

DVP-ES2

Instruction Sheet

安 裝 說 明 安 装 说 明

Programmable Logic Controller

可程式控制器

可编程控制器

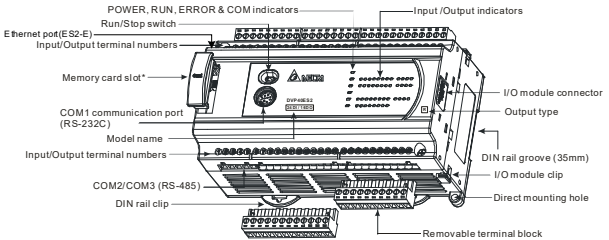
DVP-0130030-01
20210528



Thank you for choosing Delta's DVP-ES2 series PLC. DVP-ES2 series provides 16~ 80 points PLC and 8 ~ 32 points digital I/O module. The maximum I/O points including those on the PLC are 256 points. DVP-ES2 series PLCs satisfy various applications in that they can be used with analog input/output modules. Users do not have to install any batteries in DVP-ES2 series PLCs. The PLC programs and the latched data are stored in the flash memories.

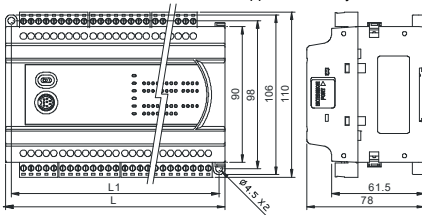
- EN ✘ DVP-ES2 is an OPEN-TYPE device. It should be installed in a control cabinet free of airborne dust, humidity, electric shock and vibration. To prevent non-maintenance staff from operating DVP-ES2, or to prevent an accident from damaging DVP-ES2, the control cabinet in which DVP-ES2 is installed should be equipped with a safeguard. For example, the control cabinet in which DVP-ES2 is installed can be unlocked with a special tool or key.
- EN ✘ DO NOT connect AC power to any of I/O terminals, otherwise serious damage may occur. Please check all wiring again before DVP-ES2 is powered up. After DVP-ES2 is disconnected, Do NOT touch any terminals in a minute. Make sure that the ground terminal ⚡ on DVP-ES2 is correctly grounded in order to prevent electromagnetic interference.
- FR ✘ DVP-ES2 est un module OUVERT. Il doit être installé que dans une enceinte protectrice (boîtier, armoire, etc.) saine, dépourvue de poussière, d'humidité, de vibrations et hors d'atteinte des chocs électriques. La protection doit éviter que les personnes non habilitées à la maintenance puissent accéder à l'appareil (par exemple, une clé ou un outil doivent être nécessaire pour ouvrir a protection).
- FR ✘ Ne pas appliquer la tension secteur sur les bornes d'entrées/Sorties, ou l'appareil DVP-ES2 pourra être endommagé. Merci de vérifier encore une fois le câblage avant la mise sous tension du DVP-ES2. Lors de la déconnection de l'appareil, ne pas toucher les connecteurs dans la minute suivante. Vérifier que la terre est bien reliée au connecteur de terre ⚡ afin d'éviter toute interférence électromagnétique.

■ Product Profile & Dimension



[Figure 1]

*: Only DVP40ES200RM and ES2-E models support a memory card slot.



[Figure 2]

Unit: mm

| Model name | 16ES2 00R/T | 24ES2 00R/T | 32ES2 00R/T | 40ES2 00R/T | 40ES2 00RM | 58ES2 00R/T | 60ES2 00R/T | 80ES2 00R/T | 20EX2 00R/T | 32ES2 11T |
|------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|-----------|
| L | 105 | 125 | 145 | 165 | 165 | 225 | 225 | 302 | 145 | 145 |
| L1 | 97 | 117 | 137 | 157 | 157 | 217 | 217 | 294 | 137 | 137 |
| WT | R | 377g | 414g | 489g | 554g | 562g | 705g | 696g | 890g | — |
| | T | 351g | 387g | 432g | 498g | — | 622g | 614g | 785g | 321g |

| Model name | 20ES2 00RE/TE | 32ES2 00RE/TE | 40ES2 00RE/TE | 60ES2 00RE/TE |
|------------|---------------|---------------|---------------|---------------|
| L | 125 | 165 | 194 | 255 |
| L1 | 117 | 157 | 186 | 247 |
| WT | RE | 453g | 569g | 630g |
| | TE | 416g | 520g | 574g |

■ Electrical Specifications

| Model | | 32ES211T | All ES2 models except for 32ES211T |
|--------------------------|--------|---|---|
| Power supply voltage | | 24VDC(-15~+20%) | 100 ~ 240VAC (-15% ~ 10%); 50 / 60Hz ± 5% |
| Connector | | European standard removable terminal block (Pin pitch: 5mm) | |
| Operation | ES 200 | DVP-ES2 starts to run when the power rises to 95 ~ 100VAC and stops when the power drops to 70VAC. If the power is suddenly cut off, the PLC will continue running for 10ms. | |
| | ES 211 | DVP-ES2 starts to run when the power rises to 20.4VDC~28.8VDC and stops when the power drops to 17.5VDC. If the power is suddenly cut off, the PLC will continue running for 10ms. | |
| Power supply fuse | | 2.5A / 30VDC, Polyswitch | 2A / 250VAC |
| Power | | 1.8W | 30VA |
| DC24V current output*1 | | — | 500mA |
| Power supply | | — | DC24V output short circuit protection |
| Voltage withstand | | 1,500VAC (Primary-secondary), 1,500VAC (Primary-PE), 500VAC (Secondary-PE) | |
| Insulation | | > 5MΩ at 500VDC (between all I/O points and ground) | |
| Noise immunity | | ESD (IEC 61131-2, IEC 61000-4-2): 8kV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2kV, Digital I/O: 1kV, Analog & Communication I/O: 1kV RS (IEC 61131-2, IEC 61000-4-3): 26MHz ~ 1GHz, 10V/m | |
| Grounding | | The diameter of grounding wire shall not be less than that of L, N terminal of the power supply. (When many PLCs are in use at the same time, please make sure every PLC is properly grounded.) | |
| Environment | | Operation: 0°C~55°C (temperature), 5~95% (humidity), pollution degree 2 Storage: -25°C~70°C (temperature), 5~95% (humidity) | |
| Agency approvals | | UL508, European community EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC | |
| Vibration/shock immunity | | International standards: IEC61131-2, IEC 68-2-6 (TEST Fc)/ IEC61131-2 & IEC 68-2-27 (TEST Ea) | |

*1: It is suggested that the power output should not be supplied to HMIs.

| Input Point | | | |
|-----------------|-----------------------|---|--------------------------------|
| Input No. | X0 ~ X3 ^{#1} | X4 ~ X7 | X10 ~ X17, X20 ~ ^{#2} |
| Input type | Digital input | | |
| Input form | DC (SINK or SOURCE) | | |
| Input current | 24VDC, 5mA | | |
| Input impedance | 4.7K Ω | | |
| Max. frequency | 100kHz | 10kHz | 60Hz |
| Action level | Off \rightarrow On | > 15VDC | |
| | On \rightarrow Off | < 5VDC | |
| Response time | Off \rightarrow On | < 2.5 μ s | < 20 μ s |
| | On \rightarrow Off | < 5 μ s | < 50 μ s |
| Filter time | X0 ~ X7 | Adjustable within 0 ~ 20ms in D1020 (Default: 10ms) | |

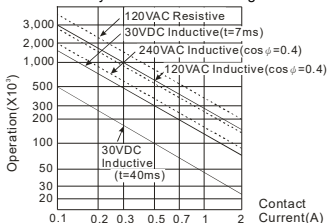
| Output Point | | | | |
|-----------------------|----------------------|-------------------------|-------------------------------------|-------------------------------|
| Output point type | Relay-R | | Transistor-T | |
| Output point number | All | Y0, Y2 | Y1, Y3 | Y4 ~ Y17, Y20 ~ ^{#2} |
| Voltage specification | < 250VAC, 30VDC | 5 ~ 30VDC ^{#3} | | |
| Max. frequency | 1Hz | 100kHz | 10kHz | 1kHz |
| Leakage current | - < 100 μ A | | | |
| Maximum load | Resistive | 2A/1 point (5A/COM) | 0.5A/1 point (4A/COM) ^{#5} | |
| | Inductive | ^{#4} | 15W (30VDC) | |
| | Lamp | 20WDC/100WAC | 2.5W(30VDC) | |
| Minimum load | 1mA / 5V | | | |
| Response time | Off \rightarrow On | Approx .10ms | < 2 μ s | < 20 μ s |
| | On \rightarrow Off | | < 3 μ s | < 30 μ s |

#1: The counting frequency of X1 and X3 on the DVP-ES200 series PLCs and the DVP-EX200 series PLCs which are produced after 2013 is increased from 10 kHz to 100 kHz.

#2: Please refer to "I/O Terminal Layout" for the max. X/Y No. on each model.

#3: UP, ZP must work with external auxiliary power supply 24VDC (-15% ~ +20%), rated consumption approx. 1mA/point.

#4: The lifetime of IO relays may differ depending on operating voltage, load type (power factor $\cos\phi$, time constant t) and different contact current. The number of operations during the lifetime can be estimated by means of the following chart of life curves.



[Figure 3]

#5: ZP for NPN COM, UP for PNP COM.

