

Temperature sensor suitable for measurement of movable or replaceable parts of machines and devices, e.g. bearings or injection moulds. Equipped with bayonet fitting that enables quick and easy installation in the measured element. Furthermore, the sensor has a spring that protects the flexible cable. The cap of a bayonet fitting can be easily moved across the spring enabling the adjustment of sensor immersion length.

### Specification

#### Temperature range / sensing element

-50÷400°C	<b>Pt100</b>	class B
-40÷400°C	<b>K, J</b>	class 2

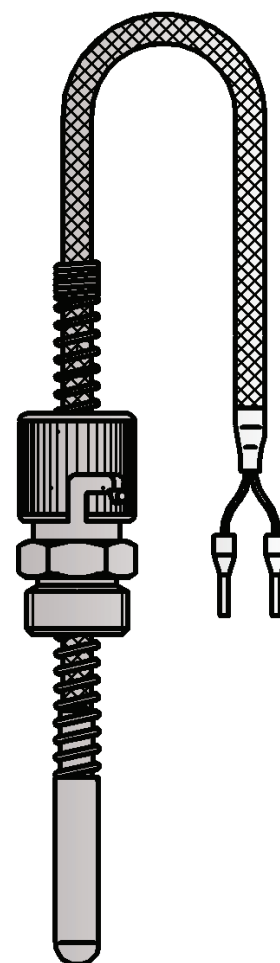
#### Sheath

- material: steel 1.4541
- diameter [mm]: 4; 5; 6
- length L [mm]: 0÷100
- spring diameter [mm]: 6
- tips: round, flat and tapered
- bayonet fitting with connector – nickel-plated brass
- standard length of sheath with round tip L[mm]: 32

#### Lead wire

- stranded Cu wire or stranded thermocouple wire: 2x0,22mm<sup>2</sup>
- fiberglass insulation, metal braid
- length L<sub>p</sub> [m]: 1,5 (standard)
- Cu wire resistance ~0,14 Ω/m = ~0,36°C

Other parameters acc. to requirements



### Options

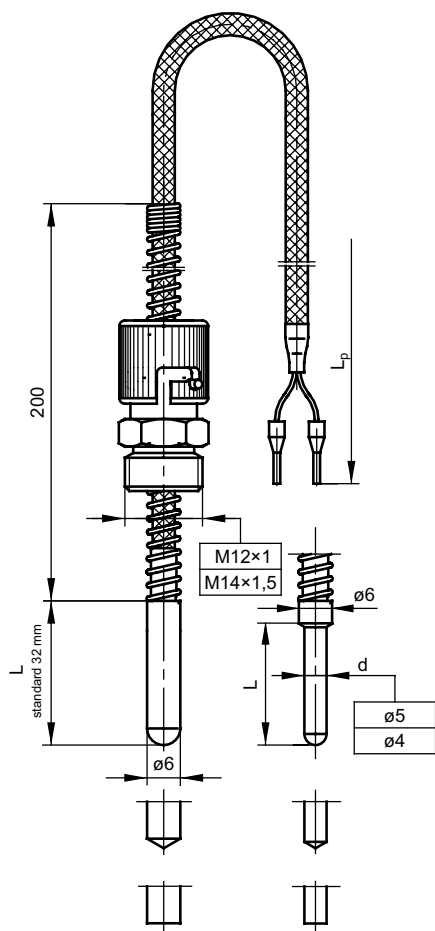
#### Temperature transmitter application

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.

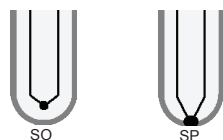
#### Non-standard design

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.**



Thermocouple hot junction types



### 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

### Measurement circuit

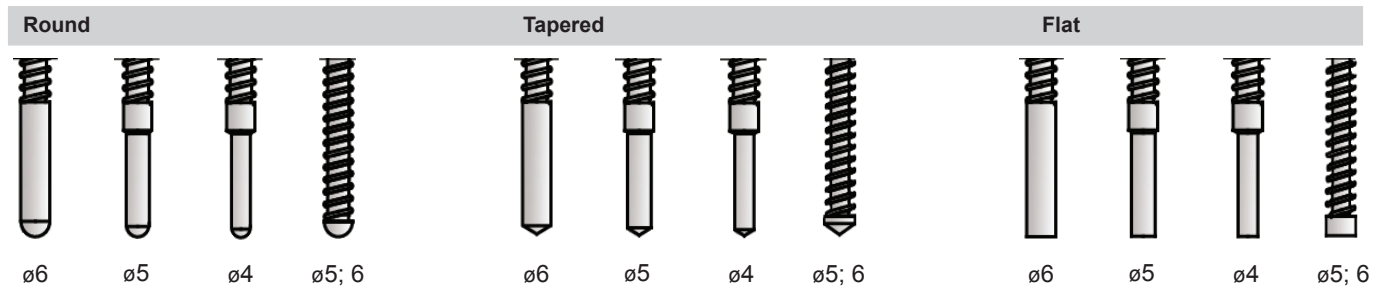
1 x Pt100			2 x Pt100			1 x TC	2 x TC
2-wire	3-wire	4-wire	2-wire	3-wire	4-wire	2-wire	2-wire
✓	✓	✓	x	x	x	✓	x

### 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]
<b>J</b> 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
<b>K</b> 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

