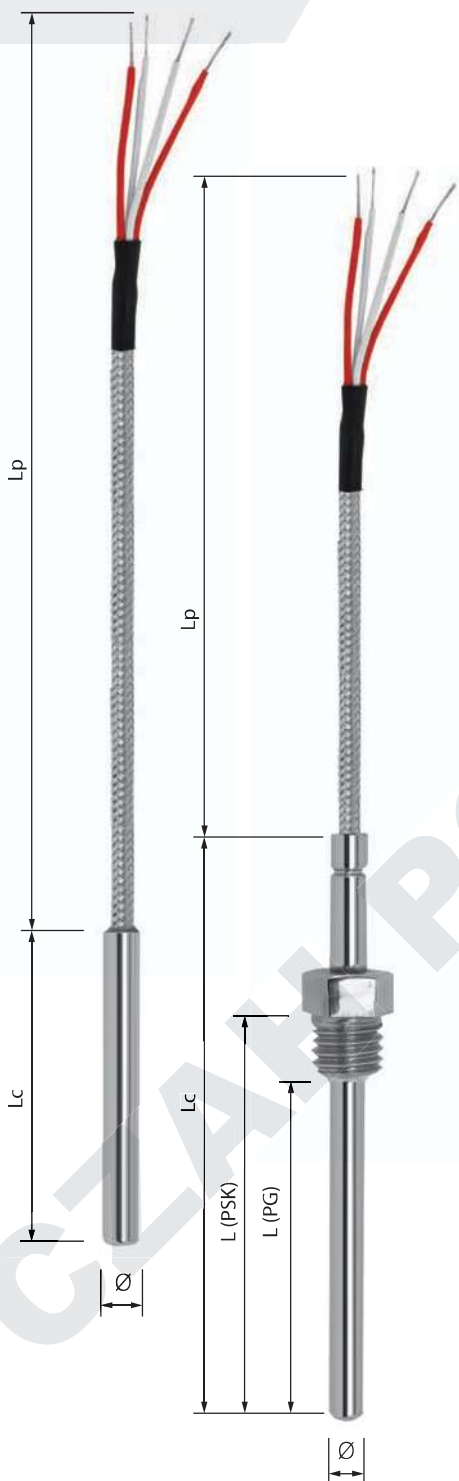


08

METAL SHEATHED CABLE RESISTANCE THERMOMETERS AND CABLE THERMOCOUPLES

- Probe sheaths are available in a wide range of steel grades to suit various operating environments.
- Depending on the sensor type and a construction, they can measure the temperature up to 400 °C max.
- With the appropriate sheath material, sensors are suitable for use in oxidising and reducing atmospheres and neutral acid, alkali, salts, etc.
- There are two options available: a protection tube or a tube with a welded fitting
- Thermocouples can be calibrated in the Accredited Laboratory



08	sensor type	accuracy class	wiring configuration or junction type	sheath material	sheath diameter	length	cable length	cable type	compression fitting	type of the measuring tip	max. operating temperature
Pt100 2xPt100 Pt500 2xPt500 Pt1000 2xPt1000 or K, J, T											
Give accuracy class, table 1		Give wiring configuration or junction type, table 2		Give sheath material, table 3		Give sheath diameter, table 4		Give length Lc [mm] or Lc/L(PG) for option with fitting		Give cable length [mm]	
Give cable type, table 5		Give fitting code, table 6 (skip if not requested)		Give the measuring tip code, table 7		Give max. operating temperature of a tip					

TAB. ORDERING CODE:

08	Pt 100	A	4	321	10	250/50 (PG)	2000	RT401	M12	KK	250° C
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08 – Pt100 – A – 4 – 321 – 10 – 250/50(PG) – 2000 – RT401 – M12 – KK – 250° C

Temperature sensor model resistance thermometer with ?) Type Pt100, class A, 4-wire configuration, sheath material 321 (1H18N9T), sheath diameter 10 mm, total length L=250 mm. Length beneath the fitting L(PG) 50 mm. Temperature sensor with the welded compression fitting with thread M12. Round measuring tip. Max. operating temperature 250° C.

