

# Parametrable / Programmable Pressure Transmitter

## **PTM/RS485**



### **CUSTOMER BENEFITS**

- High flexibility due to scalable pressure range
- Digital (RS485) and analogue (4-20mA) output signal in one sensor
- Available as multi-parameter sensor (pressure & temperature)
- Fast customization thanks to modular product design
- Stainless steel and titanium version for use in acidic or otherwise aggressive media

# Technical Specifications

## PRESSURE MEASURING RANGE (BAR)

|                                         | 0.1 ... 0.5                                         | > 0.5 ... 2            | > 2 ... 25            |
|-----------------------------------------|-----------------------------------------------------|------------------------|-----------------------|
| Overpressure                            | 3 bar                                               | 3 x FS ( $\geq 3$ bar) | 3 x FS                |
| Burst pressure, (4)                     | > 200 bar                                           | > 200 bar              | > 200 bar             |
| Accuracy, (5) ( $\pm$ % FS)             | $\leq 0.25$                                         | $\leq 0.1$             | $\leq 0.1$            |
| Total Error, (6), (7),<br>( $\pm$ % FS) |                                                     |                        |                       |
| -10 ... 50°C,<br>(typ./max.)            | $\leq 0.15 / 0.3$ ( $\leq 200$ mbar:<br>0.3 / 0.6)  | $\leq 0.15 / 0.3$      | $\leq 0.15 / 0.3$     |
| -25 ... 85°C,<br>(typ. / max.)          | $\leq 0.65 / 0.7$ ( $\leq 200$ mbar:<br>0.65 / 0.8) | $\leq 0.65 / 0.7$      | $\leq 0.55 / 0.7$     |
| Long term stability, (8)                | < 0.5% FS / < 4 mbar                                | < 0.2% FS / < 4 mbar   | < 0.1% FS / < 0.2% FS |

|                                         | > 25 ... 600, (1), (2), (3)          | > 600 ... 1000, (1)   |
|-----------------------------------------|--------------------------------------|-----------------------|
| Overpressure                            | 3 x FS ( $\leq 850 / \leq 1500$ bar) | 1500 bar              |
| Burst pressure, (4)                     | > 850 / $\leq 1500$ bar              | > 1500 bar            |
| Accuracy, (5) ( $\pm$ % FS)             | $\leq 0.1$                           | $\leq 0.25$           |
| Total Error, (6), (7),<br>( $\pm$ % FS) |                                      |                       |
| -10 ... 50°C,<br>(typ./max.)            | $\leq 0.15 / 0.3$                    | n.a.                  |
| -25 ... 85°C,<br>(typ. / max.)          | $\leq 0.55 / 0.7$                    | n.a.                  |
| Long term stability, (8)                | < 0.1% FS / < 0.2% FS                | < 0.1% FS / < 0.2% FS |

(1) Titanium available  $\leq 400$  bar (burst pressure > 550 bar)

(2) Process connection frontal and flush diaphragm available  $\leq 600$  bar

(3) Overpressure and burst pressure 1500 bar (stainless steel) optional

(4) Transducer

(5) Zero based accuracy according to DIN-16086, incl. hysteresis and repeatability at ambient temperature

(6) Total error including accuracy and temperature influences at maximum signal span (16 mA)

(7) Active compensated,  $\leq 100$  bar

(8) 1 year (typ. / max.), the long term stability can be improved by ageing (burn-in) the sensor

## TEMPERATURE MEASURING RANGE

| Standard, (1), (2)      | -10 ... 50°C               |
|-------------------------|----------------------------|
| Lower end of range, (2) | -25°C                      |
| Upper end of range, (2) | 85°C                       |
| Accuracy                | $\leq \pm 2^\circ\text{C}$ |

(1) Available active compensated only

(2) Depending on temperature range of the active compensation

## TEMPERATURE RANGE

|                       |               |
|-----------------------|---------------|
| Operating temperature | -25 ... 85°C  |
| Process temperature   | -40 ... 150°C |
| Storage temperature   | -25 ... 85°C  |

