

DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact measurements of temperatures up to 600 °C. They consist of a metal measuring stem and a metal connection head, in which a terminal board is encased. These sensors are produced in two versions: with a smooth stem, and with a stem provided with a welded-on screwed joint. The sensor stem is made of the stainless steel EN X6CrNiTi 18-10 (DIN 1.4541), the connection head is made of aluminium alloy. The basic lengths of the measuring stems are 50, 100, 160, 220, 280 and 400 mm. The metal connection head is provided with a cable outlet ending. All these sensor types meet the IP 68 ingress protection requirements according to the EN 60 529 standard.

By combination of the sensor and a stainless steel central holder or a thermowell, which are both available optionally, it is possible to use the sensors for temperature measurements in various applications of the industrial sphere. The sensors can be utilised for any control system that is compatible with sensing element output signals or output signals quoted in the sensing element specification table.

The standard temperature range in which the sensors are allowed to be utilised is -50 to +600 °C.

The sensors are designed to be operated in a chemically non-aggressive environment.



MAXIMUM STREAM VELOCITY OF THE MEASURED MEDIUM - AIR AND WATER VAPOUR / WATER [m.s⁻¹]

| Length of the thermowell/stem | > 60 to 100 mm | > 100 to 160 mm | > 160 to 220 mm | > 220 to 400 mm |
|--|----------------|-----------------|-----------------|-----------------|
| Values for the versions with screw joint | 15 / 1,5 | 8,0 / 1,0 | 2,5 / 0,6 | 0,6 / 0,3 |

SPECIFICATIONS

BASIC DATA

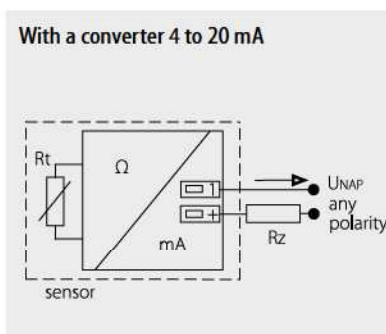
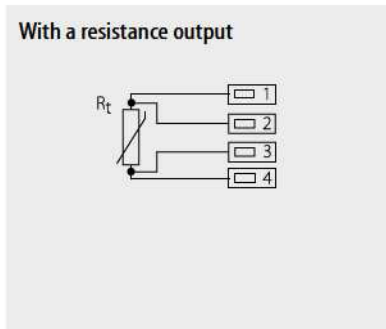
| | | |
|--|--|---------|
| Sensor type with smooth stem | PTS 641 | PTS 645 |
| Sensor type with welded-on screwed joint | PTS 661 | PTS 665 |
| Type of sensing element | Pt 100 | Pt 1000 |
| Measuring range B class | -50 to 600 °C, on a short term to 650 °C | |
| Maximum measuring DC current | 3 mA | 1 mA |

| | | |
|--|----------------------------|--|
| Sensor type with smooth stem | PTS 651 | Note |
| Sensor type with welded-on screwed joint | PTS 671 | |
| Type of sensing element | Pt 1000/3850 | |
| Output signal | 4 to 20 mA | |
| Measuring ranges | -50 to 50 °C | Connection head ambient temperature -30 to 80 °C |
| | 0 to 100 °C | |
| | 0 to 150 °C | |
| | 0 to 200 °C | |
| | 0 to 600 °C | |
| Power supply (U _{NAP}) | 11 to 30 V DC | Recommended value 24 V DC |
| Maximum voltage ripple U _{NAP} | 0,5 % | |
| Load resistance | 50(U _{NAP} -10) Ω | |
| Output signal - sensing element break | > 25 mA | |
| Output signal - sensing element short | < 3,5 mA | |

