MTC15P

MINERAL INSULATED METAL-SHEATHED THERMOCOUPLES

Thermocouple inserts with transmitter of the MTC15P series are a components with a wide range of applications as a measuring element in a wide range of temperature sensors with metal or ceramic tube and as a stand-alone temperature sensor.

The measuring element is a thermocouple of the J, K, L 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 or DIN 43 710 for L thermocouple.

The measuring part of the sensor is made of mineral insulated metal-sheathed thermocouple according to the ČSN EN 61515. The sheath is flexible and can be easily adjusted to the measuring place.

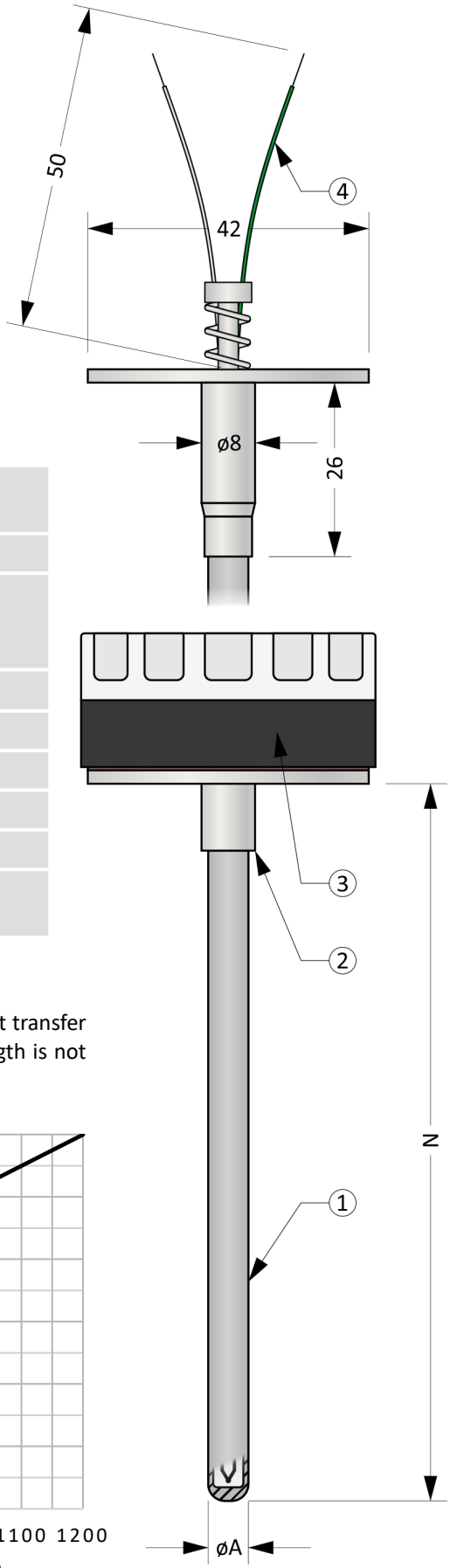


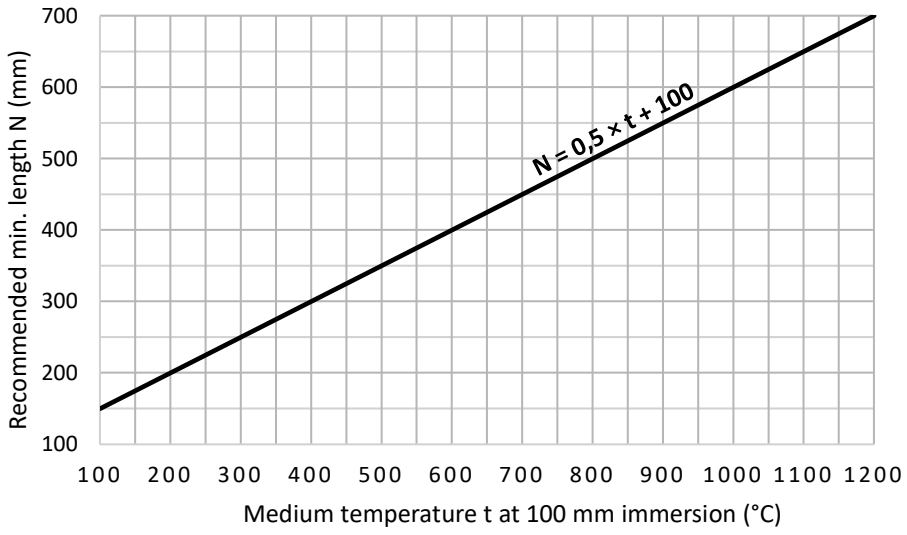
Figure 15P.1: MTC15P

General Information (Table 15P.1)

	Insulation class acc. ČSN EN 60529	IP00 (terminal block, extension wires) IP68 (measuring part in length N)
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	**Disk**	
③	**Terminal block**	
④	**Extension wires**	
	Length	50 mm
	insulation / cross-section of wires	SL (silicone), 0,22 mm², stranded

Recommended Min. Sensor Length (Chart 15P.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.



