



The KE Performance Level 'c' series of Gefran are pressure transmitters for using in high temperature environment.

The main characteristic of this series is the capability to read temperature of the media up to 538°C (1000°F).

The constructive principle is based on the hydraulic transmission of the pressure.

The fluid-filled system assures the temperature stability (NaK) (Potassium Sodium).

The physical measure is transformed in a electrical measure by means of the strain-gauge technology.

MAIN FEATURES

- Pressure ranges from:
0-35 to 0-1000 bar / 0-500 to 0-15000 psi
- Accuracy: $< \pm 0.25\%$ FSO (H); $< \pm 0.5\%$ FSO (M)
- Hydraulic transmission system for pressure signal guarantees stability at working temperature (NaK). Liquid conforming to RoHS Directive.
NaK is defined as a safe substance (GRAS)
- Quantity of NaK contained per model: KE0 series (30mm³) [0.00183 in³], KE1, KE2, (40mm³) [0.00244 in³]
- 1/2-20UNF, M18x1.5 standard threads; other types available on request
- Autozero function on board / external option
- Inconel 718 diaphragm with GTP coating for temperatures up to 538°C (1000°F)
- 15-5 PH diaphragm with GTP coating for temperatures up to 400°C (750°F)
- Hastelloy C276 diaphragm for temperatures up to 300°C (570°F)
- 17-7 PH corrugated diaphragm with GTP coating for ranges below 100bar-1500psi
- Stem material: 17-4 PH

GTP (advanced protection)

Coating with high resistance against corrosion, abrasion and high temperature

AUTOZERO FUNCTION

All signal variations in the absence of pressure can be eliminated by using the Autozero function.

This function is activated by closing a magnetic contact located on the transmitter housing.

The procedure is permitted only with pressure at zero.

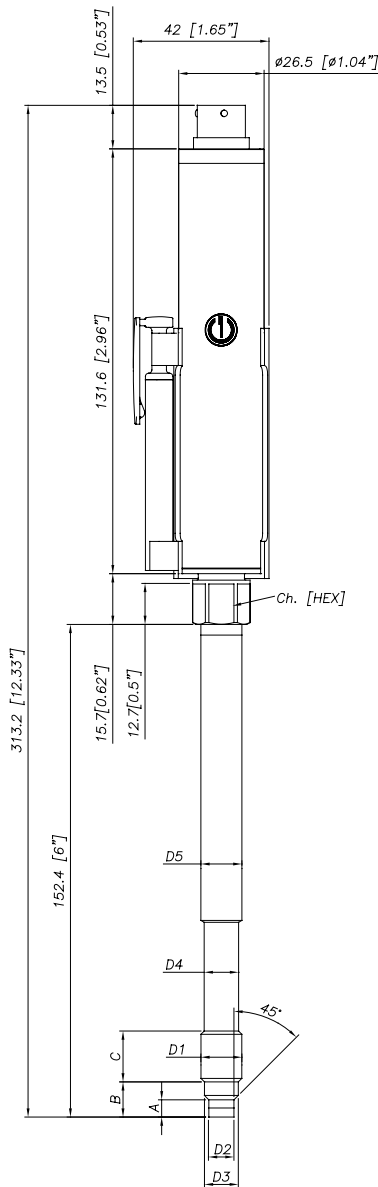
TECHNICAL SPECIFICATIONS

Accuracy (1)	H $< \pm 0.25\%$ FSO (100...1000 bar) M $< \pm 0.5\%$ FSO (35...1000 bar)
Resolution	16 bit
Measurement range	0..35 to 0..2000bar 0..500 to 0..30000psi
Maximum overpressure (without degrading performances)	2 x FS 1.5 x FS above 700bar/10000psi
Measurement principle	Extensimetric
Power supply	13...30Vdc
Maximum current absorption	23mA (40mA with relay optional)
Output signal Full Scale (FSO)	20mA
Zero balance (tolerance $\pm 0.25\%$ FSO)	4mA
Response time (10...90% FSO)	8ms
Output noise (RMS 10-400Hz)	$< 0.025\%$ FSO
Calibration signal	80% FSO
Power supply polarity reverse protection	YES
Compensated temperature range housing	0...+85°C
Operating temperature range housing	-30...+85°C
Storage temperature range housing	-40...+125°C
Thermal drift in compensated range: Zero / Calibration / Sensibility	$< 0.02\%$ FSO/°C
Diaphragm maximum temperature	538°C / 1000°F
Zero drift due to change in process temperature (zero)	< 3.5 bar/100°C / < 28 psi/100°F
Thermocouple (model KE2)	STD : type "J" (isolated junction)
Protection degree (6-pole female connect)	IP65

