

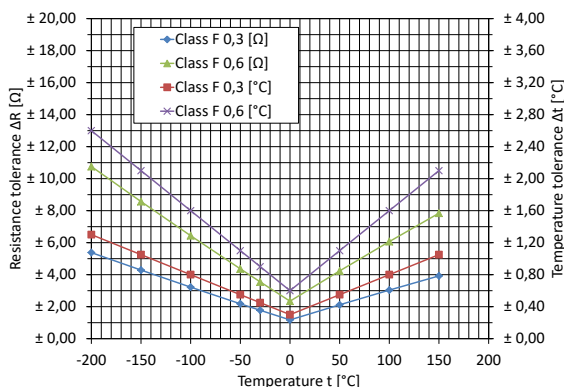
Platinum Temperature Sensor FMC 2146 cryo

Technical Data

Resistance at 0°C (R ₀)	1000 Ω
Temperature coefficient (0°C up to +100°C)	3.85 · 10 ⁻³ K ⁻¹
Tolerance classes	<ul style="list-style-type: none"> • F 0,3 (-200°C - +150°C) • F 0,6 (-200°C - +150°C)
Operating temperature range depending on lead material:	
AgPd5, NiAu,	-200 °C up to +150 °C
Pt-coated Ni-wire	-200 °C up to +150 °C
Pt	-200 °C up to +150 °C
Measurement current (DC) at 25 °C	0.1 mA
Maximal permissible peak current (DC) at 25 °C	0.3 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 _{0.5} = 0.07s, T _{0.9} = 0.3s
Flowing air (v = 1 m/s)	T _{0.5} = 6 s, T _{0.9} = 20 s
Resistance value [Ω] at	
Temperature	Tolerance class
	F 0,3 [Ω]
	F 0,6 [Ω]
0 °C	1000 ± 1.2
+100 °C	1385.1 ± 3.0
	1000 ± 2.4
	1385.1 ± 6.61

R _t measuring point	2 mm from wire end
Maximal Resistance Change at UCT 250 h	< 0.1 %
Type	Film sensor
Technology: Advanced thin-film-technology (ceramic carrier with a structured platinum layer, covered with a passivating layer)	
Operating conditions: Unprotected application only in dry environments without any contamination	
Conformity: 2011/65/EU: Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten/ Restriction of the use of Hazardous Substances Directive (RoHS)	
Dimensions [mm]	
	FMC2146 2x5x1.3
	FMC2146 2x5x1.0
	Leads
	AgPd5
	NiAu
	NiPt
	Pt
H1 [mm]	1.3 ± 0.2
H2 [mm]	0.65
	1 ± 0.2
	l [mm]
	0,25
	0,2
	0,2
	0,2

Functional performance



Picture 1: Resistance and temperature tolerances of Pt1000 cryo

Temperature range from -200 °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 +150°C:

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

Tolerance classes:

Class F 0,3 (-200°C - +150°C): $\Delta t = \pm (0.3 + 0.005 \cdot |t|)$

Class F 0,6 (-200°C - +150°C): $\Delta t = \pm (0.6 + 0.01 \cdot |t|)$

Whereby:

R_t ... Resistance [Ω] at temperature t

R₀ ... 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]
FMC2146 2x5x1.3 cryo	F 0,3	0.25x15 AgPd5	-200/+150
FMC2146 2x5x1.3 cryo	F 0,6	0.2x10 NiPt	-200/+150

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