

Pressure Transmitter - ATEX / IECEx certified

ATM.1ST/Ex - High Precision Transmitter



CUSTOMER BENEFITS

- Certificates: ATEX, IECEx, EAC, GL/DNV, ABS, Lloyds
- Any measuring ranges between 0 ... 50 mbar und 0 ... 1000 bar available
- Static accuracies available to 0.05 %FS
- Hysteresis and repeatability better than 0.01 %
- Piezoresistive technology suitable for static and dynamic pressure measurements
- Modular design ideal for customization to the application
- Barometrische oder negative Druckmessbereiche erhältlich

Technical Specifications

PRESSURE MEASURING RANGE (BAR)

| | 0 ... 0.05 to 0 ... < 0.1 | 0 ... 0.1 to 0 ... < 1 | 0 ... 1 to 0 ... ≤ 100 |
|---|---------------------------|------------------------|------------------------|
| Overpressure | 3 bar | 3 bar | 3 x FS |
| Burst pressure | > 200 bar | > 200 bar | > 200 bar |
| Accuracy, (3) (± % FS) | ≤ 0.25 | ≤ 0.2 / ≤ 0.1 | ≤ 0.2 / ≤ 0.1 / ≤ 0.05 |
| Total Error, (4), (5) (± % FS ; typ. / max.) | | | |
| 0 ... 70°C compensated | ≤ 0.4 / 0.6 | ≤ 0.2 / 0.4 | ≤ 0.15 / 0.3 |
| -25 ... 100°C compensated | ≤ 0.5 / 0.7 | ≤ 0.3 / 0.5 | ≤ 0.2 / 0.4 |
| -40 ... 125°C compensated | ≤ 0.7 / 1.0 | ≤ 0.4 / 0.7 | ≤ 0.3 / 0.6 |
| Response time, (typ.) | < 1ms / 10 ... 90 % FS | < 1ms / 10 ... 90 % FS | < 1ms / 10 ... 90 % FS |
| Long term stability, (typ./max. per year) | < 1 mbar / < 2 mbar | < 1 mbar / < 2 mbar | < 0.1% FS / < 0.2% FS |

| | 0 ... > 100 to 0 ... ≤ 600, (2) | 0 ... > 600 to 0 ... 1000 | 0.8 ... 1.2, (1) |
|---|---------------------------------|---------------------------|------------------------|
| Overpressure | 3 x FS (≤ 850 / ≤ 1500 bar) | ≤ 850 / ≤ 1500 bar | 3 x FS |
| Burst pressure | > 850 / > 1500 bar | > 850 / > 1500 bar | > 200 bar |
| Accuracy, (3) (± % FS) | ≤ 0.2 / ≤ 0.1 | ≤ 0.2 | ≤ 0.2 / ≤ 0.1 |
| Total Error, (4), (5) (± % FS ; typ. / max.) | | | |
| 0 ... 70°C compensated | ≤ 0.3 / 0.5 | ≤ 0.4 / 0.6 | ≤ 0.2 / 0.4 |
| -25 ... 100°C compensated | ≤ 0.5 / 0.7 | ≤ 0.7 / 1.0 | ≤ 0.3 / 0.5 |
| -40 ... 125°C compensated | ≤ 0.7 / 0.9 | ≤ 1.0 / 1.2 | ≤ 0.4 / 0.7 |
| Response time, (typ.) | < 1ms / 10 ... 90 % FS | < 1ms / 10 ... 90 % FS | < 1ms / 10 ... 90 % FS |
| Long term stability, (typ./max. per year) | < 0.1% FS / < 0.2% FS | < 0.1% FS / < 0.2% FS | < 1 mbar / < 2 mbar |

