

MTR15

MINERAL INSULATED METAL SHEATHED RESISTANCE TEMPERATURE SENSORS

MTR15 series sensors can be used as measuring inserts in MTR assemblies or as stand-alone sensors.

The sensor consists of a resistive RTD enclosed in a mineral insulated metal sheathed cable and terminal. The sensor is flexible and can be easily positioned to the measurement location.

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

General Information (Table 15.1)

	Insulation class acc. ČSN EN 60529	IP00 (terminal, transmitter) IP68 (measuring part)
①	Sheathed sensor	
	RTD type	Thin film resistor with characteristics according to ČSN EN 60751, $\alpha = 3850$ ppm/°C
	RTD measuring current	1 mA
	Sensitive length	10 mm
	Design	Mineral insulated metal-sheathed sensor (MIMS)
	Sheath material	Stainless steel (1.4541, 1.4404, 1.4571)
	Min. bending radius	$10 \times \phi A$
②	Disk	
③	Terminal block	
④	Transmitter	

Recommended Min. Sensor Length N (Chart 15.1)

The minimum recommended length is determined with respect to the heat transfer from the measuring end to the terminal. If the length is not observed, there is a risk of overheating.

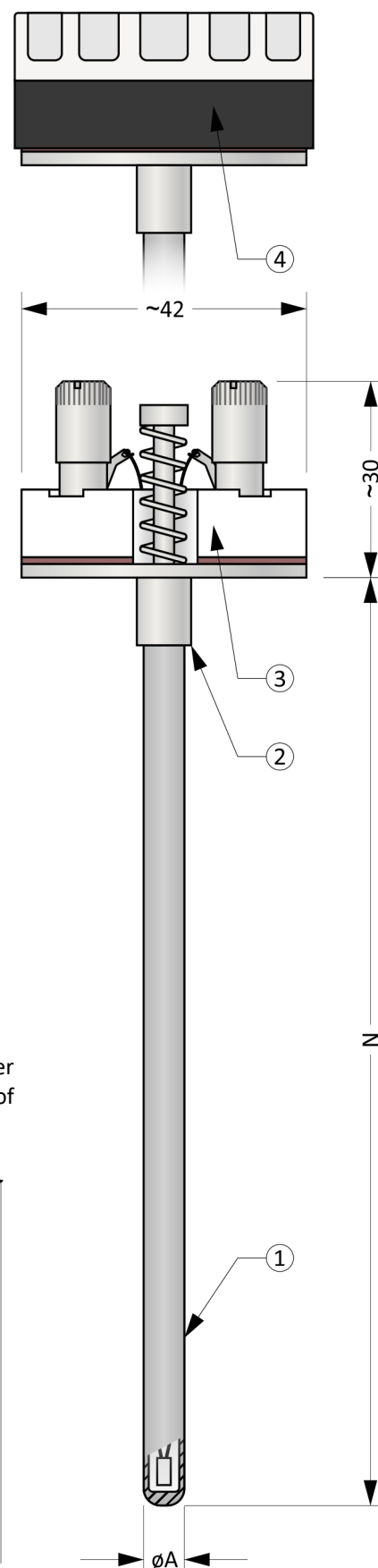
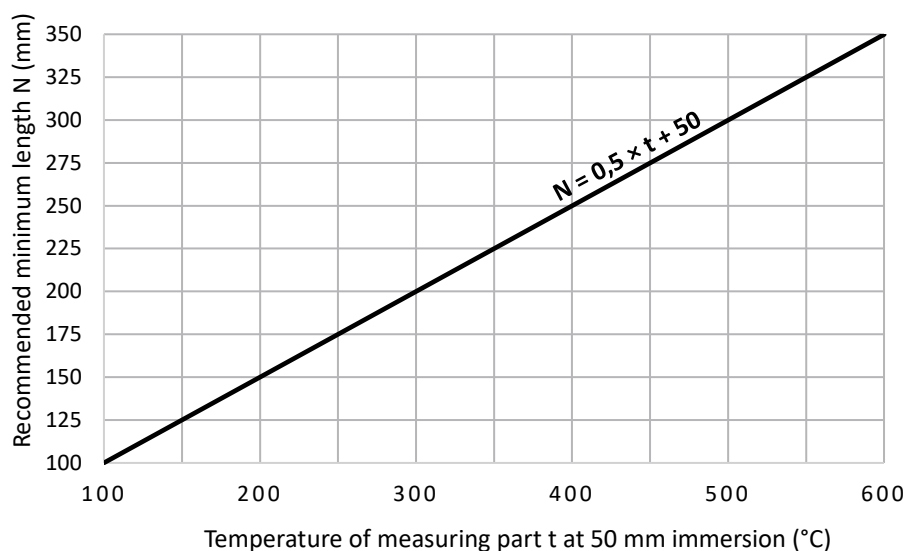


