



## MAIN FEATURES

- Pressure ranges from: 0-17 a 0-2000 bar/0-250 a 0-30000 psi
- Extensimetric measurement principle
- Accuracy:  $< \pm 0.25\%$  FS (H);  $< \pm 0.5\%$  FS (M)
- SIL2 and PL d approvals for Functional Safety
- Ex certifications for potentially explosive atmospheres (see details)
- Completely interchangeable with all existing products
- Protection level: IP66 (6-pin connector)
- 1/2-20UNF, M18x1.5 standard threads; other types available on request
- Standard diaphragm is 15-5 PH stainless steel with GTP+ coating
- 17-7 PH corrugated stainless steel diaphragm with GTP+ coating for ranges below 100 bar-1500 psi
- Other diaphragm types available on request

**HMX0** The rigid rod configuration provides fast and easy installation.

**HMX1** The flexible rod configuration is suitable for applications demanding greater thermal isolation and where installation would otherwise be difficult.

**HMX2** This configuration lets you measure process pressure and temperature at the same point with a single installation.

**HMX3** The configuration with exposed tip is ideal for applications in limited space.

**HMX4** Configuration with flange for specific applications.

## Main intrinsic safety characteristics

Transmitters are designed and produced in compliance with:

- ATEX Directive 2014/34/EU
- IECEx scheme
- EAC TR CU 012/2011 regulation
- KCs regulation
- Neps Ex regulation
- PESO CCoE regulation

## Type of Protection:

– ATEX: group II, category 1G, 1D

GAS type of protection: Ex ia IIC T6, T5, T4 Ga (Ambient Temp.: -20°C...+60°C / +75°C / +85°C)

DUST type of protection: Ex ia IIIC T<sub>200</sub>85°C, T<sub>200</sub>100°C, T<sub>200</sub>110°C Da IP65 (Ambient Temp.: -20°C...+60°C / +75°C / +85°C)

– IECEx/KCs/Neps Ex/PESO:

group II, category 1G

GAS type of protection: Ex ia IIC T6, T5, T4 Ga (Ambient Temp.: -20°C...+60°C / +75°C / +85°C)

EAC Ex:

group/category 0  
GAS type of protection: Ex ia IIC T6, T5, T4 Ga (Ambient Temp.: -20°C...+60°C / +75°C / +85°C)  
DUST type of protection: Ex ia IIIC T<sub>200</sub>85°C, T<sub>200</sub>100°C, T<sub>200</sub>110°C Da IP65 (Ambient Temp.: -20°C...+60°C / +75°C / +85°C)

Maximum voltage	30 V
Maximum current	100 mA
Maximum power	0,75 W
Maximum inductance (*)	17 $\mu$ H
Maximum capacity (*)	10 nF

The HMX series of Gefran are pressure transmitters with HART communication protocol for using in high temperature environment with explosive atmosphere presence.

The main characteristic of this series is the capability to read pressure 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 of strain-gauge technology.

The SIL2 and PL d approvals make 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.

## TECHNICAL SPECIFICATIONS

Accuracy (1)	H $< \pm 0.25\%$ FS (100...2000 bar) M $< \pm 0.5\%$ FS (17...2000 bar)
Resolution	16 bit
Measurement range	0..17 to 0..2000bar 0..250 to 0..30000psi
Rangeability	3:1
Maximum overpressure (without degrading performances)	2 x FS 1.5 x FS above 1000bar/15000psi
Measurement principle	Extensimetric thick film
Power supply	13...30Vdc
Maximum current absorption	23mA
Output signal Full Scale (FS)	20mA
Zero balance (tolerance $\pm 0.25\%$ FS)	4mA
Calibration signal	80% FS
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% FS/°C
Diaphragm maximum temperature	400°C / 750°F
Zero drift due to change in process temperature (zero)	< 0.02 bar/°C
Standard material in contact with process medium	Diaphragm: • 15-5 PH with GTP+ coating • 17-7 PH corrugated diaphragm with GTP+ coating for ranges <100bar (1500psi) Stem: • 17-4 PH
Thermocouple (model HMX2)	STD: type "J" (isolated junction)
Protection degree (with 6-pole female connector CON300)	IP66
SIL2 certification	IEC/EN 62061 - IEC 61508
PL d certification	EN ISO 13849

FS = Full scale output

For products sold to EAC Customs Union (EAC mark), due to a different method of calculation, the limits of accuracy are the following:

– M =  $\pm 1\%$

– H =  $\pm 0.5\%$

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

(\*) includes inductance levels and capacity of a cable:

(typical L 1microH/m and typical C 100pF/m) with maximum length 15m.

