# MTR8J

## RESISTANCE TEMPERATURE SENSORS INTO THERMOWELL

MTR8J series resistance temperature sensors are designed for installation into thermowells.

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 an cooling neck with a welded fitting. The head is equipped with a cable gland for connecting the cable.

### General Information (Table 8J.1)

| | | |
|---|---|---|
| | Insulation class acc. ČSN EN 60529 | IP54 (head)<br>IP68 (measuring part in length U+K) |
| 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 material | Stainless steel (1.4541, 1.4404, 1.4571) |
| | Min. bending radius | 10 × øA |
| ② | **Threaded fitting** | |
| | Material | Stainless steel |
| ③ | **Cooling neck** | |
| | Material | Stainless steel |
| | Outer / inner diameter | 14 / 10 mm |
| ④ | **Head** | |
| | Material | Aluminium alloy |
| | Cable gland | M20 x 1,5 |

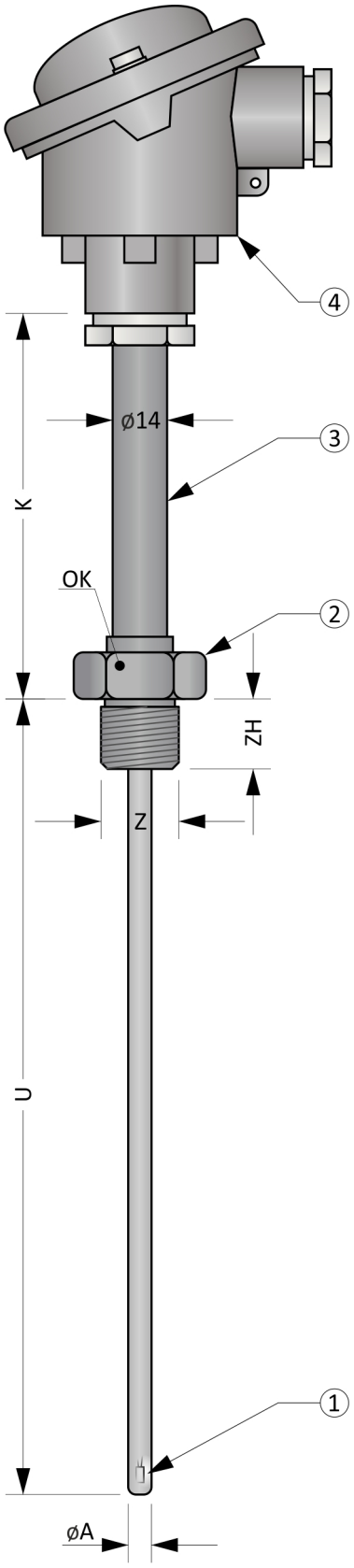



Figure 8J.1: MTR8J

## Optional Parameters Including the Creation of an Order Code (Table 8J.2)

| Pos. | Code | MTR08J - ❶❷❸ - ❹ - 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) | Not possible for ø A = 3 mm and ø A = 5 mm. |
| | B | 2 x Pt500, three-wire connection (2x3W) | Not possible for ø A = 3 mm and ø A = 5 mm. |
| | C | 2 x Pt1000, three-wire connection (2x3W) | Not possible for ø A = 3 mm and ø A = 5 mm. |
| 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 | Not possible for ø A = 5 mm. |
| | 3 | Working range -200 ... +600 °C, accuracy class A in range -30 ... +300 °C | Not possible for ø A = 5 mm. |
| | 4 | Working range -200 ... +600 °C, accuracy class B in range -200 ... +600 °C | Not possible for ø A = 5 mm, Pt500 and Pt1000. |
| | 5 | Working range -200 ... +600 °C, accuracy class A in range -200 ... +600 °C | Not possible for ø A = 5 mm, Pt500 and Pt1000. |
| ❸ | **Measuring insert diameter A [mm]** | | |
| | 0 | A = 6,0 mm | |
| | 1 | A = 5,0 mm | |
| | 2 | A = 4,5 mm | |
| | 3 | A = 3,0 mm | |
| ❹ | **Immersion depth U [mm]** | | |
| | xxx | Selectable range from 30 to 4500 mm (in 1 mm increments) | |
| | xxx | Selectable range from 4501 to 10000 mm (in 100 mm increments) | |
| ❺ | **Cooling neck length K [mm]** | | |
| | xxx | Selectable range from 80 to 1500 mm (in 10 mm increments) | |
| ❻ | **Threaded fitting** | | |
| | 0 | Welded threaded fitting Z = M27 x 2, ZH = 26 mm, WAF 36 (OK) | |
| | 1 | Welded threaded fitting Z = M20 x 1,5, ZH = 17 mm, WAF 30 (OK) | |
| | 2 | 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: MTR08J-032-300-100-200