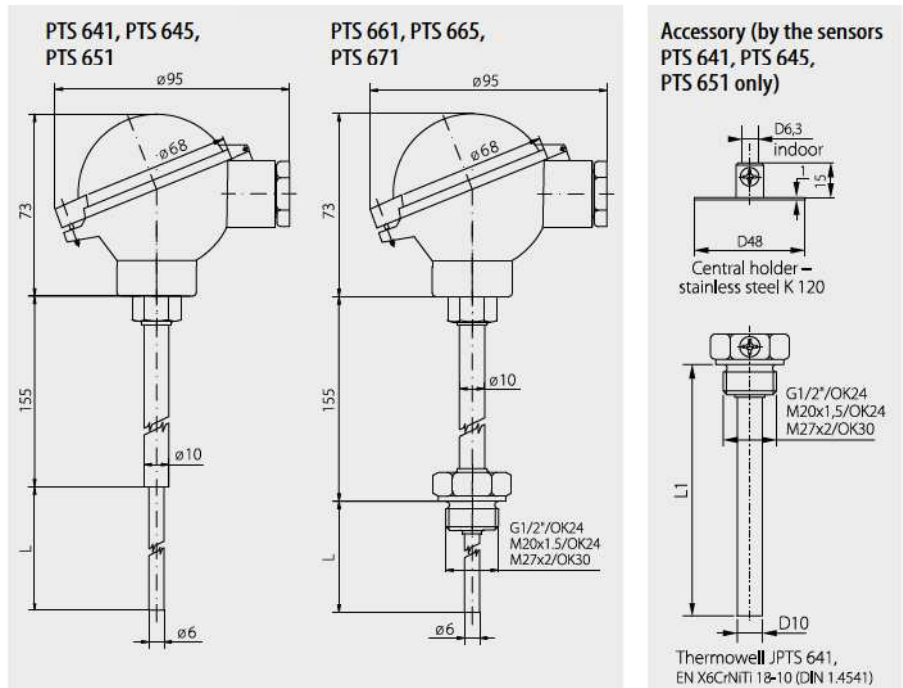
OTHER PARAMETERS:

| | |
|---|---|
| Accuracy class | B class according to IEC 751, $\Delta t = \pm (0,3 + 0,005 t)$ in °C |
| Measuring error (PTS 651, PTS 671) | < 0,6 % of the measuring range, minimum 0,5 °C |
| Sensor connection | 4-wire |
| Standard length of the stem L1 | 50, 100, 160, 220, 280, 400 mm |
| Nominal pressure of the stem | PN 63 (with a screw joint) |
| Time response | $\tau_{0,5} < 9$ s (in streaming water at 0,4 m.s ⁻¹) |
| Recommended wire cross section | 0,35 to 1,5 mm ² |
| Thread types for PTS661, PTS665, PTS671 | G 1/2"; M 20 x 1,5; M 27 x 2 |
| Insulation resistance | > 200 MΩ at 500 V DC, 25° ± 3 °C; humidity < 85 % |
| Ingress protection | IP 68 according to EN 60 529, 5 bar/30 min. |
| Material of the stem | stainless steel EN X6CrNiTi 18-10 (DIN 1.4541) |
| Material of the connection head | aluminium LIMATHERM B |
| Grommet type | M 20 x 1,5 |
| Operating conditions | ambient temperature: -30 to 100 °C; -30 to 80 °C with a converter |
| | relative humidity: max. 85 % (at the ambient temperature 25 °C) |
| | atmospheric pressure: 87 to 107 kPa |
| Mass | approximately 0,25 kg |

WIRING DIAGRAM



DIMENSIONAL DRAFT



SENSOR INSTALLATION AND SERVICING

Before connecting the supply lead-in cable, position the sensor in the location of temperature measurement, and screw off the lid of the metal connection head. The lead-in cable is connected to the terminals according to the wiring diagram after pushing it in through the loosened grommet. The recommended wire cross section is 0,35 to 1,5 mm², the outer diameter of the circular cross-section cable can range between 4 and 8 mm. In case the lead-in cable is laid in the vicinity of high voltage conductors or those supplying equipment creating disturbing electromagnetic field (e.g. inductive load equipment), a shielded cable should be used. To insure the ingress protection value of IP 68 the grommet has to be tightened and the lid has to be screwed on after connecting the lead-in cable.