The Melt pressure transmitters must be connected to other equipment (galvanic isolation barriers) with individual Ex certification such as [Ex ia Ga] IIC. The thermocouple circuit must be powered by means of galvanic isolation barriers with a maximum of 30V.

EU-Type Examination Certificate number: DNV 21 ATEX 81471

IECEx CoC number: PRE 20.0091

EAC Ex number: KG 417/043.CN.02.07305

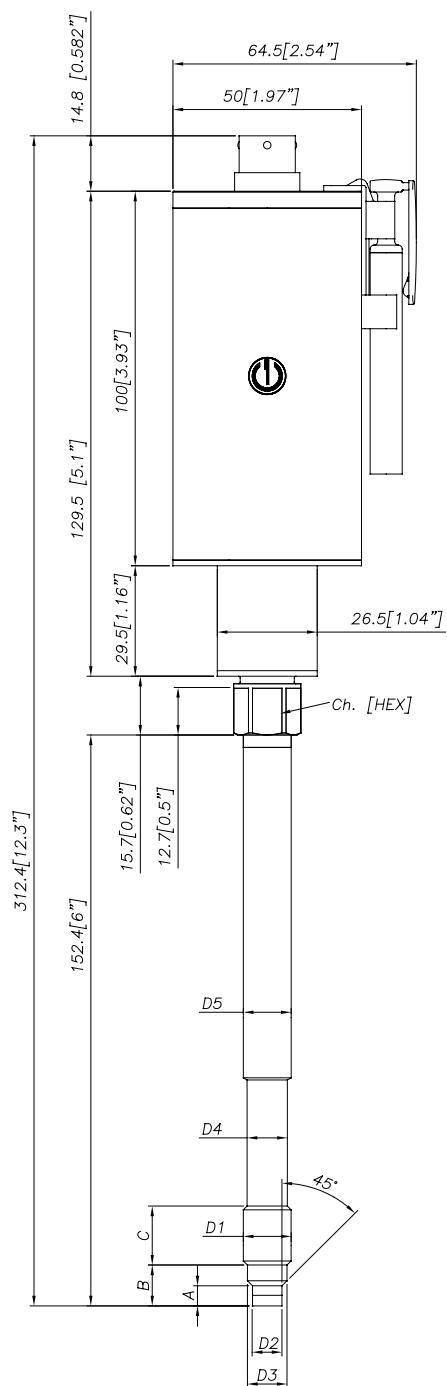
KCs certificate number: 21-KA4BO-0668 (HMX)

Neps Ex number: GYJ21.2886X

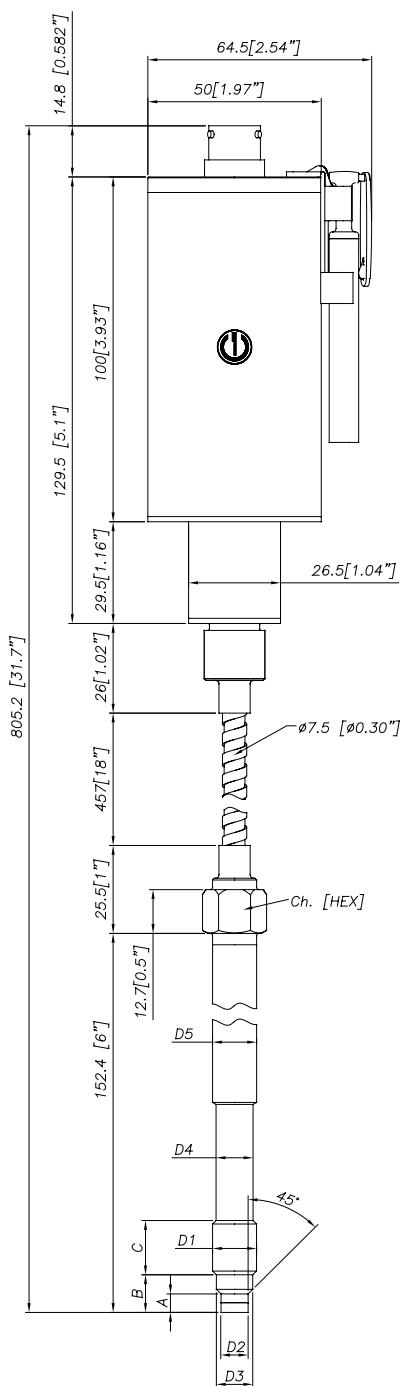
PESO approval number: A/P/HQ/MH/104/6921 (P520346)

