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Platinum-chip temperature sensors with connecting wires to EN 60 751

- **for temperatures from -70 to +600 °C**
- **standardized nominal values and tolerances**
- **resistance values from 20 to 5000Ω**
- **linear characteristic**
- **fast response**
- **highly resistant to shock and vibration**
- **low price level**

Introduction

Platinum-chip temperature sensors belong to the category of temperature sensors that incorporate thin-film techniques. They are produced at JUMO under clean-room conditions using state-of-the-art technology. A platinum layer, which constitutes the active layer, is sputtered onto a ceramic substrate and subsequently formed into a serpentine structure by a photolithographic procedure. Afterwards, a laser trimming process is used for fine calibration. After calibration, a special glass covering layer is fused onto the platinum serpentine, as a protection against external effects and for insulation. The electrical connection is made through contact areas to which the connecting wires are bonded. Depending on the version, the connecting wires may consist of different materials and may, within certain limits, also have varying lengths and diameters. A further glass layer that is applied to the contact area fixes the connecting wires and additionally provides strain relief.

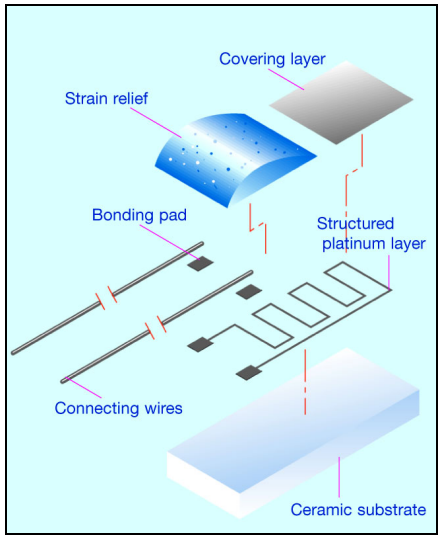
A large variety of PCA style platinum-chip temperature sensors can be supplied ex-stock as Pt100, Pt500 or Pt1000 temperature sensors. Special nominal values can be produced on request. High-resistance platinum-chip temperature sensors in small sizes are also available. And, thanks to their low mass, very fast response times are achieved. Furthermore, they are outstandingly resistant to shock and vibration when installed and fixed. The operating temperature depends on the particular version, but generally covers -70 to +600°C. However, these platinum-chip temperature sensors can also be used with temperatures far below -70°C, provided that shifts in the nominal value and hysteresis effects, which may occur within certain limits, can be tolerated.

Most temperature applications in the market make use of platinum-chip temperature sensors as the active component for acquiring temperature. Typical application areas can be found in HVAC, medical and laboratory technology, white goods, automobiles and utility vehicles as well as in machinery construction and industrial engineering.

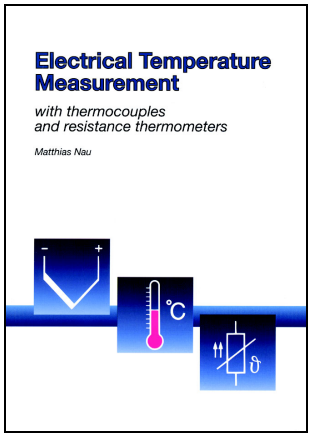
JUMO platinum temperature sensors

Construction and application of platinum temperature sensors	Data Sheet 90.6000
Platinum-glass temperature sensors	Data Sheet 90.6021
Platinum-ceramic temperature sensors	Data Sheet 90.6022
Platinum-foil temperature sensors	Data Sheet 90.6023
Platinum-glass temperature sensors with glass extension	Data Sheet 90.6024
Platinum-chip temperature sensors with connecting wires	Data Sheet 90.6121
Platinum-chip temperature sensors on epoxy card	Data Sheet 90.6122
Platinum-chip temperature sensors with terminal clamps	Data Sheet 90.6123
Platinum-chip temperature sensors in cylindrical style	Data Sheet 90.6124
Platinum-chip temperature sensors in SMD style	Data Sheet 90.6125

PCA style



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.

