

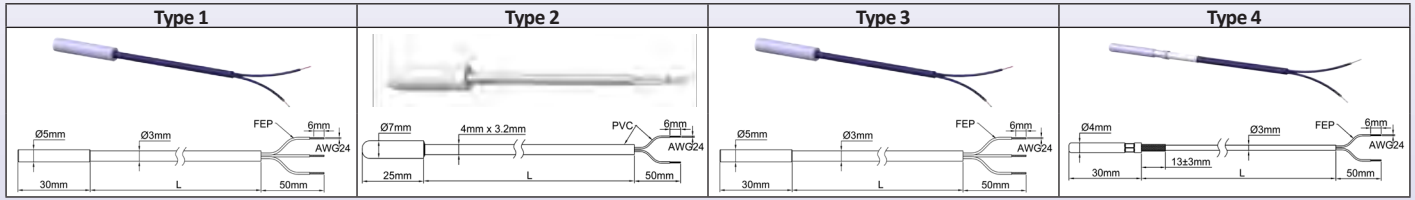
# Usual temperature sensors for applications with electronic temperature controls and control boxes

(Installation in thermo-wells, ambient or pipe surface mounting)



## NTC Thermistor

NTC thermistors (whose resistance decreases with temperature) are cheap and interchangeable. Their high resistance makes them insensitive to the resistance of the measuring line and thus a two-wires connection is allowed. Wiring is not polarized



References	Temperature ranges	R	B	Protection pocket	Cable, (L)	applications	Model
TNR60030C20001F6	-20+120°C	R25°C: 10KΩ +/- 1%	B25/50°C: 3380 +/-1%	Ni plated copper 6 x 30 mm	FEP L=2m	Common applications, ambient and up to 120°C, for controllers 273 and 2PE2N6 series	1
TNR70025P01501F6	-30+50°C	R25°C: 10KΩ +/- 1%	B25/50°C: 3380 +/-1%	PVC, sealed, 7 x 25mm	PVC 80°C, L=150 mm	Cold rooms and ambient, for controllers 273 and 2PE2N6 series	2
TNR70025P20001F6	-30+50°C	R25°C: 10KΩ +/- 1%	B25/50°C: 3380 +/-1%	PVC, sealed, 7 x 25mm	PVC 80°C L=2m	Cold rooms and ambient, for controllers 273 and 2PE2N6 series	2
TMR60030C20001F6	50-300°C	R100°C: 3.3K +/-2.5%	80/100°C : 3970 +/-2%	Stainless Steel, 6 x 30mm	FEP L=2m	200 and 300°C ranges, for controllers 273 series	3
TPR40030C20001F6	50-300°C	R25°C: 500K +/-2.5%	B25/50°C : 4260 +/-2%	Stainless Steel, 4 x 30mm	FEP L=2m	200 and 300°C ranges, for controllers 2PE2N6 series	4

## PT100

The resistivity of platinum has excellent repeatability and high accuracy over a wide temperature range. Its variation curve with temperature is much more linear than the thermocouple or thermistor curves. The low resistance of the probe requires the use of a three wire connection to measure and compensate for the resistance of the measuring line. The Pt100 sensor provides the highest accuracy in measuring low and medium temperatures.

**Temperature range:** -50 to 550°C (-60 to 1020°F) on the ceramic substrate, but temperature in use limited to 200 °C due to the FEP connecting cable

**Temperature curve:** EN 60751 (100 ohms @ 0°C, 138.5 Ohms @ 100°C)

**Accuracy and tolerances:** (according to EN 60751)

Class A, ±0.15°C @ 0°C; (±0.06 Ω @ 0°C)

Class B, ±0.3°C @ 0°C; (±0.12 Ω @ 0°C)

