



FRODE PEDERSEN

Application

- For measuring temperature where a portable, flexible, rugged, corrosive resistant, and fast responding sensor is needed.
- Used in solid, fluid and gas medias up to 1100°C (shortly 1250°C)
- Fields of application
 - With handheld digital thermometers
 - Process industry - f.inst petrochemical, combustion, furnaces and heat treatment
 - Heating and ventilation (HVAC)

Technical features

- Thermocouple type T and K according to IEC 584-1
- UHT is a mineral insulated thermocouple consisting of thermocouple wires housed in a thin-walled flexible metal tube, firmly embedded in ceramic powder (MgO - purity >96%)
- Mounted with mini compensation plug and curly leads

Ordering

The requested sensor is selected from the table below
The colour code means:

- Standard:** Built of standard modules (short delivery time)
- Variant:** Modified standard modules
- Special:** Special versions and material. We are specialist in temperature measurement
Please contact us and we will do our best to solve your specific measuring task

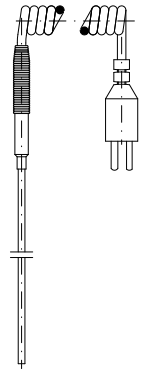
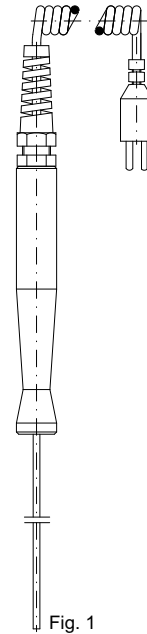


Fig. 1

Fig. 2

Ordering information

Sensor

| | |
|-----------------------------|--------------|
| Specification number | 2101- |
|-----------------------------|--------------|

Type

- | | |
|-----------------------------|----------|
| Fig. 1 With handle | 0 |
| Fig. 2 Without handle | 1 |
| Special: | s |

Plug

- | | |
|-----------------------------|----------|
| With mini compensation plug | 0 |
| Special: | s |

Thermocouple

Sheath

| Type | Diam. mm | Max. temperature °C | Material W.no. | Max. temp. °C |
|------|-------------|------------------------|-------------------|------------------|
| T | 1.0 | 400 | 1.4571 | 800 |
| T | 3.0 | 400 | 1.4571 | 800 |
| K | 1.5 | 850 | 1.4841 | 1150 |
| K | 3.0 | 1000 | 1.4841 | 1150 |
| K | 6.0 | 1000 | 1.4841 | 1150 |
| K | 1.5 | 800 | 1.4571 | 800 |
| K | 3.0 | 800 | 1.4571 | 800 |

Special:

Cable type

- | | |
|--|----------|
| XPP 2x0,08mm, curled , PVC insulated, 70°C, 1500mm (straight) | 0 |
| 2000 mm XPP 2x0,22mm ² . PVC insulated, 105°C | 1 |
| 1000 mm XGLGLO= 2x0,25mm ² . Fibreglass +steel braid, 200°C | 2 |
| 2000 mm XGLGLO= 2x0,25mm ² . Fibreglass +steel braid, 200°C | 3 |
| Special: | s |

Note 2: Only type K

Tolerance acc to IEC 584-2

- | | |
|--|----------|
| Class 2, for K, i.e. $\pm 2.5^\circ\text{C}$ or $0.0075 \times t_{\text{actual}} (^\circ\text{C})$ | 0 |
| Class 2, for T, i.e. $\pm 1.0^\circ\text{C}$ or $0.0075 \times t_{\text{actual}} (^\circ\text{C})$ | 1 |
| Special: | s |

Note 1: The highest value apply

Hot Junction

- | | |
|--|----------|
| Insulated from outer sheath | 0 |
| Grounded (thermocouple bonded to outer sheath) | 1 |

Nominal length (mm)

| | | | | |
|--|----------|----------|----------|----------|
| 150 | 0 | 1 | 5 | 0 |
| 300 | 0 | 3 | 0 | 0 |
| 500 | 0 | 5 | 0 | 0 |
| 1000 | 1 | 0 | 0 | 0 |
| Interim lengths (Min. 50, max. 9.999) | x | x | x | x |

