

MTR16S

RESISTANCE TEMPERATURE SENSORS WITH PROTECTION TUBE

MTR16S series temperature sensors are designed for applications with operating temperatures up to 600 °C and a requirement for a good 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 with welded thread fitting. The head is equipped with a cable gland for connecting the cable.

General Information (Table 16S.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, $\alpha = 3850$ ppm/°C
	RTD measuring current	1 mA
	Sensitive length	10 mm
	Design	Mineral insulated metal-sheathed sensor (MIMS)
	Sheath diameter	4,5 mm
	Sheath material	Stainless steel (1.4541, 1.4404, 1.4571)
②	Threaded fitting	
	Material	Stainless steel
③	Protection tube	
	Outer / inner diameter	8 / 6 mm
④	Head	
	Material	Aluminium alloy
	Cable gland	M20 x 1,5

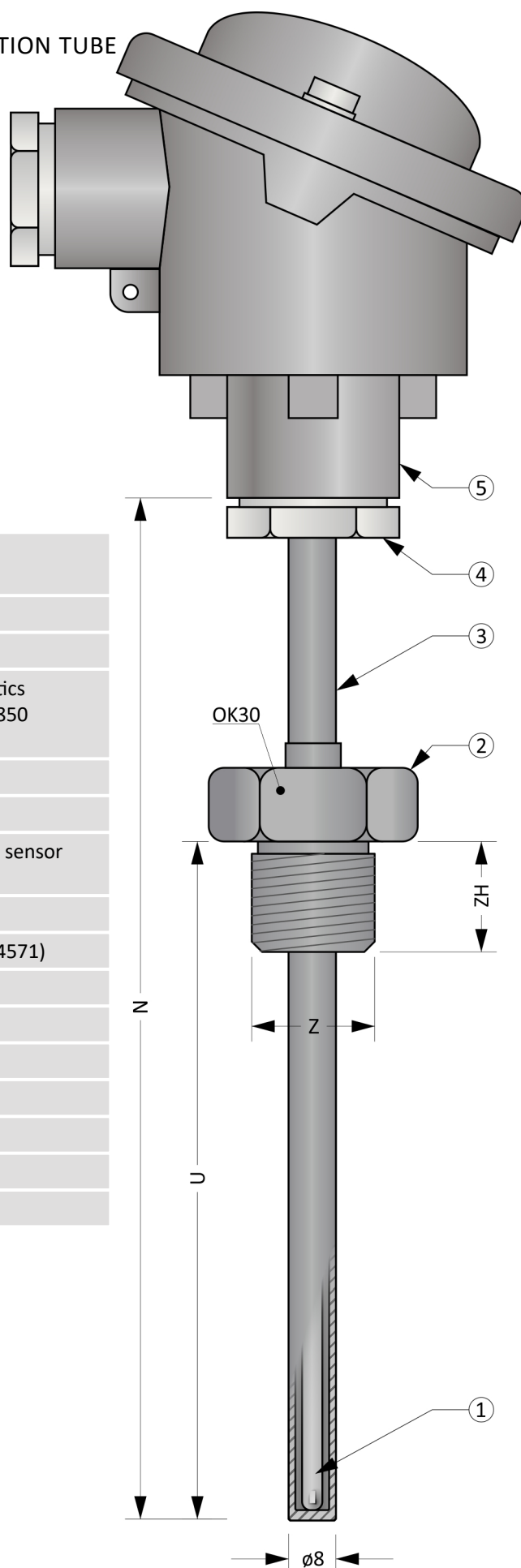


Figure 16S.1: MTR16S

Optional Parameters Including the Creation of an Order Code (Table 16S.2)

Pos.	Code	MTR016S - ① ② ③ - ④ - ⑤ - ⑥ ⑦ ⑧
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)
	B	2 x Pt500, three-wire connection (2x3W)
	C	2 x Pt1000, three-wire connection (2x3W)
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
	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 Pt500 and Pt1000.
	5	Working range -200 ... +600 °C, accuracy class A in range -200 ... +600 °C Not possible for Pt500 and Pt1000.
③	Material of protection tube	
	A	Stainless steel 1.4541
	B	Stainless steel 1.4841
④	Nominal length N [mm]	
	xxx	Selectable range from 90 to 2500 mm (in 10 mm increments)
⑤	Immersion length U [mm]	
	xxx	Selectable range from 10 to (N-80) mm (in 5 mm increments)
⑥	Threaded fitting	
	0	Welded threaded fitting Z = M20 x 1,5, ZH = 17 mm, WAF 30 (OK), incl. sealing ring
	1	Welded threaded fitting Z = G½", ZH = 17 mm, WAF 30 (OK)
⑦	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
⑧	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: MTR016S-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