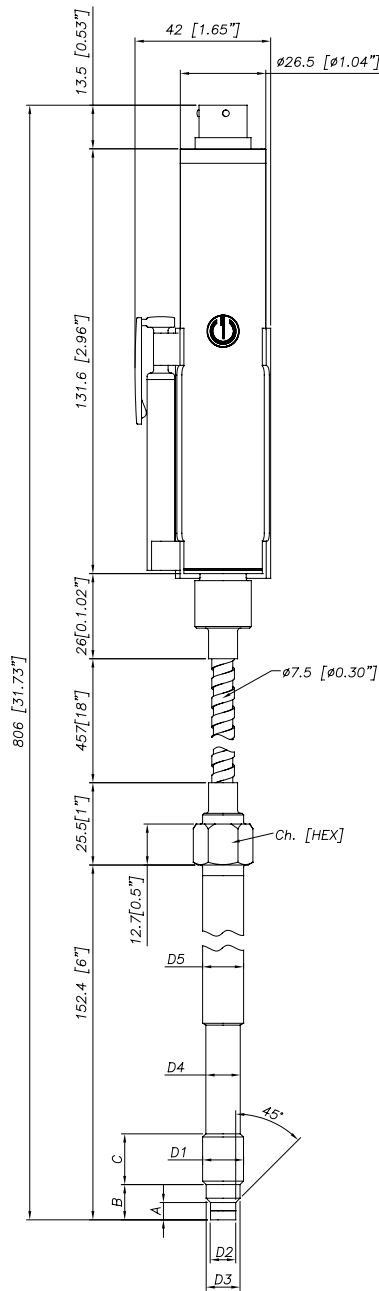
FSO = Full scale output: (1) BFSL method (Best Fit Straight Line): includes combined effects of Non-Linearity, Hysteresis and Repeatability.

