

Temperature sensor suitable for measurement of machine and device outer surface, especially their bodies, blocks, etc. For the purpose of mounting the sensor only threaded hole and M4 screw is needed.

Specification

Temperature range / sensing element

-50÷400°C	Pt100	class B
-40÷400°C	K, J	class 2

Thermowell

- material: steel 1.4541
- diameter [mm]: 6
- length [mm]: 50
- 9 mm wire tip suitable for mounting to flat surfaces with M4 screw

Lead wire

- stranded Cu wire or thermocouple wire: 2x0,22mm²
- fiberglass insulation, metal overbraid
- length L_p [m]: 1,5 (standard)
- Cu wire resistance ~0,14 Ω/m = ~0,36°C

Other parameters acc. to requirements

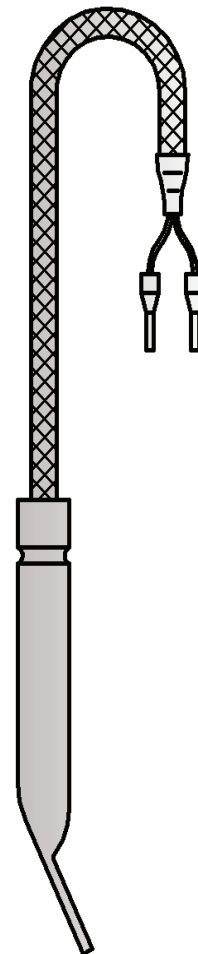
Options

Temperature transmitter application

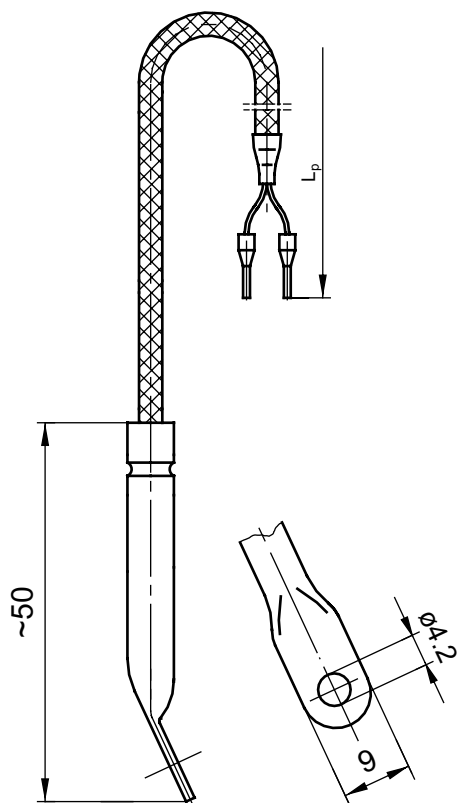
Temperature transmitter with standard 4÷20mA, 0÷10V output signals and with the HART or PROFIBUS communication protocols can be installed in the control cabinet.

Non-standard design

Immersion length, diameter and material of the sheath, and measuring insert parameters can be customized per client request.



Calibrations performed by Limatherm Sensor Sp. z o.o. are confirmed with the Calibration Certificate of the Accredited Laboratory for Temperature Measurements.



Compensation / thermocouple wire insulations

Insulation material	Operating temperature range [°C]	Properties
PCW (PCV)	-10÷105	Applied in mild environmental conditions. Waterproof and flexible.
Yc- polyvinyl chloride	-10÷105	Applied in mild environmental conditions. Waterproof and flexible.
FEP-teflon	-50÷200	Resistant to oils, acids and other aggressive liquids. Good flexibility.
Si-silicone	-50÷180	Waterproof, flexible. Applied in high humidity conditions.
Ws-fiberglass	-60÷400	Good resistance to high temperature Low resistance to liquid penetration.

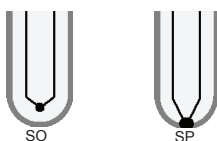
Notes: Additionally, copper or steel braids/shields are used on wires to prevent electrical noises, Increasing, at the same time, wire insulation resistance to mechanical damages. In case of longer wire lengths grounding may be needed to minimize the noise in measurement circuit

Tolerance for classes of sensors with resistors Pt acc. to PN-EN 60751

Sensor classes	Range of application [°C]	Formula for calculating acceptable deviations [°C]
AA	0÷150	$T = \pm(0,10 + 0,0017 t)$
A	-30÷300	$T = \pm(0,15 + 0,002 t)$
B	-50÷500	$T = \pm(0,3 + 0,005 t)$

|t|- absolute value of temperature

Thermocouple hot junction types



Measurement circuit

1 x Pt100			2 x Pt100			1 x TC	2 x TC
2-wire	3-wire	4-wire	2-wire	3-wire	4-wire	2-wire	2-wire
✓	✓	✓	x	x	x	✓	x

