MTC11HS

MINERAL INSULATED METAL-SHEATHED THERMOCOUPLES

Temperature sensors of the MTC11HS series are flexible and robust sensors with a fast temperature response suitable for industrial environments. Sensors are designed for screwing into welding socket. The size of the head allows the transmitier to be installed inside.

The measuring element is a thermocouple of the J, K or N type, 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.

Thermocouple is mineral insulated metal-sheathed according to the ČSN EN 61515 with connection head. The sheath is flexible and the sensor can be easily adapted to the measurement place.

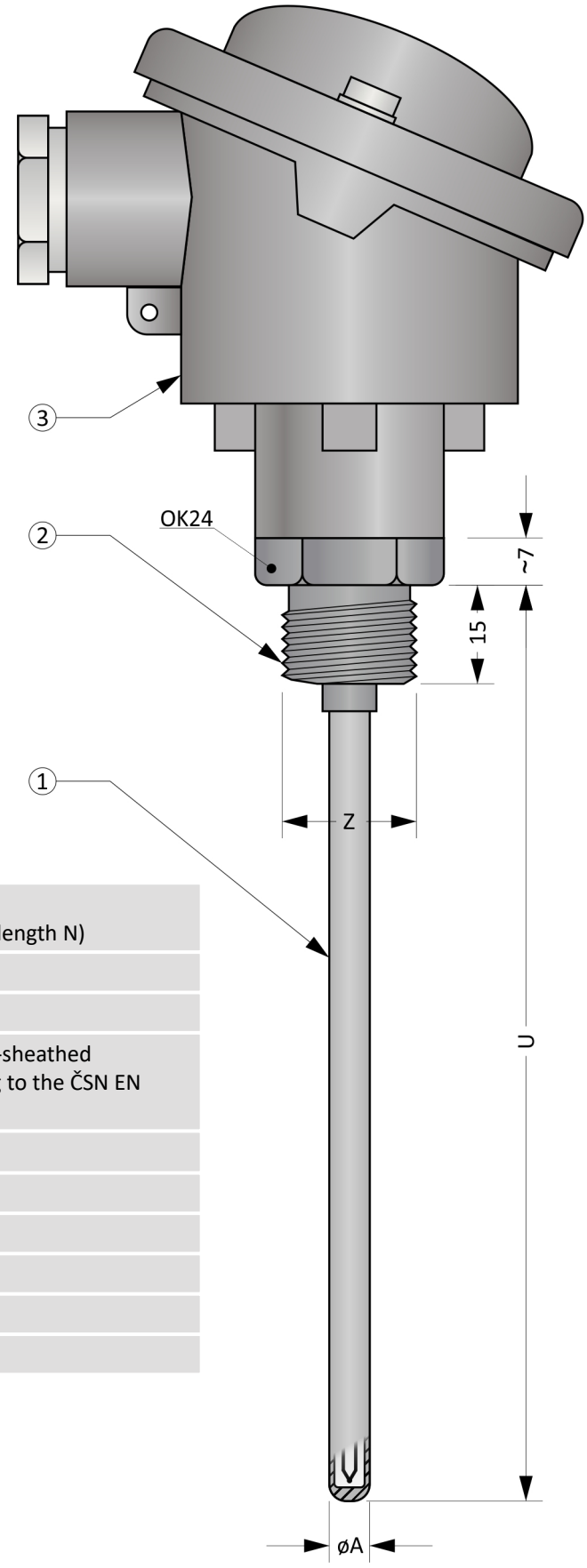


Figure 11HS.1: MTC11HS

General Information (Table 11HS.1)

	Insulation class acc. ČSN EN 60529	IP54 (head) IP68 (measuring part in length N)
	Max. medium overpressure	3 bar
①	**Common metal thermocouple (stem)**	
	Design	Mineral insulated metal-sheathed thermocouple according to the ČSN EN 61515 ed.2
	Min. bending radius	10 × øA
②	**Threaded fitting**	
	Material	Stainless steel 1.4541
③	**Head**	
	Material	Aluminium alloy
	Cable bushing	M20 x 1,5

Optional Parameters Including the Creation of an Order Code (Table 11HS.2)