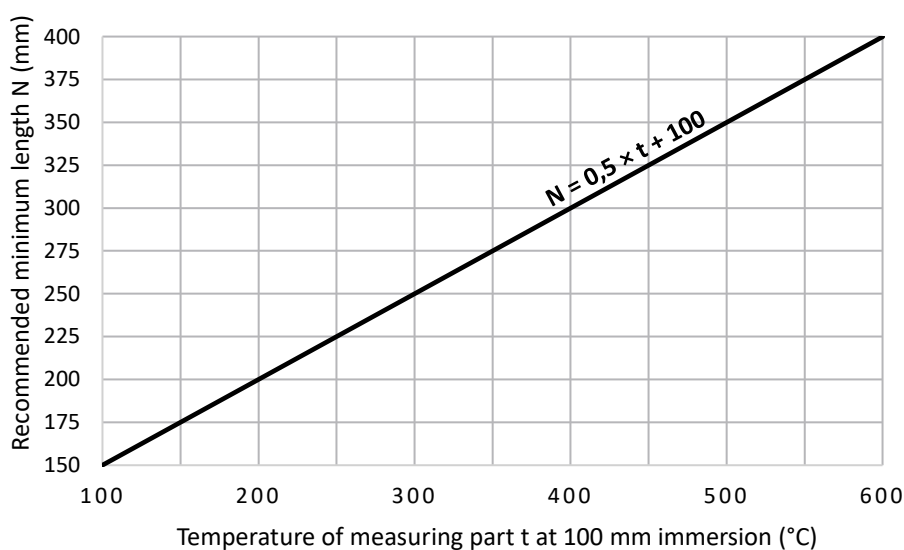
Approximate weight of the product: MTR016S-01-A500-100-300 ... 0,8 kg

Length Tolerances (Table 16S.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 16S.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 16S.4)

Sensor part	Continuous operation	Short-term operation
Head / head with transmitter	< 100 °C / < 85 °C	---
Measuring end, protection tube and thread fitting	See working range from table 14.2	---

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

Head Mounted Transmitters (Table 16S.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