**Types of measuring tips**

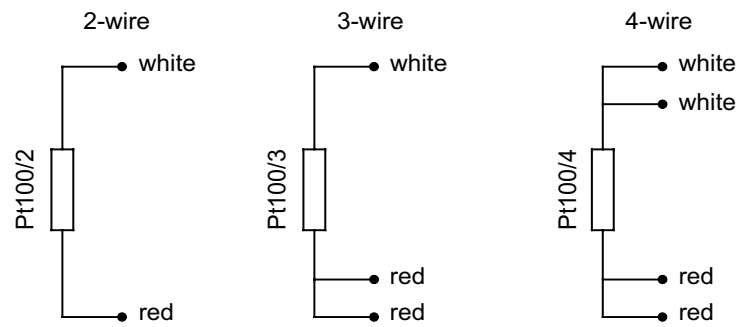


**Process connection type**

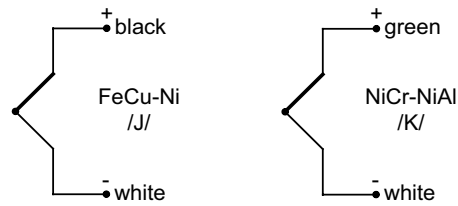


**Connection schemes**

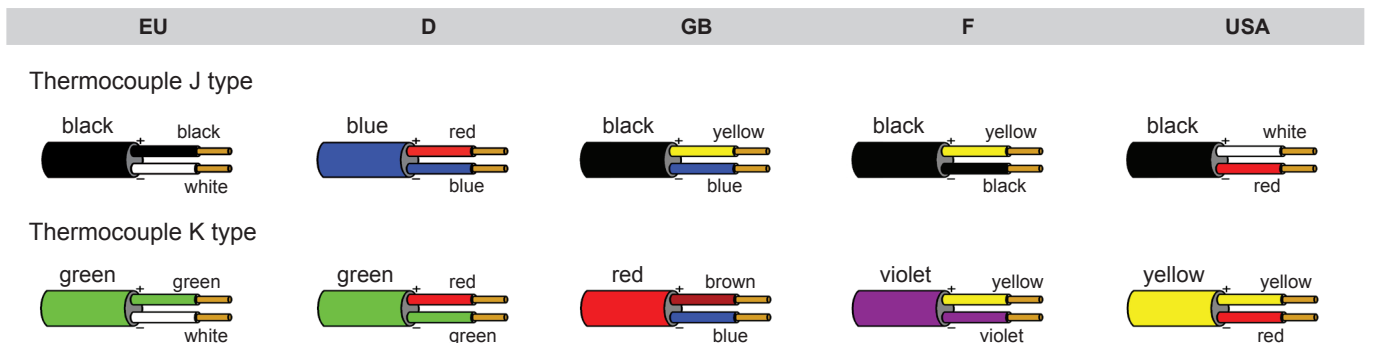
**Pt100 (thermometric resistor)**



**TC (thermocouple)**



**Cable types and colours acc. to the norm**



**Product code**

		<b>Sensing element</b>	
		<b>OP</b>	resistor Pt
		<b>TJ</b>	thermocouple Fe-CuNi /J/
1	<input style="width: 40px; height: 20px;" type="text"/>	<b>TK</b>	thermocouple NiCr-NiAl /K/
		<b>Measuring tip type</b>	
		<b>P</b>	flat
		<b>K</b>	round
2	<input style="width: 40px; height: 20px;" type="text"/>	<b>S</b>	tapered
		<b>Sheath length</b>	
		<b>32</b>	32mm
3	<input style="width: 40px; height: 20px;" type="text"/>		other parameters acc. to requirements
		<b>Sheath diameter</b>	
		<b>6</b>	ø6mm
4	<input style="width: 40px; height: 20px;" type="text"/>		other parameters acc. to requirements
		<b>Dimension of process connection thread</b>	
		<b>M12x1</b>	metric thread M12x1
5	<input style="width: 40px; height: 20px;" type="text"/>		other parameters acc. to requirements
		<b>Resistor type or hot junction type for thermocouple</b>	
		<b>Pt100</b>	Pt100/Pt500/Pt1000
		<b>SO</b>	insulated hot junction
6	<input style="width: 40px; height: 20px;" type="text"/>	<b>SP</b>	grounded hot junction
		<b>Accuracy</b>	
		<b>A or B</b>	for measuring resistor
7	<input style="width: 40px; height: 20px;" type="text"/>	<b>1 or 2</b>	for thermocouple
		<b>Measurement circuit (for resistor)</b>	
		<b>2</b>	2 - wire
		<b>3</b>	3 - wire
8	<input style="width: 40px; height: 20px;" type="text"/>	<b>4</b>	4 - wire
		<b>Lead wire length</b>	
		<b>1,5</b>	1,5m
9	<input style="width: 40px; height: 20px;" type="text"/>		other parameters acc. to requirements

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**Ordering example:**

**TOPE-26-S-32-6-G¼-Pt100-B-2-1,5 m** single sensor with Pt100, class B, 2-wire connection, sheath with tapered tip, length L=32mm and diameter 6mm with bayonet fitting and threaded connector G¼, lead wire with fiberglass insulation, metallic overbraid, length L<sub>p</sub>=1,5m