| | -0.025...0.025 to -0.1...0.1 | >-0.1... >0.1 to -0.5...0.5 | >-0.5... >0.5 to -1...100 |
|---|------------------------------|-----------------------------|---------------------------|
| Overpressure | 3 bar | 3 bar | 3 bar / 3 x FS |
| Burst pressure | > 200 bar | > 200 bar | > 200 bar |
| Accuracy, (3) (± % FS) | ≤ 0.25 | ≤ 0.2 / ≤ 0.1 | ≤ 0.2 / ≤ 0.1 |
| Total Error, (4), (5) (± % FS ; typ. / max.) | | | |
| 0 ... 70°C compensated | ≤ 0.4 / 0.6 | ≤ 0.2 / 0.4 | ≤ 0.15 / 0.3 |
| -25 ... 100°C compensated | ≤ 0.5 / 0.7 | ≤ 0.3 / 0.5 | ≤ 0.2 / 0.4 |
| -40 ... 125°C compensated | ≤ 0.7 / 1.0 | ≤ 0.4 / 0.7 | ≤ 0.3 / 0.6 |
| Response time, (typ.) | < 1ms / 10 ... 90 % FS | < 1ms / 10 ... 90 % FS | < 1ms / 10 ... 90 % FS |
| Long term stability, (typ./max. per year) | < 1 mbar / < 2 mbar | < 1 mbar / < 2 mbar | < 0.1% FS / < 0.2% FS |

(1) Typical barometric pressure range, max. offset: 900 mbar, min. span: 400 mbar

(2) Overpressure (proof) and burst pressure 1500 bar (stainless steel) optional

(3) Zero based accuracy according to EN-61298, incl. hysteresis and repeatability at ambient temperature

(4) Total error including accuracy and temperature influences at maximum signal span (16 mA / 10 V DC)

(5) Does not apply to titanium solution ≤ 1 bar

TEMPERATURE RANGE

| | |
|-----------------------|--|
| Operating temperature | -40 ... 125°C |
| Process temperature | Standard: -40 ... 125°C; Optional: -40 ... 150°C (with cooling fins) |
| Storage temperature | -40 ... 125°C |

ELECTRICAL SPECIFICATIONS

| | |
|-----------------------------|---------------|
| | 4 ... 20 mA |
| Power supply | 9 ... 28 V DC |
| Supply influence | < 0.05% FS |
| Start up time | < 170 ms |
| Circuit diagram | |
| Load resistance | |
| Load influence | < 0.05% FS |
| Reverse polarity protection | Yes |

ATEX, IECEX APPROVAL

| Certificates (1) | | | |
|--|------------------------------|---------------|---------------|
| ATEX | SEV 09 ATEX 0108 X | | |
| IECEX | IECEX MSC 14.0002 X | | |
| IECEX | IECEX SEV 10.0003 X | | |
| Standards | | | |
| EN 60079-0:2012 (A11:2013) | | | |
| EN 60079-11:2012 | | | |
| EN 60079-26:2015 | | | |
| EN 50303:2000 | | | |
| Gas | | | |
| Zone 0 | II 1G Ex ia IIC T3 ... T6 Ga | | |
| Zone 1 | II 2G Ex ia IIB T3 ... T6 Gb | | |
| Dust | | | |
| Zone 20 | II 1D Ex ia IIIC T145°C Da | | |
| Mining | | | |
| I M1 Ex ia I Ma | | | |
| I M2 Ex ia I Mb | | | |
| Maximum values of the intrinsically safe circuit | 28V / 93 mA / 0.65W | | |
| Temperature class (2) | T6 | T4 | T3 |
| Ambient temperature (Ta) | -40 ... 50°C | -40 ... 85°C | -40 ... 125°C |
| Process temperature | -40 ... 50°C | -40 ... 110°C | -40 ... 150°C |

(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

QUALIFICATIONS

| | Description | Level | Typical interferences |
|---------------|-------------------------|---|-----------------------------|
| EN 60068-2-6 | Vibration | 10 G (4 ... 2000 Hz) | |
| EN 60068-2-27 | Shock | 100 G (impulse duration 6 ms) | |
| EN 55022 | Emission, class B | < 30 dB μ 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...2.7 GHz, 3s) | 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 Ω , Line-Earth: 1 kV/42 Ω | Overvoltage |
| EN 61000-4-6 | Conducted RF | 3 V (0.15 ... 80 MHz, 3 s) | Frequency converters |