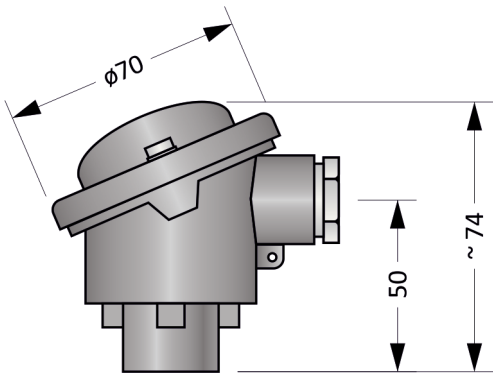


Figure 16S.2: Head B

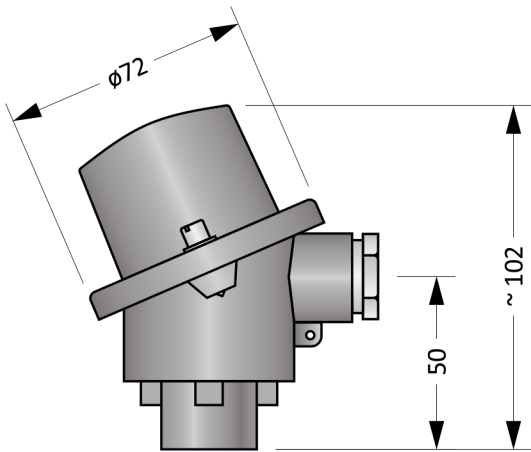


Figure 16S.3: Head BH

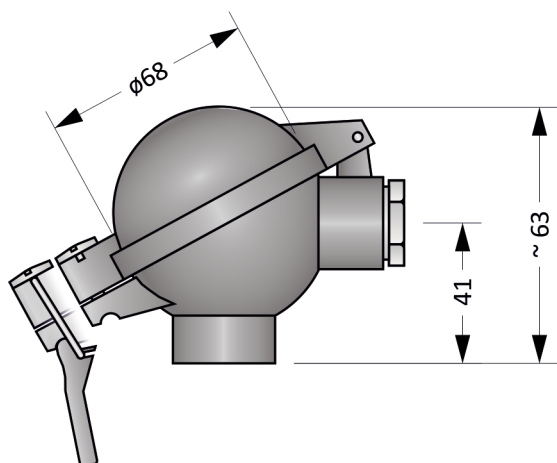


Figure 16S.4: Head BUZ

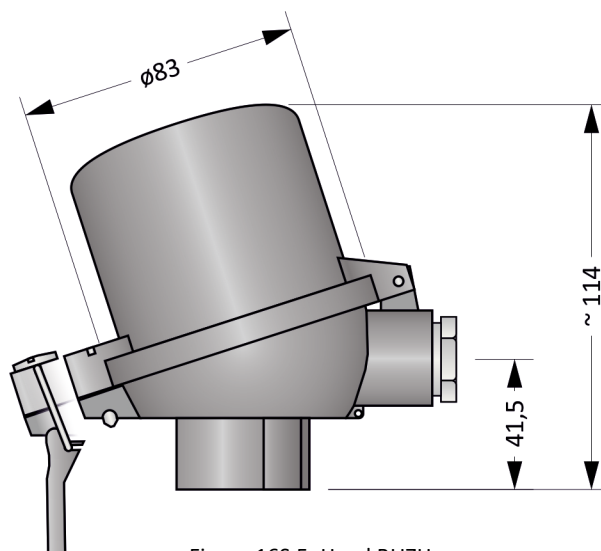


Figure 16S.5: Head BUZH

Installation And Operating Instructions

For mounting of the sensor, a tube or welded fitting is used. 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 16S.8.

Electrical connection of the sensor without transmitter is shown in the Figures 16S.6 a 16S.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.

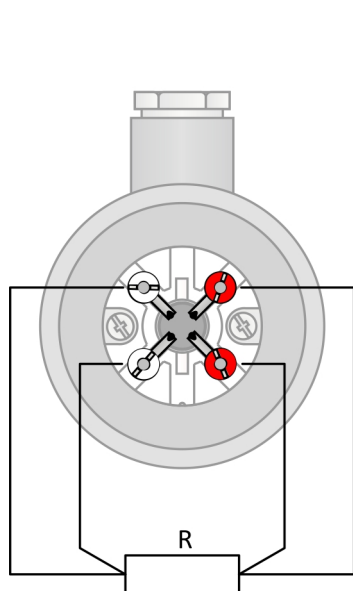


Figure 16S.6: Four-wire RTD wiring diagram

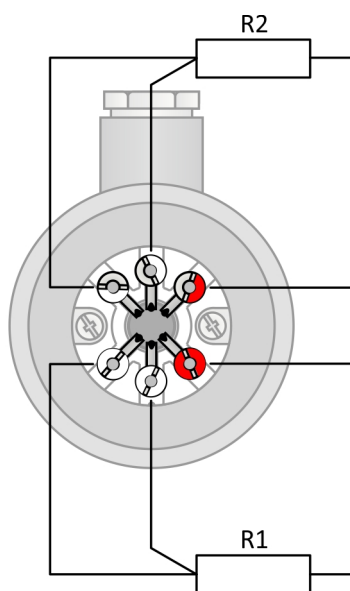


Figure 16S.7: Three-wire 2 x RTD wiring diagram

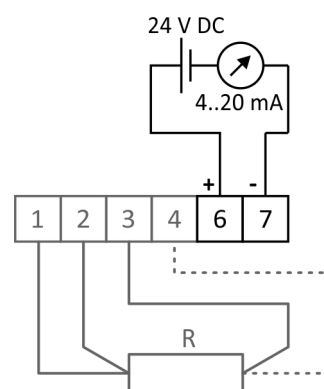


Figure 16S.8: Transmitter wiring diagram

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