



Advantages/Benefits

- ▶ Measuring range -50 to 500 °C
- ▶ Pt 100 resistance element
- ▶ Exchangeable process probe
- ▶ Two-wire transmitter with 4...20 mA output signal as an option
- ▶ Accuracy Class B to DIN 43760
- ▶ Classification standard IP 54

Design/Function

Generally the entire device consists of protective tube, connection head and process probe. The stainless steel 1.4571 protective armatures conform to DIN standards and are plasma arc welded. The aluminium die casting connection head conforms to the DIN Type B.

The process probe consisting of a stainless steel pipe with a diameter of 6 mm is provided with 1 or 2 Pt100 elements. The internal wires from the measuring element to the electrical terminal block are isolated.

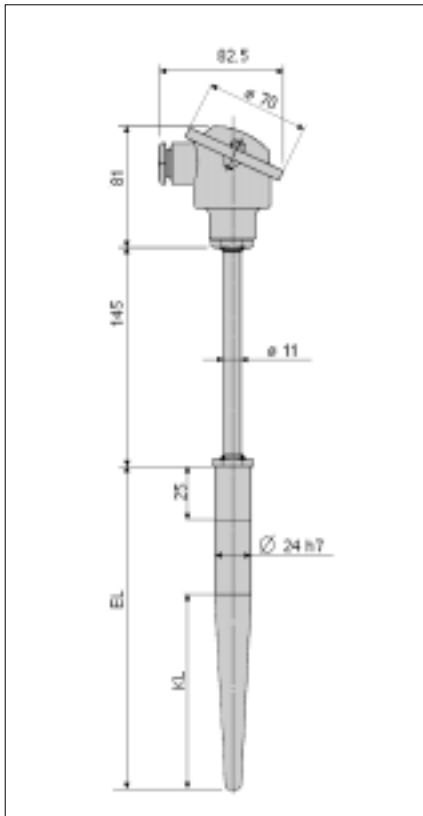
In case that a current signal 4-20mA instead of the Pt 100 resistance signal shall be used, a transmitter is mounted in place of the terminal socket in the connection head.

Applications

- Industrial platinum resistance thermometer with exchangeable process probes for temperature measurements. The process probes and protective armatures conform to DIN standards and provide simple installation into pipelines and containers. The permissible application ranges in gas, liquid and steam are specified by the relevant load diagrams.

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Easy Fluid Control Systems

Dimensions



General technical data

| | |
|--|--|
| Design: | according to DIN 43763 |
| Measuring range: | -50 to 500 °C |
| Process probe: | 1 or 2 Pt 100 resistance elements |
| Response time up to 50% and up to 90% of full scale in water with 0,4 m/s: | $T_{50} = 25 \text{ s}$ $T_{90} = 66 \text{ s}$ |
| Tube dimension: | ø 6 mm |
| Tube material: | stainless steel |
| Classification to DIN 43763: | material 1.4571 |
| Connection: | aluminium die casting connection head Type B to DIN 43729 |
| Installation: | Suitable for high pressures. |

For the model with the two-wire measuring transmitter, the transmitter is directly mounted in the connection head. The transmitter converts the resistance of the Pt 100 element into a temperature linear output current.

Technical data of transmitter

| | |
|----------------------|--|
| Measuring range: | -50 to 500 °C |
| Span: | adjustable |
| Supply voltage: | $U_s = 12 \dots 36 \text{ VDC}$ |
| Input: | Pt100 DIN IEC 751 2-wire connection |
| Output: | 4...20 mA |
| Load: | $R = \frac{U_s - 12 \text{ V}}{20 \text{ mA}}$ |
| Ambient temperature: | -20 °C ... 70 °C |

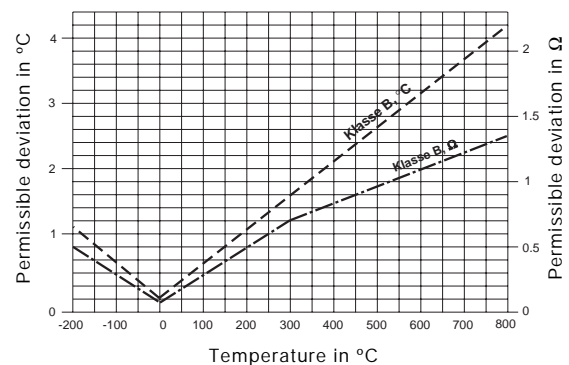
Basic Values and Tolerances

The basic values and tolerances for the Pt100 conform to DIN 43760. This standard classifies the permissible resistance tolerances and the temperature deviations. The sensor corresponds to accuracy class B, which is normally used in industrial applications.

