

TEMPERATURE PROBES – THERMOCOUPLES

Delta OHM offers a wide choice of K-type thermocouples, meeting the characteristics defined by the IEC 60584 standard.

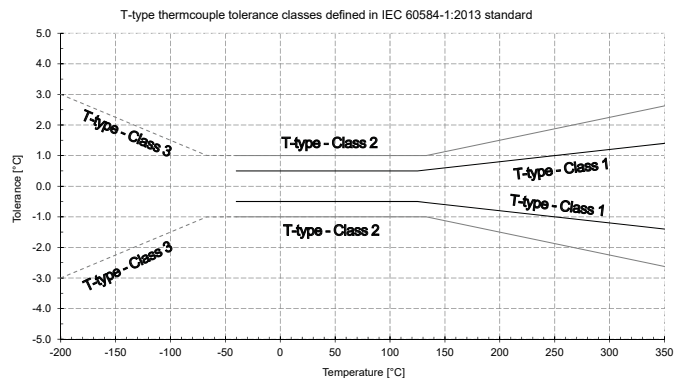
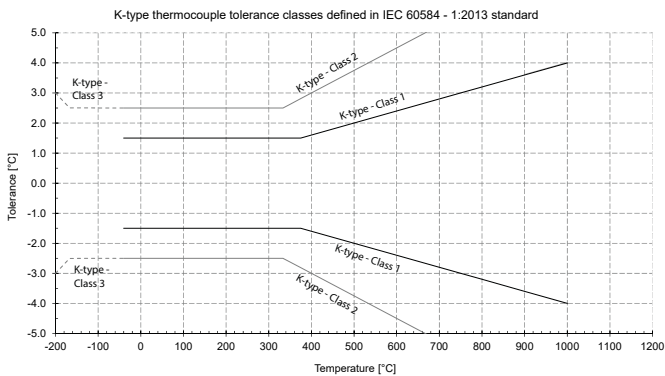
The response time $\tau_{0.63}$ indicated for each probe is the reaction time of the sensor to a temperature variation, with a variation of the measured signal corresponding to the 63% of the total variation. The response times are referred:

- in water at 100 °C for immersion probes;
- to the contact with a metal surface at 200 °C for surface probes;
- to an air temperature of 100 °C for air probes.

The IEC 60584-1:2013 standard defines the tolerance classes of the thermocouples as summarized in the following table:

| Thermocouple Type | Class 1 | | Class 2 | | Class 3 | |
|-------------------|------------------------|---------------------|------------------------|---------------------|------------------------|-------------------|
| | Tolerance ¹ | Temp. range | Tolerance ¹ | Temp. range | Tolerance ¹ | Temp. range |
| T | 0.5 °C or 0.004· t | -40 °C...+350 °C | 1 °C or 0.0075· t | -40 °C...+350 °C | 1 °C or 0.015· t | -200 °C...+40 °C |
| E | 1.5 °C or 0.004· t | -40 °C...+800 °C | 2.5 °C or 0.0075· t | -40 °C...+900 °C | 2.5 °C or 0.015· t | -200 °C...+40 °C |
| J | | -40 °C...+750 °C | | --- | --- | |
| K | | -40 °C...+1000 °C | | 2.5 °C or 0.015· t | -200 °C...+40 °C | |
| N | | -40 °C...+1000 °C | | --- | -200 °C...+40 °C | |
| R | 1 °C | 0 °C...+1100 °C | 1.5 °C or 0.0025· t | 0 °C...+1600 °C | --- | --- |
| S | [1+0.003·(t-1100)] | +1100 °C...+1600 °C | | 0 °C...+1700 °C | --- | --- |
| B | --- | --- | | +600 °C...+1700 °C | 4 °C or 0.005· t | 600 °C...+1700 °C |
| C | --- | --- | | +426 °C...+2315 °C | --- | --- |
| A | --- | --- | 0.01· t | +1000 °C...+2500 °C | --- | --- |

¹ Tolerance is expressed as a numerical value or as a function of temperature. The greater of the two values is valid



The elements that make up the thermocouple wires, with their respective polarity, are shown below.

| Thermocouple type | Alloy standard elements and composition | |
|-------------------|---|-------------------------|
| | Positive conductor | Negative conductor |
| R | Platinum – 13 % Rhodium | Platinum |
| S | Platinum – 10 % Rhodium | Platinum |
| B | Platinum – 30 % Rhodium | Platinum |
| J | Iron | Copper - Nickel |
| T | Copper | Copper - Nickel |
| E | Nickel - Chrome | Copper - Nickel |
| K | Nickel - Chrome | Nickel - Aluminium |
| N | Nickel - Chrome - Silicon | Nickel - Silicon |
| C | Tungsten - 5 % Rhenium | Tungsten - 26 % Rhenium |
| A | Tungsten - 5 % Rhenium | Tungsten - 20 % Rhenium |

By means of the calibration, the purchased instrument can be metrologically characterized, determining the systematic error of the thermometer and ensuring at the same time the traceability to international standards. Delta OHM Laboratories are able to provide this service by issuing calibration reports according to ISO 9001 or ACCREDIA LAT certificates in compliance with ISO/IEC 17025 standard, recognized internationally through ILAC MRA agreements.



