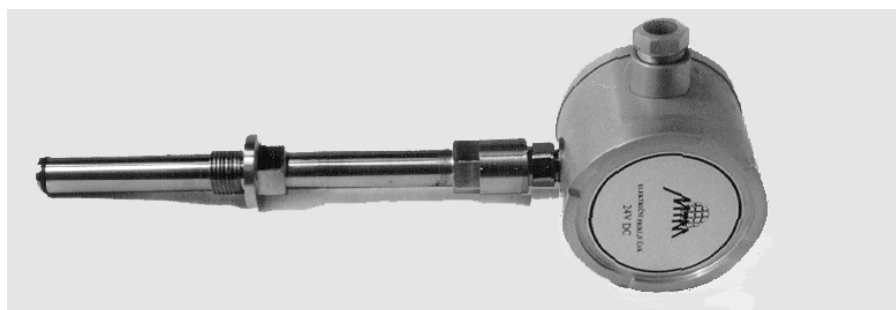


TEMPERATURE TRANSMITTER Process purpose version TPt-101



- Piezoresistive silicon pressure sensor developed and fabricated in MTM
- Ranges (-200°C , 0°C) to (0°C , 120°C).
- User-defined changes and adjustments of measurement range
- Standard outputs 4-20mA or 0-20mA
- Rugged process-purpose design
- Twin unit housing, dividing electric connections from amplifier
- High accuracy, repeatability, long term stability and reliability

APPLICATION

Measurement of of temperature in plants with standard process fluids..
Rugged process-purpose design, IP65 mechanical protection, stadardized process flanges, quality of material in contact with process fluid and excellent technical and measurement characteristics provide reliable application in control and measurement circuits under normal process conditions, with full compatibility with standard automatic regulation and control systems.

STRUCTURE

Central section consists from the stainless steel measurement chamber fabricated with several optional diameters and the pressure sensor chip structure welded to it, while the interior is filled with inert gas. Measurement chamber consists from the central section, the external housing tube with optional diameters and measurement

chamber mounts with the screw process flange connected by screws to the chamber housing. Central section is connected by a screw to the housing of the measurement chamber. The connection is made airtight by the use of Loctite glue.

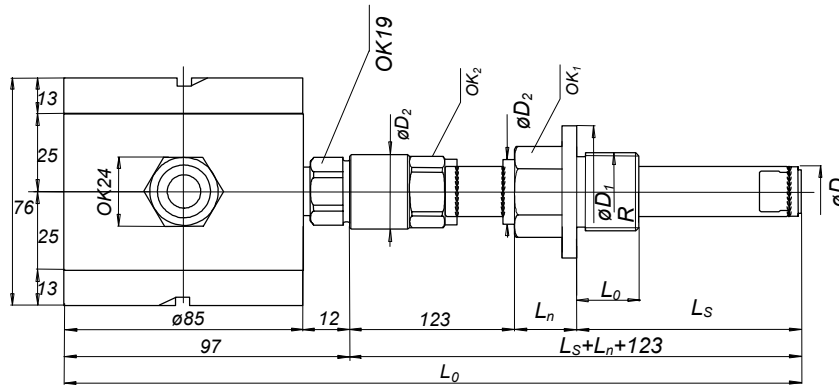
Electronic amplifier, fabricated in the surface mount technology, supplies sensors and converts its output signal into the standard electric signal. Two or three wire electrical connection at the transmitter output is intended simultaneously for supply and measurement. Zero and range potentiometers fitted in electronic amplifier provide output signal correction within the factory preset range.

OPERATION

The temperature of the measured fluid is conducted through the central section, causing changes of the measured pressure of the inert gas with constant volume and thus deflects the sensor diaphragm. The deflection causes an unbalance of the Wheatstone bridge (four piezoresistors integrated into the diaphragm edge). The bridge unbalance is detected electronically, the obtained signal is further processed in the electronic amplifier and finally sent to the transmitter output. The output signal is linearly dependent on measured fluid temperature.