February 2003, 164 pages
Publication FAS 146
Sales No. 90/00085081
ISBN 3-935742-07-X

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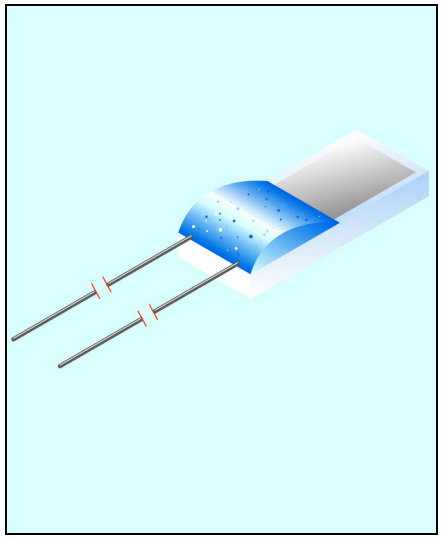
Platinum-chip temperature sensors with connecting wires to EN 60 751

PCA/L style



Brief description

Platinum-chip temperature sensors are based on a temperature-dependent resistance whose development and permissible tolerances are defined in the international standard EN 60 751. They combine the favorable properties of a platinum temperature sensor with the advantages of large-scale production. Their distinctive features are standardization and universal interchangeability, as well as high measurement accuracy, excellent long-term stability and good reproducibility of the electrical properties. Furthermore, prices have fallen considerably in recent years, since these sensors are designed to meet large-quantity requirements. With regard to the price, platinum-chip temperature sensors are therefore a genuine alternative to thermistors, which are based on semiconductors.

Platinum-chip temperature sensors, L version, are mainly used in the fabrication of various probes with connecting cables. They are particularly suitable for electrical connection through soft-soldered joints. The connecting wires are made from pure silver and are ideal for this purpose.

The application temperature ranges from -70 to +250 °C. However, the maximum temperature is +350 °C, which opens up additional application possibilities.

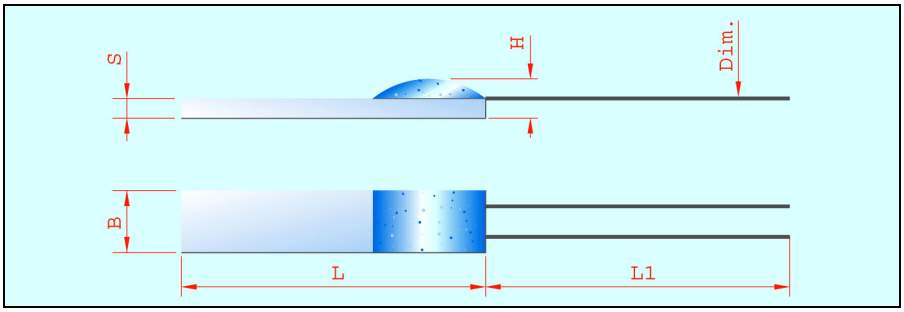
Temperature sensors in blister belt packaging or packed in bags

Temperature sensor						Connecting wire				Sales No. for tolerance class		
Type	R_0/Ω	B	L	H	S	Material	Dim.	L1	R_L in mΩ/mm	1/3 DIN B	A	B
PCA 1.2005.1L	1x100	2.0	5	1.3	0.64	Ag	0.2 x 0.3	10	0.3	90/00063358T 90/00415828B	90/00417995T 90/00415827B	90/00063260T 90/00415826B
PCA 1.2005.5L	1x500	2.0	5	1.3	0.64	Ag	0.2 x 0.3	10	0.3	90/00063359T 90/00415831B	90/00417996T 90/00415830B	90/00063261T 90/00415829B
PCA 1.2010.1L	1x100	2.0	10	1.3	0.64	Ag	0.2 x 0.3	10	0.3	90/00047408T 90/00415819B	90/00062559T 90/00415818B	90/00044789T 90/00415817B
PCA 1.2010.1L	1x100	2.0	10	1.3	0.64	Ag	0.2 x 0.3	30	0.3	on request -	on request -	90/00323380T -
PCA 1.2010.5L	1x500	2.0	10	1.3	0.64	Ag	0.2 x 0.3	10	0.3	90/00049133T 90/00415822B	on request 90/00415821B	90/00048147T 90/00415820B
PCA 1.2010.10L	1x1000	2.0	10	1.3	0.64	Ag	0.2 x 0.3	10	0.3	90/00062567T 90/00415825B	90/00062566T 90/00415824B	90/00062565T 90/00415823B
PCA 1.2010.50L	1x5000	2.0	10	1.3	0.64	Ag	0.2 x 0.3	10	0.3	on request on request	on request on request	90/00430080T 90/00430081B

Dim. tolerances: ΔB = ±0.2 / ΔL = ±0.5 / ΔH = ±0.2 / ΔS = ±0.1 / ΔDim. = approx. dim. / ΔL1 = ±0.5
Dimensions mm.

