MTR13T

CABLE RESISTANCE TEMPERATURE SENSORS

MTR13T series consists of cable resistance temperature sensors with a protective tube. They represent an economical solution for temperature measurement in environments with overpressure or underpressure of the medium to be measured.

The measuring element is a resistor whose resistance is temperature dependent according to the characteristic specified in ČSN EN 60751.

The sensor consists of a resistance temperature element protected by a protective tube, threaded fitting and a cable.

General Information (Table 13T.1)

	Insulation class acc. ČSN EN 60529	IP50 (connector), IP00 (loose conductors) IP50 (cable), IP68 (measu. part in length U)
	Max. overpressure	3 bar
①	**Sensor**	
	RTD type	Thin film resistor with characteristics according to ČSN EN 60751, α = 3850 ppm/°C
	RTD measuring current	1 mA
	Sensitive length	10 mm
②	**Protection tube**	
	Material	Stainless steel
	Outer diameter	D = 6 mm
③	**Threaded fitting**	
	Material	Stainless steel
	Thread	M12 x 1,75
	Thread length	16 mm
	WAF	19 mm
④	**Cable**	
	Min. bending radius	15 × extension cable diameter
⑤	**Connector**	
⑥	**Loose conductors**	

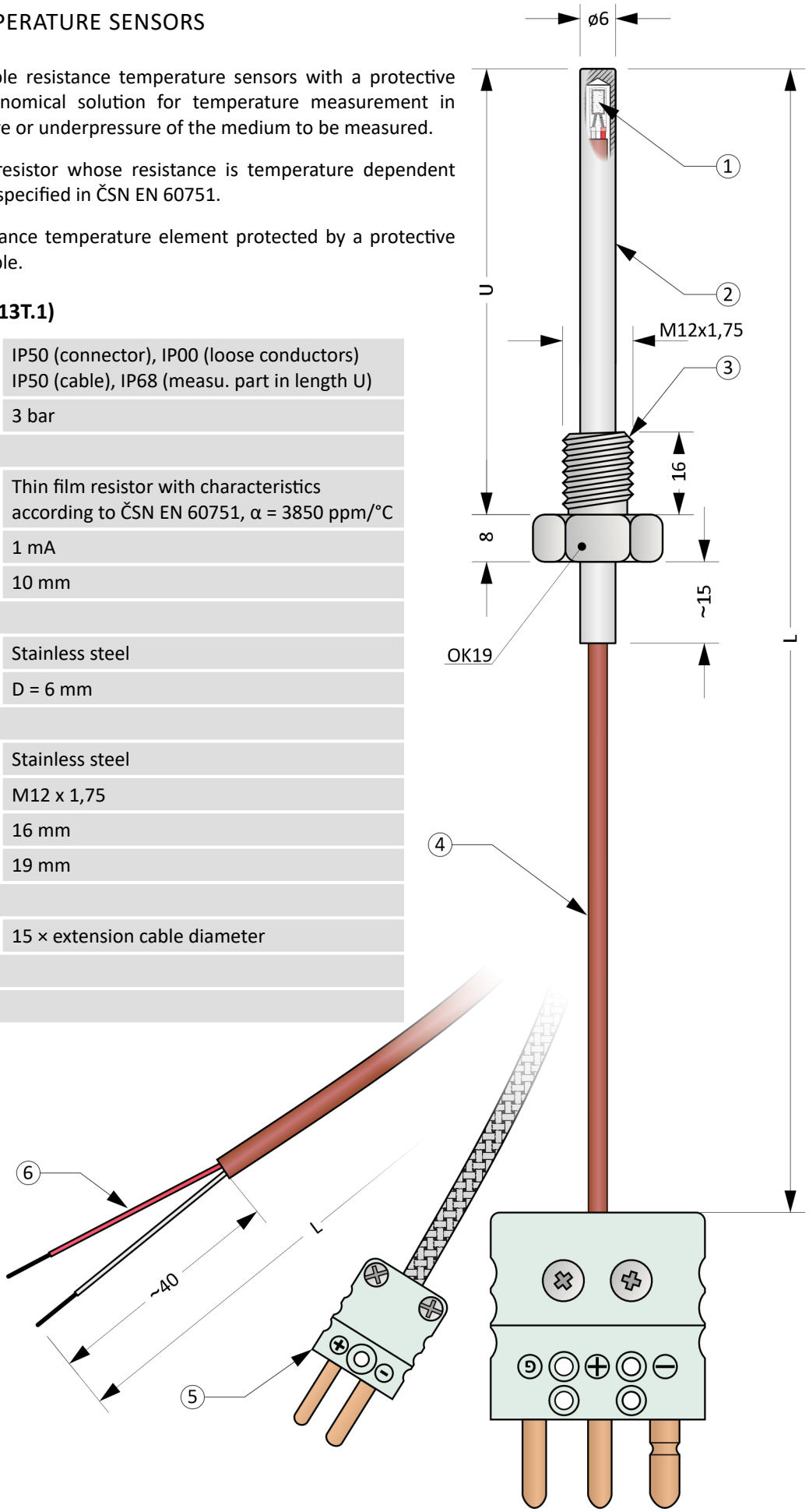


Figure 13T.1: MTR13T

Optional Parameters Including the Creation of an Order Code (Table 13T.2)

Pos.	Code	MTR013T - ❶❷❸ - ❹ - ❺ - ❻	
❶	**RTD type**		
	0	1 x Pt100, two-wire connection (2W)	
	1	1 x Pt500, two-wire connection (2W)	
	2	1 x Pt1000, two-wire connection (2W)	
	3	1 x Pt100, three-wire connection (3W)	
	4	1 x Pt500, three-wire connection (3W)	
