

# Pressure Transmitters



Models

# PTMEx PTMExFB

## Piezoresistive

Ex protection II2 G EEx ib IIC T6 acc. to ATEX

Accuracy <math>\pm 0.2\%</math><sup>1)</sup>

Pressure transmitters model PTMEx are suitable for fluid and gaseous media that do not corrode stainless steel 316 L (1.4404). The equipment when connected to a certified intrinsically safe electric circuit comply with type of protection II2 G EEx ib IIC T6 in accordance with ATEX. Two basic models are available:

Relative pressure (r) **Model PTMEx** 0-1 bar to 0-160 bar  
**Model PTMExFB** 0-100 mbar to 0-400 bar

Both models are also suitable for vacuum and compound ranges (with ventilation to the atmosphere)

Absolute pressure (a) 0-1 bar to 0-25 bar (absolute zero based measurements)

### Application

The pressure transmitters are temperature compensated and supply a calibrated output signal. The rugged design allows the pressure transmitters to be installed under aggravated conditions, e.g. in ships.

### EMC Test

The pressure transmitters comply with the electromagnetic interference requirements for residential, commercial and industrial areas in accordance with European standards and ensure thus their electromagnetic compatibility.

### Construction

The piezoresistive sensor filled with silicone oil has been welded in to the process connection. A thin diaphragm made of stainless steel separates the actual sensor from the medium.

## Standard Configuration

### Housing

Material: 1.4404/1.4305 (~316 L / 303 stainl. steel)  
Protection type: IP 65

Ventilation of inside volume for pressure ranges <math>< 16</math> bar through the plug connector [for versions (r) only]

### Electrical Connection

Angled plug connector DIN EN 175301-803, 3 terminals and ground terminal; to guarantee electromagnetical conformity (EMC) please use a shielded cable (e.g. LP/LiMYCY). The shielding must be connected to the case.

### Reverse Polarity Protection

Standard

### Electronics

Potted with silicone

### Sensor Filling

Silicone-free, synthetic oil

### Wetted Parts

Process connection stainless steel 316 L (1.4404),

PTMEx: G 1/2 B (1/2" BSP)

PTMExFB: Process connection with flush diaphragm G 1/2 B (1/2" BSP) in accordance with DIN 3852, but G 1 B (1" BSP) with O-ring NBR for pressure ranges  $\leq 1$  bar

Diaphragm: stainless steel 316 L (1.4404)

### Temperature Limitations

Storage temperature: -40...+ 90 °C (-40...+194 °F)  
Operating temperature: -10...+ 70 °C (+14...+158 °F)  
Medium temperature: -10...+ 80 °C (+14...+186 °F)  
with temperature decoupling: -10...+140 °C (+14...+284 °F)

### Temperature Influence

Zero point:  $\leq 0.2\%$  of the measurement span/10 K (18 °F)  
Span:  $\leq 0.2\%$  of measurement span/10 K (18 °F)

### Overrange Protection

Pressure range dependent, typically at least two-fold, for details see pressure range table overleaf



### Available Pressure Ranges

See table on page 2

### Settling Time

$\leq 20$  ms

### Accuracy

better than  $\pm 0.2\%$ , for pressure ranges  $> 60$  bar  $\pm 0.3\%$

### Output Signal

4...20 mA, two-wire system (others see "Special Configurations")

### Current Limiting in the Output Signal

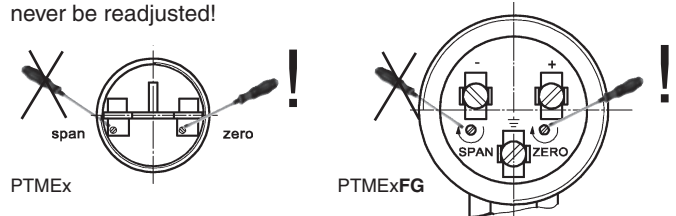
Maximum output current approx. 30 mA

### Calibration Potentiometers

Our pressure transmitters are calibrated in the factory. For this reason the potentiometers should not be adjusted. If even so a zero point correction should become necessary this can be done after removing the upper part of the plug (loosen knurled nut and fold the plug to the side).

### Adjustment Range

Zero and Span approximately  $\pm 5\%$   
ZERO and SPAN can be adjusted separately, but the SPAN should never be readjusted!