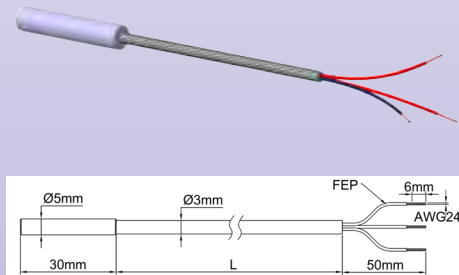
**Protection pocket:** Stainless Steel 304, dia. 5mm x 30 mm

**Temperature range:** -50°C, +200°C

**Connection cable:**

- 3 wires, 0.35 mm<sup>2</sup>, FEP insulation + silver-plated copper braid + FEP, temperature resistance 200°C, external diameter 2.7 mm (0.127").
- Ends: stripped

**Polarity:** The two red wires are connected together at their welded junction to one of the chips ceramic substrate terminal and the white wire is connected to the other terminal.



References	Class	Cable length	Applications
TSR50030I2000AK6	A	2000 mm	Remote sensing
TSR50030I2000BK6	B	2000 mm	Remote sensing
TSR50030I0070AK6	A	70 mm	Room temperature sensing
TSR50030I0070BK6	B	70 mm	Room temperature sensing
TSR50030I0150AK6	A	150 mm	Room temperature sensing
TSR50030I0150BK6	B	150 mm	Room temperature sensing

## K Thermocouple

A thermocouple is made of two different metal leads welded at their ends. When heated, the solder generates a potential difference proportional to the temperature. Thermocouples need special connection cables and a temperature compensation system.

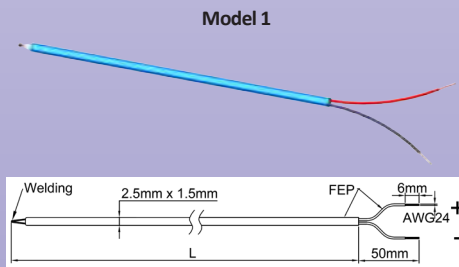
**Protection pocket:** Stainless Steel 304, dia. 6mm x 50 mm

**Temperature range:** 50°C, +200°C

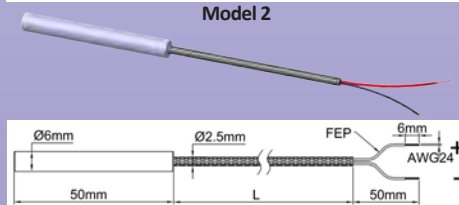
**Temperature curve:** according to EN 60584-1 and IEC 584-1

**Accuracy and tolerances:** Class 2 according to EN 60584-1 and 2, ±2.5°C within -40 °C and 333 °C

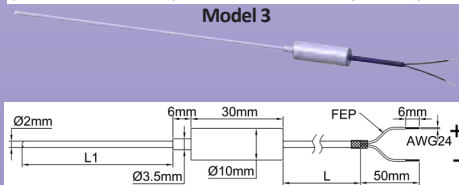
**Polarity (according to DIN 43714) :** red = positive, blue= negative



Model 1



Model 2



Model 3

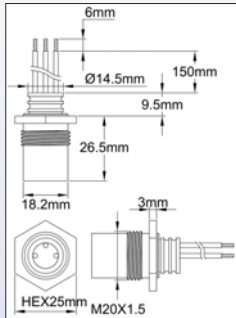
References	Protection pocket	Sensor temperature range	Connection cable	Model
TPR00060W02002F4	Bare solder	-50+200°C	2 leads 0.35mm <sup>2</sup> , FEP insulation 200°C L=200mm	1
TPR00060W05002F4	Bare solder	-50+200°C	2 leads 0.35mm <sup>2</sup> , FEP insulation 200°C L=500mm	1
TPR00060W10002F4	Bare solder	-50+200°C	2 leads 0.35mm <sup>2</sup> , FEP insulation 200°C L=1m	1
TPR00060W20002F4	Bare solder	-50+200°C	2 leads 0.35mm <sup>2</sup> , FEP insulation 200°C L=2m	1
TPR60050I10002E4	Stainless Steel dia 6mm x 50 mm	-50C, +200°C	2 leads 0.35mm <sup>2</sup> , external sleeve dia 2.7mm, Nickel plated metal braid, L=1m	2
TPR60050I20002E4	Stainless Steel dia 6mm x 50 mm	-50C, +200°C	2 leads 0.35mm <sup>2</sup> , external sleeve dia 2.7mm, Nickel plated metal braid, L=2m	2
TPR20200R20002E4	Sleeve sensor in refractory Stainless Steel, dia 2, L1=200mm	-40+800°C	2 leads 0.35mm <sup>2</sup> , external sleeve dia 2.7mm, Nickel plated metal braid, L2=1m	3
TPR20400I20002E4	Sleeve sensor in refractory Stainless Steel, dia 2, L1=400mm	-40+800°C	2 leads 0.35mm <sup>2</sup> , external sleeve dia 2.7mm, Nickel plated metal braid, L2=2m	3