	5	1 x Pt1000, three-wire connection (3W)	
	6	1 x Pt100, four-wire connection (4W)	
	7	1 x Pt500, four-wire connection (4W)	
	8	1 x Pt1000, four-wire connection (4W)	
	A	2 x Pt100, two-wire connection (2x2W)	
	B	2 x Pt500, two-wire connection (2x2W)	
	C	2 x Pt1000, two-wire connection (2x2W)	
	D	2 x Pt100, three-wire connection (2x3W)	
	E	2 x Pt500, three-wire connection (2x3W)	
	F	2 x Pt1000, three-wire connection (2x3W)	
❷	**Accuracy class according to ČSN EN 60751**		
	0	accuracy class B in range -50 ... +400 °C	
	1	accuracy class A in range -30 ... +300 °C	Not possible for 2x2W and 2W.
❸	**Cable**		
	0	Cable TGLV 4 x 0,25 mm², Copper wires	Not possible for 2W and 2x3W.
	1	Cable GLGLV 2 x 0,25 mm², Copper wires	Not possible for 3W, 4W, 2x3W and 2x2W.
	2	Cable GLGLV 4 x 0,25 mm², Copper wires	Not possible for 2x2W a 2x3W.
	3	Cable TSL 2 x 0,25 mm², Copper wires	Not possible for 3W, 4W, 2x3W and 2x2W.
	4	Cable TSL 4 x 0,25 mm², Copper wires	Not possible for 2W and 2x3W.
	5	Cable TWT 4 x 0,25 mm², Copper wires	Not possible for 2W and 2x3W.
	6	Cable TCuT 4 x 0,22 mm², Copper wires	Not possible for 2W and 2x3W.
	7	Cable TT 6 x 0,15 mm², Copper wires	Not possible for 2W, 3W, 4W and 2x2W.
	8	Cable GLGLV 6 x 0,15 mm², Copper wires	Not possible for 2W, 3W, 4W and 2x2W.
❹	**Cable length L [cm]**		
	xxx	Selectable range from 20 to 450 cm (in 1 cm increments)	
	xxx	Selectable range from 451 to 3000 cm (in 100 cm increments)	
❺	**Immersion length U [mm]**		
	xxx	Selectable range from 30 to 450 mm (in 5 mm increments)	

