EuroSensors

Temperature sensors with protection tube

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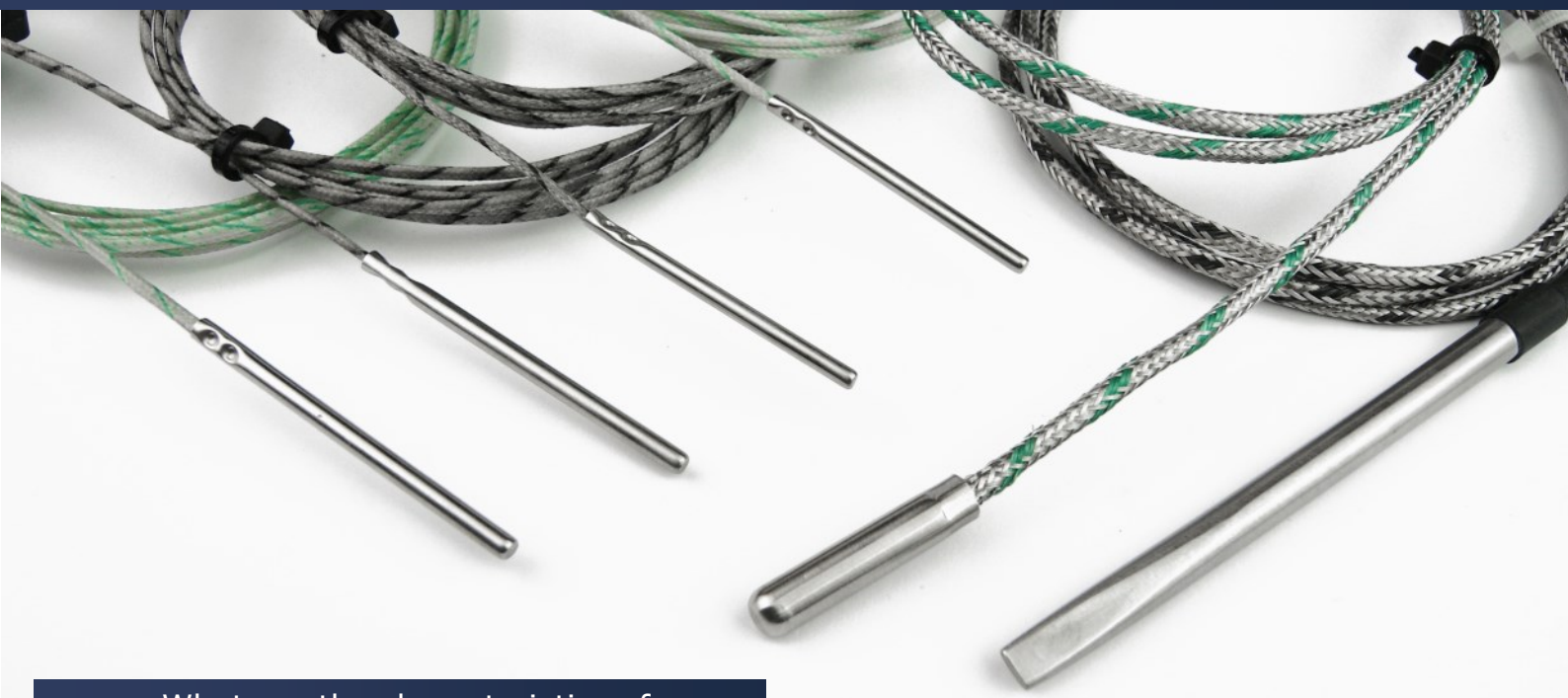
Thermocouples with protection tube - Technical information



What are the characteristics of thermocouples with protection tube ?

Protection tubes play a crucial role by providing a robust shield for the thermocouple sensor, safeguarding it from potential mechanical damage, corrosive substances, high-pressure environments, and other adverse conditions that may compromise its accuracy or integrity.

The primary purpose of the protection tube is to act as a physical barrier between the external environment and the delicate thermocouple sensor. It serves as a protective sheath, shielding the sensor from impacts, vibrations, abrasion, and other mechanical stresses that can occur during operation. This ensures the longevity and reliability of the thermocouple in rugged industrial settings.

See ***"Technical data - Protection tube"***.

Protection tube materials

For the production of tubes, stainless steel, copper and brass are often used. Due to its good characteristics such as corrosion resistance, strength (abrasion resistance) and good thermal conductivity, stainless steel (SS316) stands out as the most common material from which tubes are produced.

Tube materials:

- Stainless steel (SS316)
- Stainless steel (SS316L)
- Stainless steel (SS316Ti)
- Brass
- Aluminum
- Copper

Thermocouple classes

Classes of thermocouples have certain tolerance values and temperature limits of validity. The most common classes are **class 1** and **class 2**.
With **class 1** you get more precise measurement values while **class 2** provides a wider tolerance values.

Types of thermocouples

Thermocouples are adapted to specific applications depending on the temperature range to be measured, the accuracy required and the environment in which they will be used. They are differentiated by letters (Type K, J, N, T, etc.…) which correspond to the presence of materials that can measure a certain temperature range.
The most commonly used is the type K which is capable of measuring temperatures from -40°C to +1200°C. It is made from a chrome and an aluminum wire.

Note that connector colors vary by standard and country. Check the ***"International Color Codes applied to temperature measuring engineering"***.

Thermocouples with protection tube - Technical information

Types of thermocouple cables

For additional information about thermocouple cables see ***"Accessories - Cables".***

Fiberglass

Description: fiberglass/fiberglass/braid
Operating T°: -60°C/+400°C
Cross section shape: round

Shielded teflon

Description: teflon/shield/teflon
Operating T°: -190°C / +260°C
Cross section shape: round

Shielded PVC

Description: PVC/shield/PVC
Operating T°: -30°C / +105°C
Cross section shape: round

Silicone

Description: silicone/silicone
Operating T°: -60°C / +180°C
Cross section shape: round

Twisted teflon

Description: twisted teflon
Operating T°: -190°C / +260°C
Cross section shape: twisted

Flat teflon

Description: teflon/teflon
Operating T°: -190°C / +260°C
Cross section shape: flat

Flat fiberglass

Description: fiberglass/fiberglass
Operating T°: -60°C / +400°C
Cross section shape: flat

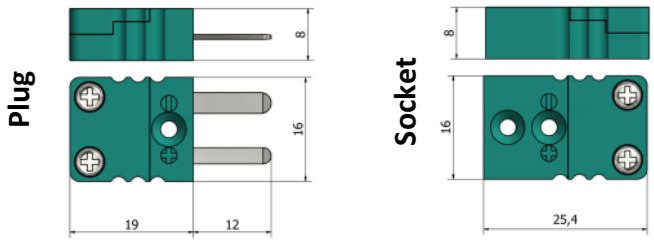
Types of connectors

Thermocouple connectors plugs and sockets are available in two sizes (miniature and standard).

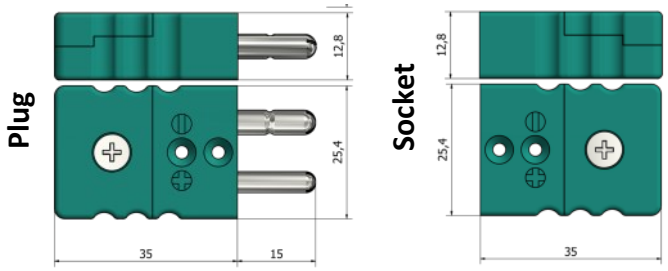
Miniature thermocouple connectors are smaller and have flat pins, these are usually found on small diameter thermocouples or fitted to the end of cables for connection to hand held and panel instruments.

Standard connectors have larger round pins and tend to be used for more industrial applications.

Miniature connector



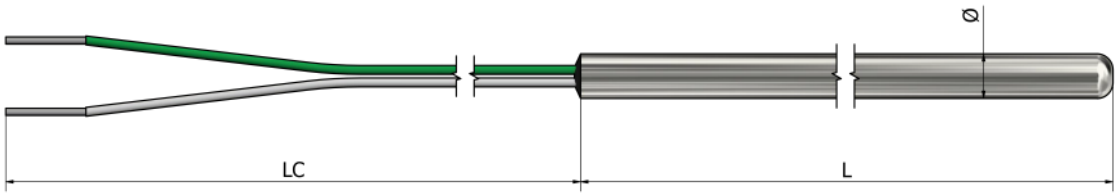
Standard connector



Global cable insulation characteristics

	PVC	Silicone	Teflon	Fiberglass
Abrasion resistance	Very good	Fair	Good	Fair
Chemical resistance	Very good	Poor	Excellent	Good
Moisture resistance	Good	Good	Excellent	Poor
Fire resistance	Good	Good	Excellent	Excellent

TT00 – Thermocouples with protection tube
Free leads



Ordering information

1. Thermocouple:

☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:

☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Free leads length LC (mm):

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

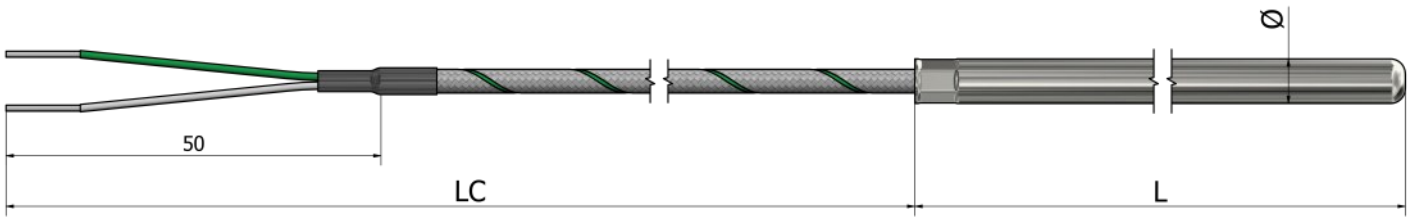
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT10 – Thermocouples with protection tube
Standard tube



Ordering information

1. Thermocouple:

☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:

☐ Class 1 ☐ Class 2

3. Tube dimensions: *(material **Stainless steel 316L**)*

☐ Ø3 x 50 mm ☐ Ø4 x 40 mm ☐ Ø5 x 50 mm
☐ Ø6 x 50 mm ☐ Other:

