

## Submersible Level Transmitter

# ATM.1ST/N - High Precision Submersible Level Transmitter



### CUSTOMER BENEFITS

- Any measuring ranges between 0 ... 0.5 mH<sub>2</sub>O and 0 ... 250 mH<sub>2</sub>O 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 pressure ranges available

# Technical Specifications

## PRESSURE MEASURING RANGE (MH2O)

	0 ... 0.5 to 0 ... < 1	0 ... 1 to 0 ... < 10	0 ... 10 to 0 ... ≤ 250
Overpressure (Proof)	3 bar	3 bar / 3 x FS	3 x FS
Burst pressure	> 200 bar	> 200 bar	> 200 bar
Accuracy, (1) (± % FS)	≤ 0.25	≤ 0.2 / ≤ 0.1	≤ 0.2 / ≤ 0.1 / ≤ 0.05
Total Error, (2), (3) (± % FS ; typ. / max.)			
-5 ... 50°C compensated	≤ 0.4 / 0.6	≤ 0.2 / 0.4	≤ 0.15 / 0.3
-5 ... 80°C compensated	≤ 0.5 / 0.7	≤ 0.3 / 0.5	≤ 0.2 / 0.4
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

	0.8 ... 1.2 bar, (4)
Overpressure (Proof)	3 x FS
Burst pressure	> 200 bar
Accuracy, (1) (± % FS)	≤ 0.2 / ≤ 0.1
Total Error, (2), (3) (± % FS ; typ. / max.)	
-5 ... 50°C compensated	≤ 0.2 / 0.4
-5 ... 80°C compensated	≤ 0.3 / 0.5
Response time, (typ.)	< 1ms / 10 ... 90 % FS
Long term stability, (typ./max. per year)	< 1 mbar / < 2 mbar

(1) Zero based accuracy according to EN-61298, incl. hysteresis and repeatability at ambient temperature

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

(3) Does not apply to titanium solution ≤ 1 bar

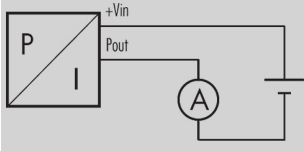
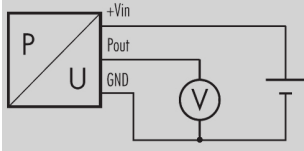
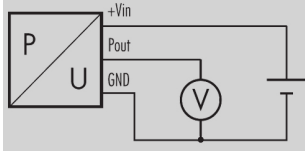
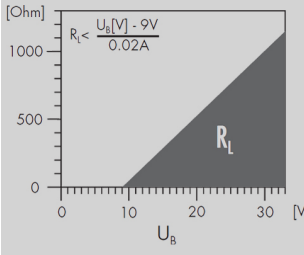
(4) Typical barometric pressure range, max. offset: 900 mbar, min. span: 400 mbar

## TEMPERATURE RANGE

Operating temperature	-5 ... 80°C (1)
Process temperature	-5 ... 80°C (1)
Storage temperature	-40 ... 100°C

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

## 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
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

## Additional documents

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## OPERATING AND SAFETY INSTRUCTIONS

