Platinum Temperature Sensor **FMC 2103 cryo**

Technical Data

Resistance at 0 °C (R_0)	100 Ω
Temperature coefficient (0 °C up to +100 °C)	3.85 · 10^{-3} K^{-1}
Tolerance classes	• F 0,3 (-200 °C - +150 °C) • F 0,6 (-200 °C - +150 °C)
Operating temperature range depending on lead material:	
AgPd5	-200 °C up to +150 °C
Pt-coated Ni-wire	-200 °C up to +150 °C
AuPd5, Pt	-200 °C up to +150 °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	< 0.5 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	100 ± 0.12	100 ± 0.24
+100 °C	138.51 ± 0.30	138.51 ± 0.61

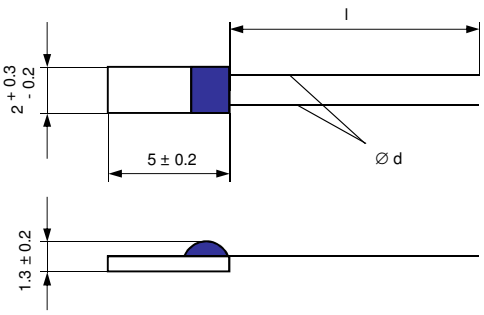
R_t measuring point	2 mm from wire end
Maximal Resistance Change at UCT 250 h	< 0.1 %
Type	Film sensor

Technology: Advanced thin-film-technology (ceramic carrier with a structured platinum layer, covered with a passivating layer)

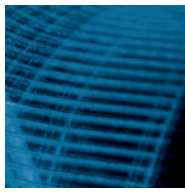
Operating conditions: Unprotected application only in dry environments without any contamination

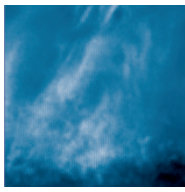
Conformity: 2002/95/EC Restriction of the use of Hazardous Substances Directive (RoHS)

Dimensions [mm]

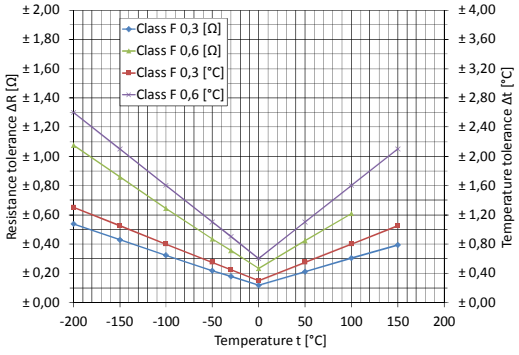


Leads	AgPd5	NiPt	AuPd5	Pt
l [mm]	15 ± 1	10 ± 1	10 ± 1	7 ± 1
d [mm]	0,25	0,2	0,2	0,2





Functional performance



Picture 1: Resistance and temperature tolerances of Pt100 cryo

Temperature range from -200 °C up to 0 °C:

$R_t = R_o \cdot (1 + A \cdot t + B \cdot t^2 + C \cdot (t - 100\ °C) \cdot t^3)$

Temperature range from 0 °C up to +150 °C:

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

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

R_o … Resistance [Ω] at 0 °C

t … Temperature [°C]

Δt … Permissible temperature deviation at t [°C]

A = 3.9083 · 10^{-3} $°C^{-1}$

B = - 5.775 · 10^{-7} $°C^{-2}$

C = - 4.183 · 10^{-12} $°C^{-4}$

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]
FMC2103 2x5x1.3 cryo	**F 0,3**	**0.25x15 AgPd5**	**-200/+150**
FMC2103 2x5x1.3 cryo	**F 0,6**	**0.2x10 NiPt**	**-200/+150**

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

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TÜV NORD ISO/TS 16949

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