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

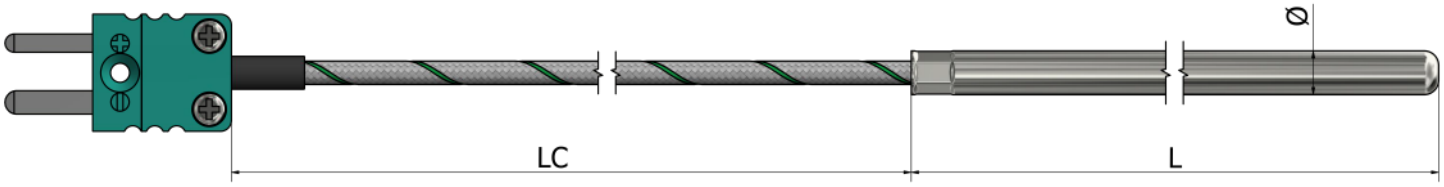
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT11 – Thermocouples with protection tube
Standard tube with connector



Ordering information

1. Thermocouple:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:
☐ Class 1 ☐ Class 2

3. Tube dimensions: *(material **Stainless steel 316L**)*
☐ Ø3 x 50 mm ☐ Ø4 x 40 mm ☐ Ø5 x 50 mm
☐ Ø6 x 50 mm ☐ Other:

4. Cable prolongation:
☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:
☐ Spring ☐ Heat shrink sleeve ☐ Without

7. Connector:
☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket

8. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

9. Option:
☐ Cable clamp ☐ Custom ID label ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

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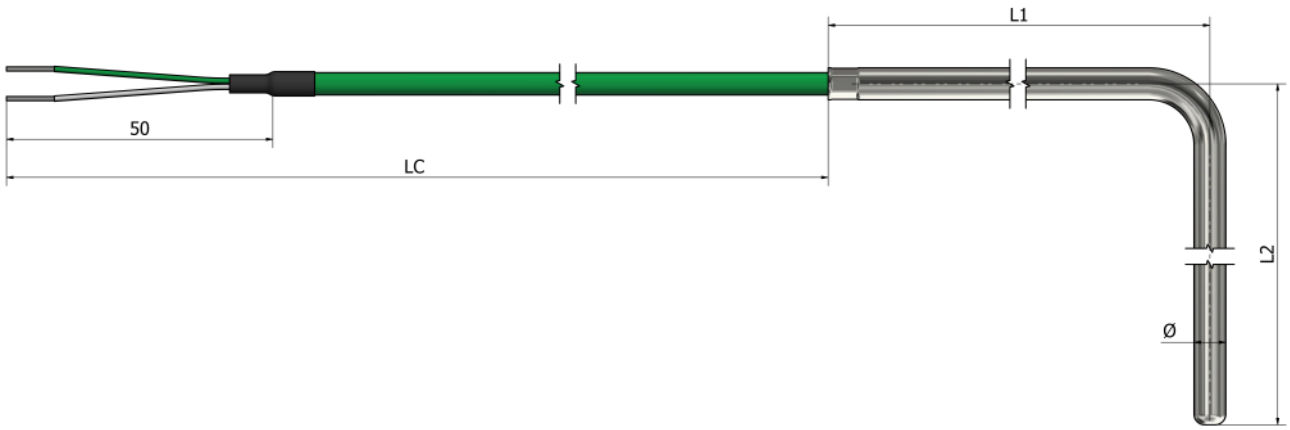
TT12 – Thermocouples with protection tube
Standard tube (90° bend)



Ordering information

1. Thermocouple:

☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:

☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L1 _____ L2 _____ Ø _____

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

7. Connector:

☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket ☐ Without

8. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

9. Option:

☐ Cable clamp ☐ Custom ID label ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT20 – Thermocouples with protection tube
Pot seal

Ordering information

1. Thermocouple:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:
☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*
L _____ Ø _____

4. Cable prolongation:
☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:
☐ Spring ☐ Heat shrink sleeve ☐ Without

7. Connector:
☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket ☐ Without

8. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

9. Option:
☐ Cable clamp ☐ Custom ID label ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

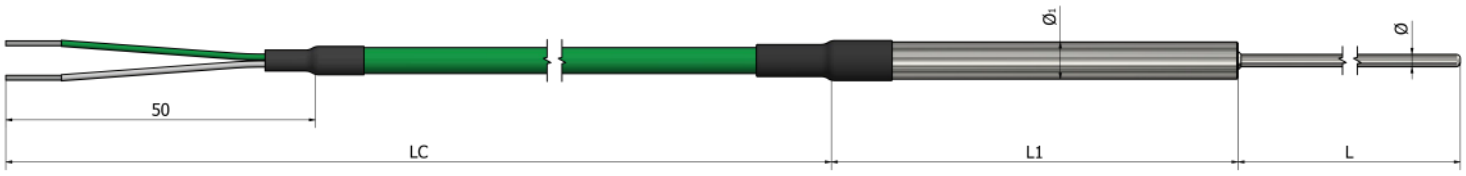
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT21 – Thermocouples with protection tube
Pot seal with reduced tip



Ordering information

1. Thermocouple:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:
☐ Class 1 ☐ Class 2

3. Tube dimensions L and Ø (mm): *(material **Stainless steel 316L**)*
L _____ Ø _____

4. Tube dimensions L1 and Ø1 (mm): *(material **Stainless steel 316L**)*
L1 _____ Ø1 _____

5. Cable prolongation:
☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

6. Cable length LC (mm):

7. Crimp protection:
☐ Spring ☐ Heat shrink sleeve ☐ Without

8. Connector:
☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket ☐ Without

9. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

10. Option:
☐ Cable clamp ☐ Custom ID label ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

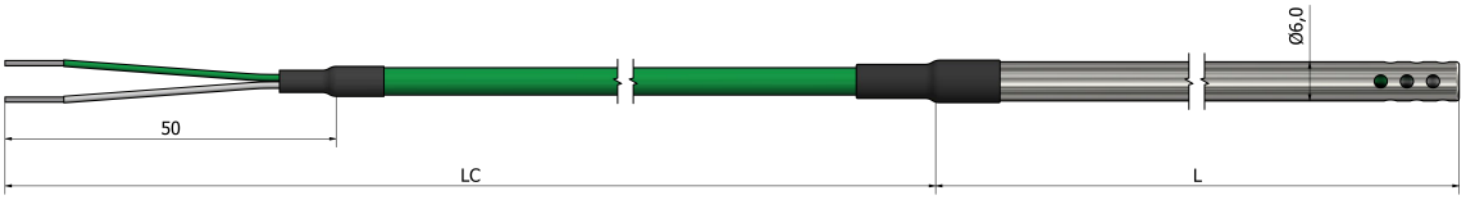
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT25 – Thermocouples with protection tube
Open air



*Tube material **Stainless steel 316L***

Ordering information

1. Thermocouple:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:
☐ Class 1 ☐ Class 2

3. Tube length L (mm):

4. Cable prolongation:
☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:
☐ Spring ☐ Heat shrink sleeve ☐ Without

7. Connector:
☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket ☐ Without

8. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

9. Option:
☐ Cable clamp ☐ Custom ID label ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

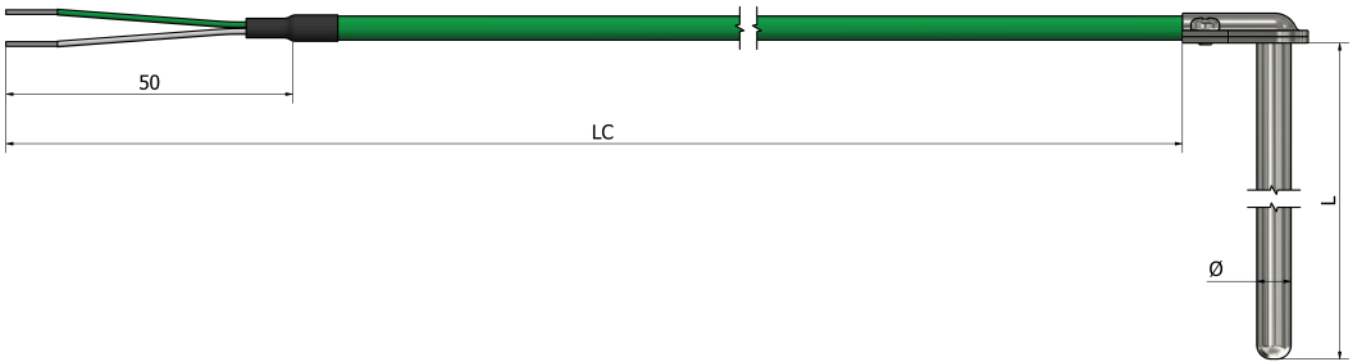
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT30 – Thermocouples with protection tube
Plug-in (clamp)



Ordering information

1. Thermocouple:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:
☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*
L _____ Ø _____

4. Cable prolongation:
☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:
☐ Spring ☐ Heat shrink sleeve ☐ Without

7. Connector:
☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket ☐ Without

8. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

9. Option:
☐ Cable clamp ☐ Custom ID label ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

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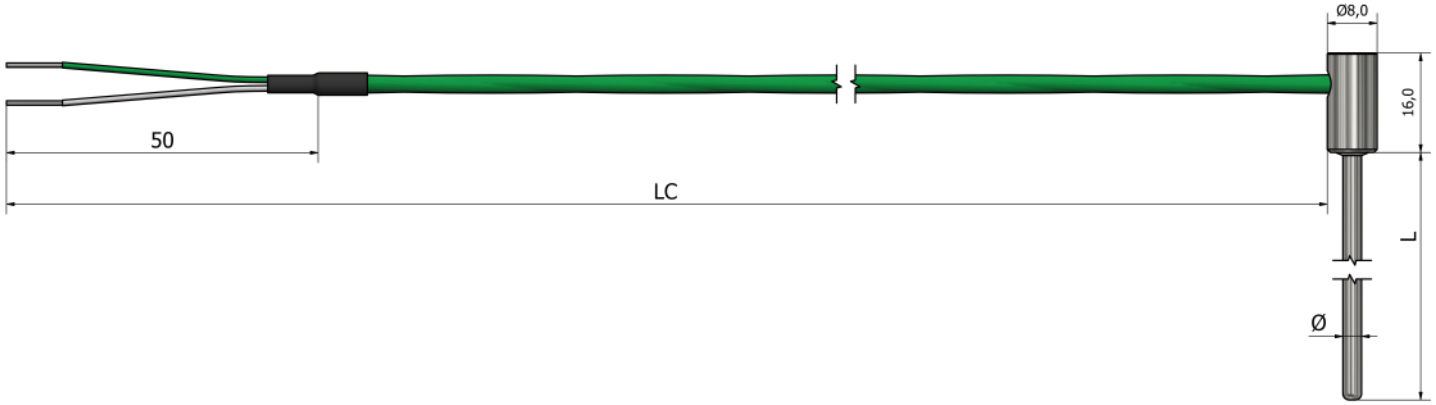
TT35 – Thermocouples with protection tube
Plug-in (miniature)



