

MTC7BM

THERMOCOUPLE ASSEMBLIES WITH METAL AND CERAMIC TUBE

Thermocouple assemblies of the MTC7BM series are designed for applications with operating temperatures up to 1250 °C and where high mechanical robustness is required. Thanks to the combination of metal and ceramic protective tubes, the assemblies show good shape stability even at higher temperatures.

The measuring element is a base metal or a precious metal thermocouple, 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, inner ceramic tube and capillary/beads in which one or two thermocouples can be installed. The head is equipped with a cable gland for connecting the compensation cable.

General Information (Table 7BM.1)

	Insulation class acc. ČSN EN 60529	IP54 (head) IP68 (measuring part in length N)
①	Base metal or precious metal thermocouple	
	Thermocouple length	(N + 70) mm
②	Insulating beads / capillary	
	Material	Ceramic C610
	Inner protection tube	
③	Material	Ceramic C610
	Outer / inner diameter	15 / 11 mm
④	Outer protection tube	
	Head	
⑤	Material	Aluminium alloy
	Cable bushing	M20 x 1,5

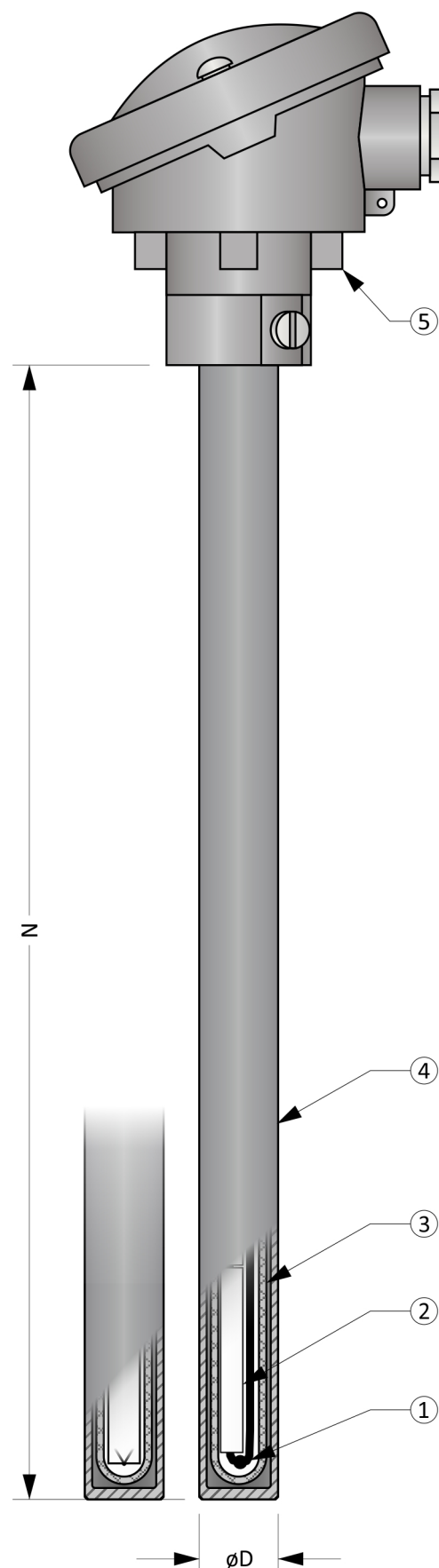


Figure 7BM.1: MTC7BM

Optional Parameters Including the Creation of an Order Code (Table 7BM.2)

Pos.	Code	MTC7BM - ① ② - ③ - ④ ⑤
①	Thermocouple type (acc. ČSN EN 60584-1 ed. 2)	
	0	Preparation for installation of precious metal thermocouple
	1	1 x „K“, accuracy class 2, wire diameter 3,0 mm
	2	1 x „K“, accuracy class 1, wire diameter 3,0 mm
	3	1 x „N“, accuracy class 2, wire diameter 3,0 mm
	4	1 x „N“, accuracy class 1, wire diameter 3,0 mm
②	Material and diameter of outer protection tube	
	0	Material 1.4841 (stainless steel), outer / /inner dia. 21,3 / 17,3 mm
	1	Material 1.4767 (Kanthal AF), outer / /inner dia. 22 / 19,4 mm
	2	Material 2.4851 (INCONEL 601), outer / /inner dia. 22 / 18 mm
③	Nominal length N [mm]	
	xxx	Selectable range from 400 mm to 2000 mm (in 10 mm increments)
④	Head type	
	0	A
	1	AUZH with screws with leaden seal holes
	2	AUZH with snap lock
	3	AUZ with screws with leaden seal holes
	4	AUZ with snap lock
⑤	Transmitter (transmitters are designed for assemblies with AUZH head and one thermocouple)	
	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: MTC7BM-10-800-00

