

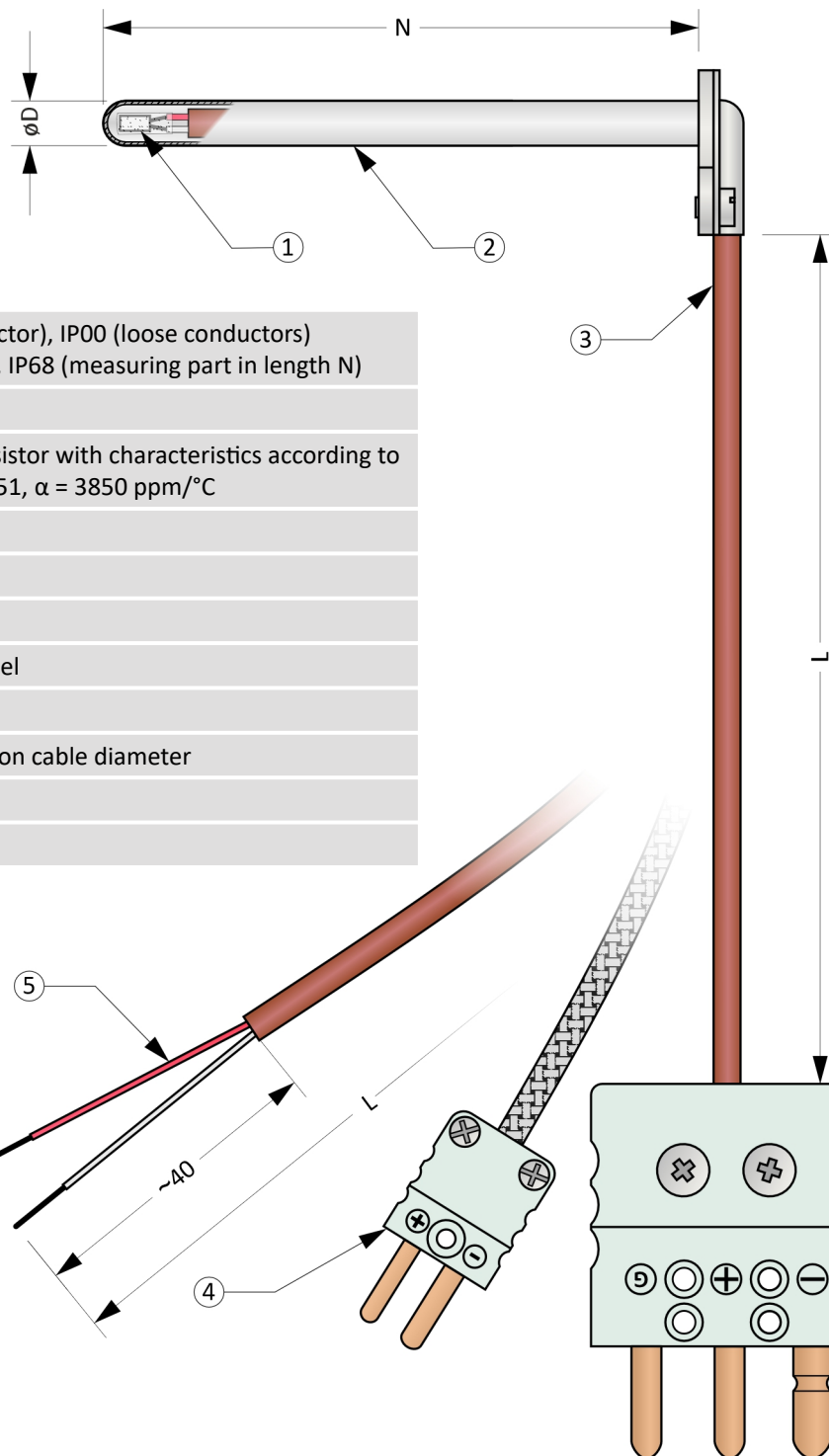
MTR12U

CABLE RESISTANCE TEMPERATURE SENSORS

MTR12U series consists of cable temperature sensors with a angled protective tube. They represent an economical solution for applications not requiring high temperature and mechanical durability.

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 and a cable.



