

MTC7C

THERMOCOUPLE ASSEMBLIES WITH CERAMIC SIC TUBE AND MEASURING INSERT

Thermocouple assembly of the MTC7C series are primarily designed to measure the temperature of non-ferrous metal melts. However, due to the thickness of the sump wall, they are not suitable for applications requiring a fast temperature response from the sensor.

The measuring element is a base 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, clamping bell, inner and outer tube and measuring insert. The head is equipped with a cable gland for connecting the compensation cable.

General Information (Table 7C.1)

	Insulation class acc. ČSN EN 60529	IP54 (head) IP5X (measuring part in length N)
	Base metal thermocouple measuring insert	
①	Design	Mineral insulated metal-sheathed thermocouple according to the ČSN EN 61515 ed.2
	Diameter	3 mm
	Inner protection tube	
②	Material	Stainless steel 1.4541
	Outer / inner diameter	5 / 4 mm
	Outer protection tube	
③	Material	SiC ceramic
	Outer / inner diameter	40 / 10 mm
	Clamping bell	
④	Material	Nickel-plated structural steel
	Head	
⑤	Material	Aluminium alloy
	Cable bushing	M20 x 1,5

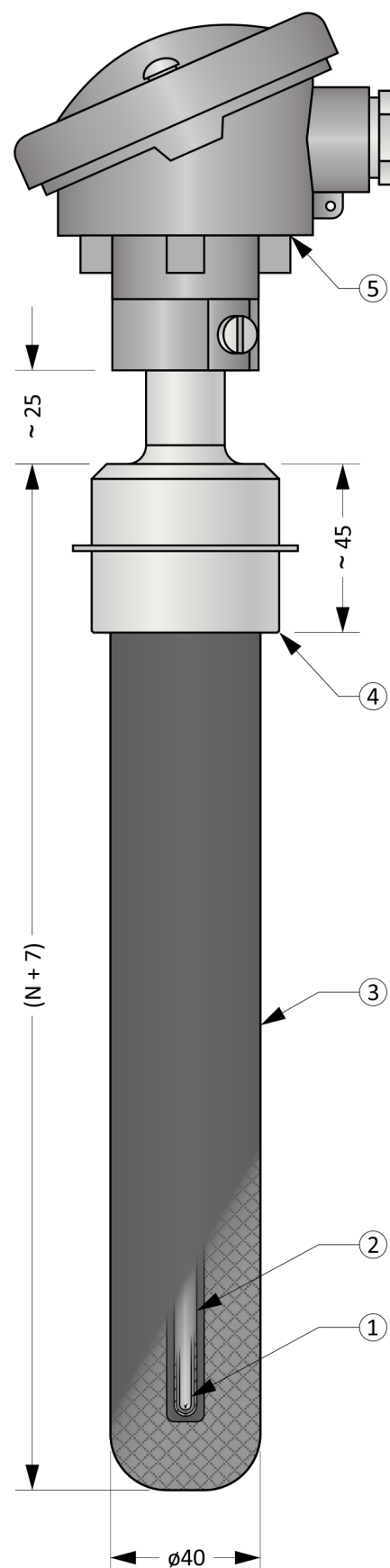


Figure 7C.1: MTC7C

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

Pos.	Code	MTC7C - ① ② - ③ - ④ ⑤ ⑥
①	Type of measuring insert with a diameter of 3.0 mm (thermocouples acc. ČSN EN 60584-1 ed. 2)	
	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	Accuracy class acc. ČSN EN 60584-1 ed. 2	
	0	accuracy class 2
	1	accuracy class 1
③	Nominal length N [mm]	
	xxx	Selectable range from 300 mm to 1000 mm (in 10 mm increments)
④	Inner protection tube	
	0	Not used
	1	material 1.4541, outer/inner diameter 5 / 4 mm
⑤	Head type	
	0	AB
	1	ABUZH with screws with leaden seal holes
	2	ABUZH with snap lock
	3	ABUZ with screws with leaden seal holes
	4	ABUZ with snap lock
⑥	Transmitter (transmitters are designed for sensors with ABUZH head and single 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: MTC7C-01-500-000

... 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
 ... Without inner protection tube
 ... Head AB
 ... Without transmitter

Approximate weight of the product: MTC7C-01-500-000 ... 2,0 kg

Length Tolerances (Table 7C.3)

Length tolerance N
$\pm 3 \text{ mm}$

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

Sensor part	Continuous operation	Short-term operation
Head / head with transmitter	$< 100 \text{ }^{\circ}\text{C} / < 85 \text{ }^{\circ}\text{C}$	-
Outer protection tube	$< 1450 \text{ }^{\circ}\text{C}$	-
Inner protection tube	$< 800 \text{ }^{\circ}\text{C}$	-
Clamping bell	$< 500 \text{ }^{\circ}\text{C}$	-
„J“, sheath dia. 3,0 mm	$< 470 \text{ }^{\circ}\text{C}$	$< 520 \text{ }^{\circ}\text{C}$
„K“, sheath dia. 3,0 mm	$< 980 \text{ }^{\circ}\text{C}$	$< 1050 \text{ }^{\circ}\text{C}$
„N“, sheath dia. 3,0 mm	$< 980 \text{ }^{\circ}\text{C}$	$< 1050 \text{ }^{\circ}\text{C}$

