

Temperature sensor

PT series

Type

PT100

PT500

PT1000



Applications

- Motors
- Electric drives
- E- mobility plug
- Medical technology
- Building technology
- Predictive maintenance
- Renewable Energy

Benefits

- High accuracy and reliability
- Long-term stability
- Wide temperature range
- Small dimensions and weight
- Short response time

Description

The PT series temperature sensors describe a family of sensors that feature a positive temperature coefficient with standardized linear characteristic curve according to DIN EN 60751. It is a precise and high performance choice suitable for use in measurement equipments and control systems. The PT-series contains various options in resistances: PT100, PT500 and PT1000 whereas the figure refers to the given resistance value at 0°C. Our PT-sensors are based on thin film technology chips which allow the completed sensor unit to be designed in smallest shapes. Standard designs are sealed by potting and consequently the mechanical stability is high and the sensor provides short response times. Beside the regular tolerance class B, advanced classes are available. Further to the standard types we offer a wide range of executions for specific customer applications.



Technical data

| description | characteristics | | |
|---|-----------------|---------------|---------------|
| | PT100 | PT500 | PT1000 |
| type | PT100 | PT500 | PT1000 |
| typical resistance at 0°C | 100 Ω | 500 Ω | 1000 Ω |
| operating temperature range | -40°C ... 175°C | | |
| insulation resistance (100V DC / 20°C) | ≥ 100 MΩ | | |
| dielectric strength (standard insulation) | 2 kV | | |
| measuring current | 0.3 to 1.0 mA | 0.1 to 0.7 mA | 0.1 to 0.3 mA |

Platinum resistance temperature detector (PRTD) according to DIN EN 60751, standard execution class B, TK = 3850ppm/K; measuring current: self-heating has to be considered

Standard types

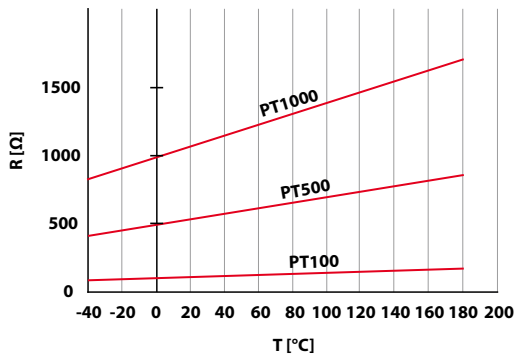
| type | code | illustration | drawing dimensions (mm) | technical description |
|--------------------------|------|--------------|-------------------------|--|
| PT100 PT500 PT1000 | G919 | | | housing PPS, potted, AWG24 |
| PT100 PT500 PT1000 | G920 | | | housing PPS, potted, AWG26 |
| PT100 PT500 PT1000 | G921 | | | housing PPS, potted, AWG20 / AWG24 |
| PT100 PT500 PT1000 | G922 | | | housing stainless steel (ø3 on request), potted, AWG24 |
| PT100 PT500 PT1000 | G924 | | | housing PPS, potted, AWG26 |

Other options on request: Tolerance class A / lead wire AWG / lead length / lead color / high temperature PT max. 250°C

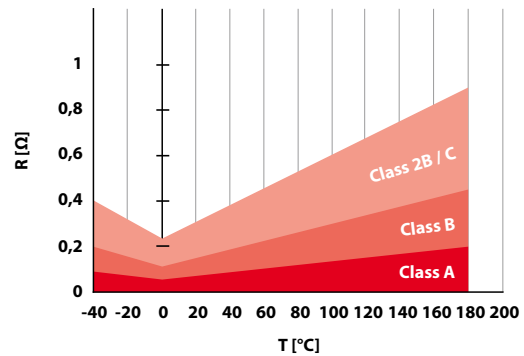
Temperature vs. resistance

| T °C | -40 | -20 | 0 | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 |
|---------|--------|--------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| PT100 | 84,27 | 92,16 | 100 | 107,79 | 115,54 | 123,24 | 130,90 | 138,51 | 146,07 | 153,58 | 161,05 | 168,48 |
| tol. ±Ω | 0,20 | 0,16 | 0,12 | 0,16 | 0,19 | 0,23 | 0,27 | 0,30 | 0,34 | 0,37 | 0,41 | 0,44 |
| PT500 | 421,35 | 460,80 | 500 | 538,97 | 577,70 | 616,21 | 654,48 | 692,53 | 730,34 | 767,92 | 805,27 | 842,39 |
| tol. ±Ω | 0,99 | 0,79 | 0,59 | 0,78 | 0,97 | 1,15 | 1,34 | 1,52 | 1,70 | 1,87 | 2,05 | 2,22 |
| PT1000 | 842,71 | 921,60 | 1000 | 1077,94 | 1155,41 | 1232,42 | 1308,97 | 1385,06 | 1460,68 | 1535,84 | 1610,54 | 1684,78 |
| tol. ±Ω | 1,98 | 1,57 | 1,17 | 1,55 | 1,93 | 2,30 | 2,67 | 3,03 | 3,39 | 3,75 | 4,10 | 4,44 |

