



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:  $< \pm 0.25\%$  FS (H);  $< \pm 0.5\%$  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).

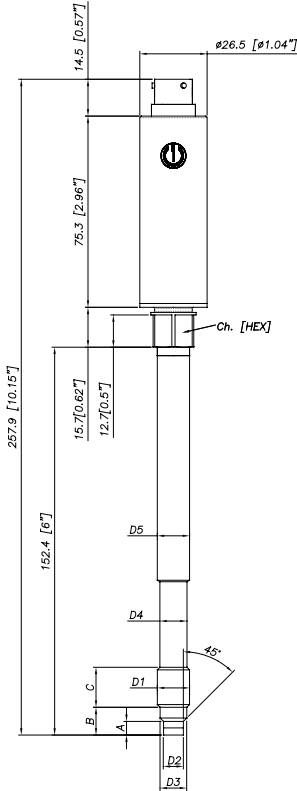
#### TECHNICAL SPECIFICATIONS

Accuracy (1)	<b>H</b> $\leq \pm 0.25\%$ FS (100...2000 bar) <b>M</b> $\leq \pm 0.5\%$ FS (17...2000 bar)
Resolution	Infinite
Measurement range	0..17 a 0..2000bar 0..250 a 0..30000psi
Maximum overpressure (without degrading performances)	2 x FS 1.5 x FS above 1000bar/15000psi
Measurement principle	Extensimetric thick film
Power supply	10...30Vdc (B) 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) 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)	$< 0.025\%$ 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: Zero / Calibration / Sensibility	$< 0.02\%$ 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	$< 0.003$ bar/°C $100 \leq p < 500$ bar $0.0014 \%FS/°C$ $p \geq 500$ bar
Standard material in contact with process medium	Diaphragm: • 15-5 PH with GTP+ coating • 17-7 PH corrugated diaphragm with GTP+ coating for ranges $< 100$ bar(1500psi) 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 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).

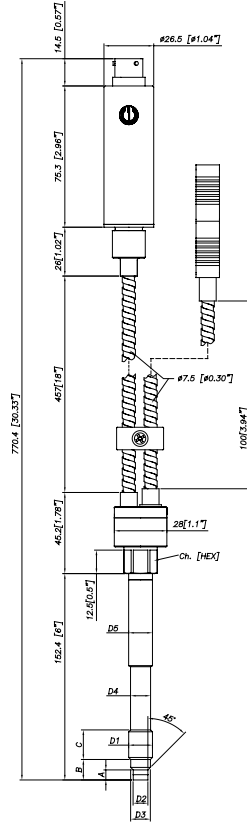
# MECHANICAL DIMENSIONS

## M70

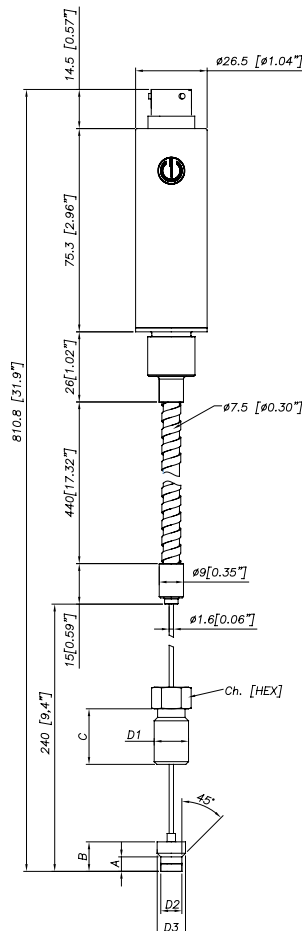


D1	<b>1/2 - 20UNF</b>
D2	$\phi 7.8 - 0.05$ [ $\phi 0.31$ " - 0.002 ]
D3	$\phi 10.5 - 0.025$ [ $\phi 0.41$ " - 0.001 ]
D4	$\phi 10.67$ [ $\phi 0.42$ " ]
D5	$\phi 12.7$ [ $\phi 0.5$ " ]
A	5.56 - 0.26 [ 0.22" - 0.01 ]
B	11.2 [ 0.44" ]
C	15.74 [ 0.62" ]
Ch [Hex]	16 [ 5/8" ]

## M72



## M73



Capillare esposto Exposed capillary	
D1	1/2-20UNF
D2	.307/.305" [7.80/7.75mm]
D3	.414/.412" [10.52/10.46mm]
A	.125/.120" [3.18/3.05mm]
B	.318/.312" [8.08/7.92mm]
C	.81" [20.6mm]

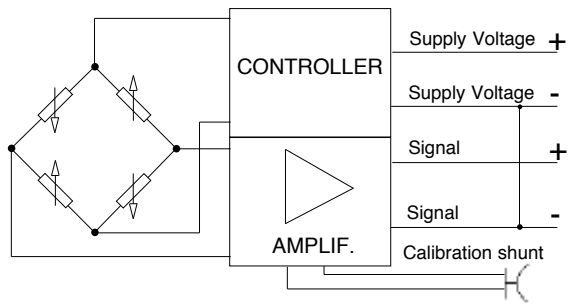
D1	<b>M18x1.5</b>
D2	$\phi 10 - 0.05$ [ $\phi 0.394$ " - 0.002 ]
D3	$\phi 16 - 0.08$ [ $\phi 0.63$ " - 0.003 ]
D4	$\phi 16 - 0.4$ [ $\phi 0.63$ " - 0.016 ]
D5	$\phi 18$ [ $\phi 0.71$ " ]
A	6 - 0.26 [ 0.24" - 0.01 ]
B	14.8 - 0.4 [ 0.58" - 0.016 ]
C	19 [ 0.75" ]
Ch [Hex]	19 [ 3/4" ]

