

The MX 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 strain-gauge technology.

### MAIN FEATURES

- Pressure ranges: 0-17 to 0-2000bar / 0-250 to 0-30000psi
- Extensimetric measurement principle with Wheatstone bridge
- Precision:  $\leq \pm 0.25\%$  FS (H);  $\leq \pm 0.5\%$  FS (M)
- Calibration signal 80% FS internally generated
- Completely interchangeable with all existing products
- Protection level: IP65 (6-pin connector)
- Standard threading 1/2-20UNF, M18x1.5, other versions on request
- Stainless steel diaphragm 15-5 PH with GTP+ coating
- For ranges below 100 bar-1500 psi: 17-7 PH corrugated stainless steel diaphragm with GTP+ coating
- Other diaphragm types available on request

- MX0** The rigid rod configuration provides fast and easy installation.
- MX1** The flexible rod configuration is suitable for applications demanding greater thermal isolation and where installation would otherwise be difficult.
- MX2** This configuration lets you measure process pressure and temperature at the same point with a single installation.
- MX3** The configuration with exposed tip is ideal for applications in limited space.
- MX4** Flange configuration for specific applications

#### Main intrinsic safety characteristics

Transmitter designed and produced in compliance with Directive ATEX 2014/34/EU and according to European standards: for the second group (II-surfaces), category 1, explosive atmosphere with presence of gases, fumes or mists (G) protection mode Ex ia IIC T5, T4 room temperature -20°C/+55°C/+60°C/+70°C

Maximum voltage	30 V
Maximum current	100 mA
Maximum power	0,75 W
Equivalent inductance (*)	0,23 mH
Equivalent capacity (*)	26 nF

(\*) includes inductance levels and capacity of a cable:  
(typical L 1microH/m and typical C 100pF/m)  
with maximum length 15m.

### TECHNICAL SPECIFICATIONS

Accuracy (1)	H $\leq \pm 0,25\%$ FS (100...2000 bar) M $\leq \pm 0,5\%$ FS (17...2000 bar)
Resolution	Infinite
Pressure ranges	0..17 a 0..2000bar 0..250 a 0..30000psi
Maximum applicable pressure	2 x FS 1,5 x FS oltre i 1000bar/15000psi
Principle of measurement	Strain gauge
Power supply	12...30Vdc
Maximum input	30mA
Isolation resistance (at 50 Vdc)	>1000 MOhm
Signal at rated pressure (FS)	20mA
Zero balancing	4mA
Calibration:	Rated pressure Room pressure
	5% FS min. 10bar (150psi)
Maximum load	see diagram (page 3)
Response time (10 at 90% FS)	~ 4ms
Output noise (RMS 10-400Hz)	< 0,05% FS
Calibration signal	80% FS
Protection against overvoltages and power supply polarity reverse	SI
Temperature range of Strain Gauge Housing	-20...+70°C -4...+158°F
Thermal drift in compensated range: Zero/Calibrat/Sensitivity	< 0,02% FS/°C < 0,01% FS/°F
Maximum temperature of diaphragm	400°C / 750°F
Influence due to fluid temperature change (zero)	0,02 bar/°C 15 psi/100°F
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 MX2)	STD: type "J" (isolated junction)
Protection level (with 6-pin female connector installed)	IP65
Electrical connections	6-pin conn. VPT07RA10-6PT (PT02A-10-6P) 8-pin conn. PC02E-12-8P

FS = Full Scale Output (Signal at rated pressure)

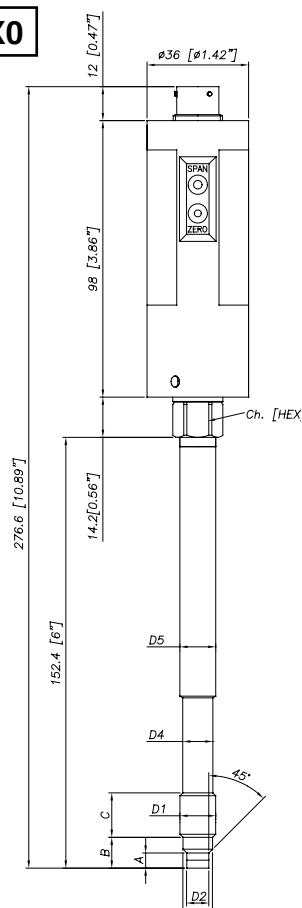
Power at zener barrier or active barrier. For version MX2, the thermocouple must be connected to EX-i circuits with devices assigned to galvanic separation and with protection mode [EX ia] IIC.



