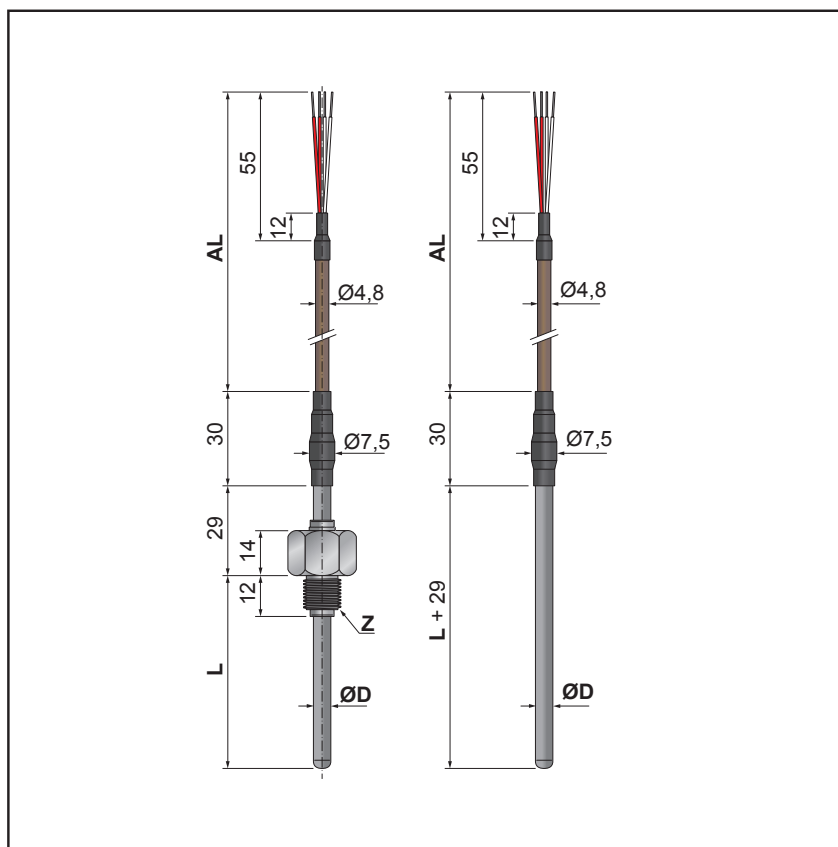


MANUAL

T1026

Cable Resistance Temperature Sensors for Cryogenic Temperatures



- Measuring resistor 1x / 2x Pt100
- Measuring range -200 to +180 °C
- Accuracy class A, B according to EN 60751
- High resistance to temperature shock
- Stainless steel design
- Selectable length of immersion
- Selectable diameter of stem
- Selectable size of connection thread
- Selectable length of extension cable
- Housing IP 67

Contents

| | |
|---|----------|
| 1. General instructions and information | 3 |
| 1.1 Symbols used..... | 3 |
| 1.2 Safety warnings and cautions..... | 3 |
| 1.3 Scope of delivery..... | 3 |
| 1.4 Description of the delivery and packing..... | 3 |
| 1.5 Storage..... | 3 |
| 1.6 Installation and commissioning..... | 3 |
| 1.7 Spare parts..... | 3 |
| 1.8 Repairs..... | 3 |
| 1.9 Warranty..... | 3 |
| 2. End of service and disposal | 3 |
| 2.1 End of service..... | 3 |
| 2.2 Disposal..... | 3 |
| 3. Product description | 4 |
| 3.1 Application..... | 4 |
| 3.2 Description..... | 4 |
| 3.3 Dimensional drawings..... | 4 |
| 4. Installation, operation and maintenance | 5 |
| 4.1 Installation and commissioning..... | 5 |
| 4.2 Operation and maintenance..... | 5 |
| 5. Product specifications | 5 |
| 5.1 Technical specifications..... | 5 |
| 5.2 Metrological parameters..... | 5 |
| 6. Ordering information | 6 |
| 6.1 Ordering table..... | 6 |

1. General instructions and information

1.1 Symbols used



Symbol of warning; for safe use it is necessary to proceed according to the instructions



This product does not belong to public waste and it is subjected to separate collection

1.2 Safety warnings and cautions



The equipment may be installed only by a qualified personnel who are familiar with national and international laws, directives, standards and with the instructions manual. The equipment shall be supplied from a safe voltage source that meets all requirements of the standard EN 61010-1 and must be installed in compliance with national requirements and standards providing safety.

The instrument may not be used for other purposes than as specified in this instruction manual. For elimination of a risk of injury from electric shock or fire, the maximum operational parameters of the instrument may not be exceeded.

1.3 Scope of delivery

With the product is delivered:

- Manual for installation, operation and maintenance
- Certificate of calibration (only with calibrated sensors)

1.4 Description of the delivery and packing

The product is packaged in a protective cover and provided with an identification label with a mark of the output control.

