

Pressure Transmitter - FM / FM-C certified

ATM.1ST/IS - High Precision Transmitter



CUSTOMER BENEFITS

- Certificate: FM, FM-C, IECEx & ATEX
- High accuracy is ensured by sophisticated digital temperature compensation algorithms
- Stainless steel and titanium version for use in acidic or otherwise aggressive media
- Short response times suitable for dynamic pressure measurements
- Fast customization thanks to configurable product design

Technical Specifications

FM / FM-C APPROVAL

| | |
|------|----------|
| FM | 3028239 |
| FM-C | 3028239C |

PRESSURE MEASURING RANGE (BAR)

| | 0.1 ... 0.5, (1) | > 0.5 ... 2 | > 2 ... 100 |
|---------------------------------|-----------------------|---------------------------------|---------------------------------|
| Overpressure | 3 bar | 3 x FS (≥ 3 bar) | 3 x FS |
| Burst pressure, (5) | > 200 bar | > 200 bar | > 850 bar |
| Accuracy, (6), (\pm % FS) | ≤ 0.10 | ≤ 0.10 / ≤ 0.05 , (8) | ≤ 0.10 / ≤ 0.05 , (8) |
| Total Error, (7), (\pm % FS) | | | |
| 0 ... 70°C, (typ./max.) | ≤ 0.8 / 1.0 | ≤ 0.3 / 0.5 | ≤ 0.3 / 0.5 |
| -25 ... 100°C, (typ./max.) | ≤ 1.3 / 1.5 | ≤ 0.75 / 1.0 | ≤ 0.75 / 1.0 |
| 0 ... 70°C, (8), (typ./max.) | n.a. | ≤ 0.2 / 0.4 | ≤ 0.2 / 0.4 |
| -40 ... 125°C, (8), (typ./max.) | n.a. | ≤ 0.5 / 0.8 | ≤ 0.5 / 0.8 |
| Response time, (typ.) | < 1ms / 10 ... 90% FS | < 1ms / 10 ... 90% FS | < 1ms / 10 ... 90% FS |
| Long term stability, (9) | < 0.5% FS / < 4 mbar | < 0.2% FS / < 4 mbar | < 0.1% FS / < 0.2% FS |

| | > 100 ... 600, (2), (4) | > 600 ... 1000, (3) |
|---------------------------------|----------------------------------------|-----------------------|
| Overpressure | 3 x FS (≤ 850 / ≤ 1500 bar) | 1500 bar |
| Burst pressure, (5) | > 850 / ≤ 1500 bar | > 1500 bar |
| Accuracy, (6), (\pm % FS) | ≤ 0.10 | ≤ 0.25 |
| Total Error, (7), (\pm % FS) | | |
| 0 ... 70°C, (typ./max.) | ≤ 0.3 / 0.5 | ≤ 0.3 / 0.5 |
| -25 ... 100°C, (typ./max.) | ≤ 0.75 / 1.0 | ≤ 0.75 / 1.0 |
| 0 ... 70°C, (8), (typ./max.) | n.a. | n.a. |
| -40 ... 125°C, (8), (typ./max.) | n.a. | n.a. |
| Response time, (typ.) | < 1ms / 10 ... 90% FS | < 1ms / 10 ... 90% FS |
| Long term stability, (9) | < 0.1% FS / < 0.2% FS | < 0.1% FS / < 0.2% FS |

(1) 50 mbar on request

(2) Titanium available ≤ 400 bar (burst pressure > 550 bar)

(3) Process connection frontal and flush diaphragm available ≤ 600 bar

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

(5) Transducer

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

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

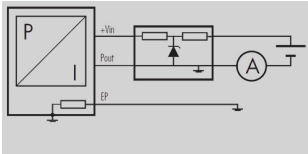
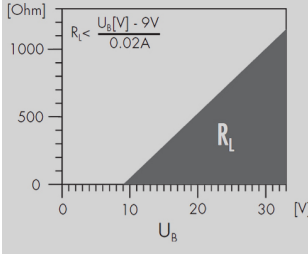
(8) Active compensated

(9) 1 year (typ. / max.), the long term stability can be improved by ageing (burn-in) the sensor

TEMPERATURE RANGE

| | |
|-----------------------|--------------|
| Operating temperature | -40...125 °C |
| Process temperatur | -40...150 °C |
| Storage temperatur | -40...125 °C |

ELECTRICAL SPECIFICATIONS

| | |
|------------------|------------------------------------------------------------------------------------|
| | 4 ... 20 mA |
| Power supply | 9...28 V DC |
| Supply influence | < 0.05% FS |
| Circuit diagram |  |
| Load resistance |  |
| Load influence | < 0.05% FS |