General Information (Table 12U.1)

	Insulation class acc. ČSN EN 60529	IP50 (connector), IP00 (loose conductors) IP50 (cable), IP68 (measuring part in length N)
①	Sensor	
	RTD type	Thin film resistor with characteristics according to ČSN EN 60751, $\alpha = 3850 \text{ ppm/}^\circ\text{C}$
	RTD measuring current	1 mA
	Sensitive length	10 mm
②	Protection tube	
	Material	Stainless steel
③	Cable	
	Min. bending radius	$15 \times \text{extension cable diameter}$
④	Connector	
⑤	Loose conductors	

Figure 12U.1: MTR12U

Optional Parameters Including the Creation of an Order Code (Table 12U.2)

Pos.	Code	MTR012U - 1 2 3 - 4 - 5 - 6 7	
1	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)		
2	Accuracy class according to ČSN EN 60751		
	0	accuracy class B in range -50 ... +500 °C	
	1	accuracy class A in range -30 ... +300 °C	Not possible for 2x2W a 2W.
3	Cable		
	0	Cable TGLV 4 x 0,25 mm ² , Copper wires	Not possible for 2W and 2x3W.
	1	Cable GLGLV 2 x 0,25 mm ² , Copper wires	Not possible for 3W, 4W, 2x3W and 2x2W.
	2	Cable GLGLV 4 x 0,25 mm ² , Copper wires	Not possible for 2W and 2x3W.
	3	Cable TSL 2 x 0,25 mm ² , Copper wires	Not possible for 3W, 4W, 2x3W and 2x2W.
	4	Cable TSL 4 x 0,25 mm ² , Copper wires	Not possible for 2W and 2x3W.
	5	Cable TWT 4 x 0,25 mm ² , Copper wires	Not possible for 2W and 2x3W.
	6	Cable TCuT 4 x 0,22 mm ² , Copper wires	Not possible for 2W and 2x3W.
	7	Cable TT 6 x 0,15 mm ² , Copper wires	Not possible for 2W, 3W, 4W and 2x2W.
8	Cable GLGLV 6 x 0,15 mm ² , Copper wires	Not possible for 2W, 3W, 4W and 2x2W.	
4	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 10 cm increments)	
5	Protection tube length N [mm]		
	xxx	Selectable range from 30 to 500 mm (in 5 mm increments)	
6	Protection tube diameter D [mm]		
	0	D = 6,0 mm	
Continuation of table 12U.2 on the next page			

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Pos.	Code	MTR012U - ① ② ③ - ④ - ⑤ - ⑥ ⑦
	Cold end	
0	Loose conductors, length 40 mm	
1	Standard 2-pin connector, type MTCK-S, plug	Not possible for 3W, 4W
2	Standard 2-pin connector, type MTCK-S, plug + socket	and 2x3W. Not possible for 3W, 4W
3	Standard ceramic 2-pin connector, type MTCK-CS, plug	Not possible for 3W, 4W
4	Standard ceramic 2-pin connector, type MTCK-CS, plug + socket	and 2x3W. Not possible for 3W, 4W
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: MTR012U-612-500-100-0E

... 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
 ... Tube length N = 100 cm
 ... D = 6,0 mm
 ... Standard 4-pin connector, type MTCK-S, plug

Approximate weight of the product: MTR012U-612-500-100-0E ... 0,1 kg

Length tolerance L (Table 12U.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 N (Table 12U.4)

Length tolerance N
± 1 mm

Diameter tolerances (Table 12U.5)

Diameter tolerance D
± 0,1 mm

Recommended Maximum Temperatures of Sensor Parts (Table 12U.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 12U.7)

