



The M7 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 400°C.

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

The fluid-filled system assures the temperature stability. The physical measure is transformed in a electrical measure by means the thick film strain-gauge technology.

The SIL2 certified version makes the product suitable for use in the Functional Safety applications, particularly in the process plants for the production of polymers, where it is an essential requirement.

#### MAIN FEATURES

- Pressure ranges from:  
0-17 to 0-2000 bar / 0-250 to 0-30000 psi
- Accuracy: <math>\pm 0.25\%</math> FS (H); <math>\pm 0.5\%</math> FS (M)
- Fluid-filled system for temperature stability
- SIL2 approvals for Functional Safety
- 1/2-20UNF, M18x1.5 standard threads; other types available on request
- Other diaphragms available on request
- Autozero function on board / external option
- Drift Autocompensation function (SP version)
- Standard diaphragm is 15-5 PH stainless steel with GTP+ coating
- 17-7 PH corrugated diaphragm with GTP+ coating for ranges below 100 bar-1500 psi

*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.

#### AUTOCOMPENSATES INFLUENCE OF MELT TEMPERATURE

Thanks to internal self-compensation, the MSP series transmitter cancels the effect of pressure signal variation caused by variation of Melt temperature.

This reduces at the minimum the read error caused by heating of the filling fluid (typical of all sensors built with "filled" technology).

#### TECHNICAL SPECIFICATIONS

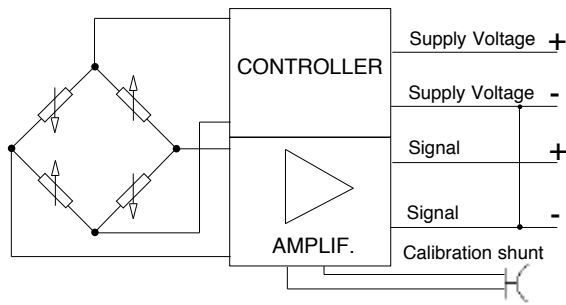
|  |   |
|--|---|
| Accuracy (1)   | H <math>\pm 0.25\%</math>FS (100...2000 bar)<br>M <math>\pm 0.5\%</math>FS (17...2000 bar)  |
| Resolution   | Infinite  |
| Measurement range  | 0..17 a 0..2000bar<br>0..250 a 0..30000psi  |
| Maximum overpressure (without degrading performances)  | 2 x FS<br>1.5 x FS above 1000bar/15000psi   |
| Measurement principle  | Extensimetric thick film  |
| Power supply   | 10...30Vdc (B)<br>15...30 Vdc (C,7)   |
| Maximum current absorption   | 25mA  |
| Insulation resistance (at 50Vdc)   | >1000 MOhm  |
| Output signal Full Scale FS  | 10.5 Vdc (7) – 5.1Vdc (B)<br>10.1Vdc (C)  |
| Zero balance (tolerance $\pm 0.25\%$ FS)   | 0.5 Vdc (7) - 0.1Vdc (B, C)   |
| Zero signals adjustment (tolerance $\pm 0.25\%$ FS)  | "Autozero" function   |
| Span adjustment within $\pm 5\%$ FS  | See Melt Manual   |
| Maximum allowed load   | 1mA   |
| Electronic response time (10...90% FS)   | ~ 1ms   |
| Output noise (RMS 10-400Hz)  | <math>< 0.025\%</math> FS   |
| Calibration signal   | 80% FS  |
| Output short circuit and reverse polarity protection   | YES   |
| Compensated temperature range  | 0...+85°C   |
| Operating temperature range  | -30...+105°C  |
| Storage temperature range  | -40...+125°C  |
| Thermal drift in compensated range:<br>Zero / Calibration / Sensibility  | <math>< 0.02\%</math> FS/°C   |
| Diaphragm maximum temperature  | 400°C / 750°F   |
| Zero drift due to change in process temperature (zero)   | 0.02 bar/°C   |
| Zero drift temperature for Autocompensated version (SP) within the temperature range 20°C-400°C inclusive the drift temperature of the housing | <math>< 0.003</math> bar/°C 100 $\leq$ p <math>< 500</math> bar<br>0.0014 %FS/°C p $\geq$ 500 bar   |
| Standard material in contact with process medium   | Diaphragm:<br>• 15-5 PH with GTP+ coating<br>• 17-7 PH corrugated diaphragm with GTP+ coating for ranges <math>< 100</math> bar(1500psi)<br>Stem: • 17-4 PH |
| Thermocouple (model M72)   | STD: type "J" (isolated junction)   |
| Protection degree (with 6-pole female connector CON300)  | IP66  |
| SIL2 certification   | IEC/EN 62061<br>IEC 61508   |

FS = Full scale output: (1) BFSL method (Best Fit Straight Line): includes combined effects of Non-Linearity, Hysteresis and Repeatability. (according to IEC 62828-2).