Ordering information

1. Thermocouple:

☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:

☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Connector:

☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket ☐ Without

7. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

8. Option:

☐ Cable clamp ☐ Custom ID label ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

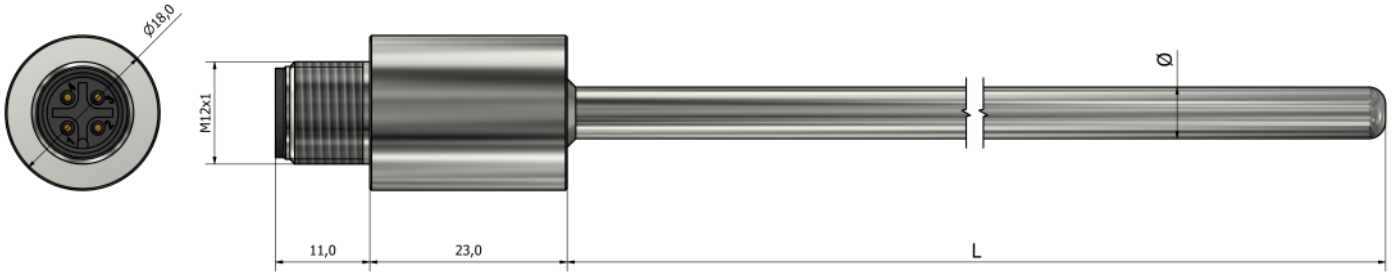
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT40 – Thermocouples with protection tube
Integrated M12 connector



Ordering information

1. Thermocouple:

☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:

☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

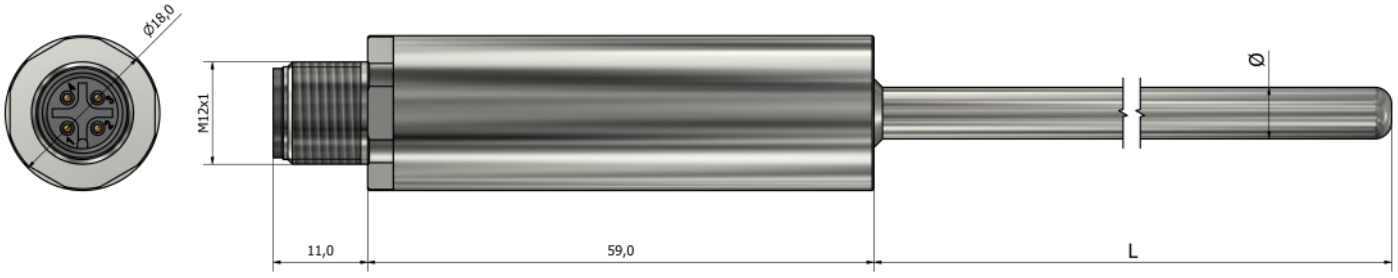
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT41 – Thermocouples with protection tube
Integrated M12 connector with transmitter



Ordering information

1. Thermocouple:

☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:

☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Transmitter (°C):
Specify temperature range

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

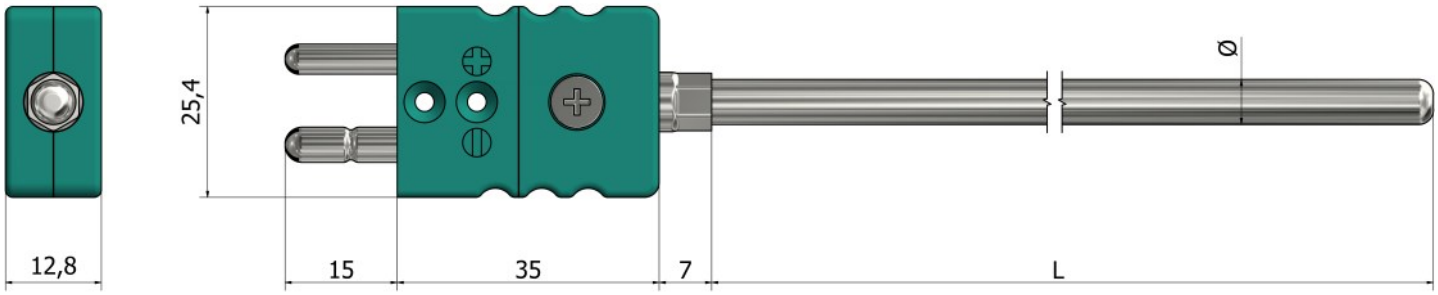
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT45 – Thermocouples with protection tube
TC connector



Ordering information

1. Thermocouple:

☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:

☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Connector:

☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket ☐ Without

5. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

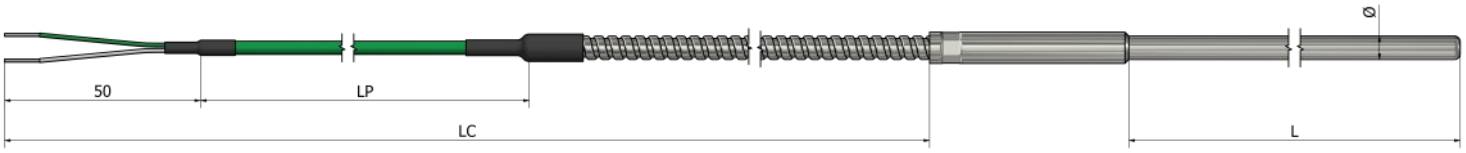
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT50 – Thermocouples with protection tube
Armored cable prolongation



Armored cable material* ***Stainless steel 304*

Ordering information

1. Thermocouple:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:
☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*
L _____ Ø _____

4. Cable prolongation:
☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Bare cable length LP (mm):

7. Crimp protection:
☐ Spring ☐ Heat shrink sleeve ☐ Without

8. Connector:
☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket ☐ Without

9. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

10. Option:
☐ Cable clamp ☐ Custom ID label ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

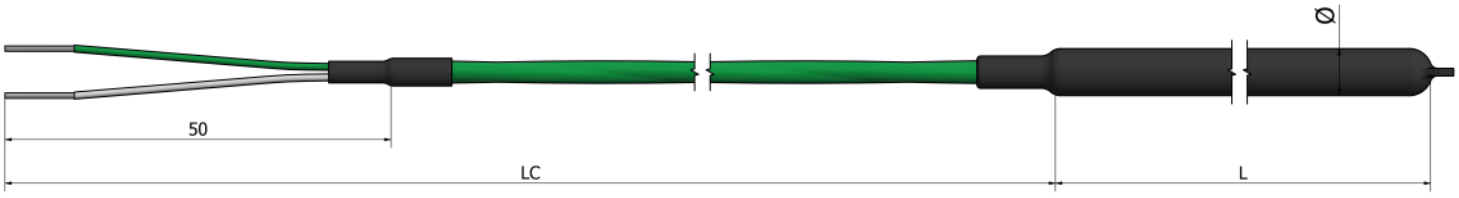
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

TT60 – Thermocouples with protection tube
For aggressive environments (with PTFE protection up to 250°C)



Protection material **PTFE*

Ordering information

1. Thermocouple:

☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E
☐ Type R ☐ Type S ☐ Type B ☐ Other:

2. Class:

☐ Class 1 ☐ Class 2

3. Tube dimensions (mm): *(material **SS 316L** with **PTFE** protection)*

L _____ Ø _____

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Connector:

☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket ☐ Without

7. Connector temperature: ☐ 200°C ☐ 350°C ☐ 650°C

8. Option:

☐ Cable clamp ☐ Custom ID label ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

EuroSensors

RTDs with protection tube

EuroSensors

RTDs with protection tube - Technical information

What are the characteristics of RTDs with protection tube ?

Protection tubes play a crucial role by providing a robust shield for the RTD sensor, safeguarding it from potential mechanical damage, corrosive substances, high-pressure environments, and other adverse conditions that may compromise its accuracy or integrity. The primary purpose of the protection tube is to act as a physical barrier between the external environment and the delicate RTD sensor. It serves as a protective sheath, shielding the sensor from impacts, vibrations, abrasion, and other mechanical stresses that can occur during operation. This ensures the longevity and reliability of the sensors in rugged industrial settings.
We have several sizes and types of tubes.
See ***"Technical data -***

Protection tube materials

For the production of tubes, stainless steel, copper and brass are often used. Due to its good characteristics such as corrosion resistance, strength (abrasion resistance) and good thermal conductivity, stainless steel (SS316) stands out as the most common material from which tubes are produced.

Tube materials:

- Stainless steel (SS316)
- Stainless steel (SS316L)
- Stainless steel (SS316Ti)
- Brass
- Aluminum
- Copper

What is an RTD sensor ?

An RTD (Resistance Temperature Detector) is a type of sensor used to measure temperature. RTDs are used for accurate, stable and reliable temperature measurements in generally high temperature ranges.

RTDs advantages

RTDs have several advantages over other types of temperature sensors:

High precision

RTDs have high temperature sensitivity, typically in the range of 0.1 to 0.2% per °C, allowing for accurate temperature measurement.

Long term stability

RTDs have long-term stability and longer life than thermistors, making them more reliable for long-term applications.

Wide operating temperature range

RTDs can operate in a temperature range of -200 to +850°C, making them suitable for many industrial applications.

Low ohmic resistance

RTDs have a low ohmic resistance compared to thermistors, which makes them easier to use with electronic circuits.

How does an RTD work ?

An RTD (variable temperature resistor) is a sensor that measures temperature using the variation of the electrical resistance of a conductive material. RTDs are usually made from platinum, gold or nickel. The operating principle of RTDs is based on Ohm's law of electrical resistance, which establishes a relationship between the electrical resistance of a conductor and its temperature. According to this law, the electrical resistance of a conductor generally increases when its temperature increases.

