EuroSensors

Penetration temperature sensors

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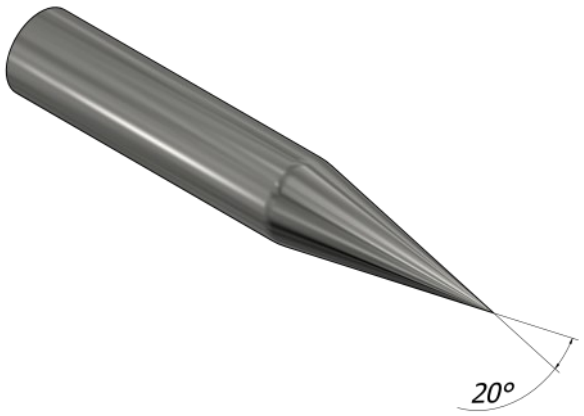
Penetration thermocouples - Technical information

What are the characteristics of penetration thermocouples ?

What sets penetration thermocouples apart is their ability to measure the internal temperature of objects with pinpoint accuracy. Penetration probes are slender, pointed sensors designed for insertion into materials such as food, liquids, or even soil.



Here are some key applications where they prove invaluable:

Food safety and culinary arts: In the culinary world, achieving the perfect level of doneness and ensuring food safety go hand in hand. Penetration probes allow chefs and food inspectors to measure the core temperature of dishes, ensuring they are both delicious and safe to eat.

Industrial processes: From chemical reactions to metallurgical processes, knowing the temperature within materials or substances is crucial. Penetration probes provide real-time insights into the temperature profiles of these processes, aiding in quality control and optimization.

Medical applications: In the healthcare sector, penetration probes are used for patient monitoring, particularly during surgeries where monitoring body temperature accurately is vital for patient safety.

Environmental research: Environmental scientists utilize penetration probes to measure soil temperature accurately, helping them understand the impact of temperature variations on ecosystems.

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.

Type K NiCr-NiAl (NiCr-Ni)

Type N NiCrSi-NiSi

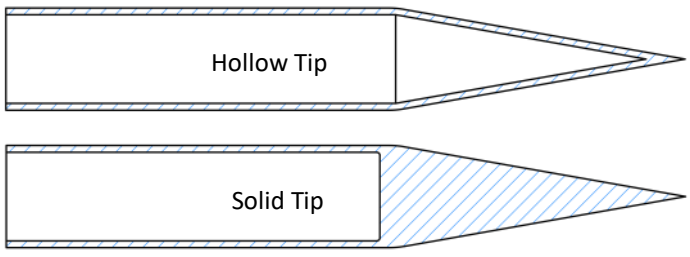
Type J Fe-CuNi

Type T Cu-Cuni

Note that connector colors vary by standard and country. Check the “International Color Codes applied to temperature measuring engineering” *page 235*

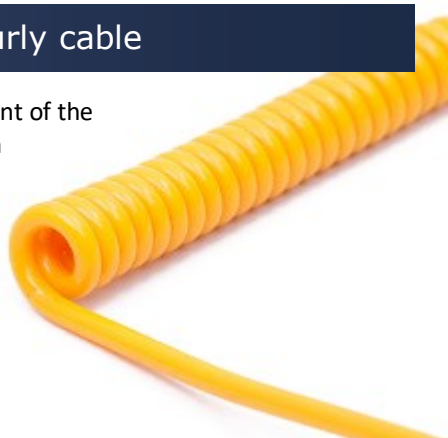
Types of penetration probes

There are two types of penetration probes: with hollow tip and solid tip. Hollow tip probes provides a faster response while solid tip probe is used in places where it is required to break through harder materials

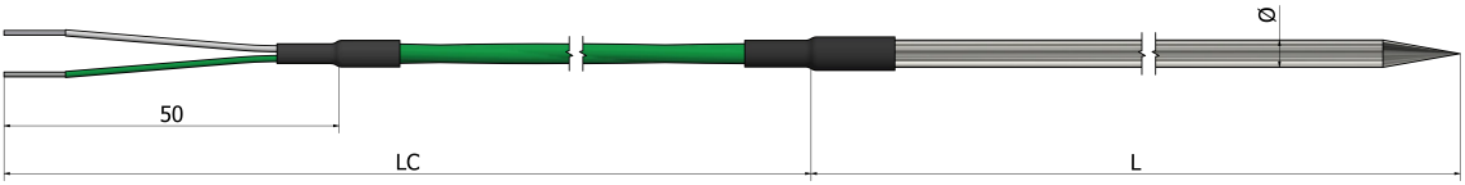


Curly cable

Due to the frequent movement of the cable while using penetration probes, there is an option to put a curly cable that will ensure a easier and more comfortable way of use.



TP01 – Penetration thermocouples
Standard



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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

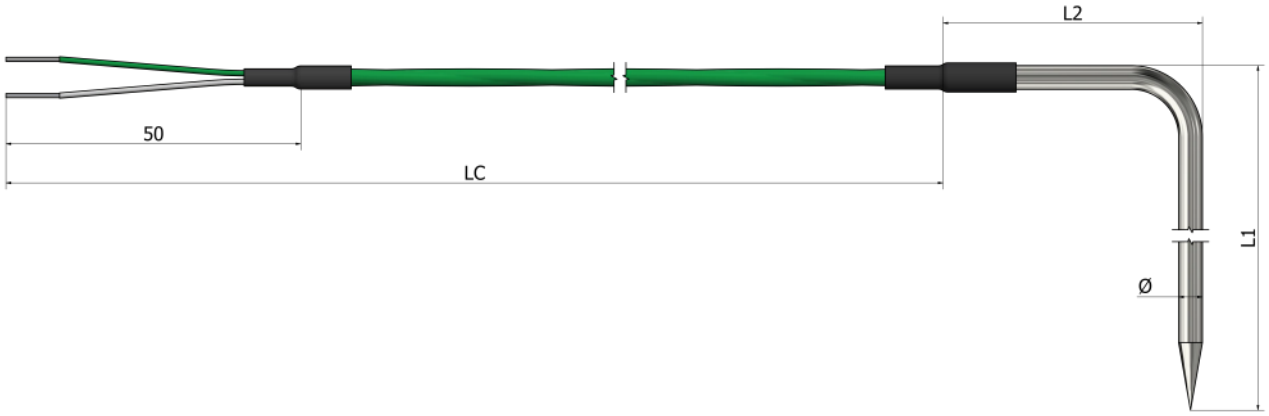
Quantity:

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.

TP02 – Penetration thermocouples
Standard (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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle lengths (mm):
L1 _____ L2 _____

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

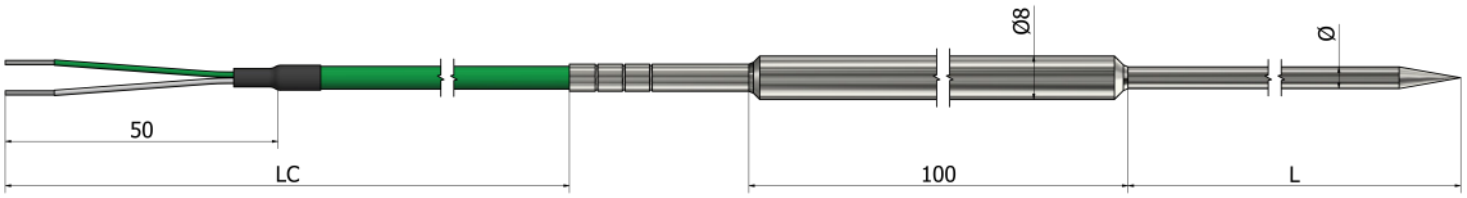
Quantity:

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.

TP11 – Penetration thermocouples
Metal handle



Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

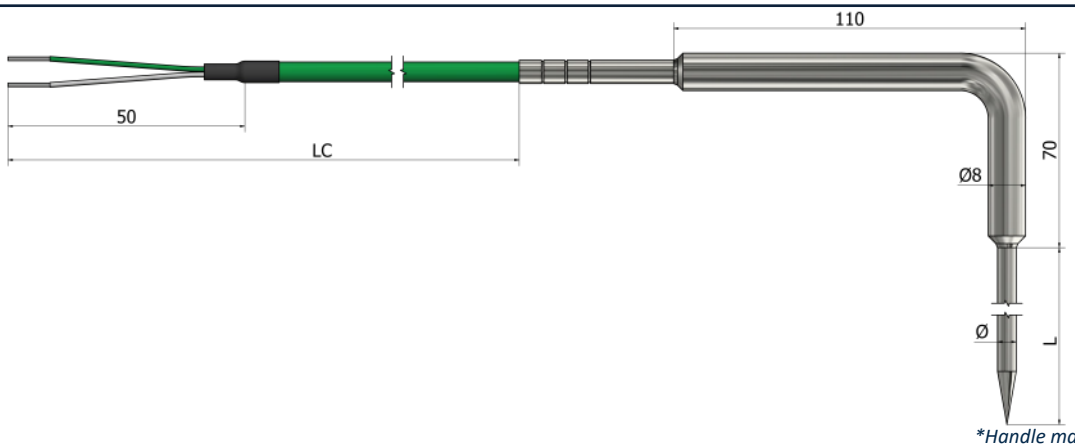
Quantity:

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.

TP12 – Penetration thermocouples
Metal handle (90° bend)



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

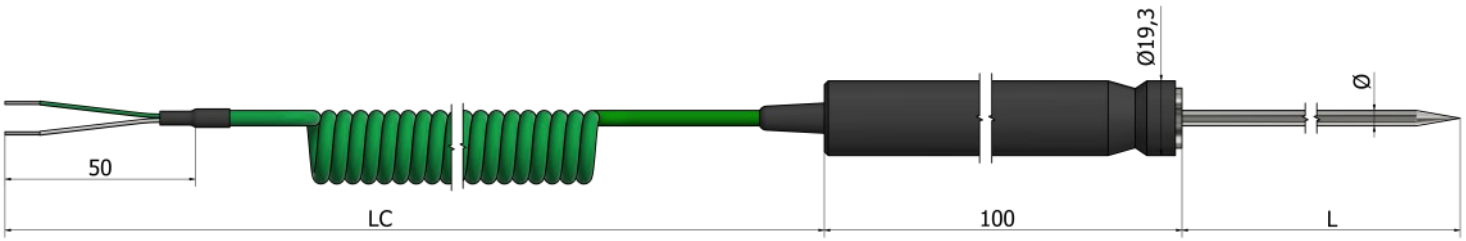
Quantity:

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.