EC-Type Examination Certificate number:  
**CESI 02 ATEX 107**

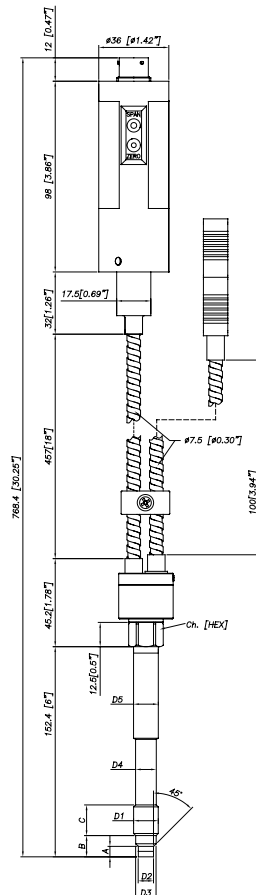
## MECHANICAL DIMENSIONS

## MXO

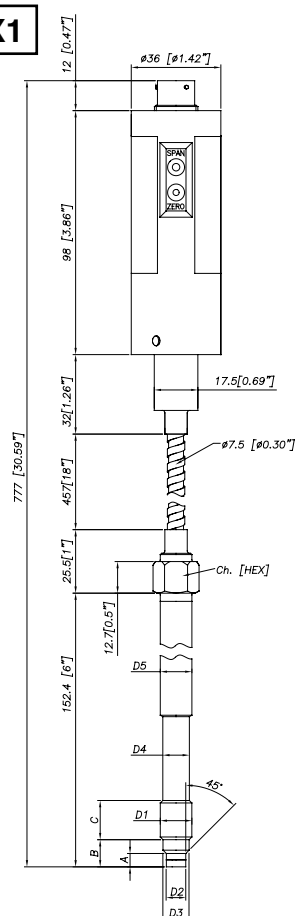


D1	<b>1/2 - 20UNF</b>
D2	$\phi 7.8 \text{ } ^{-0.05}$ [ $\phi 0.31'' \text{ } ^{-0.002}$ ]
D3	$\phi 10.5 \text{ } ^{-0.025}$ [ $\phi 0.41'' \text{ } ^{-0.001}$ ]
D4	$\phi 10.67$ [ $\phi 0.42''$ ]
D5	$\phi 12.7$ [ $\phi 0.5''$ ]
A	$5.56 \text{ } ^{-0.26}$ [ $0.22'' \text{ } ^{-0.01}$ ]
B	$11.2$ [ $0.44''$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

