

Intrinsically Safe Submersible Level Transmitter

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



CUSTOMER BENEFITS

- Certificates: ATEX, IECEx, EAC, GL/DNV, ABS, Lloyds
- Any measuring ranges between 0 ... 0.5 mH2O and 0 ... 250 mH2O 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, FEP cable must be used

ELECTRICAL SPECIFICATIONS

	4 ... 20 mA
Power supply	9 ... 28 V DC
Supply influence	< 0.05% FS
Start up time	< 170 ms
Circuit diagram	
Load resistance	
Load influence	< 0.05% FS
Reverse polarity protection	Yes

ATEX, IECEX APPROVAL

Certificates (1)		
ATEX	SEV 09 ATEX 0108 X	
IECEX	IECEX MSC 14.0002 X	
IECEX	IECEX SEV 10.0003 X	
Standards		
EN 60079-0:2012 (A11:2013)		
EN 60079-11:2012		
EN 60079-26:2015		
EN 50303:2000		
Gas		
Zone 0	II 1G Ex ia IIC T4 ... T6 Ga	
Zone 1	II 2G Ex ia IIB T4 ... T6 Gb	
Dust		
Zone 20	II 1D Ex ia IIIC T145°C Da	
Mining		
I M1 Ex ia I Ma		
I M2 Ex ia I Mb		
Maximum values of the intrinsically safe circuit	28V / 93 mA / 0.65W	
Temperature class (2)	T6	T4
Ambient temperature (Ta)	-5 ... 50°C	-5 ... 80°C
Process temperature	-5 ... 50°C	-5 ... 80°C

(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 T6

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 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

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

OPERATING AND SAFETY INSTRUCTIONS

	Article number
10.88.0435	DMM041

Ordering information

	X.	XXXX.	XXXX.	XX.	XXX
Type					
	ATM.1ST/N/Ex				
Pressure type					
	Gauge	1			
	Absolute	2			
Pressure measuring range					
	Any measuring ranges between 0 ... 0.5 mH2O and 0 ... 250 mH2O available	XX			
	Barometric pressure ranges available	XX			
Process connection					
	Closed, nose cone POM, (Fig. 8)	55			
	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			
Electrical connection					
	PUR cable, blue, IP 68, (1), (2)	17			
	FEP cable, blue, IP 68, (1)	22			
	PUR cable, blue, IP 68, with G 1/2 M conduit fitting (Fig. 11), (1), (2)	20			
	PUR cable, blue, IP 68, with strain relief (Fig. 12), (1), (2)	28			
	Connectable version, IP 68 (Fig. 13), (3)	07			
	Other electrical connections on request	99			
Output signal					
	4 ... 20 mA		05		
Accuracy					
	$\leq \pm 0.25$ % FS (0.5 mH2O ... 0.99 mH2O)			1	
	$\leq \pm 0.2$ % FS (1 mH2O ... 250 mH2O)			4	
	$\leq \pm 0.1$ % FS (1 mH2O ... 250 mH2O)			2	
	$\leq \pm 0.05$ % FS (10 mH2O ... 250 mH2O)			6	
Temperature range					
	T6 (Ta: -5 ... 50°C) -5 ... 50°C compensated (allowed process temperature: - 5 ... 50°C)				3
	T4 (Ta: -5 ... 80°C) -5 ... 80°C compensated (allowed process temperature: - 5 ... 80°C), (2)				5
Option 1					
	Special oil filling: Anderol Food (for food applications)				G
Option 2					
	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 (4)			T
Humidity filter element for gauge versions (for PUR cable only)			Z
Option 3			

- (1) Please specify the required cable length and medium
- (2) For operating temperature > 50°C, FEP cable must be used
- (3) Connector with required cable has to be ordered separately (KART100)
- (4) Profile seal not included