Figure 15.1: MTR15

Optional Parameters Including the Creation of an Order Code (Table 15.2)

Pos.	Code	MTR015 - ① ② ③ - ④ - ⑤	
①	Type of measuring insert		
	0	1 x Pt100, four-wire connection (4W)	
	1	1 x Pt500, four-wire connection (4W)	
	2	1 x Pt1000, four-wire connection (4W)	
	A	2 x Pt100, three-wire connection (2x3W)	Not possible for $\varnothing A = 3 \text{ mm}$, $\varnothing A = 5 \text{ mm}$.
	B	2 x Pt500, three-wire connection (2x3W)	Not possible for $\varnothing A = 3 \text{ mm}$, $\varnothing A = 5 \text{ mm}$.
	C	2 x Pt1000, three-wire connection (2x3W)	Not possible for $\varnothing A = 3 \text{ mm}$, $\varnothing A = 5 \text{ mm}$.
②	Working range and accuracy class according to EN 60751		
	0	Working range -200 ... +400 °C, accuracy class B in range -50 ... +400 °C	
	1	Working range -200 ... +400 °C, accuracy class A in range -30 ... +300 °C	
	2	Working range -200 ... +600 °C, accuracy class B in range -50 ... +500 °C	Not possible for $\varnothing A = 5 \text{ mm}$.
	3	Working range -200 ... +600 °C, accuracy class A in range -30 ... +300 °C	Not possible for $\varnothing A = 5 \text{ mm}$.
	4	Working range -200 ... +600 °C, accuracy class B in range -200 ... +600 °C	Not possible for $\varnothing A = 5 \text{ mm}$, Pt500 and Pt1000.
	5	Working range -200 ... +600 °C, accuracy class A in range -200 ... +600 °C	Not possible for $\varnothing A = 5 \text{ mm}$, Pt500 a Pt1000.
③	Outer sheath diameter		
	0	A = 6,0 mm	
	1	A = 5,0 mm	
	2	A = 4,5 mm	
	3	A = 3,0 mm	
④	Nominal length N [mm]		
	xxx	Selectable range from 50 to 4500 mm (in 1 mm increments)	
	xxx	Selectable range from 4501 to 10000 mm (in 10 mm increments)	
⑤	Transmitter (only for sensor with 1xRTD)		
	0	Without transmitter - equipped with terminal	
	9	INOR APAQ C130 RTD	
	3	INOR miniPAQ - HLP	
	7	INOR IPAQ C330	
	8	INOR IPAQ C530	
	5	INOR IPAQ C520	
A	With another transmitter (e.g. supplied by the customer)		

Order code example: MTR015-010-500-0

... 1 x Pt100, four-wire connection

... Working range -200 ... +400 °C, accuracy class A in range -30 ... +300 °C

... A = 6,0 mm

... Nominal length N = 500 mm

... Without transmitter

Approximate weight of the product: MTR015-010-500-0 ... 0,2 kg

Length Tolerances (Table 15.3)

Length	Length tolerance N
≤ 1500 mm	± 2 mm
1500 mm < Length ≤ 2500 mm	± 3 mm
2500 mm < Length ≤ 5000 mm	± 10 mm
> 5000 mm	± 20 mm

Diameter Tolerances (Table 15.4)

Diameter Tolerance A
± 0,1 mm

Recommended Maximum Temperatures of Sensor Parts (Table 15.5)

Sensor part	Continuous operation	Short-term operation
Terminal block / transmitter	< 100 °C / < 85 °C	---
Measuring end	See working range from table 15.2	---

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

Transmitters (Table 15.6)

The transmitter is installed on the disk and replaces the terminal block.