### Auxiliary Power

6 ... 30 VDC, maximum permissible operating voltage 30 VDC (others see "Special Configurations")

### Influence of the Supply Voltage

$\leq 0.2\%$  of full span / 10 V

### Load

2-wire circuit (others see "Special Configurations"):

$$R_{Bmax} = (U_B - 6V) / 0.02 A$$

### Load Influence

For a load change of 500 Ohm  $< 0.1\%$  of f.s.

### Fitting Position

Any (standard position is vertical)

### Ex Approval

CENELEC approval ATEX

Explosion protection, intrinsically safe TÜV 04 ATEX 2432 X

Ex II2 G EEx ib IIC T6

$U_{max} < 30$  VDC

$I_{max} < 150$  mA

$P_{max} < 1$  W

$C_i < 49$  nF

$L_i < 33$   $\mu$ H

<sup>1)</sup>  $\pm 0.3\%$  for pressure ranges  $> 60$  bar



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## Pressure Ranges/Overpressure Limits

Relative pressure (r)		Absolute pressure (a)	Overpressure limit***
0- 100 mbar*	-100/0 mbar*	—	2 bar
0 - 160 mbar*	-160/0 mbar*	—	
0 - 250 mbar*	-250/0 mbar*	—	
0 - 400 mbar*	-400/0 mbar*	—	
0 - 0,6 bar*	-0,6/0 bar*	—	6 bar
0 - 1 bar	-1/0 bar	0 - 1 bar abs	10 bar
0 - 1,6 bar	-1/+0,6 bar	0 - 1,6 bar abs	
0 - 2,5 bar	-1/+1,5 bar	0 - 2,5 bar abs	16 bar
0 - 4 bar	-1/+3 bar	0 - 4 bar abs	30 bar
0 - 6 bar	-1/+5 bar	0 - 6 bar abs	
0 - 10 bar	-1/+9 bar	0 - 10 bar abs	50 bar
0 - 16 bar	-1/+15 bar	0 - 16 bar abs	
0 - 25 bar		0 - 25 bar abs	70 bar
0 - 40 bar		—	
0 - 60 bar		—	200 bar
0 - 100 bar**		—	
0 - 160 bar**		—	500 bar
0 - 250 bar**		—	
0 - 400 bar**		—	

\* only PTMExFB with connection G 1 B

\*\* Accuracy  $\pm 0,3\%$  f.s.

\*\*\* for intermediate ranges upon request

The pressure transmitters are available also with the corresponding psi pressure ranges without extra charges.

## Special Configurations

- Model with **temperature decoupling** for temperatures of  $-10\text{ }^{\circ}\text{C}$  to  $+140\text{ }^{\circ}\text{C}$  ( $+14$  to  $284\text{ }^{\circ}\text{F}$ ), code letters **TE**

- **Electrical connection** IP 67, cable venting; **round connector** with screw plug M 12, IP 65

- **Field case, ordering code: ..FG** (e.g. PTMExFG, PTMExFBFG), Solid construction, screwed-on cover ring with O-ring seal for adjustment potentiometers accessible from the outside, screw-on cover for connection chamber with O-ring thread protection, terminals  $4\text{ mm}^2$ , cable fitting M 16x1.5 for cable diameters of  $4.5\text{--}10\text{ mm}$  ( $.18\text{--}.39\text{"}\text{)$ , protection type IP 65 or optionally IP 67, inside chamber venting through integrated sinter filter (IP65) respectively vented connection cable in the case of IP 67

- **Output signal**  
0... 20 mA, **3-wire**

Auxiliary power: 9...30 V DC,  
max. permissible operating voltage 30 VDC

Load:  $R_{Bmax} = (U_B - 9\text{ V}) / 20\text{ mA}$

( $U_B$  = Operating voltage,  $R_{Bmax}$  = max. perm. load resistance including cable)

Load influence:  $< 0.1\%/100\text{ Ohm}$

- **Other process connections:**

– **Model PTMEx:**  $\frac{1}{2}$ " NPT in accordance with DIN EN 837-1

– **Model PTMExFB,** pressure ranges from 1.6 to 25 bar

(standard at  $\leq 1\text{ bar}$ ):

