

MTC1

THERMOCOUPLE ASSEMBLIES WITH DOUBLE CERAMIC TUBE

Thermocouple assemblies of the MTC1 series are the standard version of temperature sensors with ceramic tube. They have a double protective ceramic tube made of C610 material and are suitable for applications with operating temperatures up to 1300 °C. They withstand temperature shocks well, but their chemical resistance is only average. The ceramic parts are not completely gas-tight, which may negatively affect the long-term lifetime 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, inner and outer 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 1.1)

	Insulation class acc. ČSN EN 60529	IP54 (head) IP5X (measuring part in length N)
①	Thermocouple (not included in the assembly)	
	Thermocouple length	(N + 70) mm
	Capillary	
②	Material	Ceramic C610
	Diameter	8,5 mm
	Bore for thermocouple	4 x ø1,5 mm
	Inner ceramic tube	
③	Material	Ceramic C610
	Outer / inner diameter	15 / 11 mm
	Outer ceramic tube	
④	Material	Ceramic C610 (Pythagoras)
	Outer / inner diameter	24 / 19 mm
	Holding pipe	
⑤	Material	Stainless steel
	Outer / inner diameter	32 / 28 mm
	Head	
⑥	Material	Aluminium alloy
	Cable bushing	M20 x 1,5

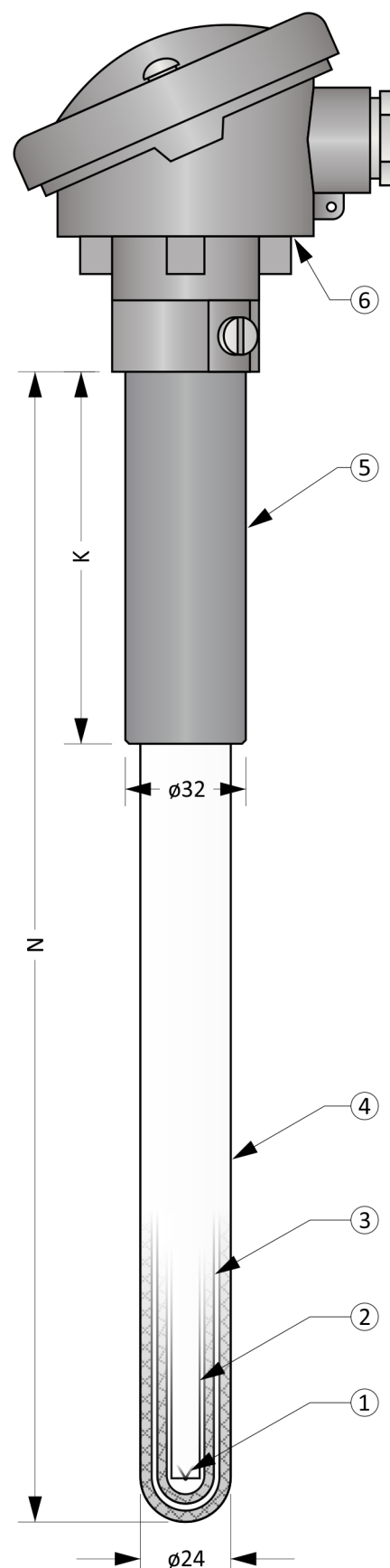


Figure 1.1: MTC1

Optional Parameters Including the Creation of an Order Code (Table 1.2)

Pos.	Code	MTC1 - ① - ② - ③ ④
①	Nominal length N [mm]	
	xxx	Selectable range from 250 mm to 2000 mm (in 10 mm increments)
②	Holding pipe length K [mm]	
	xxx	Selectable range from 50 mm to (N-30) mm (in 5 mm increments)
③	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
④	Transmitter (transmitters are designed for assemblies with AUZH head and one thermocouple)	
	0	Without transmitter
	3	INOR miniPAQ - HLP
	6	INOR IPAQ C330
	7	INOR IPAQ C530
	5	INOR IPAQ C520
	A	With another transmitter (e.g. supplied by the customer)

Recommended lengths of holding pipe:
 K = 150 mm pro N < 800 mm
 K = 200 mm pro 800 ≤ N < 1000 mm
 K = 400 mm pro 1000 ≤ N mm

Order code example: MTC1-500-150-00
 ... Nominal length N = 500 mm
 ... Holding pipe length K = 150 mm
 ... Head A
 ... Without transmitter

Approximate weight of the product: MTC1-500-150-00 ... 1,0 kg

Length Tolerances (Table 1.3)

Nominal length N	Length tolerance N	Length tolerance K
$N \leq 1000$ mm	± 3 mm	± 2 mm
$1000 < N$ mm	± 5 mm	± 2 mm

Recommended Maximum Temperatures of Sensor Parts (Table 1.4)

Sensor part	Continuous operation	Short-term operation
Head / head with transmitter	< 100 °C / < 85 °C	-
Holding pipe	< 500 °C	-
Ceramic parts (measuring part)	< 1300 °C	-
„S“, wire dia. 0,5 mm	< 1400 °C	< 1600 °C
„S“, wire dia. 0,35 mm	< 1300 °C	< 1400 °C
„B“, wire dia. 0,5 mm	< 1500 °C	< 1700 °C
„R“, wire dia. 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.

