

MTC1C

THERMOCOUPLE ASSEMBLIES WITH DOUBLE CERAMIC TUBE

Thermocouple assemblies of the MTC1C series are designed for applications with operating temperatures up to 1350 °C and increased chemical aggressiveness of the environment. They have a double ceramic tube: outer one made of "Silimantin" material, inner one and capillary made of "Pythagoras" material. They are characterised by good resistance to temperature shocks. 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 1C.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 (Pythagoras)
	Diameter	8,5 mm
	Bore for thermocouple	4 x ø1,5 mm
	Inner ceramic tube	
③	Material	Ceramic C610 (Pythagoras)
	Outer / inner diameter	15 / 11 mm
	Outer ceramic tube	
④	Material	Ceramic C530 (Silimantin)
	Outer / inner diameter	26 / 18 mm
	Holding pipe	
⑤	Material	Stainless steel
	Outer / inner diameter	32 / 28 mm
	Head	
⑥	Material	Aluminium alloy
	Cable bushing	M20 x 1,5

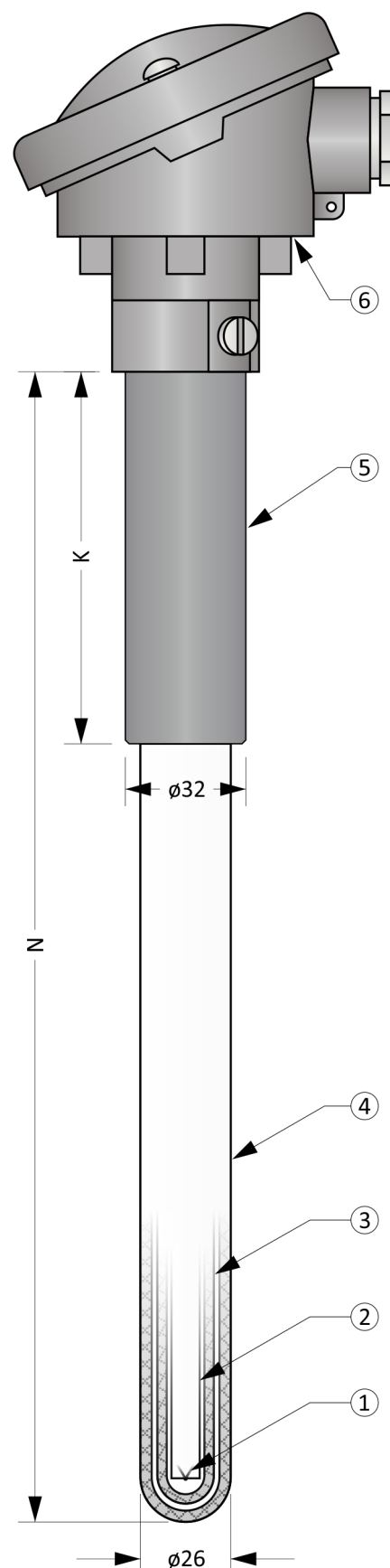


Figure 1C.1: MTC1C

Optional Parameters Including the Creation of an Order Code (Table 1C.2)

Pos.	Code	MTC1C - ① - ② - ③ ④
①	Nominal length N [mm]	
	xxx	Selectable range from 250 mm to 1600 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
	5	NOR IPAQ C520
	6	INOR IPAQ C330
	7	INOR IPAQ C530
	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 $800 \leq N < 1000$ mm
 K = 400 mm pro $1000 \leq N$ mm

Order code example: MTC1C-800-200-00
 ... Nominal length N = 800 mm
 ... Holding pipe length K = 200 mm
 ... Head A
 ... Without transmitter

Approximate weight of the product: MTC1C-800-200-00 ... 1,5 kg

Length Tolerances (Table 1C.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 1C.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