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

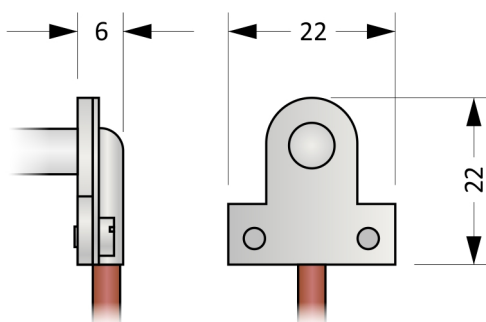


Figure 12U.2: Detail přechodky

Connectors

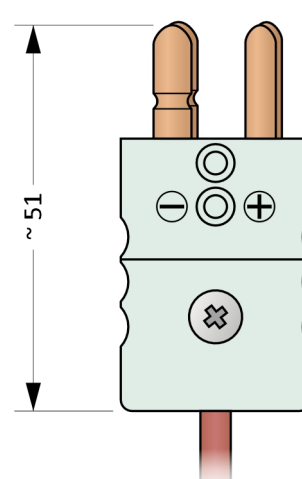
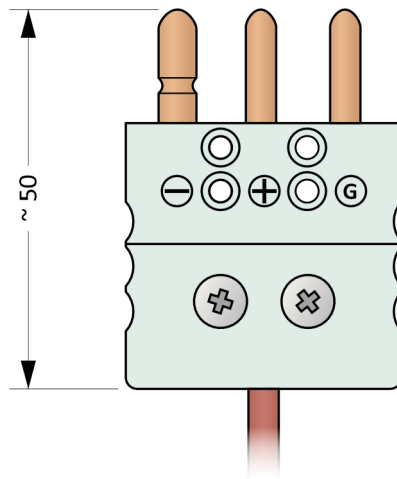
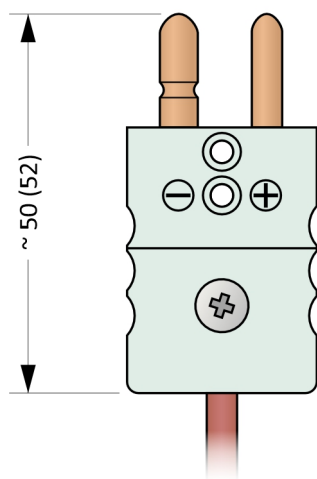
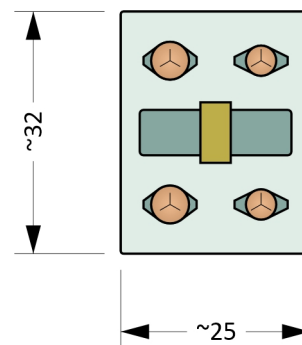
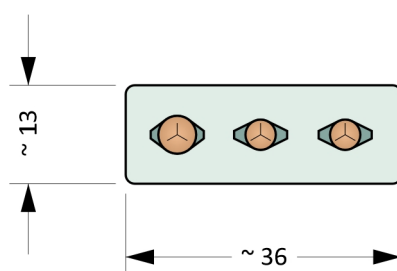
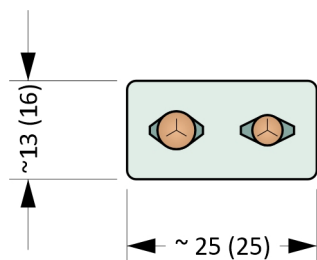


Figure 12U.3: MTCK-S a MTCK-CS

Figure 12U.4: MTCK-3S

Figure 12U.5: MTCK-DS

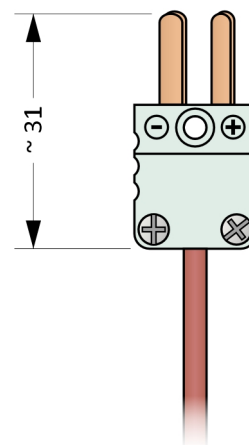
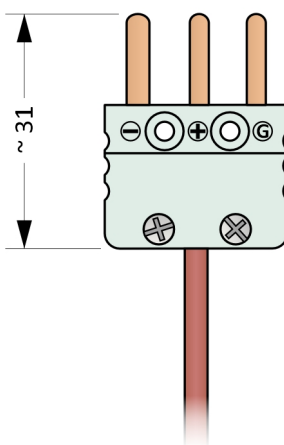
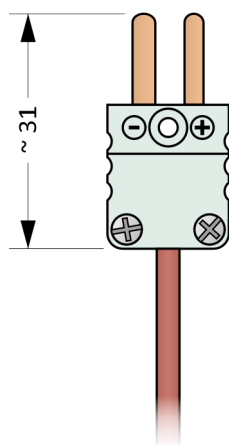
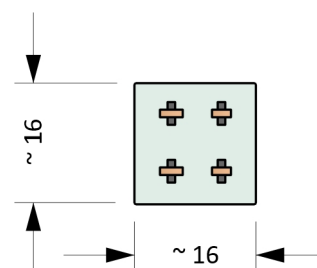
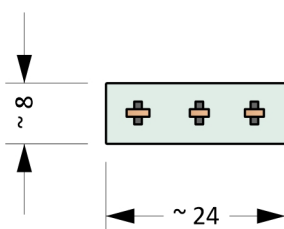
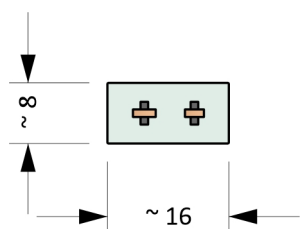