**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)

# ELECTRICAL CONNECTIONS

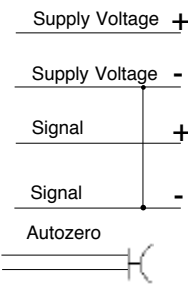
## VOLTAGE OUTPUT (B, C, 7)



### MAGNETIC AUTOZERO

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

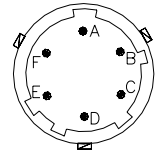
Shield drain wire is tied to connector via cable clamp



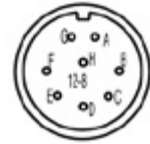
### EXTERNAL AUTOZERO

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

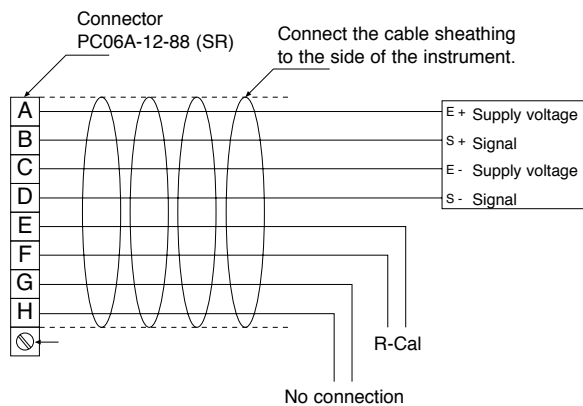
6 pin connector  
VPT07RA10-6PT2  
(PT02A-10-6P)



8 pin connector  
PC02E-12-8P Bendix



## 8-pin connector



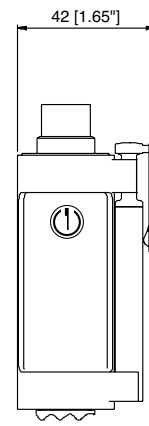
### Magnetic Autozero version

- 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

Conn.	Wire
A	Red
B	Black
C	White
D	Green
E	Blue
F	Orange

### Cable color code 8 wires

Conn.	Wire
A	White
B	Red
C	Green
D	Black
E	Blue
F	Orange
G	n.c.
H	n.c.

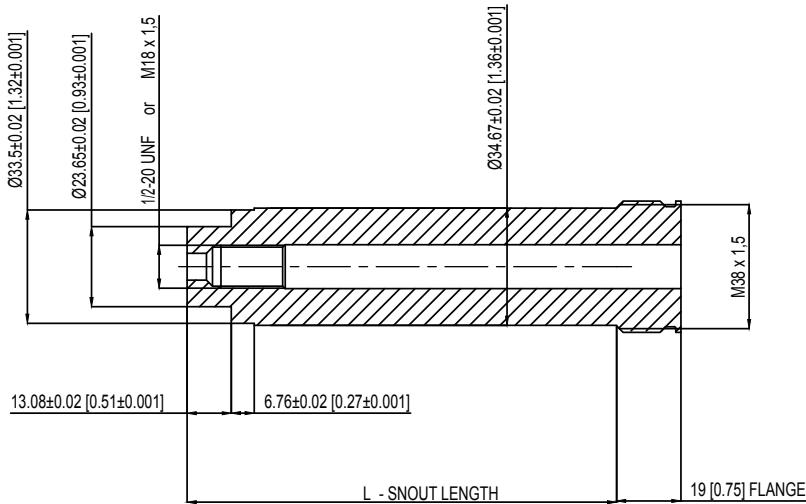
# PROCESS FLANGE ADAPTER

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

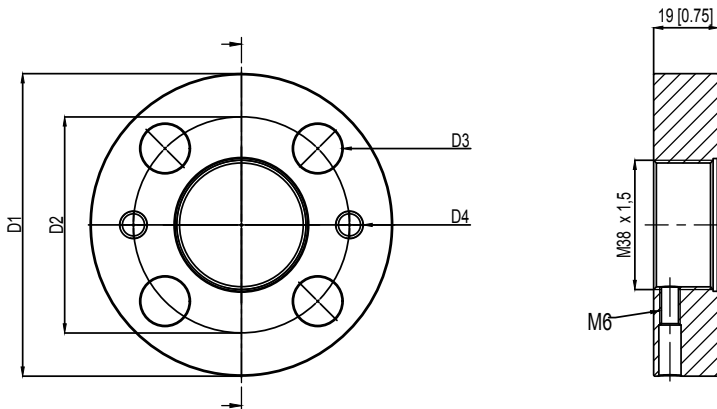
## ADAPTER BODY



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 GASKESTS			
Material	Dimensions	Max Pressure	Ord. Code
Aluminium	30.2 mm [1.19"] OD 24.1 mm [.950"] ID	200 bar/3000 psi	RON360
AISI 303 SS	30.2 mm [1.19"] OD 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 (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
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**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.

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

