# Platinum Temperature Sensor **FMC 2105 cbsp**

## Technical Data

| | |
|---|---|
| Resistance at 0°C ($R_0$) | 100 Ω |
| Temperature coefficient (0°C up to +100°C) | 3,85 · $10^{-3}$ $C^{-1}$ |
| Tolerance classes according to DIN EN 60751 | F 0,1 (0°C - +150°C)<br>F 0,15 (-30°C - +300°C)<br>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 | < 0,5 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 values [Ω] at Temperature t

| t | 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 |

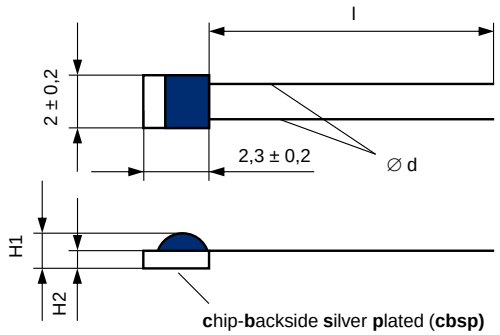
| | |
|---|---|
| Maximal Resistance Change at UCT 250 h | < 0,1 % |
| Specification | DIN EN 60751 |
| Type | Film sensor |

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

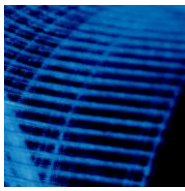
**Operating conditions:** Unprotected application only in dry environments without any contamination.

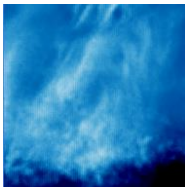
**Conformity:** 2011/65/EU: Restriction of the use of Hazardous Substances Directive (RoHS)

Dimensions [mm]

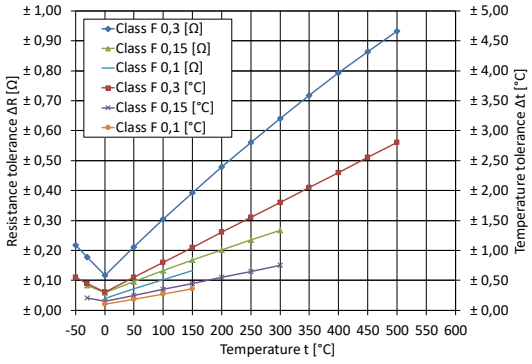



| | FMC2105 2x2,3x1,3 | FMC2105 2x2,3x1,0 | Leads | AgPd5 | NiAu | NiPt | Pt |
|---|---|---|---|---|---|---|---|
| H1 [mm] | 1,3 ± 0,2 | 1± 0,2 | l [mm] | 15 ± 1 | 15 ± 1 | 10 ± 1 | 7 ± 1 |
| H2 [mm] | 0,65 | 0,4 | d [mm] | 0,25 | 0,2 | 0,2 | 0,2 |





**Functional performance** (according to DIN EN 60751)




Picture 1: Resistance and temperature tolerances of Pt100 (Please note - the 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 cbsp 2x2,3x1,3** | **F 0,15** | **0,25x15 AgPd5** | **-50/+400** |
| **FMC 2105 cbsp 2x2,3x1,0** | **F 0,3** | **0,2x10 NiPt** | **-50/+500** |

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





*Made in Germany*

UST Umweltsensortechnik GmbH, Dieselstr. 2 und 4,
99331 Geratal OT Geschwenda, Germany
Tel. +49 36205 713-0
Fax +49 36205 713-10
info@umweltsensortechnik.de
www.umweltsensortechnik.de