PHYSICAL SPECIFICATIONS

| | |
|-------------|---|
| Oil filling | Standard: Silicone oil AS100; Optional: Anderol Food or PAO4 |
| Transducer | Standard: Stainless steel (316L/1.4435); Optional: Titanium (Gr.2) or Hastelloy C-276 |
| Housing | Standard: Stainless steel (316L/1.4435); Optional: Titanium (Gr.2) or Hastelloy C-276 |
| Weight | typ. 145 gram, depending on the configuration |

Accessories

CABLE SOCKET CONNECTOR

| | |
|---------|--|
| HART001 | Cable socket connector DIN43650 (EN 175301-803A) |
| HART002 | Cable socket connector Binder 723, 5 pins |
| HART012 | Cable socket connector MIL C26482, 10-6 |
| HART018 | Cable socket connector M12x1, 5 pins |

Additional documents

OPERATING AND SAFETY INSTRUCTIONS

| | Article number |
|------------|----------------|
| 10.88.0435 | DMM041 |

Ordering information

| | X. | XXXX. | XXXX. | XX. | XXX |
|---------------------------------|--|-------|-------|-----|-----|
| Type | | | | | |
| | ATM.1ST/Ex | | | | |
| Pressure type | | | | | |
| | Gauge | 1 | | | |
| | Absolute | 2 | | | |
| | Sealed gauge | 3 | | | |
| Pressure measuring range | | | | | |
| | Any measuring ranges between 0 ... 50 mbar and 0 ... 1000 bar available | XX | | | |
| | Barometric pressure ranges available | XX | | | |
| | Negative pressure ranges available | XX | | | |
| Process connection | | | | | |
| | G 1/2 M, bore 14 mm (Fig. 1) | 17 | | | |
| | G 1/4 F (Fig. 2) | 00 | | | |
| | G 1/4 M (Fig. 3) | 11 | | | |
| | G 1/4 M, manometer EN 837 (Fig. 4) | 12 | | | |
| | G 1/2 M (Fig. 5) | 13 | | | |
| | G 1/2 M, manometer EN 837 (Fig. 6) | 16 | | | |
| | 1/4 NPT M (Fig. 7) | 10 | | | |
| | 1/2 NPT M (Fig. 8) | 19 | | | |
| | G 1/2 M, frontal diaphragm (Fig. 9), (1) | 14 | | | |
| | G 1/2 M, frontal diaphragm Hastelloy C-276 (Fig. 9), (1) | 37 | | | |
| | G 1/2 M, with flush diaphragm membrane (Fig. 10), (1) | 15 | | | |
| | G 1/4, with flush diaphragm (Fig. 11), (1) | 21 | | | |
| | Other pressure connections on request | 99 | | | |
| Electrical connection | | | | | |
| | DIN 43650 (EN 175301-803A), demountable, IP 65, (Fig. 12), (2), (3) | 01 | | | |
| | Binder 723, 5 pins, IP 67 (Fig. 13), (2) | 03 | | | |
| | MIL C26482, 10-6, 316L, IP 67 (Fig. 14), (2) | 80 | | | |
| | M12x1, 4 pins, (Fig. 15), (2) | 07 | | | |
| | PUR cable, blue, IP 67, (Fig. 16), (4), (6) | 17 | | | |
| | FEP cable, blue, IP 67, (Fig. 16), (4) | 22 | | | |
| | PUR cable, blue, IP 68, (Fig. 17), (4), (6) | 36 | | | |
| | Other electrical connections on request | 99 | | | |
| Output signal | | | | | |
| | 4 ... 20 mA | | 05 | | |
| Accuracy | | | | | |
| | ≤ ± 0.25 % FS (50 mbar ... 99 mbar) | | | 1 | |
| | ≤ ± 0.2 % FS (100 mbar ... 1000 bar) | | | 4 | |
| | ≤ ± 0.1 % FS (100 mbar ... 600 bar) | | | 2 | |
| | ≤ ± 0.05 % FS (1 bar ... 100 bar) | | | 6 | |
| Temperature range | | | | | |
| | T6 (Ta: -40 ... 50°C), 0 ... 70°C compensated, (without cooling fins) | | | 0 | |
| | T4 (Ta: -40 ... 85°C), -25 ... 100°C compensated, (without cooling fins) | | | 1 | |

