

MTC5MA

THERMOCOUPLE ASSEMBLIES WITH CERAMIC TUBE

Thermocouple assemblies of the MTC5MA series are designed for applications with operating temperatures up to 1300 °C. They have a single ceramic tube made of C610 material, which resists temperature shocks well. The ceramic tube is not gas-tight, which can adversely affect the long-term life of the installed thermocouple.

The measuring element is 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. Precious metal thermocouples are not included in the ordering code (ordered separately).

The assembly consists of head, holding pipe, protection ceramic tube and a capillary 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 5MA.1)

	Insulation class acc. ČSN EN 60529	IP54 (head) IP5X (measuring part in length N)
①	Precious metal thermocouple (not included in the assembly)	
	Thermocouple length	(N + 40) mm
	Capillary tube	
②	Material	Ceramic C610
	Diameter	4,5 mm
	Bore for thermocouple	4 x ø1,2 mm
	Protection tube	
③	Material	Ceramic C610
	Outer / inner diameter	9 / 6 mm
	Holding pipe	
④	Material	Stainless steel
	Outer / inner diameter	14 / 10 mm
	Head	
⑤	Material	Aluminium alloy
	Cable bushing	M20 x 1,5

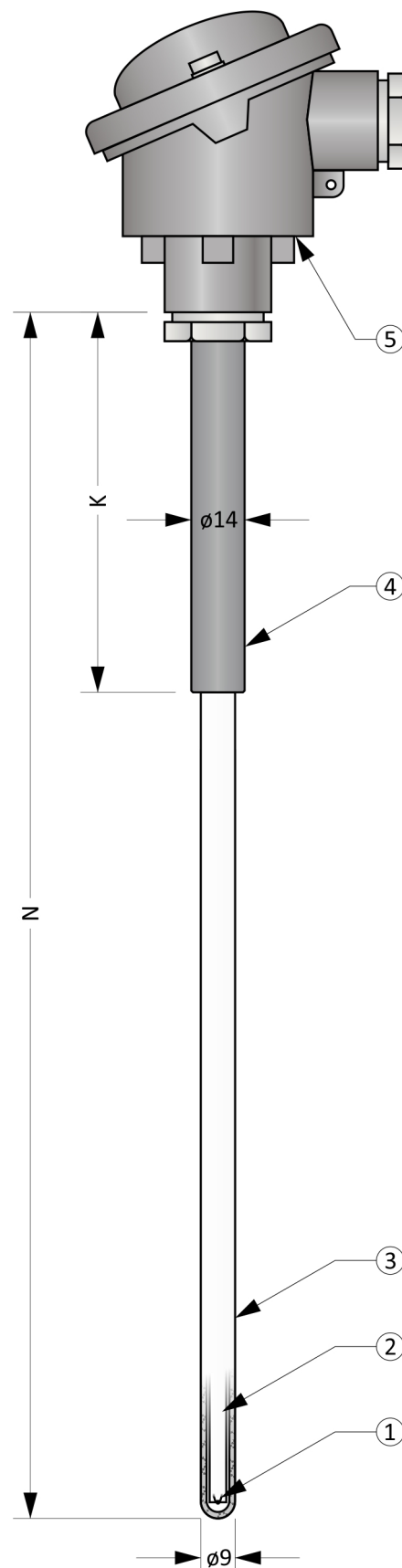


Figure 5MA.1: MTC5MA

Optional Parameters Including the Creation of an Order Code (Table 5MA.2)

Pos.	Code	MTC5MA - ① - ② - ③ ④
①	Nominal length N [mm]	
	0	Selectable range from 100 mm to 1000 mm (in 10 mm increments)
②	Holding pipe length K [mm]	
	0	Selectable range from 40 mm to (N-40) mm (in 5 mm increments)
③	Head type	
	0	B
	1	BH
	2	BUZH with screws with leaden seal holes
	3	BUZH with snap lock
	4	BUZ with screws with leaden seal holes
	5	BUZ with snap lock
④	Transmitter (transmitters are designed for assemblies with BUZH, BH 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: MTC5MA-800-150-00

 ... Nominal length N = 800 mm

 ... Holding pipe length K = 150 mm

 ... Head B

 ... Without transmitter

Approximate weight of the product: MTC5MA-800-150-00 ... 1,0 kg

Recommended Maximum Temperatures of Sensor Parts (Table 5MA.3)

Sensor part	Continuous operation	Short-term operation
Head / head with transmitter	< 100 °C / < 85 °C	-
Holding pipe	< 500 °C	-
Protection tube (measuring part)	< 1300 °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

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

Length Tolerances (Table 5MA.4)

Nominal length N	Length tolerance N	Length tolerance K
$N \leq 1000 \text{ mm}$	$\pm 3 \text{ mm}$	$\pm 2 \text{ mm}$

