GEFRAN

MELT PRESSURE TRANSMITTERS FOR APPLICATIONS IN POTENTIALLY EXPLOSIVE ATMOSPHERES

MX SERIES *4-20mA Output*

ATEX

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 trasmission of the pressure.
The fluid-filled system assures the temperature stability.
The phisical measure is transformed in a electrical measure by means the strain-gauge technology.

MAIN FEATURES

- Pressure ranges: 0-35 to 0-2000bar / 0-500 to 0-30000psi
- Extensimetric measurement principle with Wheatstone bridge
- Precision: <±0.25% FSO (H); <±0.5% FSO (M)
- Calibration signal 80% FSO 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.

TECHNICAL SPECIFICATIONS

Rated precision, including effects of Linearity, Repeatability and Hysteresis	**H** <±0.25%FSO (100...2000 bar) **M** <±0.5%FSO (35...2000 bar)
Resolution	Infinite
Pressure ranges	0..35 to 0..2000bar 0..500 to 0..30000psi
Maximum applicable pressure	2 x FS 1,5 x FS beyond 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 (FSO)	20mA
Zero balancing	4mA
Calibration: Rated pressure Room pressure	5% FSO min. 10bar (150psi)
Maximum load	see diagram (page 3)
Response time (10 at 90% FSO)	~ 4ms
Output noise (RMS 10-400Hz)	< 0.05% FSO
Calibration signal	80% FSO
Protection against overvoltages and power supply polarity reverse	YES
Temperature range of Strain Gauge Housing	-20...+70°C -4...+158°F
Thermal drift in compensated range: Zero/Calibrat/Sensitivity	< 0.02% FSO/°C < 0.01% FSO/°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

FSO = Full Scale Output (Signal at rated pressure)

Main intrinsic safety characteristics

Transmitter designed and produced in compliance with Directive 94/9/CE ATEX and according to European standards:
for the second group (II-surfaces), category1,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

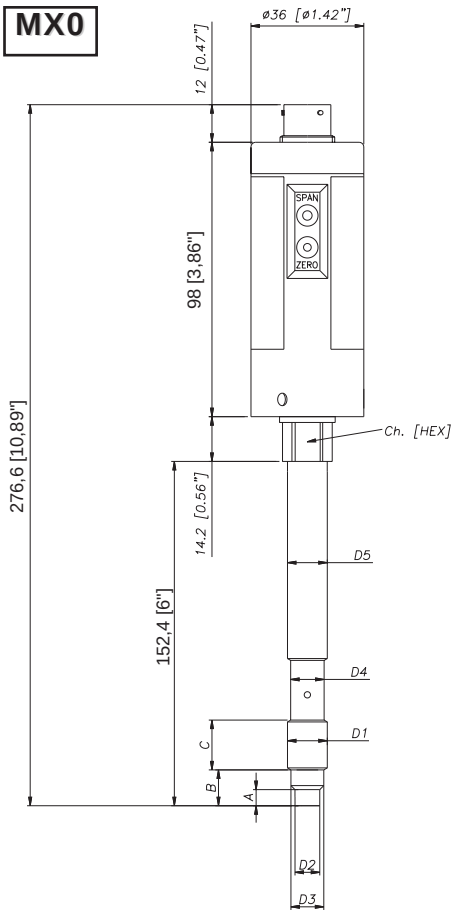
(*) includes inductance levels and capacity of a cable:
(typical L 1microH/m and typical C 100pF/m) with maximum length 15m.

