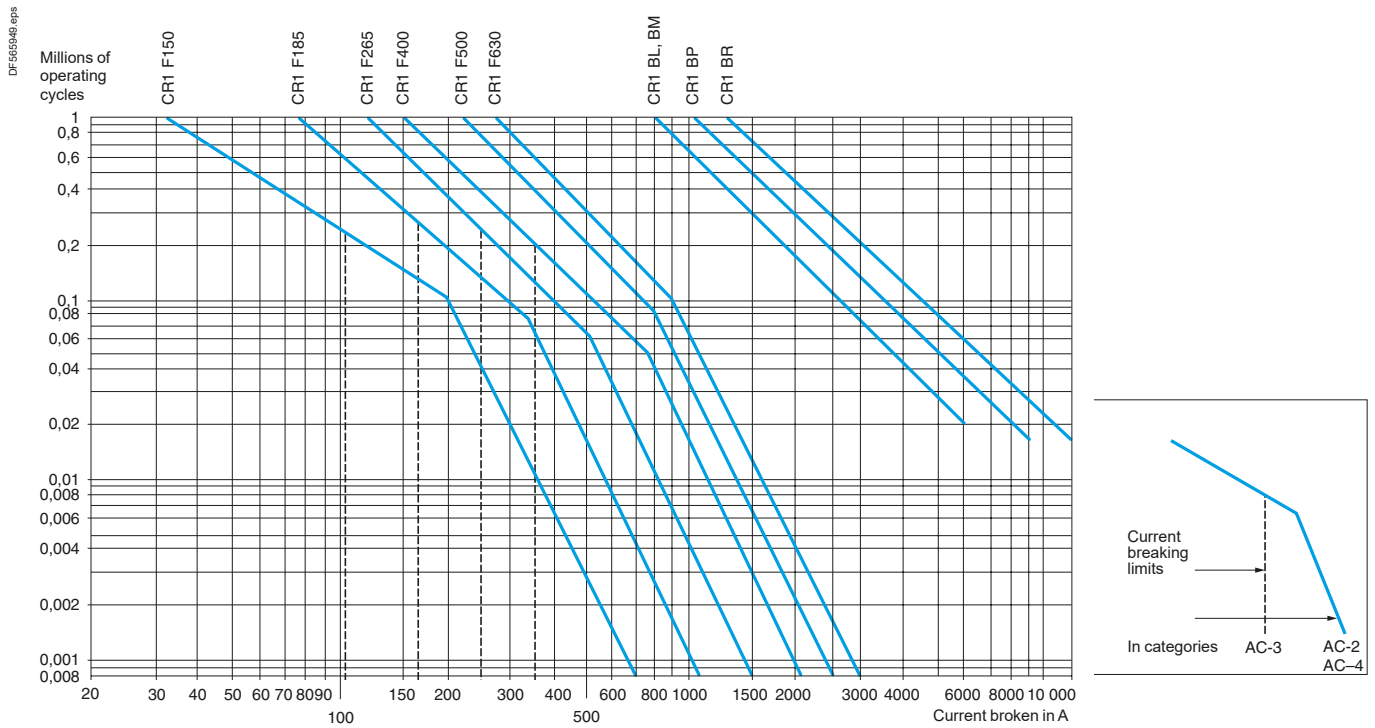
TeSys Control

CR1F Magnetic latching high power contactors

Characteristics - Durability (AC)

Use in category AC-3 ($U_e \leq 440 \text{ V}$) ⁽¹⁾ ($\theta \leq 55 \text{ °C}$)

The current (I_c) in AC-3 is equal to the rated operational current (I_e) drawn by the motor.



Example:

Asynchronous motor with $P = 50 \text{ kW}$, $U_e = 380 \text{ V}$, $I_e = 100 \text{ A}$, $I_c = I_e = 100 \text{ A}$, or asynchronous motor with $P = 55 \text{ kW}$, $U_e = 415 \text{ V}$, $I_e = 100 \text{ A}$, $I_c = I_e = 100 \text{ A}$.
600000 operating cycles required.

The above selection curves show the contactor rating needed, CR1F185.

⁽¹⁾ For 660 V, multiply the number of operating cycles by 0.8.

Ref.



High power contactors

TeSys Control

CR1F Magnetic latching high power contactors

Characteristics - Durability (AC)

Maximum operational current (on-load factor ≥ 0.95)

Maximum operating rate: 120 operating cycles/hour

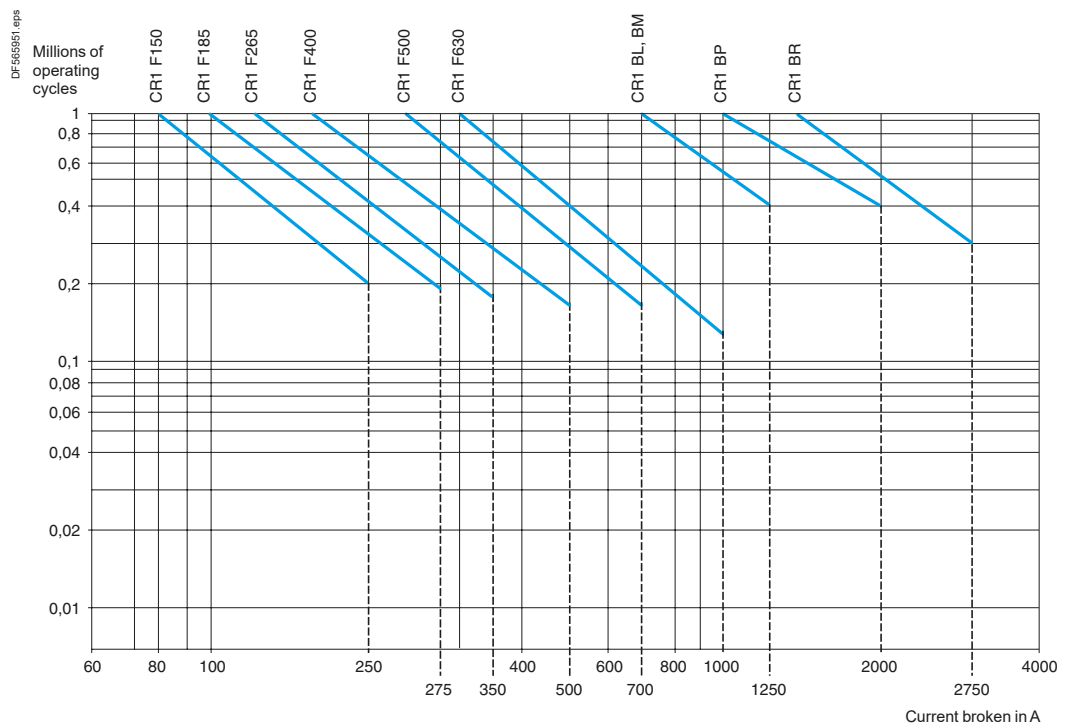
| Contactor size | | CR1 F150 | CR1 F185 | CR1 F265 | CR1 F400 | CR1 F500 | CR1 F630 | CR1 BL | CR1 BM | CR1 BP | CR1 BR | |
|---|-----------------------------------|----------|----------|----------|----------|----------|----------|--------|--------|---------|---------|------|
| Cable c.s.a. | mm ² | 120 | 150 | 185 | – | – | – | – | – | – | – | |
| Number of bars | | – | – | – | 2 | 2 | 2 | 2 | 2 | 3 | 4 | |
| Bar c.s.a. | mm | – | – | – | 30 x 5 | 40 x 5 | 60 x 5 | 50 x 5 | 80 x 5 | 100 x 5 | 100 x 5 | |
| Operational current in category AC-1 at ambient temperature | $\leq 40\text{ }^{\circ}\text{C}$ | A | 250 | 275 | 350 | 500 | 700 | 1000 | 800 | 1250 | 2000 | 2750 |
| | $\leq 55\text{ }^{\circ}\text{C}$ | A | 250 | 275 | 300 | 430 | 580 | 850 | 700 | 1100 | 1750 | 2400 |
| | $\leq 70\text{ }^{\circ}\text{C}$ | A | 170 | 180 | 250 | 340 | 500 | 700 | 600 | 900 | 1500 | 2000 |

Increase in operational current by parallel connection of poles

Apply the following coefficients to the above currents; these coefficients take into account an often unbalanced distribution of current between the poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.

Electrical durability (U_e \leq 440 V) ⁽¹⁾



Example:

U_e = 220 V - I_e = 200 A - θ = 40 °C - I_c = I_e = 200 A

600000 operating cycles required.

The above selection curves show the contactor rating needed, CR1F400.

⁽¹⁾ For 660 V, multiply the number of operating cycles by 0.8.



3-phase transformer primaries switching

Operating conditions

Maximum ambient temperature: 55 °C.

Maximum operational voltage: 1000 V, 50...60 Hz.

When a transformer is switched on, there is generally an initial current surge which reaches its peak value almost instantaneously and then decreases in a largely exponential manner to quickly reach its steady state value.

The value of this current depends on:

- the characteristics of the magnetic circuit and of the windings (cross sectional area of the core, rated inductance, number of turns, size of the windings, ...)
- the performance of the magnetic laminations used (residual induction and saturation inductance),
- the magnetic state of the circuit and the instantaneous value of the a.c. mains voltage at the moment of switch-on.

The peak current at the moment of switch-on can reach 20 to 40 times the rated current for the various kVA power ratings in the tables below. This value is independent of the “no-load” or “on-load” state of the transformer.

The peak magnetising current of the transformer must be lower than the values given in the tables below.

| Contactor selection | | | | | | | | | | | |
|---|-------------|----------------|-------------|-------------|-------------|-------------|-------------|-----------|-----------|-----------|-----------|
| Maximum operating rate: 120 operating cycles/hour | | | | | | | | | | | |
| Contactor size | | CR1 F150 | CR1 F185 | CR1 F265 | CR1 F400 | CR1 F500 | CR1 F630 | CR1 BL | CR1 BM | CR1 BP | CR1 BR |
| Maximum permissible current peak at switch-on | A | 1700 | 2800 | 3500 | 5500 | 6800 | 9000 | 18 000 | 18 000 | 24 000 | 30 000 |
| Maximum operational power ⁽¹⁾ | 220...230 V | kVA 25 | 40 | 50 | 75 | 100 | 140 | 230 | 230 | 300 | 380 |
| | 380...400 V | kVA 50 | 75 | 90 | 130 | 170 | 225 | 400 | 400 | 530 | 660 |
| | 415...440 V | kVA 55 | 80 | 100 | 140 | 190 | 250 | 450 | 450 | 560 | 700 |
| | 500 V | kVA 65 | 95 | 110 | 170 | 225 | 280 | 480 | 480 | 600 | 750 |
| | 660 V | kVA 80 | 120 | 140 | 200 | 270 | 315 | 600 | 600 | 800 | 950 |
| | 1000 V | kVA 100 | 150 | 200 | 250 | 375 | 470 | 700 | 700 | 1000 | 1200 |

⁽¹⁾ Maximum operational power corresponding to a current peak at switch-on of 30 In.

Ref.



High power contactors

TeSys Control

CR1F Magnetic latching high power contactors

Characteristics

| Environment | | | | | |
|---|--|----|--|---------|---------|
| Contactor type | | | CR1F150 | CR1F185 | CR1F265 |
| Rated insulation voltage (Ui) | Conforming to IEC 60158-1, BS 775, 60947-4 | V | 1000 | 1000 | 1000 |
| Ambient air temperature around the device | Storage | °C | -60...+80 | | |
| | For operation at Uc | °C | -15...+70 | | |
| Maximum operating altitude | Without derating | m | 3000 | | |
| Operating positions | Without derating | | ±5 ° in relation to normal vertical mounting plane | | |

| Pole characteristics | | | | | | |
|---|-------------------------------|-----------------|----------|----------|----------|------|
| Number of poles | | | 3 or 4 | 3 or 4 | 3 or 4 | |
| Rated operational current (Ie) (Ue ≤ 440 V) | In AC-3, θ ≤ 40 °C | A | 150 | 185 | 265 | |
| | In AC-1, θ ≤ 40 °C | A | 250 | 275 | 350 | |
| | In AC-4, θ ≤ 40 °C | A | 138 | 170 | 245 | |
| Rated operational voltage (Ue) | Up to | V | 1000 | 1000 | 1000 | |
| Frequency limits (sine wave) | Of the operational current | Hz | 25...200 | 25...200 | 25...200 | |
| Rated making capacity | I rms | A | 1700 | 2100 | 2940 | |
| Rated breaking capacity | I rms | 220...440 V | A | 1500 | 1800 | 2450 |
| | | 500 V | A | 1200 | 1600 | 2200 |
| | | 660/690 V | A | 1100 | 1200 | 1700 |
| | | 1000 V | A | 450 | 600 | 800 |
| Permissible short time rating from cold state, with no current flowing for previous 60 minutes at θ ≤ 40 °C | For 1 s | A | 1200 | 1500 | 2200 | |
| | For 5 s | A | 1200 | 1500 | 2200 | |
| | For 10 s | A | 1200 | 1500 | 2200 | |
| | For 30 s | A | 700 | 920 | 1230 | |
| | For 1 min | A | 600 | 740 | 950 | |
| | For 3 min | A | 450 | 500 | 620 | |
| | For 10 min | A | 350 | 400 | 480 | |
| Short-circuit protection by fuses θ ≤ 440 V | Motor circuit AC-3 (type aM) | A | 160 | 200 | 315 | |
| | AC-1 circuit (type gG, BS 88) | A | 250 | 315 | 400 | |
| Average impedance per pole | At Ith and 50 Hz | mΩ | 0.45 | 0.36 | 0.32 | |
| Power dissipated per pole for the above operational currents | AC-3 | W | 6 | 12 | 22 | |
| | AC-1 | W | 18 | 26 | 39 | |
| Connection | Number of conductors | | 1 | 1 | 1 | |
| | Cable with lugs | mm ² | 120 | 150 | 240 | |
| | Cable with connector | mm ² | 120 | 150 | 240 | |
| | Number of bars | | 2 | 2 | 2 | |
| | Bar c.s.a. | mm | 25 x 3 | 25 x 3 | 32 x 4 | |
| | Bolt diameter | | Ø8 | Ø8 | Ø10 | |
| | Tightening torque | N.m | 18 | 18 | 35 | |

Ref.



High power contactors

TeSys Control

CR1F Magnetic latching high power contactors

Characteristics

| CR1F400 | CR1F500 | CR1F630 | CR1BL | CR1BM | CR1BP | CR1BR |
|---|----------|----------|---|--------------|-------------------------|-------------------------|
| 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| -60...+80 | | | -60...+80 | | | |
| -15...+70 | | | -15...+60 | | | |
| 3000 | | | 3000 | | | |
| ±5° in relation to normal vertical mounting plane | | | ±5° in relation to normal vertical mounting plane | | | |
| 3 or 4 | 3 or 4 | 3 or 4 | 1, 2, 3 or 4 | 1, 2, 3 or 4 | 1, 2, 3 or 4 | 1, 2, 3 or 4 |
| 400 | 500 | 630 | 750 | 1000 | 1500 | 1800 |
| 500 | 700 | 1000 | 800 | 1250 | 2000 | 2750 |
| 370 | 460 | 560 | 700 | 800 | 1250 | 1500 |
| 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| 25...200 | 25...200 | 25...200 | 50...60 | 50...60 | 50...60 | 50...60 |
| 4500 | 5000 | 6740 | 10 000 | 10 000 | 15 000 | 18 000 |
| 4000 | 5000 | 6300 | 10 000 | 10 000 | 15 000 | 18 000 |
| 3500 | 4500 | 5400 | 9000 | 9000 | 12 000 | 15 000 |
| 3000 | 3560 | 4600 | 8000 | 8000 | 9000 | 11 000 |
| 1200 | 2500 | 3200 | 4000 | 4000 | 5000 | 6000 |
| 3600 | 4200 | 5050 | 9600 | 9600 | 12 000 | 15 000 |
| 3600 | 4200 | 5050 | 9600 | 9600 | 12 000 | 15 000 |
| 3600 | 4200 | 5050 | 7000 | 8000 | 9600 | 12 000 |
| 2400 | 3200 | 4400 | 4800 | 5200 | 6400 | 8000 |
| 1700 | 2400 | 3400 | 3500 | 3800 | 5200 | 6300 |
| 1200 | 1500 | 2200 | 2100 | 2400 | 3600 | 4400 |
| 1000 | 1200 | 1600 | 1200 | 1800 | 2800 | 3600 |
| 400 | 500 | 630 | 800 | 1200 | 800 x 2 ⁽¹⁾ | 1000 x 2 ⁽¹⁾ |
| 500 | 800 | 1000 | 800 | 1200 | 1000 x 2 ⁽¹⁾ | 1200 x 2 ⁽¹⁾ |
| 0.28 | 0.18 | 0.12 | 0.18 | 0.18 | 0.13 | 0.09 |
| 45 | 45 | 48 | 88 | 180 | 290 | 360 |
| 70 | 88 | 120 | 115 | 280 | 520 | 680 |
| 2 | 2 | – | – | – | – | – |
| 150 | 240 | – | – | – | – | – |
| – | – | – | – | – | – | – |
| 2 | 2 | 2 | 2 | 2 | 3 | 4 |
| 30 x 5 | 40 x 5 | 60 x 5 | 50 x 5 | 80 x 5 | 100 x 5 | 100 x 10 |
| Ø10 | Ø10 | Ø12 | 4 x Ø8 | 4 x Ø10 | 4 x Ø10 | 4 x Ø10 |
| 35 | 35 | 58 | 21 | 35 | 35 | 35 |

⁽¹⁾ Paralleling of poles must be carried out only in accordance with the fuse manufacturer's recommendations.

High power contactors

TeSys Control

CR1F Magnetic latching high power contactors

Characteristics

| a.c. and d.c. control circuit characteristics | | | | CR1F150 | CR1F185 | CR1F265 | |
|---|---------------------------------|------------|-----------|---------------|----------|----------|------|
| Contactor type | | | | | | | |
| Rated control circuit voltage (Uc) | ~ 50 or 60 Hz | | V | 48...415 | | | |
| | ~ 400 Hz | | V | 48...220 | | | |
| | --- | | V | 48...220 | | | |
| | --- low consumption | | V | 48...220 | | | |
| Control voltage limits ~ and --- | Latching | | | 0.85...1.1 Uc | | | |
| | Unlatching | | | 0.85...1.1 Uc | | | |
| Maximum operating rate at ambient temperature ≤ 40 °C | In operating cycles per hour | | | 120 | | | |
| Mechanical durability | In millions of operating cycles | | | 1 | | | |
| Average consumption 50/60 Hz | Latching | 1-pole | VA | – | – | – | |
| | | 2-pole | VA | – | – | – | |
| | | 3-pole | VA | 1100 | 1600 | 1650 | |
| | | 4-pole | VA | 100 | 1600 | 1650 | |
| | Unlatching | 1-pole | VA | – | – | – | |
| | | 2-pole | VA | – | – | – | |
| | | 3-pole | VA | 7.3 | 8 | 9 | |
| | | 4-pole | VA | 7.3 | 8 | 9 | |
| | 400 Hz and --- | Latching | 1-pole | VA | – | – | – |
| | | | 2-pole | VA | – | – | – |
| | | | 3-pole | VA | 1260 | 1750 | 1800 |
| | | | 4-pole | VA | 1260 | 1750 | 1800 |
| | | Unlatching | 1-pole | VA | – | – | – |
| | | | 2-pole | VA | – | – | – |
| | | | 3-pole | VA | 10 | 11 | 12 |
| | | | 4-pole | VA | 10 | 11 | 12 |
| --- low consumption | Latching | 3/4-pole | W | 500 | 500 | 500 | |
| | Unlatching | 3/4-pole | W | 15 | 20 | 40 | |
| Average operating time at Uc ⁽¹⁾ | Latching | | ms | 35...40 | 35...40 | 45...50 | |
| | Unlatching | | ms | 50...100 | 50...100 | 50...100 | |

(1) The closing time is measured from the moment the closing coil is energised to initial contact of the main poles. The opening time is measured from the moment the opening coil is energised to the moment the main poles separate.

Note: the arcing time depends on the circuit switched by the main poles. For 3-phase applications the arcing time is usually less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.

| Auxiliary contact characteristics | | | |
|--|---|---|---|
| Type of contacts | | | LADN for contactors CR1F |
| Conventional thermal current | | A | 10 |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-5-1 | V | 690 |
| Connection | Flexible or solid conductor with or without cable end | mm² | 1 x 1 min; 2 x 2.5 max |
| Operational power of contacts LADN for contactors CR1F | | | |
| | | a.c. supply | d.c. supply |
| | | Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4). | Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load. |
| | | V 48 115 230 400 600 | V 48 125 250 440 |
| 1 million operating cycles | | VA 120 280 560 960 1440 | W 90 75 68 61 |
| Occasional making capacity | | VA 2600 7000 13 000 15 000 9000 | W 700 400 260 220 |



TeSys Control

CR1F Magnetic latching high power contactors

Characteristics

| CR1F400 | CR1F500 | CR1F630 | CR1BL | CR1BM | CR1BP | CR1BR |
|---------------|----------|----------|---------------|-----------|-----------|-----------|
| 48...415 | | | 110...500 | | | |
| 48...220 | | | 110...500 | | | |
| 48...220 | | | 110...500 | | | |
| 48...220 | | | – | | | |
| 0.85...1.1 Uc | | | 0.85...1.1 Uc | | | |
| 0.85...1.1 Uc | | | 0.85...1.1 Uc | | | |
| 120 | | | 120 | | | |
| 1 | | | 1 | | | |
| – | – | – | 650 | 650 | 650 | 650 |
| – | – | – | 1100 | 1100 | 1100 | 1100 |
| 1450 | 1650 | 2100 | 1650 | 1650 | 1650 | 1650 |
| 1450 | 1650 | 2100 | 1850 | 1850 | 1850 | 1850 |
| – | – | – | 110 | 110 | 110 | 110 |
| – | – | – | 125 | 125 | 125 | 125 |
| 12 | 9.5 | 8 | 165 | 165 | 165 | 165 |
| 12 | 9.5 | 8 | 175 | 175 | 175 | 175 |
| – | – | – | 600 | 600 | 600 | 600 |
| – | – | – | 1000 | 1000 | 1000 | 1000 |
| 1600 | 1800 | 2300 | 1500 | 1500 | 1500 | 1500 |
| 1600 | 1800 | 2300 | 1700 | 1700 | 1700 | 1700 |
| – | – | – | 100 | 100 | 100 | 100 |
| – | – | – | 115 | 115 | 115 | 115 |
| 16 | 13 | 11 | 150 | 150 | 150 | 150 |
| 16 | 13 | 11 | 160 | 160 | 160 | 160 |
| 500 | 550 | 620 | – | – | – | – |
| 70 | 60 | 45 | – | – | – | – |
| 40...75 | 40...80 | 40...80 | 100...150 | 100...150 | 100...150 | 100...150 |
| 50...100 | 50...100 | 50...100 | 20...40 | 20...40 | 20...40 | 20...40 |

(1) The closing time is measured from the moment the closing coil is energised to initial contact of the main poles. The opening time is measured from the moment the opening coil is energised to the moment the main poles separate.

Note: the arcing time depends on the circuit switched by the main poles. For 3-phase applications the arcing time is usually less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.

| LADN for contactors CR1F | ZC4GM for contactors CR1B | | | | | | | | | | | | | | | | | | |
|---|---|------|------|------|------|-----|----------|-----|-----|-----|-----|----------|------|-----------|------|------|------|------|------|
| 10 | 20 | | | | | | | | | | | | | | | | | | |
| 690 | 660 | | | | | | | | | | | | | | | | | | |
| 1 x 1 min; 2 x 2.5 max | 2 min; 4 max | | | | | | | | | | | | | | | | | | |
| Operational power of contacts ZC4GM for contactors CR1 B | a.c. supply Electrical durability (valid for up to 2400 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \varphi 0.7$) = 10 times the power broken ($\cos \varphi 0.4$). | | | | | | | | | | | | | | | | | | |
| | d.c. supply Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load. | | | | | | | | | | | | | | | | | | |
| 1 million operating cycles | <table border="1"> <thead> <tr> <th>V</th> <th>110</th> <th>220</th> <th>380</th> <th>415</th> <th>500</th> </tr> </thead> <tbody> <tr> <td></td> <td>127</td> <td></td> <td></td> <td>440</td> <td></td> </tr> <tr> <td>VA</td> <td>2000</td> <td>4000</td> <td>4000</td> <td>4000</td> <td>3500</td> </tr> </tbody> </table> | V | 110 | 220 | 380 | 415 | 500 | | 127 | | | 440 | | VA | 2000 | 4000 | 4000 | 4000 | 3500 |
| V | 110 | 220 | 380 | 415 | 500 | | | | | | | | | | | | | | |
| | 127 | | | 440 | | | | | | | | | | | | | | | |
| VA | 2000 | 4000 | 4000 | 4000 | 3500 | | | | | | | | | | | | | | |
| Occasional making capacity | <table border="1"> <thead> <tr> <th>V</th> <th>110</th> <th>120</th> <th>440</th> <th>500</th> </tr> </thead> <tbody> <tr> <td>W</td> <td>250</td> <td>250</td> <td>230</td> <td>200</td> </tr> <tr> <td>W</td> <td>1600</td> <td>800</td> <td>400</td> <td>360</td> </tr> </tbody> </table> | V | 110 | 120 | 440 | 500 | W | 250 | 250 | 230 | 200 | W | 1600 | 800 | 400 | 360 | | | |
| V | 110 | 120 | 440 | 500 | | | | | | | | | | | | | | | |
| W | 250 | 250 | 230 | 200 | | | | | | | | | | | | | | | |
| W | 1600 | 800 | 400 | 360 | | | | | | | | | | | | | | | |

TeSys Control

CR1F Magnetic latching high power contactors

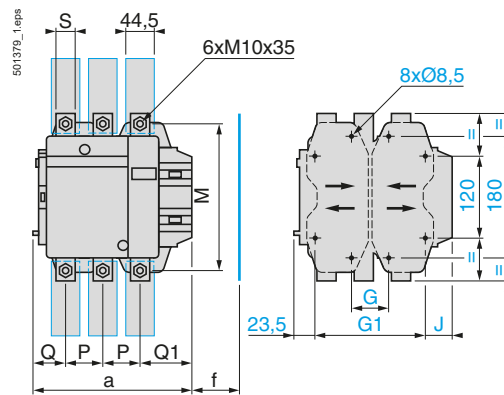
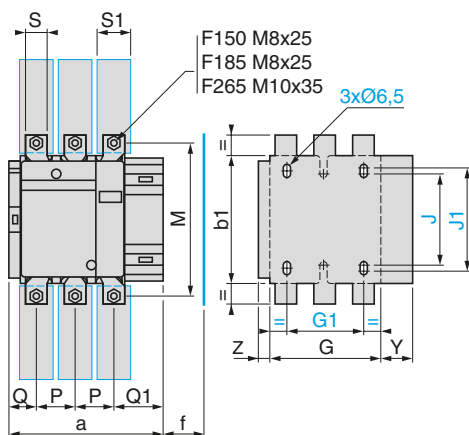
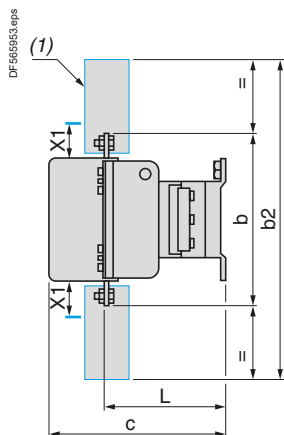
Dimensions

CR1F150 to F500

Common side view

CR1F150, F185, F265

CR1F400, F500



| CR1 | F150 | | F185 | | F265 | |
|-----|-------|-------|-------|-------|-------|-------|
| | 3P | 4P | 3P | 4P | 3P | 4P |
| a | 163.5 | 201.5 | 168.5 | 208.5 | 201.5 | 244.5 |
| b | 170 | 170 | 174 | 174 | 203 | 203 |
| b1 | 137 | 137 | 137 | 137 | 145 | 145 |
| b2 | 301 | 301 | 305 | 305 | 370 | 370 |
| c | 171 | 171 | 181 | 181 | 213 | 213 |
| f | 131 | 131 | 130 | 130 | 147 | 147 |
| G | 106 | 143 | 111 | 151 | 142 | 190 |
| G1 | 80 | 80 | 80 | 80 | 96 | 96 |
| J | 106 | 106 | 106 | 106 | 106 | 106 |
| J1 | 120 | 120 | 120 | 120 | 120 | 120 |
| L | 107 | 107 | 113.5 | 113.5 | 141 | 141 |
| M | 150 | 150 | 154 | 154 | 178 | 178 |
| P | 40 | 40 | 40 | 40 | 48 | 48 |
| Q | 26 | 26 | 29 | 29 | 39 | 34 |
| Q1 | 57.5 | 55.5 | 59.5 | 59.5 | 66.5 | 66.5 |
| S | 20 | 20 | 20 | 20 | 25 | 25 |
| S1 | 27 | 27 | 34 | 34 | 38 | 38 |
| Y | 44 | 44 | 38.5 | 30.5 | 30.5 | 21.5 |
| Z | 13.5 | 13.5 | 13.5 | 13.5 | 15.5 | 15.5 |

f = minimum distance required for coil removal.

X1: Minimum electrical clearance according to operational voltage and breaking capacity.

| CR1 | F400 | | F500 | |
|-----------------|------|-----|------|-----|
| | 3P | 4P | 3P | 4P |
| a | 213 | 261 | 233 | 288 |
| b | 206 | 206 | 238 | 238 |
| b2 | 375 | 375 | 400 | 400 |
| c | 219 | 219 | 232 | 232 |
| f | 146 | 146 | 150 | 150 |
| G supplied 80 | 80 | 80 | 140 | 140 |
| G max. | 102 | 150 | 120 | 175 |
| G1 supplied 170 | 170 | 170 | 230 | 230 |
| G1 min. | 156 | 156 | 156 | 156 |
| G1 max. | 192 | 240 | 210 | 265 |
| J | 12 | 60 | 32 | 27 |
| L | 145 | 145 | 146 | 146 |
| M | 181 | 181 | 208 | 208 |
| P | 48 | 48 | 55 | 55 |
| Q | 43 | 43 | 47 | 47 |
| Q1 | 74 | 74 | 77 | 77 |
| S | 25 | 25 | 30 | 30 |

f = minimum distance required for coil removal.

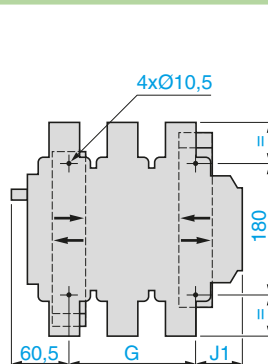
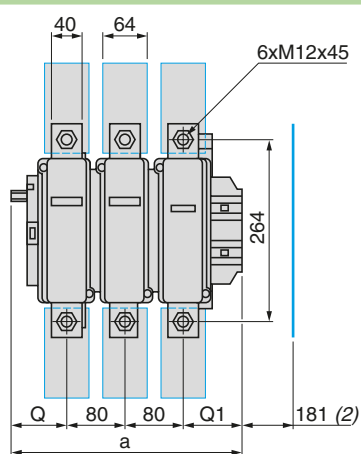
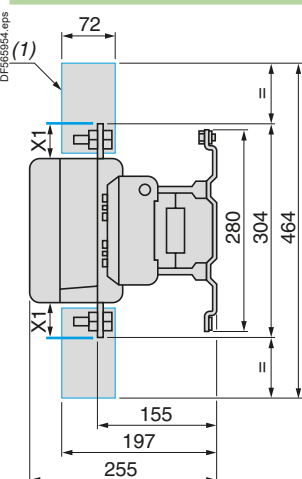
X1: Minimum electrical clearance according to operational voltage and breaking capacity.

| Voltage in V | 200...500 | 660...1000 |
|--------------|-----------|------------|
| CR1F150 | 10 | 15 |
| CR1F185 | 10 | 15 |
| CR1F265 | 10 | 15 |

| Voltage in V | 200...500 | 660...1000 |
|--------------|-----------|------------|
| CR1F400 | 15 | 20 |
| CR1F500 | 15 | 20 |

(1) Power terminal protection shroud (see page B9/14).

CR1F630



| CR1F630 | 3P | | 4P | |
|------------|-----|-----|-----|--|
| | a | 309 | 389 | |
| G supplied | 180 | 240 | | |
| G min. | 100 | 150 | | |
| G max. | 195 | 275 | | |
| J1 | 61 | 81 | | |
| Q | 60 | 60 | | |
| Q1 | 89 | 89 | | |

X1: Min. electrical clearance according to operational voltage and breaking capacity.

| Voltage in V | X1 |
|--------------|----|
| 200...500 | 20 |
| 690...1000 | 30 |

(1) Power terminal protection shroud.
(2) Minimum distance required for coil removal.

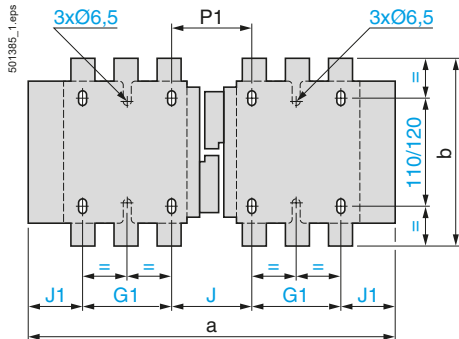
TeSys Control

CR1F Magnetic latching reversing contactors

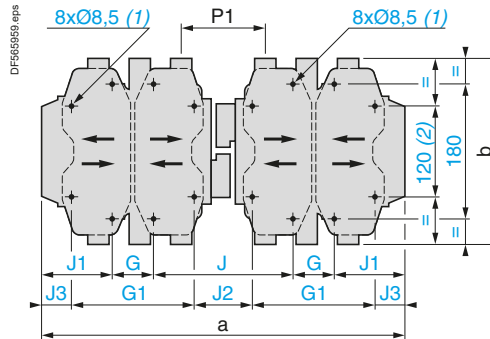
Mounting

Reversing contactors 2 x CR1F150...F265

Horizontally mounted



Reversing contactors 2 x CR1F400...F630



| 2 x CR1 | F150 | F185 | F265 | |
|---------|------|------|------|------|
| a | 3P | 345 | 357 | 425 |
| | 4P | 422 | 437 | 521 |
| b | 3P | 170 | 174 | 203 |
| | 4P | 170 | 174 | 203 |
| G1 | 3P | 80 | 80 | 96 |
| | 4P | 80 | 80 | 96 |
| J | 3P | 71 | 78 | 109 |
| | 4P | 111 | 118 | 157 |
| J1 | 3P | 57 | 59.5 | 61.5 |
| | 4P | 75.5 | 79.5 | 85.5 |
| P1 | 3P | 71 | 78 | 100 |
| | 4P | 71 | 78 | 100 |

| 2 x CR1 | F400 | F500 | F630 | |
|---------|------|-------|------|------|
| a | 3P | 446 | 485 | 636 |
| | 4P | 542 | 595 | 796 |
| b | 3P | 206 | 238 | 304 |
| | 4P | 206 | 238 | 304 |
| G | 3P | 80 | 80 | 180 |
| | 4P | 80 | 140 | 240 |
| G1 | 3P | 170 | 170 | — |
| | 4P | 170 | 230 | — |
| J | 3P | 157 | 156 | 139 |
| | 4P | 157 | 156 | 139 |
| J1 | 3P | 64.5 | 84.5 | 68.5 |
| | 4P | 112.5 | 79.5 | 68.5 |
| J2 | 3P | 67 | 66 | — |
| | 4P | 67 | 66 | — |
| J3 | 3P | 19.5 | 39.5 | — |
| | 4P | 67.5 | 34.5 | — |
| P1 | 3P | 107 | 112 | 137 |
| | 4P | 107 | 112 | 137 |

(1) Except F630: 4 x Ø 10.5.

(2) Except F630: 180.

Ref.



High power
contactors

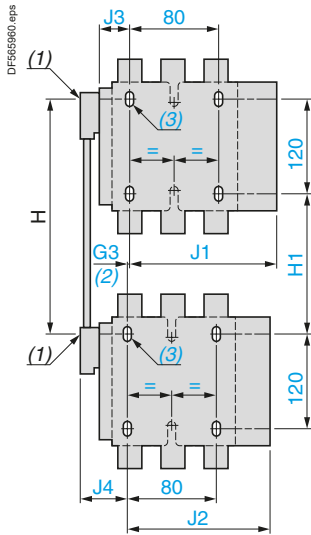
TeSys Control

CR1F Magnetic latching reversing contactors

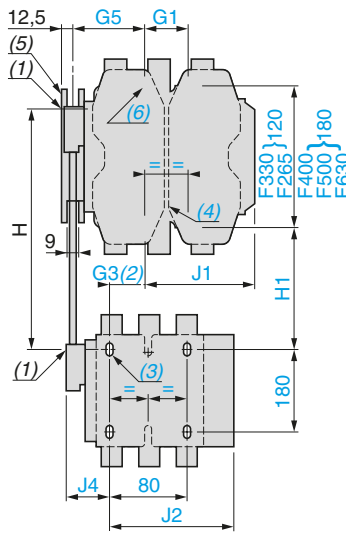
Mounting

Reversing contactors

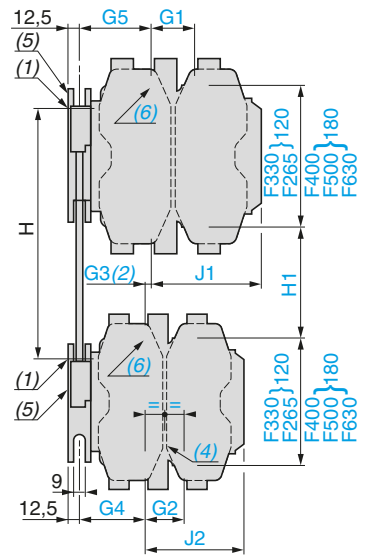
Vertically mounted with mechanical interlock **LA9F**...
 2 contactors **CR1F** of identical or different ratings (CR1F150...F630), see pages B9/81 and B9/81.
 Assembly A



Assembly B



Assembly C



- (1) Mechanical interlock shaft.
- (2) For assembly of contactors of different ratings only.
- (3) 3 x Ø6.5 mm for CR1F150...F265.
- (4) 3 x Ø6.5 mm for CR1F265.
- (5) Mechanical interlock guide bracket.
- (6) 4 x Ø8.5 mm for CR1F400, F500 or 4 x Ø10.5 mm.

| Assembly type LA9F | A | | | B | | | | | | | | C | | | | | | | | | |
|-----------------------|------|------|-----|-----|-------|------|------|------|-------|-----|-----|-------|-------|-------|------------------|-----|-----|------------------|-----|------------------|-----|
| | F4F | G4F | G4G | H4F | J4F | K4F | L4F | H4G | J4G | K4G | L4G | H4H | J4H | K4H | L4H | J4J | K4J | L4J | K4K | L4K | L4L |
| G1 | 3P | - | - | 96 | 80 | 80 | 180 | 96 | 80 | 80 | 180 | 96 | 80 | 80 | 180 | 80 | 80 | 180 | 80 | 180 | 180 |
| | 4P | - | - | 96 | 80 | 140 | 240 | 96 | 80 | 140 | 240 | 96 | 80 | 140 | 240 | 80 | 140 | 240 | 140 | 240 | 240 |
| G2 | 3P | - | - | - | - | - | - | - | - | - | - | 96 | 96 | 96 | 96 | 80 | 80 | 80 | 80 | 80 | 180 |
| | 4P | - | - | - | - | - | - | - | - | - | - | 96 | 96 | 96 | 96 | 80 | 80 | 80 | 140 | 140 | 240 |
| G3 | 3P | 0 | 3 | 0 | 21 | 45 | 45 | 35 | 19 | 42 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | 9 ⁽⁷⁾ | 0 | 9 ⁽⁷⁾ | 0 |
| | 4P | 0 | 4 | 0 | 27 | 26 | 26 | 17 | 23 | 22 | 22 | 0 | 0 | 0 | 9 ⁽⁷⁾ | 0 | 0 | 9 ⁽⁷⁾ | 0 | 9 ⁽⁷⁾ | 0 |
| G4 | 3P | - | - | - | - | - | - | - | - | - | - | 60 | 60 | 60 | 60 | 83 | 83 | 83 | 83 | 83 | 74 |
| | 4P | - | - | - | - | - | - | - | - | - | - | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 74 |
| G5 | 3P | - | - | - | 60 | 83 | 83 | 74 | 60 | 83 | 83 | 60 | 83 | 83 | 74 | 83 | 83 | 74 | 83 | 74 | 74 |
| | 4P | - | - | - | 83 | 83 | 83 | 74 | 83 | 83 | 83 | 83 | 83 | 83 | 74 | 83 | 83 | 74 | 83 | 74 | 74 |
| H | min. | 200 | 210 | 220 | 240 | 250 | 270 | 310 | 250 | 250 | 270 | 250 | 260 | 280 | 330 | 260 | 280 | 325 | 300 | 345 | 380 |
| | max. | 310 | 300 | 310 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 |
| H1 | min. | 80 | 90 | 100 | 110 | 80 | 100 | 140 | 120 | 90 | 110 | 130 | 110 | 130 | 170 | 60 | 100 | 140 | 120 | 160 | 200 |
| | max. | 190 | 180 | 190 | 250 | 210 | 210 | 210 | 250 | 220 | 220 | 260 | 230 | 230 | 220 | 200 | 200 | 195 | 200 | 195 | 200 |
| J1 | 3P | 133 | 134 | 134 | 149.5 | 137 | 157 | 241 | 149.5 | 137 | 157 | 149.5 | 137 | 157 | 24 | 137 | 157 | 241 | 157 | 244 | 241 |
| | 4P | 145 | 146 | 146 | 164.5 | 185 | 212 | 321 | 164.5 | 185 | 212 | 164.5 | 185 | 212 | 321 | 185 | 212 | 321 | 212 | 321 | 321 |
| J2 | 3P | 133 | 133 | 134 | 183 | 133 | 183 | 133 | 134 | 134 | 134 | 142.5 | 149.5 | 149.5 | 149.5 | 137 | 137 | 137 | 157 | 157 | 241 |
| | 4P | 145 | 145 | 146 | 145 | 145 | 145 | 145 | 146 | 146 | 146 | 164.5 | 164.5 | 164.5 | 164.5 | 185 | 185 | 185 | 212 | 212 | 312 |
| J3 | 3P | 48.5 | 53 | 53 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4P | 67 | 73 | 73 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| J4 | 3P | 48.5 | 54 | 53 | 48.5 | 48.5 | 48.5 | 48.5 | 53 | 53 | 53 | - | - | - | - | - | - | - | - | - | - |
| | 4P | 67 | 69 | 73 | 67 | 67 | 67 | 67 | 73 | 73 | 73 | - | - | - | - | - | - | - | - | - | - |

(7) In this case, G4 is greater than G5.

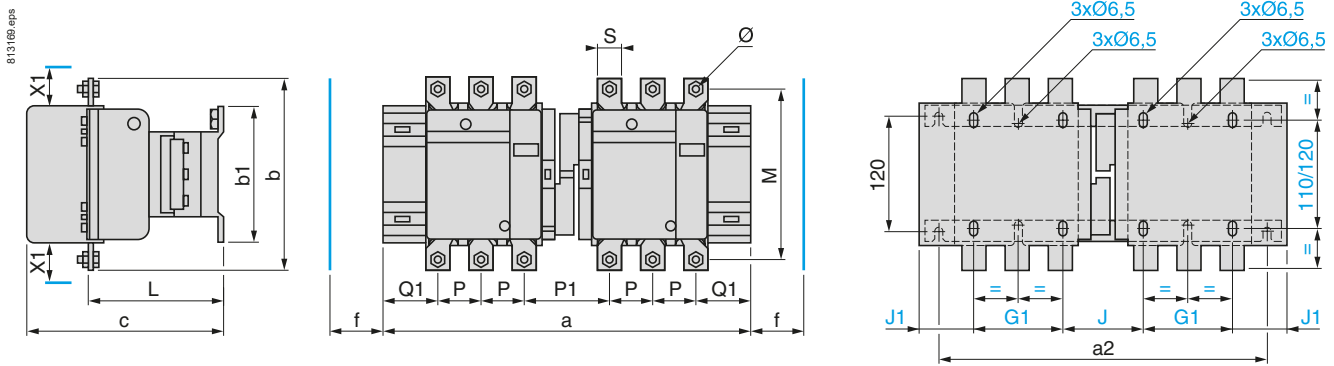
TeSys Control

F - Reversing and changeover contactors

Dimensions

Pre-assembled

LC2F115 to F265 (reverser supplied on 2 bars which can be used for fixing the device)



f - Minimum distance required for coil removal.

Bar fixing centres
Vertical: 120 mm
Horizontal: a2 see table

X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

| LC1 | 200...500 V | 660...1000 V |
|------------|-------------|--------------|
| F115, F150 | 10 | 15 |
| F185 | 10 | 15 |
| F225, F265 | 10 | 15 |

Ref.



| LC2 | | a | a2 | b | b1 | c | G1 | J | J1 | L | M | P | P1 | Q1 | S | f | Ø |
|------|----|-----|-----|-----|-----|-----|----|-----|------|-------|-----|----|-----|------|----|-----|-----|
| F115 | 3P | 345 | 317 | 162 | 137 | 171 | 80 | 71 | 57 | 107 | 147 | 37 | 77 | 60 | 20 | 131 | M6 |
| | 4P | 419 | 378 | 162 | 137 | 171 | 80 | 108 | 75.5 | 107 | 147 | 37 | 77 | 60 | 20 | 131 | M6 |
| F150 | 3P | 345 | 317 | 170 | 137 | 171 | 80 | 71 | 57 | 107 | 150 | 40 | 71 | 57 | 20 | 131 | M8 |
| | 4P | 422 | 381 | 170 | 137 | 171 | 80 | 111 | 75.5 | 107 | 150 | 40 | 71 | 55.5 | 20 | 131 | M8 |
| F185 | 3P | 357 | 326 | 174 | 137 | 181 | 80 | 78 | 59.5 | 113.5 | 154 | 40 | 78 | 59.5 | 20 | 130 | M8 |
| | 4P | 437 | 390 | 174 | 137 | 181 | 80 | 118 | 79.5 | 113.5 | 154 | 40 | 78 | 59.5 | 20 | 130 | M8 |
| F225 | 3P | 357 | 326 | 197 | 137 | 181 | 80 | 78 | 59.5 | 113.5 | 172 | 48 | 62 | 51.5 | 25 | 130 | M10 |
| | 4P | 437 | 390 | 197 | 137 | 181 | 80 | 118 | 79.5 | 113.5 | 172 | 48 | 54 | 47.5 | 25 | 130 | M10 |
| F265 | 3P | 425 | 386 | 203 | 145 | 213 | 96 | 109 | 61.5 | 141 | 178 | 48 | 100 | 66.5 | 25 | 147 | M10 |
| | 4P | 521 | 464 | 203 | 145 | 213 | 96 | 157 | 85.5 | 141 | 178 | 48 | 100 | 66.5 | 25 | 147 | M10 |

High power contactors

TeSys Control

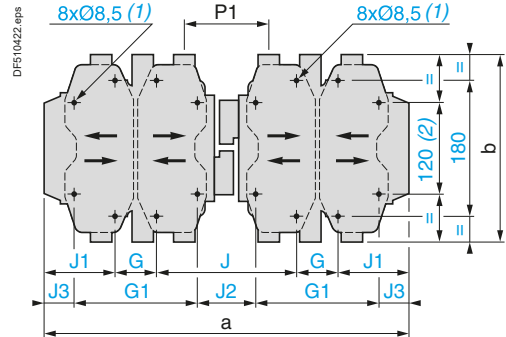
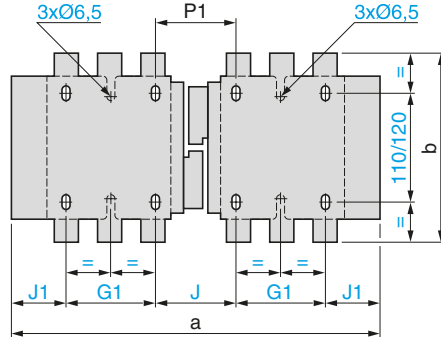
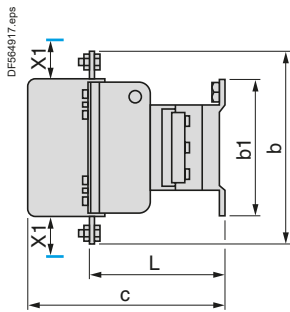
F - Reversing and changeover contactors

Dimensions

For customer assembly, fixing recommended on AM1EC uprights, please consult your Regional Sales Office.

2 x LC1F115 to F330

2 x LC1F400, F500, F630, F800



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

| LC1 | 200...500 V | 660...1000 V | 200...690 V | 1000 V |
|------------|-------------|--------------|-------------|--------|
| F115, F150 | 10 | 15 | - | - |
| F185 | 10 | 15 | - | - |
| F225, F265 | 10 | 15 | - | - |
| F330 | 10 | 15 | - | - |
| F400 | 15 | 20 | - | - |
| F500 | 15 | 20 | - | - |
| F630 | 20 | 30 | - | - |
| F800 | - | - | 10 | 20 |

| 2 x LC1 | | a | b | b1 | c | G | G1 | J | J1 | J2 | J3 | L | P1 |
|---------|----|-----|-----|-----|-----|-----|-----|-----|-------|----|------|-------|-----|
| F115 | 3P | 345 | 162 | 137 | 171 | - | 80 | 71 | 57 | - | - | 107 | 77 |
| | 4P | 419 | 162 | 137 | 171 | - | 80 | 108 | 75.5 | - | - | 107 | 77 |
| F150 | 3P | 345 | 170 | 137 | 171 | - | 80 | 71 | 57 | - | - | 107 | 71 |
| | 4P | 422 | 170 | 137 | 171 | - | 80 | 111 | 75.5 | - | - | 107 | 71 |
| F185 | 3P | 357 | 174 | 137 | 181 | - | 80 | 78 | 59.5 | - | - | 113.5 | 78 |
| | 4P | 437 | 174 | 137 | 181 | - | 80 | 118 | 79.5 | - | - | 113.5 | 78 |
| F225 | 3P | 357 | 197 | 137 | 181 | - | 80 | 78 | 59.5 | - | - | 113.5 | 62 |
| | 4P | 437 | 197 | 137 | 181 | - | 80 | 118 | 79.5 | - | - | 113.5 | 54 |
| F265 | 3P | 425 | 203 | 145 | 213 | - | 96 | 109 | 61.5 | - | - | 141 | 100 |
| | 4P | 521 | 203 | 145 | 213 | - | 96 | 157 | 85.5 | - | - | 141 | 100 |
| F330 | 3P | 447 | 206 | 145 | 219 | - | 96 | 124 | 65.5 | - | - | 145 | 107 |
| | 4P | 543 | 206 | 145 | 219 | - | 96 | 172 | 89.5 | - | - | 145 | 107 |
| F400 | 3P | 446 | 206 | 209 | 219 | 80 | 170 | 157 | 64.5 | 67 | 19.5 | 145 | 107 |
| | 4P | 542 | 206 | 209 | 219 | 80 | 170 | 157 | 112.5 | 67 | 67.5 | 145 | 107 |
| F500 | 3P | 485 | 238 | 209 | 232 | 80 | 170 | 156 | 84.5 | 66 | 39.5 | 146 | 112 |
| | 4P | 595 | 238 | 209 | 232 | 140 | 230 | 156 | 79.5 | 66 | 34.5 | 146 | 112 |
| F630 | 3P | 636 | 304 | 280 | 255 | 180 | - | 139 | 68.5 | - | - | 155 | 137 |
| | 4P | 796 | 304 | 280 | 255 | 240 | - | 139 | 88.5 | - | - | 155 | 137 |
| F800 | 3P | 636 | 304 | 280 | 255 | 180 | - | 139 | 68.5 | - | - | 155 | 137 |

(1) Except LC1F630 and F800: 4 x Ø10.5.

(2) Except LC1F630 and F800.

For other dimensions: see pages B9/54 and B9/55.

COORD.

Ref.



High power contactors

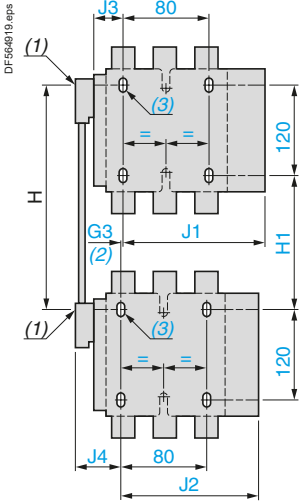
TeSys Control

F - Reversing and changeover contactors

Dimensions

For customer assembly, with mechanical interlock (MI) **LA9F**, fixing recommended on AM1EC uprights (please consult your Regional Sales Office). 2 x **LC1** identical or different ratings (**LC1F115 to F630 and F800**). See pages B9/34 to B9/37.

Assembly A

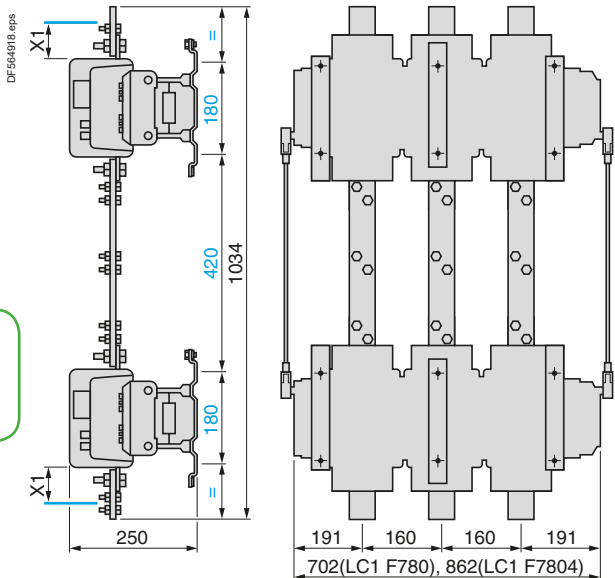


- (1) Mechanical interlock shaft.
- (2) For assembly of contactors of different ratings only.
- (3) 4 x Ø6.5 for LC1F115 to F225.

Assembly A⁽⁷⁾ - Mechanical interlock reference

| | G3 3P | G3 4P | H min. | H max. | H1 min. | H1 max. | J1 3P | J1 4P |
|---------|-------|-------|--------|--------|---------|---------|-------|-------|
| LA9FF4F | 0 | 0 | 200 | 310 | 80 | 190 | 137 | 155.5 |
| LA9FG4G | 0 | 0 | 220 | 310 | 100 | 190 | 139.5 | 159.5 |
| | J2 3P | J2 4P | J3 3P | J3 4P | J4 3P | J4 4P | | |
| LA9FF4F | 137 | 155.5 | 48.5 | 67 | 48.5 | 67 | | |
| LA9FG4G | 139.5 | 159.5 | 53 | 73 | 53 | 73 | | |

For customer assembly, fixing recommended on AM1EC uprights, please consult your Regional Sales Office.
2 x **LC1F780**

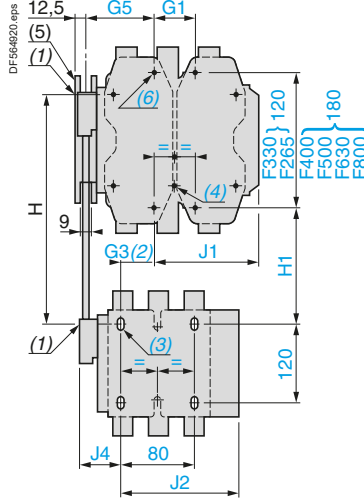


X1 and fixings, see page B9/86.

(7) Only 3P for F800.

(8) In this case, G4 is greater than G5.

Assembly B



- (4) 4 x Ø6.5 for LC1F265.
- (5) Mechanical interlock guide bracket.

Assembly B⁽⁷⁾ - Mechanical interlock reference

| | G1 3P | G1 4P | G3 3P | G3 4P | G5 3P | G5 4P | H min. | H max. |
|---------|-------|-------|-------|-------|-------|-------|--------|--------|
| LA9FH4F | 96 | 96 | 21 | 27 | 60 | 83 | 240 | 380 |
| LA9FJ4F | 80 | 80 | 45 | 26 | 83 | 83 | 250 | 380 |
| LA9FH4G | 96 | 96 | 19 | 23 | 60 | 83 | 250 | 380 |
| LA9FJ4G | 80 | 80 | 42 | 22 | 83 | 83 | 250 | 380 |
| LA9FL4G | 180 | 240 | 33 | 13 | 74 | 74 | 310 | 380 |

| | H1 min. | H1 max. | J1 3P | J1 4P | J2 3P | J2 4P | J4 3P | J4 4P |
|---------|---------|---------|-------|-------|-------|-------|-------|-------|
| LA9FH4F | 110 | 250 | 157.5 | 181.5 | 137 | 155.5 | 48.5 | 67 |
| LA9FJ4F | 80 | 210 | 144.5 | 192.5 | 137 | 155.5 | 48.5 | 67 |
| LA9FH4G | 120 | 250 | 157.5 | 181.5 | 139.5 | 159.5 | 53 | 73 |
| LA9FJ4G | 90 | 220 | 144.5 | 192.5 | 139.5 | 159.5 | 53 | 73 |
| LA9FL4G | 150 | 220 | 248.5 | 328.5 | 139.5 | 159.5 | 53 | 73 |

Assembly C⁽⁷⁾

| | G1 3P | G1 4P | G2 3P | G2 4P | G3 3P | G3 4P | G4 3P | G4 4P | G5 3P | G5 4P |
|---------|--------|--------|---------|---------|------------------|------------------|-------|-------|-------|-------|
| LA9FH4H | 96 | 96 | 96 | 96 | 0 | 0 | 60 | 83 | 60 | 83 |
| LA9FJ4H | 80 | 80 | 96 | 96 | 23 | 0 | 60 | 83 | 83 | 83 |
| LA9FK4H | 80 | 140 | 96 | 96 | 23 | 0 | 60 | 83 | 83 | 83 |
| LA9FL4H | 180 | 240 | 96 | 96 | 14 | 9 ⁽⁸⁾ | 60 | 83 | 74 | 74 |
| LA9FJ4J | 80 | 80 | 80 | 80 | 0 | 0 | 83 | 83 | 83 | 83 |
| LA9FK4J | 80 | 140 | 80 | 80 | 0 | 0 | 83 | 83 | 83 | 83 |
| LA9FL4J | 180 | 240 | 80 | 80 | 9 ⁽⁸⁾ | 9 ⁽⁸⁾ | 83 | 83 | 74 | 74 |
| LA9FL4L | 180 | 240 | 180 | 240 | 0 | 0 | 74 | 74 | 74 | 74 |
| | H min. | H max. | H1 min. | H1 max. | J1 3P | J1 4P | J2 3P | J2 4P | | |
| LA9FH4H | 250 | 380 | 130 | 260 | 157.5 | 181.5 | 157.5 | 181.5 | | |
| LA9FJ4H | 260 | 380 | 110 | 230 | 144.5 | 192.5 | 157.5 | 181.5 | | |
| LA9FK4H | 280 | 380 | 130 | 230 | 164.5 | 219.5 | 157.5 | 181.5 | | |
| LA9FL4H | 330 | 380 | 170 | 220 | 248.5 | 328.5 | 157.5 | 181.5 | | |
| LA9FJ4J | 260 | 380 | 60 | 200 | 144.5 | 192.5 | 144.5 | 192.5 | | |
| LA9FK4J | 280 | 380 | 100 | 200 | 164.5 | 219.5 | 144.5 | 192.5 | | |
| LA9FL4J | 325 | 380 | 140 | 195 | 248.5 | 329.5 | 144.5 | 192.5 | | |
| LA9FL4L | 380 | 380 | 200 | 200 | 248.5 | 328.5 | 248.5 | 328.5 | | |

TeSys Control

F - Reversing and changeover contactors

Dimensions

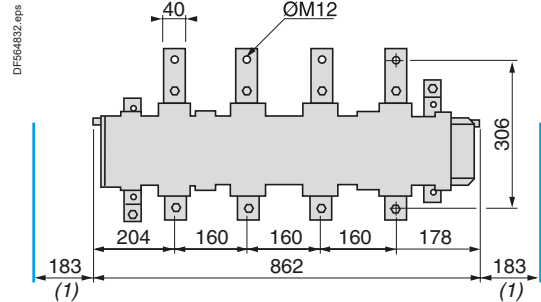
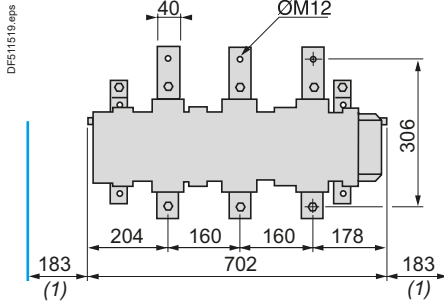
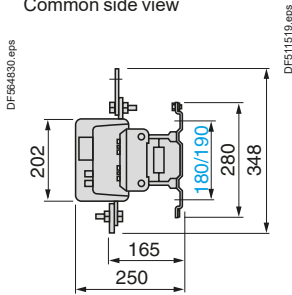
Dimensions

Contactors used to assemble high power changeover contactor pairs LC1F780

LC1F6309

LC1F63049

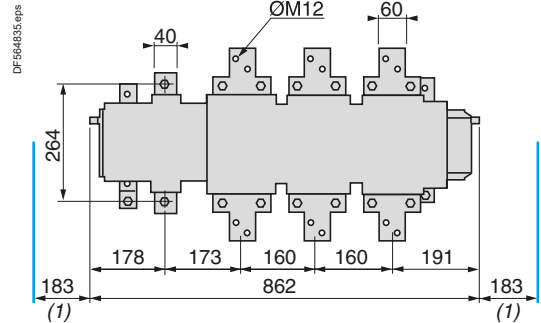
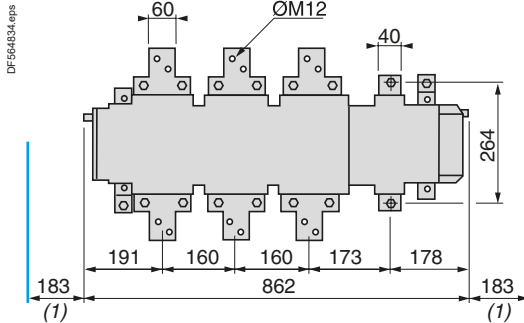
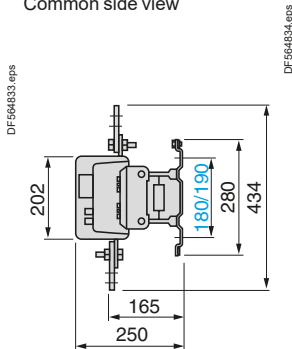
Common side view



LC1F78040

LC1F78041

Common side view



(1) Minimum distance required for removal of each coil.

TeSys Control

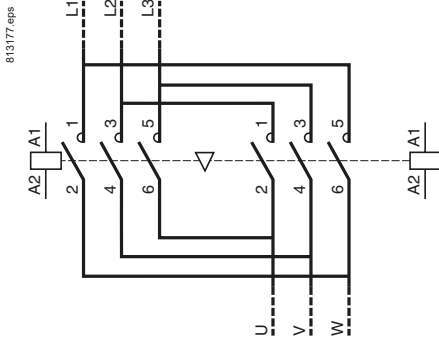
F - Reversing and changeover contactors

Schemes

Reversing contactors for motor control LC2F

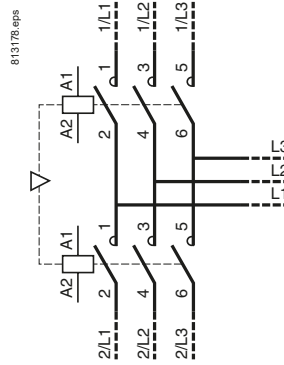
2 x LC1F

Horizontally mounted



2 x LC1F

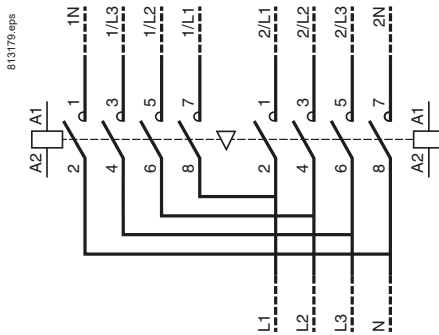
Vertically mounted



Changeover contactor pairs for distribution LC2F

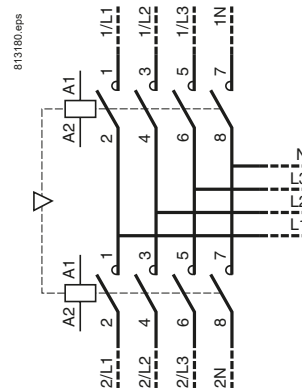
2 x LC1F

Horizontally mounted



2 x LC1F

Vertically mounted

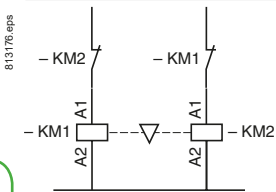


Ref.



Electrical interlocking of reversers fitted with mechanical interlock without integral electrical contacts

LA9F


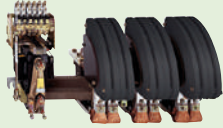


High power contactors




Introduction

| | |
|----------------|-------|
| Applications | B10/2 |
| Offer panorama | B10/4 |
| Technology | B10/6 |

TeSys B Bar mounted contactors - Variable composition (composition is defined by customer)

| Type of product | Range | Pages |
|--|--|--|
| TeSys CV1B Standard performance - 690 V | From 80 to 700 A - AC-3 From 80 to 1000 A - AC-1 |  B10/10 |
| TeSys CV3B - TeSys LC1B High performance - 1000 V | From 80 to 1800 A - AC-3 From 80 to 2750 A - AC-1 |  B10/20 |
| Variable composition contactors - ordering process | | B10/29 |

TeSys B Bar mounted contactors - Predefined composition

| | | |
|---|--|--|
| TeSys LC1B High performance / power - 1000 V | From 750 to 1800 A - AC-3 From 800 to 2750 A - AC-1 |  B10/32 |
| TeSys CVEB, CWBE, CRXB, CVXB, CWXB For control of DC excitation circuit of synchronous motors - 1200 V DC | From 80 to 2750 A - DC |  B10/35 |
| TeSys CR1B Magnetic latching - 1000 V | From 750 to 1800 A - AC-3 From 800 to 2750 A - AC-1 |  B10/40 |

TeSys B Variable composition contactors

All details and composition list in the
TeSys B Bar mounted contactors dedicated catalogue




Catalogue ref:
DIA1ED2070702EN

Click here
to
download

Bar
mounted
contactors

TeSys B Bar mounted contactors - from specification of customer's application

| | | |
|---|---------------------------|--|
| Excitation circuit of synchronous motor, magnetic latching, furnaces and induction heating applications, tramways rails grounding... CF452 - Customer requirements specification form | From 80 to 16300 A - AC-1 |  B10/43 |
|---|---------------------------|--|

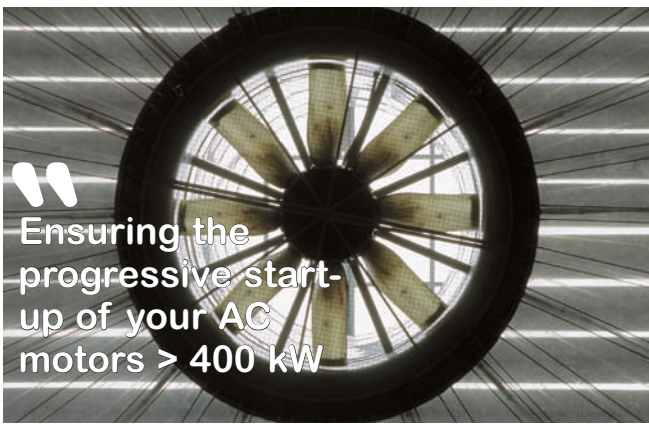
Variable composition contactors: other solution

The use of a variable composition contactor becomes evident when the specification of the application can no longer be met with a standard contactor.

