

## Pressure Transmitter

# ATM.1ST - High Precision Transmitter



### CUSTOMER BENEFITS

- Any measuring ranges between 0 ... 50 mbar and 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
- Barometric or negative pressure ranges available

# 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 (Proof)	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 (Proof)	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 (Proof)	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

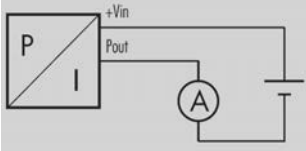
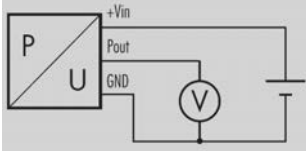
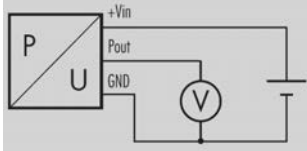
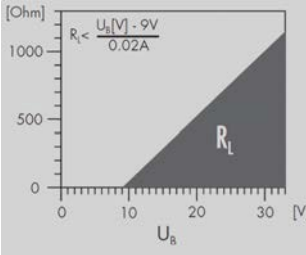
(4) Total error including accuracy and temperature influences at maximum signal span (16 mA / 10 V DC)

(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	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 (typ.)	n.a.	3 mA	3 mA
Start up time	< 170 ms	< 170 ms	< 170 ms
Circuit diagram			
Load resistance		$R_L > 10k\Omega$	$R_L > 10k\Omega$
Load influence	< 0.05% FS	< 0.05% FS	< 0.05% FS
Reverse polarity protection	Yes	Yes	Yes
Short-circuit resistance	n.a.	Yes	Yes

## 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 $\mu$ 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 $\Omega$ , Line-Earth: 1 kV/42 $\Omega$	Overvoltage
---	Surge (1)	Line-Line: 2.0 kV/2 $\Omega$ , Line-Earth 5 kV/12 $\Omega$	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

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. 125 gram, depending on the configuration

# Accessories

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## 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

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### OPERATING AND SAFETY INSTRUCTIONS

	Article number
10.88.0092	DMM029



<b>Temperature range</b>		
0 ... 70°C compensated, (without cooling fins)		0
-25 ... 100°C compensated, (without cooling fins)		1
-25 ... 100°C compensated, (with cooling fins)		2
-40 ... 100°C compensated, (without cooling fins)		3
-40 ... 100°C compensated, (with cooling fins)		4
-40 ... 125°C compensated, (without cooling fins)		6
Other temperature ranges on request		9
<b>Option 1</b>		
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
<b>Option 2</b>		
Electronics packed in gel: Gauge sensors		C
Electronics packed in gel: Absolute and sealed gauge sensors		D
<b>Option 3</b>		
Titanium		K
Seals: FKM (standard)		U
Seals: EPDM		S
Seals: Kalrez (5)		T
Seals: NBR (8)		H

