

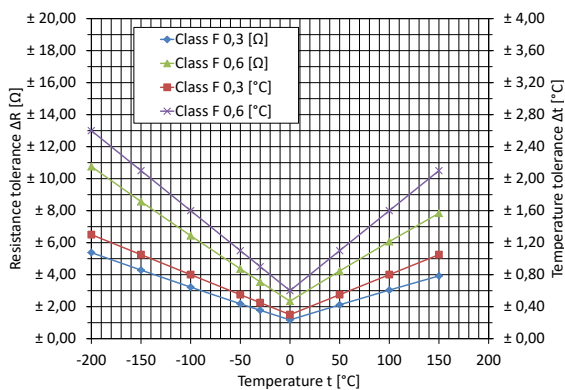
# Platinum Temperature Sensor FMC 2145 cryo

## Technical Data

Resistance at 0°C (R <sub>0</sub> )	1000 Ω	
Temperature coefficient (0°C up to +100°C)	3.85 · 10 <sup>-3</sup> K <sup>-1</sup>	
Tolerance classes	<ul style="list-style-type: none"> <li>• F 0,3 (-200°C - +150°C)</li> <li>• F 0,6 (-200°C - +150°C)</li> </ul>	
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 <sub>0.5</sub> = 0.07s, T <sub>0.9</sub> = 0.2s	
Flowing air (v = 1 m/s)	T <sub>0.5</sub> = 4 s, T <sub>0.9</sub> = 10 s	
Resistance value [Ω] at		
Temperature	Tolerance class	
	F 0,3 [Ω]	F 0,6 [Ω]
0 °C	1000 ± 1.2	1000 ± 2.4
+100 °C	1385.1 ± 3.0	1385.1 ± 6.61

R <sub>t</sub> measuring point	2 mm from wire end							
Maximal Resistance Change at UCT 250 h	< 0.1 %							
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> Conformity: 2011/65/EU: Restriction of the use of Hazardous Substances Directive (RoHS)								
Dimensions [mm]								
	FMC 2145 1,25x1,6x1.3	FMC 2145 1,25x1,6x1.3	Leads	AgPd5	Ni	NiAu	NiPt	Pt
H1 [mm]	1.3 ± 0.2	1 ± 0.2	l [mm]	15 ± 1	15 ± 1	10 ± 1	10 ± 1	17 ± 1
H2 [mm]	0.65	0.4	d [mm]	0,15	0,2	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<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
- 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]
FMC2145 2x2,3x1.3 cryo	F 0,3	0.25x15 AgPd5	-200/+150
FMC2145 2x2,3x1.0 cryo	F 0,6	0.2x10 NiPt	-200/+150

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