TP13 – Penetration thermocouples
Plastic handle



*Handle material **Plastic***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

7. Cable length LC (mm):

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

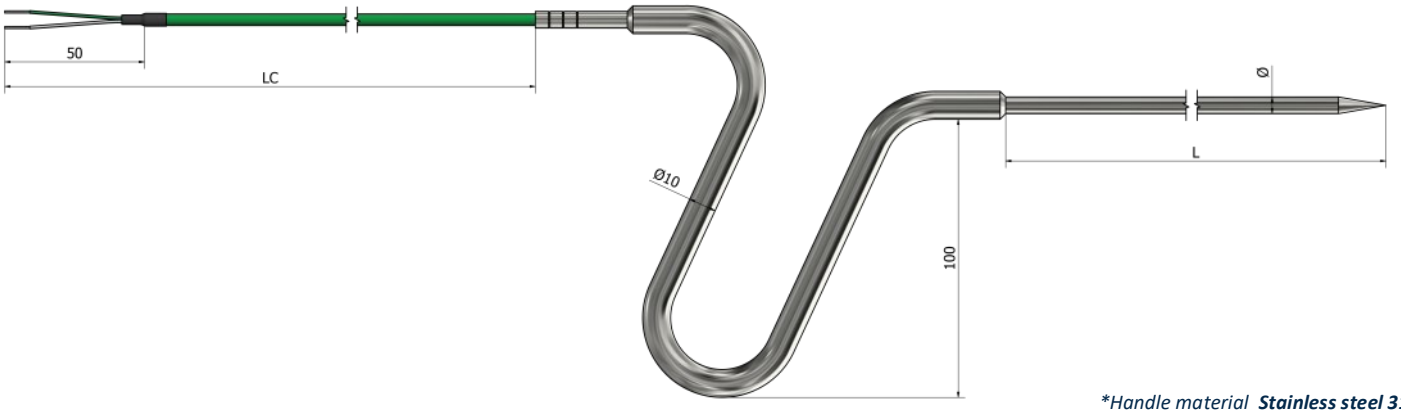
Quantity:

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.

TP20 – Penetration thermocouples
Ergonomic handle



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

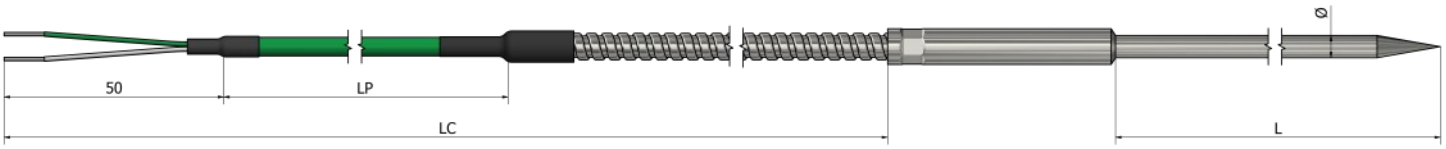
Quantity:

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.

TP31 – Penetration thermocouples
Armored cable prolongation



*Handle material ***Stainless steel 316L***
*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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

7. Cable lengths (mm):
LC _____ LP _____

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

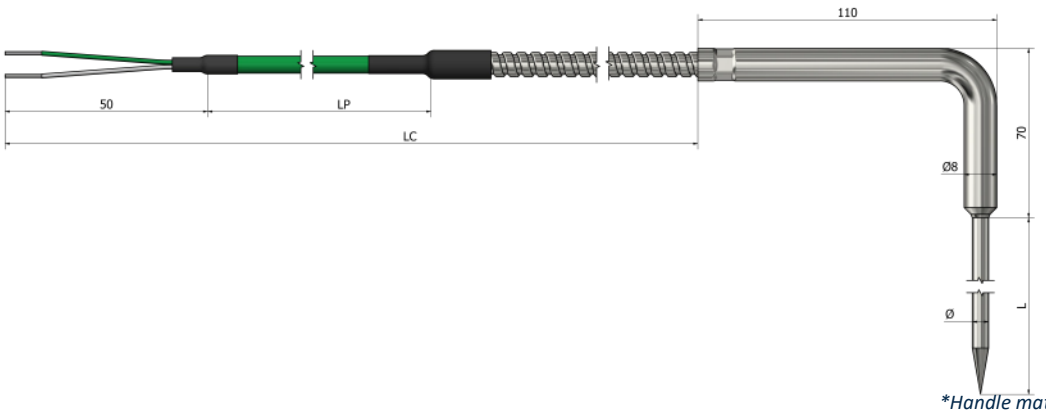
Quantity:

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.

TP32 – Penetration thermocouples
Armored cable prolongation (90° bend)



*Handle material **Stainless steel 316L***
*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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

7. Cable lengths (mm):
LC _____ LP _____

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

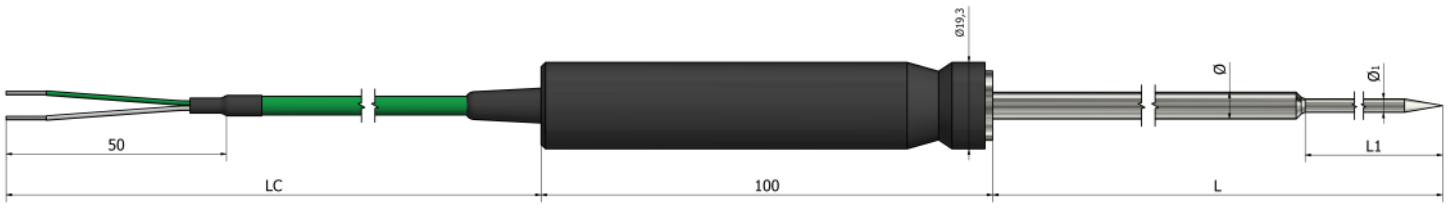
Quantity:

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.

TP40 – Penetration thermocouples
Reduced tip



Handle material* ***Plastic*

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. Needle tip diameter Ø1: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle diameter Ø (mm):

5. Needle lengths (mm):
L _____ L1 _____

6. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

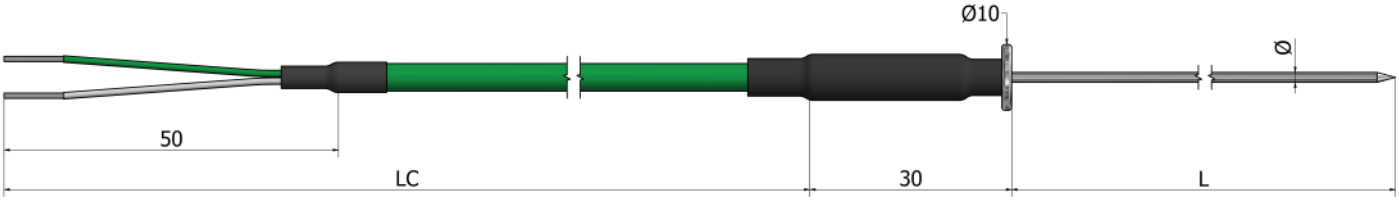
Quantity:

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.

TP41 – Penetration thermocouples
Miniature



*Handle material ***Stainless steel 316L with rubber cover***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø1,5 mm ☐ Ø2 mm
☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

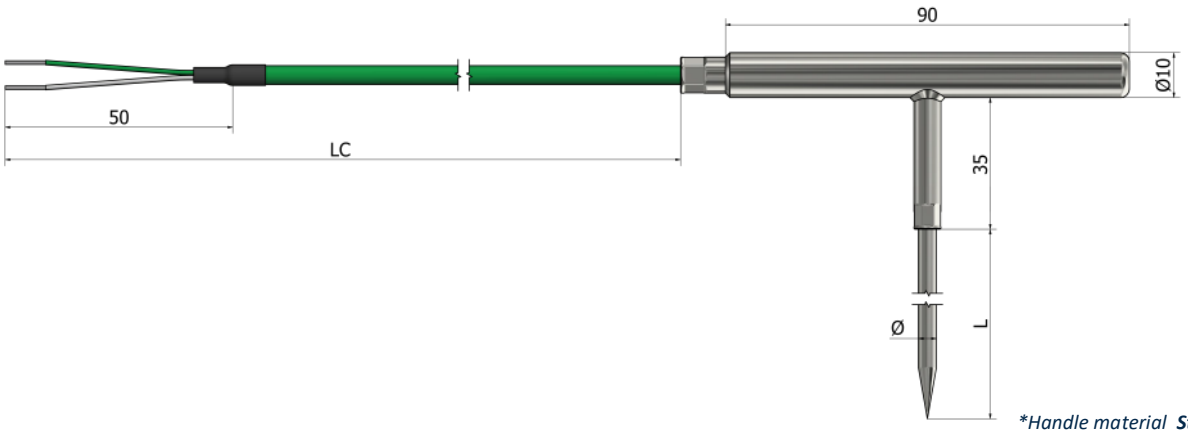
Quantity:

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.