RTDs with protection tube - Technical information

What is a PT probe ?

A PT (Platinum Resistance Thermometer) is a type of temperature sensor that uses a temperature deflection resistor (RTD) to measure temperature. It is based on the principle that the electrical resistance of a conductive material increases when its temperature increases.

Understanding the naming of Pt100, PT500 and PT1000 sensors

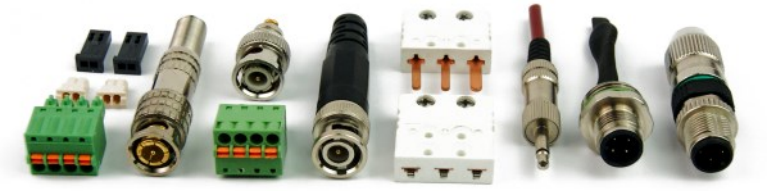
First of all, "Pt" is the chemical symbol for platinum because platinum is the basic material for making the measuring element. The naming conventions of P100, PT500, and PT1000 sensors are closely tied to the nominal resistance values they exhibit at 0°C. P100 sensor has a nominal resistance of 100 Ω at 0°C, Pt500 sensor has a nominal resistance of 500 Ω at 0°C and Pt1000 sensor has a nominal resistance of 1000 Ω at 0°C. Understanding the meaning behind these designations allows us to discern their specific characteristics and applications. Whether you require a standard PT100 sensor or a higher resistance variant like PT500 or PT1000, these RTD sensors provide reliable and accurate temperature measurements in a wide range of industries and applications.

Pt-s wiring configurations

The cable has certain resistance which adds to the RTD resistance. Thus, the total resistance is the sum of the RTD resistance and the lead wire resistance. This causes more voltage drop across the RTD measurement system and as a result causes inaccuracy in measurement. This is the reason why we use 2 wire, 3 wire, and 4 wire RTD configurations.

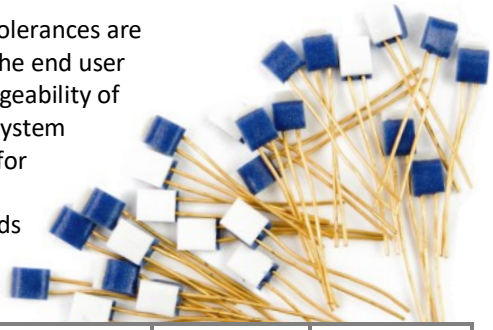
RTD connectors

Due to the lack of standardization in RTD connectors, our company takes pride in its ability to produce a wide range of RTD connectors. We understand that different industries and applications have unique requirements when it comes to temperature measurement, and that includes the connectors used. With our expertise and advanced manufacturing capabilities, we have the flexibility to design and produce various types of RTD connectors.



Pt-s classes

Tolerances of RTD sensors can be tailored to customer specifics and thus manufactured to different tolerances. The higher the tolerance the smaller the margin of error relative to lower tolerances.
A system where these tolerances are classified is helpful for the end user and helps the interchangeability of these sensors. The IEC system is seen as the standard for the industry although there are other standards and other tolerance classes.

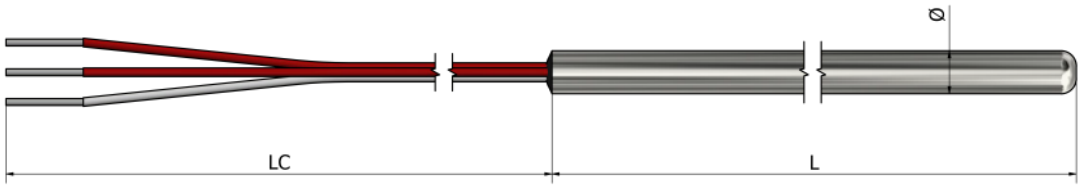


IEC Standard	DIN4370	Temperature Range ºC	Tolerance Ω at 0ºC	Tolerance ºC
W0.03	1/10 DIN	-100 to 350	100±0.012 Ω	±0.03 °C
/	1/5 DIN	-100 to 350	100±0.024 Ω	±0.06 °C
W0.1	1/3 DIN	-100 to 350	100±0.04 Ω	±0.10 °C
W0.15	Class A	-100 to 450	100±0.06 Ω	±0.15 °C
W0.3	Class B	-196 to 660	100±0.12 Ω	±0.30 °C

Global cable insulation characteristics

	PVC	Silicone	Teflon	Fiberglass
Abrasion resistance	Very good	Fair	Good	Fair
Chemical resistance	Very good	Poor	Excellent	Good
Moisture resistance	Good	Good	Excellent	Poor
Fire resistance	Good	Good	Excellent	Excellent

PT00 – RTDs with protection tube
Free leads



Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*

☐ 2 ☐ 3 ☐ 4

5. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

6. Free leads length LC (mm):

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

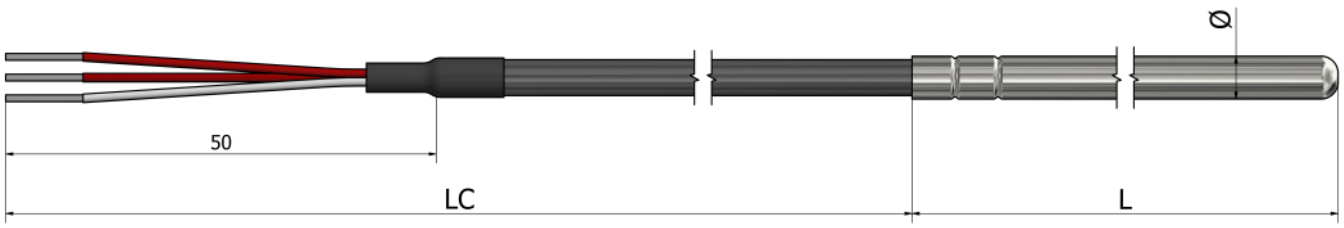
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT10 – RTDs with protection tube
Standard tube



Ordering information

1. Element type:
☐ Pt 100 ☐ Pt 500 ☐ Pt 1000
☐ Other:

2. Element class:
☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*
☐ 2 ☐ 3 ☐ 4

5. Tube dimensions: *(material **Stainless steel 316L**)*
☐ Ø3 x 50 mm ☐ Ø4 x 40 mm ☐ Ø5 x 50 mm
☐ Ø6 x 50 mm ☐ Other:

6. Cable prolongation:
☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

7. Cable length LC (mm):

8. Crimp protection:
☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

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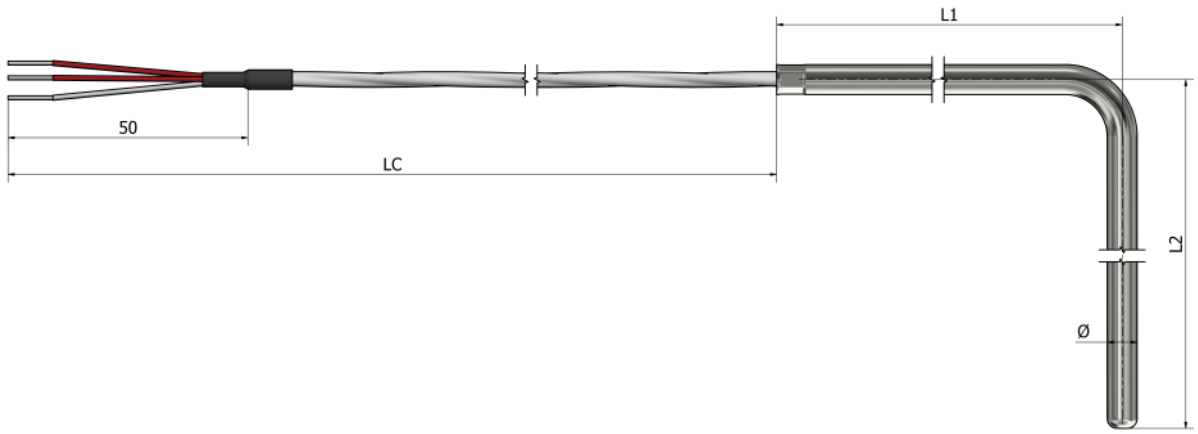
PT12 – RTDs with protection tube
Standard tube (90° bend)



Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*

☐ 2 ☐ 3 ☐ 4

5. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L1 _____ L2 _____ Ø _____

6. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

7. Cable length LC (mm):

8. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

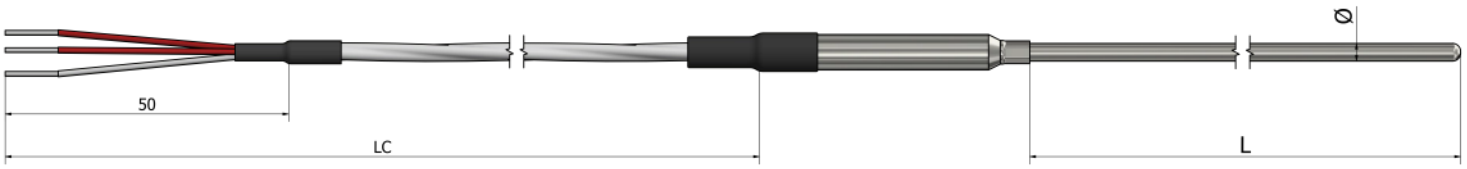
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT20 – RTDs with protection tube
Pot seal



Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*

☐ 2 ☐ 3 ☐ 4

5. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

6. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

7. Cable length LC (mm):

8. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

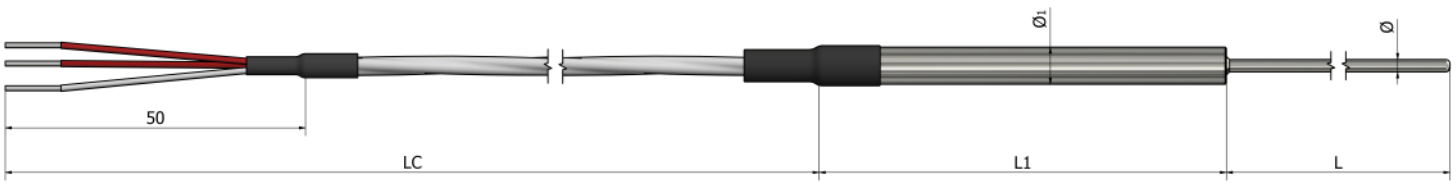
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT21 – RTDs with protection tube
Pot seal with reduced tip