Optional Parameters Including the Creation of an Order Code (Table 15.2)

Pos.	Code	MTC15 - ❶❷ - ❸ - ❹ - ❺ - ❻
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
	D	1 x „N“, sheath material 2.4816
	C	1 x „L“, sheath material 1.4541 (acc. DIN 43 710)
	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
	E	1 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
	F	1 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 — For J, K, N thermocouples only.
	2	Accuracy class 1, thermocouple connected to the sheath, blunt tip — For J, K, N thermocouples only.
	0	Accuracy class 2, thermocouple isolated from the sheath, blunt tip (Type L without accuracy class acc. DIN 43 710)
	3	Accuracy class 2, thermocouple connected to the sheath, blunt tip (Type L without accuracy class acc. DIN 43 710)
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	**Transmitter**	
	8	INOR APAQ C130 TC — Not for L thermocouples.
	1	INOR miniPAQ - HLP
	4	INOR IPAQ C520 — Not for L thermocouples.
	5	INOR IPAQ C330 — Not for L thermocouples.
	6	INOR IPAQ C530 — Not for L thermocouples.
	A	With another transmitter (e.g. supplied by the customer)
❺	**Transmitter range settings 4 ... 20 mA [°C]**	
	xxx	Lower limit (= 4 mA)
❻	xxx	Upper limit (= 20 mA)

Order code example: MTC15P-00-500-5-0-250

... 1 x „K“, sheath dia. A = 1 mm, sheath material 2.4816 (INCONEL 600)
... Accuracy class 2, thermocouple isolated from the sheath, blunt tip
... Nominal length N = 500 mm
... INOR IPAQ C330
... Lower limit = 0 °C
... Upper limit = 250 °C

Approximate weight of the product: MTC15P-00-500-5-0-250 ... 0,2 kg

Length Tolerances (Table 15P.3)

Nominal length N	Tolerance N
50 ≤ N ≤ 1500 mm	± 2 mm
1500 < N ≤ 2500 mm	± 3 mm
2500 < N mm	± 5 mm

Diameter tolerance (Table 15P.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 15P.5)

Sensor part	Sheat dia.	Continuous operation	Short-term operation
Transmitter		< 85 °C	-
Thermocouple type „L“ measuring junction	3 mm	< 480 °C	< 530 °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 15P.2: Thermocouple isolated from the sheath

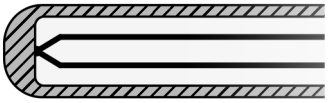


Figure 15P.3: Thermocouple connected to the sheath

Head mounted transmitter (Table 15P.6)

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 thermocouple insert is mounted into the sensor assembly using screws.

The electrical connection of the sensor is shown in Figures 15P.4 and 15P.5. The output signal is a thermoelectric voltage, the value of which is according to the ČSN EN 60584-1 ed. 2 or DIN 43 710 for L thermocouple.

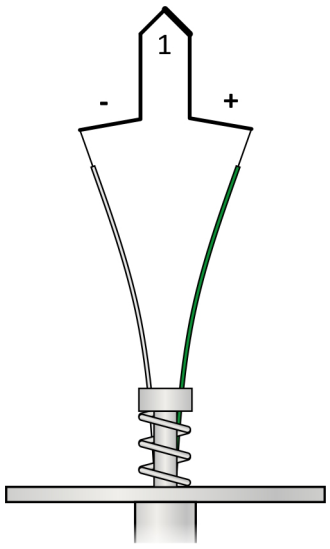


Figure 15P.4: Thermocouple wiring diagram

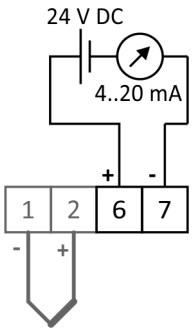


Figure 15P.5: Transmitter wiring diagram