

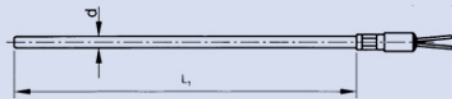
Mineral insulated resistance thermometers

type

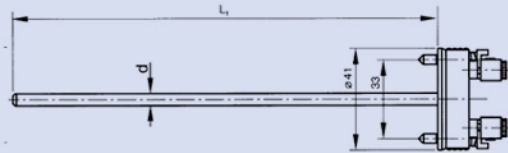
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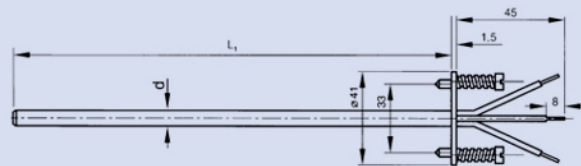
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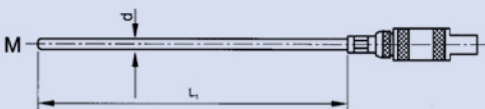
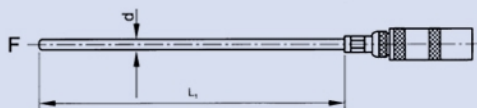
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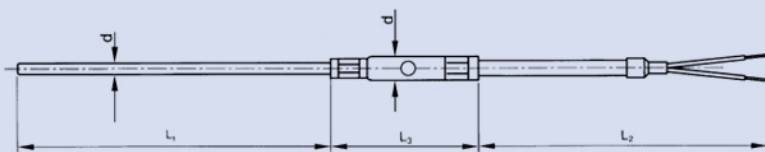
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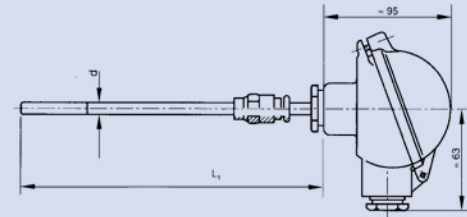


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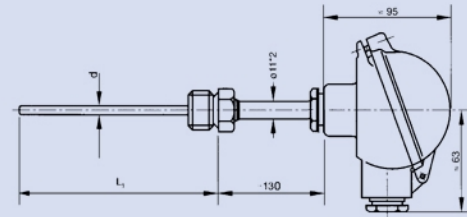


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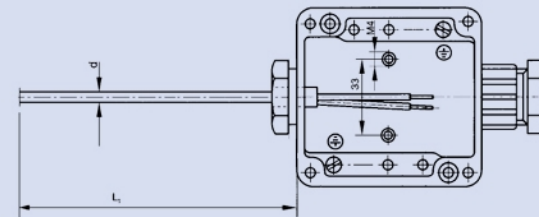
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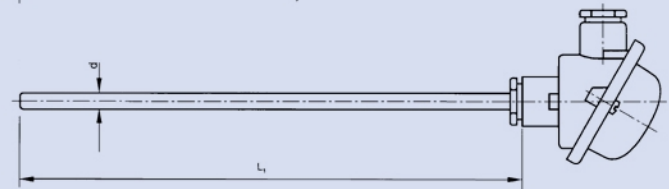
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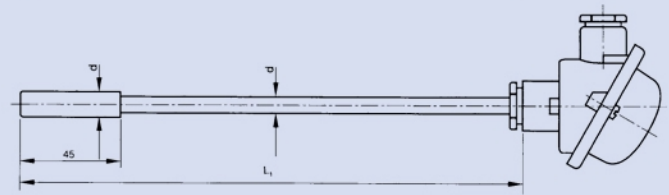
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230



235



Mineral insulated resistance thermometers

- flexible mineral insulated cable (minerals as sheath material)
- copper wires with low resistance
- diameter 1,0 to 8 mm
- low response time
- fitting length acc. to customer requirement
- vibration-proof construction
- material 1.4541 / 1.4571
- temperature range: -200°C ... +600°C
- connection heads and plugs according to customer requirement
- two, three or four-wire system
- standard measuring head with Pt 100 sensor resistor (for temperature measurement) according to DIN EN 60-751, class B; also possible Pt 500 or Pt 1000 or other tolerance classes
- minimum bend radius to 5 x outside diameter

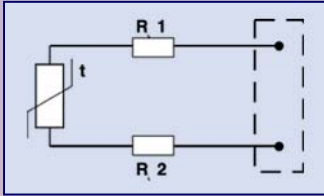
Tolerances for 100-ohm-thermometer

temperature in °C	tolerances			
	class A		class B	
	°C	ohm	°C	ohm
- 200	± 0,55	± 0,24	± 1,3	± 0,56
- 100	± 0,35	± 0,14	± 0,8	± 0,32
0	± 0,15	± 0,06	± 0,3	± 0,12
+100	± 0,35	± 0,13	± 0,8	± 0,30
+200	± 0,55	± 0,20	± 1,3	± 0,48
+300	± 0,75	± 0,27	± 1,8	± 0,64
+400	± 0,95	± 0,33	± 2,3	± 0,79
+500	± 1,15	± 0,38	± 2,8	± 0,93
+600	± 1,35	± 0,43	± 3,3	± 1,06
+650	± 1,45	± 0,46	± 3,6	± 1,13
+700	-	-	± 3,8	± 1,17
+800	-	-	± 4,3	± 1,28
+850	-	-	± 4,6	± 1,34

Mineral insulated resistance thermometers

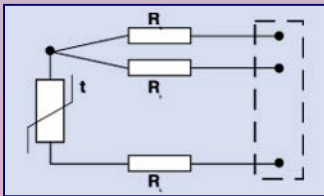
Connection technologies for resistance thermometers

There are different techniques for the electrical connection of resistance thermometers. The circuit types differ in regard to the number of wires and to the compensation of parasitic resistance effects. Independently from the connection technique the measuring currents should be as small as possible to avoid errors caused by self heating.



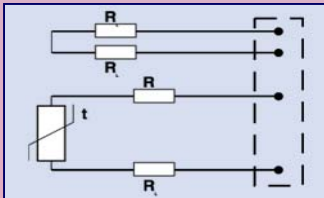
Two-wire circuit

This is the most simple circuit. Here, the compensation of parasitic wiring resistances is either impossible at all or can be done only for a fixed value ($R_{L1} + R_{L2}$). The temperature dependence of wiring resistances cannot be compensated.



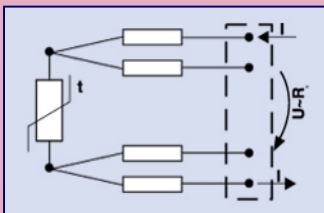
Three-wire circuit

The wiring resistances can be almost fully compensated provided that the resistances of the three wires are identical. Contact resistances, however, can adulterate the result of the measurement.



Two-wire circuit with compensation loop

The materials of the wires to the sensor and of the loop are identical. The loop ends close to the sensor. The compensation of wiring resistances is similar to the case of the three-wire circuit. Measuring circuit and compensating circuit are galvanically isolated.



Four-wire circuit – measurement according to KELVIN

Using the four-wire circuit the parasitic wiring resistances can be fully compensated. A defined current is fed to the sensor by separate wires. The resulting voltage drop measured via a second set of unloaded wires is proportional to the resistance. If required, parasitic thermo-electric effects can be compensated as well by reversing the polarity of the measuring current. Contact resistances do not influence the measurement.