MECHANICAL DIMENSIONS

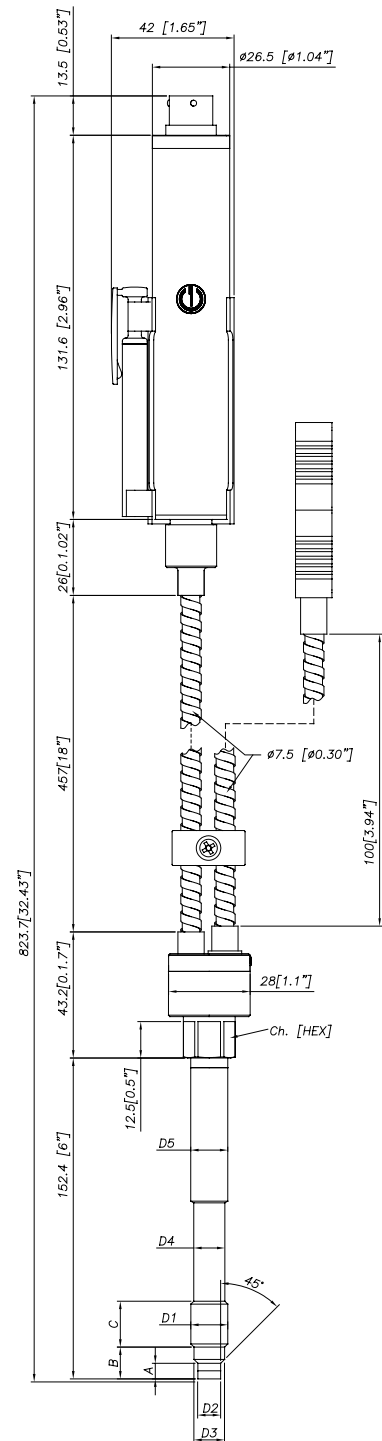
KE0



KE1



KE2



D1	1/2 - 20UNF
D2	Ø7.8 -0.05 [Ø0.31" -0.002]
D3	Ø10.5 -0.025 [Ø0.41" -0.001]
D4	Ø10.67 [Ø0.42"]
D5	Ø12.7 [Ø0.5"]
A	5.56 -0.26 [0.22" -0.01]
B	11.2 [0.44"]
C	15.74 [0.62"]
Ch [Hex]	16 [5/8"]

D1	M18x1.5
D2	Ø10 -0.05 [Ø0.394" -0.002]
D3	Ø16 -0.08 [Ø0.63" -0.003]
D4	Ø16 -0.4 [Ø0.63" -0.016]
D5	Ø18 [Ø0.71"]
A	6 -0.26 [0.24" -0.01]
B	14.8 -0.4 [0.58" -0.016]
C	19 [0.75"]
Ch [Hex]	19 [3/4"]

NOTE : dimensions refer to rigid stem length option "4" (153 mm – 6")

WARNING : For installation use a maximum tightening torque of 56 Nm (500 in-lb)

SELF DIAGNOSTICS

Below the conditions detected by the sensor self-diagnostics:

- Cut cable / device non connected / broken power supply, output <3.6mA
- Pin detachment, output >21mA
- Pressure above 200% of the span, output >21mA
- Voltage monitor in case of overvoltage/undervoltage/voltage variation in the electronics, output <3.6mA
- Program sequence error, output <3.6mA
- Overtemperature on the electronics, output <3.6mA
- Error on the primary element output or on the first amplification stage, output <3.6mA

OPTIONAL RELAY OUTPUT FOR EXCESS PRESSURE PROTECTION

Safety relay characteristics:

- Activation threshold to be defined in the order code
- Rated carry current: 1A
- Rated voltage: 24Vdc $\pm$ 20%
- Switch accuracy: 2 x sensor accuracy
- Hysteresis: 2% FSO

SUPPLY	OUTPUT	RELAY STATUS
OFF	-	OPEN
ON	< X%fs	CLOSED
ON	> X%fs	OPEN
ON	output < 3,6mA	OPEN
ON	output > 21mA	OPEN

NAMUR COMPLIANCE

The sensors are tested according to Namur NE21 recommendations. The same compatibility is valid for the NE43 Namur recommendation with the following sensor behaviour in case of breakdown:

- Cut cable: breakdown information as the signal is <3,6mA
- Device not connected: breakdown information as the signal is <3,6mA
- Broken power-supply: breakdown information as the signal is <3,6mA

or in case of performance problems:

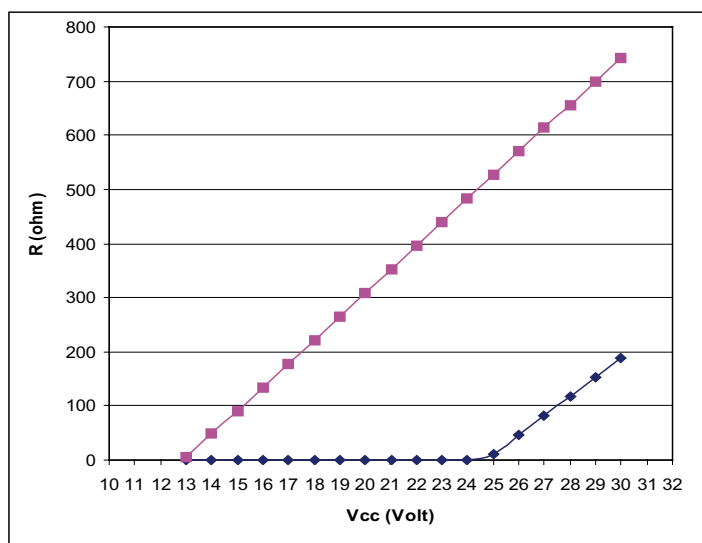
- most common failures on primary sensors: the signal goes to >21mA

Note: in all the remaining situations, the output signal is always included between 3,6 and 21mA.