... 1 x „K“, accuracy class 2, wire diameter 3,0 mm

... Material 1.4841 (stainless steel), outer / /inner dia. 21,3 / 17,3 mm

... Nominal length N = 800 mm

... Head A

... Without transmitter

Approximate weight of the product: MTC7BM-10-800-00 ... 1,9 kg

Length Tolerances (Table 7BM.3)

Nominal length N	Length tolerance N
$N \leq 1000$ mm	± 2 mm
$1000 < N$ mm	± 3 mm

Recommended Maximum Temperatures of Sensor Parts (Table 7BM.4)

Sensor part	Continuous operation	Short-term operation
Head / head with transmitter	< 100 °C / < 85 °C	-
Outer protection tube made of 1.4841	< 1100 °C	-
Outer protection tube made of 1.4767	< 1200 °C	-
Outer protection tube made of 2.4851	< 1250 °C	-
„S“, wire diameter 0,5 mm	< 1400 °C	< 1600 °C
„S“, wire diameter 0,35 mm	< 1300 °C	< 1400 °C
„B“, wire diameter 0,5 mm	< 1500 °C	< 1700 °C
„R“, wire diameter 0,5 mm	< 1400 °C	< 1600 °C
„K“, wire diameter 3,0 mm	< 1000 °C	< 1150 °C
„N“, wire diameter 3,0 mm	< 1100 °C	< 1260 °C

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

Head types

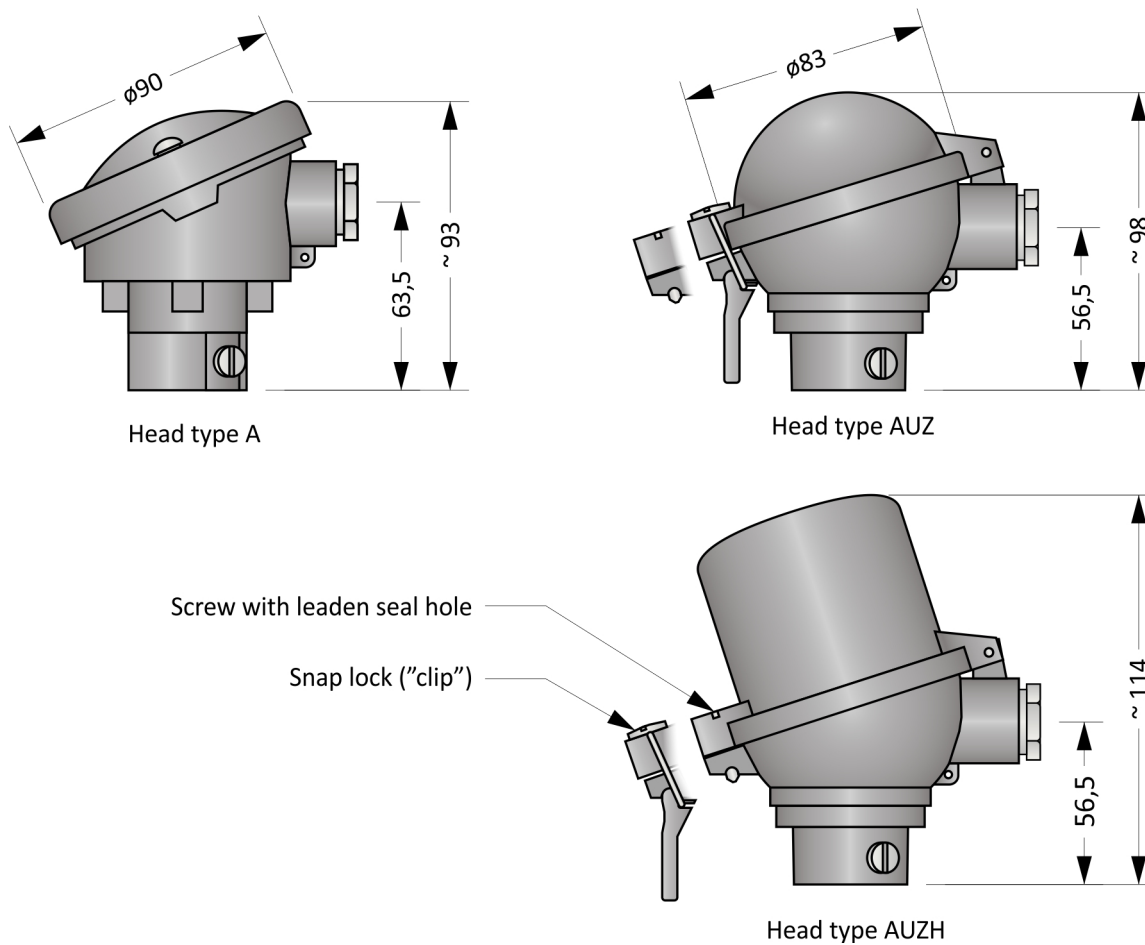


Figure 7BM.2: Head types

Head mounted transmitter (Table 7BM.5)