A/D and D/A Specifications (For EX2 Model Only)

| Items | Analog Input (A/D) | | | Analog Output (D/A) | | |
|-----------------------------|---|--------------|------------------------|------------------------|------------------------|------------------------|
| | Voltage | Current | | Voltage | Current | |
| Analog I/O range | ± 10 V | ± 20 mA | 4 ~ 20mA ^{#1} | ± 10 V | 0 ~ 20mA | 4 ~ 20mA ^{#1} |
| Digital conversion range | $\pm 2,000$ | $\pm 2,000$ | 0 ~ +2,000 | $\pm 2,000$ | 0 ~ +4,000 | 0 ~ +4,000 |
| Resolution ^{#2} | 12-bit | | | | | |
| Input impedance | > 1M Ω | 250 Ω | | - | | |
| Output impedance | - | | | $\leq 0.5\Omega$ | $\geq 1\text{M}\Omega$ | |
| Tolerance carried impedance | - | | | $\geq 5\text{K}\Omega$ | $\leq 500\Omega$ | |
| Overall accuracy | Non-linear accuracy: $\pm 1\%$ of full scale within the range of PLC operation temperature Maximum deviation: $\pm 1\%$ of full scale at 20mA and +10V | | | | | |
| Response time | 2ms (set up in D1118) ^{#3} | | | 2ms ^{#4} | | |
| Absolute input range | ± 15 V | ± 32 mA | | - | | |
| Digital data format | 2's complement of 16-bit, 12 significant bits | | | | | |

| Items | Analog Input (A/D) | | Analog Output (D/A) | |
|------------------|--|---------|---------------------|---------|
| | Voltage | Current | Voltage | Current |
| Average function | Provided (set up in D1062) ^{#5} | | - | |
| Isolation method | No Isolation between digital circuit and analog circuit | | | |
| Protection | Voltage output has short circuit protection, but a long period of short circuit may cause internal wire damage and open circuit of current output. | | | |

#1: V1.2 and above supports this mode. Please refer to the detailed explanation of D1115.

#2: Resolution formula

| Analog Input (A/D) | | Analog Output (D/A) | |
|--|--|--|---|
| Voltage | Current | Voltage | Current |
| $(5\text{mV} = \frac{20\text{V}}{4000})$ | $(10\mu\text{A} = \frac{40\text{mA}}{4000})$ | $(5\text{mV} = \frac{20\text{V}}{4000})$ | $(5\mu\text{A} = \frac{20\text{mA}}{4000})$ |

#3: When the scan period is longer than 2ms or the set value, the setting will follow the scan period.

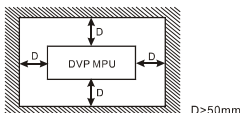
#4: When the scan period is longer than 2ms, the setting will follow the scan period.

#5: When the sampling range is "1", the present value will be read.

■ Installation

Please install the PLC in an enclosure with sufficient space around it to allow heat dissipation, as shown in the figure.

- **Direct Mounting:** Please use M4 screw according to the dimension of the product.
- **DIN Rail Mounting:** When mounting the PLC to 35mm DIN rail, be sure to use the retaining clip to stop any side-to-side movement of the PLC and reduce the chance of wires being loose. The retaining clip is at the bottom of the PLC. To secure the PLC to DIN rail, pull down the clip, place it onto the rail and gently push it up. To remove the PLC, pull the retaining clip down with a flat screwdriver and gently remove the PLC from DIN rail.



■ Wiring

1. Use the 12-24 AWG single-core bare wire or the multi-core wire for the I/O wiring. The PLC terminal screws should be tightened to 3.80 kg-cm (3.30 in-lbs) and please use 60/75°C copper conductor only.
2. DO NOT wire empty terminal. DO NOT place the input signal wire and output power wire in the same wiring circuit.
3. DO NOT drop tiny metallic conductor into the PLC while screwing and wiring.
 - Please attach the dustproof sticker to the PLC before the installation to prevent conductive objects from dropping in.
 - Tear off the sticker before running the PLC to ensure normal heat dissipation.

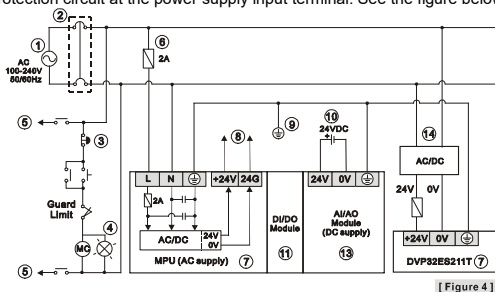
◆ Power Supply

The power input type for DVP-ES2 model is AC input. When operating DVP-ES2, please note the following points:

1. The range of the input voltage should be 100 ~ 240VAC. The power supply should be connected to L and N terminals. Please note that wiring AC110V or AC220V to +24V output terminal or digital input points will result in serious damage on the PLC.
2. The AC power inputs for the PLC and the digital I/O module should be ON or OFF at the same time.
3. Use 1.6mm wire (or longer) for the grounding of the PLC.
4. The power shutdown of less than 10ms will not affect the operation of the PLC. However, power shutdown time that is too long or the drop of power supply voltage will stop the running of the PLC, and all outputs will go "OFF". When the power returns to normal status, the PLC will automatically resume operation. (Care should be taken on the latched auxiliary relays and registers inside the PLC when programming.)
5. The +24V output is rated at 0.5A from PLC. DO NOT connect other external power supplies to this terminal. Every input terminal requires 5 ~ 7mA to be driven; e.g. the 16-point input will require approximately 100mA. Therefore, +24V terminal cannot give output to the external load that is more than 400mA.

◆ Safety Wiring

In PLC control system, many devices are controlled at the same time and actions of any device could influence each other, i.e. breakdown of any device may cause the breakdown of the entire auto-control system and danger. Therefore, we suggest you wire a protection circuit at the power supply input terminal. See the figure below.



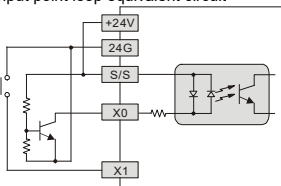
[Figure 4]

- | | |
|---|----------------------------------|
| ① AC power supply: 100 ~ 240VAC, 50/60Hz | ② Breaker |
| ③ Emergency stop: This button cuts off the system power supply when accidental emergency takes place. | |
| ④ Power indicator | ⑤ AC power supply load |
| ⑥ Power supply circuit protection fuse (2A) | ⑦ DVP-PLC (main processing unit) |
| ⑧ DC power supply output: 24VDC, 500mA | ⑨ Grounding resistance: < 100Ω |
| ⑩ DC power supply: 24VDC | ⑪ Digital I/O module (DC supply) |
| ⑫ Digital I/O module (AC supply) | ⑬ Analog I/O module (DC supply) |
| ⑭ DC power supply: 20.4VDC~28.8VDC | |

◆ I/O Point Wiring

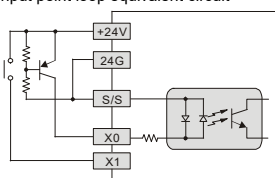
There are 2 types of DC inputs, SINK and SOURCE. (See the example below. For detailed point configuration, please refer to the specification of each model.)

- DC Signal IN – SINK mode
Input point loop equivalent circuit



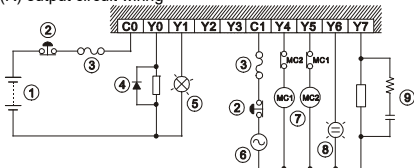
[Figure 5]

- DC Signal IN – SOURCE mode
Input point loop equivalent circuit

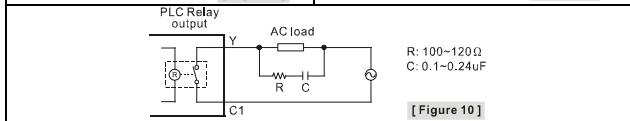
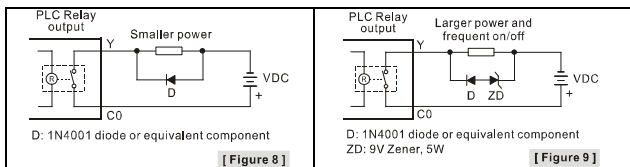


[Figure 6]

- Relay (R) output circuit wiring

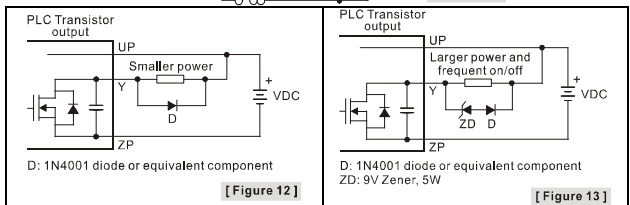
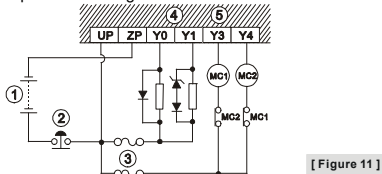


[Figure 7]



- ① DC power supply
- ② Emergency stop: Uses external switch
- ③ Fuse: Uses 5 ~ 10A fuse at the shared terminal of output contacts to protect the output circuit
- ④ Transient voltage suppressor: To extend the life span of contact.
 1. Diode suppression of DC load: Used when in smaller power (Figure 8)
 2. Diode + Zener suppression of DC load: Used when in larger power and frequent On/Off (Figure 9)
- ⑤ Incandescent light (resistive load)
- ⑥ AC power supply
- ⑦ Manually exclusive output: For example, Y4 and Y5 control the forward running and reverse running of the motor, forming an interlock for the external circuit, together with the PLC internal program, to ensure safe protection in case of any unexpected errors.
- ⑧ Neon indicator
- ⑨ Absorber: To reduce the interference on AC load (Figure 10)

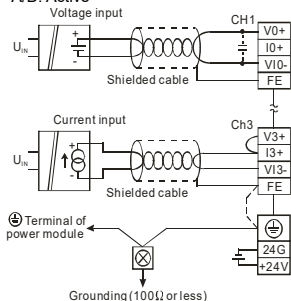
• Transistor (T) output circuit wiring



- ① DC power supply
- ② Emergency stop
- ③ Circuit protection fuse
- ④ The output of the transistor model is "open collector". If Y0/Y1 is set to pulse output, the output current has to be bigger than 0.1A to ensure normal operation of the model.
 1. Diode suppression: Used when in smaller power (Figure 12)
 2. Diode + Zener suppression: Used when in larger power and frequent On/Off (Figure 13)
- ⑤ Manually exclusive output: For example, Y3 and Y4 control the forward running and reverse running of the motor, forming an interlock for the external circuit, together with the PLC internal program, to ensure safe protection in case of any unexpected errors.