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

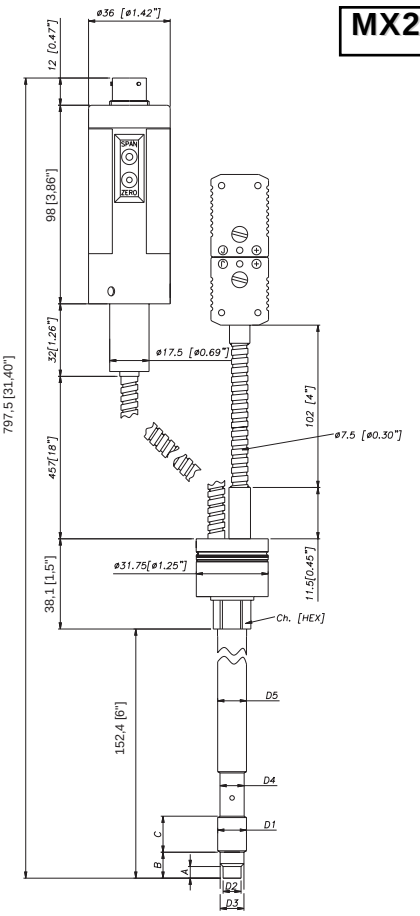
MECHANICAL DIMENSIONS

MX0

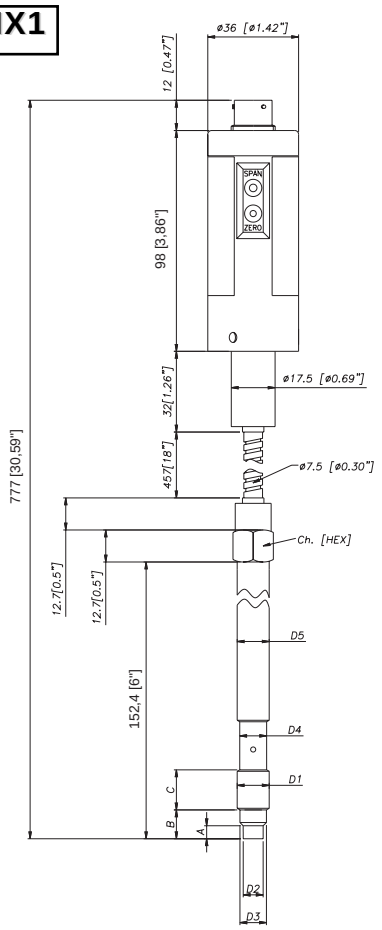


D1	**1/2 - 20UNF**
D2	ø7.8 -0.05 [ø0.31" -0.002]
D3	ø10.5 -0.025 [ø0.41" -0.001]
D4	ø10.67 [ø0.42"]
D5	ø12.7 [ø0.5"]
A	5.56 -0.26 [0.22" -0.01]
B	11.2 [0.44"]
C	15.74 [0.62"]
Ch [Hex]	16 [5/8"]

MX2

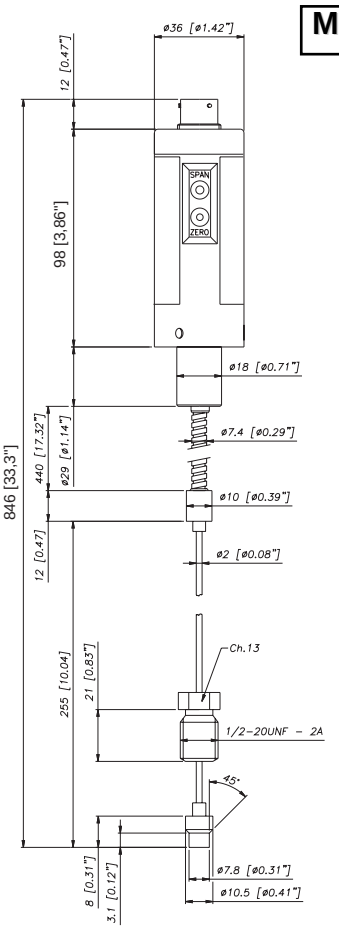


MX1



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"]

MX3



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 CHARACTERISTICS AND TEMPERATURE CLASSES

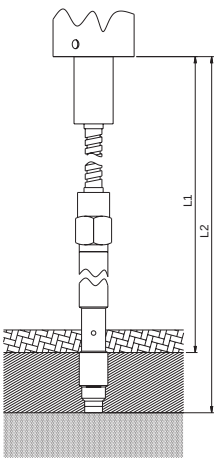
MODEL	(*) LEVEL L2	(*) LEVEL L1	TEMPERATURE CLASSES	ROOM TEMPERATURE
MX0	> 165mm	> 125mm	T4	-20...+60°C
MX1	> 665mm	> 625mm	T5	-20...+55°C
			T4	-20...+70°C
MX2	> 665mm	> 625mm	T5	-20...+55°C
			T4	-20...+70°C
MX3	> 665mm	> 625mm	T5	-20...+55°C
			T4	-20...+70°C

(*) 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.

thermal isolating material with adequate thickness for the process temperature

pressure transmitter housing block

fluid at temperature (400°C)