- (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

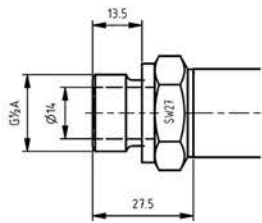


Fig. 5 - G 1/2 M

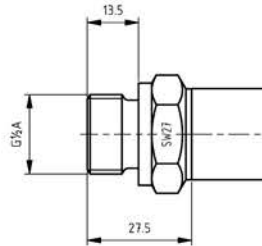


Fig. 2 - G 1/4 F

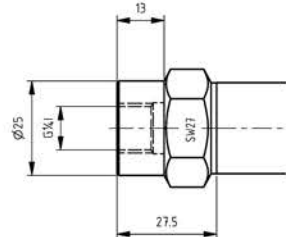


Fig. 6 - G 1/2 M, Manometer EN837

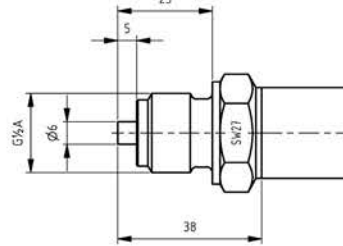


Fig. 3 - G 1/4 M

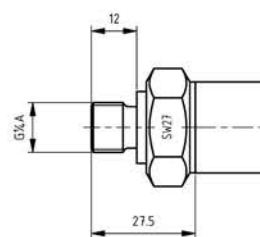


Fig. 7 - 1/4 NPT M

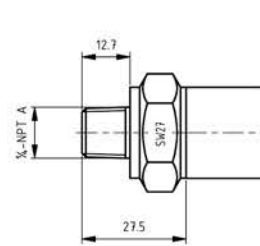


Fig. 4 - G 1/4 M, Manometer EN837

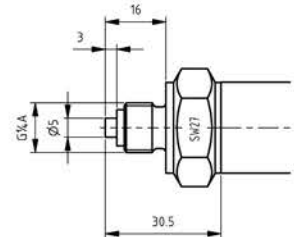
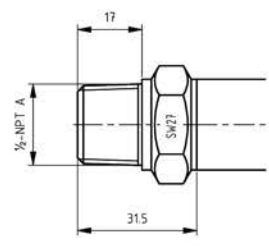


Fig. 8 - 1/2 NPT M



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

Fig. 2 - G 1/4 F

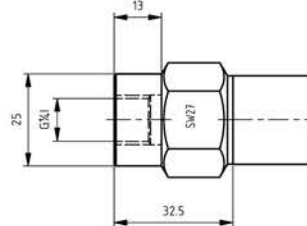


Fig. 5 - G 1/2 M

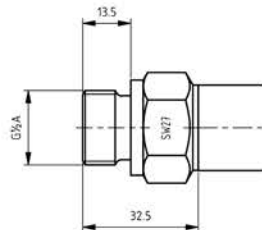


Fig. 3 - G 1/4 M

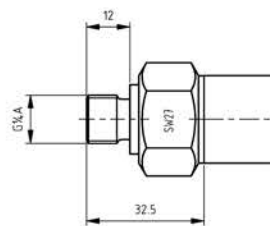


Fig. 6 - G 1/2 M, Manometer EN837

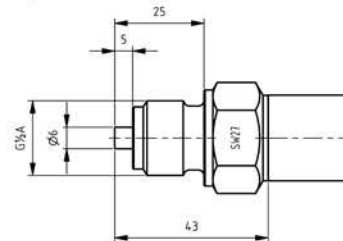


Fig. 4 - G 1/4 M, Manometer EN837

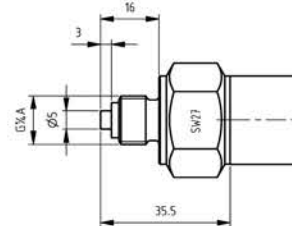


Fig. 7 - 1/4 NPT M

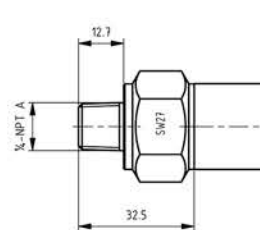
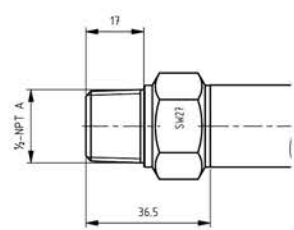
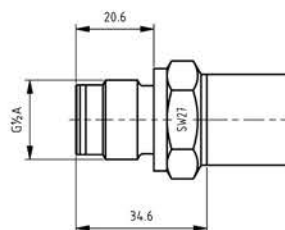


Fig. 8 - 1/2 NPT M



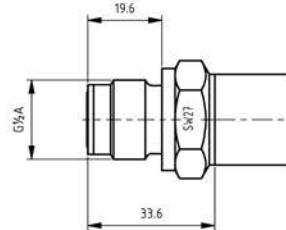
$P_N \geq 50 \text{ mbar} \dots 600 \text{ bar}$

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



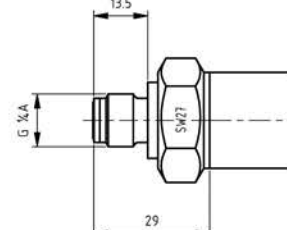
$P_N \geq 100 \text{ mbar} \dots 1000 \text{ bar (3)}$

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

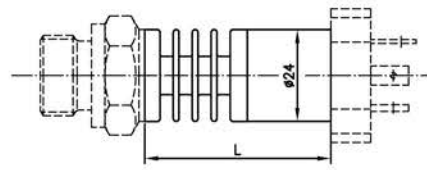
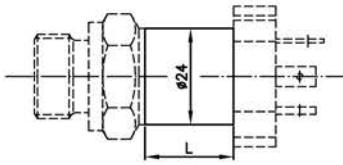