| | |
|--|---|
| T3 (Ta: -40 ... 125°C), -25 ... 100°C compensated, (with cooling fins) | 2 |
| Option 1 | |
| Throttle, (7) | A |
| Special oil filling: Anderol Food (for food applications) | G |
| Special oil filling: PAO4 (siliconfree) | Q |
| Pressure connection elastomerfree | N |
| Pressure connection welded | V |
| Option 2 | |
| Titanium | K |
| Seals: FKM (standard) | U |
| Seals: EPDM | S |
| Seals: Kalrez (5) | T |
| Seals: NBR (8) | H |
| Option 3 | |

- (1) Process connection available \leq 600 bar
- (2) Cable socket connector not included
- (3) IP67 if the cable socket connector HART001 is installed correctly
- (4) Please specify the required cable length and medium
- (5) Profile seal not included
- (6) For operating temperature $>$ 50°C, PE or FEP cable must be used
- (7) Only with pressure connection Fig. 3, Fig. 5, Fig. 6, Fig. 7 and Fig. 8
- (8) Suitable for drinking water

Process connections

$P_N \geq 50 \text{ mbar} \dots 25 \text{ bar (1)}$

Fig. 1 - G 1/2 M, bore 14 mm

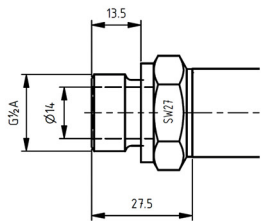


Fig. 5 - G 1/2 M

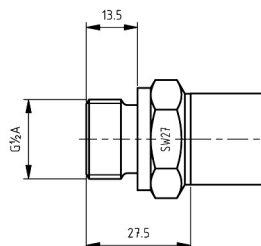


Fig. 2 - G 1/4 F

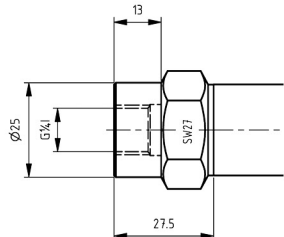


Fig. 6 - G 1/2 M, Manometer EN837

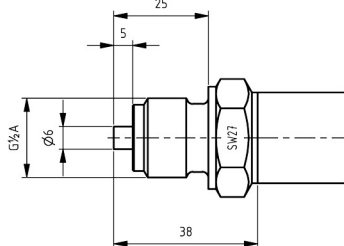


Fig. 3 - G 1/4 M

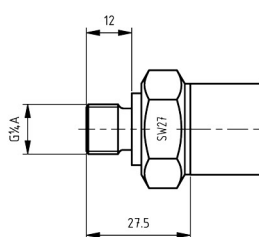


Fig. 7 - 1/4 NPT M

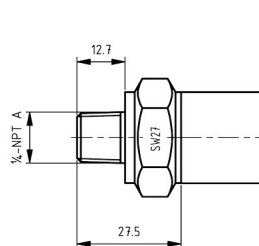


Fig. 4 - G 1/4 M, Manometer EN837

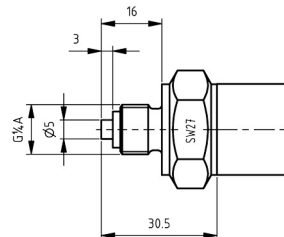
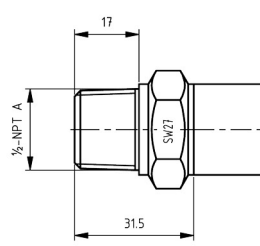


