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OPERATION MANUAL

ATM

Analogue Pressure Transmitter

*** VERSION 1.1 ***
State: 19.12.2005

Ordering Information

			ATM- PT	-MR	-PC	-EC	-AO	-MR	-TA	-XXXX
Pressure Type	Gauge Pressure		231							
	Absolute Pressure		232							
	Sealed Gauge Pressure		233							
Measuring Range	0 .. 0,1 bar			00						
	0 .. 0,16 bar			01						
	0 .. 0,25 bar			02						
	0 .. 0,40 bar			03						
	0 .. 0,60 bar			04						
	0 .. 1,0 bar			05						
	0 .. 1,6 bar			06						
	0 .. 2,5 bar			07						
	0 .. 4,0 bar			08						
	0 .. 6,0 bar			09						
	0 .. 10 bar			10						
	0 .. 16 bar			11						
	0 .. 25 bar			12						
	0 .. 40 bar		233	13						
	0 .. 60 bar		233	14						
	0 .. 100 bar		233	15						
	0 .. 160 bar		233	16						
	0 .. 250 bar		233	17						
	0 .. 400 bar		233	18						
	0 .. 600 bar		233	19						
	0 .. 1000 bar		233	20						
	Special calibration			99						
Process Connection	G 1/4"**f**				00					
	G 1/4"**m**				11					
	G 1/4"**m**, for manometer DIN 16288				12					
	G 1/2"**m**				13					
	G 1/2"**m**, frontal diaphragm				14					
	G 1/2"**m**, flush diaphragm				15					
	G 1/2"**m**, for manometer DIN 16288				16					
	1/4" NPT**m**				10					
	1/2" NPT**m**				19					
	Special process connection				99					
Electrical Connection	Connector DIN 43650 (screwable)[3]	IP 65				01				
	Connector Binder 723, 5-pin[3]	IP 67				03				
	Connector Binder 723, 5-pin (screwable)[3]	IP 67				43				
	Connector MIL C26482, (10-6)[3]	IP 40				06				
	PE-cable[4][5][6]	IP 67				13				
	PUR-cable[4][5]	IP 67				15				
	Teflon-cable[4]	IP 67				21				
	Special electrical connection					99				
Output Option	0 .. 5 VDC						46			
	0 .. 10 VDC						47			
	0 .. 20 mA						00			
	4 .. 20 mA						05			
	4 .. 20 mA with surge (lightning) protection						08			
	0 .. 10 VDC with surge (lightning) protection						49			
	Special output signal						99			
Measuring Accuracy (Linearity Deviation)	≤ 0.5 % F.S.							0		
	≤ 0.25 % F.S.							1		
	≤ 0.1 % F.S. (from 0 .. 0,6 bar range on)							2		
Temperature Range	Compensated 0 .. +70 °C (medium temp. 0 .. +80 °C)								0	
	Compensated -25 .. +85 °C (medium temp. -25 .. +100 °C)[5]								1	
	Compensated -25 .. +85 °C (medium temp. -25 .. +150 °C)[5]								2	
	Special temperature range								9	
Options	Throttle[2]									A
	Electronics packed in gel: Gauge pressure									C
	Absolute and sealed gauge press.									D
	Special oil filling: ASEOL Food									G
	Halocarbon									H
	Seals: Viton (standard)									U
	EPDM									S
	Kalrez									T
	Special design									Z

[1] Zero offset and span adjustable subsequently
[2] Available only with three process connections (PC = 11, 13 or 16)
[3] Cable socket connector not included
[4] Please specify the required cable length
[5] For environment temperature > 50 °C a teflon cable must be used
[6] Suitable for drinking water (food approved)

Technical Description

The piezo-resistive measurement element is isolated from the medium by a stainless steel diaphragm and oil filling. All variants are protected against reverse polarity and short circuit. There is a large range of different process connections available. The external parallel thread process connections are equipped with a flat sealing profile gasket.

Specifications

Pressure Resistance

Measuring Range		**100 up to 500 mbar**	**> 0,5 up to 2 bar**	**> 2 up to 25 bar**	**> 25 up to 600 bar**	**> 600 up to 1000 bar**
Overpressure		3 bar	3 x F.S., min. 3 bar	3 x F.S.	3 x F.S., max. 850 bar	1500 bar
Burst Pressure		≥ 200 bar	≥ 200 bar	≥ 200 bar	≥ 850 bar	≥ 1500 bar

Accuracy*

Standard	[% F.S.]	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 1
Optimised	[% F.S.]	≤ 0,25	≤ 0,25	≤ 0,25	≤ 0,25	≤ 0,5
High-performance	[% F.S.]		≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,25
Supply Voltage Influence	[% F.S.]	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1
Load Resistance Influence	[% F.S.]	< 0,1	< 0,1	< 0,1	< 0,1	< 0,1

* Zero based non-conformity according to DIN 16086, including hysteresis and repeatability