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# Usual temperature sensors for applications with electronic temperature controls and control boxes

## Pt100 sensor with M20x1.5 front fitting



3 wires Pt100 sensor in an anodized aluminum bolt.

*For temperature control of a pipe surface:* to be screwed on the mounting stand. The length of the conductor outputs allows direct connection into the control box via the M20 rear outlets, if this component is mounted on the same stand;

*For ambient temperature control:* to be screwed from the inside on a M20x1.5 rear outlet.

**Connection:** AWG18 wires, FEP, 300V, 150 mm length.

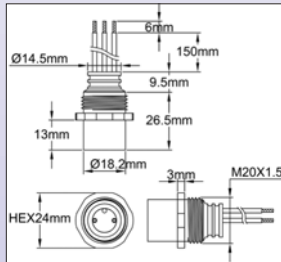
2 white AWG18 wires correspond to one pole of the Pt100, the blue wire to the other pole.

It is equipped with a tip (diameter 14 mm) to connect with the waterproof filling kit type G, if it is used at a greater distance from the box.

See assembling method on page 105.

Reference	TSJBA265A0150BT6
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## Pt100 sensor with M20x1.5 back fitting



3 wires Pt100 sensor in an anodized aluminum bolt.

*To measure the temperature outside of cabinet:* can be screwed directly to the rear outputs M20 thread or to the cable gland outlet board.

Can also be mounted on the insulation output plates, or directly through the sheet into a dia. 20 mm hole, tightened with a cable gland nut

**Connection:** AWG18 wires, FEP, 300V, 150 mm length.

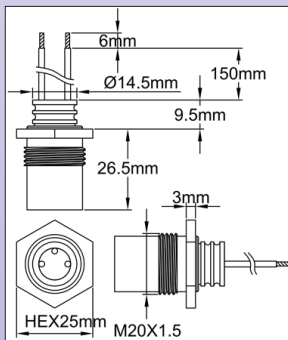
2 white AWG18 wires correspond to one pole of the Pt100, the blue wire to the other pole.

It is equipped with a tip (diameter 14 mm) to connect with the waterproof filling kit type G, if it is used at a greater distance from the box.

See assembling method on page 105.

Reference	TSJBA266A0150BT6
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## NTC thermistor with M20x1.5 front fitting



2 wires NTC in an anodized aluminum bolt

*For temperature control of a pipe surface:* to be screwed on the mounting stand. The length of the conductor outputs allows direct connection into the control box via the M20 rear outlets, if this component is mounted on the same stand;

*For ambient temperature control:* to be screwed from the inside on a M20x1.5 rear outlet.

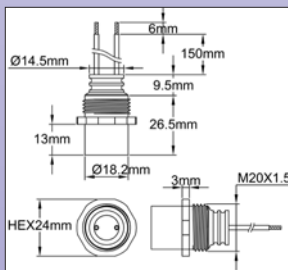
**Connection:** AWG18 white wires, FEP, 300V, 150 mm length.

Each lead wire corresponds to a pole of the NTC.

It is equipped with a tip (diameter 14 mm) to connect with the waterproof filling kit type G, if it is used at a greater distance from the box. See assembling method on page 105.

