

PLATINUM - TEMPERATURE SENSORS

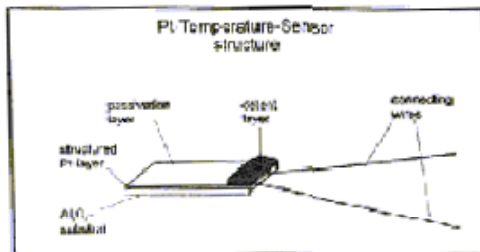
Traditional products of STG Pt-Temperature Sensors in thin-layer-technology. These sensor elements are used in measuring instruments and they are stable against vibration and extreme conditions of application.

Temperature sensors are applicable in measuring and controlling devices:

- in industry
- in medicine
- in car industry
- in agriculture
- in energy- and environmental technic

PT-TEMPERATURE SENSORS ARE DIFFERENT IN:

- measuring range
- nominal resistance
- geometric dimension
- size



basic values

| type | temperature range | connecting wire |
|----------|----------------------|---|
| HMS 2000 | 50 °C ... + 400 °C | AgSPd Ø=0,25 mm |
| FMA 2000 | - 50 °C ... + 400 °C | AgSPd Ø=0,25mm vertical on the Chip |
| FMP 2000 | - 50 °C ... + 600 °C | Platinum Ø=0,20mm |

Tab. 1: types of Pt-Temperature Sensors

basic values for temperature range - 50 °C ... + 600 °C (DIN IEC 751)

average temperature coefficient between 0 °C and 100 °C $3,85 \times 10^{-3} \text{ K}^{-1}$

The basic values for Pt-Temperature Sensors can be calculated according the following equation:

temperature range - 50 °C ... 0 °C:

$$R_t = R_0 (1 + At + Bt^2 + C(t - 100) t^3)$$

temperature range: 0 °C ... + 600 °C:

$$R_t = R_0 (1 + At + Bt^2)$$

R_t - resistance in Ω for temperature t

R_0 - nominal resistance for 0 °C

t - temperature in °C

$$A = 3,90802 \times 10^{-3} \text{ } ^\circ\text{C}^{-1}$$

$$B = - 5,802 \times 10^{-7} \text{ } ^\circ\text{C}^{-2}$$

$$C = - 4,2735 \times 10^{-12} \text{ } ^\circ\text{C}^{-3}$$

The Temperature Sensors which we described in our prospect will be deliver as tolerance class B in principle.

$$t \text{ in } ^\circ\text{C} = \pm (0,3 + 0,005 [t]) \text{ bei } 0 \text{ } ^\circ\text{C}$$

t = temperature

Sensors of tolerance class A are available for special exactness on inquiry and for an extra charge.

$$t \text{ in } ^\circ\text{C} = \pm (0,15 + 0,002 [t]) \text{ bei } 0 \text{ } ^\circ\text{C}$$

t = temperature

We can offer Sensors with following special tolerance ranges for many applications. These Sensors are available also on inquiry.

$$\pm 0,15 \text{ } ^\circ\text{C} \text{ bei } 0 \text{ } ^\circ\text{C} \text{ and } \pm 0,1 \text{ } ^\circ\text{C} \text{ bei } 0 \text{ } ^\circ\text{C}$$

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Temperature Sensors are available for applications with lower exactness in enlarged tolerance and for a good price.

$$\pm 0,45 \text{ }^{\circ}\text{C bei } 0 \text{ }^{\circ}\text{C und } \pm 1,5 \text{ }^{\circ}\text{C bei } 0 \text{ }^{\circ}\text{C}$$

The deviations in $^{\circ}\text{C}$ are valid for all nominal resistance and the deviations in Ohm (Ω) are valid for Pt 100 only. The deviation for other nominal resistance has to multiply by the factor $R_0/100$.

| temperature in $^{\circ}\text{C}$ | permitted deviations | | | |
|--------------------------------------|----------------------|-----------------------|------------|-----------------------|
| | class A | | class B | |
| | in Ohm | in $^{\circ}\text{C}$ | in Ohm | in $^{\circ}\text{C}$ |
| -50 | $\pm 0,10$ | $\pm 0,25$ | $\pm 0,21$ | $\pm 0,5$ |
| 0 | $\pm 0,06$ | $\pm 0,15$ | $\pm 0,12$ | $\pm 0,3$ |
| 100 | $\pm 0,13$ | $\pm 0,35$ | $\pm 0,30$ | $\pm 0,8$ |
| 200 | $\pm 0,20$ | $\pm 0,55$ | $\pm 0,48$ | $\pm 1,3$ |
| 300 | $\pm 0,27$ | $\pm 0,75$ | $\pm 0,64$ | $\pm 1,8$ |
| 400 | $\pm 0,33$ | $\pm 0,95$ | $\pm 0,79$ | $\pm 2,3$ |
| 500 | $\pm 0,38$ | $\pm 1,15$ | $\pm 0,93$ | $\pm 2,8$ |
| 600 | $\pm 0,43$ | $\pm 1,35$ | $\pm 1,06$ | $\pm 3,3$ |

tab 2: permitted deviations

| t in $^{\circ}\text{C}$ | 0 | -10 | -20 | -30 | -40 | -50 |
|-------------------------|--------|-------|-------|-------|-------|-------|
| | 100,00 | 98,09 | 92,16 | 88,22 | 84,27 | 80,31 |

tab 3: basic value for Pt 100 from $-50 \text{ }^{\circ}\text{C}$... $0 \text{ }^{\circ}\text{C}$ (DIN IEC 751)

| t in $^{\circ}\text{C}$ | 0 | 20 | 40 | 60 | 80 |
|-------------------------|--------|--------|--------|--------|--------|
| 0 | 100,00 | 107,79 | 115,54 | 123,24 | 130,89 |
| 100 | 138,50 | 146,06 | 153,58 | 161,04 | 168,46 |
| 200 | 175,84 | 183,17 | 190,45 | 197,69 | 204,88 |
| 300 | 212,02 | 219,12 | 226,17 | 233,17 | 240,13 |
| 400 | 247,04 | 253,90 | 260,72 | 267,49 | 274,22 |
| 500 | 280,90 | 287,53 | 294,11 | 300,65 | 307,15 |
| 600 | 313,59 | | | | |

tab 4: basic value for Pt 100 from $0 \text{ }^{\circ}\text{C}$... $+600 \text{ }^{\circ}\text{C}$ (DIN IEC 751)