MTC5L

THERMOCOUPLE ASSEMBLIES WITH CERAMIC TUBE

Thermocouple assemblies of the MTC5L series are designed for applications with operating temperatures up to 1090 °C. They have a single ceramic tube made of „Lunit 73“ material. They are characterized by good resistance to temperature shocks. The ceramic tube is gas-tight. The assemblies of this series therefore provide a slightly increased long-term lifetime of the installed thermocouple.

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, holding pipe, protection ceramic tube and a capillary/beads in which one or two thermocouples can be installed. The head is equipped with a cable gland for connecting the compensation cable.

General Information (Table 5L.1)

	Insulation class acc. ČSN EN 60529	IP54 (head) IP5X (measuring part in length N)
①	**Base metal thermocouple**	
②	**Insulating beads / capillary**	
	Material	Ceramic C610 (Lunit73)
③	**Protection tube**	
	Material	Ceramic C610 (Lunit73)
	Outer / inner diameter	15 / 11 mm
④	**Holding pipe**	
	Material	Stainless steel
	Outer / inner diameter	22 / 18 mm
⑤	**Head**	
	Material	Aluminium alloy
	Cable bushing	M20 x 1,5

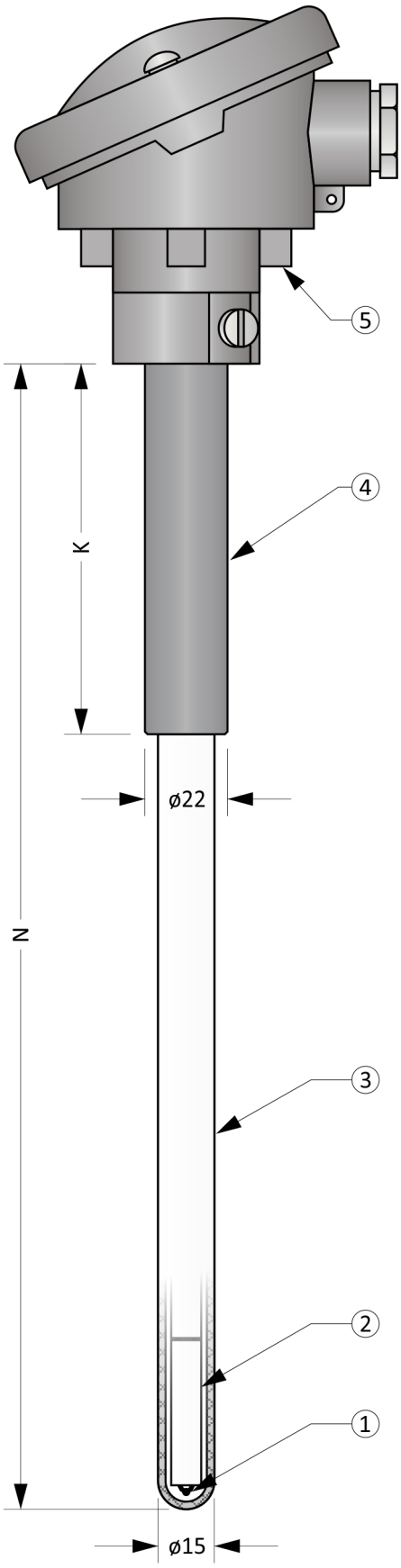

Figure 5L.1: MTC5L

Optional Parameters Including the Creation of an Order Code (Table 5L.2)

Pos.	Code	MTC5L - ❶ - ❷ - ❸ - ❹❺
❶	**Thermocouple type (acc. ČSN EN 60584-1 ed. 2)**	
	0	1 x „J“, accuracy class 2, wire diameter 1,0 mm
	1	1 x „K“, accuracy class 2, wire diameter 1,38 mm
	2	2 x „J“, accuracy class 2, wire diameter 1,0 mm
	3	2 x „K“, accuracy class 2, wire diameter 1,38 mm
	4	1 x „N“, accuracy class 2, wire diameter 1,3 mm
	5	2 x „N“, accuracy class 2, wire diameter 1,3 mm
❷	**Nominal length N [mm]**	
	xxx	Selectable range from 250 mm to 1600 mm (in 10 mm increments)
❸	**Holding pipe length K [mm]**	
	xxx	Selectable range from 40 mm to (N-40) mm (in 5 mm increments)
❹	**Head type**	
	0	A
	1	AUZH with screws with leaden seal holes
	2	AUZH with snap lock
	3	AUZ with screws with leaden seal holes
	4	AUZ with snap lock
❺	**Transmitter (transmitters are designed for assemblies with AUZH head and one 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: MTC5L-1-800-200-00

... 1 x „K“, accuracy class 2, wire diameter 1,38 mm

... Nominal length N = 800 mm

... Holding pipe length K = 200 mm

... Head A

... Without transmitter

Approximate weight of the product: MTC5L-1-800-200-00 ... 1,0 kg

Length Tolerances (Table 5L.3)

Nominal length N	Length tolerance N	Length tolerance K
N ≤ 1000 mm	± 3 mm	± 2 mm
1000 < N mm	± 5 mm	± 2 mm

Recommended Maximum Temperatures of Sensor Parts (Table 5L.4)

Sensor part	Continuous operation	Short-term operation
Head / head with transmitter	< 100 °C / < 85 °C	-
Holding pipe	< 500 °C	-
Ceramic parts (measuring part)	< 1300 °C	-
„J“, wire diameter 1,0 mm	< 400 °C	< 520 °C
„K“, wire diameter 1,38 mm	< 900 °C	< 1020 °C
„N“, wire diameter 1,3 mm	< 950 °C	< 1090 °C

