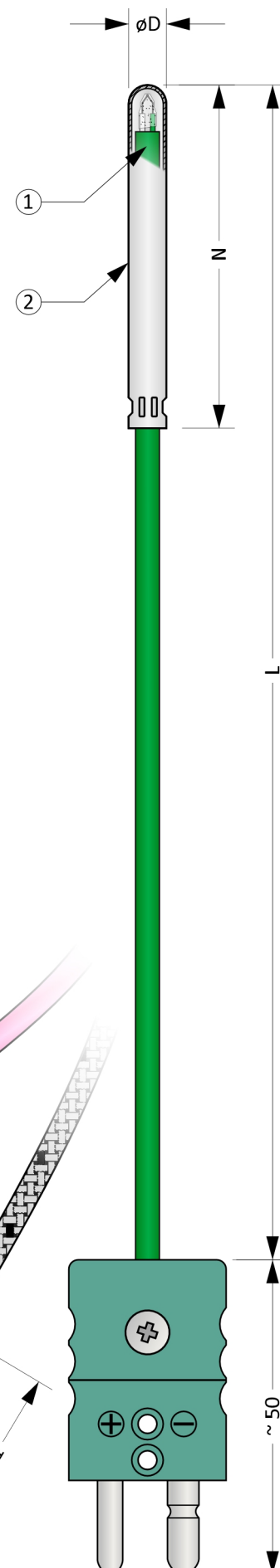


MTC12A

CABLE THERMOCOUPLES

MTC12A series temperature sensors are cable thermocouples with a protective tube protecting the measuring junction. They represent an economically feasible solution at the cost of certain compromises in sensor performance. The parameters of the sensor are determined by the type of cable used.

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.



General Information (Table 12A.1)

	Insulation class acc. ČSN EN 60529	IP50 (connector), IP00 (stripped ends) IP50 (measuring part in length L)
①	Cable thermocouple	
	Min. bending radius	15 × outer cable diameter
②	Protection tube	
	Material	Stainless steel 1.4404
③	Stripped ends	
④	Connector	

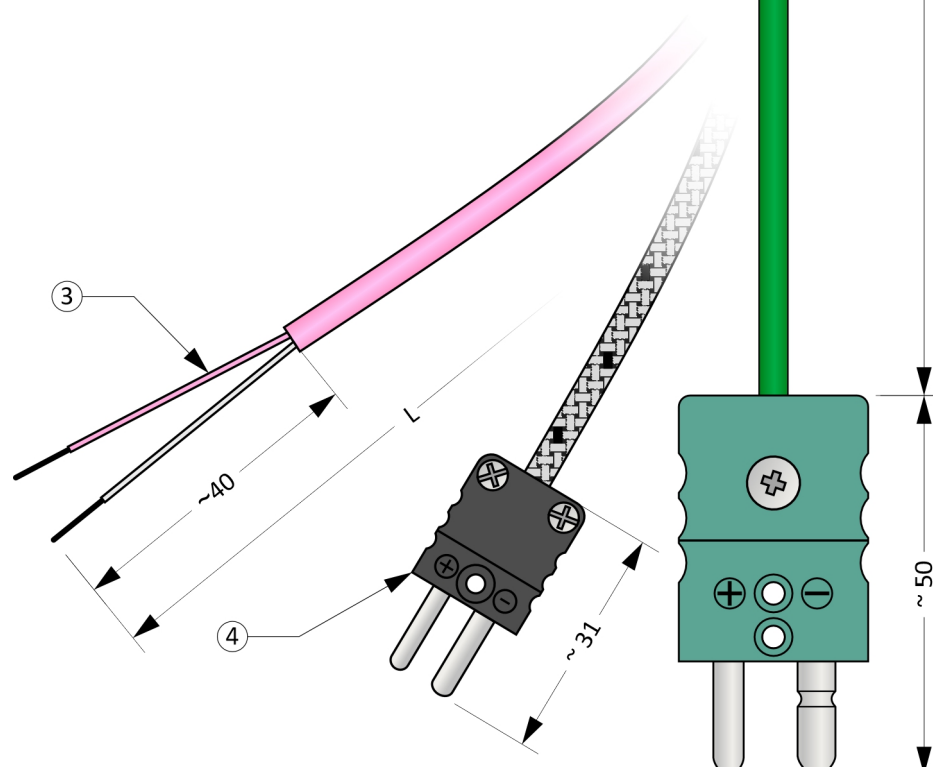


Figure 12A.1: MTC12A

Optional Parameters Including the Creation of an Order Code (Table 12A.2)

