MTR9

RESISTANCE TEMPERATURE SENSORS WITH PROTECTION TUBE

MTR9 series temperature sensors are designed for applications with operating temperatures up to 600 °C and a requirement for high 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 an assembly and a replaceable measuring insert. The assembly consists of a head and a protection tube. The head is equipped with a cable gland for connecting the cable.

General Information (Table 9.1)

	Insulation class acc. ČSN EN 60529	IP54 (head) IP68 (measuring part in length N)
	Max. overpressure	16 bar
①	**Measuring insert**	
	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
	Design	Mineral insulated metal-sheathed sensor (MIMS)
	Sheath diameter	6 mm
	Sheath material	Stainless steel (1.4541, 1.4404, 1.4571)
②	**Threaded fitting**	
	Material	Stainless steel
③	**Protection tube**	
	Outer / inner diameter	14 / 10 mm
④	**Head**	
	Material	Aluminium alloy
	Cable gland	M20 x 1,5

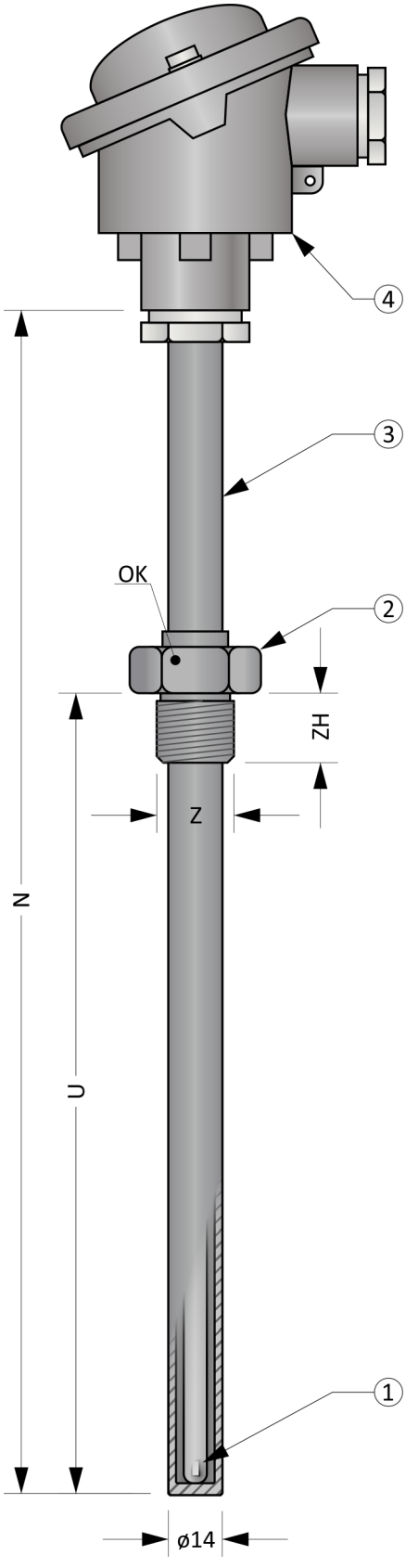


Figure 9.1: MTR9

Optional Parameters Including the Creation of an Order Code (Table 9.2)

Pos.	Code	MTR09 - ❶❷ - ❸❹ - ❺ - ❻❼❽	
❶	**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)	
	B	2 x Pt500, three-wire connection (2x3W)	
	C	2 x Pt1000, three-wire connection (2x3W)	
❷	**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	
	3	Working range -200 ... +600 °C, accuracy class A in range -30 ... +300 °C	
	4	Working range -200 ... +600 °C, accuracy class B in range -200 ... +600 °C	Not possible for ø A = 5 mm, Pt500 a Pt1000.
	5	Working range -200 ... +600 °C, accuracy class A in range -200 ... +600 °C	Not possible for ø A = 5 mm, Pt500 a Pt1000.
❸	**Material of protection tube**		
	A	Stainless steel 1.4541	
	B	Stainless steel 1.4841	
❹	**Nominal length N [mm]**		
	xxx	Selectable range from 150 to 2500 mm (in 10 mm increments)	
❺	**Immersion length U [mm]**		
	0	Without fitting	
	xxx	Selectable range from 50 to (N-100) mm (in 5 mm increments)	
❻	**Threaded fitting**		
	0	Without fitting	
	1	Welded threaded fitting Z = M27 x 2, ZH = 26 mm, WAF 36 (OK), incl. sealing ring	
	2	Welded threaded fitting Z = M20 x 1,5, ZH = 17 mm, WAF 30 (OK), incl. sealing ring	
	3	Welded threaded fitting Z = G½“, ZH = 17 mm, WAF 30 (OK)	
❼	**Head**		
	0	B	
	1	BH	
	2	BUZ with screws with leaden seal holes	
	3	BUZ with snap lock	
	4	BUZH with screws with leaden seal holes	
	5	BUZH with snap lock	
❽	**Transmitter (only for sensor with 1xRTD)**		
	0	Without transmitter	
	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: MTR09-01-A500-100-300

