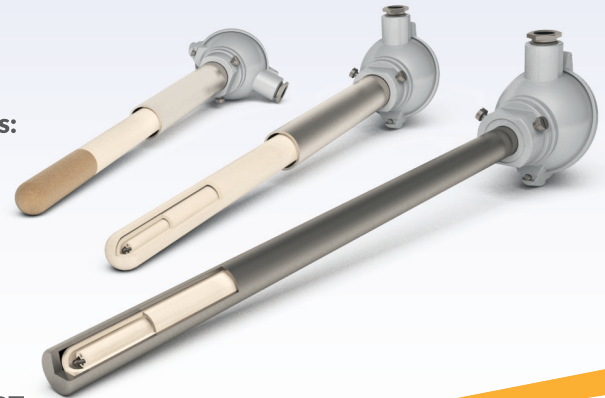


## Thermocouple Temperature Sensors for Glass and Ceramic Industry

- Measuring range from -40 to +1 800 °C.
- Thermocouples “J”; “K”; “N”; “R”; “S”; “B”.
- Protective tubes from materials for high temperatures:
  - Stainless steel, Kanthal
  - Ceramic C530, C610 or C799
  - Platinum
  - Sapphire
- Wide range of modifications available
- Optional head mounted transmitter 4 to 20 mA / HART.



### Application

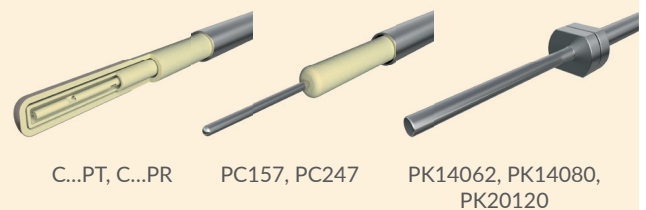
Series of temperature sensors GlasTEMP includes a wide range of types designed for temperature measurement in the glass and ceramic industry – in recuperators, air conditioners, smokestacks, in bath, pan or vault of the furnace. These are straight temperature sensors for medium and high temperature measurement in mediums with low over pressure or under pressure. GlasTEMP sensors are mounted to the technology by fixing shift pipe union or flange.

### Description

Sensors are based mainly on wire thermocouple sensing elements placed in insulating ceramic beads or ceramic capillary, which are then installed into a metal or ceramic protective tube, or into two ceramic protective tubes. It is possible to choose various combinations of one up to three protective tubes made from different materials. Available materials include ceramic tubes with platinum coat, platinum thermowells, sapphire etc. Sensors are also available with multiple thermocouples in one sensor, usually up to three thermocouples, which can have individual location of measuring points in different length of sensor immersion.

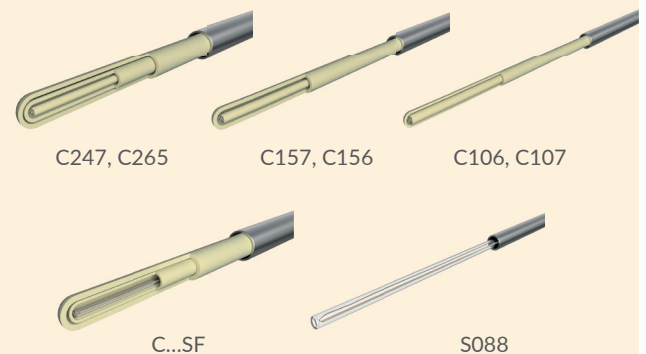
Cold junctions of thermocouples are connected to a terminal board, which is used for connection of compensating or extension cables. When the arrangement of the sensor ensures that temperature in the sensor head does not exceed 80 °C, sensor can be equipped with a transmitter mounted directly in the sensor head with 4 to 20 mA output, alternatively with HART, Fieldbus or Profibus communication protocol.

