

## Intrinsically Safe Submersible Transmitters

### PTM/N/Ex - Programmable 4-20mA



#### CUSTOMER BENEFITS

- Certificate: ATEX
- High flexibility due to scalable pressure range
- Adjustment of zero and span setting through software commands
- Fast customization thanks to configurable product design
- Stainless steel and titanium version for use in acidic or otherwise aggressive media

# Technical Specifications

## PRESSURE MEASURING RANGE (MH<sub>2</sub>O)

|                                     | 1 ... 5                                             | > 5 ... 20             | > 20 ... 250          |
|-------------------------------------|-----------------------------------------------------|------------------------|-----------------------|
| Overpressure                        | 3 bar                                               | 3 x FS ( $\geq 3$ bar) | 3 x FS                |
| Burst pressure, (2)                 | > 200 bar                                           | > 200 bar              | > 200 bar             |
| Accuracy, (2) ( $\pm$ % FS)         | $\leq \pm 0.25$                                     | $\leq \pm 0.1$         | $\leq \pm 0.1$        |
| Total error, (3), (4) ( $\pm$ % 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, (5)            | < 0.5% FS / < 4 mbar                                | < 0.2% FS / < 4 mbar   | < 0.1% FS / < 0.2% FS |

(1) Transducer

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

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

(4) Active compensated

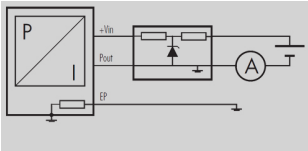
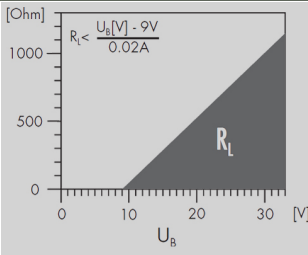
(5) 1 year (typ. / max.), the long term stability can be improved by ageing (burn-in) the sensor

## TEMPERATURE RANGE

|                       |                |
|-----------------------|----------------|
| Operating temperature | -5...80 °C (1) |
| Process temperature   | -5...80 °C (1) |
| Storage temperature   | -10...80 °C    |

(1) For operating temperature > 50°C, PE or FEP cable must be used

## ELECTRICAL SPECIFICATIONS

|                   |                                                                                   |
|-------------------|-----------------------------------------------------------------------------------|
| Resolution        | 0.025% FS                                                                         |
| Output adjustable |                                                                                   |
| 4 mA              | -5% FS...105% FS                                                                  |
| 20 mA             | -5% FS...105% FS                                                                  |
| Span              | 25% FS...110% FS ( $\geq 1$ mH <sub>2</sub> O)                                    |
| Low pass filter   | 0.1 / 1 / 10 / 30 Hz<br>(standard: 30 Hz)                                         |
| Power supply      | 9...28 V DC                                                                       |
| Supply influence  | < 0.1% FS                                                                         |
| Circuit diagram   |  |
| Load resistance   |  |
| Load influence    | < 0.1% FS                                                                         |

## ATEX APPROVAL

|                                          |                                        |                        |
|------------------------------------------|----------------------------------------|------------------------|
| Certificate, (1)                         | SEV 08 ATEX 0142                       |                        |
| Gas                                      | II 1G Ex ia IIC T3 ... T6              | EN 60079-0 / -11 / -26 |
| Dust                                     | II 1D Ex ia IIIC IP6x T80°C ... T125°C | EN 61241-0 / -11       |
| Temperature class, (2)                   | T6                                     | T4                     |
| Ambient temperature                      | -5...50 °C                             | -5...80 °C             |
| Process temperature                      | -5...50 °C                             | -5...80 °C             |
| Maximum values of the connection circuit | 30 V / 140 mA / 0.9W                   |                        |

(1) For detailed Ex specifications see certificate and operating and safety instructions

(2) Without any information about temperature class the transmitter will be delivered for T4

## GL APPROVAL

|                      |             |
|----------------------|-------------|
| Certificate          | 60332-09 HH |
| Field of application | D, F, EMC1  |