## MX2

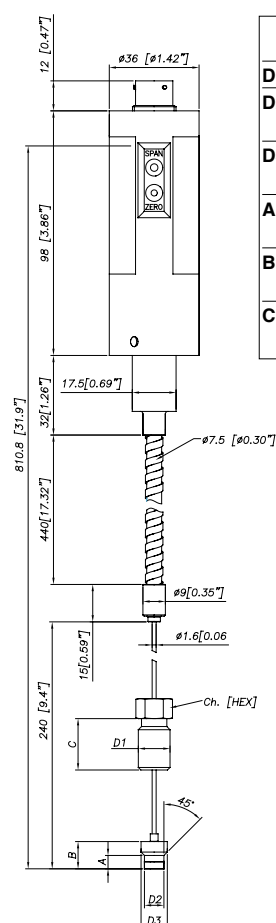


## MX1



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

## MX3

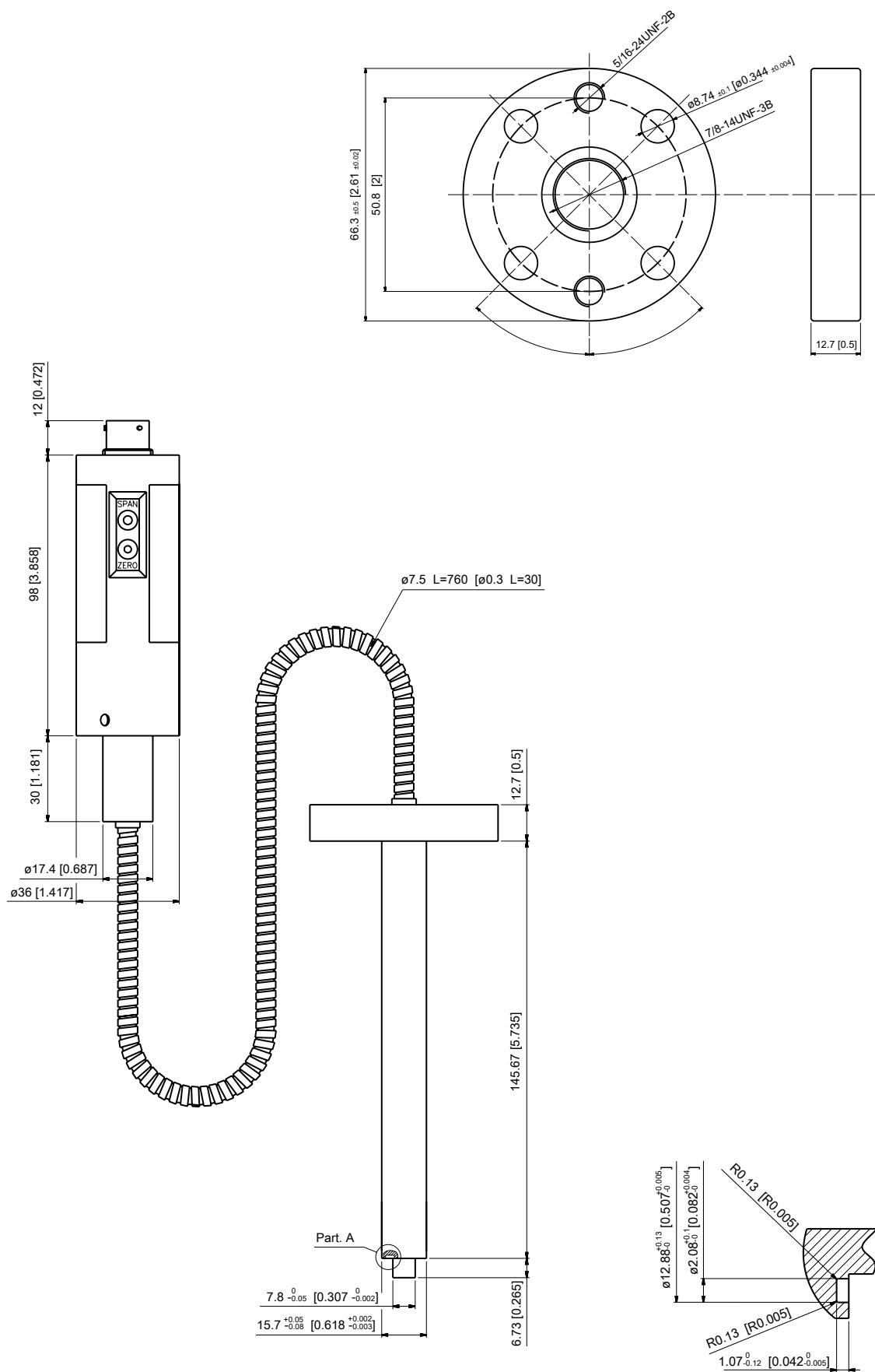


Exposed capillary	
D1	1/2-20UNF
D2	.307/.305" [7.80/7.75mm]
D3	.414/.412" [10.52/10.46mm]
A	.145/.151" [3.68/3.84mm]
B	.318/.312" [8.08/7.92mm]
C	.81" [20.6mm]

**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)

MX4

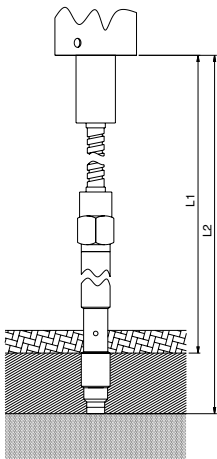





ELECTRICAL CHARACTERISTICS AND TEMPERATURE CLASSES

MODEL	(*) LEVEL L2	(*) LEVEL L1	TEMPERATURE CLASSES	ROOM TEMPERATURE
MX0	>165mm	>125mm	T4	-20...+60°C
MX1	>665mm	>625mm	T5 T4	-20...+55°C -20...+70°C
MX2	>665mm	>625mm	T5 T4	-20...+55°C -20...+70°C
MX3	>665mm	>625mm	T5 T4	-20...+55°C -20...+70°C
MX4	>785 mm	-	T5 T4	-20...+55°C -20...+70°C

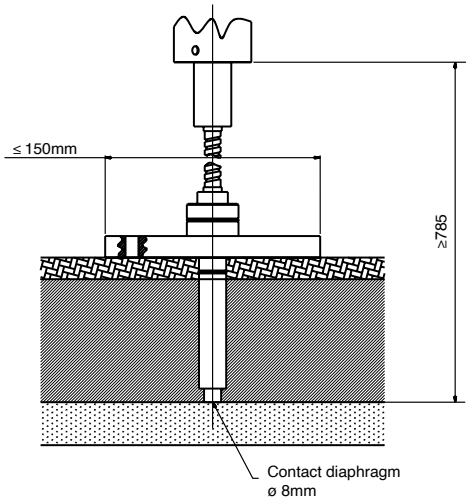
(\*) with the level (L) in fig. 1, the table sets the minimum distance that the electrical circuit has to maintain from the block at high temperature.




