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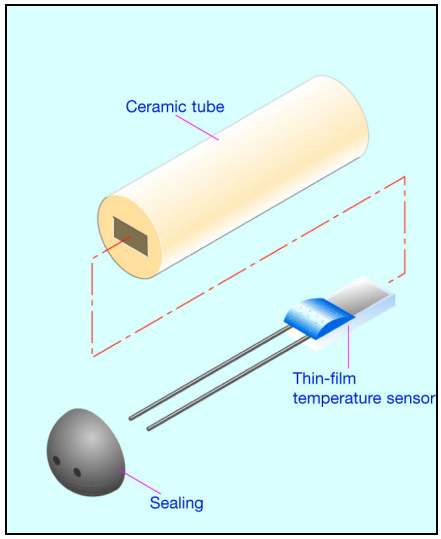
Platinum-chip temperature sensors in cylindrical style to EN 60 751

- **for temperatures from -70 to +300°C**
- **standardized nominal values and tolerances**
- **with the nominal values 100, 500 and 1000Ω**
- **readily adaptable to protection tubes or fittings**
- **high mechanical strength**

PCR style



Introduction

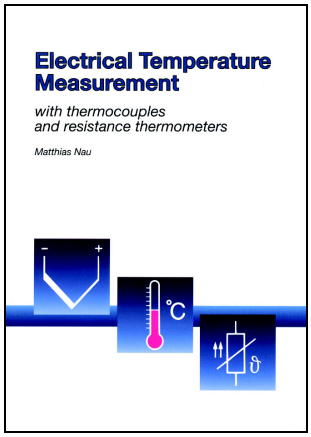
This cylindrical style incorporates a platinum-chip temperature sensor which is inserted into a ceramic sleeve that is open at one end. Accordingly, this style also belongs to the category of temperature sensors which are manufactured using thin-film technology. After inserting the platinum-chip temperature sensor, the opening of the ceramic sleeve is hermetically sealed by fusing a glass paste.

JUMO temperature sensors in cylindrical style are a cost-effective alternative to wirewound ceramic temperature sensors. Thanks to the cylindrical body, good thermal adaptation to the internal wall of protection tubes can be achieved, which is otherwise only provided by wirewound glass or ceramic temperature sensors.

The application temperature ranges from -70 to +300°C.

These sensors are frequently used in equipment and machinery construction.

Technical publication



This revised edition takes account of altered standards and recent developments. The new chapter “Measurement uncertainty” incorporates the basic concept of the internationally recognized ISO guideline “Guide to the expression of uncertainty in measurement” (abbreviated: GUM).
In addition, the chapter on explosion protection for thermometers has been updated in view of the European Directive 94/9/EC, which has been in force since 1st July 2003.

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JUMO platinum temperature sensors

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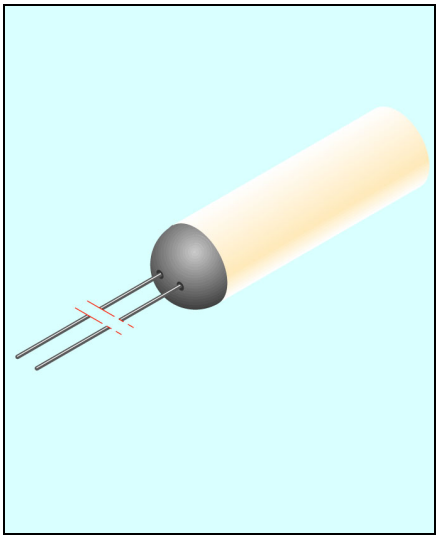
PCR style



Brief description

Platinum-chip temperature sensors in cylindrical style are a cost-effective alternative to wirewound ceramic temperature sensors, provided that the application temperature range of -70 to +300 °C is sufficient. The temperature sensors have particularly close diameter tolerances, which greatly facilitates subsequent manufacturing processes, in equipment construction, for example. In addition, the cylindrical style of the temperature sensor enables good thermal contact with protection tubes.

PCR style temperature sensors are also more resistant to mechanical stress than bare platinum-chip sensors, which makes them particularly suitable for embedding or glueing into various compounds.

They are frequently used in analytical and medical equipment, and in machinery and plant construction.