Process connections

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

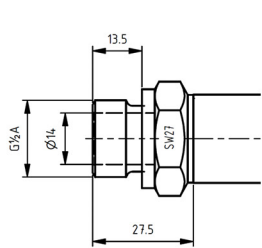


Fig. 2 - G 1/2 M

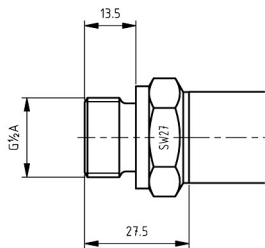


Fig. 3 - G 1/2 M, frontal diaphragm

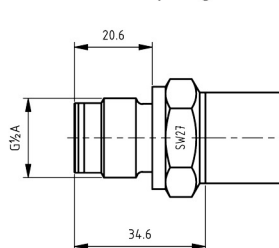


Fig. 4 - G 1/2 M, flush diaphragm

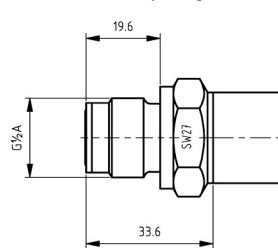


Fig. 5 - G 1/4 M

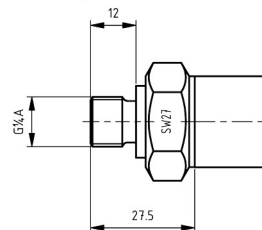


Fig. 6 - 1/4 NPT M

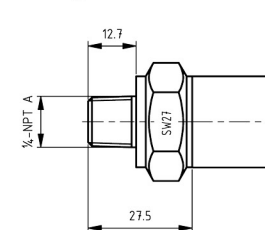
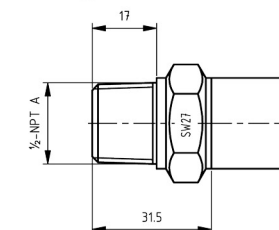


Fig. 7 - 1/2 NPT M



Dimensions

Fig. 8
Closed version

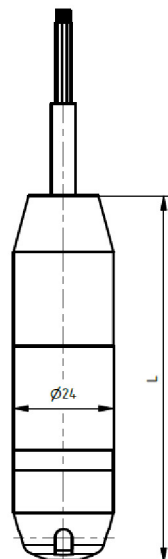


Fig. 9
Open version

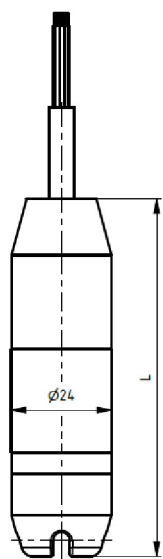


Fig. 10
With process connection

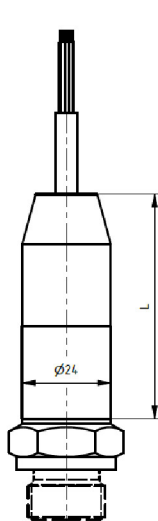


Fig. 11
With G 1/2 M conduit fitting

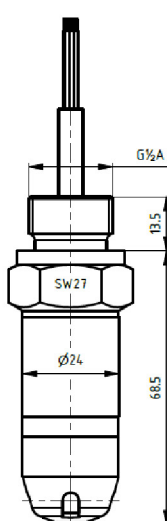


Fig. 12
With strain relief

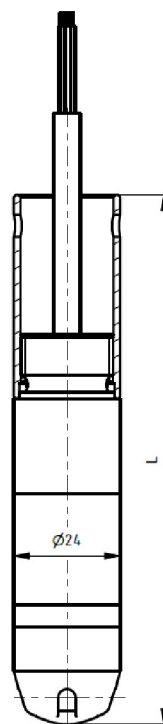
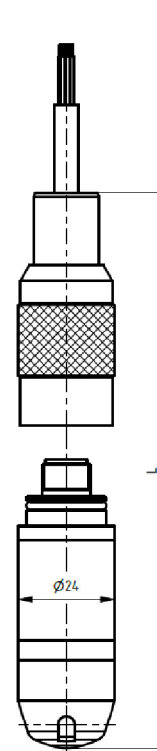


Fig. 13
Connectable version



Version

L [mm]

Weight [g]
(without cable)

Figure 8 - closed
Figure 9 - open
Figure 10 - with process connection
Figure 11 - with G 1/2 M conduit fitting
Figure 12 - with strain relief
Figure 13 - connectable version
Additional length with ballast weight
Additional weight with ballast weight

ca. 90
ca. 85
ca. 60
ca. 82
ca. 120
ca. 120
ca. 140

ca. 200
ca. 200
ca. 230
ca. 200
ca. 230
ca. 250
ca. 330

Colour 2-wire
white +Vin
yellow Pout
grey EP

Specifications may change without notice

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