Reference	Value A	Value B
TNJBA265265A01501R6	10 Kohms @25°C	3380
TMJBA265265A01501R6	3.3 Kohms @100°C	3970
TPJBA265265A01501R6	500 Kohms @25°C	4260

## NTC thermistor with M20x1.5 back fitting



2 wires NTC in an anodized aluminum bolt

*To measure the temperature outside of cabinet:* can be screwed directly to the rear outputs M20 thread or to the cable gland outlet board.

Can also be mounted on the insulation output plates, or directly through the sheet into a dia. 20 mm hole, tightened with a cable gland nut

**Connection:** AWG18 white wires, FEP, 300V, 150 mm length.

Each lead wire corresponds to a pole of the NTC.

It is equipped with a tip (diameter 14 mm) to connect with the waterproof filling kit type G, if it is used at a greater distance from the box. See assembling method on page 105.

Reference	Value A	Value B
TNJBA266265A01501R6	10 Kohms @25°C	3380
TMJBA266265A01501R6	3.3 Kohms @100°C	3970
TPJBA266265A01501R6	500 Kohms @25°C	4260

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# Usual temperature sensors for applications with electronic temperature controls and control boxes

(Installation in thermo-wells, ambient or pipe surface mounting)



## Room temperature sensors with housing

The correct measurement of ambient temperature requires to install the sensor at a location representative of the average temperature of the room where it is located. We have developed a series of boxes incorporating temperature sensors, and allowing an effective measure of this temperature.

Inside these boxes, the sensor is thermally insulated from the wall on which it is installed, and mechanically protected by a black painted copper or nickel plated probe in order to eliminate measurement errors due to thermal conduction, while ensuring good durability. The housing is provided with retractable lateral mounting legs.

### Variants:

#### 2 types of housing

- 1: Black PC-ABS, IP65, side output by two M20 cable glands for industrial applications or outdoor installation.
- 2: Cream-colored PC-ABS rear output, IP20, for domestic applications or indoor installation.

#### 3 temperature measuring systems

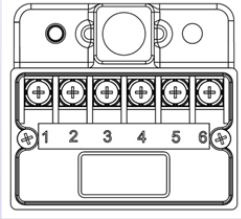
- 1: Measurement of the temperature of the ambient air flowing around the sensor and transmitted by conduction through the probe wall to the temperature sensor (This heat component called "convection")
- 2: Measurement of the temperature radiated mainly in the infrared, and transmitted to the temperature sensor by means of a "black body" that absorbs these radiations (This heat component called "radiation")
- 3 Measurement of both conduction and radiation.

#### 2 temperature measurement sensing elements

- 1: NTC (R25 10Kohms, B25/50 = 3380)
- 2: Pt100

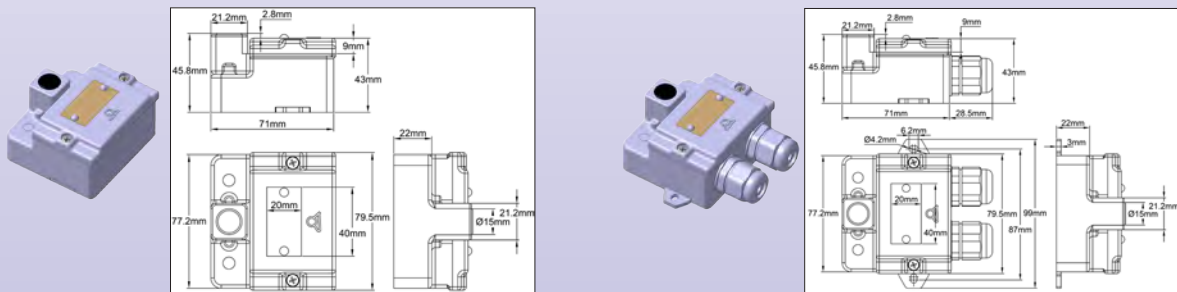
Other sensing elements such as Pt1000, Thermocouple J or E, Cu50 RTD, can be installed. Contact us.