	Article number
10.88.0092	DMM029

# Ordering information

	X	XXX.	XXXX.	XX.	XXX
<b>Type</b>					
					ATM.1ST/N
<b>Pressure type</b>					
					Gauge 1
					Absolute 2
<b>Pressure measuring range</b>					
					Any measuring ranges between 0 ... 0.5 mH2O and 0 ... 250 mH2O available XX
					Barometric pressure ranges available XX
<b>Process connection</b>					
					Closed, nose cone POM, (Fig. 8) 55
					Closed, nose cone 1.4435, (Fig. 8), (1) 59
					Open, nose cone POM, (Fig. 9) 56
					G 1/2 M, bore 14 mm (Fig. 1), (Fig. 10) 17
					G 1/2 M (Fig. 2), (Fig. 10) 13
					G 1/2 M, frontal diaphragm (Fig. 3), (Fig. 10) 14
					G 1/2 M, frontal diaphragm Hastelloy C-276 (Fig. 3), (Fig. 10) 37
					G 1/2 M, with flush diaphragm membrane (Fig. 4), (Fig. 10) 15
					G 1/4 M (Fig. 5), (Fig. 10) 11
					1/4 NPT M (Fig. 6), (Fig. 10) 10
					1/2 NPT M (Fig. 7), (Fig. 10) 19
					Other pressure connections on request 99
<b>Electrical connection</b>					
					PE cable, black, IP 68, (1), (2) 13
					PUR cable, black, IP 68, (2), (3) 15
					FEP cable, black, IP 68, (2) 21
					FEP cable, (high temperature), black, IP 68, (2), (4) 12
					PVC cable, blue, IP 68, (1), (2) 14
					PUR cable, black, IP 68, with G 1/2 M conduit fitting (Fig. 11), (2), (3) 19
					PUR cable, black, IP 68, with strain relief (Fig. 12), (2), (3) 25
					Connectable version, IP 68 (Fig. 13), (5) 07
					Other electrical connections on request 99
<b>Output signal</b>					
					0 ... 5 VDC 46
					0 ... 10 VDC 47
					4 ... 20 mA 05
					4 ... 20 mA surge protection 08
<b>Accuracy</b>					
					≤ ± 0.25 % FS (0.5 mH2O ... 0.99 mH2O) 1
					≤ ± 0.2 % FS (1 mH2O ... 250 mH2O) 4
					≤ ± 0.1 % FS (1 mH2O ... 250 mH2O) 2
					≤ ± 0.05 % FS (10 mH2O ... 250 mH2O) 6
<b>Temperature range</b>					
					-5 ... 50°C compensated (allowed process temperature: - 5 ... 50°C) 4

	-5 ... 80°C compensated (allowed process temperature: - 5 ... 80°C)			5
<b>Option 1</b>				
	Special oil filling: Anderol Food (for food applications)			G
<b>Option 2</b>				
	Electronics packed in gel: Gauge sensors			C
	Electronics packed in gel: Absolute sensors			D
<b>Option 3</b>				
	Ballast weight 1.4435 (with figure 8, 9 and 10 only)			B
	Version titanium (without ballast weight)			K
	Seals: FKM (standard)			U
	Seals: EPDM			S
	Seals: Kalrez (6)			T
	Seals: NBR (1)			H
	Humidity filter element for gauge versions (for PUR and PE cable only)			Z

(1) Suitable for drinking water

(2) Please specify the required cable length and medium

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

(4) max. 130°C @ 10 mH<sub>2</sub>O, max. 110°C @ 50 mH<sub>2</sub>O

(5) Connector with required cable has to be ordered separately (KART100)