Figure 12U.6: MTCK-M

Figure 12U.7: MTCK-3M

Figure 12U.8: MTCK-DM

Installation And Operating Instructions

The sensor protection tube including the transition part is used for mounting.

The electrical wiring of the sensor is shown in the Figures 12U.9 to 12U.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.

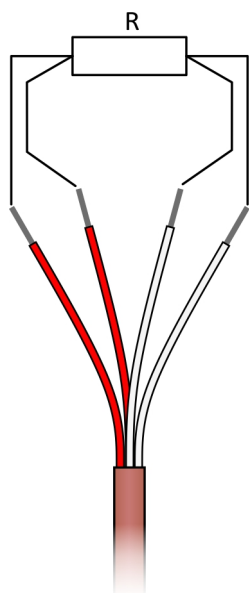


Figure 12U.9: Four-wire RTD wiring diagram

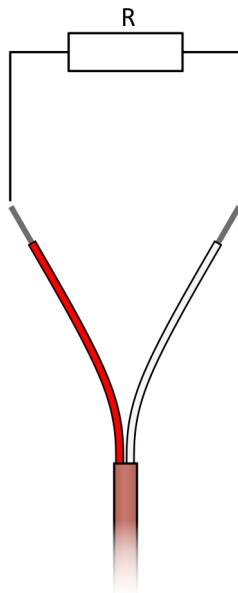


Figure 12U.10: Two-wire RTD wiring diagram

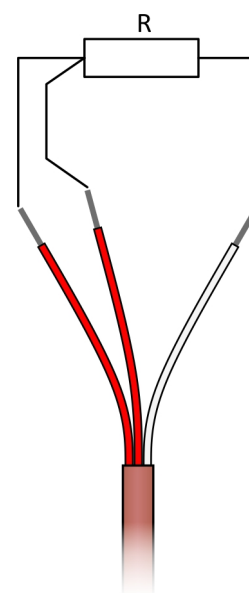


Figure 12U.11: Three-wire RTD wiring diagram

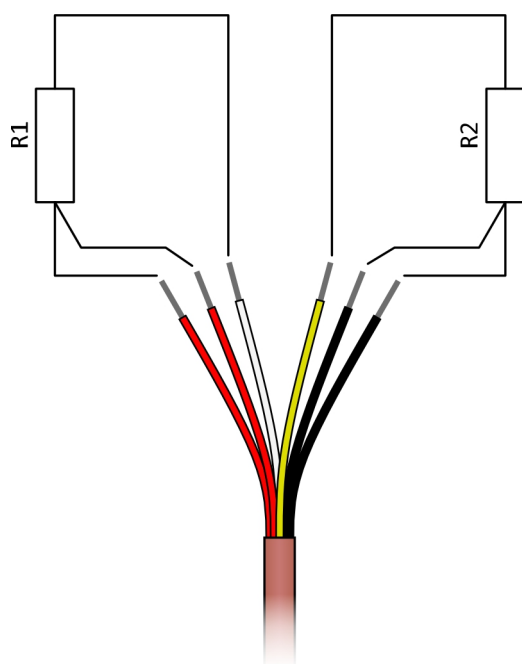