Continuarion of table 13T.2 on the next page

Continuarion of table 13T.2 from the previous page

Pos.	Code	MTR013T - ❶❷❸ - ❹ - ❺ - ❻	
❻	**Cold end**		
	0	Loose conductors, length 40 mm	
	1	Standard 2-pin connector, type MTCK-S, plug	Not possible for 3W, 4W and 2x3W.
	2	Standard 2-pin connector, type MTCK-S, plug + socket	Not possible for 3W, 4W and 2x3W.
	3	Standard ceramic 2-pin connector, type MTCK-CS, plug	Not possible for 3W, 4W and 2x3W.
	4	Standard ceramic 2-pin connector, type MTCK-CS, plug + socket	Not possible for 3W, 4W and 2x3W.
	5	Miniature 2-pin connector, type MTCK-M, plug	Not possible for 3W, 4W and 2x3W.
	6	Miniature 2-pin connector, type MTCK-M, plug + socket	Not possible for 3W, 4W and 2x3W.
	A	Standard 3-pin connector, type MTCK-S, plug	Not possible for 2W, 4W, 2x2W.
	B	Standard 3-pin connector, type MTCK-S, plug + socket	Not possible for 2W, 4W, 2x2W.
	C	Miniature 3-pin connector, type MTCK-M, plug	Not possible for 2W, 4W, 2x2W.
	D	Miniature 3-pin connector, type MTCK-M, plug + socket	Not possible for 2W, 4W, 2x2W.
	E	Standard 4-pin connector, type MTCK-S, plug	Not possible for 2W, 3W a 2x3W.
	F	Standard 4-pin connector, type MTCK-S, plug + socket	Not possible for 2W, 3W a 2x3W.
	G	Miniature 4-pin connector, type MTCK-DM, plug	Not possible for 2W, 3W.
	H	Miniature 4-pin connector, type MTCK-DM, plug + socket	Not possible for 2W, 3W.

Order code example: MTR013T-012-500-100-E

... 1 x Pt100, four-wire connection
... accuracy class A in range -30 ... +300 °C
... Cable GLGLV 4 x 0,25 mm², Copper wires
... Cable length L = 500 mm
... Immersion length U = 100 cm
... Standard 4-pin connector, type MTCK-S, plug

Approximate weight of the product: MTR013T-012-500-100-E ... 0,1 kg

Length tolerance L (Table 13T.3)

Length L	Length tolerance L
20 ≤ L ≤ 250 cm	± 1 cm
250 cm < L ≤ 500 cm	± 1,5 cm
500 cm < L ≤ 3000 cm	± 0,5 % z L

Length tolerance U (Table 13T.4)

Length tolerance U
± 1 mm

Diameter tolerances (Table 13T.5)

Diameter tolerance D
± 0,1 mm

Recommended Maximum Temperatures of Sensor Parts(Table 13T.6)

Sensor part	Cable insulation	Continuous operation
Connector MTCK-M, MTCK-S		See cable insulation, max. 220 °C
Ceramic connector MTCK-CS		See cable insulation
Measuring end incl. cable	SL nebo TSL	-60 ... 180 °C
	TWT	-60 ... 205 °C
	TT, TGLV nebo TCuT	-60 ... 205 °C
	GLGLV	< 400 °C

Notes: Operating temperatures are related to temperature measurement in a chemically inert environment. The values are determined empirically.

Cables (Table 13T.7)

Insulation	Number x cross-section / dia. of wires	Outer cable diameter	Pros and cons
TSL	2 x 0,25 mm² 4 x 0,25 mm²	~ 3,8 mm ~ 4,3 mm	↗ Good flexibility, moisture resistant ↘ No shielding, low mechanical resistance
TWT	4 x 0,25 mm²	~ 3,6 mm	↗ Moisture resistant ↘ No shielding, low mechanical resistance
TCuT	4 x 0,22 mm²	~ 3,7 mm	↗ Moisture resistant
TT	6 x 0,15 mm²	~ 3,5 mm	↗ Moisture resistant ↘ No shielding, low mechanical resistance
TGLV	4 x 0,25 mm²	~ 3,6 mm	↗ Moisture resistant, high mechanical resistance
GLGLV	2 x 0,25 mm² 4 x 0,25 mm² 6 x 0,15 mm²	~ 3,0 mm ~ 3,2 mm ~ 3,5 mm	↗ High mechanical resistance, suitable for higher temperatures ↘ Low moisture resistance

