

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	$\leq 0.10 / \leq 0.05$, (8)	$\leq 0.10 / \leq 0.05$, (8)
Total Error, (7), ($\pm$ % 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 ... 1000, (3)
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), ($\pm$ % 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)

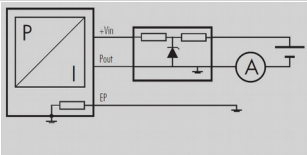
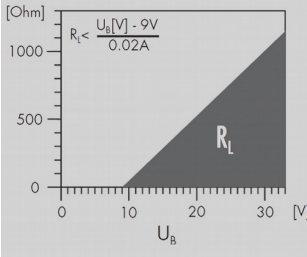
(8) Active compensated

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

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
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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

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 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				
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					
$\leq \pm 0.25 \% \text{ FS } (> 600 \text{ bar})$			1		
$\leq \pm 0.1 \% \text{ FS } (\leq 600 \text{ bar})$			2		
$\leq \pm 0.05 \% \text{ FS } (\geq 500 \text{ mbar} \dots \leq 100 \text{ bar}) (8)$			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

Technical drawings

Pressure connections

Fig. 1

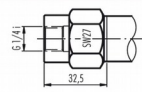


Fig. 2

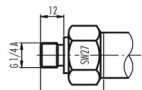


Fig. 3

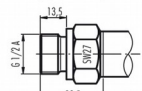


Fig. 4

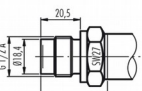


Fig. 5

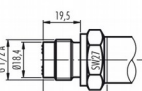


Fig. 6

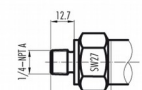
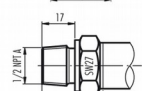
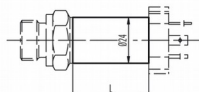


Fig. 7



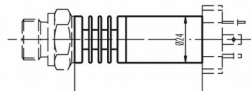
Dimensions

Version for medium temperature up to 125°C



L = 25 mm for connector DIN 43650

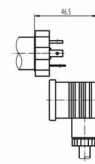
Version for medium temperature >125°C up to 150°C



L = 52 mm for connector DIN 43650

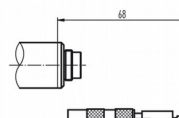
Electrical Connections

Fig. 8



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

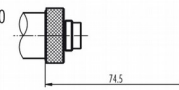
Fig. 9



Cable socket connector

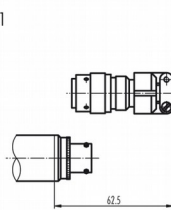


Fig. 10



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

Fig. 11

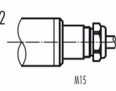


Cable socket connector



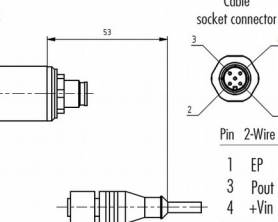
Pin	2-wire
A	+Vin
B	
C	Pout
D	
E	EP (only Ex)

Fig. 12



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

Fig. 15



Cable socket connector



Pin	2-Wire
1	EP
3	Pout
4	+Vin