| Temperature | Basic Value | Tolerance | Class B |
|-------------|-------------|-----------|---------|
| -200 °C | 18.49 Ω | ±1.3 °C | ±0.56 Ω |
| -100 °C | 60.25 Ω | ±0.8 °C | ±0.32 Ω |
| 0 °C | 100.00 Ω | ±0.3 °C | ±0.12 Ω |
| 100 °C | 138.50 Ω | ±0.8 °C | ±0.30 Ω |
| 200 °C | 175.84 Ω | ±1.3 °C | ±0.48 Ω |
| 300 °C | 212.02 Ω | ±1.8 °C | ±0.64 Ω |
| 400 °C | 247.04 Ω | ±2.3 °C | ±0.79 Ω |
| 500 °C | 280.90 Ω | ±2.8 °C | ±0.93 Ω |
| 600 °C | 313.59 Ω | ±3.3 °C | ±1.06 Ω |
| 650 °C | 329.51 Ω | ±3.6 °C | ±1.13 Ω |
| 700 °C | 345.13 Ω | ±3.8 °C | ±1.17 Ω |
| 800 °C | 375.51 Ω | ±4.3 °C | ±1.28 Ω |
| 850 °C | 390.26 Ω | ±4.6 °C | ±1.34 Ω |

Installation

When installing make sure that the sensor takes up the temperature to be measured accurately. Avoid heat absorption or heat supply. When installing into pipelines, the installation should be within the range of the larger flow velocity. The protective tube may either be in vertical or angular position to the flow. It is important to oppose it to the flow direction, in order to guarantee that the fluid contacts the temperature sensitive part first.



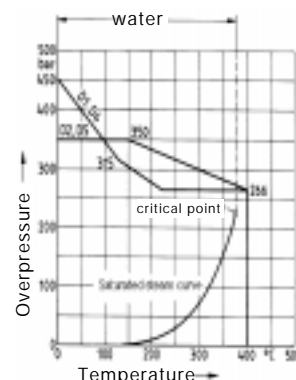
Material: 1.4571

Permissible flow velocity for air: D1, D2, D4, D5 60 m/s
 for water and superheated steam: D1, D4 60 m/s
 D2, D5 60 m/s

Mechanic and Thermal Load Rating of Protective Tube Type D to DIN 43763

The max. load rating depends upon the fluid to be measured, its temperature and flow velocity. Material and installation are also of importance. The specific values are valid for water and air, and for steam when pressurized vertically. The load rating varies with fluids of other densities.

Protective Tube 11 x 2 mm
Type D



Ordering Chart (Other Versions on Request)

| Version | Length [mm] | Cone Length [mm] | Probe Length [mm] | Order-No. |
|-------------------------------|----------------|------------------------|-------------------------|-----------|
| Sensor, 1 x Pt100 2-wire | 140 | 65 | 315 | 413 953 K |
| | 200 | 125 | 375 | 413 955 M |
| | 200 | 65 | 375 | 414 032 C |
| | 260 | 125 | 435 | 413 957 P |
| Sensor, 1 x Pt100 3-wire | 140 | 65 | 315 | 414 761 T |
| | 200 | 125 | 375 | 415 002 Q |
| | 200 | 65 | 375 | 415 003 R |
| | 260 | 125 | 435 | 415 004 J |
| Sensor, 2 x Pt100 2-wire | 140 | 65 | 315 | 413 954 L |
| | 200 | 125 | 375 | 413 956 N |
| | 200 | 65 | 375 | 414 033 D |
| | 260 | 125 | 435 | 413 958 Y |
| Transmitter, 1 x Pt100 2-wire | 140 | 65 | 315 | 414 366 X |
| | 200 | 125 | 375 | 415 005 K |
| | 200 | 65 | 375 | 415 006 L |
| | 260 | 125 | 435 | 415 007 M |