Figure 12U.12: Three-wire 2 x RTD wiring diagram

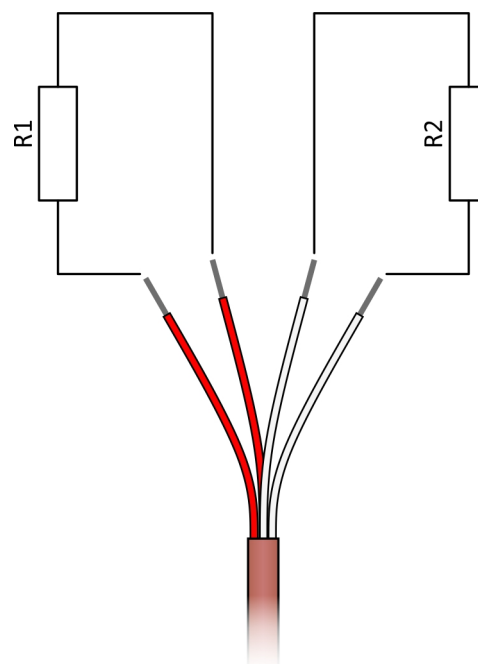


Figure 12U.13: Two-wire 2 x RTD wiring diagram

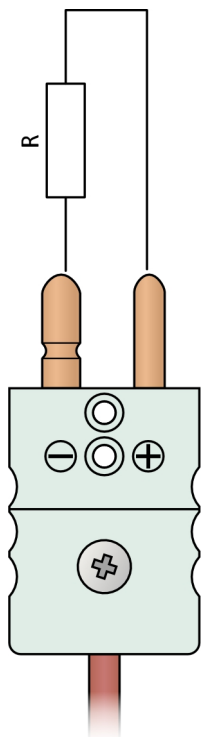


Figure 12U.15: Two-wire RTD wiring diagram with miniature connector

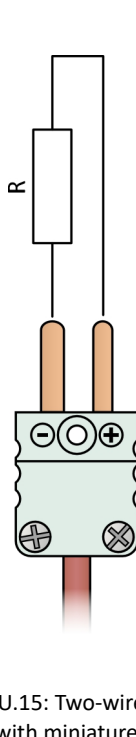


Figure 12U.16: Three-wire RTD wiring diagram with connector

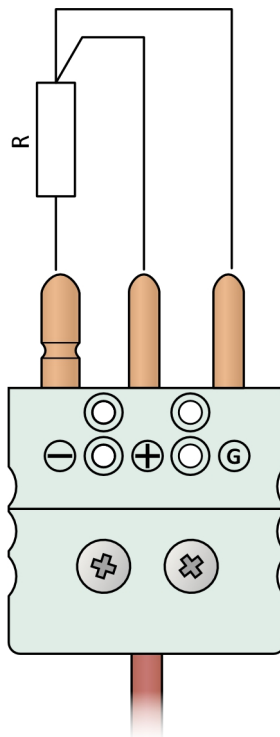


Figure 12U.17: Three-wire RTD wiring diagram with miniature connector

Figure 12U.14: Two-wire RTD wiring diagram with connector

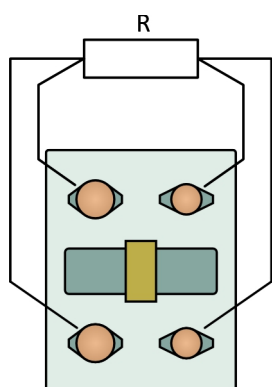


Figure 12U.18: Four-wire RTD wiring diagram with connector