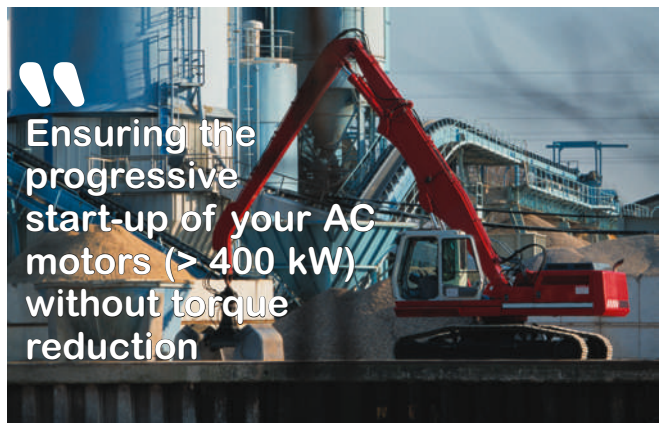
- High power load: > 400 kW.
- AC main supply from 1000 to 3000 V.
- Very inductive DC load: L/R > 15 ms.
- DC main supply with low current but voltage over 1000 V.
- High operating frequency: up to 1200 op./h.
- High durability: several millions of operations.

Some examples

The fact sheets are available at <http://www.se.com/>



Application form ref. EDCED110013EN



Application form ref. EDCED110014EN



Application form ref. EDCED110017EN



Application form ref. EDCED110018EN

Bar mounted contactors

Videos

Very high power contactors - TeSys B - 1 - Discovery
Discover Schneider Electric's TeSys B bar contactors that are designed to cut out considerable electric arcs. See how they are manufactured in the Schneider Electric factory and check out the presentation of the range.



Very high power contactors - TeSys B - 2 - Applications
Discover very high-power applications for which Schneider Electric's TeSys B bar contactors offer great advantages.



TeSys Control

B Bar mounted contactors

Applications



Application form ref. EDCED110015EN



Application form ref. EDCED110016EN



Application form ref. EDCED110019EN



Application form ref. EDCED110020EN

Very high power contactors -TeSys B - 3 - Technology
Discover how Schneider Electric's TeSys B bar contactors cut out electric arcs of up to several thousand Amps: 'magnetic blowing'.



Bar
mounted
contactors

TeSys Control

B Bar mounted contactors

Offer panorama

Applications

- Motor switching in categories AC-3.
- Resistive load switching: heating, lighting.
- Distribution circuit switching: line contactor.
- Supply changeover switching: circuit coupling.
- Transformer, capacitor.

PB110969.eps



PB110969.eps



| Contactors | Type |
|------------|------|
| | Size |

CV1B

| | |
|---------------------------|-----------|
| Rated operational current | AC-3 |
| | AC-4/DC-5 |
| | AC-1 |

| F | G ⁽¹⁾ | H | J ⁽¹⁾ | K (with Type 1 pole) | K (with Type 3 poles) | L ⁽¹⁾ |
|--------|------------------|---------|------------------|----------------------|-----------------------|------------------|
| 80 A | | 250 A | | 460 A | 460 A | |
| 72 A/- | | 205 A/- | | -/- A | 380 / 630 A | |
| 80 A | | 300 A | | 630 A | 630 A | |

| |
|--------------------------------|
| Max. rated operational voltage |
|--------------------------------|

| | | | | | | |
|---------|--|---------|--|---------|-----------|--|
| 690 V ~ | | 690 V ~ | | 690 V ~ | 1 000 V ~ | |
|---------|--|---------|--|---------|-----------|--|

| |
|---|
| Available with configuration type command |
|---|

| | | | | | | |
|---------------|--|--|--|--|--|--|
| A - B - C - D | | | | | | |
|---------------|--|--|--|--|--|--|

Available control circuit configuration

Type A
a.c. supply ~



Type B
d.c. supply ---



⁽¹⁾ CV1B legacy size 'G', 'J', 'L', CV3B legacy size 'G', 'J', 'K', please consult us.

Bar
mounted
contactors

TeSys Control

B Bar mounted contactors

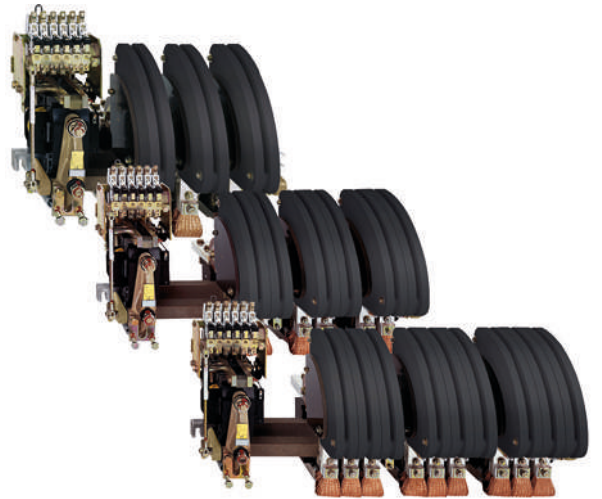
Offer panorama

- Motor switching in categories AC-4, DC-5.
- Inductive circuit switching: crane electromagnets.
- High voltage d.c. switching: railway locomotives.
- Load switching at high operating rates.

PB121215.eps



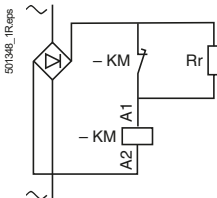
PB121216.eps



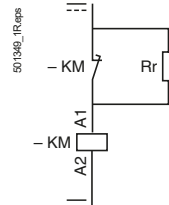
| CV3B | | | | |
|---------------|------------------|-----------|------------------|------------------|
| F | G ⁽¹⁾ | H | J ⁽¹⁾ | K ⁽¹⁾ |
| 80 A | | 250 A | | |
| 80/80 A | | 208/300 A | | |
| 80A | | 300 A | | |
| 1000 V ~ | | 1000 V ~ | | |
| A - B - C - D | | | | |

| CV3B and LC1B | | | |
|---|------------------|-------------|-------------|
| L | M ⁽¹⁾ | P | R |
| 800 A | 1000 A | 1500 A | 1800 A |
| 720/800 A | 830/1000 A | 1200/1800 A | 1500/2500 A |
| 800 A | 1250 A | 2000 A | 2750 A |
| 1000 V ~ | 1000 V ~ | 1000 V ~ | 1000 V ~ |
| C - D (B: special conditions - contact us) | | | |

Type C
a.c. supply via economy resistor



Type D
d.c. supply via economy resistor



Bar
mounted
contactors

The variable composition contactor range is split into 3 groups:

■ **Low power switching contactors:**

- type CV1B●, 80 to 630 A
- type CV3B●, 80 to 300 A.

For motor control, the references of the CV1 and CV3 contactors are given on catalogue DIA2070702EN.

For other applications, the composition of the commercial references is described on Symbol combination table, see pages B10/29 to B10/31 or use the configuration software "bar contactor soft-customer.xls" to download on: www.se.com.

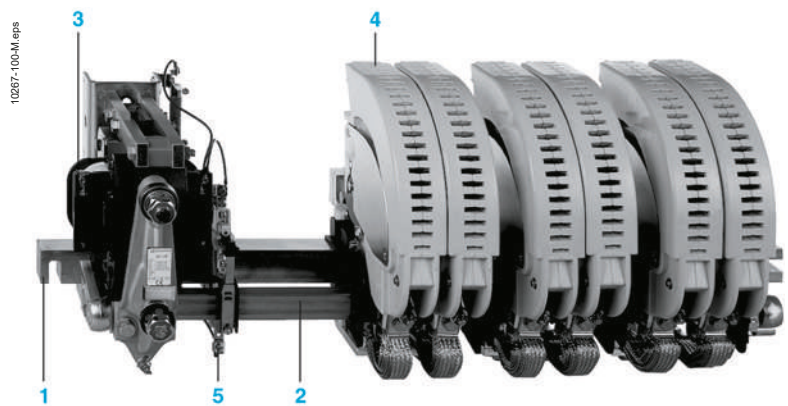
■ **Increased power switching contactors:**

- type LC1B●, 800 to 2750 A. References shown on B10/32 and B10/33.

■ **Specific contactors** (large number of main poles, pole arrangement, customised fixing and dimensions, component referencing, etc.) :

- type CV1●B, 80 to 630 A
- type CV3●B, 80 to 2750 A.

To order these contactors, complete the Order form on catalogue DIA2070702EN.



- 1 Mounting bar
- 2 Rotating armature shaft
- 3 Electromagnet
- 4 Main pole
- 5 Instantaneous auxiliary contacts

Variable composition contactors are particularly suited for switching a.c. or d.c. motors and other circuits and are capable of providing a high number of operating cycles. Their variable composition design allows them to be built to customer specification.

Applications

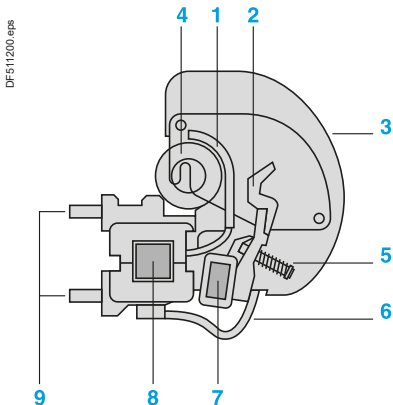
These variable composition contactors are ideally suited for the most frequently encountered applications:

- Switching a.c. squirrel cage and slip-ring motors in all utilisation categories (AC-2, AC-3, AC-4).
- Switching d.c. motors in all utilisation categories (DC-2, DC-3, DC-4, DC-5).
- Switching a.c. resistive loads (category AC-1) and d.c. resistive loads (category DC-1).
- Switching distribution circuits (category AC-1).
- Short-circuiting of rotor resistors.
- Switching capacitors, power factor correction.
- Switching transformer primaries.
- Switching inductive circuits with high time constant ($L/R > 15$ ms)
 Example: alternator excitation circuit.
- Severe duty requirements and main pole arrangements comprising 1 to 6 N/O and/or N/C poles.

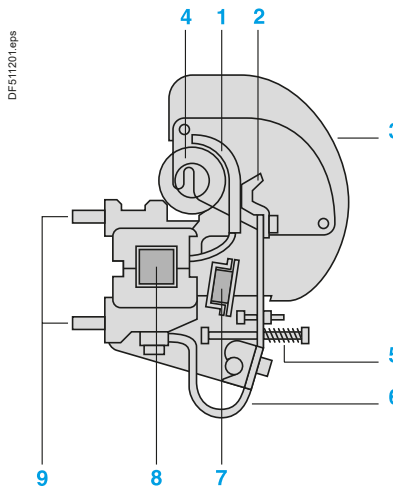
TeSys Control

B Bar mounted contactors

Technology



N/O pole 80...2750 A.



N/C pole 80...1000 A.

- 1 Fixed contact
- 2 Moving contact
- 3 Arc chamber
- 4 Blow-out coil
- 5 Pole pressure spring
- 6 Braided conductor
- 7 Rotating armature shaft (moving contact actuator)
- 8 Mounting bar
- 9 Terminal lugs

Power circuit

The principal function of a main pole is to make and break the supply current. It is designed to continuously carry its nominal operational current.

Making the current

On energisation of the electromagnet coil, the armature shaft rotates and the moving contact makes with the fixed contact. The contact pressure, maintained by the pole pressure spring, is sufficient to overcome the electrodynamic forces of transient current peaks (e.g.: switching a transformer, starting a motor, etc.).

Breaking the current

On de-energisation of the electromagnet coil, the contacts separate and electrical arcing is dissipated by the blow-out coil and arc chamber. To optimise the performance of the magnetic blow-out, the blow-out coil can be selected to suit the operational current, which is particularly important when switching d.c. The N/C pole operates in a reverse manner to the N/O pole, i.e. the contacts are closed whilst the electromagnet coil is de-energised and open during energisation.

CV1 contactors

- 690 V ~, 220 V ≡ / pole
- N/O poles 80...1000 A (PN1)
- N/C poles 80...1000 A (PR1).

■ Variants:

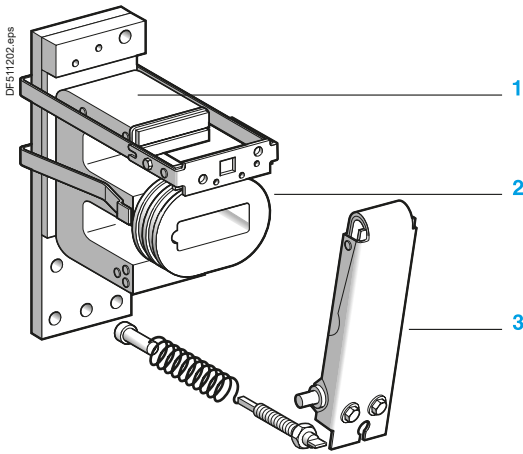
- no-load breaking poles
 - N/O poles 80...1000 A (PN5)
 - N/C poles 80...1000 A (PR5).
- arc chambers with splitters for dispersing the electric arc: 1000 V ~ / 440 V ≡ per pole
 - N/O poles 630...1000 A (PN3)
 - N/C poles 630...1000 A (PR3).

CV3 contactors

- 1000 V ~, 440 V ≡ / pole
- N/O poles 0...300 A (PA3)
- N/C poles 80...300 A (PR3)
- N/O poles 750...2750 A (PA1).

■ Variants:

- high making capacity poles 750...2750 A (PA2)
- high breaking capacity poles and poles with reduced safety clearances (arc chambers with closed splitters) 750...2750 A (PA1PX8)
- no-load breaking poles
 - N/O poles 750...2750 A (PA5).



Electromagnet EB1

- 1 Electromagnet core
- 2 Coil
- 3 Electromagnet armature

Control circuit

- 2 types of electromagnet: E shaped core and U shaped core.
- 2 types of coil: type WB1 and type WB2.

Electromagnet with E shaped core and coil type WB1

- **Electromagnet with E shaped laminated iron core, type EB**
 - with central air gap machined in armature,
 - with single coil type **WB1** fitted on centre limb of core.
- The upper limb incorporates a shading ring, the armature rotates.

■ Coil - direct a.c. 50 or 60 Hz supply

- 20 to 600 V
- 1200 operations/hour.

At the moment of inrush, with the armature open, the coil impedance is low and power consumption is high.

In the sealed state the armature is closed, the coil impedance increases and power consumption is low.

The inrush current is 6 to 10 times higher than the sealed current.

■ Electromagnet directly DC powered or via individual rectifier (50-400 Hz):

- the electromagnet is mounted with the reduction in consumption
- 12 to 500 V
- 120 operations/hour.

■ Electromagnet powered via individual rectifier (50-400 Hz):

- the electromagnet is mounted with the reduction in consumption
- 12 to 500 V
- 120 operations/hour.

At the moment of inrush, the full actuating voltage is applied to the coil and the inrush current is determined by the coil resistance.

In the sealed state an additional resistor is switched automatically in series with the coil, so as to reduce power consumption.

This economy resistor is switched by a N/C auxiliary contact which is adjusted to open only when the armature is fully closed.

The inrush current is 15 to 40 times higher than the sealed current.

Coils type WB1, used in conjunction with laminated iron cores, have a much higher inrush current than sealed current, whatever the nature of the supply current.

When establishing the current and selecting the supply voltage rating, it is important to take into account the line voltage drop due to the inrush current.

Electromagnet with U shaped core and coil type WB2 for d.c. supply

■ Electromagnet with U shaped solid iron core, type EK:

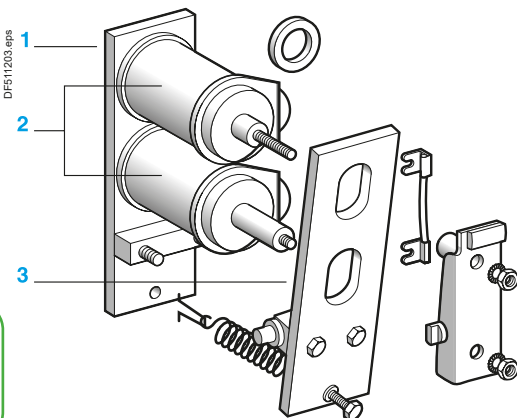
- 2 similar coils type **WB2** connected in series, one coil being fitted to each limb of the core
- the armature rotates.

■ Electromagnet for d.c. supply

- 12 to 600 V
- 1200 operations/hour.

The coils for this type of electromagnet have a considerable number of turns so as to obtain sufficient magnetic flux to attract the armature.

Due to its simplicity and relatively slow movements the assembly is very robust and, therefore, has increased mechanical durability.



Electromagnet EK

- 1 Electromagnet core
- 2 Coil
- 3 Electromagnet armature

Instantaneous and time delay auxiliary contacts

Signalling, electrical interlocking and slave functions can be achieved by using auxiliary contacts.

Instantaneous auxiliary contacts suitable for use with all contactor types are available:

- 1 block of 3 instantaneous N/O contacts and 2 N/C instantaneous contacts, reference LA1BN32A.

Delayed auxiliary contacts can be mounted onto contactors CV1 and CV3:

- On the block LA1BN32A, 1 block of N/O ON-delayed contact + 1 N/C ON-delayed contact, references LADT0 (delay from 0.1 to 3 s), LADT2 (0.1 to 30 s), LADT4 (10 to 180 s)
- On the block ref. LA1BN32A: 1 block of N/O OFF-delayed contact + 1 N/C OFF-delayed contact, references LADR0 (delay from 0.1 to 3 s), LADR4 (10 to 180 s).

The delayed contacts are established or separate some time after the closing or opening of the contactor which operates them. This time is adjustable.

On the block LA1BN32A all D contactors additives can be mounted, with the exception of LA6DK, LAD6K, LAD8N, LADN01, LADN10.

Assembling reversing/changeover contactor pairs

Mounting accessories

For applications involving the switching of reversing motors or changeover circuits, contactors of different ratings can easily be mounted vertically and interlocked. Mechanical interlock kits are available and auxiliary contacts can be used for electrical interlocking.

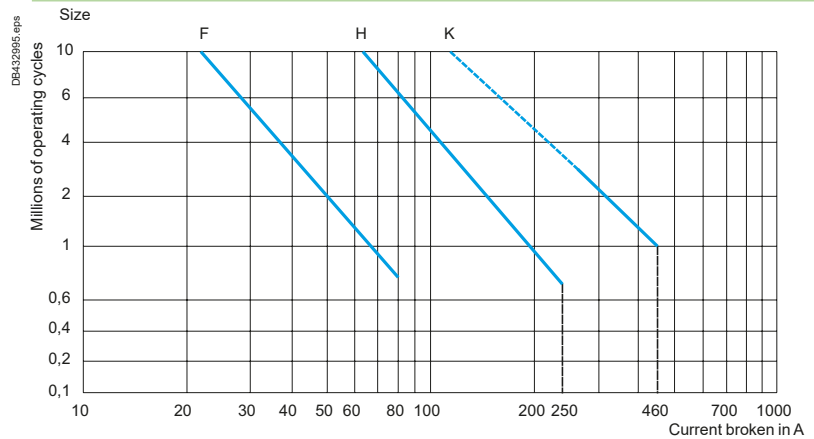
Selection criteria of the CV1B contactor size - utilisation category AC-3

| Rated operational current in A at $\theta \leq 55$ °C | | | | | | |
|---|------|------------------|------|------------------|------|------------------|
| CV1 contactors | Size | | | | | |
| | F | G ⁽¹⁾ | H | J ⁽¹⁾ | K | L ⁽¹⁾ |
| Maximum operating rate in operating cycles/hour | 1200 | | 1200 | | 1200 | |
| ≤ 440 V | 80 | | 250 | | 460 | |
| 500 V | 50 | | 200 | | 450 | |
| 690 V | 35 | | 150 | | 400 | |

| Nominal operational power at $\theta \leq 55$ °C | | | | | | |
|--|------|------------------|------|------------------|------|------------------|
| CV1 contactors | Size | | | | | |
| | F | G ⁽¹⁾ | H | J ⁽¹⁾ | K | L ⁽¹⁾ |
| Maximum operating rate in operating cycles/hour | 1200 | | 1200 | | 1200 | |
| 220/230 V | 22 | | 75 | | 140 | |
| 380/400 V | 37 | | 132 | | 250 | |
| 415/440 V | 37 | | 140 | | 260 | |
| 500 V | 30 | | 110 | | 315 | |
| 660/690 V | 22 | | 110 | | 315 | |

⁽¹⁾ CV1B legacy size 'G', 'J', 'L', please consult us.

Electrical durability ($U_e \leq 440$ V)



TeSys Control

B Bar mounted contactors

Variable composition - CV1B for motor control ≤ 690 V in AC-3

PB 10086 eps



CV1BF0A

Contactor reference tables, according standard motor power ratings in category AC-3

References

3-pole contactors for motor control

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | Maximum rated operational current, category AC-3 | Instantaneous auxiliary contacts per contactor | Basic reference, to be completed by adding the voltage code ^{(1) (2)} | Frequently used voltage codes | Weight | |
|--|-------|-------|-------|-------|-----------|--|--|--|-------------------------------|-------------|--------|
| 220 V | 380 V | 415 V | 440 V | 500 V | 660/690 V | | | | | | |
| kW | kW | kW | kW | kW | kW | A | | | | kg | |
| 22 | 37 | 37 | 37 | 30 | 22 | 80 | 3 | 2 | CV1BF3F0Z●●A | E5 F5 M5 Q5 | 4.000 |
| 75 | 132 | 140 | 140 | 110 | 110 | 250 | 3 | 2 | CV1BH3H0Z●●A | E5 F5 M5 Q5 | 11.000 |
| 140 | 250 | 260 | 260 | 315 | 315 | 460 | 1 | 1 | CV1BK3K0Z●●11 | F5 M5 Q5 | 40.000 |

(1) For other compositions, make up the contactor reference as explained on pages B10/29 to B10/31.

(2) Standard control circuit voltages (variable delivery, please contact us):

| Volts | 48 | 110 | 120 | 127 | 208 | 220 | 230 | 240 | 380 | 400 | 440 |
|------------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 50 Hz | E5 | F5 | – | G5 | – | M5 | P5 | U5 | Q5 | V5 | R5 |
| 60 Hz | E6 | – | K6 | – | L6 | M6 | P6 | U6 | Q6 | V6 | R6 |
| 50/60 Hz | E7 | F7 | K7 | G7 | L7 | M7 | P7 | U7 | Q7 | V7 | R7 |
| --- | ED | FD | KD | GD | – | MD | PD | UD | QD | VD | – |
| --- + Econ.R. ⁽³⁾ | ER | FR | KR | GR | – | MR | PR | UR | QR | VR | – |

For other voltages: please consult your Regional Sales Office.

(3) Econ.R.: Economy resistor.

Bar mounted contactors

Selection criteria of the CV1B contactor size - utilisation category AC-1

| Maximum rated operational current (open-mounted device) | | | | | | |
|---|--------|------------------|------|------------------|------|------------------|
| CV1 contactors | Size | | | | | |
| | F | G ⁽¹⁾ | H | J ⁽¹⁾ | K | L ⁽¹⁾ |
| Maximum operating rate in operating cycles/hour | 1200 | | 1200 | | 1200 | |
| Connections | | | | | | |
| Cable | C.s.a. | mm ² | 25 | | 185 | – |
| Bars | Number | | – | | – | 2 |
| | C.s.a. | mm | – | | – | 40 x 5 |
| ≤ 40 °C | | A | 80 | | 300 | 630 |
| ≤ 55 °C | | A | 80 | | 300 | 600 |
| ≤ 70 °C | | A | 80 | | 300 | 550 |

⁽¹⁾ CV1B legacy size 'G', 'J', 'L', please consult us.

Increase in operational current by paralleling of poles

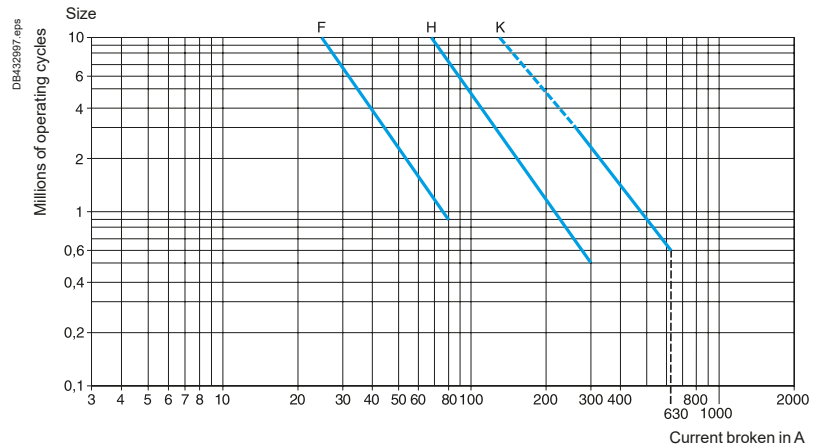
Apply the following multiplying factors to the current values given above. The factors take into account the often unbalanced current distribution between poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.



Example: 2 poles in parallel.

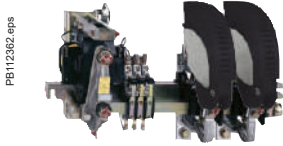
Electrical durability (U_e \leq 440 V)



TeSys Control

B Bar mounted contactors

Variable composition - CV1B for resistive circuit control ≤ 690 V in AC-1



CV1BK

Selection criteria of the CV1B contactor size - utilisation category AC-1

Maximum possibilities of the contactor, new design (size F to H)

| N/O poles | N/C poles |
|-----------|-----------|
| 0 | 1 |
| 1 | 0 |
| 1 | 1 |
| 2 | 0 |
| 2 | 1 |
| 3 | 0 |
| 4 | 0 |

For another combination, please contact us.

Maximum possibilities of the standard contactor (size K)

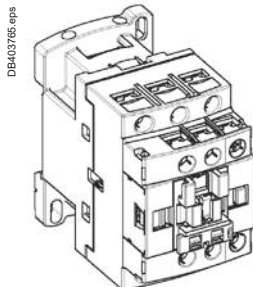
| N/O poles | N/C poles |
|-----------|-----------|
| 0 | 1 |
| 1 | 0 |
| 1 | 1 |
| 0 | 2 |
| 2 | 0 |
| 2 | 1 |
| 3 | 0 |
| 4 | 0 |

Auxiliaries contacts

■ Size F-H, 5 instantaneous contacts (3N/C + 2N/O) + D contactor (except for LA6DK, LADN01, LADN10, LAD6K and LAD8N).

Electromagnet and coil(s)

- For direct a.c. control
- For direct d.c. control
- For a.c. or d.c. control via economy resistor (accessories: economy resistor + contact, rectifier).



LA1BN32A

Auxiliary contact blocks per contactor

| Contact type | Composition | | Control circuit | | | Reference | Weight kg |
|-----------------------------------|-------------|-----|-----------------|----------|------------------------------|----------------------|--------------|
| | N/O | N/C | ~ direct | ⋯ direct | ~ or ⋯ with economy resistor | | |
| Contactor - Size F - H - K | | | | | | | |
| Instantaneous | 3 | 2 | 1 | 1 | 1 | LA1BN32A | 0.060 |
| Time delay | | | | | | | |
| On-delay | 1 | 1 | 1 | 1 | 1 | LADT● ⁽¹⁾ | 0.060 |
| Off-delay | 1 | 1 | 1 | 1 | 1 | LADR● ⁽¹⁾ | 0.060 |

⁽¹⁾ Choose additives LADT● and LADR● from the D range.

Bar mounted contactors

Selection criteria of the CV1B contactor size - utilisation category AC-2 and AC-4

Maximum current broken in A

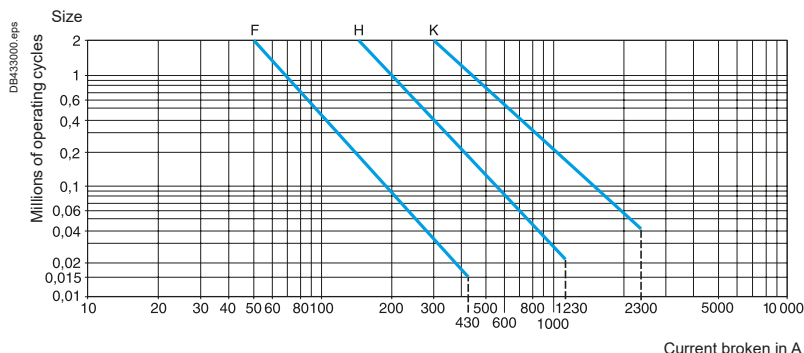
Related to maximum operating rate (operating cycles/hour) and on-load factor

| CV1B contactors ⁽¹⁾ | Thermal limit zone ⁽⁴⁾ | Size | | | | | |
|---|-----------------------------------|-----------------------------|------------------|-----|------------------|------|------------------|
| | | F | G ⁽²⁾ | H | J ⁽²⁾ | K | L ⁽²⁾ |
| Operating cycles/hour ⁽³⁾ and on-load factor | | Maximum current broken in A | | | | | |
| From 150 and 15 % to 300 and 10 % | A | 165 | | 520 | | 1300 | |
| From 150 and 20 % to 600 and 10 % | B | 145 | | 460 | | 1150 | |
| From 150 and 30 % to 1200 and 10 % | C | 120 | | 380 | | 950 | |
| From 150 and 55 % to 1200 and 20 % | D | 90 | | 280 | | 700 | |
| From 150 and 85 % to 1200 and 35 % | E | 70 | | 220 | | 550 | |

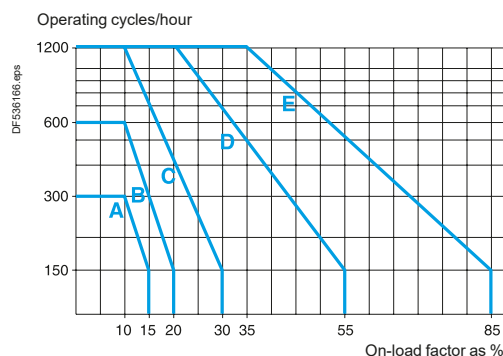
Counter current braking (plugging)

The current varies from the maximum counter current braking value up to the nominal motor current. The current made must be compatible with the making and breaking capacities of the contactor. In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

Electrical durability ($U_e \leq 440$ V)



Example: contactor size selection



For an on-load factor of 17 % at 180 operating cycles per hour, the above curve indicates zone B. If the maximum current broken is 200 A, the table above will lead to the selection of a size H contactor. Referring to the electrical durability curves, it can be seen that the contactor will have a life of 1 million operating cycles. Where a higher value of electrical durability is required, 2 million operating cycles for example, size K would be recommended.

⁽¹⁾ To obtain the complete reference of the contactor see the Symbol combination table on pages B10/29 to B10/31. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

⁽²⁾ CV1B legacy size 'G', 'J', 'L', please consult us.

⁽³⁾ Do not exceed the maximum limit for the mechanical operating cycles.

⁽⁴⁾ See curve at foot of page for thermal limit zone.

Bar
mounted
contactors

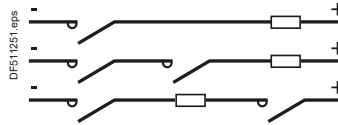
Selection criteria of the CV1B contactor size - utilization category DC-1

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage U_e
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage U_e

This depends on the time constant of the circuit $L/R \leq 1$ ms and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



Number of poles to be connected in series according to the operational voltage (time constant of the circuit $L/R \leq 1$ ms)

| CV1B contactors ⁽¹⁾ | | Size | | |
|--------------------------------|---|------|-----|------|
| | | F | H | K |
| 1 pole PN1 | V | 220 | 220 | 220 |
| 2 poles PN1 in series | V | 440 | 440 | 440 |
| 1 pole PN3 | V | – | – | 500 |
| 2 poles PN3 in series | V | – | – | 1000 |

Normal operation: $U_e \geq U$ supply.

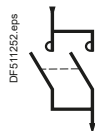
Rated operational current in A at $\theta \leq 40$ °C

| CV1B contactors | Size | | |
|-----------------|------|-----|-----|
| | F | H | K |
| | 80 | 300 | 630 |

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to $2 \times I_e \times 0.8$.



⁽¹⁾ To obtain the complete reference of the contactor refer to pages B10/29 to B10/31.

For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

TeSys Control

B Bar mounted contactors

Variable composition - CV1B for circuit control ≤ 1000 V in DC-1

Selection guide for utilisation categorie DC-1 according to required electrical durability

Power broken

| Utilisation categories | U broken | I broken | P broken |
|---|----------|----------|----------|
| DC-1: Non inductive or slightly inductive loads | Ue | Ie | Ue x Ie |

Electrical durability (time constant L/R ≤ 1 ms)

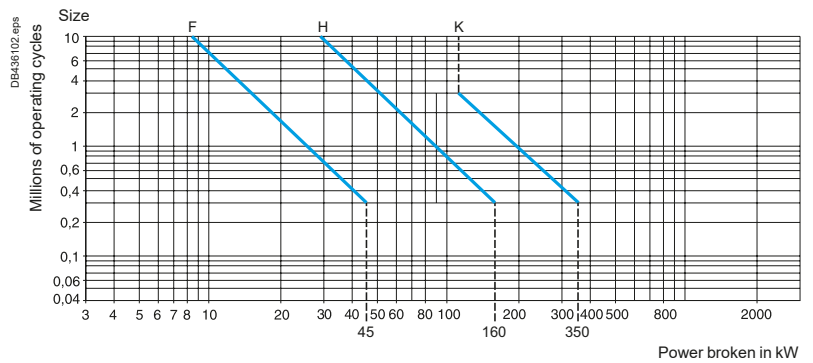
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$$P \text{ broken} = U \text{ broken} \times I \text{ broken.}$$

The table gives the values of U_c and I_c for the various utilisation categories.

Two-pole switching (time constant L/R ≤ 1 ms)

The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current I_e.

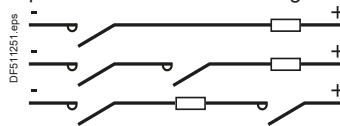
Selection criteria of the CV1B contactor size - utilisation category DC-3 and DC-5

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage U_e
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage U_e

This depends on the time constant of the circuit $L/R \leq 15$ ms and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



Number of poles to be connected in series according to the operational voltage (time constant of the circuit $L/R \leq 15$ ms)

| CV1B contactors ⁽¹⁾ | V | Size | | |
|--------------------------------|---|------|-----|-----|
| | | F | H | K |
| 1 pole PN1 | V | 220 | 220 | 220 |
| 2 poles PN1 in series | V | 440 | 440 | 440 |
| 1 pole PN3 | V | – | – | 440 |
| 2 poles PN3 in series | V | – | – | 850 |

Normal operation: $U_e \geq U$ supply.

With breaking during counter current braking (plugging): $U_e \geq 1.5 U$ supply.

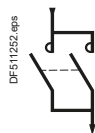
Rated operational current in A at $\theta \leq 40$ °C

| CV1B contactors | Size | | |
|-----------------|------|-----|-----|
| | F | H | K |
| | 80 | 300 | 630 |

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to $2 \times I_e \times 0.8$.



⁽¹⁾ To obtain the complete reference of the contactor, refer to pages B10/29 to B10/31. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

TeSys Control

B Bar mounted contactors

Variable composition - CV1B for circuit control ≤ 850 V in DC-3, DC-5

Selection criteria of the CV1B contactor size - utilisation category DC-3 and DC-5

| Power broken | | | |
|--|----------|----------|-------------|
| Utilisation categories | U broken | I broken | P broken |
| DC-3: Shunt motors, reversing, inching | Ue | 2.5 Ie | Ue x 2.5 Ie |
| DC-5: Shunt motors, reversing, inching | Ue | 2.5 Ie | Ue x 2.5 Ie |

Electrical durability (time constant L/R ≤ 15 ms)

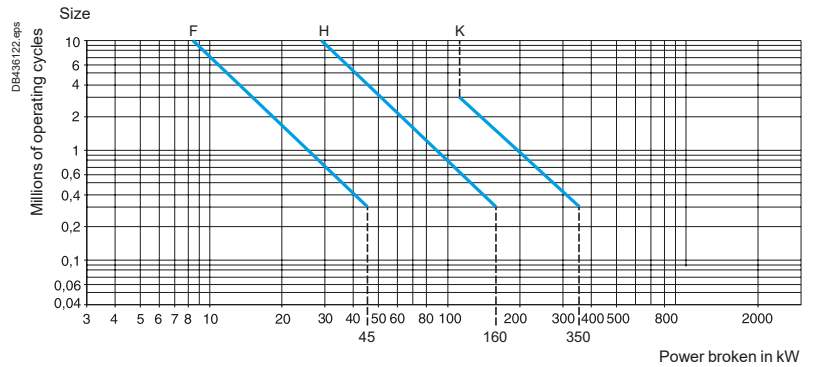
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$$P \text{ broken} = U \text{ broken} \times I \text{ broken}$$

The table gives the values of U_c and I_c for the various utilisation categories.

Two-pole switching (time constant L/R ≤ 15 ms)

The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current I_e.

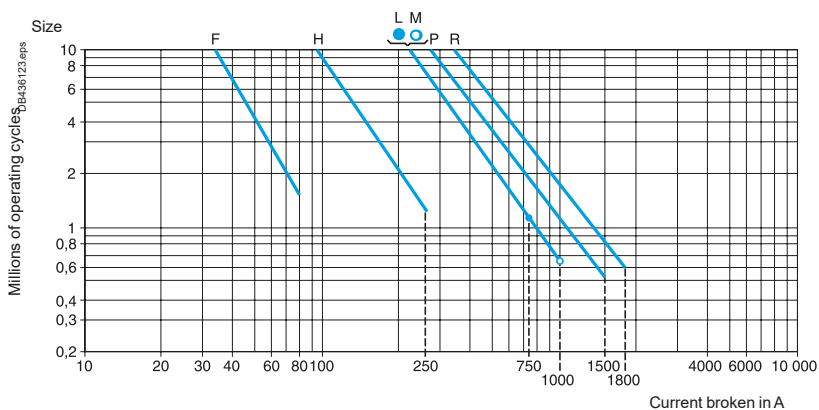
Selection criteria of the CV3B and LC1B contactor size - utilization category AC-3

| Rated operational current in A at $\theta \leq 55$ °C | | | | | | | | | |
|---|------|------------------|------|------------------|------------------|-----|------|------|------|
| Contactors CV3 and LC1B | Size | | | | | | | | |
| | F | G ⁽¹⁾ | H | J ⁽¹⁾ | K ⁽¹⁾ | L | M | P | R |
| Maximum operating rate in operating cycles/hour | 1200 | | 1200 | | | 120 | 120 | 120 | 120 |
| ≤ 440 V | 80 | | 290 | | | 800 | 1000 | 1500 | 1800 |
| 500 V | 80 | | 250 | | | 800 | 1000 | 1500 | 1800 |
| 690 V | 70 | | 240 | | | 750 | 900 | 1000 | 1100 |
| 1000 V | 70 | | 220 | | | 500 | 500 | 600 | 700 |

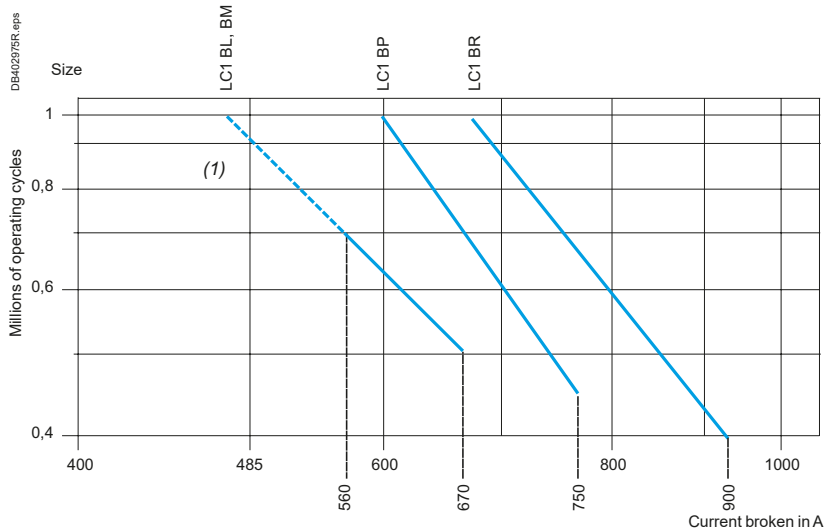
| Nominal operational power at $\theta \leq 55$ °C | | | | | | | | | |
|--|------|------------------|------|------------------|------------------|-----|-----|-----|-----|
| Contactors CV3 and LC1B | Size | | | | | | | | |
| | F | G ⁽¹⁾ | H | J ⁽¹⁾ | K ⁽¹⁾ | L | M | P | R |
| Maximum operating rate in operating cycles/hour | 1200 | | 1200 | | | 120 | 120 | 120 | 120 |
| 220/230 V | 22 | | 75 | | | 220 | 280 | 425 | 500 |
| 380/400 V | 37 | | 132 | | | 400 | 500 | 750 | 900 |
| 415 V | 37 | | 132 | | | 425 | 530 | 800 | 900 |
| 440 V | 45 | | 132 | | | 450 | 560 | 800 | 900 |
| 500 V | 45 | | 160 | | | 500 | 600 | 750 | 900 |
| 660/690 V | 55 | | 200 | | | 560 | 670 | 750 | 900 |
| 1000 V | 90 | | 250 | | | 530 | 530 | 670 | 750 |

(1) CV3B legacy size 'G', 'J', 'K', please consult us.

Electrical durability (Ue ≤ 440 V)



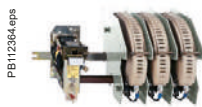
Electrical durability (Ue ≤ 690 V)



TeSys Control

B Bar mounted contactors

Variable composition - CV3B and LC1B for circuit control ≤ 1000 V in AC-3



CV3BF



CV3BK

References

Contactors for motor control in category AC-3, from 80 to 460 A

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | | Maximum rated operational current, category AC-3 | Instantaneous auxiliary contacts per contactor | Basic reference, to be completed by adding the voltage code ⁽¹⁾⁽²⁾ | Frequently used voltage codes | Weight |
|--|-------|-------|-------|-------|-----------|--------|-----|--|--|---|-------------------------------|--------|
| 220 V | 380 V | 415 V | 440 V | 500 V | 660/230 V | 1000 V | A | | | | | |
| 22 | 37 | 37 | 45 | 45 | 55 | 90 | 80 | 3 | 2 | CV3BF3F0Z●●A | E5 F5 M5 Q5 | 10.600 |
| 75 | 132 | 132 | 132 | 160 | 200 | 250 | 285 | 3 | 2 | CV3BH3F0Z●●A | E5 F5 M5 Q5 | 15.000 |

(1) For other compositions, make up the contactor reference as explained on pages B10/29 and B10/30.

(2) Standard control circuit voltages (variable delivery, please contact us):

| Volts | 48 | 110 | 120 | 127 | 208 | 220 | 230 | 240 | 380 | 400 | 440 |
|----------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 50 Hz | E5 | F5 | — | G5 | — | M5 | P5 | U5 | Q5 | V5 | R5 |
| 60 Hz | E6 | — | K6 | — | L6 | M6 | P6 | U6 | Q6 | V6 | R6 |
| 50/60 Hz | E7 | F7 | K7 | G7 | L7 | M7 | P7 | U7 | Q7 | V7 | R7 |
| — | ED | FD | KD | GD | — | MD | PD | UD | QD | VD | — |
| — + Econ.R. ⁽³⁾ | ER | FR | KR | GR | — | MR | PR | UR | QR | VR | — |

For other voltages: please consult your Regional Sales Office.

(3) Econ.R.: Economy resistor.

Contactors for motor control in category AC-3, from 750 to 1800 A (~ or —)

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | | Maximum rated operational current in AC-3 | Instantaneous auxiliary contacts per contactor ⁽⁴⁾ | Basic reference, to be completed by adding the voltage code | Frequently used voltage codes | Weight |
|--|-------|-------|-------|-------|-------|--------|------|---|---|---|-------------------------------|---------|
| 220 V | 380 V | 415 V | 440 V | 500 V | 660 V | 1000 V | A | | | | | |
| 220 | 400 | 425 | 450 | 500 | 560 | 530 | 800 | 2 | 2 | LC1BL33●22 | G P V | 57.000 |
| | | | | | | | | 3 | 1 | LC1BL33●31 | G P V | 57.000 |
| | | | | | | | | 1 | 3 | LC1BL33●13 | G P V | 57.000 |
| | | | | | | | | 4 | — | LC1BL33●40 | G P V | 57.000 |
| 280 | 500 | 530 | 560 | 600 | 670 | 530 | 1000 | 2 | 2 | LC1BM33●22 | G P V | 60.000 |
| | | | | | | | | 3 | 1 | LC1BM33●31 | G P V | 60.000 |
| | | | | | | | | 1 | 3 | LC1BM33●13 | G P V | 60.000 |
| | | | | | | | | 4 | — | LC1BM33●40 | G P V | 60.000 |
| 425 | 750 | 800 | 800 | 700 | 750 | 670 | 1500 | 2 | 2 | LC1BP33●22 | G P V | 94.000 |
| | | | | | | | | 3 | 1 | LC1BP33●31 | G P V | 94.000 |
| | | | | | | | | 1 | 3 | LC1BP33●13 | G P V | 94.000 |
| | | | | | | | | 4 | — | LC1BP33●40 | G P V | 94.000 |
| 500 | 900 | 900 | 900 | 900 | 900 | 750 | 1800 | 3 | 1 | LC1BR33●31 | G P V | 129.000 |
| | | | | | | | | 1 | 3 | LC1BR33●13 | G P V | 129.000 |
| | | | | | | | | 4 | — | LC1BR33●40 | G P V | 129.000 |

(4) Standard control circuit voltages (variable delivery, please contact us):

| Volts | 48 | 110 | 120 | 125 | 127 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
|---------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ~ 50...400 Hz | — | F | K | — | G | M | P | U | Q | V | N | R | S |
| — | ED | FD | — | GD | — | MD | — | UD | — | — | — | RD | SD |

For voltages other than those listed above, please consult us.



LC1BP

Bar mounted contactors

Selection criteria of the CV3B and LC1B contactor size - utilization category AC-1

Maximum rated operational current (open-mounted device)

| Contactors CV3 and LC1B | Size | | | | | | | | | |
|---|--------|------------------|------|------------------|------------------|-----|--------|--------|---------|----------|
| | F | G ⁽¹⁾ | H | J ⁽¹⁾ | K ⁽¹⁾ | L | M | P | R | |
| Maximum operating rate in operating cycles/hour | 1200 | | 1200 | | | 120 | 120 | 120 | 120 | |
| Connections | | | | | | | | | | |
| Cable | C.s.a. | mm ² | 25 | | 120 | | - | - | - | - |
| Bars | Number | | - | | - | | 2 | 2 | 3 | 3 |
| | C.s.a. | mm | - | | - | | 50 x 5 | 80 x 5 | 100 x 5 | 100 x 10 |
| ≤ 40 °C | A | 80 | | 250 | | 800 | 1250 | 2000 | 2750 | |
| ≤ 55 °C | A | 80 | | 250 | | 700 | 1100 | 1750 | 2400 | |
| ≤ 70 °C | A | 80 | | 250 | | 600 | 900 | 1500 | 2000 | |

⁽¹⁾ CV3B legacy size 'G', 'J', 'K', please consult us.

Increase in operational current by paralleling of poles

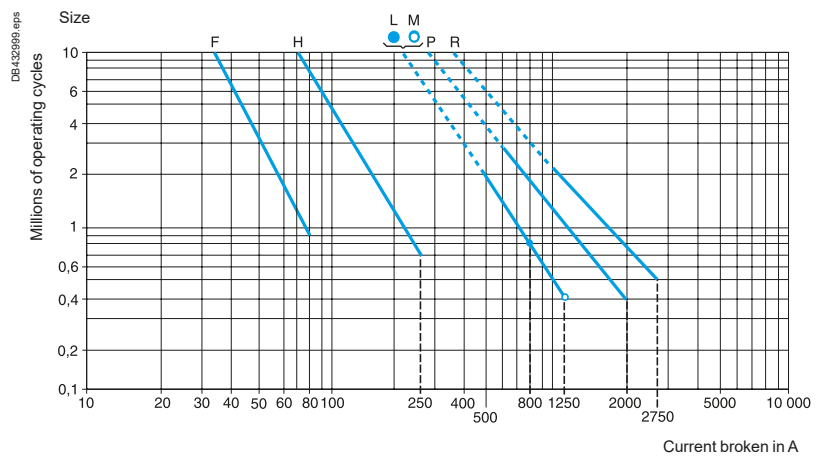
Apply the following multiplying factors to the current values given above. The factors take into account the often unbalanced current distribution between poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.



Example: 2 poles in parallel.

Electrical durability ($U_e \leq 440$ V)



TeSys Control

B Bar mounted contactors

Variable composition - CV3B and LC1B for resistive circuit control ≤ 1000 V in AC-1

PB112364.eps



CV3BF

Selection criteria of the CV3B and LC1B contactor size - utilization category AC-1

Maximum possibilities of the contactor

CV3B contactors are characterised by their extensive composition alternatives:

■ Poles ⁽¹⁾

| Size F - H | | Size L - M - P - R | |
|------------|-----------|--------------------|-----------|
| N/O poles | N/C poles | N/O poles | N/C poles |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 2 | 0 |
| 1 | 1 | 3 | 0 |
| 2 | 0 | 4 | 0 |
| 2 | 1 | | |
| 3 | 0 | | |
| 4 | 0 | | |







Auxiliaries contacts

■ Size F-H, 5 instantaneous contacts (3N/C + 2N/O) + D contactor (except for LA6DK, LAD6K, LADN01, LADN10 and LAD8N).

Electromagnet and coil(s)

- For direct a.c. control
- For direct d.c. control
- For a.c. or d.c. control via economy resistor (accessories: economy resistor + contact, rectifier).

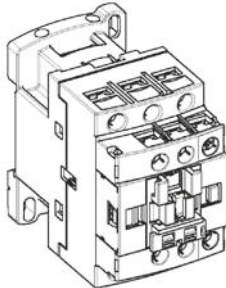
Auxiliary contact blocks contactor - Size F - H

| Contact type | Composition | | Control circuit | | | Reference | Weight kg |
|-------------------|---|---|--|--|--|----------------------|--------------|
| |  |  |  direct |  direct |  or  with economy resistor | | |
| Instantaneous | 3 | 2 | 1 | 1 | 1 | LA1BN32A | 0.060 |
| Time delay | | | | | | | |
| On-delay | 1 | 1 | 1 | 1 | 1 | LADT● ⁽²⁾ | 0.060 |
| Off-delay | 1 | 1 | 1 | 1 | 1 | LADR● ⁽²⁾ | 0.060 |

⁽¹⁾ For possible compositions, see pages B10/29 to B10/31.

⁽²⁾ Choose additives LADT● and LADR● from the D range.

DB403765.eps



LA1BN32A

Bar mounted contactors

Selection criteria of the CV3B and LC1B contactor size - utilization category AC-2 and AC-4

Thermal limits

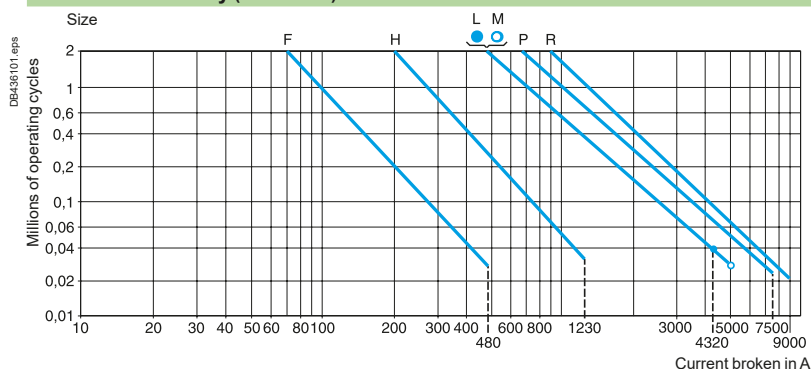
Related to maximum operating rate (operating cycles/hour) and on-load factor

| Contactors CV3 ⁽¹⁾ and LC1B | Thermal limit zone ⁽⁴⁾ | Size | | | | | | | | |
|---|-----------------------------------|---|------------------|-----|------------------|------------------|------|------|------|------|
| | | F | G ⁽²⁾ | H | J ⁽²⁾ | K ⁽²⁾ | L | M | P | R |
| Operating cycles/hour ⁽³⁾ and on-load factor | | Maximum current broken depending on the duty Thermal limit at ambient temperature ≤ 55 °C | | | | | | | | |
| From 150 and 15 % to 300 and 10 % | A | 165 | | 520 | | | 2250 | 3000 | 4500 | 5400 |
| From 150 and 20 % to 600 and 10 % | B | 145 | | 460 | | | 2000 | 2400 | 3750 | 5000 |
| From 150 and 30 % to 1200 and 10 % | C | 120 | | 380 | | | 1500 | 2000 | 3000 | 3600 |
| From 150 and 55 % to 1200 and 20 % | D | 90 | | 280 | | | 1000 | 1500 | 2000 | 2500 |
| From 150 and 85 % to 1200 and 35 % | E | 70 | | 220 | | | 750 | 1000 | 1500 | 1800 |

Counter current braking (plugging)

The current varies from the maximum counter current braking value up to the nominal motor current. The current made must be compatible with the making and breaking capacities of the contactor. In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

Electrical durability ($U_e \leq 440$ V)

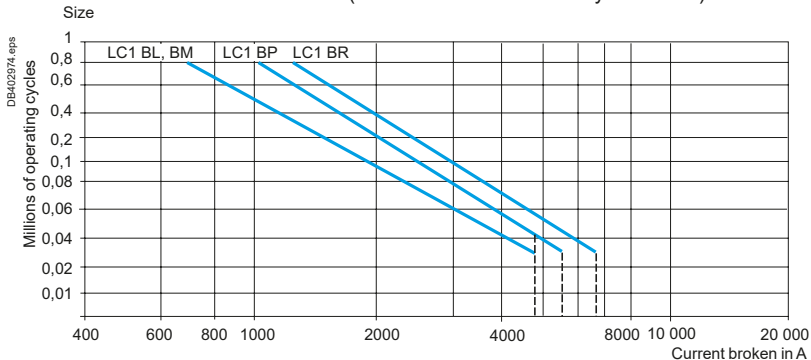


Example:

For an on-load factor of 17 % at 180 operating cycles per hour, the above curve indicates zone B. If the maximum current broken is 90 A, the table above will lead to the selection of a size F contactor. Referring to the electrical durability curves, it can be seen that the contactor will have a life of 1 100 000 operating cycles. Where a higher value of electrical durability is required, 2 million operating cycles for example, size H would be recommended.

Electrical durability ($U_e \leq 690$ V)

Control of 3 phase asynchronous squirrel cage motors with "motor stalled" stop. The current I_c cut in AC-4 is $6 \times I_e$. (I_e = rated current drawn by the motor).



- (1) To obtain the complete reference of the contactor see the Symbol combination table on pages B10/29 to B10/31. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.
- (2) CV3B legacy size 'G', 'J', 'K', please consult us.
- (3) Do not exceed the maximum limit for the mechanical operating cycles.
- (4) See curve at the previous page for thermal limit zone.

TeSys Control

B Bar mounted contactors

Variable composition - CV3B and LC1B for circuit control ≤ 1500 V in DC-1

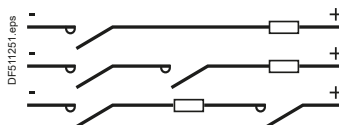
Selection criteria of the CV3B and LC1B contactor size - utilization category DC-1

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage U_e
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage U_e

This depends on the time constant L/R of the circuit and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



Number of poles to be connected in series according to the operational voltage

| | | |
|---------------------|--------|---------------------|
| Operational voltage | 500 V | 1 |
| | 1000 V | 2 |
| | 1500 V | Please, consult us. |

Normal operation: $U_e \geq U$ supply.

Rated operational current in A at $\theta \leq 40$ °C

| Contactor size CV3B ⁽¹⁾ | | CV3B and LC1B | | | |
|------------------------------------|-----|---------------|------|------|------|
| F | H | L | M | P | R |
| 80 | 300 | 800 | 1000 | 1800 | 2500 |

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to $2 \times I_e \times 0.8$.



⁽¹⁾ To obtain the complete reference of the contactor refer to pages B10/29 and B10/30. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

Bar
mounted
contactors

Selection criteria of the CV3B and LC1B contactor size - utilization category DC-1

Power broken

| Utilisation category | U broken | I broken | P broken |
|---|----------|----------|------------------|
| DC-1: Non inductive or slightly inductive loads | U_e | I_e | $U_e \times I_e$ |

Electrical durability (time constant $L/R \leq 1$ ms)

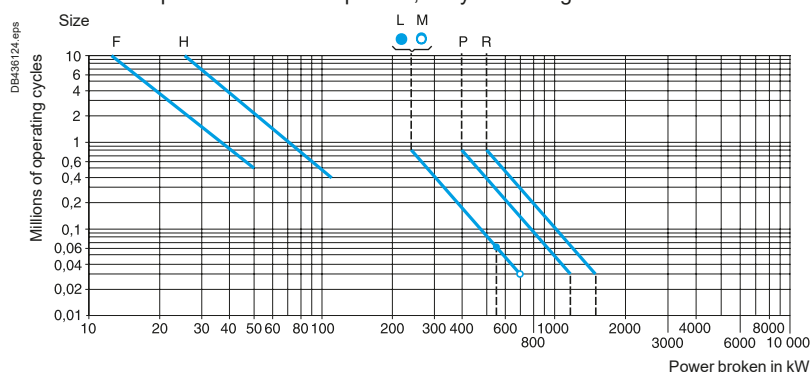
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$$P \text{ broken} = U \text{ broken} \times I \text{ broken.}$$

The table gives the values of U_c and I_c for the various utilisation categories.

Power broken per pole (time constant $L/R \leq 1$ ms)

The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current I_e .

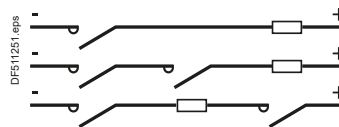
Selection criteria of the CV3B and LC1B contactor size - utilization category DC-3 and DC-5

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage U_e
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage U_e

This depends on the time constant L/R of the circuit and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



Number of poles to be connected in series according to the operational voltage and time constant L/R (in ms) of the circuit

| Time constant in ms | | 15 | 30 | 60 | 90 | 120 | 150 |
|---------------------|------------------------|----|----|----|----|-----|-----|
| Operational voltage | 125 V | 1 | 1 | 1 | 2 | 2 | 2 |
| | 225 V | 1 | 1 | 2 | 3 | 3 | 4 |
| | 330 V | 1 | 2 | 3 | 3 | 4 | - |
| | 440 V | 1 | 2 | 3 | 4 | - | - |
| | 850 V | 2 | 3 | 4 | - | - | - |
| | 1200 V (consult us) | 3 | 4 | - | - | - | - |
| | 1500 V (consult us) | 4 | - | - | - | - | - |

Normal operation: $U_e \geq U$ supply.

With breaking during counter current braking (plugging): $U_e \geq 1.5 U$ supply.

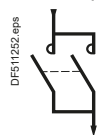
Rated operational current in A at $\theta \leq 40^\circ\text{C}$

| Contactor size CV3B ⁽¹⁾ | | CV3B and LC1B | | | |
|------------------------------------|-----|---------------|------|------|------|
| F | H | L | M | P | R |
| 80 | 300 | 800 | 1000 | 1800 | 2500 |

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to $2 \times I_e \times 0.8$.



⁽¹⁾ To obtain the complete reference of the contactor refer to pages B10/29 and B10/30. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

Selection criteria of the CV3B and LC1B contactor size - utilization category DC-3 and DC-5

Power broken

| Utilisation category | U broken | I broken | P broken |
|---|----------|----------|-------------|
| DC-3: Shunt motors, reversing, inching | Ue | 2.5 Ie | Ue x 2.5 Ie |
| DC-5: Series motors, reversing, inching | Ue | 2.5 Ie | Ue x 2.5 Ie |

Electrical durability (time constant L/R ≤ 15 ms)

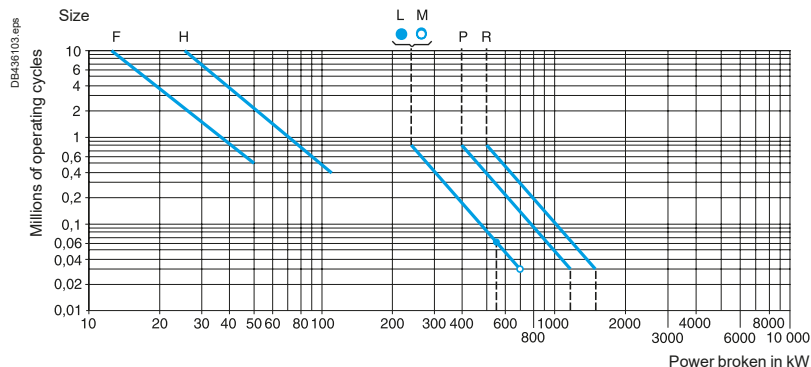
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$$P \text{ broken} = U \text{ broken} \times I \text{ broken}$$

The table gives the values of U_c and I_c for the various utilisation categories.

Power broken per pole (time constant L/R ≤ 15 ms)

The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Example: 30 kW motor, 500 V-70 A in category DC-3: $P \text{ broken} = U_e \times 2.5 I_e = 500 \times 2.5 \times 70 = 86 \text{ kW}$ or 43 kW per pole.
For a 2-pole size F contactor, the curve gives an electrical durability of 6×10^5 operating cycles.

Electrical durability depending on the time constant

- According to the time constant L/R.
- $L/R \leq 15$ ms, read the number of operating cycles directly from the curves.
- $15 < L/R \leq 30$ ms, the number of operating cycles is equal to the number read from the curves $\times \frac{15}{L/R}$.
- $L/R > 30$ ms, please consult your Regional Sales Office.

Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current I_e.

From assembly definition to contactor ordering

Contactor assembly definition

The criteria required to define the composition of a contactor are:

- the number of N/O and N/C power poles
- the current and power supply voltage
(note: on a d.c. supply, the time constant $\frac{L}{R}$ of the load must be known in order to define the number of poles to be wired in series to break the arc)
- the control circuit voltage
- the number of auxiliary contacts.

Contactor ordering - product reference composition

For all contactors:

- configuration software "bar contactor soft-customer.xls"
- Link for download: <https://www.se.com/ww/en/product-range-download/667-tesys-b/#/software-firmware-tab>
- from order form in TeSys B catalogue ref. DIA2070702EN.

For contactors CV1BF/BH/BK, CV3BF/BH:

- software or selection tables below.

Checking of contactor possible assemblies

CV1B and CV3B have some restrictions:

- in rated operational current (Ie) per power pole
- in number of N/O - N/C power poles
- in number of auxiliary contacts.

Please refer to tables below.

Rated operational current per poles - codes per contactor type

| Contactor type | | CV1BF CV3BF | CV1BH CV3BH | CV1BK |
|--|--------|----------------|----------------|-------|
| Rated operational current ⁽¹⁾ | 11 A | E | - | - |
| | 13 A | M | - | - |
| | 20 A | N | - | - |
| | 40 A | P | - | - |
| | 50 A | Q | Q | - |
| | 80 A | F | F | - |
| | 125 A | - | R | I |
| | 200 A | - | G | S |
| | 250 A | - | - | H |
| | 300 A | - | H | - |
| | 320 A | - | - | - |
| | 400 A | - | - | U |
| | 470 A | - | - | - |
| | 500 A | - | - | V |
| | 630 A | - | - | K |
| | 1000 A | - | - | - |
| 0 no magnetic blowing | Z | Z | Z | |

(1) Other rating: contact us.

CV1B contactors: maximum number of power poles

| Contactor type | CV1BF | | CV1BH | | CV1BK | |
|-----------------|-------|-----|-------|-----|-------|-----|
| | N/O | N/C | N/O | N/C | N/O | N/C |
| Number of poles | 5 | 0 | 4 | 0 | 4 | 0 |
| | 0 | 2 | 0 | 2 | 0 | 2 |
| | 2 | 1 | 2 | 1 | 2 | 1 |

CV3B contactors: maximum number of power poles

| Contactor type | CV3BF | | CV3BH | |
|-----------------|-------|-----|-------|-----|
| | N/O | N/C | N/O | N/C |
| Number of poles | 5 | 0 | 4 | 0 |
| | 0 | 2 | 0 | 2 |
| | 1 | 2 | - | - |
| | 3 | 1 | 2 | 1 |

CV1B/CV3B contactors: maximum number of auxiliary contacts

| Contactor type | CV1B | | CV3B | |
|----------------|-------------------------------|-----|------|-----|
| | N/O | N/C | N/O | N/C |
| Pole type | 4 + 1 time delay if necessary | | | |

Examples

- Switching of single-phase capacitor: 400 V - 80 A - 1 N/O main pole. 220 V / 50 Hz. control circuit voltage, 3 N/O and 2 N/C auxiliary contacts. Reference: **CV1BF1F0ZM5A**.
- Switching of d.c. heating circuits: 800 V - 250 A - 2 N/O main poles - 48 V ---. control circuit, instantaneous auxiliary contact 1 N/O + 1 on-delay. Reference: **CV3BH2H0ZEDA + LADT0, 2 or 4**.

Other versions

To obtain a composition with more main poles or with more than 4 auxiliary contacts, please use **order form CF 452**, on catalogue DIA2070702EN.