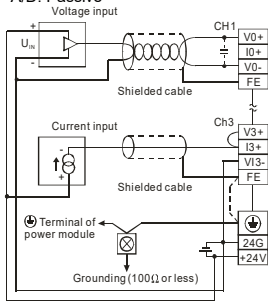
◆ A/D and D/A External Wiring (For EX2 Model Only)

● A/D: Active



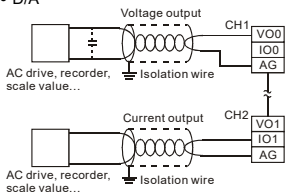
[Figure 14]

● A/D: Passive



[Figure 15]

● D/A



[Figure 16]

Note: When the A/D module is connected to current signals, make sure to short-circuit "V+" and "I+" terminals.

◆ RS-485 Wiring

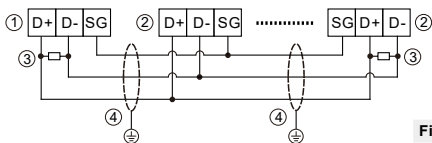


Figure 17

- ① Master node ② Slave node ③ Terminal resistor ④ Shielded cable

Note: 1. Terminal resistors are suggested to be connected to master and the last slave with resistor value of 120Ω.

2. To ensure communication quality, please apply double shielded twisted pair cable (20AWG) for wiring.

3. When voltage drop occurs between the internal ground references of two systems, connect the systems with Signal Ground point (SG) for achieving equal potential between systems so that a stable communication can be obtained.

◆ Ethernet (RJ45) Wiring

Please use the twisted pair CAT-5e to connect the Ethernet RJ45 communication port.



| | |
|-------|-------|
| ① Tx+ | ⑤ N/C |
| ② Tx- | ⑥ Rx- |
| ③ Rx+ | ⑦ N/C |
| ④ N/C | ⑧ N/C |

Note: The DVP-ES2-E series PLC is equipped with the Auto MDI/MDIX function. It does not need any jumper wire when it connects to the network device.

◆ Setting the Ethernet

The DVP-ES2-E series PLC contains a built-in Ethernet communication port. Users have to set the network parameter before the PLC connects to other network devices. The default parameter setting values are 192.168.1.5 (the IP address) and 255.255.255.0 (the subnet mask). Users can set the parameter by using DCISoft, or by using the PLC program to write the values into the network control register (CR).

- **Software:** Start the DCISoft, and connect the PC to the DVP-ES2-E series PLC through the ethernet cable. Enter "Communication Setting" page in DCISoft, and choose "Ethernet" communication port. Then, click "Search" to search for the picture representing the DVP-ES2-E series PLC. After users click the picture twice, the setting page appears. Finally, enter the related parameters, and click "Apply" to finish the setting.
- **PLC program:** Users use the instruction "To" to write the IP address (CR#88, 89) and the subnet mask (CR#90, 91). For example, when the IP address is 192.168.1.5, users write 192.168 (H'C0A8) into CR#89, and .1.5 into CR#88 (H'105).

Note: When users use the instruction "From/To" to read the data from the network control register and write the data into it, the module number is K108.

■ I/O Terminal Layouts

• DVP16ES200R/T

| | | | | | | | | | | | | | | |
|-----------------------------|----|----|----|------|-----|-----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| L | N | ⊕ | NC | +24V | 24G | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 |
| DVP16ES2-R (8DI/8DO) | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| L | N | ⊕ | NC | +24V | 24G | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 |
| DVP16ES2-T (8DI/8DO) | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | UP | ZP | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

• DVP20ES200RE/TE

| | | | | | | | | | | | | | | | | |
|-------------------------------|----|----|-----|----|------|-----|----|----|----|----|----|-----|-----|-----|-----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| L | N | ⊕ | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | |
| DVP20ES2-RE (12DI/8DO) | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| L | N | ⊕ | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | |
| DVP20ES2-TE (12DI/8DO) | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | UP | ZP | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |

• DVP20EX200R/T

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|----|----|----|-----|------|-----|----|----|----|----|----|----|----|-----|-----|------|-----|------|------|-----|-----|------|-----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | FE | V0+ | I0+ | V10- | V1+ | I1+ | V11- | V2+ | I2+ | V12- | | |
| DVP20EX2-R (8DI/6DO/4AI/2AO) | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | FE | V3+ | I3+ | V13- | V00 | I00 | AG | V01 | I01 | AG |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | FE | V0+ | I0+ | V10- | V1+ | I1+ | V11- | V2+ | I2+ | V12- | | |
| DVP20EX2-T (8DI/6DO/4AI/2AO) | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | UP | ZP | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | FE | V3+ | I3+ | V13- | V00 | I00 | AG | V01 | I01 | AG |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |

• DVP24ES200R/T

| | | | | | | | | | | | | | | | | | | | | |
|------------------------------|----|----|----|-----|------|-----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 |
| DVP24ES2-R (16DI/8DO) | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 |
| DVP24ES2-T (16DI/8DO) | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | UP | ZP | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | | | |

● DVP32ES200R/T

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|----|----|----|------|-----|-----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | |
| L | N | ⊕ | NC | +24V | 24G | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | | |
| DVP32ES2-R (16DI/16DO) | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 | C2 | Y10 | Y11 | Y12 | Y13 | C3 | Y14 | Y15 | Y16 | Y17 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| L | N | ⊕ | NC | +24V | 24G | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | | |
| DVP32ES2-T (16DI/16DO) | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | UP0 | ZP0 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | UP1 | ZP1 | Y10 | Y11 | Y12 | Y13 | Y14 | Y15 | Y16 | Y17 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |

● DVP32ES200RE/TE

| | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|----|----|----|-----|------|-----|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | | |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | | |
| DVP32ES2-RE (16DI/16DO) | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 | C2 | Y10 | Y11 | Y12 | Y13 | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | |
| DVP32ES2-TE (16DI/16DO) | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | UP0 | ZP0 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | UP1 | ZP1 | Y10 | Y11 | Y12 | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | |
| DVP32ES2-TE (16DI/16DO) | | | | | | | | | | | | | | | | | | | | | | |
| DVP32ES2-TE (16DI/16DO) | | | | | | | | | | | | | | | | | | | | | | |

● DVP32ES211T

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|----|----|-----|----|-----|-----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | |
| SG3 | D+ | D- | SG2 | D+ | D- | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | | |
| DVP32ES211T (16DI/16DO) | | | | | | | | | | | | | | | | | | | | | | | | |
| 24V | 0V | ⊕ | NC | NC | UP0 | ZP0 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | UP1 | ZP1 | Y10 | Y11 | Y12 | Y13 | Y14 | Y15 | Y16 | Y17 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |

● DVP40ES200R/T, DVP40ES200RM

| | | | | | | | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|------|-----|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 |
| DVP40ES2-R, DVP40ES2-RM (24DI/16DO) | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 | C2 | Y10 | Y11 | Y12 | Y13 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 | | | | | | | | | | | | | | | |
| X21 | X22 | X23 | X24 | X25 | X26 | X27 | | | | | | | | | | | | | | | |
| DVP40ES2-R, DVP40ES2-RM (24DI/16DO) | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | UP0 | ZP0 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | UP1 | ZP1 | Y10 | Y11 | Y12 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 | | | | | | | | | | | | | | | |
| X21 | X22 | X23 | X24 | X25 | X26 | X27 | | | | | | | | | | | | | | | |
| DVP40ES2-T (24DI/16DO) | | | | | | | | | | | | | | | | | | | | | |
| Y13 | Y14 | Y15 | Y16 | Y17 | | | | | | | | | | | | | | | | | |
| 23 | 24 | 25 | 26 | 27 | | | | | | | | | | | | | | | | | |

● DVP40ES200RE/TE

| | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|------|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| L | N | ⊕ | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | X21 |
| DVP40ES2-RE (24DI/16DO) | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 | C2 | Y10 | Y11 | Y12 | Y13 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | | | | | | | | | | | | | | | | |
| X22 | X23 | X24 | X25 | X26 | X27 | | | | | | | | | | | | | | | | |
| DVP40ES2-RE (24DI/16DO) | | | | | | | | | | | | | | | | | | | | | |
| Y13 | Y14 | Y15 | Y16 | Y17 | | | | | | | | | | | | | | | | | |
| 23 | 24 | 25 | 26 | 27 | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|-----------|-----------|-----------|-----------|-------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | |
| L | N | ⊕ | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | X21 | | |
| DVP 40ES 2-TE (24DI/16DO) | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | UP0 | ZP0 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | UP1 | ZP1 | Y10 | Y11 | Y12 | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 |
| | | | | | | | | | | | | | | | | | | X22 | X23 | X24 | X25 | X26 | X27 |
| | | | | | | | | | | | | | | | | | | → | | | | | |
| | | | | | | | | | | | | | | | | | | Y13 | Y14 | Y15 | Y16 | Y17 | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | |

• DVP58ES200R/T

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|-----------|-----------|-----------|-----------|-------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | | | | | | | | | | | | | | | | | |
| DVP 58E S2-R (24DI/34DO) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 | C2 | Y10 | Y11 | Y12 | Y13 | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | | |
| | | | | | | | | | | | | | | | | | | X21 | X22 | X23 | X24 | X25 | X26 | X27 | C6 | Y30 | Y31 | Y32 | Y33 | Y34 | C7 | Y35 | Y36 | Y37 | Y40 | Y41 | | |
| | | | | | | | | | | | | | | | | | | → | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | C3 | Y14 | Y15 | Y16 | Y17 | C4 | Y20 | Y21 | Y22 | Y23 | C5 | Y24 | Y25 | Y26 | Y27 | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | | | | | | | | | | | | | | | | | |
| DVP 58E S2-T (24DI/34DO) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | UP0 | ZP0 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | UP1 | ZP1 | Y10 | Y11 | Y12 | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | | |
| | | | | | | | | | | | | | | | | | | X21 | X22 | X23 | X24 | X25 | X26 | X27 | UP3 | ZP3 | Y30 | Y31 | Y32 | Y33 | Y34 | Y35 | Y36 | Y37 | Y40 | Y41 | | |
| | | | | | | | | | | | | | | | | | | → | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | Y13 | Y14 | Y15 | Y16 | Y17 | UP2 | ZP2 | Y20 | Y21 | Y22 | Y23 | Y24 | Y25 | Y26 | Y27 | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | | | | | | |

• DVP60ES200R/T

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|-----------|-----------|-----------|-----------|-------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | | | | | | | | | | | | | | | | | |
| DVP 60E S2-R (36DI/24DO) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 | C2 | Y10 | Y11 | Y12 | Y13 | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | | |
| | | | | | | | | | | | | | | | | | | X21 | X22 | X23 | X24 | X25 | X26 | X27 | X30 | X31 | X32 | X33 | X34 | X35 | X36 | X37 | X40 | X41 | X42 | X43 | | |
| | | | | | | | | | | | | | | | | | | → | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | C3 | Y14 | Y15 | Y16 | Y17 | C4 | Y20 | Y21 | Y22 | Y23 | C5 | Y24 | Y25 | Y26 | Y27 | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| L | N | ⊕ | NC | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | | | | | | | | | | | | | | | | | |
| DVP 60E S2-T (36DI/24DO) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | UP0 | ZP0 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | UP1 | ZP1 | Y10 | Y11 | Y12 | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | | |
| | | | | | | | | | | | | | | | | | | X21 | X22 | X23 | X24 | X25 | X26 | X27 | X30 | X31 | X32 | X33 | X34 | X35 | X36 | X37 | X40 | X41 | X42 | X43 | | |
| | | | | | | | | | | | | | | | | | | → | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | Y13 | Y14 | Y15 | Y16 | Y17 | UP2 | ZP2 | Y20 | Y21 | Y22 | Y23 | Y24 | Y25 | Y26 | Y27 | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | | | | | | |

• DVP60ES200RE/TE

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|-----------|-----------|-----------|-----------|-------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| L | N | ⊕ | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | X21 | | | | | | | | | | | | | | | | | |
| DVP 60E S2-RE (36DI/24DO) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 | C2 | Y10 | Y11 | Y12 | Y13 | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | | | |
| | | | | | | | | | | | | | | | | | | X22 | X23 | X24 | X25 | X26 | X27 | X30 | X31 | X32 | X33 | X34 | X35 | X36 | X37 | X40 | X41 | X42 | X43 | | | |
| | | | | | | | | | | | | | | | | | | → | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | C3 | Y14 | Y15 | Y16 | Y17 | C4 | Y20 | Y21 | Y22 | Y23 | C5 | Y24 | Y25 | Y26 | Y27 | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| L | N | ⊕ | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | X21 | | | | | | | | | | | | | | | | | |
| DVP 60E S2-TE (36DI/24DO) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SG | D+ | D- | +24V | 24G | UP0 | ZP0 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | UP1 | ZP1 | Y10 | Y11 | Y12 | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | | | |
| | | | | | | | | | | | | | | | | | | X22 | X23 | X24 | X25 | X26 | X27 | X30 | X31 | X32 | X33 | X34 | X35 | X36 | X37 | X40 | X41 | X42 | X43 | | | |
| | | | | | | | | | | | | | | | | | | → | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | Y13 | Y14 | Y15 | Y16 | Y17 | UP2 | ZP2 | Y20 | Y21 | Y22 | Y23 | Y24 | Y25 | Y26 | Y27 | | | | | | |
| | | | | | | | | | | | | | | | | | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | | | | | | |

● DVP80ES200R/T

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----|-----|------|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | | | | | |
| L | N | Q | t24V | 24G | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | X21 | X22 | | | |
| DVP80ES 2-R (40 DI/4 DO) → | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SS | D+ | D- | C0 | Y0 | Y1 | Y2 | Y3 | C1 | Y4 | Y5 | Y6 | Y7 | C2 | Y10 | Y11 | Y12 | Y13 | C3 | Y14 | Y15 | Y16 | Y17 | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | | | | | |
| 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | | | | | | | | | |
| X23 X24 X25 X26 X27 X30 X31 X32 X33 X34 X35 X36 X37 X40 X41 X42 X43 X44 X45 X46 X47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ↪ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | Y20 | Y21 | Y22 | Y23 | C5 | Y24 | Y25 | Y26 | Y27 | C6 | Y30 | Y31 | Y32 | Y33 | C7 | Y34 | Y35 | Y36 | Y37 | C8 | Y40 | Y41 | Y42 | Y43 | C9 | Y44 | Y45 | Y46 | Y47 |
| 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | | | | | |
| L | N | Q | t24V | 24G | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | X21 | X22 | | | | | |
| DV P80ES 2-T (40 DI/4 DO) → | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D+ | D- | SS | D+ | D- | JP0 | ZP0 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | JP1 | ZP1 | Y10 | Y11 | Y12 | Y13 | Y14 | Y15 | Y16 | Y17 | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | | | | | |
| 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | | | | | | | | | |
| X23 X24 X25 X26 X27 X30 X31 X32 X33 X34 X35 X36 X37 X40 X41 X42 X43 X44 X45 X46 X47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ↪ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| JP2 | ZP2 | Y20 | Y21 | Y22 | Y23 | Y24 | Y25 | Y26 | Y27 | JP3 | ZP3 | Y30 | Y31 | Y32 | Y33 | Y34 | Y35 | Y36 | Y37 | JP4 | ZP4 | Y40 | Y41 | Y42 | Y43 | Y44 | Y45 | Y46 | Y47 |
| 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 |

■ Precision of the RTC (Second/Month)

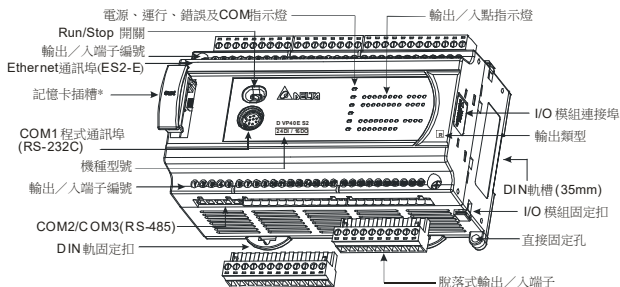
| | | | |
|------------------------|------|-------|--------|
| Temperature (°C/°F) | 0/32 | 25/77 | 55/131 |
| Maximum error (Second) | -117 | 52 | -132 |

Duration in which the RTC is latched: One week (Only version 2.00 and above are supported.)

感謝您採用台達 DVP-ES2 系列可程式控制器。此系列提供 16 ~ 80 點數的主機及 8 ~ 32 點數位輸入/輸出模組，含主機最大輸入/輸出擴充最多可達 256 點。另可搭配類比輸入/輸出模組使用，以滿足各種應用場合。全系列採用免電池設計，其 PLC 程式與停電保持資料皆運用高速快閃記憶體儲存。

- ✧ 本安裝說明書提供給使用者電氣規格、功能規格、安裝配線之相關注意事項。其他詳細之程式設計及指令說明請見 DVP-ES2 操作手冊【程式篇】，選購之周邊裝置詳細說明請見該產品隨機安裝說明書。
- ✧ 本機為開放型 (OPEN TYPE) 機殼，因此使用者使用本機時，必須將之安裝於具防塵、防潮及免於電擊/衝擊意外之外殼配線箱內。另必須具備保護措施（如：特殊之工具或鑰匙才可打開）防止非維護人員操作或意外衝擊本體，造成危險及損壞。
- ✧ 交流輸入電源不可連接於輸入/出信號端，否則可能造成嚴重損壞，請在上電之前再次確認電源配線。請勿在上電時觸摸任何端子。本體上之接地端子 ⚡ 務必正確的接地，可提高產品抗雜訊能力。

■ 產品外觀尺寸與部位介紹



*：此記憶卡插槽僅 DVP40ES200RM 及 ES2-E 機種支援。

● 詳細尺寸圖請參閱英文版[Figure 2]，單位：mm。

| 機種 型號 | 16ES2 00R/T | 24ES2 00R/T | 32ES2 00R/T | 40ES2 00R/T | 40ES2 00RM | 58ES2 00R/T | 60ES2 00R/T | 80ES2 00R/T | 20EX2 00R/T | 32ES2 11T |
|----------|----------------|----------------|----------------|----------------|---------------|----------------|----------------|----------------|----------------|--------------|
| L | 105 | 125 | 145 | 165 | 165 | 225 | 225 | 302 | 145 | 145 |
| L1 | 97 | 117 | 137 | 157 | 157 | 217 | 217 | 294 | 137 | 137 |
| 重量 | R | 377g | 414g | 489g | 554g | 562g | 705g | 696g | 890g | 462g |
| | T | 351g | 387g | 432g | 498g | - | 622g | 614g | 785g | 442g |

| 機種 型號 | 20ES2 00RE/ TE | 32ES2 00RE/ TE | 40ES2 00RE/ TE | 60ES2 00RE/ TE |
|----------|----------------------|----------------------|----------------------|----------------------|
| L | 125 | 165 | 194 | 255 |
| L1 | 117 | 157 | 186 | 247 |
| 重量 | RE | 453g | 569g | 630g |
| | TE | 416g | 520g | 574g |

