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PRESSURE TRANSDUCERS AND TRANSMITTERS



GEFRAN
BEYOND TECHNOLOGY



GEFRAN

BEYOND TECHNOLOGY

More than fifty years of experience, and being an organisation with a strong focus on the customer's needs and constant technological innovation have made Gefran a benchmark in the design and production of sensors, systems and components for industrial process automation and control. Expertise, flexibility and process quality are the factors that distinguish Gefran in the production of integrated tools and systems for specific applications in various fields of industry, with consolidated know-how in the plastics, mobile hydraulics, heating and lift sectors. Technology, innovation and versatility represent the catalogue's added value, in addition to the ability to create specific application solutions in association with the world's leading machine manufacturers.

PRESSURE TRANSDUCERS

A pressure transducer is an electronic device that transforms a physical variable (pressure) into an electrical signal (current or voltage), acquired by various control, measurement and regulation devices such as controllers or PLCs.

Gefran sensors are capable of measuring fluid and gas pressure in all applications required by the industry.

The Gefran Group relies on a unit dedicated exclusively to the design and production of a full range of sensors capable of measuring pressure, displacement, force, humidity and temperature. Based on know-how gained over years of activity in the field of sensors, Gefran guarantees:

- Total control of the production process, from the design of the sensitive element to the production of precision mechanical parts, ensuring high standards of quality, reliability and precision of the finished product.
- The constant updating of technologies and solutions meets the specific needs of the customer. Automated production lines use sophisticated pressure controllers making it possible to work with gas at an absolute pressure of up to 40 bar and oil up to 5000 bar.
- Effective product research and development. Gefran offers a complete range of measurement from 0...50 mbar to 0...5000bar, for relative and absolute pressures.

Gefran is one of the few companies at an international level that has developed the know-how to produce sensitive elements based on the following technologies in its Technological Pole:

- Thick film on steel;
- Glued strain gauge;
- Silicon piezoresistive.

Gefran pressure transducers are the result of years of experience and close collaboration with the best European universities as well as the company's own customers. Each transducer has been designed and manufactured with characteristics aimed at satisfying the requirements of its particular application.



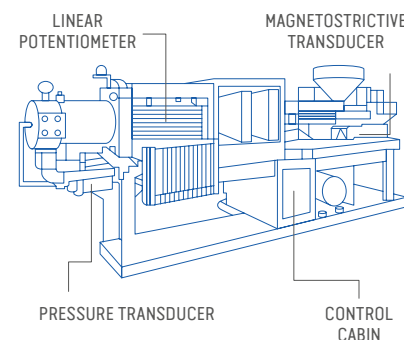
KS, KH, KHC PRESSURE TRANSDUCERS



TPFADA, TPFAS FLUSH DIAPHRAGM PRESSURE TRANSDUCERS



TPHADA HIGH PRESSURE TRANSDUCERS



PLASTIC INJECTION PRESS

APPLICATION SECTORS



PLASTIC AND RUBBER INJECTION PRESSES



BLOW MOULDING MACHINES



MATERIALS PROCESSING



HYDRAULICS AND HYDRAULIC POWER PACKS



FARMING AND EARTHMOVING MACHINERY



AUTOMOTIVE TEST BENCHES ENGINE TEST ROOMS



STEAM TREATMENT PLANTS



FOOD INDUSTRY



EQUIPMENT TEST BENCHES



MATERIALS TESTING MACHINES



HEAT EXCHANGE SYSTEMS



ATEX: INTRINSIC SAFETY METHANE GAS DISTRIBUTION SYSTEMS METHANE GAS COMPRESSORS

WIDE RANGE OF PRODUCTS
FOR EVERY APPLICATION

Gefran offers an extensive range of transducers for pressure measurement in all industrial applications. Models are available for special and high-precision applications, also for use in particularly heavy duty and demanding environments, such as mobile vehicles.

The TPF/TPFADA series adopts a state-of-the-art technical solution with a very sturdy flush steel measuring diaphragm.

This makes the product unique and particularly suitable for pressure measurement in very dense and aggressive fluids and pastes.

In addition, the new TPFAS series introduces new membranes miniaturised up to Ø 8.6 mm which are the smallest of their kind on the market.

The TPH/TPHADA series, with its monolithic measuring diaphragm structure, is the ideal product for very high pressure measurements, up to 5000 bar, even with high dynamic push- button pressure.

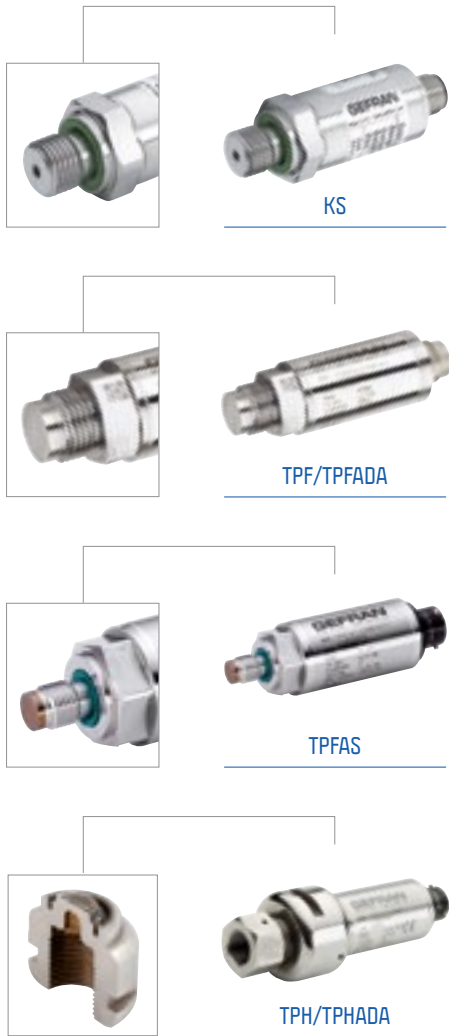


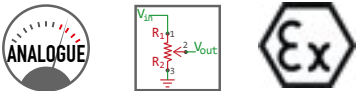
Table with 16 columns (KS, KH, KHC, KX, TK, TKDA, TSA, TPS, TPSA, TPSADA, TPH, TPHADA, TPF, TPFADA, TPFAS) and 11 rows (4-20mA, 0-10Vdc, RATIOMETRIC mV/V, CAN OPEN - SAE 1939, SIL2, cULus, ATEX, EAC EX, AUTOZERO).

