

# Platinum Temperature Sensor Pt100 FMA 5x5

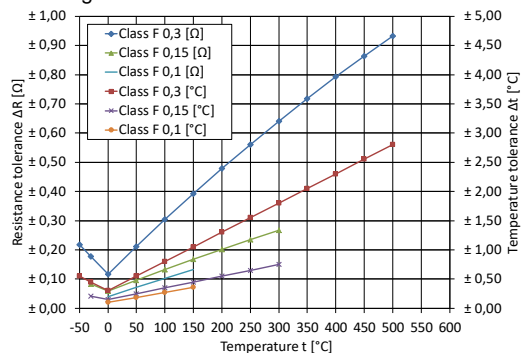
## Technical Data

Resistance at 0 °C (R <sub>0</sub> )	100 Ω
Temperature coefficient (0 °C up to +100 °C)	$3.85 \cdot 10^{-3} \text{ K}^{-1}$
Tolerance classes according to DIN EN 60751	<ul style="list-style-type: none"> <li>• F 0,1 (0°C - +150°C)</li> <li>• F 0,15 (-30°C - +300°C)</li> <li>• F 0,3 (-50°C - +500°C)</li> </ul>
Operating temperature range depending on lead material:	
AgPd5, Au-coated Ni-wire	-50 °C up to +400 °C
Pt-coated Ni-wire	-50 °C up to +500 °C (short-time up to +550 °C)
Pt	-50 °C up to +600 °C
Measurement current (DC) at 25 °C	1 mA
Maximal permissible peak current (DC) at 25 °C	3 mA
Insulation resistance	> 10 MΩ
Self-heating at 0 °C	< 0.5 K / mW
Thermal response time	
Flowing water (v = 0.2 m/s)	T <sub>0,5</sub> = 0.07 s, T <sub>0,9</sub> = 0.3 s
Flowing air (v = 1 m/s)	T <sub>0,5</sub> = 8 s, T <sub>0,9</sub> = 30 s
Resistance value [Ω] at	
Temperature	Tolerance class
	F 0,1 [Ω]    F 0,15 [Ω]    F 0,3 [Ω]
0 °C	100 ± 0.04    100 ± 0.06    100 ± 0.12
+100 °C	138.51 ± 0.1    138.51 ± 0.13    138.51 ± 0.3

R <sub>t</sub> measuring point	2 mm from wire end
Maximal Resistance Change at UCT 250 h	< 0.1 %
Specification	DIN EN 60751
Type	Film sensor
<b>Technology:</b> Advanced thin-film-technology (ceramic carrier with a structured platinum layer, covered with a passivation layer)	
<b>Operating conditions:</b> Unprotected application only in dry environments without any contamination	
<b>Conformity:</b> 2011/65/EU: Restriction of the use of Hazardous Substances Directive (RoHS)	
<b>Dimensions [mm]:</b>	
Leads	AgPd5    NiAu    NiPt    Pt
l [mm]	15 ± 1    10 ± 1    10 ± 1    7 ± 1
Ø d [mm]	0,15    0,2    0,2    0,2

## Functional performance

according to DIN EN 60751



Picture 1: Resistance and temperature tolerances of Pt100 (Please note - the operating temperature range depends on lead material!)

Temperature range from -50 °C up to 0 °C:

$$R_t = R_0 \cdot (1 + A \cdot t + B \cdot t^2 + C \cdot (t - 100 \text{ °C}) \cdot t^3)$$

Temperature range from 0 °C up to +600 °C:

$$R_t = R_0 \cdot (1 + A \cdot t + B \cdot t^2)$$

Tolerance classes according to DIN EN 60751:

Class F 0,1 (0°C - +150°C):  $\Delta t = \pm (0.1 + 0.0017 \cdot |t|)$

Class F 0,15 (-30°C - +300°C):  $\Delta t = \pm (0.15 + 0.002 \cdot |t|)$

Class F 0,3 (-50°C - +500°C):  $\Delta t = \pm (0.3 + 0.005 \cdot |t|)$

Whereby:

R<sub>t</sub> ... Resistance [Ω] at temperature t

R<sub>0</sub> ... Resistance [Ω] at 0 °C

t ... Temperature [°C]

Δt ... Permissible temperature deviation at t [°C]

$$A = 3.9083 \cdot 10^{-3} \text{ °C}^{-1}$$

$$B = -5.775 \cdot 10^{-7} \text{ °C}^{-2}$$

$$C = -4.183 \cdot 10^{-12} \text{ °C}^{-4}$$

Fields of application

- Industrial electronics
- Building automation
- Automotive electronics
- Process, energy, environmental, safety, medical engineering

Specification example

Article-No.: VMW1-12340921310/B

Type/Construction: Pt100 FMA 5x5

Class of accuracy: F 0,3

Leads (ø d x l [mm] lead material): 0.15x15 AgPd5

Operating temperature range [°C]: -50/+400

Other: silver plated chip backside

*Other classes of accuracy, wire lengths etc. are available on request.*