

# MTC8VR

## THERMOCOUPLE ASSEMBLIES WITH TAPERED METAL TUBE AND MEASURING INSERT

Thermocouple assemblies of the MTC8V series are designed for applications with operating temperatures up to 1100 °C and where high mechanical robustness and fast temperature response is required. Optional parameters include welded threaded fitting.

The measuring element is a thermocouple of the J, K or N type, which uses the dependence of the thermoelectric voltage on the temperature to measure the temperature. The output signal is a thermoelectric voltage, the value of which is according to the ČSN EN 60584-1 ed. 2.

The assembly consists of head, protection metal tube with tapered tip and measuring insert. The head is equipped with a cable gland for connecting the compensation cable.

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

|   |                                                 |                                                                                  |
|---|-------------------------------------------------|----------------------------------------------------------------------------------|
|   | Insulation class acc. ČSN EN 60529              | IP54 (head)<br>IP68 (measuring part in length N)                                 |
|   | Max. medium overpressure                        | 16 bar                                                                           |
|   | <b>Base metal thermocouple measuring insert</b> |                                                                                  |
| ① | Design                                          | Mineral insulated metal-sheathed thermocouple according to the ČSN EN 61515 ed.2 |
|   | Diameter                                        | 3 mm                                                                             |
|   | <b>Protection tube</b>                          |                                                                                  |
| ② | Material                                        | 1.4841                                                                           |
|   | Diameter                                        | 14 mm                                                                            |
|   | <b>Tapered tip</b>                              |                                                                                  |
| ③ | Material                                        | Stainless steel 1.4841                                                           |
|   | Diameter                                        | 6 mm                                                                             |
|   | <b>Threaded fitting</b>                         |                                                                                  |
| ④ | Material                                        | Stainless steel 1.4541                                                           |
|   | <b>Head</b>                                     |                                                                                  |
| ⑤ | Material                                        | Aluminium alloy                                                                  |
|   | Cable bushing                                   | M20 x 1,5                                                                        |