The product must not be exposed to direct rain, vibrations and shocks during transport.

1.5 Storage

The product shall be stored at temperatures from 5 to 35 °C and maximum relative humidity 80 % in the rooms with elimination of condensation of water vapours on the products. The stored products shall not be exposed to any shocks, vibrations and effects of harmful vapours and gases.

1.6 Installation and commissioning

During installation, commissioning, operation and maintenance follow the instructions in chapter 4.

1.7 Spare parts

Any of the compact parts of the product can be also ordered as a spare part if there are not required special procedures or technological operations for the exchange.

1.8 Repairs

Products are repaired by the manufacturer. The products for repair should be sent in a packing that guarantees damping of shocks and vibrations and protects against damage during transport.

1.9 Warranty

Products are covered by a warranty for a period of 24 months from the delivery date on the delivery note. The manufacturer guarantees technical and operational parameters of the products within scope of the applicable documentation. Warranty period is specified with individual items and begins from the day of takeover of the goods by the purchaser or delivery to the carrier. Any claims concerning to defects of the goods together can be filed in writing with the manufacturer within the warranty period and the claimed product shall be presented. The claiming party shall give identification of the product, number of the delivery note and description of the fault or defect.

The manufacturer is not responsible for any defects caused by improper storage, incorrect connection, damages caused by external effects, in particular by effects of factors with excessive values, unqualified installation, improper operation or common wearing.

2. End of service and disposal

2.1 End of service



Before removing and ending of service of the sensor is at first necessary to switch the control loop to manual operation, or take other appropriate action to prevent potential harm associated with the end of sensor operation. Connected power supply is switched off and connecting wires of the sensor are disconnected (cut off).

2.2 Disposal

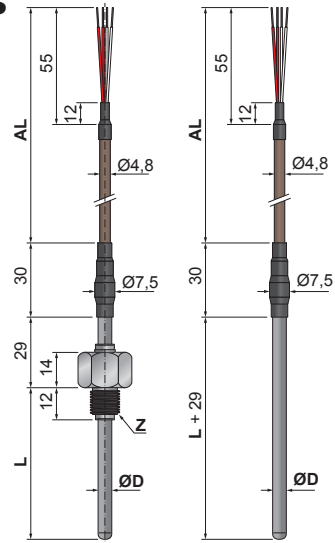


The products do not contain any environmentally hazardous parts. When disposing the packing and destroyed or irreparably damaged product proceed according to the local regulations.

3. Product description

T1026 Cable Resistance Temperature Sensors for Cryogenic Temperatures

- Measuring resistor 1x / 2x Pt100
- Measuring range -200 to +180 °C
- Accuracy class A, B according to EN 60751
- High resistance to temperature shock
- Stainless steel design
- Selectable length of immersion
- Selectable diameter of stem
- Selectable size of connection thread
- Selectable length of extension cable
- Housing IP 67



3.1 Application

Cable resistance temperature sensors T1026 with firmly connected connection wires are designed for measuring in areas with cryogenic temperatures. Construction of the sensors allows measuring in areas with repeated abrupt temperature changes in the range -200 to +180 °C.

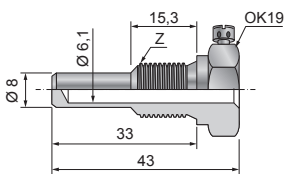
3.2 Description

Sensor is made of one or two measuring resistors Pt100 embedded in the ceramic housing and metal protective tube. Sensor terminals are firmly connected to the extension wires with cooper wires and FEP insulation, cooper screen and outer silicone insulation. Version without welded connecting pipe union is mounted to the technology by fixing shift pipe union or into protective thermowell. Version with welded connecting pipe union on the protective tube of the sensor is screwed into welded on piece or into inner thread in the technology.