TP50 – Penetration thermocouples
T shape



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

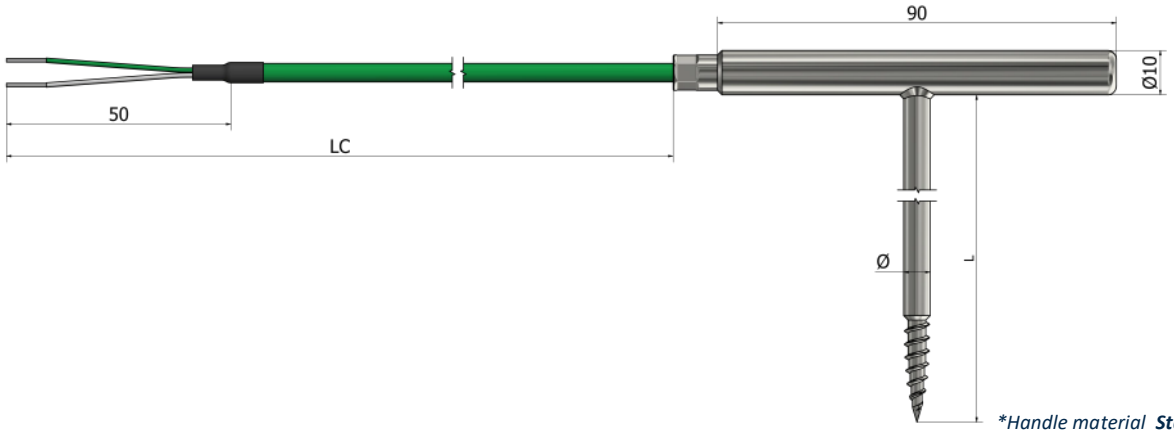
Quantity:

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.

TP51 – Penetration thermocouples
T shape with thread



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

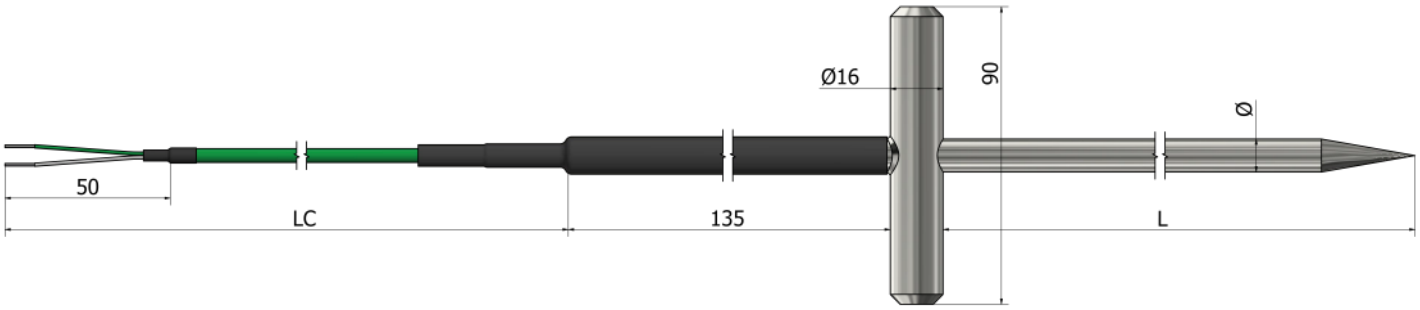
Quantity:

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.

TP60 – Penetration thermocouples
T shape for compost



*Handle material ***Stainless steel 316L with rubber***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

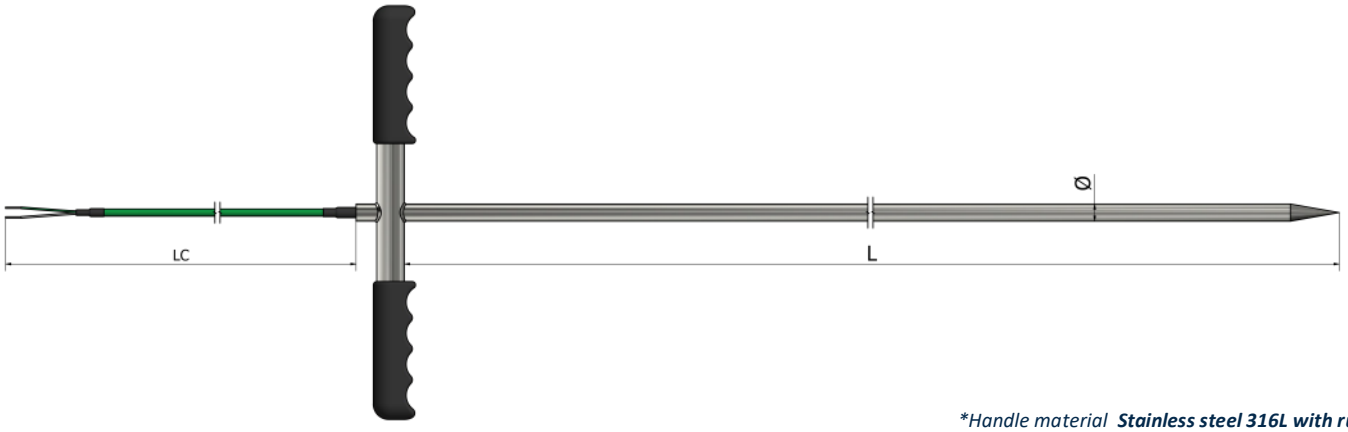
Quantity:

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.

TP61 – Penetration thermocouples
Robust T shape for compost



*Handle material ***Stainless steel 316L with rubber***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Junction type:
☐ Ungrounded ☐ Grounded

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

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

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

11. 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

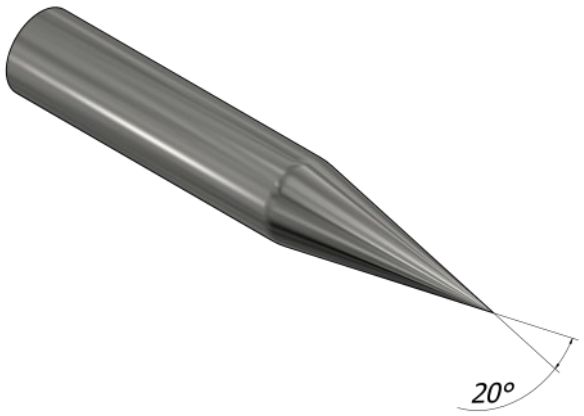
Penetration RTDs

EuroSensors

Penetration RTDs - Technical information

What are the characteristics of penetration RTDs ?

What sets penetration RTDs apart is their ability to measure the internal temperature of objects with pinpoint accuracy. Penetration probes are slender, pointed sensors designed for insertion into materials such as food, liquids, or even soil.



Here are some key applications where they prove invaluable:

Food safety and culinary arts: In the culinary world, achieving the perfect level of doneness and ensuring food safety go hand in hand. Penetration probes allow chefs and food inspectors to measure the core temperature of dishes, ensuring they are both delicious and safe to eat.

Industrial processes: From chemical reactions to metallurgical processes, knowing the temperature within materials or substances is crucial. Penetration probes provide real-time insights into the temperature profiles of these processes, aiding in quality control and optimization.

Medical applications: In the healthcare sector, penetration probes are used for patient monitoring, particularly during surgeries where monitoring body temperature accurately is vital for patient safety.

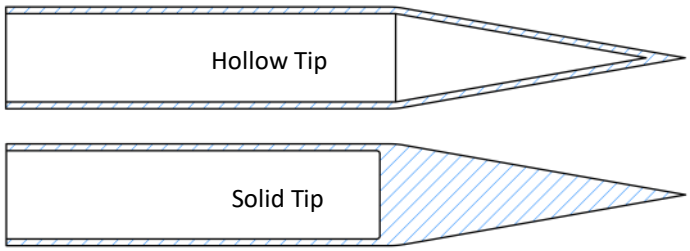
Environmental research: Environmental scientists utilize penetration probes to measure soil temperature accurately, helping them understand the impact of temperature variations on ecosystems.

Curly cable

Due to the frequent movement of the cable while using penetration probes, there is a option to put a curly cable that will ensure a easier and more comfortable way of use.

Types of penetration probes

There are two types of penetration probes with hollow tip and solid tip. Hollow tip probes provides a faster response while solid tip probe is used in places where it is required to break through harder materials



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.

Penetration RTDs - 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

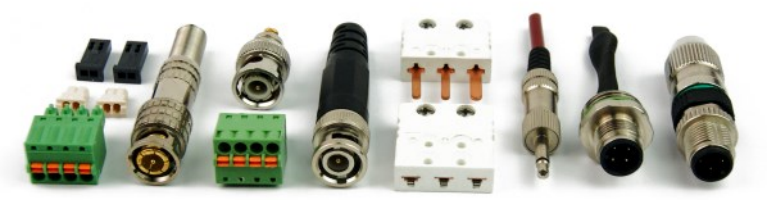
First of all, "Pt" is the chemical symbol for platinum because platinum is the basic material for making the measuring element. The naming conventions of P100, PT500, and PT1000 sensors are closely tied to the nominal resistance values they exhibit at 0°C. P100 sensor has a nominal resistance of 100 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

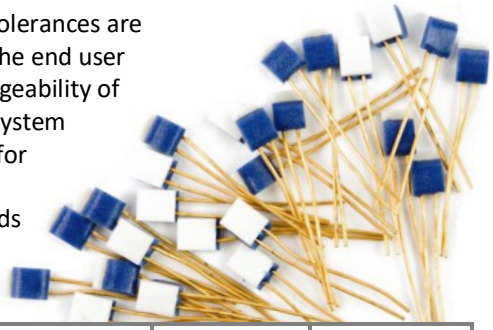
Due to the lack of standardization in RTD connectors, our company takes pride in its ability to produce a wide range of RTD connectors. We understand that different industries and applications have unique requirements when it comes to temperature measurement, and that includes the connectors used. With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