Ordering information

1. Element type:
☐ Pt 100 ☐ Pt 500 ☐ Pt 1000
☐ Other:

2. Element class:
☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*
☐ 2 ☐ 3 ☐ 4

5. Tube dimensions L and Ø (mm): *(material **Stainless steel 316L**)*
L _____ Ø _____

6. Tube dimensions L1 and Ø1 (mm): *(material **Stainless steel 316L**)*
L1 _____ Ø1 _____

7. Cable prolongation:
☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

8. Cable length LC (mm):

9. Crimp protection:
☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

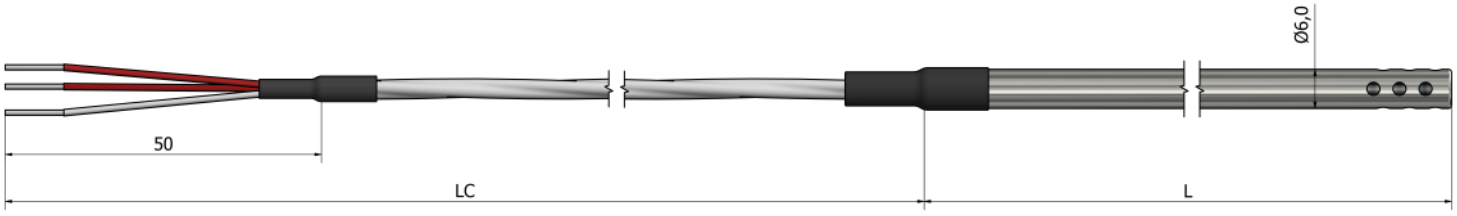
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT25 – RTDs with protection tube
Open air



*Tube material **Stainless steel 316L***

Ordering information

1. Element type:
☐ Pt 100 ☐ Pt 500 ☐ Pt 1000
☐ Other:

2. Element class:
☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*
☐ 2 ☐ 3 ☐ 4

5. Tube length L (mm):

6. Cable prolongation:
☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)
☐ Fiberglass (400°C) ☐ Other:

7. Cable length LC (mm):

8. Crimp protection:
☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

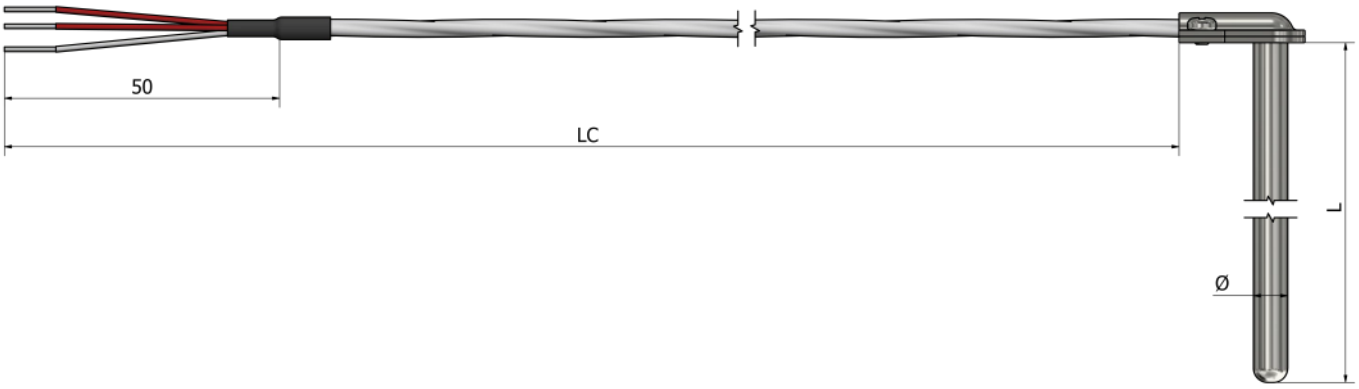
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT30 – RTDs with protection tube
Plug-in (clamp)



Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*

☐ 2 ☐ 3 ☐ 4

5. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

6. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

7. Cable length LC (mm):

8. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

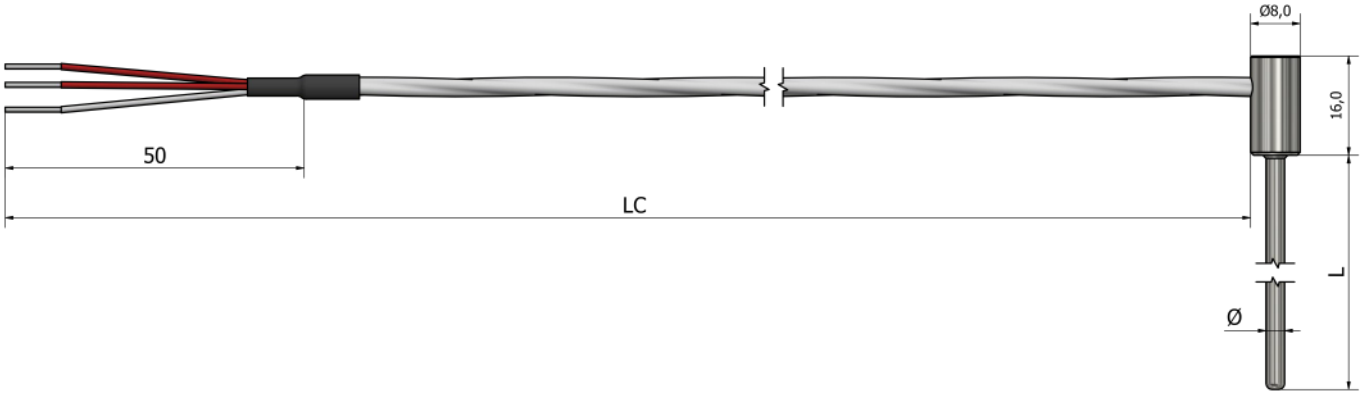
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT35 – RTDs with protection tube
Plug-in (miniature)



Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*

☐ 2 ☐ 3 ☐ 4

5. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

6. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

7. Cable length LC (mm):

8. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

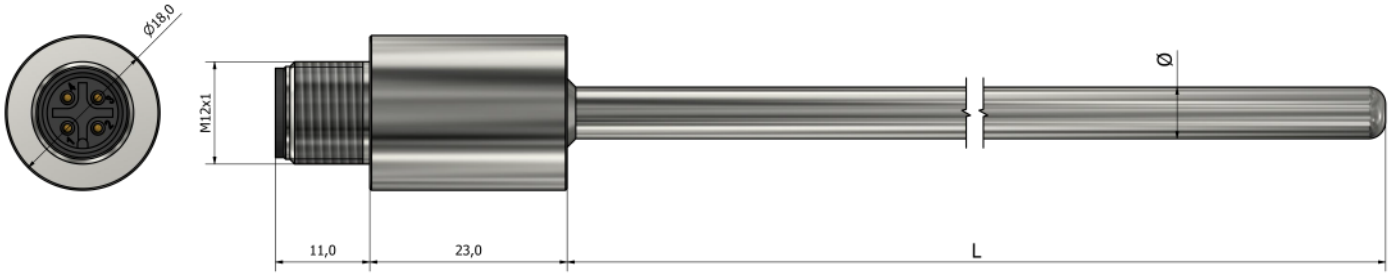
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT40 – RTDs with protection tube
Integrated M12 connector



Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*

☐ 2 ☐ 3 ☐ 4

5. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

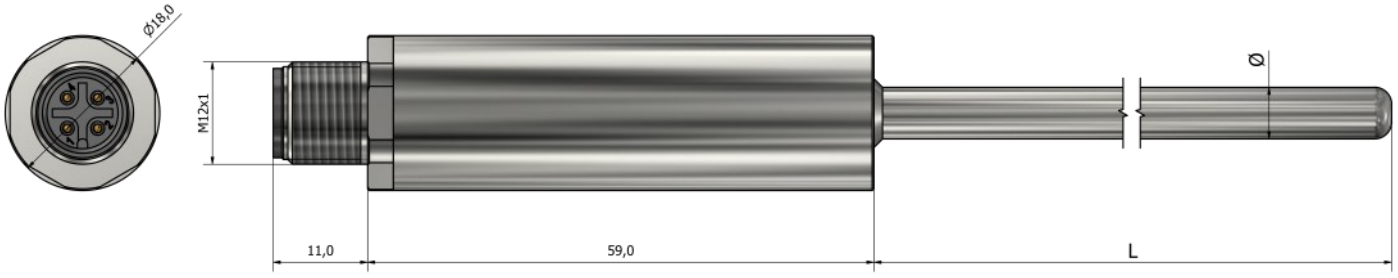
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT41 – RTDs with protection tube
Integrated M12 connector with transmitter



Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*

☐ 2 ☐ 3 ☐ 4

5. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

6. Transmitter (°C):
Specify temperature range

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

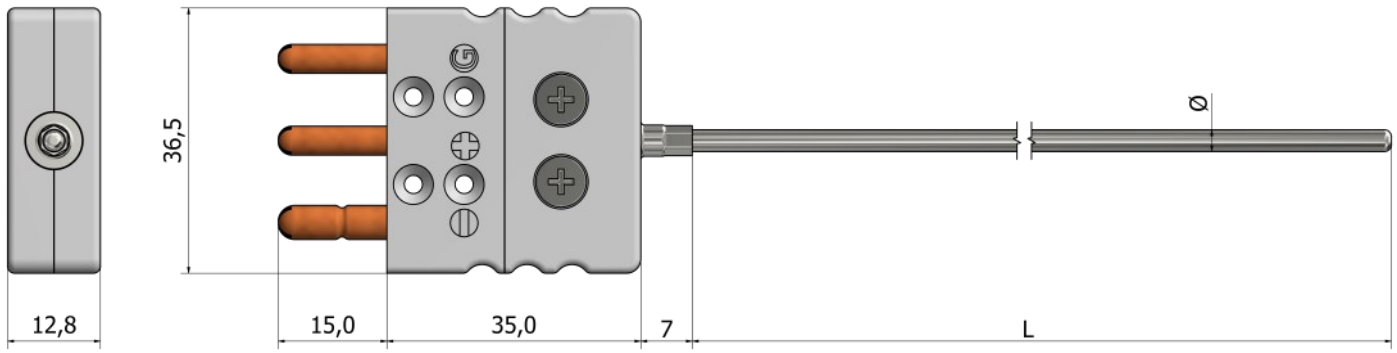
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT45 – RTDs with protection tube
RTD connector



Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Wiring configuration: *(number of wires)*

☐ 2 ☐ 3

4. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

5. Connector:

☐ Miniature Plug ☐ Miniature Socket ☐ Standard Plug ☐ Standard Socket

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

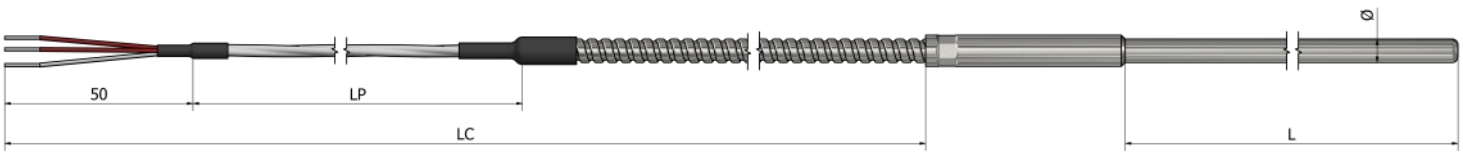
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT50 – RTDs with protection tube
Armored cable prolongation



Armored cable material* ***Stainless steel 304*

Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*

☐ 2 ☐ 3 ☐ 4

5. Tube dimensions (mm): *(material* ***Stainless steel 316L****)*

L _____ Ø _____

6. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

7. Cable length LC (mm):

8. Bare cable length LP (mm):

9. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

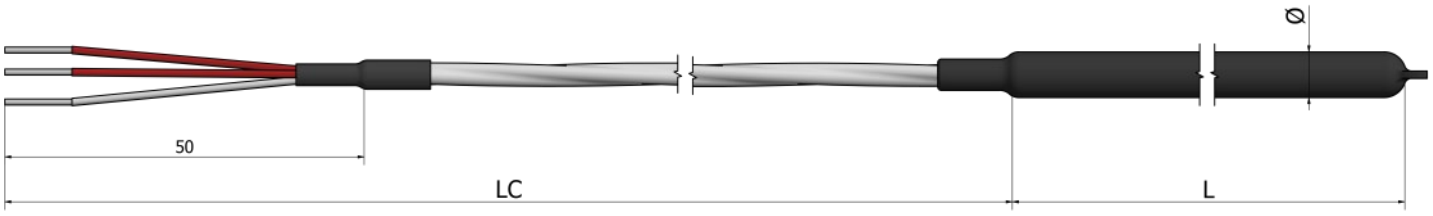
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

PT60 – RTDs with protection tube
For aggressive environments (with PTFE protection up to 250°C)



Protection material **PTFE*

Ordering information

1. Element type:

☐ Pt 100 ☐ Pt 500 ☐ Pt 1000

☐ Other:

2. Element class:

☐ A ☐ B ☐ Other:

3. Number of sensor elements: ☐ x 1 ☐ x 2

4. Wiring configuration: *(number of wires per element)*

☐ 2 ☐ 3 ☐ 4

5. Tube dimensions (mm): *(material **SS 316L** with **PTFE** protection)*

L _____ Ø _____

6. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

7. Cable length LC (mm):

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

EuroSensors

Thermistors with protection tube

EuroSensors

Thermistors with protection tube - Technical information

What are the characteristics of RTDs with protection tube ?

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We have several sizes and types of tubes.
See ***"Technical data -***

Protection tube materials

For the production of tubes, stainless steel, copper and brass are often used. Due to its good characteristics such as corrosion resistance, strength (abrasion resistance) and good thermal conductivity, stainless steel (SS316) stands out as the most common material from which tubes are produced.

Tube materials:

- Stainless steel (SS316)
- Stainless steel (SS316L)
- Stainless steel (SS316Ti)
- Brass
- Aluminum
- Copper

What is an RTD sensor ?

An RTD (Resistance Temperature Detector) is a type of sensor used to measure temperature. RTDs are used for accurate, stable and reliable temperature measurements in generally high temperature ranges.

RTDs advantages

RTDs have several advantages over other types of temperature sensors:

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RTDs have high temperature sensitivity, typically in the range of 0.1 to 0.2% per °C, allowing for accurate temperature measurement.

Long term stability

RTDs have long-term stability and longer life than thermistors, making them more reliable for long-term applications.

Wide operating temperature range

RTDs can operate in a temperature range of -200 to +850°C, making them suitable for many industrial applications.

Low ohmic resistance

RTDs have a low ohmic resistance compared to thermistors, which makes them easier to use with electronic circuits.

How does an RTD work ?

An RTD (variable temperature resistor) is a sensor that measures temperature using the variation of the electrical resistance of a conductive material. RTDs are usually made from platinum, gold or nickel. The operating principle of RTDs is based on Ohm's law of electrical resistance, which establishes a relationship between the electrical resistance of a conductor and its temperature. According to this law, the electrical resistance of a conductor generally increases when its temperature increases.

EuroSensors

Thermistors with protection tube - Technical information

What is a thermistor ?

A thermistor is an electrical component that changes its resistance according to temperature. It consists of a conductive material that is wrapped in an insulating material. As the temperature increases, the resistance of the conductive material decreases (NTC), or increases (PTC), which can be detected and measured.

What are the two types of thermistor ?

NTC (*Negative Temperature Coefficient*) are made of a conductive material based on transition metals and are used to measure temperatures up to 300 °C.
PTC (*Positive Temperature Coefficient*) are made of a conductive material based on polymer or ceramic and are used to measure temperatures up to 200 °C.

What is the difference between an NTC and a PTC ?

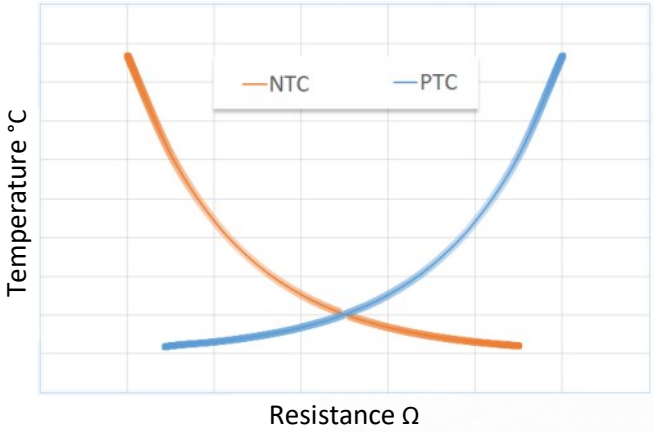
NTCs and PTCs are both thermistors, i.e. temperature sensors that change resistance depending on the temperature.
However, there is a major difference between these two types of thermistors:

NTC thermistors

NTCs have a resistance that decreases as the temperature increases. They are commonly used in thermostats and temperature control devices to measure room temperature.

PTC thermistors

PTCs have a resistance that increases as the temperature rises. They are commonly used in thermostatic fuses and overcurrent protection devices to shut off power in the event of overheating.



Wiring configurations

The cable has certain resistance which adds to the RTD resistance. Thus, the total resistance is the sum of the RTD resistance and the lead wire resistance. This causes more voltage drop across the RTD measurement system and as a result causes inaccuracy in measurement. This is the reason why we use 2 wire, 3 wire, and 4 wire RTD configurations.

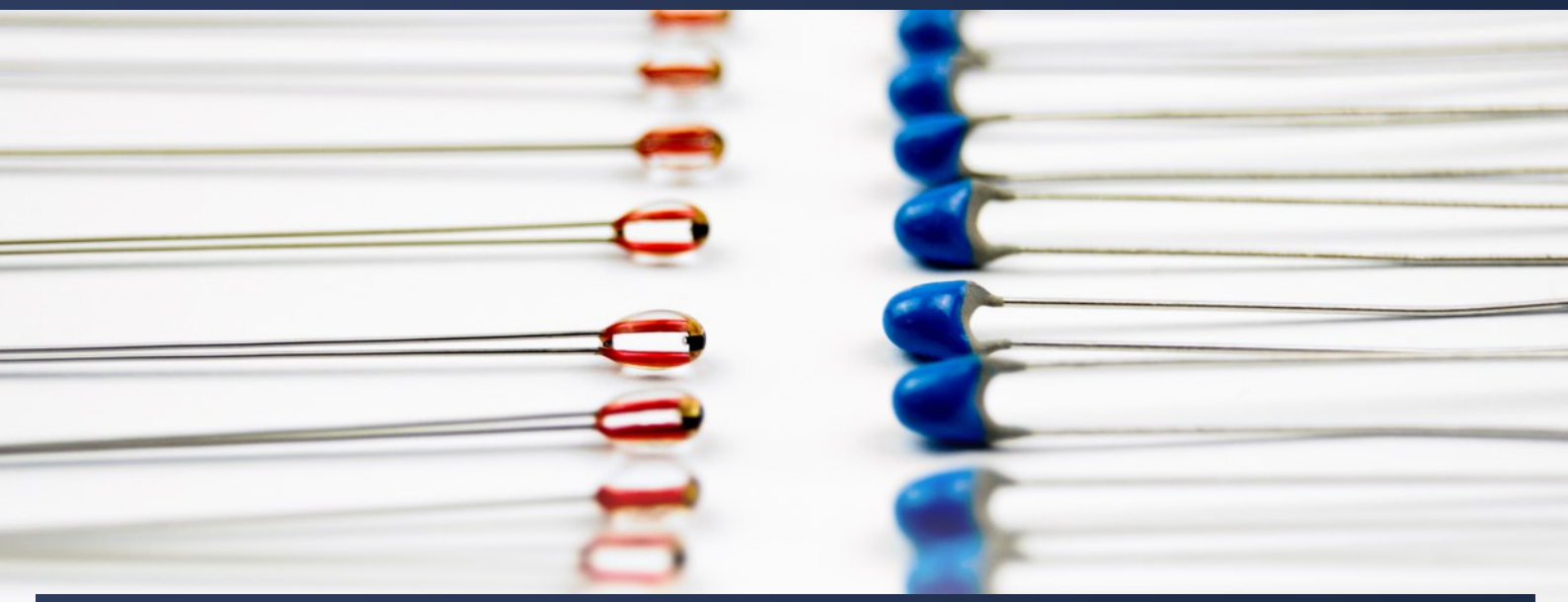
Thermistor connectors

Due to the lack of standardization in RTD connectors, our company takes pride in its ability to produce a wide range of RTD connectors. We understand that different industries and applications have unique requirements when it comes to temperature measurement, and that includes the connectors used. With our expertise and advanced manufacturing capabilities, we have the flexibility to design and produce various types of RTD connectors.