Pos.	Code	MTC12A - ① - ② - ③ - ④ ⑤
①	Thermocouple type J, accuracy class 2 acc. ČSN EN 60584-1 ed. 2 - cable type	
	6	Cable SLSL 2 x 0,22 mm ² , stranded
	3	Cable TSL 2 x 0,22 mm ² , stranded
	5	Cable TT oval 2 x 0,75 mm ² , stranded
	F	Cable GLGL wrap 2 x 0,2 mm, solid
	G	Cable GLGL wrap 2 x 0,5 mm, solid
	1	Cable GHGHV 2 x 0,22 mm ² , stranded
	M	Cable TcuT 2 x 0,22 mm ² , stranded
	Thermocouple type K, accuracy class 2 acc. ČSN EN 60584-1 ed. 2 - cable type	
	9	Cable TT oval 2 x 0,2 mm, solid
	A	Cable TT oval 2 x 0,5 mm, solid
	B	Cable TcuT 2 x 0,22 mm ² , stranded
	D	Cable GLGL wrap 2 x 0,2 mm, solid
	E	Cable GLGL wrap 2 x 0,5 mm, solid
	H	Cable GHGH oval 2 x 0,5 mm, solid
	I	Cable GHGH oval 2 x 1,0 mm, solid
	J	Cable GHGHV 2 x 1,0 mm, solid
	0	Cable GHGHV 2 x 0,22 mm ² , stranded
	L	Cable KFKF 1400 oval 2 x 0,8 mm, solid
	Thermocouple type L, acc. DIN 43 710 - cable type	
	4	Cable TSL 2 x 0,22 mm ² , stranded
	8	Cable TT oval 2 x 0,5 mm ² , stranded
	2	Cable GHGHV 2 x 0,22 mm ² , stranded
	Thermocouple type N, accuracy class 2 acc. ČSN EN 60584-1 ed. 2 - cable type	
	7	Cable TSL 2 x 0,22 mm ² , stranded
	C	Cable TcuT 2 x 0,22 mm ² , stranded
	K	Cable GHGHV 2 x 0,22 mm ² , stranded
②	Sensor length L [cm]	
	xxx	Selectable range from (L+50) cm to 450 cm (in 1 cm increments)
	xxx	Selectable range from 460 cm to 3 500 cm (in 10 cm increments)
③	Protection tube length N [mm]	
	xxx	Selectable range from 20 mm to 150 mm (in 1 mm increments) For dia. D = 3,0 ... 5,0 mm
	xxx	Selectable range from 20 mm to 500 mm (in 1 mm increments) For dia. D = 6,0 mm
④	Protection tube diameter D [mm]	
	4	D = 3,0 mm Can be for: ① ... 9, A, D, E, F, G
	0	D = 4,0 mm Can be for: ① ... 0, 1, 2, 9, A, B, C, D, E, F, G, K
	2	D = 5,0 mm Can be for: ① ... 0, 1, 2, 3, 4, 6, 7, 8, B, C, H, I, K
	3	D = 6,0 mm Can be for: ① ... 0, 1, 2, 3, 4, 5, 6, 7, 8, B, C, H, I, J, K, L
Continuation of table 12A.2 on the next page		

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Pos.	Code	MTC12A - ① - ② - ③ - ④ ⑤
⑤	Design of the cold junction	
	0	Stripped ends, length 40 mm
	1	Standard connector, MTCK-S type, plug
	2	Standard connector, MTCK-S type, plug + socket
	3	Miniature connector, MTCK-M type, plug
	4	Miniature connector, MTCK-M type, plug + socket
	5	Ceramic standard connector, MTCK-CS type, plug
	6	Ceramic standard connector, MTCK-CS type, plug + socket
	7	Ceramic miniature connector, MTCK-CM type, plug
	8	Ceramic miniature connector, MTCK-CM type, plug + socket

Order code example: MTC12A-D-500-50-30

... Thermocouple type K, accuracy class 2, GLGL wrap 2 x 0,2 mm, solid

... Sensor length L = 500 cm

... Protection tube length N = 50 mm

... Protection tube diameter D = 6,0 mm

... Stripped ends

Approximate weight of the product: MTC12A-D-500-50-30 ... 0,2 kg

Length Tolerances L (Table 12A.3)