CHARACTERISTICS

- Available ranges (-200... -100... 0), (-100... -50... 0), (-50... -25... 0), (-25... 0...+50), and (0...50...120)⁰C
- Two-wire (4-20)mA or three-wire (0-20mA) connection
- Electric output via screw terminals, through cable conduit PG-13,5.
- Zero suppression: 100% of range
- Elevation: standardly 20% of range
- The measurement range is manufacturer-preset, and the user may perform additional corrections during transmitter operation within the preset range.
- Materials: electronic unit housing Al.Cu5.Mg1.55, measurement chamber 316 Stainless Steel, measurement chamber housing Al.Cu5.Mg1.55 or 316 stainless steel, central section housing and process flange stainless steel with galvanic Zn or 316 Stainless Steel. Other materials upon request.
- Measurement chamber housing diameter Ø13.5, Ø17 ili Ø21.
- standard lengths of measurement chamber 80, 100, 160, 200, 250, 360 i 400.
- Process connection R1/2" or 1/2"NPT-M for Ø13.5, R3/4" or 3/4" NPT-M for Ø17 and R1" or 1"NPT-M for Ø21.
- Mechanical protection IP65



C	21	1"	41	32	32	27	27	32	C	112	132	192	232	282	392	432	C	364	384	444	484	534	644	684
B	17	3/4"	32	27	25	22	22	21	B	101	121	181	221	271	381	421	B	342	362	422	462	512	622	662
A	13.5	1/2"	27	22	25	17	17	16	A	96	116	176	216	266	376	416	A	332	353	412	452	502	612	652
Var.	D	R	D	OK	D	OK	D	L	Var.	80	100	160	200	250	360	400	Var.	80	100	160	200	250	360	400

L_s for standard lengths

TABLE 1: GENERAL AND OPERATING CONDITIONS

Parameter	Units	Reference conditions	Normal conditions	Limit conditions	Transport conditions
Ambient temperature	°C	20±1	-30 to +80	-40 to +80	-50 to +100
Chamber temperature	°C	-200 to 120	-200 to 120	-200 to 120	-50 to +100
Relative humidity	%	10 to 50	0 to 100	0 to 100	0 to 100
Vibration frequency	Hz			≤500	≤500
Vibration acceleration	9.81 m/s ²			≤2 ¹⁾	≤2 ¹⁾
Vibration amplitude	mm			≤0.21 ²⁾	≤0.21 ²⁾
Shock	9.81 m/s ²			≤100	≤100
Supply voltage	V	24±1	24±1	12 to 36	
Line resistance	Ω	600	600	0 to 1100	

¹⁾ Frequency range 60 to 500Hz; ²⁾ Frequency range 10 to 60Hz

Operating condition for measurement fluid:

- Temperature max. 120°C
- Pressure max. 50 bar
- Permitted gas flow velocity 9, 12 or 15 m/s for measurement probe diameters Ø13.5, Ø17 or Ø21, respectively.
- Water flow velocity 2, 2.5, 3.5 m/s for measurement probe diameters Ø13.5, Ø17 or Ø21, respectively.

MEASUREMENT CHARACTERISTICS

- In accordance with IEC 770/84
- Accuracy (linearity, hysteresis, repeatability), table 2; independent on measuring range.
- Additional effects for minimum (4mA) and maximum (20mA) signal:
 - Power supply effect $\pm 0.01\%$ FS/1V,
 - Line resistance effect, $\pm 0.01\%$ FS/100Ω.
 - Long term stability $\pm 0.2\%$ FS/1 year.

These effects are independent on measurement range.

- Effects of overtemperature and temperature of the ambient around the amplifier are dependent on measurement range. They are measured for each transmitter separately and the data are enclosed in the data sheets.

TABLE 2: MEASURING ACCURACY ($\pm\%$ FS)

Class	0.20	0.40	0.60	1.00
Linearity	0.10	0.30	0.40	0.60
Hysteresis	0.05	0.05	0.10	0.20
Repeatability	0.05	0.05	0.10	0.20