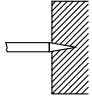
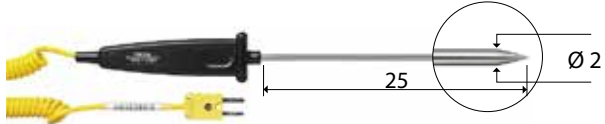
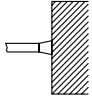

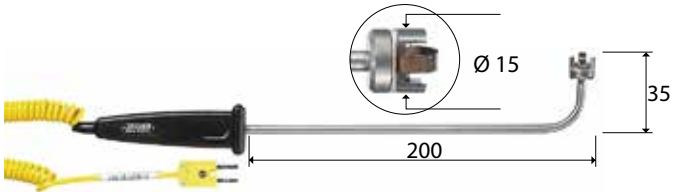
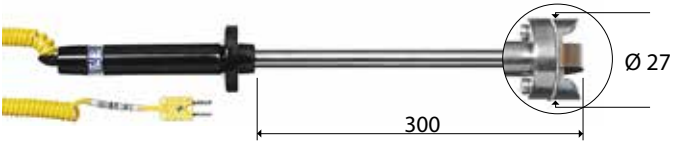
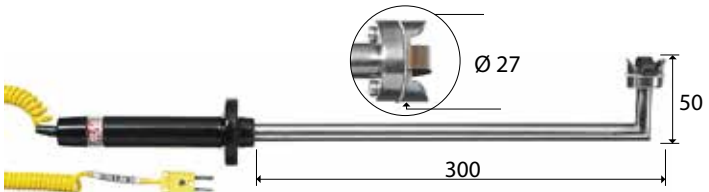

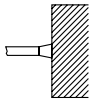
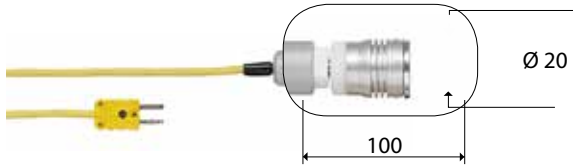
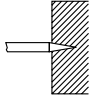
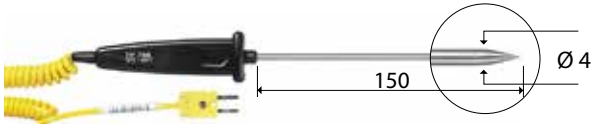
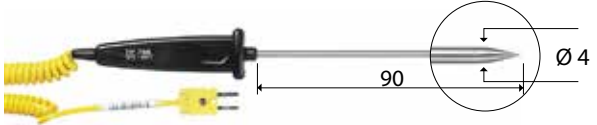
LAT N° 124

Temperature - Humidity - Pressure - Air speed
Photometry/Radiometry - Acoustics

"K" type THERMOCOUPLES - Chromel (Ni-Cr) / Almel (Ni-Al) - Class 1

| CODE | T _{max} (°C) | USE | τ _{0,63} | DIMENSIONS | |
|---------|-----------------------|-----|-------------------|------------|--|
| TP741 | +800 | | 2s | | |
| TP741/1 | +400 | | 2s | | |
| TP741/2 | +800 | | 2s | | |
| TP742 | +800 | | | 2s | |
| TP742/1 | +400 | | | 2s | |
| TP742/2 | +800 | | | 2s | |
| TP743 | +800 | 3s | | | |
| TP744 | +400 | | | 4s | |
| TP745 | +500 | | 5s | | |
| TP746 | +250 | | 2s | | |
| TP750 | +1000 | | 3s | | |
| TP750.0 | +800 | | 3s | | |