Recommendation: the error level set by the customer (e.g. maximum pressure value) has to be inside the nominal range

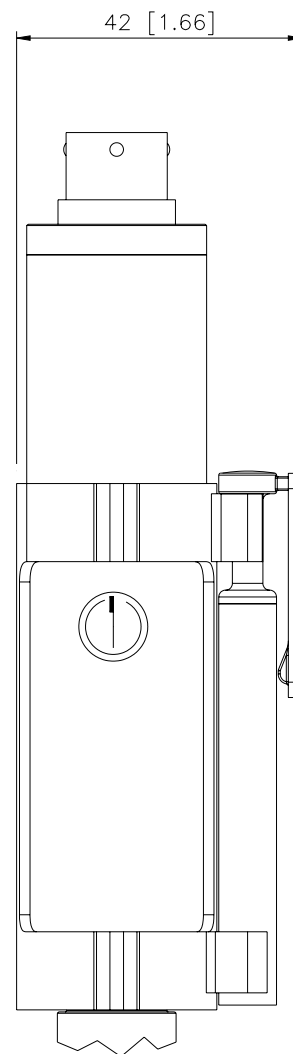
LOAD DIAGRAM



The diagram shows the optimum ratio between load and power supply for transmitters with 4...20mA output.

For correct function, use a combination of load resistance and voltage that falls within the two lines in the graph above.

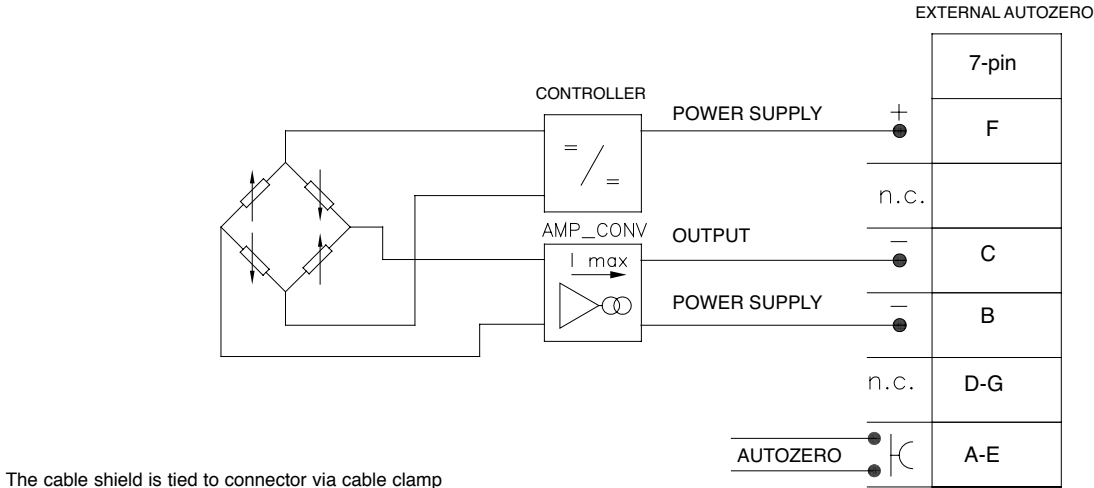
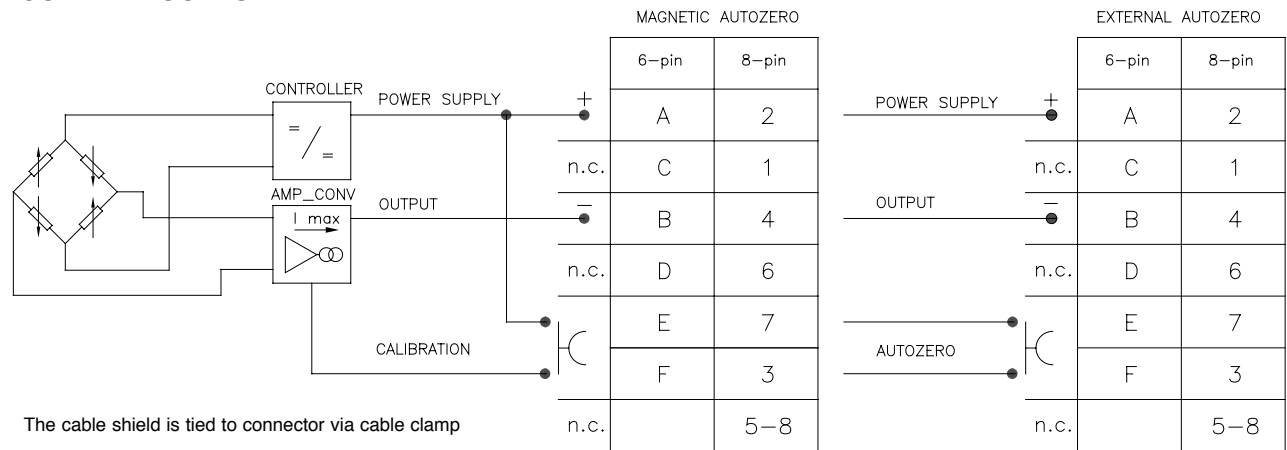
AUTOZERO FUNCTION