... 1 x Pt100, four-wire connection
... Working range -200 ... +600 °C, accuracy class A in range -30 ... +300 °C
... Measuring insert diameter A = 4,5 mm
... Immersion depth U = 300 mm
... Cooling neck length K = 100 mm
... Welded threaded fitting G½
... Head B
... Without transmitter

Approximate weight of the product: MTR08J-032-300-100-300 ... 0,8 kg

## Length Tolerances (Table 8J.3)

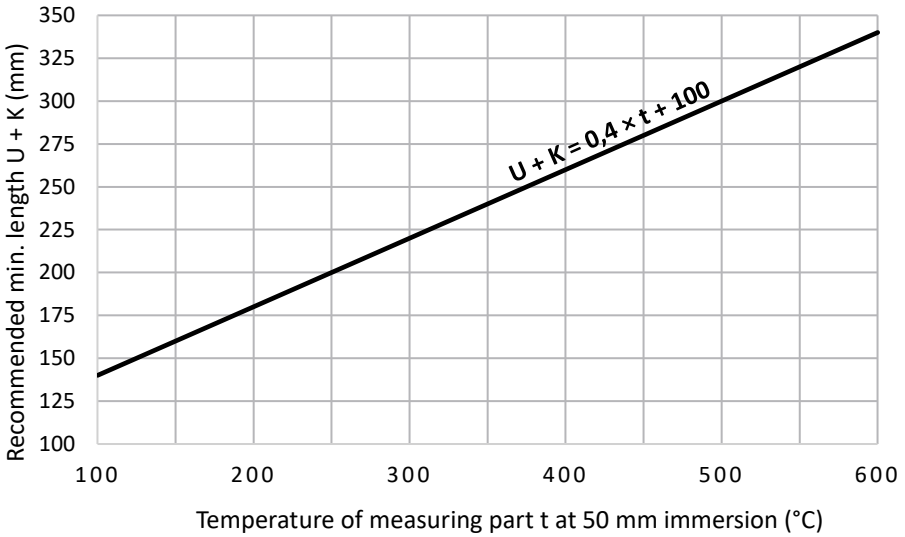
| Length | Length tolerance U | Length tolerance K |
|---|---|---|
| ≤ 1500 mm | ± 2 mm | ± 2 mm |
| 1500 mm < Length ≤ 2500 mm | ± 3 mm | --- |
| 2500 mm < Length ≤ 5000 mm | ± 10 mm | --- |
| > 5000 mm | ± 20 mm | --- |

## Diameter Tolerances (Table 8J.5)

| Diameter Tolerance A |
|---|
| ± 0,1 mm |

## Recommended min. length U (graf 8J.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 8J.4)

| Sensor part | Continuous operation | Short-term operation |
|---|---|---|
| Head / head with transmitter | < 100 °C / < 85 °C | --- |
| Cooling neck, threaded fitting | See working range from table 8J.2 | --- |
| Measuring end | See working range from table 8J.2 | --- |