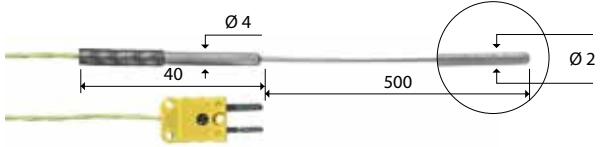
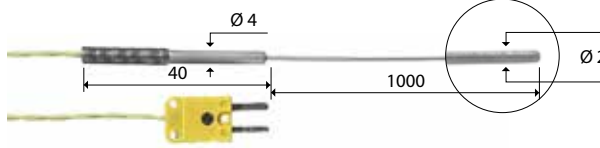

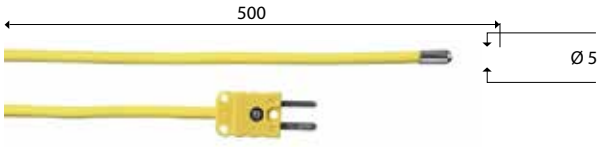
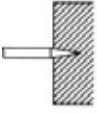
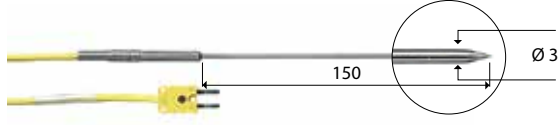
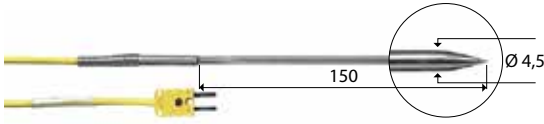


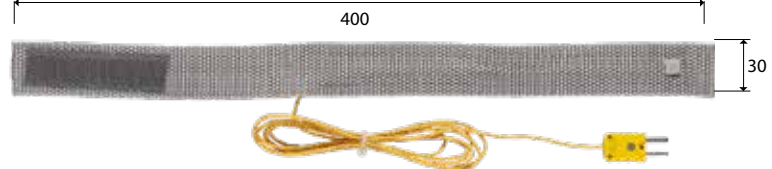

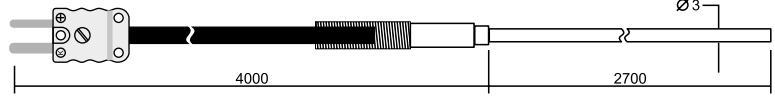
"K" type THERMOCOUPLES - Chromel (Ni-Cr) / Alumel (Ni-Al) - Class 1

| CODE | T _{max} (°C) | USE | τ _{0,63} | DIMENSIONS |
|---------|-----------------------|---|---|--|
| TP751 | +200 |  | 2s |  |
| TP754 | +500 |  | 2s |  |
| TP754/9 | +500 | | 2s |  |
| TP755 | +800 | | 2s |  |
| TP755/9 | +800 | | 2s |  |
| TP756 | +200 | |  | 2s |
| TP757 | +180 |  | 30s | Magnetic probe for contact measurements on magnetic metal surfaces  |
| TP758 | +400 |  | 4s |  |
| TP758.1 | +400 | | 4s |  |




"K" type THERMOCOUPLES - Chromel (Ni-Cr) / Almel (Ni-Al) - Class 1

| | | | | |
|----------|-------|--|----|-------------------------------|
| TP772 | +400 | | 3s | |
| TP774 | +250 | | 2s | |
| TP776 | +200 | | 2s | |
| TP777 | +200 | | 3s | |
| TP647 | +300 | | 2s | Fiberglass cable |
| TP647/2 | | | | 1m / 2m / 3m / 5m / 10m / 20m |
| TP647/3 | | | | |
| TP647/5 | | | | |
| TP647/10 | | | | |
| TP647/20 | | | | |
| TP651 | +1200 | | 6s | |
| TP652 | +1200 | | 6s | |
| TP655 | +180 | | 2s | |
| TP656 | +200 | | 1s | |

"K" type THERMOCOUPLES - Chromel (Ni-Cr) / Alumel (Ni-Al) - Class 1

| CODE | T _{max} (°C) | USE | τ _{0.63} | DIMENSIONS |
|---------|-----------------------|---|-------------------|---|
| TP656/1 | +1000 |  | 1s |  |
| TP656/2 | +1000 | | 1s |  |
| TP657/1 | +100 |  | 5s |  |
| TP659 | +400 |  | 3s |  |
| TP660 | +400 | | 4s |  |
| TP661 | +50 | | 30s |  |
| TP662 | +180 |  | 120s |  Strap probe with velcro for measurements on pipes with Ø max 110 mm |
| TP663 | +1050 |  | 3s |  |

THERMOCOUPLE CONNECTORS AND CABLES

| | | | |
|----------|-----|---|---|
| CM CS | "K" |  CS |  CM |
| PW | "K" |  Cable Length: 2m/5m/10m/15m/20m | |