ANALOGUE OR DIGITAL ELECTRICAL OUTPUT?

GEFRAN manufactures both transmitters and transducers with the following electrical outputs:

ANALOGUE

- Ratiometric
- 4...20mA
- 0.5...4.5Vdc, 0...5Vdc, 0...10Vdc



DIGITAL

- Can Open CiA DP 3.01 rel.4.0 and DS406 with the following special features - Selectable baud rate from 10KBaud to 1MBaud
- Can SAE J1939 multi-PDU approach (CiA 602-2) - 14 bit digital resolution



MEASUREMENT RANGES

Gefran sensors are capable of measuring fluid and gas pressure in all applications required by the industry.

Gefran offers a complete range for measurement from 0...50 mbar to 0...5000bar, for relative and absolute pressures.

Table with 15 columns (MODEL, PRESSURE, KS, KX, KH, KHC, TK TKDA, TSA, TPS, TPSA, TPSADA, TPF, TPH, TPHADA, TPF TPFADA, TPFAS) and 4 rows (CAMPO MIN., CAMPO MAX., BAR, PSI).

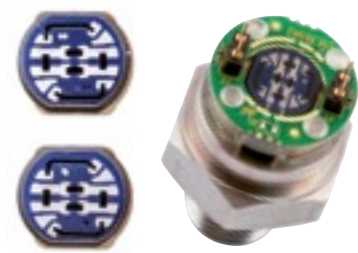
PRESSURES FROM 0...50MBAR TO 0...5000 BAR

TECHNOLOGY

Gefran uses one of the most widespread and proven existing measurement principles, the so-called “Wheatstone Bridge”. There are a number of different technologies for making the sensitive element on the basis of this principle.

THICK FILM ON STEEL TECHNOLOGY

Using the “screen printing process” technique, the insulating layers (dielectric), the conductive layer (cermet) and the resistive layer are deposited on the steel membrane to create the “Wheatstone bridge”. The thickness of the membrane determines the measurement range, and the step-by-step transition from 200°C to 900°C makes the sensor extremely robust and reliable.



EXTENSIMETRIC TECHNOLOGY

“Glued strain gauge” technology, originally developed by Gefran, is one of the most widely used methods in the construction of pressure sensors for its versatility of application, reliability and precision. The measuring element (resistance) consists of an ultra-thin sheet of metal alloy, chemically etched using the process employed in printed circuit boards. It is glued to the steel diaphragm using sophisticated techniques following careful positioning of the strain gauge to ensure perfect adhesion to the surface and the necessary linearity.

SILICON PIEZORESISTIVE TECHNOLOGY

Silicon piezoresistive technology is characterized by the complex and delicate step of installing the chip (solid state Wheatstone bridge) in the metal substrate and the metal separation membrane, interposing silicone insulation oil (filling) in a vacuum. With this technology, the measurement range of Gefran sensors can also be very low (0-50 mbar), with high precision and overpressure capability.



PRESSURE TRANSDUCERS AND TRANSMITTERS

SIL2: FUNCTIONAL SAFETY

The new **KS** series represents the **best solution for all applications**, both hydraulic and pneumatic, requiring a pressure transducer and offering not only competitive price but also high performance and **reliability**. The KS series is supplied with SIL2 certification according to IEC/EN 62061 in accordance with Machinery Directive 2006/42/EC. The KH series for applications on mobile vehicles and the KX series for potentially explosive areas are also available with the same SIL2 certification.



PFD	PFH	SIL	PL	RISK REDUCTION FACTOR
(PROBABILITY OF FAILURE ON DEMAND)	(PROBABILITY OF FAILURES FOR HOUR)	EN 61508 EN 62061	EN 13849-1	
10 ⁻² < PFD < 10 ⁻¹	10 ⁻⁶ < PFH < 10 ⁻⁵	1	B,C	10 TO 100
10 ⁻³ < PFD < 10 ⁻²	10 ⁻⁷ < PFH < 10 ⁻⁶	2	D	100 TO 1.000
10 ⁻⁴ < PFD < 10 ⁻³	10 ⁻⁸ < PFH < 10 ⁻⁷	3	E	1000 TO 10.000

The concepts Safety Integrity Level (SIL) and Performance Level (PL) describe the ability of the control and command system to reduce the risk factor, in terms of safety.



ATEX: SICUREZZA INTRINSECA

Gefran’s range of pressure sensors includes pressure transmitters in **ATEX versions ideal for applications in potentially explosive atmospheres**. ATEX Directive 2014/34/EU refers to electrical and mechanical equipment and protective systems that can be used in potentially explosive atmospheres (flammable gases, vapours and dusts), even under extreme conditions. The KX series is IIIG Ex ia IIC T4, T5 and T6 certified and covers measurement ranges of ±1 bar at 0...1000bar, with operation from -40°C to +80°C. To guarantee maximum safety and reliability, the KX series is also SIL2 (Functional Safety) certified, and is therefore applicable in safety equipment that can be installed in potentially explosive atmospheres.







AUTOZERO & SPAN

The Autozero & Span function permits simple, and effective adjustment of the pressure transducer zero as well as full scale using a magnetic pen. Simply place the pen on the contact point identified by the symbol for a few seconds and the operation is complete, with no need to open or disassemble the transducer. The Digital Autozero & Span function is optional.