## ELECTRICAL SPECIFICATIONS

|                   |                                           |
|-------------------|-------------------------------------------|
| Output            |                                           |
| Digital           | RS485                                     |
| Protocol          | Modbus RTU                                |
| Analog            | 4 ... 20 mA                               |
| Resolution        |                                           |
| Digital output    | 0.01% FS                                  |
| Analog output     | 0.025% FS                                 |
| Output adjustable |                                           |
| 4 mA              | -5% FS ... 105% FS                        |
| 20 mA             | -5% FS ... 105% FS                        |
| Span              | 25% FS ... 110% FS (≥ 100 mbar)           |
| Low pass filter   | 0.1 / 1 / 10 / 30 Hz<br>(standard: 30 Hz) |
| Power supply      | 9 ... 30 VDC                              |
| Supply influence  | < 0.1% FS                                 |
| Circuit diagram   |                                           |
| Load resistance   |                                           |
| Load influence    | < 0.1% FS                                 |
| Cable length      | max. 300 m                                |

## QUALIFICATIONS

|                   | Description             | Level                               | Typical interferences       |
|-------------------|-------------------------|-------------------------------------|-----------------------------|
| EN 60068-2-6      | Vibration               | 4 G (4 ... 100 Hz / $\pm 3.2$ mmpp) |                             |
| EN 60068-2-27     | Shock                   | 100 G (impulse duration 6 ms)       |                             |
| EN 55022          | Emission, class B       | < 30 dB $\mu$ V/m (0.03 ... 1 GHz)  |                             |
| EN 61000-4-2      | Electrostatic discharge | 4 kV contact / 8 kV air             |                             |
| EN 61000-4-3      | Irradiated RF           | 10V/m (0.08...1 GHz)                | Radio sets, wireless phones |
| EN 61000-4-4      | Transients (burst)      | 2 kV                                | Motors, valves              |
| EN 61000-4-5, (1) | Surge                   | 10 kA (8 / 20 $\mu$ s)              | Overvoltage                 |
| EN 61000-4-6      | Conducted RF            | 10 V (0.15 ... 80 MHz)              | Frequency converters        |

(1) Only with optional surge (lightning) protection

## PHYSICAL SPECIFICATIONS

| Materials  |                                                        |
|------------|--------------------------------------------------------|
| Transducer | Stainless steel (316L / 1.4435), titanium (Gr. 2), (1) |
| Housing    | Stainless steel (316L / 1.4404), titanium (Gr. 2)      |
| Seals      | Viton (Standard), EPDM, Kalrez, NBR                    |
| Cable      | PUR, FEP, PE                                           |

(1) Hastelloy (C-276) on request

# Equipment

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## OVERVIEW

| 10.00.0091 | Accessories overview |
|------------|----------------------|

## INTERFACE

| 101138 | PTM - Interface |
|--------|-----------------|

## SOFTWARE

| 101224 | PC Software V1.50 |
|--------|-------------------|

# Additional documents

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## MANUALS

|            | Article number | Description            |
|------------|----------------|------------------------|
| 10.00.0079 | DEB003         | Configuration software |
| 10.00.0089 | DEB005         | User manual            |

## OPERATING AND SAFETY INSTRUCTIONS

|            | Article number |
|------------|----------------|
| 10.00.0137 | DMM009         |