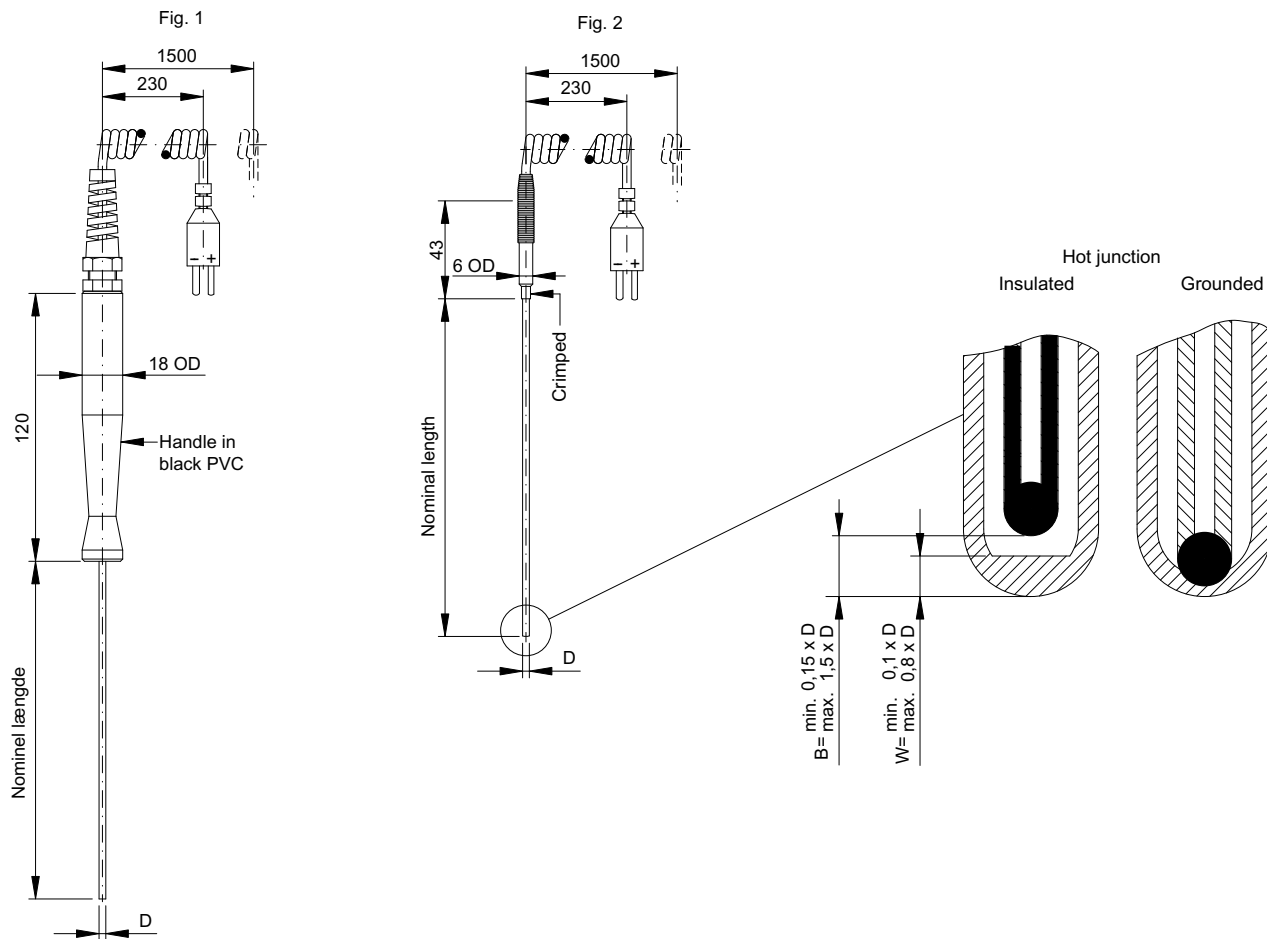
Accessories

Customer information

Name:

Tel.:

Dimensions



Properties for MI sheath material

| Application | W.no. 1.4571 AISI 316Ti max. 800°C | W.no. 1.4841 AISI 314 max. 1150°C |
|-------------------------|--|---|
| Liquids | Recommended | Suitable |
| Acid | Recommended | Not recommended |
| Sulphur atmospheres | Suitable | Not recommended |
| Chlorine atmospheres | Suitable | Suitable |
| Oxidising atmospheres | Recommended | Recommended |
| Reducing atmospheres | Not recommended | Not recommended |
| Carburizing atmospheres | Not recommended | Suitable |

Bending radius
Min. bending radius is
5 x D @ repeatable bendings
2 x D @ stationary bending

Insulation resistance and test voltage

Depending of temperature and length acc. to IEC 1515

| Thermo-couple | Length m | Test temperature °C | Insulation resistance minimum | |
|---------------|-------------|------------------------|-------------------------------|-------|
| | | | M ohm x m | M ohm |
| All | ≥1 | 20 ±15 | 1000 | - |
| | <1 | 20 ±15 | - | 1000 |
| K | All lengths | 500 ±15 | - | 5 |
| T | All lengths | 300 ±15 | - | 500 |

Depending of test voltage and diameter

| Diameter mm | Number of thermocouple | |
|----------------|------------------------|-------------------|
| | 1 | |
| | U Volt | Rmin M ohm x m |
| < 1 | 75 ±25 | 100 |
| 1 - 1.5 | 75 ±25 | 1000 |
| 2 - 6 | 500 ±50 | 1000 |

Note:

The insulation resistance is dependent upon the length of the cable. Therefore, it is listed as a length related resistance in Mohm x m for length > 1 meter and Mohm for length <1 meter

Response time Hot junction insulated

Hot junction grounded

| Sheath diameter | Response time in seconds (guidelines) | | | | Response time in seconds (guidelines) | | | |
|-----------------|---------------------------------------|------------------|------------------|------------------|---------------------------------------|------------------|------------------|------------------|
| | In water @ 0.2m/sec. | | In air @ 2m/sec. | | In water @ 0.2m/sec. | | In air @ 2m/sec. | |
| | t _{0.5} | t _{0.9} | t _{0.5} | t _{0.9} | t _{0.5} | t _{0.9} | t _{0.5} | t _{0.9} |
| 0.5 | 0.06 | 0.13 | 1.8 | 5.52 | 0.03 | 0.10 | 1,8 | 5,85 |
| 1.0 | 0.15 | 0.5 | 3 | 10 | 0.06 | 0.18 | 3 | 10 |
| 1.5 | 0.21 | 0.6 | 8 | 25 | 0.13 | 0.4 | 8 | 25 |
| 3.0 | 1.2 | 2.9 | 23 | 80 | 0.22 | 0.75 | 23 | 80 |
| 6.0 | 4 | 9.6 | 60 | 200 | 0.55 | 2.6 | 55 | 185 |

Note:

The 0.5/0.9 time is the time that it takes the sensor to reach 50%/90% of the final value of a temperature change of a medium. If media and velocity are different from the ones stated, the time can change significantly.