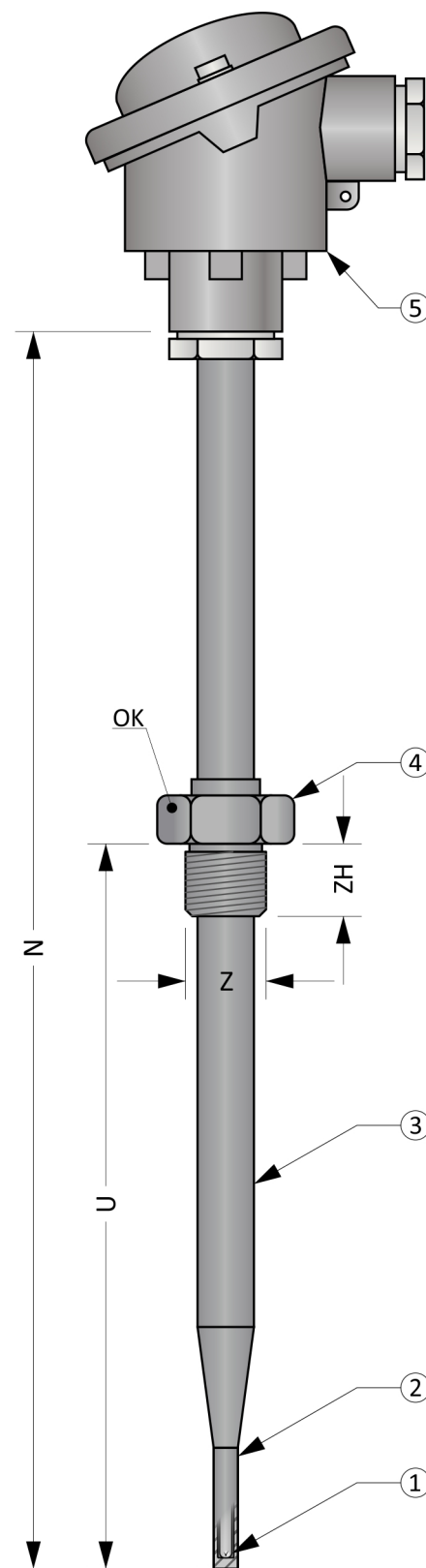


Figure 8VR.1: MTC8VR

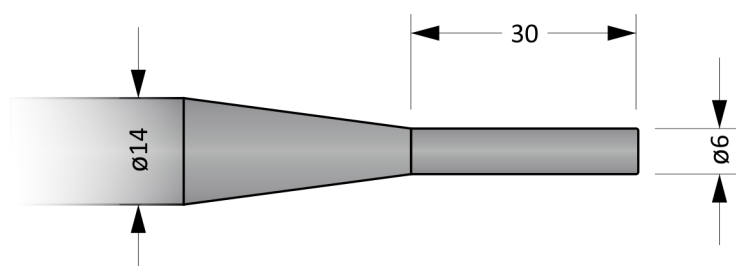


Figure 8VR.2: Detail of tapered tip

**Optional Parameters Including the Creation of an Order Code (Table 8VR.2)**

| Pos. | Code                                                                      | MTC8VR - ① ② - ③ - ④ - ⑤ ⑥ ⑦                                           |
|------|---------------------------------------------------------------------------|------------------------------------------------------------------------|
| ①    | <b>Type of measuring insert (thermocouples acc. ČSN EN 60584-1 ed. 2)</b> |                                                                        |
|      | 0                                                                         | 1 x „K“, thermocouple isolated from the sheath, sheath material 2.4816 |
|      | 1                                                                         | 1 x „J“, thermocouple isolated from the sheath, sheath material 1.4541 |
|      | 2                                                                         | 2 x „K“, thermocouple isolated from the sheath, sheath material 2.4816 |
|      | 3                                                                         | 2 x „J“, thermocouple isolated from the sheath, sheath material 1.4541 |
|      | 4                                                                         | 1 x „N“, thermocouple isolated from the sheath, sheath material 2.4816 |
|      | 5                                                                         | 2 x „N“, thermocouple isolated from the sheath, sheath material 2.4816 |
| ②    | <b>Accuracy class acc. ČSN EN 60584-1 ed. 2</b>                           |                                                                        |
|      | 0                                                                         | Accuracy class 2                                                       |
|      | 1                                                                         | Accuracy class 1                                                       |
| ③    | <b>Nominal length N [mm]</b>                                              |                                                                        |
|      | xxx                                                                       | Selectable range from 250 mm to 2000 mm (in 10 mm increments)          |
| ④    | <b>Immersion depth U [mm]</b>                                             |                                                                        |
|      | 0                                                                         | Without threaded fitting                                               |
|      | xxx                                                                       | Selectable range from 50 mm to (N-100) mm (in 5 mm increments)         |
| ⑤    | <b>Threaded fitting</b>                                                   |                                                                        |
|      | 0                                                                         | Without threaded fitting                                               |
|      | 1                                                                         | Welded threaded fitting Z = M27 x 2, ZH = 26 mm, WAF36                 |
|      | 2                                                                         | Welded threaded fitting Z = M20 x 1,5, ZH = 17 mm, WAF30               |
|      | 3                                                                         | Welded threaded fitting Z = G½“, ZH = 17 mm, WAF30                     |
| ⑥    | <b>Head type</b>                                                          |                                                                        |
|      | 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                                                    |
| ⑦    | <b>Transmitter (only for single thermocouple)</b>                         |                                                                        |
|      | 0                                                                         | Without transmitter                                                    |
|      | 8                                                                         | INOR APAQ C130 TC                                                      |
|      | 3                                                                         | INOR miniPAQ - HLP                                                     |
|      | 5                                                                         | INOR IPAQ C520                                                         |
|      | 6                                                                         | INOR IPAQ C330                                                         |
|      | 7                                                                         | INOR IPAQ C530                                                         |
|      | A                                                                         | With another transmitter (e.g. supplied by the customer)               |