■ 電氣規格

| 機種 項目 | 32ES2 11T | 其他機種 |
|------------------|---|--|
| 電源電壓 | 24VDC (-15~+20%) | 100 ~ 240VAC (-15% ~ 10%) , 50 / 60Hz ± 5% |
| 連接方式 | 脫落式歐式端子座 (端點距離: 5mm) | |
| 動作 規格 | ES200 | 當電源緩升至 95 ~ 100VAC 時, PLC 開始動作, 當電源緩降至 70VAC 時, PLC 停止動作。電源瞬間斷電 10ms 以內繼續運行。 |
| | ES211 | 當電源緩升至 20.4VDC~28.8VDC 時, PLC 開始動作, 當電源緩降至 17.5VDC 時, PLC 停止動作。電源瞬間斷電 10ms 以內繼續運行。 |
| 電源保險絲 容量 | 2.5A / 30VDC 可恢復式 | 2A / 250VAC |
| 消耗功率 | 1.8W | 30VA |
| DC24V 電流 輸出*1 | — | 500mA |
| 電源保護 | — | DC24V 輸出具短路保護 |
| 突波電壓耐 受量 | 1,500VAC (Primary-secondary) 、 1,500VAC (Primary-PE) 、 500VAC (Secondary-PE) | |
| 絕緣阻抗 | 5MΩ 以上 (所有輸出/入點對地之間 500VDC) | |
| 雜訊免疫力 | ESD (IEC 61131-2, IEC 61000-4-2): 8kV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2kV, Digital I/O: 1kV, Analog & Communication I/O: 1kV RS (IEC 61131-2, IEC 61000-4-3): 26MHz ~ 1GHz, 10V/m | |
| 接地 | 接地配線之線徑不得小於電源端 L, N 之線徑 (多台 PLC 同時使用時, 請務必單點接地) | |
| 操作 / 儲存 環境 | 操作: 0°C ~ 55°C (溫度), 5 ~ 95% (濕度) 污染等級 2 儲存: -25°C ~ 70°C (溫度), 5 ~ 95% (濕度) | |
| 認證標準 | UL508 European community EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC | |
| 耐振動 / 衝擊 | 國際標準規範 IEC61131-2 , IEC 68-2-6 (TEST Fc)/IEC61131-2 & IEC 68-2-27 (TEST Ea) | |

*1: 此電源輸出不建議供應人機 (HMI) 產品使用

| 輸入點電氣規格 | | | |
|---------|--------------------|------------------------------------|---------------------|
| 輸入點 No. | X0 ~ X3 #1 | X4 ~ X7 | X10 ~ X17, X20 ~ #2 |
| 輸入點類型 | 數位輸入 | | |
| 輸入形式 | 直流 (SINK 或 SOURCE) | | |
| 輸入電流 | 24VDC, 5mA | | |
| 輸入阻抗 | 4.7KΩ | | |
| 最高切換頻率 | 100kHz | 10kHz | 60Hz |
| 動作位準 | Off → On | > 15VDC | |
| | On → Off | < 5VDC | |
| 反應時間 | Off → On | < 2.5μs | < 10ms |
| | On → Off | < 5μs | < 15ms |
| 濾波時間 | X0 ~ X7 | 由 D1020 可作 0 ~ 20ms 的調整 (預設值 10ms) | |

| 輸出點電氣規格 | | | | | |
|---------|------------------|-----------------|----------------------|------------------|---------|
| 輸出點形式 | 繼電器-R | | 電晶體-T | | |
| 輸出點 No. | 全部 | Y0, Y2 | Y1, Y3 | Y4~Y17, Y20 ~ #2 | |
| 電壓規格 | 250VAC, 30VDC 以下 | | 5 ~ 30VDC #3 | | |
| 最高切換頻率 | 1Hz | 100kHz | 10kHz | 1kHz | |
| 漏電流 | - | | <100uA | | |
| 最大負載 | 電阻性 | 2A/1 點 (5A/COM) | 0.5A/1 點 (4A/COM) #5 | | |
| | 電感性 | #4 | 15W (30VDC) | | |
| | 燈泡 | 20WDC/100WAC | 2.5W(30VDC) | | |
| 最小負載 | 1mA / 5V | | | | |
| 反應時間 | Off → On | 約 10 ms | < 2μs | < 20μs | < 100μs |
| | On → Off | | < 3μs | < 30μs | < 100μs |

#1：ES200 及 EX200 於 2013 年後產出的序號其 X1、X3 計數頻率由 10kHz 提升為 100kHz

#2：主機上最大點數編號請參考「輸入 / 輸出端子台配置」。

#3：UP, ZP 必須外加輔助電源 24VDC (-15% ~ +20%) 額定消耗約 1mA/點。

#4：繼電器接點壽命隨著工作電壓、負載種類(功率因素 $\cos\phi$ 、時間常數 t)、及接點電流大小而有所不同，參考生命週期曲線圖預估可操作次數。生命週期曲線圖請參閱英文版[Figure 3]。

#5：NPN 模式使用 ZP 端點，PNP 模式使用 UP 端點。

AD/DA 規格 (EX2 機種適用)

| 項目 | 類比輸入 (A/D) | | | 類比輸出 (D/A) | | |
|-------------|---|--------|------------|------------|------------|------------|
| | 電壓輸入 | 電流輸入 | | 電壓輸出 | 電流輸出 | |
| 類比輸入 / 輸出範圍 | ±10V | ±20mA | 4 ~ 20mA#1 | ±10V | 0 ~ 20mA | 4 ~ 20mA#1 |
| 數位轉換範圍 | ±2,000 | ±2,000 | 0 ~ +2,000 | ±2,000 | 0 ~ +4,000 | 0 ~ +4,000 |
| 解析度 #2 | 12-bit | | | | | |
| 輸入阻抗 | > 1MΩ | 250 Ω | | - | | |
| 輸出阻抗 | - | | | ≤ 0.5Ω | ≥ 1MΩ | |
| 容許負載阻抗 | - | | | ≥ 5KΩ | ≤ 500Ω | |
| 總和精密度 | 非線性精度：±1%在整個溫度範圍內滿刻度時 最大誤差：±1%在滿刻度 20mA 及 +10V 時 | | | | | |
| 回應時間 | 2ms (可由 D1118 設定)#3 | | | 2ms #4 | | |
| 絕對輸入範圍 | ±15V | ±32mA | | - | | |
| 數位資料格式 | 16 位 2 補數 (有效位 12 bits) | | | | | |
| 平均功能 | 是 (由 D1062 設定)#5 | | | - | | |
| 隔離方式 | 數位及類比電路間未隔離 | | | | | |
| 保護 | 電壓輸出有短路保護但須注意長時間短路仍有可能造成內部線路損壞，電流輸出可開路。 | | | | | |

#1：在 V1.2 版(含)以上支援此模式，詳細請參考 D1115 說明。

#2：解析度計算

| 類比電壓輸入 | 類比電流輸入 | 類比電壓輸出 | 類比電流輸出 |
|----------------------------|---------------------------------|----------------------------|--------------------------------|
| $(5mV = \frac{20V}{4000})$ | $(10\mu A = \frac{40mA}{4000})$ | $(5mV = \frac{20V}{4000})$ | $(5\mu A = \frac{20mA}{4000})$ |

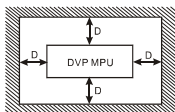
#3：當掃描週期大於 2ms 或設定值時，以掃描週期為主。

#4：當掃描週期大於 2ms 時，以掃描週期為主。

#5：當平均次數 D1062 為 1 時，即是讀取現在值。

■ 安裝方式

PLC 在安裝時，請裝配於封閉式之控制箱內，其周圍應保持一定之空間(如圖所示)，以確保 PLC 散熱功能正常。



D>50mm 以上

• 直接鎖螺絲方式：請依產品外形尺寸並使用 M4 螺絲。

• DIN 鋁軌之安裝方法：適用於 35mm 之 DIN 鋁軌。在將主機掛上鋁軌時，請先將主機(或數位輸入/輸出模組)下方之固定塑膠片，以一字形起子插入凹槽並向外撐開拉出，再將主機(或數位輸入/輸出模組)掛上鋁軌，之後將固定塑膠片壓扣回去即可。欲取下主機時，同樣以一字形起子先將固定塑膠片撐開，再將主機以往外向上的方式取出即可。該固定機構塑膠片為保持型，因此撐開後便不會彈回去。

■ 配線端子

1. 輸出 / 輸入配線端請使用 12-24 AWG 單蕊裸線或多蕊線-PLC 端子鏢絲扭力為 3.80 kg-cm (3.30 lb-in)。請使用 60/75°C 銅導線。
2. 空端子：請勿配線。輸入點信號線與輸出點等動力線請勿置於同一線槽內。
3. 鎖螺絲及配線時請避免微小的金屬導體掉入 PLC 內部。
 - 安裝前請貼上防塵貼紙，防止導電異物掉入。
 - 運轉前請撕下防塵貼紙，保持良好散熱效果。