Connectors

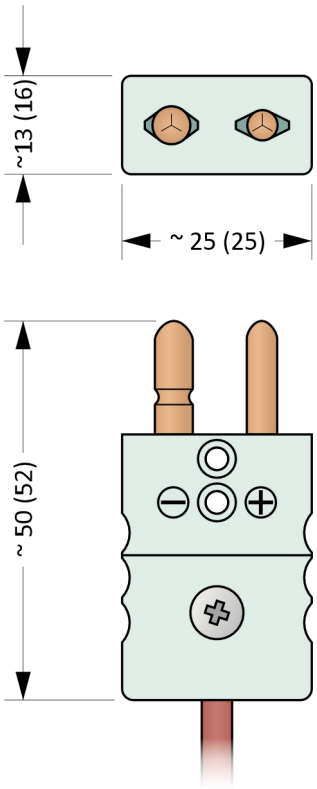


Figure 13T.2: MTCK-S a MTCK-CS

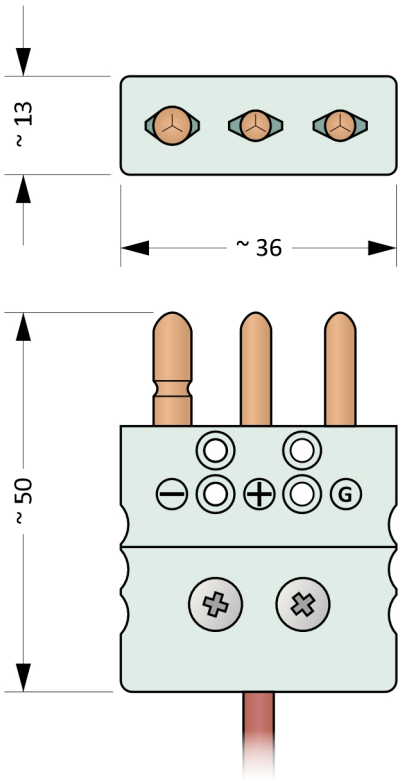


Figure 13T.3: MTCK-3S

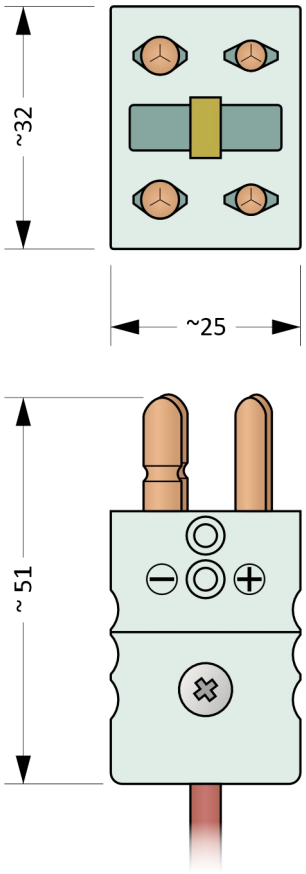


Figure 13T.4: MTCK-DS

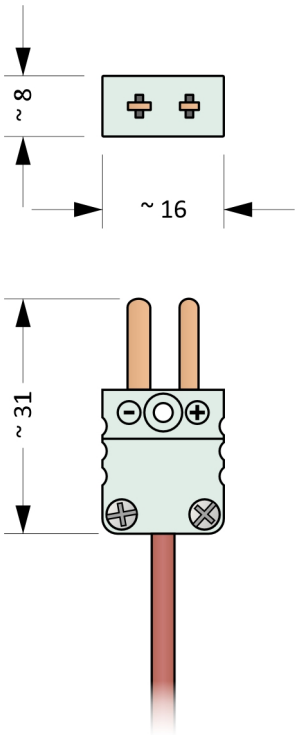


Figure 13T.5: MTCK-M

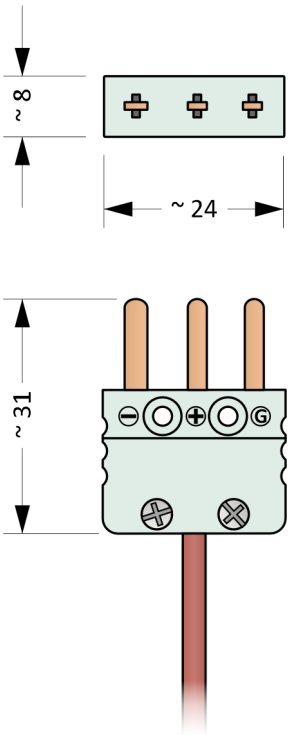


Figure 13T.6: MTCK-3M

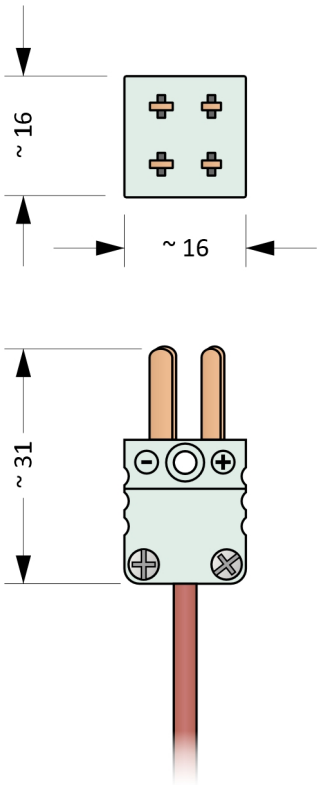


Figure 13T.7: MTCK-DM

Installation And Operating Instructions

For mounting the sensor, a fitting is used, which is screwed into the weld-on piece.

