

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
- Reverse polarity and short circuit protected, with integrated overvoltage protection

Technical Specifications

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	$\leq 0.10 / \leq 0.05$, (8)	$\leq 0.10 / \leq 0.05$, (8)
Total Error, (7), (11) ($\pm$ % FS)			
0 ... 70°C, (typ./max.)	$\leq 0.8 / 1.0$	$\leq 0.3 / 0.5$	$\leq 0.3 / 0.5$
-25 ... 100°C, (typ./max.)	$\leq 1.3 / 1.5$	$\leq 0.75 / 1.0$	$\leq 0.75 / 1.0$
0 ... 70°C, (8), (typ./max.)	n.a.	$\leq 0.2 / 0.4$	$\leq 0.2 / 0.4$
-40 ... 125°C, (8), (typ./max.)	n.a.	$\leq 0.5 / 0.8$	$\leq 0.5 / 0.8$
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 ... 690, (3), (10)
Overpressure	3 x FS ($\leq 850 / \leq 1500$ bar)	1500 bar
Burst pressure, (5)	> 850 / ≤ 1500 bar	> 1500 bar
Accuracy, (6), ($\pm$ % FS)	≤ 0.10	≤ 0.25
Total Error, (7), (11) ($\pm$ % FS)		
0 ... 70°C, (typ./max.)	$\leq 0.3 / 0.5$	$\leq 0.3 / 0.5$
-25 ... 100°C, (typ./max.)	$\leq 0.75 / 1.0$	$\leq 0.75 / 1.0$
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

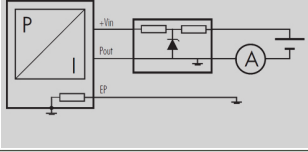
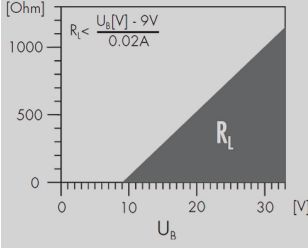
(10) Maximum pressure allowed by FM/FMc certification body 690bar

(11) Does not apply to titanium solution ≤ 2 bar

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
Reverse polarity protection	Pout to +Vin
Short-circuit resistance	---

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

FM / FM-C APPROVAL

FM	3028239
FM-C	3028239C

ADDITIONAL APPROVALS

IEC Ex	IEC Ex SEV 10.0003
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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 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

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

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/IS					
Pressure type					
Gauge	1				
Absolute (vacuum)	2				
Sealed gauge	3				
Pressure measuring range					
50 mbar ... < 100 mbar	XX				
600 ... 690 bar	XX				
600 ... 690 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, (4)	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, (4)	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 Ø 14 mm	17				
Customized	99				
Electrical connection					
DIN-43650, with metal threaded part, demountable, IP 65 (Fig. 8), (5), (16)	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				
M12x1, 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					
≤ ± 0.25 % FS (> 600 bar)	1				
≤ ± 0.1 % FS (≤ 600 bar)	2				
≤ ± 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

(16) Connector side not to be used in Zone 0 or Ex ia IIC, explosion risk

Pressure connections

Fig. 1

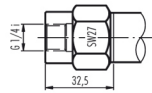


Fig. 2

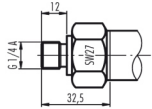


Fig. 3

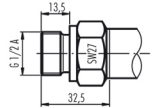


Fig. 4

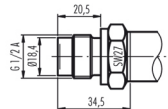


Fig. 5

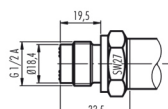


Fig. 6

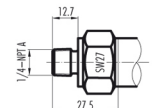
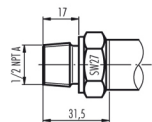
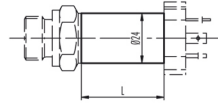


Fig. 7



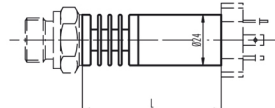
Dimensions

Version for medium temperature up to 125°C



L = 25 mm for connector DIN 43650

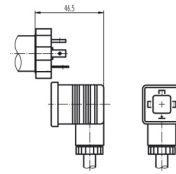
Version for medium temperature >125°C up to 150°C



L = 52 mm for connector DIN 43650

Electrical Connections

Fig. 8



Pin	2-wire
1	+Vin
2	Pout
3	
E	
E	EP (only Ex)

Fig. 9

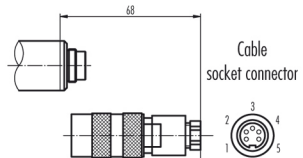
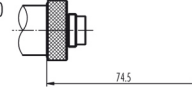
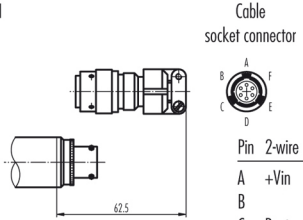


Fig. 10



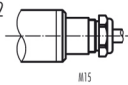
Pin	2-wire
1	Pout
2	
3	+Vin
4	
5	EP (only Ex)

Fig. 11



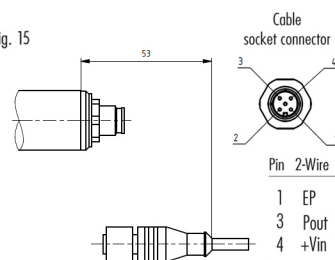
Pin	2-wire
A	+Vin
B	
C	Pout
D	
E	EP (only Ex)

Fig. 12



Colour	2-wire
white	+Vin
yellow	Pout
brown	
grey	EP (only Ex)

Fig. 15



Pin	2-Wire
1	EP
3	Pout
4	+Vin