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



### Heads

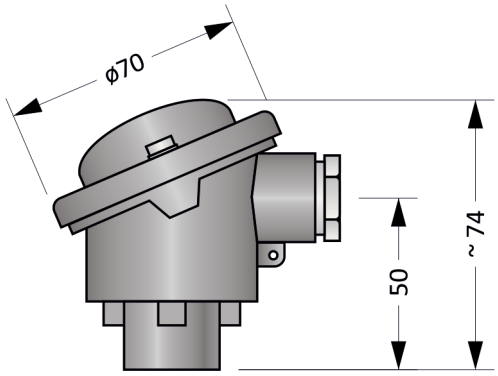



Figure 8J.2: Head B

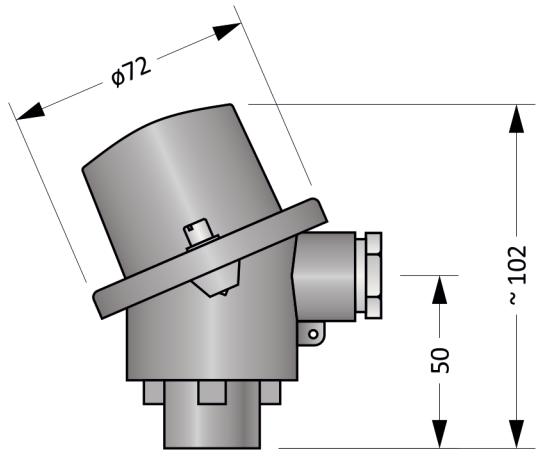



Figure 8J.3: Head BH

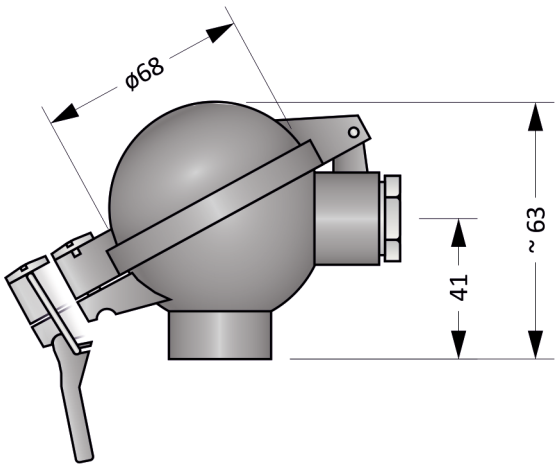



Figure 8J.4: Head BUZ

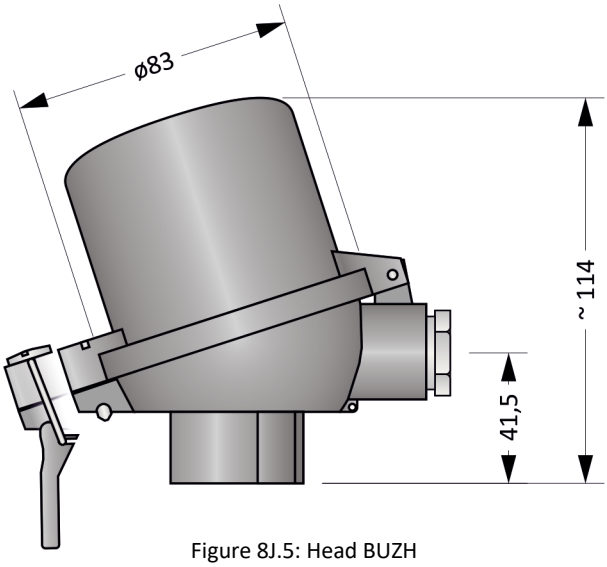



Figure 8J.5: Head BUZH

### Head Mounted Transmitters (Table 8J.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<br>RTD | 4 ... 20 mA | PC WIN ConSoft (ICON USB adaptor) | |
| INOR IPAQ C330 | Thermocouple - B, C, D, E, J, K, N, R, S, T<br>RTD, mV | 4 ... 20 mA, galvanically isolated | PC WIN ConSoft (ICON USB adaptor)<br>INOR CONNECT (NFC, Bluetooth®) | |
| INOR IPAQ C530 | Thermocouple - B, C, D, E, J, K, N, R, S, T<br>RTD, mV | 4 ... 20 mA, HART, galvanically isolated | INOR CONNECT (NFC, Bluetooth®)<br>PC WIN ConSoft (ICON USB adaptor) | |
| INOR IPAQ C520 | Thermocouple - B, C, D, E, J, K, N, R, S, T<br>RTD, mV | 4 ... 20 mA, HART, galvanically isolated | PC WIN ConSoft (ICON USB adaptor) | 2 Inputs (redundance)<br>SIL 2 certificate, ATEX |

