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Pressure Transmitter

ATM.1ST - High Precision Transmitter

CUSTOMER BENEFITS

- High measurement accuracy is ensured by sophisticated digital temperature compensation algorithms
- Short response times suitable for dynamic pressure measurements
- Any measuring ranges between 0...50mbar and 0...1000bar available
- Fast customization thanks to modular product design
- Stainless steel and titanium version for use in acidic or otherwise aggressive media
- 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) (± % FS)	≤ 0.10	≤ 0.10 / ≤0.05 (9)	≤ 0.10 / ≤0.05 (9)
Total Error, (7), (11) (± % FS ; typ. / max.)			
0...70 °C compensated / Allowed process temperature -40...150°C, (8)	≤ 0.5 / 1.0	≤ 0.2 / 0.4	≤ 0.1 / 0.3
-25...100 °C compensated / Allowed process temperature -40...150°C, (8)	≤ 1.3 / 1.5	≤ 0.75 / 1.0	≤ 0.75 / 1.0
-40...100°C compensated / Allowed process temperature -40...150°C, (8)	≤ 1.5 / 2.0	≤ 1.0 / 1.5	≤ 1.0 / 1.25
0...70 °C compensated / Allowed process temperature -40...150°C, (9)	n.a.	≤ 0.1 / 0.2	≤ 0.1 / 0.2
-25...100 °C compensated / Allowed process temperature -40...150°C, (9)	n.a.	≤ 0.3 / 0.6	≤ 0.3 / 0.6
-40...125 °C compensated / Allowed process temperature -40...150°C, (9)	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, (10)	< 0.5% FS / < 4 mbar	< 0.2% FS / < 4 mbar	< 0.1% FS / < 0.2% FS

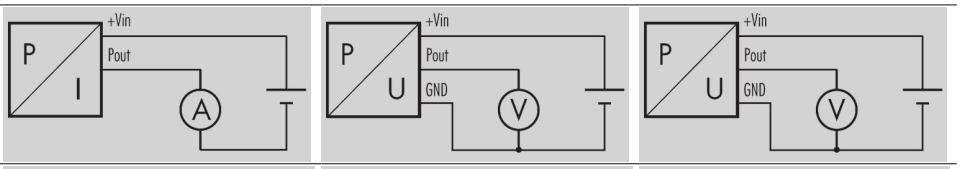
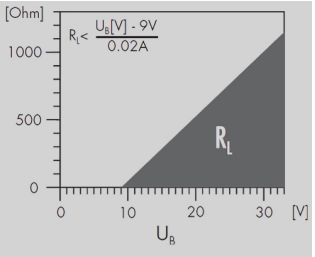
	> 100 ... 600, (2), (4)	> 600 ... 1000, (3)
Overpressure	3 x FS (≤ 850 / ≤ 1500 bar)	1500 bar
Burst pressure, (5)	> 850 / ≤ 1500 bar	> 1500 bar
Accuracy, (6) (± % FS)	≤ 0.10	≤ 0.25
Total Error, (7), (11) (± % FS ; typ. / max.)		
0...70 °C compensated / Allowed process temperature -40...150°C, (8)	≤ 0.3 / 0.5	≤ 0.3 / 0.5
-25...100 °C compensated / Allowed process temperature -40...150°C, (8)	≤ 0.75 / 1.0	≤ 0.75 / 1.0
-40...100°C compensated / Allowed process temperature -40...150°C, (8)	≤ 1.0 / 1.25	≤ 1.0 / 1.25
0...70 °C compensated / Allowed process temperature -40...150°C, (9)	n.a.	n.a.
-25...100 °C compensated / Allowed process temperature -40...150°C, (9)	n.a.	n.a.
-40...125 °C compensated / Allowed process temperature -40...150°C, (9)	n.a.	n.a.
Response time, (typ.)	< 1ms / 10...90% FS	< 1ms / 10...90% FS
Long term stability, (10)	< 0.1% FS / < 0.2% FS	< 0.1% FS / < 0.2% FS

1) 50 mbar on request
(2) Titanium available <400bar (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 / 10 V DC)
(8) For currents and voltage output signals
(9) Active compensation, only for current output signals
(10) 1 year (typ. / max.), the long term stability can be improved by aging (burn-in) the sensor
(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	0 ... 5 V	0 ... 10 V
Power supply	9...33 V DC	10...30 V DC	12...30 V DC
Supply influence	< 0.05% FS	< 0.05% FS	< 0.05% FS
Current consumption		3 mA	3 mA
Circuit diagram			
Load resistance		$R_L > 10kOhm$	$R_L > 10kOhm$
Load influence	< 0.05% FS	< 0.05% FS	< 0.05% FS
Reverse polarity protection	Pout to +Vin	+Vin to GND, Pout to +Vin, Pout to GND	+Vin to GND, Pout to +Vin, Pout to GND
Short-circuit resistance	---	Pout to GND	Pout to GND

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
---	Surge (1)	Line-Line: 2.0 kV/2 Ω, Line-Earth 5 kV/12 Ω	Overvoltage
EN 61000-4-6	Conducted RF	3 V (0.15...80 MHz, 3 s)	Frequency converters