PRESSURE TRANSDUCERS

MAIN TECHNICAL CHARACTERISTICS





																																																																																																																							
MODEL	KS	KH	KHC																																																																																																																				
MEASUREMENT RANGES	0...1 a 0...1000 bar (0...15 a 0...15000 psi)	4...1000 bar (60...15000 psi)	4...1000 bar (60...15000 psi)																																																																																																																				
ACCURACY	<± 0,5% FS	< ± 0.5% FS	<± 0.5% FS																																																																																																																				
NON-LINEARITY	+/- 0,15% FS (typical)	+/- 0,15% FS (typical)	+/- 0,15% FS (typical)																																																																																																																				
OVERPRESSURE	2x	2x	2x																																																																																																																				
BURST STRENGTH	4x	4x	4x																																																																																																																				
SAMPLING TIME	< 1 msec.	< 1 msec	< 1 msec																																																																																																																				
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane																																																																																																																				
OPERATING TEMPERATURE (PROCESS) RANGE	-40...+125°C (-40...+257°F)	-40...+125°C (-40...+257°F)	-40...+125°C (-40...+257°F)																																																																																																																				
COMPENSATED TEMPERATURE RANGE	-20...+85°C (-4...+185°F)	-20...+85°C (-4...+185°F)	-20 ... +85°C (-4...185°F)																																																																																																																				
ZERO DRIFT IN COMPENSATED FIELD	± 0,01% FS/°C typical (± 0,02% FS/°C max.)	± 0.01% FS/°C typical (± 0.02% FS/°C max.)	± 0.01%FS/°C typical (± 0.02% FS/°C max.)																																																																																																																				
TRANSDUCER BODY CONSTRUCTION MATERIAL	Stainless steel	Stainless steel	Stainless steel																																																																																																																				
PARTS IN CONTACT WITH THE PROCESS	Fluids compatible with AISI 430F and 17-4 PH stainless steel	Fluids compatible with AISI 430F and 17-4 PH stainless steel	Fluids compatible with AISI 430F and 17-4 PH stainless steel																																																																																																																				
ELECTRICAL CONNECTIONS	4-pin microDIN connector (P8) (C) 4-pin M12x1 connector (Z) 4-pin DIN connector (P18) (E) 2/3 pole shielded cable (1m) (F)	4-pin M12x1 connector (Z) 3-pin connector - EN 175301-803 (E) 3 pole shielded cable (1m) (F) 4-pin Deutsch DT04 connector (G) 3-pin AMP Superseal 1.5 connector (S) 3-pin Metri-Pack 150 connector (K) 3-pin Deutsch DT04 connector (D)	5-pin M12x1 connector (A)																																																																																																																				
OUTPUT SIGNAL	Analogue 0.1...5.1 Vdc 0.1...10.1 Vdc 4...20 mA 0...5 Vdc* 0...10 Vdc* 1...5 Vdc 1...6 Vdc * SIL2 certification not available	Analogue 0...10 Vdc* (3 wires) 4...20mA (2 wires) 0.5...4.5 V ratiometric * SIL2 certification not available	Digital CANopen J1939																																																																																																																				
MEASUREMENT RANGES	<table><tr><th colspan="2">bar</th><th colspan="2">bar</th></tr><tr><td>B01U</td><td>1"</td><td>B04D</td><td>40</td></tr><tr><td>B1V6</td><td>1,6"</td><td>B06D</td><td>60</td></tr><tr><td>B02U</td><td>2"</td><td>B01C</td><td>100</td></tr><tr><td>B2V5</td><td>2,5"</td><td>B16D</td><td>160</td></tr><tr><td>B04U</td><td>4</td><td>B16D</td><td>160</td></tr><tr><td>B06U</td><td>6</td><td>B02C</td><td>200</td></tr><tr><td>B01D</td><td>10</td><td>B25D</td><td>250</td></tr><tr><td>B16U</td><td>16</td><td>B04C</td><td>400</td></tr><tr><td>B02D</td><td>20</td><td>B06C</td><td>600</td></tr><tr><td>B25U</td><td>25</td><td>B01M</td><td>1000</td></tr></table> * SIL and UL certification not available	bar		bar		B01U	1"	B04D	40	B1V6	1,6"	B06D	60	B02U	2"	B01C	100	B2V5	2,5"	B16D	160	B04U	4	B16D	160	B06U	6	B02C	200	B01D	10	B25D	250	B16U	16	B04C	400	B02D	20	B06C	600	B25U	25	B01M	1000	<table><tr><th colspan="2">bar</th><th colspan="2">bar</th></tr><tr><td>B04U</td><td>4</td><td>B06D</td><td>60</td></tr><tr><td>B06U</td><td>6</td><td>B01C</td><td>100</td></tr><tr><td>B01D</td><td>10</td><td>B16D</td><td>160</td></tr><tr><td>B16U</td><td>16</td><td>B02C</td><td>200</td></tr><tr><td>B02D</td><td>20</td><td>B25D</td><td>250</td></tr><tr><td>B25U</td><td>25</td><td>B04C</td><td>400</td></tr><tr><td>B04D</td><td>40</td><td>B06C</td><td>600</td></tr><tr><td></td><td></td><td>B01M</td><td>1000</td></tr></table>	bar		bar		B04U	4	B06D	60	B06U	6	B01C	100	B01D	10	B16D	160	B16U	16	B02C	200	B02D	20	B25D	250	B25U	25	B04C	400	B04D	40	B06C	600			B01M	1000	<table><tr><th colspan="2">bar</th><th colspan="2">bar</th></tr><tr><td>B04U</td><td>4</td><td>B01C</td><td>100</td></tr><tr><td>B06U</td><td>6</td><td>B16D</td><td>160</td></tr><tr><td>B01D</td><td>10</td><td>B02C</td><td>200</td></tr><tr><td>B16U</td><td>16</td><td>B25D</td><td>250</td></tr><tr><td>B02D</td><td>20</td><td>B04C</td><td>400</td></tr><tr><td>B25U</td><td>25</td><td>B06C</td><td>600</td></tr><tr><td>B04D</td><td>40</td><td>B01M</td><td>1000</td></tr><tr><td>B06D</td><td>60</td><td></td><td></td></tr></table>	bar		bar		B04U	4	B01C	100	B06U	6	B16D	160	B01D	10	B02C	200	B16U	16	B25D	250	B02D	20	B04C	400	B25U	25	B06C	600	B04D	40	B01M	1000	B06D	60		
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B06D	60																																																																																																																						
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65/IP67	IP65/IP67	IP67/IP69K																																																																																																																				
PROCESS CONNECTIONS	G 1/4 gas male (DIN 3852-E) (E) G 1/2 gas male (DIN 3852-E) (3)	G 1/4 gas male (DIN 3852-E) (E) 1/4-18 NPT male (7)	G1/4 gas male (DIN 3852-E) (E) 1/4-18 NPT male (7)																																																																																																																				
MAIN APPLICATIONS	- Industrial automation - Compressors - Hydraulic power units - Plastic injection presses - Hydraulic presses - Hydraulic systems - Pumps	- Agricultural vehicles - Railways - Municipalities - Mining - Construction - Mobile hydraulics	- Agricultural vehicles - Municipalities - Mining - Construction - Mobile hydraulics																																																																																																																				
																																																																																																																							