MX0 - MX1 - MX2 - MX3



-  thermal isolating material with adequate thickness for the process temperature
-  pressure transmitter housing block
-  fluid at temperature Max. (400°C)

MX4



-  thermal isolating material with adequate thickness for the process temperature
-  installation Vs process
-  fluid at temperature Max. (400°C)

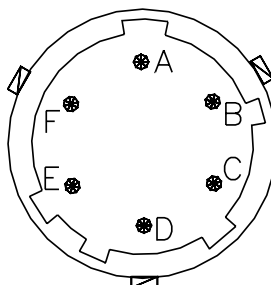
## ELECTRICAL CONNECTIONS

**Output in current (4...20mA 2 wires)**

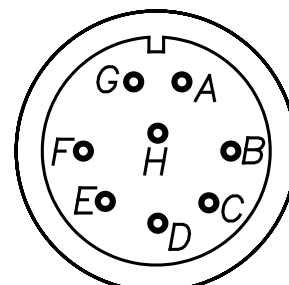
	6-pin	8-pin
Power supply (12...30Vdc)	A	B
n.c.	C	A
Signal (4...20mA)	B	D
n.c.	D	C
Calibration shunt	E - F	E - F
n.c.		G - H

The cable sheathing is connected to the transducer body

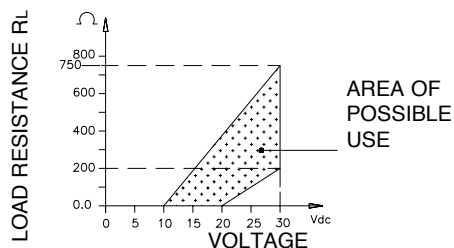
6 pin connector  
VPT07RA10-6PT2  
(PT02A-10-6P)



8 pin connector  
PC02E-12-8P Bendix

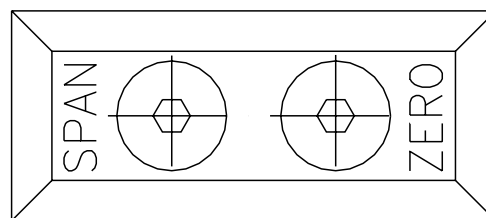


## LOAD DIAGRAM (current output)



The diagram shows the best ratio of load to power supply for transmitters with 4...20mA output. For correct function, use a combination of load resistance and voltage that stays in the shaded zone.

## SETTINGS



The signal setting to room pressure (ZERO) and the setting to rated pressure (SPAN) can be made with the appropriate trimmers, accessed inside the transmitter after removing the two fastening screws.

**The SPAN setting is made during production and must not be changed.**

### Accessories

Fastening bracket  
Silver-plated copper washer  
Protection plug for 1/2-20 UNF  
Protection plug for M18x1.5  
Drill kit for 1/2 -20 UNF  
Drill kit for M18 x 1.5  
Cleaning kit for 1/2-20 UNF  
Cleaning kit for M18x1.5

SF18  
RON007  
SC12  
SC18  
KF12  
KF18  
CT12  
CT18

### Extension cables

6-pin connector with 3mt Atex cable  
6-pin connector with 4mt Atex cable  
6-pin connector with 5mt Atex cable  
6-pin connector with 10mt Atex cable

