

## Intrinsically Safe Submersible Level Transmitter

# ATM.ECO/N/Ex - Analog Submersible Level Transmitter



### CUSTOMER BENEFITS

- Certificates: ATEX, IECEx, EAC, GL/DNV, ABS, Lloyds
- Any measuring ranges between 0 ... 1 mH2O and 0 ... 250 mH2O available
- Static accuracy available of 0.2 % 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 (MH<sub>2</sub>O)

	0 ... 1 to 0 ... < 10	0 ... 10 to 0 ... ≤ 250	0.8 ... 1.2 bar, (3)
Overpressure (Proof)	3 bar	3 x FS	3 x FS
Burst pressure	> 200 bar	> 200 bar	> 200 bar
Accuracy, (1) (± % FS)	≤ 0.2	≤ 0.2	≤ 0.2
Total Error, (2) (± % FS ; typ. / max.)			
-5 ... 50°C compensated	≤ 0.4 / 0.8	≤ 0.3 / 0.6	≤ 0.4 / 0.8
-5 ... 80°C compensated	≤ 0.6 / 1.0	≤ 0.4 / 0.8	≤ 0.6 / 1.0
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	< 0.1% FS / < 0.2% FS	< 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)

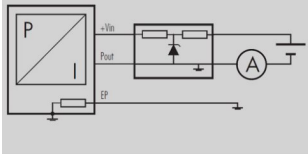
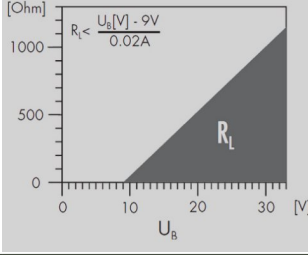
(3) Typical barometric pressure range, max. offset: 900 mbar, min. span: 400 mbar

## 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 $\mu$ 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
EN 61000-4-6	Conducted RF	3 V (0.15 ... 80 MHz, 3 s)	Frequency converters

## PHYSICAL SPECIFICATIONS

Oil filling	Standard: Silicone oil AS100
Transducer	Standard: Stainless steel (316L/1.4435); Optional: Hastelloy C-276
Housing	Standard: Stainless steel (316L/1.4435); Optional: Hastelloy C-276

## Additional documents

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### OPERATING AND SAFETY INSTRUCTIONS

	Article number
10.88.0435	DMM041

# Ordering information

	X.	XXXX.	XXXX.	XX.	XXX
<b>Type</b>					
	ATM.ECO/N/Ex				
<b>Pressure type</b>					
	Gauge	1			
	Absolute	2			
<b>Pressure measuring range</b>					
	Any measuring ranges between 0 ... 1 mH2O and 0 ... 250 mH2O available	XX			
	Barometric pressure ranges available	XX			
<b>Process connection</b>					
	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			
<b>Electrical connection</b>					
	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			
<b>Output signal</b>					
	4 ... 20 mA		05		
<b>Accuracy</b>					
	$\leq \pm 0.2$ % FS			4	
<b>Temperature range</b>					
	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
<b>Option 1</b>					
	Ballast weight 1.4435 (with figure 8, 9 and 10 only)				B
	Seals: FKM (standard)				U
	Seals: EPDM				S
	Seals: Kalrez (4)				T
	Humidity filter element for gauge versions (for PUR cable only)				Z
<b>Option 2</b>					

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### Option 3

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- (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

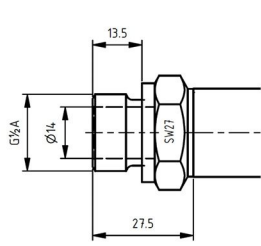


Fig. 2 - G 1/2 M

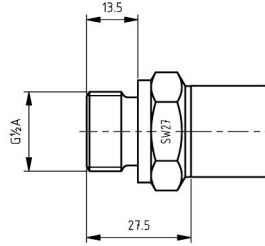


Fig. 3 - G 1/2 M, frontal diaphragm

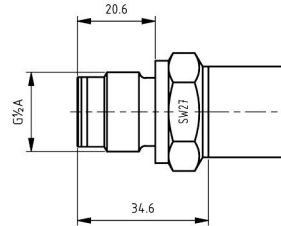


Fig. 4 - G 1/2 M, flush diaphragm

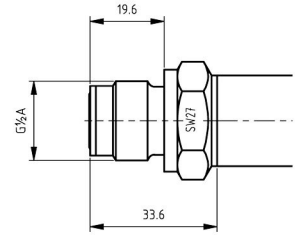


Fig. 5 - G 1/4 M

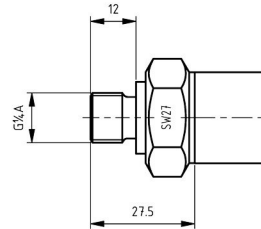


Fig. 6 - 1/4 NPT M

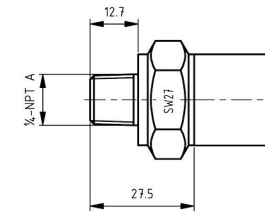
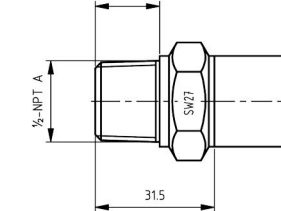


Fig. 7 - 1/2 NPT M



## Dimensions

Fig. 8  
Closed version

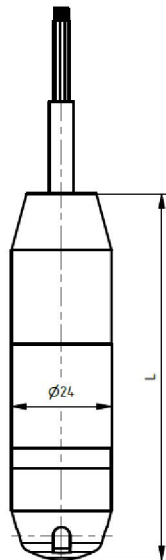


Fig. 9  
Open version

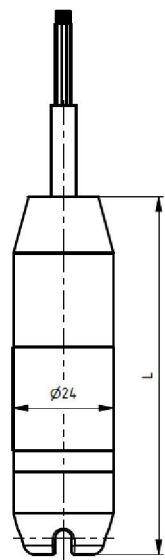


Fig. 10  
With process connection

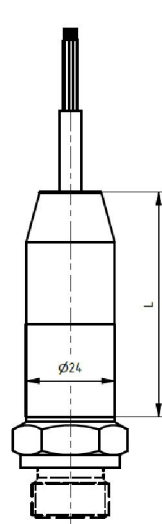


Fig. 11  
With G 1/2 M conduit fitting

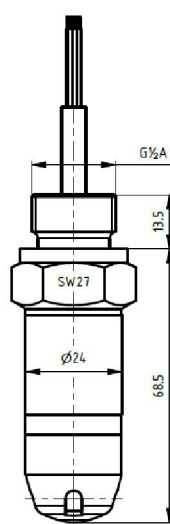


Fig. 12  
With strain relief

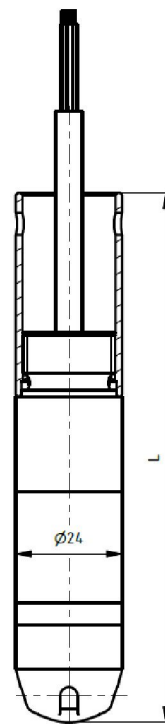
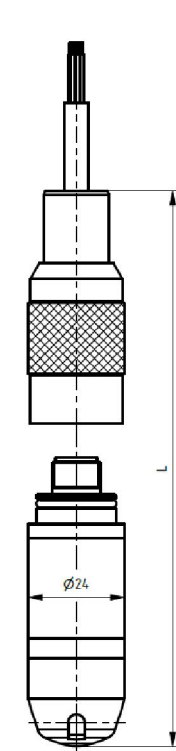


Fig. 13  
Connectable version



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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