PRESSURE TRANSDUCERS AND TRANSMITTERS







												
MODEL	KX	TK	TKDA									
MEASUREMENT RANGES	-1...1 a 0...1000 bar (-15...15 a 0...15000 psi)	0...1000bar 0...15000psi	0...1000bar 0...15000psi									
ACCURACY	+/- 0,15% FS (typical)	H ± 0,25% FS (typical) M ± 0,5% FS (typical)	H ± 0,25% FS (typical) M ± 0,5% FS (typical)									
OVERPRESSURE	2x	2x	2x									
BURST STRENGTH	4x	4x	4x									
SAMPLING TIME	< 1 msec	< 1 msec	< 1 msec									
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane									
OPERATING TEMPERATURE (PROCESS) RANGE	-40...+125°C (-40...+257°F)	-40...+105°C (-40...+221°F)	-40...+105°C (-40...+221°F)									
COMPENSATED TEMPERATURE RANGE	-20...+85°C (-4...+185°F)	-10...+85°C (+14...+185°F)	-10...+85°C (+14...+185°F)									
ZERO DRIFT IN COMPENSATED FIELD	± 0,01% FS/°C	± 0,012% FS/°C (typical)	± 0,012% FS/°C (typical)									
TRANSDUCER BODY CONSTRUCTION MATERIAL	Steel	Stainless steel	Stainless steel									
PARTS IN CONTACT WITH THE PROCESS	Fluids compatible with AISI 430F and 17-4 PH stainless steel	Fluids compatible with AISI 430F and 17-4 PH stainless steel	Fluids compatible with AISI 430F and 17-4 PH stainless steel									
ELECTRICAL CONNECTIONS	7-pin M16x0.75 connector (P) 6-pin connector (V) 2 pole 2x0.25 shielded cable (1m) (F) 4-pin solenoid valve connector (E) 4-pin micro-solenoid valve connector (M) 4-pin M12x1 connector (Z)	7-pin connector (P) 6-pin connector (V) 2x0.25 shielded cable (2m) (F) 4-pin 4x0.25 shielded cable (2m) (F) 4-pin M12x1 connector (Z) 4-pin solenoid valve connector (E) 4-pin micro-solenoid valve connector (M)	7-pin connector (P) 6-pin connector (V) 2x0.25 shielded cable (2m) (F) 4-pin 4x0.25 shielded cable (2m) (F) 4-pin M12x1 connector (Z) 4-pin solenoid valve connector (E) 4-pin micro-solenoid valve connector (M)									
OUTPUT SIGNAL	Analogue	Analogue	Analogue									
	4-20 mA	4...20mA (two wires) 0.1...5.1Vdc 0.1...10.1Vdc 0...5Vdc 0...10Vdc 1...5Vdc 1...10Vdc	4...20mA (two wires) 0.1...5.1Vdc 0.1...10.1Vdc 0...5Vdc 0...10Vdc 1...5Vdc 1...10Vdc									
MEASUREMENT RANGES	bar		bar		bar		bar		bar		bar	
	N01U	-1...+1	B16U	16	N01U	-1...+1 *	B03D	0.30	N01U	-1...+1 *	B25U	0.25
	N1V6	-1...+1,6	B02D	20	N02U	-1...+2 *	B04D	0.40	N02U	-1...+2 *	B03D	0.30
	N02U	-1...+2	B25U	25	N03U	-1...+3 *	B05D	0.50	N03U	-1...+3 *	B04D	0.40
	N2V5	-1...+2,5	B04D	40	N05U	-1...+5	B06D	0.60	N05U	-1...+5	B05D	0.50
	N04U	-1...+4	B06D	60	N01D	-1...+10	B01C	0.100	N01D	-1...+10	B06D	0.60
	N06U	-1...+6	B01C	100	B03U	0.3	B16D	0.160	B03U	0.3	B01C	0.100
	N01D	-1...+10	B16D	160	B04U	0.4	B02C	0.200	B04U	0.4	B16D	0.160
	B02U	2	B02C	200	B05U	0.5	B25D	0.250	B05U	0.5	B02C	0.200
	B2V5	2,5	B25D	250	B06U	0.6	B35D	0.350	B06U	0.6	B25D	0.250
	B04U	4	B04C	400	B07U	0.7	B04C	0.400	B07U	0.7	B35D	0.350
	B06U	6	B06C	600	B01D	0.10	B05C	0.500	B01D	0.10	B04C	0.400
	B01D	10	B01M	1000	B16U	0.16	B06C	600	B16U	0.16	B05C	0.500
					B02D	0.20	B07C	700	B02D	0.20	B01M	0...1000
					B25U	0.25	B01M	1000				
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65/IP67				IP65/IP66/IP67				IP65/IP67			
PROCESS CONNECTIONS	G1/4 gas male (DIN 3852-E) (E) 1/4-18 NPT male (7)				G 1/4 gas male (DIN 3852-E) (E) G 1/2 gas male (DIN 3852-E) (3) 1/4"-18 NPT male (7) 1/2"-14 NPT male (J)				G 1/4 gas male (DIN 3852-E) (E) 1/4-18 NPT male (7) 1/2"-14 NPT male (J) G 1/2 gas male (DIN 3852-E) (3)			
MAIN APPLICATIONS	- Compressors - Distributors - Methane gas				- Hydraulic power units - Test benches - Plastic injection presses - Die-casting injection presses on request				- Hydraulic power units - Test benches - Plastic injection presses - Die-casting injection presses			
												