Head types

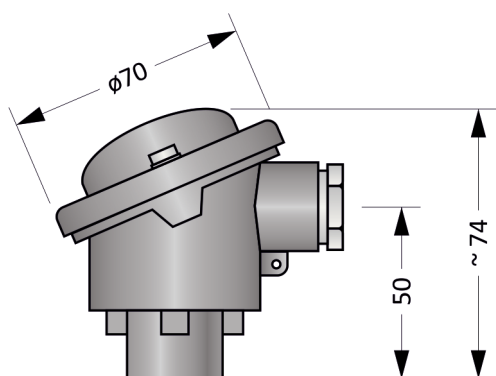


Figure 5MA.2: Head B

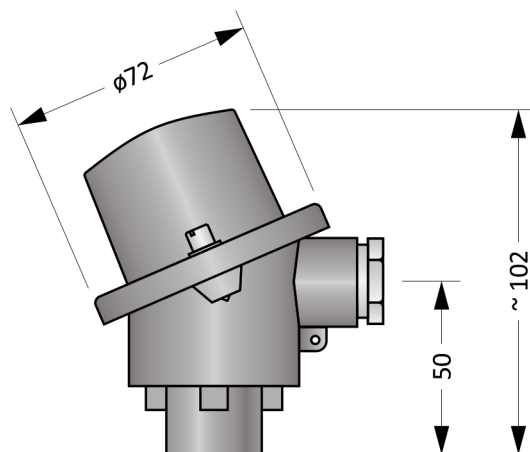


Figure 5MA.3: Head BH

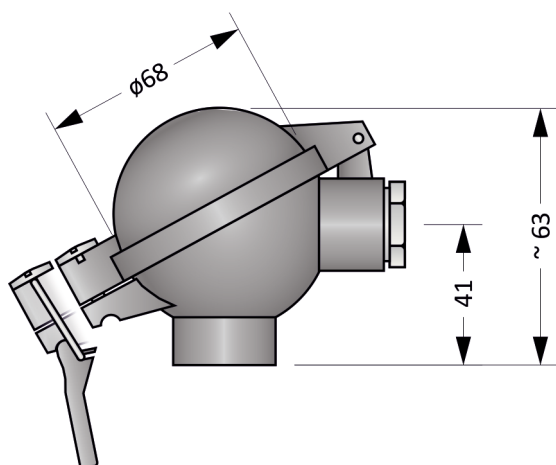


Figure 5MA.4: Head BUZ

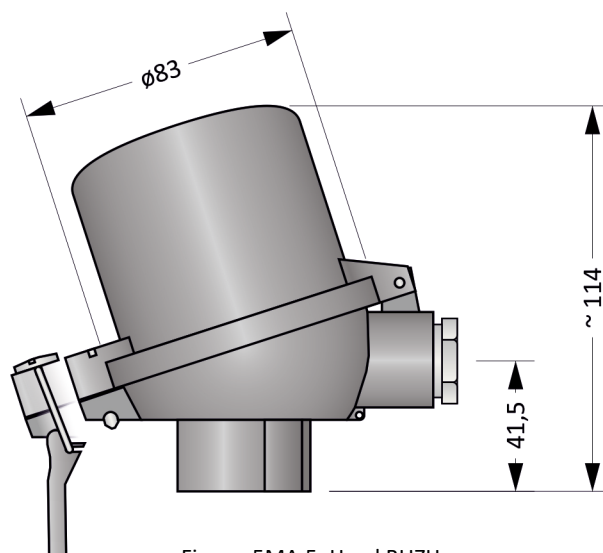


Figure 5MA.5: Head BUZH

Head mounted transmitter (Table 5MA.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

For mechanical installation, a holding pipe is used. 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 5MA.8.

Electrical connection of the sensor without transmitter is shown in the Figures 5MA.6 a 5MA.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.

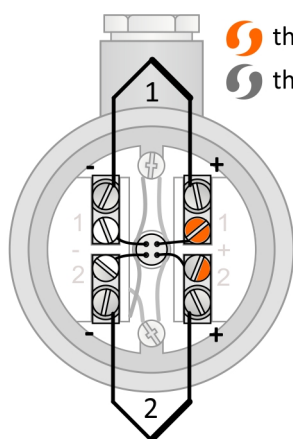


Figure 5MA.6: Double thermocouple wiring diagram

 thermocouple „S” and „R” (orange)
 thermocouple „B” (grey)

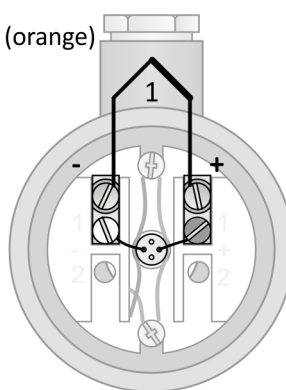


Figure 5MA.7: Single thermocouple wiring diagram

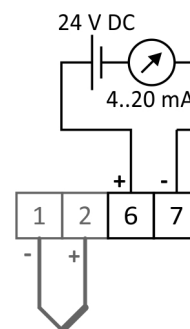


Figure 5MA.8: Transmitter wiring diagram