Sheathed thermometer, stern tube
For shipbuilding industry
Models TR791, TC791

Applications

- Monitoring of temperatures in stern tubes

Special features

- Robust
- Flexible
- Approval Lloyd's Register
- Optional: with PTFE cable

Description

Electrical thermometers specifically for the monitoring of temperatures in stern tubes. The flexible sheath and the compression fitting enable individual adjustment to the mounting position in the stern tube.

The flexible part of a sheathed sensor is a mineral-insulated cable, the sheathed cable. It consists of a stainless steel outer sheath in which the internal lead is pressed and isolated within a high-density ceramic mass.

Optional connection box and/or cable available. For resistance thermometers a PTFE cable with an aluminium shield is used, suitable up to 200 °C. The PTFE glass fibre cable of the thermocouples is designed with metal braiding and is suitable up to 250 °C.

To secure the cable, a second process connection can be supplied as an option.
Resistance thermometer for model TR791

Sensor tolerance value per DIN EN 60751
- Class B
- Class A (not with 2-wire connection)

The combination of 2-wire connection and Class A is not permissible.

With the 2-wire connection the lead resistance of the cable compounds the error. The error increases with increasing length of the sheath or of the cable. The thermometers described here are often designed significantly longer than 1000 mm. Therefore, the 3-wire or 4-wire connection should be used.

For detailed specifications for Pt100 sensors, see Technical Information IN 00.17 at www.wika.com.

Thermocouple for model TC791

Sensor type
- K (NiCr-Ni)
- J (Fe-CuNi)

Listed thermocouples are available both as single or dual thermocouples. The thermocouple will be delivered with an insulated measuring point.

Tolerance value
For the tolerance value of thermocouples, a cold junction temperature of 0 °C has been taken as the basis.

Type K

<table>
<thead>
<tr>
<th>Class</th>
<th>Temperature range</th>
<th>Tolerance value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN EN 60584 part 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-40 ... +375 °C</td>
<td>± 1.5 °C</td>
</tr>
<tr>
<td>1</td>
<td>+375 ... +1000 °C</td>
<td>± 0.0040 •</td>
</tr>
<tr>
<td>2</td>
<td>-40 ... +333 °C</td>
<td>± 2.5 °C</td>
</tr>
<tr>
<td>2</td>
<td>+333 ... +1200 °C</td>
<td>± 0.0075 •</td>
</tr>
</tbody>
</table>

1) | t | is the value of the temperature in °C irrespective of the sign.

Type J

<table>
<thead>
<tr>
<th>Class</th>
<th>Temperature range</th>
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<tbody>
<tr>
<td>DIN EN 60584 part 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-40 ... +375 °C</td>
<td>± 1.5 °C</td>
</tr>
<tr>
<td>1</td>
<td>+375 ... +750 °C</td>
<td>± 0.0040 •</td>
</tr>
<tr>
<td>2</td>
<td>-40 ... +333 °C</td>
<td>± 2.5 °C</td>
</tr>
<tr>
<td>2</td>
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</tr>
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</table>

1) | t | is the value of the temperature in °C irrespective of the sign.

Tolerance value at selected temperatures in °C

<table>
<thead>
<tr>
<th>Temperature (ITS 90) °C</th>
<th>Type K Tolerance value</th>
<th>Type J Tolerance value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>± 2.5</td>
<td>± 2.5</td>
</tr>
<tr>
<td>200</td>
<td>± 2.5</td>
<td>± 2.5</td>
</tr>
<tr>
<td>400</td>
<td>± 3.0</td>
<td>± 3.0</td>
</tr>
<tr>
<td>600</td>
<td>± 4.5</td>
<td>± 4.5</td>
</tr>
<tr>
<td>800</td>
<td>± 6.0</td>
<td>undefined</td>
</tr>
</tbody>
</table>

Process connection

Connection type
Compression fitting

Material
Stainless steel 1.4571

Thread
G ¼ B, G ½ B, G ½ B
other versions on request

Probe

Design
Sheathed cable

Bending radius
The permissible bending radius is 3-times the sheath diameter. With the TR791 the probe tip is a rigid tube, approx. 60 mm long.

Material
Stainless steel 1.4571

Diameter
3, 4.5, 6.0 mm

Nominal length
To customer specification, min. 500 mm

Connection box (option)

Material
Aluminium, epoxy coated

Cover
Detachable, 2 mounting screws, EPDM flat seal

Cable glands
Pg 16

Ingress protection
IP 67

Terminal block
Ceramic, max. 1.5 mm², screws captive

Ground terminal
Present
Cable (option)

- **Model TR791**
  - Insulation: PTFE
  - Screen: Aluminium foil
  - Permissible ambient temperature: -200 ... +200 °C
  - Wire material: Cu (strands)
  - Wire cross-section: 0.25 mm²
  - Number of wires: According to the number of sensors and the sensor connection method
  - Wire ends: Blank
  - Cable length: To customer specification

- **Model TC791**
  - Insulation: PTFE glass fibre
  - Armour: Galvanised steel braid
  - Permissible ambient temperature: -200 ... +250 °C
  - Wire material: Compensating cable depending on type of sensor (lead)
  - Wire cross-section: 0.22 mm²
  - Number of wires: Depends on the number of sensors
  - Wire ends: Blank
  - Cable length: To customer specification

Dimensions in mm

![Dimensions Diagram](image-url)
Electrical connection

Model TR791 with cable

1 x Pt100, 2-wire

1 x Pt100, 3-wire

1 x Pt100, 4-wire

2 x Pt100, 2-wire

2 x Pt100, 3-wire

Model TC791 with cable

Sensor type K
- green
- white

Sensor type J
- black
- white

Model TR791 with terminal block in connection box

1 x Pt100, 2-wire

1 x Pt100, 3-wire

1 x Pt100, 4-wire

2 x Pt100, 2-wire

2 x Pt100, 3-wire

Model TC791 with terminal block in connection box

For colour coding, see table below

<table>
<thead>
<tr>
<th>Colour coding</th>
<th>Standard</th>
<th>Positive</th>
<th>Negative</th>
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<td>Sensor type</td>
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<td>J</td>
<td></td>
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<tr>
<td>Standard</td>
<td>DIN EN 60584</td>
<td>DIN EN 60584</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>green</td>
<td>black</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>white</td>
<td>white</td>
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Model TC791 with cable

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Ordering information

Model / Sensor type and number of sensors / Sensor connection method / Tolerance value / Process conenction / Nominal length NL / Cable / Cable length KL / Connection box

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