Order code example: MTC8VR-01-500-250-300

... 1 x „K“, thermocouple isolated from the sheath, sheath material 2.4816

... Accuracy class 1 acc. ČSN EN 60584-1 ed. 2

... Nominal length N = 500 mm

... Immersion depth U = 250 mm

... Welded threaded fitting G½“

... Head A

... Without transmitter

Approximate weight of the product: MTC8VR-01-500-250-300 ... 2,0 kg

**Length Tolerances (Table 8VR.3)**

| Nominal length N          | Length tolerance N | Length tolerance U |
|---------------------------|--------------------|--------------------|
| $250 \leq N \leq 1000$ mm | $\pm 2$ mm         | $\pm 2$ mm         |
| $1000 < N$ mm             | $\pm 3$ mm         | $\pm 2$ mm         |

**Recommended Maximum Temperatures of Sensor Parts (Table 8VR.4)**

| Sensor part                  | Continuous operation   | Short-term operation |
|------------------------------|------------------------|----------------------|
| Head / head with transmitter | $< 100$ °C / $< 85$ °C | -                    |
| Threaded fitting             | $< 800$ °C             | -                    |
| Protection tube              | $< 1100$ °C            | -                    |
| „J“, sheath dia. 3,0 mm      | $< 470$ °C             | $< 520$ °C           |
| „K“, sheath dia. 3,0 mm      | $< 980$ °C             | $< 1050$ °C          |
| „N“, sheath dia. 3,0 mm      | $< 980$ °C             | $< 1050$ °C          |