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 RTD	4 ... 20 mA	PC WIN ConSoft (ICON USB adapter)	
INOR IPAQ C330	Thermocouple - B, C, D, E, J, K, N, R, S, T RTD, mV	4 ... 20 mA, galvanic isolated	PC WIN ConSoft (ICON USB adapter) INOR CONNECT (NFC, Bluetooth®)	
INOR IPAQ C530	Thermocouple - B, C, D, E, J, K, N, R, S, T RTD, mV	4 ... 20 mA, HART, galvanic isolated	INOR CONNECT (NFC, Bluetooth®) PC WIN ConSoft (ICON USB adapter)	
INOR IPAQ C520	Thermocouple - B, C, D, E, J, K, N, R, S, T RTD, mV	4 ... 20 mA, HART, galvanic isolated	PC WIN ConSoft (ICON USB adapter)	2 inputs (redundancy) SIL 2, ATEX certificate

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

Installation And Operating Instructions

A protection tube is used for mechanical installation of the sensor. 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 measuring part of the sensor is allowed to be exposed to a temperature gradient up to 60 °C/min. Exceeding this value may damage the sensor.

The electrical connection of sensor with the transmitter is shown in Figure 7BM.3.

Electrical connection of the sensor without transmitter is shown in the Figures 7BM.4, 7BM.5 a 7BM.6. The output signal is thermoelectric voltage. The dependence of temperature on thermoelectric voltage is given by the standard ČSN EN 60584-1 ed. 2.

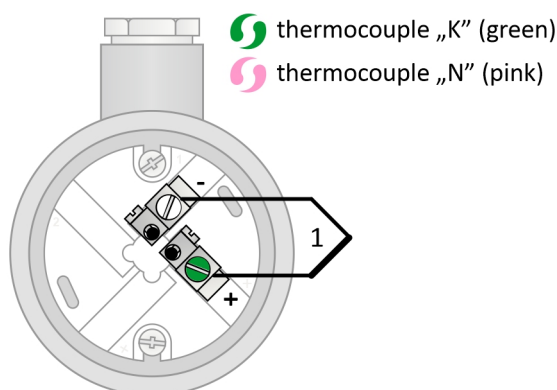


Figure 7BM.4: Single thermocouple wiring diagram

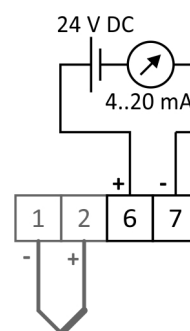


Figure 7BM.3: Transmitter wiring diagram

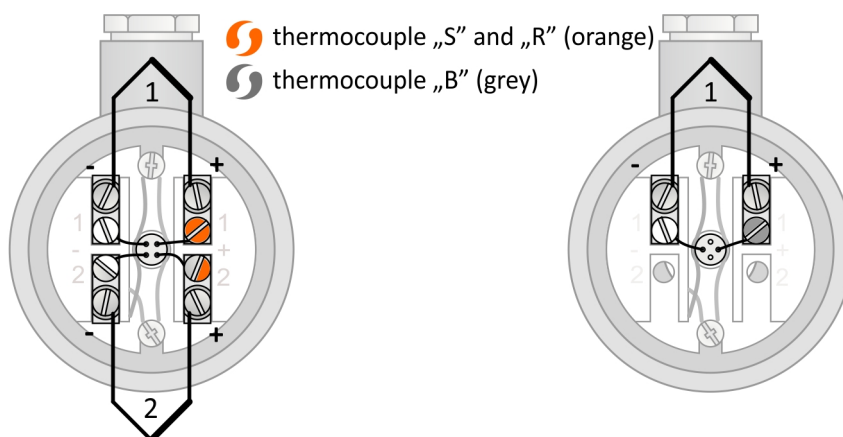


Figure 7BM.5: Double thermocouple wiring diagram

Figure 7BM.6: Single thermocouple wiring diagram

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