PRESSURE TRANSDUCERS

MAIN TECHNICAL CHARACTERISTICS










												
MODEL	TSA		TPS		TPSA							
MEASUREMENT RANGES	0...0.05 a 0...60bar (0...1 a 0...1000psi) Absolute ranges >= 1 bar / 15psi		0...10 bar a 0...1000 bar (0...150psi a 0...15000psi)		0...4 bar a 0...1000 bar (0...60psi a 0...15000psi)							
ACCURACY	± 0.15% FS (typical) (±0.5% FS for absolute ranges)		± 0.15% FS (typical) >200bar/3000psi ± 0.25% FS (typical) ≤200bar/3000psi		± 0.1% FS (typical) ≥ 100bar/1500psi ± 0.15% FS (typical) <100bar/1500psi							
OVERPRESSURE	4x...2x		2x		3x...2x							
BURST STRENGTH	6x...3x		4x...2.5x		5x...2.5x							
RESPONSE TIME	< 4 msec		<0.1 msec.		< 1 msec.							
MEASURING PRINCIPLE PROPERTIES	Silicon piezoresistive		Extensimeter		Thick film of sensitive element deposited on steel membrane							
OPERATING TEMPERATURE (PROCESS) RANGE	-20...+85°C (-4...+185°F)		-40...+120°C (-40...+248°F)		-40...+105°C (-40...+221°F)							
COMPENSATED TEMPERATURE RANGE	-10...+85°C (+14...+185°F)		-20...+85°C (-4...+185°F)		-10...+85°C (14...+185°F)							
ZERO DRIFT IN COMPENSATED FIELD	+ 0.01% FS/°C (typical) (± 0.02% FS/°C max) ranges >1 bar ± 0.04%FS/°C (typical) ranges ≤1 bar		± 0.01% FS/°C (typical) (± 0.02% FS/°C max.)		± 0.008% FS/°C (typical) (± 0.015% FS/°C max.)							
TRANSDUCER BODY CONSTRUCTION MATERIAL	AISI 304 stainless steel		AISI 304 stainless steel		AISI 304 stainless steel							
PARTS IN CONTACT WITH THE PROCESS	AISI 316L stainless steel		17-4PH stainless steel		17-4PH stainless steel							
ELECTRICAL CONNECTIONS	4-pin M12x1 connector (Z) EN 175301-801 type A connector (E) EN 175301-801 type C connector (M) 2/3 pole shielded cable (F)		7-pin connector (P) 6-pin connector (V) 6-pin x0.25 shielded cable (1m) (F) 4-pin M12x1 connector (Z) 4-pin solenoid valve connector (E) 4-pin micro-solenoid valve connector (M)		4-pin solenoid valve connector (E) 2/4-pin x0.25 shielded cable (2m) (F) 4-pin M12x1 connector (Z) 4-pin micro solenoid valve connector (M) 7-pin connector (P) 6-pin connector (V)							
	Analogue		Ratiometric		Analogue							
OUTPUT SIGNAL	4 ... 20 mA 0 ... 10 Vdc 0.1 ... 10.1 Vdc 0 ... 5 Vdc		mV/V		Standard 0.1 ... 10.1 Vdc - 4 ... 20 mA 0...10 Vdc On request 0.1 ... 5.1 Vdc - 0 ... 5 Vdc 1 ... 5 Vdc - 1 ... 10 Vdc 1 ... 6 Vdc							
	bar		bar		bar							
MEASUREMENT RANGES	BV05*	0...0.05	B06U	0...6	B01D	0...10	B01C	0...100	B04U	0...4	B05D	0...50
	BV10*	0...0.1	B07U	0...7	B16U	0...16	B16D	0...160	B05U	0...5	B16D	0...160
	BV25*	0...0.25	B01D	0...10	B02D	0...20	B25D	0...250	B06U	0...6	B02C	0...200
	BV50*	0...0.5	B16U	0...16	B25U	0...25	B35D	0...350	B07U	0...7	B25D	0...250
	B01U	0...1	B02D	0...20	B03D	0...30	B35D	0...350	B01D	0...10	B35D	0...350
	B1V2	0.8...1.2	B25U	0...25	B35U	0...35	B04C	0...400	B16U	0...16	B04C	0...400
	B02U	0...2	B03D	0...30	B04D	0...40	B05C	0...500	B02D	0...20	B05C	0...500
	B2V5	0...2.5	B04D	0...40	B05D	0...50	B06C	0...600	B25U	0...25	B06C	0...600
	B04U	0...4	B05D	0...50	B06D	0...60	B07C	0...700	B03D	0...30	B07C	0...700
	B05U	0...5	B06D	0...60			B01M	0...1000	B04D	0...40	B01M	0...1000
	*related fields only											
	PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65/IP67		IP65/IP66/IP67		IP65/IP66/IP67						
	PROCESS CONNECTIONS	G 1/4 gas male (DIN 3852-E) (E) G 1/2A (DIN 16288) (3)		Standard G 1/4 gas male (1) On request 7/16-20 UNF-2A male (SAE 4 for AS4395-E) (2) G 1/2A (DIN 16288) (3) G 1/4 gas female (4)		Standard G 1/4 gas male (1) On request 7/16-20 UNF-2A maschio (SAE 4 per AS4395-E) (2) G 1/2A (DIN 16288) (3) G 1/4 gas female (4)						
	MAIN APPLICATIONS	- Food industri - Packaging - Air filters		- Test benches - Material testing machines		- Test benches						
												