Head types

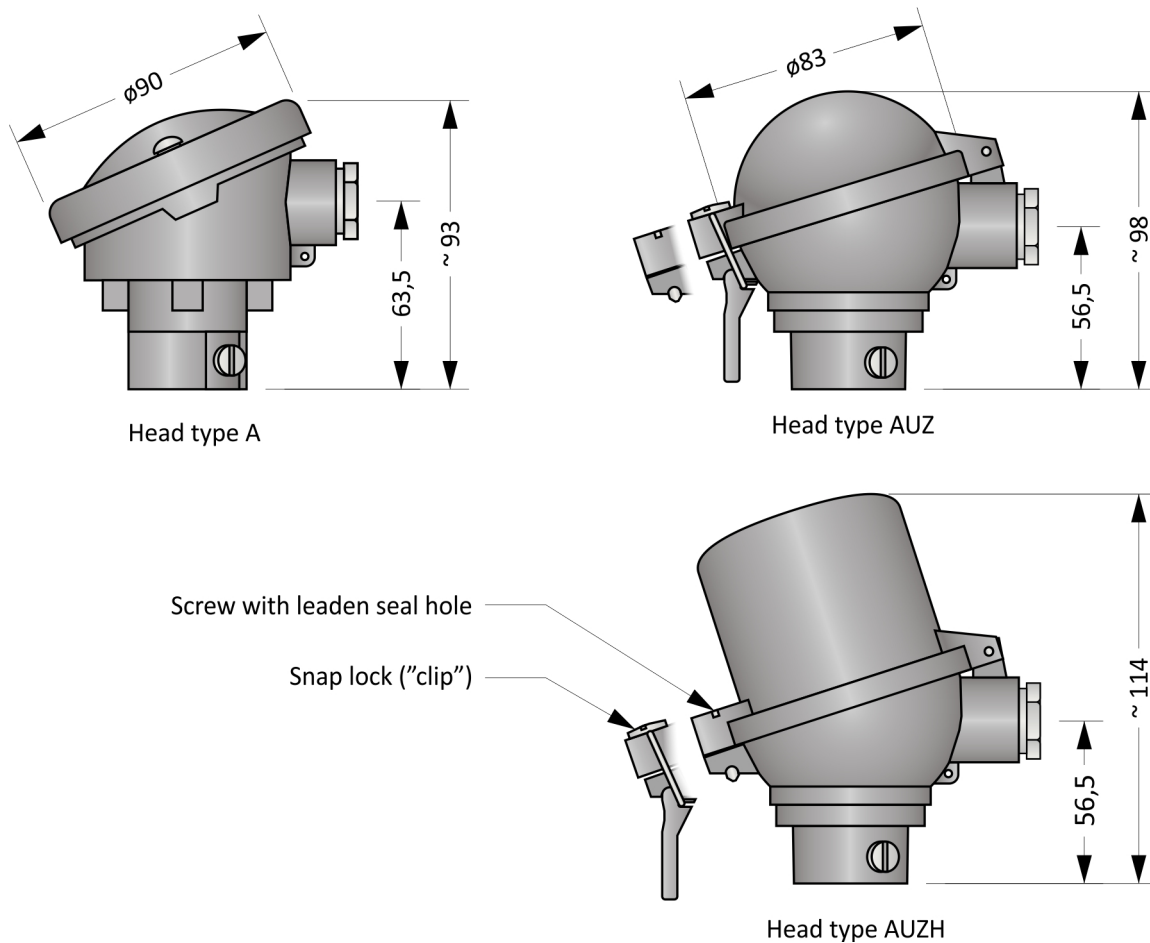


Figure 1.2: Head types

Head mounted transmitter (Table 1.5)

Typ	Input	Output	Setting	Notes
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 may be exposed to a temperature gradient of up to 60 °C/min. Exceeding this value may cause damage.

The electrical connection of sensor with the transmitter is shown in Figure 1.3.

Electrical connection of the sensor without transmitter is shown in the Figures 1.4 and 1.5. The output signal is thermoelectric voltage. The dependence of temperature on thermoelectric voltage is given by the standard ČSN EN 60584-1 ed. 2.

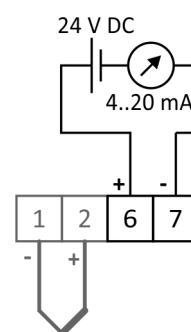


Figure 1.3: Transmitter wiring diagram

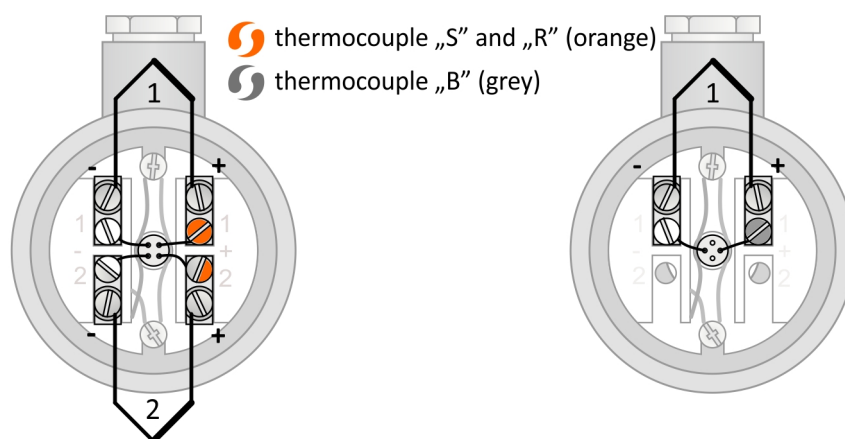


Figure 1.4: Double thermocouple wiring diagram

Figure 1.5: Single thermocouple wiring diagram