## MECHANICAL DIMENSIONS

**HMX0**



**HMX1**

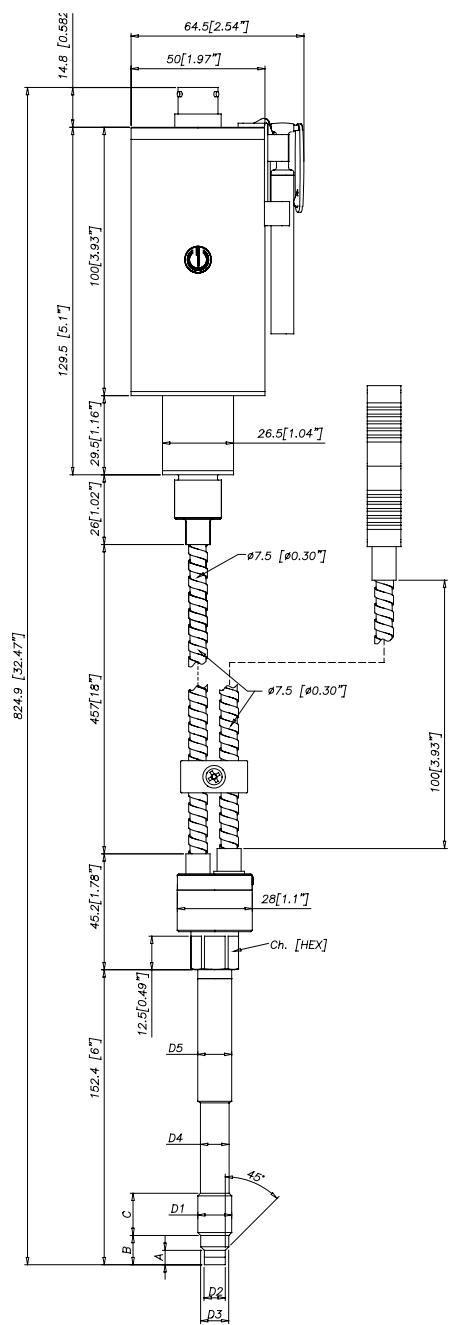


**NOTE:** dimensions refer to rigid stem length option "4" (153 mm- 6")

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

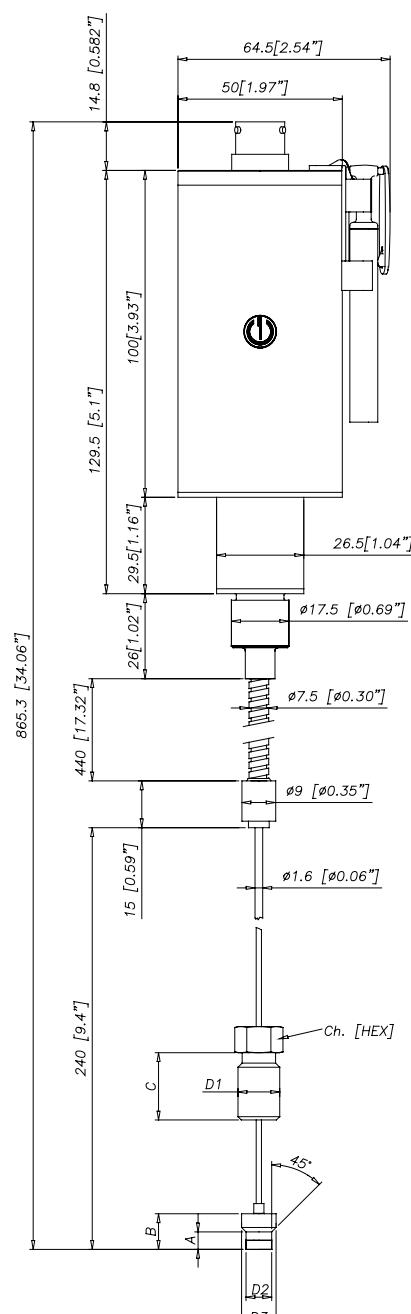
## MECHANICAL DIMENSIONS

**HMX2**



**HMX3**

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



### Exposed capillary

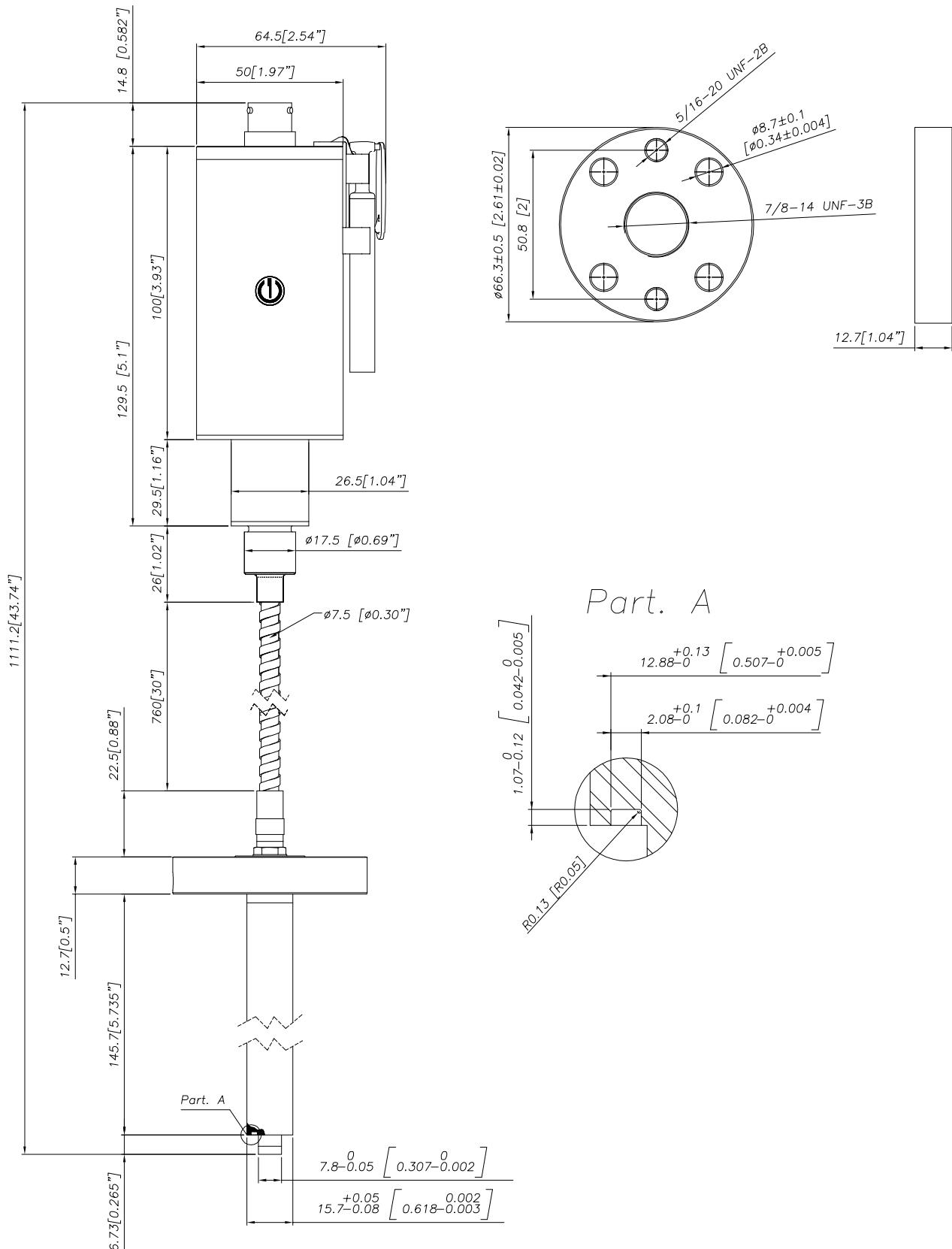
<b>D1</b>	1/2-20UNF
<b>D2</b>	.307/.305" [7.80/7.75mm]
<b>D3</b>	.414/.412" [10.52/10.46mm]
<b>A</b>	.145/.151" [3.68/3.84mm]
<b>B</b>	.318/.312" [8.08/7.92mm]
<b>C</b>	.81" [20.6mm]

**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)

## MECHANICAL DIMENSIONS

**HMX4**



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

## SELF DIAGNOSTICS (ONLY FOR SIL2 / PL d VERSIONS)

Below the conditions detected by the sensor self-diagnostics:

- Cut cable / device non connected / broken power supply, output  $\leq 3.6\text{mA}$
- Pin detachment output  $\leq 3.6\text{mA}$
- Broken primary element  $\geq 21\text{mA}$
- Pressure above 200% of the span, output  $\geq 21\text{mA}$
- Voltage monitor in case of overvoltage/undervoltage/voltage variation in the electronics, output  $\leq 3.6\text{mA}$  (\*)
- Program sequence error, output  $\leq 3.6\text{mA}$  (\*)
- Overtemperature on the electronics, output  $\leq 3.6\text{mA}$  (\*)
- Error on the primary element output or on the first amplification stage, output  $\geq 21\text{mA}$

(\*) In such conditions the Alarm Type can be programmed via HART at  $\geq 21\text{ mA}$ .