PRESSURE TRANSDUCERS AND TRANSMITTERS

												
MODEL	TPSADA				TPH				TPHADA			
MEASUREMENT RANGES	0...4 bar a 0...1000 bar (0...60psi a 0...15000psi)				0...1000 a 0...5000 bar (0...15000 a 0...75000 psi)				0...1000 a 0...5000 bar (0...15000 a 0...75000 psi)			
ACCURACY	± 0,1% FS (typical) ± 0,15% FS (typical)				± 0,1% FS (typical) ± 0,15% FS (typical)				± 0,1% FS (typical)			
OVERPRESSURE	3x...2x				2 x Fondo Scala (max 6000 bar)				2 x Fondo Scala (max 6000 bar)			
BURST STRENGTH	5x...2,5x				3 x Fondo Scala (max 7500 bar)				3 x Fondo Scala (max 7500 bar)			
RESPONSE TIME	<1 msec.				<0,1 msec.				<1 msec.			
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane				Strain gauge extensometer on steel				Strain gauge extensometer on steel			
OPERATING TEMPERATURE (PROCESS) RANGE	-40...+105°C (-40...+221°F)				-30...+120°C (-22...+248°F)				-30...+120°C (-22...+248°F)			
COMPENSATED TEMPERATURE RANGE	-10...+85°C (14...+185°F)				-10...+85°C (14...+185°F)				-10...+85°C (14...+185°F)			
ZERO DRIFT IN COMPENSATED FIELD	± 0,008% FSO/°C typical (± 0,015% FSO/°C max.)				± 0,008% FSO/°C typical (± 0,015% FSO/°C max.)				± 0,01% FSO/°C typical (± 0,020% FSO/°C max.)			
TRANSDUCER BODY CONSTRUCTION MATERIAL	AISI 304 stainless steel				AISI 304 stainless steel				AISI 304 stainless steel			
PARTS IN CONTACT WITH THE PROCESS	17-4PH stainless steel				15-5PH stainless steel / 17-4PH stainless steel				15-5PH stainless steel / 17-4PH stainless steel			
ELECTRICAL CONNECTIONS	4-pin solenoid valve connector (E) 2/4-pin x0.25 shielded cable (2m) (F) 4-pin M12x1 connector (Z) 4-pin micro solenoid valve connector (M) 7-pin connector (P) 6-pin connector (V)				6-pin connector (V) 7-pin connector (P) 4-pin M12x1 connector (Z) 4/6-pin x0.25 shielded cable (1m) (F) 4-pin Type A DIN connector (E) MicroDin 4-pin Type C-ind D 9.4 mm connector (M)				6-pin connector (V) 7-pin connector (P) 4-pin M12x1 connector (Z) 4/6-pin x0.25 shielded cable (1m) (F) 4-pin Type A DIN connector (E) MicroDin 4-pin Type C-ind D 9.4 mm connector (M)			
	Analogue				Ratiometric				Analogue			
OUTPUT SIGNAL	Standard 0.1 ... 10.1 Vdc - 4 ... 20 mA 0...10 Vdc On request 0.1 ... 5.1 Vdc - 0 ... 5 Vdc 1 ... 5 Vdc - 1 ... 10 Vdc 1 ... 6 Vdc				mV/V				Standard 4.20 mA - 0.10 Vdc On request 0.1...5.1 Vdc - 0...5 Vdc 1.5 Vdc - 1...10 Vdc 0.1...10.1 Vdc			
MEASUREMENT RANGES	bar		bar		bar				bar			
	B04U	0.4	B05D	0.50					B01M	0.1000		
	B05U	0.5	B01C	0.100					B15C	0.1500		
	B06U	0.6	B16D	0.160	B01M	0.1000			B02M	0.2000		
	B07U	0.7	B02C	0.200	B15C	0.1500			B35C	0.3500		
	B01D	0.10	B25D	0.250	B02M	0.2000			B04M	0.4000		
	B16U	0.16	B35D	0.350	B35C	0.3500			B05M	0.5000		
	B02D	0.20	B04C	0.400	B04M	0.4000						
	B25U	0.25	B05C	0.500	B05M	0.5000						
	B03D	0.30	B06C	0.600								
	B04D	0.40	B07C	0.700								
			B01M	0.1000								
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)												
	IP65/IP66/IP67				IP65/IP66/IP67				IP65/IP66/IP67			
PROCESS CONNECTIONS	Standard G 1/4 gas male (1) On request 7/16-20 UNF-2A male (SAE 4 for AS4395-E) (2) G 1/2A (DIN 16288) (3) G 1/4 gas female (4)				F-250-C (9/16-18UNF female) (D) M16 x 1.5 female (E)				F-250-C (9/16-18UNF female) (D) M16 x 1.5 female (E)			
MAIN APPLICATIONS	- Production test benches				- Waterjet - High pressure pumps - High pressure test benches				- Waterjet - High pressure pumps - High pressure test benches			
	 								 			