For a definition of the tolerance classes, see Data Sheet 90.6000
T = bag, B = blister belt

Dimensional drawing



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Technical data

Standard
EN 60 751

Temperature coefficient
α = 3.850 x 10^{-3} °C^{-1} (between 0 and 100 °C)

Temperature range
-70 to +250 °C (+350 °C)

Tolerance

Temperature validity range Class 1/3 DIN B:	-50 to +200 °C
Temperature validity range Class A:	-70 to +300 °C
Temperature validity range Class B:	-70 to +350 °C

Measuring current/maximum current

Pt100	recommended: 1.0 mA	maximum: 7 mA
Pt500	recommended: 0.7 mA	maximum: 3 mA
Pt1000	recommended: 0.1 mA	maximum: 1 mA
Pt5000	recommended: 0.1 mA	maximum: 1 mA

Operating conditions
Platinum-chip temperature sensors may not be used unprotected in humid ambient conditions or corrosive atmospheres. They must also not be immersed directly in liquids. 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
These temperature sensors feature connecting wires that are made from pure silver. The connecting wires are especially suitable for soft-soldered joints. During further processing, it is essential to ensure that the connections are not subjected to lateral pressures. The horizontal tension on the individual connecting wire must not exceed the maximum value of 5 N. Any unnecessary bending of the connecting wires must be avoided, as this may result in material fatigue and a wire break. Please also refer to section 3 “Connection methods” in our installation instructions. Longer connecting wires up to 300 mm length (in one piece) can optionally be fitted. Alternatively, extensions of any length or insulated stranded wires can, on request, be fitted at a later stage.

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. R_0 drift 0.05 %/year (see Data Sheet 90.6000 for definitions)

Low-temperature application
Taking into account nominal value drifts and hysteresis effects that may occur within certain limits, temperature measurements down to -200 °C are also possible. Further details can be obtained on request.

Insulation resistance
>10 MΩ at room temperature

Vibration strength
see EN 60 751, Section 4.4.2

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

Packaging
Blister belt/bag

Storage
In the standard belt packaging, JUMO temperature sensors, PCA/L 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 humidiy. Since the connecting wires for this version are made from pure silver, storability is enhanced by air-tight packaging and dark surroundings. If this is not the case, the silver will tend to get tarnished with time, which may lead to difficulties when making the solder joint.

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)	
			$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
PCA 1.2005.1L	0.02	0.2	0.1	0.3	4	16
PCA 1.2005.5L	0.02	0.2	0.1	0.3	4	16
PCA 1.2010.1L	0.02	0.2	0.3	0.3	7	22
PCA 1.2010.5L	0.01	0.2	0.3	0.5	7	22
PCA 1.2010.10L	0.01	0.2	0.3	0.5	7	22
PCA 1.2010.50L	0.01	0.2	0.3	0.5	7	22

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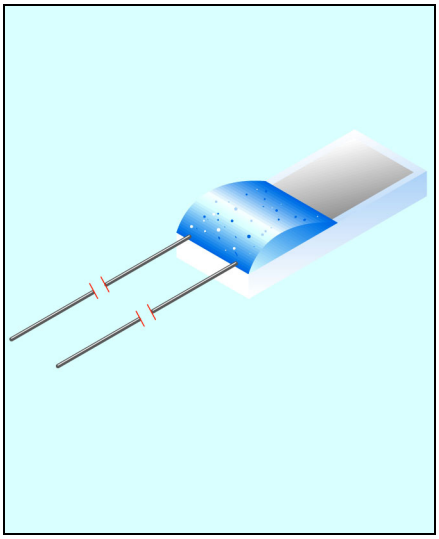
Platinum-chip temperature sensors with connecting wires to EN 60 751

PCA/S style



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Platinum-chip temperature sensors, S version, are mainly used for applications at temperatures above 180 °C. They are particularly suitable for electrical connection through weld/crimp or hard-soldered joints. The connecting wires consist of a solid sheathed platinum wire and exhibit high strength. The application temperature ranges from -70 to +400 °C.