◆ 電源端

DVP-ES2 之電源輸入為交流輸入機種時，在使用上應注意下列事項：

1. 交流電源輸入電壓，範圍寬廣 (100 ~ 240VAC)，電源請接於 L·N 兩端，如果將 AC110V 或 AC220V 接至+24V 輸出端或數位輸入點端，將使 PLC 損壞，請使用者特別注意。
2. 主機及數位輸入/輸出模組之交流電源輸入請同時作 On 或 Off 的動作。
3. 主機之接地端使用 1.6mm 以上之電線接地。
4. 當停電時間低於 10ms 時，PLC 不受影響繼續運轉，當停電時間過長或電源電壓下降將使 PLC 停止運轉，輸出全部 Off，當電源恢復正常時，PLC 亦自動回復運轉。(PLC 內部具有停電保持的輔助繼電器及暫存器，使用者在程式設計規劃時應注意使用。)
5. +24V 電源供應輸出端，最大為 0.5A，請勿將其他的外部電源連接至此端子。每個輸入點驅動電流必須 5 ~ 7mA，若以 16 點輸入計算，大約需 100mA，因此+24V 輸出給外部負載不可大於 400mA。

◆ 安全配線回路

由於 PLC 控制許多裝置，任一裝置的動作可能都會影響其他裝置的動作，因此任一裝置的故障都可能造成整個自動控制系統失控，甚至造成危險。所以在電源端輸入回路，建議的保護回路配置圖如英文版[Figure 4]所示：

- | | |
|---|--------------------|
| ① 交流電源供應：100 ~ 240VAC, 50/60Hz | ② 斷路器 |
| ③ 緊急停止：為預防突發狀況發生，設置緊急停止按鈕，可在狀況發生時，切斷系統電源。 | |
| ④ 電源指示燈 | ⑤ 交流電源負載 |
| ⑥ 電源回路保護用保險絲 (2A) | ⑦ DVP PLC 主機本體 |
| ⑧ 直流電源供應輸出：24VDC, 500mA | ⑨ 接地阻抗 100Ω 以下 |
| ⑩ 直流電源供應：24VDC | ⑪ 數位輸入/輸出模組 (直流供應) |
| ⑫ 數位輸入/輸出模組 (交流供應) | ⑬ 類比輸入/輸出模組 (直流供應) |
| ⑭ 直流電源供應：20.4VDC ~ 28.8VDC | |

◆ 輸入/輸出點之配線

輸入點之入力信號為直流電源 DC 輸入，DC 型式共有兩種接法：SINK 及 SOURCE，其定義如下：（以下為舉例說明，詳細點數配置請見各機種）

● 直流形式（DC Signal IN）配線 – SINK 模式

輸入點回路等效電路配線圖，請參閱英文版[Figure 5]。

● 直流形式（DC Signal IN）配線 – SOURCE 模式

輸入點回路等效電路配線圖，請參閱英文版[Figure 6]。

● 實用之繼電器輸出回路配線

詳細配線圖請參閱英文版[Figure 7]。

① 直流電源供給

② 緊急停止：使用外部開關

③ 保險絲：使用 5 ~ 10A 的保險絲容量於輸出接點的共用點，保護輸出點回路。

④ 突波吸收二極體：可增加接點壽命。

1. DC 負載電源之二極體抑制：功率較小時使用（請參閱英文版[Figure 8]）

2. DC 負載電源之二極體+Zener 抑制：大功率且 On/Off 頻繁時使用（請參閱英文版 [Figure 9]）

⑤ 白熾燈（電阻性負載）

⑥ 交流電源供給

⑦ 互斥輸出：例如，將 Y4 與 Y5 用以控制對應馬達的正轉及反轉，使外部電路形成互鎖，配合 PLC 內部程式，確保任何異常突發狀況發生時，均有安全的保護措施。

⑧ 指示燈：氖燈

⑨ 突波吸收器：可減少交流負載上的雜訊（請參閱英文版[Figure 10]）

● 實用之電晶體輸出回路配線

詳細配線圖請參閱英文版[Figure 11]。

① 直流電源供應

② 緊急停止

③ 電路回路保護用保險絲

④ 因電晶體模組輸出均為開集極輸出（Open Collector），若 Y0/Y1 設定為脈波串輸出，為確保電晶體模組能夠動作正常，其輸出提升電阻，必須維持輸出電流大於 0.1A。

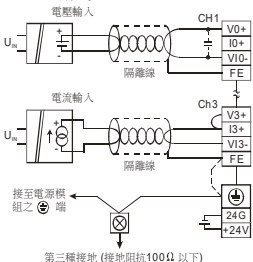
1. 二極體抑制：功率較小時使用（請參閱英文版[Figure 12]）

2. 二極體+Zener 抑制：大功率且 On/Off 頻繁時使用（請參閱英文版[Figure 13]）

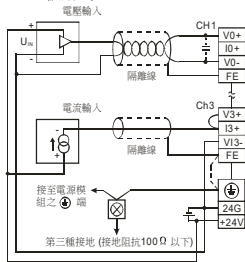
⑤ 互斥輸出：例如，將 Y3 與 Y4 用以控制對應馬達的正轉及反轉，使外部電路形成互鎖，配合 PLC 內部程式，確保任何異常突發狀況發生時，均有安全的保護措施。

◆ A/D 與 D/A 外部配線（EX2 機種適用）

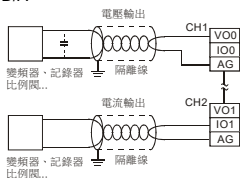
● A/D：主動式



● A/D：被動式



• D/A



註：如果連接電流訊號時，V+ 及 I+ 端子請務必短路。

◆ RS-485 建議接線

詳細接線圖請參閱英文版[Figure 17]。

- ① 主站 ② 從站 ③ 終端電阻 ④ 遮蔽線

附註：1. 終端電阻建議連接於主站及最後一台從站上，且其電阻值建議為 120Ω。

- 為確保連線品質，線材建議使用具有雙層遮蔽線之通訊雙絞線(20AWG)。
- 當兩個系統內部地準位存在壓降，可透過連接 SG (Signal Ground) 讓地準位等電位，使通訊更加穩定。

◆ 乙太網路(RJ45)接線說明

請使用 CAT-5e 雙絞線連接乙太網路 RJ45 通訊埠



- | | | |
|-------|-------|-------|
| ① Tx+ | ④ N/C | ⑦ N/C |
| ② Tx- | ⑤ N/C | ⑧ N/C |
| ③ Rx+ | ⑥ Rx- | |

註：DVP-ES2-E 系列具有 Auto MDI/MDIX 功能，與網路設備連接時無需跳線。

◆ 乙太網路設定方式

DVP-ES2-E 系列內建乙太網路通訊埠，需設定網路參數後，才可與其他網路設備連結，其參數預設值為：192.168.1.5 (IP 地址)、255.255.255.0 (子網路遮罩)。使用者可透過 DCISoft 網路參數設定軟體或 PLC 程式寫入網路控制暫存器(CR)兩種方式進行參數設定。

- 專用軟體：於 PLC 編輯軟體中開啟 DCISoft，並以網路線連接 PC 與 DVP-ES2-E 系列設備，接著進入 DCISoft 的“通訊設定”之頁面，並確認選擇“Ethernet”通訊口之後，再按下“搜尋”功能後，即可找到 DVP-ES2-E 機種之圖示；“雙擊”圖示後可開啟相關設定頁面，並於設定頁面中，輸入 IP 等相關參數後，按下“套用”即可完成設定。
- PLC 程式：透過 PLC 編輯軟體撰寫 “To 指令” 寫入 IP 地址 (CR#88, 89)與子網路遮罩(CR#90,91)，例如 IP 地址為：192.168.1.5，則將 CR#89 寫入 192.168 (H'C0A8)；CR88 寫入 1.5 (H'105)。

註：DVP-ES2-E 系列透過 From/To 指令讀寫網路控制暫存器(CR)時，其模組編號固定設定為 K108。

■ 輸入/輸出端子台配置

請參閱英文版之端子配置，在此語言版本省略說明。

■ 萬年曆的精度 (秒 / 月)

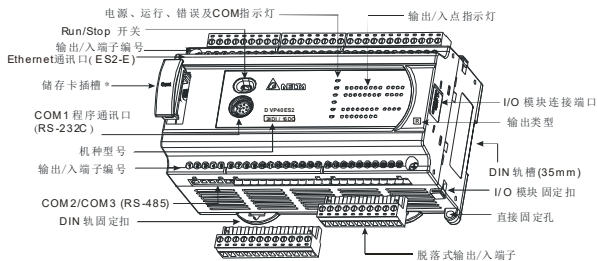
| | | | |
|------------|------|-------|--------|
| 溫度 (°C/°F) | 0/32 | 25/77 | 55/131 |
| 最大誤差 (秒) | -117 | 52 | -132 |

萬年曆停電保持時間：一週 (限版本 V2.00 以上支援)

感谢您采用台达 DVP-ES2 系列可编程控制器。此系列提供 16 ~ 80 点数的主机及 8 ~ 32 点数字量输入 / 输出模块，含主机最大输入 / 输出扩展最多可达 256 点。另可搭配模拟输入 / 输出模块使用，以满足各种应用场合。全系列采用免电池设计，其 PLC 程序与停电保持数据皆运用高速闪存储存。