G 1 B (1" BSP) with NBR O-ring

pressure ranges from 1 bar to 60 bar

G  $\frac{1}{2}$  B ( $\frac{1}{2}$ " BSP) or M 22 x 1.5 with NBR O-ring

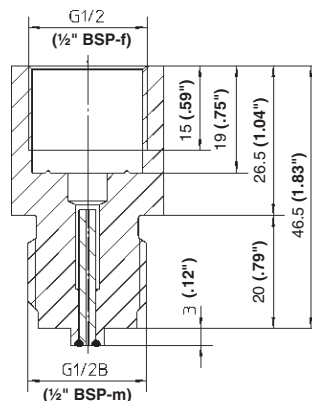
- **Connection to Zone 0**

with usage of our adapter "Adapt-FS" (see right column at the top); connection to Zone 0 using a correspondingly approved diaphragm chemical seal upon request

## Accessories

Flame arrester "Adapt-FS" version 1 in accordance with data sheet I-11001, made of 316Ti (1.4571) / channel 304 stainl. steel (1.4301), process connection G  $\frac{1}{2}$  B ( $\frac{1}{2}$ " BSP) in accordance with EN 837-1, with EG type approval certificate PTB 99 ATEX 4023 X in accordance with directive 94/9/EG, marking of this protection system:

Ex II G II C



## How to Order

Model code:	Inside diaphragm Flush welded diaphragm	<b>PTMEx</b> <b>PTMExFB</b>
Housing:	Standard: Field case:	<b>without</b> code letter <b>FG</b>
Medium temperature:	Standard version, up to $+80\text{ }^{\circ}\text{C}$ with temperature decoupling, up to $+140\text{ }^{\circ}\text{C}$ ( $+284\text{ }^{\circ}\text{F}$ ): (see left)	<b>without</b> code letter <b>TE</b>
Ignition protection type:		<b>ib</b>
Marking with temperature class:		<b>T4, T5, or T6</b>
Pressure type:	Relative pressure: Absolute pressure:	<b>(r)</b> <b>(a)</b>
Pressure range:	see table above, e.g.	<b>0-4 bar</b>
Output signal:	Standard: Option:	<b>4 ... 20 mA,</b> <b>0 ... 20 mA</b>
Special configurations:	e.g. process connection $\frac{1}{2}$ " NPT, M 22x1.5 and others., <b>see on the left</b> ; special fitting position, other special configurations upon request	

### Examples for Ordering Information:

#### PTMEx ib T6 (r) -1/+3 bar, 4...20 mA

i.e.: PTMEx pressure transmitter with explosion protection, standard version for max. medium temperature  $+80\text{ }^{\circ}\text{C}$  ( $+176\text{ }^{\circ}\text{F}$ ), ignition protection type ib, temperature class T6, for relative pressure  $-1/+3\text{ bar}$ , output signal  $4\text{--}20\text{ mA}$  (2-wire), process connection G  $\frac{1}{2}$  B ( $\frac{1}{2}$ " BSP)

#### PTMExFG TE ib T6 (a) 0-6 bar, 0...20 mA

i.e.: PTMExFG pressure transmitter in field case with explosion protection, with temperature decoupling for max. medium temperature  $+140\text{ }^{\circ}\text{C}$  ( $+284\text{ }^{\circ}\text{F}$ ), ignition protection type ib, temperature class T6, for absolute pressure  $0\text{--}6\text{ bar}$ , output signal  $0\text{--}20\text{ mA}$  (3-wire), process connection G  $\frac{1}{2}$  B ( $\frac{1}{2}$ " BSP)

#### PTMExFB ib T5 (r) 0-400 mbar, 4...20 mA, G1B

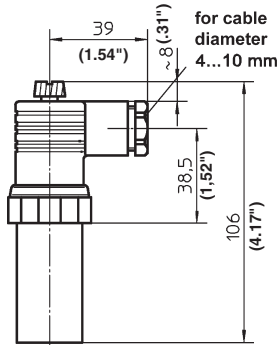
i.e.: PTMExFB pressure transmitter with explosion protection, standard version for max. medium temperature  $+80\text{ }^{\circ}\text{C}$  ( $+176\text{ }^{\circ}\text{F}$ ), ignition protection type ib, marking with temperature class T5, for relative pressure  $0\text{--}400\text{ mbar}$ , output signal  $4\text{--}20\text{ mA}$  (2-wire), process connection G 1 B with flush diaphragm