Temperature sensors in blister belt packaging or packed in bags

Temperature sensor						Connecting wire				Sales No. for tolerance class		
Type	R_0/Ω	B	L	H	S	Material	D1	L1	R_L in mΩ/mm	1/3 DIN B	A	B
PCA 1.2003.1S	1x100	2.0	2.5	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00358368T 90/00415816B	90/00358365T 90/00415815B	90/00358363T 90/00415811B
PCA 1.2003.1S	1x100	2.0	2.5	1.3	0.64	Pt-Ni	0.20	13	2.8	90/00373811T on request	on request on request	90/00400734T on request
PCA 1.2005.1S	1x100	2.0	5	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00309664T 90/00415804B	90/00089225T 90/00415803B	90/00089206T 90/00415801B
PCA 1.2005.1S	1x100	2.0	5	1.3	0.64	Pt-Ni	0.20	20	2.8	90/00364145T -	on request -	90/00357968T -
PCA 1.2005.5S	1x500	2.0	5	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00309666T 90/00415807B	90/00089226T 90/00415806B	90/00089207T 90/00415805B
PCA 1.2005.5S	1x500	2.0	5	1.3	0.64	Pt-Ni	0.20	20	2.8	90/00364146T -	on request -	90/00357969T -
PCA 1.2005.10S	1x1000	2.0	5	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00358360T 90/00415810B	90/00358359T 90/00415809B	90/00358358T 90/00415808B
PCA 1.2005.10S	1x1000	2.0	5	1.3	0.64	Pt-Ni	0.20	20	2.8	on request -	on request -	90/00358285T -
PCA 1.2010.1S	1x100	2.0	10	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00309674T 90/00415794B	90/00089222T 90/00415793B	90/00089203T 90/00415792B
PCA 1.2010.1S	1x100	2.0	10	1.3	0.64	Pt-Ni	0.20	20	2.8	on request -	on request -	90/00067265T -
PCA 1.2010.5S	1x500	2.0	10	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00309676T 90/00415797B	90/00089223T 90/00415796B	90/00089204T 90/00415795B
PCA 1.2010.10S	1x1000	2.0	10	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00309681T 90/00415800B	90/00089224T 90/00415799B	90/00089205T 90/00415798B
PCA 1.2010.10S	1x1000	2.0	10	1.3	0.64	Pt-Ni	0.25	50	1.8	on request -	on request -	90/00315095T -
PCA 1.2010.20S	1x2000	2.0	10	1.3	0.64	Pt-Ni	0.20	10	2.8	on request on request	on request on request	90/00417435T 90/00417434B
PCA 1.2010.50S	1x5000	2.0	10	1.3	0.64	Pt-Ni	0.20	10	2.8	on request on request	on request on request	90/00430079T 90/00430075B

Dim. tolerances: ΔB = ±0.2 / ΔL = ±0.5 / ΔH = ±0.2 / ΔS = ±0.1 / ΔD1 = ±0.01 / ΔL1 = ±0.5
Dimensions in mm.

For a definition of the tolerance classes, see Data Sheet 90.6000
T = bag, B = blister belt

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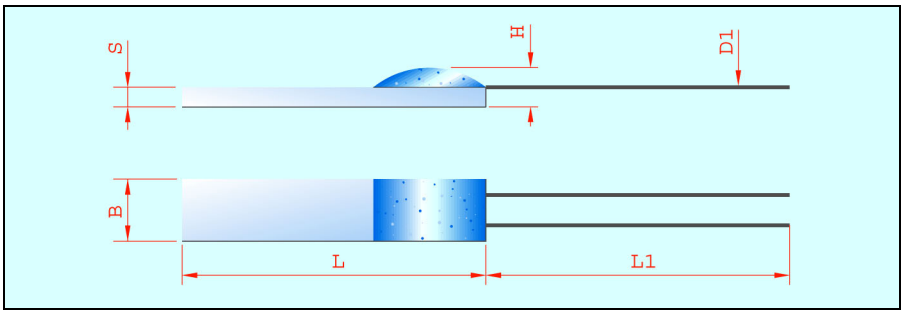
Dimensional drawing



