MTC15

MINERAL INSULATED METAL-SHEATHED THERMOCOUPLES

Thermocouple inserts of the MTC15 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.

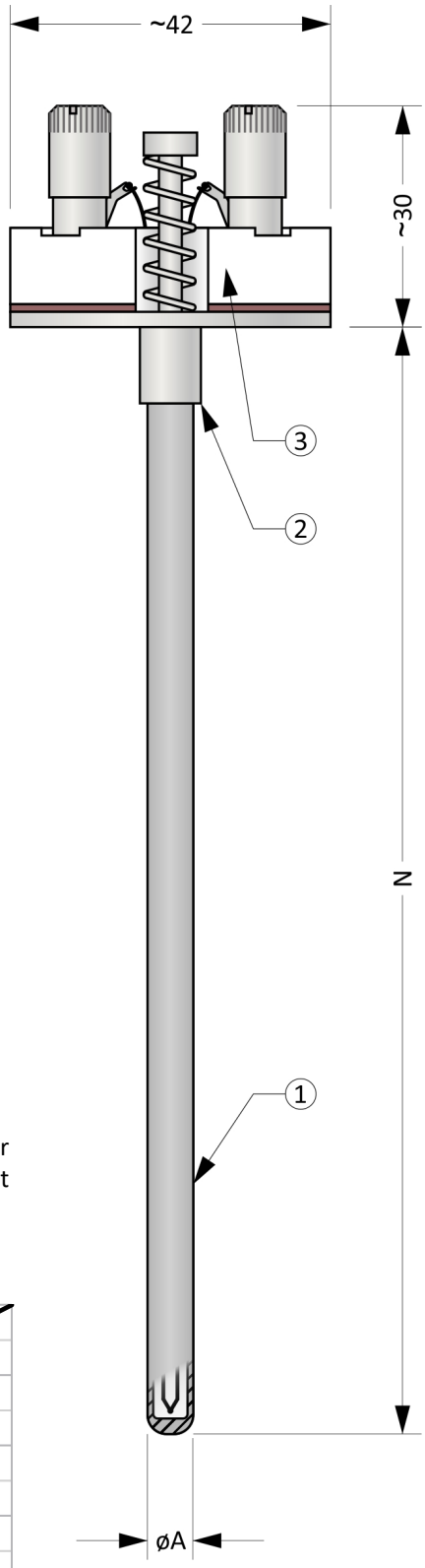


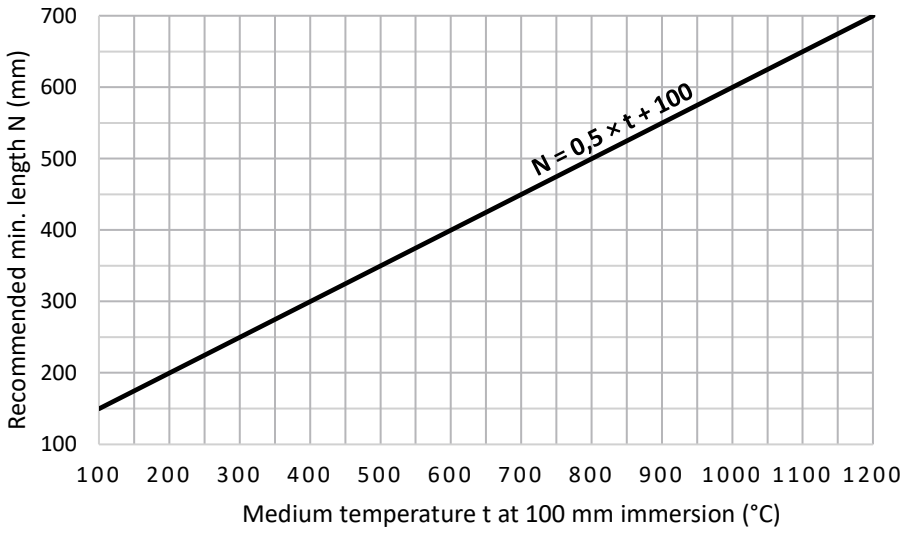
Figure 15.1: MTC15

General Information (Table 15.1)

	Insulation class acc. ČSN EN 60529	IP00 (terminal) 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**	

Recommended Min. Sensor Length (Chart 15.1)

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
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)
	7	2 x „J“, sheath material 1.4541
	6	2 x „K“, sheath material 2.4816
	G	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
	E	1 x „N“, sheath material 2.4816
	B	2 x „J“, sheath material 1.4541
	A	2 x „K“, sheath material 2.4816
	H	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
	F	1 x „N“, sheath material 2.4816
	9	2 x „J“, sheath material 1.4541
	8	2 x „K“, sheath material 2.4816
	I	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 — 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)

Order code example: MTC15-00-500

... 1 x „K“, sheath dia. A = 3 mm, sheath material 2.4816 (INCONEL 600)

... Accuracy class 2, thermocouple isolated from the sheath, blunt tip

... Nominal length N = 500 mm

Approximate weight of the product: MTC15-00-500 ... 0,2 kg

Length Tolerances (Table 15.3)

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 15.4)

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 15.5)

Sensor part	Sheat dia.	Continuous operation	Short-term operation
Terminal block		< 100 °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 15.2: Thermocouple isolated from the sheath

Figure 15.3: Thermocouple connected to the sheath

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 15.4 and 15.5. 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.

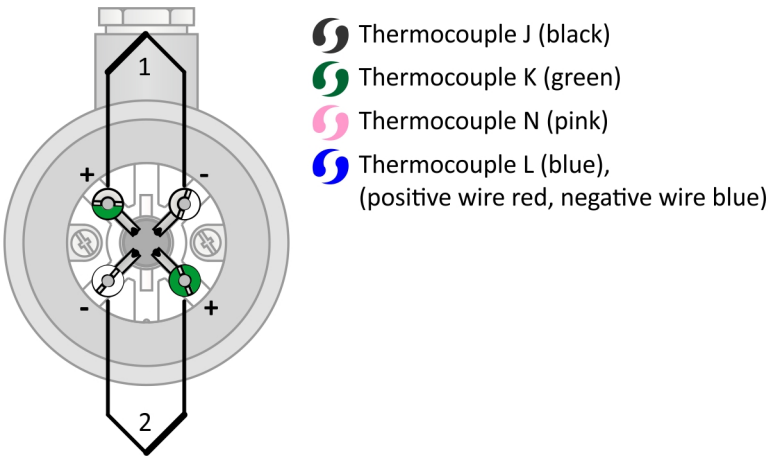


Figure 15.4: Double thermocouple wiring diagram

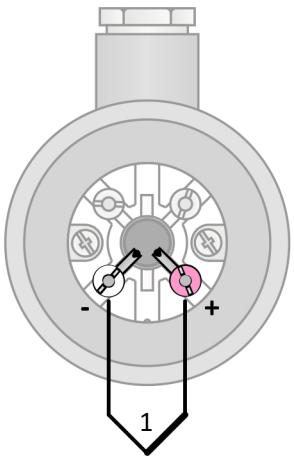


Figure 15.5: Single thermocouple wiring diagram

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