Type	Input	Output	Settings	Notes
INOR APAQ C130 RTD	RTD	4 ... 20 mA	INOR CONNECT (NFC)	
INOR miniPAQ - HLP	Thermocouple - B, C, E, J, K, L, N, R, S, T, U RTD	4 ... 20 mA	PC WIN ConSoft (ICON USB adaptor)	
INOR IPAQ C330	Thermocouple - B, C, D, E, J, K, N, R, S, T RTD, mV	4 ... 20 mA, galvanically isolated	PC WIN ConSoft (ICON USB adaptor) INOR CONNECT (NFC, Bluetooth®)	
INOR IPAQ C530	Thermocouple - B, C, D, E, J, K, N, R, S, T RTD, mV	4 ... 20 mA, HART, galvanically isolated	INOR CONNECT (NFC, Bluetooth®) PC WIN ConSoft (ICON USB adaptor)	
INOR IPAQ C520	Thermocouple - B, C, D, E, J, K, N, R, S, T RTD, mV	4 ... 20 mA, HART, galvanically isolated	PC WIN ConSoft (ICON USB adaptor)	2 Inputs (redundance) SIL 2 certificate, ATEX

Notes: Detailed information about the transmitters can be found in the respective data sheets.

Installation And Operating Instructions

The sensor stem or terminal screws are used for mounting the sensor.

The sensor stem can be bent to adapt it to the measuring place. The bend must be made outside the protected part of the stem, i.e. at a distance of at least 30 mm from the measuring end, see Figure 15.2.

The electrical connection of sensor with the transmitter is shown in Figure 15.5.

Electrical connection of the sensor without transmitter is shown in the Figures 15.3 a 15.4. The output signal is thermoelectric voltage. The dependence of temperature on thermoelectric voltage is given by the standard ČSN EN 60584-1 ed. 2.

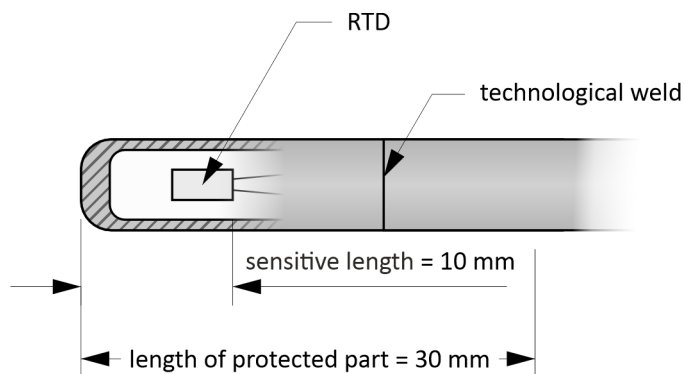


Figure 15.2: Measuring end detail

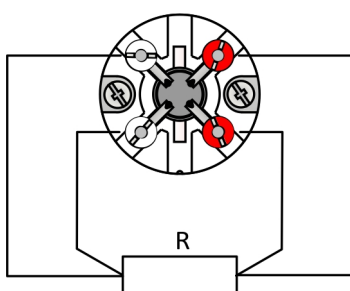


Figure 15.3: Four-wire RTD wiring diagram

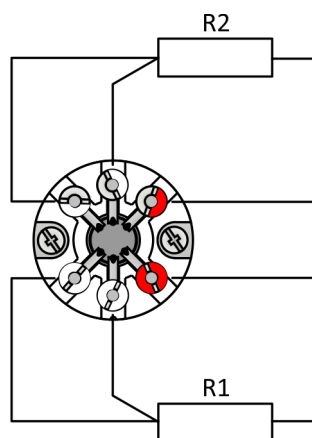


Figure 15.4: Three-wire 2 x RTD wiring diagram

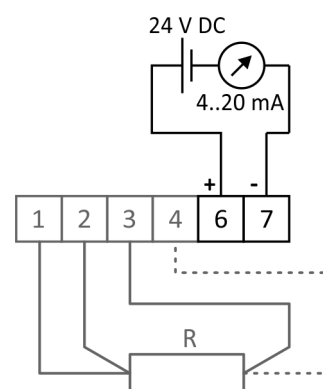


Figure 15.5: Transmitter wiring diagram