... 1 x Pt100, four-wire connection
... Working range -200 ... +400 °C, accuracy class A in range -30 ... +300 °C
... Tube material 1.4541
... Nominal length N = 500 mm
... Immersion depth U = 100 mm
... Welded threaded fitting G½
... Head B
... Without transmitter

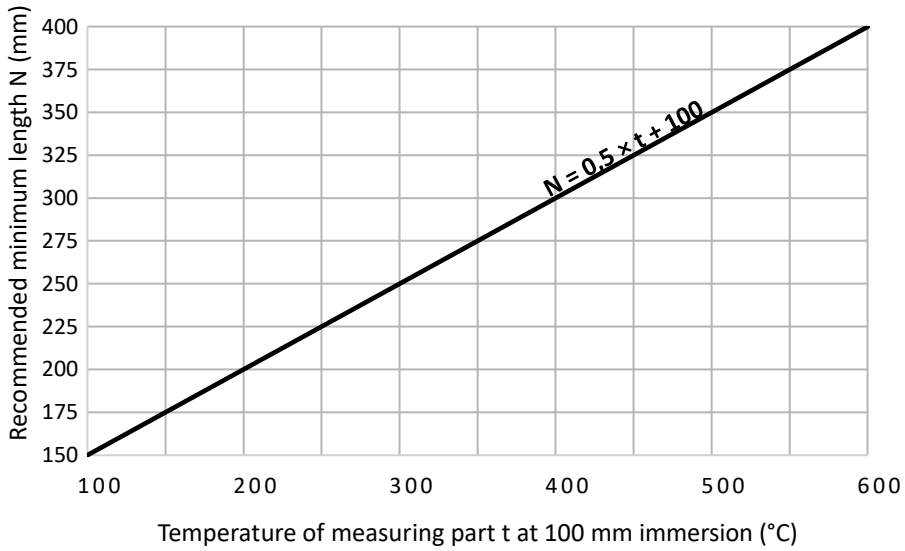
Approximate weight of the product: MTR09-01-A500-100-300 ... 1,0 kg

Length Tolerances (Table 9.3)

Length	Length tolerance N	Length tolerance U
≤ 1500 mm	± 2 mm	± 2 mm
> 1500 mm	± 3 mm	± 3 mm

Recommended Min. Sensor Length N (Chart 9.1)

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.



Recommended Maximum Temperatures of Sensor Parts (Table 9.4)

Sensor part	Continuous operation	Short-term operation
Head / head with transmitter	< 100 °C / < 85 °C	---
Protection tube, threaded fitting	See working range from table 9.2	---
Measuring end	See working range from table 9.2	---

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

Head Mounted Transmitters (Table 9.5)

The transmitter is installed in the head and replaces the terminal block. When using a head with a raised lid (version BH, BUZH), the terminal block is preserved and the transmitter is placed in the lid.

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.