Technical data

Standard	EN 60 751
Temperature coefficient	α = 3.850 x 10^{-3} °C^{-1} (between 0 and 100 °C)
Temperature range	-70 to +400 °C
Tolerance	Temperature validity range Class 1/3 DIN B: -50 to +200 °C Temperature validity range Class A: -70 to +300 °C Temperature validity range Class B: -70 to +400 °C
Measuring current/maximum current	Pt100 recommended: 1.0 mA maximum: 7 mA Pt500 recommended: 0.7 mA maximum: 3 mA Pt1000 recommended: 0.1 mA maximum: 1 mA Pt2000 recommended: 0.1 mA maximum: 1 mA Pt5000 recommended: 0.1 mA maximum: 1 mA
Operating conditions	Platinum-chip temperature sensors may not be used unprotected in humid ambient conditions or corrosive atmospheres. They must also not be immersed directly in liquids. 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	These temperature sensors feature connecting wires made from sheathed platinum wire with a nickel core. The connecting wires are suitable for crimp/weld and hard-soldered joints. During further processing, it is essential to ensure that the connections are not subjected to lateral pressures. The horizontal tension on the individual connecting wire must not exceed the maximum value of 10 N. Any unnecessary bending of the connecting wires must be avoided, as this may result in material fatigue and a wire break. Please also refer to section 3 “Connection methods” in our installation instructions. Longer connecting wires up to 300 mm length (in one piece) can optionally be fitted. Alternatively, silver wire or insulated stranded wires of whatever length is required can be used as extensions at a later time. Please note, however, that there may be restrictions on the application temperature.
Measurement point	The nominal value specified refers to the standard connecting wire length L1. The measurement is acquired 2mm 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. R_0 drift 0.05 %/year (see Data Sheet 90.6000 for definitions)
Low-temperature application	Taking into account nominal value drifts and hysteresis effects that may occur within certain limits, temperature measurements down to -200 °C are also possible. Further details can be obtained on request.
Insulation resistance	>10 MΩ at room temperature
Vibration strength	see EN 60 751, Section 4.4.2
Self-heating	$\Delta t = I^2 \times R \times E$ (see Data Sheet 90.6000 for definitions)
Packaging	Blister belt/bag
Storage	In the standard belt packaging, JUMO temperature sensors, PCA/S 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.

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Self-heating coefficients and response times

Type	Self-heating coefficient E in °C/mW		Response times in seconds			
	in water (v = 0.2m/sec)	in air (v = 2m/sec)	in water (v = 0.4m/sec)		in air (v = 1m/sec)	
			$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
PCA 1.2003.1S	0.02	0.2	0.1	0.3	3	9
PCA 1.2005.1S	0.02	0.2	0.1	0.3	3	9
PCA 1.2005.5S	0.02	0.2	0.1	0.3	3	9
PCA 1.2005.10S	0.02	0.2	0.1	0.3	3	9
PCA 1.2010.1S	0.02	0.2	0.1	0.3	3	9
PCA 1.2010.5S	0.01	0.2	0.2	0.4	3	9
PCA 1.2010.10S	0.01	0.2	0.2	0.4	3	9
PCA 1.2010.20S	0.01	0.2	0.2	0.4	3	9
PCA 1.2010.50S	0.01	0.2	0.2	0.4	3	9

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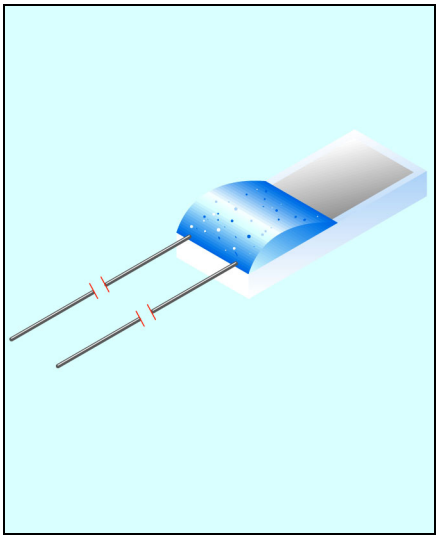
PCA/M style



Brief description

Platinum-chip temperature sensors are based on a temperature-dependent resistance whose development and permissible tolerance is defined in the international standard EN 60 751. They combine the favorable properties of a platinum temperature sensor with the advantages of large-scale production. Their distinctive features are standardization and universal interchangeability, as well as high measurement accuracy, excellent long-term stability and good reproducibility of the electrical properties. Furthermore, prices have fallen considerably in recent years, since these sensors are designed to meet large-quantity requirements. With regard to the price, platinum-chip temperature sensors are therefore a genuine alternative to thermistors, which are based on semiconductors.