## NAMUR COMPLIANCE (ONLY FOR SIL2 / PL d VERSIONS)

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  $\leq 3.6\text{mA}$
- Device not connected: breakdown information as the signal is  $\leq 3.6\text{mA}$
- Broken power-supply: breakdown information as the signal is  $\leq 3.6\text{mA}$  or in case of performance problems:
- Broken primary element  $\geq 21\text{mA}$
- Pressure above 200% of the span, output  $\geq 21\text{ mA}$
- Others  $\leq 3.6\text{mA}$  (\*)

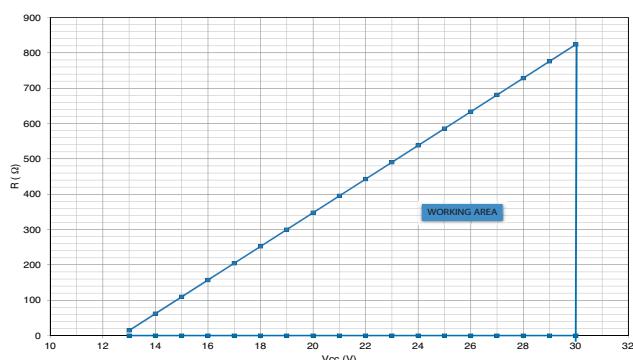
(\*) In such a condition the Alarm Type can be programmed via HART at  $\geq 21\text{ mA}$ .

Note: in all the remaining situations, the output signal is always included between 3.8 and 20.5mA.



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

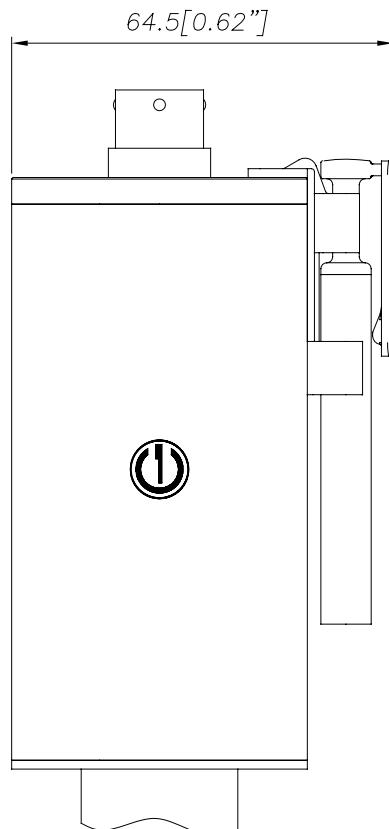
## LOAD DIAGRAM



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



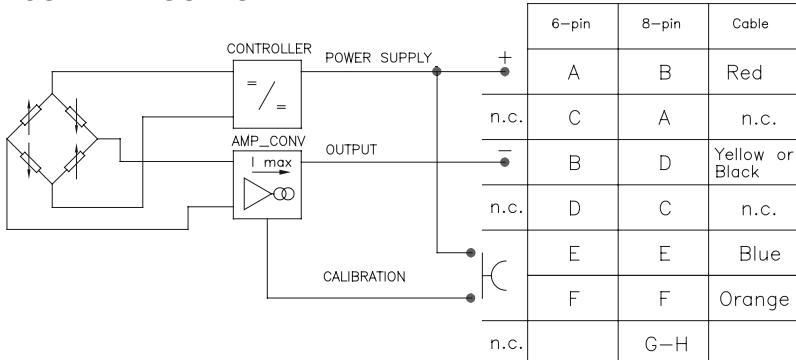
The Autozero function is activated through a magnetic contact (external magnet supplied with the sensor).

The Autozero function can be activated through HART command as well.

See the manual for a complete Autozero function explanation.