Pos.	Code	MTC11HS - ❶❷ - ❸ - ❹❺❻
❶	**Thermocouple type of dia. A = 3,0 mm (thermocouples acc. ČSN EN 60584-1 ed. 2)**	
	1	1 x „J“, sheath material 1.4541
	0	1 x „K“, sheath material 2.4816
	C	1 x „N“, sheath material 2.4816
	7	2 x „J“, sheath material 1.4541
	6	2 x „K“, sheath material 2.4816
	F	2 x „N“, sheath material 2.4816
	Thermocouple type of dia. A = 4,5 mm (thermocouples acc. ČSN EN 60584-1 ed. 2)	
	5	1 x „J“, sheath material 1.4541
	4	1 x „K“, sheath material 2.4816
	D	1 x „N“, sheath material 2.4816
	B	2 x „J“, sheath material 1.4541
	A	2 x „K“, sheath material 2.4816
	G	2 x „N“, sheath material 2.4816
	Thermocouple type of dia. A = 6,0 mm (thermocouples acc. ČSN EN 60584-1 ed. 2)	
	3	1 x „J“, sheath material 1.4541
	2	1 x „K“, sheath material 2.4816
	E	1 x „N“, sheath material 2.4816
	9	2 x „J“, sheath material 1.4541
	8	2 x „K“, sheath material 2.4816
	H	2 x „N“, sheath material 2.4816
❷	**Measuring junction design and thermocouple accuracy class acc. ČSN EN 60584-1 ed. 2**	
	1	Accuracy class 1, thermocouple isolated from the sheath, blunt tip
	3	Accuracy class 1, thermocouple connected to the sheath, blunt tip
	0	Accuracy class 2, thermocouple isolated from the sheath, blunt tip
	2	Accuracy class 2, thermocouple connected to the sheath, blunt tip
❸	**Nominal length N [mm]**	
	xxx	Selectable range from 50 mm to 4 500 mm (in 1 mm increments)
	xxx	Selectable range from 4501 mm to 50 000 mm (in 100 mm increments)
❹	**Process thread Z**	
	0	Process thread Z = G½“, OK24
	1	Process thread Z = M20 x 1,5, OK24
❺	**Head type**	
	0	B
	1	BH
	2	BUZ with screws with leaden seal holes
	3	BUZ with snap lock
	4	BUZH with screws with leaden seal holes
	5	BUZH with snap lock

Continuation of table 11HS.2 on the next page

Continuation of table 11HS.2 from the previous page		
Pos.	Code	**MTC11HS - ❶❷ - ❸ - ❹❺❻**
❻	**Transmitter (only for 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: MTC11HS-00-500-200
... 1 x „K“, sheath dia. A = 3,0 mm, sheath material 2.4816 (INCONEL 600)
... Accuracy class 2, thermocouple isolated from the sheath, blunt tip
... Nominal length N = 500 mm
... Process thread M20 x 1,5
... Head A
... Without transmitter

Approximate weight of the product: MTC11HS-00-500-200 ... 0,6 kg

Length Tolerances (Table 11HS.3)

Nominal length N	Tolerance N
50 ≤ N ≤ 1500 mm	± 2 mm
1500 < N ≤ 2500 mm	± 3 mm
2500 < N ≤ 5000 mm	± 5 mm
5000 < N ≤ 50000 mm	± 0,5 % of N

Diameter tolerance (Table 11HS.4)

Stem diameter A	Tolerance A
1 ≤ A ≤ 4,5 mm	± 0,05 mm
4,5 < A mm	± 0,06 mm

Recommended Maximum Temperatures of Sensor Parts (Table 11HS.5)

Sensor part	Sheat dia.	Continuous operation	Short-term operation
Head / head with transmitter		< 100 °C / < 85 °C	-
Threaded fitting		< 500 °C	-
Thermocouple type „J“ measuring junction	3 mm	< 470 °C	< 520 °C
	4,5 mm	< 550 °C	< 620 °C
	6 mm	< 650 °C	< 720 °C
Thermocouple type „K“ and „N“ measuring junction	3 mm	< 980 °C	< 1050 °C
	4,5 mm	< 1080 °C	< 1140 °C
	6 mm	< 1140 °C	< 1200 °C