Platinum-chip temperature sensors, M version, provide the ultimate solution to most application tasks. The temperature sensors feature a particularly wide temperature range, extending from -70 to +550 °C. A large selection of different versions is available ex-stock. Miniaturized versions can also be supplied, which considerably facilitate fabrication for locations where space is at a premium. Of particular advantage is the special covering layer procedure adopted for this version, allowing unprotected use under humid ambient conditions. Typical application examples can be found in HVAC engineering, and in industrial humidity measurement.

Temperature sensors in blister belt packaging or packed in bags

Temperature sensor						Connecting wire				Sales No. for tolerance class		
Type	R_0/Ω	B	L	H	S	Material	D1	L1	R_L in mΩ/mm	1/3 DIN B	A	B
PCA 1.1505.1M	1x100	1.5	5	1.0	0.38	Pt-Ni	0.20	10	2.8	90/00409843T 90/00417179B	90/00409841T 90/00417177B	90/00409840T 90/00417178B
PCA 1.1505.1M	1x100	1.5	5	1.0	0.38	Pt-Ni	0.20	15	2.8	90/00430392T 90/00430396B	90/00430393T 90/00430394B	90/00430391T 90/00430395B
PCA 1.1505.5M	1x500	1.5	5	1.0	0.38	Pt-Ni	0.20	10	2.8	90/00409847T 90/00417185B	90/00409845T 90/00417183B	90/00409844T 90/00417184B
PCA 1.1505.10M	1x1000	1.5	5	1.0	0.38	Pt-Ni	0.20	10	2.8	90/00409850T 90/00417182B	90/00409849T 90/00417180B	90/00409848T 90/00417181B
PCA 1.1505.10M	1x1000	1.5	5	1.0	0.38	Pt-Ni	0.20	15	2.8	on request on request	on request on request	90/00425409T on request
PCA 1.2003.1M	1x100	2.0	2.5	1.3	0.64	Pt-Ni	0.20	13	2.8	90/00412342T 90/00415833B	90/00412341T 90/00415834B	90/00412318T 90/00415832B
PCA 1.2005.1M	1x100	2.0	5	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00387454T 90/00415836B	90/00387455T 90/00415837B	90/00387456T 90/00415835B
PCA 1.2005.5M	1x500	2.0	5	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00387453T 90/00415839B	90/00387449T 90/00415840B	90/00387465T 90/00415838B
PCA 1.2005.10M	1x1000	2.0	5	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00412308T 90/00415842B	90/00412311T 90/00415843B	90/00412307T 90/00415841B
PCA 1.2010.1M	1x100	2.0	10	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00412338T 90/00415845B	90/00412337T 90/00415846B	90/00412339T 90/00415844B
PCA 1.2010.5M	1x500	2.0	10	1.3	0.64	Pt-Ni	0.20	10	2.8	on request on request	on request on request	on request on request
PCA 1.2010.10M	1x1000	2.0	10	1.3	0.64	Pt-Ni	0.20	10	2.8	90/00387458T 90/00415848B	90/00387459T 90/00415849B	90/00387460T 90/00415847B

Dim. tolerances: ΔB = ±0.2 / ΔL = ±0.5 / ΔH = ±0.2 / ΔS = ±0.1 / ΔD1 = ±0.01 / ΔL1 = ±0.5
Dimensions mm.

For a definition of the tolerance classes, see Data Sheet 90.6000
T = bag, B = blister belt

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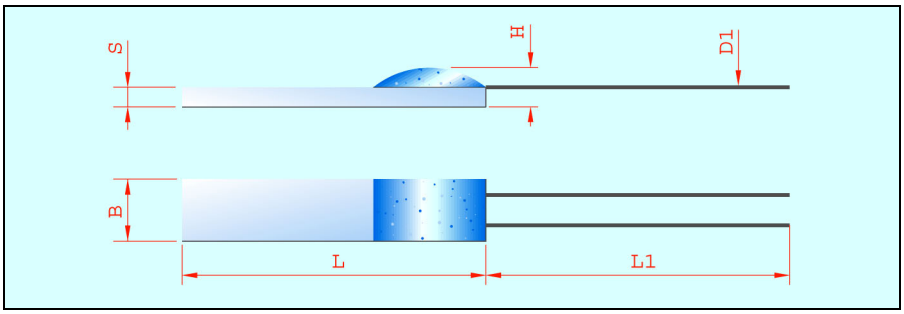
Dimensional drawing



