

Platinum Temperature Sensor Pt100 FMC 1,5x4x1

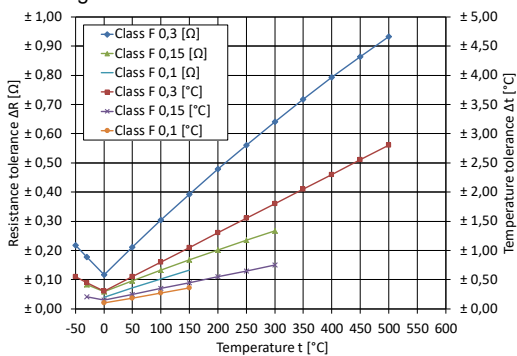
Technical Data

Resistance at 0°C	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"> • F 0,1 (0°C - +150°C) • F 0,15 (-30°C - +300°C) • F 0,3 (-50°C - +500°C)
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	1.0 mA
Maximal permissible peak current (DC) at 25 °C	3.0 mA
Insulation resistance	> 10 MΩ
Self-heating at 0 °C	< 0.4 K / mW
Thermal response time	
Flowing water (v = 0.2 m/s)	$T_{0,5} = 0.07\text{s}, T_{0,9} = 0.3\text{s}$
Flowing air (v = 1 m/s)	$T_{0,5} = 6\text{s}, T_{0,9} = 20\text{s}$
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_t measuring point	2 mm from wire end
Maximal Resistance Change at UCT 250 h	< 0.1 %
Specification	DIN EN 60751
Type	Film sensor
Technology: Advanced thin-film-technology (ceramic carrier with a structured platinum layer, covered with a passivation layer)	
Operating conditions: Unprotected application only in dry environments without any contamination	
Conformity: 2011/65/EU Restriction of the use of Hazardous Substances Directive (RoHS)	
Dimensions [mm]	
Leads	AgPd5 AgPd5 NiAu NiPt Pt
l [mm]	15 ± 1 15 ± 1 10 ± 1 10 ± 1 7 ± 1
d [mm]	0,15 0,25 0,2 0,2 0,2

Functional performance

according to DIN EN 60751



Picture 1: Resistance and temperature tolerances of Pt100 (Please note - the permitted 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_t ... Resistance [Ω] at temperature t

R_0 ... 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
- Energy and environmental engineering
- Safety and medical engineering

Ordering examples

Construction	Class of accuracy	Leads (ø d x l [mm] lead material)	Operating temperature range [°C]
Pt100 FMC 1,5x4x1	F 0,15	0.15x15 AgPd5	-50/+400
Pt100 FMC 1,5x4x1	F 0,3	0.2x10 NiPt	-50/+500

Other classes of accuracy and wire lengths are available on request.