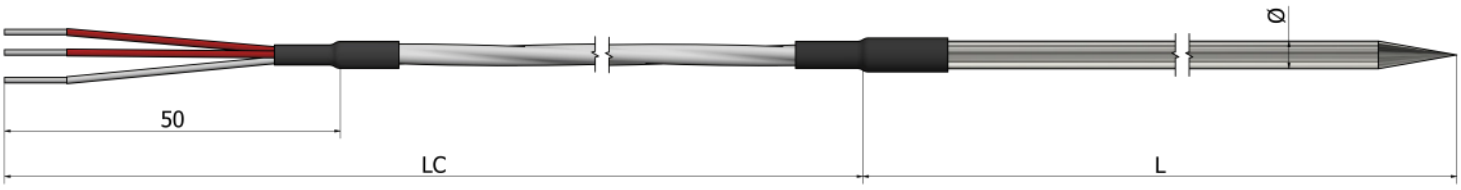


IEC Standard	DIN4370	Temperature Range ºC	Tolerance Ω at 0ºC	Tolerance ºC
W0.03	1/10 DIN	-100 to 350	100±0.012 Ω	±0.03 °C
/	1/5 DIN	-100 to 350	100±0.024 Ω	±0.06 °C
W0.1	1/3 DIN	-100 to 350	100±0.04 Ω	±0.10 °C
W0.15	Class A	-100 to 450	100±0.06 Ω	±0.15 °C
W0.3	Class B	-196 to 660	100±0.12 Ω	±0.30 °C

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

PP01 – Penetration RTDs
Standard



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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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"

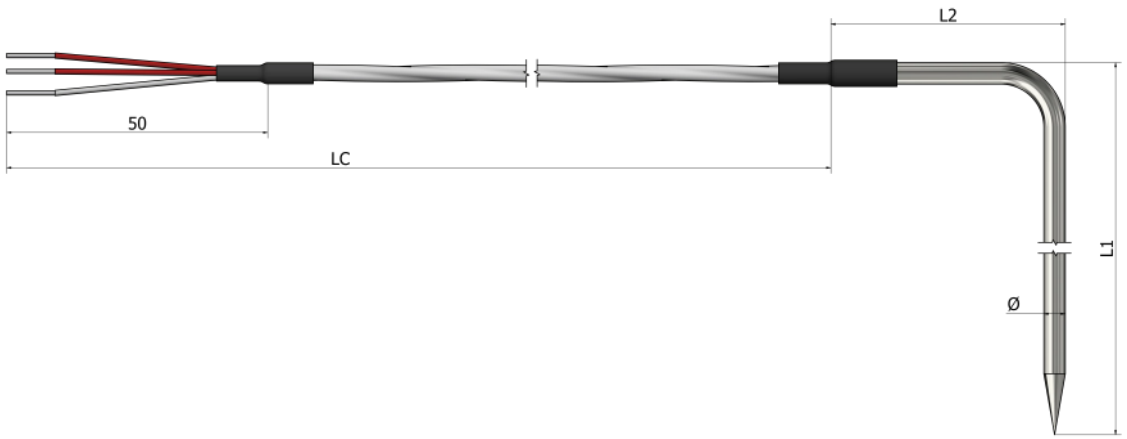
Quantity:

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.

PP02 – Penetration RTDs
Standard (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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle lengths L (mm):

L1 _____ L2 _____

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"

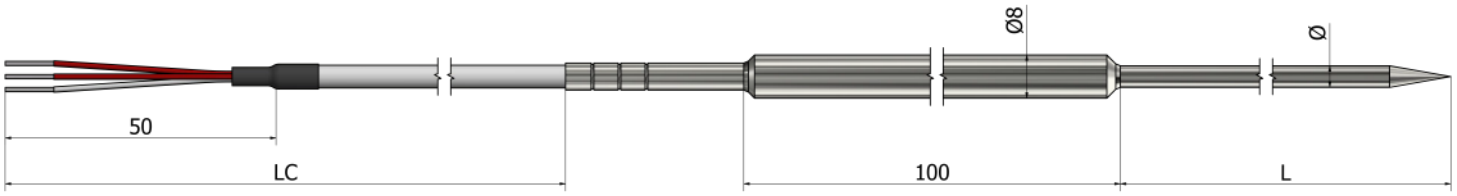
Quantity:

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.

PP11 – Penetration RTDs
Metal handle



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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"

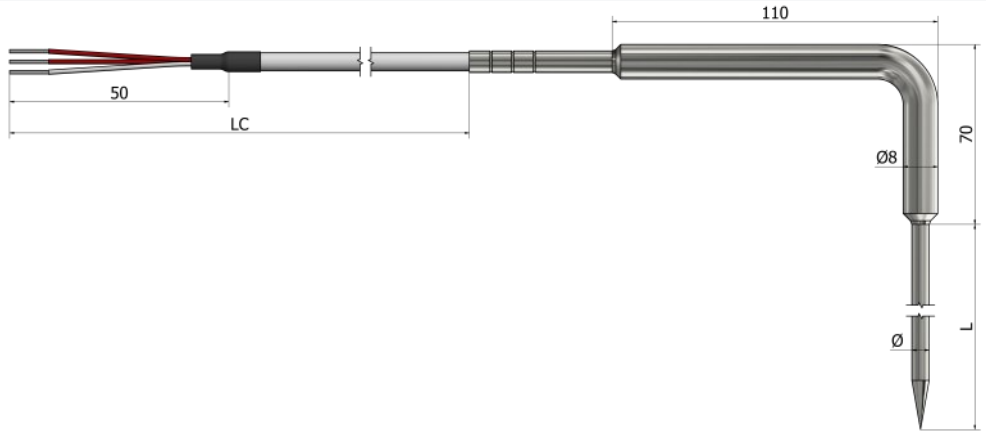
Quantity:

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.

PP12 – Penetration RTDs
Metal handle (90° bend)



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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"

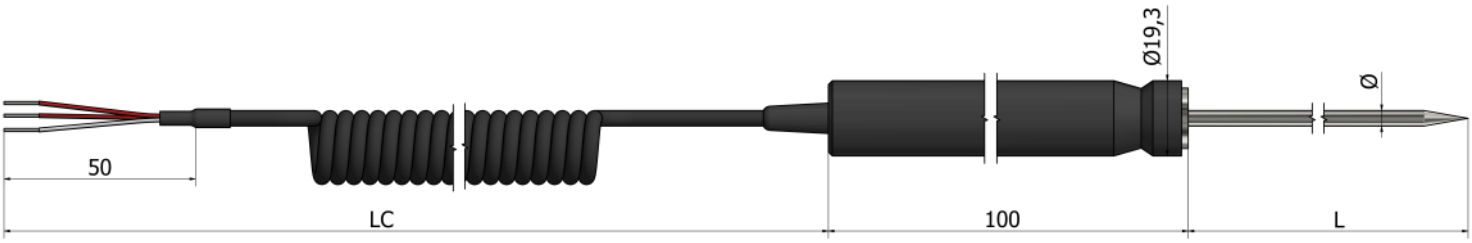
Quantity:

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.

PP13 – Penetration RTDs
Plastic handle



*Handle material ***Plastic***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

7. Cable prolongation:

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

☐ Fiberglass (400°C) ☐ Curly polyurethane (105°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"

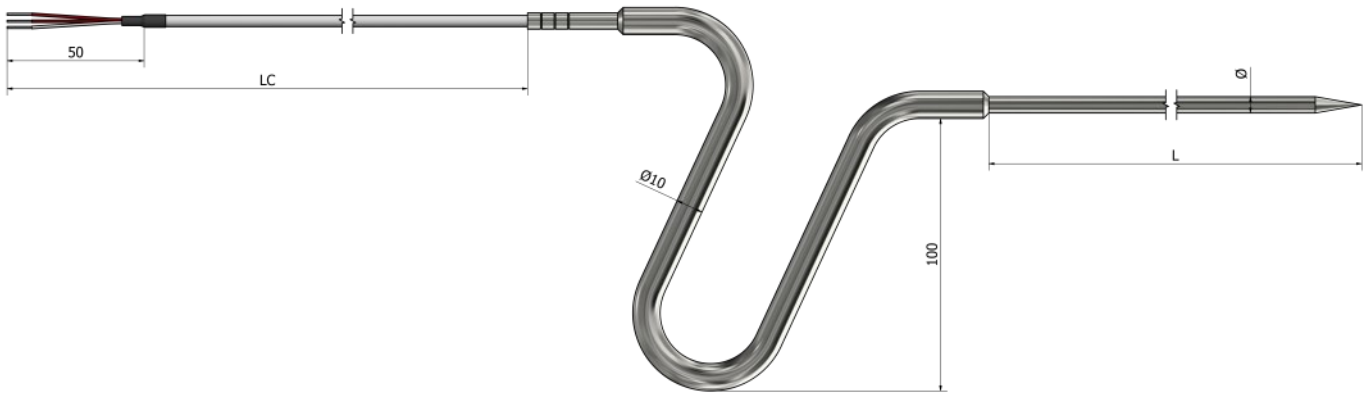
Quantity:

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.

PP20 – Penetration RTDs
Ergonomic handle



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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"

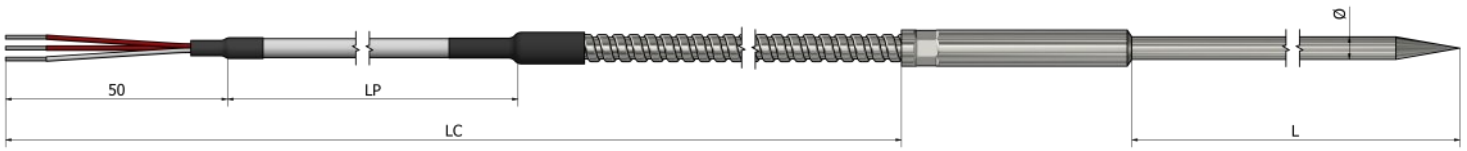
Quantity:

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.