#### SENSORS FOR TEMPERATURE MEASUREMENT OF MOLTEN GLASS IN BATH OR PAN OF THE FURNACE (THROUGH BOTTOM, THROUGH MOLTED GLASS SURFACE) AND IN FEEDERS



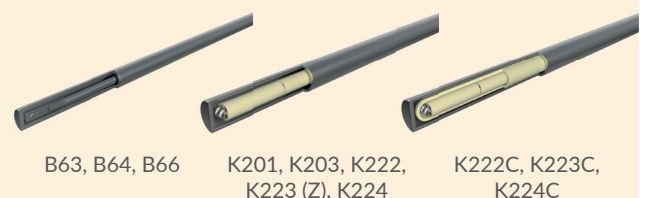
C...PT, C...PR    PC157, PC247    PK14062, PK14080, PK20120

#### SENSORS FOR TEMPERATURE MEASUREMENT OVER MOLTEN GLASS OR IN VAULT OF THE FURNACE



C247, C265    C157, C156    C106, C107  
C...SF    S088

#### SENSORS FOR TEMPERATURE MEASUREMENT IN RECUPERATORS, AIR CONDITIONERS, SMOKESTACKS



B63, B64, B66    K201, K203, K222, K223 (Z), K224    K222C, K223C, K224C

## List of versions

### › Sensors for temperature measurement of molten glass in bath or pan of the furnace and in feeders

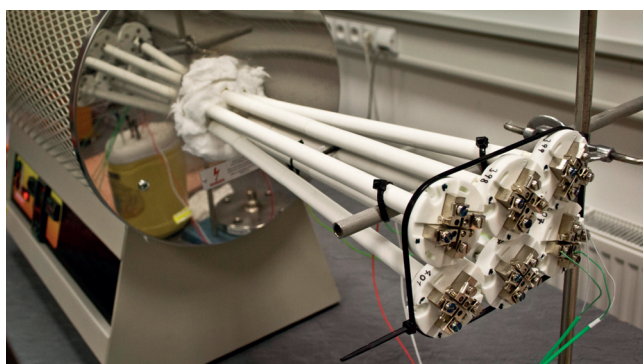
Version	Description
<b>C...PT</b>	with platinum coated ceramic protective tube, coated with Pt, $T_{MAX}$ 1550 °C
<b>C...PR</b>	with platinum coated ceramic protective tube, coated with PtRh10, $T_{MAX}$ 1600 °C
<b>PC157, PC247</b>	with platinum protective thermowell connected to ceramic support tube C799, $T_{MAX}$ 1650 °C
<b>PK14062, PK14080, PK20120</b>	with platinum protective thermowell connected to metal support tube, $T_{MAX}$ 1650 °C

### › Sensors for temperature measurement over molten glass or in vault of the furnace

Version	Description
<b>C247</b>	with double ceramic protective tube C799 / C799, capillary C799, $T_{MAX}$ 1700°C
<b>C265</b>	with double ceramic protective tube C530 / C610, capillary C610, $T_{MAX}$ 1550°C
<b>C157, C107</b>	with ceramic protective tube C799, capillary C799, $T_{MAX}$ 1700°C
<b>C156, C106</b>	with ceramic protective tube C610, capillary C610, $T_{MAX}$ 1550°C
<b>C...SF</b>	with ceramic and sapphire protective tube

### › Sensors for temperature measurement in recuperators, air conditioners, smokestacks

Version	Description
<b>B63, B64</b>	with stainless steel protective tube, up to $T_{MAX}$ 1100 °C
<b>B66</b>	with metal protective tube KANTHAL AF, $T_{MAX}$ 1300 °C
<b>K201, K203, K222, K223</b>	with stainless steel protective tube, capillary C610, up to $T_{MAX}$ 1100 °C
<b>K224</b>	with metal protective tube KANTHAL AF, capillary C610, $T_{MAX}$ 1200 °C
<b>K222C, K223C, K224C</b>	with metal and C610 ceramic protective tube, capillary C610 up to $T_{MAX}$ 1300 °C
<b>C265</b>	with double ceramic protective tube C530 / C610, capillary C610 up to $T_{MAX}$ 1200 °C
<b>C156</b>	with ceramic protective tube C610, capillary C610, $T_{MAX}$ 1200 °C



### Calibration in selected number of temperature points, including calibration certificate

JSP operates its own calibration laboratory accredited according to standard EN ISO/IEC 17025 by the Czech Accreditation Institute for temperature and pressure calibration. Accreditation also applies to calibrations performed at the place of sensor installation.

Glasstemp sensors can be supplied calibrated in required number of temperature points in the range of -40 up to +1600 °C. Calibration could be performed separately or including a temperature transmitter.



### Head mounted or DIN rail mounted transmitters

JSP produces a range of precise, programmable temperature transmitters which could be mounted directly into the sensor head or on a DIN rail. Transmitters feature current output 4 to 20 mA, optionally HART protocol, galvanic isolation and ATEX approvals.