Fig. 8 - 1/2 NPT M



$P_N > 25 \text{ bar} \dots 1000 \text{ bar (1) (2)}$

Fig. 2 - G 1/4 F

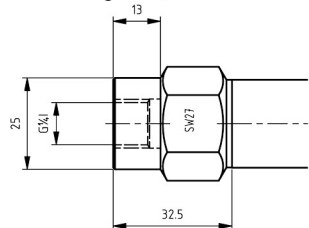


Fig. 5 - G 1/2 M

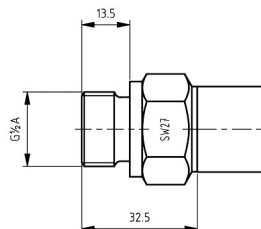


Fig. 3 - G 1/4 M

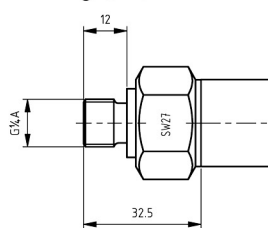


Fig. 6 - G 1/2 M, Manometer EN837

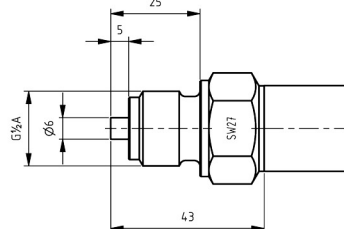


Fig. 4 - G 1/4 M, Manometer EN837

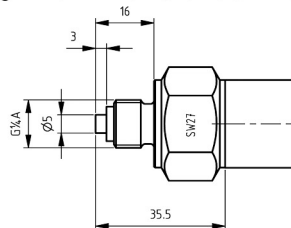


Fig. 7 - 1/4 NPT M

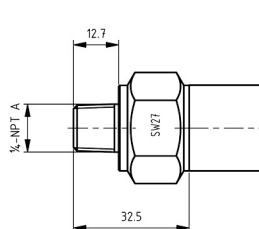
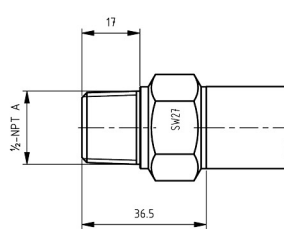
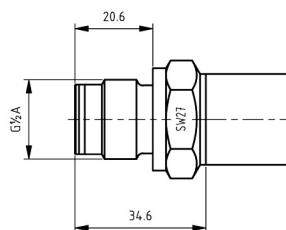


Fig. 8 - 1/2 NPT M



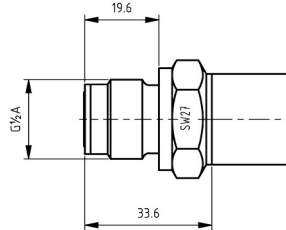
$P_N \geq 50 \text{ mbar} \dots 600 \text{ bar}$

Fig. 9 - G 1/2 M, frontal diaphragm



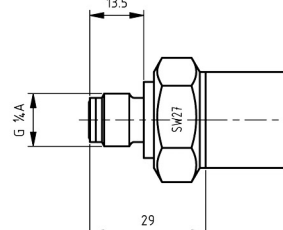
$P_N \geq 100 \text{ mbar} \dots 1000 \text{ bar (3)}$

Fig. 10 - G 1/2 M, flush diaphragm



$P_N \geq 10 \text{ bar} \dots 600 \text{ bar}$

Fig. 11 - G 1/4 M, flush diaphragm

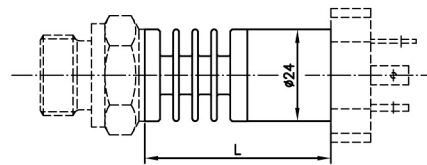
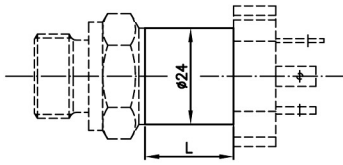