TeSys Control

B Bar mounted contactors

Variable composition - CV1B and CV3B ordering process

Product reference coding table

| | | Serie | Size | Number of N/O poles | Op. current in N/O pole | Number of N/C poles | Op. current in N/C pole | Control voltage | Control frequency | Aux. contacts |
|--|----|----------------|------|---------------------|-------------------------|---------------------|-------------------------|-----------------|-------------------|---------------|
| Type of contactor related to application | | | | | | | | | | |
| ~ 690 V, ~ 220 V/pole | | CV1B | | | | | | | | |
| ~ 1000 V, ~ 440 V/pole | | CV3B | | | | | | | | |
| Contactor size AC-1/AC-3 | | | | | | | | | | |
| CV1: 80/80 A | | CV3: 80/80 A | | F* | | | | | | |
| CV1: 300/250 A | | CV3: 300/285 A | | H* | | | | | | |
| Number of poles | | | | | | | | | | |
| N/O poles | | | | 0 | | | | | | |
| | | | | 1 | | | | | | |
| | | | | 2 | | | | | | |
| | | | | 3 | | | | | | |
| | | | | 4 | | | | | | |
| N/C poles | | | | | | 0 | | | | |
| | | | | | | 1 | | | | |
| Operational current (determines the blow-out coil size) | | | | | | | | | | |
| CV1BF/CV3BF | | CV1BH/CV3BH | | | | | | | | |
| AC | DC | AC | DC | | | | | | | |
| 0 A breaking | | 0 A breaking | | | Z | | Z | | | |
| 0.9 A | | 1 A | | | A | | A | | | |
| 1.75 A | | 1.9 A | | | B | | B | | | |
| 3.6 A | | 4 A | | | C | | C | | | |
| 6.8 A | | 7.6 A | | | D | | D | | | |
| 11 A | | 12 A | | | E | | E | | | |
| 13 A | | 14.5 A | | | M | | M | | | |
| 20 A | | 22 A | | | N | | N | | | |
| 40 A | | 45 A | | | P | | P | | | |
| 50 A | | 55 A | | | Q | | Q | | | |
| 80 A | | 80 A | | | F | | F | | | |
| 125 A | | 130 A | | | R | | R | | | |
| 200 A | | 200 A | | | G | | G | | | |
| 300 A | | 300 A | | | H | | H | | | |
| Control circuit voltage | | | | | | | | | | |
| 24 V | | | | | | | | B | | |
| 48 V | | | | | | | | E | | |
| 110 V | | | | | | | | F | | |
| 120 V | | | | | | | | K | | |
| 127 V | | | | | | | | G | | |
| 208 V | | | | | | | | L | | |
| 220 V | | | | | | | | M | | |
| 230 V | | | | | | | | P | | |
| 240 V | | | | | | | | U | | |
| 380 V | | | | | | | | Q | | |
| 400 V | | | | | | | | V | | |
| Operating frequency | | | | | | | | | | |
| 50 Hz | | | | | | | | | 5 | |
| 60 Hz | | | | | | | | | 6 | |
| 50/60 Hz (with rectifier + economy resistor) | | | | | | | | | 7 | |
| --- | | | | | | | | | D | |
| --- with economy resistor | | | | | | | | | R | |
| Auxiliary contacts (LA1BN32 + additives (fitted as standard)) | | | | | | | | | | |
| Instantaneous | | 3 N/O + 2 N/C | | | | | | | | A |

To check whether the symbol combinations are possible, refer to the selection information and guide on page B10/29.
If in doubt, fill out order form CF 452, on page B10/43.

* Can use any additives in the range of contactors D except LA6DK, and LAD6K LAD8N.

Important information for use by Schneider Electric

To place an order in SAP GRC switch-LOGOS

Example: Order the contactor CV1BH2HCZM5A

- enter in the Reference product "CV1BH"
- in the field "Technical text", specify "CV1BH2H02M5A".

Bar mounted contactors

TeSys Control

B Bar mounted contactors

Variable composition - CV1BK with PN1 or PN3 poles - ordering process

Product reference coding table

| | Serie | Size | Number of N/O poles | Op. current in N/O pole | Number of N/C poles | Op. current in N/C pole | Pole type | Control voltage | Control frequency | Aux. contacts |
|--|-------|------|-----------------------|-------------------------|---------------------|-------------------------|-----------|-----------------|-------------------|---------------|
| Type of contactor related to application | | | | | | | | | | |
| ~ 690 V, ~ 220 V/pole | CV1B | | | | | | | | | |
| ~ 1000 V, ~ 440 V/pole | | | | | | | | | | |
| Contactor size AC-1/AC-3 | | | | | | | | | | |
| CV1: 630/460 A | | K | | | | | | | | |
| Number of poles | | | | | | | | | | |
| N/O poles | | | 0 N/O | 0 | | | | | | |
| | | | 1 N/O | 1 | | | | | | |
| | | | 2 N/O | 2 | | | | | | |
| | | | 3 N/O | 3 | | | | | | |
| | | | 4 N/O | 4 | | | | | | |
| N/C poles | | | 0 N/C | | 0 | | | | | |
| | | | 1 N/C | | 1 | | | | | |
| | | | 2 N/C | | 2 | | | | | |
| Type of poles | | | | | | | | | | |
| ~ 690 V, ~ 220 V/pole | | | Type 1 pole (PN1) | | | | 1 | | | |
| ~ 1000 V, ~ 440 V/pole | | | Type 3 pole (PN3) | | | | 3 | | | |
| Operational current (determines the blow-out coil size) | | | | | | | | | | |
| 0 A breaking | | | | Z | | Z | | | | |
| 150 A | | | | I | | I | | | | |
| 250 A | | | | S | | S | | | | |
| 300 A | | | | H | | H | | | | |
| 400 A | | | | U | | U | | | | |
| 500 A | | | | V | | V | | | | |
| 630 A | | | | K | | K | | | | |
| Control circuit voltage | | | | | | | | | | |
| 24 V | | | | | | | B | | | |
| 48 V | | | | | | | E | | | |
| 110 V | | | | | | | F | | | |
| 120 V | | | | | | | K | | | |
| 127 V | | | | | | | G | | | |
| 208 V | | | | | | | L | | | |
| 220 V | | | | | | | M | | | |
| 230 V | | | | | | | P | | | |
| 240 V | | | | | | | U | | | |
| 380 V | | | | | | | Q | | | |
| 400 V | | | | | | | V | | | |
| 415 V | | | | | | | N | | | |
| 440 V | | | | | | | R | | | |
| 480 V | | | | | | | T | | | |
| 500 V | | | | | | | S | | | |
| 600 V | | | | | | | X | | | |
| Operating frequency | | | | | | | | | | |
| 50 Hz | | | | | | | | 5 | | |
| 60 Hz | | | | | | | | 6 | | |
| 50/60 Hz (with rectifier + economy resistor) | | | | | | | | 7 | | |
| --- | | | | | | | | D | | |
| --- with economy resistor | | | | | | | | R | | |
| Auxiliary contacts (LA1BN32 auxiliary contact block) | | | | | | | | | | |
| 3 N/O - instantaneous | | | 1 aux. contact block | | | | | | | A |
| 2 N/C - instantaneous | | | 2 aux. contact blocks | | | | | | | B |

To check whether the symbol combinations are possible, refer to the selection information and guide on page B10/29.
If in doubt, fill out order form CF 452, on page B10/43.

Bar
mounted
contactors

TeSys Control

B Bar mounted contactors

Predefined composition - LC1B contactor



LC1BP33

PE112359_L35_eps

Contactors for motor control in category AC-3, from 750 to 1800 A (~ or ---)

3-pole contactors

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 | | | | | | | | Rated operational current in AC-3 440V up to | Instantaneous auxiliary contacts | | Basic reference, to be completed by adding the voltage code ⁽¹⁾ | Weight | | | |
|--|-------|-------|-----|-----|-------|-------|-------|--|----------------------------------|------------|--|--------|-------|--------|---|
| 220 V | 380 V | 660 V | | | 230 V | 400 V | 415 V | | 440 V | 500 V | | | 690 V | 1000 V | A |
| 220 | 400 | 425 | 450 | 500 | 560 | 530 | 750 | 2 | 2 | LC1BL33•22 | 57.000 | | | | |
| | | | | | | | | 3 | 1 | LC1BL33•31 | 57.000 | | | | |
| | | | | | | | | 1 | 3 | LC1BL33•13 | 57.000 | | | | |
| | | | | | | | | 4 | - | LC1BL33•40 | 57.000 | | | | |
| 280 | 500 | 530 | 560 | 600 | 670 | 530 | 1000 | 2 | 2 | LC1BM33•22 | 60.000 | | | | |
| | | | | | | | | 3 | 1 | LC1BM33•31 | 60.000 | | | | |
| | | | | | | | | 1 | 3 | LC1BM33•13 | 60.000 | | | | |
| | | | | | | | | 4 | - | LC1BM33•40 | 60.000 | | | | |
| 425 | 750 | 800 | 800 | 750 | 750 | 670 | 1500 | 2 | 2 | LC1BP33•22 | 94.000 | | | | |
| | | | | | | | | 3 | 1 | LC1BP33•31 | 94.000 | | | | |
| | | | | | | | | 1 | 3 | LC1BP33•13 | 94.000 | | | | |
| | | | | | | | | 4 | - | LC1BP33•40 | 94.000 | | | | |
| 500 | 900 | 900 | 900 | 900 | 900 | 750 | 1800 | 2 | 2 | LC1BR33•22 | 129.000 | | | | |
| | | | | | | | | 3 | 1 | LC1BR33•31 | 129.000 | | | | |
| | | | | | | | | 1 | 3 | LC1BR33•13 | 129.000 | | | | |
| | | | | | | | | 4 | - | LC1BR33•40 | 129.000 | | | | |

Contactors for control in category AC-1, from 800 to 2750 A (~ or ---)

Single, 2, 3 or 4-pole contactors

| Maximum operational current in AC-1 (θ ≤ 40 °C) | Number of poles | Instantaneous auxiliary contacts | | Basic reference, to be completed by adding the voltage code ⁽¹⁾ | Weight |
|---|-----------------|----------------------------------|------------|--|--------|
| A | | | | | |
| 800 | 1 | 2 | 2 | LC1BL31•22 | 31.000 |
| | | 3 | 1 | LC1BL31•31 | 31.000 |
| | | 1 | 3 | LC1BL31•13 | 31.000 |
| | | 4 | - | LC1BL31•40 | 31.000 |
| | 2 | 2 | 2 | LC1BL32•22 | 44.000 |
| | | 3 | 1 | LC1BL32•31 | 44.000 |
| | | 1 | 3 | LC1BL32•13 | 44.000 |
| | | 4 | - | LC1BL32•40 | 44.000 |
| | 3 | 2 | 2 | LC1BL33•22 | 57.000 |
| | | 3 | 1 | LC1BL33•31 | 57.000 |
| | | 1 | 3 | LC1BL33•13 | 57.000 |
| | | 4 | - | LC1BL33•40 | 57.000 |
| 4 | 2 | 2 | LC1BL34•22 | 71.000 | |
| | 3 | 1 | LC1BL34•31 | 71.000 | |
| | 1 | 3 | LC1BL34•13 | 71.000 | |
| | 4 | - | LC1BL34•40 | 71.000 | |

(1) Please check the availability of your variant in the index page B10/44. The SEARCH function of your viewer can be used.

| Volts | 48 | 110 | 120 | 125 | 127 | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 500 |
|---------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ~ 50...400 Hz | - | F | K | - | G | M | P | U | Q | V | N | R | S |
| --- | ED | FD | - | GD | - | MD | - | UD | - | - | - | RD | SD |

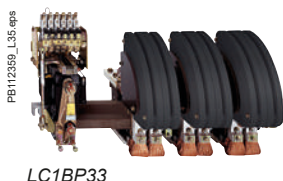
For voltages other than those indicated above, replace the p in the reference with the operational voltage (3 figures) and the type of current (2 letters: AC for a.c. supply and DC for d.c. supply). Example: 82 V d.c., the reference becomes LC1BP33082DC22.

Bar mounted contactors

TeSys Control

B Bar mounted contactors

Predefined composition - LC1B contactor



Contactors for control in category AC-1, from 800 to 2750 A (~ or ---)

| Single, 2, 3 or 4-pole contactors | | | | | | | |
|--|-----------------|----------------------------------|---|--|------------|------------|--------|
| Maximum operational current in AC-1 ($\theta \leq 40^\circ\text{C}$) | Number of poles | Instantaneous auxiliary contacts | | Basic reference, to be completed by adding the voltage code ⁽¹⁾ | Weight | | |
| | | | | | | | |
| A | 1250 | 1 | 2 | 2 | LC1BM31●22 | 34.000 | |
| | | | 3 | 1 | LC1BM31●31 | 34.000 | |
| | | | 1 | 3 | LC1BM31●13 | 34.000 | |
| | | | 4 | – | LC1BM31●40 | 34.000 | |
| | | 2 | 2 | 2 | LC1BM32●22 | 47.000 | |
| | | | 3 | 1 | LC1BM32●31 | 47.000 | |
| | | | 1 | 3 | LC1BM32●13 | 47.000 | |
| | | | 4 | – | LC1BM32●40 | 47.000 | |
| | | 3 | 2 | 2 | LC1BM33●22 | 60.000 | |
| | | | 3 | 1 | LC1BM33●31 | 60.000 | |
| | | | 1 | 3 | LC1BM33●13 | 60.000 | |
| | | | 4 | – | LC1BM33●40 | 60.000 | |
| | 4 | 2 | 2 | LC1BM34●22 | 74.000 | | |
| | | 3 | 1 | LC1BM34●31 | 74.000 | | |
| | | 1 | 3 | LC1BM34●13 | 74.000 | | |
| | | 4 | – | LC1BM34●40 | 74.000 | | |
| | 2000 | 1 | 1 | 2 | 2 | LC1BP31●22 | 41.000 |
| | | | | 3 | 1 | LC1BP31●31 | 41.000 |
| | | | | 1 | 3 | LC1BP31●13 | 41.000 |
| | | | | 4 | – | LC1BP31●40 | 41.000 |
| | | | 2 | 2 | 2 | LC1BP32●22 | 65.000 |
| | | | | 3 | 1 | LC1BP32●31 | 65.000 |
| | | | | 1 | 3 | LC1BP32●13 | 65.000 |
| | | | | 4 | – | LC1BP32●40 | 65.000 |
| 3 | | | 2 | 2 | LC1BP33●22 | 94.000 | |
| | | | 3 | 1 | LC1BP33●31 | 94.000 | |
| | | | 1 | 3 | LC1BP33●13 | 94.000 | |
| | | | 4 | – | LC1BP33●40 | 94.000 | |
| 4 | | 2 | 2 | LC1BP34●22 | 120.000 | | |
| | | 3 | 1 | LC1BP34●31 | 120.000 | | |
| | | 1 | 3 | LC1BP34●13 | 120.000 | | |
| | | 4 | – | LC1BP34●40 | 120.000 | | |
| 2750 | | 1 | 1 | 2 | 2 | LC1BR31●22 | 52.000 |
| | | | | 3 | 1 | LC1BR31●31 | 52.000 |
| | | | | 1 | 3 | LC1BR31●13 | 52.000 |
| | | | | 4 | – | LC1BR31●40 | 52.000 |
| | | | 2 | 2 | 2 | LC1BR32●22 | 85.000 |
| | | | | 3 | 1 | LC1BR32●31 | 85.000 |
| | | | | 1 | 3 | LC1BR32●13 | 85.000 |
| | | | | 4 | – | LC1BR32●40 | 85.000 |
| | 3 | | 2 | 2 | LC1BR33●22 | 129.000 | |
| | | | 3 | 1 | LC1BR33●31 | 129.000 | |
| | | | 1 | 3 | LC1BR33●13 | 129.000 | |
| | | | 4 | – | LC1BR33●40 | 129.000 | |
| | 4 | 2 | 2 | LC1BR34●22 | 160.000 | | |
| | | 3 | 1 | LC1BR34●31 | 160.000 | | |
| | | 1 | 3 | LC1BR34●13 | 160.000 | | |
| | | 4 | – | LC1BR34●40 | 160.000 | | |

(1) See previous page.

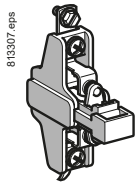
Please check the availability of your variant in the index page B10/44. The SEARCH function of your viewer can be used.

Bar mounted contactors

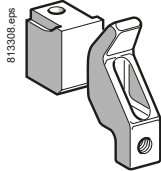
TeSys Control

B Bar mounted contactors

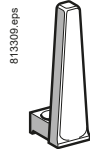
Predefined composition - LC1B contactor - Accessories and spare parts



ZC4GM1



PA1LB80



PA1LB89



PA1LB89

Spare parts

| Description | For contactor | Composition | Reference | Weight kg |
|--|---------------|-------------|-----------|-----------|
| Instantaneous auxiliary contact blocks | LC1B | 1 N/O | ZC4GM1 | 0.030 |
| | | 1 N/C | ZC4GM2 | 0.030 |

| Description | For contactor | Number of sets required per contactor pole | Set reference | Weight kg |
|---|---------------|--|---------------|-----------|
| Set of contacts (1 moving contact, 1 fixed contact) | LC1BL | 1 | PA1LB80 | 0.420 |
| | LC1BM | 1 | PA1LB80 | 0.420 |
| | LC1BP | 2 | PA1LB80 | 0.420 |
| | LC1BR | 3 | PA1LB80 | 0.420 |

| Description | For contactor | Reference | Weight kg |
|------------------------------------|---------------|-----------|-----------|
| Moving contact only (for 1 finger) | LC1B | PA1LB75 | 0.220 |
| Blow-out horn only (for 1 finger) | LC1B | PA1LB89 | 0.120 |

Mounting accessories

| Description | Specification | Height mm | Sold in lots of | Unit reference | Weight kg |
|---|--|-----------|-----------------|----------------|-----------|
| Notched mounting rails used as uprights and as equipment support | 2 mm steel, with zinc chromate treatment | 1650 | 4 | AM1EC165 | 2.460 |
| | | 1850 | 4 | AM1EC185 | 2.760 |
| | | 2000 | 4 | AM1EC200 | 2.980 |
| 1/4 turn sliding clip nut and corresponding screw for assembly of rails AM1EC | M8 | - | 10 | NSYSNM8 | 0.020 |
| | M8 x 18 | - | 10 | AF1VC820 | 0.024 |

TeSys Control

B Bar mounted contactors

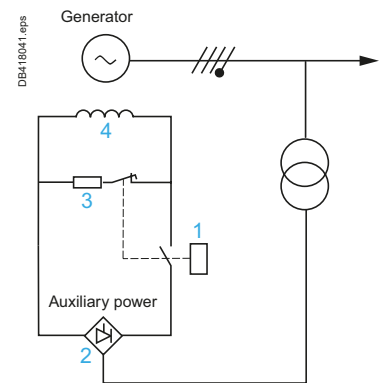
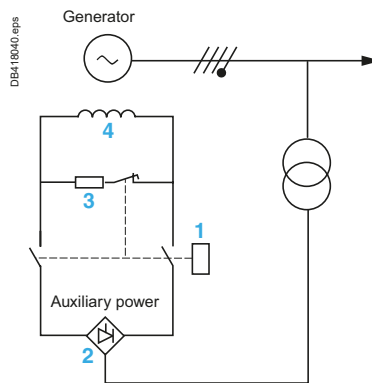
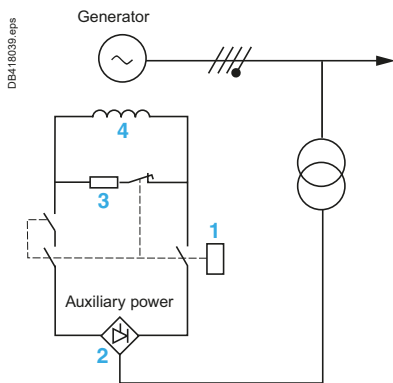
Predefined composition - CVE, CWE, CVX, CRX, CWXB contactors for synchronous motor excitation circuit

Introduction

Variable composition contactors CVE, CWE, CVX, CRX, CWXB are designed for switching the excitation circuits of synchronous machines, in particular electrical power station generators, for operational currents from 80 to 2750 A.

Example: Static excitation generator.

Basic scheme



- 1 Excitation contactor
- 2 Thyristor bridge
- 3 Discharge resistor R_d
- 4 Excitation winding

Operating principle

The voltage delivered by the generator is related to the current flowing through the excitation winding 4.

Start-up phase

- The contactor 1 closes, off load.
- An adjustable auxiliary power supply generates current in the excitation winding 4 to allow power-up of the generator.
- When the voltage delivered by the generator is sufficient to supply the excitation winding 4 via a thyristor bridge 2, the auxiliary supply is switched off.

Stop phase

When a stop instruction is received, the thyristor bridge 2 operates for a few seconds as an inverter, then the excitation contactor 1 opens. The function of the N/C pole is to discharge residual electromagnetic energy from the excitation winding 4 via the discharge resistor R_d 3.

Under normal operating conditions, breaking is therefore easy, especially as the N/O poles and the N/C pole are make before break.

However, in the event of a problem, the contactor must be able to break.

Contactor selection

Selection is done according to the nominal operating voltage of the machine and the necessity or not to fully isolate the thyristor bridge coil of the power supply (1, 2, or 3 N/O poles).

Note: The N/C pole, which is used for machine de-excitation, has no arc chambers. Its breaking capacity is nil. Re-energisation of the contactor must therefore be avoided during the de-excitation phase.

If there is any risk of this happening, it is advisable to add an off-delay function that prevents pick-up of the contactor for the 10 seconds following drop-out.

Bar
mounted
contactors

TeSys Control

B Bar mounted contactors

Predefined composition - CVEB, CWEB, CVXB, CRXB, CWXB contactors
for synchronous motor excitation circuit

CVEB and CWEB contactors composition:

- 2 or N/O poles with magnetic blow-out (80...300 A)
- 1 N/C pole without blow-out, overlapping contacts (possible mounting of a blow-out device)
- 1 electromagnet with d.c. supply
 - either mechanical latching (CWEB)
 - or with economy resistor (CVEB).
- 1 ZC4GM auxiliary contact or 1 or 2 instantaneous auxiliary contact heads (3 to 6 N/O contacts + 2 to 4 N/C contacts).
- 1 mounting bar, 1 rotary drive shaft.

The following can be added:

- 1 or 2 blocks of 4 instantaneous auxiliary contacts LADN●●, without increasing the overall size of the contactor
- or 1 time delay block LADT● or LADR●.

Note: it is not possible to fit a mechanical latch block type LA6DK●● on these contactors.

| Characteristics | | | | | | |
|--|--------------------------------|----|--------|---------|--------|---------|
| CVEB, CWEB contactor sizes | | | F | | H | |
| N/O pole | | | 1 pole | 2 poles | 1 pole | 2 poles |
| Rated current | $\theta \leq 40^\circ\text{C}$ | A | 80 | 80 | 300 | 300 |
| Maximum operating voltage | d.c | V | 220 | 440 | 220 | 440 |
| Rated insulation voltage According to IEC 60664-1 | d.c | V | 690 | 690 | 690 | 690 |
| Making capacity | d.c | A | 1600 | 1600 | 4000 | 4000 |
| Breaking capacity | d.c L/R = 15 ms | A | 240 | 240 | 900 | 900 |
| Overlap time with the N/C pole | | ms | 2 | 2 | 2 | 2 |
| N/C pole | | | | | | |
| Rated current | $\theta \leq 40^\circ\text{C}$ | A | 80 | 80 | 300 | 300 |
| Making capacity | d.c | A | 1600 | 1600 | 4000 | 4000 |
| Breaking capacity | d.c L/R = 15 ms | A | 0 | 0 | 0 | 0 |
| Permissible current | For 10 s | A | 480 | 480 | 1400 | 1400 |

TeSys Control

B Bar mounted contactors

Predefined composition - CVEB, CWEB, CVXB, CWXB contactors
for synchronous motor excitation circuit

CVXB, CRXB and CWXB contactors composition:

- 1 to 3 N/O poles with magnetic blow-out (80...2750 A)
- 1 N/C pole without blow-out, overlapping contacts (possible mounting of a blow-out device)
- 1 electromagnet with d.c supply
 - or with economy resistor (CVXB)
 - either with magnetic latching (CRXB)
 - either with mechanical latching (CWXB)
- 1 ZC4GM auxiliary contact or 1 or 2 instantaneous auxiliary contacts (3 to 6 N/O contacts + 2 to 4 N/C contacts)
- 1 mounting bar, 1 rotary drive shaft.

The following can be added:

- 1 or 2 blocks of 4 instantaneous auxiliary contacts type LADN●●, without increasing the overall size of the contactor.
- or 1 time delay block type LADT● or LADR●.

Note: it is not possible to fit a mechanical latch block type LA6DK●● on these contactors.

| Characteristics | | | | | | | | | | | |
|--|--------------------------------|------|--------|---------|---------|--------|---------|---------|--------|---------|---------|
| Size of contactors C●XB ⁽¹⁾ | | | F | | | H | | | | | |
| N/O pole | | | 1 pole | 2 poles | 3 poles | 1 pole | 2 poles | 3 poles | | | |
| Rated current | $\theta \leq 40^\circ\text{C}$ | A | 80 | 80 | 80 | 300 | 300 | 300 | | | |
| Maximum operating voltage | | V DC | 440 | 850 | 1000 | 440 | 850 | 1000 | | | |
| Rated insulation voltage | | V DC | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | | | |
| Making capacity | | A | 1400 | 1400 | 1400 | 3500 | 3500 | 3500 | | | |
| Breaking capacity | For U max | A | 500 | 500 | 500 | 1200 | 1200 | 1200 | | | |
| Overlap time with the N/C pole | | ms | 2 | 2 | 2 | 2 | 2 | 2 | | | |
| N/C pole | | | | | | | | | | | |
| Rated current | $\theta \leq 40^\circ\text{C}$ | A | 80 | 80 | 80 | 300 | 300 | 300 | | | |
| Making capacity | | A | 1600 | 1600 | 1600 | 4000 | 4000 | 4000 | | | |
| Breaking capacity | | A | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Permissible current | For 10s | A | 480 | 480 | 480 | 1400 | 1400 | 1400 | | | |
| Characteristics | | | | | | | | | | | |
| Size of contactors C●XB | | | K | | | L | | | | | |
| N/O pole | | | 1 pole | 2 pole | 3 poles | 1 pole | 2 pole | 3 poles | | | |
| Rated current | $\theta \leq 40^\circ\text{C}$ | A | 630 | 630 | 630 | 800 | 800 | 800 | | | |
| Maximum operating voltage | | V DC | 440 | 850 | 1000 | 440 | 850 | 1200 | | | |
| Rated insulation voltage | | V DC | 1000 | 1000 | 1000 | 1500 | 1500 | 1500 | | | |
| Making capacity | | A | 6500 | 6500 | 6500 | 14000 | 14000 | 14000 | | | |
| Breaking capacity | For U max | A | 2500 | 2500 | 2500 | 3200 | 3200 | 3200 | | | |
| Overlap time with the N/C pole | | ms | 2 | 2 | 2 | 2 | 2 | 2 | | | |
| N/C pole | | | | | | | | | | | |
| Rated current | $\theta \leq 40^\circ\text{C}$ | A | 630 | 630 | 630 | 630 | 630 | 630 | | | |
| Making capacity | | A | 6500 | 6500 | 6500 | 6500 | 6500 | 6500 | | | |
| Breaking capacity | | A | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Permissible current | For 10s | A | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | | | |
| Characteristics | | | | | | | | | | | |
| Size of contactors C●XB | | | M | | | P | | | R | | |
| N/O pole | | | 1 pole | 2 poles | 3 poles | 1 pole | 2 poles | 3 poles | 1 pole | 2 poles | 3 poles |
| Rated current | $\theta \leq 40^\circ\text{C}$ | A | 1250 | 1250 | 1250 | 2000 | 2000 | 2000 | 2750 | 2750 | 2750 |
| Maximum operating voltage | | V DC | 440 | 850 | 1200 | 440 | 850 | 1200 | 440 | 850 | 1200 |
| Rated insulation voltage | | V DC | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 |
| Making capacity | | A | 14000 | 14000 | 14000 | 21000 | 21000 | 21000 | 25000 | 25000 | 25000 |
| Breaking capacity | For U max | A | 4400 | 4400 | 4400 | 7200 | 7200 | 7200 | 10000 | 10000 | 10000 |
| Overlap time with the N/C pole | | ms | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| N/C pole | | | | | | | | | | | |
| Rated current | $\theta \leq 40^\circ\text{C}$ | A | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 |
| Making capacity | | A | 6500 | 6500 | 6500 | 6500 | 6500 | 6500 | 6500 | 6500 | 6500 |
| Breaking capacity | | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Permissible current | For 10s | A | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 |

(1) CRX, CVXB legacy size 'G', 'J'. Please consult us.

Bar mounted contactors

TeSys Control

B Bar mounted contactors

Predefined composition - CVEB, CWEB, CVXB, CWXB contactors
for synchronous motor excitation circuit

| Control circuit | | | | | With economy resistor | With mechanical latching | | Scheme |
|---------------------|---------------------|---------------------|---|---------------------------|---|---|--------------|--------|
| Operational voltage | Number of poles N/O | Number of poles N/C | Instantaneous auxiliary contacts ⁽²⁾ | Rated operational current | Basic reference to be completed by adding the code of the blow-out coils ⁽¹⁾ , of the control voltage ⁽²⁾ and of the aux. contacts ⁽³⁾ | Basic reference to be completed by adding the code of the blow-out coils ⁽¹⁾ , of the control voltage ⁽²⁾ and of the aux. contacts ⁽³⁾ | | |
| V | | | | A | | | | |
| 220V DC | 1 | 1 | 1, 3 or 6 | 1, 2 or 4 | 80 | CVEBF1●1●●●● | CWEBF1●1●●●● | 1 |
| | | | | | 200 | CVEBG1●1●●●● | CWEBG1●1●●●● | 1 |
| | | | | | 300 | CVEBH1●1●●●● | | 1 |
| 440V DC | 2 | 1 | 1, 3 or 6 | 1, 2 or 4 | 80 | CVEBF2●1●●●● | CWEBF2●1●●●● | 2 |
| | | | | | 200 | CVEBG2●1●●●● | CWEBG2●1●●●● | 2 |
| | | | | | 300 | CVEBH2●1●●●● | | 2 |

| Control circuit | | | | | Economy resistor | Mechanical latching | Magnetic latching | Scheme | |
|---------------------|---------------------|---------------------|---|---------------------------|---|---|---|--------------|---|
| Operational voltage | Number of poles N/O | Number of poles N/C | Instantaneous auxiliary contacts ⁽²⁾ | Rated operational current | Basic reference to be completed by adding the code of the blow-out coils ⁽¹⁾ , of the control voltage ⁽²⁾ and of the aux. contacts ⁽³⁾ | Basic reference to be completed by adding the code of the blow-out coils ⁽¹⁾ , of the control voltage ⁽²⁾ and of the aux. contacts ⁽³⁾ | Basic reference to be completed by adding the code of the blow-out coils ⁽¹⁾ , of the control voltage ⁽²⁾ and of the aux. contacts ⁽³⁾ | | |
| V | | | | A | | | | | |
| 440V DC | 1 | 1 | 1, 3 or 6 | 1, 2 or 4 | 80 | CVXBF1●1●●●● | CWVBF1●1●●●● | CRVBF1●1●●●● | 1 |
| | | | | | 300 | CVXBH1●1●●●● | CWVBH1●1●●●● | CRVBH1●1●●●● | 1 |
| | | | | | 630 | CVXBK1●1●●●● | CWVBK1●1●●●● | CRVBK1●1●●●● | 1 |
| | | | | | 800 | CVXBL1●1●●●● | CWVBL1●1●●●● | CRVBL1●1●●●● | 1 |
| | | | | | 1250 | CVXBM1●1●●●● | CWVBM1●1●●●● | CRVBM1●1●●●● | 1 |
| | | | | | 2000 | CVXBP1●1●●●● | CWVBP1●1●●●● | CRVBP1●1●●●● | 1 |
| | | | | | 2750 | CVXBR1●1●●●● | CWVBR1●1●●●● | CRVBR1●1●●●● | 1 |
| 850V DC | 2 | 1 | 1, 3 or 6 | 1, 2 or 4 | 80 | CVXBF2●1●●●● | CWVBF2●1●●●● | CRVBF2●1●●●● | 2 |
| | | | | | 300 | CVXBH2●1●●●● | CWVBH2●1●●●● | CRVBH2●1●●●● | 2 |
| | | | | | 630 | CVXBK2●1●●●● | CWVBK2●1●●●● | CRVBK2●1●●●● | 2 |
| | | | | | 800 | CVXBL2●1●●●● | CWVBL2●1●●●● | CRVBL2●1●●●● | 2 |
| | | | | | 1250 | CVXBM2●1●●●● | CWVBM2●1●●●● | CRVBM2●1●●●● | 2 |
| | | | | | 2000 | CVXBP2●1●●●● | CWVBP2●1●●●● | CRVBP2●1●●●● | 2 |
| | | | | | 2750 | CVXBR2●1●●●● | CWVBR2●1●●●● | CRVBR2●1●●●● | 2 |
| 1000V DC | 3 | 1 | 1, 3 or 6 | 1, 2 or 4 | 80 | CVXBF3●1●●●● | CWVBF3●1●●●● | CRVBF3●1●●●● | 3 |
| | | | | | 300 | CVXBH3●1●●●● | CWVBH3●1●●●● | CRVBH3●1●●●● | 3 |
| | | | | | 630 | CVXBK3●1●●●● | CWVBK3●1●●●● | CRVBK3●1●●●● | 3 |
| 1200V DC | 3 | 1 | 1, 3 or 6 | 1, 2 or 4 | 800 | CVXBL3●1●●●● | CWVBL3●1●●●● | CRVBL3●1●●●● | 3 |
| | | | | | 1250 | CVXBM3●1●●●● | CWVBM3●1●●●● | CRVBM3●1●●●● | 3 |
| | | | | | 2000 | CVXBP3●1●●●● | CWVBP3●1●●●● | CRVBP3●1●●●● | 3 |
| | | | | | 2750 | CVXBR3●1●●●● | CWVBR3●1●●●● | CRVBR3●1●●●● | 3 |

(1) For the codes of the blow-out coils, please refer next page.

(2) Existing control voltages (other voltages, please consult us).

| Volts | 24 | 48 | 110 | 125 | 220 | 230 | 240 | 250 |
|-------|------|------|-----|-----|-----|-----|-----|-----|
| DC | BD * | ED * | FD | GD | MD | PD | - | UD |
| AC | B7 * | E7 * | F7 | G7 | M7 | P7 | U7 | - |

* K to R rating: please consult us.

(3) 1 auxiliary contact type ZC4GM1 (code 1) or 1 auxiliary contact type ZC4GM2 (code 2)
or 1 auxiliary contacts block type LA1BN32 (3 N/O contacts + 2 N/C contacts) (code A)
or 2 auxiliary contacts blocks type LA1BN32 (6 N/O contacts + 4 N/C contacts) (code B).

Bar mounted contactors

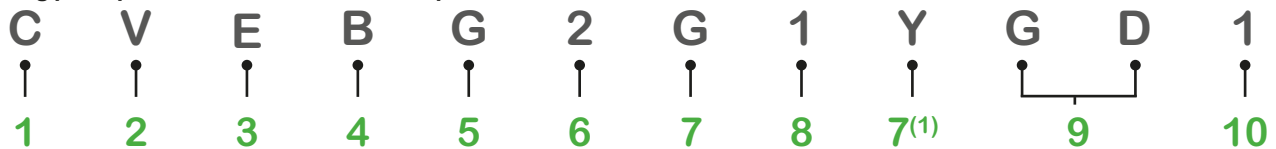
TeSys Control

B Bar mounted contactors

Predefined composition - CVE, CWE, CVX, CRX, CWXB contactors for synchronous motor excitation circuit

Ordering process

Coding principle of an excitation contactor product reference



(1) Standard construction without blow-out: code Y.

| <p>1 - Contactor</p> | <p>2 - Type of control circuit of the contactor</p> <ul style="list-style-type: none"> ■ V = Electromagnet with economy resistor ■ R = Electromagnet with magnetic latching ■ W = Electromagnet with mechanical latching | | | | | | | | | | | | | | |
|---|--|-----|-----|------|------|------|---|----|-----|-----|-----|------|------|------|---|
| <p>3 - Type of N/O poles</p> <ul style="list-style-type: none"> ■ E = PN1 ■ X = PA3 (FB to HB), PN3 (KB) and PA1 (LB to RB) | <p>4 - Evolution</p> | | | | | | | | | | | | | | |
| <p>5 - Size of the contactor (in A)</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>F</th> <th>H</th> <th>K</th> <th>L</th> <th>M</th> <th>P</th> <th>R</th> </tr> </thead> <tbody> <tr> <td>80</td> <td>300</td> <td>630</td> <td>800</td> <td>1250</td> <td>2000</td> <td>2750</td> </tr> </tbody> </table> | F | H | K | L | M | P | R | 80 | 300 | 630 | 800 | 1250 | 2000 | 2750 | <p>6 - Number of N/O poles</p> <p>1, 2 or 3 according to the scheme used by the customer</p> |
| F | H | K | L | M | P | R | | | | | | | | | |
| 80 | 300 | 630 | 800 | 1250 | 2000 | 2750 | | | | | | | | | |

7 - Operating current (Ie)

| Code | Contactor | | | | | |
|------|---|------------------|----------|------------------|----------|------------------|
| | BF Ie | Rep* blow-out | BH Ie | Rep* blow-out | BK Ie | Rep* blow-out |
| A | 1 | 05 | | | | |
| B | 1.9 | 07 | | | | |
| C | 4 | 10 | | | | |
| D | 7,6 | 14 | | | | |
| E | 12 | 18 | | | | |
| M | 12 | 20 | | | | |
| N | 22 | 25 | | | | |
| P | 45 | 9 | | | | |
| Q | 55 | 7 | | | | |
| F | 80 | 4 | | | | |
| R | | | | | | |
| G | | | 200 | 2 | | |
| H | | | 300 | 1 | | |
| T | | | | | | |
| U | | | | | 400 | 53 |
| J | | | | | | |
| V | | | | | 500 | 52 |
| K | | | | | 630 | 51 |
| Y | Only for CV1 with pole type PN5 ou PR5 without blow-out | | | | | |

8 - 1 N/C pole

10 - Block of auxiliary contacts

- 1 = 1 ZC4GM1
- A = 1 block type LA1BN32
- B = 2 blocks type LA1BN32 (standard configuration)

9 - Control voltage

| Code | BD | ED | FD | GD | MD | UD | |
|-----------|----|----|-----|-----|-----|-----|-----|
| Uc (V DC) | 24 | 48 | 110 | 125 | 220 | 250 | |
| Code | B7 | E7 | F7 | G7 | M7 | P7 | U7 |
| Uc (V AC) | 24 | 48 | 110 | 127 | 220 | 230 | 240 |

Performance label for the excitation contactors

| | CVE, CRE, CWE | | | | CVX, CRX, CWX | | | | | | | | | | |
|-----------|---------------|-----|----------|----------|---------------|------|----------|----------|------|----------|-----|------|----------|-----|------|
| | BF 1P | 2P | BH 1P | 2P | BF 1P | 2P | 3P | BH 1P | 2P | 3P | | | | | |
| Ue (V DC) | 200 | 440 | 200 | 440 | 440 | 850 | 1000 | 440 | 850 | 1000 | | | | | |
| In (A) | 80 | | 300 | | 80 | | | 300 | | | | | | | |
| Ie | See table 7 | | | | | | | | | | | | | | |
| Uc | See table 9 | | | | | | | | | | | | | | |
| | CVX, CRX, CWX | | | | | | | | | | | | | | |
| | BK 1P | 2P | 3P | BL 1P | 2P | 3P | BM 1P | 2P | 3P | BP 1P | 2P | 3P | BR 1P | 2P | 3P |
| Ue (V DC) | 440 | 850 | 1000 | 440 | 850 | 1000 | 440 | 850 | 1000 | 440 | 850 | 1000 | 440 | 850 | 1000 |
| In (A) | 630 | | | 800 | | | 1250 | | | 2000 | | | 2750 | | |
| Ie | See table 7 | | | | | | | | | | | | | | |
| Uc | See table 9 | | | | | | | | | | | | | | |

Bar mounted contactors

CR1B Magnetic latching contactors introduction

The magnetic latching contactors are equipped with a specific electromagnet allowing them to maintain position "ON" although the coil is fed by any current.

Use

The specific properties of magnetic latching contactors make them suitable for many uses:

| Properties | Use |
|---|---|
| Memory retention of the sequence in automatic equipment, in the event of loss of the control voltage. | Refineries, power plants, excitation circuits. |
| Energy saving, as no current is drained when the contactor is activated. | Contactor staying activated for long periods. Examples: refineries, alimentation energy, ST distribution. |
| Change of state "Work" / "Rest" by current pulse sent to the coil. | Selective opening control. |
| Insensitivity to main perturbations. | No unexpected opening or closing of power poles |
| Use of contactors beyond breaking capacity as they are activated off-load. | Passer diverter, for use with 1000 V |
| Silent contactor when locked in ON position | |

Electro-magnet operation of the CR1B contactors

The CR1B magnetic latching contactors are equipped with a single coil, supplied with direct current or alternating current through a rectifier.

The latching is obtained by direct feeding of the coil with a current in a given direction. The unlatching is produced by a current of opposite direction, adjusted by resistors.

Range

- The magnetic latching contactors are available from 80 to 630 A (Size F to K).
- The characteristics of N/O and N/C poles are identical to those of CV1 and CV3B (Size F to K).
- For other characteristics and mounting dimensions, please contact us.
- For ratings of 800 to 2750 A, see next page.

Selection criteria of contactors for rotor starting motors

In simple starting systems the contactors which short-circuit the rotor current are subjected to a static voltage, the value of which, decreasing with time, is lower the further away the contactors are located from the rotor terminals. As a result, the operational rotor voltage is deducted from the maximum operational voltage. In this way, it is possible to use contactors with a rated insulation voltage lower than the rotor voltage.

In this application, making and breaking are easy. The selection table below takes into account a ratio of 2 between the maximum rotor operational voltage (U_{er}) and the stator operational voltage (U_{es}). This ratio is proposed in starter standard IEC 60947-4.


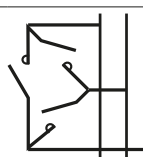
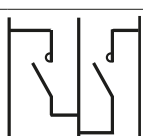
With counter current braking, the rotor operational voltage will be equal to the insulation voltage.

In a system with slowdown or braking, the selection of the contactors concerned should, in addition, take into account the breaking conditions.

The use of magnetic blow-out contactors is recommended in the event of control by a manually operated master controller.

Multiplying factor for rotor voltage and current, depending on type of contactor connection

As far as the current flowing through a rotor circuit contactor is concerned, the short time rating should be taken into account according to the starting time. Only the final rotor short-circuit contactor takes account of the continuous current.

| Type of connection | Circuit diagram | I rotor operational | Maximum 3-phase rotor voltage U_e | 3-phase rotor voltage U_E with counter-current braking | Contactor type |
|--------------------|---|---------------------|-------------------------------------|--|----------------|
| | | | V | V | |
| Star |  | 1 | 1320 | 660 | CV1B |
| | | 1 | 2000 | 1000 | CV3B LC1B |
| Delta |  | 1,4 | 1100 | 550 | CV1B |
| | | 1,4 | 1700 | 850 | CV3B LC1B |
| V |  | 1 | 1100 | 550 | CV1B |
| | | 1 | 1700 | 850 | CV3B LC1B |

Hoisting applications

For this type of application contactor selection is made according to the duty requirements, required durability, type of connection, etc. Please consult your Regional Sales Office.

Other versions:

For rotor voltage above 3000 V \sim , please consult your Regional Sales Office.

TeSys Control

B Bar mounted contactors

From specification of customer's application - CE, CS, CV1BKS contactors

Contactors for furnaces and induction heating applications (CE1 - CS1, CE5 - CE6, CS5 - CS6)

Induction heating covers all applications where metals (or a metal part) are heated in crucible or "channel" furnaces, or in dies, by the induction of a.c. currents at various frequencies.

There are several frequency ranges which, for industrial purposes, can be grouped as follows:

- 50 Hz to 400 Hz:
 - industrial mains power frequencies from 50 to 250 Hz
 - intermediate frequencies of 350 Hz and 400 Hz.
- Maximum operating limits for contactors (single-pole and 6-pole):
 - frequency range up to 500 Hz
 - supply voltage up to 3000 V
 - currents up to 2750 A.

Please refer to our "Contactors for furnaces and induction heating applications" catalogue.

Contactor for the grounding of supply rail tram (CV1BKS)

Designed for networks up to 1000 V DC (high closing capacity up to 43 kA) to ensure the grounding of the rail when it loses power.

But also under fault condition in the event that the rail remains supplied after the passage of the tram.


View the application form CV1BKS on the site: www.se.com.

TeSys Control

B Bar mounted contactors

Product references

| | |
|-----------|-----------------|
| CV1BF | LA9FL976 |
| CV1BG | LC1BL32M22 |
| CV1BH | LC1BL33M22 |
| CV1BJ | LC1BM |
| CV1BK | LC1BM32F22 |
| CV1BL | LC1BM33M22 |
| CV3BF | LC1BM33P22 |
| CV3BG | LC1BM33R22 |
| CV3BH | LC1BM34M22 |
| CV3BJ | LC1BP31F22 |
| CV3BK | LC1BP33F22 |
| CV3BL | LC1BP33M22 |
| CV3BP | LC1BP33M31 |
| CVXBF | LC1BP33P22 |
| DR5TE1U | LC1BP33R22 |
| EB1KB40 | LC1BR |
| EB5KB40 | LC1BR32M22 |
| EB5KB50 | LC1SKGC310P7S19 |
| LA9D730 | PA1PB16 |
| LA9F100 | PA2GB80 |
| LA9F15076 | PA2HB80 |
| LA9F18517 | PN1FB80 |
| LA9F2100 | PN1GB80 |
| LA9F22582 | PN1HB80 |
| LA9F705 | PN1JB80 |
| LA9F709 | PN1KB10 |
| LA9F801 | PN1KB101 |
| LA9FF601 | PN1KB80 |
| LA9FF981 | WB1GA105 |
| LA9FG601 | WB1KB124 |
| LA9FG979 | WB2EA355 |
| LA9FG980 | ZC1GP4 |
| LA9FH601 | ZC1GP5 |
| LA9FH610 | ZC1GP6 |
| LA9FH982 | ZC2GG1 |
| LA9FJ610 | ZC4GM1 |
| LA9FJ980 | ZC4GM2 |
| LA9FK982 | |

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

| Thermal overload relays - For use with TeSys K contactors | | | |
|---|--------------------|---|--------|
| Type of product | Range | | Pages |
| Adjustable thermal overload relays For motors TeSys LRK | From 0.16 to 16 A |  | B11/2 |
| Adjustable thermal overload relays For unbalanced loads TeSys LRK | From 0.8 to 16 A | | B11/3 |
| Thermal overload relays Class 10 A - For use with TeSys Deca contactors | | | |
| TeSys Deca adjustable thermal overload relays For motors | From 0.16 to 140 A |  | B11/4 |
| TeSys Deca adjustable thermal overload relays For unbalanced loads | From 0.16 to 140 A | | B11/4 |
| Thermal overload relays Class 20 - For use with TeSys Deca contactors | | | |
| TeSys Deca adjustable thermal overload relays For motors | From 0.63 to 80 A |  | B11/6 |
| TeSys Deca adjustable thermal overload relays For unbalanced loads | From 0.63 to 32 A | | B11/6 |
| Electronic thermal overload relays - For use with TeSys Deca contactors | | | |
| TeSys Deca adjustable electronic overload relay, Multi-class, multi-scale | From 0.1 to 150 A |  | B11/10 |
| Electronic thermal overload relays - For use with TeSys F contactors | | | |
| TeSys LR9F Compensated and differential overload relays, with or without alarm | From 50 to 630 A |  | B11/11 |
| Single pole magnetic over current relays | | | |
| TeSys RM1 Latching or non latching overload relays | From 1.15 to 630 A |  | B11/15 |
| Thermistor-type protection units – For use detection of motor overheating | | | |
| TeSys LT3 Protection units and PTC probes, with or without fault memory | From 90 to 170 °C |  | B11/17 |
| Electronic over current relays - For machine protection | | | |
| Predefined or adjustable starting times, Manual reset | From 1.5 to 34 A |  | B11/19 |
| Automatic, electric or manual reset | From 0.5 to 50 A |  | B11/19 |

TeSys Protect

LRK Thermal overload relays

Product references

3-pole thermal overload relays for TeSys K contactors

These overload relays are designed for the protection of motors. They are compensated and phase failure sensitive. Resetting can either be manual or automatic.

Direct mounting: under the contactor for versions with screw clamp terminals only; pre-wired terminals, see pages B11/28 and B11/30.

Separate mounting: using terminal block LA7K0064 (see below).

On the front face of the overload relay:

- selection of reset mode: Manual (marked H) or Automatic (marked A),
- red pushbutton: Trip Test function,
- blue pushbutton: Stop and manual Reset,
- yellow trip flag indicator: overload relay tripped.

Protection by magnetic circuit breaker GV2LE, see pages coordination tables chapter A6.

Class 10 A (the standard specifies a tripping time of between 2 and 10 seconds at 7.2 In)

| Relay setting range | Fuses to be used with selected relay Maximum rating Type | | | Reference |
|---------------------|--|-----|------|-----------|
| | aM | gG | BS88 | |
| A | A | A | A | |
| 0.11...0.16 | 0.25 | 0.5 | – | LR2K0301 |
| 0.16...0.23 | 0.25 | 0.5 | – | LR2K0302 |
| 0.23...0.36 | 0.5 | 1 | – | LR2K0303 |
| 0.36...0.54 | 1 | 1.6 | – | LR2K0304 |
| 0.54...0.8 | 1 | 2 | – | LR2K0305 |
| 0.8...1.2 | 2 | 4 | 6 | LR2K0306 |
| 1.2...1.8 | 2 | 6 | 6 | LR2K0307 |
| 1.8...2.6 | 4 | 8 | 10 | LR2K0308 |
| 2.6...3.7 | 4 | 10 | 16 | LR2K0310 |
| 3.7...5.5 | 6 | 16 | 16 | LR2K0312 |
| 5.5...8 | 8 | 20 | 20 | LR2K0314 |
| 8...11.5 | 10 | 25 | 20 | LR2K0316 |
| 10...14 | 16 | 32 | 25 | LR2K0321 |
| 12...16 | 20 | 40 | 32 | LR2K0322 |

Overload relays for unbalanced loads

Class 10 A: to order, replace the prefix LR2 by LR7 in the references selected from above (only applicable to overload relays LR2K0305 to LR2K0322).

Example: LR7K0308.

PB121487 eps



LR2K0307



TeSys Protect

TeSys Protect accessory for LRK Thermal overload relays

Product references



LA7K0064

| Accessory for TeSys LRK Thermal overload relay | | |
|--|--------------------|-----------|
| Description | Type of connection | Reference |
| Terminal block for separate clip-on mounting of the overload relay on 35 mm rail | Screw clamp | LA7K0064 |

Overload relays

TeSys Protect

Deca Thermal overload relays

Product references

3-pole differential thermal overload relays for Deca contactors - Class 10

- for use with fuses or magnetic circuit breakers ref. GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

| Relay setting range (A) | Fuses to be used with selected relay | | | For use with contactor LC1 | Reference | Weight kg |
|---|--------------------------------------|--------|----------|----------------------------|-----------------|-----------|
| | aM (A) | gG (A) | BS88 (A) | | | |
| Class 10 A ⁽¹⁾ for connection by screw clamp terminals or connectors | | | | | | |
| 0.10...0.16 | 0.25 | 2 | – | D09...D38 | LRD01 | 0.124 |
| 0.16...0.25 | 0.5 | 2 | – | D09...D38 | LRD02 | 0.124 |
| 0.25...0.40 | 1 | 2 | – | D09...D38 | LRD03 | 0.124 |
| 0.40...0.63 | 1 | 2 | – | D09...D38 | LRD04 | 0.124 |
| 0.63...1 | 2 | 4 | – | D09...D38 | LRD05 | 0.124 |
| 1...1.6 | 2 | 4 | 6 | D09...D38 | LRD06 | 0.124 |
| 1.6...2.5 | 4 | 6 | 10 | D09...D38 | LRD07 | 0.124 |
| 2.5...4 | 6 | 10 | 16 | D09...D38 | LRD08 | 0.124 |
| 4...6 | 8 | 16 | 16 | D09...D38 | LRD10 | 0.124 |
| 5.5...8 | 12 | 20 | 20 | D09...D38 | LRD12 | 0.124 |
| 7...10 | 12 | 20 | 20 | D09...D38 | LRD14 | 0.124 |
| 9...13 | 16 | 25 | 25 | D12...D38 | LRD16 | 0.124 |
| 12...18 | 20 | 35 | 32 | D18...D38 | LRD21 | 0.124 |
| 16...24 | 25 | 50 | 50 | D25...D38 | LRD22 | 0.124 |
| 23...32 | 40 | 63 | 63 | D25...D38 | LRD32 | 0.124 |
| 30...38 | 40 | 80 | 80 | D32 and D38 | LRD35 | 0.124 |
| Class 10 A ⁽¹⁾ for connection by EverLink[®] BTR screw connectors ⁽²⁾ | | | | | | |
| 9...13 | 16 | 25 | 25 | D40A...D65A | LRD313 | 0.375 |
| 12...18 | 20 | 32 | 35 | D40A...D65A | LRD318 | 0.375 |
| 17...25 | 25 | 50 | 50 | D40A...D65A | LRD325 | 0.375 |
| 23...32 | 40 | 63 | 63 | D40A...D65A | LRD332 | 0.375 |
| 30...40 | 40 | 80 | 80 | D40A...D65A | LRD340 | 0.375 |
| 37...50 | 63 | 100 | 100 | D40A...D65A | LRD350 | 0.375 |
| 48...65 | 63 | 100 | 100 | D50A and D65A | LRD365 | 0.375 |
| 62...80 | 80 | 125 | 125 | D80A | LRD380 | 0.375 |
| Class 10 A ⁽¹⁾ for connection by screw clamp terminals or connectors | | | | | | |
| 17...25 | 25 | 50 | 50 | D80 and D95 | LRD3322 | 0.510 |
| 23...32 | 40 | 63 | 63 | D80 and D95 | LRD3353 | 0.510 |
| 30...40 | 40 | 100 | 80 | D80 and D95 | LRD3355 | 0.510 |
| 37...50 | 63 | 100 | 100 | D80 and D95 | LRD3357 | 0.510 |
| 48...65 | 63 | 100 | 100 | D80 and D95 | LRD3359 | 0.510 |
| 55...70 | 80 | 125 | 125 | D80 and D95 | LRD3361 | 0.510 |
| 63...80 | 80 | 125 | 125 | D80 and D95 | LRD3363 | 0.510 |
| 80...104 | 100 | 160 | 160 | D80 and D95 | LRD3365 | 0.510 |
| 80...104 | 125 | 200 | 160 | D115 and D150 | LRD4365 | 0.900 |
| 95...120 | 125 | 200 | 200 | D115 and D150 | LRD4367 | 0.900 |
| 110...140 | 160 | 250 | 200 | D150 | LRD4369 | 0.900 |
| 80...104 | 100 | 160 | 160 | ⁽³⁾ | LRD33656 | 1.000 |
| 95...120 | 125 | 200 | 200 | ⁽³⁾ | LRD33676 | 1.000 |
| 110...140 | 160 | 250 | 200 | ⁽³⁾ | LRD33696 | 1.000 |

Class 10 A ⁽¹⁾ for connection by lugs

Select the appropriate overload relay with screw clamp terminals or connectors from the table above and add one of the following suffixes:

- figure 6 for relays LRD01 to LRD35 and relays LRD313 to LRD380.
- A66 for relays LRD3322 to LRD3363.

Relays LRD43●● are suitable, as standard, for use with lug-clamps.

Thermal overload relays for use with unbalanced loads

Class 10 A ⁽¹⁾ for connection by screw clamp terminals or lugs

In the references selected above, change the prefix LRD (except LRD43●●) to LR3D.

Example: LRD02 becomes LR3D02.

Example with EverLink[®] connectors: LRD340 becomes LR3D340.

Example with lugs: LRD3806 becomes LR3D3806.

- ⁽¹⁾ Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_{Rt} : class 10 A: between 2 and 10 seconds.
- ⁽²⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).
- ⁽³⁾ Independent mounting of the contactor.

Please check the availability of your variant in the index page B11/20. The SEARCH function of your viewer can be used.



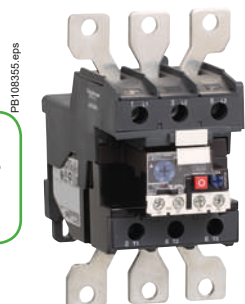
LRD01



LRD33



LRD43



LRD306

Overload relays

TeSys Protect

Deca Thermal overload relays

Product references



LRD33

3-pole differential thermal overload relays for Deca contactors - Class 10 A

- for use with fuses or magnetic circuit breakers ref. GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

| Relay setting range (A) | Fuses to be used with selected relay | | | For use with contactor LC1 | Reference |
|--|--------------------------------------|--------|----------|----------------------------|---------------|
| | aM (A) | gG (A) | BS88 (A) | | |
| Classes 10 A ⁽¹⁾ for connection by spring terminals (only for direct mounting beneath the contactor) | | | | | |
| 1...1.6 | 2 | 4 | 6 | D09...D38 | LRD063 |
| 1.6...2.5 | 4 | 6 | 10 | D09...D38 | LRD073 |
| 2.5...4 | 6 | 10 | 16 | D09...D38 | LRD083 |
| 4...6 | 8 | 16 | 16 | D09...D38 | LRD103 |
| 5.5...8 | 12 | 20 | 20 | D09...D38 | LRD123 |
| 7...10 | 12 | 20 | 20 | D09...D38 | LRD143 |
| 9...13 | 16 | 25 | 25 | D12...D38 | LRD163 |
| 12...18 | 20 | 35 | 32 | D18...D38 | LRD213 |
| 16...24 | 25 | 50 | 50 | D25...D38 | LRD223 |

Class 10 A with connection by EverLink® BTR screw connectors ⁽²⁾ and control by spring terminals

| | | | | | |
|---------|----|-----|-----|---------------|----------------|
| 23...32 | 40 | 63 | 63 | D40A...D65A | LRD3323 |
| 37...50 | 63 | 100 | 100 | D40A...D65A | LRD3503 |
| 48...65 | 63 | 100 | 100 | D50A and D65A | LRD3653 |
| 62...80 | 80 | 125 | 125 | D80A | LRD3803 |

Thermal overload relays for use with unbalanced loads

Classes 10 A ⁽¹⁾ for connection by BTR screw connectors ⁽²⁾ and control by spring terminals

In the references selected above, replace **LRD3** with **LR3D3**.
Example: **LRD3803** becomes **LR3D3803**.

Thermal overload relays for use on 1000 V supplies

Classes 10 A ⁽¹⁾ for connection by screw clamp terminals

For relays LRD06 to LRD35 only, for an operating voltage of 1000 V, and only for independent mounting, the reference becomes **LRD33●●A66**.
Order an **LA7D3064** terminal block separately, see page B11/9.

| Standard relay | Relay for 1000 V network |
|----------------|--------------------------|
| LRD32 | LRD3353A66 |

- ⁽¹⁾ Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_r : class 10 A: between 2 and 10 seconds.
⁽²⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/42).

Please check the availability of your variant in the index page B11/20. The SEARCH function of your viewer can be used.

PE121670_F.eps



LRD05L...LRD32L



PE105234_eps



LR2D35●●

3-pole differential thermal overload relays for Deca contactors - Class 20

- for use with fuses or magnetic circuit breakers ref. GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

| Relay setting range (A) | Fuses to be used with selected relay | | | For use with contactor LC1 | Reference |
|--|--------------------------------------|--------|----------|----------------------------|-----------------|
| | aM (A) | gG (A) | BS88 (A) | | |
| Classes 20 ⁽¹⁾ for connection by screw clamp terminals | | | | | |
| 0.63...1 | 2 | 4 | - | D09...D38 | LRD05L |
| 1...1.6 | 2 | 4 | 6 | D09...D38 | LRD06L |
| 1.6...2.5 | 4 | 6 | 10 | D09...D38 | LRD07L |
| 2.5...4 | 6 | 10 | 16 | D09...D38 | LRD08L |
| 4...6 | 8 | 16 | 16 | D09...D38 | LRD10L |
| 5.5...8 | 12 | 20 | 20 | D09...D38 | LRD12L |
| 7...10 | 12 | 20 | 20 | D09...D38 | LRD14L |
| 9...13 | 16 | 25 | 25 | D12...D38 | LRD16L |
| 12...18 | 20 | 35 | 32 | D18...D38 | LRD21L |
| 17...24 | 25 | 50 | 50 | D25...D38 | LRD22L |
| 23...32 | 40 | 63 | 63 | D25...D38 | LRD32L |
| Class 20 ⁽¹⁾ for connection by EverLink® BTR screw connectors ⁽²⁾ | | | | | |
| 9...13 | 20 | 32 | 35 | D40A...D65A | LRD313L |
| 12...18 | 25 | 40 | 40 | D40A...D65A | LRD318L |
| 17...25 | 32 | 50 | 50 | D40A...D65A | LRD325L |
| 23...32 | 40 | 63 | 63 | D40A...D65A | LRD332L |
| 30...40 | 50 | 80 | 80 | D40A...D65A | LRD340L |
| 37...50 | 63 | 100 | 100 | D40A...D65A | LRD350L |
| 48...65 | 80 | 125 | 125 | D50A and D65A | LRD365L |
| Classes 20 ⁽¹⁾ for connection by screw clamp terminals | | | | | |
| 17...25 | 32 | 50 | 50 | D80 and D95 | LR2D3522 |
| 23...32 | 40 | 63 | 63 | D80 and D95 | LR2D3553 |
| 30...40 | 40 | 100 | 80 | D80 and D95 | LR2D3555 |
| 37...50 | 63 | 100 | 100 | D80 and D95 | LR2D3557 |
| 48...65 | 80 | 125 | 100 | D80 and D95 | LR2D3559 |
| 55...70 | 100 | 125 | 125 | D80 and D95 | LR2D3561 |
| 63...80 | 100 | 160 | 125 | D80 and D95 | LR2D3563 |

Class 20 ⁽¹⁾ for connection by lugs

For relays LRD05L to LRD32L and relays LRD313L to LRD365L, select the appropriate overload relay with screw clamp terminals or connectors from the table above and add the suffixe **6**.

Example: **LRD05L** becomes **LRD05L6**.

Thermal overload relays for use with unbalanced loads

Class 20 ⁽¹⁾ for connection by screw clamp terminals or lugs

For relays LRD05L to LRD32L and relays LR2D3522 to LR2D3563, select the appropriate overload relay with screw clamp terminals or connectors from the table above and change the prefix LRD or LR2D to **LR3D**.

Example: **LRD05L** becomes **LR3D05L**.

⁽¹⁾ Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R : class 20: between 6 and 20 seconds

⁽²⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/42).

Please check the availability of your variant in the index page B11/20. The **SEARCH** function of your viewer can be used.

3-pole differential thermal overload relays for Deca contactors - Class 20

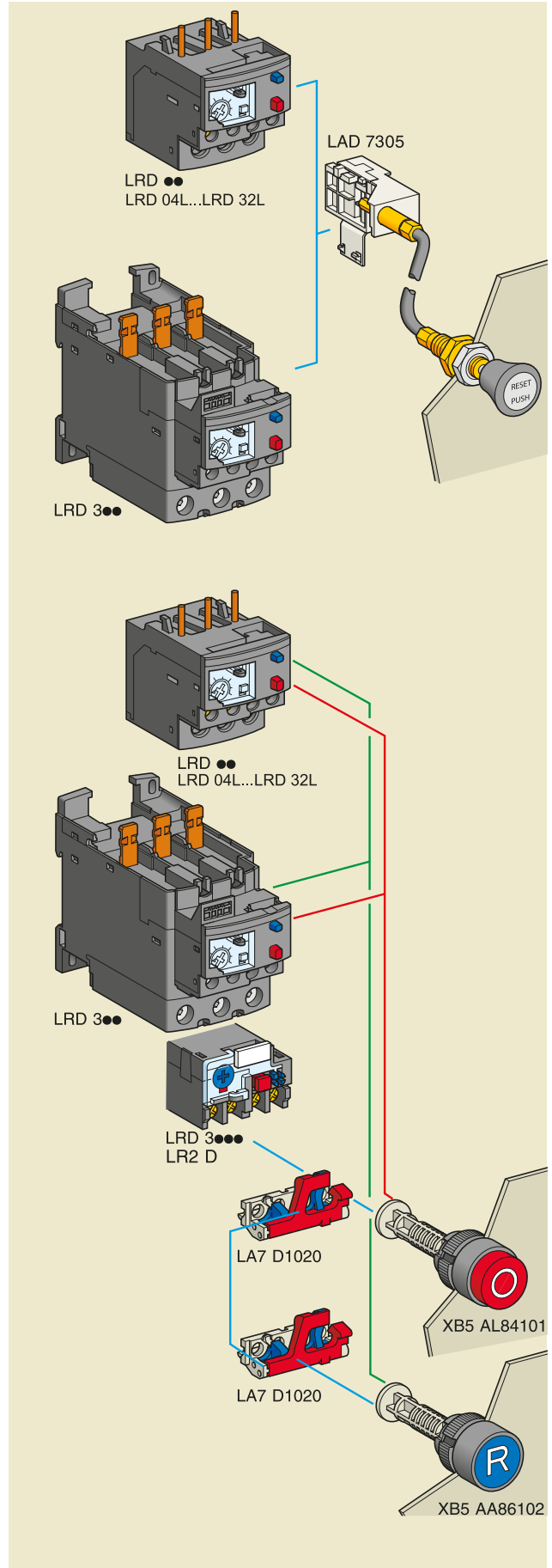
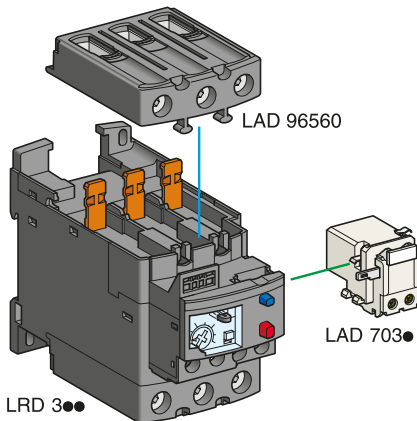
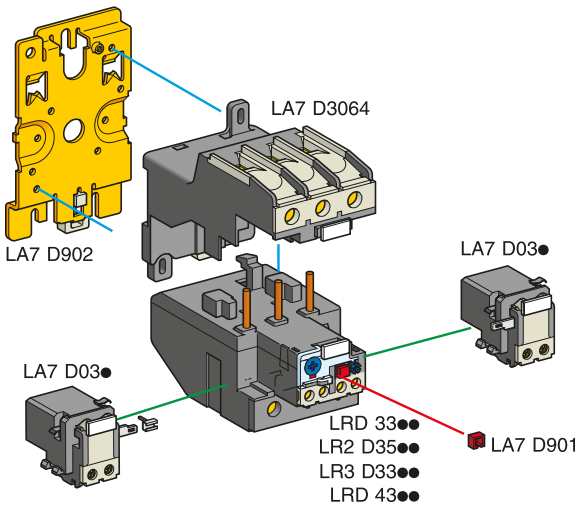
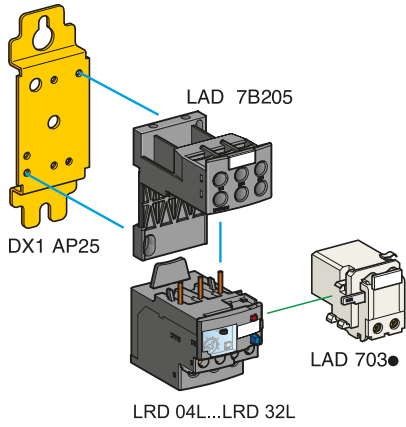
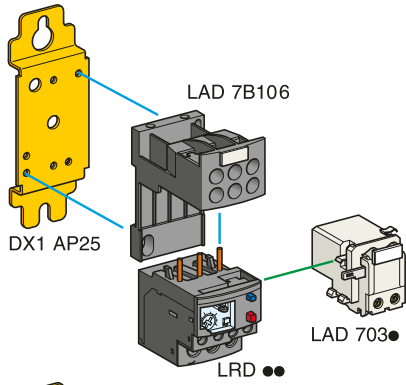
- for use with fuses or magnetic circuit breakers ref. GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

| Relay setting range (A) | Fuses to be used with selected relay | | | For mounting beneath contactor LC1 | Reference |
|--|--------------------------------------|--------|----------|------------------------------------|-----------|
| | aM (A) | gG (A) | BS88 (A) | | |
| Class 20 ⁽¹⁾ with connection by EverLink[®] BTR screw connectors ⁽²⁾ and control by spring terminals | | | | | |
| 9...13 | 20 | 32 | 35 | D40A...D65A | LRD313L3 |

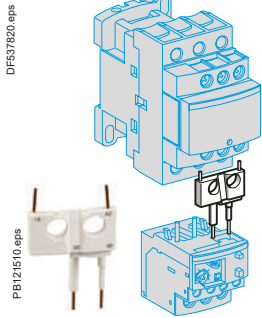
(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R :
 class 10: between 4 and 10 seconds,
 class 10 A: between 2 and 10 seconds,
 class 20: between 6 and 20 seconds.