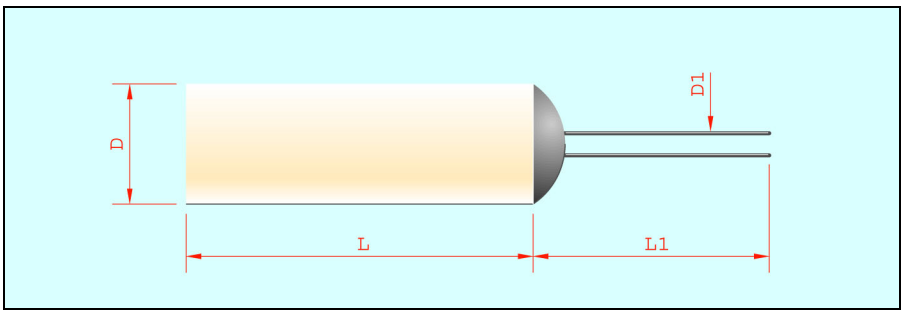
Temperature sensors in blister belt packaging

Temperature sensor				Connecting wire				Sales No. for tolerance class		
Type	R_0/Ω	D	L	Material	D1	L1	R_L in mΩ/mm	1/3 DIN B	A	B
PCR 1.3815.1	1x100	3.8	15	Pt-Ni	0.20	8	2.8	-	-	90/00049127
PCR 1.3815.5	1x500	3.8	15	Pt-Ni	0.20	8	2.8	-	-	90/00049033
PCR 1.3815.10	1x1000	3.8	15	Pt-Ni	0.20	8	2.8	-	-	90/00049130
PCR 1.4815.1	1x100	4.8	15	Pt-Ni	0.20	8	2.8	90/00047254	-	90/00044914
PCR 1.4815.5	1x500	4.8	15	Pt-Ni	0.20	8	2.8	-	-	90/00044915
PCR 1.4815.10	1x1000	4.8	15	Pt-Ni	0.20	8	2.8	-	-	90/00044916

Dim. tolerances: ΔD = +0/-0.3 / ΔL = +0/-2 / ΔD1 = ±0.01 / ΔL1 = ±1
Dimensions in mm.

For a definition of the tolerance classes, see Data Sheet 90.6000

Dimensional drawing



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Technical data

Standard EN 60 751

Temperature coefficient $\alpha = 3.850 \times 10^{-3} °C^{-1}$ (between 0 and 100 °C)

Temperature range -70 to +300 °C

Tolerance

Temperature validity range Class 1/3 DIN B:	-50 to +200 °C
Temperature validity range Class B:	-70 to +300 °C

Measuring current

Pt100	recommended: 1.0 mA
Pt500	recommended: 0.7 mA
Pt1000	recommended: 0.1 mA

Maximum current

Pt100	7 mA
Pt500	3 mA
Pt1000	1 mA

Operating conditions Platinum-chip temperature sensors may not be used unprotected in humid ambient conditions or corrosive atmospheres. The user may have to carry out some checks before operation.

Please also refer to the Installation Instructions B 90.6121.4 "Notes on the application of platinum-chip temperature sensors."

Connecting wires The connecting wires are made from sheathed platinum wire, 0.20 mm thick, with a nickel core. The maximum tensile strength is 10N/wire. Any tension on the sensor must not be at an angle of more than 30° to the axis of the sensor. Any unnecessary bending must be avoided as this may result in material fatigue and a break of the connecting wires.

Measurement point The nominal value specified refers to the standard connecting wire length L1. The measurement is acquired 2 mm from the open end of the wire. If the wire length is altered, changes in resistance will occur which may result in the tolerance class not being met.

Long-term stability max. drift ±0.05 %/year (see Data Sheet 90.6000 for definitions)

Insulation resistance >10 MΩ at room temperature

Vibration strength see EN 60 751, Section 4.4.2

Shock resistance see EN 60 751, Section 4.4.1

Self-heating $\Delta t = I^2 \times R \times E$ (see Data Sheet 90.6000 for definitions)

Packaging Blister belt

Storage In the standard packaging, JUMO temperature sensors, PCR style, can be stored for at least 12 months under normal ambient conditions. It is not permissible to store the sensors in aggressive atmospheres, corrosive media, or in high humidity.

Self-heating coefficients and response times

Type	Self-heating coefficient E in °C/mW		Response times in seconds			
	in water (v = 0.2 m/sec)	in air (v = 2 m/sec)	in water (v = 0.4 m/sec)		in air (v = 1 m/sec)	
			$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
PCR 1.3815.1	0.05	0.1	2	4.5	23	93
PCR 1.3815.5	0.05	0.1	2	4.5	23	93
PCR 1.3815.10	0.05	0.1	2	4.5	23	93
PCR 1.4815.1	0.05	0.1	3	7.5	47	115
PCR 1.4815.5	0.05	0.1	3	7.5	47	115
PCR 1.4815.10	0.05	0.1	3	7.5	47	115