- (1) Dimensions for welded or elastomerfree versions may be different
- (2) Not all process connections available for pressure ranges > 600 bar
- (3) Dimensions for pressure ranges > 600 bar differ

Dimensions

Version for medium temperature up to 125°C

Version for medium temperature >125°C up to max. 150°C



L = 25 mm for connector DIN 43650 (EN 175301-803A)

L = 52 mm for connector DIN 43650 (EN 175301-803A)

Electrical connections

Fig. 12 - DIN43650 (EN 175301-803A)

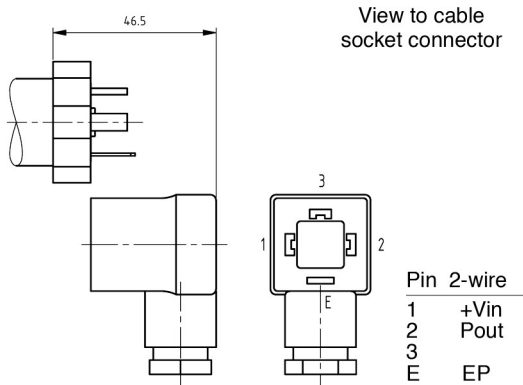


Fig. 13 - Binder 723, 5 pins

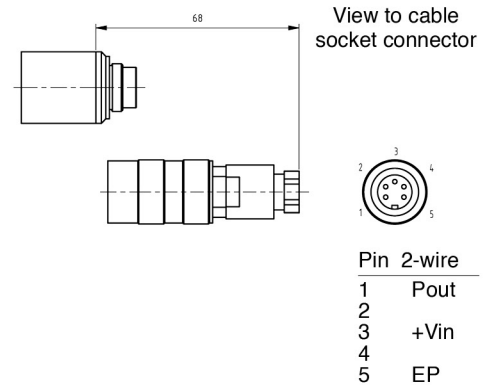


Fig. 14 - MIL C26482, 10-6, 316L

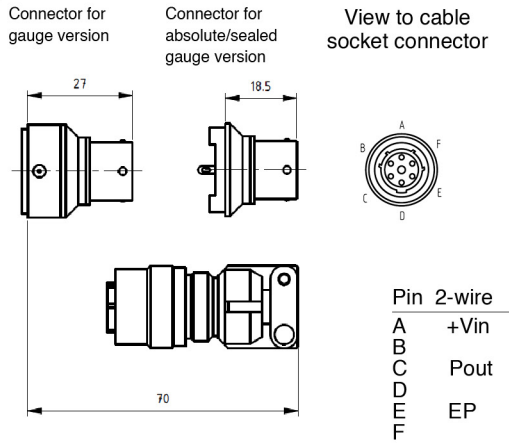


Fig. 15 - M12 x 1, 4 pins (Lumberg RSF4)

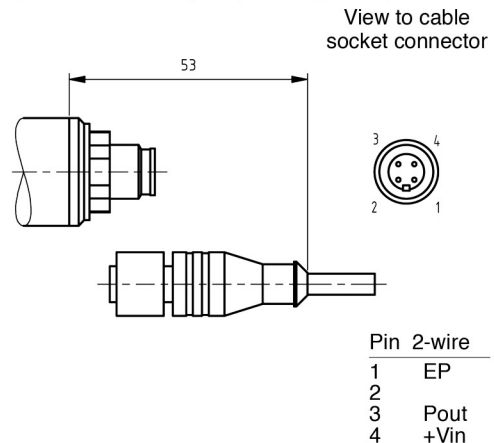


Fig. 16 - Cable connection IP67

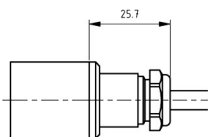
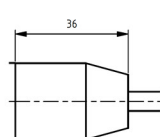


Fig. 17 - Cable connection IP68



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

Specifications may change without notice

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