(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/42).

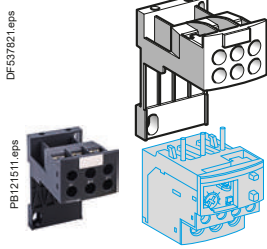




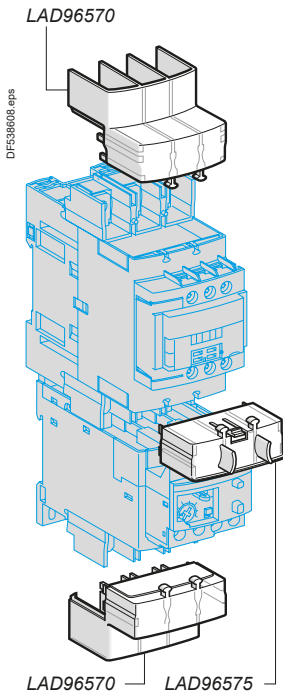
Overload relays



LAD7C



LAD7B106



LAD96570 LAD96575



PB 121512



PB 121513

Separate components for relays

| Description | For use with | Sold in lots of | Unit reference |
|---|--|-----------------|------------------------------|
| Pre-wiring kit allowing direct connection of the N/C contact of relay LRD01...35 or LR3D02...D35 to the contactor | LC1D09...D18 | 10 | LAD7C1 ⁽¹⁾ |
| | LC1D25...D38 | 10 | LAD7C2 ⁽¹⁾ |
| Terminal block ⁽²⁾ for clip-on mounting on 35 mm rail (AM1DP200) or screw fixing; for fixing centres, see pages B11/35 to B11/37 | LRD01...35 and LR3D02...D35 | 1 | LAD7B106 |
| | LRD05L...LRD32L, LR3D05L...LR3D32L | 1 | LAD7B205 |
| | LRD33...L, LR3D33...L, LR2D35...L, LR3D35...L | 1 | LA7D3064 ⁽³⁾ |
| | LRD33...L, LR3D33...L and LR3D35...L | 1 | LAD96560 |
| EverLink [®] terminal block for independent mounting | LRD3...L, LR3D3...L and LR3D35...L | 1 | LAD96560 |
| Size 4 Allen key, insulated, 1000 V | LRD3...L, LR3D3...L and LR3D35...L | 5 | LADALLEN4 |
| Terminal block adapter for mounting a relay beneath an LC1D115 or D150 contactor | LRD33...L, LR3D33...L, LR3D35...L | 1 | LA7D3058 ⁽³⁾ |
| Mounting plates ⁽⁴⁾ for screw fixing on 110 mm centres | LRD01...35, LR3D02...D35, LRD05L...LRD32L, LR3D05L...LR3D32L | 10 | DX1AP25 |
| | LRD3...L, LR3D3...L, LR2D35...L | 1 | LA7D902 |
| Marker holders, snap-in 8 x 18 mm | LRD3...L | 100 | LAD90 |
| | All relays except LRD01...35, LRD05L...32L, LR3D05L...D32L, LR3D02...D35, LRD3...L, LR3D3...L and LR3D35...L | 100 | LA7D903 |
| Bag of 400 blank legends (self-adhesive, 7 x 16 mm) | All relays | 1 | LA9D91 |
| Remote Stop or electrical reset device ⁽⁵⁾ | LRD01...35, LR3D02...D35, LRD05L...32L, LR3D05L...D32L and LR3D313...LRD380 | 1 | LAD703... ^{(6) (7)} |
| Remote tripping or electrical reset device ⁽⁵⁾ | All relays except LRD01...35, LR9D01...32, LRD05L...32L, LR3D05L...D32L, LR3D02...D35, LR9D01...32, LRD3...L, LR3D3...L and LR3D35...L | 1 | LA7D03... ⁽⁶⁾ |
| Block of insulated terminals | LR9D | 2 | LA9F103 ⁽⁷⁾ |
| IP 20 cover for lug type terminals for independent mounting | LRD3256...3806 | 1 | LAD96570 |
| IP 20 cover for lug type terminals for mounting with contactor LC1D40A6...D65A6 | LRD3256...3806 | 1 | LAD96575 |
| Terminal block for lug type terminals for independent mounting | LRD3256...3806 | 1 | LAD96566 |

Remote control

"Reset" function

| Description | For use with | Sold in lots of | Unit reference |
|------------------------------------|---|-----------------|------------------------|
| By flexible cable (length = 0.5 m) | LRD01...35, LR3D02...D35, LR3D05L...D32L and LR3D313...LRD380, LRD05L...LRD32L | 1 | LAD7305 ⁽⁸⁾ |
| | All relays except LRD01...35, LR3D02...D35, LRD3...L, LRD05L...32L, LR3D05L...D32L, LRD3...L, LR3D3...L, LR9D01, LR9D110S | 1 | LA7D305 |

"Stop" and/or "Reset" functions

The terminal protection shroud must be removed and the following 3 products must be ordered separately:

| | | | | |
|--|-----------------|------------|----------|------------|
| Adapter for door mounting | LRD33...L, LR2D | 1 | LA7D1020 | |
| Operating heads for spring return pushbutton | Stop | All relays | 1 | XB5AL84101 |
| | Reset | All relays | 1 | XB5AA86102 |

- ⁽¹⁾ These pre-wiring kits cannot be used with reversing contactors.
- ⁽²⁾ Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.
- ⁽³⁾ To order a terminal block for connection by lugs, the reference becomes LA7D30646.
- ⁽⁴⁾ Remember to order the terminal block corresponding to the type of relay.
- ⁽⁵⁾ The time for which the coil of remote tripping or electrical resetting device LA7D03 or LAD703 can remain energised depends on its rest time: 1 s pulse duration with 9 s rest time; 5 s pulse duration with 30 s rest time; 10 s pulse duration with 90 s rest time; maximum pulse duration 20 s with a rest time of 300 s. Minimum pulse time: 200 ms.
- ⁽⁶⁾ Reference to be completed by adding the code indicating the control circuit voltage.
Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

| Volts | 12 | 24 | 48 | 96 | 110 | 220/230 | 380/400 | 415/440 |
|--|----|----|----|----|-----|---------|---------|---------|
| 50/60 Hz | — | B | E | — | F | M | Q | N |
| Consumption, inrush and sealed: < 100 VA | — | — | — | — | — | — | — | — |
| Consumption, inrush and sealed: < 100 W. | J | B | E | DD | F | M | — | — |

- ⁽⁷⁾ Only one terminal block can be mounted below LR9D.
- ⁽⁸⁾ Not compatible with 3-pole relays fitted with spring terminals.

TeSys Protect

Deca Electronic thermal overload relays

Product references



LR9D01 and LR9D32



LR9D110S



LR9D5567



LAD7B205



LAD7B205 mounted on LR9D01



LR9D67

Electronic thermal overload relays for Deca contactors

- for use with fuses or magnetic circuit breakers
- compensated relays, with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting ⁽¹⁾.

| Relay setting range | Fuses to be used with selected relay | | For direct mounting beneath contactor LC1 | Reference |
|---------------------|--------------------------------------|----|---|-----------|
| | aM | gG | | |

A A A

Classes 5.10.20.30 ⁽¹⁾ selectable for direct connection on Deca contactors or connection using connectors

| | | | | |
|-----------|--|--|-----------|--------|
| 0.1...0.5 | | | D09...D38 | LR9D01 |
| 0.4...2 | | | D09...D38 | LR9D02 |
| 1.6...8 | | | D09...D38 | LR9D08 |
| 6.4...32 | | | D09...D38 | LR9D32 |

Classes 5.10.20.30 ⁽¹⁾ selectable for connection using connectors

| | | | | |
|----------|--|--|--|----------|
| 22...110 | | | | LR9D110S |
|----------|--|--|--|----------|

Classes 10 or 10 A ⁽¹⁾ for connection using bars or connectors

| | | | | |
|----------|-----|-----|-------------|----------|
| 60...100 | 100 | 160 | D115...D150 | LR9D5367 |
| 90...150 | 160 | 250 | D115...D150 | LR9D5369 |

Classes 20 ⁽¹⁾ for connection using bars or connectors

| | | | | |
|----------|-----|-----|-------------|----------|
| 60...100 | 125 | 160 | D115...D150 | LR9D5567 |
| 90...150 | 200 | 250 | D115...D150 | LR9D5569 |

Separate components for relays

| Description | For use with | Sold in lots of | Unit reference |
|---|----------------|-----------------|----------------|
| Terminal block ⁽²⁾ | LR9D01, | 1 | LAD7B205 |
| For clips-on mounting on 35 mm rails (AM1DP200) or screws fixing; | LR9D02, | | |
| for fixing centres, see pages B11/35 to B11/37 | LR9D08, LR9D32 | | |

Electronic overload relays for balanced or unbalanced loads

| Relay setting range | Fuses to be used with selected relay | | For direct mounting beneath contactor LC1 | Reference |
|---------------------|--------------------------------------|----|---|-----------|
| | aM | gG | | |

A A A

Classes 10 or 20 ⁽¹⁾ selectable for direct connection using bars or connectors

| | | | | |
|----------|-----|-----|-------------|--------|
| 60...100 | 100 | 160 | D115...D150 | LR9D67 |
| 90...150 | 160 | 250 | D115...D150 | LR9D69 |

⁽¹⁾ Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_{R^*} :
 class 5: between 0.5 and 5 seconds
 class 10: between 4 and 10 seconds
 class 10 A: between 2 and 10 seconds
 class 20: between 6 and 20 seconds
 class 30: between 9 and 30 seconds.

⁽²⁾ Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.

⁽³⁾ Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page B8/20).

TeSys Protect

LR9F Electronic thermal overload relays

Product references



LR9F53●●



LR9F73●●

Compensated and differential overload relays for F contactors

- with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting ⁽¹⁾.

| Relay setting range | Fuses to be used with selected relay | | For direct mounting beneath contactor LC1 | Reference | Weight |
|--------------------------------|--------------------------------------|-----|---|-----------|--------|
| | aM | gG | | | |
| A | A | A | | | kg |
| Class 10 ⁽²⁾ | | | | | |
| 30...50 | 50 | 80 | F115...F185 | LR9F5357 | 0.885 |
| 48...80 | 80 | 125 | F115...F185 | LR9F5363 | 0.900 |
| 60...100 | 100 | 200 | F115...F185 | LR9F5367 | 0.900 |
| 90...150 | 160 | 250 | F115...F185 | LR9F5369 | 0.885 |
| 132...220 | 250 | 315 | F225...F265 | LR9F5371 | 0.950 |
| 200...330 | 400 | 500 | F225...F500 | LR9F7375 | 2.320 |
| 300...500 | 500 | 800 | F225...F500 | LR9F7379 | 2.320 |
| 380...630 | 630 | 800 | F400...F630 and F800 | LR9F7381 | 4.160 |
| Class 20 ⁽²⁾ | | | | | |
| 30...50 | 50 | 80 | F115...F185 | LR9F5557 | 0.885 |
| 48...80 | 80 | 125 | F115...F185 | LR9F5563 | 0.900 |
| 60...100 | 100 | 200 | F115...F185 | LR9F5567 | 0.900 |
| 90...150 | 160 | 250 | F115...F185 | LR9F5569 | 0.885 |
| 132...220 | 250 | 315 | F225...F265 | LR9F5571 | 0.950 |
| 200...330 | 400 | 500 | F225...F500 | LR9F7575 | 2.320 |
| 300...500 | 500 | 800 | F225...F500 | LR9F7579 | 2.320 |
| 380...630 | 630 | 800 | F400...F630 and F800 | LR9F7581 | 4.160 |

⁽¹⁾ When mounting overload relays LR9F5●57...LR9F5●71 directly beneath the contactor, supporting the relays with a mounting plate is recommended (see page B11/14).
With overload relays LR9F7●75...LR9F7●81, use of a support mounting plate is mandatory (see page B11/14).

Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page B11/14).
Interconnection kit LA7F407 is required for mounting an LR9F5●71 thermal overload relay together with an LC1F185 contactor.

⁽²⁾ Standard IEC 60947-4 specifies a tripping time for 7.2 times the setting current I_n :
- class 10: between 4 and 10 seconds,
- class 20: between 6 and 20 seconds.

TeSys Protect

LR9F Electronic thermal overload relays

Product references



LR9F57



Overload relays

Compensated overload relays for F contactors - class 10 or 20

- with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting ⁽¹⁾,
- class 10 or 20 by selector switch,
- protection of 3-phase or single-phase circuits by selector switch,
- with alarm function that enables tripping to be forestalled.

| Relay setting range | Fuses to be used with selected relay | | For direct mounting beneath contactor LC1 | Reference | Weight |
|---------------------|--------------------------------------|-----|---|-----------|--------|
| | aM | gG | | | |
| A | A | A | | | kg |
| 30...50 | 50 | 80 | F115...F185 | LR9F57 | 0.885 |
| 48...80 | 80 | 125 | F115...F185 | LR9F63 | 0.900 |
| 60...100 | 100 | 200 | F115...F185 | LR9F67 | 0.900 |
| 90...150 | 160 | 250 | F115...F185 | LR9F69 | 0.885 |
| 132...220 | 250 | 315 | F185...F265 | LR9F71 | 0.950 |
| 200...330 | 400 | 500 | F225...F500 | LR9F75 | 2.320 |
| 300...500 | 500 | 800 | F225...F500 | LR9F79 | 2.320 |

⁽¹⁾ When mounting overload relays LR9F57...LR9F71 directly beneath the contactor, supporting the relays with a mounting plate is recommended (see page B11/14).
 With overload relays LR9F75...LR9F79, use of a support mounting plate is mandatory (see page B11/14).
 Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page B11/14).
 Interconnection kit LA7F407 is required for mounting an LR9F71 thermal overload relay together with an LC1F185 contactor.

TeSys Protect

TeSys Protect accessories for LR9F Electronic thermal overload relays

Product references



LA7D03●



LA7D305

Control accessories

| Description | Sold in lots of | Unit reference |
|---|-----------------|-------------------------|
| Remote electrical reset device ⁽¹⁾ | 1 | LA7D03● ⁽²⁾ |
| Remote Reset function control by flexible cable (length = 0.5 m) | 1 | LA7D305 |
| Remote Stop and/or Reset function control | 1 | LA7D1020 |
| Adapter for door mounted operator | 1 | LA7D1020 |
| Rod (snap-off end to obtain required length, between 17 and 120 mm) | 10 | ZA2BZ13 |
| Operating head for spring return pushbutton | 1 | ZA2B●●●● ⁽³⁾ |

Connection accessories

For mounting an LR9F5●71 thermal overload relay together with an LC1 F185 contactor

| Description | Reference |
|------------------|-----------|
| Set of 3 busbars | LA7F407 |

For mounting a thermal overload relay beneath a reversing contactor or star-delta contactors

| Application | Width of terminal lug | Set of 3 busbars Reference |
|------------------------------|-----------------------|----------------------------|
| For relay | For contactor | mm |
| LR9F5●71, LR9F71 | LC1F185 | 25 LA7F407 |
| LR9F5●71, LR9F71 | LC1F225, F265 | 25 LA7F403 |
| LR9F7●75, F7●79, LR9F75, F79 | LC1F225...F400 | 25 LA7F404 |
| LR9F7●81, | LC1F400 | 25 LA7F404 |
| LR9F7●81, | LC1F630, F800 | 40 LA7F406 |

⁽¹⁾ The time for which the coil of remote electrical reset device LA7D03 can remain energised depends on its rest time: 1 s pulse duration with 9 s rest time; 5 s pulse duration with 30 s rest time; 10 s pulse duration with 90 s rest time. Maximum pulse duration of 20 s with rest time of 300 s. Minimum pulse time: 200 ms.

⁽²⁾ Reference to be completed by adding the coil voltage code. Standard control circuit voltages, (for other voltages, please consult your Regional Sales Office):

| Volts | 12 | 24 | 48 | 96 | 110 | 220/230 | 380/400 | 415/440 |
|--|----|----|----|----|-----|---------|---------|---------|
| ~ 50/60 Hz | – | B | E | – | F | M | Q | N |
| Consumption, inrush and sealed: < 100 VA | | | | | | | | |
| --- | J | B | E | DD | F | M | – | – |

Consumption, inrush and sealed: < 100 W.

⁽³⁾ Stop: ZA2BL432 and Reset: ZA2BL639.

Please check the availability of your variant in the index page B11/20. The SEARCH function of your viewer can be used.

TeSys Protect

TeSys Protect accessories for LR9F Electronic thermal overload relays

Product references



LA7F90●



LA9F70●



LA7F70●



LA9F103

Mounting plates for overload relay

| For use with relays | Reference |
|---------------------|-----------|
|---------------------|-----------|

| | |
|--|---------|
| LR9F5●57, F5●63, F5●67, F5●69, F5●71, LR9F57, F63, F67, F69, F71 | LA7F901 |
|--|---------|

| | |
|-------------------------------------|---------|
| LR9F7●75, F7●79, F7●81, LR9F75, F79 | LA7F902 |
|-------------------------------------|---------|

Sets of power terminal protection shrouds, single-pole

| For use with relays | Number of shrouds per set | Set reference |
|---------------------|---------------------------|---------------|
|---------------------|---------------------------|---------------|

| | | |
|------------------|---|---------|
| LR9F5●57, LR9F57 | 6 | LA9F701 |
|------------------|---|---------|

| | | |
|--|---|---------|
| LR9F5●63, F5●67, F5●69, LR9F63, F67, F69 | 6 | LA9F702 |
|--|---|---------|

| | | |
|------------------|---|---------|
| LR9F5●71, LR9F71 | 6 | LA9F705 |
|------------------|---|---------|

| | | |
|-------------------------------------|---|---------|
| LR9F7●75, F7●79, F7●81, LR9F75, F79 | 6 | LA9F703 |
|-------------------------------------|---|---------|

Power terminal protection shrouds, 3-pole

| For use with relays | Reference |
|---------------------|-----------|
|---------------------|-----------|

| | |
|--|---------|
| LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69 | LA7F701 |
|--|---------|

| | |
|------------------|---------|
| LR9F5●71, LR9F71 | LA7F702 |
|------------------|---------|

| | |
|-------------------------------------|---------|
| LR9F7●75, F7●79, F7●81, LR9F75, F79 | LA7F703 |
|-------------------------------------|---------|

Insulated terminal blocks

| For use with relays | Set of 2 blocks Reference |
|---------------------|---------------------------|
|---------------------|---------------------------|

| | |
|--|---------|
| LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69 | LA9F103 |
|--|---------|

Marking accessories

| Description | Sold in lots of | Unit reference |
|-------------|-----------------|----------------|
|-------------|-----------------|----------------|

| | | |
|-----------------------|-----|---------|
| Clip-in marker holder | 100 | LA7D903 |
|-----------------------|-----|---------|

| | | |
|--|---|--------|
| Bag of 400 blank self-adhesive legends 7 x 16 mm | 1 | LA9D91 |
|--|---|--------|

TeSys Protect

RM1XA magnetic over current relays

Product references



RM1XA●●●

Single-pole, non-latching, over current relays

With 1 C/O contact block

| Recommended operating range (motor I _n) | Setting range (trip current) | Maximum continuous current ~ or ☰ | Reference |
|---|------------------------------|--------------------------------------|-----------------|
| A ~ or ☰ 0.7...1.15 | A 1.25...4 | A 1.6 | RM1XA001 |
| 3...4.6 | 5...16 | 6.3 | RM1XA006 |
| 7.3...11.5 | 12.5...40 | 16 | RM1XA016 |
| 18.1...29 | 32...100 | 40 | RM1XA040 |
| 46.1...72 | 80...250 | 100 | RM1XA100 |
| 73...115 | 125...400 | 160 | RM1XA160 |
| 146...230 | 250...800 | 315 | RM1XA315 |
| 231...360 | 400 ...1250 | 500 | RM1XA500 |



Overload relays

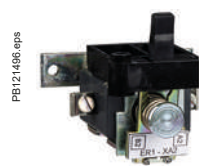
TeSys Protect

RM1X magnetic over current relays

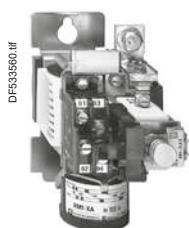
Product references



RM1XA3151



ER1XA2M



ER1XA2●
mounted on
RM1XA3151

Single-pole, latching, manual reset, over current relays

With 1 C/O contact block

| Recommended operating range (motor In) | Setting range (trip current) | Maximum continuous current ~ or --- | Reference |
|--|------------------------------|-------------------------------------|-----------|
| A | A | A | RM1XA3151 |
| 146...230 | 250...800 | 315 | |

Accessories (to be ordered separately)

| Description | Reference |
|--|-----------|
| Electrical reset ⁽¹⁾ (consumption: inrush, sealed: 500 VA, 220 V 50 Hz coil) (fitted to the relay together with a latching contact block) | ER1XA2M |

⁽¹⁾ The impulse duration must not exceed 2 seconds within 10 minute intervals.



TeSys Protect

LT3 Thermal protection units

Product references



PB121498.eps

LT3SE00M



PB121499.eps

LT3SA00M



PB121500.eps

LT3SM00M

Protection units

- to be used with PTC thermistor probes
- with thermistor short-circuit detection
- The contact changes state when a rapid rise in temperature above the nominal probe rating is detected.

With automatic reset

| Connection | Voltage | | Output contact | Reference | |
|-----------------|------------|-------|----------------|-----------|-----------|
| Cage connectors | ~ 50/60 Hz | 115 V | N/C | LT3SE00F | |
| | | 230 V | N/C | LT3SE00M | |
| | | --- | 24 V | N/C | LT3SE00BD |

Units with automatic reset and front signalling by LED's (Power-Fault)

| Connection | Voltage | | Output contact | Reference |
|-----------------|------------|------------|----------------|-----------|
| Cage connectors | ~ 50/60 Hz | 115/230 V | N/C + N/O | LT3SA00M |
| | | --- | 24/48 V | N/C + N/O |
| | ~ 50/60 Hz | 24...230 V | 2 C/O | LT3SA00MW |
| | or --- | | | |

Manual reset, on front: Test/Reset pushbutton Power + Fault LED's

| Connection | Voltage | | Output contact | Reference | |
|-----------------|------------|------------|----------------|-----------|-----------|
| Cage connectors | ~ 50/60 Hz | 400 V | N/C + N/O | LT3SM00V | |
| | | 24/48 V | N/C + N/O | LT3SM00E | |
| | | 115/230 V | N/C + N/O | LT3SM00M | |
| | | --- | 24/48 V | N/C + N/O | LT3SM00ED |
| | ~ 50/60 Hz | 24...230 V | 2 C/O | LT3SM00MW | |
| | or --- | | | | |



Overload relays

TeSys Protect

PTC⁽¹⁾ thermistor probes for LT3 thermal protection units

Product references



DA1TT●●●



Triple probe to be inserted into equipment



DA1TS●●●



Probe to be screwed on equipment casing

PTC thermistor probes

| Description | Nominal Operating Temperature (NOT) °C | Colour | Sold in lots of | Unit reference |
|--------------------------|---|-------------|-----------------|----------------|
| Integrated triple probes | 90 | Green/green | 10 | DA1TT090 |
| | 110 | Brown/brown | 10 | DA1TT110 |
| | 120 | Grey/grey | 10 | DA1TT120 |
| | 130 | Blue/blue | 10 | DA1TT130 |
| | 140 | White/blue | 10 | DA1TT140 |
| | 150 | Black/black | 10 | DA1TT150 |
| | 160 | Blue/red | 10 | DA1TT160 |
| Surface probes | 170 | White/green | 10 | DA1TT170 |
| | 60 | White/grey | 10 | DA1TS060 |
| | 70 | White/brown | 10 | DA1TS070 |
| | 80 | White/white | 10 | DA1TS080 |
| | 90 | Green/green | 10 | DA1TS090 |
| | 100 | Red/red | 10 | DA1TS100 |

Accessories (to be ordered separately)

Mounting accessories

| Description | Applicationi | Sold in lots of | Unit reference |
|-------------|-----------------------------|-----------------|----------------|
| Adapter | For fixing on C rail DZ5 MB | 10 | RHZ66 |

Marking accessories

| | | | |
|---|---|----|----------------------|
| Clip-in markers (maximum of 5 per unit) | Strips of 10 identical numbers (0 to 9) | 25 | AB1R● ⁽²⁾ |
| | Strips of 10 identical capital letters (A to Z) | 25 | AB1G● ⁽²⁾ |

(1) PTC: Positive Temperature Coefficient.

(2) When ordering, replace the ● in the reference with the number or letter required.

TeSys Protect

LR97, LT47 Electronic over current relays

Product references



LR97D07●●



LT4730●●●●

LR97D electronic over current relays

| Relay setting range | Usable range (1) | For use with contactor (2) | Relay supply voltage | Reference (3) |
|---------------------|------------------|----------------------------|----------------------|---------------|
| A | | | | |
| 0.3...1.5 | 0.3...1.3 | LC1 D09...D38 | ~ 200...240 V | LR97D015M7 |
| | | | ~ 100...120 V | LR97D015F7 |
| | | | ~/~ 24 V | LR97D015B |
| | | | ~/~ 48 V | LR97D015E |
| 1.2...7 | 1.2...6 | LC1 D09...D38 | ~ 200...240 V | LR97D07M7 |
| | | | ~ 100...120 V | LR97D07F7 |
| | | | ~/~ 24 V | LR97D07B |
| | | | ~/~ 48 V | LR97D07E |
| 5...25 | 5...21 | LC1 D09...D38 | ~ 200...240 V | LR97D25M7 |
| | | | ~ 100...120 V | LR97D25F7 |
| | | | ~/~ 24 V | LR97D25B |
| | | | ~/~ 48 V | LR97D25E |
| 20...38 | 20...34 | LC1 D25...D38 | ~ 200...240 V | LR97D38M7 |
| | | | ~ 100...120 V | LR97D38F7 |
| | | | ~/~ 24 V | LR97D38B |
| | | | ~/~ 48 V | LR97D38E |

LT47 electronic over current relays

| Relay setting range | Usable range (1) | Relay supply voltage | Reference |
|--|------------------|----------------------|-----------|
| A | | | |
| LT47 relay with manual/electric reset | | | |
| 0.5...6 | 0.5...5 | ~ 200...240 V | LT4706M7S |
| | | ~ 100...120 V | LT4706F7S |
| | | ~/~ 24 V | LT4706BS |
| 3...30 | 3...25 | ~ 200...240 V | LT4730M7S |
| | | ~ 100...120 V | LT4730F7S |
| | | ~/~ 24 V | LT4730BS |
| 5...60 | 5...50 | ~ 200...240 V | LT4760M7S |
| | | ~ 100...120 V | LT4760F7S |
| | | ~/~ 24 V | LT4760BS |
| LT47 relay with automatic reset | | | |
| 0.5...6 | 0.5...5 | ~ 200...240 V | LT4706M7A |
| | | ~/~ 24 V | LT4706BA |
| 3...30 | 3...25 | ~ 200...240 V | LT4730M7A |
| | | ~ 100...120 V | LT4730F7A |
| | | ~/~ 24 V | LT4730BA |
| 5...60 | 5...50 | ~/~ 48 V | LT4730EA |
| | | ~ 200...240 V | LT4760M7A |
| | | ~/~ 24 V | LT4760BA |

Accessories (to be ordered separately)

| Description | For use with | Sold in lots of | Unit reference |
|--|---------------|-----------------|----------------|
| Pre-wiring kits allowing connection of the LR97D relay N/C contact directly to the contactor | LC1 D09...D18 | 10 | LAD7C1 |
| | LC1 D25...D38 | 10 | LAD7C2 |
| Terminal block for clip-on mounting on 35 mm rail (AM1 DP200) | LR97D | 1 | LAD7B106 |

(1) To allow adjustment of the tripping sensitivity, see adjustment method (page B11/58).

(2) Please see chapter B8.

(3) If a pre-wiring kit is used, it is no longer possible to electrically wire signalling of tripped status.

TeSys Protect

Thermal and electronic overload relays

Product references

| | | | | |
|-----------|----------|--------------|---------|------------|
| DA1TT090 | LR2K0303 | LR3D3803 | LRD04L6 | LRD332 |
| DA1TT110 | LR2K0304 | LR3D3806 | LRD05 | LRD3322 |
| DA1TT120 | LR2K0305 | LR3D4365 | LRD056 | LRD3323 |
| DA1TT130 | LR2K0306 | LR3D4367 | LRD05L | LRD332L |
| DA1TT140 | LR2K0307 | LR3D4369 | LRD06 | LRD3353 |
| DA1TT150 | LR2K0308 | LR7K0305 | LRD063 | LRD3353A66 |
| DA1TT160 | LR2K0310 | LR7K0306 | LRD066 | LRD3355 |
| DA1TT170 | LR2K0312 | LR7K0308 | LRD06L | LRD3357 |
| DPER01 | LR2K0314 | LR7K0310 | LRD07 | LRD3357A66 |
| DPER21 | LR2K0316 | LR7K0312 | LRD073 | LRD3359 |
| DPER32 | LR2K0321 | LR7K0314 | LRD076 | LRD3359A66 |
| DPER35 | LR2K0322 | LR7K0316 | LRD07L | LRD3361 |
| ER1XA2M | LR3D02 | LR97D015B | LRD07L6 | LRD3363 |
| LA7D03B | LR3D03 | LR97D015E | LRD08 | LRD3365 |
| LA7D03F | LR3D04 | LR97D015F7 | LRD083 | LRD33656 |
| LA7D03M | LR3D046 | LR97D015M7 | LRD086 | LRD33676 |
| LA7D03Q | LR3D05 | LR97D07B | LRD08L | LRD33696 |
| LA7D1020 | LR3D056 | LR97D07E | LRD08L6 | LRD340 |
| LA7D1064 | LR3D06 | LR97D07F7 | LRD10 | LRD3406 |
| LA7D305 | LR3D066 | LR97D07M7 | LRD103 | LRD340L |
| LA7D3058 | LR3D07 | LR97D25B | LRD106 | LRD340L6 |
| LA7D3064 | LR3D076 | LR97D25E | LRD10L | LRD35 |
| LA7D30646 | LR3D07L | LR97D25F7 | LRD10L6 | LRD350 |
| LA7D903 | LR3D08 | LR97D25M7 | LRD12 | LRD3503 |
| LA7K0064 | LR3D086 | LR97D38B | LRD123 | LRD3506 |
| LA9D730 | LR3D08L | LR97D38E | LRD126 | LRD350L |
| LA9D91 | LR3D10 | LR97D38F7 | LRD12L | LRD356 |
| LA9F100 | LR3D106 | LR97D38M7 | LRD14 | LRD365 |
| LA9F15076 | LR3D10L | LR9D5367 | LRD143 | LRD3653 |
| LA9F18517 | LR3D12 | LR9D5369 | LRD146 | LRD3656 |
| LA9F2100 | LR3D126 | LR9D5567 | LRD14L | LRD365L |
| LA9F22582 | LR3D12L | LR9D5569 | LRD1508 | LRD365L6 |
| LA9F705 | LR3D14 | LR9D67 | LRD1510 | LRD380 |
| LA9F709 | LR3D146 | LR9D69 | LRD1512 | LRD3803 |
| LA9F801 | LR3D14L | LR9F5357 | LRD1514 | LRD3806 |
| LA9FF601 | LR3D16 | LR9F5363 | LRD1516 | LRD4365 |
| LA9FF981 | LR3D166 | LR9F5363S219 | LRD1521 | LRD4367 |
| LA9FG601 | LR3D16L | LR9F5367 | LRD1522 | LRD4369 |
| LA9FG979 | LR3D21 | LR9F5367S219 | LRD1530 | LRD488C |
| LA9FG980 | LR3D216 | LR9F5369 | LRD1532 | LT4706BA |
| LA9FH601 | LR3D21L | LR9F5369S219 | LRD16 | LT4706BS |
| LA9FH610 | LR3D22 | LR9F5371 | LRD163 | LT4706F7S |
| LA9FH982 | LR3D226 | LR9F5557 | LRD166 | LT4706M7A |
| LA9FJ610 | LR3D22L | LR9F5563 | LRD16L | LT4706M7S |
| LA9FJ980 | LR3D313 | LR9F5567 | LRD16L6 | LT4730BA |
| LA9FK982 | LR3D318 | LR9F5569 | LRD21 | LT4730BS |
| LA9FL976 | LR3D32 | LR9F5571 | LRD213 | LT4730EA |
| LAD703B | LR3D325 | LR9F57 | LRD216 | LT4730F7A |
| LAD703E | LR3D326 | LR9F63 | LRD21L | LT4730F7S |
| LAD703F | LR3D32L | LR9F63S219 | LRD21L6 | LT4730M7A |
| LAD703M | LR3D332 | LR9F67 | LRD22 | LT4730M7S |
| LAD703Q | LR3D3322 | LR9F67S219 | LRD223 | LT4760BA |
| LAD7305 | LR3D3353 | LR9F69 | LRD226 | LT4760BS |
| LAD7B105 | LR3D3355 | LR9F69S219 | LRD22L | LT4760ES |
| LAD7B1056 | LR3D3363 | LR9F71 | LRD22L6 | LT4760F7S |
| LAD7B106 | LR3D3365 | LR9F7375 | LRD313 | LT4760M7A |
| LAD7B205 | LR3D340 | LR9F7379 | LRD313L | LT4760M7S |
| LAD7C1 | LR3D35 | LR9F7381 | LRD318 | RM1XA001 |
| LAD7C2 | LR3D350 | LR9F75 | LRD318L | RM1XA006 |
| LR2D3522 | LR3D3522 | LR9F7575 | LRD32 | RM1XA016 |
| LR2D3553 | LR3D3553 | LR9F7579 | LRD325 | RM1XA040 |
| LR2D3555 | LR3D3555 | LR9F7581 | LRD3256 | RM1XA100 |
| LR2D3557 | LR3D3557 | LR9F79 | LRD325L | RM1XA160 |
| LR2D3559 | LR3D3559 | LRD01 | LRD326 | RM1XA315 |
| LR2D3561 | LR3D3561 | LRD02 | LRD32L | RM1XA3151 |
| LR2D3563 | LR3D3563 | LRD03 | LRD32L6 | RM1XA500 |
| LR2K0301 | LR3D365 | LRD04 | LRD3312 | |
| LR2K0302 | LR3D380 | LRD046 | LRD3314 | |

Overload
relays

This document is current. Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

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Introduction

Exceeding the operating limits of an electric motor will lead, eventually, not only to destruction of the motor itself but also of the mechanisms it drives.

This type of load can be the cause of electrical or mechanical faults.

■ **Electrical faults:**

- overvoltage, voltage drop, imbalance and phase failure which cause variations in the current drawn,
- short-circuits which can cause the current to reach levels capable of destroying the load.

■ **Mechanical faults:**

- locked rotor,
- brief or prolonged overload which leads to an increase in the current drawn by the motor, and therefore overheating.

The cost of these faults must take into account loss of production, loss of raw materials, repair of the production tool, poor quality of production and delays in delivery.

These faults can also have dramatic consequences on the safety of persons in direct or indirect contact with the motor.

To prevent these faults, protection measures are necessary. They make it possible to isolate the equipment to be protected from the mains supply by measuring variations in electrical values (voltage, current, etc.).

Each motor starter must therefore have:

■ **short-circuit protection**, to detect and break, as quickly as possible, abnormal currents generally greater than 10 times the rated current (I_n).

■ **overload protection**, to detect increases in current up to about $10 I_n$ and switch off the starter before overheating of the motor and conductors damages the insulation.

This protection is provided by specific devices such as fuses, circuit breakers and thermal overload relays, or by more integrated devices offering several types of protection.

Causes, effects and consequences of various faults

There are two types of fault:

- Internal faults within the motor
- External faults: these are located outside the electric motor but their consequences can lead to damage inside the motor.

| Faults | Causes | Effects | Consequences on the motor and on the machine |
|-----------------------------------|--|--|---|
| Short-circuit | Contact between several phases, or between one phase and neutral or between several turns of the same phase. | <ul style="list-style-type: none"> ■ Current peak ■ Electrodynamical forces on the conductors | Destruction of windings |
| Overvoltage | <ul style="list-style-type: none"> ■ Lightning ■ Electrostatic discharge ■ Operation | Dielectric breakdown in the windings | Destruction of the windings due to loss of insulation |
| Phase imbalance and phase failure | <ul style="list-style-type: none"> ■ Opening of a phase ■ Single-phase load upstream of the motor ■ Short-circuit between the turns of the same winding | <ul style="list-style-type: none"> ■ Reduction of usable torque, efficiency and speed ■ Increase in losses ■ Starting impossible if phase failure | Overheating ⁽¹⁾ |
| High starting frequency | <ul style="list-style-type: none"> ■ Failure of the automation system ■ Too many manual control operations ■ Numerous fault trips | High stator and rotor temperature rise due to the frequent start current | Overheating ⁽¹⁾ Consequences on the process |
| Voltage variations | <ul style="list-style-type: none"> ■ Instability of the mains voltage ■ Connection of heavy loads | <ul style="list-style-type: none"> ■ Reduction of usable torque ■ Increase in losses | Overheating ⁽¹⁾ |
| Harmonics | ■ Pollution of the mains supply by variable speed drives, inverters, etc... | <ul style="list-style-type: none"> ■ Reduction of usable torque ■ Increase in losses | Overheating ⁽¹⁾ |
| Long starting time | <ul style="list-style-type: none"> ■ Resistive torque too high (load too heavy) ■ Voltage drop | Increase in starting time | Overheating ⁽¹⁾ |
| Jamming | <ul style="list-style-type: none"> ■ Mechanical problem (crusher) ■ Seizures | Overcurrent | Overheating ⁽¹⁾ Consequences on the process |
| No-load running | <ul style="list-style-type: none"> ■ Pump running empty ■ Mechanical break in drive to the load | Drop in current drawn | Consequences on the process |
| Frequency fluctuations | <ul style="list-style-type: none"> ■ Overload of a supply powered by limited independent sources ■ Faulty alternator speed regulator | <ul style="list-style-type: none"> ■ Increase in losses ■ Interferes with synchronous devices (clock, recorder, ...) | – |
| Overload | <ul style="list-style-type: none"> ■ Increase in resistive torque ■ Voltage drop ■ Drop in power factor | Increase in current consumption | Overheating ⁽¹⁾ |
| Loss of machine excitation | <ul style="list-style-type: none"> ■ Significant drop in excitation current ■ Break in rotor winding | <ul style="list-style-type: none"> ■ Increase in active power ■ Drop in power factor | Significant overheating of rotor and cage |
| Phase-Earth fault | <ul style="list-style-type: none"> ■ Accidental Phase-Earth contacts ■ Accidental Phase-machine casing contacts (casing connected to earth) | <ul style="list-style-type: none"> ■ Overvoltage developed in the mains supply ■ Rise in earth potential (safety of persons) | Consequences on safety of persons |

⁽¹⁾ Then, in the longer or shorter term, depending on the seriousness of the fault and/or its frequency, short-circuit and destruction of the windings.

TeSys Protect

Overload relays

Motor and machine protection



Fuse carrier
Ref. LS1D32



Switch disconnectors
Ref. GS2N3



Deca Magnetic circuit
breaker
Ref. GV2L



Deca Magnetic circuit
breaker
Ref. GV4LE

Protection functions

Short-circuit protection

General

A short-circuit results in a very rapid rise in current which can reach several hundred times the value of the operational current. The consequences of a short-circuit are dangerous to both equipment and persons. It is therefore imperative to use protection devices to detect the fault and very quickly break the circuit.

Two types of protection are commonly used:

- fuses (cutout) which break the circuit by melting, which then requires their replacement,
 - magnetic trip circuit breakers, often more simply called "magnetic circuit breakers", which only require re-setting to put them back into service.
- Short-circuit protection can also be built-into multifunction devices such as motor circuit breakers and contactor-breakers.

The main characteristics of short-circuit protection devices are:

- their breaking capacity: this is the highest prospective short-circuit current value that a protection device can break at a given voltage.
- their making capacity: this is the highest current value that the protection device can make at its rated voltage in specified conditions.

The making capacity is equal to k times the breaking capacity.

Fuses (cutouts)

Fuses provide individual phase protection (single-pole), with a high breaking capacity in a compact size:

- mounted either in fuse carriers,
- or in isolators, replacing the original links or shunt bars.

For motor protection, aM type fuses are used. Their design characteristics allow them to conduct the high magnetising currents that occur when motors are switched on. They are therefore unsuitable for overload protection (unlike gG type fuses). This is why an overload relay must be included in the motor power supply circuit.

Magnetic circuit breakers

These circuit breakers protect installations against short-circuits, within the limit of their breaking capacity.

Magnetic circuit breakers provide omnipole breaking as standard.

For relatively low short-circuit currents, the operation of a circuit breaker is faster than that of fuses.

This protection conforms to standard IEC 60947-2.

The thermal and electrodynamic effects are also limited, therefore ensuring better protection of cables and equipment.

TeSys Protect

Overload relays

Motor and machine protection



Deca Thermal overload relay
Ref. LRD08



Current measurement relay
Ref. RM4JA

Protection functions

Overload protection

General

An overload condition is the most frequently encountered fault. The symptoms are a rise in the current drawn by the motor and thermal effects. A rapid return to normal operating conditions is important. The actual operating conditions (ambient temperature, operating altitude and type of standard duty) are essential to determine the operating values of the motor (power, current) and to be able to select effective overload protection. These operational values are given by the motor manufacturer.

According to the level required, protection can be provided by:

- overload relays and thermal overload relays (bi-metallic or electronic type) which protect motors in the event of:
 - overload, by monitoring the current drawn by each phase,
 - phase imbalance or failure, by their differential mechanism.
- relays with PTC thermistor probes (Positive Temperature Coefficient).
- overtorque relays,
- multifunction relays.

Overload relays

These relays protect motors against overload. They must allow the temporary overload that occurs on starting and must only trip if the starting time is abnormally long.

The overload relay will be selected according to the length of the starting time (tripping class) and the motor rating.

These relays have a thermal memory (except for certain electronic overload relays, indicated by their manufacturers) and can be connected:

- either in series with the load,
- or to current transformers placed in series with the load.

Bi-metallic thermal overload relays

Combined with a contactor, these relays protect the line and the equipment against small and prolonged overloads. They must be protected against strong overcurrent by a circuit breaker or fuses.

These relays may be used on an a.c. or d.c. system and are generally:

- 3-pole,
- compensated, i.e. insensitive to ambient temperature variations,
- with manual or automatic reset,
- graduated with a "motor FLC" scale: allowing direct setting to the full load current as shown on the motor rating plate.

They can also be sensitive to phase failure: this is known as 'differential'. This function conforms to standards IEC 60947-4-1 and 60947-6-2.

This type of relay is extremely reliable and is a relatively low cost device.

Electronic thermal overload relays

Electronic thermal overload relays have the advantage of electronics which allow a more complex thermal image of the motor to be created.

They can be combined with products having complementary functions, such as:

- temperature sensing via PTC probes,
- protection against jamming and overtorque,
- protection against phase reversal,
- earth fault protection,
- protection against no-load running,
- alarm function.

TeSys Protect

Overload relays

Motor and machine protection



Relays for use with thermistor probes
Ref. LT3S



Instantaneous electronic overcurrent relays
Ref. LR97D07



Ultra starter Ref. LUB320 with multifunction control unit Ref. LUCM



Ultra controller Ref. LUTM20BL



Tera controller Ref. LTMR08MBD

Protection functions *(continued)*

Overload protection *(continued)*

Relays for use with PTC thermistor probes

With direct sensing of the stator windings, these relays can be used to protect motors against:

- overload,
- a rise in ambient temperature,
- a ventilation circuit fault,
- a high starting frequency,
- mechanical shocks, etc.

Overload (or overtorque) relays

These relays protect the drive line in the event of a locked rotor, seizure or mechanical shocks. This is an additional protection.

Unlike thermal overload relays, these relays do not have a thermal memory. They have definite time characteristics (adjustable current threshold and time delay).

The overtorque relay can be used as overload protection for motors with long starting times or very frequent starting (for example, lifting hoists).

Multifunction relays

■ Overcurrent relays are limited when it is necessary to take into account problems associated with voltage, temperature or special applications. New production or maintenance management needs have prompted manufacturers to offer products which provide not only adaptable protection, but also complete management of the motor and its load.

They incorporate:

- current and voltage sensors (Tera controllers),
- hybrid analog and digital electronic technology,
- the use of communication buses for data exchange and control,
- powerful motor modelling algorithms,
- integrated application programs whose parameters can be set.

These products make it possible to reduce installation and operating costs by reducing maintenance and downtime.

Ultra starters:

The multifunction relay is incorporated in the motor starter.

This solution is very compact with reduced wiring. It is limited to 32 A.

Ultra controllers:

The multifunction relay is separate from the power line and reuses the function blocks from the Ultra solution. It can be used in conjunction with a contactor up to 810 A.

Tera controllers:

The multifunction relay is separate from the power line and incorporates inputs and outputs. It can be used in conjunction with a contactor up to 810 A.

TeSys Protect

Overload relays

Motor and machine protection

| Protection relay selection table | | | | | |
|----------------------------------|---|---|---------------------------------------|-------------------------------|------------------------------|
| Relay type | Motor protection | | Machine protection | Motor and machine protection | |
| | Thermal overload relay Ref. LR2K, LRD, LRD3, LR9F, LR9D ⁽¹⁾ | Relays for use with PTC probes Ref. LT3S | Overtorque relays Ref. LR97D, LT47 | Ultra controller Ref. LUTM | Tera controller Ref. LTMR |
| Causes of overheating | (2) | | (2) | (2) | (3) |
| Slight overload | ■ | ■ | ■ | ■ | ■ |
| Locked rotor | ■ | ■ | ■ | ■ | ■ |
| No-load running | □ | □ | □ | ■ | ■ |
| Supply phase failure | ■ | ■ | LR97D | ■ | ■ |
| Ventilation fault | □ | ■ | □ | □ | With probes |
| Abnormal temperature rise | ■ | ■ | □ | □ | With probes |
| Shaft bearing seizure | ■ | ■ | ■ | ■ | With probes |
| Insulation fault | ■ | □ | □ | ■ | ■ |
| Protracted starting time | ■ | ■ | ■ | ■ | ■ |
| Severe duty | ■ | ■ | □ | ■ | With probes |
| Voltage variation | ■ | ■ | ■ | ■ | ■ |
| Frequency fluctuations | ■ | □ | □ | □ | ■ |
| Loss of machine excitation | □ | □ | □ | □ | ■ |

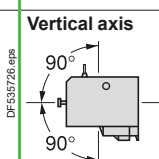
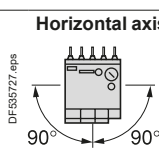
- Ideally suited
- Possible solution
- Not suitable (no protection)

(1) For motor circuit breaker ref. GV2ME.
 (2) Protection based on current.
 (3) Protection based on current and voltage.

TeSys Protect

LRK Thermal overload relay

Characteristics

| Environment | | | | | |
|--|---|-----------------|--|---|----------------------|
| Conforming to standards | | | IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T14048. | | |
| Product certifications | | | UL, CSA, CCC, EAC, CB, UKCA certification | | |
| Degree of protection | Conforming to IEC 60529 | | Protection against direct finger contact | | |
| Ambient air temperature around the device | Storage | °C | -40...+70 | | |
| | For normal operation (IEC 60947) | °C | -20...+55 (without derating) | | |
| | Operating limit | °C | -30...+60 (with derating) ⁽¹⁾ | | |
| Maximum operating altitude | Without derating | m | 2000 | | |
| Operating positions | | |  <p>Vertical axis</p> <p>Without derating</p> |  <p>Horizontal axis</p> <p>With derating⁽¹⁾</p> | |
| Flame resistance | Conforming to 60695-2-11 | °C | 850 | | |
| Shock resistance, hot state (1/2 sine wave, 11 ms) | Conforming to IEC 60068-2-27, N/C contact | | 10 gn | | |
| | Conforming to IEC 60068-2-27, N/O contact | | 10 gn | | |
| Vibration resistance, hot state 5 to 300 Hz | Conforming to IEC 60068-2-6, N/C contact | | 2 gn | | |
| | Conforming to IEC 60068-2-6, N/O contact | | 2 gn | | |
| Cabling Screw clamp terminals | Solid cable | mm ² | Minimum | Maximum | Maximum to IEC 60947 |
| | Flexible cable without cable end | mm ² | 1 x 1.5 | 2 x 4 | 1 x 4 + 1 x 2.5 |
| | Flexible cable with cable end | mm ² | 1 x 0.75 | 2 x 4 | 2 x 2.5 |
| | | mm ² | 1 x 0.34 | 1 x 1.5 + 1 x 2.5 | 1 x 1.5 + 1 x 2.5 |
| Tightening torque | Philips head n° 2 - Ø6 | N.m | 0.8 | | |
| Mounting | | | Directly under the contactor or reversing contactor | | |
| Connections | | | <p>Made automatically when mounted under the contactor, as follows:</p> <ul style="list-style-type: none"> ■ contactor terminal A2 connected to overload relay terminal 96 on all products, ■ contactor terminal 14 connected to overload relay terminal 95 on products with 3 P + N/O. <p>When using 3 P + N/C, or 4 P contactors, or the N/O auxiliary contact marked 13-14, at a voltage other than the coil voltage, break off the link marked 14.</p> | | |

| Auxiliary contact characteristics | | | | | | | | | | |
|---|--|----|---------------|-----|-----|---------|-----|---------|---------|--|
| Number of contacts | | | 1 N/C + 1 N/O | | | | | | | |
| Conventional thermal current | | A | 6 | | | | | | | |
| Short-circuit protection | Conforming to IEC 60947 gG fuse or circuit breaker GB2CB●● | A | 6 max. | | | | | | | |
| Maximum power of the controlled contactor coils (sealed) (Occasional operating cycles of contact 95-96) | a.c. | V | 24 | 48 | 110 | 220/230 | 400 | 415/440 | 600/690 | |
| | | VA | 100 | 200 | 400 | 600 | 600 | 600 | 600 | |
| | d.c. | V | 24 | 48 | 110 | 220 | 250 | – | – | |
| | | W | 100 | 100 | 50 | 45 | 35 | – | – | |
| | | V | 690 | | | | | | | |
| | | V | 250 | | | | | | | |

(1) Please consult your Regional Sales Office.
(2) Very low safety voltage.

Ref.



Overload relays

TeSys Protect

LRK Thermal overload relays

Characteristics

Electrical characteristics of the power circuit

| | | | |
|---|--|-----------|-----------|
| Rated operational voltage (Ue) | Up to | V | 690 |
| Rated insulation voltage (Ui) | Conforming to IEC 60947 | V | 690 |
| | Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1 | V | 600 |
| Rated impulse withstand voltage (Uimp) | | kV | 6 |
| Frequency limits of the operational current | | Hz | Up to 400 |
| Power dissipated per pole | | W | 2 |

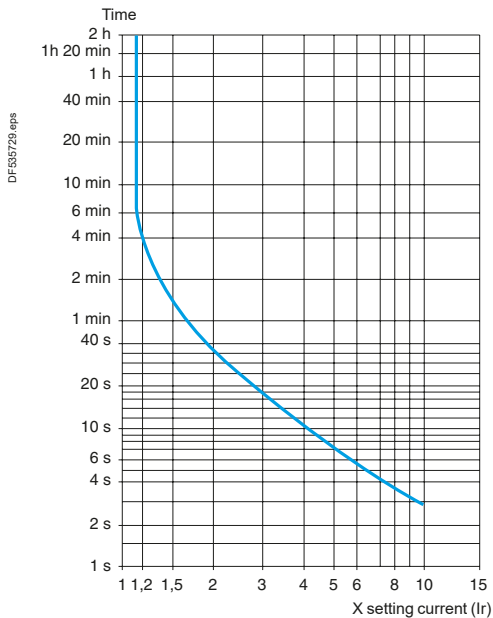
Operating characteristics

| | | | |
|---|-----------------------------|----------|--|
| Tripping threshold | Conforming to IEC 60947-4-1 | A | 1.14 ±0.06 I _r |
| Sensitivity to phase failure | Conforming to IEC 60947 | | Yes |
| Reset | Manual or automatic | | Selected by means of a lockable and sealable switch on the front of the relay |
| Signalling | On front of relay | | Trip indicator |
| Reset-Stop function | | | Pressing the Reset-Stop button: - actuates the N/C contact - has no effect on the N/O contact |
| Test function | By pushbutton | | Pressing the Test button enables: - checking of the control circuit wiring - simulation of overload tripping (actuation of both N/C and N/O contacts, and of the trip indicator) |
| Short-circuit protection and coordination | | | See pages A6/11 and A6/20 |

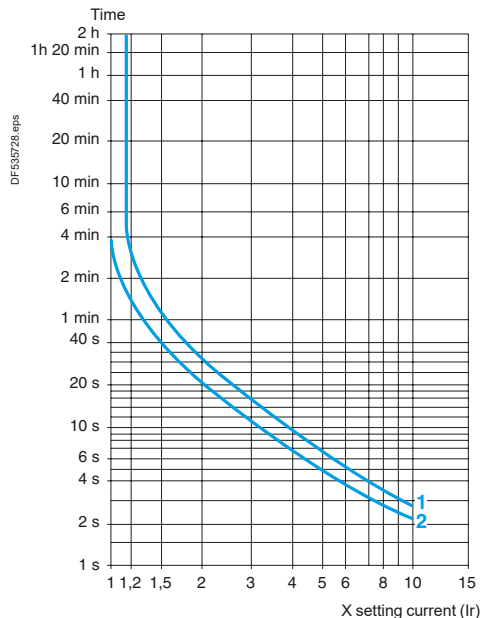
Tripping curves

Average operating time related to multiples of the current setting (Class 10 A)

Balanced 3-phase operation, from cold state



Balanced operation with 2 phases only, from cold state



Setting: at lower end of scale

Setting: at upper end of scale

TeSys Protect

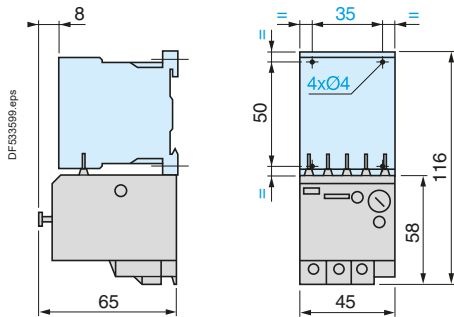
LRK Thermal overload relays

Dimensions, mounting, schemes

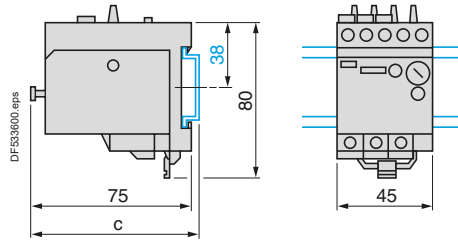
Dimensions, mounting

LR2K

Direct mounting beneath the contactor



Separate mounting with terminal block LA7 K0064 on 35 mm rail (AM1DP200 or AM1DE200)



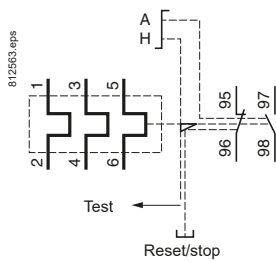
| AM1 | c |
|-------|------|
| DP200 | 78.5 |
| DE200 | 86 |

Schemes

LR2K

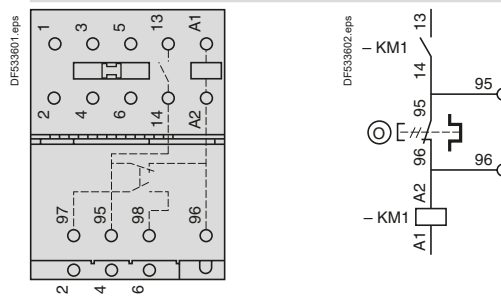


Ref.

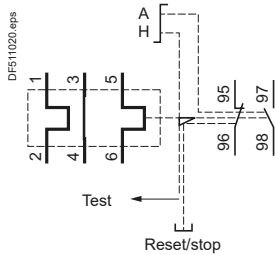


LR2K + LC0K

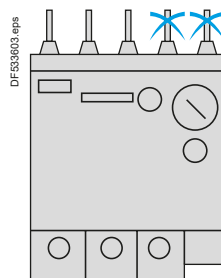
Pre-wiring scheme



LR7K



Note: If pre-wiring is not required, break off the 2 links located on the thermal overload relay.



Overload relays

TeSys Protect

Deca Thermal overload relays

Characteristics



Ref. LRD08



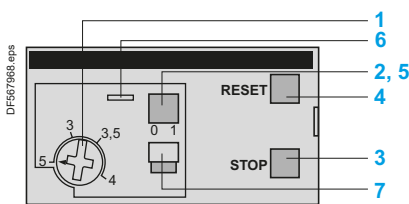
Ref. LRD05L...32L



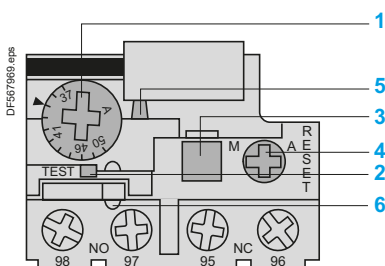
Ref. LRD365



Ref. LRD33●●



Ref. LRD01...35, LRD05L...32L
LRD313...LRD365



Ref. LRD3361...4369, LR2 D3561...3563

Introduction

3-pole Deca thermal overload relays are designed to protect a.c. circuits and motors against:

- overloads
- phase failure
- excessively long starting times
- prolonged stalled rotor condition.

Power connection

Product references LRD01 to LRD35

LRD01 to 35 relays are designed for connection by screw clamp terminals. They can be supplied for connection by spring terminals or by lugs ⁽¹⁾.

Product references LRD04 to LRD32L

These relays are designed for connection by screw clamp terminals. They can be supplied for connection by lugs ⁽¹⁾.

Product references LRD313 to LRD380

These relays are for connection by BTR screw connectors (hexagon socket head). The screws are tightened by means of a size 4, insulated Allen key.

This type of connection uses the **EverLink**[®] system with creep compensation ⁽²⁾ (Schneider Electric patent).

This technique makes it possible to achieve accurate and durable tightening torque.

These relays are also available for connection by lugs ⁽¹⁾.

Product references LRD3361 to 4369, LR2D3561 to D3563

Product references LRD3361 to 4369 and LR2D3561 to D3563 relays are designed for connection by screw clamp terminals. They can be supplied for connection by lugs ⁽¹⁾.

Description

Deca 3-pole thermal overload relays are designed to protect a.c. circuits and motors against overloads, phase failure, long starting times and prolonged stalling of the motor.

- 1 Adjustment dial Ir.
- 2 Test button.
Operation of the Test button allows:
 - checking of control circuit wiring,
 - simulation of relay tripping (actuates both the N/O and N/C contacts).
- 3 Stop button. Actuates the N/C contact; does not affect the N/O contact.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Selector for manual or automatic reset.

Product references LRD01 to 35, LRD05L to 32L and LRD313 to LRD380 relays are supplied with the selector in the manual position, protected by a cover. Deliberate action is required to move it to the automatic position.

⁽¹⁾ Connection by lugs meets the requirements of certain Asian markets and is suitable for applications subject to strong vibration, such as railway transport.

⁽²⁾ Creep: normal crushing phenomenon of copper conductors, that is accentuated over time.



Overload relays

TeSys Protect

Deca Thermal overload relays

Characteristics

| Environment | | | |
|---|---|----|--|
| Conforming to standards | | | IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, EN 50495 ⁽¹⁾ , GB/T 14048.4, GB/T 14048.5 |
| Product certifications | | | UL ⁽²⁾ , CSA ⁽²⁾ , UKCA IEC, CCC ⁽³⁾ , EAC, ATEX ⁽¹⁾ ABS, BV ⁽⁴⁾ , DNV-GL ⁽⁵⁾ , LRoS ⁽⁶⁾ , RINA ⁽⁷⁾ , RMRS ⁽⁸⁾ , EU RO Mutual recognition ⁽⁹⁾ |
| Degree of protection (front face) | Conforming to IEC 60529 | | Protection against direct finger contact IP20 |
| Climatic withstand | | | Conforming to IACS E10 |
| Ambient air temperature around the device | Storage | °C | -60...+70 |
| | Normal operation, without derating (IEC 60947-4-1) | °C | -20...+60 |
| | Minimum /maximum operating temperatures (with derating) | °C | -20...+70 |
| Operating positions without derating | In relation to normal vertical mounting plane | | Any position. When mounting on a vertical rail, use a stop. |
| Flame resistance | Conforming to 60695-2-11 | °C | 850 |
| Shock resistance | Permissible acceleration conforming to IEC 60068-2-27 | | 15 gn - 11 ms |
| Vibration resistance ⁽¹⁰⁾ | Permissible acceleration conforming to IEC 60068-2-6 | | 6 gn except LRD05L...LRD32L: 3 gn |
| Dielectric strength at 50 Hz | Conforming to IEC 60947-1 | kV | 1.89 (product Ui 690 V), 2.2 (product Ui 1000 V) |
| Impulse withstand voltage | Conforming to IEC 60947-1 | kV | 6 |

| Electrical characteristics of power circuit | | | | | | | | | | |
|---|---|------------------------------------|------------------|------------------------------------|---------------------------------------|--------------------|--|--------------------------|-------------------------|------------------------------|
| Relay type | | LRD01 ...16, LR3D02 ...16 | LRD05L ...32L | LRD21 ...35, LR3D21 ...35 | LRD313 ...365 LR3D 313 ...38 | LRD313L ...365L | LRD3322 ...33696 LR3D3322 ... 33696 | LR2D 3522 ... 3563 | LRD 4365 ... 4369 | |
| Tripping class | Conforming to UL 60947-4-1, IEC 60947-4-1 | 10 A | 20 | 10 A | 10 A | 20 | 10 A | 20 | 10 A | |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-4-1 | V | | | | | | 690 | | 1000 ⁽¹¹⁾ |
| | Conforming to UL, CSA | V | | | | | | 600 | | 600 except LRD 4369 |
| Rated impulse withstand voltage (Uimp) | | kV | | | | | | 6 | | |
| Rated operational voltage (Ue) | | V | | | | | | 690 | | |
| Frequency limits | Of the operating current | Hz | | | | | | 0...400 | | |
| Setting range | Depending on model | A | 0.1...13 | 0.63...32 | 12...38 | 9...80 | 9...65 | 17...140 | 17...80 | 80...140 |

| Auxiliary contact characteristics | | | | | | | | | | |
|--|--|---|------|-----|------|------|------|------|--|--|
| Conventional thermal current | | A | 5 | | | | | | | |
| Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96) | a.c. supply, AC-15 | V | 120 | 240 | 380 | 480 | 500 | 600 | | |
| | | A | 3 | 1.5 | 0.95 | 0.75 | 0.72 | 0.12 | | |
| | d.c. supply, DC-13 | V | 125 | 250 | 440 | | | | | |
| | | A | 0.22 | 0.1 | 0.06 | | | | | |
| Protection against short-circuits | By gG, BS fuses. Maximum rating or by GB2 | A | 4 | | | | | | | |

⁽¹⁾ For relays LRD01 to LRD380, LRD3322 to LRD3365, LRD04L to LRD32L, LRD4365 to LRD4369, LRD33656 to LRD33696.

⁽²⁾ Except for relays LRD4369.

⁽³⁾ CCC: Except for LRD/LR3D04L to LRD/LR3D32L, LR2D3522 to LR2D3563.

⁽⁴⁾ BV: except for LRD/LR3D04L to LRD/LR3D32L, LRD/LR3D313 to LRD/LR3D380.

⁽⁵⁾ DNV-GL: except for LRD04L to LRD32L.

⁽⁶⁾ LRoS: except for LRD/LR3D04L to LRD/LR3D32L, LRD/LR3D380.

⁽⁷⁾ RINA: for LRD/LR3D01 to LRD/LR3D35.

⁽⁸⁾ RMRS: for LRD/LR3D313 to LRD/LR3D380.

⁽⁹⁾ EU RO Mutual Recognition: for LRD/LR3D313 to LRD/LR3D380, LRD313L to LRD365L.

⁽¹⁰⁾ In case of vibration above 3gn on Deca Green contactor directly mounted with LRD, it is recommended do mount the devices separately by screws on metal plate.

⁽¹¹⁾ 750 V for LRD33656, LRD33676, LRD33696.