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

### Installation And Operating Instructions

A threaded fitting is used for mounting the sensor, which is screwed into the thermowell. 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 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 8J.6.

The electrical connection of sensor with the transmitter is shown in Figure 8J.9.

Electrical connection of the sensor without transmitter is shown in the Figures 8J.7 a 8J.8. The output signal is thermoelectric voltage. The dependence of temperature on thermoelectric voltage is given by the standard ČSN EN 60584-1 ed. 2.

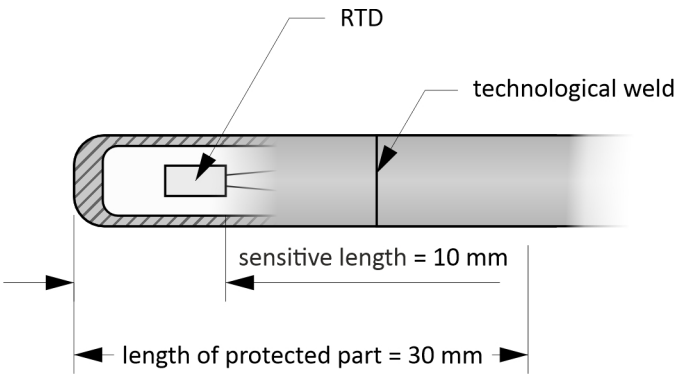



Figure 8J.6: Measuring end detail

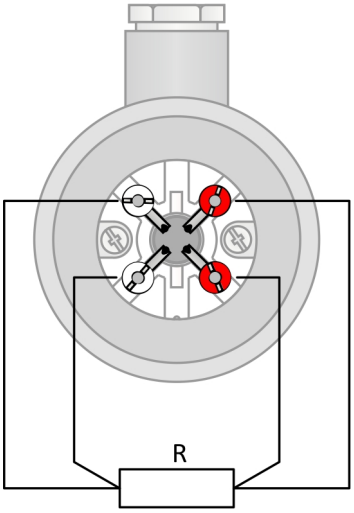



Figure 8J.7: Four-wire RTD wiring diagram

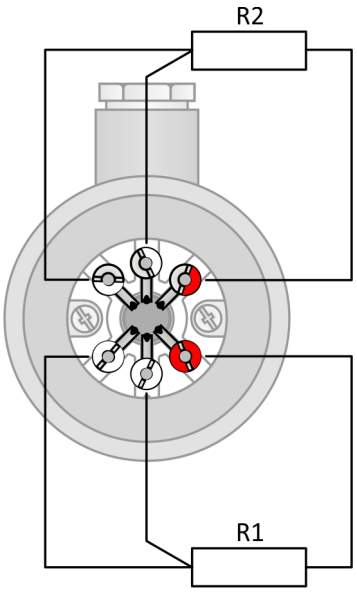



Figure 8J.8: Three-wire 2 x RTD wiring diagram

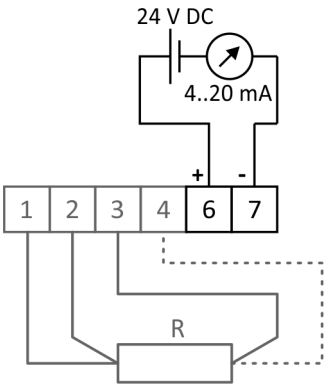



Figure 8J.9: Trasmitter wirring diagram