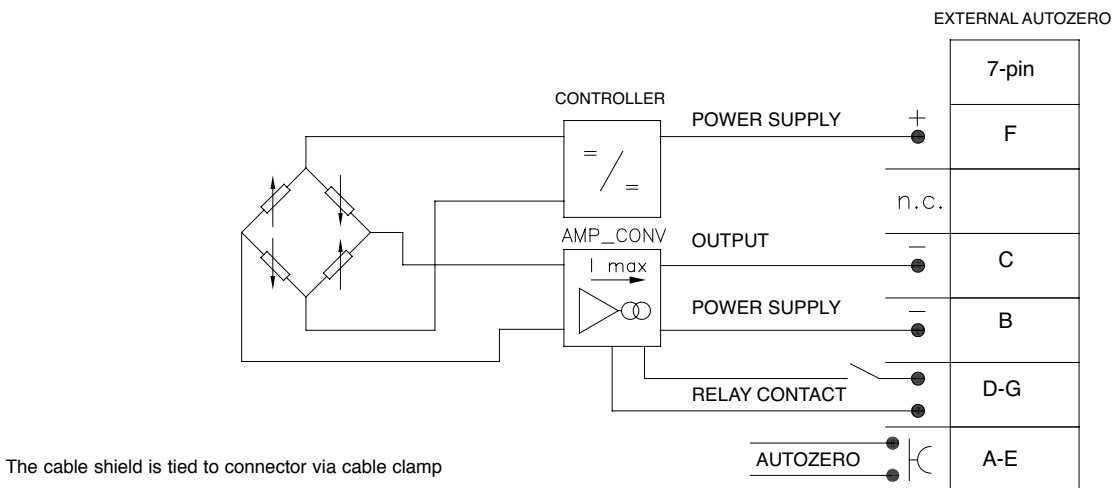
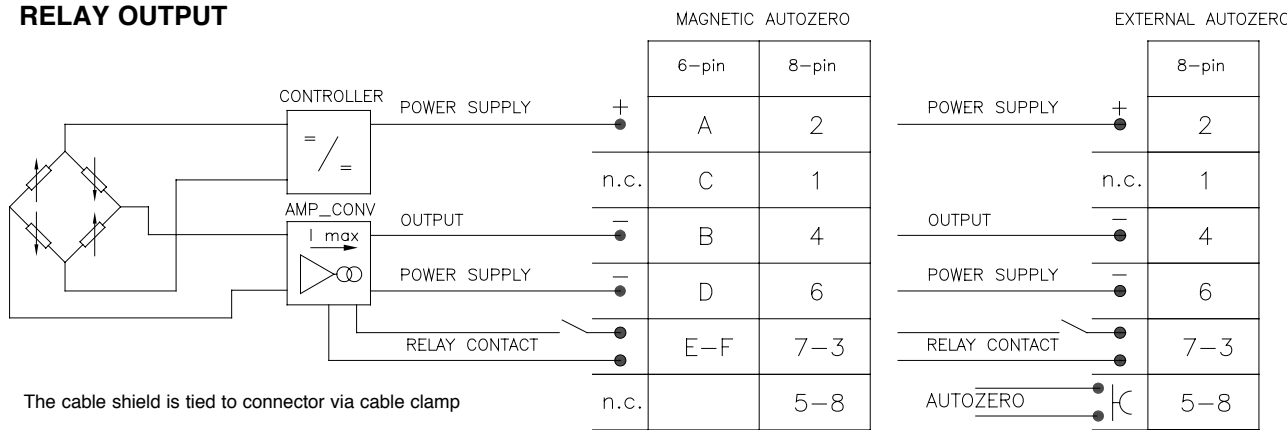
The Autozero function is activated through a magnetic contact (external magnet supplied with the sensor). See the manual for a complete Autozero function explanation.