The electrical wiring of the sensor is shown in the Figures 13T.8 to 13T.22. The output signal is thermoelectric voltage. The dependence of temperature on thermoelectric voltage is given by the standard ČSN EN 60584-1 ed. 2.

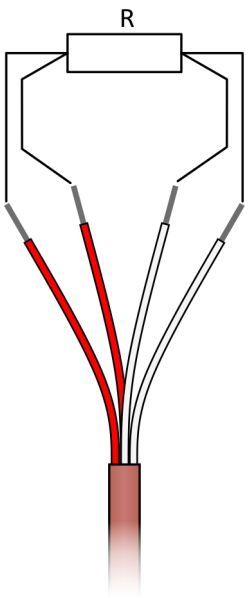


Figure 13T.8: Four-wire RTD wiring diagram

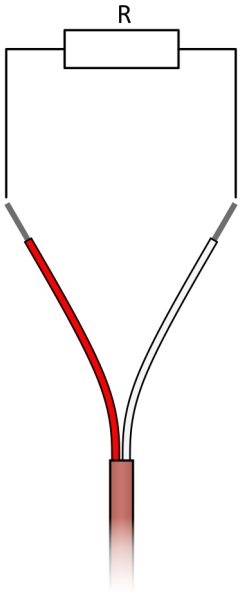


Figure 13T.9: Two-wire RTD wiring diagram

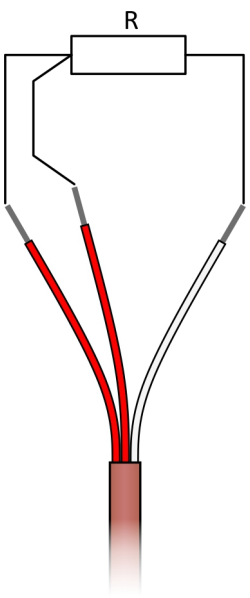


Figure 13T.10: Three-wire RTD wiring diagram

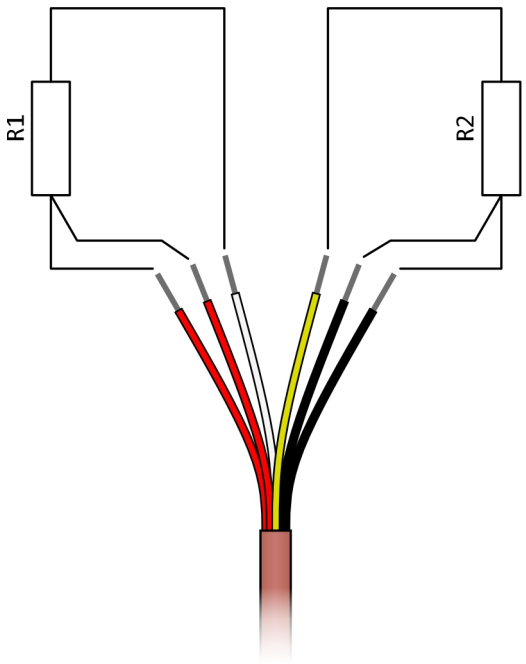


Figure 13T.11: Three-wire 2 x RTD wiring diagram

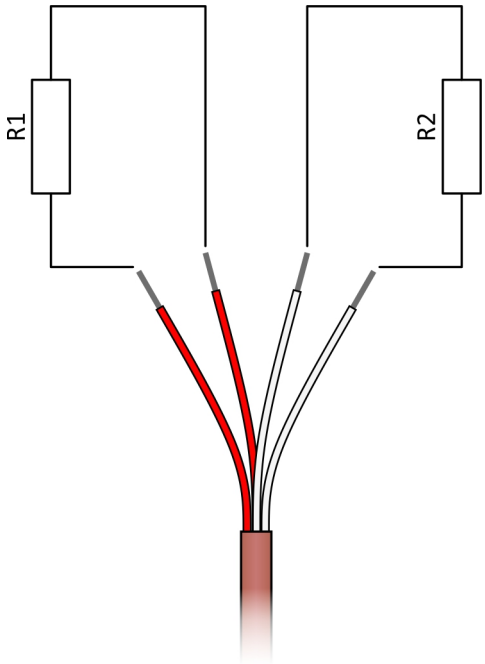