Global cable insulation characteristics

	PVC	Silicone	Teflon	Fiberglass
Abrasion resistance	Very good	Fair	Good	Fair
Chemical resistance	Very good	Poor	Excellent	Good
Moisture resistance	Good	Good	Excellent	Poor
Fire resistance	Good	Good	Excellent	Excellent

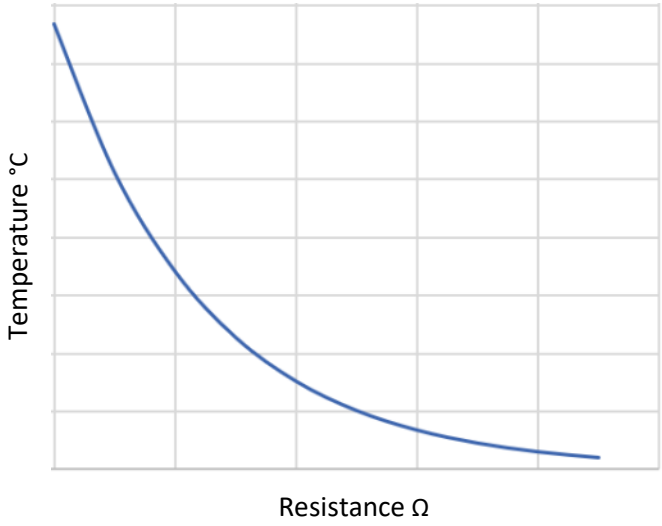
Thermistors with protection tube - Technical information



The β beta value

A thermistor's "β" value, or beta value, is an indication of the shape of the curve representing the relationship between resistance and temperature of an NTC thermistor.

Calculating the beta value is a vital step in the component selection process as it gives the characteristic at a given temperature vs the resistance for a specific application.



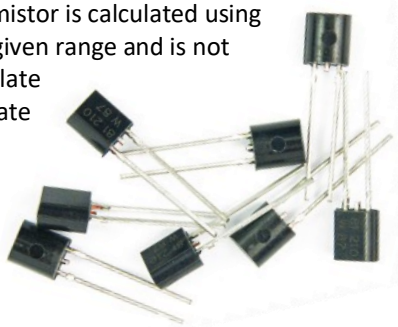
NTC thermistors are non-linear resistors that alter their resistance characteristics with temperature. Simply put, as temperature increases the thermistor's resistance decreases.

The manner in which the resistance of a thermistor decreases is related to a constant known in the thermistor industry as beta (β). Beta is measured in degrees Kelvin (K) and is computed based on the formulation given below.

Where:
Rt1 = Resistance at Temperature 1
Rt2 = Resistance at Temperature 2
T1 = Temperature 1 (K)
T2= Temperature 2 in (K)

$$\beta = \frac{\ln(\frac{R_{T1}}{R_{T2}})}{(\frac{1}{T_1} - \frac{1}{T_2})}$$

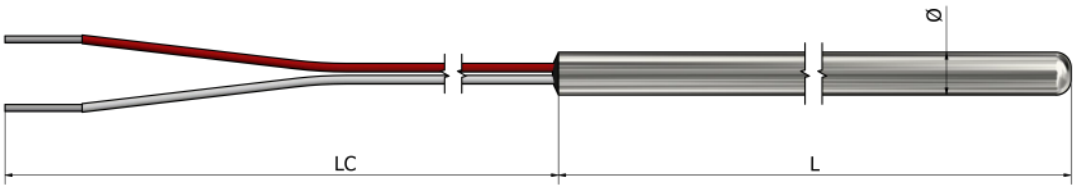
The beta value of an NTC Thermistor is calculated using only two temperatures over a given range and is not the most accurate way to calculate the R vs. T curve. A more accurate method is to use the Steinhart and Hart method, which uses three temperatures over a given range.



Types of thermistors

Type	Resistance	Beta value	Temperature
PTC KTY81/121	990Ω at 25°C	/	T° (-55/+150°C)
NTC	3,3kΩ at 100°C	β=3970	T° (-40/+200°C)
NTC	10kΩ at 25°C	β=3977	T° (-40/+125°C)
NTC	10kΩ at 25°C	β=3435	T° (-40/+150°C)
NTC	20kΩ at 25°C	β=4260	T° (-40/+125°C)

HT00 – Thermistors with protection tube
Free leads



Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Free leads length LC (mm):

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

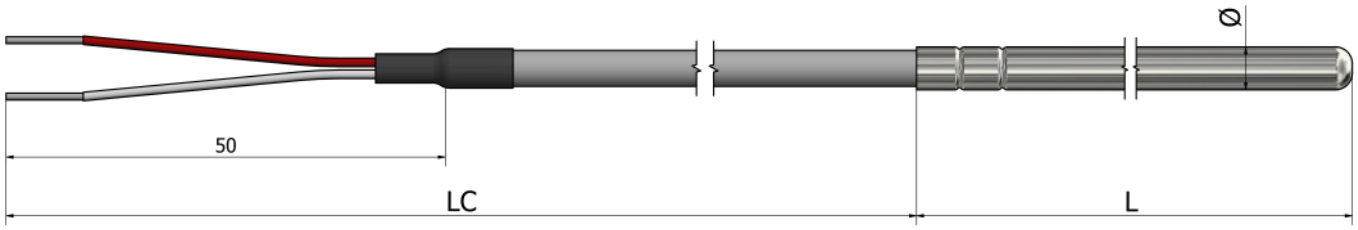
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT10 – Thermistors with protection tube
Standard tube



Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions: *(material **Stainless steel 316L**)*

☐ Ø3 x 50 mm ☐ Ø4 x 40 mm ☐ Ø5 x 50 mm

☐ Ø6 x 50 mm ☐ Other:

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

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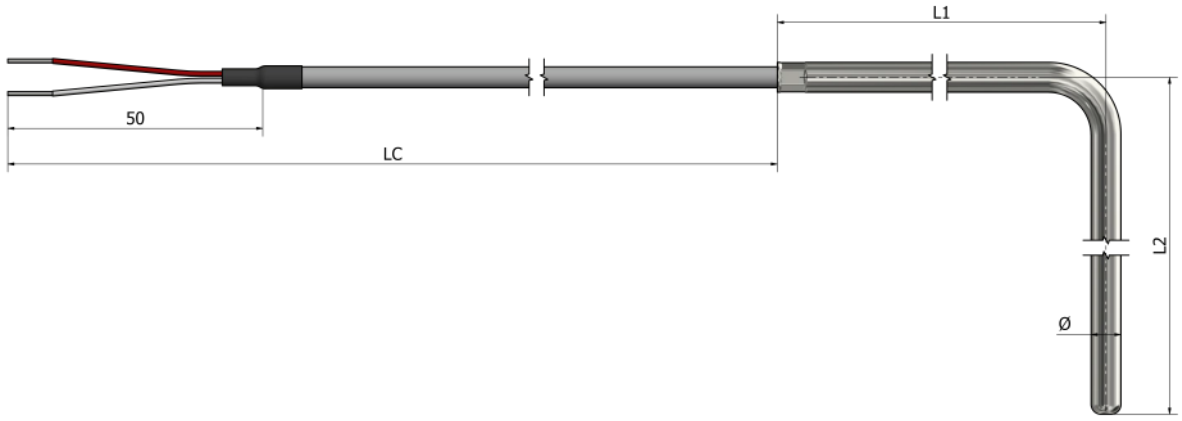
HT12 – Thermistors with protection tube
Standard tube (90° bend)



Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L1 _____ L2 _____ Ø _____

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

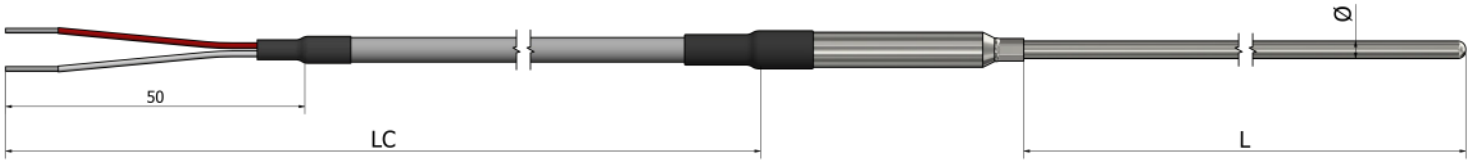
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT20 – Thermistors with protection tube
Pot seal



Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

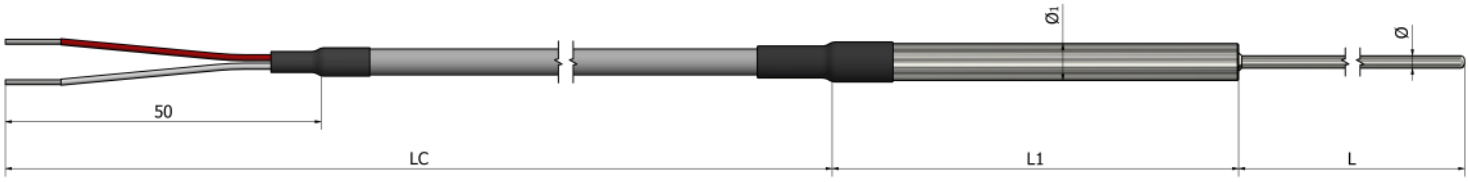
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT21 – Thermistors with protection tube
Pot seal with reduced tip



Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions L and Ø (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Tube dimensions L1 and Ø1 (mm): *(material **Stainless steel 316L**)*

L1 _____ Ø1 _____

5. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

6. Cable length LC (mm):

7. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

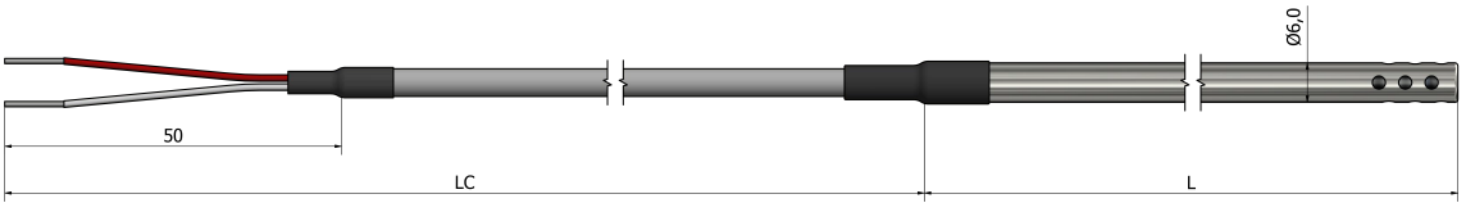
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT25 – Thermistors with protection tube
Open air