Technical data

Standard	EN 60 751
Temperature coefficient	α = 3.850 x 10^{-3} °C^{-1} (between 0 and 100 °C)
Temperature range	-70 to +550 °C
Tolerance	Temperature validity range Class 1/3 DIN B: -50 to +200 °C Temperature validity range Class A: -70 to +300 °C Temperature validity range Class B: -70 to +550 °C
Measuring current/maximum current	Pt100 recommended: 1.0 mA maximum: 7 mA Pt500 recommended: 0.7 mA maximum: 3 mA Pt1000 recommended: 0.1 mA maximum: 1 mA
Operating conditions	This version of platinum-chip temperature sensors may not be used unprotected in corrosive atmospheres. They must also not be immersed directly in liquids. 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	These temperature sensors feature connecting wires made from sheathed platinum wire with a nickel core. The connecting wires are suitable for crimp/weld and hard-soldered joints. During further processing, it is essential to ensure that the connections are not subjected to lateral pressures. The horizontal tension on the individual connecting wire must not exceed the maximum value of 10 N. Any unnecessary bending of the connecting wires must be avoided as this may result in material fatigue and a wire break. Please also refer to section 3 "Connection methods" in our installation instructions. Longer connecting wires up to 300 mm length (in one piece) can optionally be fitted. Alternatively, silver wire or insulated stranded wires of whatever length is required can be used as extensions at a later time. Please note that there may be restrictions on the application temperature.
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. R_0 drift 0.05 %/year (see Data Sheet 90.6000 for definitions)
Low-temperature application	Taking into account nominal value drifts and hysteresis effects that may occur within certain limits, temperature measurements down to -200 °C are also possible. Further details can be obtained on request.
Insulation resistance	>10 MΩ at room temperature
Vibration strength	see EN 60 751, Section 4.4.2
Self-heating	$\Delta t = I^2 \times R \times E$ (see Data Sheet 90.6000 for definitions)
Packaging	Blister belt/bag
Storage	In the standard belt packaging, JUMO temperature sensors, PCA/M 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.

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Self-heating coefficients and response times

Type	Self-heating coefficient E in °C/mW		Response times in seconds			
	in water (v = 0.2m/sec)	in air (v = 2m/sec)	in water (v = 0.4m/sec)		in air (v = 1m/sec)	
			$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
PCA 1.1505.1M	0.02	0.2	0.1	0.3	3	8
PCA 1.1505.5M	0.02	0.2	0.1	0.3	3	8
PCA 1.1505.10M	0.02	0.2	0.1	0.3	3	8
PCA 1.2003.1M	0.02	0.2	0.1	0.3	3	9
PCA 1.2005.1M	0.02	0.2	0.1	0.3	4	16
PCA 1.2005.5M	0.02	0.2	0.1	0.3	4	16
PCA 1.2005.10M	0.02	0.2	0.2	0.3	4	16
PCA 1.2010.1M	0.02	0.2	0.3	0.5	7	22
PCA 1.2010.5M	0.01	0.2	0.3	0.5	7	22
PCA 1.2010.10M	0.01	0.2	0.3	0.5	7	22

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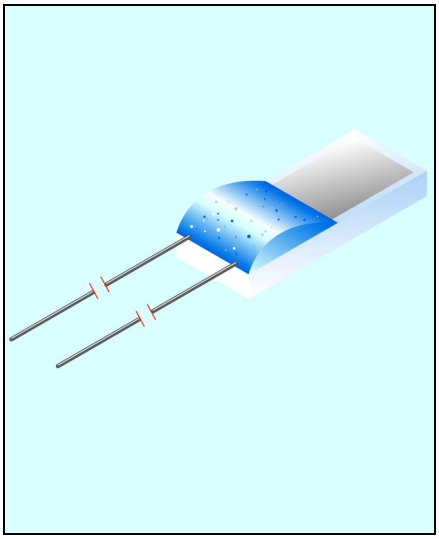
Platinum-chip temperature sensors with connecting wires to EN 60 751