Thermal Shift

Zero (Comp. **0 .. +70 °C**)	[% F.S./°C]	≤ 0,06	≤ 0,03	≤ 0,015	≤ 0,015	≤ 0,015
Span (Comp. **0 .. +70 °C**)	[% F.S./°C]	≤ 0,015	≤ 0,015	≤ 0,015	≤ 0,015	≤ 0,015
Zero (Comp. **-25 .. +85 °C**)	[% F.S./°C]	≤ 0,08	≤ 0,04	≤ 0,02	≤ 0,02	≤ 0,02
Span (Comp. **-25 .. +85 °C**)	[% F.S./°C]	≤ 0,02	≤ 0,02	≤ 0,02	≤ 0,02	≤ 0,02
Long-time Drift (per year, typ.)	[% F.S.]	< 0,5	< 0,2	< 0,1	< 0,1	< 0,1
Long-time Drift (per year, max.)		< 4 mbar	< 4 mbar	< 0,2 % F.S.	< 0,2 % F.S.	< 0,2 % F.S.

Electromagnetic Emission

EN 61000-6-3	Generic emission standard
EN 55022	Emission, class B

Electromagnetic Immunity

EN 61000-6-2	Generic immunity standard		
EN 61000-4-2	Electrostatic discharge	4 kV contact, 8 kV air	
EN 61000-4-3	Radiated electro-magnetic field	10 V/m, 80-1000 MHz, 80 % AM 1kHz	Radio sets, cellular phones
EN 61000-4-3	Radiated electro-magnetic field (GSM)	10 V/m, 950 MHz, 200 Hz on/off	Digital portable phones
EN 61000-4-4	Fast transients (burst)	2 kV	Motors, Valves
EN 61000-4-5*	Surge	10 kA (8/20 µs)	Lightning strikes
EN 61000-4-6	Conducted radio-frequency	10 V, 0,15-80 MHz, 80 % AM 1 kHz	Radio sets, cellular phones

* Only with optional surge (lightning) protection

Enclosure

Process Connection	G 1/4“**i**, G 1/4“**a**, G 1/2“**a**, 1/4“ NPT**a** or 1/2“ NPT**a**
Materials in Contact with Medium	Stainless steel 1.4435 (316L) for process connection, diaphragm, housing Viton (Seals) Other materials on request

Power Supply

Output Signal	**4 .. 20 mA**	**0 .. 20 mA**	**0 .. 10 V**
Supply Voltage	9 .. 33 VDC	9 .. 33 VDC	15 .. 30 VDC
Connection Type	Two wire	Three wire	Three wire
Assigned Pins	$+V_{in}$, P_{out}	$+V_{in}$, P_{out}, GND	$+V_{in}$, P_{out}, GND
Permissible Load	R_L < (U - 9 V)/20 mA	R_L < (U - 6 V)/20 mA ≤ 1 kΩ	R_L > 10 kΩ

Electrical Connections

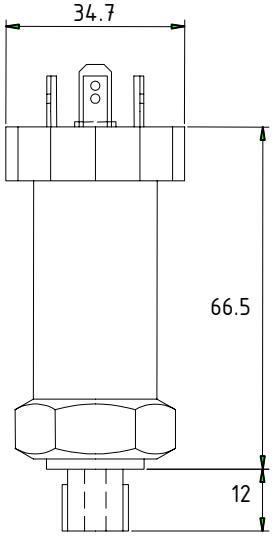
Connector	**DIN 43650 (cube conn.)**	**Binder 723 (round conn.)**
Pin 1	$+V_{in}$	P_{out}
Pin 2	P_{out}	Not assigned
Pin 3	GND*	$+V_{in}$
Pin 4	PE	GND*
Pin 5	-	Not assigned
Shield	-	PE

* Pin is not assigned for variants with output signal 4 .. 20 mA.

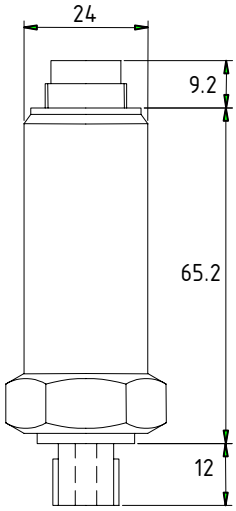
Physical Dimensions of the Customary Variants

Schemes of other variants are available on request.

Electrical connector DIN 43650 (cube connector)



Electrical connector Binder 723 (round connector)



Mounting

Safety Instructions

- Mounting and demounting by competent personnel only!
- Before starting work make sure that the measurement point is not under pressure.
- Make sure that no dangerous gases (poisonous, suffocative or inflammable) can discharge from the measurement point.
- Make sure that pressure range and supply voltage of the sensor are appropriate for your application.

Required Tools

- Open-end wrench 27 mm

Mounting Place

- Avoid mounting near interference sources (motors, pumps, valves, transmitters etc.) and heat sources - excessive vibrations or pressure peaks can corrupt the measuring signal or damage the sensor.
- Mount pressure sensors with measuring range < 1 bar with the process connector pointing downwards because they are calibrated in this orientation.

Mounting the Pressure Sensor

- Clean the mounting hole.
- Remove the yellow protective cap from the sensor.
- Tighten the pressure sensor with approx. 35 Nm.
- Establish electrical connection.