- (1) Dimensions for welded or elastomerfree versions may be different
- (2) Not all process connections available for pressure ranges > 600 bar
- (3) Dimensions for pressure ranges > 600 bar differ

## 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)

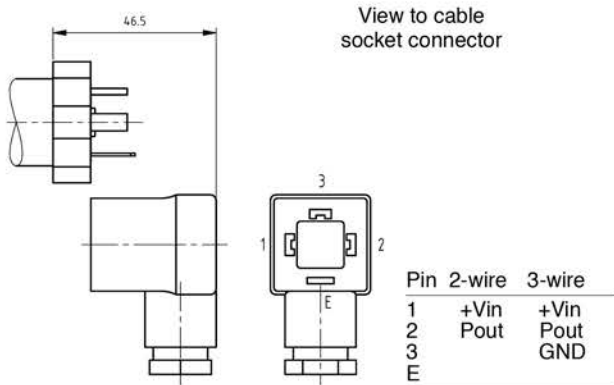


Fig. 13 - Binder 723, 5 pins

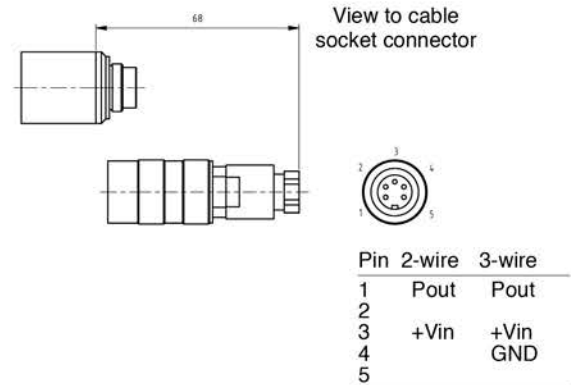


Fig. 14 - MIL C26482, 10-6, 316L

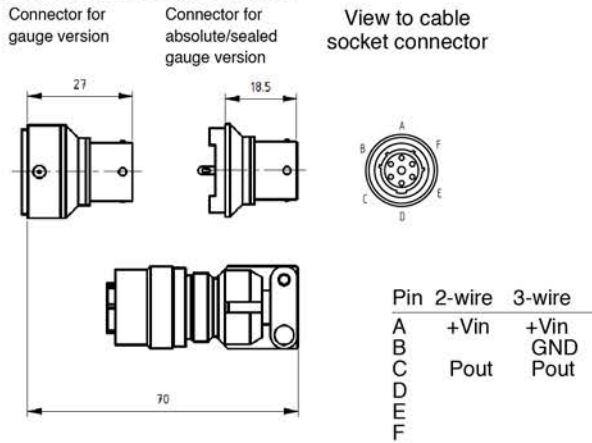


Fig. 15 - M12 x 1, 4 pins (Lumberg RSF4)

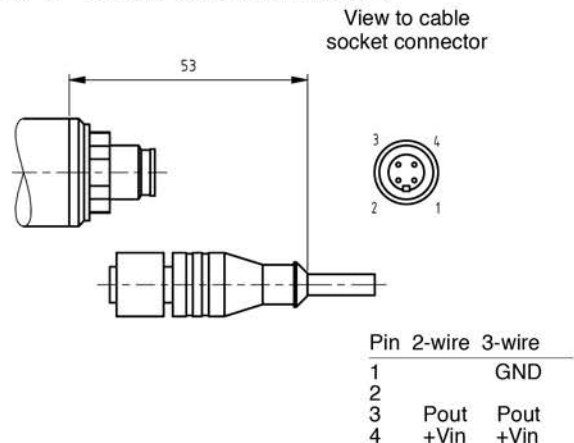


Fig. 16 - Cable connection IP67

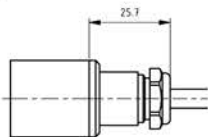
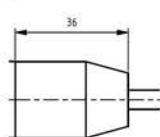


Fig. 17 - Cable connection IP68



Colour	2-wire	3-wire
white	+Vin	+Vin
yellow	Pout	GND
brown		Pout

Specifications may change without notice

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