ELECTRICAL CONNECTIONS

CURRENT OUTPUT

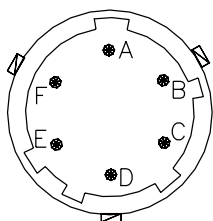


RELAY OUTPUT

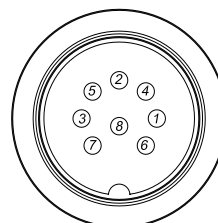


ELECTRICAL CONNECTIONS

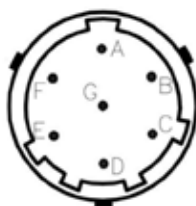
6 pin connector VPT07RA10-6PT2 (PT02A-10-6P)



8 pin connector (Binder) M16 DIN/EN45326 (09-0173-00-08)



7 pin connector (AMPHENOL) 62IN-5016-10-7P-4-M



ACCESSORIES

Connectors

6-pin female connector (IP65 protection degree)

7-pin female connector

8-pin female connector

CON300

CON345

CON026

Extension cables

6-pin connector with 8m (25ft) cable

6-pin connector with 15m (50ft) cable

6-pin connector with 25m (75ft) cable

6-pin connector with 30m (100ft) cable

C08WLS

C15WLS

C25WLS

C30WLS

Accessories

Mounting bracket

Dummy plug for 1/2-20UNF

Dummy plug for M18x1.5

Drill kit for 1/2-20UNF

Drill kit for M18x1.5

Cleaning kit for 1/2-20UNF

Cleaning kit for M18x1.5

Fixing pen clip

Autozero pen

SF18

SC12

SC18

KF12

KF18

CT12

CT18

PKIT 379

PKIT 378

Thermocouple for KE2 model

Type "J" (153mm - 6" rigid rod)

TTER 601

Cable color code	
Conn.	Wire
A-2	Red
B-4	Black
C-1	White
D-6	Green
E-7	Blue
F-3	Orange
5	Grey
8	Pink

ORDER CODE

K - - - - -				0000 X 000 X 00																																																			
OUTPUT SIGNAL 4...20mA E				Output Relay Version (activation threshold): X=no relay B=80%fs A=70%fs C=90%fs																																																			
VERSION Rigid rod 0 Rigid + flexible rod 1 With thermocouple 2				000= Special executions																																																			
CONNECTOR 6 pin 6 7 pin 7 8 pin 8				E External Autozero* - Magnetic Autozero																																																			
ACCURACY CLASS 0.25% FSO (ranges ≥ 100 bar/1500 psi) H 0.5% FSO M				(*) as an alternative to the CAL function																																																			
MEASUREMENT RANGE <table border="1"> <thead> <tr> <th colspan="2">bar</th> <th colspan="2">psi</th> </tr> </thead> <tbody> <tr><td>35</td><td>B35U</td><td>500</td><td>P05C</td></tr> <tr><td>50</td><td>B05D</td><td>750</td><td>P75D</td></tr> <tr><td>70</td><td>B07D</td><td>1000</td><td>P01M</td></tr> <tr><td>100</td><td>B01C</td><td>1500</td><td>P15C</td></tr> <tr><td>200</td><td>B02C</td><td>3000</td><td>P03M</td></tr> <tr><td>350</td><td>B35D</td><td>5000</td><td>P05M</td></tr> <tr><td>500</td><td>B05C</td><td>7500</td><td>P75C</td></tr> <tr><td>700</td><td>B07C</td><td>10000</td><td>P10M</td></tr> <tr><td>1000</td><td>B01M</td><td>15000</td><td>P15M</td></tr> <tr><td>1400</td><td>B14C</td><td>20000</td><td>P20M</td></tr> <tr><td>2000</td><td>B02M</td><td>30000</td><td>P30M</td></tr> </tbody> </table>				bar		psi		35	B35U	500	P05C	50	B05D	750	P75D	70	B07D	1000	P01M	100	B01C	1500	P15C	200	B02C	3000	P03M	350	B35D	5000	P05M	500	B05C	7500	P75C	700	B07C	10000	P10M	1000	B01M	15000	P15M	1400	B14C	20000	P20M	2000	B02M	30000	P30M	P Performance Level='c'			
bar		psi																																																					
35	B35U	500	P05C																																																				
50	B05D	750	P75D																																																				
70	B07D	1000	P01M																																																				
100	B01C	1500	P15C																																																				
200	B02C	3000	P03M																																																				
350	B35D	5000	P05M																																																				
500	B05C	7500	P75C																																																				
700	B07C	10000	P10M																																																				
1000	B01M	15000	P15M																																																				
1400	B14C	20000	P20M																																																				
2000	B02M	30000	P30M																																																				
				CONTACT DIAPHRAGM I INCONEL 718 (538°C*) S 15-5 PH (400°C*) H HASTELLOY C276 (300°C*) (*) max temperature																																																			
				FLEXIBLE ROD LENGTH (mm / inches) Standard (KE0) 0 nessuno Standard (KE1,KE2) D 457mm 18" E 610mm 24" F 760mm 30" Available on request A 76mm 3" B 152mm 6" C 300mm 12" G 914mm 36" H 1067mm 42" I 1220mm 48" J 1372mm 54" K 1520mm 60"																																																			
				RIGID ROD LENGTH (mm / inches) Standard (KE0, KE1, KE2) 4 153mm 6" 5 318mm 12.5" Available on request 1 38mm 1.5" 2 50mm 2" 3 76mm 3" 6 350mm 14" 7 400mm 16" 8 456mm 18"																																																			
				THREADING Standard 1 1/2 - 20 UNF 4 M18 x 1.5 (*) (*) M18x1.5 (not available with membrane in Inconel)																																																			

Example

KE1-6-M-B07C-1-4-D-I-P

Melt pressure transducer, 4...20mA output, 6-pin connector, 1/2-20 UNF threading, 700 bar pressure range, 0.5% accuracy, 153 mm (6") rigid rod, 457 mm (18") flexible rod; membrane Inconel 718; Performance Level='c'

Sensors are manufactured in compliance with:

- EMC 2004/108/CE compatibility directive
- RoHS 2002/95/CE directive
- 2006/42/CE machinery directive

Electrical installation requirements and Conformity certificate are available on our web site: www.gefran.com

GEFRAN reserves the right to make any kind of design or functional modification at any moment without prior notice

GEFRAN spa
 via Sebina, 74
 25050 PROVAGLIO D'ISEO (BS) - ITALIA
 tel. 0309888.1 - fax. 0309839063
 Internet: <http://www.gefran.com>

GEFRAN

DTS_KE-PLc_07-2014_ENG