Length L	Tolerance L
$50 \leq L \leq 250 \text{ cm}$	$\pm 1 \text{ cm}$
$250 < L \leq 500 \text{ cm}$	$\pm 1,5 \text{ cm}$
$500 < L \leq 3500 \text{ cm}$	$\pm 0,5 \% \pm L$

Length Tolerance N (Table 12A.4)

Tolerance N
$\pm 1 \text{ mm}$

Recommended Maximum Temperatures of Sensor Parts (Table 12.5)

Sensor part	Insulation type	Continuous operation	Short-term operation
Thermocouple - measuring end	SLSL	-60 ... 180 °C	-
	TSL	-60 ... 180 °C	-
	TT	-200 ... 205 °C	-
	TCuT	-200 ... 205 °C	-
	GLGL	-200 ... 400 °C	-
	GHGH	-40 ... 600 °C	-
	GHGHV	-40 ... 600 °C	-
	KFKF 1400	-40 ... 1200 °C	< 1400 °C
Connectors MTCK-S, MTCK-M		See cable insulation, max. 220 °C	-
Connectors MTCK-CS, MTCK-CM		See cable insulation, max. 650 °C	-

Cable Parameter (Table 12A.6)

Insulation	Number x cross-section / dia. of wires	Outer dia. / size of cable	Pros and cons
SLSL (silicone / silicone)	2 x 0,22 mm ²	~ 3,8 mm	↗ Great flexibility ↘ Low mechanical resistance
TSL (teflon FEP / silicone)	2 x 0,22 mm ²	~ 3,7 mm	↗ Great flexibility, resistant to weak chemicals ↘ Low mechanical resistance
TT oval (teflon FEP / teflon FEP)	2 x 0,2 mm 2 x 0,5 mm 2 x 0,50 mm ² 2 x 0,75 mm ²	~ 1,3 x 2,0 mm ~ 1,6 x 3,4 mm ~ 2,0 x 3,5 mm ~ 2,4 x 4,2 mm	↗ Great flexibility ↘ Low mechanical resistance
TCuT (teflon FEP / tinned copper wire braid / teflon FEP)	2 x 0,22 mm ²	~ 3,0 mm	↗ Great flexibility, resistant to weak chemicals, screening
GLGL wrap (glass fiber braid / glass fiber braid)	2 x 0,2 mm 2 x 0,5 mm	~ 0,6 x 1,0 mm ~ 1,1 x 1,9 mm	↗ Good flexibility ↘ Low moisture resistance, low abrasion resistance
GHGH (glass fiber braid / glass fiber braid)	2 x 0,5 mm 2 x 1,0 mm	~ 1,5 x 2,4 mm ~ 1,8 x 3,1 mm	↗ Long durability ↘ Low flexibility, Low mechanical resistance, low abrasion resistance
GHGHV (glass fiber braid / glass fiber braid / stainless steel wire braid)	2 x 0,22 mm ² 2 x 1,0 mm	~ 3,0 mm ~ 2,5 x 4,0 mm	↗ Long durability, very good flexibility, good abrasion resistance ↘ Low moisture resistance
KFKF 1400 (glass fiber braid / glass fiber braid)	2 x 0,8 mm	~ 4,5 mm	↗ Long durability ↘ Low flexibility, Low mechanical resistance, low abrasion resistance

Installation And Operating Instructions

The protection tube is used for mechanical fixing.

The electrical connection of the sensor is shown in Figures 12A.2 and 12A.3. 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.

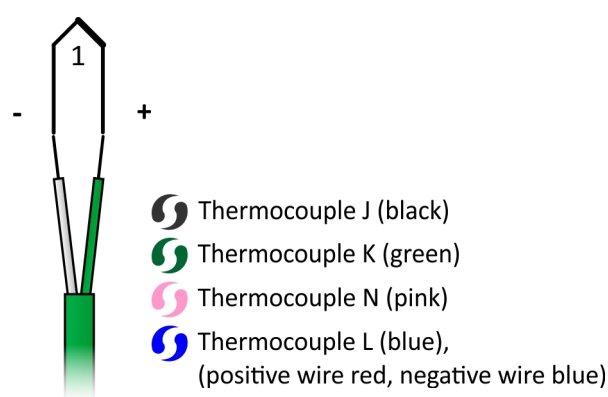


Figure 12A.2: Single thermocouple wiring diagram

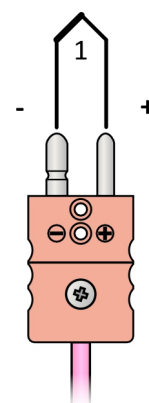


Figure 12A.3: Connector wiring diagram