# ELECTRICAL CONNECTIONS

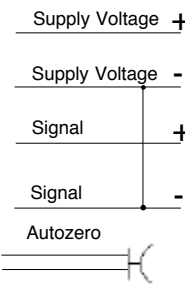
## VOLTAGE OUTPUT (B, C, 7)



### MAGNETIC AUTOZERO

| 6-pin            |       |
|------------------|-------|
| Supply Voltage + | C     |
| Supply Voltage - | D     |
| Signal +         | A     |
| Signal -         | B     |
| Autozero         | E - F |

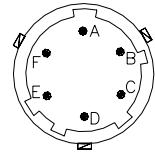
Shield drain wire is tied to connector via cable clamp



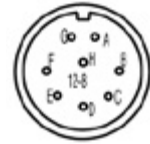
### EXTERNAL AUTOZERO

| 6-pin            |       |
|------------------|-------|
| Supply Voltage + | C     |
| Supply Voltage - | D     |
| Signal +         | A     |
| Signal -         | B     |
| Autozero         | E - F |

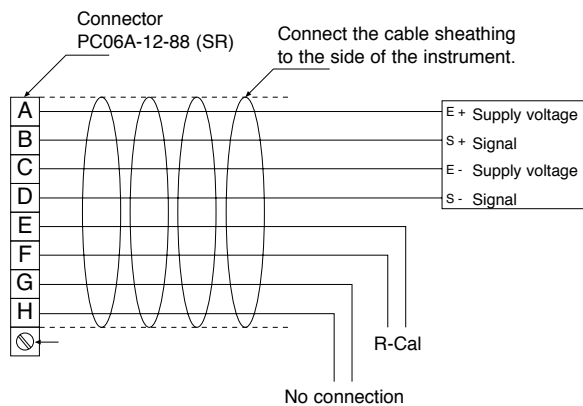
6 pin connector  
VPT07RA10-6PT2  
(PT02A-10-6P)



8 pin connector  
PC02E-12-8P Bendix



## 8-pin connector



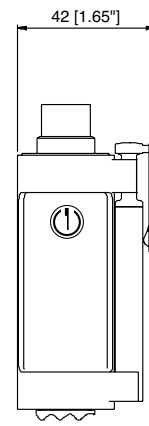
### Magnetic Autozero version

- A = Excitation + (white)
- B = Signal + (red)
- C = Excitation - (green)
- D = Signal - (black)
- E = R-Cal (blue)
- F = R-Cal (brown)
- G = no connection
- H = no connection

### External Autozero version

- A = Excitation + (white)
- B = Signal + (red)
- C = Excitation - (green)
- D = Signal - (black)
- E = Autozero (blue)
- F = Autozero (brown)
- G = no connection
- H = no connection

## 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.

## ACCESSORIES

### Connectors

- 6-pin mating connector (IP66 protection degree)
- 8-pin mating connector

### 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
- 8-pin connector with 8m (25ft) cable
- 8-pin connector with 15m (50ft) cable
- 8-pin connector with 25m (75ft) cable
- 8-pin connector with 30m (100ft) cable

Other lengths

### 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

### Thermocouple for M72 model

Type "J" (153mm - 6" stem)

- CON300
- CON307

- C08WLS
- C15WLS
- C25WLS
- C30WLS
- E08WLS
- E15WLS
- E25WLS
- E30WLS

consult factory

- SF18
- SC12
- SC18
- KF12
- KF18
- CT12
- CT18
- PKIT309
- PKIT312

TTER 601

| Cable color code 6 wires |        | Cable color code 8 wires |        |
|--------------------------|--------|--------------------------|--------|
| Conn.                    | Wire   | Conn.                    | Wire   |
| A                        | Red    | A                        | White  |
| B                        | Black  | B                        | Red    |
| C                        | White  | C                        | Green  |
| D                        | Green  | D                        | Black  |
| E                        | Blue   | E                        | Blue   |
| F                        | Orange | F                        | Orange |
|                          |        | G                        | n.c.   |
|                          |        | H                        | n.c.   |