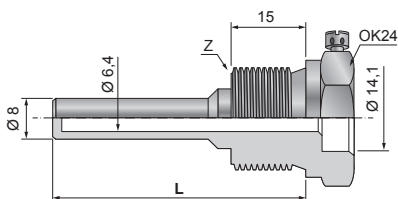
3.3 Dimensional drawings

Thermowells - stainless steel 1.4541 for PN 63

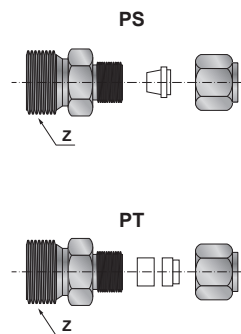
Version A for code S60 M00



Version C for code S60 M00



Fixing shift pipe union



4. Installation, operation and maintenance

4.1 Installation and commissioning

4.1.1 General

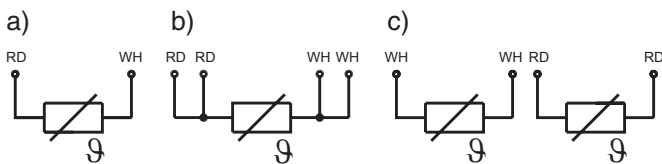
Sensor shall be fixed by screwing inside of the welded-on piece of pipe or technological equipment. Thermowells of the sensors shall be fixed by corresponding connecting pipe union into direct or oblique welded-on piece into pipe etc. When installing the sensor into thermowell type A, sensor is inserted to the bottom of the thermowell and secured by a screw on the side of the thermowell (connection thread shall be treated against galling and for easy mounting and dismantling especially to stainless steel fitting). When installing the sensor with stainless steel housing into thermowell type C, sensor is inserted to the bottom of the thermowell and secured by screwing cap nut with safety copper ring. All versions of the thermowells allow sealing against unauthorized manipulation. Sealing is performed by authorized worker during commissioning.

Sensors are connected to the evaluating device by connecting copper wire (cable). In case of two-wire sensor is needed to count with internal resistance of the cable. The value of the internal resistance per meter is listed on the type plate.

4.1.2 Commissioning

Sensor is ready for operation after connection of connection wires between the sensor terminals and terminals of the associated apparatus.

4.1.3 Electrical connection



- a) 1x Pt100, two-wire
 - b) 1x Pt100, four-wire
 - c) 2x Pt100, two-wire
- RD - red, WH - white

4.2 Operation and maintenance

The product does not need any maintenance.

It is recommended to check the mounting of the sensor at preselected intervals.

To ensure metrological parameters of the sensors, periodic checks of calibration parameters must be performed. Period of calibrations is set by the user and it is based on operating conditions and internal metrology regulations. Manufacturer's recommended period is 12 months. If there is during the calibration found calibration difference from the expected metrological parameters, it is necessary to replace the sensor.

5. Product specifications

5.1 Technical specifications

Measuring resistor:

1xPt100, accuracy class A, B according to EN 60751,
 four-wire inside wiring (cable 4x0.22 mm²)
 two-wire inside wiring (cable 2x0.50 mm²)
 2xPt100, accuracy class B according to EN 60751,
 two-wire inside wiring (cable 4x0.22 mm²)

Measuring range:

-200 to +180 °C (in accuracy class B)

Measuring current:

recommended 0.3 to 1 mA
 maximal 3 mA

Dielectric strength: 500 V eff

Electrical insulation resistance:

min. 100 MOhm according to EN 60751,
 at temperature (25 ±10) °C
 max. 80 % relative humidity

Used materials:

thermowell, pipe union
 - stainless steel 1.4541 (AISI 321)
 inside wiring - Cu
 core insulation - PFA
 cable insulation - silicone

Connecting wires resistance R₃ for two-wire connections:

- cable 4x0.22 mm² ... 0.17 Ohm/m (two cores)
 - cable 2x0.50 mm² ... 0.08 Ohm/m (two cores)

Housing:

IP 67

5.2 Metrological parameters

Temperature sensors can be supplied:

- as sensors with calibration,
- as sensors without calibration.

Tolerance limits of accuracy classes are listed in EN 60751. The initial tolerance is related to the initial calibration of the sensor. Drift of the sensor meets the requirements of EN 60751, Sec. 6.5.3. To ensure accuracy of measurement, it is necessary to calibrate sensors periodically according to the operating parameters. Sensors can be supplied with calibration at several temperature points, according to customer requirements.