- ✦ 本安装说明书提供给使用者电气规格、功能规格、安装配线的相关注意事项。其它详细的程序设计及指令说明请见 DVP-ES2 操作手册【程序篇】，选购的周边装置详细说明请见该产品随机安装说明书。
- ✦ 本机为开放型 (OPEN TYPE) 機種，因此使用者使用本机时，必须将其安装于具防尘、防潮及免于电击 / 冲击意外的外壳配线箱内。另必须具备保护措施（如：特殊的工具或钥匙才可打开）防止非维护人员操作或意外冲击本体，造成危险及损坏。
- ✦ 交流输入电源不可连接于输入 / 出信号端，否则可能造成严重损坏，请在上电之前再次确认电源配线。请勿在上电时触摸任何端子。本体上的接地端子 ⊕ 务必正确的接地，可提高产品抗干扰能力。

■ 产品外观尺寸与部位介绍



*：此储存卡插槽仅 DVP40ES200RM 及 ES2-E 機種支持。

● 详细尺寸图请参阅英文版[Figure 2]，单位：mm。

| 機種 型号 | 16ES2 00R/T | 24ES2 00R/T | 32ES2 00R/T | 40ES2 00R/T | 40ES2 00RM | 58ES2 00R/T | 60ES2 00R/T | 80ES2 00R/T | 20EX2 00R/T | 32ES2 11T |
|----------|----------------|----------------|----------------|----------------|---------------|----------------|----------------|----------------|----------------|--------------|
| L | 105 | 125 | 145 | 165 | 165 | 225 | 225 | 302 | 145 | 145 |
| L1 | 97 | 117 | 137 | 157 | 157 | 217 | 217 | 294 | 137 | 137 |
| 重量 | R | 377g | 414g | 489g | 554g | 562g | 705g | 696g | 890g | 462g |
| | T | 351g | 387g | 432g | 498g | — | 622g | 614g | 785g | 442g |

| 機種 型号 | 20ES2 00RE/ TE | 32ES2 00RE/ TE | 40ES2 00RE/ TE | 60ES2 00RE/ TE |
|----------|----------------------|----------------------|----------------------|----------------------|
| L | 125 | 165 | 194 | 255 |
| L1 | 117 | 157 | 186 | 247 |
| 重量 | RE | 453g | 569g | 630g |
| | TE | 416g | 520g | 574g |

■ 电气规格

| 机种 项目 | 32ES2 11T | 其他機種 |
|------------------|---|--|
| 电源电压 | 24VDC (-15~+20%) | 100 ~ 240VAC (-15% ~ 10%), 50/60Hz ± 5% |
| 连接方式 | 脱落式欧式端子座 (端点距离: 5mm) | |
| 动作 规格 | ES200 | 当电源缓升至 95 ~ 100VAC 时, PLC 开始动作, 当电源缓降至 70VAC 时, PLC 停止动作。 电源瞬间断电 10ms 以内继续运行。 |
| | ES211 | 当电源缓升至 20.4VDC~28.8VDC 时, PLC 开始动作, 当电源缓降至 17.5VDC 时, PLC 停止动作。电源瞬间断电 10ms 以内继续运行。 |
| 电源保险丝 容量 | 2.5A / 30VDC 可恢复式 | 2A/250VAC |
| 消耗功率 | 1.8W | 30VA |
| DC24V 电 流输出*1 | — | 500mA |
| 电源保护 | — | DC24V 输出具短路保护 |
| 突波电压承 受量 | 1,500VAC (Primary-secondary)、1,500VAC (Primary-PE)、500VAC (Secondary-PE) | |
| 绝缘阻抗 | 5MΩ 以上 (所有输出 / 入点对地之间 500VDC) | |
| 干扰免疫力 | ESD (IEC 61131-2, IEC 61000-4-2): 8kV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2kV, Digital I/O: 1kV, Analog & Communication I/O: 1kV RS (IEC 61131-2, IEC 61000-4-3): 26MHz ~ 1GHz, 10V/m | |
| 接地 | 接地配线的线径不得小于电源端 L, N 的线径 (多台 PLC 同时使用时, 请务必单点接地) | |
| 操作 / 储存 环境 | 操作: 0°C ~ 55°C (温度), 5 ~ 95% (湿度) 污染等级 2 储存: -25°C ~ 70°C (温度), 5 ~ 95% (湿度) | |
| 认证标准 | UL508 European community EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC | |
| 耐振动 / 冲击 | 国际标准规范 IEC61131-2, IEC 68-2-6 (TEST Fc)/IEC61131-2 & IEC 68-2-27 (TEST Ea) | |

*1: 此电源输出不建议供应触摸屏 (HMI) 产品使用

| 输入点电气规格 | | | |
|---------|------------|------------------------------------|---------------------|
| 输入点 No. | X0 ~ X3 #1 | X4 ~ X7 | X10 ~ X17, X20 ~ #2 |
| 输入点类型 | 数字量输入 | | |
| 输入形式 | 直流 (漏型或源型) | | |
| 输入电流 | 24VDC, 5mA | | |
| 输入阻抗 | 4.7KΩ | | |
| 最高切换频率 | 100kHz | 10kHz | 60Hz |
| 动作临界点 | Off → On | > 15VDC | |
| | On → Off | < 5VDC | |
| 反应时间 | Off → On | < 2.5μs | < 20μs < 10ms |
| | On → Off | < 5μs | < 50μs < 15ms |
| 滤波时间 | X0 ~ X7 | 由 D1020 可作 0 ~ 20ms 的调整 (默认值 10ms) | |

| 输出点电气规格 | | | | | |
|---------|----------|------------------|--|----------------------|--------------------------|
| 输出点形式 | | 继电器-R | | 晶体管-T | |
| 输出点 No. | | 全部 | | Y0, Y2 | Y1, Y3, Y4~Y17, Y20 ~ #2 |
| 电压规格 | | 250VAC, 30VDC 以下 | | 5~30VDC #3 | |
| 最高切换频率 | | 1Hz | | 100kHz | 10kHz, 1kHz |
| 漏电流 | | - | | <100uA | |
| 最大负载 | 电阻性 | 2A/1 点 (5A/COM) | | 0.5A/1 点 (4A/COM) #5 | |
| | 电感性 | #4 | | 15W (30VDC) | |
| | 灯泡 | 20WDC/100WAC | | 2.5W(30VDC) | |
| 最小负载 | | 1mA / 5V | | | |
| 反应时间 | Off → On | 约 10 ms | | < 2μs | < 20μs, < 100μs |
| | On → Off | | | < 3μs | < 30μs, < 100μs |

#1: ES200 及 EX200 于 2013 年后产出的序号其 X1、X3 计数频率由 10kHz 提升为 100kHz

#2: 主机上最大点数编号请参考「输入/输出端子台配置」。

#3: UP, ZP 必须外加辅助电源 24VDC (-15% ~ +20%) 额定消耗约 1mA/点。

#4: 继电器接点寿命随着工作电压、负载种类(功率因素 $\cos\phi$ 、时间常数 t)、及接点电流大小而有所不同, 参考生命周期曲线图预估可操作次数。生命周期曲线图请参阅英文版[Figure 3]。

#5: NPN 模式使用 ZP 端点, PNP 模式使用 UP 端点。

A/D 与 D/A 规格(EX2 机种适用)

| 项目 | 模拟量输入 (A/D) | | | 模拟量输出 (D/A) | | |
|--------------|---|--------|------------|-------------|------------|------------|
| | 电压输入 | 电流输入 | | 电压输出 | 电流输出 | |
| 模拟量输入 / 输出范围 | ±10V | ±20mA | 4 ~ 20mA#1 | ±10V | 0 ~ 20mA | 4 ~ 20mA#1 |
| 数字转换范围 | ±2,000 | ±2,000 | 0 ~ +2,000 | ±2,000 | 0 ~ +4,000 | 0 ~ +4,000 |
| 分辨率 #2 | 12-bit | | | | | |
| 输入阻抗 | > 1MΩ | 250 Ω | | - | | |
| 输出阻抗 | - | | | ≤ 0.5Ω | ≥ 1MΩ | |
| 允许负载阻抗 | - | | | ≥ 5KΩ | ≤ 500Ω | |
| 总和精密度 | 非线性精度: ±1%在整个温度范围内满刻度时 最大误差: ±1%在满刻度 20mA 及 +10V 时 | | | | | |
| 响应时间 | 2ms (可由 D1118 设定)#3 | | | 2ms #4 | | |
| 绝对输入范围 | ±15 V | ±32mA | | - | | |
| 数字数据格式 | 16 位 2 补码 (有效位 12 bits) | | | | | |
| 平均功能 | 是 (由 D1062 设定)#5 | | | - | | |
| 隔离方式 | 数字及模拟电路间未隔离 | | | | | |
| 保护 | 电压输出有短路保护但须注意长时间短路仍有可能造成内部线路损坏, 电流输出可开路。 | | | | | |

#1: 在 V1.2 版(含)以上支持此模式, 详细请参考 D1115 说明。

#2: 分辨率计算

| 模拟量输电压输入 | 模拟量输电流输入 | 模拟量输电压输出 | 模拟量输电流输出 |
|--|--|--|---|
| $(5\text{mV} = \frac{20\text{V}}{4000})$ | $(10\mu\text{A} = \frac{40\text{mA}}{4000})$ | $(5\text{mV} = \frac{20\text{V}}{4000})$ | $(5\mu\text{A} = \frac{20\text{mA}}{4000})$ |