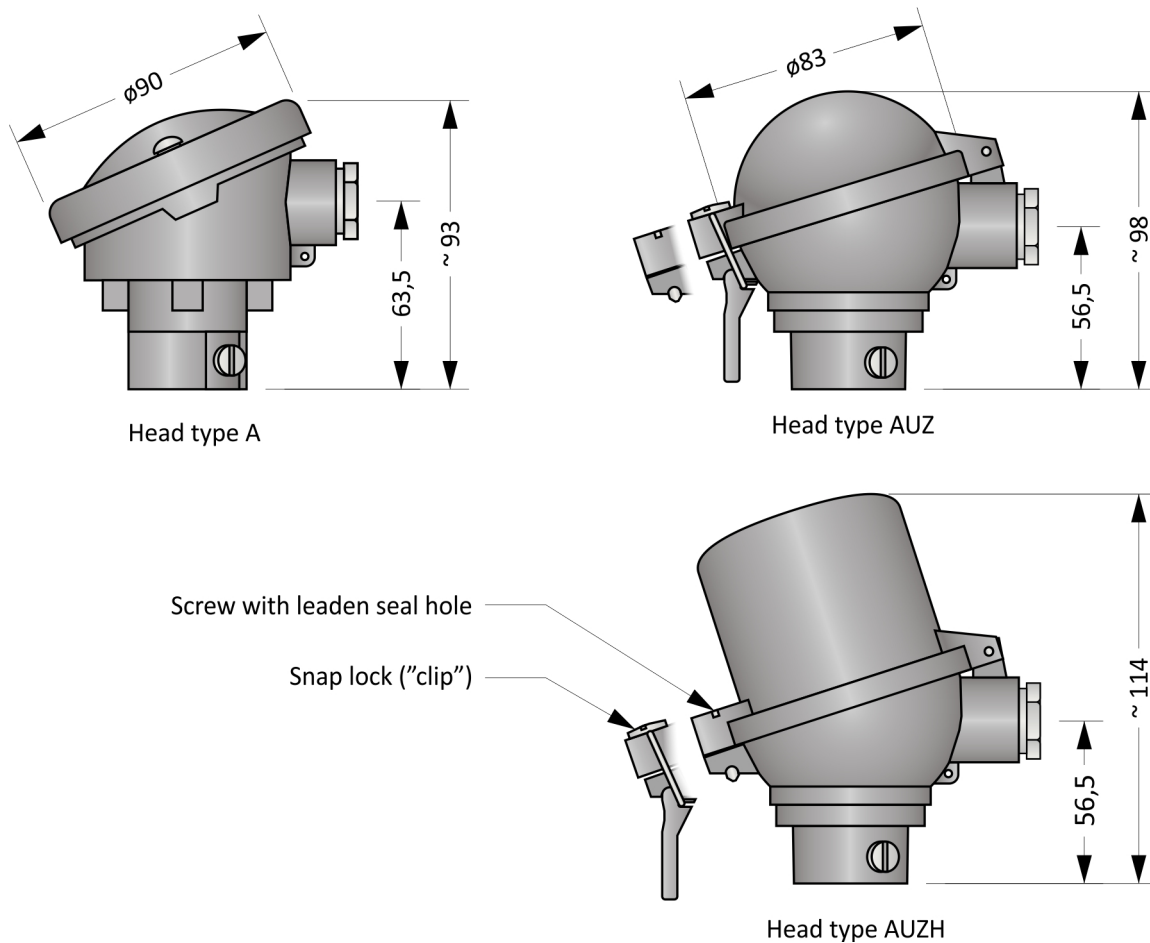


Figure 1C.2: Head types

Head mounted transmitter (Table 1C.5)

Type	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 1C.3.

Electrical connection of the sensor without transmitter is shown in the Figures 1C.4 and 1C.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.

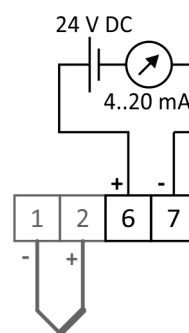


Figure 1C.3: Transmitter wiring diagram

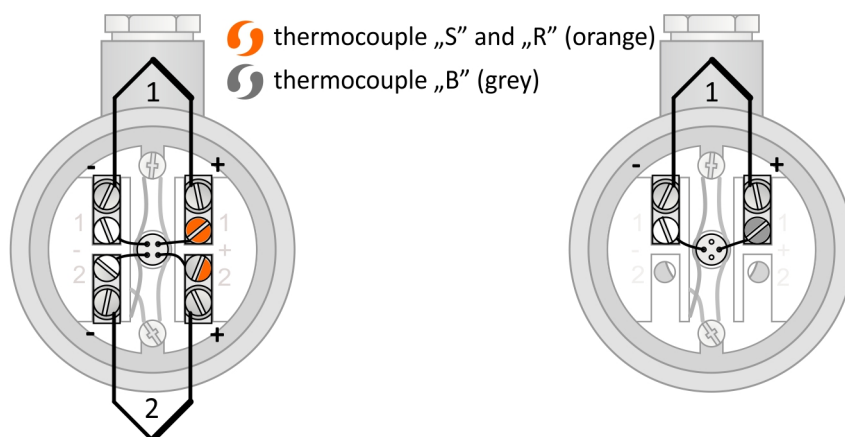


Figure 1C.4: Double thermocouple wiring diagram

Figure 1C.5: Single thermocouple wiring diagram