(6) Profile seal not included

## Process connections

Fig. 1 - G 1/2 M, bore 14 mm

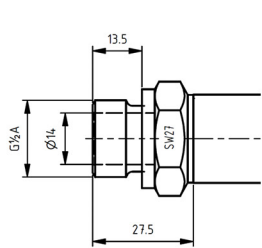


Fig. 2 - G 1/2 M

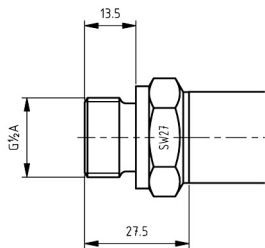


Fig. 3 - G 1/2 M, frontal diaphragm

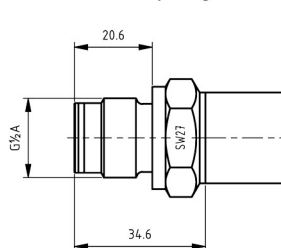


Fig. 4 - G 1/2 M, flush diaphragm

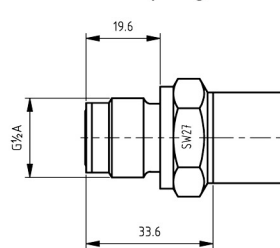


Fig. 5 - G 1/4 M

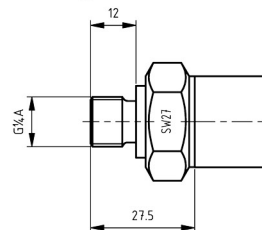


Fig. 6 - 1/4 NPT M

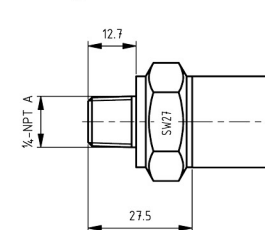
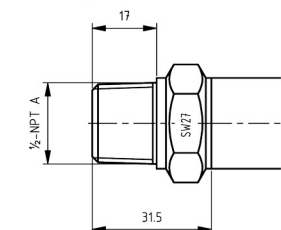


Fig. 7 - 1/2 NPT M



## Dimensions

Fig. 8  
Closed version

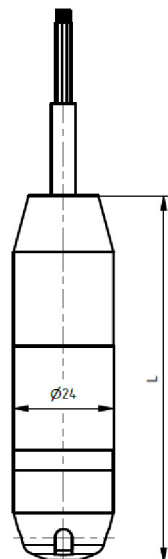


Fig. 9  
Open version

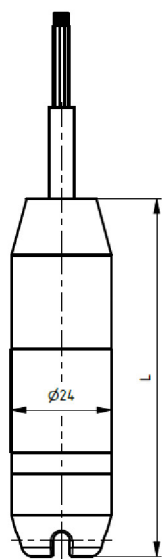


Fig. 10  
With process connection

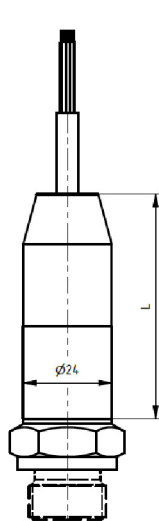


Fig. 11  
With G 1/2 M conduit fitting

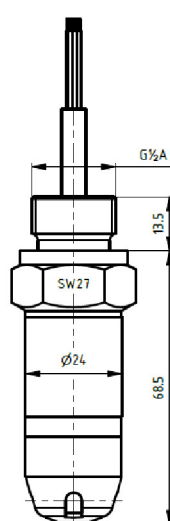


Fig. 12  
With strain relief

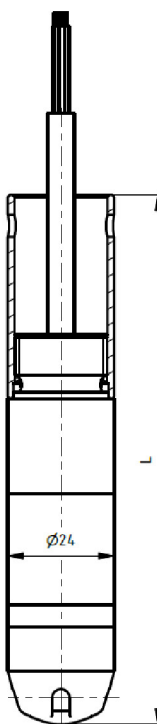
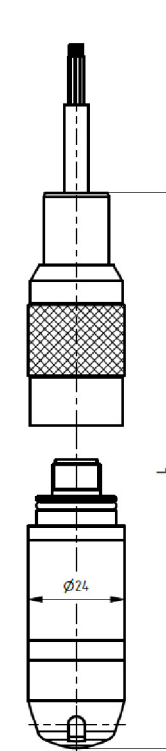


Fig. 13  
Connectable version



Version

L [mm]

Weight [g]  
(without cable)

Figure 8 - closed	ca. 90	ca. 150
Figure 9 - open	ca. 85	ca. 150
Figure 10 - with process connection	ca. 60	ca. 180
Figure 11 - with G 1/2 M conduit fitting	ca. 82	ca. 150
Figure 12 - with strain relief	ca. 120	ca. 180
Figure 13 - connectable version	ca. 120	ca. 200
Additional length with ballast weight	ca. 140	
Additional weight with ballast weight		ca. 330

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

Specifications may change without notice

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