PRESSURE TRANSDUCERS

MAIN TECHNICAL CHARACTERISTICS

<div></div>													
MODEL	TPF				TPFADA				TPFAS				
MEASUREMENT RANGES	0...10 a 0...1000bar (0...150 a 0...15000psi)				0...10 a 0...1000bar (0...150 a 0...15000psi)				0...25 a 0...600 bar (0...375 a 0...9000 psi)				
ACCURACY	H ± 0,2% FS (typical) M ± 0,5% FS (typical)				H ± 0,2% FS (typical) M ± 0,5% FS (typical)				±0.5% FS				
OVERPRESSURE	3 x Full scale (max 2000 bar)				3 x Full scale (max 2000 bar)				3 x Full scale				
BURST STRENGTH	4 x Full scale (max 2000 bar)				4 x Full scale (max 2000 bar)				4 x Full scale (max 2000 bar)				
RESPONSE TIME	<0,1 msec.				<1 msec.				<1 msec.				
MEASURING PRINCIPLE PROPERTIES	Strain gauge extensometer on steel				Strain gauge extensometer on steel				Strain gauge extensometer on steel				
OPERATING TEMPERATURE (PROCESS) RANGE	-40...+120°C (-40...+248°F)				-40...+120°C (-40...+248°F)				-40...+120°C (-40...+248°F)				
COMPENSATED TEMPERATURE RANGE	-20...+85°C (-4...+185°F)				-10...+85°C (-14...+185°F)				-10...+85°C (-14...+185°F)				
ZERO DRIFT IN COMPENSATED FIELD	± 0,01% FS/°C (typical) ± 0,02% FS/°C (typical)				± 0,01% FS/°C (typical)				± 0,01% FS/°C (typical)				
TRANSDUCER BODY CONSTRUCTION MATERIAL	AISI 304 stainless steel				AISI 304 stainless steel				AISI 305 stainless steel				
PARTS IN CONTACT WITH THE PROCESS	17-4PH stainless steel				17-4PH stainless steel				17-4PH stainless steel				
ELECTRICAL CONNECTIONS	6-pin connector (V) 7-pin connector (P) 4-pin M12x1 connector (Z) 6-pin x0.25 shielded cable (1m) (F) 4-pin solenoid valve connector (E) 4-pin micro-solenoid valve connector (M)				6-pin connector (V) 7-pin connector (P) 4-pin M12x1 connector (Z) 4/6-pin x0.25 shielded cable (1m) (F) 4-pin solenoid valve connector (E) 4-pin micro-solenoid valve connector (M)				6-pin connector (V) 7-pin connector (P) 4-pin M12x1 connector (Z) 4/6-pin x0.25 shielded cable (1m) (F) 4-pin solenoid valve connector (E) 4-pin micro-solenoid valve connector (M)				
OUTPUT SIGNAL	Ratiometric				Analogue				Analogue				
	mV/V				Standard 4...20 mA 0...10 Vdc 0...5.1 Vdc On request 0...5 Vdc - 1...5 Vdc 1...10 Vdc - 1...6 Vdc 0...10.1 Vdc				4...20 mA - 0...10 Vdc 0...5.1 Vdc - 0...5 Vdc 1...5 Vdc - 1...10 Vdc 1...6 Vdc - 0...10.1 Vdc				
MEASUREMENT RANGES	bar		bar		bar		bar		bar		bar		
	B01D	0...10	B16D	0...160	B01D	0...10	B01C	0...100	B25U	0...25	B16D	0...160	
	B16U	0...16	B02C	0...200	B16U	0...16	B16D	0...160	B35D	0...30	B02C	0...200	
	B02D	0...20	B25D	0...250	B02D	0...20	B02C	0...200	B03D	0...30	B25D	0...250	
	B25U	0...25	B35D	0...350	B25U	0...25	B25D	0...250	B35U	0...35	B25D	0...250	
	B03D	0...30	B04C	0...400	B03D	0...30	B35D	0...350	B04D	0...40	B35D	0...350	
	B35U	0...35	B05C	0...500	B35U	0...35	B04C	0...400	B05D	0...50	B04C	0...400	
	B04D	0...40	B06C	0...600	B04D	0...40	B05C	0...500	B06D	0...60	B05C	0...500	
	B05D	0...50	B07C	0...700	B05D	0...50	B06C	0...600	B01C	0...100	B06C	0...600	
	B06D	0...60	B01M	0...1000	B06D	0...60	B07C	0...700					
	B01C	0...100					B01M	0...1000					
	PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65/IP66/IP67				IP65/IP66/IP67				IP65/IP66/IP67			
PROCESS CONNECTIONS	Standard M18x1,5 (G) - 1/2" G male (M) On request 3/4-16 UNF (L)				Standard M18x1,5 (G) - 1/2" G male (M) On request 3/4-16 UNF (L)				G ¼ B front seal (Y) G ¼ E (E) M10x1 E (T)				
MAIN APPLICATIONS	- Mixing dosing pumps - Food industry				- Rubber processing - Mixing dosing pumps - Concrete pumps				- Mixing dosing pumps - Concrete pumps				
					  				 				
























PROCESS CONNECTIONS

	KS	KX	KH	KHC	TK	TKDA *	TSA	TPS	TPSA	TPSADA *	TPH	TPHADA	TPF	TPFADA	TPFAS
G 1/4 GAS MALE (DIN 3852-E)	(E)	(E)	(E)	(E)	(E)*	(E)*	(E)	(E)*	(E)*	(E)*					(E)
G 1/4 GAS MALE (DIN 3852-A)					(1)	(1)	(1)	(1)	(1)	(1)					
7/16-20 UNF-2A MALE (SAE 4 PER AS4395-E)					(2)	(2)		(2)*	(2)*	(2)*					
G 1/2A (DIN 16288)	(3)	(3)			(3)	(3)	(3)	(3)*	(3)*	(3)*					
G 1/4 GAS FEMALE					(4)*	(4)*		(4)*	(4)*	(4)*					
1/8-27 NPT FEMALE					(5)*	(5)*		(5)*	(5)*	(5)*					
1/4 - 18 NPT FEMALE					(6)*	(6)*		(6)*	(6)*	(6)*					
1/4 - 18 NPT MALE		(7)	(7)	(7)	(7)*	(7)*		(7)*	(7)*	(7)*					
1/2 -14 NPT MALE		(J)													
M14 X 1,5 MALE					(8)*	(8)*		(8)(*)	(8)(*)	(8)(*)					
1/8 - 27 NPT MALE					(9)*	(9)*		(9)(*)	(9)(*)	(9)(*)					
M12 X 1,5 MALE					(R)	(R)		(R)*	(R)*	(R)*					
7/16-20 UNF-2A MALE (SAE 4 PER J1926-2)					(K)* **	(K)* **		(K)* **	(K)* **	(K)* **					
7/16-20 UNF-2A FEMALE (SAE 4)					(F)*	(F)*		(F)*	(F)*	(F)*					
F-250-C (9/16-18UNF FEMALE)											(D)	(D)			
M16 X 1.5 FEMALE											(E)	(E)			
G ¼ B FRONT SEAL															(Y)
M18X1,5													(G)	(G)	
1/2" G MALE													(M)	(M)	
3/4-16 UNF													(L)*	(L)*	
M10X1 E															(T)

* Process connection on request
** Max. working pressure: 630 bar (9137 psi)

In the PROCESS CONNECTIONS table, the letter or number between () is the option that identifies the type of mechanical installation connection of the pressure probe to the process port.

