PTS8082

SPECIAL PRESSURE TRANSMITTER

High Temperature Pressure Transmitter

FOR BIOTECHNOLOGY / FOOD-INDUSTRIES

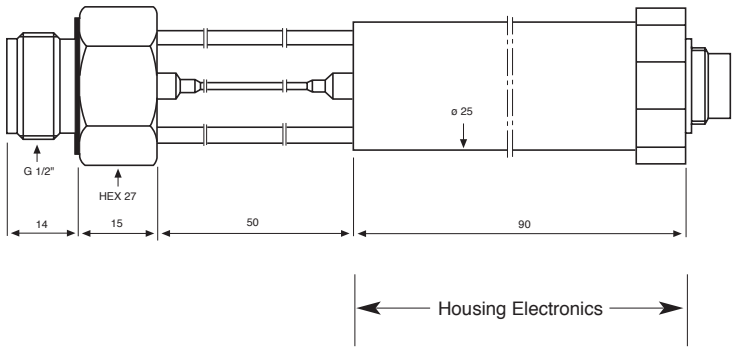
This piezoresistive high temperature transmitter is suited for media temperatures up to 300 °C. The pressure, acting onto the flush diaphragm, is transferred over an oil-filled capillary onto the silicon measuring cell. The capillary has the function of a cooling spiral, allowing media temperatures of up to 300°C. The temperature of the electronics may not exceed 120°C.
For highly aggressive media, and we offer pressure ports in different materials.

Digital Output of Transmitter

These Series are based on the stable, piezoresisitive transducer and a micro-processor electronics with integrated 16 bit A/D converter. Temperature dependencies and non-linearities of the sensor are mathematically compensated.

Transmitter with Analog Output

The micro-processor integrates a D/A converter of 16 bit for analog signal outputs of 4…20 mA or 0…10 V. The output rate is 100 Hz (adjustable). The digital output is available on all transmitters with analog output.



PIN ASSIGNMENT

Output	Function	Binder 723	DIN 43650	MIL C-26482
4…20 mA	OUT / GND	1	1	C
2 Wire	+Vcc	3	3	A
0…10 V	GND	1	1	C
3 Wire	OUT	2	2	B
	+Vcc	3	3	A

CE

Subject to alterations

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SPECIFICATIONS

Type	Standard Pressure Ranges (FS) and Overpressure in Bar					
PTS8082	3	10	30			
	3	10	30	100	300	1000
Overpressure	5	20	60	200	400	1100

All intermediate ranges for the analog output are realizable with no surcharge by spreading the standard ranges.

Option: Adjustment directly to intermediate ranges (below 20 pieces against surcharge).

	2 Wire (analog)	3 Wire (analog)
Output	**4…20 mA**	**0…10 V**
Supply (U)	8…28 Vcc	13…28 Vcc
Accuracy, Error Band [1] (20…300 °C) [2]	0,5 %FS	0,5 %FS

[1] Linearity + Hysteresis + Repeatability + Temp. Coeff. + Zero + Span Tolerance

[2] Media Temperature (temperature of electronics max. 120 °C)

Linearity (best straight line)	0,05 %FS
True Output Rate	100 Hz
Resolution	0,002 %FS
Long Term Stability typ.	0,2 %FS
Load Resistance (Ω)	<(U-7V) / 0,02A (2-wire) > 5'000 (3-wire)
Electrical Connection	- Binder-Plug 723 (5 pole) - DIN 43650 Plug (4 pole) - MIL C-26482-Plug (6 pole)
Insulation	> 10 MΩ / 50 V
Storage- / Operating Temperature Range	Media: 0…300 °C Electronics: 0…120 °C
Pressure Endurance	10 Million Pressure Cycles 0…100 %FS at 25 °C
Vibration Endurance, IEC 68-2-6	20 g (5...2000 Hz, max. amplitude ± 3 mm)
Shock Endurance	20 g (11 ms)
Protection	IP65 optional: IP 67
CE-Conformity	EN 61000-6-1 to -6-4
Material in Contact with Media	Stainless Steel 316L (DIN 1.4435) / Viton®
Weight	≈ 300 g
Dead Volume Change	< 0,1 mm³
Mounting	- Horizontal position (carrying-off of heat) - Cooling spiral exposed to room temperature

Options:
- Switch output, programmable via interface
- Special calculations with pressure and temperature
- Different housing-material, oil filling, pressure thread or connector

Polynomial Compensation

This uses a mathematical model to derive the precise pressure value (P) from the signals measured by the pressure sensor (S) and the temperature sensor (T). The microprocessor in the transmitter calculates P using the following polynomial:

$$P(S,T) = A(T)\cdot S^0 + B(T)\cdot S^1 + C(T)\cdot S^2 + D(T)\cdot S^3$$

With the following coefficients A(T)…D(T) depending on the temperature:

$$A(T) = A_0\cdot T^0 + A_1\cdot T^1 + A_2\cdot T^2 + A_3\cdot T^3$$
$$B(T) = B_0\cdot T^0 + B_1\cdot T^1 + B_2\cdot T^2 + B_3\cdot T^3$$
$$C(T) = C_0\cdot T^0 + C_1\cdot T^1 + C_2\cdot T^2 + C_3\cdot T^3$$
$$D(T) = D_0\cdot T^0 + D_1\cdot T^1 + D_2\cdot T^2 + D_3\cdot T^3$$

The transmitter is factory-tested at various levels of pressure and temperature. The corresponding measured values of S, together with the exact pressure and temperature values, allow the coefficients A0…D3 to be calculated. These are written into the EEPROM of the microprocessor.

When the pressure transmitter is in service, the microprocessor measures the signals (S) and (T), calculates the coefficients according to the temperature and produces the exact pressure value by solving the P(S,T) equation.

Calculations and conversions are performed at least 400 times per second.