# Housing Types, Dimensions, Weight, Connection Diagrams

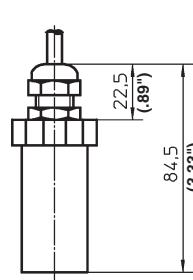
## Standard housing

(without additional code letters)

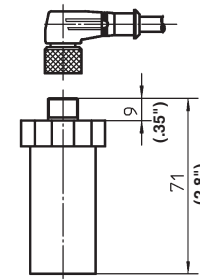
Plug connector DIN EN 175301-803  
Venting through connector  
Protection type IP 65



Cable connection  
Venting through cable  
Protection type IP 67



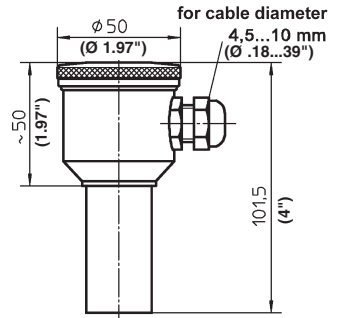
Round connector with screw plug  
Venting through cable  
Protection type IP 65



## Field case

Code letters **FG**

Screwed cable gland M 16x1.5  
Venting through sinter filter, IP 65  
Option: venting through cable, IP 67



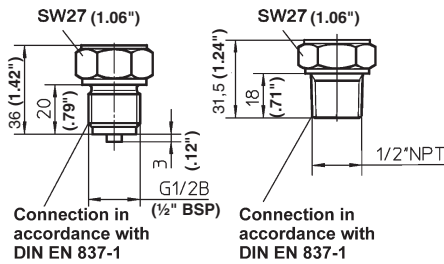
**Weight** Standard housing: approx. 0.20 kg (0.44 lb),  
with temperature decoupling approx. +0.05 kg (+0.11 lb)

**Weight** Field case: approx. 0.46 kg (1.01 lb),  
with temperature decoupling approx. +0.05 kg (+0.11 lb)

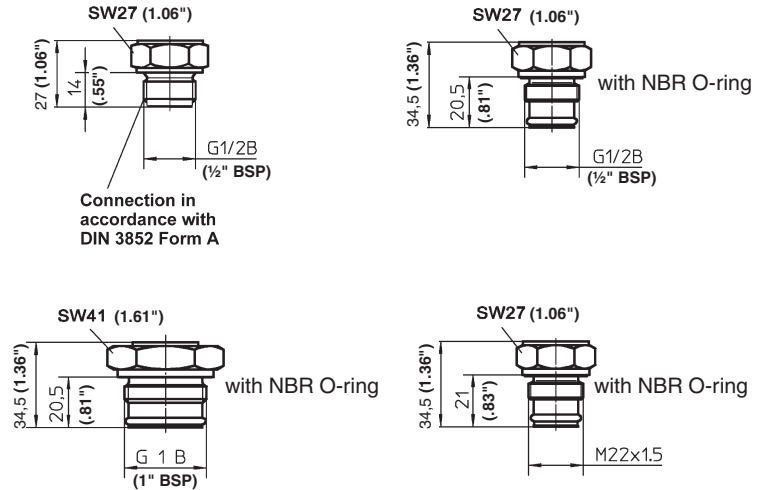
### Option: Temperature decoupling



## Process connections PTMEx



## Process connections PTMExFB

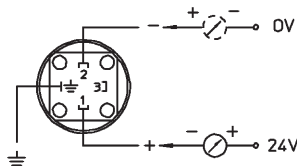


## Connection Diagrams:

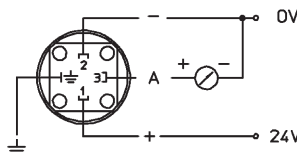
### Angled plug

DIN EN 175301-803

2-wire terminals



3-wire terminals

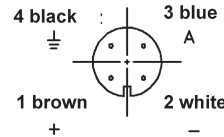
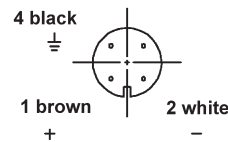


### Cable connection

brown + Supply  
white - Ground  
green - Supply

brown + Supply  
white - Ground  
green - Supply  
black A Output

### Round connector



### Field case

Screwed cable gland M 16x1.5