TeSys Protect

Deca Thermal overload relays

Characteristics

| Power circuit connection characteristics | | | | LRD01 ...16, LR3D01 ...16 | LRD04L ...21L | LRD22L ...32L | LRD21 ...35, LR3D21 ...35 | LRD 313 ...365 LR3D 313 ...380 | LRD 313L ...365L | LRD 3322 ...33696 LR3D 3322 ... 33696 | LR2D 35223563 | LRD 4365 ...4369 |
|--|-------------------|-----------------|-------------------------------------|-------------------------------------|---------------------|---------------------------|------------------------------------|---|------------------------|--|-----------------------------|------------------------|
| Connection to screw clamp terminals | | | | | | | | | | | | |
| Flexible cable without cable end | 1 conductor | mm ² | 1.5...10 | | | 1.5...10 | 1...35 | 1...35 | 4...35 | | | 4...50 |
| Flexible cable with cable end | 1 conductor | mm ² | 1...4 | | 1...6 | 1...6 except LRD21: 1...4 | 1...35 | 1...35 | 4...35 | | | 4...35 |
| Solid cable without cable end | 1 conductor | mm ² | 1...6 | | 1.5...10 | 1.5/10 except LRD21: 1/6 | 1...35 | 1...35 | 4...35 | | | 4...50 |
| Tightening torque | | N.m | 1.7 | | 2.5 | 2.5 | 1...25: 5 35: 8 | 1...25: 5 35: 8 | 9 | 9 | | 9 |
| Connection to spring terminals (Min/max c.s.a.) (except LRD04L...LRD32L) | | | | | | | | | | | | |
| Flexible cable without cable end | 1 conductor | mm ² | 1.5...4 | - | - | 1.5...4 | - | - | - | - | - | - |
| Flexible cable with cable end | 1 conductor | mm ² | 1.5...4 | - | - | 1.5...4 | - | - | - | - | - | - |
| Connection by bars or lugs | | | | | | | | | | | | |
| Relay type | | | LRD016...166 LRD04L6 ... 16L6 | LRD216...356 LRD21L6 ... 32L6 | LRD3136 ... 3806 | LRD313L6 ... 365L6 | LRD3322A66 ... 3365A66 | | | | | |
| Pitch | Without spreaders | mm | 14.5 | 17.5 | 17.5 | 17.5 | 21.5 | | | | | |
| Bars or cables with lugs | e | mm | ≤ 6 | ≤ 6 | ≤ 6 | ≤ 6 | ≤ 6 | | | | | |
| | L | mm | ≤ 8 | ≤ 8 | ≤ 13.5 | ≤ 13.5 | ≤ 16 | | | | | |
| | L' | mm | ≤ 9.5 | ≤ 9.5 | ≤ 16.5 | ≤ 16.5 | ≤ 16 | | | | | |
| | d | | ≤ 7 | ≤ 7 | ≤ 10 | ≤ 10 | ≤ 12 | | | | | |
| Screws | | | M4 | M4 | M6 | M6 | M10 | | | | | |
| | Tightening torque | | N.m | 1.7 | 2.5 | 6 | 6 | 11.3 | | | | |

| Control circuit connection characteristics | | | | | | | | | | | | |
|--|----------------------------------|-----------------|------------------------------------|------------------|------------------|------------------------------------|---|------------------------|--|--------------------------|------------------------|--|
| Connection to screw clamp terminals or spring terminals | | | | | | | | | | | | |
| Bare cables | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Relay type | | | LRD01 ...16, LR3D01 ...16 | LRD04L ...21L | LRD22L ...32L | LRD21 ...35, LR3D21 ...35 | LRD 313 ...365 LR3D 313 ...380 | LRD 313L ...365L | LRD3322 ...33696 LR3D 3322 ... 33696 | LR2D 3522 ... 3563 | LRD 4365 ...4369 | |
| Connection to screw clamp terminals ⁽¹⁾ | Solid cable without cable end | mm ² | 2 x 1...2.5 | | | | | | | | | |
| | Flexible cable without cable end | mm ² | 2 x 1...2.5 | | | | | | | | | |
| | Flexible cable with cable end | mm ² | 2 x 1...2.5 | | | | | | | | | |
| Tightening torque | | N.m | 1.7 | | | | | | | | | |
| Connection to spring terminals (Min/max c.s.a.) (except LRD04L...LRD32L) | Solid cable | mm ² | 1...2.5 | - | | 1...2.5 | | | - | | | |
| | Flexible cable without cable end | mm ² | 1...2.5 | - | | 1...2.5 | | | - | | | |

(1) For relays LRD313 to 380: BTR hexagon socket head screws, EverLink® system. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/42).



Overload relays

TeSys Protect

Deca Thermal overload relays

Characteristics

Operating characteristics

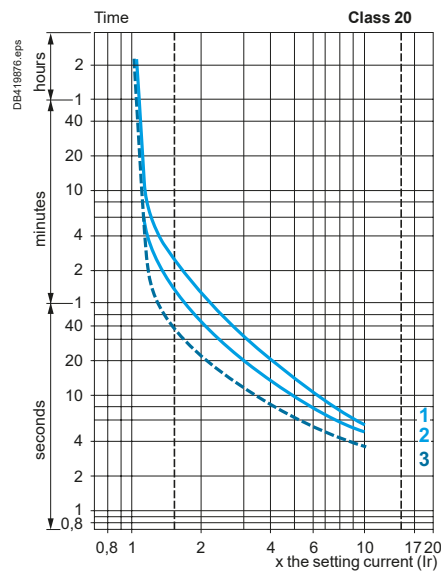
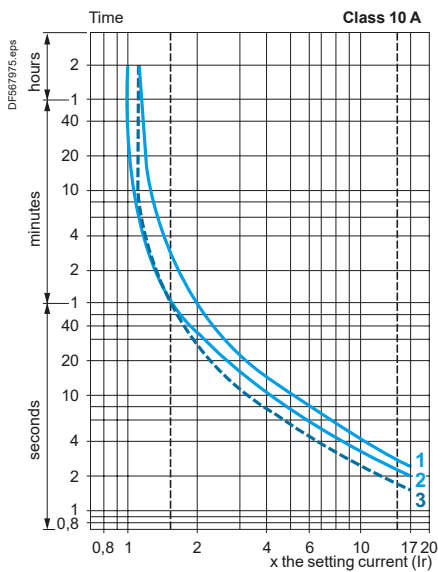
| Relay type | LRD01 ...16, LR3D02 ...16 | LRD04L... LRD32L | LRD21 ...35, LR3D21 ...35 | LRD313 ...365 LR3D 313 ...380 | LRD313L ...365L | LRD3322 ...33696 LR3D3322 ... 33696 | LR2D 3522 ... 3563 | LRD 4365 ...4369 |
|------------------------------|---|---------------------|------------------------------------|---|--------------------|--|-----------------------------|------------------------|
| Temperature compensation | °C | | -20...+60 | | | | | |
| Tripping threshold | Conforming to IEC 60947-4-1 | | A | | | | | |
| Sensitivity to phase failure | Tripping current 130 % of Ir on two phases, the third phase at 0. | | | | | | | |

Tripping curves

Average operating time related to multiples of the setting current

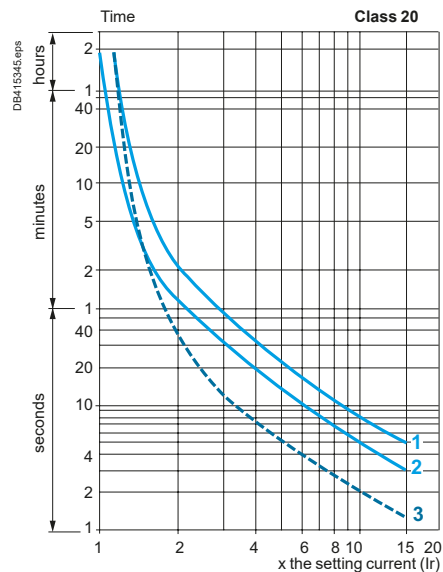
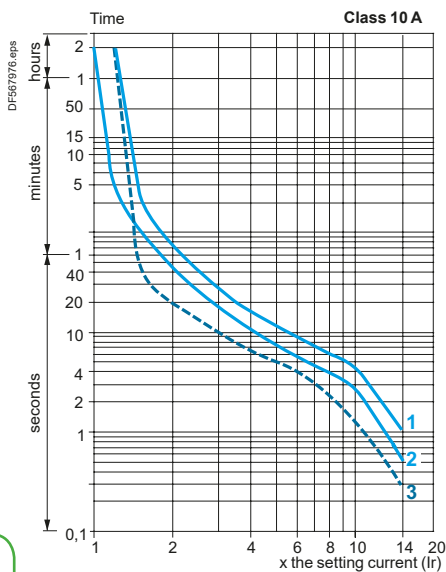
LRD01 to LRD35, LR2D and LRD3322 to LRD4369

LRD04L to LRD32L and LR2D3522 to LR2D3563



LRD313 to LRD380

LRD313L to LRD365L



- 1 Balanced operation, 3-phase, without prior current flow (cold state).
- 2 2-phase operation, without prior current flow (cold state).
- 3 Balanced operation, 3-phase, after a long period at the set current (hot state).



Overload relays

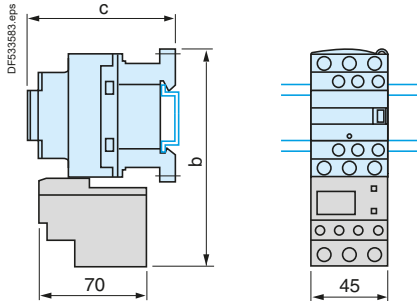
TeSys Protect

Deca Thermal overload relays

Dimensions, mounting

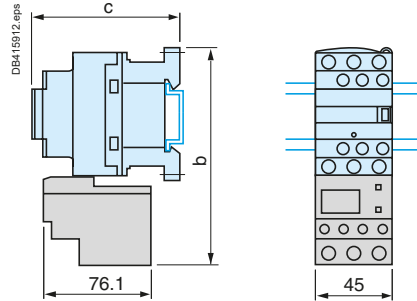
LRD01...35 ⁽¹⁾

Direct mounting beneath contactors with screw clamp connections



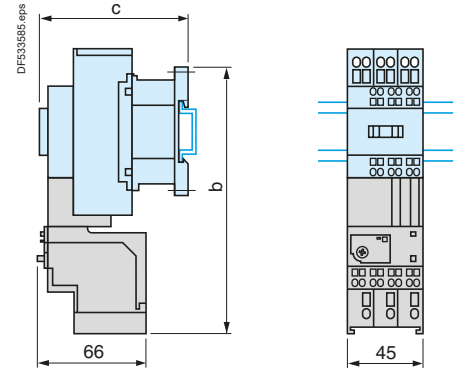
LRD04...32L ⁽¹⁾

Direct mounting beneath contactors with screw clamp connections



LRD063...223

Direct mounting beneath contactors with spring terminal connections



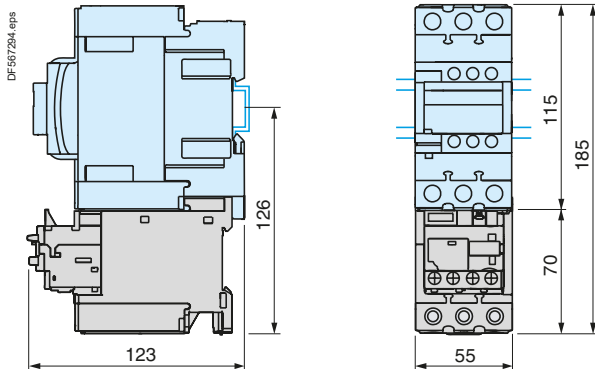
| LC1 | D09...D18 | D25...D38 |
|-----|----------------------------|-----------|
| b | 123 | 137 |
| c | See pages B11/32 and B8/95 | |

| LC1 | D09...D18 | D25...D38 |
|-----|----------------------------|-----------|
| b | 123 | 137 |
| c | See pages B11/32 and B8/95 | |

| LC1 | D093...D253 |
|-----|----------------------------|
| b | 168 |
| c | See pages B11/32 and B8/95 |

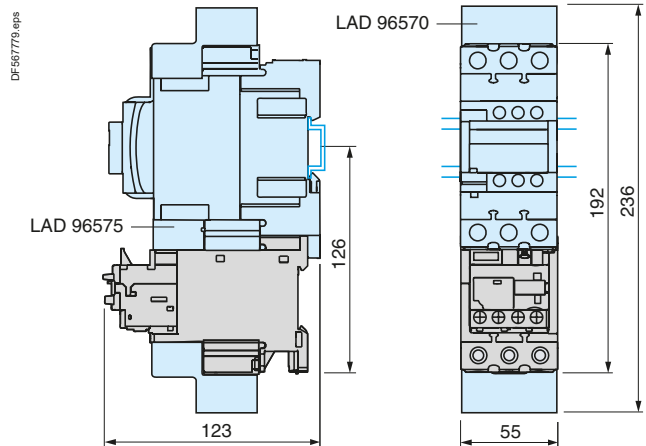
LRD313...380 ⁽¹⁾

Direct mounting beneath contactors LC1D40A...D80A with screw clamp connections or EverLink® connectors



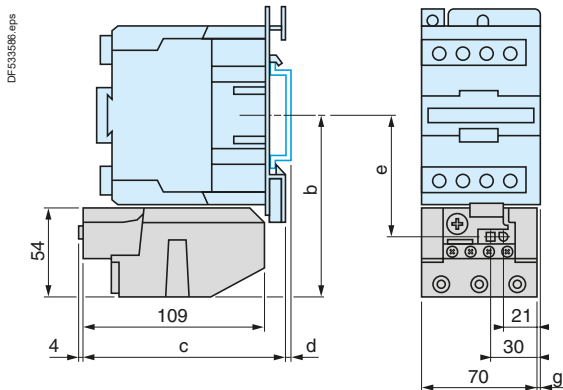
LRD3256...3806 ⁽¹⁾

Direct mounting beneath contactors LC1D40A6...D80A6 with lugs



LRD33...^{●●●}

Direct mounting beneath contactors LC1D80...D95



| AM1 | DL201 | DL200 |
|-----|-------|-------|
| d | 7 | 17 |

Control circuit AC

| | b | c | e | g (tri) | g (tetra) |
|--------|-------|-----|------|---------|-----------|
| LC1D80 | 115.5 | 124 | 76.9 | 9.5 | 22 |
| LC1D95 | 115.5 | 124 | 76.9 | 9.5 | - |

Control circuit DC

| | | | | | |
|-------------|-------|-------|------|-----|----|
| LC1D80, D95 | 115.5 | 179.4 | 76.9 | 9.5 | 22 |
|-------------|-------|-------|------|-----|----|

⁽¹⁾ In case of vibration above 3 gn on Deca Green contactor directly mounted with LRD, it is recommended do mount the devices separately by screws on metal plate.

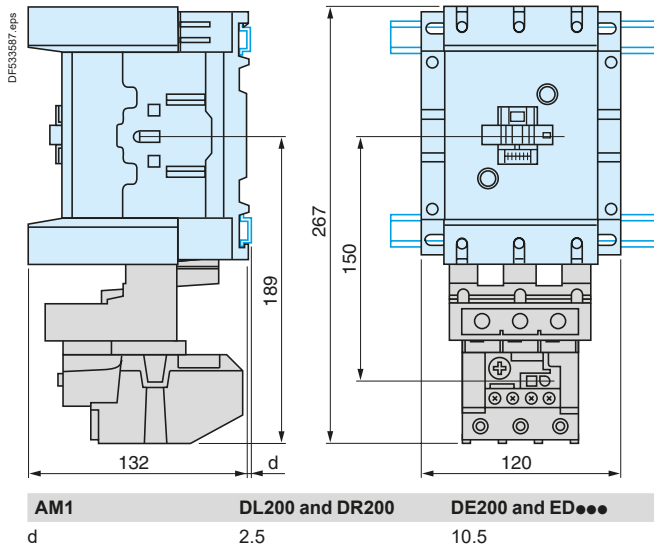
TeSys Protect

Deca Thermal overload relays

Dimensions, mounting

LRD4●●●

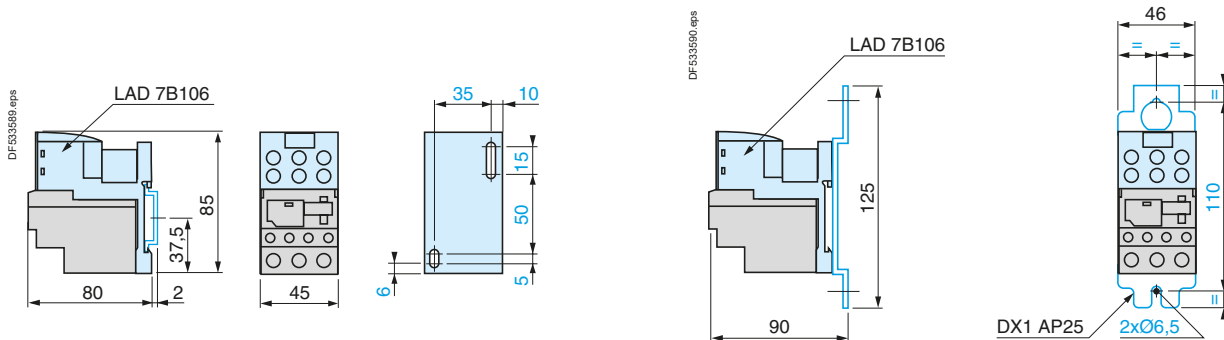
Direct mounting beneath contactors LC1D115 and D150



LRD01...35

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200

Independent mounting on 110 mm centres



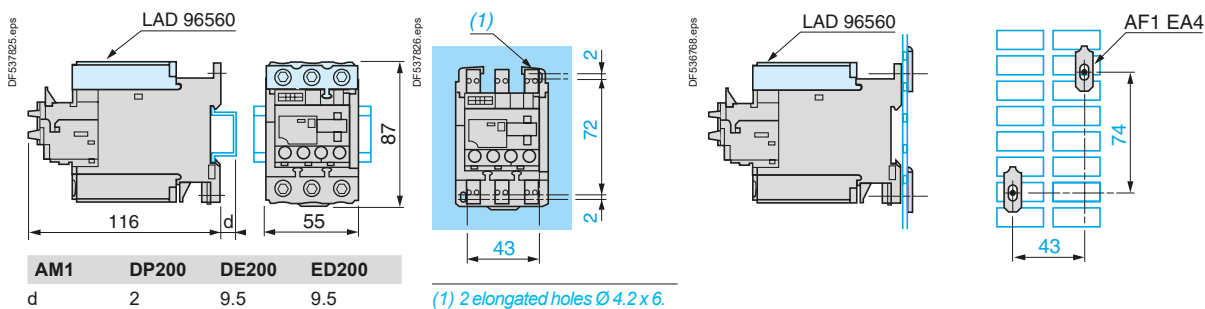
LRD313...380

Mounting on rail AM1D●200 or ED200
With terminal block LAD96560

Panel mounting

Outgoing terminal block not shown

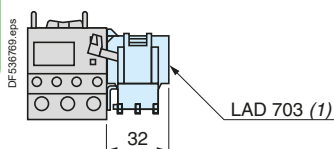
Mounted on plate AM1P



LRD01...35 and LRD313...380

Remote tripping or electrical reset

Overload relays



(1) Can only be mounted on RH side of relay LRD01...35 and LRD313...380.

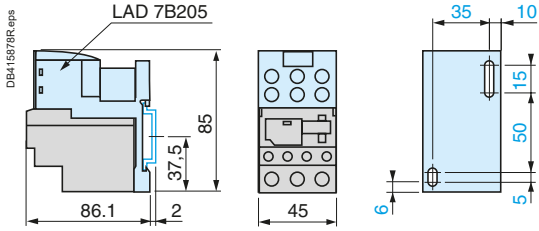
TeSys Protect

Deca Thermal overload relays

Dimensions, mounting and schemes

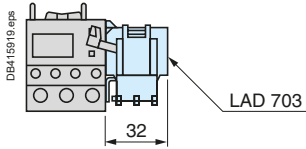
LRD04L...32L

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200



| AM1 | DP200 | DE200 |
|-----|-------|-------|
| d | 2 | 9.5 |

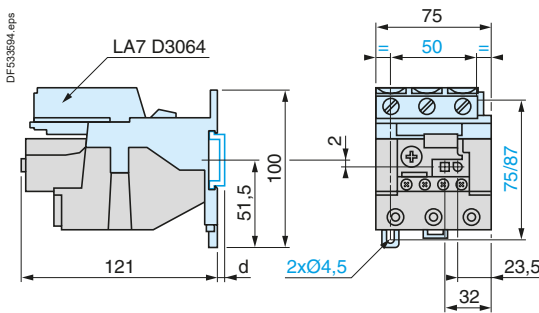
Remote tripping or electrical reset



(1) Can be mounted on RH or LH side of relay LR2D15.

LRD3... and LR2D35...

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200



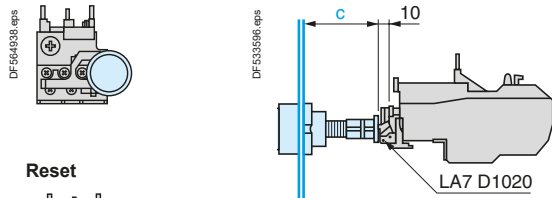
| AM1 | DP200 | DE200 |
|-----|-------|-------|
| d | 2 | 9.5 |

LRD3...

Adapter for door mounted operator

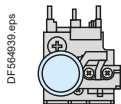
LA7D1020

Stop

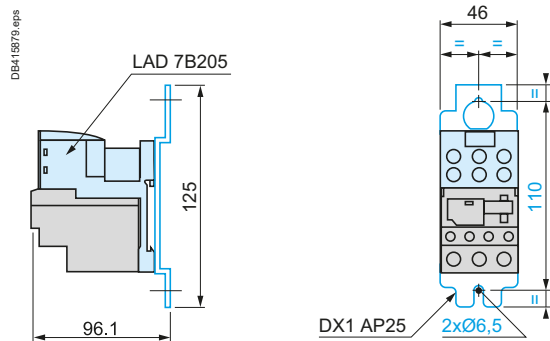


c: adjustable from 17 to 120 mm

Reset

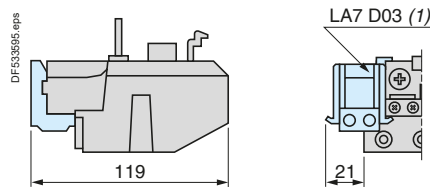


Independent mounting on 110 mm centres



LRD3..., LR2D35... and LR9D

Remote tripping or electrical reset



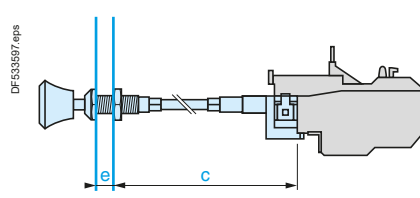
(1) Can be mounted on RH or LH side of relay LRD3..., LR2D35... or LR9D.

LRD, LRD313...380, LRD04...32L

"Reset" by flexible cable

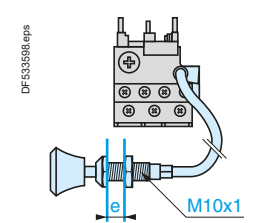
LA7D305 and LAD7305

Mounting with cable straight

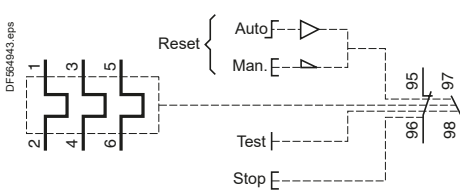


e: up to 20 mm / c: up to 550 mm

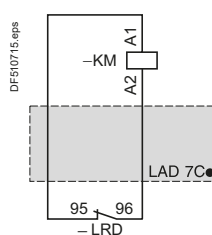
Mounting with cable bent



LRD..., LRD3... and LR2D...



Pre-wiring kit LAD7C1, LAD7C2



Characteristics:
pages B11/31 to B11/34

References:
pages B11/4 to B11/7



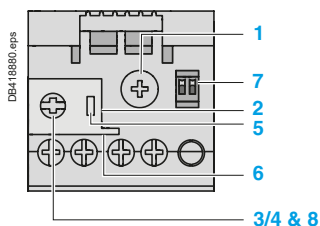
Ref.

Overload relays

TeSys Protect

Deca Electronic overload relays

Characteristics



LR9D01...110S

Product references LR9D01, 02, 08 and 32

These self-powered electronic thermal overload relays are designed for direct mounting to contactors LC1D09 through LC1D38.

LR9D110S self-powered electronic thermal overload relay is designed for separate mounting only.

In addition to the protection provided by the Deca thermal overload relays (see page B11/31), they offer the following additional features:

- protection against phase imbalance
- choice of starting class
- protection of unbalanced circuits
- protection of single-phase circuits

- 1 Adjustment dial Ir.
- 2 Test button.
- 3 Stop button.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Class 5/10/20/30 dipswitches.
- 8 Reset mode selector.

Environment

| Relay type | | LR9D01, 02, 08, 32 and LR9D110S | |
|---|---|--|------------|
| Conforming to standards | | IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4 | |
| Product certifications | | CCC, CSA, UL, CB, UKCA certification | |
| Degree of protection | Conforming to IEC 60529 and VDE 0106 | IP 20 on front panel | |
| Ambient air temperature around the device (Conforming to IEC 60255-8) | Storage | °C | -55 to +80 |
| | Normal operation | °C | -25 to +70 |
| Maximum operating altitude | Without derating | m | 2000 |
| Operating positions without derating | In relation to normal vertical mounting plane | Any position | |
| Shock resistance | Permissible acceleration conforming to IEC 60068-2-27 | 15 g (11ms) | |
| Vibration resistance | Permissible acceleration conforming to IEC 60068-2-6 | 6 g (10-150 Hz) | |
| Dielectric strength at 50 Hz | Conforming to IEC 60947-4-1 | kV | 6 |
| Surge withstand, common mode | Conforming to IEC 61000-4-5 | kV | 2 |
| Resistance to electrostatic discharge | Conforming to IEC 61000-4-2 | kV | 8 |
| Immunity to radiated radio-frequency disturbances | Conforming to IEC 61000-4-3 and NF C 46-022 | V/m | 10 |
| Immunity to fast transient currents | Conforming to IEC 61000-4-4 | kV | 2 |
| Electromagnetic compatibility | Draft EN 50081-1 and 2, EN 50082-2 | Meets requirements | |

Electrical characteristics of auxiliary contacts

| | | | | | | | | |
|--|---|-----------------------|---------------------|-----|-----|-----|-----|-----|
| Conventional thermal current | | A | 5 | | | | | |
| Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96) | a.c. supply, AC-15 | V | 24 | 48 | 110 | 220 | 380 | 600 |
| | | VA | 100 | 200 | 400 | 600 | 600 | 600 |
| | d.c. supply, DC-13 | V | 24 | 48 | 110 | 220 | – | – |
| | | W | 100 | 100 | 50 | 45 | – | – |
| Protection against short-circuits | By gG or BS fuses or by circuit breaker GB2 | A | 5 | | | | | |
| Cabling Flexible cable without cable end | 1 or 2 conductors | mm ² (AWG) | 1 to 2.5 (18 to 14) | | | | | |
| | Tightening torque | Nm (lb-in) | 0.8 (7) | | | | | |



TeSys Protect

Deca Electronic overload relays

Characteristics

Electrical characteristics of power circuit

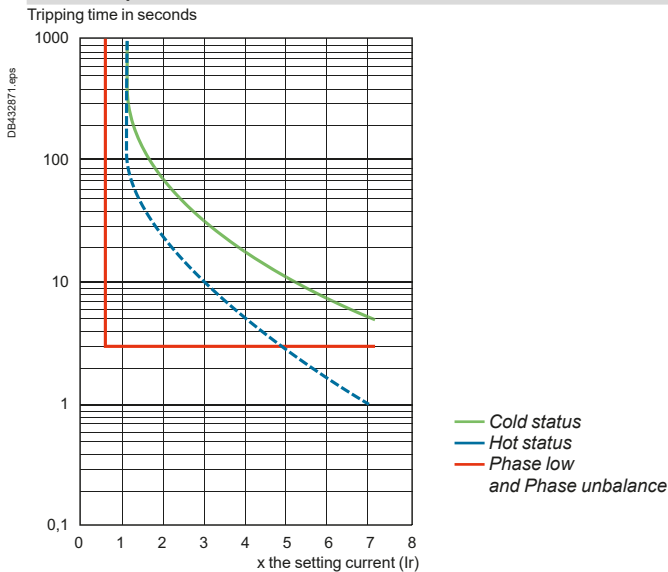
| Relay type | | LR9D01 | LR9D02 | LR9D08 | LR9D32 | LR9D110S |
|---------------------------------|--|-----------------------------|-------------------|---------|---------|---------------------|
| Tripping class | Conforming to IEC/EN 60947-4-1 | 5, 10, 20, 30 | | | | |
| | Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1 | 10, 20, 30 | | | | |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-4-1 | V AC | 1000 | | | |
| Rated operational voltage (Ue) | Conforming to IEC 60947-4-1 | V AC | 690 | | | |
| | Conforming to UL/CSA | V AC | 600 | | | |
| Rated impulse withstand voltage | | kV | 6 | | | |
| Frequency limits | Of the operating current | Hz | 50...60 | | | |
| Setting range | | A | 0.1...0.5 | 0.4...2 | 1.6...8 | 6.4...32 |
| Power circuit connections | Wire size - 1 or 2 conductors | mm² (AWG) | 1 to 16 (14 to 6) | | | 4 to 50 (10 to 1/0) |
| | Tightening torque | Nm (lb-in) | 3.1 (28) | | | 9 (80) |

Operating characteristics

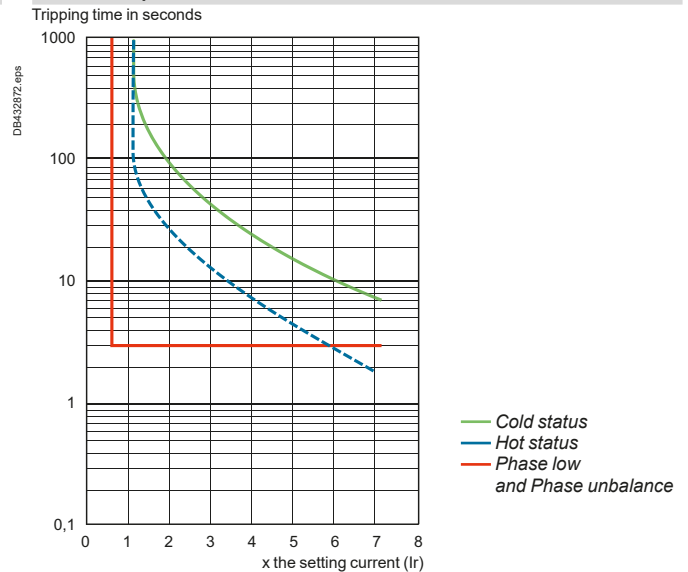
| | | | | | | |
|--------------------------------|-----------------------------|-------------|---|--|--|--|
| Consumption | | mW | < 300 | | | |
| Tripping thresholds | Conforming to IEC 60947-4-1 | A | 1.25 I _n | | | |
| Sensitivity to phase unbalance | Conforming to IEC 60947-4-1 | | Phase difference > 40%, tripping in 3 s | | | |
| Current setting ratio | | | 5:1 | | | |
| Automatic reset time | | min. | 1.5...4 | | | |

LR9D01, 02, 08, 32, LR9110S tripping curves

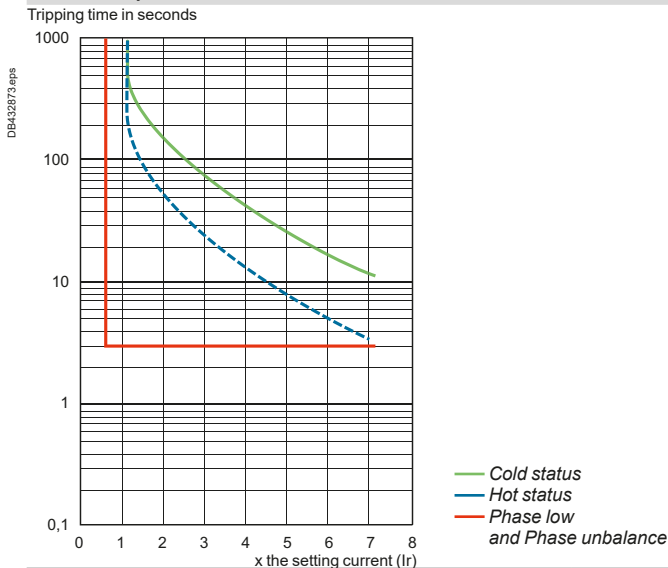
Class 5 Trip curve



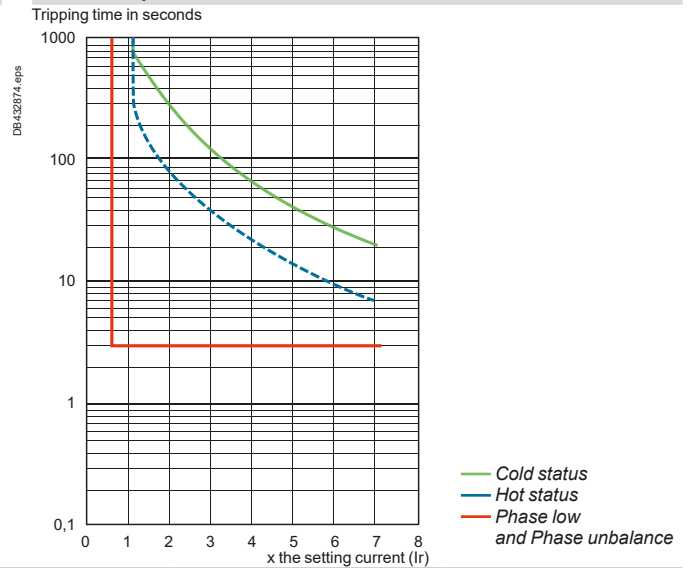
Class 10 Trip curve



Class 20 Trip curve



Class 30 Trip curve



References:
page B11/10

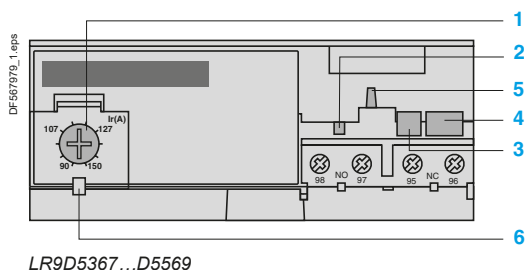
Dimensions, mounting:
page B11/42

Schemes:
page B11/43

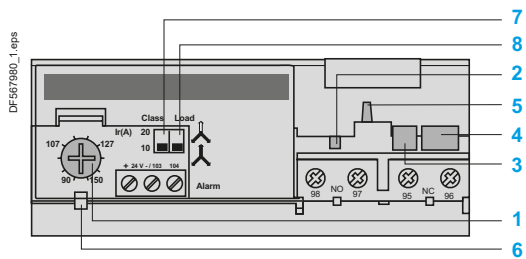
TeSys Protect

Deca Electronic overload relays

Characteristics



LR9D5367...D5569



LR9D67 and D69

Description: LR9D5367...LR9D5569, LR9D67, LR9D69

These electronic thermal overload relays are designed for use with contactors LC1D115 and D150.

In addition to the protection provided by Deca thermal overload relays (see page B11/31), they offer the following special features:

- protection against phase imbalance
- choice of starting class
- protection of unbalanced circuits
- protection of single-phase circuits
- alarm function to avoid tripping by load shedding.

- 1 Adjustment dial Ir.
- 2 Test button.
- 3 Stop button.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Class 10/class 20 selector switch.
- 8 Selector for balanced load /unbalanced load

Environment

| Relay type | | LR9D5367...LR9D5569, LR9D67, LR9D69 | |
|--|--|--|----------------------------|
| Conforming to standards | | IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4 | |
| Product certifications | | UL, CSA, CCC, ABS, BV, DNV-GL, UKCA | |
| Degree of protection | Conforming to IEC 60529 | IP 20 on front panel with protective covers LA9D11570● or D11560● | |
| Climatic withstand | | according to IACS E10 | |
| Ambient air temperature around the device (Conforming to IEC 60255-8) | Storage | °C | - 40...+ 85 |
| | Normal operation | °C | - 20...+ 55 ⁽¹⁾ |
| Maximum operating altitude | Without derating | m | 2000 |
| Operating positions without derating | In relation to normal vertical mounting plane | Any position | |
| Shock resistance | Permissible acceleration conforming to IEC60028-2-27 | 13 gn - 11 ms | |
| Vibration resistance | Permissible acceleration conforming to IEC 60068-2-6 | 2 gn - 5...300 Hz | |
| Dielectric strength at 50 Hz | Conforming to IEC 60947-4-1 | kV | 6 |
| Surge withstand | Conforming to IEC 61000-4-5 | kV | 6 |
| Resistance to electrostatic discharge | Conforming to IEC 61000-4-2 | kV | 8 |
| Immunity to radiated radio-frequency disturbances | Conforming to IEC 61000-4-3 | V/m | 10 |
| Immunity to fast transient currents | Conforming to IEC 61000-4-4 | kV | 2 |
| Electromagnetic compatibility | EN 50081-1 and 2, EN 50082-2 | Meets requirements | |

Electrical characteristics of auxiliary contacts

| | | | | | | | | |
|---|--|-----------------------|---------------------|-----|-----|-----|-----|-----|
| Conventional thermal current | | A | 5 | | | | | |
| Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96) | a.c. supply | V | 24 | 48 | 110 | 220 | 380 | 600 |
| | | VA | 100 | 200 | 400 | 600 | 600 | 600 |
| | d.c. supply | V | 24 | 48 | 110 | 220 | 440 | – |
| | | W | 100 | 100 | 50 | 45 | 25 | – |
| Protection against short-circuits | By gG or BS fuses or by circuit breaker GB2 | A | 5 | | | | | |
| Cabling Flexible cable without cable end | 1 or 2 conductors | mm² | Minimum c.s.a.: 1 | | | | | |
| | Tightening torque | Nm | Maximum c.s.a.: 2.5 | | | | | |
| | | | 1.2 | | | | | |

⁽¹⁾ For operating temperatures up to 70 °C, please consult your Regional Sales Office.

TeSys Protect

Deca Electronic overload relays

Characteristics

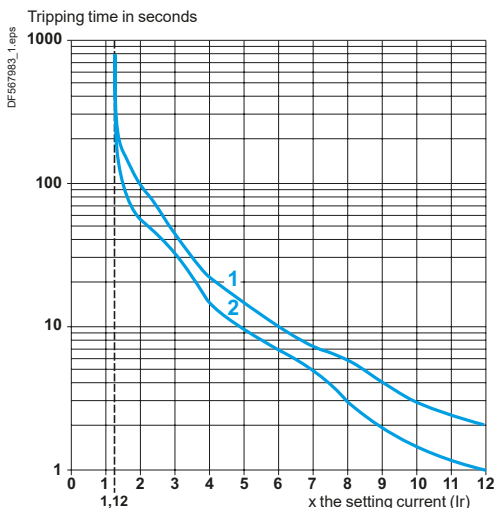
| Electrical characteristics of power circuit | | | |
|---|--|-------------------------------------|------------------------|
| Relay type | | LR9D5367...LR9D5569, LR9D67, LR9D69 | |
| Tripping class | Conforming to IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1 | | 10 or 20 |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-4-1 | V | 1000 |
| | Conforming to UL, CSA | V | 600 |
| Rated impulse withstand voltage (Uimp) | | kV | 8 |
| Frequency limits | Of the operating current | Hz | 50...60 ⁽¹⁾ |
| Setting range | Depending on model | A | 60...150 |
| Power circuit connections | Width of terminal lug | mm | 20 |
| | Clamping screw | | M8 |
| | Tightening torque | N.m | 18 |

| Operating characteristics | | | |
|------------------------------|-----------------------------|----|--|
| Temperature compensation | | °C | -20...+70 |
| Tripping thresholds | Conforming to IEC 60947-4-1 | | |
| | Alarm | A | 1.05 ± 0.06 I _n |
| | Trip | A | 1.12 ± 0.06 I _n |
| Sensitivity to phase failure | Conforming to IEC 60947-4-1 | | Tripping in 4 s ± 20 % in the event of phase failure |

| Alarm circuit characteristics | | | |
|-------------------------------|----------------------------------|-----------------|----------------|
| Rated supply voltage | d.c. supply | V | 24 |
| Supply voltage limits | | V | 17...32 |
| Current consumption | No-load | mA | ≤ 5 |
| Switching capacity | | mA | 0...150 |
| Protection | Short-circuit and overload | | Self protected |
| Voltage drop | Closed state | V | ≤ 2.5 |
| Cabling | Flexible cable without cable end | mm ² | 0.5...1.5 |
| Tightening torque | | N.m | 0.45 |

⁽¹⁾ For other frequencies and for applications involving the use of these overload relays with soft starters or variable speed drives, please consult your Regional Sales Office.

LR9D5367...LR9D5569, LR9D67, LR9D69 tripping curves



Average operating time related to multiples of the setting current

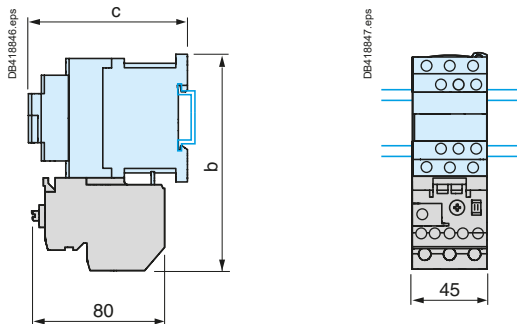
- 1 Cold state curve
- 2 Hot state curve

TeSys Protect

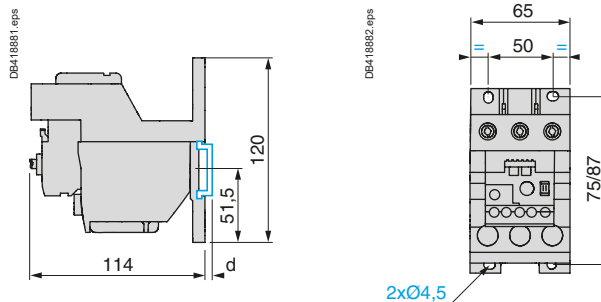
Deca Electronic overload relays

Dimensions, mounting

LR9D01, 02, 08, 32



LR9D110S

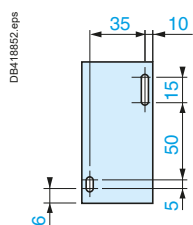
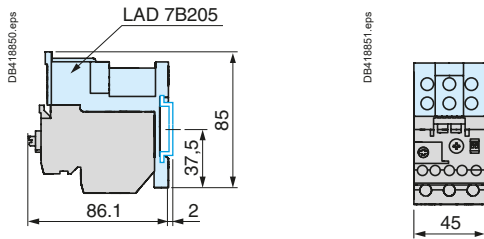


| LC1 | D09...D18 | D25...D38 |
|-----|-----------|-----------|
|-----|-----------|-----------|

| | | |
|---|-----|-----|
| b | 130 | 140 |
|---|-----|-----|

| | | |
|---|---------------------------|--|
| c | See pages B8/65 and B8/66 | |
|---|---------------------------|--|

LR9D01...32

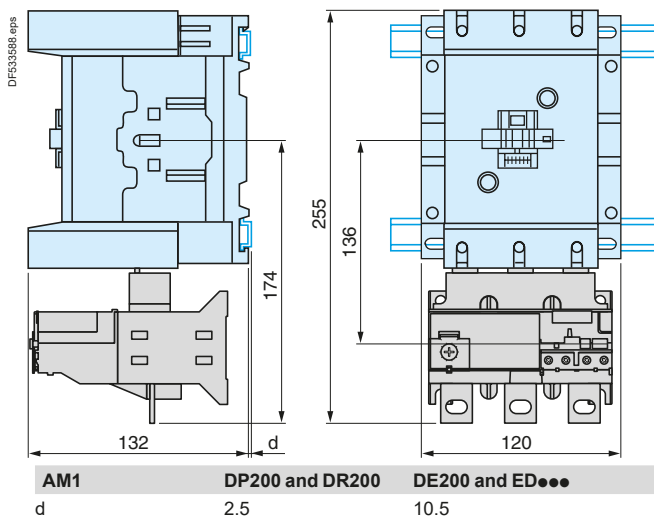


Ref.



LR9D53●●, LR9D55●●, LR9D67, LR9D69

Direct mounting beneath contactors LC 1D115 and D150

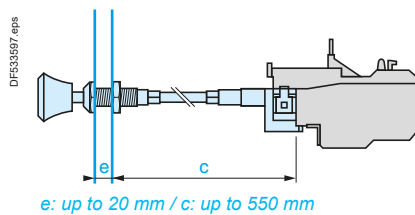


LR9D

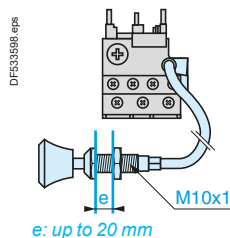
"Reset" by flexible cable

LA7D305 and LAD7305

Mounting with cable straight



Mounting with cable bent



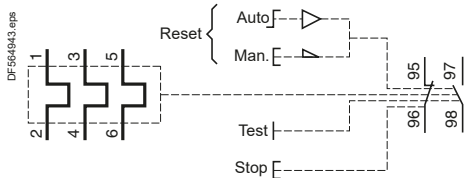
Overload relays

TeSys Protect

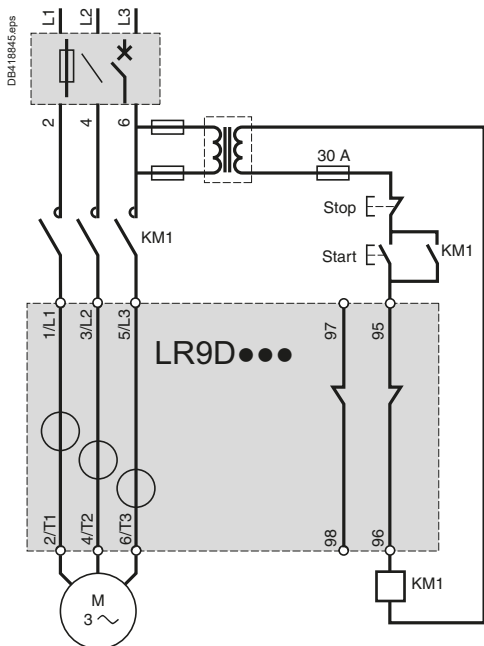
Deca Electronic overload relays

Schemes

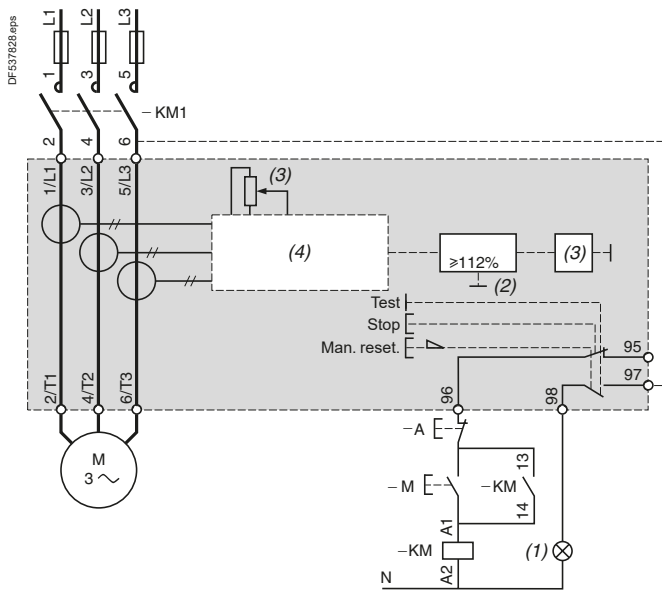
LR9D01, 02, 08, 32, LR9D110S



LR9D01, 02, 08, 32, LR9 D110S



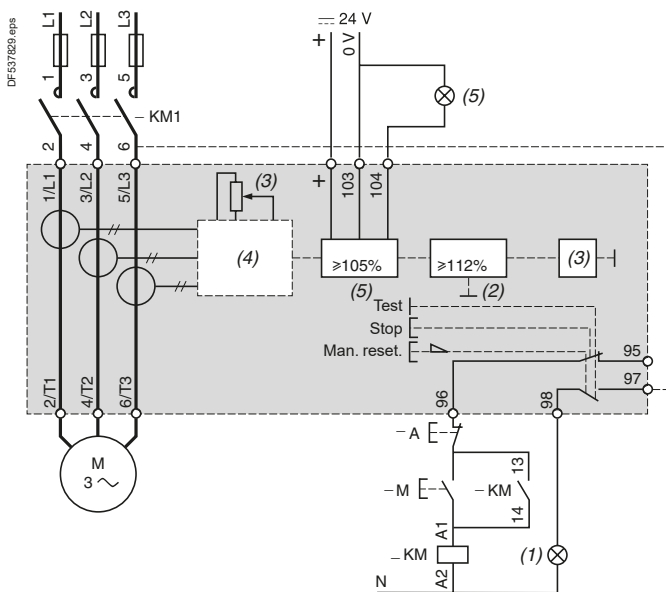
LR9D5...



- (1) Tripped.
- (2) Overload.

- (3) Setting current.
- (4) Specialised circuit.

LR9D67 and LR9D69



- (1) Tripped.
- (2) Overload.
- (3) Setting current.
- (4) Specialised circuit.
- (5) Alarm.

Introduction

LR9F electronic protection relays are especially suited to the operating conditions of motors.

They provide protection against:

- thermal overload of 3-phase or single-phase balanced or unbalanced circuits;
- phase failure and large phase unbalance,
- protracted starting times,
- prolonged stalled rotor condition.

LR9F electronic protection relays are mounted directly below an LC1 F type contactor. They cover a range from 30 to 630 A, in eight ratings.

The settings can be locked by sealing the transparent protective cover.

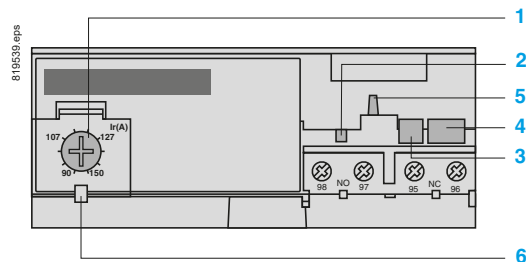
A reset button is mounted on the front of the relay.

Two versions are available:

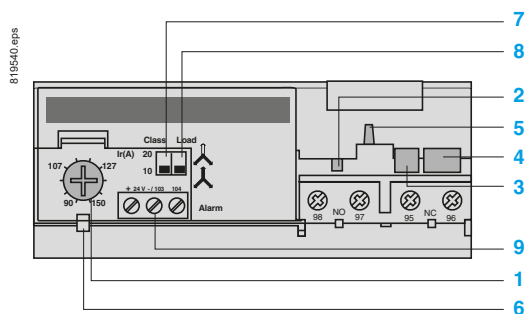
- simplified version: class 10: LR9F●3●●, class 20: LR9F●5●●,
- complete version: class 10, 10 A or class 20, selectable, conforming to EN 60947-4-1: LR9F●●.



This latter version includes an alarm function which makes it possible to forestall tripping by load shedding.

Simplified version: class 10 or 20



Complete version: class 10, 10 A or class 20, selectable, and alarm circuit



- 1 Ir adjustment dial
- 2 Test button
- 3 Stop button
- 4 Reset button
- 5 Trip indicator
- 6 Setting locked by sealing the cover
- 7 Class 10/class 20 selector switch
- 8 Selector switch for balanced load  / unbalanced load 
- 9 Alarm circuit

Ref.



TeSys Protect

LR9F Electronic overload relays

Characteristics

| Environment | | | |
|---|--|-----|--|
| Conforming to standards | | | IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4 |
| Product certifications | | | UL, CSA, CCC, ABS, BV, DNV-GL |
| Degree of protection | Conforming to VDE 0106 | | IP 20 |
| | Conforming to IEC 60529 | | IP 20 on front of relay with accessories LA9F103 or LA7F70 , see page B11/14 |
| Climatic withstand | | | according to IACS E10 |
| Ambient air temperature around the device (conforming to IEC 60255-8) | Storage | °C | -40...+85 |
| | Normal operation | °C | -20...+55 ⁽¹⁾ |
| Maximum operating altitude | Without derating | m | 2000 |
| Operating positions without derating | In relation to normal vertical mounting plane | | Any position |
| Shock resistance | Permissible acceleration conforming to IEC 60068-2-7 | | 13 gn - 11 ms |
| Vibration resistance | Permissible acceleration conforming to IEC 60068-2-6 | | 2 gn - 5 to 300 Hz |
| Dielectric strength at 50 Hz | Conforming to IEC 60947-4-1 | kV | 6 |
| Surge withstand | Conforming to IEC 61000-4-5 | kV | 4 |
| Resistance to electrostatic discharge | Conforming to IEC 61000-4-2 | kV | 8 (in air) 6 (in indirect mode) |
| Resistance to radiated radio-frequency disturbance | Conforming to IEC 61000-4-3 | V/m | 10 |
| Resistance to fast transient currents | Conforming to IEC 61000-4-4 | kV | 2 |
| Electromagnetic compatibility | EN 50081-1 and 2, EN 50082-2 | | Conforming |

⁽¹⁾ For operating temperatures up to 70 °C, please consult your Regional Sales Office.

Ref.



Overload relays

TeSys Protect

LR9F Electronic overload relays

Characteristics

Electrical characteristics of power circuit

| Relay type | LR9 | F5●57, F57 | F5●63, F63 F5●67, F67F5●69, F69 | F5●71, F71 | F7●75, F75 F7●79, F79 | F7●81, F81 | |
|--|-----------------------|--|---------------------------------------|------------|--------------------------|--|-----|
| Rated insulation voltage (Ui) Conforming to IEC 60947-4-1 | V | 1000 | | | | | |
| Rated impulse withstand voltage (Uimp) Conforming to IEC 60947-1 | kV | 8 | | | | | |
| Rated operational current (Ie) | A | 30 to 630 | | | | | |
| Short-circuit protection and coordination | | See pages: A6/11, A6/12, A6/15 and A6/16 | | | | | |
| Frequency limits Of the operating current | Hz | 50...60. For other frequencies, please consult your Regional Sales Office ⁽¹⁾ | | | | | |
| Power circuit connections | Width of terminal lug | mm | 20 | 25 | 25 | 30 LR9F7●75 and LR9F75 40 LR9F7●79 and LR9F79 | 40 |
| | Clamping screw | | M6 | M8 | M10 | M10 | M12 |
| | Tightening torque | N.m | 10 | 18 | 35 | 35 | 58 |

Auxiliary contact electrical characteristics

| | | | | | | | | |
|---|----------------------------------|--------------|-----------------|------------------|-----|-----------------|-----|-----|
| Conventional thermal current | A | 5 | | | | | | |
| Short-circuit protection By gG or BS fuses or by circuit-breaker GB2CD10 | A | 5 | | | | | | |
| Control circuit connections | Flexible cable with cable end | 1 conductor | mm ² | Min. 1 x 0.75 | | Max. 1 x 2.5 | | |
| | | 2 conductors | mm ² | 2 x 1 | | 2 x 1.5 | | |
| | Flexible cable without cable end | 1 conductor | mm ² | 1 x 0.75 | | 1 x 4 | | |
| | | 2 conductors | mm ² | 2 x 1 | | 2 x 2.5 | | |
| | Solid cable | 1 conductor | mm ² | 1 x 0.75 | | 1 x 2.5 | | |
| | | 2 conductors | mm ² | 2 x 1 | | – | | |
| | Tightening torque | N.m | 1.2 | | | | | |
| Maximum sealed current consumption of the coils of associated contactors (occasional operating cycles of contact 95-96) | a.c. supply | V | 24 | 48 | 110 | 220 | 380 | 600 |
| | | VA | 100 | 200 | 400 | 600 | 600 | 600 |
| | d.c. supply | V | 24 | 48 | 110 | 220 | 440 | – |
| | | W | 100 | 100 | 50 | 45 | 25 | – |

⁽¹⁾ For applications involving the use of these overload relays with soft starters or variable speed drives, please consult your Regional Sales Office.

Ref.



Overload relays

TeSys Protect

LR9F Electronic overload relays

Characteristics

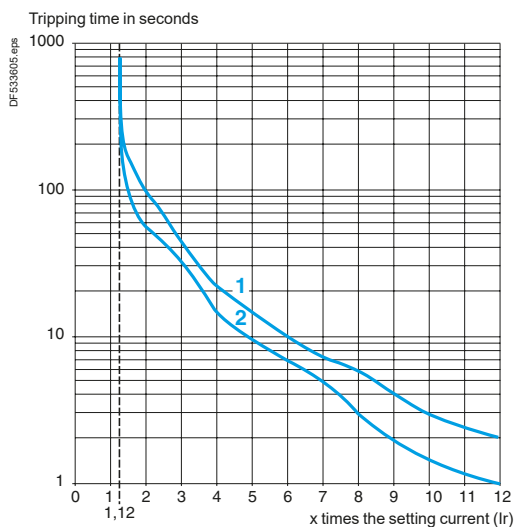
| Operating characteristics | | | | |
|------------------------------------|---|-----------|--|---------------------|
| Tripping class | Conforming to IEC 60947-4-1 | | 10 and 20 | |
| Temperature compensation | °C | -20...+70 | | |
| Reset | Manual on front of relay | | | |
| Fault indication | On front of relay | | | |
| Test function | On front of relay | | | |
| Stop function | Actuation of N/C contact, without affecting N/O contact | | | |
| Tripping thresholds | Conforming to IEC 60947-4-1 | Alarm | A | $1.05 \pm 0.06 I_n$ |
| | | Tripping | A | $1.12 \pm 0.06 I_n$ |
| Sensitivity to phase failure | Conforming to IEC 60947-4-1 | | Tripping in 4 s \pm 20 % in the event of phase failure | |
| Adjustment (nominal motor current) | Setting dial on front of relay | | | |
| Security sealing | Yes | | | |

| Alarm circuit characteristics | | | |
|-------------------------------|----------------------------------|-----------------|----------------|
| Rated supply voltage | d.c. supply | V | 24 |
| Supply voltage limits | | V | 17...32 |
| Current consumption | No-load | mA | ≤ 5 |
| Switching current | | mA | 0...150 |
| Protection | Short-circuit and overload | | Auto-protected |
| Voltage drop | Closed state | V | ≤ 2.5 |
| Connection | Flexible cable without cable end | mm ² | 0.5...1.5 |
| Tightening torque | | N.m | 0.45 |

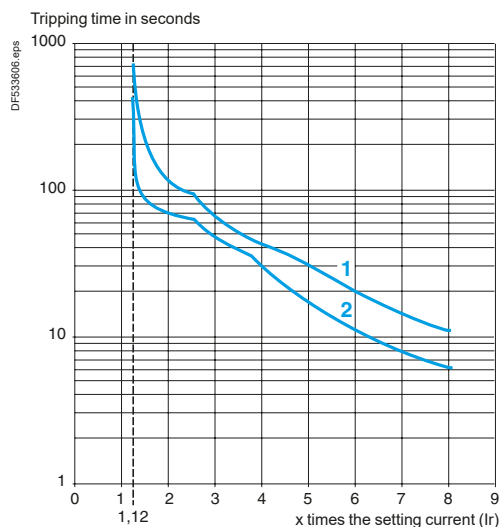
LR9F tripping curve

Average operating times depending on multiples of the setting current

Class 10



Class 20



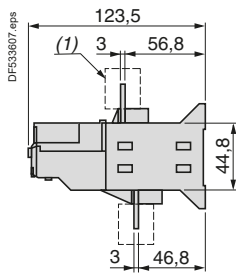
- 1 Cold state curve
- 2 Hot state curve

TeSys Protect

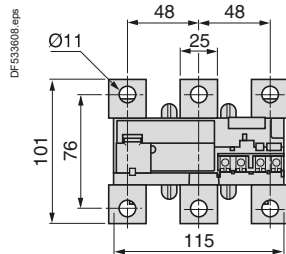
LR9F Electronic overload relays

Dimensions

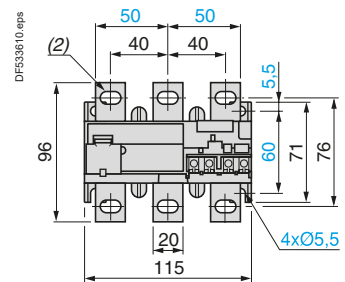
Common side view



LR9F57, F71



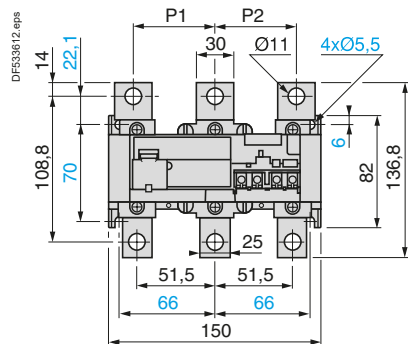
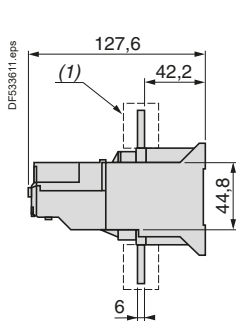
LR9F57, F563, F567, LR9F569, F57, F63, F67, F69



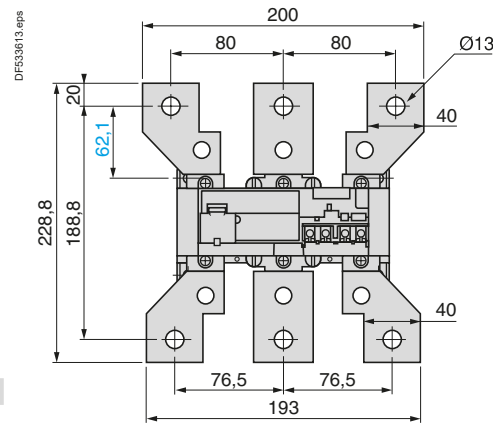
(1) Terminal shroud LA9F70●

(2) 6.5 x 13.5 for LR9F57 and F57. 8.5 x 13.5 for LR9F563, F567, F569, F63, F67, F69

Common side view



LR9F781 (for mounting beneath LC1F630 and F800)



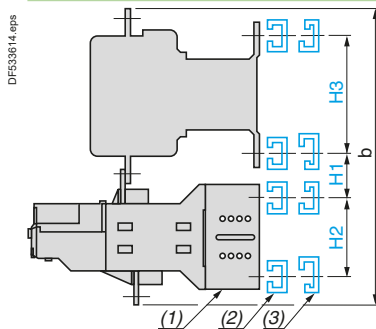
Ref.



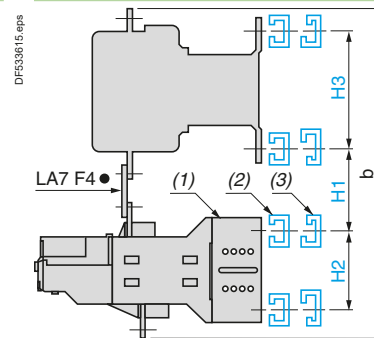
(1) Terminal shroud LA9F70●

| | P1 | P2 |
|-------------------------|----|----|
| LR9F775, F75 | 48 | 48 |
| LR9F779, F781, F79, F81 | 55 | 55 |

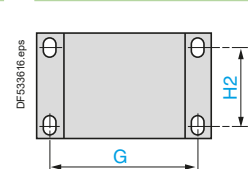
Direct mounting beneath contactor LC1F



Mounting beneath contactors: reversing LC2F or star-delta LC3F



Mounting plate for LR9F



| LA7 | G |
|------|-----|
| F901 | 145 |
| F902 | 190 |

| Contactors LC1 | With LR9 relays | b | H1 | H2 | H3 |
|----------------|---|-----|-----|----|-----|
| F115 | F57, F563, F567, F569, F57, F63, F67, F69 | 240 | 30 | 50 | 120 |
| F150 | F57, F563, F567, F569, F57, F63, F67, F69 | 246 | 30 | 50 | 120 |
| F185 | F57, F563, F567, F569, F57, F63, F67, F69 | 250 | 30 | 50 | 120 |
| F225 | F571, F71 | 273 | 40 | 50 | 120 |
| F265 | F775, F779, F75, F79 | 308 | 50 | 58 | 120 |
| | F571, F71 | 279 | 40 | 50 | 120 |
| F330 | F775, F779, F75, F79 | 314 | 60 | 58 | 120 |
| | F775, F779, F75, F79 | 317 | 60 | 58 | 120 |
| F400 | F775, F779, F781, F75, F79, F81 | 317 | 60 | 58 | 180 |
| F500 | F775, F779, F781, F75, F79, F81 | 346 | 70 | 58 | 180 |
| F630, F800 | F781, F81 | 510 | 110 | 58 | 180 |

| Contactors LC1 | With LR9 relays | b | H1 | H2 | H3 |
|----------------|---|-----|-----|----|-----|
| F115 | F57, F563, F567, F569, F57, F63, F67, F69 | 279 | 60 | 50 | 120 |
| F150 | F57, F563, F567, F569, F57, F63, F67, F69 | 283 | 60 | 50 | 120 |
| F185 | F57, F563, F567, F569, F57, F63, F67, F69 | 285 | 60 | 50 | 120 |
| F225 | F571, F71 | 360 | 100 | 58 | 120 |
| F265 | F775, F779, F75, F79 | 360 | 100 | 58 | 120 |
| | F571, F71 | 332 | 90 | 50 | 120 |
| F330 | F775, F779, F75, F79 | 363 | 100 | 58 | 120 |
| | F775, F779, F75, F79 | 364 | 100 | 58 | 120 |
| F400 | F775, F779, F781, F75, F79, F81 | 364 | 100 | 58 | 180 |
| F500 | F775, F779, F781, F75, F79, F81 | 390 | 110 | 58 | 180 |
| F630, F800 | F781, F81 | 509 | 120 | 58 | 180 |

(1) Relay mounting plate LA7F90●, see page B11/14.

(2) AM1EC or AM1DF for LC1F115 to F630 and LC1F800.

(3) DZ5MB for LC1F115 to F400.