# Ordering information

|                                                                            | X. | XXXX. | XXXX. | XX. | XXX |
|----------------------------------------------------------------------------|----|-------|-------|-----|-----|
| <b>Type</b>                                                                |    |       |       |     |     |
| PTM/RS485                                                                  | 43 |       |       |     |     |
| <b>Pressure type</b>                                                       |    |       |       |     |     |
| Gauge                                                                      | 1  |       |       |     |     |
| Absolute (vacuum)                                                          | 2  |       |       |     |     |
| Seald gauge                                                                | 3  |       |       |     |     |
| <b>Pressure measuring range</b>                                            |    |       |       |     |     |
| 100 mbar ... 600 bar                                                       | XX |       |       |     |     |
| > 600 bar                                                                  | XX |       |       |     |     |
| Offset, special adjustment                                                 | 99 |       |       |     |     |
| <b>Process connection</b>                                                  |    |       |       |     |     |
| G 1/4 F (Fig. 1)                                                           | 00 |       |       |     |     |
| G 1/4 M (Fig. 2)                                                           | 11 |       |       |     |     |
| G 1/4 M, manometer DIN 16288 (Fig. 3)                                      | 12 |       |       |     |     |
| G 1/4 M, flush diaphragm, (3)                                              | 21 |       |       |     |     |
| G 1/2 M (Fig. 4)                                                           | 13 |       |       |     |     |
| G 1/2 M, with bore Ø14mm                                                   | 17 |       |       |     |     |
| G 1/2 M, Hastelloy C-276                                                   | 98 |       |       |     |     |
| G 1/2 M, frontal diaphragm (Fig. 5), (3)                                   | 14 |       |       |     |     |
| G 1/2 M, frontal diaphragm in Hastelloy C-276, (3)                         | 37 |       |       |     |     |
| G 1/2 M, flush diaphragm (Fig. 6), (3)                                     | 15 |       |       |     |     |
| G 1/2 M, manometer DIN 16288 (Fig. 7)                                      | 16 |       |       |     |     |
| 1/4 NPT M                                                                  | 10 |       |       |     |     |
| 1/2 NPT M (Fig. 8)                                                         | 19 |       |       |     |     |
| Customized                                                                 | 99 |       |       |     |     |
| <b>Electrical connection</b>                                               |    |       |       |     |     |
| M16 (Binder 723), 7 pins, IP 67 (Fig.10), (4)                              | 04 |       |       |     |     |
| M16 (Binder 723), 5 pins, IP 67 (Fig.10), (4)                              | 03 |       |       |     |     |
| MIL C2682, 10-6, IP 40 (Fig. 11), (4)                                      | 06 |       |       |     |     |
| PE cable, black, IP 67 (Fig. 12), (5), (6)                                 | 13 |       |       |     |     |
| PUR-cable, black, IP 67 (Fig. 12), (5), (7)                                | 15 |       |       |     |     |
| FEP cable, black, IP 67 (Fig. 12), (5)                                     | 21 |       |       |     |     |
| Customized                                                                 | 99 |       |       |     |     |
| <b>Output signal</b>                                                       |    |       |       |     |     |
| RS485 / 4 ... 20mA (pressure)                                              | 62 |       |       |     |     |
| RS485 / 4 ... 20mA (pressure) with surge protection                        | 64 |       |       |     |     |
| RS485 / 4 ... 20mA (pressure and temperature)                              | 65 |       |       |     |     |
| RS485 / 4 ... 20mA (pressure and temperature) with surge protection        | 66 |       |       |     |     |
| <b>Accuracy</b>                                                            |    |       |       |     |     |
| $\leq \pm 0.25 \% \text{ FS } (\leq 500 \text{ mbar} / > 600 \text{ bar})$ | 1  |       |       |     |     |
| $\leq \pm 0.1 \% \text{ FS } (> 500 \text{ mbar} \dots 600 \text{ bar})$   | 2  |       |       |     |     |
| <b>Temperature range</b>                                                   |    |       |       |     |     |
| 0 ... 70°C compensated<br>(allowed process temperature: -25 ... 100°C)     | 0  |       |       |     |     |
| 25 ... 100°C compensated<br>(allowed process temperature: -25 ... 100°C)   | 7  |       |       |     |     |

|                                                                                               |  |  |   |
|-----------------------------------------------------------------------------------------------|--|--|---|
| -25 ... 85°C compensated<br>(allowed process temperature: -25 ... 100°C) with<br>cooling fins |  |  | 1 |
| -25 ... 85°C compensated<br>(allowed process temperature: -25 ... 150°C)                      |  |  | 2 |
| 20 ... 100°C compensated<br>(allowed process temperature: -25 ... 150°C) with<br>cooling fins |  |  | 6 |
| Customized                                                                                    |  |  | 9 |
| <b>Option 1</b>                                                                               |  |  |   |
| Throttle, (8)                                                                                 |  |  | A |
| Special oil filling: Anderol Food (for food applications)                                     |  |  | G |
| Special oil filling: AS 100 (suitable for media<br>temperature -55 ... 150°C)                 |  |  | J |
| Special oil filling: PAO4 (silicone free)                                                     |  |  | Q |
| <b>Option 2</b>                                                                               |  |  |   |
| Electronics packed in gel: Gauge pressure                                                     |  |  | C |
| Electronics packed in gel: Absolute pressure                                                  |  |  | D |
| <b>Option 3</b>                                                                               |  |  |   |
| Active compensated ( $\geq 100$ mbar $\leq 100$ bar)                                          |  |  | E |
| Version titanium                                                                              |  |  | K |
| Seals: Viton (standard)                                                                       |  |  | U |
| Seals: EPDM                                                                                   |  |  | S |
| Seals: Kalrez                                                                                 |  |  | T |
| Seals: NBR (ACS)                                                                              |  |  | H |