PCAV221  
PCAV104  
PCAV105  
PCAV106

### Thermocouples for model MX2

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

TTER 718

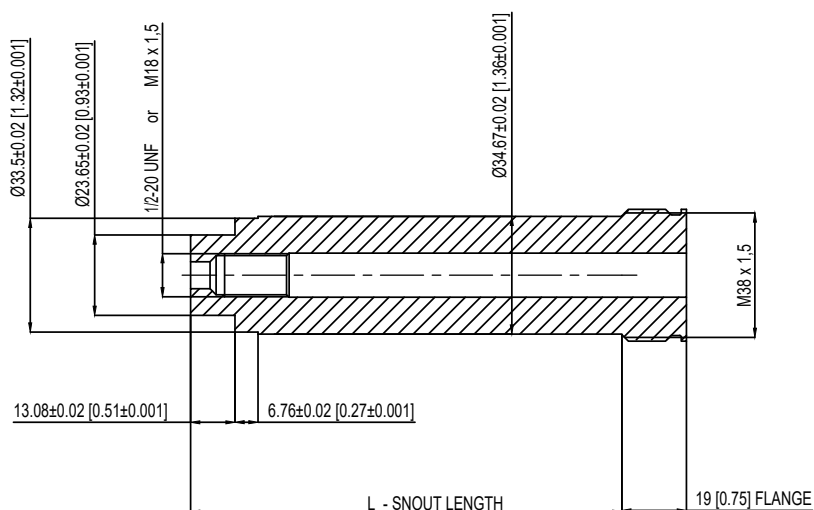
## PROCESS FLANGE ADAPTER

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

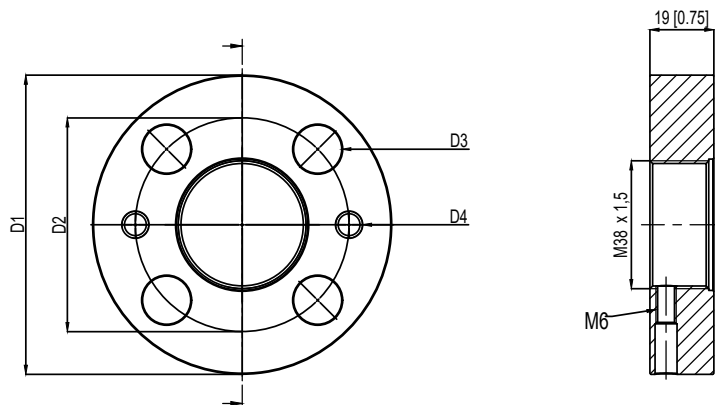
### ADAPTER BODY



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 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**

000= Special executions of the standard version or of custom versions may be requested.

OUTPUT SIGNAL	
4...20mA	<b>X</b>

CONFIGURATION	
Rigid rod	<b>0</b>
Rigid rod + flexible	<b>1</b>
With thermocouple	<b>2</b>
Exposed tip	<b>3</b>
Flange assembly	<b>4</b>

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

PRECISION CLASS	
0,25% FS (ranges ≥100 bar/1500 psi)	<b>H</b>
0,5% FS	<b>M</b>

MEASUREMENT RANGE			
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>

Notes:  
the models MX0/MX1/MX3 are available in a special version XM3GD realized to work in the presence of gases (zone 2) and powders (zone 22).

Marking: **CE** **Ex** II 3G Ex ec IIC T4,T5,Gc  
II 3D Ex tc IIIC T135°C,T100°C Dc,IP65

Examples:

**MX1-6-M-B05C-1-4-D-5-(XM3GD)**

Example

### MX1-6-M-B07C-1-4-D-4-000

Melt pressure transducer with flexible rod, 4...20mA output, 6-pin connector, fi-20 UNF threading, pressure range 700 bar, precision class 0.5%, 153 mm (6") rigid rod, 457 mm (18") flexible rod, temperature class T4

Sensors are manufactured in compliance with:

- EMC compatibility directive: 2014/30/EU
- ATEX directive: 2014/34/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** spa reserves the right to make aesthetic or functional changes at any time and without notice.

<b>4</b>	T4
<b>5</b>	T5

NOTES: Series MX0 available only in T4 class

FLEXIBLE ROD LENGTH (mm / inches)		
Standard (MX0)		
0	none	
Standard (MX1, MX2)		
D	457mm	18"
E	610mm	24"
F	760mm	30"
Standard (MX1, MX2)		
L	711mm	28"
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 (MX0, MX1, MX2)		
4	153mm	6"
5	318mm	12.5"
Standard (MX3)		
0	nessuno	
Available on request		
1	38mm	1.5"
2	50mm	2"
3	38mm	3"
6	350mm	14"
7	400mm	16"
8	456mm	18"
Standard (MX4)		
4	153mm	6"
Available on request		
H	102mm	4"
M	229mm	9"
5	305mm	12"

THREADING	
Standard	
<b>1</b>	1/2 - 20 UNF
<b>4</b>	M18 x 1.5
<b>6</b>	Flange assembly ø 66.3mm (2.61")

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