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

Head types

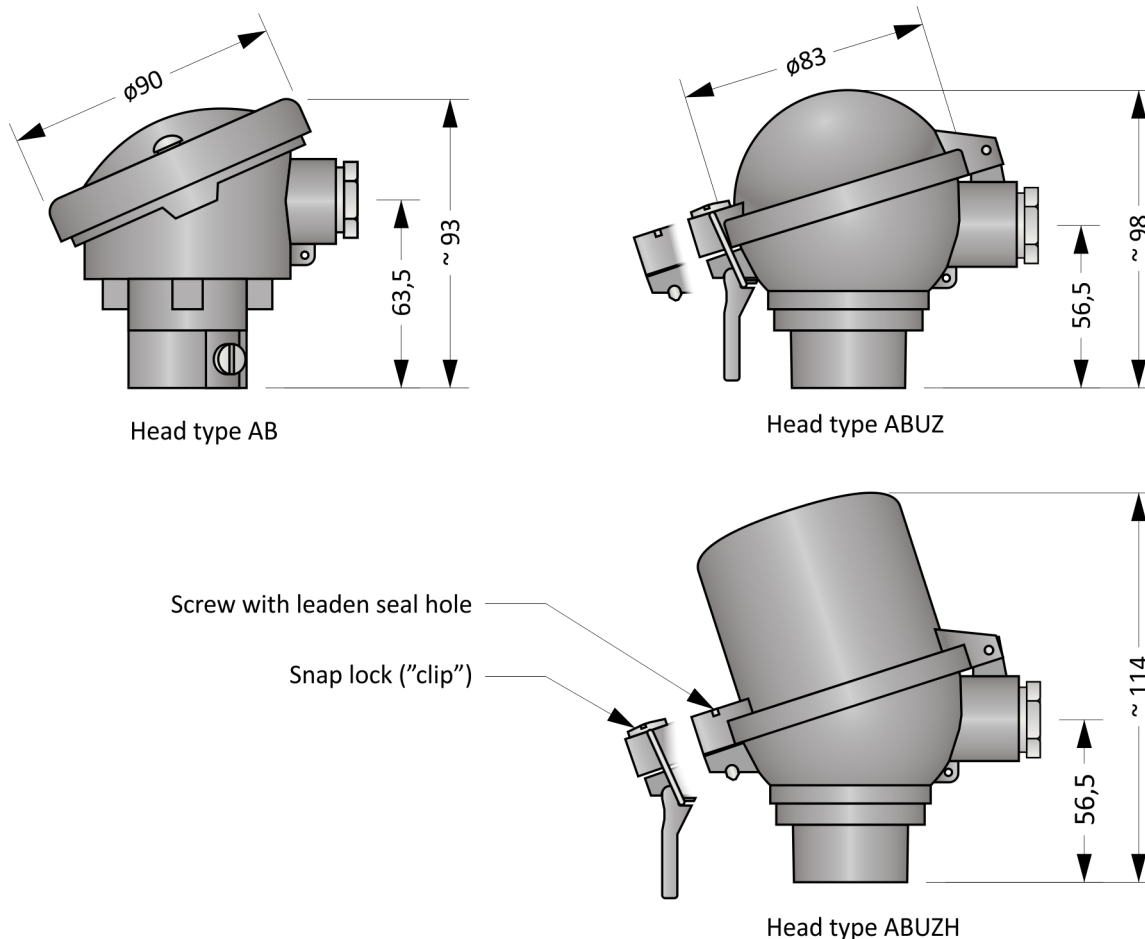


Figure 7C.2: Head types

Head mounted transmitter (Table 7C.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 assembly. 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 7C.5.

Electrical connection of the sensor without transmitter is shown in the Figures 7C.3 and 7C.4. The output signal is thermoelectric voltage. The dependence of temperature on thermoelectric voltage is given by the standard ČSN EN 60584-1 ed. 2.

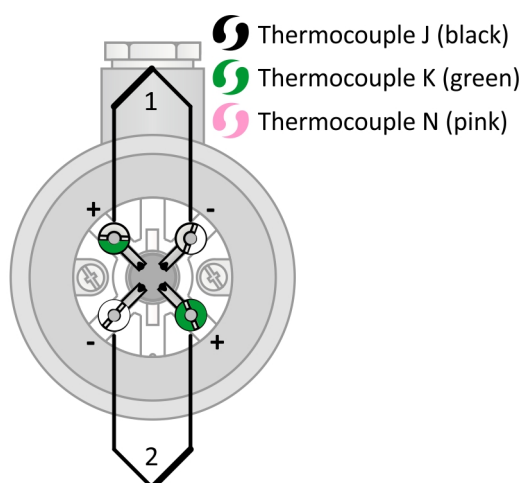


Figure 7C.3: Double thermocouple wiring diagram

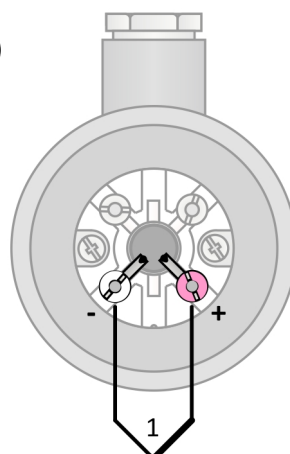


Figure 7C.4: Single thermocouple wiring diagram

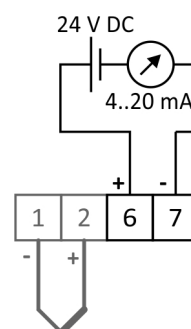


Figure 7C.5: Transmitter wiring diagram