**Internal connections :** built in terminal block , 2 to 6 screw terminals, 4 mm<sup>2</sup>



## « Convection » sensor

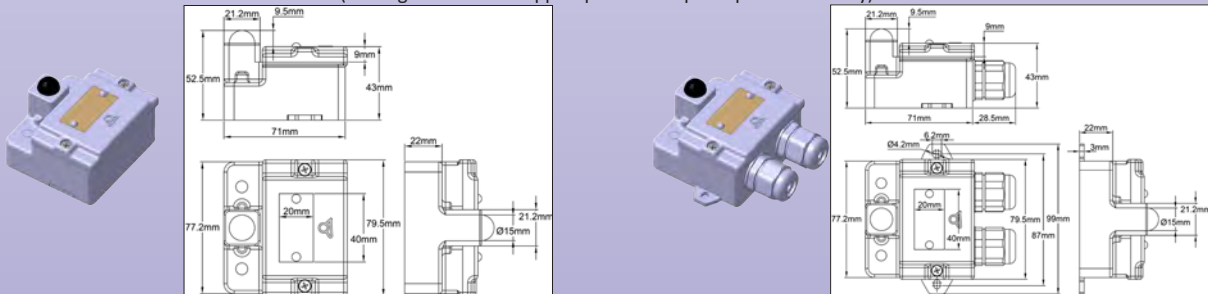
(Sensing element protected by nickel plated bracket)



References	Temperature sensor	Connection	Color
TSRC071077045ACB	Pt100	Backside	Cream, RAL1010
TSRC071077045ABP	Pt100	2 M20 cable glands	Black
TNRC0710770451CB	NTC	Backside	Cream, RAL1010
TNRC0710770451BP	NTC	2 M20 cable glands	Black

## « Radiation » sensor

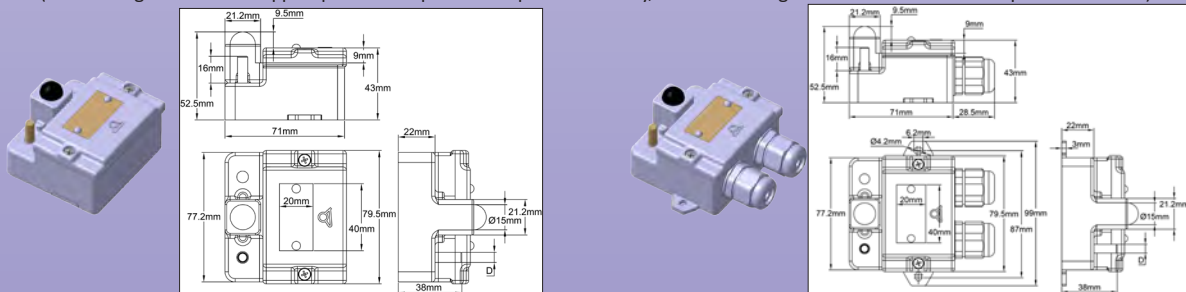
(Sensing element in a copper sphere with special paint black body)



References	Temperature sensor	Connection	Color
TSSR071077045ACB	Pt100	Backside	Cream, RAL1010
TSSR071077045ABP	Pt100	2 M20 cable glands	Black
TNRR0710770451CB	NTC	Backside	Cream, RAL1010
TNRR0710770451BP	NTC	2 M20 cable glands	Black

## Sensor « Convection + radiation »

(One sensing element in a copper sphere with special black paint black body, and one sensing element in a stainless steel pocket dia.6 mm)



References	Temperature sensor	Connection	Color
TSRM071077045ACB	2 x Pt100	Backside	Cream, RAL1010
TSRM071077045ABP	2 x Pt100	2 M20 cable glands	Black
TNRM0710770451CB	2 x NTC	Backside	Cream, RAL1010
TNRM0710770451BP	2 x NTC	2 M20 cable glands	Black

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