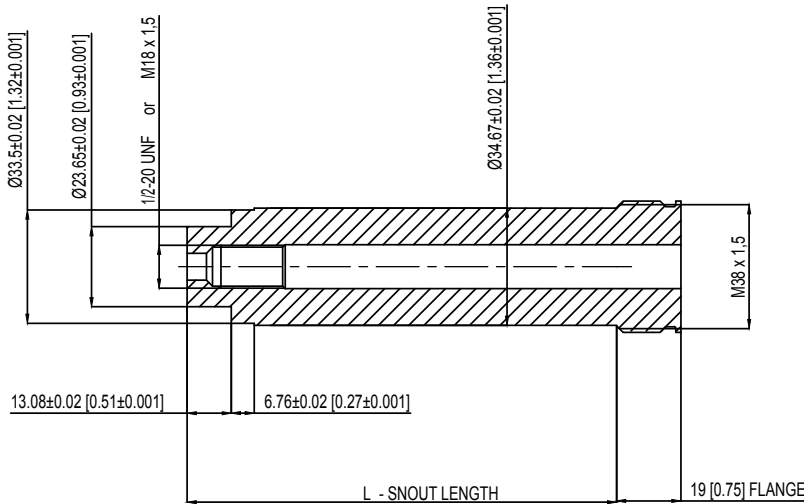
# PROCESS FLANGE ADAPTER

The process flange adapter is a sensor accessory that allows for the installation of 1/2-20 UNF or M18x1.5 melt pressure sensor in a button seal style process mounting port. The adapter is made with an adapter body with different snout lengths plus an adapter flange available in different sizes (see tables and drawing below). Each combination of snout and flange is available according to the ordering information with a specific ordering code.

## SPECIFICATIONS

- Pressure range: according to the selected sensor (up to 1000 bar/15000 psi max)
- Temperature range: according to the selected sensor
- Material of construction: 17-4PH Stainless steel

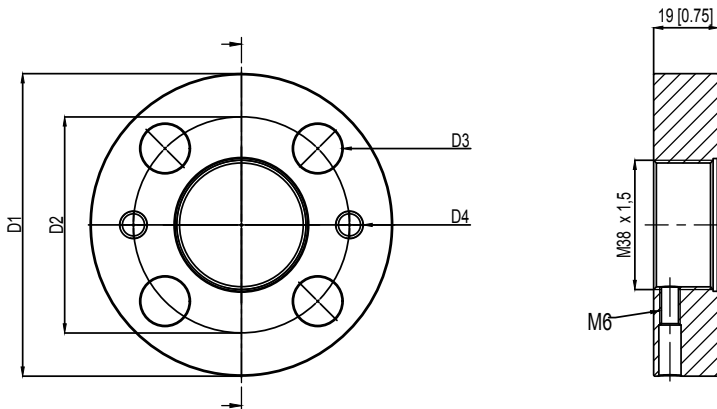
## ADAPTER BODY



| 1/2-20 UNF | L - SNOOT LENGTH |
|------------|------------------|
| STE1020    | 127 [5]          |
| STE1021    | 51,6 [2,031]     |

| M18 X 1,5 | L - SNOOT LENGTH |
|-----------|------------------|
| STE1022   | 127 [5]          |
| STE1023   | 51,6 [2,031]     |

## ADAPTER FLANGE



|    | FLA960      | FLA961      |
|----|-------------|-------------|
| D1 | 82,6 [3,25] | 88,9 [3,50] |
| D2 | 54 [2,14]   | 63,5 [2,50] |
| D3 | 13,2 [0,52] | 14,3 [0,56] |
| D4 | 5/16-18 UNC | 5/16-18 UNC |

## ORDER CODE

KIT - 5 - 0 - 1

| Snout length         |   |
|----------------------|---|
| 5 inch [127 mm]      | 5 |
| 2,031 inch [51,6 mm] | 2 |

| Flange type (see technical drawing) |   |
|-------------------------------------|---|
| FLA960                              | 0 |
| FLA961                              | 1 |

| Thread dimensions |   |
|-------------------|---|
| 1/2-20 UNF        | 1 |
| M18 x 1,5         | 4 |

| ADAPTER GASKETS |  |                   |           |
|-----------------|--|-------------------|-----------|
| Material        | Dimensions                               | Max Pressure      | Ord. Code |
| Aluminium       | 30.2 mm [1.19"] OD<br>24.1 mm [.950"] ID | 200 bar/3000 psi  | RON360    |
| AISI 303 SS     | 30.2 mm [1.19"] OD<br>24.1 mm [.950"] ID | 700 bar/10000 psi | RON361    |

## Example:

### KIT501

Process adapter with 5" snout length, 82.6 mm size flange, suitable for 1/2-20 UNF melt sensor

# ORDER CODE

**M** - - - - - **000**

|                       |           |
|-----------------------|-----------|
| Autocompensazione (*) | <b>SP</b> |
| Standard              | -         |