CONNECTORS

				
CON069 4 PIN EV IP67	CON006 4 PIN EV IP65	CON031 5 PIN M12 (UL) IP67	CON041 5 PIN M12 90° (UL) IP67	CON035 8 PIN M12 (UL) IP67
				
CON042 8 PIN M12 90° IP67	CON117 8 PIN M12 90° (UL) IP67	CON021 6 PIN M16 IP40	CON022 6 PIN M16 IP67	CON118 6 PIN M16 (UL) IP67
				
CON023 6 PIN M16 90° IP67	CON026 7/8 PIN M16 IP40	CON027 7/8 PIN M16 IP67	CON028 7/8 PIN M16 90° IP67	CAV011 CAVO M12 5 PIN 2M. IP67
				
CAV021 CAVO M12 5 PIN 90° 2M. IP67	CAV002 CAVO M12 8 PIN 2M. IP67	CAV005 CAVO M12 8 PIN 90° 2M. IP67	CON380 5 PIN M12 M. PROFIBUS IP67	CON390 5 PIN M12 F. PROFIBUS IP67
				
PCAV700 CAVO M8 4 PIN 3M. IP67	PCAV702 CAVO M8 F. 5 PIN 3M. IP67	PCAV703 CAVO M8 M. 5 PIN 3M. IP67		

CONNECTORS

			KS	KX	KH	KHC	TK	TKDA	TSA	TPS	TPSA	TPSADA	TPH	TPHADA	TPF	TPFADA	TPFAS
CON006	3 POLE + EARTH FEMALE CONNECTOR (EN 175301-803A); CULUS -40...+65°C	IP65		X			X	X	X	X	X	X	X	X	X	X	X
CON008	FEM. FEMALE 3 POLE + EARTH CONNECTOR (EN 175301- 803C); P9.4	IP65		X			X	X		X	X	X	X	X	X	X	X
CON031	M12 5-POLE FEMALE CONNECTOR;	IP67				X											
CON041	M12 5-POLE FEMALE CONNECTOR; 90°	IP67				X											
CON045	FEM. CONN. 3-POLE + EARTH FEMALE CONN. (EN 175301-803A);H=28; CULUS -40...+65°C	IP65	X													X	
CON047	FEMALE 3 POLE + EARTH CONNECTOR (EN 175301- 803C); P8	IP65	X						X								
CON050	4-POLE 90° M12X1 FEMALE CONNECTOR	IP67	X							X			X	X	X	X	X
CON064	3-POLE + EARTH FEMALE CONNECTOR(EN 175301-803A); CULUS -40...+65°C (KH/KS SERIES)	IP65	X		X												
CON087	4-POLE M12X1 FEMALE CONNECTOR; CULUS -25...+90°C	IP67	X													X	
CON088	4-POLE, 90°, M12X1 FEMALE CONNECTOR; CULUS -25...+90°C	IP67	X													X	
CON110	7-POLE 90° M16 FEMALE CONNECTOR; CULUS -40...+100°C	IP40														X	
CON111	7-POLE M16 FEMALE CONNECTOR; CULUS -40...+100°C	IP67														X	
CON112	7-POLE M16 FEMALE CONNECTOR; CULUS -40...+100°C	IP40														X	
CON113	3 POLE +EARTH FEMALE CONNECTOR (EN 175301- 803A); CULUS -40...+90°C	IP65	X													X	
CON114	3-POLE + EARTH FEMALE CONNECTOR (EN 175301-803A);H=28; CULUS -40...+90°C	IP65	X													X	
CON115	3-POLE + EARTH FEMALE CONNECTOR (EN 175301- 803C); P9.4 IP65, CULUS -40...+90°C	IP65	X													X	
CON116	3-POLE + EARTH FEMALE CONNECTOR (EN 175301-EN 803C); P8, CULUS -40...+90°C	IP65	X														
CON293	4-POLE M12X1 FEMALE CONNECTOR	IP67	X	X	X		X	X	X	X	X	X	X	X	X	X	X
CON300	6-POLE FEMALE CONNECTOR, BAYONET	IP66		X			X	X		X	X	X	X	X	X	X	X
CON320	7-POLE M16 FEMALE CONNECTOR	IP40		X						X			X	X	X	X	X
CON321	7-POLE M16 FEMALE CONNECTOR	IP67		X			X	X		X	X	X	X	X	X	X	X
CON322	7-POLE 90° M16 FEMALE CONNECTOR	IP40								X			X	X	X	X	X
C02W	6-PIN FEMALE CONNECTOR (CON300) + 2M CABLE	IP65								X					X		
C02WLS	6-POLE FEMALE CONNECTOR (CON300) + 2M CABLE (6X0.25)	IP66											X	X		X	X
CAV011	FEMALE CONNECTOR WITH 2 METRES OF CABLE	IP67				X											
CAV220	M12X1 FEMALE CONNECTOR WITH 2 METRES OF CABLE, VENTED (CULUS -30+80°C)	IP67	X	X	X	X			X							X	

ACCESSORIES

DISPLAY

The TDP-1001 plug-in display is a universal local display device suitable for use with all Gefran pressure transmitters with 4-20 mA output and an EN 175301-803 A solenoid valve type connector.

It requires no doesn't require power supply, plugs directly into the connector and provides a 4-digit digital local indication in a programmable engineering unit. It is also equipped with a PNP type open collector alarm threshold that can be set by the user for independent management of security systems, if present.

An intrinsically safe Atex certified version is also available for use in hazardous areas at risk of explosion, called TDP-2000.



ADAPTERS AND SEALS

A vast selection of native threaded connections is available for Gefran pressure transducers, from metric to gas, from NPT to UNF threads. A wide range of stainless steel adapters is also available, both male/male and male/female, with the corresponding seals, named PKITxxx, in order to meet all possible process connection requirements.



CONNECTORS AND EXTENSION CABLES

Gefran pressure transducers are available with various types of electrical connectors (EN175301803, M12x1, etc.), and each of these may be supplied with the corresponding female solder cable (named CONxxx) or an extension cable already assembled with the female connector (named CAVxxx), up to 30 metres in length.



MATCHING PRODUCTS

CONTROLLERS

- universal inputs for amplified and non-amplified probes - very high acquisition speed
- high accuracy
- mathematical calculations, pressure delta
- 4 configurable outputs
- Modbus and Profibus communication



PRESSURE GAUGES

- universal inputs for amplified probes
- very high acquisition speed
- high accuracy
- mathematical calculations, pressure delta - 4 configurable outputs
- Modbus and Profibus communication
- input from non-amplified pressure probes - 4 configurable outputs
- Modbus communication
- input from amplified pressure probes
- 4 configurable outputs
- Modbus communication