## ADDITIONAL APPROVALS

|     |                   |
|-----|-------------------|
| ABS | 09-HG436727/1-PDA |
| DNV | A-11280           |

## QUALIFICATIONS

|               | Description             | Level                                                           | Typical interferences       |
|---------------|-------------------------|-----------------------------------------------------------------|-----------------------------|
| EN 60068-2-6  | Vibration               | 4 G (4...100 Hz / $\pm$ 3.2 mmp)                                |                             |
| 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 | 8 kV contact / 15 kV air                                        |                             |
| EN 61000-4-3  | Irradiated RF           | 10V/m (0.08...1 GHz)                                            | Radio sets, wireless phones |
| EN 61000-4-4  | Transients (burst)      | 4 kV                                                            | Motors, valves              |
| EN 61000-4-5  | Surge                   | Line-Line: 0.5 kV/42 $\Omega$ ,<br>Line-Earth: 1 kV/42 $\Omega$ | Lightning                   |
| EN 61000-4-6  | Conducted RF            | 10 V (0.15...80 MHz, 3 s)                                       | Frequency converters        |

## PHYSICAL SPECIFICATIONS

|            |                                                           |
|------------|-----------------------------------------------------------|
| Materials  |                                                           |
| Transducer | Stainless steel (316L / 1.4435), titanium (Gr. 2),<br>(1) |
| Housing    | Stainless steel (316L / 1.4404), titanium (Gr. 2)         |
| Seals      | Viton (standard), EPDM, Kalrez, NBR                       |
| Cable      | PUR, FEP                                                  |
| Weight (2) | 157 g                                                     |

(1) Hastelloy (C-276) on request

(2) Specification for a PTM/N/Ex, closed, without cable

# Equipment

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## OVERVIEW

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

## INTERFACE

| 102442 | PTM/Ex - 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 |
|------------|----------------|
| 10.00.0271 | DMM023         |



# Ordering information

|                                 |                                                                                        | X.   | XXXX. | XXXX. | XX. | XXX |
|---------------------------------|----------------------------------------------------------------------------------------|------|-------|-------|-----|-----|
| <b>Type</b>                     |                                                                                        |      |       |       |     |     |
|                                 | PTM/N/Ex                                                                               | 48   |       |       |     |     |
| <b>Pressure type</b>            |                                                                                        |      |       |       |     |     |
|                                 | Gauge                                                                                  | 1    |       |       |     |     |
|                                 | Absolute (vacuum)                                                                      | 2    |       |       |     |     |
| <b>Pressure measuring range</b> |                                                                                        |      |       |       |     |     |
|                                 | 1 ... 250 mH2O                                                                         | XX   |       |       |     |     |
|                                 | Offset, special adjustment                                                             | 99   |       |       |     |     |
| <b>Process connection</b>       |                                                                                        |      |       |       |     |     |
|                                 | Closed (Fig. 1)                                                                        | 55   |       |       |     |     |
|                                 | Open (Fig. 2)                                                                          | 56   |       |       |     |     |
|                                 | G 1/4 M (Fig. 3)                                                                       | 11   |       |       |     |     |
|                                 | G 1/2 M (Fig. 3)                                                                       | 13   |       |       |     |     |
|                                 | Customized                                                                             | 99   |       |       |     |     |
| <b>Electrical connection</b>    |                                                                                        |      |       |       |     |     |
|                                 | PUR cable, blue, IP 68, (2), (3)                                                       | 17   |       |       |     |     |
|                                 | FEP cable, blue, IP 68, (2)                                                            | 22   |       |       |     |     |
|                                 | Connectable version, IP 68, M12x1                                                      | 07   |       |       |     |     |
| <b>Output signal</b>            |                                                                                        |      |       |       |     |     |
|                                 | 4...20 mA                                                                              | 05   |       |       |     |     |
|                                 | 4...20 mA with surge protection                                                        | 08   |       |       |     |     |
| <b>Accuracy</b>                 |                                                                                        |      |       |       |     |     |
|                                 | $\leq \pm 0.25 \% \text{ FS } (\leq 5 \text{ mH}_2\text{O})$                           | 1    |       |       |     |     |
|                                 | $\leq \pm 0.1 \% \text{ FS } (> 5 \text{ mH}_2\text{O})$                               | 2    |       |       |     |     |
| <b>Temperature range</b>        |                                                                                        |      |       |       |     |     |
|                                 | T6 (Ta: -5...50 °C) -5...50 °C compensated<br>(allowed process temperature: -5...50°C) | 3    |       |       |     |     |
|                                 | T4 (Ta: -5...80 °C) -5...80 °C compensated<br>(allowed process temperature: -5...80°C) | 5    |       |       |     |     |
| <b>Option 1</b>                 |                                                                                        |      |       |       |     |     |
|                                 | Special oil filling: Anderol Food<br>food applications)                                | (for |       |       |     | G   |
|                                 | Cutting ring connection G 1/2 M                                                        |      |       |       |     |     |
|                                 | Strain relief                                                                          |      |       |       |     |     |
| <b>Option 2</b>                 |                                                                                        |      |       |       |     |     |
| <b>Option 3</b>                 |                                                                                        |      |       |       |     |     |
|                                 | Ballast weight 1.4435                                                                  |      |       |       |     | B   |
|                                 | Active compensated                                                                     |      |       |       |     | E   |
|                                 | Version titanium (without ballast weight)                                              |      |       |       |     | K   |
|                                 | Seals: Viton (standard)                                                                |      |       |       |     | U   |
|                                 | Seals: EPDM                                                                            |      |       |       |     | S   |
|                                 | Seals: Kalrez (Level)                                                                  |      |       |       |     | T   |
|                                 | Seals: NBR                                                                             |      |       |       |     | H   |
|                                 | Humidity filter element for gauge version<br>(only for PUR cable)                      |      |       |       |     | Z   |