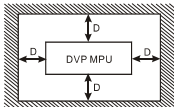
#3: 当扫描周期大于 2ms 或设定值时, 以扫描周期为主。

#4: 当扫描周期大于 2ms 时, 以扫描周期为主。

#5: 当平均次数 D1062 为 1 时, 即读取现在值。

■ 安装方式

PLC 在安装时, 请装配于封闭式的控制箱内, 其周围应保持一定的空间(如图所示), 以确保 PLC 散热功能正常。



D>50mm 以上

- 直接锁螺丝方式: 请依产品外形尺寸并使用 M4 螺丝。
- DIN 铝轨的安装方法: 适用于 35mm 的 DIN 铝轨。在将主机挂上铝轨时, 请先将主机(或数字量输入/输出模块)下方的固定塑料片, 以一字形起子插入凹槽并向外撑开拉出, 再将主机(或数字量输入/输出模块)挂上铝轨, 之后将固定塑料片压扣回去即可。欲取下主机时, 同样以一字形起子先将固定塑料片撑开, 再将主机以往外向上的方式取出即可。该固定机构塑料片为保持型, 因此撑开后便不会弹回去。

■ 配线端子

1. 输出/入配线端请使用 12-24AWG 单蕊裸线或多蕊线, 端子规格如图所示。PLC 端子螺丝扭力为 3.80 kg-cm (3.30 lb-in)。请使用 60/75°C 铜导线
2. 空端子 · 请勿配线。输入点信号线与输出点等动力线请勿置于同一线槽内。
3. 锁螺丝及配线时请避免微小的金属导体掉入 PLC 内部。
 - 安装前请贴上防尘贴纸, 防止导电异物掉入。
 - 运转前请撕下防尘贴纸, 保持良好散热效果。

◆ 电源端

DVP-ES2 的电源输入为交流输入机种时, 在使用上应注意下列事项:

1. 交流电源输入电压, 范围大小(100 ~ 240VAC), 电源请接于 L、N 两端, 如果将 AC110V 或 AC220V 接至+24V 输出端或数字量输入点端, 将使 PLC 损坏, 请使用者特别注意。
2. 主机及数字量输入/输出模块的交流电源输入请同时作 On 或 Off 的动作。
3. 主机的接地端使用 1.6mm 以上的电线接地。
4. 当停电时间低于 10ms 时, PLC 不受影响继续运转, 当停电时间过长或电源电压下降将使 PLC 停止运转, 输出全部 Off, 当电源恢复正常时, PLC 亦自动恢复运转。(PLC 内部具有停电保持的辅助继电器及寄存器, 使用者在程序设计规划时别注意使用。)
5. +24V 电源供应输出端, 最大为 0.5A, 请勿将其余的外部电源连接至此端子。每个输入点驱动电流必须 5 ~ 7mA, 若以 16 点输入计算, 大约需 100mA, 因此+24V 输出给外部负载不可大于 400mA。

◆ 安全配线回路

由于 PLC 控制许多装置, 任一装置的动作可能都会影响其它装置的动作, 因此任一装置的故障都可能会造成整个自动控制系统的失控, 甚至造成危险。所以在电源端输入回路, 建议的保护回路配置图如英文版[Figure 4]所示:

- | | |
|---|---------------------|
| ① 交流供应电源: 100 ~ 240VAC, 50/60Hz | ② 断路器 |
| ③ 紧急停止: 为预防突发状况发生, 设置紧急停止按钮, 可在状况发生时, 切断系统电源。 | |
| ④ 电源指示灯 | ⑤ 交流电源负载 |
| ⑥ 电源回路保护用保险丝 (2A) | ⑦ DVP PLC 主机本体 |
| ⑧ 直流供应电源输出: 24VDC, 500mA | ⑨ 接地阻抗 100Ω 以下 |
| ⑩ 直流供应电源: 24VDC | ⑪ 数字量输入/输出模块 (直流供应) |
| ⑫ 数字量输入/输出模块 (交流供应) | ⑬ 模拟量输入/输出模块 (直流供应) |
| ⑭ 直流电源供应: 20.4VDC ~ 28.8VDC | |

◆ 输入/输出点之配线

输入点的接入信号为直流电源 DC 输入, DC 型式共有两种接法: 漏型及源型, 其定义如下:(以下为举例说明, 详细点数配置请见各机种)

- 直流形式 (DC Signal IN) 配线 - 漏型模式
输入点回路等效电路配线图, 请参阅英文版[Figure 5]。

- 直流形式 (DC Signal IN) 配线 – 源型模式
输入点回路等效电路配线图, 请参阅英文版[Figure 6]。

- 实用的继电器输出回路配线
详细配线图请参阅英文版[Figure 7]。

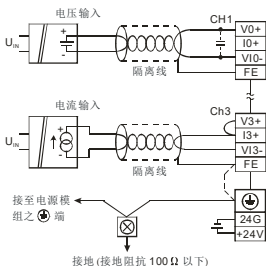
- | | |
|--|----------------|
| ① 直流电源供给 | ② 紧急停止: 使用外部开关 |
| ③ 保险丝: 于输出接点的公共端使用容量 5 ~ 10A 的保险丝, 保护输出点回路。 | |
| ④ 突波吸收二极管: 可增加接点寿命。 1. DC 负载电源的二极管抑制: 功率较小时使用 (请参阅英文版[Figure 8]) 2. DC 负载电源的二极管+Zener 抑制: 大功率及 On/Off 频繁时使用 (请参阅英文版[Figure 9]) | |
| ⑤ 白炽灯 (电阻性负载) | ⑥ 交流电源供给 |
| ⑦ 互斥输出: 例如, 将 Y4 与 Y5 用于控制对应马达的正转及反转, 使外部电路形成互锁, 配合 PLC 内部程序, 确保任何异常突发状况发生时, 均有安全的保护措施。 | |
| ⑧ 指示灯: 氖灯 | |
| ⑨ 突波吸收器: 可减少交流负载上的干扰 (请参阅英文版[Figure 10]) | |

- 实用的晶体管输出回路配线
详细配线图请参阅英文版[Figure 11]。

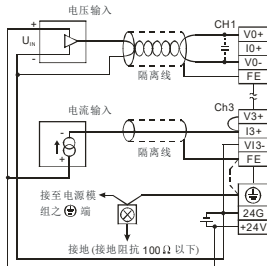
- | | | |
|--|--------|--------------|
| ① 直流供应电源 | ② 紧急停止 | ③ 电路回路保护用保险丝 |
| ④ 因晶体管模块输出均为开集极输出 (Open Collector), 若 Y0/Y1 设定为脉冲式输出, 为确保晶体管模块能够动作正常, 其输出提升电阻, 必须维持输出电流大于 0.1A。 1. 二极管抑制: 功率较小时使用 (请参阅英文版[Figure 12]) 2. 二极管+Zener 抑制: 大功率及 On/Off 频繁时使用 (请参阅英文版[Figure 13]) | | |
| ⑤ 互斥输出: 例如, 将 Y3 与 Y4 用于控制对应马达的正转及反转, 使外部电路形成互锁, 配合 PLC 内部程序, 确保任何异常突发状况发生时, 均有安全的保护措施。 | | |

◆ A/D 与 D/A 外部配线 (EX2 机种适用)

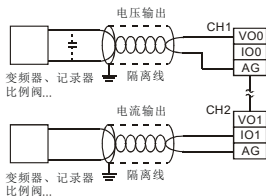
- A/D: 主动式



- A/D: 被动式



- D/A



注: 如果连接电流信号时, V+ 及 I+ 端子请务必短路。

◆ RS-485 建议接线

详细接线图请参阅英文版[Figure 17]。

① 主站

② 从站

③ 终端电阻

④ 屏蔽线

附注：1. 终端电阻建议连接于主站及最后一台从站上，且其阻值建议为 120Ω。

2. 为确保联机质量，线材建议使用具有双层屏蔽线的通讯双绞线(20AWG)。

3. 当两个系统内部地准位存在压降，可透过连接 SG (Signal Ground) 让地准位等电位，使通讯更加稳定。

◆ 以太网网络(RJ45)接线说明

请使用 CAT-5e 双绞线连接以太网网络 RJ45 通讯端口



① Tx+

⑤ N/C

② Tx-

⑥ Rx-

③ Rx+

⑦ N/C

④ N/C

⑧ N/C

注：DVP-ES2-E 系列具有 Auto MDI/MDIX 功能，与网络设备连接时无需跳线。

◆ 以太网网络设定方式

DVP-ES2-E 系列内建以太网网络通讯端口，需设定网络参数后，才可与其它网络设备连结，其参数默认值为：192.168.1.5 (IP 地址) 255.255.255.0 (子网掩码) 使用者可透过 DCISoft 网络参数设定软件或 PLC 程序写入网络控制寄存器(CR)两种方式进行参数设定。

- 专用软件：于 PLC 编辑软件中开启 DCISoft，并以网络线连接 PC 与 DVP-ES2-E 系列设备，接着进入 DCISoft 的“通讯设定”之页面，并确认选择“Ethernet”通讯口之后，再按下“搜寻”功能后，即可找到 DVP-ES2 机种之图示；“双击”图示后可开启相关设定页面，并于设定页面中，输入 IP 等相关参数后，按下“套用”即可完成设定。
- PLC 程序：透过 PLC 编辑软件撰写“To 指令”写入 IP 地址 (CR#88, 89) 与子网掩码(CR#90,91)，例如 IP 地址为：192.168.1.5，则将 CR#89 写入 192.168 (H'C0A8)；CR88 写入 1.5 (H'105)。

注：DVP-ES2-E 系列透过 From/To 指令读写网络控制寄存器(CR)时，其模块编号固定设定为 K108。

■ 输入 / 输出端子排配置

请参阅英文版之端子配置，在此语言版本省略说明。

■ 万年历的精度 (秒 / 月)

| | | | |
|------------|------|-------|--------|
| 温度 (°C/°F) | 0/32 | 25/77 | 55/131 |
| 最大误差 (秒) | -117 | 52 | -132 |

万年历停电保持时间：一周 (限版本 V2.00 以上支持)