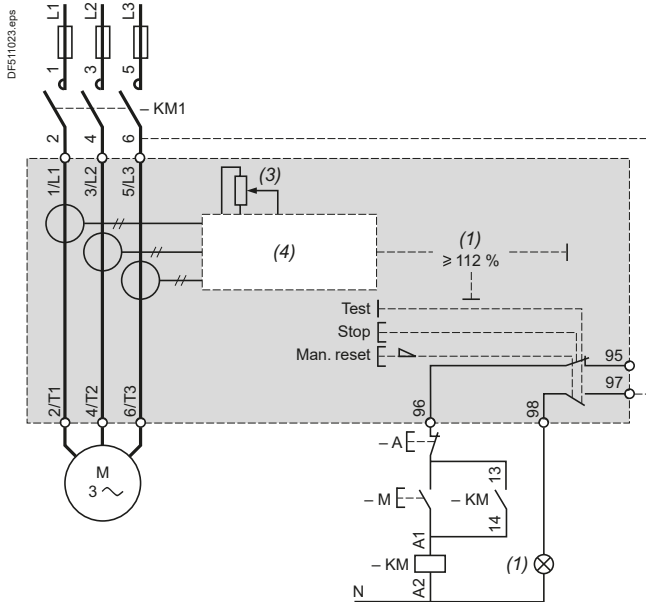
TeSys Protect

LR9F Electronic overload relays

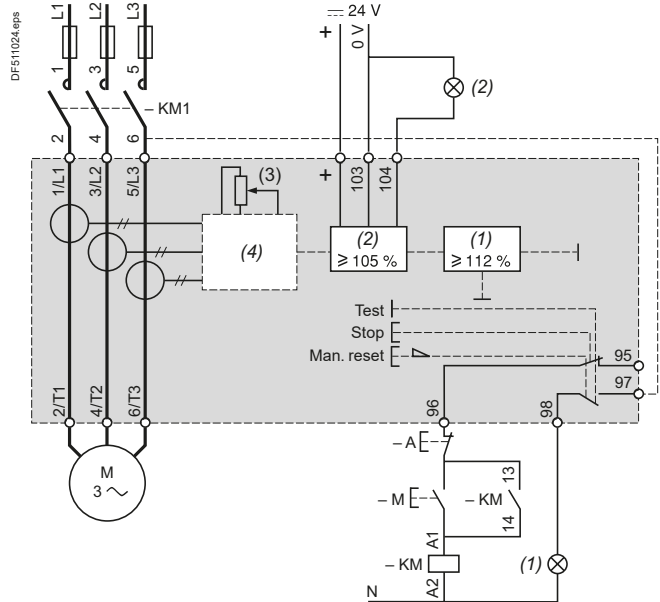
Schemes, setting-up

Schemes

LR9F5...F7...F81



LR9F57...F81 (with alarm)

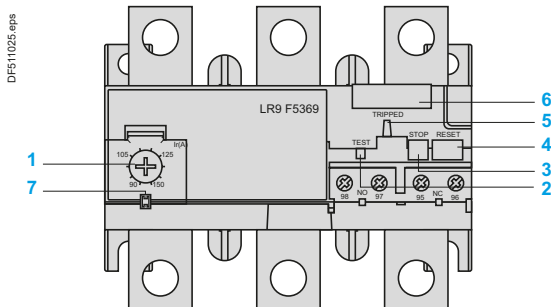


- (1) Tripped on thermal overload.
- (2) Overheating alarm.
- (3) Setting current.
- (4) Specialised circuit.

Setting-up the special functions of LR9F thermal overload relays

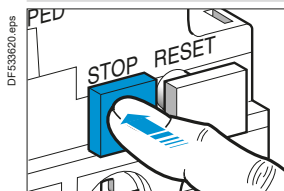
Setting the relay

- Lift the transparent cover 7 to gain access to the various settings.
- Adjustment is achieved by turning dial 1 which is graduated directly in Amperes.
- The setting can be locked by sealing the cover 7.



"Stop" function 3

Stop

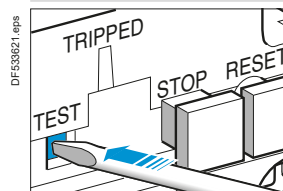


- The "Stop" function is obtained by pressing the red "STOP" button 3.
- Pressing the Test button:

- actuates the N/C contact,
- has no effect on the N/O contact.

"Test" function 2

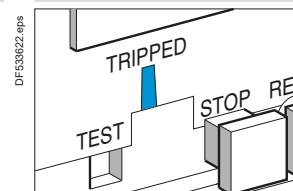
Test



- The "Test" function is obtained by pressing the red "TEST" button 2 with a screwdriver.
- Operation of the "TEST" button simulates tripping of the relay and:

- actuates both the N/O and N/C contacts,
- actuates the trip indicator 5.

Trip indicator



TeSys Protect

RM1XA Magnetic overload relays

Characteristics

Introduction

The RM1XA electromagnetic relay detects over current peaks in excess of the maximum permissible current value. It is designed for the protection of circuits which are not subject to current peaks (starters, resistors) or for controlling starting peaks on slip ring motors.

It trips instantaneously and is not suitable for frequent operation (12 operating cycles per hour). It can withstand a continuous current equivalent to 1.25 times the minimum setting current.

Environment characteristics

| | | |
|---|----|--|
| Conforming to standards | | IEC/EN 60947-4-1 |
| Product certifications | | UKCA |
| Ambient air temperature around the device | °C | Storage: - 60...+ 70 Operation: - 40...+ 60 |
| Maximum operating altitude | m | 2000 |
| Operating position | | ± 15° in relation to normal vertical mounting position |

Electrical characteristics of power circuit

| | | |
|---|----|------------|
| Maximum rated operational voltage | V | ~ or ≡ 600 |
| Frequency limits of the rated operational current | Hz | 0...60 |

Electrical characteristics of auxiliary contacts

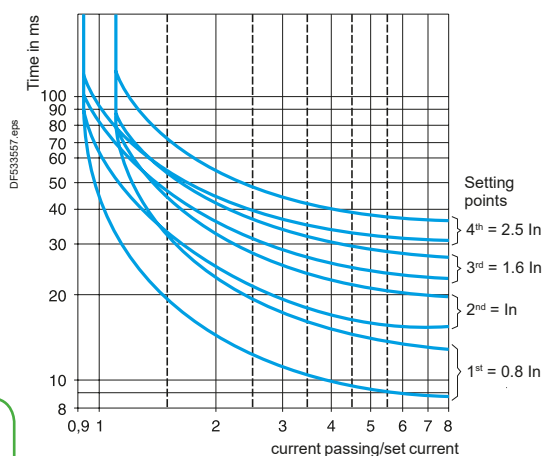
| | | | | | | | | |
|---|-------------|----------------------|----|------|--------|--------|--------|-----|
| Conventional thermal current | A | 10 | | | | | | |
| Occasional making and breaking capacities | a.c. supply | Voltage | V | 48 | 110 | 220 | 380 | 600 |
| | | Power ⁽¹⁾ | VA | 4000 | 12 000 | 17 000 | 22 000 | – |
| | d.c. supply | Voltage | V | 48 | 110 | 220 | 440 | 600 |
| | | Power ⁽²⁾ | W | 240 | 200 | 190 | 180 | 180 |

⁽¹⁾ Circuit such as the electromagnet of a contactor - $\cos \phi$ inrush: 0.7 and $\cos \phi$ sealed: 0.4.

⁽²⁾ Circuit such as an electromagnet without economy resistor ; time constant varying from 20 ms for 5 W to 200 ms for 100 W or more.

Operating times

Operating times: because of the numerous applications for RM1 XA over current relays, it is not possible to give precise operating times. The curves shown are therefore purely indicative.



TeSys Protect

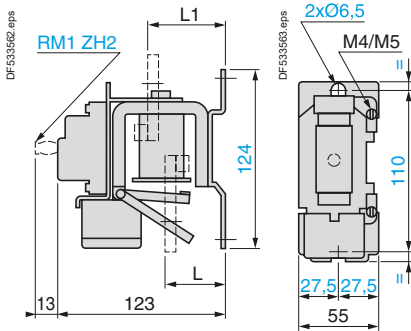
RM1XA Magnetic overload relays

Dimensions, schemes

Dimensions

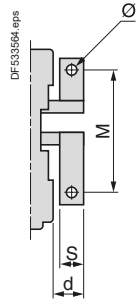
RM1XA●●●,
RM1XA●●●1

Common side view

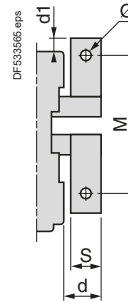


RM1XA001...XA040

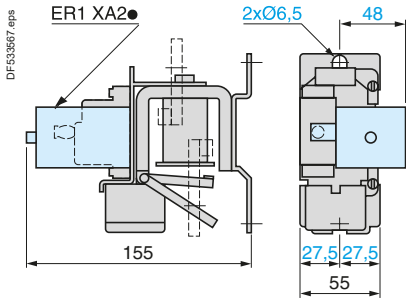
RM1XA100, RM1XA315
and RM1XA351



RM1XA160, RM1XA500



RM1XA●●●1 with electrical reset ER1XA2●

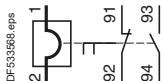


| RM1 | d | d1 | M | L | L1 | S | Ø |
|-------|------|-----|----|----|----|----|-----|
| XA100 | 20.5 | – | 87 | 25 | 40 | 20 | M8 |
| XA160 | 27.5 | 5.5 | 94 | 25 | 40 | 25 | M8 |
| XA315 | 35.5 | – | 74 | 44 | 55 | 30 | M10 |
| XA500 | 40.5 | 7 | 84 | 44 | 55 | 40 | M10 |

Schemes

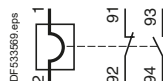
RM1XA●●●1

Latching



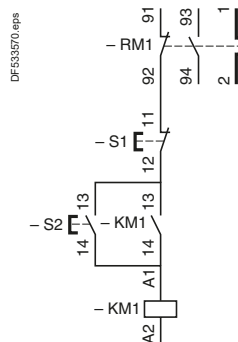
RM1XA●●●

Non-latching

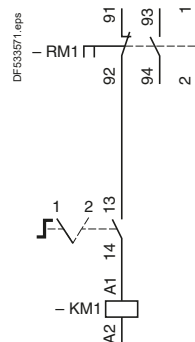


RM1XA

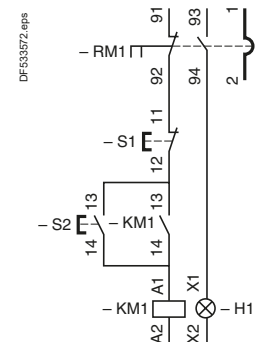
3-wire control (without
mechanical latching)



2-wire control (with
mechanical latching)



3-wire control
(with "trip" signal)





Application

LT3S thermistor protection units continuously monitor the temperature of the machines to be protected (motors, generators, etc.) by means of PTC thermistor probes embedded in the machine windings.

If the nominal operating temperature of the probes is reached, they convert the rapid increase in resistance into a switching function which can be used to switch off the machine or signal a fault (see paragraph relating to thermistor probes below).

Accidental breaks in the supply circuits of the thermistors are also detected.

Electromagnetic compatibility

Conforming to "Electromagnetic compatibility" directive.
 Conforming to standard IEC/EN 61000-6-2.

| | |
|--|----------------|
| Resistance to electrostatic discharge (conforming to IEC 61000-4-2) | Level 3 |
| Resistance to fast transients (conforming to IEC 61000-4-4) | Level 3 |
| Susceptibility to electromagnetic fields (conforming to IEC 61000-4-3) | Level 3 |
| Surge resistance 1.2/50 - 8/20 (conforming to IEC 61000-4.5) | Level 4 |
| Immunity to microbreaks and voltage drops (IEC 61000-4-11) | |
| Suitable for use with variable speed controllers | |

Thermistor probes

Range of most commonly used PTC thermistor probes:
 from 90 to 160 °C, in steps of 10 °C.

Curve $R = f(\theta)$, characteristic of a PTC thermistor probe, is defined by standard IEC 60947-8.

The choice of PTC thermistor probe to be incorporated in the motor winding depends on the insulation class, the type of motor and the most suitable location for the probe. This choice is usually made by the motor manufacturer or the motor rewinder, who have all the necessary information.

Application example

| Insulation class of rotating machines conforming to IEC 60034-11 (S1 duty) | NOT Nominal operating temperature | Temperature at which rapid increase in resistance occurs | |
|--|-----------------------------------|--|----------|
| | °C | Probes used for Alarm °C | Fault °C |
| A | 100 | 100 | 100 |
| B | 110 | 110 | 120 |
| E | 120 | 120 | 130 |
| F | 140 | 140 | 150 |
| H | 160 | 160 | 170 |

(1) PTC: Positive Temperature Coefficient.

TeSys Protect

LT3 Thermal protection units

Characteristics

| Protection unit type | LT3SE | LT3SA | LT3SM |
|--------------------------|--------------------------------|-----------------------------------|--------------------------------------|
| Reset method | Automatic | Automatic | Manual/Automatic |
| Fault indication | – | On front panel of unit and remote | On front panel of unit and remote |
| Fault test | – | – | By pushbutton on front panel of unit |
| Probe interchangeability | Label "Mark A" to IEC 60034-11 | Label "Mark A" to IEC 60034-11 | Label "Mark A" to IEC 60034-11 |

Environment

| | | | | |
|---|---|--|---|-------------|
| Conforming to standards | | IEC 60947-8 | IEC 60947-8 | IEC 60947-8 |
| Product certifications | | UL, CSA | | |
| Degree of protection | | IP 20 conforming to IEC 60529 | | |
| CE marking | | LT3S● protection units have been designed to comply with the basic recommendations of European directives relating to low voltage and EMC. Therefore LT3S● products bear the European Community CE mark. | | |
| Ambient air temperature around the device | Storage | °C | - 40...+ 85 | |
| | Conforming to IEC 60068-2-1 and 2-2 | | | |
| | Operation | °C | - 25...+ 60 | |
| Maximum operating altitude | Without derating | | 2000 m | |
| | With derating | | Up to 3000 m, the maximum permissible ambient air temperature for operation (60 °C) must be reduced by 5 °C per additional 500 m above 1500 m | |
| Vibration resistance | Conforming to IEC 60068-2-6 | | 2.5 gn (2...25 Hz) 1 gn (25...150 Hz) | |
| Shock resistance | Conforming to IEC 60068-2-27 | | 5 gn (11 ms) | |
| Operating positions without derating | In relation to normal vertical mounting plane | | Any position | |

Power supply circuit characteristics

| | | | | | | |
|------------------------------------|---------------|----------------|----|------------|----------|---------------------------|
| Rated control circuit voltage (Uc) | ~ 50/60 Hz | Single voltage | V | 115 or 230 | – | 400 |
| | 0.85...1.1 Uc | Dual voltage | V | – | 115/230 | 115/230, 24/48 |
| | ~ 50/60 Hz | Multivoltage | V | – | 24...230 | 24...230 |
| | 0.85...1.1 Uc | | | | | |
| | – | Single voltage | V | 24 | – | – |
| | 0.8...1.25 Uc | Dual voltage | V | – | 24/48 | 24/48 |
| | 0.85...1.1 Uc | Multivoltage | V | – | 24...230 | 24...230 |
| Average consumption | Sealed | ~ | VA | < 2.5 | < 2.5 | < 2.5 except (400 V: 2.7) |
| | | – | W | < 1 | < 1 | < 1 |

(1) PTC: Positive Temperature Coefficient.

Ref.



Overload relays

TeSys Protect

LT3 Thermal protection units

Characteristics

| Control circuit characteristics | | | | | | | | |
|--|---|-----------------|-------------|--|-------------|--|---------------------|--|
| Protection unit type | | | LT3SE | | LT3SA | | LT3SM | |
| Resistance | Tripping | Ω | 2700...3100 | | 2700...3100 | | 2700...3100 | |
| | Reset | Ω | 1500...1650 | | 1500...1650 | | 1500...1650 | |
| Maximum number of probes fitted in series ⁽²⁾ | Probes ≤ 250 Ω at 25° | | 6 | | 6 | | 6 | |
| Voltage at terminals in the thermistor circuit | Normal operation (R = 1500 Ω) | V | < 2.5 | | < 2.5 | | < 2.5 | |
| | Conforming to IEC 60034-11 (R = 4000 Ω) | V | < 7.5 | | < 7.5 | | < 7.5 | |
| Thermistor probe short-circuit detection | Operating threshold | Ω | – | | < 20 | | < 20 | |
| Connection of probes to the LT3 | Distance | m | 300 | | 400 | | 500 | |
| | Minimum c.s.a. of conductors | mm ² | 0.75 | | 1 | | 1.5 | |
| | | | | | | | 1000 ⁽³⁾ | |
| | | | | | | | 2.5 | |

| Electrical characteristics of the output relay contacts | | | | | | | | |
|---|--------------------------------|-----------------|--------------------------------------|---|---------------|--|---------------|--|
| Contact type | Single voltage or dual voltage | | 1 N/C | | 1 N/C + 1 N/O | | 1 N/C + 1 N/O | |
| | Multivoltage | | – | | 2 C/O | | 2 C/O | |
| Rated insulation voltage | | V | ~ 500 | | | | | |
| Maximum operational voltage | | V | ~ 250 (~ 400 V for LT3SM00V) | | | | | |
| Rated impulse withstand voltage | Uimp | kV | 2.5 | | | | | |
| Conventional thermal current | | A | 5 | | | | | |
| Operational power | At 220 V | VA | 100 for 0.5 million operating cycles | | | | | |
| Breaking capacity | In cat. AC-15 | 120 V | A | 6 | | | | |
| | | 250 V | A | 3 | | | | |
| | In DC-13 | 24 V | A | 2 | | | | |
| Cabling (cage type connector) for flexible or solid cable | Without cable end | mm ² | 2 x 1...1 x 2.5 | | | | | |
| | With cable end | mm ² | 1 x 0.75...2 x 2.5 | | | | | |
| Tightening torque | | N.m | 0.8 | | | | | |

| Thermistor probe characteristics | | | | | | |
|----------------------------------|--|----|----------------------|--|---------------|--|
| Probe type | | | DA1TT●●● | | DA1TS●●● | |
| Conforming to standards | | | IEC 60034-11. Mark A | | | |
| Resistance | At 25 °C | Ω | 3 x 250 in series | | 250 | |
| Rated operational voltage (Ue) | Per probe | V | --- 2.5 V max | | --- 2.5 V max | |
| Rated insulation voltage (Ui) | | kV | 2.5 | | 1 | |
| Insulation | | | Reinforced | | Reinforced | |
| Length of connecting cables | Between probes | mm | 250 | | – | |
| | Between probe and motor terminal plate | m | 1 | | 1 | |

(1) PTC: Positive Temperature Coefficient.

(2) Provided that the total resistance of the probe circuit is less than 1500 Ω at 20 °C.

(3) For distances greater than 500 m take cabling precautions (twisted shielded pairs).

Ref.

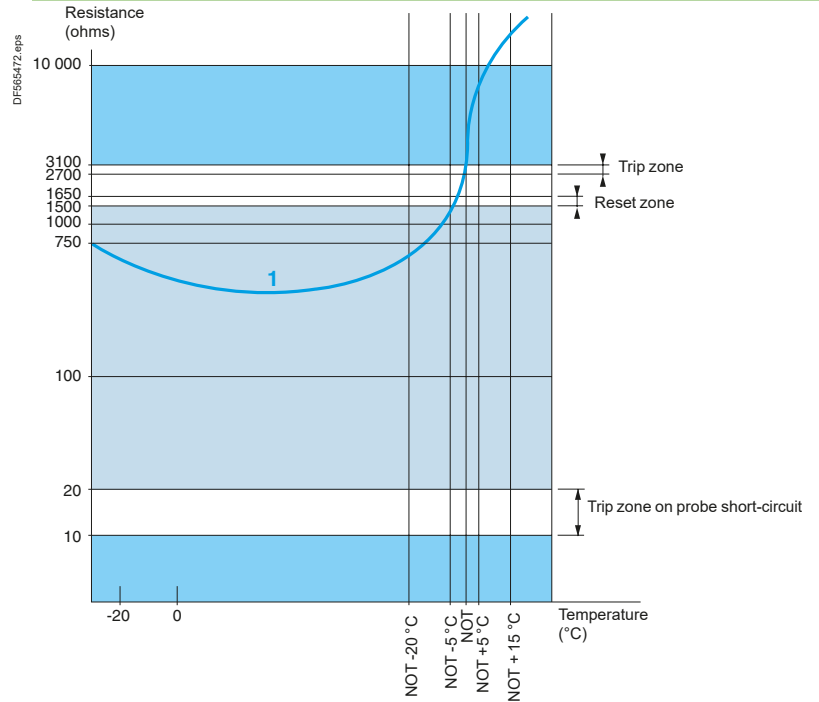


Overload relays

LT3S protection unit/thermistor probe combination

Guaranteed operating zones: examples with 3 probes type DA1TT●●● (250 Ω at 25 °C) in series, conforming to standard IEC 60034-11, Mark A.

LT3SE, LT3SA, LT3SM protection units



1 3 probes type DA1TT●●● (250 Ω at 25 °C) in series.

NOT: Nominal Operating Temperature

Protection unit tripped.

Protection unit reset.

(1) PTC: Positive Temperature Coefficient.

Ref.



Overload relays

TeSys Protect

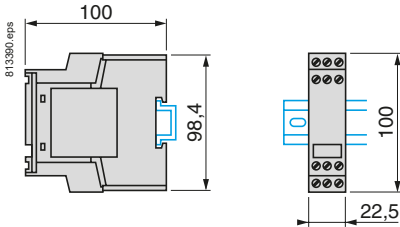
LT3 Thermal protection units

Dimensions, schemes, setting-up

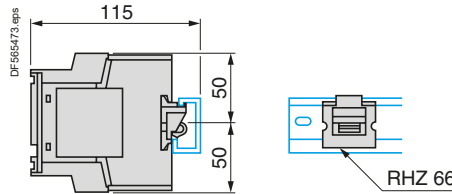
Dimensions

LT3SE, SA, SM

Mounting on L rail AM1 DP200



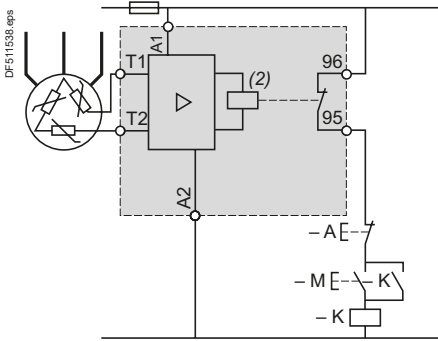
Mounting on 1 L rail (with adapter RHZ 66)



Schemes for "no fault" operation

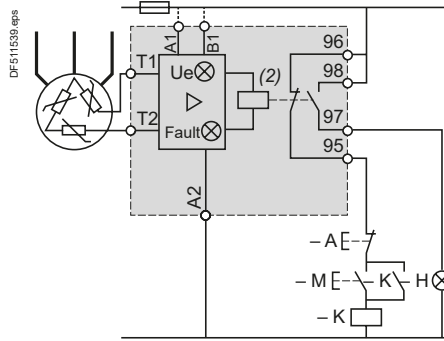
LT3SE00BD (24 V DC), LT3SE00F (115 V AC), LT3SE00M (230 V AC)

Without fault memory

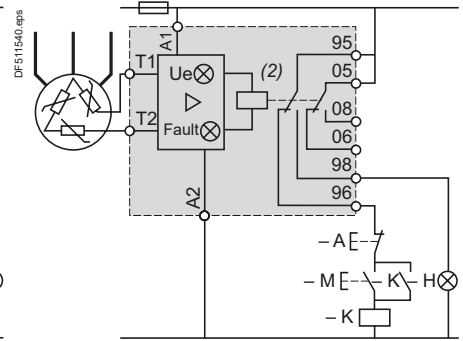


LT3SA00ED (24/48 V DC), LT3SA00M (115/230 V AC)

Refer to chart for use of A1/B1 terminal according power supply

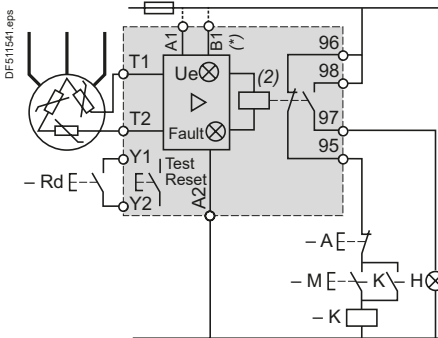


LT3SA00MW (24 to 230V AC/DC)

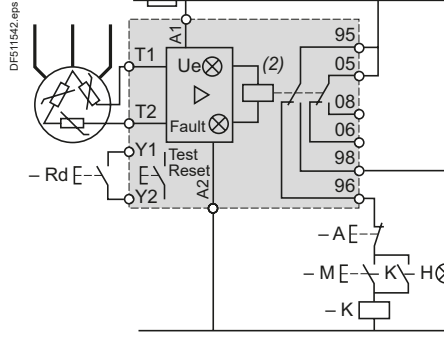


LT3SM00E (24/48V AC), LT3SM00ED (24/48V DC), LT3SM00M (115/230 V AC), LT3SM00V (400V AC)

Refer to chart for A1 - A2 - B1 supply terminals to be used



LT3SM00MW (24 to 230 V AC/DC)



(*) no B1 terminal on LT3SM00V (400V AC).

LT3SA, LT3SM - dual voltage and 400 V - power terminal assignment

| | 24 V DC | 48 V DC |
|----------------------|------------------|------------------|
| LT3SA00ED, LT3SM00ED | B1(+) A2 (0V) | A1(+) A2 (0V) |
| LT3SA00M, LT3SM00M | 115 V AC | 230 V AC |
| Terminals | A1-B1 | A1-A2 |
| LT3SA00M, LT3SM00M | - | 400 V AC |
| Terminals | - | A1-A2 |

Setting-up

Cabbling

It is inadvisable to use the same multi-core cable for the thermistor probe circuit and the power circuit. This is especially important for long cable runs. If it is impossible to comply with the above recommendation, a pair of twisted conductors must be used for the thermistor probe circuit.

Testing the insulation of the line connecting the thermistors to the LT3S unit

Before carrying out this test, short-circuit all the terminals of the LT3S protection unit.

Measure the insulation value between these terminals and earth using a megger or a flash tester, progressively increasing the voltage to the value defined by the standards.

Checking the PTC thermistor probes for correct operation

With the machine stopped, in the cold state and after having taken all the necessary safety precautions:

- disconnect the line linking the thermistors to the LT3S protection unit, at the terminals of the machine being protected: motor, etc.,
- using an ohmmeter with a voltage rating less than or equal to 2.5 V, measure the resistance of the probe circuit at the machine terminals,
- depending on the number and type of thermistors connected in series, check that their resistance value at 25 °C is correct.

Example: motor fitted with 3 PTC thermistor probes with a resistance $\leq 250 \Omega$ at 25 °C.

Any value higher than $250 \times 3 = 750 \Omega$ indicates a problem.

(1) PTC: Positive Temperature Coefficient.

(2) Relay energised: the contacts are shown in the "operating" position.

References:

pages B11/17 and B11/18

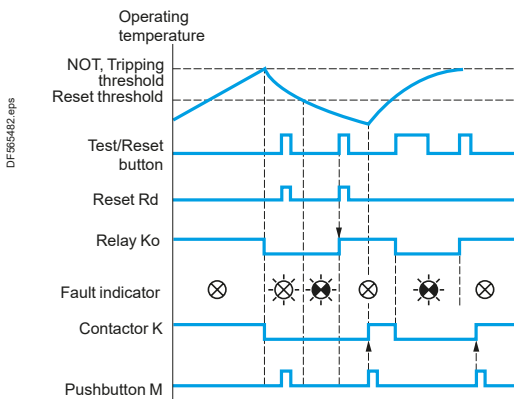
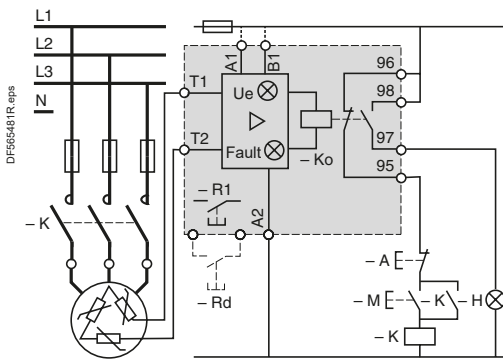
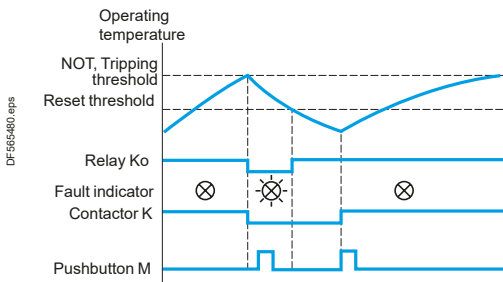
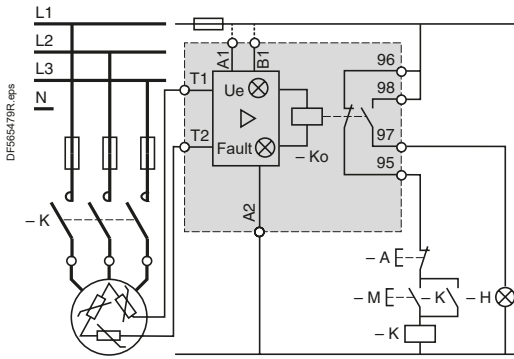
Characteristics:

pages B11/52 to B11/55

TeSys Protect

LT3 Thermal protection units

Schemes, operation



LT3SA protection units

Starting

The LT3SA is normally energised and its internal relay is in the pre-energised position. The motor is started by operating pushbutton M automatically held in by K (3-wire control circuit).

Thermal fault

The strong increase in resistance of the PTC probes at the moment their temperature reaches the nominal operating temperature (NOT) is detected by the LT3SA unit and causes the relay to drop out; indicator H comes on, as does the built-in indicator on unit LT3SA. Contactor K drops out and pressing button M has no effect.

Reset

As the motor cools, it reaches the reset threshold, 2 to 3 °C below the nominal operating temperature. The relay resets and the motor can be started by pressing button M.

LT3SM protection units

Operation is very similar to that described above, except for the following:

Reset

After tripping on thermal fault and cooling to the reset threshold, the Test/RESET button on the unit (R1) or a remote reset button (Rd) must be pressed to energise the relay.

The fault is therefore memorised, even though the temperature of the probes has dropped to well below the reset threshold.

Signalling circuit

As the relay is fitted with 2 separate contacts, the signalling voltage may be different from the contactor control voltage.

Test

Pressing the Test/RESET button simulates a fault and causes the relay to drop out: the FAULT indicator comes on, as does the remote signalling indicator. The unit is reset by pressing the Test/RESET button again.

(1) PTC: Positive Temperature Coefficient.

TeSys Protect

LR97, LT47 Electronic over current relays

Characteristics

Introduction



LR97D



LT47

LR97D and LT47 electronic over current relays have been developed to satisfy machine protection requirements. These relays have definite time characteristics: current threshold and time based function. They are particularly recommended for providing mechanical protection on machines with high resistive torque, high inertia and with strong probability of jamming under steady state conditions. They can be used for motor protection in the case of long starting times or frequent starting. The LR97D relay also incorporates two fixed time protection functions, one of 0.5 seconds against locked rotor and one of 3 seconds against phase failure. LR97D and LT47 can be used to provide mechanical shock protection. In this case, setting the O-Time knob to minimum will ensure tripping in 0.3 seconds. LR97D is designed to be directly connected downstream of the Deca contactor. LT47 provides two current transformers, to be crossed by the motor power cables.

Applications

LR97D and LT47 relays are particularly suitable for the following machines:

- Monitoring function for excessively long starting time on machines with a risk of difficult starting:
 - Machines with high resistive torque, high inertia machines.
 - Monitoring of machines during steady state operation: overtorque detection function
 - Machines with strong risk of jamming, machines with torque build-up over time,
 - Mechanical failure monitoring,
 - Faster detection of malfunctioning on machines where the motor is oversized in relation to its thermal protection I^2t .
- Motor protection for specific applications:
 - Machines with long starting times,
 - Machines with high on-load factor: more than 30 to 50 starts/hour,
 - Machine with fluctuating load from a steady state, where the thermal image of a thermal overload relay (thermal memory) is unsuitable in relation to actual overheating of the motor.

Examples of machines:

- Conveyors, crushers and mixers,
- Fans, pumps and compressors,
- Centrifuges and spin-dryers,
- Presses, shearing machines, saws, broaching machines, sanders and lifting hoists.

Operation

Because of their two separate time settings, LR97D and LT47 relays can be combined with the motor-starter function:

D-Time: starting time, O-Time: trip time during steady state.

The D-Time function is only available during the motor starting phase. During this phase the overload detection function is inhibited in order to allow starting. Under steady state conditions, when the motor current is greater than the setting current due to an overload or single-phasing, the red LED lights up and the internal relay switches its contact after a time preset by the O-Time knob.

The red LED stays on, indicating that the relay has tripped.

The relays are simple to set, in 5 easy steps:

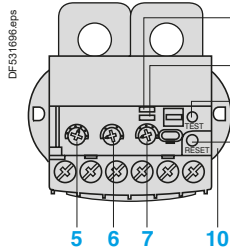
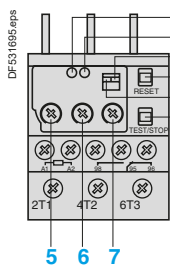
- Adjust the 3 knobs to maximum (Load, D-Time and O-Time),
- Adjust the D-Time knob to the value corresponding to the motor starting time.
- When the motor reaches steady state, adjust the Load knob (turn the knob counter-clockwise until the red LED starts to flicker).
- Slowly turn the Load knob clockwise until the LED goes out.
- Set the required tripping time, using the O-Time knob.

Description

Description

LR97D●●●●●

LT47●●●●●



- 1 RESET knob
- 2 TEST/STOP knob
- 3 Ready/Run Indicator
- 4 Relay tripped indicator
- 5 Current setting
- 6 Adjustment of starting time
- 7 Adjustment of tripping time
- 8 Manual/Auto adjustment
- 9 Single-phase/3-phase adjustment
- 10 Retractable fixing lugs

Status signalling

LR97D●●●●●

LT47●●●●●

To assist fast diagnostics, two LEDs (one green and one red) allow signalling of the operating status:

| Status | LED signal | |
|--------------|---------------|---------|
| | Green LED | Red LED |
| Voltage | On | Off |
| Starting | | |
| Steady state | On | Off |
| Overload | On | |
| Trip | Over-current | Off On |
| | Rotor locked | Off |
| | Phase failure | L1 |
| L2 | | Off |
| L3 | | Off |

| Condition | LED signal | |
|--------------|------------|---------|
| | Green LED | Red LED |
| Voltage | On | Off |
| Starting | | |
| Steady state | On | Off |
| Overload | On | |
| Trip | Off On | |

Overload relays

TeSys Protect

LR97, LT47 Electronic over current relays

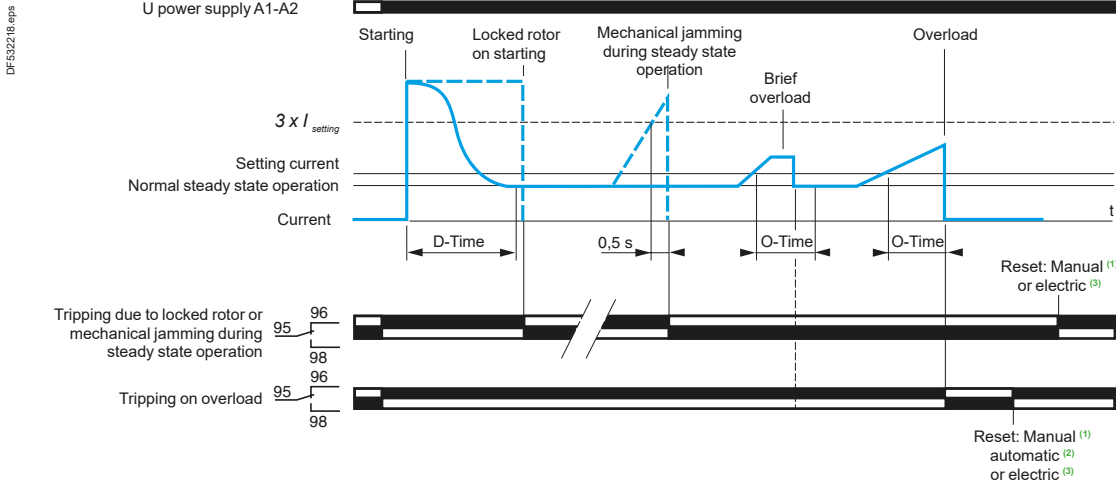
Characteristics

Curves

LR97D

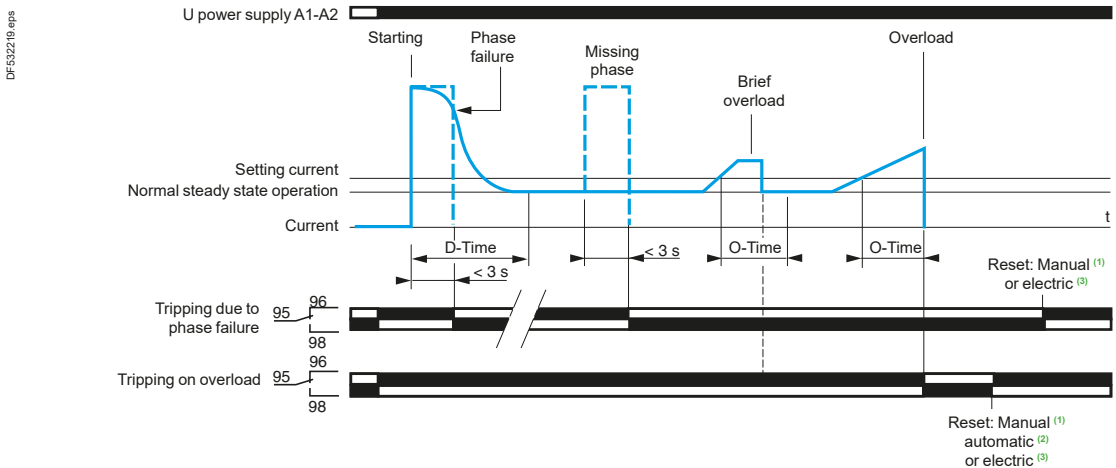
Overload protection

Protection against locked rotor and mechanical jamming under steady state conditions

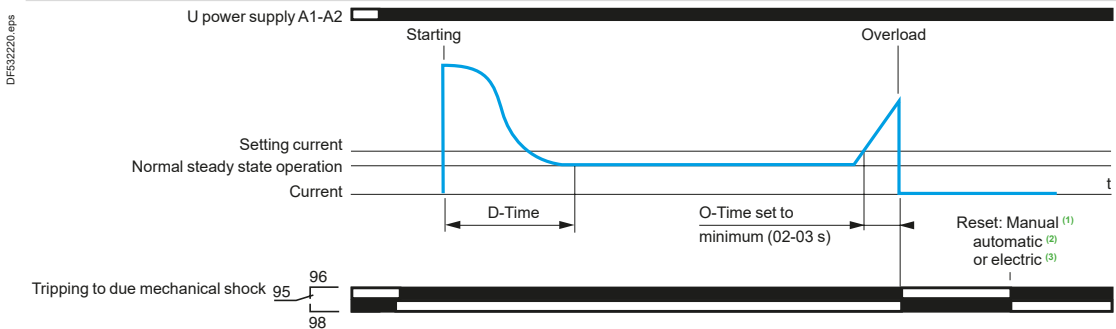


Overload protection

Protection against phase failure during starting and during steady state operation



Mechanical shock protection



(1) By Reset button.

(2) Fixed time of 120 s. Selectable by dip switch. Function not available in the event of tripping due to locked rotor/mechanical jamming ($I > 3 \times I_{setting}$) or phase failure.

(3) By brief interruption of power supply, minimum 0.1 s.

TeSys Protect

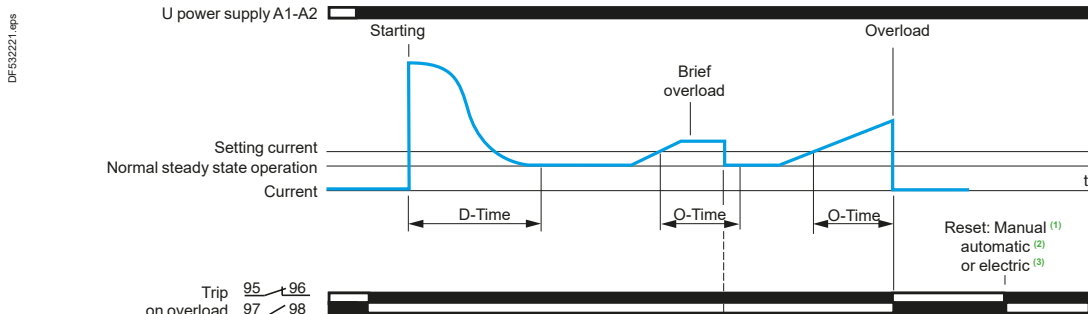
LR97, LT47 Electronic over current relays

Characteristics

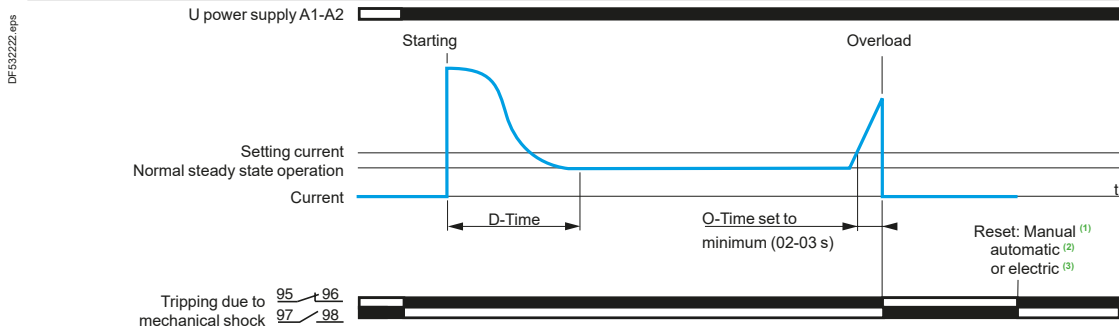
Curves

LT47

Overload protection



Mechanical shock protection



- (1) By Reset button.
- (2) Only available on version with automatic reset (LT47●●●●A). Time adjustable from 1 to 120 s with the R-Time knob.
- (3) By brief interruption of power supply, minimum 0.1 s.

Characteristics

Environment

| Relay type | | LR97D●●●●● | LT47●●●●● |
|--|---|--|--|
| Conforming to standards | | IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5 | IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5 |
| Product certifications | | UL, CSA, CCC, EAC | UL, CSA, CCC, EAC |
| Degree of protection | Conforming to IEC 60529 | IP 20 (front face) | IP 20 (front face) |
| Ambient air temperature around the device | Storage | °C - 30...+ 80 | - 30...+ 80 |
| | Normal operation without derating (IEC 60947-4-1) | °C - 25...+ 60 | - 25...+ 60 |
| Maximum operating altitude | m | 2000 | 2000 |
| Operating positions without derating | In relation to normal vertical mounting plane | Any position | Any position |
| Shock resistance | Permissible acceleration conforming to IEC 60068-2-27 | 15 gn - 11 ms | 15 gn - 11 ms |
| Vibration resistance | Permissible acceleration conforming to IEC 60068-2-6 | 4 gn | 4 gn |
| Dielectric strength at 50 Hz | Conforming to IEC 60947-4-1 | kV 2 | 2 |
| Surge withstand | Conforming to IEC 61000-4-5 | kV 6 | 6 |
| Resistance to electrostatic discharge | In open air | kV 8 (level 3) | 8 (level 3) |
| | In direct mode | kV 6 (level 3) | 6 (level 3) |
| Immunity to radiated radio-frequency disturbance | | V/m 10 (level 3) | 10 (level 3) |
| Immunity to fast transient currents | | kV 2 | 2 |
| Conducted emissions | Conforming to EN 55011 | Class A | Class A |
| Conducted HF disturbance | Conforming to EN 61000-4-6 | V 10 | 10 |



TeSys Protect

LR97, LT47 Electronic over current relays

Characteristics

| Characteristics | | | | | | | | | | | |
|---|-------------------|--|-----------------------|-------------------------|---|---------------------|---|---------------------|---|--------------|-------|
| Auxiliary contact characteristics | | | | | | | | | | | |
| Relay type | | LR97D●●●●● | | | | LT47●●●●● | | | | | |
| Contact type | | 1 NO/NC | | | | 1 N/O + 1N/C | | | | | |
| Conventional thermal current | | A | 3 | | | | 3 | | | | |
| Maximum hold consumption of controlled contactor coils (occasional operating cycles of contact 95-96) | | Conforming to IEC 60947 | V | ~ 24 | ~ 48 | ~ 110 | ~ 220 | ~ 24 | ~ 48 | ~ 110 | ~ 220 |
| | | | VA | 70 | 140 | 360 | 360 | 70 | 140 | 360 | 360 |
| | | | V | ~ 24 | ~ 48 | ~ 110 | ~ 220 | ~ 24 | ~ 48 | ~ 110 | ~ 220 |
| | | | W | 55 | 55 | 28 | 28 | 55 | 55 | 28 | 28 |
| Short-circuit protection | | By gG, BS fuses. Maximum rating or GB2 circuit breaker | A | 3 | | | | 3 | | | |
| Connection by cable or lug-clamps | | | | | | | | | | | |
| Flexible cable without cable end | 1 or 2 conductors | Min. | mm² | 1 x 0.75 | | | | 1 x 1 | | | |
| | | Max. | mm² | 2 x 2.5 | | | | 2 x 2.5 | | | |
| Flexible cable with cable end | 1 or 2 conductors | Min. | mm² | 1 x 0.34 | | | | 1 x 1 | | | |
| | | Max. | mm² | 1 x 1.5 + 1 x 2.5 | | | | 2 x 2.5 | | | |
| External Ø of lugs | | | mm | 7 | | | | 7 | | | |
| Ø of screw | | | mm | M3 | | | | M3.5 | | | |
| Tightening torque | | | N.m | 0.6...1.2 | | | | 0.8...1.7 | | | |
| Electrical characteristics of power circuit | | | | | | | | | | | |
| Relay type | | | | LR97D015●● to LR97D25●● | | LR97D38●● | | LT47●●●●● | | | |
| Setting range | | Depending on model | | A | 0.3...38 | | 0.5...60 | | | | |
| Tripping class | | | | | Adjustable | | Adjustable | | | | |
| Rated insulation voltage (Ui) | | Conforming to IEC 60947-4-1 | | V | 690 | | 690 | | | | |
| | | Conforming to UL, CSA | | V | 600 | | 600 | | | | |
| Rated impulse withstand voltage (Uimp) | | | | kV | 6 | | 6 | | | | |
| Frequency limits | | Of the operating current | | Hz | 50...60 | | 50...60 | | | | |
| Connection by cable or lug-clamps | | | | | | | | | | | |
| Flexible cable without cable end | 1 conductor | Min. | mm² | 1.5 | 2.5 | - | | | | | |
| | | Max. | mm² | 10 | 10 | - | | | | | |
| Flexible cable with cable end | 1 conductor | Min. | mm² | 1 | 1 | - | | | | | |
| | | Max. | mm² | 4 | 6 | - | | | | | |
| External Ø of lugs | | | mm | 10 | 12 | - | | | | | |
| Ø of screw | | | mm | M4 | M4 | - | | | | | |
| Tightening torque | | | N.m | 2 | 2 | - | | | | | |
| Operating characteristics | | | | | | | | | | | |
| Relay type | | | | LR97D●●●●● | | LT47●●●●S | | LT47●●●●A | | | |
| Adjustment | | Current | | A | "Load" knob | | "Load" knob | | "Load" knob | | |
| | | Time | | D-time knob | s | 0.5...30 | | 0.5...30 | | - | |
| | | | | O-time knob | s | 0.2/0.3...10 | | 0.2/0.3...10 | | 0.2/0.3...30 | |
| | | | | R-time knob | s | - | | - | | 1...120 | |
| Reset | | Manual | | | Reset button | | Reset button | | Reset button | | |
| | | Automatic | | | 120 s fixed | | - | | R-time knob: 1-120 s | | |
| | | Electrical | | | By interruption of power supply (minimum 0.1 s) | | By interruption of power supply (minimum 0.1 s) | | By interruption of power supply (minimum 0.1 s) | | |
| Protection functions | | | | | | | | | | | |
| Overload $I_{max} > I_{setting}$ | | Tripping | | | On starting | Steady state | On starting | Steady state | - | | |
| | | | | | Inhibited during D-time | After O-time | Inhibited during D-time | After O-time | After O-time | | |
| Locked rotor, mechanical jamming $I > 3 \times I_{setting}$ | | Tripping | | | After D-time | < 0.5 s | Inhibited during D-time | After O-time | After O-time | | |
| Sensitivity to phase failure | | Tripping | | | < 3 s | < 3 s | Inhibited during D-time | After O-time | After O-time | | |
| Status and fault signalling (see table page 24517/2) | | | | | | | | | | | |
| TEST/STOP function | | Test | | | No load | | No load | | No load | | |
| | | Stop | | | Under load | | Under load | | Under load | | |
| Sealing | | | | | Yes | | Yes | | Yes | | |

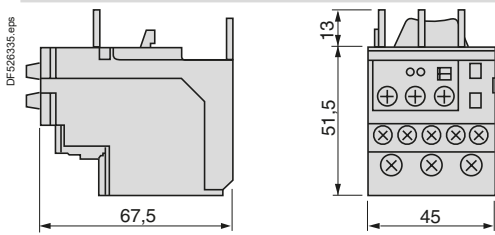
TeSys Protect

LR97, LT47 Electronic over current relays

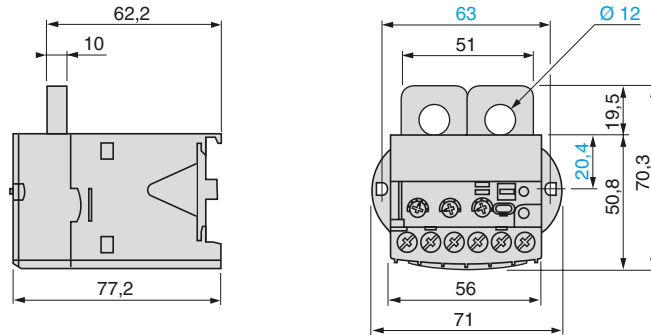
Dimensions, mounting, schemes

Dimensions

LR97D●●●●



LT47●●●●

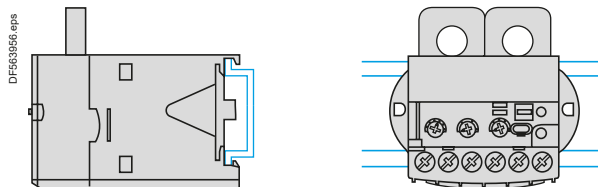
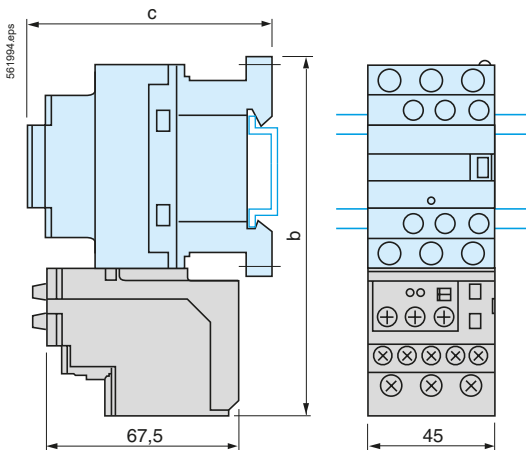


Mounting

LR97D●●●●

Direct mounting beneath the contactor

LT47●●●●

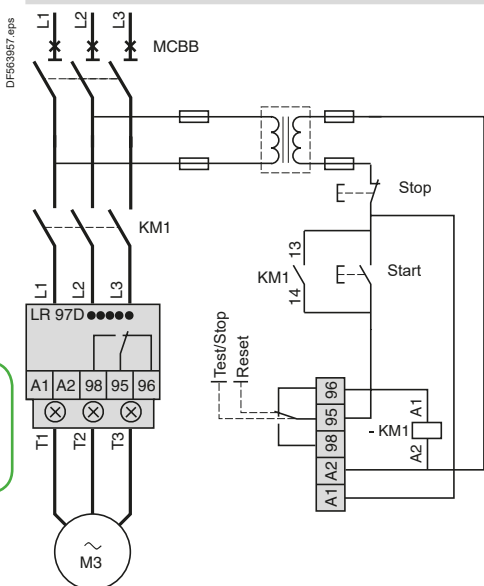


| LC1 | D09...D18 | D25...D38 |
|-----|---------------------------|-----------|
| b | 123 | 137 |
| c | See pages B8/76 and B8/77 | |

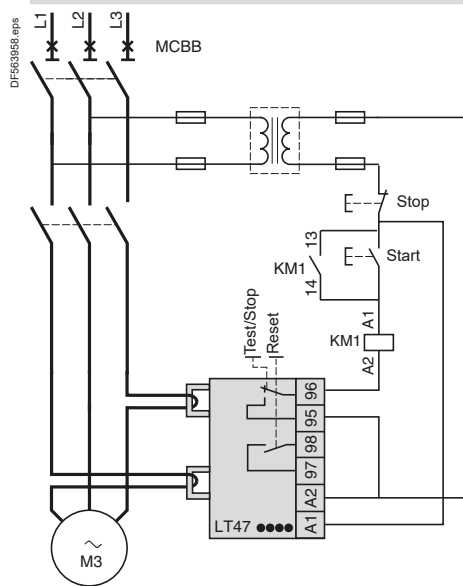
Note: Can be mounted on \perp rail.

Schemes

LR97D●●●●



LT47●●●●



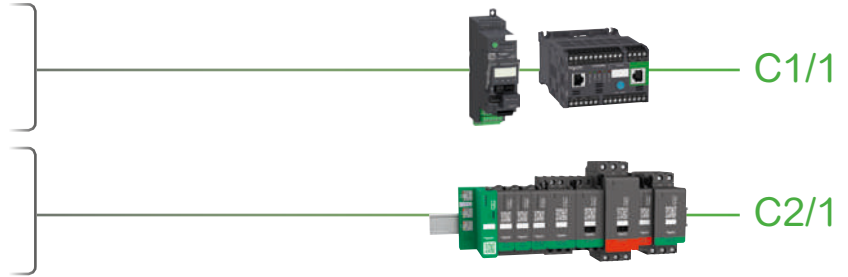
Part C

COMPONENTS FOR ADVANCED SOLUTIONS

TeSys Control
Ultra motor management controller





TeSys Active
T motor management system

TeSys Active
Island motor starters



Motor
management
devices

Control and
monitoring
island

| TeSys Ultra Motor management controller | | |
|--|---|-------|
| Type of product | Range | Pages |
| TeSys Ultra Motor management controller |  | C1/2 |
| Current transformers for TeSys Ultra Motor management controller | From 30 to 800 A | C1/2 |
| Type 2 coordination table for assemblies of: ■ circuit breaker + contactor + TeSys Ultra Motor management controller + current transformer ■ fuses + contactor + TeSys Ultra Motor management controller + current transformer | | C1/3 |
| TeSys T Motor management system | | |
| TeSys T Motor management controllers with Modbus, or CANopen, Devicenet, Profibus, Ethernet TCP/IP communication port |  | C1/4 |
| Extension modules for TeSys T Motor management system |  | C1/5 |
| HMI terminal and cables |  | C1/5 |
| Accessories | | C1/6 |

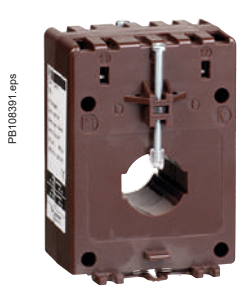
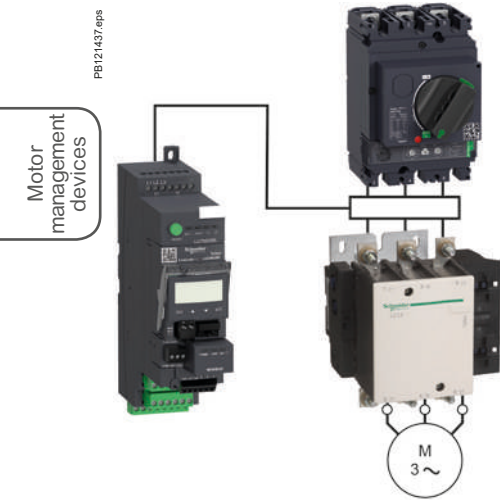
Motor management devices

Technical Data for Designers C1/13

TeSys Control

Ultra Motor management controller

Product references



References

Control bases (auxiliary supply voltage \approx 24 V)

| Connection | Control | For use with contactor | Reference | Weight kg |
|------------|---------|------------------------|-----------|-----------|
| Screws | Screws | LC1D●● | LUTM10BL | 0.800 |
| | | LC1F●●● | LUTM20BL | 0.800 |

Control units

| Description | Class | For motor type | Setting range | Reference | Weight kg |
|---------------|---------|----------------|---------------|-----------|-----------|
| Advanced | 10 | 3-phase | 0.35...1.05 | LUCBT1BL | 0.140 |
| | 20 | 3-phase | 0.35...1.05 | LUCDT1BL | 0.140 |
| Multifunction | 5 to 30 | 3-phase | 0.35...1.05 | LUCMT1BL | 0.175 |

Current transformers

| Operating current | | Reference | Weight kg |
|-------------------|-----------|-----------|-----------|
| Primary | Secondary | | |
| 50 | 1 | LUTC0501 | 0.330 |
| 100 | 1 | LUTC1001 | 0.450 |
| 200 | 1 | LUTC2001 | 0.590 |
| 400 | 1 | LUTC4001 | 0.870 |
| 800 | 1 | LUTC8001 | 1.210 |

Function modules and communication modules

The Ultra Motor management controller is compatible with the modules listed below:

- Thermal overload alarm module LUFW10,
- Motor load indication module LUFV2,
- Communication modules:
 - Modbus (LULC033),
 - CANopen (LULC08),
 - DeviceNet (LULC09),
 - Advantys STB (LULC15).

Note: Communication modules LULC07 (Profibus DP), ASILUFC5 and ASILUFC51 (AS-Interface) are not compatible with the Ultra controller. Module LUFW10 is only compatible with control units LUCBT1BL and LUCDT1BL.

TeSys Control

Ultra Motor management controller

Product references

Combinations providing type 2 coordination

With Circuit breaker

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 400/415 V | | Circuit breaker | | | Contactor | Ultra controller | Current transformers |
|--|-----|-----------------|----------|----------------------------------|--------------------------|------------------|----------------------|
| PkW | IeA | Reference | Rating A | I _{rm} ⁽¹⁾ A | Reference ⁽²⁾ | Reference | Reference |
| 18.5 | 35 | GV3L40 | 40 | 560 | LC1D50A | LUTM + LUC● | 3 x LUTC0501 |
| 22 | 41 | GV3L50 | 50 | 700 | LC1D50A | LUTM + LUC● | 3 x LUTC1001 |
| 30 | 55 | GV3L65 | 65 | 910 | LC1D65A | LUTM + LUC● | 3 x LUTC1001 |
| 37 | 66 | GV4L80 | 80 | 1040 | LC1D80 | LUTM + LUC● | 3 x LUTC1001 |
| 45 | 80 | NSX100HMA | 100 | 1300 | LC1D95 | LUTM + LUC● | 3 x LUTC1001 |
| 55 | 97 | NSX160HMA | 150 | 1350 | LC1D115 | LUTM + LUC● | 3 x LUTC2001 |
| 75 | 132 | NSX160HMA | 150 | 1800 | LC1D150 | LUTM + LUC● | 3 x LUTC2001 |
| 90 | 160 | NSX250HMA | 220 | 2200 | LC1F185 | LUTM + LUC● | 3 x LUTC2001 |
| 110 | 195 | NSX250HMA | 220 | 2640 | LC1F225 | LUTM + LUC● | 3 x LUTC4001 |
| 132 | 230 | NSX400HMA | 320 | 3200 | LC1F265 | LUTM + LUC● | 3 x LUTC4001 |
| 160 | 280 | NSX400HMA | 320 | 4160 | LC1F330 | LUTM + LUC● | 3 x LUTC4001 |
| 200 | 350 | NSX630HMA | 500 | 5000 | LC1F400 | LUTM + LUC● | 3 x LUTC4001 |
| 220 | 385 | NSX630HMA | 500 | 5500 | LC1F400 | LUTM + LUC● | 3 x LUTC4001 |
| 250 | 430 | NSX630HMA | 500 | 6000 | LC1F500 | LUTM + LUC● | 3 x LUTC8001 |

With fuses

| Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 400/415 V | | Switch-disconnector fuse | aM fuses | | Contactor | Ultra controller | Current transformers |
|--|-----|--------------------------|----------|----------|--------------------------|------------------|----------------------|
| PkW | IeA | Reference | Size | Rating A | Reference ⁽²⁾ | Reference | Reference |
| 18.5 | 35 | GS●F | 14 x 51 | 40 | LC1D40A | LUTM + LUC● | 3 x LUTC0501 |
| 22 | 41 | GS●J | 22 x 58 | 50 | LC1D50A | LUTM + LUC● | 3 x LUTC1001 |
| 30 | 55 | GS●J | 22 x 58 | 80 | LC1D80 | LUTM + LUC● | 3 x LUTC1001 |
| 37 | 66 | GS●J | 22 x 58 | 100 | LC1D80 | LUTM + LUC● | 3 x LUTC1001 |
| 45 | 80 | GS●J | 22 x 58 | 100 | LC1D95 | LUTM + LUC● | 3 x LUTC1001 |
| 55 | 97 | GS●L | T0 | 125 | LC1D115 | LUTM + LUC● | 3 x LUTC2001 |
| 75 | 132 | GS●L | T0 | 160 | LC1D150 | LUTM + LUC● | 3 x LUTC2001 |
| 90 | 160 | GS●N | T1 | 200 | LC1F185 | LUTM + LUC● | 3 x LUTC2001 |
| 110 | 195 | GS●N | T1 | 250 | LC1F225 | LUTM + LUC● | 3 x LUTC4001 |
| 132 | 230 | GS●QQ | T2 | 315 | LC1F265 | LUTM + LUC● | 3 x LUTC4001 |
| 160 | 280 | GS●QQ | T2 | 400 | LC1F330 | LUTM + LUC● | 3 x LUTC4001 |
| 200 | 350 | GS2S | T3 | 500 | LC1F400 | LUTM + LUC● | 3 x LUTC4001 |
| 220 | 385 | GS2S | T3 | 500 | LC1F400 | LUTM + LUC● | 3 x LUTC4001 |
| 250 | 430 | GS2S | T3 | 500 | LC1F500 | LUTM + LUC● | 3 x LUTC8001 |
| 315 | 540 | GS2S | T3 | 630 | LC1F630 | LUTM + LUC● | 3 x LUTC8001 |

(1) I_{rm}: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

Motor management devices



TeSys Active

T Motor management system

Product references

Motor management devices



PB121434.eps

LTMR08MBD



PB121440.eps

LTMR08CBD



PB121441.eps

LTMR08DBD



PB121442.eps

LTMR08PBD



PB121443.eps

LTMR08EBD

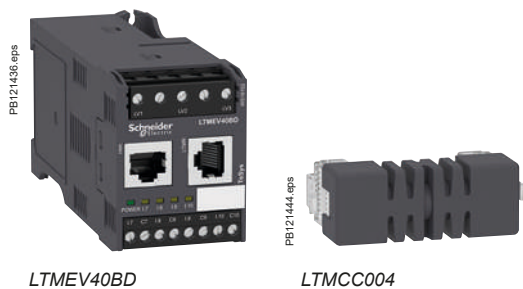
Controllers

| Setting range | Control voltage | Current range | Reference |
|--|--|------------------|------------|
| A | V | A | |
| For Modbus | | | |
| 8 | $\overline{\sim}$ 24 \sim 100...240 | 0.4...8 | LTMR08MBD |
| 27 | $\overline{\sim}$ 24 \sim 100...240 | 1.35...27 | LTMR27MBD |
| 100 | $\overline{\sim}$ 24 \sim 100...240 | 5...100 | LTMR100MBD |
| For CANopen | | | |
| 8 | $\overline{\sim}$ 24 \sim 100...240 | 0.4...8 | LTMR08CBD |
| 27 | $\overline{\sim}$ 24 \sim 100...240 | 1.35...27 | LTMR27CBD |
| 100 | $\overline{\sim}$ 24 \sim 100...240 | 5...100 | LTMR100CBD |
| For DeviceNet | | | |
| 8 | $\overline{\sim}$ 24 \sim 100...240 | 0.4...8 | LTMR08DBD |
| 27 | $\overline{\sim}$ 24 \sim 100...240 | 1.35...27 | LTMR27DBD |
| 100 | $\overline{\sim}$ 24 \sim 100...240 | 5...100 | LTMR100DBD |
| For Profibus DP | | | |
| 8 | $\overline{\sim}$ 24 \sim 100...240 | 0.4...8 | LTMR08PBD |
| 27 | $\overline{\sim}$ 24 \sim 100...240 | 1.35...27 | LTMR27PBD |
| 100 | $\overline{\sim}$ 24 \sim 100...240 | 5...100 | LTMR100PBD |
| For Ethernet TCP/IP (communication protocols: Modbus/TCP and EtherNet/IP) | | | |
| 8 | $\overline{\sim}$ 24 \sim 100...240 | 0.4...8 | LTMR08EBD |
| 27 | $\overline{\sim}$ 24 \sim 100...240 | 1.35...27 | LTMR27EBD |
| 100 | $\overline{\sim}$ 24 \sim 100...240 | 5...100 | LTMR100EBD |
| Filter | | | |
| Control voltage | Current max | Reference | |
| V | mA | | |
| \sim 150...240 | 130 | LTM9F | |

TeSys Active

T Motor management system

Product references



Extension modules (with voltage measurement on the 3 phases)

| Input control voltage | Number of inputs | Supply to the electronics | Reference |
|-----------------------|------------------|---------------------------|------------------|
| V | | | |
| 24 | 4 | Via the controller | LTMEV40BD |
| ~ 100...240 | 4 | Via the controller | LTMEV40FM |

HMI terminals

| Description | Supply Voltage | Reference |
|--|---|---------------|
| Operator control unit | Languages: English French Spanish Supply via the controller | LTMCU |
| Operator control unit with Fast Device Replacement Service (FDR) | Languages: English French Spanish Supply via the controller | LTMCUF |

| Kit for portable LTM CU | | | Reference |
|---|-------------------------------|----------|-----------------|
| Description | Number and type of connectors | Length m | Reference |
| Connecting cables for the LTM CU control unit | 2 x RJ45 | 1 | LTM9CU10 |
| | | 3 | LTM9CU30 |
| Connecting cables for the XBT N410 | SUB-D 25-way female RJ45 | 2.5 | XBTZ938 |

Cables

| Description | Number and type of connectors | Length m | Reference |
|---|-------------------------------|----------|-------------------------------|
| Connecting cables For connecting the controller to the extension module | 2 x RJ45 | 0.04 | LTMCC004⁽¹⁾ |
| | | 0.3 | LTM9CEXP03 |
| | | 1 | LTM9CEXP10 |

⁽¹⁾ Sold in lots of 6.

Motor management devices



TeSys Active

T Motor management system

Product references

Motor
management
devices

PF526393.eps



LT6CT4001



PB121445.eps



DA1TT...