Heads

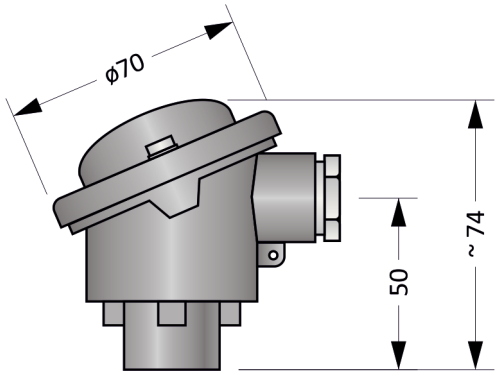


Figure 9.2: Head B

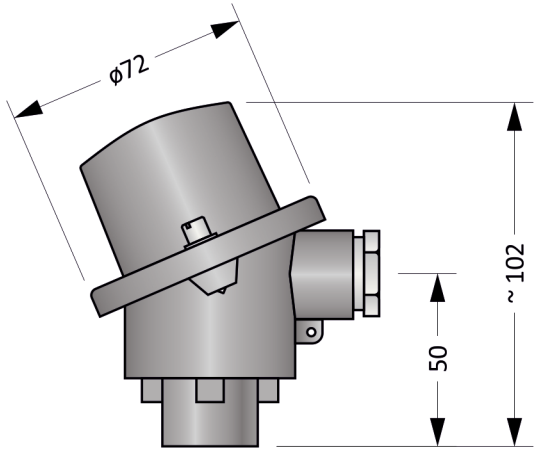


Figure 9.3: Head BH

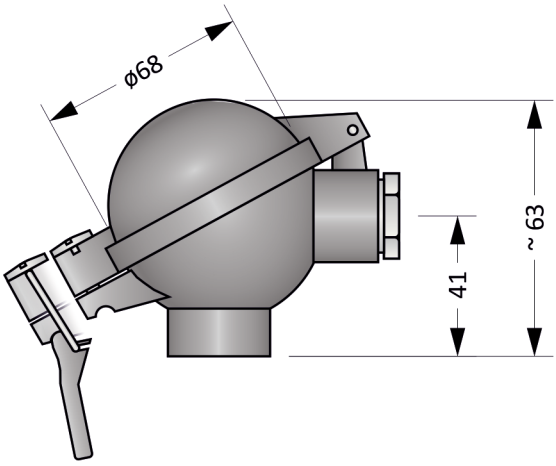


Figure 9.4: Head BUZ

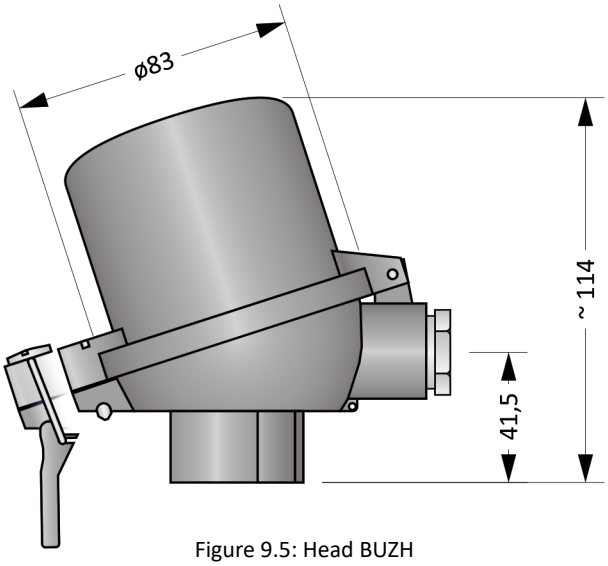


Figure 9.5: Head BUZH

Installation And Operating Instructions

A protection tubeor or welded fitting is used for mounting. To ensure IP54 protection of the head, it is necessary to install the sensor in a vertical position with the head in the upper position.

The electrical connection of sensor with the transmitter is shown in Figure 9.8.

Electrical connection of the sensor without transmitter is shown in the Figures 9.6 a 9.7. The output signal is thermoelectric voltage. The dependence of temperature on thermoelectric voltage is given by the standard ČSN EN 60584-1 ed. 2.

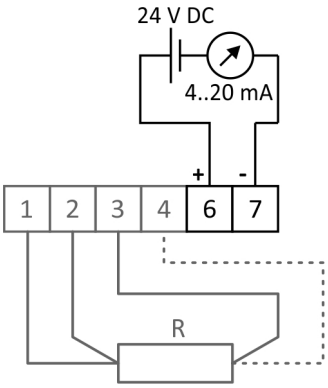


Figure 9.8: Trasmitter wirring diagram

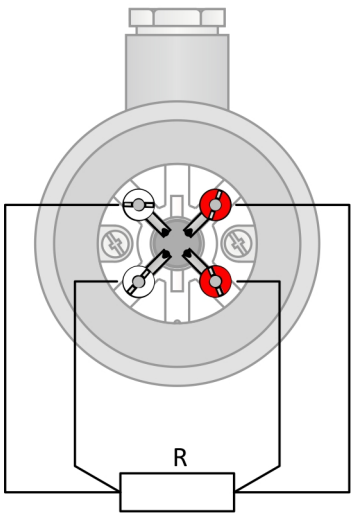


Figure 9.6: Four-wire RTD wiring diagram

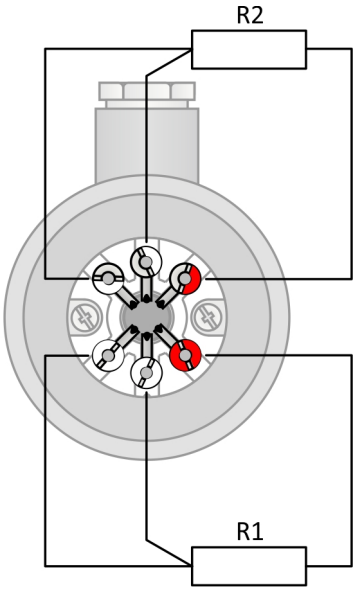


Figure 9.7: Three-wire 2 x RTD wiring diagram

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