Figure 13T.12: Two-wire 2 x RTD wiring diagram

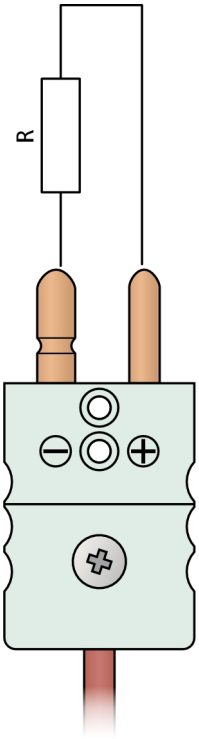


Figure 13T.13: Two-wire RTD wiring diagram with connector

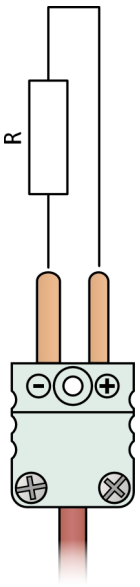


Figure 13T.14: Two-wire RTD wiring diagram with miniature connector

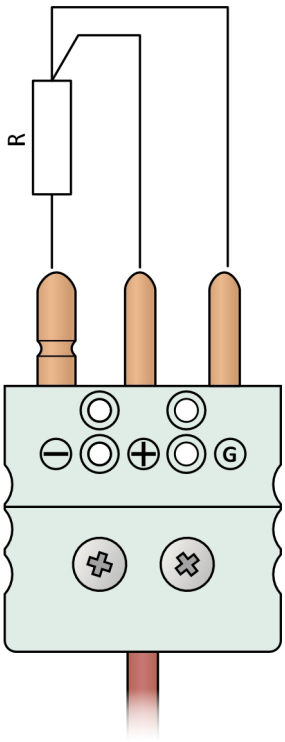


Figure 13T.15: Three-wire RTD wiring diagram with connector

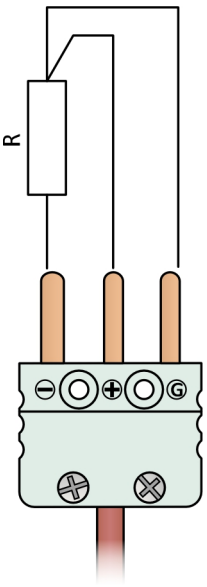
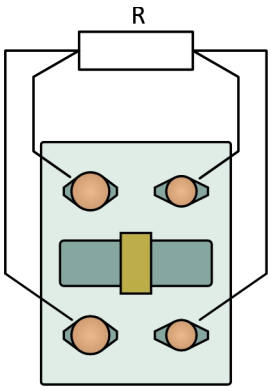


Figure 13T.16: Three-wire RTD wiring diagram with miniature connector



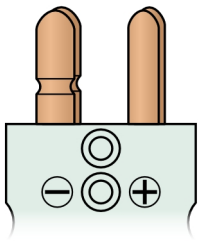
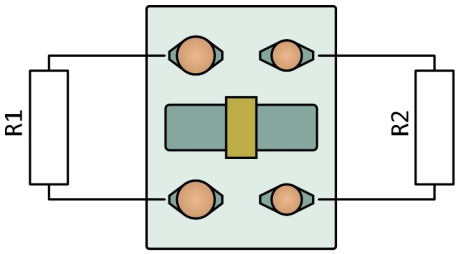


