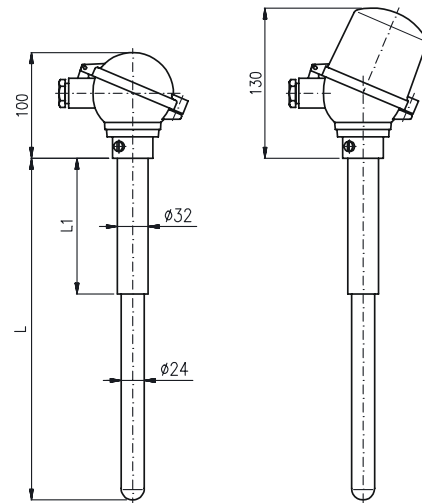


# T1523

## Straight Thermocouple Temperature Sensors with Ceramic Protective Tubes C799 without/with Transmitters 4 to 20 mA

- Thermocouple S, B (wire  $\varnothing$  0.5 mm)
- Measuring range 0 to 1300 °C ("S"), 300 to 1600 °C ("B")
- Accuracy class 2 to 3 according to EN 60584-2
- Spherical head form A according to DIN
- Two protective tubes of C799 ceramics
- Selectable protective tube lengths
- Thermometer is fixed with shift weld-on flange
- Housing IP 55
- Optional headmounted programmable transmitter with output 4 to 20 mA, including circuit isolation version and II 1G EEx d IIC T1 ... T6 (ATEX)



### Application

Straight thermocouple temperature sensors T1523 are designed for remote measuring of temperature in furnaces, incinerating plants and the like. They are designed for mounting into furnace walls and other technologic plants. They can be supplied with or without a 4 to 20 mA headmounted transmitter.

### Description

A single or dual thermocouple type S or type B which is placed in capillary and in two protective tubes of C799 ceramics and connected to a terminal board inside the spherical head form A according to DIN. There is made use of rise of thermoelectric voltage. Its size depends on a temperature difference between a measuring junction and a cold junction of the thermocouple. With a version with a transmitter the thermoelectric voltage is converted to a unified linear current signal of 4 to 20 mA. The thermometer should be mounted by a fixing shift flange.

### Technical Specifications

#### Thermocouple:

- S (PtRh10-Pt), accuracy class 2 according to EN 60584-2
- B (PtRh30-PtRh6), accuracy class 3 according to EN 60584-2

#### Measuring Range:

- |                  |                |                  |
|------------------|----------------|------------------|
| Permanent        | Short-term     |                  |
| 0 to +1300 °C    | up to +1600 °C | (thermocouple S) |
| +300 to +1600 °C | up to +1700 °C | (thermocouple B) |

**Output signal:** linearized 4 to 20 mA <sup>1)</sup>

**Dielectric Strength:** 500 V eff

**Diameter of Wires:**  $\varnothing$ 0.5 mm

#### Materials:

- Head - Varnished Aluminium alloy
- Support tube  $\varnothing$ 32x2 - Varnished carbon steel
- Outside protective tube  $\varnothing$ 24x3 - C799 ceramics
- Inside protective tube  $\varnothing$ 15x2.5 - C799 ceramics
- Insulation tube of T/C  $\varnothing$ 8.5x1.5 - C799 ceramics

#### Typical Composition of C799 Ceramics:

99.7 % Al<sub>2</sub>O<sub>3</sub>

#### Porosity of C799 Ceramics:

No porosity

#### Maximum Temperature of Head:

150 °C (without transmitter)

#### Housing:

IP 55

### Operation conditions

#### Maximal Temperature of Head:

- 150 °C (without transmitter)
- 80 °C (with transmitter PT-031 and P3301)
- 85 °C (with transmitter P5102, P5201 and P5310)

### Other specifications

#### EMC (Electromagnetic Compatibility):

According to EN 61326-1:98 / A1:99

#### Weight:

a) without transmitters with head H1:

- |                 |                  |
|-----------------|------------------|
| Nominal length: | 500 ... 1.30 kg  |
|                 | 710 ... 1.50 kg  |
|                 | 800 ... 1.60 kg  |
|                 | 1000 ... 2.10 kg |
|                 | 1400 ... 2.60 kg |
|                 | 1600 ... 2.80 kg |
|                 | 2000 ... 3.30 kg |

b) with head H2 plus 0.03 kg

- c) with transmitter PT-031 plus 0.02 kg  
 with transmitter P5102 plus 0.04 kg  
 with transmitter P5201 plus 0.05 kg  
 with transmitter P3301 plus 0.04 kg  
 with transmitter P5310 plus 0.04 kg

#### Caution!

If the temperature sensor is being installed or replaced in operation it is necessary to insert it into a furnace tube gradually (see table) so as to prevent the ceramic protective tubes from cracking because of the heat stress caused by a rapid temperature change.