ATEX APPROVAL

| | | | |
|--------------------------------------------------|----------------------------------------|------------------------|---------------|
| Certificate, (1) | SEV 09 ATEX 0108 | | |
| Gas | II 1G Ex ia IIB/IIC T3 ... T6 | EN 60079-0 / -11 / -26 | |
| Dust | II 1D Ex ia IIIC IP6x T140°C ... T70°C | EN 61241-0 / -11 | |
| Mining | I M1 Ex ia I | EN 50303 | |
| Temperature class, (2) | T6 | T4 | T3 |
| Ambient temperature | -40 ... 50°C | -40 ... 90°C | -40 ... 125°C |
| Process temperature | -40 ... 50°C | -40 ... 100°C | -40 ... 150°C |
| Maximum values of the intrinsically safe circuit | 28V / 93 mA / 0.65W | | |

(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

ADDITIONAL APPROVALS

| | |
|--------|--------------------|
| IEC Ex | IEC Ex SEV 10.0003 |
|--------|--------------------|

QUALIFICATIONS

| | Description | Level | Typical interferences |
|---------------|-------------------------|--------------------------------------------------|-----------------------------|
| EN 60068-2-6 | Vibration | 10 G (4...2000 Hz / ± 10 mmpp) | |
| EN 60068-2-27 | Shock | 100 G (impulse duration 6 ms) | |
| EN 55022 | Emission, class B | < 30 dBµV/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

| 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 |
| Cable | PUR, FEP |

(1) Hastelloy (C-276) on request

Equipment

CABLE SOCKET CONNECTOR

| HART018 | Cable socket M16 (Binder) |
|---------|------------------------------------------------|
| HART001 | Cable Socket Connector DIN43650 |
| HART002 | Cable socket M16 (Binder 723), IP67, 5-pins |
| HART058 | Cable Socket Connector DIN43650 MICRO |

OVERVIEW

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

Additional documents

OPERATING AND SAFETY INSTRUCTIONS

| | Article number |
|------------|----------------|
| 10.88.0092 | DMM029 |

Ordering information

| | X. | XXXX. | XXXX. | XX. | XXX |
|---------------------------------|-------------------------------------------------------------------------------------------------|-------|-------|-----|-----|
| Type | | | | | |
| | ATM.1ST/IS | | | | |
| Pressure type | | | | | |
| | Gauge | 1 | | | |
| | Absolute (vacuum) | 2 | | | |
| | Sealed gauge | 3 | | | |
| Pressure measuring range | | | | | |
| | 50 mbar ... < 100 mbar | | XX | | |
| | 100 mbar ... 600 bar | | XX | | |
| | > 600 bar | | XX | | |
| Process connection | | | | | |
| | G 1/4 F, (Fig. 1) | | 00 | | |
| | 1/4 NPT M, (Fig. 6) | | 10 | | |
| | 1/2 NPT M, (Fig. 7) | | 19 | | |
| | G 1/4 M, (Fig. 2) | | 11 | | |
| | G 1/4 flush diaphragm | | 21 | | |
| | G 1/4 M, manometer DIN-16288 | | 12 | | |
| | G 1/2 M, (Fig. 3) | | 13 | | |
| | G 1/2 M, Hastelloy C-276 | | 98 | | |
| | G 1/2 M, frontal diaphragm (Fig. 4), (4) | | 14 | | |
| | G 1/2 M, frontal diaphragm, Hastelloy C-276 | | 37 | | |
| | G 1/2 M, flush diaphragm (Fig. 5), (4) | | 15 | | |
| | G 1/2 M, manometer DIN-16288 | | 16 | | |
| | G 1/2 M, with bore \varnothing 14 mm | | 17 | | |
| | Customized | | 99 | | |
| Electrical connection | | | | | |
| | DIN-43650, with metal threaded part, demountable, IP 65 (Fig. 8), (5) | | 01 | | |
| | M16 (Binder 723), 5 pins, IP 67, (Fig. 9), (5) | | 03 | | |
| | M16 (Binder 723), 5 pins, demountable, IP 67, (Fig. 10), (5) | | 43 | | |
| | MIL C26482, 10-6, IP 40 (Fig. 11), (5) | | 06 | | |
| | M12 (Lumberg RSF4), 4 pins (Fig. 15), (5) | | 07 | | |
| | PUR cable, blue, IP 67, (Fig. 12), (6), (7) | | 17 | | |
| | FEP cable, blue, IP 67, (Fig. 12), (6) | | 22 | | |
| | Customized connection available | | 99 | | |
| Output signal | | | | | |
| | 4 ... 20 mA | | 05 | | |
| Accuracy | | | | | |
| | $\leq \pm 0.25$ % FS (> 600 bar) | | | 1 | |
| | $\leq \pm 0.1$ % FS (≤ 600 bar) | | | 2 | |
| | $\leq \pm 0.05$ % FS (≥ 500 mbar ... ≤ 100 bar) (8) | | | 6 | |
| Temperature range | | | | | |
| | T6 (Ta: -40 ... 50°C) 0 ... 70°C compensated (allowed process temperature: -40 ... 50°C) | | | 0 | |
| | T4 (Ta: -40 ... 85°C) -25 ... 100°C compensated (allowed process temperature: -40 ... 110°C) | | | 1 | |

| | | | |
|-----------------|--------------------------------------------------------------------------------------------------|--|---|
| | T3 (Ta: -40 ... 125°C) -25 ... 100°C compensated (allowed process temperature: -40 ... 150°C) | | 2 |
| Option 1 | | | |
| | Throttle (9) | | A |
| | Special oil filling: Anderol Food (for food applications) | | G |
| | Special oil filling: AS100 | | J |
| | Special oil filling: PAO4 (silicon free) | | Q |
| | Pressure connection elastomer free | | N |
| | Pressure connection welded | | V |
| Option 2 | | | |
| Option 3 | | | |
| | Active compensated, (≥ 500 mbar ... ≤ 100 bar) | | E |
| | Titanium | | K |
| | Seals: Viton (standard) | | U |
| | Seals: EPDM | | S |
| | Seals: Kalrez | | T |

(4) Process connection available ≤ 600 bar

(5) Cable socket connector not included

(6) Please specify the required cable length and medium

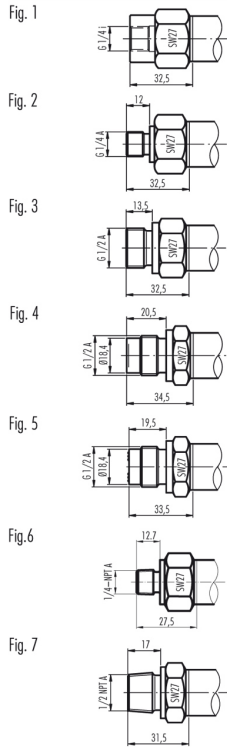
(7) For operating temperature $> 50^\circ\text{C}$, FEP cable must be used, with connector

(8) Active compensated, with connector

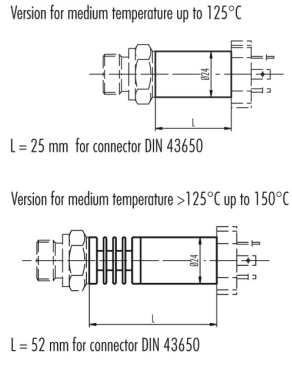
(9) Only with pressure connection Fig. 2, Fig. 3, Fig. 6 and Fig. 7

Technical drawings

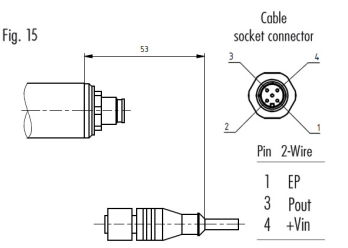
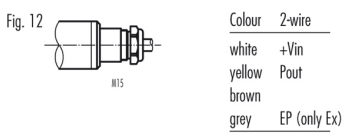
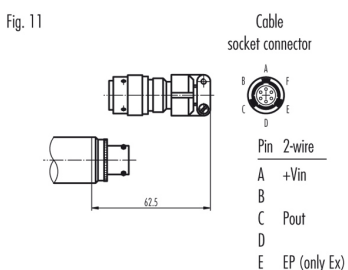
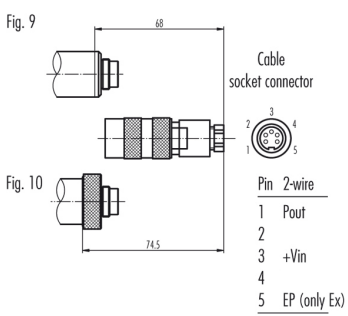
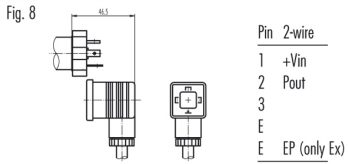
Pressure connections



Dimensions



Electrical Connections



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