Configuration tools

| Description | Composition | Reference | Weight kg |
|-------------------------|---------------------------------|----------------|--------------|
| Connection cable for PC | USB to RJ45 cable, length 2.5 m | TCSMCNAM3M002P | 0.200 |

Current transformers ⁽¹⁾

| Operational current | | Reference | Weight kg |
|---------------------|------------------|-----------|--------------|
| Primary A | Secondary A | | |
| 100 | 1 ⁽²⁾ | LT6CT1001 | 0.550 |
| 200 | 1 ⁽²⁾ | LT6CT2001 | 0.550 |
| 400 | 1 ⁽²⁾ | LT6CT4001 | 0.550 |
| 800 | 1 ⁽²⁾ | LT6CT8001 | 0.680 |

Earth fault toroids (marketed under the Schneider Electric brand)

| Rated operational current Ie A | Internal Ø of toroid mm | Reference | Weight kg |
|--------------------------------------|-------------------------------|-----------|--------------|
| Closed toroids, type A | | | |
| 65 | 30 | 50437 | 0.120 |
| 85 | 50 | 50438 | 0.200 |
| 160 | 80 | 50439 | 0.420 |
| 250 | 120 | 50440 | 0.530 |
| 400 | 200 | 50441 | 1.320 |
| 630 | 300 | 50442 | 2.230 |

Split toroids, type OA

| | | | |
|-----|-----|-------|-------|
| 85 | 46 | 50485 | 1.300 |
| 250 | 110 | 50486 | 3.200 |

PTC thermistor probes ⁽³⁾

| Description | Nominal Operating Temperature (NOT) °C | Colour | Unit reference ⁽⁴⁾ |
|---------------|--|-------------|----------------------------------|
| Triple probes | 90 | Green/green | DA1TT090 |
| | 110 | Brown/brown | DA1TT110 |
| | 120 | Grey/grey | DA1TT120 |
| | 130 | Blue/blue | DA1TT130 |
| | 140 | White/blue | DA1TT140 |
| | 150 | Black/black | DA1TT150 |
| | 160 | Blue/red | DA1TT160 |
| | 170 | White/green | DA1TT170 |

⁽¹⁾ The transformers offered for use with Ultra starters are suitable.
Please consult our "Ultra starter-controllers" catalogue.

⁽²⁾ For use with LTMRO8... controllers.

⁽³⁾ PTC: Positive Temperature Coefficient.

⁽⁴⁾ Sold in lots of 10.

| Marking accessories (to be ordered separately) | | | | |
|--|---|--------------|---------------------------|--------------|
| Description | Composition | Height mm | Unit reference | Weight kg |
| Clip-in markers | Strips of 10 identical numbers (0 to 9) or capital letters (A to Z) | 5 | NSYTRABF5● ⁽¹⁾ | 0.002 |
| | | 6 | NSYTRABF6● ⁽¹⁾ | 0.002 |

| Connection accessories | | | | |
|--|-------------|--------------|--------------|--|
| Description | Length m | Reference | Weight kg | |
| For Modbus connection | | | | |
| Cables fitted with 2 x RJ45 connectors | 0.3 | VW3A8306R03 | 0.045 | |
| | 1 | VW3A8306R10 | 0.065 | |
| | 3 | VW3A8306R30 | 0.125 | |
| T-junctions | 0.3 | VW3A8306TF03 | 0.032 | |
| | 1 | VW3A8306TF10 | 0.032 | |
| RS 485 line terminator | – | VW3A8306R | 0.012 | |

| For CANopen connection | | | | |
|-------------------------|--|-------------|----------------|-------|
| Cables | 50 | TSXCANCA50 | 4.930 | |
| | 100 | TSXCANCA100 | 8.800 | |
| | 300 | TSXCANCA300 | 24.560 | |
| IP20 connectors | Elbowed (90°) | – | TSXCANKCDF90T | 0.046 |
| SUB-D 9-way female | Straight | – | TSXCANKCDF180T | 0.049 |
| Line end adapter switch | Elbowed (90°) with SUB-D 9-way connector for connection to PC or diagnostic tool | – | TSXCANKCDF90TP | 0.051 |

| For DeviceNet connection | | | | |
|--------------------------|-----|-------------|--------|--|
| Cables | 50 | TSXCANCA50 | 4.930 | |
| | 100 | TSXCANCA100 | 8.800 | |
| | 300 | TSXCANCA300 | 24.560 | |

| For Profibus DP connection ⁽²⁾ | | | | |
|---|--|-------------|-------------|---|
| Cables | 100 | TSXPBSCA100 | – | |
| | 400 | TSXPBSCA400 | – | |
| Connectors | With line terminator | – | 490NAD91103 | – |
| | Without line terminator | – | 490NAD91104 | – |
| | With line terminator and terminal port | – | 490NAD91105 | – |

| For Ethernet TCP/IP connection | | | | |
|---|--------------|----|---------------------------|-------|
| Shielded twisted pair cables to standard EIA/TIA568 | | | | |
| Cables fitted with 2 x RJ45 connectors for connection to terminal equipment | Straight | 2 | 490NTW00002 | – |
| | | 5 | 490NTW00005 | – |
| | | 12 | 490NTW00012 | – |
| | | 40 | 490NTW00040 | – |
| | | 80 | 490NTW00080 | – |
| Shielded twisted pair cables, UL and CSA 22.1 approved | | | | |
| Cables fitted with 2 x RJ45 connectors for connection to terminal equipment | Straight | 2 | 490NTW00002U | – |
| | | 5 | 490NTW00005U | – |
| | | 12 | 490NTW00012U | – |
| | | 40 | 490NTW00040U | – |
| | | 80 | 490NTW00080U | – |
| Ethernet Connector | Elbowed 180° | – | LTM9CE180T ⁽³⁾ | 0.180 |

⁽¹⁾ When ordering, replace the ● in the reference with the number or letter required.

⁽²⁾ To order other connectors and cables (UL cables for harsh environments, etc.), please consult our Customer Care Centre.

⁽³⁾ Sold in packs of 6.

TeSys Active

T Motor management system

Product references

Motor management devices



| 0.37 to 355 kW at 400/415 V: type 2 coordination | | | | | | | |
|--|----------------|--------------------------|----------|--------|--------------------------|--------------|------------------------------|
| With switch-disconnector, contactor and class 10 controller | | | | | | | |
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 400/415 V | | Switch-disconnector | aM fuses | | Contactor | T controller | External current transformer |
| P | I _e | Reference ⁽¹⁾ | Size | Rating | Reference ⁽²⁾ | Reference | Reference |
| kW | A | | | A | | | |
| 0.37 | 1.1 | GS1DD | 10 x 38 | 2 | LC1D09 | LTMR08●● | – |
| 0.55 | 1.5 | GS1DD | 10 x 38 | 2 | LC1D09 | LTMR08●● | – |
| 0.75 | 1.9 | GS1DD | 10 x 38 | 4 | LC1D09 | LTMR08●● | – |
| 1.1 | 2.7 | GS1DD | 10 x 38 | 4 | LC1D09 | LTMR08●● | – |
| 1.5 | 3.6 | GS1DD | 10 x 38 | 4 | LC1D09 | LTMR08●● | – |
| 2.2 | 4.9 | GS1DD | 10 x 38 | 6 | LC1D09 | LTMR08●● | – |
| 3 | 6.5 | GS1DD | 10 x 38 | 8 | LC1D09 | LTMR27●● | – |
| 4 | 8.5 | GS1DD | 10 x 38 | 10 | LC1D09 | LTMR27●● | – |
| 5.5 | 11.5 | GS1DD | 10 x 38 | 16 | LC1D12 | LTMR27●● | – |
| 7.5 | 15.5 | GS1DD | 10 x 38 | 16 | LC1D25 | LTMR27●● | – |
| 10 | 19 | GS●F | 14 x 51 | 25 | LC1D25 | LTMR27●● | – |
| 11 | 22 | GS●F | 14 x 51 | 25 | LC1D25 | LTMR27●● | – |
| 15 | 29 | GS●F | 14 x 51 | 32 | LC1D32 | LTMR100●● | – |
| 18.5 | 35 | GS●F | 14 x 51 | 40 | LC1D40A | LTMR100●● | – |
| 22 | 41 | GS●J | 22 x 58 | 50 | LC1D50A | LTMR100●● | – |
| 30 | 55 | GS●J | 22 x 58 | 80 | LC1D65A | LTMR100●● | – |
| 37 | 66 | GS●J | 22 x 58 | 100 | LC1D80 | LTMR100●● | – |
| 45 | 80 | GS●J | 22 x 58 | 100 | LC1D95 | LTMR100●● | – |
| 55 | 97 | GS●K | T00 | 125 | LC1D115 | LTMR08●● | LT6CT2001 |
| 75 | 132 | GS●L | T0 | 160 | LC1D150 | LTMR08●● | LT6CT2001 |
| 90 | 160 | GS●N | T1 | 200 | LC1F185 | LTMR08●● | LT6CT2001 |
| 110 | 195 | GS●N | T1 | 250 | LC1F225 | LTMR08●● | LT6CT4001 |
| 132 | 230 | GS●QQ | T2 | 315 | LC1F265 | LTMR08●● | LT6CT4001 |
| 160 | 280 | GS●QQ | T2 | 355 | LC1F400 | LTMR08●● | LT6CT4001 |
| 200 | 350 | GS2S | T3 | 500 | LC1F400 | LTMR08●● | LT6CT8001 |
| 250 | 430 | GS2S | T3 | 500 | LC1F500 | LTMR08●● | LT6CT8001 |
| 315 | 540 | GS2S | T3 | 630 | LC1F630 | LTMR08●● | LT6CT8001 |
| 355 | 610 | GS2V | T4 | 800 | LC1F630 | LTMR08●● | LT6CT8001 |

(1) GS●: GS1 for direct operator, GS2 for external operator.
 (2) For reversing operation, replace the prefix LC1 with LC2.

TeSys Active

T Motor management system

Product references

| 0.06 to 250 kW at 400/415 V: type 2 coordination | | | | | | |
|--|----------------|-----------------|-----------------|-----------|--------------|------------------------------|
| With Circuit breaker, contactor and class 10 controller | | | | | | |
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 400/415 V | | | Circuit breaker | Contactor | T controller | External current transformer |
| P | I _e | I _{cc} | Reference | Reference | Reference | Reference |
| kW | A | kA | | | | |
| 0.06 | 0.2 | 130 | GV2L03 | LC1D09 | LTMR08●● | – |
| 0.09 | 0.3 | 130 | GV2L03 | LC1D09 | LTMR08●● | – |
| 0.12 | 0.44 | 130 | GV2L04 | LC1D09 | LTMR08●● | – |
| 0.18 | 0.6 | 130 | GV2L04 | LC1D09 | LTMR08●● | – |
| 0.25 | 0.85 | 130 | GV2L05 | LC1D09 | LTMR08●● | – |
| 0.37 | 1.1 | 130 | GV2L05 | LC1D09 | LTMR08●● | – |
| 0.55 | 1.5 | 130 | GV2L06 | LC1D09 | LTMR08●● | – |
| 0.75 | 1.9 | 130 | GV2L07 | LC1D09 | LTMR08●● | – |
| 1.1 | 2.7 | 130 | GV2L07 | LC1D18 | LTMR08●● | – |
| 1.5 | 3.6 | 130 | GV2L08 | LC1D18 | LTMR08●● | – |
| 2.2 | 4.9 | 130 | GV2L10 | LC1D18 | LTMR08●● | – |
| 3 | 6.5 | 130 | GV2L14 | LC1D18 | LTMR08●● | – |
| 4 | 8.5 | 130 | GV2L14 | LC1D18 | LTMR27●● | – |
| 5.5 | 11.5 | 130 | GV2L16 | LC1D25 | LTMR27●● | – |
| 7.5 | 15.5 | 50 | GV2L20 | LC1D25 | LTMR27●● | – |
| 9 | 18.1 | 50 | GV2L22 | LC1D25 | LTMR27●● | – |
| 11 | 22 | 50 | GV2L22 | LC1D25 | LTMR27●● | – |
| 15 | 29 | 50 | GV3L32 | LC1D40A | LTMR100●● | – |
| 18.5 | 35 | 50 | GV3L40 | LC1D50A | LTMR100●● | – |
| 22 | 41 | 50 | GV3L50 | LC1D50A | LTMR100●● | – |
| 30 | 55 | 50 | GV3L65 | LC1D65A | LTMR100●● | – |
| 37 | 66 | 70 | GV4LE80S | LC1D80 | LTMR100●● | – |
| 45 | 80 | 70 | NSX100HMA | LC1D115 | LTMR100●● | – |

Motor management devices



TeSys Active

T Motor management system

Product references

Motor management devices



| 0.06 to 250 kW at 400/415 V: type 2 coordination | | | | | | |
|--|------------------|--------------------|-----------------|-----------|--------------|------------------------------|
| With circuit breaker, contactor and class 10 controller | | | | | | |
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 400/415 V | | | Circuit breaker | Contactor | T controller | External current transformer |
| P kW | I _e A | I _{cc} kA | Reference | Reference | Reference | Reference |
| 55 | 97 | 50 | NSX160NMA | LC1D115 | LTMR08●● | LT6CT2001 |
| 55 | 97 | 70 | NSX160HMA | LC1D115 | LTMR08●● | LT6CT2001 |
| 75 | 132 | 50 | NSX160NMA | LC1D150 | LTMR08●● | LT6CT2001 |
| 75 | 132 | 70 | NSX160HMA | LC1D150 | LTMR08●● | LT6CT2001 |
| 90 | 160 | 50 | NSX250NMA | LC1F185 | LTMR08●● | LT6CT2001 |
| 90 | 160 | 70 | NSX250HMA | LC1F185 | LTMR08●● | LT6CT2001 |
| 110 | 195 | 50 | NSX250NMA | LC1F225 | LTMR08●● | LT6CT2001 |
| 110 | 195 | 70 | NSX250HMA | LC1F225 | LTMR08●● | LT6CT2001 |
| 132 | 230 | 70 | NSX400HMA | LC1F265 | LTMR08●● | LT6CT4001 |
| 132 | 230 | 130 | NSX400LMA | LC1F265 | LTMR08●● | LT6CT4001 |
| 160 | 280 | 70 | NSX400HMA | LC1F330 | LTMR08●● | LT6CT4001 |
| 160 | 280 | 130 | NSX400LMA | LC1F330 | LTMR08●● | LT6CT4001 |
| 200 | 350 | 70 | NSX630HMA | LC1F400 | LTMR08●● | LT6CT4001 |
| 200 | 350 | 130 | NSX630LMA | LC1F400 | LTMR08●● | LT6CT4001 |
| 220 | 388 | 70 | NSX630HMA | LC1F500 | LTMR08●● | LT6CT4001 |
| 220 | 388 | 130 | NSX630LMA | LC1F500 | LTMR08●● | LT6CT4001 |
| 250 | 430 | 70 | NSX630HMA | LC1F500 | LTMR08●● | LT6CT8001 |
| 250 | 430 | 130 | NSX630LMA | LC1F500 | LTMR08●● | LT6CT8001 |

| Substitution table | | | | | | |
|--------------------|--|---------------|--|----------------------------|------------|--|
| Motor current | Old range LT6P multifunction protection relay | | | New range T controllers | | |
| | Reference | Reference | External current transformer Reference | Reference | Reference | External current transformer Reference |
| | ~ 100...240 V | ≡ 24 V | | ~ 100...240 V | ≡ 24 V | |
| I < 5 A | LT6POM005FM | LT6POM005S144 | – | LTMR08●FM | LTMR08●BD | – |
| 5 A < I < 25 A | LT6POM025FM | LT6POM025S144 | – | LTMR27●FM | LTMR27●BD | – |
| 25 A < I < 100 A | LT6POM005FM | LT6POM005S144 | LT6CT1001 | LTMR100●FM | LTMR100●BD | – |
| 100 A < I < 200 A | LT6POM005FM | LT6POM005S144 | LT6CT2001 | LTMR08●FM | LTMR08●BD | LT6CT2001 |
| 200 A < I < 400 A | LT6POM005FM | LT6POM005S144 | LT6CT4001 | LTMR08●FM | LTMR08●BD | LT6CT4001 |
| 400 A < I < 800 A | LT6POM005FM | LT6POM005S144 | LT6CT8001 | LTMR08●FM | LTMR08●BD | LT6CT8001 |

TeSys Active

T Motor management system

Product references

| 0.37 to 400 kW at 690 V: type 2 coordination | | | | | | | |
|--|----------------|----------------------------|----------|--------|-----------|--------------|------------------------------|
| With switch-disconnector, contactor and class 10 controller | | | | | | | |
| Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 | | Switch-disconnector (1) | aM fuses | | Contactor | T controller | External current transformer |
| P | I _e | Reference | Size | Rating | Reference | Reference | Reference |
| kW | A | | | A | | | |
| 0.37 | 0.64 | GS●F | 14 x 51 | 1 | LC1D09 | LTMR08●● | – |
| 0.55 | 0.87 | GS●F | 14 x 51 | 2 | LC1D09 | LTMR08●● | – |
| 0.75 | 1.1 | GS●F | 14 x 51 | 2 | LC1D09 | LTMR08●● | – |
| 1.1 | 1.6 | GS●F | 14 x 51 | 2 | LC1D09 | LTMR08●● | – |
| 1.5 | 2.1 | GS●F | 14 x 51 | 4 | LC1D09 | LTMR08●● | – |
| 2.2 | 2.8 | GS●F | 14 x 51 | 4 | LC1D09 | LTMR08●● | – |
| 3 | 3.8 | GS●F | 14 x 51 | 6 | LC1D09 | LTMR08●● | – |
| 4 | 4.9 | GS●F | 14 x 51 | 6 | LC1D09 | LTMR08●● | – |
| 5.5 | 6.7 | GS●F | 14 x 51 | 8 | LC1D25 | LTMR08●● | – |
| 7.5 | 8.9 | GS●F | 14 x 51 | 10 | LC1D25 | LTMR27●● | – |
| 11 | 12.8 | GS●F | 14 x 51 | 16 | LC1D25 | LTMR27●● | – |
| 15 | 17 | GS●G | T000 | 20 | LC1D32 | LTMR27●● | – |
| 18.5 | 21 | GS●G | T000 | 25 | LC1D32 | LTMR27●● | – |
| 22 | 24 | GS●G | T000 | 32 | LC1D40A | LTMR27●● | – |
| 30 | 32 | GS●G | T000 | 40 | LC1D50A | LTMR100●● | – |
| 37 | 39 | GS●J | 22 x 58 | 50 | LC1D65A | LTMR100●● | – |
| 45 | 47 | GS●J | 22 x 58 | 63 | LC1D80 | LTMR100●● | – |
| 55 | 57 | GS●J | 22 x 58 | 80 | LC1D115 | LTMR100●● | – |
| 75 | 77 | GS●KK | T00 | 100 | LC1D115 | LTMR100●● | – |
| 90 | 93 | GS●KK | T00 | 125 | LC1F150 | LTMR08●● | LT6CT2001 |
| 110 | 113 | GS●KK | T00 | 125 | LC1F185 | LTMR08●● | LT6CT2001 |
| 132 | 134 | GS●L | T0 | 160 | LC1F265 | LTMR08●● | LT6CT2001 |
| 160 | 162 | GS●N | T1 | 200 | LC1F265 | LTMR08●● | LT6CT2001 |
| 200 | 203 | GS●N | T1 | 250 | LC1F330 | LTMR08●● | LT6CT4001 |
| 220 | 224 | GS●QQ | T2 | 250 | LC1F400 | LTMR08●● | LT6CT4001 |
| 250 | 250 | GS●QQ | T2 | 315 | LC1F400 | LTMR08●● | LT6CT4001 |
| 290 | 292 | GS●QQ | T2 | 355 | LC1F500 | LTMR08●● | LT6CT4001 |
| 315 | 313 | GS●QQ | T2 | 355 | LC1F500 | LTMR08●● | LT6CT4001 |
| 355 | 354 | GS2S | T3 | 400 | LC1F630 | LTMR08●● | LT6CT4001 |
| 400 | 400 | GS2S | T3 | 500 | LC1F630 | LTMR08●● | LT6CT8001 |

(1) GS●: GS1 for direct operator, GS2 for external operator.

Characteristics:
pages C1/20 to C1/34

Curves:
page C1/35

Dimensions, mounting:
pages C1/36 to C1/37

Schemes:
pages C1/38 to C1/41



TeSys Control - TeSys Active

Ultra Motor management controller

T Motor management system

Product references

Motor
management
devices

| | |
|--------------|----------------|
| 50437 | LTMR08PFM |
| 50438 | LTMR100CBD |
| 50439 | LTMR100CFM |
| 50440 | LTMR100DBD |
| 50441 | LTMR100DFM |
| 50442 | LTMR100EBD |
| 50485 | LTMR100EFM |
| 50486 | LTMR100MBD |
| 490NAD91103 | LTMR100MFM |
| 490NAD91104 | LTMR100PBD |
| 490NAD91105 | LTMR100PFM |
| 490NTW00012U | LTMR27CBD |
| 490NTW00040U | LTMR27CFM |
| 490NTW00080U | LTMR27DBD |
| DA1TT090 | LTMR27DFM |
| DA1TT110 | LTMR27EBD |
| DA1TT120 | LTMR27EFM |
| DA1TT130 | LTMR27MBD |
| DA1TT140 | LTMR27MFM |
| DA1TT150 | LTMR27PBD |
| DA1TT160 | LTMR27PFM |
| DA1TT170 | LUCBT1BL |
| LT6CT1001 | LUCDT1BL |
| LT6CT2001 | LUCMT1BL |
| LT6CT4001 | LUTC0501 |
| LT6CT8001 | LUTC1001 |
| LTM9BPS | LUTC2001 |
| LTM9CE180T | LUTC4001 |
| LTM9CEXP10 | LUTC8001 |
| LTM9CU10 | LUTM10BL |
| LTM9CU30 | LUTM20BL |
| LTM9F | TSXCANCA100 |
| LTM9KCU | TSXCANCA300 |
| LTMCU | TSXCANCA50 |
| LTMCUF | TSXCANKCDF180T |
| LTMEV40BD | TSXCANKCDF90T |
| LTMEV40FM | TSXCANKCDF90TP |
| LTMR08CBD | TSXPBSCA100 |
| LTMR08CFM | TSXPBSCA400 |
| LTMR08DBD | VW3A8306R |
| LTMR08DFM | VW3A8306R03 |
| LTMR08EBD | VW3A8306R10 |
| LTMR08EFM | VW3A8306R30 |
| LTMR08MBD | VW3A8306TF03 |
| LTMR08MFM | VW3A8306TF10 |
| LTMR08PBD | XBTZ938 |

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

Contents

Ultra Motor management controller:

- > characteristics..... C1/14 to C1/17
- > dimensions..... C1/18
- > schemes..... C1/19

T Motor management system:

- > characteristics..... C1/20 to C1/34
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- > dimensions..... C1/36 to C1/37
- > schemes..... C1/38 to C1/41

TeSys Control

Ultra Motor management controller

Characteristics

Motor management devices



Introduction

Above 32 A, TeSys Ultra Motor management controller provides a motor starter management solution identical to that provided by TeSys Ultra starter-controllers.

Used in conjunction with a short-circuit protection device and a contactor, it provides a motor starter whose functions are the same as those of a TeSys Ultra starter-controller and, in particular, provides the following functions: overload protection, motor starter control and application monitoring.

It consists of a control unit whose adjustment range is compatible with the secondary of current transformers, plus a control base which also allows fitment of a function module or a communication module.

It requires a \sim 24 V external power supply.

The secondaries of current transformers, the \sim 24 V power supply, the 10 inputs and the 5 outputs are connected by screw terminal block.

Application example

Detecting blockage of a rock crusher by monitoring the motor current.

Operating conditions

- Power: 90 kW at 400 V.
- In: 185 A.
- Duty class S1.
- Control circuit voltage: \sim 230 V
- Control-command by PLC and serial link using the Modbus protocol.

Products used

| Description | Item | Quantity | Reference | Page |
|-----------------------------|------|----------|-----------|-------------------|
| Controller | 1 | 1 | LUTM20BL | C1/2 |
| | | | | C1/3 |
| Multifunction control unit | 2 | 1 | LUCMT1BL | A4/12 |
| Modbus communication module | 3 | 1 | LULC033 | A4/27 to A4/31 |
| Current transformer | 4 | 3 | LUTC4001 | C1/2 |
| | | | | C1/3 |
| Contactor | 5 | 1 | LC1F185P7 | – |
| Circuit breaker | 6 | 1 | GV5P150F | – |

Functions performed

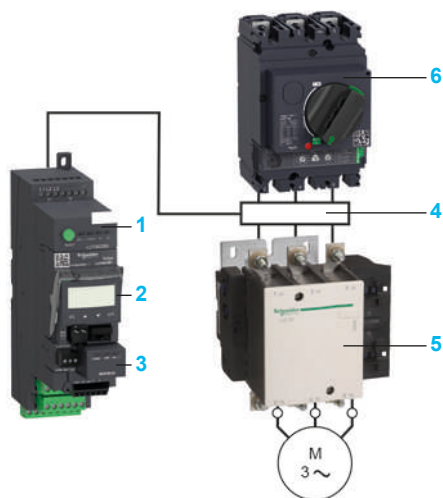
- Short-circuit protection with level of protection of 70 kA at 400V.
- Electronic protection against thermal overloads with an adjustment range of 4.
- Detection of crusher blockage by monitoring the induced overcurrent. To use the "overtorque or jam" function, the following parameters must be entered:
 - trip: the answer yes/no enables or disables the function,
 - time before tripping: the time period during which the value of the current must be above the tripping threshold in order to cause tripping (adjustable from 1 to 30 s).
 - tripping threshold: value as a % of the load current ratio in relation to the setting current. If the ratio remains above this threshold for the time specified in the previous parameter, the product trips (adjustable from 100 to 800 %).

It is possible to set the parameter for an alarm at a preset threshold under the same conditions as above.

Ref.



PB121437 eps



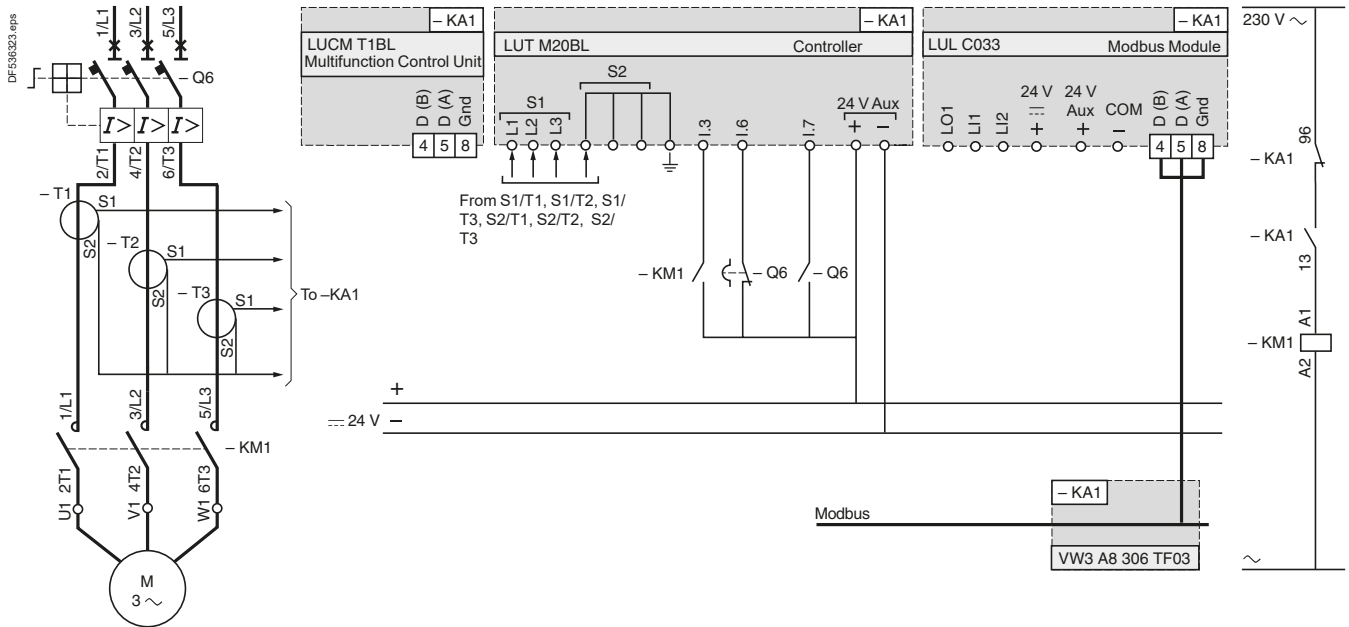
TeSys Control

Ultra Motor management controller

Characteristics

Application example

Scheme



Other functions

The multifunction control unit incorporates other control and protection functions, such as: monitoring and control of phase current, alarm, ... Communication module LUL C033 also provides a programmable output and two programmable inputs.

Motor management devices

Ref.

TeSys Control

Ultra Motor management controller

Characteristics

Motor management devices



| Environment | | | |
|---|--|--|---|
| Control base and control unit type | | LUTM + LUCBT1BL or LUCDT1BL without LULC | LUTM + LUCMT1BL or LULC |
| Product certifications | | UL, CSA, ASEFA, UKCA | |
| Conforming to standards | | IEC/EN 60947-4-1, UL 508, CSA C22-2 N°14 | |
| Rated insulation voltage of the outputs (Ui) | Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3 | V | 250 |
| | Conforming to UL508, CSA C22-2 n°14 | V | 250 |
| Rated impulse withstand voltage of the outputs (Uimp) | Conforming to IEC/EN 60947-4-1 | kV | 4 |
| Degree of protection Conforming to IEC/EN 60947-1 (protection against direct finger contact) | Front panel (outside connection zone) | | IP 40 |
| | Front panel and wired terminals | | IP 20 |
| | Other faces | | IP 20 |
| Protective treatment | Conforming to IEC/EN 60068-2-30 | Cycles | 12 |
| | Conforming to IEC/EN 60068-2-11 | h | 48 |
| Ambient air temperature around the device | Storage | °C | - 40...+ 85 |
| | Operation | °C | - 25...+ 70 - 25...+ 60 |
| Maximum operating altitude | | m | 2000 |
| Operating positions Without derating | In relation to normal vertical mounting plane | | |
| Flame resistance | Conforming to UL 94 | | V2 |
| | Conforming to IEC/EN 60695-2-12 | °C | 960 (parts supporting live components) 650 |
| Shock resistance 1/2 sine wave = 11 ms | Conforming to IEC/EN60068-2-27 ⁽¹⁾ | | 15 gn |
| Vibration resistance 5...300 Hz | Conforming to IEC/EN 60068-2-6 ⁽¹⁾ | | 4 gn |
| Resistance to electrostatic discharge | Conforming to IEC/EN 61000-4-2 | kV | In open air: 8 - Level 3 |
| | | kV | On contact: 6 - Level 3 |
| Resistance to radiated fields | Conforming to IEC/EN 61000-4-3 | V/m | 10 - Level 3 |
| Immunity to fast transient currents | Conforming to IEC/EN 61000-4-4 | kV | CT outputs and inputs: 4 - Level 4 |
| | | kV | Inputs and supply: 2 - Level 3 |
| Immunity to radioelectric fields | Conforming to IEC/EN 61000-4-6 | V | 10 |
| Control base and control unit relays | | | |
| Immunity to dissipated shock waves | Conforming to IEC/EN 60947-4-1 | | Common mode Serial mode |
| | Output relays / power line | kV | 4 2 |
| | Inputs | kV | 2 1 |
| | Serial communication | kV | 2 - |

⁽¹⁾ Without modifying the contact states, in the most unfavourable direction.

TeSys Control

Ultra Motor management controller

Characteristics

| Control circuit supply characteristics | | | |
|--|---------------------------------------|-----------------------|----------------|
| Operational voltage | | V | ≈ 20.4...28.8 |
| Power consumption | | W | 2 max |
| Associated protection | | A | gG fuse, 0.5 |
| Cabling | | | |
| Connectors | Pitch | mm | 5 |
| Flexible cable without cable end | 1 conductor | mm² | 0.2...2.5 |
| | 2 identical conductors | mm² | 0.2...1.5 |
| Flexible cable with cable end | | | |
| Without insulated ferrule | 1 conductor | mm² | 0.25...2.5 |
| | 2 identical conductors | mm² | 0.25...1 |
| With insulated ferrule | 1 conductor | mm² | 0.25...2.5 |
| | 2 identical conductors ⁽¹⁾ | mm² | 0.5...1.5 |
| Solid cable without cable end | 1 conductor | mm² | 0.2...2.5 |
| | 2 identical conductors | mm² | 0.2...1 |
| Conductor size | 1 conductor | | AWG24 to AWG12 |
| Tightening torque | | N.m | 0.5...0.6 |
| Flat screwdriver | | mm | 3 |

| Input characteristics | | |
|-----------------------|----------|---|
| Operational voltage | V | ≈ 24 |
| Logic inputs | | Logic state 1: $I \geq 6 \text{ mA} - 16 \text{ V}$ Logic state 0: $I \leq 1.5 \text{ mA} - 5 \text{ V}$ |

| Discrete output characteristics | | | |
|---|------------------------------|--|--|
| Base controller type | | LUTM10BL | LUTM20BL |
| Type | | Single break volt-free contacts | |
| Load | a.c. supply | C 300 | B 300 |
| | d.c. supply | 24 V/5 A | 24 V/5 A |
| Permissible power in cat. AC-15 | For 500 000 operating cycles | VA 180 | 500 |
| Permissible power in cat. DC-13 | For 500 000 operating cycles | W 30 | 30 |
| Associated protection | | A gG fuse, 4 | gG fuse, 4 |
| Used with contactor type ⁽²⁾ | | Control voltage ≈ 24 V: LP1K, LC1D09...D95. Control voltage ≈ 24...240 V: LC1K, LC1D. | Control voltage ≈ 100...240 V: LC1K, LC1D, LC1F185...F500 |

| Characteristics of external current transformers LUTC●●●1 | | | | | | |
|---|-----------------------|----------|---------|---------|----------|----------|
| Precision | | Class 5P | | | | |
| Precision limit factor | | 10 | | | | |
| Maximum operating temperature | °C | 70 | | | | |
| Transformer ratio | | 50/1 | 100/1 | 200/1 | 400/1 | 800/1 |
| Diameter of conductor passage hole | mm | 22 | 35 | 32 | – | – |
| Maximum wire c.s.a. | mm² | 30 x 10 | 40 x 10 | 65 x 32 | 38 x 127 | 53 x 127 |

⁽¹⁾ Use a double cable end.

⁽²⁾ For other combinations, use an intermediate relay between the output of controller LUTM and the contactor coil.

TeSys Control

Ultra Motor management controller

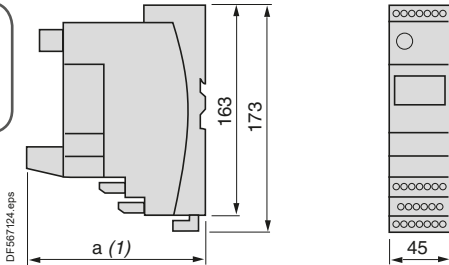
Dimensions, mounting

Dimensions, mounting

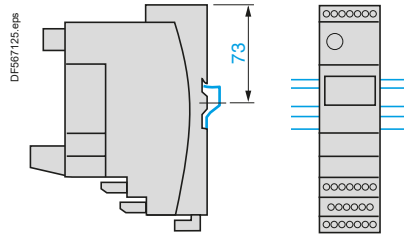
Controllers

LUTM●0BL

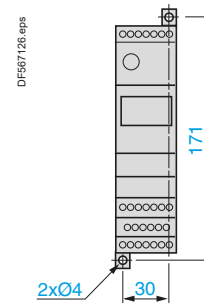
Motor management devices



Rail mounting



Rail mounting



a

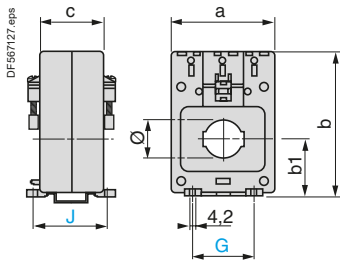
| | |
|---|-----|
| With Modbus module | 135 |
| With Advantys STB, CANopen or DeviceNet modules | 147 |

(1) Depth with communication module.

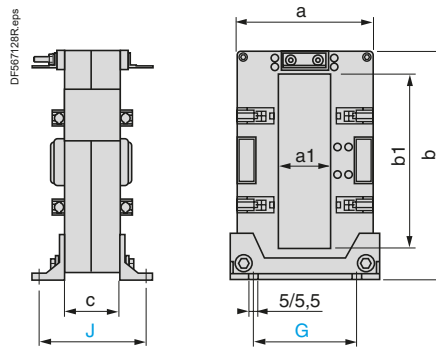
Current transformers

LUTC0501...1001

Ref.



LUTC2001...8001



| LUTC | a | b | b1 | c | Ø | G | J |
|------|----|-----|------|----|----|----|----|
| 0501 | 56 | 84 | 31 | 42 | 23 | 45 | 50 |
| 1001 | 77 | 107 | 42.5 | 46 | 35 | 45 | 54 |

| LUTC | a | b | b1 | c | Ø | G | J |
|------|-----|----|-----|-----|----|-----|----|
| 2001 | 90 | 32 | 94 | 55 | 40 | 62 | 62 |
| 4001 | 99 | 38 | 160 | 127 | 40 | 75 | 65 |
| 8001 | 125 | 54 | 160 | 127 | 40 | 100 | 65 |

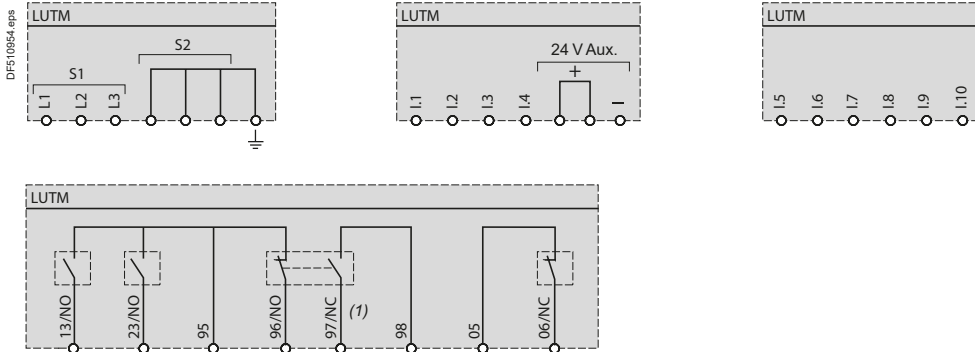
TeSys Control

Ultra Motor management controller

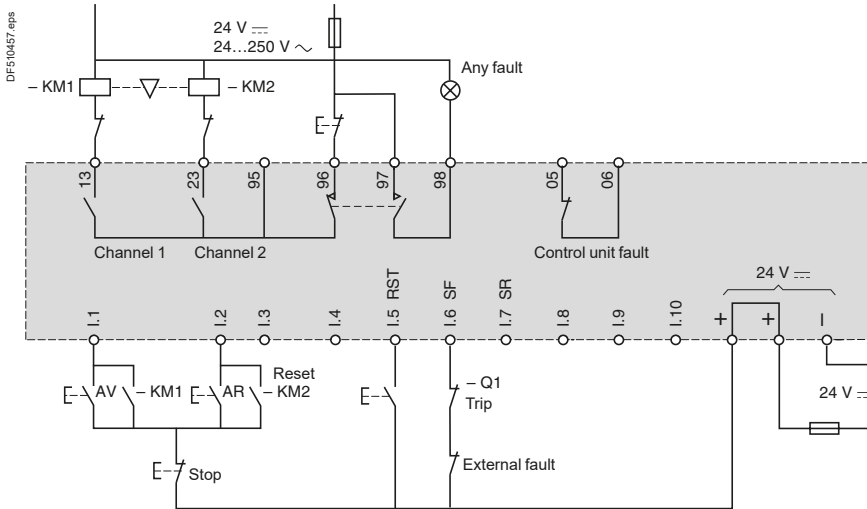
Schemes

Schemes

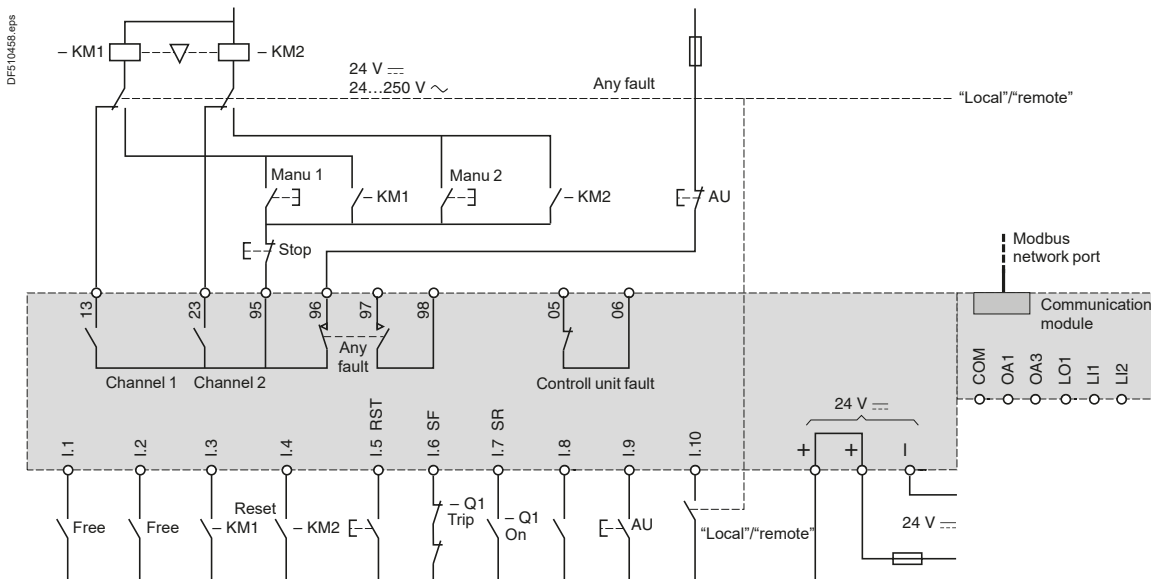
Reversing controller LUTM



3-wire control, pulsed start with maintaining contact



Control for Modbus communication module LULC033



(1) The contacts are represented with controller powered up and not in a fault condition.

Characteristics:
pages C1/14 to C1/17

References:
pages C1/2 and C1/3

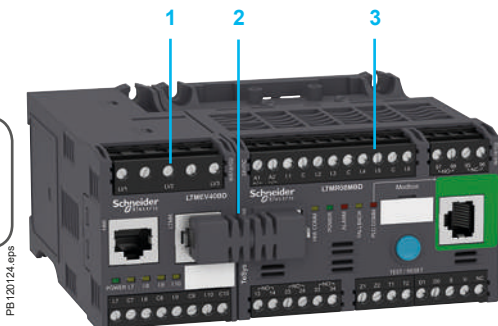
Dimensions, mounting:
page C1/18

TeSys Active

T Motor management system

Characteristics

Motor management devices



- 1 LTMEV40BD extension module
- 2 LTMCC004 2 x RJ45 jumper
- 3 LTMR08MBD controller

Ref.



Introduction

TeSys T is a motor management system that provides protection, metering and monitoring functions for single-phase and 3-phase, constant speed, a.c. motors up to 810 A.

Suitable for the harshest applications, this product range offers:

- high-performance multifunction protection, independent of the automation system
- a local HMI control unit for reading, displaying and modifying the parameters monitored, diagnostics, etc.
- configuration using SoMove software
- connection to the automation system via a communication network (selection according to various protocols).

Application

The TeSys T motor management system is used for motor control and protection in harsh industrial applications, in which downtime must be avoided because it is very costly: Oil & Gas, chemical industry, water treatment, metal, minerals and mining, pharmaceutical industry, microelectronics, tunnels, airports etc.

With TeSys T motor management system, unexpected stops of a process or manufacturing, associated with a motor, are anticipated via predictive analysis of fault situations. Fault tripping is therefore reduced to a minimum.

Its use in motor control panels makes it possible to:

- increase the operational availability of installations
- improve flexibility from project design through to implementation
- increase productivity by making available all information needed to run the system.

The motor management system integrates perfectly with Schneider Electric low voltage equipment, such as Okken, Blokset and Prisma.

PB121449.eps



- 1 Magnetic Circuit breaker
- 2 Contactor
- 3 Controller with extension module
- 4 Operator control unit

TeSys Active

T Motor management system

Characteristics



LTMRO8MBD



LTMEV40BD



LTMCUF

Introduction

Composition of the motor management system

The system comprises:

- an LTMR motor management controller
 - with internal current transformer up to 100 A
 - above 100 A, by external current transformer up to 810 A
- an LTME extension module
- an LTMCU operator control unit
- configuration software incorporated in the SoMove software application
- accessories for system set-up.

Communication

The LTMR controller is equipped with a communication interface to allow remote monitoring and control of the motor. All motor information is then available at automation system level.

The following networks are available:

- Modbus, CANopen, DeviceNet, ProfiBus DP and Ethernet TCP/IP (with two communication protocols, Modbus/TCP and EtherNet/IP).

T system functions

Protection functions

- against thermal overload
- against phase imbalance and phase failure
- thermal motor protection via PTC probes
- against phase reversal
- against earth faults
- against long starting times and motor stalling
- against automatic load shedding and restarting
- against load fluctuations (I, U, P)
- against variations of Cos φ (power factor).

Metering functions

- Measurements (rms values):
 - current on the 3 phases
 - voltage on the 3 phases (shedding)
 - motor temperature
 - earth fault.
- Values calculated:
 - average current
 - frequency
 - Cos φ (power factor), power, power consumption...

Motor control functions

A motor managed by TeSys T motor management system can be controlled:

- locally, using the logic inputs present on the product, or via the HMI terminal
- remotely, via the network (connection by terminal block or connector except for DeviceNet: terminal block only).

Motor control modes

5 predefined motor control modes are incorporated in the controller:

- overload mode: monitoring of motors whose control is not managed by the controller,
- independent mode: starting of non-reversing motors,
- reverser mode: starting of reversing motors,
- 2-step mode: 2-step starting of motors (star-delta, by autotransformer and by resistor),
- 2-speed mode: 2-speed starting of motors (Dahlander, pole changer).

A 6th "Custom" mode is available to allow the user to create a specific motor control mode that is not predefined in the controller.

Statistical and diagnostic functions

- Fault statistics: counters per type of protection and history of the last 5 faults.
- Motor statistics: saving of motor statistics values.
- Diagnosis of faults affecting correct operation of the product.

TeSys Active

T Motor management system

Characteristics

Motor management devices



LTM02M8D0

Ref.



Controller ref. LTMR

The controller is the central component in the motor management system. It manages the basic functions such as:

- measurement of 3-phase current via integral current transformers from 0.4 to 100 A (up to 810 A by external current transformers)
- measurement of earth current by external earth fault toroid
- measurement of motor temperature by PTC probe
- inputs and outputs for the various motor control modes, fault management and associated functions.

Characteristics

Supply

2 types of controller power supply are available:

- 24 V $\overline{\text{DC}}$
- 100...240 V \sim .

Current ranges

3 current ranges allow measurement of motor current from 0.4 to 100 A:

- 0.4...8 A
- 1.35...27 A
- 5...100 A.

For use with external current transformers, choose the 0.4...8 A range (1 or 5 A current transformer secondary).

Inputs

- 6 discrete logic inputs.

Outputs

- 3 relay logic outputs (1N/O).
- 1 relay output for fault signalling (1N/O + 1N/C).

Measurements

- Connections for a temperature probe.
- Connections for an earth fault toroid.

Extension module ref. LTME

The extension module adds the following functionalities to the T controller:

- voltage measurement on the 3 phases. This enables it to calculate numerous engine monitoring parameters (power, frequency, Cos ϕ ...)
- 4 additional inputs.

Characteristics

Inputs

- 4 discrete logic inputs (independent).

Power supplies

- 2 types of power supply for the inputs: 24 V $\overline{\text{DC}}$ and 100...240 V \sim .
- A 24 V $\overline{\text{DC}}$ expansion module can be assembled with a 24 V $\overline{\text{DC}}$ controller or with a 100...240 V \sim controller.
- A 100...240 V \sim expansion module can be assembled with a 100...240 V \sim controller.

Voltage measurement between phases up to 690 V nominal.



LTMCU

Human/Machine Interfaces (HMI)

Depending on the application, 2 types of HMI can be used with the LTMR controller.

- The LTMCU operator control unit:
 - entirely dedicated to the T range
 - only for control/monitoring of an LTMR controller.
- A Magelis XBTN410 terminal for control/monitoring of 1 to 8 LTMR controllers.

Operator control unit ref. LTMCU

Dedicated exclusively to T controllers, control unit LTMCU makes it possible to:

- configure the parameters of the LTMR controller
- display information on controller configuration and operation
- monitor the alarms and faults generated by the controller
- local control of the motor via the local control interface (keys can be customised). Three different languages can be loaded into the LTMCU controller at the same time.

By default, these 3 languages are:

- LTMCU: English, French and Spanish

Note: English is the only compulsory language.

A language download utility (LangTool), together with all the other languages, are available on the website "www.se.com".

This tool allows the languages present in the LTMCU control unit to be adapted.

The LTMCU HMI control unit has an RJ45 port, protected by a flexible cover to provide a good level of protection (IP54).

This port on the front panel allows connection to a PC, via a connecting cable, in order to use SoMove software.

In this case, the control unit acts as a transmitter and all information can then be viewed in SoMove.

The LTMCU HMI can be used as a portable version by using the separate kit LTM9KCU. This kit consists of two snap-on plastic shells (tool-free mounting) fitted with a simple fixing system that uses magnets for mounting on all types of metal surfaces.

The Magelis XBT N410 HMI terminal

Two applications have been predefined for T motor management system.

Depending on the application loaded, the HMI terminal makes it possible to:

- configure and monitor a motor starter (LTM_1T1_V1.dop)
- monitor and modify certain parameters on up to 8 motor starters (LTM_1T8_X_V1.dop) ⁽¹⁾.

XBTL 1000 programming software is needed for loading applications into the HMI terminal.

These applications are available on the website "www.se.com".

(1) Replace the X with an E for the English version, or an F for the French version.

TeSys Active

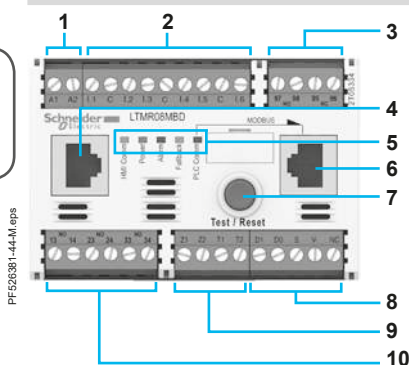
T Motor management system

Characteristics

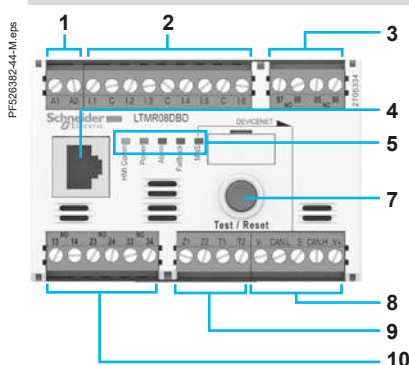
Motor management devices

Controllers ref. LTMR

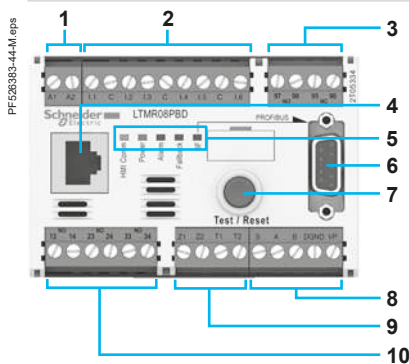
Modbus



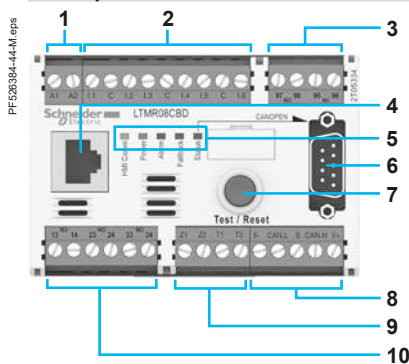
DeviceNet



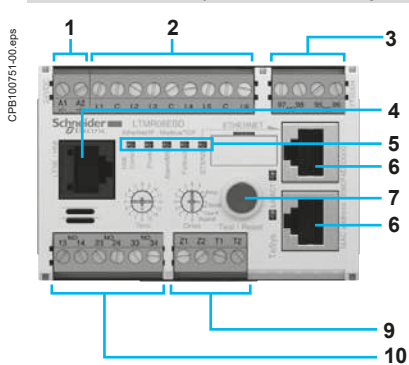
Profibus DP



CANopen



Ethernet TCP/IP (communication protocols: Modbus/TCP and EtherNet/IP)



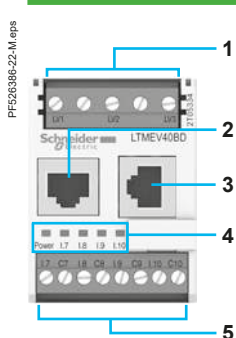
Controllers feature the following on their front panel:

- 1 Controller power supply.
- 2 Input connections.
- 3 Fault outputs (N/O+N/C).
- 4 Port for connection to the HMI terminal, a PC or an extension module (RJ45).
- 5 Controller status LEDs.
- 6 Network port for connection to the network by connector (except DeviceNet) ⁽¹⁾.
- 7 Test/Reset button.
- 8 Connection to the network by terminal block (except Ethernet TCP/IP).
- 9 Connection for an earth fault toroid and temperature probes.
- 10 Outputs for motor control mode function.

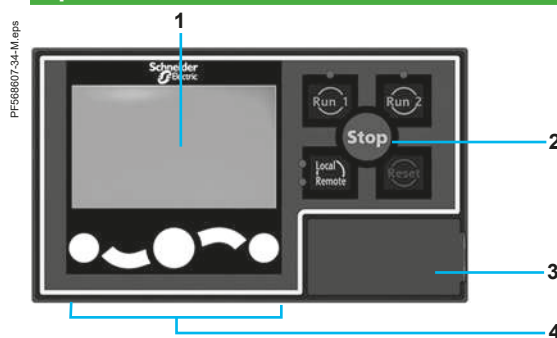
- Ref.
-
-
-

⁽¹⁾ Connection using power extension (daisy-chaining) is possible for Ethernet TCP/IP.

Extension modules ref. LTMEV40



Operator control unit ref. LTMCU



Extension modules have the following on their front face:

- 1 Inputs for voltage measurement.
- 2 Port for connection to the HMI terminal or to the PC.
- 3 Port for connection to the controller.
- 4 Extension module status LEDs.
- 5 Connection of additional inputs.

The control unit has the following on its front face:

- 1 Screen LCD display.
- 2 Local control interface including control keys and LEDs.
- 3 RJ45 port on front panel for connection to a PC (protected by a cover).
- 4 Contextual navigation keys.

| Thermal and current protection functions | | | | | |
|--|--|-----------------|---|-----------------|-----------------|
| Functions | Setting range | Controller LTMR | Controller and extension module (LTMR + LTME) | Alarm threshold | Fault threshold |
| Description | | | | | |
| Thermal overload: thermal protection of motor by monitoring current consumption | Class: 5, 10, 15, 20, 25, 30. Inverse ther/definite time | | | | |
| Motor temperature: thermal monitoring of the motor using temperature probes (winding, paper...). Up to 3 sensors in series. | PTC binary PTC/NTC analogue: 20 ...6500 Ohm | | | | |
| Phase imbalance: monitors the symmetry of currents. To be used for imbalance < 80 % of the average current ⁽¹⁾ . | 10...70% I average 0.2...20 s | | | | |
| Phase failure: monitors the symmetry of currents. To be used for imbalance < 80 % of the average current ⁽¹⁾ . | 0.1...30 s | | | | |
| Phase reversal: signals when the phase sequence is different from the defined sequence (motor running). | A-B-C A-C-B | | | | |
| Long starting time: monitors the motor starting time | 100...800 % of FLC ⁽²⁾ 1...200 s | | | | |
| Locked rotor: locking detected by a sudden increase in current after the start phase | 100...800 % of FLC ⁽²⁾ 1...30 s | | | | |
| Min/max current load limit variations: monitors motor load through variations of current around preset thresholds. | min.: 30...100 % of FLC ⁽²⁾ 1...200 s max.: 20...800 % of FLC ⁽²⁾ 1...250 s | | | | |
| Earth fault: signals internal insulation faults, by vectorial summing of external currents, via earth fault toroid. | internal: 50...500 % min FLC ⁽²⁾ 0.5...25 s external: 0.02...21 A 0.1...25 s | | | | |
| Frequent starting: Protects the motor against overheating due to frequent starting. | 0...999.9 s | | | | |

| Voltage and power protection functions | | | | | |
|---|--|--|--|--|--|
| Phase imbalance: monitors the symmetry of voltage between phases. To be used for imbalance < 40 % of the average voltage ⁽³⁾ . | 3...15 % 0.2...20 s | | | | |
| Phase failure: monitors the symmetry of voltage between phases. To be used for imbalance > 40 % of the average voltage ⁽³⁾ . | 0.1...30 s | | | | |
| Phase reversal: signals when the phase sequence is different from the defined sequence (motor stopped). | A-B-C A-C-B | | | | |
| Voltage variations. Min/max voltage limits: monitors voltage variations around preset thresholds. | min.: 70...99 % 0.2...25 s max.: 101...115 % 0.2...25 s | | | | |
| Load shedding: opens outputs O.1 and O.2 if voltage drops below a preset threshold. | 68...115 % 1...9999 s | | | | |
| Power variations. Min/max power limits: monitors power variations around preset thresholds. | 20...800 % 1...100 s | | | | |
| Variations of Cos φ. Min/max limits of Cos φ: monitors variations of Cos φ around preset thresholds. | 0...1 s 1...25 s | | | | |

Function performed.

(1) Average current value measured on the 3 phases.
 (2) FLC: Full Load Current (setting current).
 (3) Average voltage value measured on the 3 phases.

TeSys Active

T Motor management system

Characteristics

Motor management devices



| Motor control functions | | | |
|-------------------------|--|----------------------|--|
| Functions | Description | With controller LTMR | With controller LTMR and extension module LTME |
| Control modes | Local, via terminal block | ■ | ■ |
| | Local, via HMI terminal ⁽¹⁾ | ■ | ■ |
| | Remote, via network | ■ | ■ |
| Operating modes | Overload | ■ | ■ |
| | Independent | ■ | ■ |
| | Reverser | ■ | ■ |
| | 2-step | ■ | ■ |
| | 2-speed | ■ | ■ |
| | "Custom" mode | ■ | ■ |
| Fault management | Manual reset | ■ | ■ |
| | Automatic reset | ■ | ■ |
| | Remote reset | ■ | ■ |

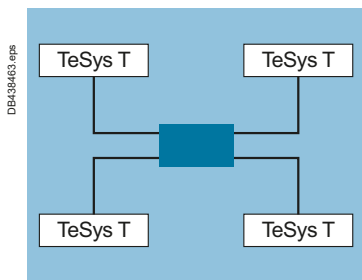
| Metering functions and statistics | | | | |
|-----------------------------------|--|---------------------------|----------------------|--|
| Functions | Description | Measurement range | With controller LTMR | With controller LTMR and extension module LTME |
| Measurements ⁽²⁾ | Current/Phase | 0.08...1000 A | ■ | ■ |
| | Earth current | 0.1633 x CT ratio | ■ | ■ |
| | Average current | 0.08...1000 A | ■ | ■ |
| | Current imbalance between phases | 0...200 % | ■ | ■ |
| | Thermal capacity level | 0...200 % | ■ | ■ |
| | Motor temperature rise | 0...6500 Ohm | ■ | ■ |
| | Frequency | 0... 100 Hz | ■ | ■ |
| | Voltage between phases | ~ 0...830 V | ■ | ■ |
| | Voltage imbalance between phases | 0...200 % | ■ | ■ |
| | Active power | 0...6553.5 kW | ■ | ■ |
| | Reactive power | 0...6553.5 kWr | ■ | ■ |
| | Cos φ (power factor) | 0...100 | ■ | ■ |
| | Active power consumption | 0...400 kWh | ■ | ■ |
| | Reactive power consumption | 0...400 kWrh | ■ | ■ |
| | Fault statistics | Protection fault counters | | ■ |
| Protection alarm counters | | | ■ | ■ |
| Diagnostic fault counters | | | ■ | ■ |
| Motor control function counters | | | ■ | ■ |
| Fault history | | | ■ | ■ |
| Fault diagnostics | Internal watchdog fault | | ■ | ■ |
| | Controller internal temperature | | ■ | ■ |
| | Temperature sensor connection | | ■ | ■ |
| | Current connection | | ■ | ■ |
| | Voltage connection | | ■ | ■ |
| | Motor control commands (start, stop, run check back and stop check back) | | ■ | ■ |
| | Control configuration checksum | | ■ | ■ |
| Motor statistics | Loss of communication | | ■ | ■ |
| | Number of motor control commands (O.1/O.2 starts) | | ■ | ■ |
| | Operating time | | ■ | ■ |
| | Number of starts/hour | | ■ | ■ |
| | Last start I max. | | ■ | ■ |
| Thermal overload statistics | Duration of last start | | ■ | ■ |
| | Time to trip | | ■ | ■ |
| System operating statistics | Time to restart | | ■ | ■ |
| | Run, ON, Start, alarm, fault. | | ■ | ■ |

(1) HMI: Human Machine Interface.
 (2) See measurement details page C1/32.

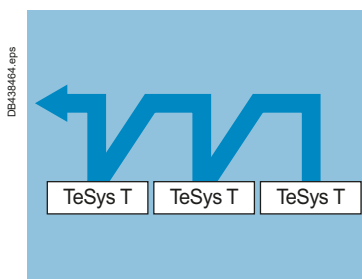
TeSys Active

T Motor management system

Characteristics



Star topology



Daisy chain topology

Star topology

In a star topology, all the peripherals are linked via an intermediate peripheral (hub or switch).

In industrial Ethernet applications, the use of full duplex switches (instead of hubs) as central peripherals is strongly recommended.

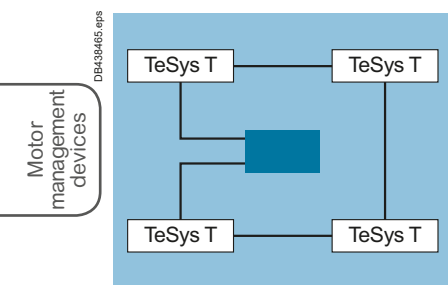
Daisy chain topology

Daisy chaining, at bus level, is another connection topology commonly used in industrial automation system networks. The cable segments link several peripherals to each other, constituting the peripheral "section" of the network cable.

Motor
management
devices

Ref.





Ring topology

Ethernet: different network topologies

Ring topology

In a ring topology, all the peripherals or components of the network infrastructure are connected within a loop.

This type of topology makes it possible to achieve different levels of redundancy of the network.

Ethernet ring

Ethernet rings are generally the main networks in applications where a high level of reliability is required. If a ring topology is required, the switches handling this function must be used.

Redundancy

Redundancy of the network infrastructure is the key to development of applications with high operational reliability.

Implementing a single or double ring architecture makes it possible to provide protection against breaks in network segments.

Single ring

The first level of redundancy can be achieved by installing a single ring.

ConneXium switches can be used to establish main network ring configurations.

The ring is created using RSTP protocol.

If a section of the line fails, the ring structure converts into a line type configuration.

Ethernet: different communication protocols

LTMR controllers communicating over an Ethernet network can communicate either using the Modbus/TCP communication protocol or using the EtherNet/IP communication protocol. Both protocols are loaded in the controller. One must be selected for the operation.

Note: EtherNet/IP communication protocol is supported by ODVA, also promoter of DeviceNet communication solution. Note that in EtherNet/IP, IP stands for Industrial Protocol.

- IP address Class for Ethernet TCP/IP version: Class A 20.ETH10/100.

Services available on Ethernet TCP/IP version

| | In Modbus/TCP | In Ethernet/IP |
|----------------------------|---------------|----------------|
| Web Server | ■ | ■ |
| Modbus messaging | ■ | |
| IO Messaging | | ■ |
| Explicit Messaging | | ■ |
| Client FDR | ■ | ■ |
| SNMP network administrator | ■ | ■ |
| RSTP | ■ | ■ |
| Discovery | ■ | ■ |
| Master IP | ■ | ■ |
| Broadcast Storm Protection | ■ | ■ |

Ref.

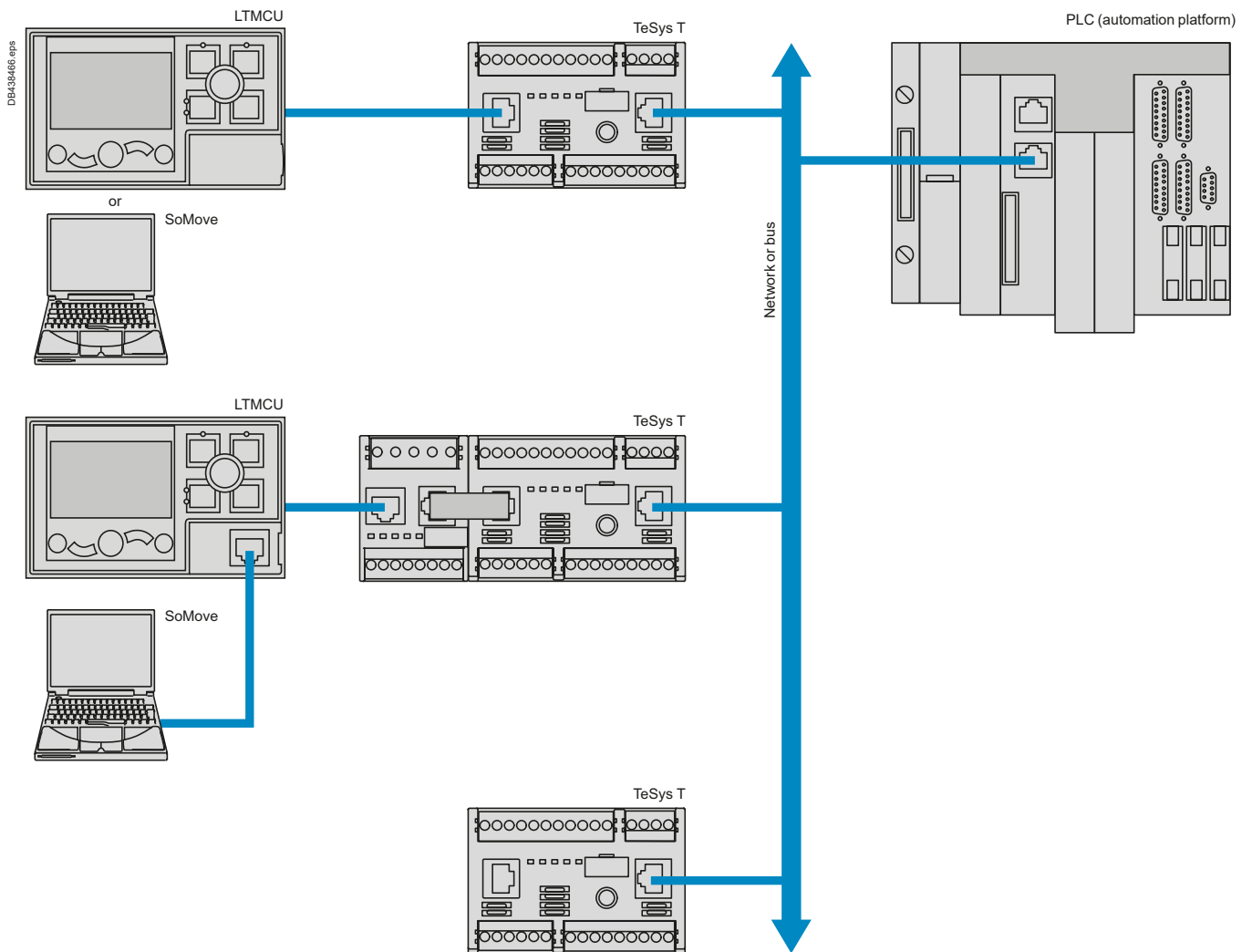


TeSys Active

T Motor management system

Characteristics

Possible configurations and applications



Motor management devices

Ref.