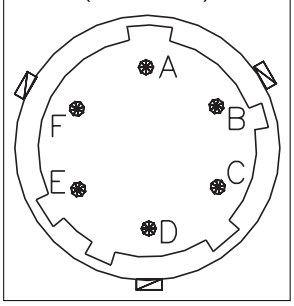
ELECTRICAL CONNECTIONS

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

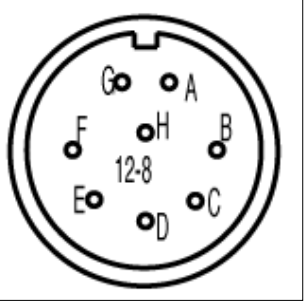
	6-pin	8-pin
Power supply (12...30Vdc) +	A	B
n.c.	C	A
Signal (4...20mA) -	B	D
n.c.	D	C
Calibrtation shunt	E - F	E - F
n.c.		G - H

The cable sheathing is connected to the transducer body

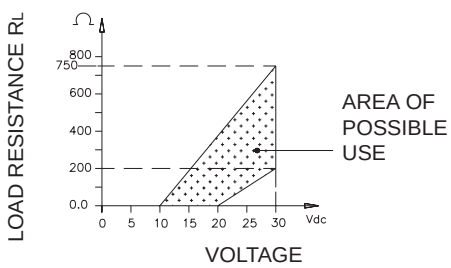
6 pin connector
VPT07RA10-6PT2
(PT02A-10-6P)



8 pin connector
PC02E-12-8P Bendix

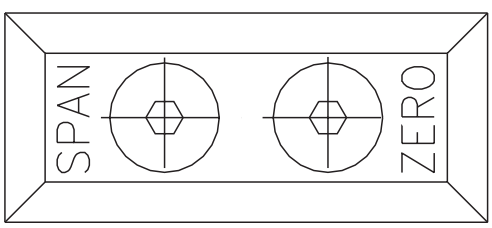


LOAD DIAGRAM (current output)



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	**SF18**
Protection plug for 1/2-20 UNF	**SC12**
Protection plug for M18x1.5	**SC18**
Drill kit for 1/2 -20 UNF	**KF12**
Drill kit for M18 x 1.5	**KF18**
Cleaning kit for 1/2-20 UNF	**CT12**
Cleaning kit for M18x1.5	**CT18**

Extension cables

6-pin connector with 3mt Atex cable	**PCAV221**
6-pin connector with 4mt Atex cable	**PCAV104**
6-pin connector with 5mt Atex cable	**PCAV105**
6-pin connector with 10mt Atex cable	**PCAV106**

Thermocouples for model MX2

Type "J" (for rigid rod 153mm - 6")	**TTER 718**

ORDER CODE

M - □ - □ - □ - □ - □□□□ - □ - □ - □ - □ - 000

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

OUTPUT SIGNAL	
4...20mA	X

CONFIGURATION	
Rigid rod	0
Rigid rod + flexible	1
With thermocouple	2
Exposed tip	3

CONNECTOR	
Standard	
6 pin	6
8 pin	8

PRECISION CLASS	
0.25% FSO (ranges ≥100 bar/1500 psi)	H
0.5% FSO	M

MEASUREMENT RANGE			
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**

4	T4
5	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 (MX3)			
L	711mm	28”	
Available on request			
A	76mm	3”	1)
B	152mm	6”	1)
C	300mm	12”	1)
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	none		
Available on request			
1	38mm	1.5”	1)
2	50mm	2”	1)
3	76mm	3”	1)
6	350mm	14”	
7	400mm	16”	
8	456mm	18”	

1) use rod MX1 and MX2 in combination with sheathings or rigid rods so that total length L is ≥ 630mm

THREADING	
Standard	
1	1/2 - 20 UNF
4	M18 x 1.5
Available on request	
2	M10 x 1 (ranges ≥200bar / 3000psi)
3	M14 x 1.5

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 II3GD Ex nL IIC T5, Ex tD A22, IP65 T100°C Tamb -20°C/+65°C

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 2004/108/CE compatibility directive
- RoHS 2002/95/CE directive
- ATEX 94/9/CE

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

HO03
The Melt pressure transmitter/transducer are available with GOST-R certification.
The request of this version must be specified on the order.

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