(1) Only with surge (lightning) protection

PHYSICAL SPECIFICATIONS

Materials	
Oil filling	Silicone oil AS100
Transducer	Stainless steel (316L / 1.4435), Titanium (Gr.2), (1)
Housing	Stainless steel (316L / 1.4435), Titanium (Gr.2)
Seals	Viton (Standard), EPDM, Kalrez, NBR
Cable	PUR, FEP, PE

(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					
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, with 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, with flush diaphragm membrane (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)			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		
	PE cable, IP 67, black (Fig. 12), (6), (7)			13		
	PUR cable, IP 67, black (Fig. 12), (6), (8)			15		
	PUR cable, black, with submersible back end IP 68			24		
	FEP cable, IP 67, black (Fig. 12), (6)			21		
	FEP cable, (high temperature), black, IP 67 (6)			11		
	Customized connection available			99		
Output signal						
	0 ... 5 VDC no active compensation				46	
	0 ... 10 VDC no active compensation				47	
	4 ... 20 mA				05	
	4 ... 20 mA surge protection				08	
Accuracy						
	≤ ± 0.25 % FS					1
	≤ ± 0.1 % FS (≤ 600 bar)					2

	≤ ± 0.05 % FS (≥ 500 mbar...≤ 100 bar) (9) (active comp. / Option E)				6	
Temperature range						
	0 ... 70°C compensated (allowed process temperature: -40 ... 125°C)				0	
	-25 ... 100°C compensated (allowed process temperature: -40 ... 125°C)				1	
	-25 ... 100°C compensated (allowed process temperature: -40 ... 150°C) with cooling fins				2	
	-40 ... 100°C compensated (allowed process temperature: -40 ... 125°C)				3	
	-40 ... 100°C compensated (allowed process temperature: -40 ... 150°C) with cooling fins				4	
	-40 ... 125°C compensated (allowed process temperature: -40 ... 125°C), (9) Active compensated / Option E				6	
Option 1						
	Throttle, (10)					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						
	Electronics packed in gel: Gauge pressure					C
	Electronics packed in gel: Absolute and sealed gauge sensors					D
Option 3						
	Active compensated (only 4 ... 20 mA and ≥ 500mbar ... ≤ 100bar)					E
	Titanium					K
	Seals: Viton (standard)					U
	Seals: EPDM					S
	Seals: Kalrez					T
	Seals: NBR (ACS)					H

(4) Process connection available ≤ 600 bar

(5) Cable socket connector not included

(6) Please specify the required cable length and medium

(7) Suitable for drinking water (food approved)

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

(9) Active compensated, with connector

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

Technical drawings

Pressure connections

Fig. 1

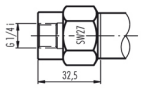


Fig. 2

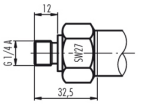


Fig. 3

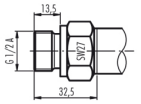


Fig. 4

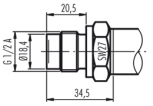


Fig. 5

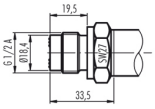


Fig.6

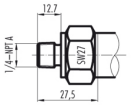
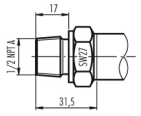
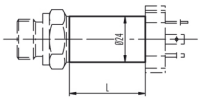


Fig. 7



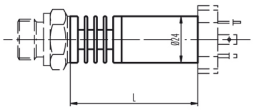
Dimensions

Version for medium temperature up to 125°C



L = 25 mm for connector DIN 43650

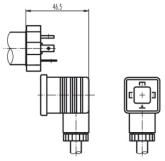
Version for medium temperature >125°C up to 150°C



L = 52 mm for connector DIN 43650

Electrical Connections

Fig. 8



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

Fig. 9

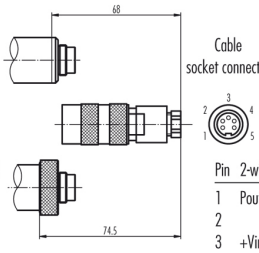
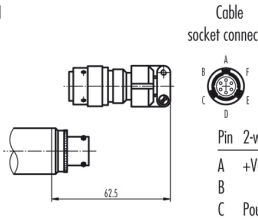


Fig. 10

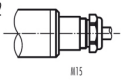
Pin	2-wire	3-wire
1	Pout	Pout
2		
3	+Vin	+Vin
4		GND
5	EP (only Ex)	

Fig. 11



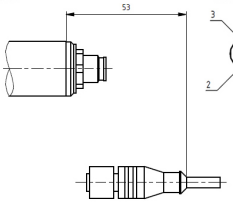
Pin	2-wire	3-wire
A	+Vin	+Vin
B		GND
C	Pout	Pout
D		
E	EP (only Ex)	

Fig. 12



Colour	2-wire	3-wire
white	+Vin	+Vin
yellow	Pout	GND
brown		Pout
grey	EP (only Ex)	

Fig. 15



Pin	2-Wire	3-Wire
1		GND
3	Pout	Pout
4	+Vin	+Vin

Specifications may change without notice.

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