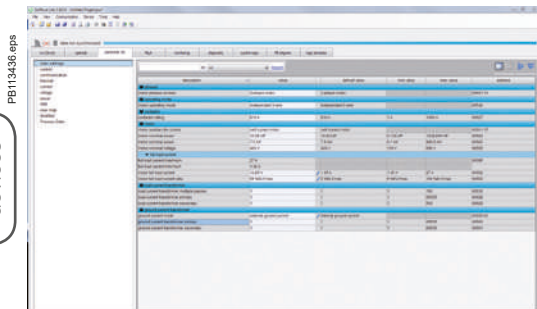


TeSys Active

T Motor management system

Characteristics

Motor
management
devices



Example of T configurator setup screen

Configuration with SoMove

The T configurator is incorporated in the SoMove software application, as from version 2.5. ⁽¹⁾

It allows configuration, commissioning and maintenance of motor starters protected by TeSys T motor management system.

A library containing predefined motor control mode functions is available in order to:

- allow standardisation
- avoid errors
- reduce motor starter setup times.

5 predefined motor control modes are incorporated in the controller:

- overload mode: monitoring of motors whose control is not managed by the controller
- independent mode: starting of non-reversing motors
- reverser mode: starting of reversing motors
- 2-step mode: 2-step starting of motors (star-delta, by autotransformer and by resistor)
- 2-speed mode: 2-speed starting of motors (Dahlander, pole changer).

By using logic functions, a "Custom" mode makes it possible to:

- easily adapt these predefined motor control mode functions to the specific needs of your applications
- create a link with the motor starter environment or
- create new functions.

The functions thus defined can be saved and used to build your function library for future applications.

To create special functions, a logic editor is incorporated in the configurator and allows a choice of 2 programming languages:

- function block
- structured text.

⁽¹⁾ An update file is available, free of charge, on the website "www.se.com". It will enable you to take advantage of the latest functions in the T motor management system.

Ref.

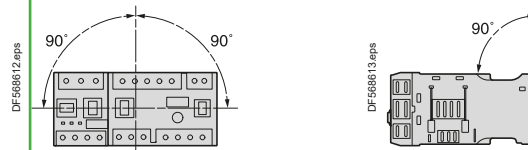


TeSys Active

T Motor management system

Characteristics

| Environment | | LTMR controllers | | LTMEV40 extension modules | | | |
|---|---|--|---|---------------------------|-------------|-------------|--------|
| Product type | | LTMR controllers | | LTMEV40 extension modules | | | |
| Conforming to standards | | IEC/EN 60947-4-1, UL60947-4-1A, CSA 22-2 n°60947-4-1, IACS E10 | | | | | |
| Product certifications | | UL, CSA, CE, CCC, UKCA, EAC/GOST, RCM/CTIC'K, Atex, Marine (BV, LROS, DNV, RINA, ABS) ⁽¹⁾ | | | | | |
| Rated insulation voltage of the outputs (Ui) | Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution 3 | V | 690 | | | | |
| | Conforming to UL 508, CSA C222 n° 14 | V | 690 | | | | |
| Rated impulse withstand voltage (Uimp) | Conforming to IEC/EN 60947-4-1 | | | | | | |
| | ~ 100...240 V supply, inputs and outputs | kV | 4 | 4 | | | |
| | --- 24 V supply, inputs and outputs | kV | 0.8 | 0.8 | | | |
| | Communication circuits | kV | 0.8 | - | | | |
| | Current or voltage measurement circuit | kV | 6 | 6 | | | |
| Short-circuit withstand | Conforming to IEC/EN 60947-4-1 | kA | 100 | | | | |
| Climatic withstand | Conforming to IEC/EN 60068-2-30 | | 12 x 24 hour cycles | | | | |
| | Conforming to IEC/EN 60070-2-11 | h | 48 | | | | |
| Ambient air temperature around the device | Storage | °C | -40...+80 | | | | |
| | Operation | °C | -20...+60 | | | | |
| Operating position without dating | In relation to normal vertical mounting plane | | ±30° in relation to mounting plate, ±90° | | | | |
| Flame resistance | Conforming to UL 94 | °C | 960 (for parts supporting live components) | | | | |
| | Conforming to IEC/EN 60695-2-12 | °C | 650 (for other parts) | | | | |
| Shock resistance (1/2 sine wave, 11 ms) | Conforming to IEC/EN 60068-2-27 ⁽²⁾ | | 15 gn | | | | |
| Vibration resistance | Conforming to IEC/EN 60068-2-6 ⁽²⁾ 5...300 Hz | | 4 gn (plate mounted) 1 gn (mounted on rail) | | | | |
| Resistance to electrostatic discharge | Conforming to IEC/EN 61000-4-2 | kV | In open air: 8 - Level 3 On contact: 6 - Level 3 | | | | |
| Immunity to radiated electromagnetic interference | Conforming to IEC 61000-4-3 | V/m | 10 - Level 3 | | | | |
| Immunity to fast transient bursts | Conforming to IEC 61000-4-4 | kV | On supply and relay outputs: 4 - Level 4 Other circuits: 2 - Level 3 | | | | |
| Immunity to radioelectric fields ⁽³⁾ | Conforming to IEC/EN 61000-4-6 | V | 10 - Level 3 | | | | |
| Immunity to dissipated shock waves | Conforming to IEC/EN 61000-4-5 | | Common mode | Serial mode | Common mode | Serial mode | |
| | Relay outputs and supply | kV | 4 | 2 | - | - | |
| | --- 24 V inputs | kV | 1 | 1 | 1 | 1 | |
| | ~ 100...240 V inputs | kV | 2 | 1 | 2 | 1 | |
| | Voltage inputs | kV | - | - | 4 | 2 | |
| | Communication | kV | 2 | - | 2 | - | |
| | Temperature sensor (IT1/IT2) | kV | 1 | 0.5 | - | - | |
| Altitude derating | | | 2000 m | 3000 m | 3500 m | 4000 m | 4500 m |
| | Rated operational voltage (Ui) | | 1 | 0.93 | 0.87 | 0.8 | 0.7 |
| | Max. operating temperature | | 1 | 0.93 | 0.92 | 0.9 | 0.88 |



(1) Certain certifications are pending; please consult your Customer Care Centre.

(2) Without modifying the contact states, in the most unfavorable direction.

(3) This product has been designed for use in environment A and in B, it may cause unwanted electromagnetic disturbance to other devices, which may require the implementation of adequate mitigation measures.

TeSys Active

T Motor management system

Characteristics

Motor management devices

Ref.



| Controller and extension module characteristics | | | | | | | |
|---|---|------------------------|---|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| Product type | | | Controllers | | Extension modules | | |
| | | | LTMR●●●BD | LTMR●●●FM | LTMEV40BD | LTMEV40FM | |
| Control supply | | | | | | | |
| Operational voltage (U) | Conforming to IEC/EN 60947-1 | V | ≡ 24 | ~ 100...240 | - | | |
| Resistance to voltage dips | Conforming to IEC/EN 61000-4-11 | V | 0 for 3 ms 70 % of U for 500 ms | | - | | |
| Associated protection | | A | gG fuse, 0.5 | | - | | |
| Operational voltage | Limit values | V | ≡ 20.4...26.24 | ~ 93.5...264 | - | | |
| Current consumption | 50/60 Hz | mA | ≡ 56...127 | ~ 8...62.8 | - | | |
| Connectors | Pitch | mm | 5.08 | | 5.08 | | |
| Flexible cable without cable end | 1 conductor | mm ² | 0.2...2.5 | | 0.2...2.5 | | |
| | 2 identical conductors | mm ² | 0.2...1.5 | | 0.2...1.5 | | |
| Flexible cable with cable end | Without insulated ferrule | 1 conductor | 0.25...2.5 | | 0.25...2.5 | | |
| | | 2 identical conductors | 0.5...1.5 | | 0.5...1.5 | | |
| | With insulated ferrule | 1 conductor | 0.25...2.5 | | 0.25...2.5 | | |
| | | 2 identical conductors | 0.2...1 | | 0.2...1 | | |
| Solid cable without cable end | 1 conductor | mm ² | 0.2...2.5 | | 0.2...2.5 | | |
| | 2 identical conductors | mm ² | 0.2...1 | | 0.2...1 | | |
| Conductor size | | | AWG24 to AWG14 | | AWG24 to AWG14 | | |
| Tightening torque | | N.m | 0.5...0.6 | | 0.5...0.6 | | |
| Flat screwdriver | | mm | 3 | | 3 | | |
| Input characteristics | | | | | | | |
| Nominal values | Conforming to IEC/EN 61131-1 | | Type 1 positive logic (≡: resistive, ~: capacitive) | | | | |
| | Voltage | V | ≡ 24 | ~ 100...240 | ≡ 24 | ~ 100...240 | |
| | Current | mA | ≡ 7 | ~ 3.1 for 100 V ~ 7.5 for 240 V | ≡ 7 | ~ 3.1 for 100 V ~ 7.5 for 240 V | |
| Logic inputs | Logic state 1 | Voltage | V | 15 min | 79 < U < 264 | 15 min | 79 < U < 264 |
| | | Current | mA | 2 min...15 max | 2 min at 110 V... 3 min at 220 V | 2 min...15 max | 2 min at 110 V... 3 min at 220 V |
| | Logic state 0 | Voltage | V | 5 max | 0 < U < 40 | 5 max | 0 < U < 40 |
| | | Current | mA | 15 max | 15 max | 15 max | 15 max |
| Response time | Change to state 1 | ms | 15 | 25 | 15 | 25 | |
| | Change to state 0 | ms | 5 | 25 | 5 | 25 | |
| Output characteristics | | | | | | | |
| Type | | | Volt free, single break | | | | |
| Load | ~ | | 250 V / 5 A B300 | | | | |
| | ≡ | | 30 V / 5 A | | | | |
| Permissible power in cat. AC-15 | For 500 000 operating cycles | VA | 480 / Ie max: 2 A | | | | |
| Permissible power in cat. DC-13 | For 500 000 operating cycles | W | 30 / Ie max: 1.25 A | | | | |
| Associated protection | | A | gG fuse, 4 | | | | |
| Max. frequency | | Hz | 2 | | | | |
| Max. operating level | | op. cycles/h | 1800 | | | | |
| Response time | Change to state 1 | ms | 10 max | | | | |
| | Change to state 0 | ms | 10 max | | | | |
| Measurement details | | | | | | | |
| Current | | | 1 % for the 0.4...8 A and 1.35...27 A ranges 2 % for the 5...100 A range | | | | |
| Voltage | | | 1 % from 100 to 830 V | | | | |
| Earth fault current | Internal measurement without earth fault toroid | | 5...15 % for current > 0.1 A in the 0.4...8 A range current > 0.2 A in the 1.35...27 A range current > 0.3 A in the 5...100 A range | | | | |
| | External measurement with earth fault toroid | | < 5 % or 0.01 A | | | | |
| Temperature measurement | | | 2 % | | | | |
| Power factor | | | 10 % | | | | |
| Active and reactive power | | | 15 % | | | | |
| Internal clock | | | ±30 min / year | | | | |

References: pages C1/4 to C1/11 Curves: page C1/35 Dimensions, mounting: pages C1/36 to C1/37 Schemes: pages C1/38 to C1/41

TeSys Active

T Motor management system

Characteristics

| Bus and network characteristics | | | | | | |
|---------------------------------|--|--------------------------|--|---------------------------|----------------------------------|---|
| Type of bus/network | | Modbus | CANopen | DeviceNet | Profibus DP | Ethernet |
| Physical interface | | 2-wire RS 485 | ISO 11898 | ISO 11898 | polarised 2-wire RS 485 | IEEE 802.3 |
| Addressing | | 1 to 247 | 1 to 127 | 1 to 64 | 1 to 125 | 0 to 159 ⁽¹⁾ |
| Transmission speeds | | 1.2 to 19.2 kb/s | 10, 20, 50, 125, 250, 500, 800 and 1000 kb/s + Auto baud | 125 to 500 kb/s | 9.6 kb to 12 Mb/s | 10/100 Mb/s, with automatic recognition |
| Connections | | RJ45/terminal block | 9-way SUB-D/terminal block | Terminal block | 9-way SUB-D/terminal block | RJ45 |
| Cables | | 2 shielded twisted pairs | 4 twisted, shielded wires | 4 twisted, shielded wires | 2 shielded twisted pairs, type A | 2 shielded twisted pairs |

| LTMCU operator control unit | | | |
|---|---|----|--|
| Environment | | | |
| Conforming to standards | | | IEC/EN 61131-2, UL60947-4-1A, CSA 22-2 n°60947-4-1 |
| Product certifications | | | UL, CSA, CE, EAC/GOST, RCM/CTIC'K |
| Ambient air temperature around the device | Storage | °C | -40...+80 |
| | Operation | °C | -20...+60 |
| Relative humidity | | | 15...95 % without condensation |
| Climatic withstand | Conforming to IEC/EN 60068-2-30 | | 12 x 24 hour cycles |
| Degree of protection | Conforming to IEC 60947-1 | | IP54 |
| Shock resistance | Conforming to IEC/EN 60068-2-27 | | 15 gn / 11ms |
| Vibration resistance | Conforming to IEC/EN 60068-2-6 5...300 Hz | | 4 gn |
| Flame resistance | Conforming to IEC 60947-1 | °C | 650 |
| | Conforming to UL 94 | | V2 |

| Electrical characteristics | | | |
|---|--------------------------------|------------|---|
| Supply to the product | | | Powered via the controller |
| Maximum current | | mA | 140 |
| Maximum power dissipated | | W | 1 |
| Resistance to electromagnetic discharge | Conforming to IEC/EN 61000-4-2 | kV | In open air: 8. Level 3 On contact: 4. Level 3 |
| Immunity to radiated electromagnetic interference | Conforming to IEC/EN 61000-4-3 | V/m | 10 - Level 3 |
| Immunity to fast transient bursts | Conforming to IEC/EN 61000-4-4 | kV | 2, shielded access. Level 3 |
| Immunity to radioelectric fields | Conforming to IEC/EN 61000-4-6 | V | 10. Level 3 |
| Immunity to shock waves | Conforming to IEC/EN 61000-4-5 | kV | 2, shielded access. Level 3 |

| Physical characteristics | | |
|--------------------------|--|---------------|
| Mounting | | Flush mounted |
| Display | | Backlit LCD |
| Signalling | | By 4 LEDs |
| Cabling | | RJ45 |

(1) For DHCP, stored IP, addressing limited by subnet mask.

TeSys Active

T Motor management system

Characteristics

Motor management devices

LT6CT●●●● external current transformer characteristics

| | | | | | |
|------------------------------------|--------------------|---------|---------|---------|-----------------------------|
| Conforming to standards | IEC 60185, BS 7626 | | | | |
| Precision | Class 5P | | | | |
| Precision limit factor | 15 | | | | |
| Rated insulation voltage (Ui) | 690 | | | | |
| Maximum operating temperature | °C | 50 | | | |
| Transformer ratio | A | 100/1 | 200/1 | 400/1 | 800/1 |
| Diameter of conductor passage hole | mm | 35 | 35 | 35 | 35 |
| Maximum cabling c.s.a. | mm ² | 30 x 10 | 30 x 10 | 30 x 10 | incorporated ⁽¹⁾ |

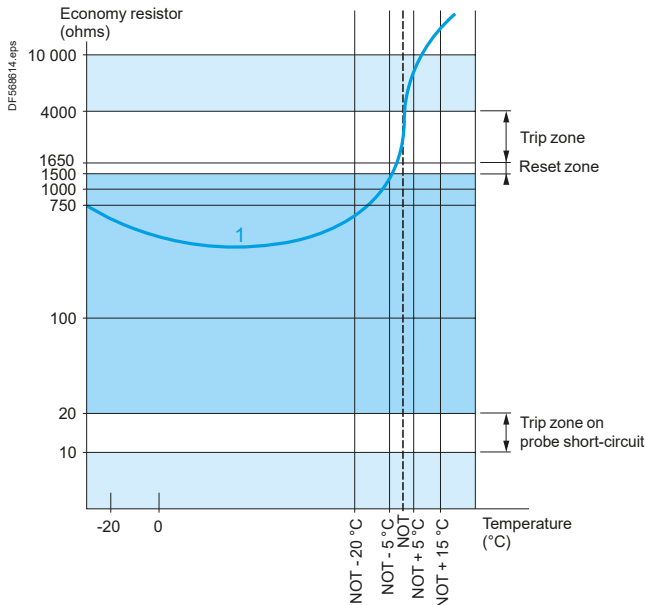
Earth fault toroid characteristics

| Toroid type | | 50437 | 50438 | 50439 | 50440 | 50441 | 50442 | 50485 | 50486 |
|---------------------------------|-----------------|-------------------------|-------|-------|-------|---------|---------|-------|-------|
| Rated insulation voltage Ui | V | 1000 | | | | | | | |
| Operating temperature | °C | - 35... + 70 | | | | | | | |
| Protection index | | IP30 (connections IP20) | | | | | | | |
| Transformer ratio | | 1/1000 | | | | | | | |
| Rated operational current Ie | A | 65 | 85 | 160 | 250 | 400 | 630 | 85 | 250 |
| Max. conductor c.s.a. per phase | mm ² | 25 | 50 | 95 | 240 | 2 x 185 | 2 x 240 | 50 | 240 |

DA1TT●● probe characteristics

| | | | |
|--------------------------------|--|---------------------|-------------------|
| Conforming to standards | | IEC 60034-11 mark A | |
| Economy resistor | At 25 °C | Ω | 3 x 250 in series |
| Rated operational voltage (Ue) | Per probe | V | ~ 2.5 max |
| Rated insulation voltage (Ui) | | kV | 2.5 |
| Insulation | | | Reinforced |
| Length of connecting cables | Between probes | mm | 250 |
| | Between probe and motor terminal plate | m | 1 |

Guaranteed operating zones: example with 3 probes type DA1TT●●● (250 Ω at 25 °C) in series, conforming to standard EC 60034-11, mark A.



1 3 probes type DA1●●● (250 Ω at 25 °C) in series.

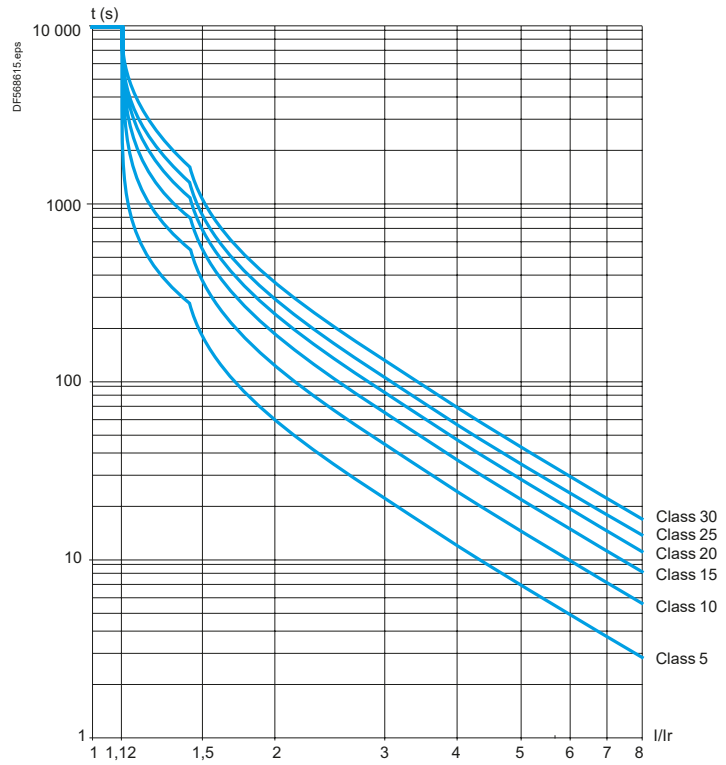
NOT: Nominal Operating Temperature.

Protection unit tripped.

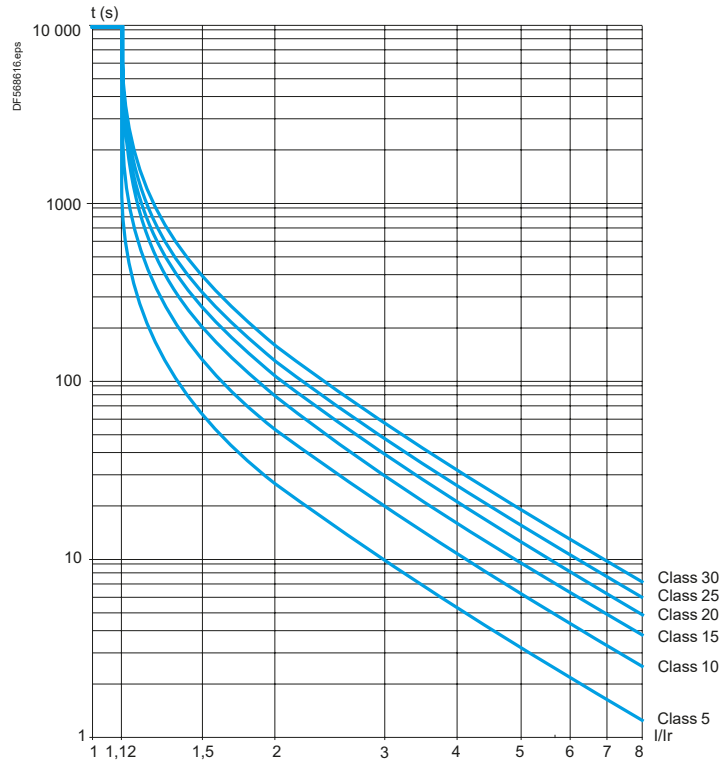
Protection unit reset.

⁽¹⁾ Electrical connection to be made using M10 bolt.

Cold state curves



Hot state curves

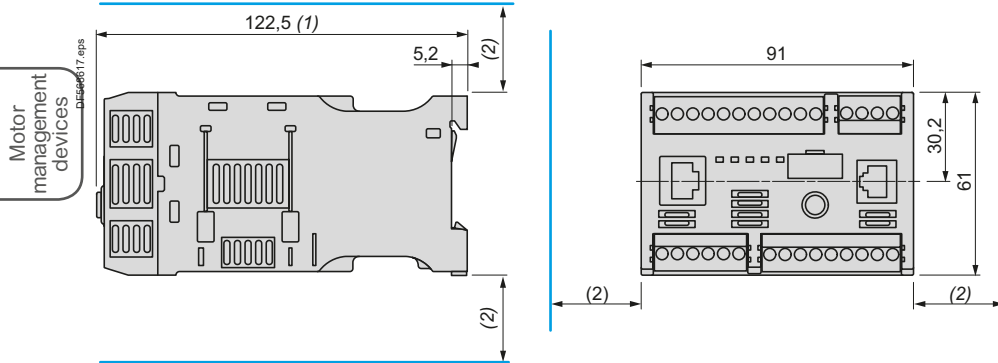


TeSys Active

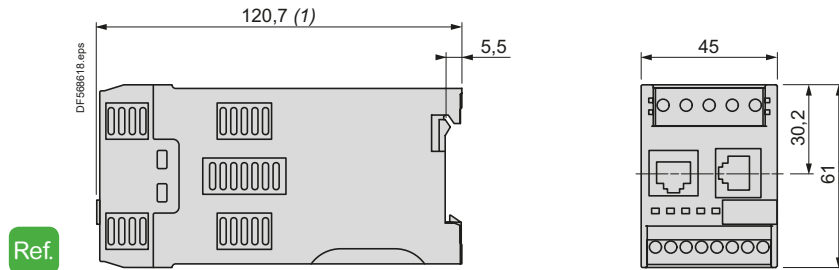
T Motor management system

Dimensions, mounting

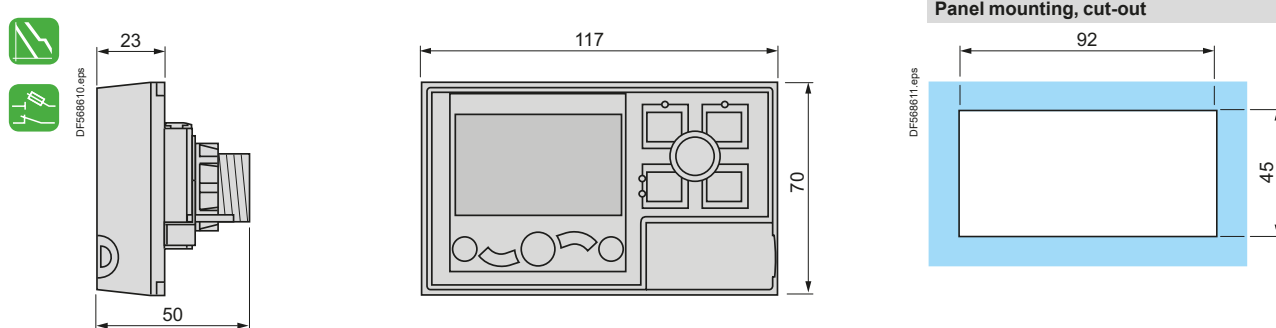
LTMR●● controllers



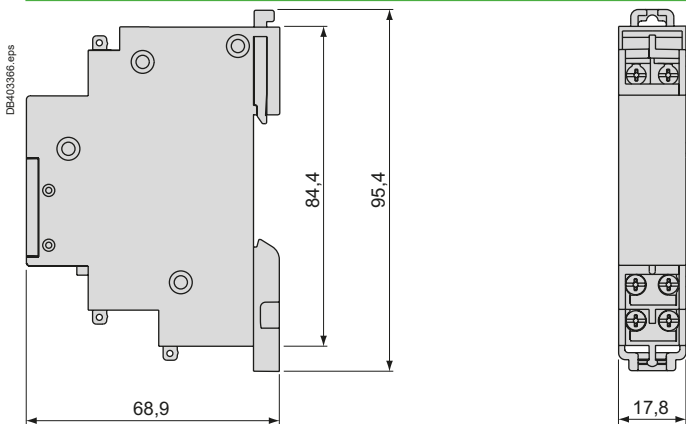
LTMEV40●● extension modules



LTMCU operator control unit



LTM9F



- (1) 140 mm with RJ45 connector for connection to extension module and to network, 166 mm with Profibus DP/CANopen connector.
- (2) Leave a gap around the device of: 9 mm at 45 °C, 9 to 40 mm from 45 to 50 °C, 40 mm at 60 °C.

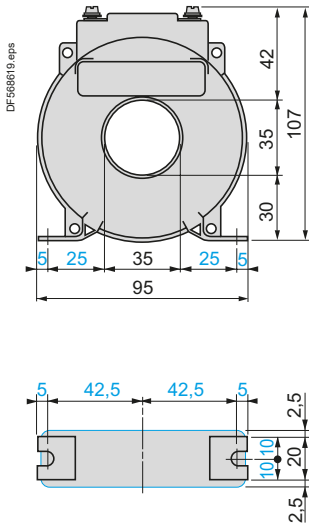
TeSys Active

T Motor management system

Dimensions

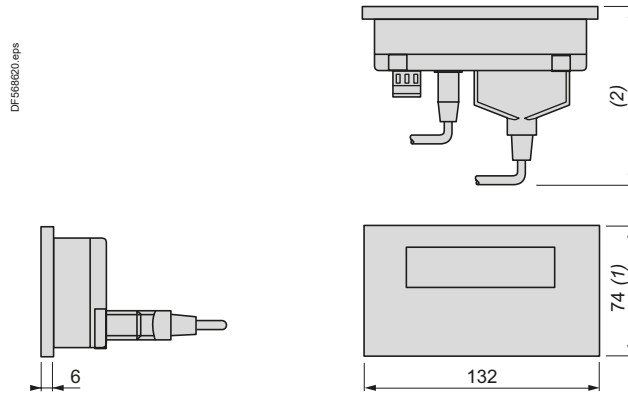
Current transformers

LT6CT



HMI terminal

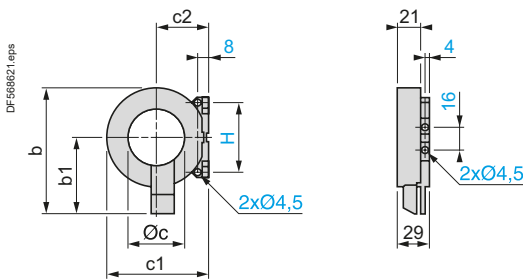
XBTN410



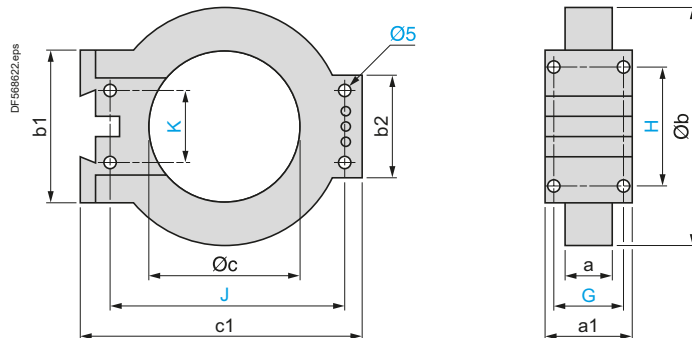
- (1) 104 mm with fixing clips (supplied with the product).
 (2) 58 mm with SUB-D 25-way elbowed cable **XBTZ9680** for Twido, TSX Micro and Premium or **XBTZ998** for Advantys STB.
 104 mm with SUB-D 25-way cable **XBTZ68/Z9681** for Twido, TSX Micro and Premium.

Earth fault toroids

50437 and 50438



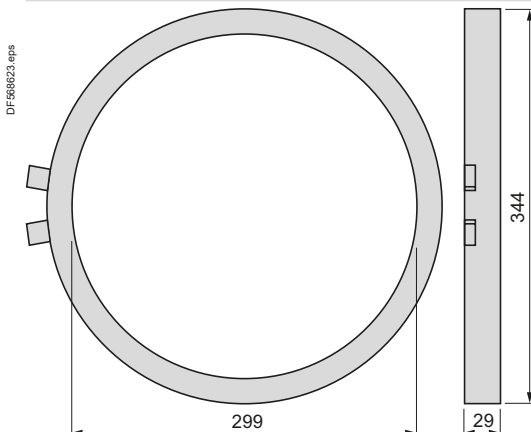
50439, 50440 and 50441



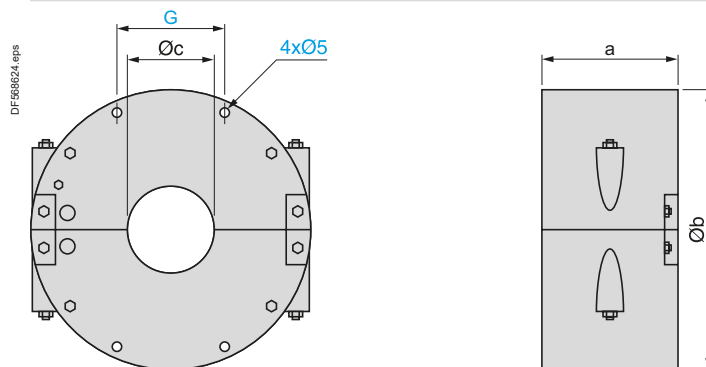
| Type | b | b1 | Øc | c1 | c2 | H |
|-------|-----|----|----|----|----|----|
| 50437 | 83 | 53 | 30 | 60 | 31 | 50 |
| 50438 | 109 | 66 | 50 | 87 | 45 | 60 |

| Type | a | a1 | Øb | b1 | b2 | Øc | c1 | G | H | J | K |
|-------|------|----|-----|-----|----|-----|-----|----|-----|-----|----|
| 50439 | 26.5 | 44 | 122 | 80 | 55 | 80 | 150 | 35 | 65 | 126 | 40 |
| 50440 | 26.5 | 44 | 164 | 80 | 55 | 120 | 190 | 35 | 65 | 166 | 40 |
| 50441 | 29 | 46 | 256 | 120 | 90 | 196 | 274 | 37 | 104 | 254 | 60 |

50442



50485 and 50486



| Type | a | Øb | Øc | G |
|-------|----|-----|-----|----|
| 50485 | 72 | 148 | 46 | 57 |
| 50486 | 78 | 224 | 110 | 76 |

References:
pages C1/4 to C1/11

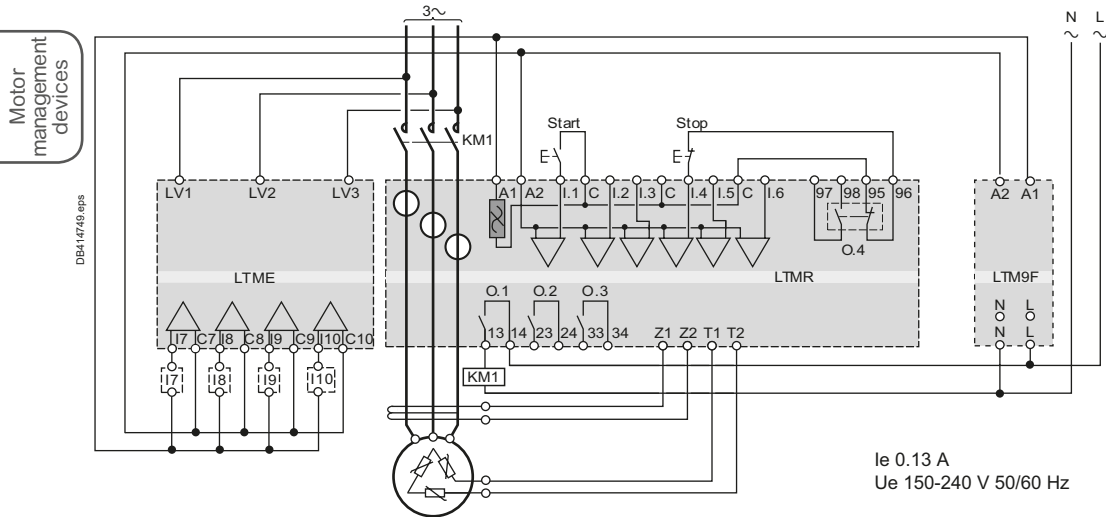
Characteristics:
pages C1/20 to C1/34

Curves:
page C1/35

Schemes:
pages C1/38 to C1/41

Schemes

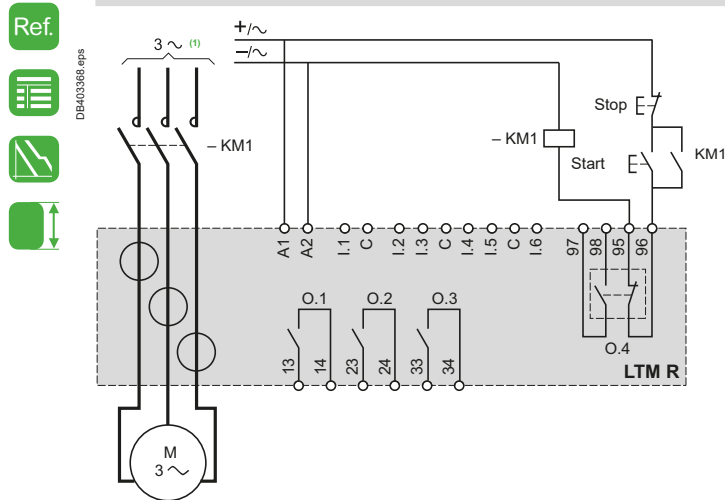
LTMR●●FM wiring with LTM9F filter



Note: inputs **MUST** be connected across the common terminals (C).

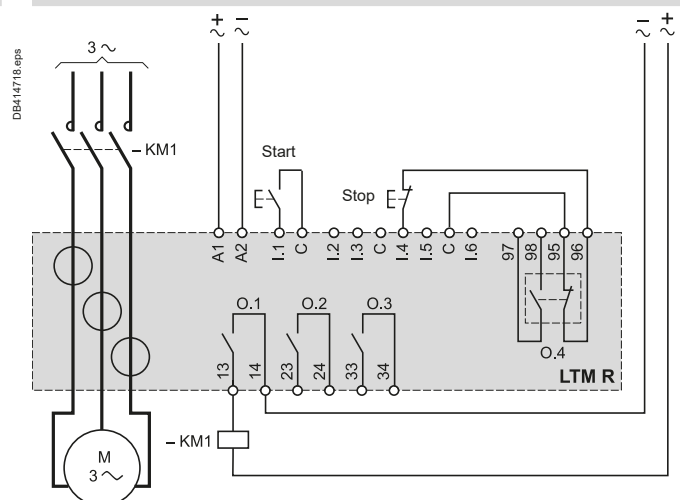
Overload mode

3-wire local-control



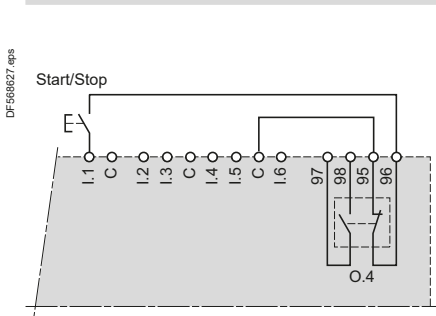
Independent mode

3-wire local-control

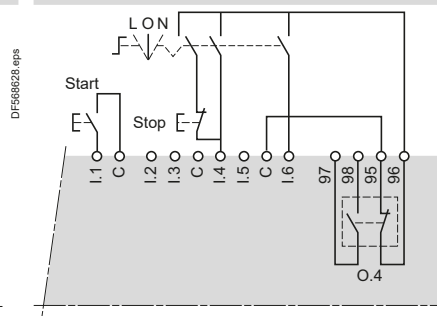


(1) Connection of a single-phase motor is possible. In this case, do not use the central current transformer.

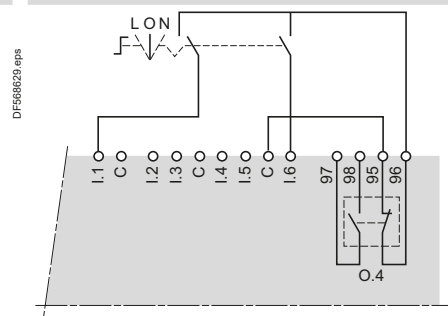
2-wire local-control



3-wire with switchable local/network control



2-wire with switchable local/network control



L: Local control
O: Stop
N: Network control

TeSys Active

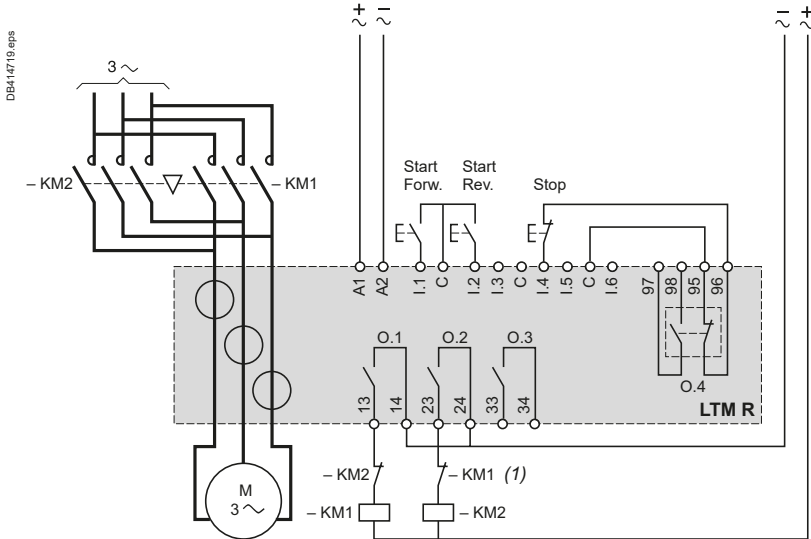
T Motor management system

Schemes

Schemes

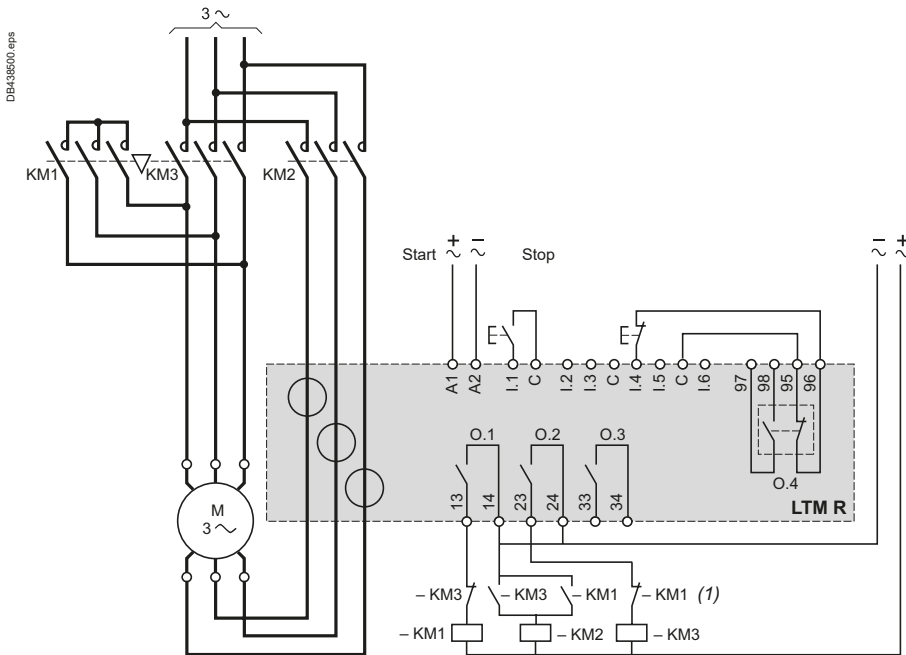
Reverser mode

3-wire local-control



2-step mode, star-delta application

3-wire local-control



(1) Contacts for interlocking KM1 and KM2 are not obligatory because the controller electronically interlocks outputs O.1 and O.2.

Motor management devices

Ref.

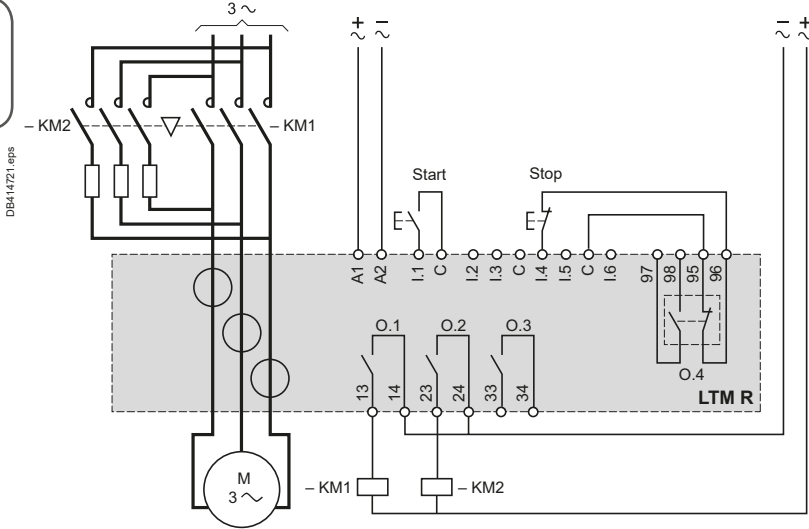


Schemes

2-step mode, primary resistor application

3-wire local-control

Motor management devices

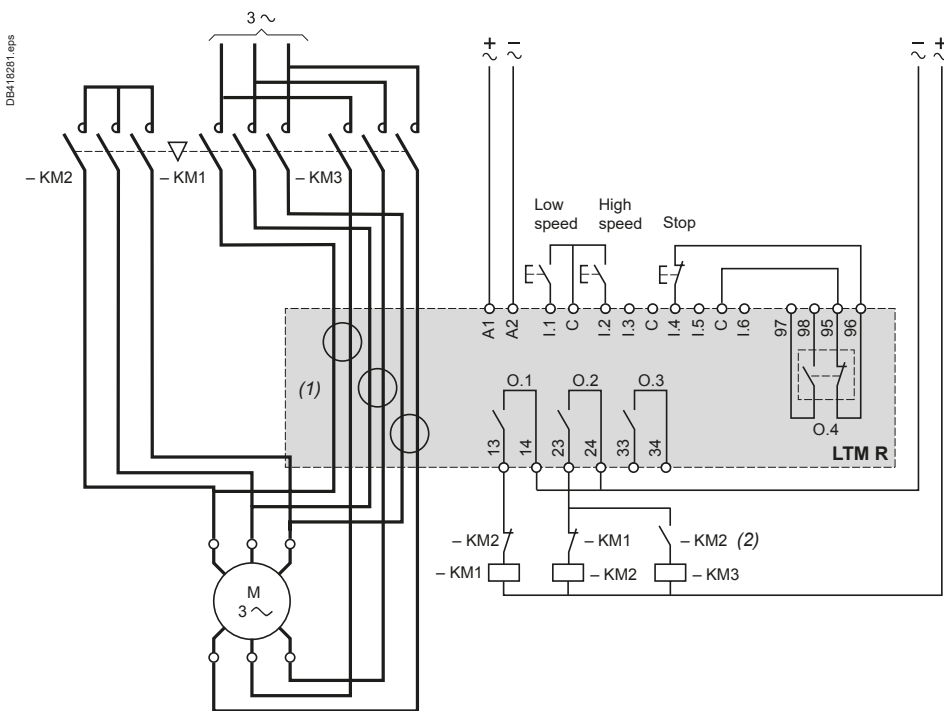


Ref.

2-speed mode, Dahlander application

3-wire local-control

Motor management devices

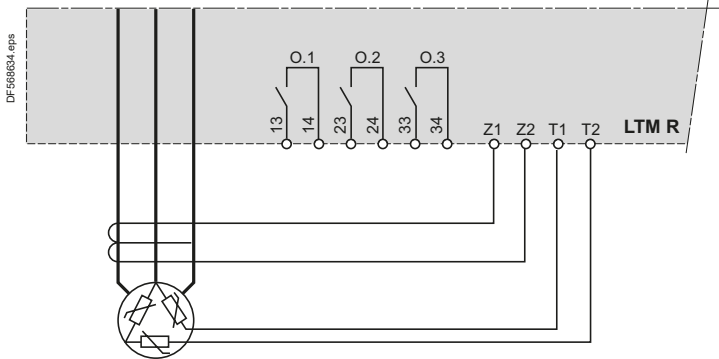


(1) For a Dahlander application, all the power cables must pass through current transformers. The controller can also be placed upstream of the contactor. In this case, and if the Dahlander motor is used in "variable torque" mode, all the cables downstream of the contactors must be of identical size.

(2) Contacts for interlocking KM1 and KM2 are not obligatory because the controller electronically interlocks outputs O.1 and O.2.

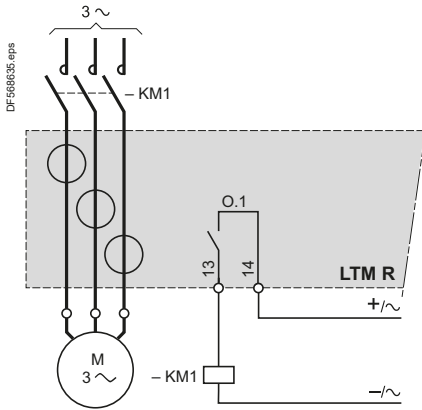
Schemes

Earth fault toroid and motor temperature probe connection

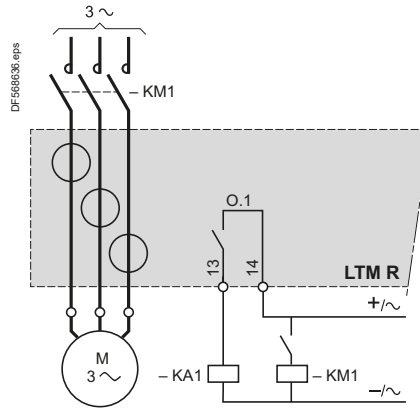


Connection of outputs for motor control mode function

Without intermediate relay



With intermediate relay



Motor management devices

Ref.



TeSys island Motor starters

Type of information

Pages

Introduction

Digital multifunctional load management solution



C2/2

Control and
monitoring
island

Digital multifunctional load management solution

TeSys Active - island Motor starters are designed to switch, protect, and manage motors and other electrical loads up to 80 Amps (AC3) in an electrical control panel.



Dedicated to Control and Monitor Machine and Processes

TeSys island is a digital load management solution that makes machines and processes smarter and more reliable.

TeSys island is a fully digitized and object-oriented load management system and an Industry 4.0 compliant data provider.

It is reducing time to market and is enabling OEMs to move forward in their Industry 4.0 journey.

Benefits of the object-oriented functional approach

The TeSys avatar approach simplifies application and system configuration and reduces engineering tasks. Thus TeSys island makes the machine engineering and installation phase much faster.

In addition, TeSys island can be easily integrated into 3rd party automation systems and supports several fieldbuses like EtherNet/IP, Modbus TCP, PROFINET and PROFIBUS.

TeSys island gives users access to all relevant load data for advanced system diagnostics.



More information

- Watch videos, read documents and use the product selector online on Schneider Electric website.

TeSys Active island Motor starters

Introduction

TeSys island
catalog:



> Ref. Document:
LVCATISL_EN

TeSys island
design guides:

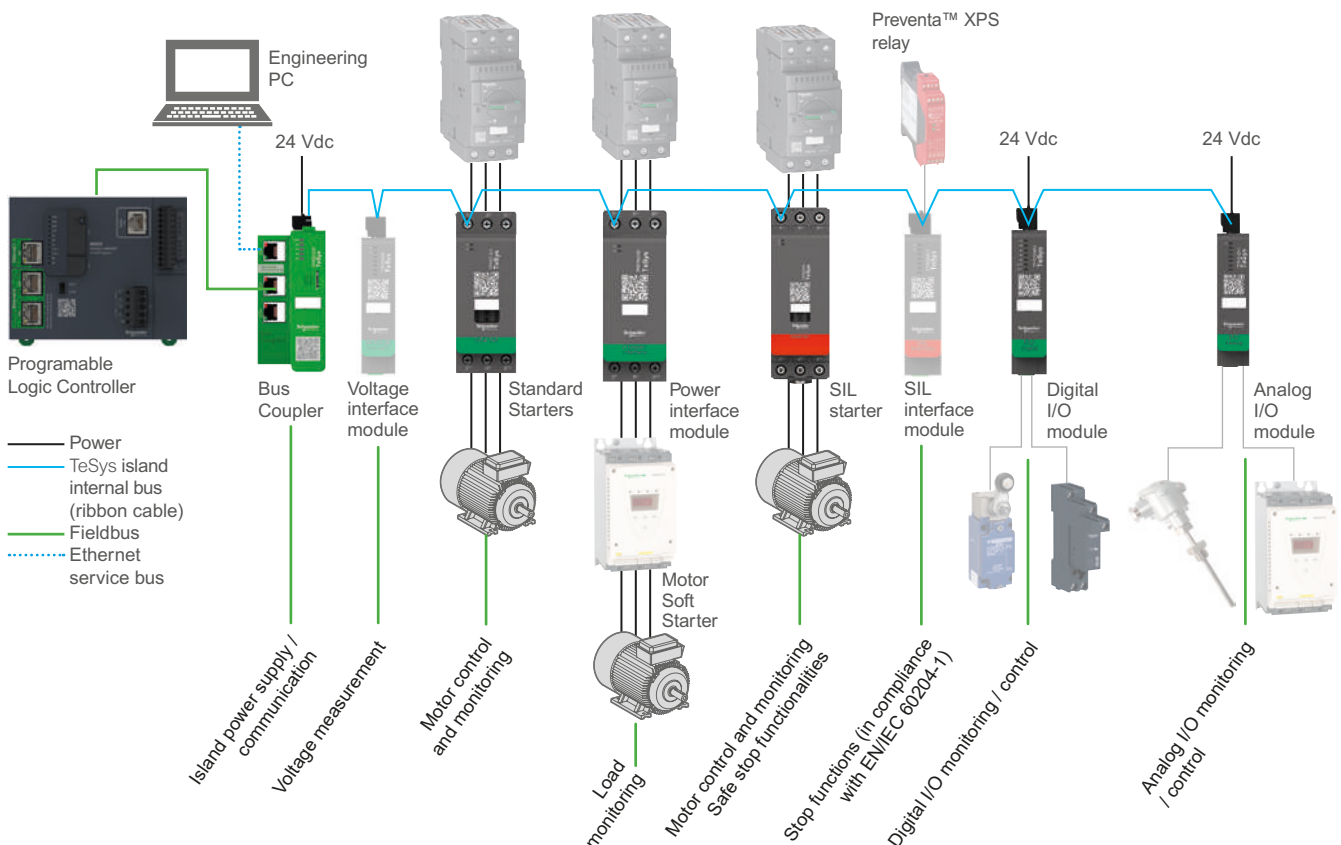
- > 8536IB1901: TeSys island System Guide
- > 8536IB1902: TeSys island Installation Guide
- > 8536IB1903: TeSys island Operating Guide
- > 8536IB1904: TeSys island Functional Safety (Safe Stop according to EN 61800-5-2) Guide
- > 8536IB1905: Third Party Function Block Guide and more.

Main characteristics

- TeSys island manages motors and other electrical loads up to 80 A (AC-3) / 37 kW/40 hp
- Fieldbus connectivity via bus coupler for EtherNet/IP, Modbus TCP, PROFINET or PROFIBUS
- Availability of all relevant load data like current, power, energy and advanced diagnostic data
- Simplified engineering and commissioning due to TeSys avatar objects and dedicated configuration and maintenance tools
- Up to 20 modules on 1 island mounted on DIN rail (up to 112 cm length)
- No control or auxiliary wiring required, thanks to full connectivity over fieldbus
- All adjustments and setting are digitized, no mechanical dials or dip switches
- Limited number of references including 5 starter sizes, digital & analog I/Os and voltage measurement modules
- SIL starter available for integration into functional safety systems according to IEC 61508, IEC 62061 and ISO 13849-1, including TUV certification (Stop 0 and 1 with wiring categories 1 to 2, suitable for PL c, d and SIL level 2), UKCA
- Fully compliant to international standards (IEC / UL / CSA 61010, IEC / UL / CSA 60947, GB/T14018)
- Embedded Cybersecurity (Achilles Level 2).

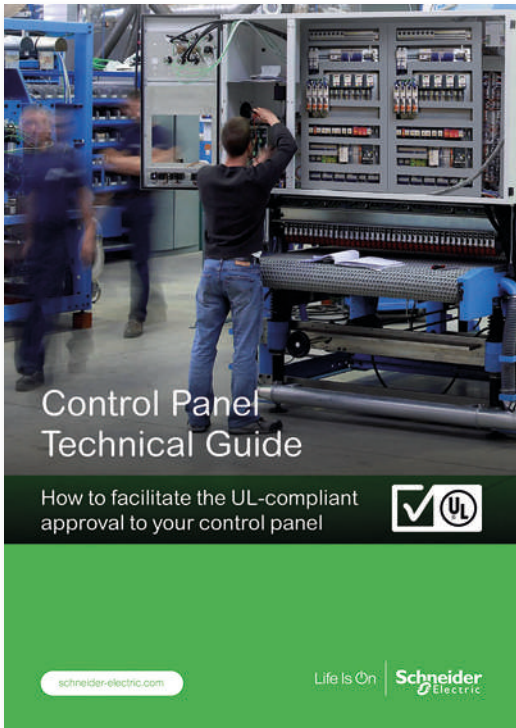
Control and
monitoring
island

Modular architecture, thanks to TeSys Active - island Motor starters internal bus



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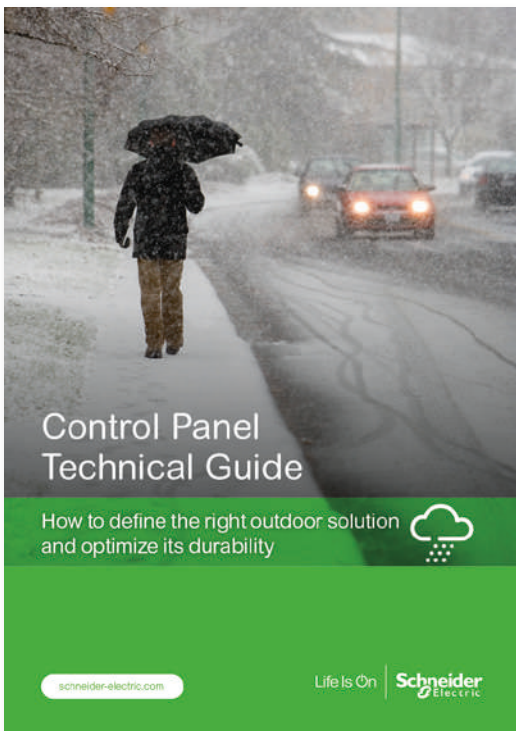
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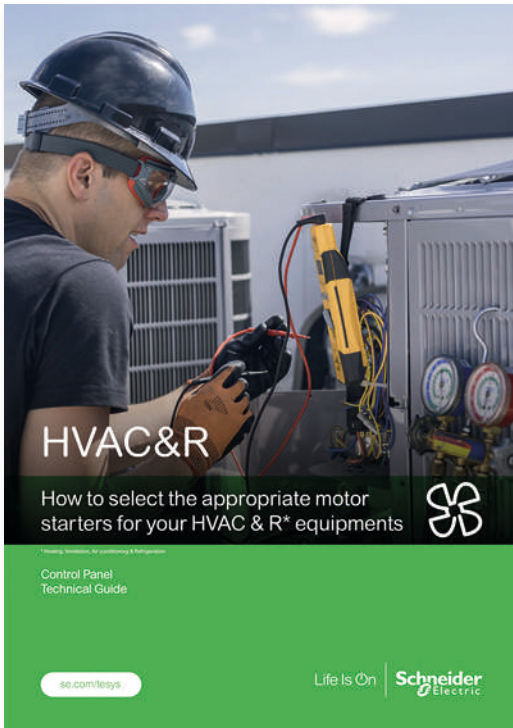
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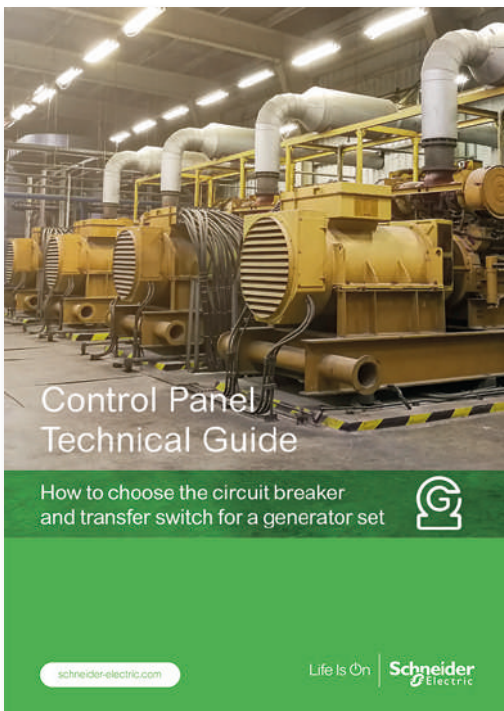


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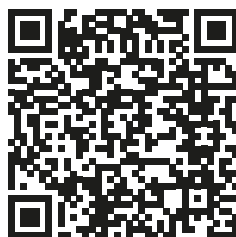
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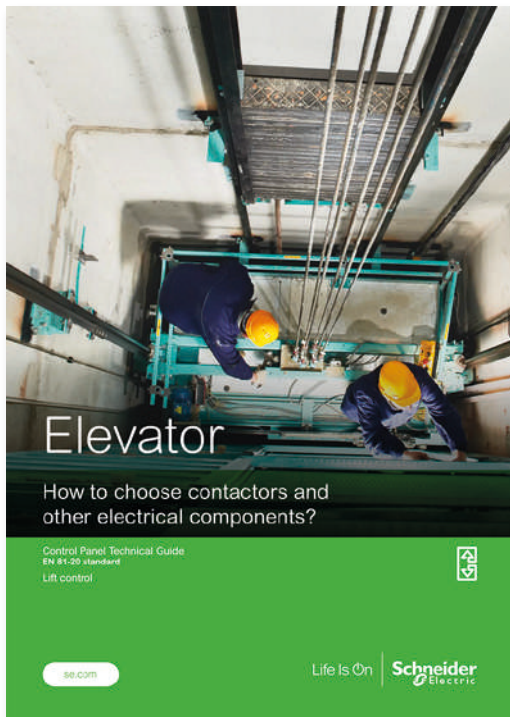
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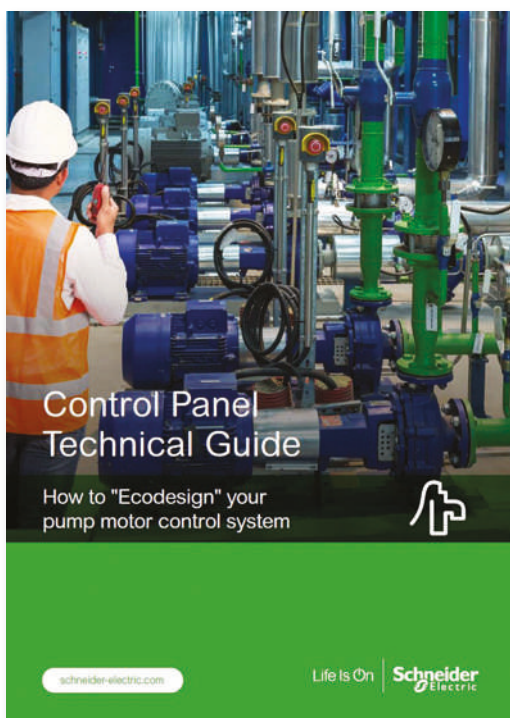


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Elevator
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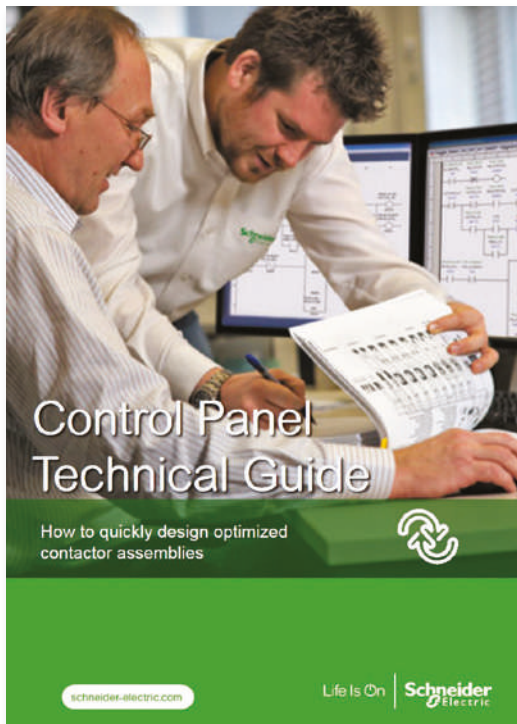
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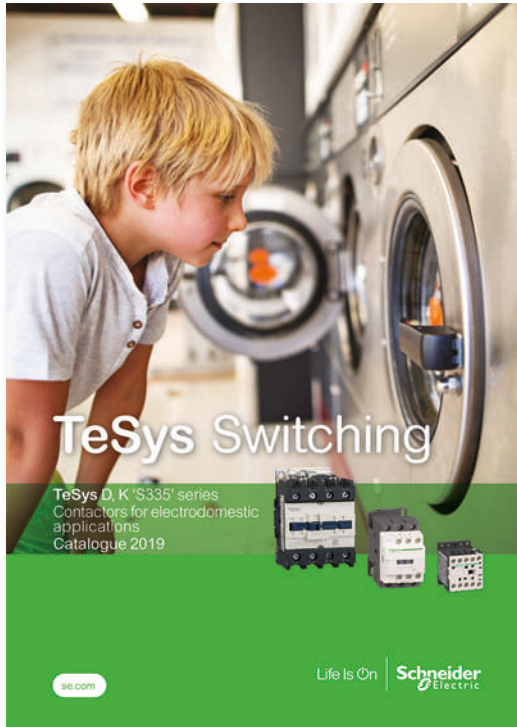


Catalogues of contactors for specific applications

> For applications requiring components conforming to specific standards with increased severity.

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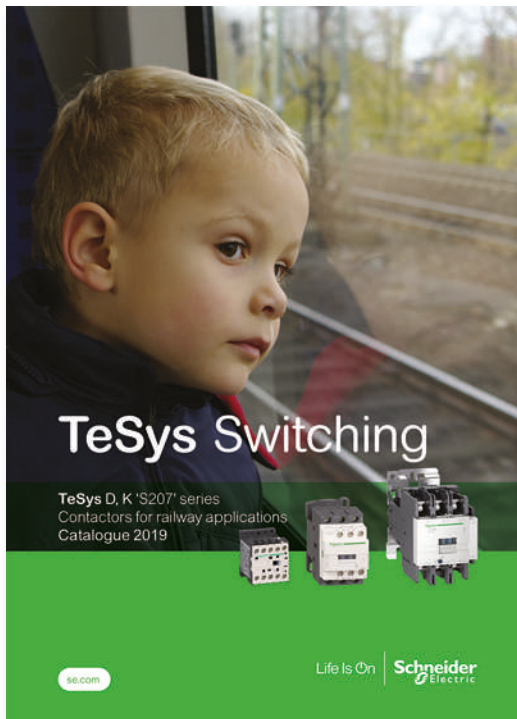
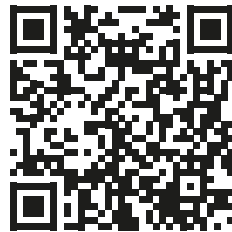


> TeSys Switching

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Contactors for electrodomestic applications

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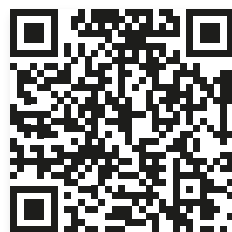


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*PEP: Product Environmental Profile (i.e. Environmental Product Declaration)

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October, 2021
ART834519

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