PP31 – Penetration RTDs
Armored cable prolongation



*Handle material ***Stainless steel 316L***
*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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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

8. Cable lengths (mm):
LC _____ LP _____

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

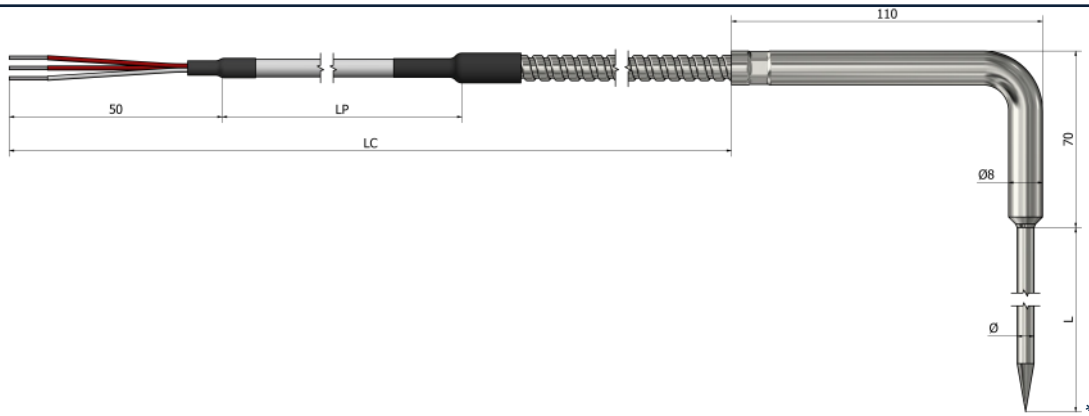
Quantity:

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.

PP32 – Penetration RTDs
Armored cable prolongation (90° bend)



*Handle material **Stainless steel 316L***
*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. Needle diameter Ø: *(material **Stainless steel 316L**)*
☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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

8. Cable lengths (mm):
LC _____ LP _____

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

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

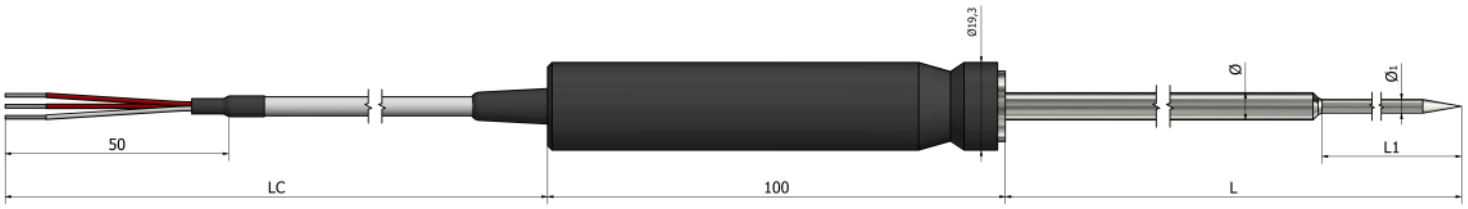
Quantity:

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.

PP40 – Penetration RTDs
Reduced tip



*Handle material ***Plastic***

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. Needle tip diameter Ø1: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle diameter Ø (mm):

7. Needle lengths (mm):

L _____ L1 _____

8. Cable prolongation:

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

☐ Fiberglass (400°C) ☐ Other:

9. Cable length LC (mm):

10. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

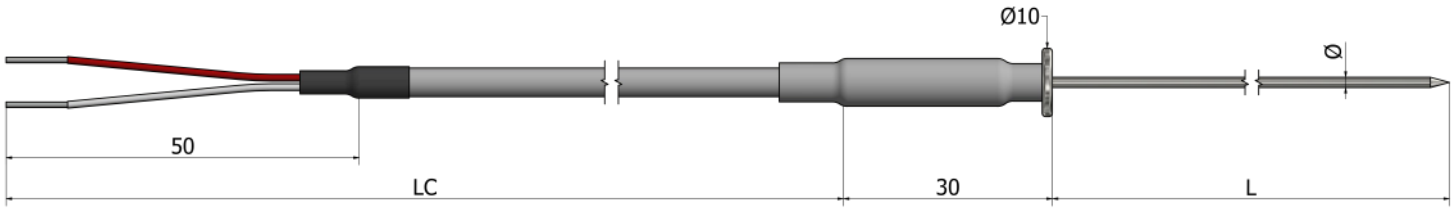
Quantity:

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.

PP41 – Penetration RTDs
Miniature



*Handle material ***Stainless steel 316L with rubber cover***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø1,5 mm ☐ Ø2 mm

☐ Other:

6. Needle length L (mm):

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"

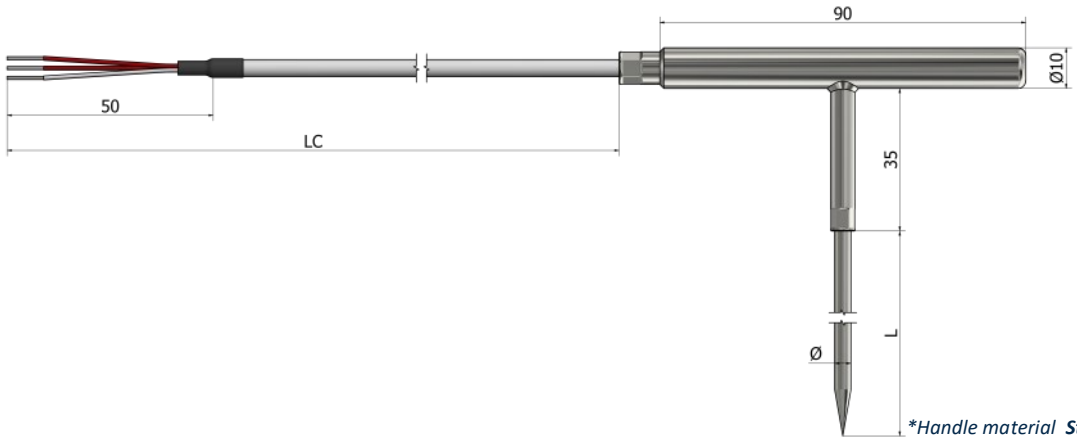
Quantity:

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.

PP50 – Penetration RTDs
T shape



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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"

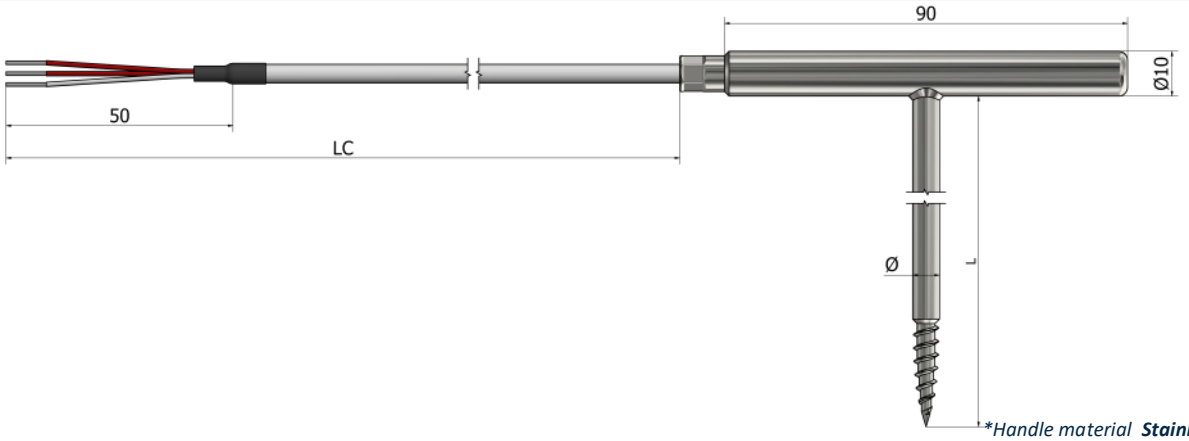
Quantity:

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.

PP51 – Penetration RTDs
T shape with thread



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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"

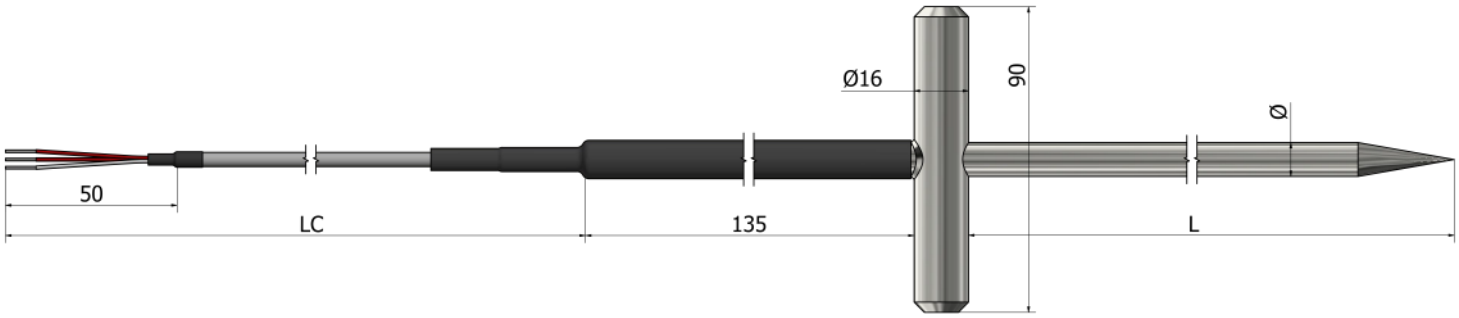
Quantity:

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.

PP60 – Penetration RTDs
T shape for compost



*Handle material ***Stainless steel 316L with rubber***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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"

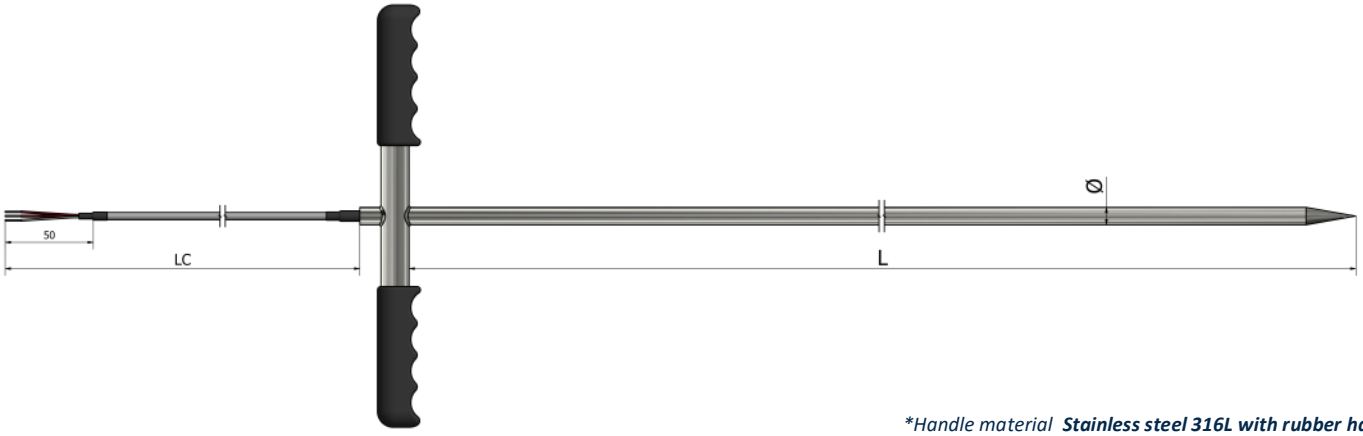
Quantity:

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.

PP61 – Penetration RTDs
Robust T shape for compost



*Handle material ***Stainless steel 316L with rubber hand***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

6. Needle length L (mm):

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.

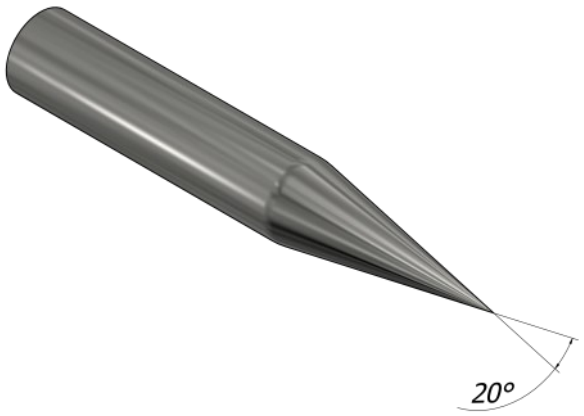
EuroSensors

Penetration thermistors

Penetration thermistors - Technical information

What are the characteristics of penetration thermistors ?

What sets penetration thermistors apart is their ability to measure the internal temperature of objects with pinpoint accuracy. Penetration probes are slender, pointed sensors designed for insertion into materials such as food, liquids, or even soil.



Here are some key applications where they prove invaluable:

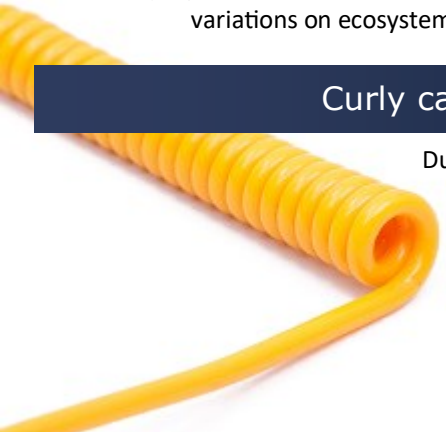
Food safety and culinary arts: In the culinary world, achieving the perfect level of doneness and ensuring food safety go hand in hand. Penetration probes allow chefs and food inspectors to measure the core temperature of dishes, ensuring they are both delicious and safe to eat.

Industrial processes: From chemical reactions to metallurgical processes, knowing the temperature within materials or substances is crucial. Penetration probes provide real-time insights into the temperature profiles of these processes, aiding in quality control and optimization.

Medical applications: In the healthcare sector, penetration probes are used for patient monitoring, particularly during surgeries where monitoring body temperature accurately is vital for patient safety.

Environmental research: Environmental scientists utilize penetration probes to measure soil temperature accurately, helping them understand the impact of temperature variations on ecosystems.

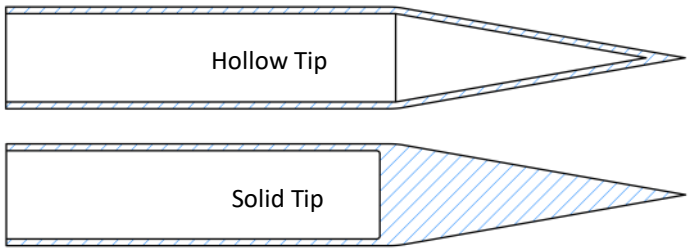
Curly cable



Due to the frequent movement of the cable while using penetration probes, there is a option to put a curly cable that will ensure a easier and more comfortable way of use.

Types of penetration probes

There are two types of penetration probes with hollow tip and solid tip. Hollow tip probes provides a faster response while solid tip probe is used in places where it is required to break through harder materials



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 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.

Penetration thermistors - 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?

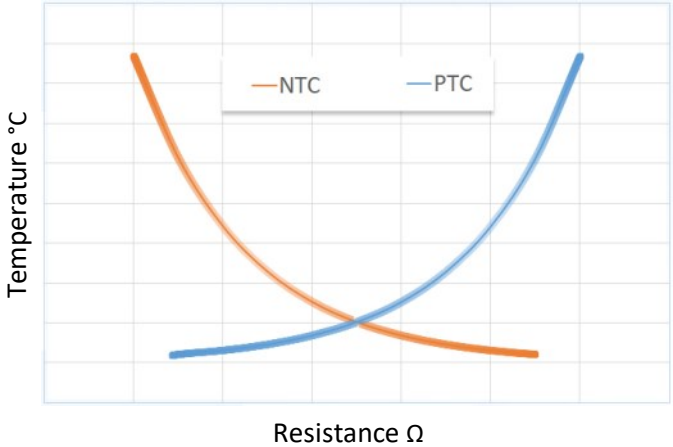
NTCs and PTCs are both thermistors, i.e. temperature sensors that change resistance depending on the temperature.
However, there is a major difference between these two types of thermistors:

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.



Thermistor 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.

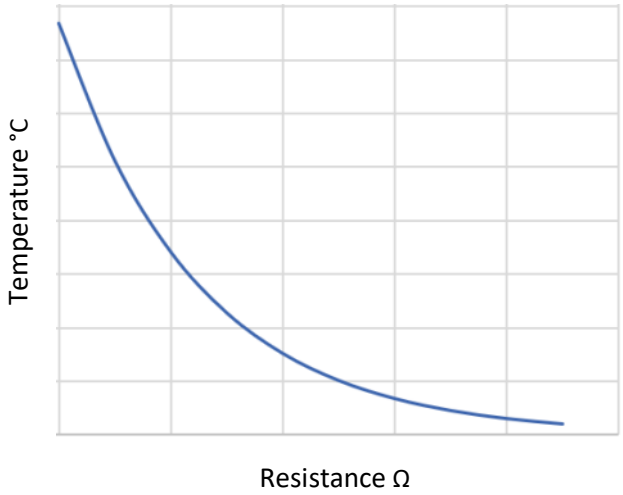
Global cable insulation characteristics

	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

Penetration thermistors - 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.



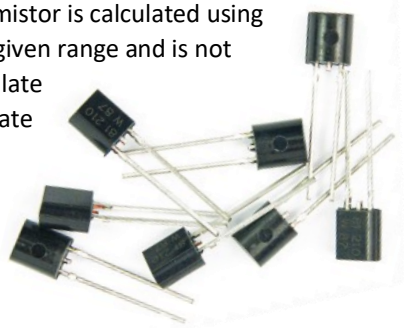
NTC thermistors are non-linear resistors that alter their resistance characteristics with temperature. Simply put, as temperature increases the thermistor's resistance decreases.

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)

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

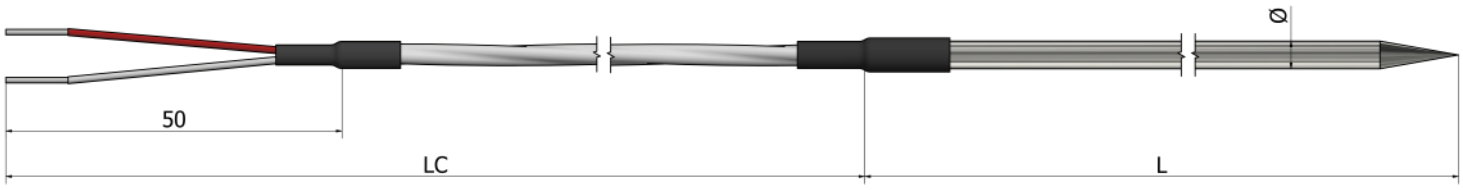
The beta value of an NTC Thermistor is calculated using only two temperatures over a given range and is not the most accurate way to calculate the R vs. T curve. A more accurate method is to use the Steinhart and Hart method, which uses three temperatures over a given range.



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)

HP01 – Penetration thermistors
Standard



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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

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"

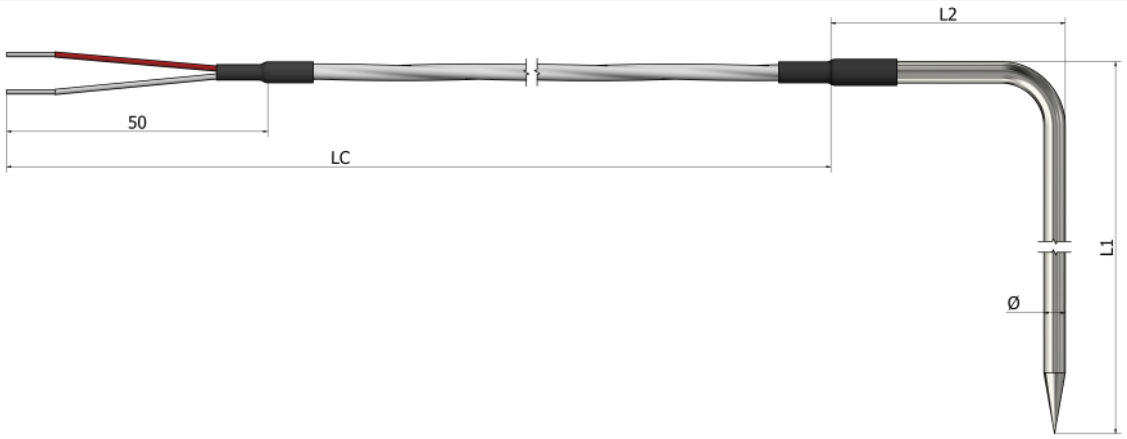
Quantity:

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.

HP02 – Penetration thermistors
Standard (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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle lengths (mm):

L1 _____ L2 _____

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"

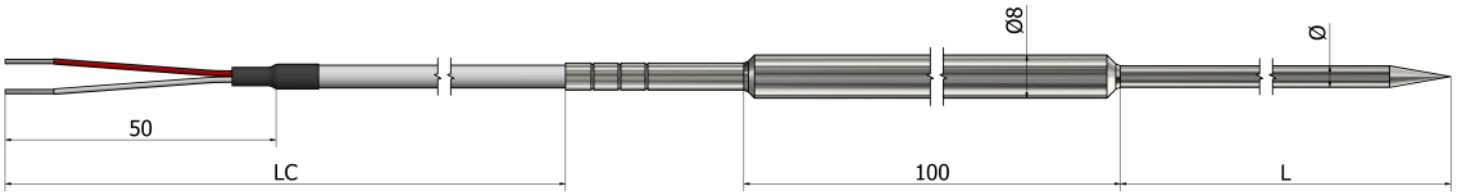
Quantity:

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.

HP11 – Penetration thermistors
Metal handle



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

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"

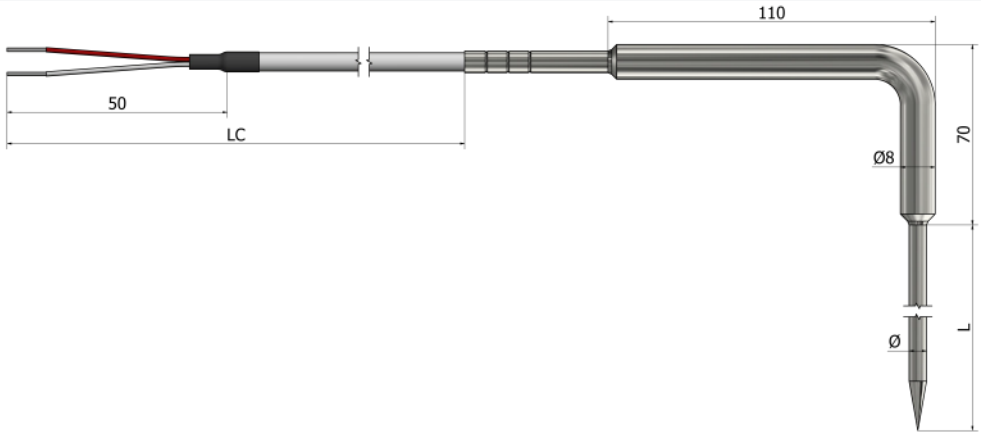
Quantity:

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.

HP12 – Penetration thermistors
Metal handle (90° bend)



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

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"

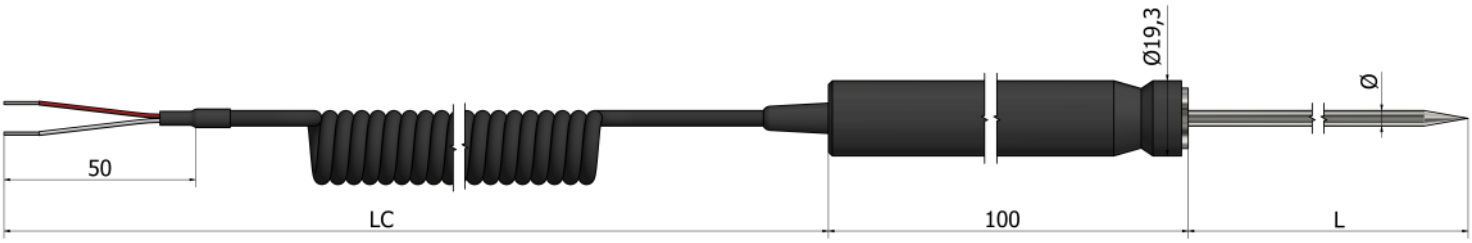
Quantity:

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.

HP13 – Penetration thermistors
Plastic handle



*Handle material ***Plastic***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Cable prolongation:

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

☐ Fiberglass (400°C) ☐ Curly polyurethane (105°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"

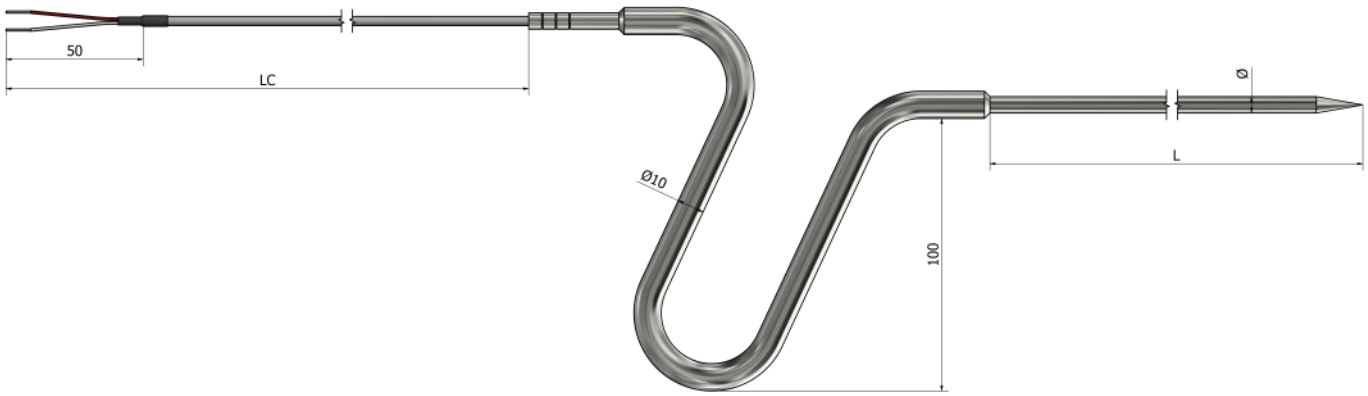
Quantity:

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.

HP20 – Penetration thermistors
Ergonomic handle



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

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"

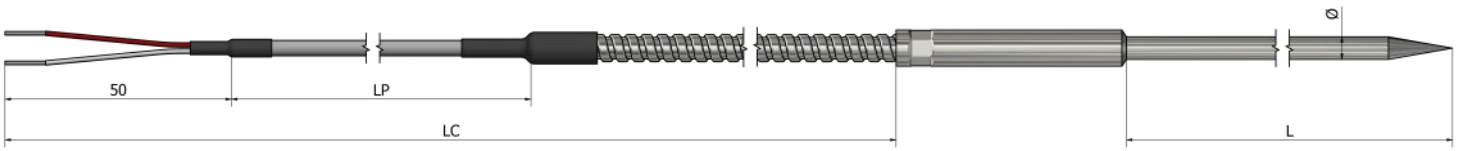
Quantity:

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.

HP31 – Penetration thermistors
Armored cable prolongation



*Handle material ***Stainless steel 316L***
*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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Cable prolongation:

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

8. Cable lengths (mm):

LC _____ LP _____

9. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

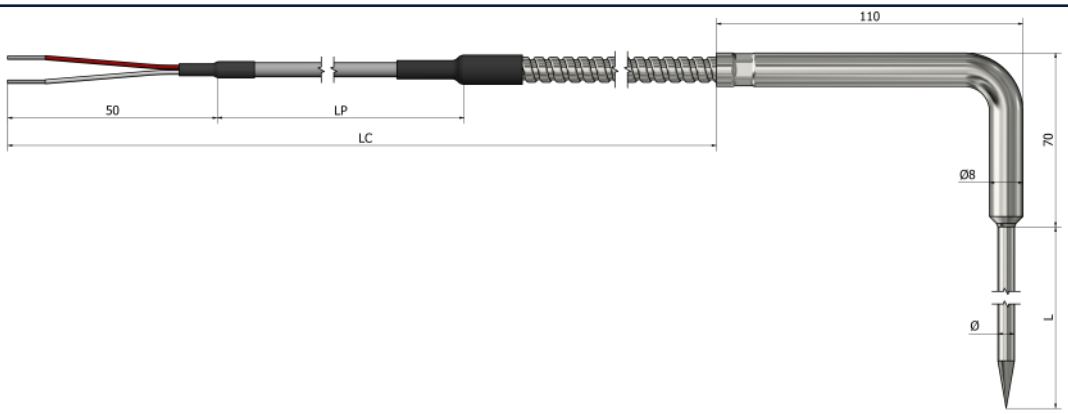
Quantity:

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.

HP32 – Penetration thermistors
Armored cable prolongation



*Handle material ***Stainless steel 316L***
*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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm
☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

5. Cable prolongation:

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

6. Cable lengths (mm):

LC _____ LP _____

7. Crimp protection:

☐ Spring ☐ Heat shrink sleeve ☐ Without

Additional:

Application:

Operating temperature (min/max):

Type of environment:

Accessories:
See the part "Accessories"

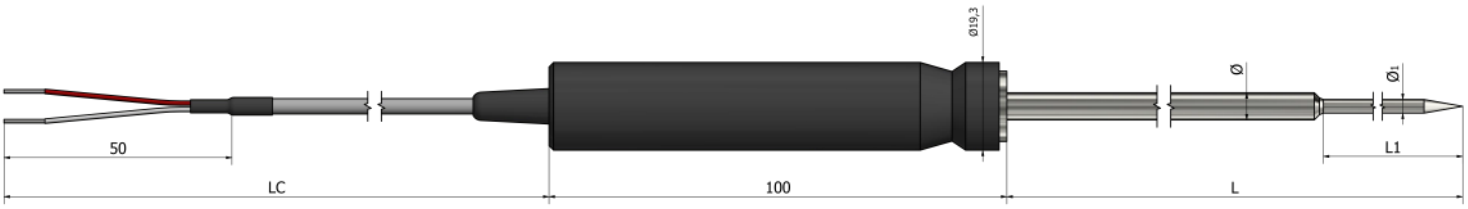
Quantity:

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.

HP40 – Penetration thermistors
Reduced tip



*Handle material ***Plastic***

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. Needle tip diameter Ø1: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle diameter Ø (mm):

5. Needle lengths (mm):

L _____ L1 _____

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"

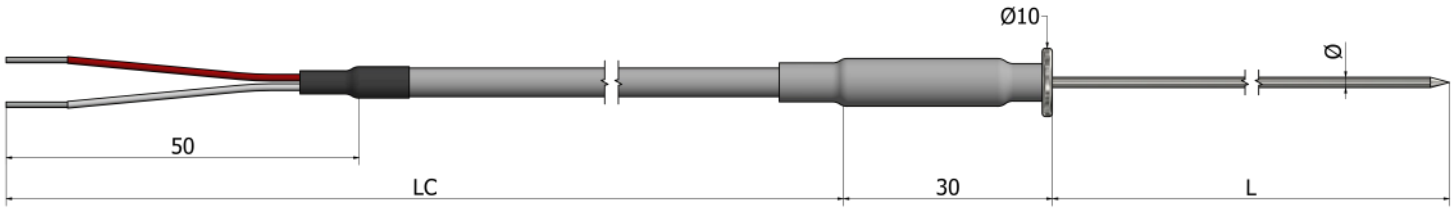
Quantity:

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.

HP41 – Penetration thermistors
Miniature



*Handle material ***Stainless steel 316L with rubber***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø1,5 mm ☐ Ø2 mm

☐ Other:

4. Needle length L (mm):

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"

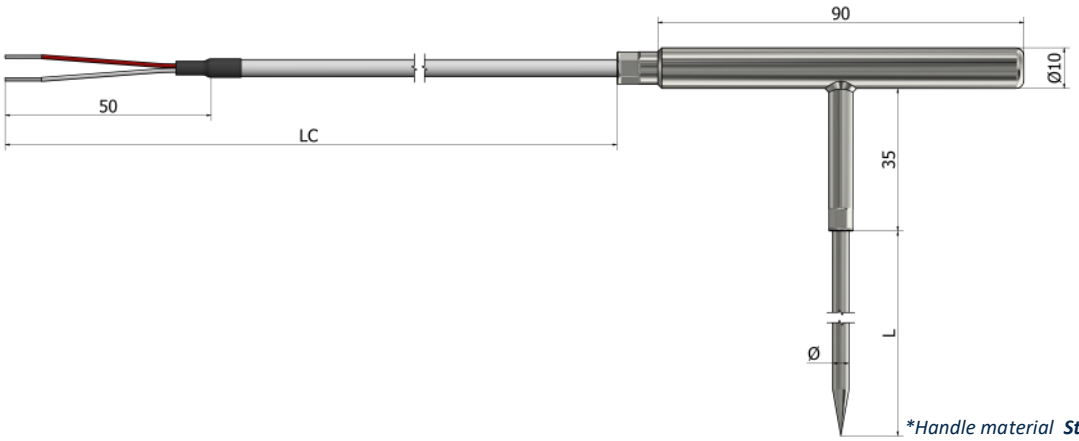
Quantity:

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.

HP50 – Penetration thermistors
T shape



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

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"

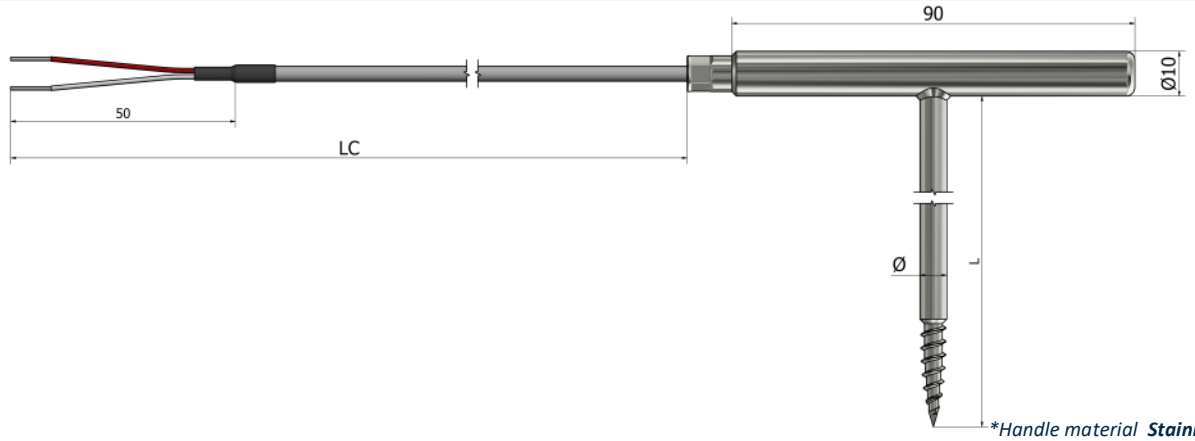
Quantity:

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.

HP51 – Penetration thermistors
T shape with thread



*Handle 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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

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"

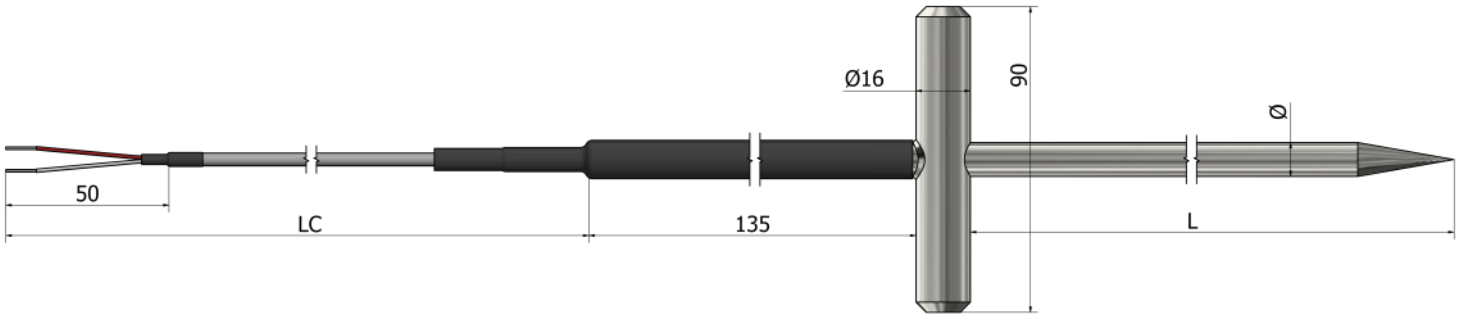
Quantity:

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.

HP60 – Penetration thermistors
T shape for compost



*Handle material ***Stainless steel 316L with rubber***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

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"

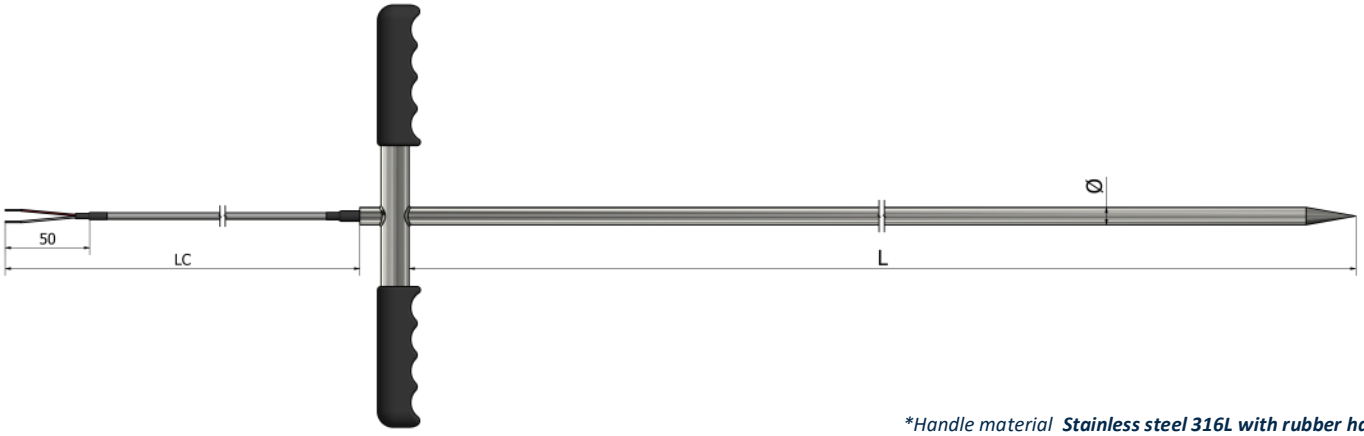
Quantity:

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.

HP61 – Penetration thermistors
Robust T shape for compost



*Handle material ***Stainless steel 316L with rubber hand***

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. Needle diameter Ø: *(material **Stainless steel 316L**)*

☐ Ø3 mm ☐ Ø4 mm ☐ Ø5 mm

☐ Ø6 mm ☐ Other:

4. Needle length L (mm):

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.