(3) Process connection available  $\leq 600$  bar

(4) Cable socket connector not included

(5) Please specify the required cable length and medium

(6) Suitable for drinking water (food approved)

(7) For operating temperature  $> 50^{\circ}\text{C}$ , PE or FEP cable must be used

(8) Only with pressure connection Fig. 2, Fig. 3, Fig. 4, Fig. 7 and Fig. 8

## Process Connection

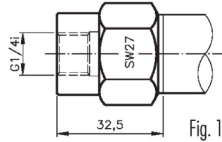


Fig. 1

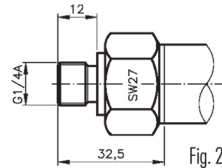


Fig. 2

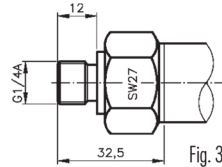


Fig. 3

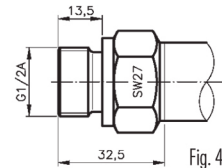


Fig. 4

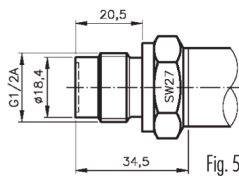


Fig. 5

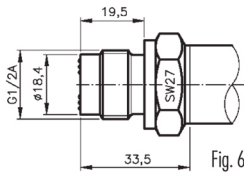


Fig. 6

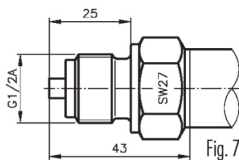


Fig. 7

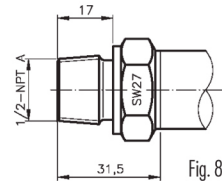
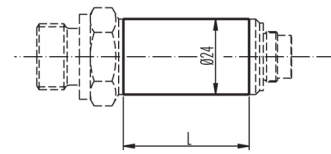


Fig. 8

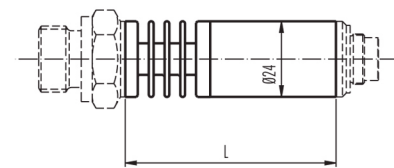
## Dimensions

Version for medium temperature up to 100°C



L = 94 mm, with overvoltage protection = 195 mm

Version for medium temperature up to 150°C



L = 121 mm, with overvoltage protection = 222 mm

## Electrical Connection

Fig. 10

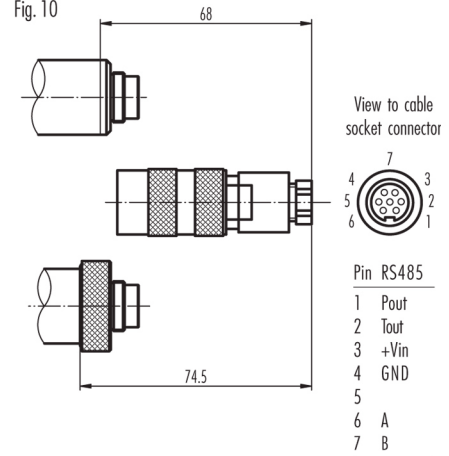


Fig. 11

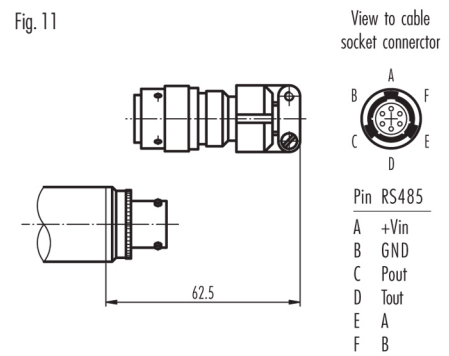


Fig. 12