(\*) available for ranges > to 100bar  
 (\*) not available with M73 version

|                      |          |
|----------------------|----------|
| <b>OUTPUT SIGNAL</b> |          |
| 0.5 .. 10.5Vdc       | <b>7</b> |
| 0.1 .. 10.1Vdc       | <b>C</b> |
| 0.1 .. 5.1Vdc        | <b>B</b> |

|                       |          |
|-----------------------|----------|
| <b>CONFIGURATION</b>  |          |
| Rigid stem            | <b>0</b> |
| Rigid stem + flexible | <b>1</b> |
| With thermocouple     | <b>2</b> |
| Exposed capillary     | <b>3</b> |

|                  |          |
|------------------|----------|
| <b>CONNECTOR</b> |          |
| Standard         |          |
| 6 pin            | <b>6</b> |
| 8 pin            | <b>8</b> |

|   |          |
|---|----------|
| <b>ACCURACY CLASS</b>                   |          |
| 0.25% FS<br>(ranges ≥ 100 bar/1500 psi) | <b>H</b> |
| 0.5% FS                                 | <b>M</b> |

|              |             |       |             |
|--------------|-------------|-------|-------------|
| <b>RANGE</b> |             |       |             |
| bar          |             | psi   |             |
| 17           | <b>B17U</b> | 250   | <b>P25D</b> |
| 35           | <b>B35U</b> | 500   | <b>P05C</b> |
| 50           | <b>B05D</b> | 750   | <b>P75D</b> |
| 70           | <b>B07D</b> | 1000  | <b>P01M</b> |
| 100          | <b>B01C</b> | 1500  | <b>P15C</b> |
| 200          | <b>B02C</b> | 3000  | <b>P03M</b> |
| 350          | <b>B35D</b> | 5000  | <b>P05M</b> |
| 500          | <b>B05C</b> | 7500  | <b>P75C</b> |
| 700          | <b>B07C</b> | 10000 | <b>P10M</b> |
| 1000         | <b>B01M</b> | 15000 | <b>P15M</b> |
| 1400         | <b>B14C</b> | 20000 | <b>P20M</b> |
| 2000         | <b>B02M</b> | 30000 | <b>P30M</b> |

000= Standard version  
 Special or customized versions  
 available on request

|          |                   |
|----------|-------------------|
| <b>E</b> | External autozero |
| -        | Magnetic autozero |

|          |                    |
|----------|--------------------|
| <b>S</b> | SIL2 certification |
|----------|--------------------|

**FLEXIBLE LENGTH**  
 (mm / inches)

|                       |      |  |
|-----------------------|------|--|
| <b>Standard (M70)</b> |      |  |
| <b>0</b>              | none |  |

|                            |       |     |
|----------------------------|-------|-----|
| <b>Standard (M71, M72)</b> |       |     |
| <b>D</b>                   | 457mm | 18" |
| <b>E</b>                   | 610mm | 24" |
| <b>F</b>                   | 760mm | 30" |

|                       |       |     |
|-----------------------|-------|-----|
| <b>Standard (M73)</b> |       |     |
| <b>L</b>              | 711mm | 28" |

**Available on request**

|          |        |     |
|----------|--------|-----|
| <b>A</b> | 76mm   | 3"  |
| <b>B</b> | 152mm  | 6"  |
| <b>C</b> | 300mm  | 12" |
| <b>G</b> | 914mm  | 36" |
| <b>H</b> | 1067mm | 42" |
| <b>I</b> | 1220mm | 48" |
| <b>J</b> | 1372mm | 54" |
| <b>K</b> | 1520mm | 60" |

**RIGID STEM LENGTH**  
 (mm / inches)

|                                 |       |       |
|---------------------------------|-------|-------|
| <b>Standard (M70, M71, M72)</b> |       |       |
| <b>4</b>                        | 153mm | 6"    |
| <b>5</b>                        | 318mm | 12.5" |

|                       |      |  |
|-----------------------|------|--|
| <b>Standard (M73)</b> |      |  |
| <b>0</b>              | none |  |

**Available on request**

|          |       |      |
|----------|-------|------|
| <b>1</b> | 38mm  | 1.5" |
| <b>2</b> | 50mm  | 2"   |
| <b>3</b> | 76mm  | 3"   |
| <b>6</b> | 350mm | 14"  |
| <b>7</b> | 400mm | 16"  |
| <b>8</b> | 456mm | 18"  |

**THREAD**

|                 |              |
|-----------------|--------------|
| <b>Standard</b> |              |
| <b>1</b>        | 1/2 - 20 UNF |
| <b>4</b>        | M18 x 1.5    |

**Example**

**M72-6-M-B07C-1-4-D-S**

Melt pressure transmitter with type "J" thermocouple, 0.5..10.5Vdc output, 6-pin connector, 1/2-20UNF thread, 700 bar full scale, 0,5% accuracy class, 153 mm (6") rigid stem, 457mm (18") flexible capillary, SIL2 certification.

Sensors are manufactured in compliance with:

- EMC compatibility directive: 2014/30/EU

Product designed and available in compliance with Directive 2011/65/EU (RoHS II) only for large-scale stationary installation or industrial tools, or for B-to-B laboratory equipments for R&D purposes

Electrical installation requirements and Conformity certificate are available on our web site: [www.gefran.com](http://www.gefran.com)

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

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