Characteristics curve



Resistance error



Tolerance class

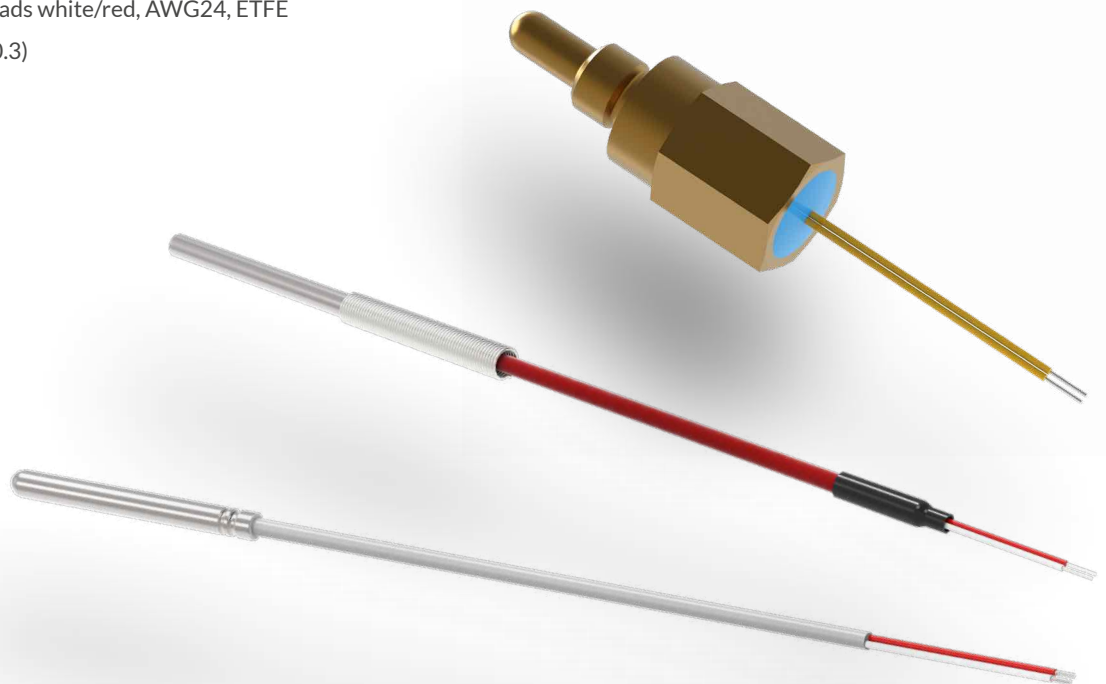
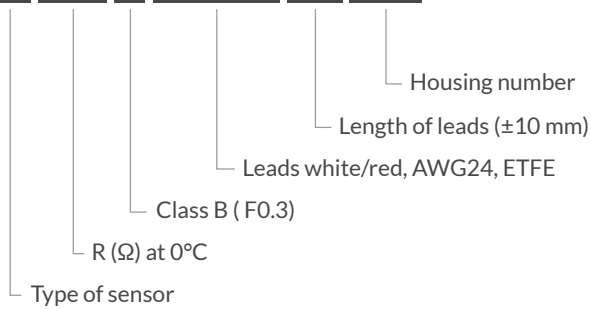
| tolerance class designation | | limiting deviation |
|---|---|--|
| tolerance acc. to DIN EN 60751 2009-05 | tolerance acc. to DIN EN 60751 1996-07 | $ t $ = absolute value of temperature in °C without consideration of the sign |
| F 0.15 | Class A | $\pm (0.15 + 0.002 t)$ |
| F 0.30 | Class B | $\pm (0.3 + 0.005 t)$ |
| F 0.60 | Class 2B / C | $\pm (0.6 + 0.01 t)$ |

Standard types

| lead (stranded) | code | temp. max. | operating voltage | approx. Ø insulation | approx. cross section | material | UL-Style |
|-----------------|------|------------|-------------------|----------------------|------------------------------|----------|----------|
| white | L390 | 200°C | 600V | 1.0 mm | AWG26 / 0.14 mm ² | ETFE | 10086 |
| red | L396 | | | | | | |
| white | L360 | | | 1.1 mm | AWG24 / 0.24 mm ² | | |
| red | L366 | | | | | | |
| white | L370 | | | 1.5 mm | AWG20 / 0.50 mm ² | | |
| red | L376 | | | | | | |

Ordering example standard types

PT 1000 B L360/L366 500 G919



Microtherm Sentronic GmbH

Taschenwaldstraße 3
 75181 Pforzheim
 Deutschland
 Tel.: +49 7231 787-0
 Fax: +49 7231 787-155
 info@microtherm.de
 www.microtherm.de



MICROTHERM
sentronic