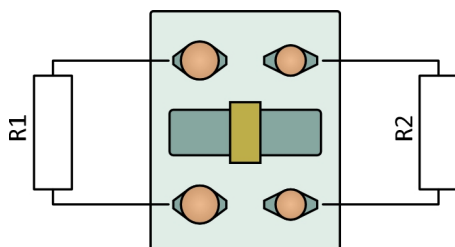


Figure 12U.19: Two-wire 2 x RTD wiring diagram with connector

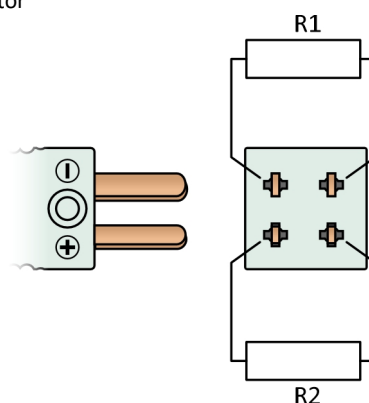


Figure 12U.20: Two-wire 2 x RTD wiring diagram with miniature connector

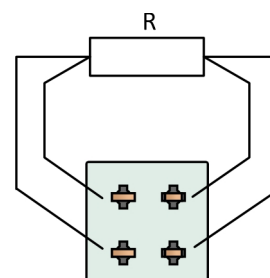
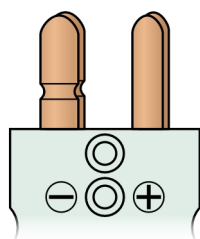
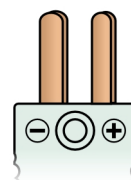


Figure 12U.21: Four-wire RTD wiring diagram with miniature connector



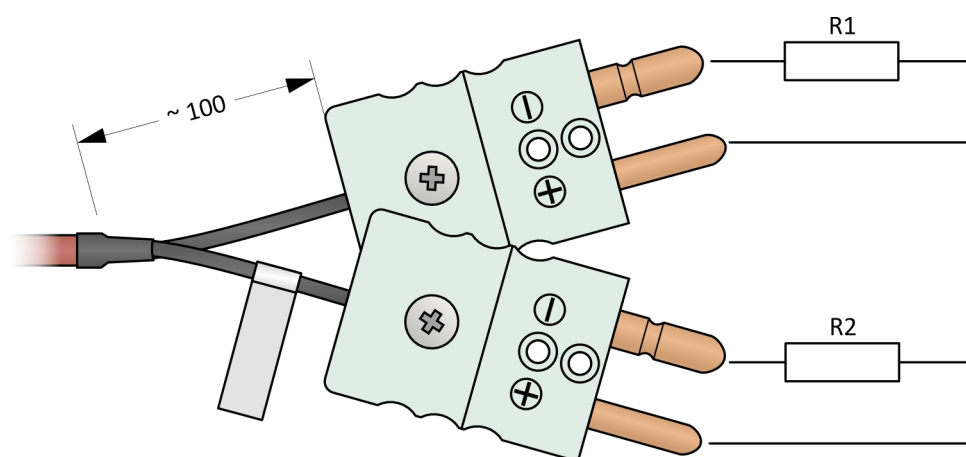


Figure 12U.22: Two-wire 2 x RTD wiring diagram with connectors

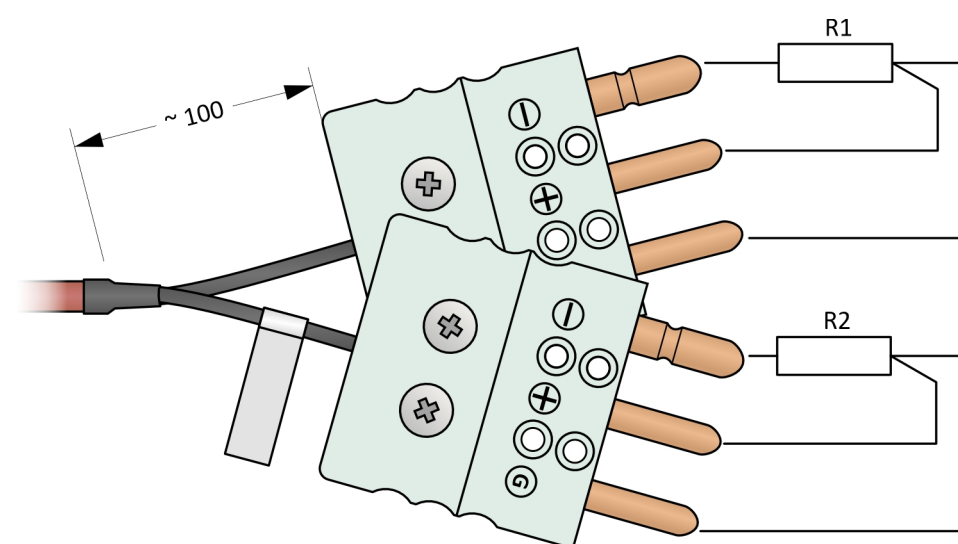


Figure 12U.23: Three-wire 2 x RTD wiring diagram with connectors