

PAIRED TEMPERATURE SENSORS TP 16, TP 16A



DESCRIPTION AND APPLICATION

These paired temperature sensors are used as component parts of the electrical heat-quantity meters. They are produced with the Pt 100, Pt 500 and Pt 1000 temperature sensing elements. Two-wire or four-wire circuits can be connected to the sensors (the inner circuit is always two-wire). The sensors are compatible with heat-quantity meters manufactured by SIEMENS, LANDIS+GYR, KAMSTRUP, ITRON, CODEA, COMAC CAL, SENSUS METERING and others. The sensors are designed for installation in thermowells. The standard operating temperature range is 0 to 180 °C or 0 to 150 °C.

The sensors are designed to operate in a chemically non-aggressive environment.

ACCESSORIES

- The thermowell JPT 16 or JPT 16A

DECLARATION, CERTIFICATES

The sensors are compliant with the requirements of the EN 60 751 and EN 1434 standards and have an EC-Type Examination Certificate No. TCM 321/07-4530.

EC Declaration of Conformity – the sensors are manufactured in conformity with the Directive of the European Parliament and of the Council 2004/22/EC on Measuring Instruments (so-called MID).



Type TP 16A ensures a fast response time to changes in temperature.

SPECIFICATIONS

BASIC DATA

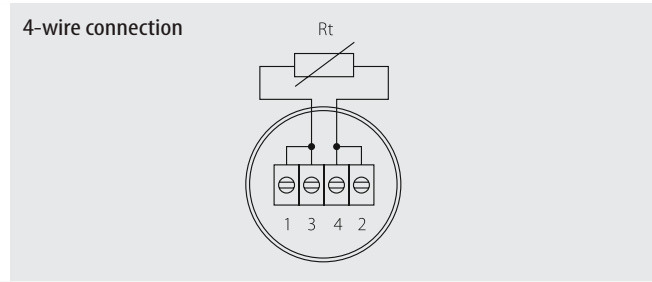
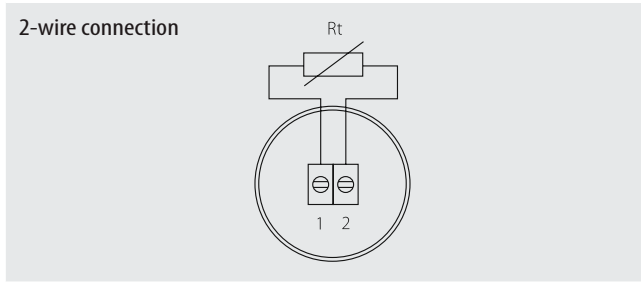
Type of sensing element	Pt 100, Pt 500, Pt 1000
Maximum measuring DC current	3 mA (Pt 100); 1.5 mA (Pt 500); 1 mA (Pt 1000)
Recommended measuring DC current	1 mA (Pt 100); 0.5 mA (Pt 500); 0.3 mA (Pt 1000)
Measuring range	0 to 180 °C or 0 to 150 °C
$\Delta\Theta_{min}$	2 °C or 3 °C
$\Delta\Theta_{max}$	180 °C or 150 °C
Accuracy class of individual sensors	B according to IEC 751
Sensor connection	according to the wiring diagram
Maximum overpressure of the thermowell	6.3 MPa