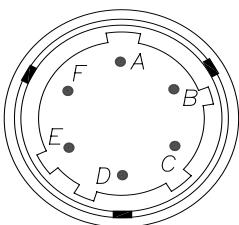
## ELECTRICAL CONNECTIONS

### CURRENT OUTPUT

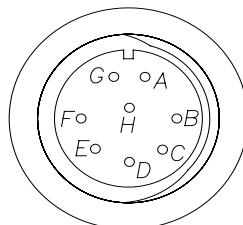


The cable shield is tied to both sides, i.e. to the sensor connector and to the controller

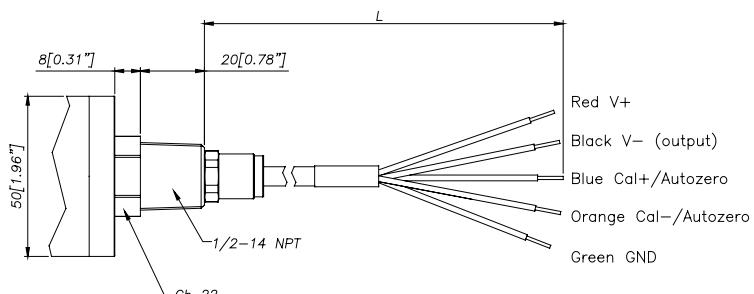
**6 pin Connector**  
**VPT07RA10-6PT2**  
**(PT02A-10-6P)**



**8 pin Connector**  
**(PC02E-12-8P) Bendix**



**Cable outlet (1/2 14-NPT)**  
**Current output**  
**L = 1 m**



## ACCESSORIES

### Connectors

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

**CON300**  
**CON307**

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

### Accessories

Mounting bracket  
Silver-plated copper washer  
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**  
**RON007**  
**SC12**  
**SC18**  
**KF12**  
**KF18**  
**CT12**  
**CT18**  
**PKIT1032**  
**PKIT378**

### 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 HMX2

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

**TTER 601**

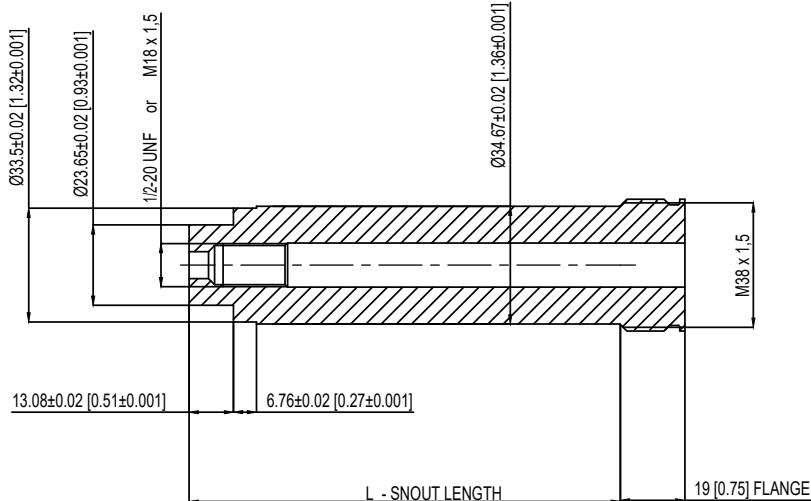
## PROCESS FLANGE ADAPTER

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

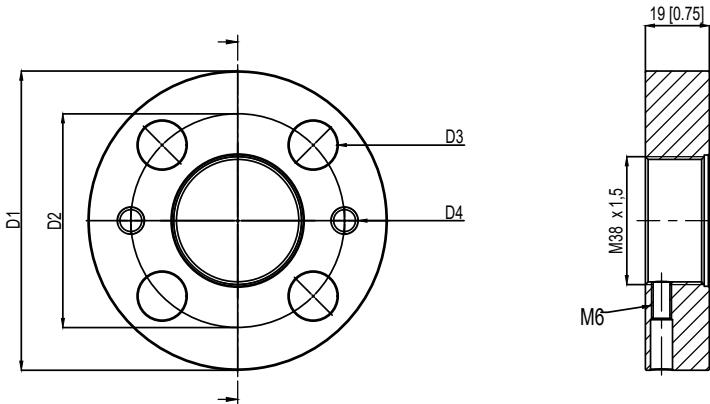
### ADAPTER BODY



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

M18 X 1,5	L - SNOUT 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

<b>KIT</b>	<b>5</b>	<b>0</b>	<b>1</b>
<b>Snout length</b>			
5 inch [127 mm]	5		
2,031 inch [51,6 mm]		2	
<b>Flange type (see technical drawing)</b>			
FLA960	0		
FLA961		1	
<b>Thread dimensions</b>			
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

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

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