Platinum Temperature Sensor **FMC 2105**

Technical Data

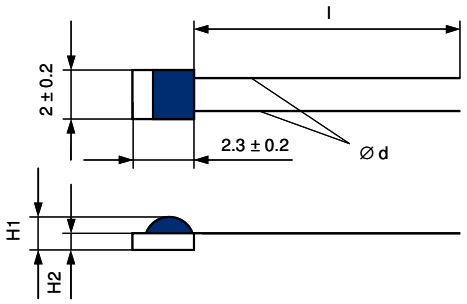
Resistance at 0 °C (R_0)	100 Ω
Temperature coefficient (0 °C up to +100 °C)	3.85 · 10^{-3} K^{-1}
Tolerance classes according to DIN EN 60751	• F 0,1 (0 °C - +150 °C) • F 0,15 (-30 °C - +300 °C) • F 0,3 (-50 °C - +500 °C)
Operating temperature range depending on lead material:	
AgPd5, Ni, Au-coated Ni-wire	-50 °C up to +400 °C
Pt-coated Ni-wire	-50 °C up to +500 °C (short-time up to +550 °C)
AuPd5, 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	< 0.5 K / mW
Thermal response time	
Flowing water (v = 0.2 m/s)	$T_{0.5}$ = 0.07s, $T_{0.9}$ = 0.2s
Flowing air (v = 1 m/s)	$T_{0.5}$ = 4 s, $T_{0.9}$ = 10 s

Resistance value [Ω] at

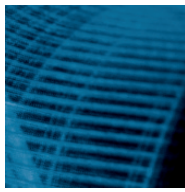
Temperature	Tolerance class		
	F 0,1 [Ω]	F 0,15 [Ω]	F 0,3 [Ω]
0 °C	100 ± 0.04	100 ± 0.06	100 ± 0.12
+100 °C	138.51 ± 0.10	138.51± 0.13	138.51 ± 0.30

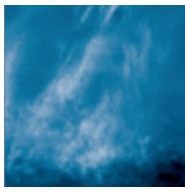
R_t measuring point	2 mm from wire end
Maximal Resistance Change at UCT 250 h	< 0.1 %
Specification	DIN EN 60751
Type	Film sensor
Technology: Advanced thin-film-technology (ceramic carrier with a structured platinum layer, covered with a passivating layer)	
Operating conditions: Unprotected application only in dry environments without any contamination	
Conformity: 2002/95/EC Restriction of the use of Hazardous Substances Directive (RoHS)	

Dimensions [mm]



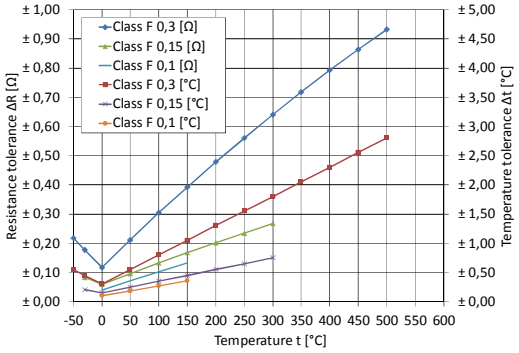
	FMC2105 2x2.3x1.3	FMC2105 2x2.3x1.0	Leads	AgPd5	Ni	NiAu	NiPt	AuPd5
H1 [mm]	1.3 ± 0.2	1± 0.2	l [mm]	15 ± 1	10 ± 1	10 ± 1	10 ± 1	10 ± 1
H2 [mm]	0.65	0.4	d [mm]	0,25	0,2	0,2	0,2	0,25





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:

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

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

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

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_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]
FMC 2105 2x2,3x1.3	**F 0,15**	**0.25x15 AgPd5**	**-50/+400**
FMC 2105 2x2,3x1.0	**F 0,3**	**0.2x10 NiPt**	**-50/+500**

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

UST Umweltsensortechnik GmbH is certified according to

TÜV NORD ISO/TS 16949

TÜV NORD ISO 14001

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