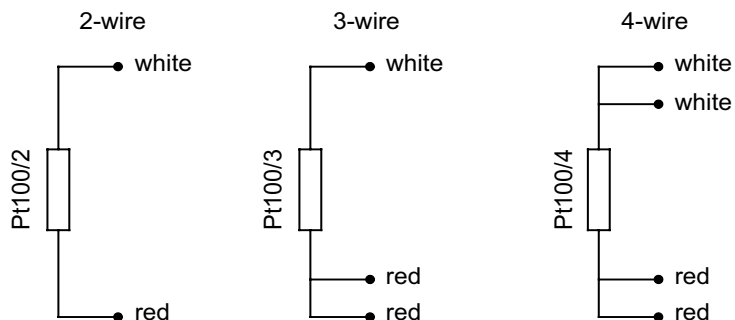
Tolerance for thermocouple classes acc. to PN-EN 60584

Thermocouple type	Class 1		Class 2	
	Range of application [°C]	Tolerance [°C]	Range of application [°C]	Tolerance [°C]
J Fe-CuNi	from -40 to +375 from +375 to +750	±1,5 ±0,004 t	from -40 to +333 from +333 to +750	±2,5 ±0,0075 t
K NiCr-NiAl	from -40 to +375 from +375 to +1000	±1,5 ±0,004 t	from -40 to +333 from +333 to +1200	±2,5 ±0,0075 t

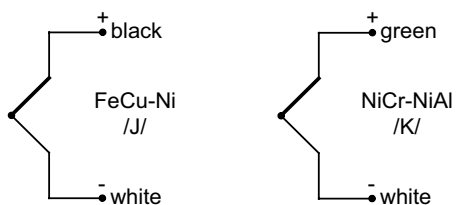
|t|- absolute value of temperature

Connection schemes

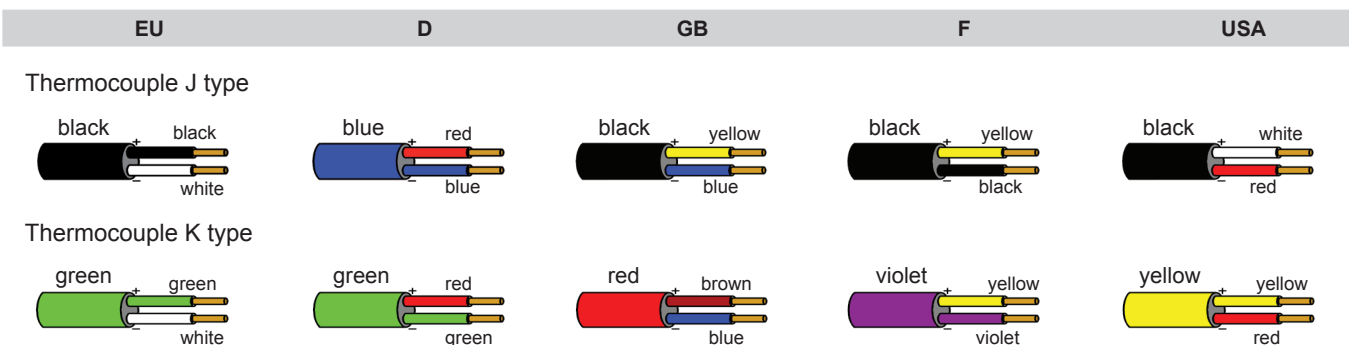
Pt100 (thermometric resistor)



TC (thermocouple)



Cable types and colours acc. to the norm



Product code

Sensing element		
	OP resistor Pt	
	ON resistor Ni	
1		TJ thermocouple Fe-CuNi /J/
		TK thermocouple NiCr-NiAl /K/
Resistor type		
2		Pt100 Pt100
		other parameters acc. to requirements
Accuracy		
3		A or B for measuring resistor
		1 or 2 for thermocouple

Measurement circuit for resistor or hot junction type for thermocouple		
2	2 - wire	
3	3 - wire	
4	4 - wire	
4	SO	insulated hot junction
	SP	grounded hot junction
Lead wire type		
5	Si	silicone
	Ws	fiberglass
Lead wire length		
6	1,5	1,5m
		other parameters acc. to requirements

1
2
3
4
5
6
T

E-6
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Ordering example:

TOPE-6-Pt500-B-2-Si-2 m RTD sensor with Pt500, class B, 2-wire connection, silicone insulated lead wire length $L_p=2$ m

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