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

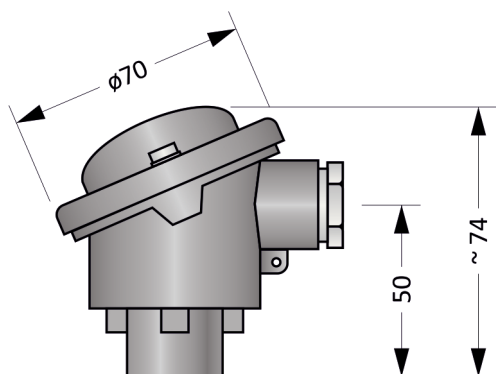
**Head types**


Figure 8VR.3: Head B

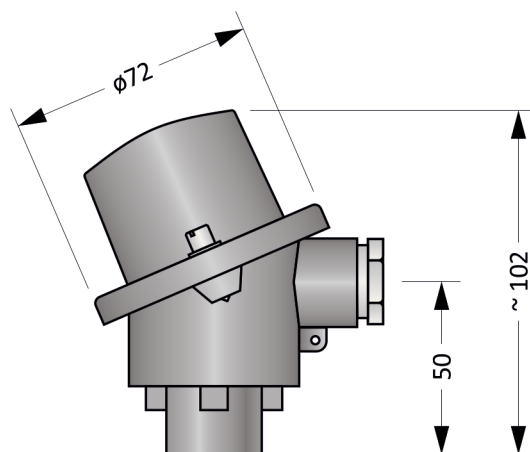


Figure 8VR.4: Head BH

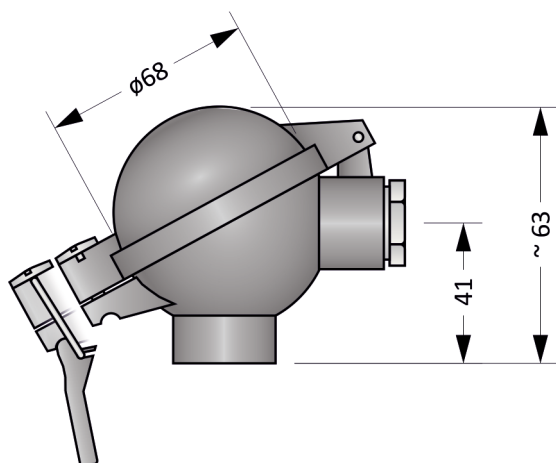


Figure 8VR.5: Head BUZ

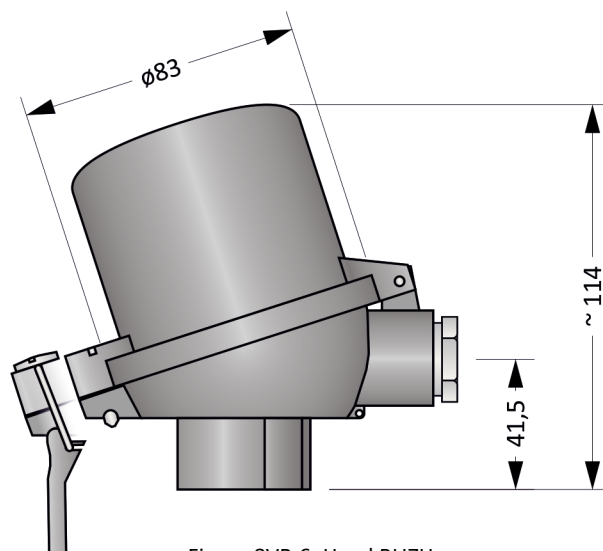


Figure 8VR.6: Head BUZH

### Head mounted transmitter (Table 8VR.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.

| Typ                | Input                                                  | Output                               | Setting                                                             | Notes                                            |
|--------------------|--------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------|--------------------------------------------------|
| INOR APAQ C130 TC  | Thermocouple - B, E, J, K, N, R, S, T                  | 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 adapter)                                   |                                                  |
| INOR IPAQ C330     | Thermocouple - B, C, D, E, J, K, N, R, S, T<br>RTD, mV | 4 ... 20 mA, galvanic isolated       | PC WIN ConSoft (ICON USB adapter)<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, galvanic isolated | INOR CONNECT (NFC, Bluetooth®)<br>PC WIN ConSoft (ICON USB adapter) |                                                  |
| INOR IPAQ C520     | Thermocouple - B, C, D, E, J, K, N, R, S, T<br>RTD, mV | 4 ... 20 mA, HART, galvanic isolated | PC WIN ConSoft (ICON USB adapter)                                   | 2 inputs (redundancy)<br>SIL 2, ATEX certificate |

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

### Installation And Operating Instructions

Use metal tube or welded fitting (if applicable) for mounting. Other parts cannot be used. The longest lifetime of the sensor can be achieved by mounting it vertically.

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 8VR.9.

Electrical connection of the sensor without transmitter is shown in the Figures 8VR.7 a 8VR.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.

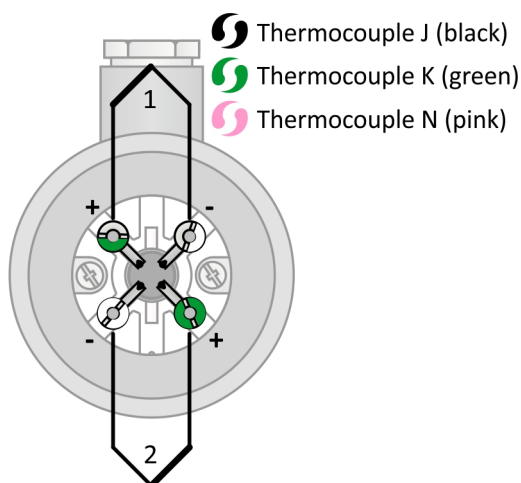


Figure 8VR.7: Double thermocouple wiring diagram

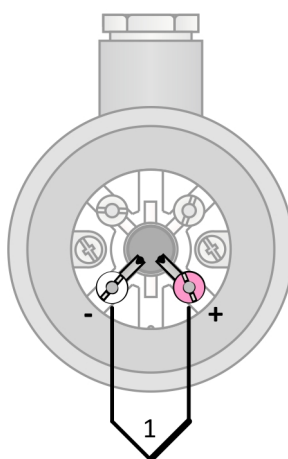


Figure 8VR.8: Single thermocouple wiring diagram

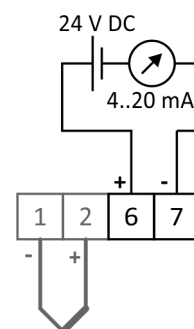


Figure 8VR.9: Transmitter wiring diagram