*Tube material **Stainless steel 316L***

Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube length L (mm):

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

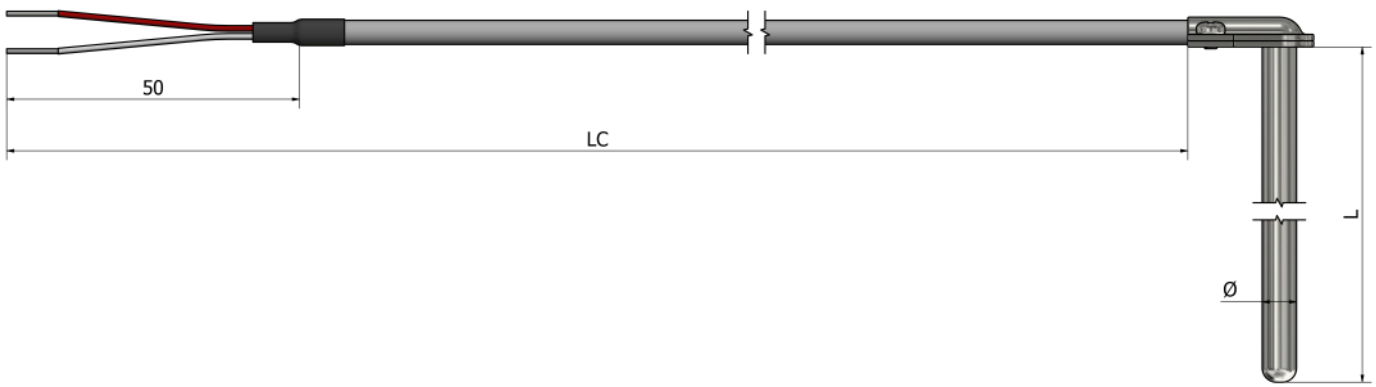
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT30 – Thermistors with protection tube
Plug-in (clamp)



Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

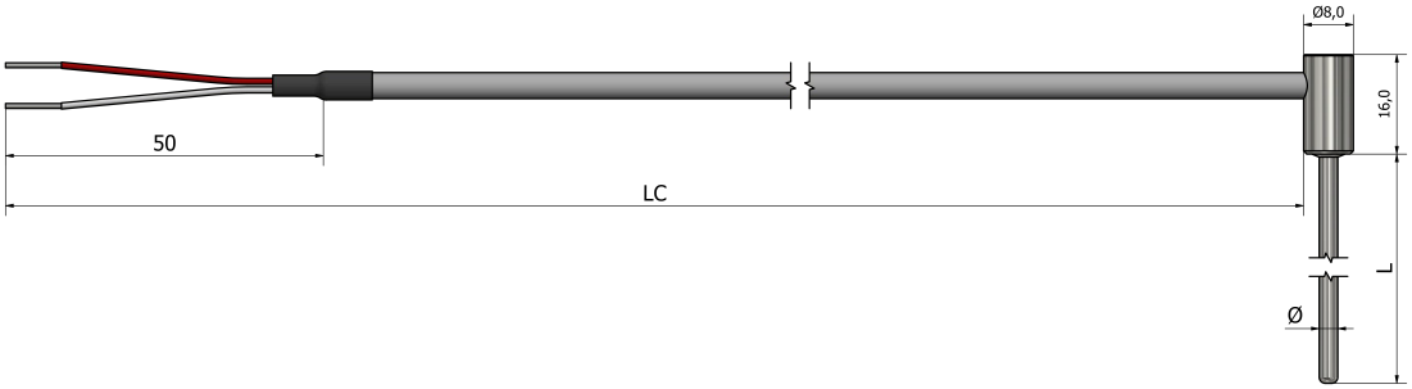
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT35 – Thermistors with protection tube
Plug-in (miniature)



Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

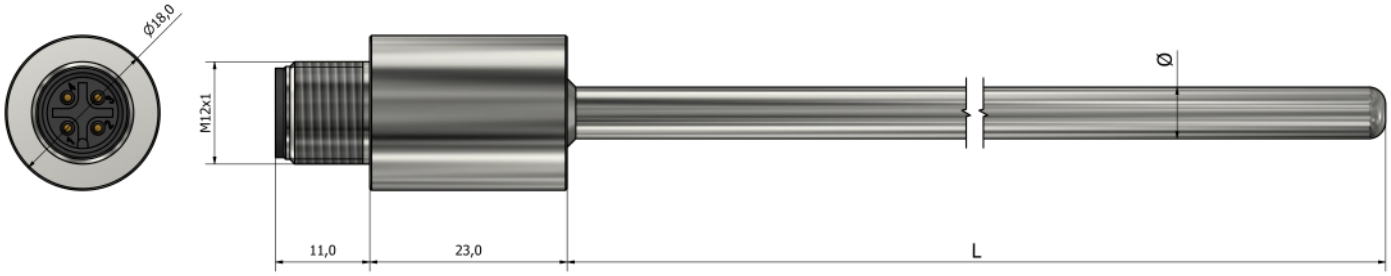
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT40 – Thermistors with protection tube
Integrated M12 connector



Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

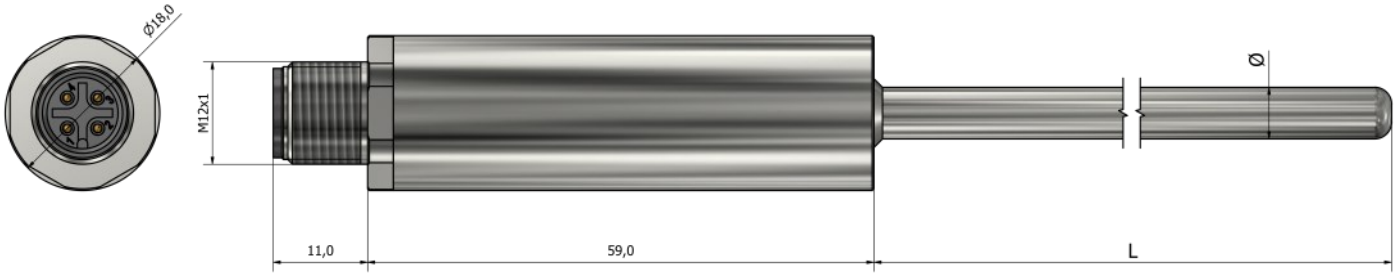
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT41 – Thermistors with protection tube
Integrated M12 connector with transmitter



Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions (mm): *(material **Stainless steel 316L**)*

L _____ Ø _____

4. Transmitter (°C):

Specify temperature range

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

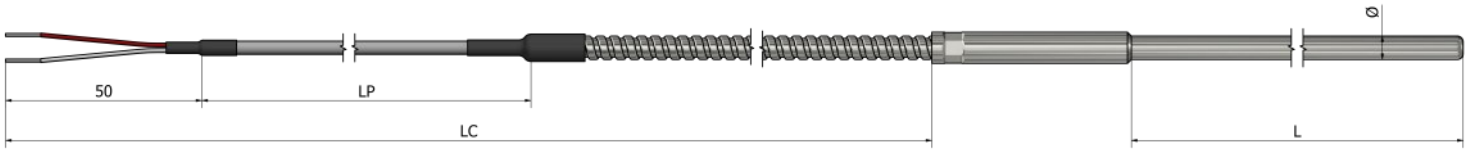
Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT50 – Thermistors with protection tube
Armored cable prolongation



Armored cable material* ***Stainless steel 304*

Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions (mm): *(material* ***Stainless steel 316L****)*

L _____ Ø _____

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

6. Bare cable length LP (mm):

7. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

Quantity:

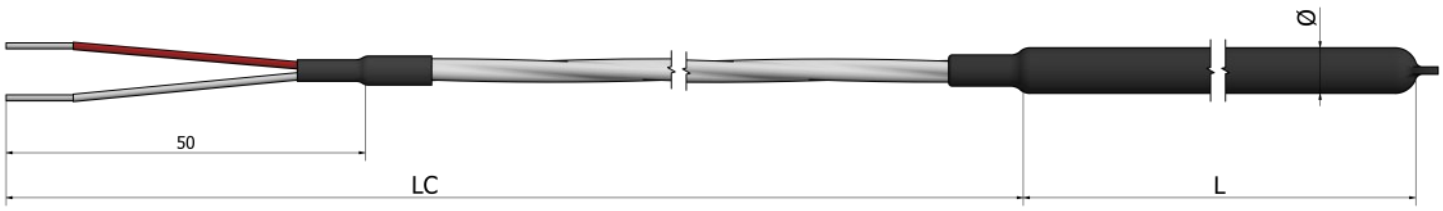
Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.

HT60 – Thermistors with protection tube

For aggressive environments (with PTFE protection up to 250°C)



Protection material **PTFE*

Ordering information

1. Element type:

- ☐ PTC KTY 81/110 (-40°C / +150°C)
- ☐ PTC KTY 81/121 (-40°C / +150°C)
- ☐ NTC 10kΩ at 25°C ß3977 (-40°C / +125°C)
- ☐ NTC 20kΩ at 25°C ß4260 (-40°C / +125°C)
- ☐ NTC 3,3kΩ at 100°C ß3970 (-40°C / +200°C)
- ☐ Other:

(NTC / PTC , T° (min / max) , ß value, tolerance)

2. Wiring configuration: *(number of wires)*

☐ 2 ☐ Other:

3. Tube dimensions (mm): *(material **SS 316L** with **PTFE** protection)*

L _____ Ø _____

4. Cable prolongation:

☐ PVC (105°C) ☐ Silicone (180°C) ☐ Teflon (260°C)

☐ Fiberglass (400°C) ☐ Other:

5. Cable length LC (mm):

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

Quantity:

Note:

How to order?

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images, personal notes, special requirements or any important data. For additional questions and assistance, feel free to contact us.