TAB. 1 RESISTOR TOLERANCE CLASS AND OPERATING TEMP. RANGE *)

TOLERANCE CLASS	FOR WIRE WOUND RESISTORS	FOR THIN FILM RESISTORS	TOLERANCE VALUE **)
AA	-50 ÷ +250	0 ÷ +150	± (0.1+0.0017 t)
A	-100 ÷ +400	-30 ÷ +300	± (0.15+0.002 t)
B	-196 ÷ +400	-50 ÷ +400	± (0.3+0.005 t)
C	-196 ÷ +400	-50 ÷ +400	± (0.6+0.01 t)

*) to PN-EN60751:2009 **)|t| = temperature in °C no matter what unit (absolute value)

TEMPERATURE RANGE FOR THERMOCOUPLES *)

SENSOR TYPE	THERMO-ELDTRODES TYPE	LONG TERM OPERATING RANGE [°C] *)	SHOT TERM OPERATING RANGE [°C] *)
J	Fe - CuNi	+20 ÷ 400	-180 ÷ 400
T	Cu - CuNi	-185 ÷ 300	-250 ÷ 400
K	NiCr - NiAl	0 ÷ 400	-180 ÷ 400

*) Given temperature ranges are mostly dependent on the type of wire and thermowell. Tolerance to PN-EN 60584-1; table I, page 63

TAB. 2 WIRING CONFIGURATION AND COLOUR MARKING

SINGLE (ONE RESISTOR)		
2-WIRE DESIGN	3-WIRE DESIGN	4-WIRE DESIGN
DOUBLE (2 RESISTORS)		
2-WIRE DESIGN	3-WIRE DESIGN	4-WIRE DESIGN
HOT JUNCTION TYPES		
HOT JUNCTION CODE	DESCRIPTION	DRAWING
I1	Simplex insulated junction	
Z1	Simplex grounded junction	

TAB. 3 STEEL SHEATH MATERIAL *)

TYPE	DESCRIPTION
304 (1.4301; 0H18N9)	Austenitic stainless steel 18%Cr-8%Ni. Corrosion resistant (with no excess oxidation and no resistance lost) up to 800 °C. It is the most popular acidproof material, easy for metalworking and welding.
321 (1.4541; 1H18N9T)	Steel similar to grade 304 (18% Cr, 10% Ni) but with titanium as a stabilizer.
316 (1.4401; H17N13M2T)	Steel similar to 304 (17% Cr, 9% Ni) with 3% of molybdenum. Because this steel grade is more corrosion resistant than 321 and 304, it is good for humid environment and for application in places threatened by corrosion (sea water).

*) other material on request

TAB. 4 DIAMETER

OUTER THERMOWELL DIAMETER W [mm] *)
4,0
5,0
6,0
8,0
10,0

*) other diameters available on request

TAB. 5 CABLES

The sensors can be supplied complete with cables of various design. The following insulation types are available: PCV, PTFE, fiberglass, Kapton or combination of the mentioned materials. Standards cable sections are 0.22mm² (7/0.2 mm). To choose the right cable, please see table D, page 54. If you required a cable not mentioned in the catalogue, please contact the sales department.

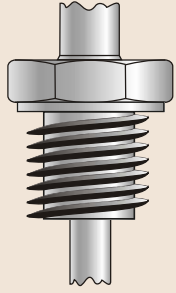
The most common RTD cables:

- RS301 - 3x0,22 mm² – silicone insulated / 3 wires
- RS401 - 4x0,22 mm² – silicone insulated / 4 wired
- RW301 - 3x0,22 mm² – fiberglass insulated / steel overbraid, 3 wires
- RW401 - 4x0,22 mm² – fiberglass insulated / steel overbraid, 4 wires

The most common thermocouple cables:

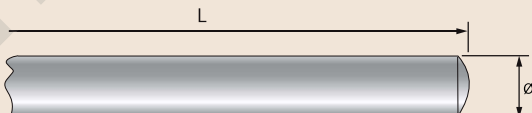
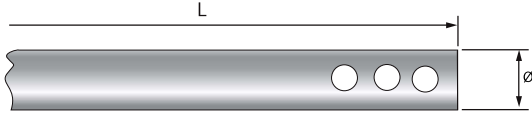
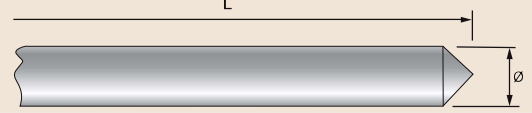
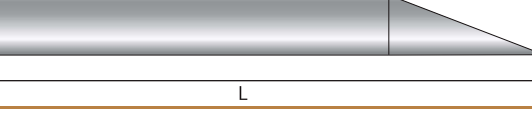
- TS201 - 2x0,22 mm² – silicone insulated
- TW204 - 2x0,22 mm² – fiberglass insulated / stainless steel overbraid
- TT201 - 2x0,22 mm² – Teflon insulated / stainless steel overbraid

TAB. 6 COMPRESSION FITTING

TYPE	DESCRIPTION	MATERIAL	THREAD	DRAWING
M8	Fitting welded to a thermowell Ø10 mm	steel	M8	
M10			M10	
M101			M10x1	
M12			M12	

*) other threads on request

TAB. 7 MEASURING TIP OPTIONS *)

TYPE	DRAWING	DESCRIPTION
KK **		closed round
KP		open, perforated, for applications in gaseous atmospheres
KS		conelike
KI		needlelike

*) tip shape depends on the tube **) flat tip available on request