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

Measuring Junction Design

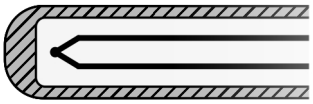


Figure 11HS.2: Thermocouple isolated from the sheath

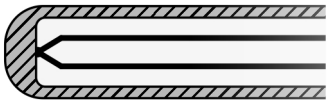
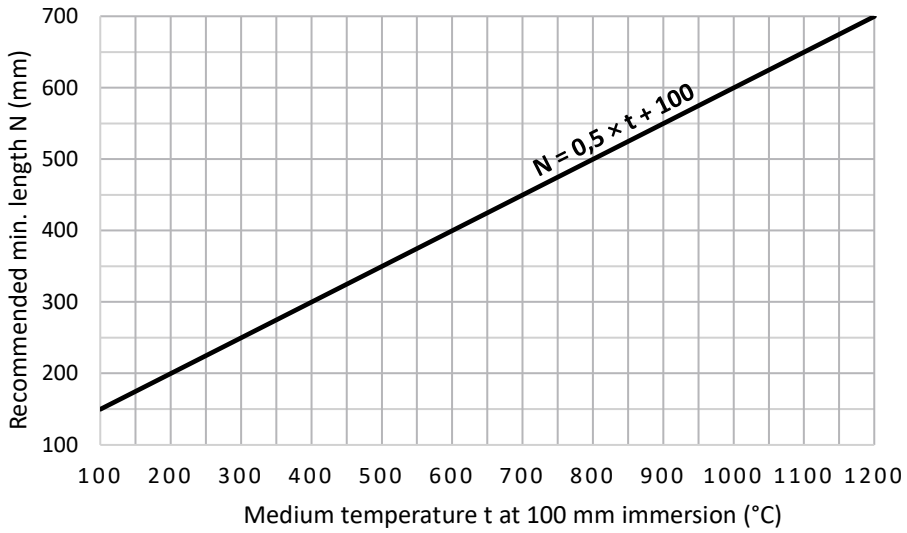


Figure 11HS.3: Thermocouple connected to the sheath

Recommended Min. Sensor Length (Chart 11HS.1)

The minimum recommended length is determined with respect to the heat transfer from the measuring end to the connector or the stripped ends. If the length is not observed, there is a risk of overheating.



Head types

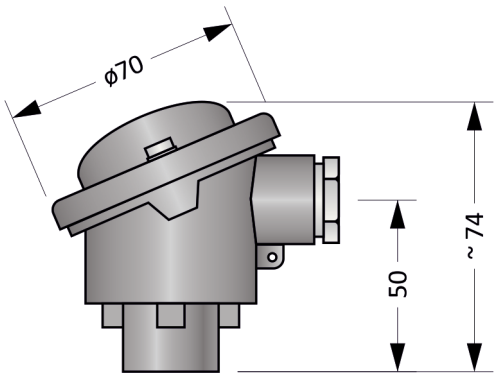


Figure 11HS.4: Head B

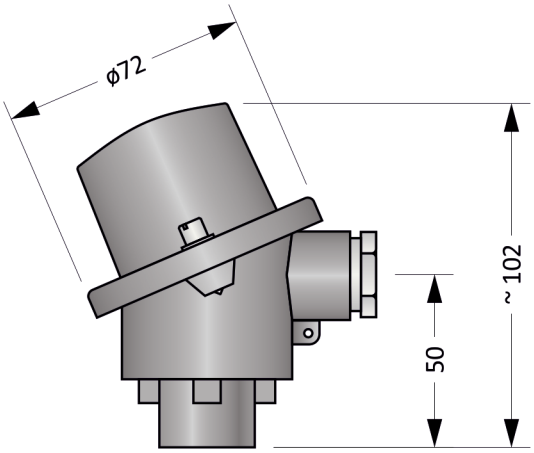


Figure 11HS.5: Head BH

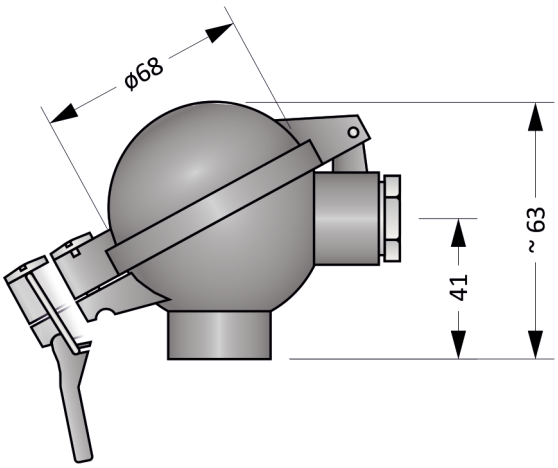


Figure 11HS.6: Head BUZ

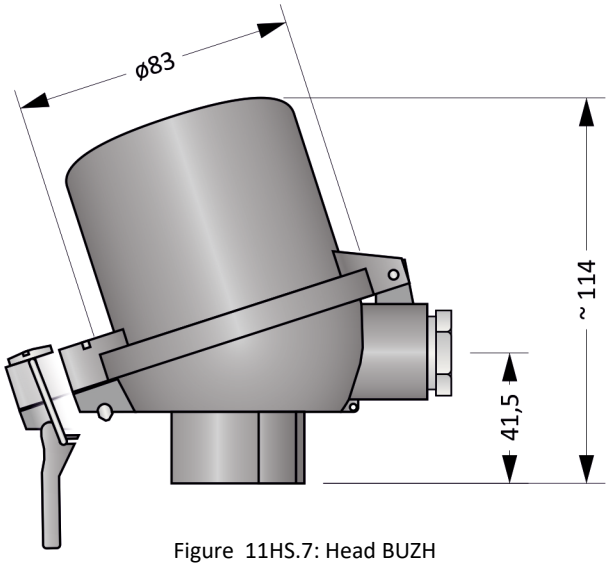


Figure 11HS.7: Head BUZH

Head mounted transmitter (Table 11HS.5)

The transmitter is installed in the head and replaces the terminal block. When using a head with a raised lid (version BH, BUZH), the terminal block is preserved and the transmitter is placed in the lid.

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

The sensor's threaded fiting is used for mechanical fastening.

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 electrical connection of sensor with the transmitter is shown in Figure 11HS.10.

The electrical connection of the sensor is shown in Figures 11HS.8 and 11HS.9. The output signal is thermoelectric voltage. The dependence of temperature on thermoelectric voltage is given by the standard ČSN EN 60584-1 ed. 2.

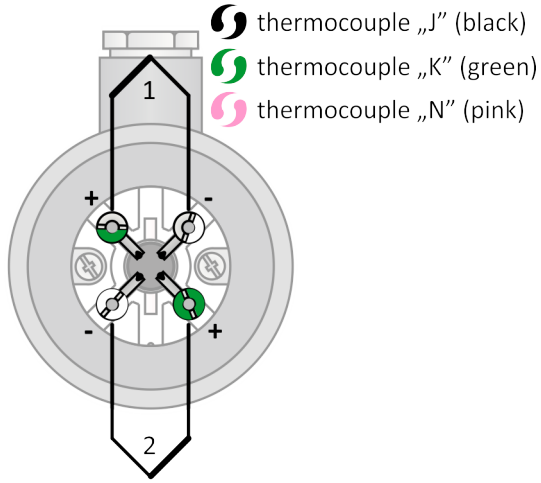


Figure 11HS.8: Double thermocouple wiring diagram

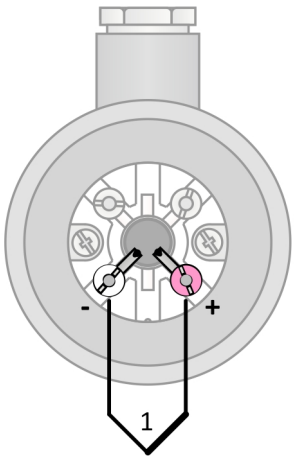


Figure 11HS.9: Single thermocouple wiring diagram

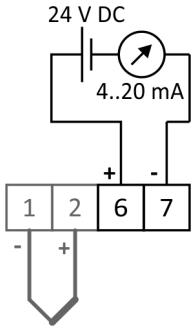


Figure 11HS.10: Transmitter wiring diagram