In case of using a stainless steel thermowell or a holder these accessories have first to be installed in the temperature measurement location, then the sensor will be pushed into the holder or eventually to the thermowell bottom, after which the sensor is secured with a screw. (This applies for the PTS 641, PTS 645 and PTS 651 sensors only). The openings for the stainless steel holder installation have to be drilled according to the attached template, on which the opening diameters are illustrated, too. (This applies for the PTS 641, PTS 645 and PTS 651 sensors only). After installing and connecting to the appropriate evaluating electrical equipment the sensor is ready to use. The sensor does not require any special attendance or maintenance. The device can be operated in any working position, but the grommet must not be directed upwards.

CUSTOMER SPECIFIC MODIFICATIONS

REGARDING TO SENSORS MANUFACTURED IN A STANDARD VERSION THE FOLLOWING PARAMETERS CAN BE MODIFIED:

- changing the sensor length (from 600 mm the pipe D8 x 1 must be used)
- A class of accuracy for the range -50 to 300 °C
- changing the stem version

HOW TO ORDER

Platinum temp. sensors for measuring up to 600 °C

| | | | | | | | | | | | | | |
|-----------------------|---|---|---|---|---|------------|---|---|---|---|---|---|---|
| | 1 | 2 | D | C | C | D | D | 0 | E | G | G | G | G |
| output 4–20 mA | | | | 0 | A | | | | | | | | |
| Pt 100/3850, class B | | | | 0 | 6 | | | | | | | | |
| Pt 1000/3850, class B | | | | 1 | 1 | | | | | | | | |
| with resistive output | | | | | | 0 | 0 | | | | | | |
| 0 to 100 °C | | | | | | 0 | 3 | | | | | | |
| 0 to 150 °C | | | | | | 0 | 4 | | | | | | |
| -50 to 50 °C | | | | | | 0 | 6 | | | | | | |
| 0 to 200 °C | | | | | | 0 | 7 | | | | | | |
| 0 to 400 °C | | | | | | 0 | 8 | | | | | | |
| 0 to 600 °C | | | | | | 0 | 9 | | | | | | |
| Thread | | | | | | Unthreaded | | | 0 | | | | |
| | | | | | | G 1/2 | | | 1 | | | | |
| | | | | | | M 20 x 1,5 | | | 3 | | | | |
| | | | | | | M 27 x 2 | | | 4 | | | | |
| Stem length L1 | | | | | | 50 mm | | 0 | 0 | 5 | 0 | | |
| | | | | | | 100 mm | | 0 | 1 | 0 | 0 | | |
| | | | | | | 160 mm | | 0 | 1 | 6 | 0 | | |
| | | | | | | 220 mm | | 0 | 2 | 2 | 0 | | |
| | | | | | | 280 mm | | 0 | 2 | 8 | 0 | | |
| | | | | | | 400 mm | | 0 | 4 | 0 | 0 | | |

Thermowell – Stainless steel, JPTS 641 (only for PTS 641, PTS 645, PTS 651)

| | | | | | | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 | 0 | 2 | 2 | B | B | 0 | 1 | 0 | 0 | G | G | G | G |
| Thread | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Thermowell length L1 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Central holder – Stainless steel, K 120 (only for PTS 641, PTS 645, PTS 651)

| | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

WHEN ORDERING GOODS, THE FOLLOWING DATA ARE REQUIRED:

| Required data | Example 1 | Required data | Example 2 |
|------------------------------------|--------------------------------------|-----------------|-------------|
| Product type | PTS 641 | Product type | PTS 671 |
| Stem length | 220 mm | Stem length | 160 mm |
| Measuring range | – | Measuring range | 0 to 100 °C |
| Acc. – thermowell (length, thread) | Thermowell JPTS 641 (220 mm, G 1/2") | Thread | M 20 x 1,5 |
| – central holder | NO | | |

The accuracy class is the B class if not stated otherwise.

DELIVERY

The sensors are packed in pasteboard boxes in accordance with the ordered quantity.

In addition, the following accessories and documents may be provided together with the product:

- the thermowell, the central holder (for PTS 641, PTS 645 and PTS 651 sensors only)
- calibration sheet
- the EU certificate of conformity for PTS 651 and PTS 671.