Figure 13T.17: Four-wire RTD wiring diagram with connector



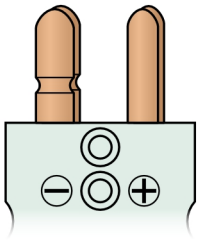


Figure 13T.18: Two-wire 2 x RTD wiring diagram with connector

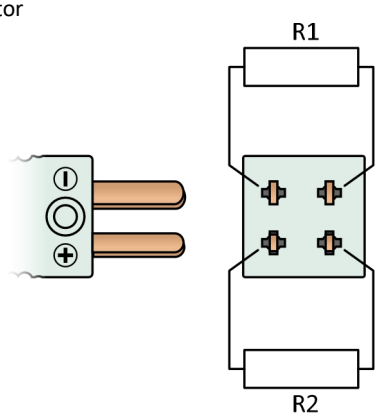


Figure 13T.19: Two-wire 2 x RTD wiring diagram with miniature connector

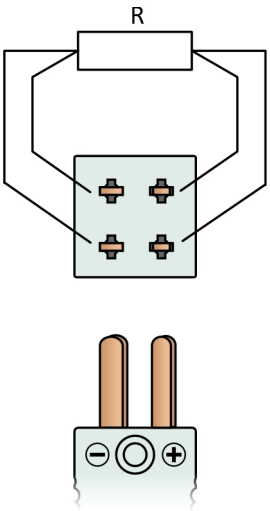


Figure 13T.20: Four-wire RTD wiring diagram with miniature connector

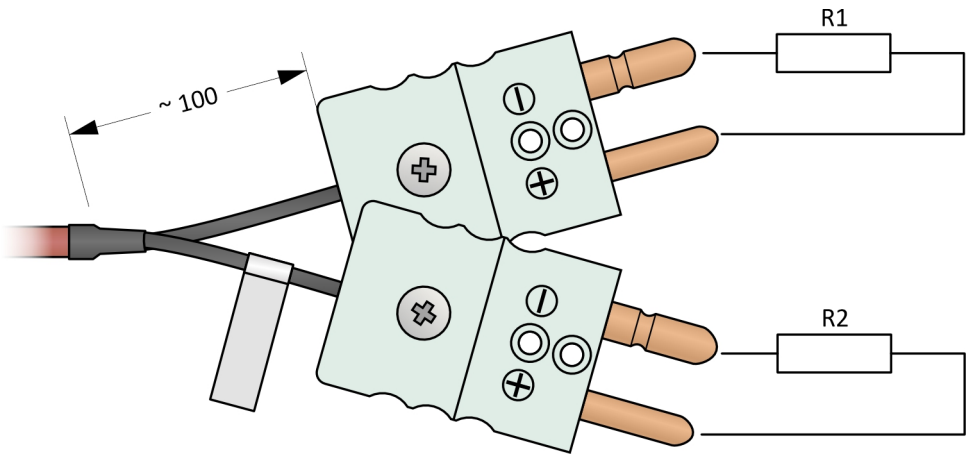


Figure 13T.21: Two-wire 2 x RTD wiring diagram with connectors

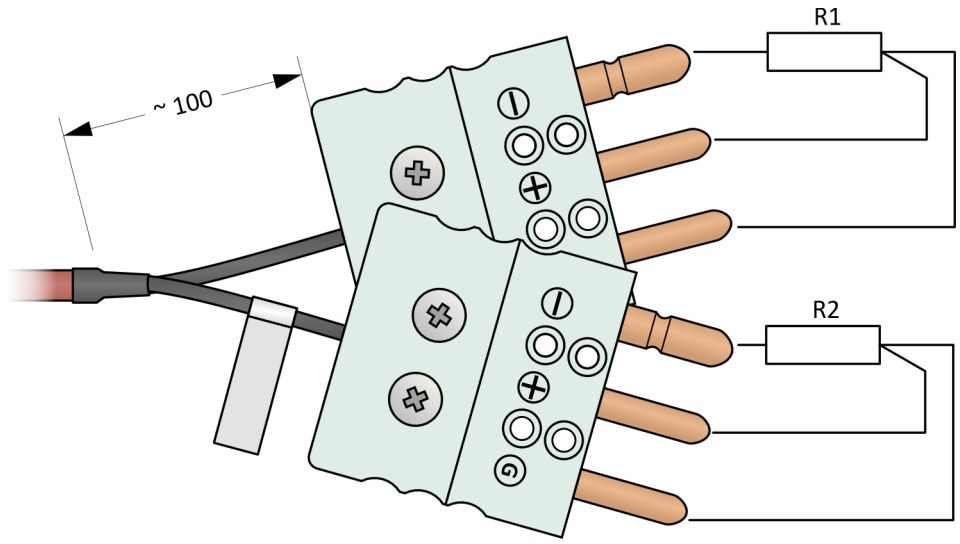


Figure 13T.22: Three-wire 2 x RTD wiring diagram with connectors