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

Head types

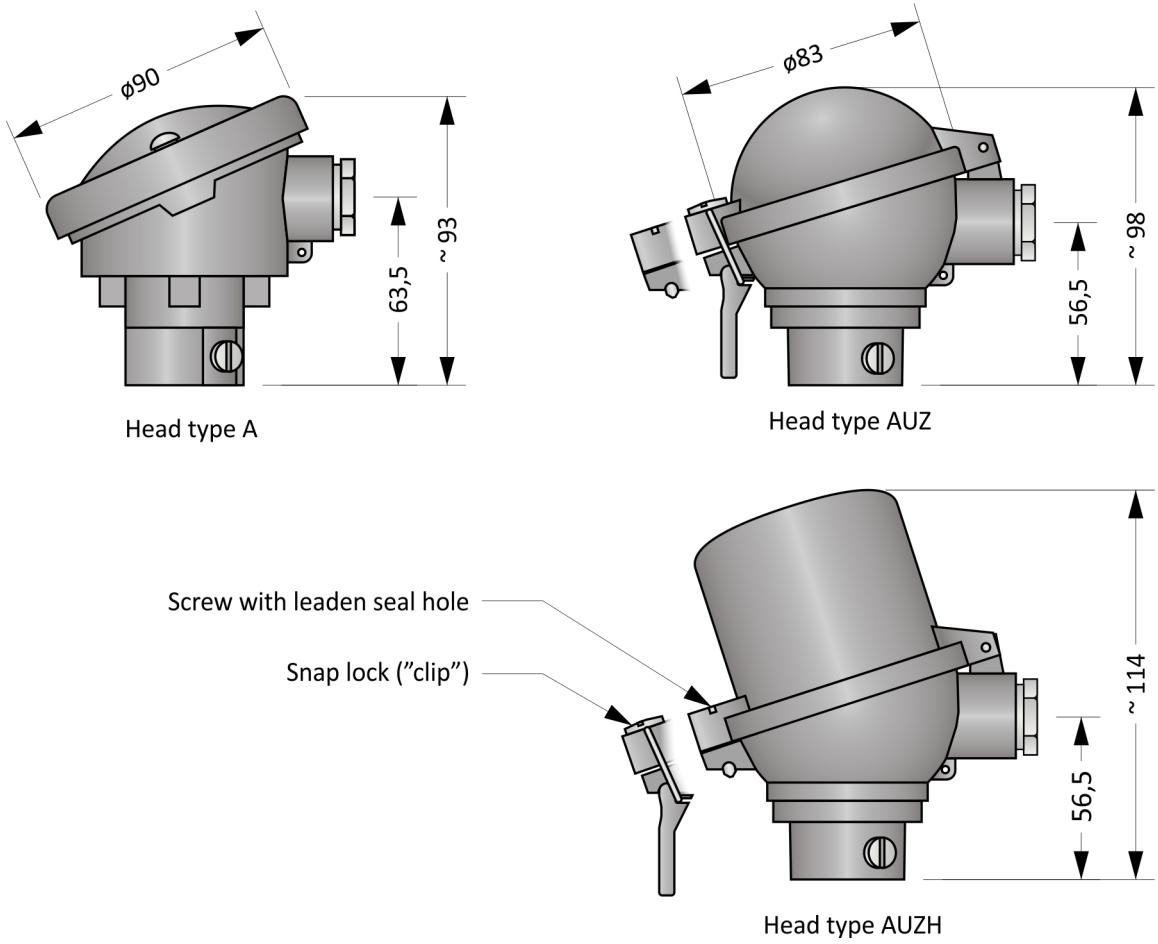

Figure 5L.2: Head types

Head mounted transmitter (Table 5L.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

For mechanical installation, a holding pipe is used. 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 5L.5.

Electrical connection of the sensor without transmitter is shown in the Figures 5L.3 and 5L.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.

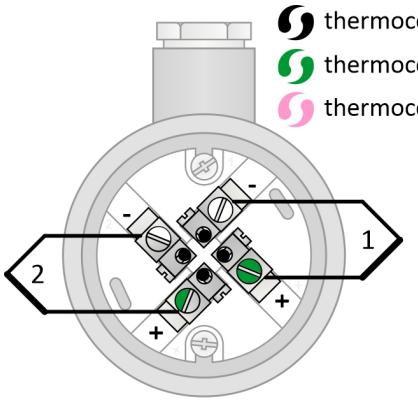

Figure 5L.3: Double thermocouple wiring diagram

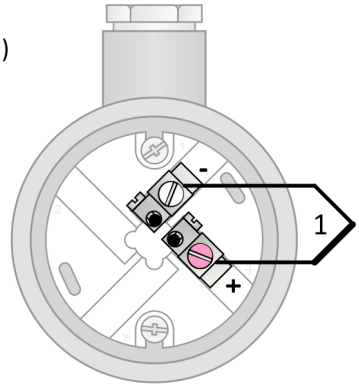

Figure 5L.4: Single thermocouple wiring diagram

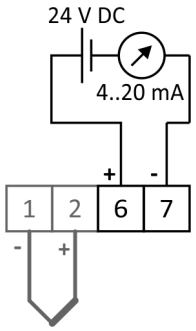

Figure 5L.5: Transmitter wiring diagram