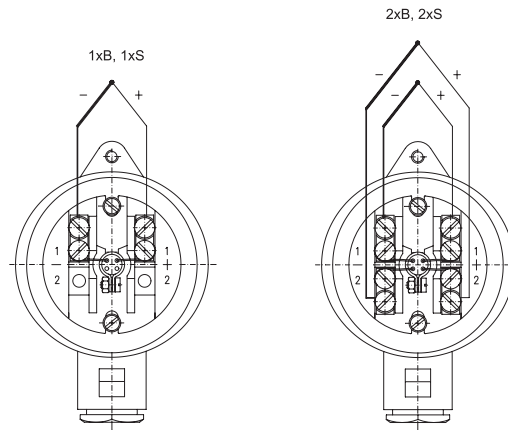
Working Temperature [°C]	1200	1400	1600
Velocity of shifting [mm/min]	200	60	20

If it is impossible to provide recommended velocity of shifting, sensors have to be slowly and evenly pre-heating.

<sup>1)</sup>... Only for sensor with transmitter

# Straight Thermocouple Temperature Sensors T1523 with Ceramic Protective Tubes C799

## Electrical Connections



Type	Description
◦ T1523-6 →	<b>Straight Thermocouple Temperature Sensors with Ceramic Protective Tubes C799/C799</b>
<b>Code</b>	<b>Thermocouple</b>
◦ 26 →	1x"S" (PtRh10-Pt), Insulated
◦ 66	2x"S" (PtRh10-Pt), Insulated, Isolated Junctions
◦ 28	1x"B" (PtRh30-PtRh6), Insulated
◦ 68	2x"B" (PtRh30-PtRh6), Insulated, Isolated Junctions
99	Other
<b>Code</b>	<b>Accuracy Class according to EN 60584-2</b>
◦ 7 →	2 (Standard for Thermocouple "S")
◦ 8	3 (Standard for Thermocouple "B")
9	Other
<b>Code</b>	<b>Nominal Length L [mm]</b>
◦ 150	500
◦ 171 →	710
◦ 180	800
◦ 210	1000
◦ 214	1400
◦ 216	1600
220	2000
999	Other
<b>Code</b>	<b>Outside Protective Tube / Inside Protective Tube Outside Diameter x Wall Thickness [mm]</b>
◦ O1 →	∅24x3 / ∅15x2.5
O9	Other
<b>Code</b>	<b>Support Tube - L1 Length [mm]</b>
◦ N0 →	200 (Standard for Lengths 500, 710, 800 mm)
◦ N1	400 (Standard for Lengths 1000, 1400, 1600, 2000 mm)
N9	Other
<b>Code</b>	<b>Head</b>
◦ H1 →	Al Alloy, Cable Outlet M20x1.5, Housing IP 55, with Terminal Board
◦ H2 <sup>1</sup>	Al Alloy, with High Cap for Mounting of Transmitter into Cap, Cable Outlet M20x1.5, Housing IP 55, with Terminal Board
H9	Other
<b>Code</b>	<b>OPTIONAL ACCESSORIES</b>
<b>Code</b>	<b>Calibration</b>
◦ KTE3	Sensor Calibration in Three Customer's Given Temperature Points (0 to +1100 °C)
KTE9	Other
<b>Code</b>	<b>Fixing Flanges</b>
◦ P1 →	Fixing Shift Flange UP 04 (See Data Sheet No. 126)
P9	Other
<b>Code</b>	<b>Transmitters for Headmounting</b>
• P5310	Programmable Transmitter P5310 with LHP Communication, Base Accuracy up to 0.1 % from Set Range (See Data Sheet No. 824)
• PT-031	Programmable Transmitter for Thermoelectric Sensors PT-031, Base Accuracy 0.15 % from Input Range (See Data Sheet No. 471)
• P5102	Programmable Transmitter P5102 H10, Base Accuracy to 0.07 % from Set Range (See Data Sheet No. 451)
◦ P5102EEx	Intrinsically Safe Programmable Transmitter P5102 H10EEx, Base Accuracy to 0.07 % from Set Range (See Data Sheet No. 451)
• P5201 →	Universal Programmable Transmitter P5201 H10 with Circuit Isolation, Base Accuracy to 0.05 % from Set Range (See Data Sheet No. 288)
◦ P5201EEx	Intrinsically Safe Universal Programmable Transmitter P5201 H10EEx with Circuit Isolation, Base Accuracy to 0.05 % from Set Range (See Data Sheet No. 288)
• P3301	Universal Programmable Transmitter P3301 SMART with Circuit Isolation, Base Accuracy to 0.065 % from Set Range HART Communication Interface (See Data Sheet No. 507)

Example of Order: T1523-6 26 7 171 O1 N0 H1 P1 P5201 H10 RL 0 °C RH 350 °C ECL

• ... Ex Stock Version      ◦ ... Marked Version can be Dispatched up to 10 Working Days

<sup>1</sup> ... Temperature of head with transmitter inside should not exceed 80 or 85 °C according to transmitter type