6. Ordering information

6.1 Ordering table

| Type | Description | |
|--|---|------------------------------|
| T1026 | Cable resistance temperature sensor for cryogenic temperatures | |
| Code | Temperature sensor | Inside wiring |
| 04 | 1xPt100, two-wire inside wiring | Cu, 0.50 mm ² |
| 06 | 1xPt100, four-wire inside wiring | Cu, 0.22 mm ² |
| 08 | 2xPt100, two-wire inside wiring | Cu, 0.22 mm ² |
| 99 | Other | |
| Code | Accuracy class according to EN 60751 | |
| 1 | B | |
| 2 | A (only for sensors with four-wire inside wiring and in range -30 to +180 °C) | |
| Code | Stem | |
| | Outer diameter of stem D [mm] | Stem material |
| S50 | 5 | 1.4541 |
| S60 | 6 | 1.4541 |
| Code | Nominal immersion length L [mm] | |
| L065 | 65 | |
| L100 | 100 | |
| L160 | 160 | |
| L250 | 250 | |
| L | Other (specify length in mm) | |
| Code | Connection thread Z | Thread length L2 [mm] |
| M00 | Without connecting pipe union | - not for stem diameter 5 mm |
| G14 | G1/4" outer | 12 |
| M12 | M12 outer | 12 |
| P20 | Diameter 20 mm, height 7 mm (for cap nut) | |
| M99 | Other | |
| Code | Length of extension cable AL [mm] | |
| AL1600 | 1600 | |
| AL2500 | 2500 | |
| AL4000 | 4000 | |
| AL6000 | 6000 | |
| AL | Other (specify length in mm - in 100 mm steps) | |
| Code | Outer insulation / shield / inner insulation | |
| I1 | Silicon / Cu braid / Teflon FEP | |
| Code | Cable termination | |
| 00 | Flying leads (standard) | |
| 01 | Insulated pressing tube according to DIN 46228 | |
| 09 | Other | |
| Code | OPTIONAL ACCESSORIES | |
| | Calibration in customer defined points, including certificate of calibration | |
| KTE31A | Resistance temperature sensor calibration in three points in range -40 to +180 °C | |
| KTE41A | Resistance temperature sensor calibration in four points in range -40 to +180 °C | |
| KTE51A | Resistance temperature sensor calibration in five points in range -40 to +180 °C | |
| KTE31B | Resistance temperature sensor calibration in three points in range (-196 °C; -75 to +180 °C) | |
| KTE41B | Resistance temperature sensor calibration in four points in range (-196 °C; -75 to +180 °C) | |
| KTE51B | Resistance temperature sensor calibration in five points in range (-196 °C; -75 to +180 °C) | |
| KTE9 | Other | |
| Code | OPTIONAL ACCESSORIES | |
| | Thermowell (only for S60 M00) | |
| J01 | Thermowell, version A, length L= 33 mm, material stainless steel 1.4541, PN 63, thread G1/4" | |
| J02 | Thermowell, version A, length L= 33 mm, material stainless steel 1.4541, PN 63, thread M12x1.5 | |
| J11 | Thermowell, version C, length L= 100 mm, material stainless steel 1.4541, PN 63, thread G1/2" | |
| J12 | Thermowell, version C, length L= 150 mm, material stainless steel 1.4541, PN 63, thread G1/2" | |
| J13 | Thermowell, version C, length L= 85 mm, material stainless steel 1.4541, PN 63, thread G1/2" | |
| J14 | Thermowell, version C, length L= 120 mm, material stainless steel 1.4541, PN 63, thread G1/2" | |
| J15 | Thermowell, version C, length L= 210 mm, material stainless steel 1.4541, PN 63, thread G1/2" | |
| J16 | Thermowell, version C, length L= 100 mm, material stainless steel 1.4541, PN 63, thread M20x1.5 | |
| J17 | Thermowell, version C, length L= 150 mm, material stainless steel 1.4541, PN 63, thread M20x1.5 | |
| J18 | Thermowell, version C, length L= 85 mm, material stainless steel 1.4541, PN 63, thread M20x1.5 | |
| J19 | Thermowell, version C, length L= 120 mm, material stainless steel 1.4541, PN 63, thread M20x1.5 | |
| J20 | Thermowell, version C, length L= 210 mm, material stainless steel 1.4541, PN 63, thread M20x1.5 | |
| J99 | Other | |
| Example of order: T1026 06 1 S50 L065 G14 AL6000 I1 00 KTE31A (-40, 0, 20 °C) | | |

Cable Resistance Temperature Sensors T1026 for Cryogenic Temperatures

| OPTIONAL ACCESSORIES | | | |
|-------------------------------------|---|------------------|------------------|
| Type | Description | | |
| P | Fixing shift pipe union for sheath temperature sensor | | |
| Code | Version | T _{max} | p _{max} |
| S ¹⁾ | With stainless steel cutting ring, pipe union of stainless steel material | 600 °C / 0.1 MPa | 4 MPa / 100 °C |
| T ²⁾ | With PTFE sealing ring, pipe union of stainless steel material | 200 °C / 0.1 MPa | 0.6 MPa / 100 °C |
| Code | Connection thread Z | | |
| M02 | M12x1.5 | | |
| M03 | M16x1.5 | | |
| M04 | M20x1.5 | | |
| G02 | G1/4" | | |
| G03 | G3/8" | | |
| G04 | G1/2" | | |
| N02 | 1/4" NPT | | |
| N03 | 3/8" NPT | | |
| N04 | 1/2" NPT | | |
| Code | Outer diameter of stem sensor | | |
| D60 | 6 mm | | |
| Example of order: PS M04 D60 | | | |

¹⁾ ... Adjustable nominal length only for first time of mounting.

²⁾ ... Always adjustable nominal length.



JSP Industrial Controls

JSP, s.r.o. | Raisova 547, 506 01 Jičín, Czech Republic
+420 493 760 811 | export@jsp.cz | www.jsp.cz

Your Supplier: