

Temperature sensor in Alnico type magnet suitable for measurement of steel surfaces. Magnet application enables quick and easy installation of sensor on steel surface where temperature is to be measured.

Specification

Temperature range / sensing element

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

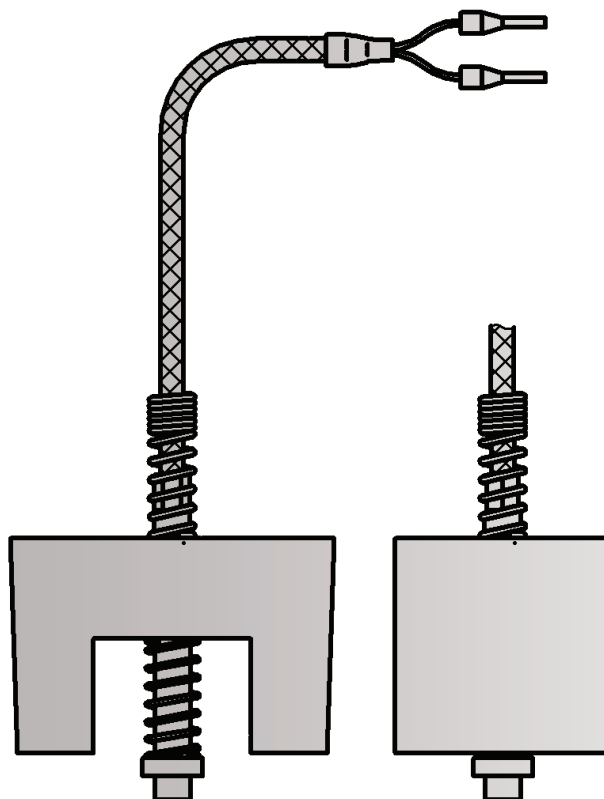
Sheath

- material: steel 1.4541
- mounting: Alnico magnet 22-36
- sensor sheath pressed with spring

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

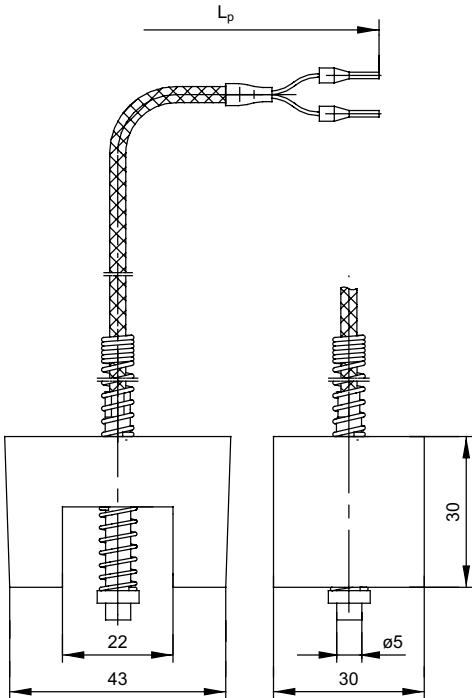
Temperature transmitter application

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.

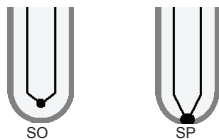
Notes: Additionally, copper or steel braids/shields are used on wires to prevent electrical noises, Increasing, at the same time, wire insulation resistance to mechanical damages. In case of longer wire lengths grounding may be needed to minimize the noise in measurement circuit

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

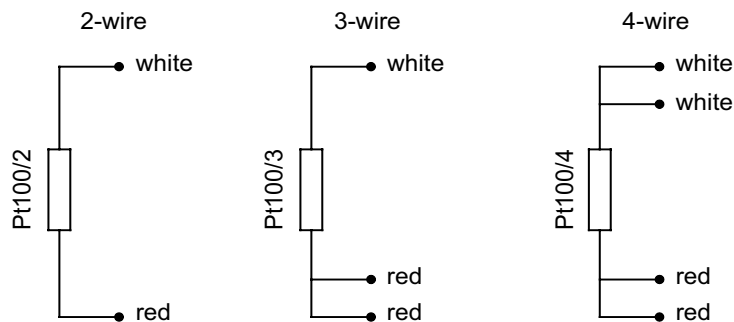
Tolerance for thermocouple classes acc. to PN-EN 60584

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

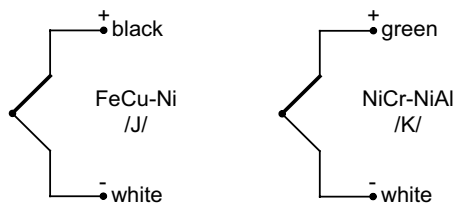
|t| - absolute value of temperature

Connection schemes

Pt100 (thermometric resistor)



TC (thermocouple)



Cable types and colours acc. to the norm

EU	D	GB	F	USA
Thermocouple J type				
Thermocouple K type				

Product code

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

		Measurement circuit for resistor or hot junction for thermocouple	
		2	2 - wire
		3	3 - wire
		4	4 - wire
4	<input type="text"/>	SO	insulated hot junction
		SP	grounded hot junction
		Lead wire length	
5	<input type="text"/>	1,5	1,5m
			other parameters acc. to requirements

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T

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AL-2

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Ordering example:

TOP-AL2-Pt100-A-3-1 m single sensor with Pt100, class A, 3-wire connection, lead wire length $L_p=1$ m