PCA/H style



Brief description

Platinum-chip temperature sensors are based on a temperature-dependent resistance whose development and permissible tolerance is defined in the international standard EN 60 751. They combine the favorable properties of a platinum temperature sensor with the advantages of large-scale production. Their distinctive features are standardization and universal interchangeability, as well as high measurement accuracy, excellent long-term stability and good reproducibility of the electrical properties. Furthermore, prices have fallen considerably in recent years, since these sensors are designed to meet large-quantity requirements. With regard to the price, platinum-chip temperature sensors are therefore a genuine alternative to thermistors, which are based on semiconductors.

Platinum-chip temperature sensors, H version, are mainly used for applications at especially high or permanently elevated temperatures. They are particularly suitable for electrical connection through bonding or laser welding procedures, and through hard-soldered joints. The connecting wires are made from pure palladium. The application covers temperatures from -70 to +600 °C.

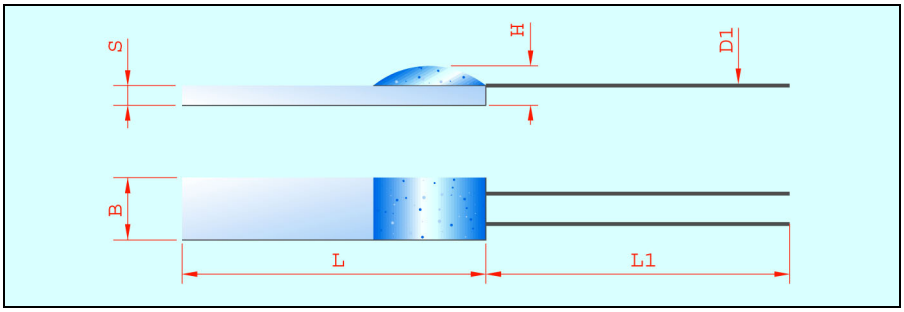
Temperature sensors in blister belt packaging or packed in bags

Temperature sensor						Connecting wire				Sales No. for tolerance class		
Type	R_0/Ω	B	L	H	S	Material	D1	L1	R_L in mΩ/mm	1/3 DIN B	A	B
PCA 1.2010.1H	1x100	2.0	10	1.2	0.64	Pd	0.25	10	2.3	90/00343070T 90/00415851B	90/00343069T 90/00415852B	90/00053198T 90/00415850B
PCA 1.2010.5H	1x500	2.0	10	1.2	0.64	Pd	0.25	10	2.3	on request on request	on request on request	on request on request
PCA 1.2010.10H	1x1000	2.0	10	1.2	0.64	Pd	0.25	10	2.3	90/00343065T 90/00415855B	90/00343064T 90/00415856B	90/00044796T 90/00415854B

Dim. tolerances: ΔB = ±0.2 / ΔL = ±0.5 / ΔH = ±0.2 / ΔS = ±0.1 / ΔD1 = ±0.01 / ΔL1 = ±0.5
Dimensions in mm.

For a definition of the tolerance classes, see Data Sheet 90.6000
T = bag, B = blister belt

Dimensional drawing



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Temperature range	-70 to +600 °C
Tolerance	Temperature validity range Class 1/3 DIN B: -50 to +200 °C Temperature validity range Class A: -70 to +300 °C Temperature validity range Class B: -70 to +600 °C
Measuring current/maximum current	Pt100 recommended: 1.0 mA maximum: 7 mA Pt1000 recommended: 0.1 mA maximum: 1 mA
Operating conditions	Platinum-chip temperature sensors may not be used unprotected in humid ambient conditions or corrosive atmospheres. They must also not be immersed directly in liquids. 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."**
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Self-heating	$\Delta t = I^2 \times R \times E$ (see Data Sheet 90.6000 for definitions)
Packaging	Blister belt/bag
Storage	In the standard belt packaging, JUMO temperature sensors, PCA/H 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)	
			$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
PCA 1.2010.1H	0.02	0.2	0.3	0.5	7	22
PCA 1.2010.5H	0.02	0.2	0.3	0.5	7	22
PCA 1.2010.10H	0.01	0.2	0.3	0.5	7	22