OTHER PARAMETERS

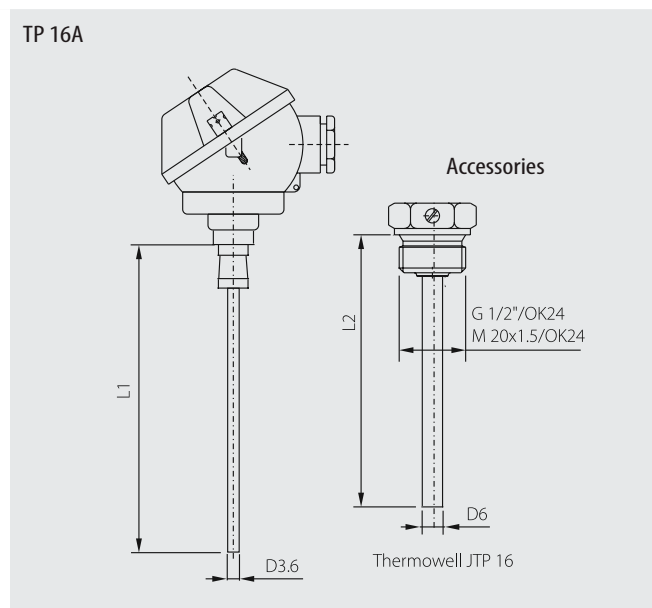
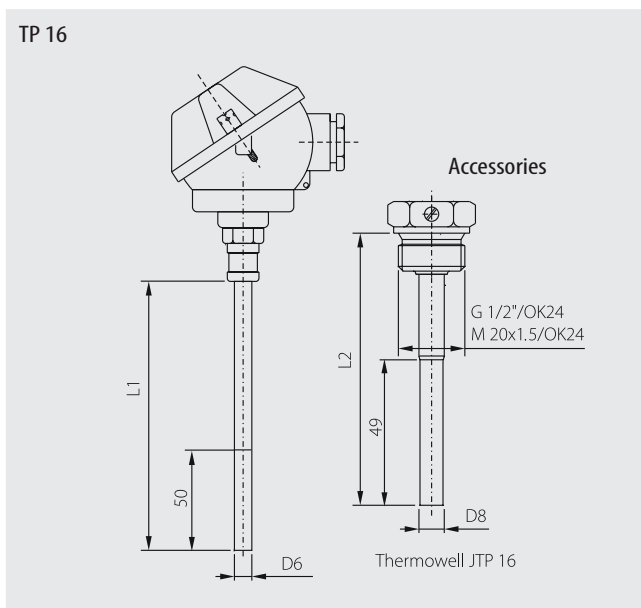
Length of the case	TP 16: 105, 140, 230 mm; TP 16A: 97, 133 mm
Diameter of the case	TP 16: 6 mm ± 0.1 mm; TP 16A: 3.6 mm ± 0.005 mm
Material of the case and of the thermowell	stainless steel 1.4301
Type of the connection head	LIMATHERM MA
Material of the connection head	aluminium alloy
Temperature stability of the connection head	-25 to 100 °C
Internal wiring resistance	TP 16: 0.013 Ω / 105 mm 0.017 Ω / 140 mm 0.027 Ω / 230 mm TP 16A: 0.03 Ω / 97 mm 0.04 Ω / 133 mm
Recommended wire cross section	0.35 to 1.5 mm ²
Ingress protection	IP 54 according to EN 60 529
Insulation resistance	> 100 MΩ at 100 V DC, 15 to 35 °C, humidity < 85 %
Response time	TP 16: $\tau_{0.5} < 5$ s (in streaming water at 0.4 m.s ⁻¹) TP 16A: $\tau_{0.5} < 3$ s (in streaming water at 0.4 m.s ⁻¹)
Lengths of thermowells	105, 140, 230 mm (TP 16); 88, 124 mm (TP 16A)
Thermowell thread	G ½", M 20 x 1.5

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WIRING DIAGRAM



DIMENSIONAL DRAFT



L1 Case length for TP 16	L2 thermowell length for JTP 16
105	105
140	140
230	230

L1 Case length for TP 16A	L2 thermowell length for JTP 16A
97	88
133	124

SENSOR INSTALLATION AND SERVICING

As a rule, the sensors are fitted with thermowells and installed in tubing in a skew position in an angle of 45° counter to the streaming of the media the temperature of which is to be measured. Before installing these paired temperature sensors place first the thermowells in locations where the temperature will be measured, and after that push in the sensors as far as the thermowell bottom. Secure the sensor by a screw located in the thermowell. The screw must be tightened to the endstop.

Before connecting the lead-in cable screw off the lid of the metal connection head. To secure the IP 54 ingress protection the cable grommet has to be tightened and the lid has to be screwed on after connecting the lead-in cable.

To prevent unauthorized manipulation the sensors are provided with sealing openings. The installation sealing wire has first to be pushed through the opening in the connection head, and then through the plumb opening in the thermowell. Then it has to be sealed not to allow to pull out the sensor out of the thermowell.

Finally the individual sensors are connected to the heat quantity meter.

Caution: Before installation check the identity of the paired sensors by means of the code quoted in the sensor's name plate (the numbers within one pair must be identical). Consult the producer in case the serial numbers are not identical.