(2) Please specify the required cable length and medium

(3) For operating temperature > 50°C, FEP cable must be used



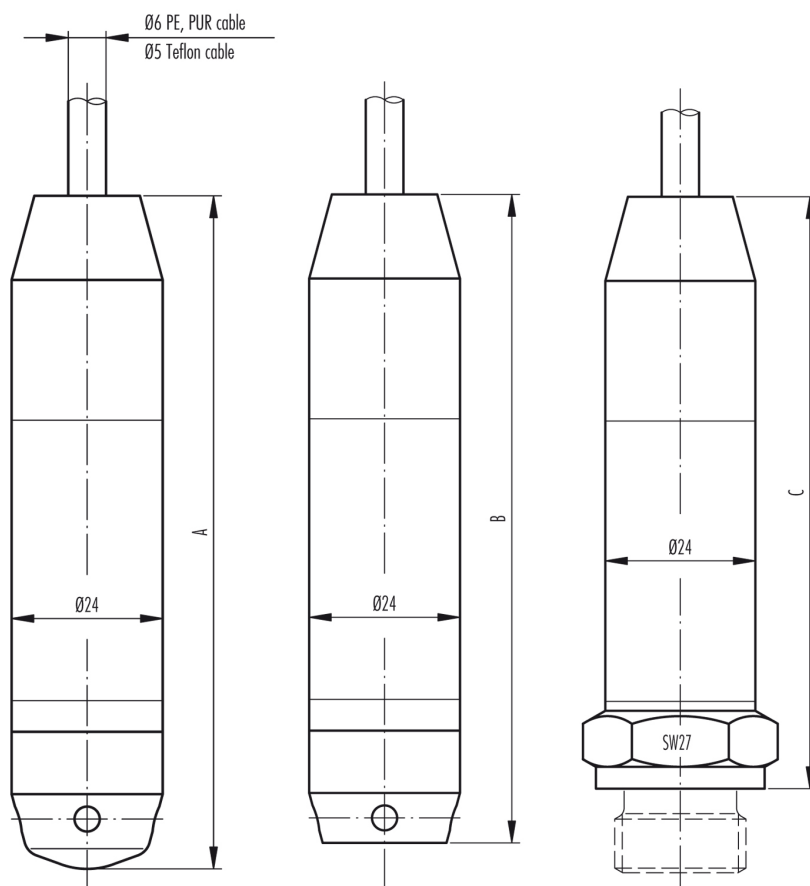
# Technical drawings

## Dimensions

closed version (Fig. 1)

open version (Fig. 2)

with thread (Fig. 3)



Standard and version with surge (lightning) protection

|                        | A [mm] | B [mm] | C [mm]      | Weight [g] |
|------------------------|--------|--------|-------------|------------|
| without ballast weight | 157    | 153    | on request* | ca. 200    |
| with ballast weight    | 244    | 240    | on request* | ca. 460    |

\*C: Depending on process connection

| Colour | 2-wire |
|--------|--------|
| white  | +Vin   |
| yellow | Pout   |
| grey   | EP     |

Specifications may change without notice.

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