

MTC1L

THERMOCOUPLE ASSEMBLIES WITH DOUBLE CERAMIC TUBE

Thermocouple assemblies of the MTC1L series are designed for applications with operating temperatures up to 1350°C and high chemical aggressiveness of the environment. They have a double ceramic tube: outer made of „Lunit 20“ and inner made of „Lunit 73“ material. They are characterized by good resistance to temperature shocks. The outer ceramic tube is not completely gas-tight, the inner one is. The assemblies in this series therefore provide a slightly increased long-term lifetime of the installed thermocouple compared to the MTC1 series.

The measuring element is a precious 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. Precious metal thermocouples are not included in the ordering code (ordered separately).

The assembly consists of head, holding pipe, inner and outer ceramic tube and a capillary 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 1L.1)

	Insulation class acc. ČSN EN 60529	IP54 (head) IP5X (measuring part in length N)
①	Thermocouple (not included in the assembly)	
	Thermocouple length	(N + 70) mm
	Capillary	
②	Material	Ceramic C610 (Lunit 73)
	Diameter	8,5 mm
	Bore for thermocouple	4 x ø1,5 mm
	Inner ceramic tube	
③	Material	Ceramic C610 (Lunit 73)
	Outer / inner diameter	15 / 11 mm
	Outer ceramic tube	
④	Material	Ceramic C530 (Lunit 20)
	Outer / inner diameter	26 / 18 mm
	Holding pipe	
⑤	Material	Stainless steel
	Outer / inner diameter	32 / 28 mm
	Head	
⑥	Material	Aluminium alloy
	Cable bushing	M20 x 1,5

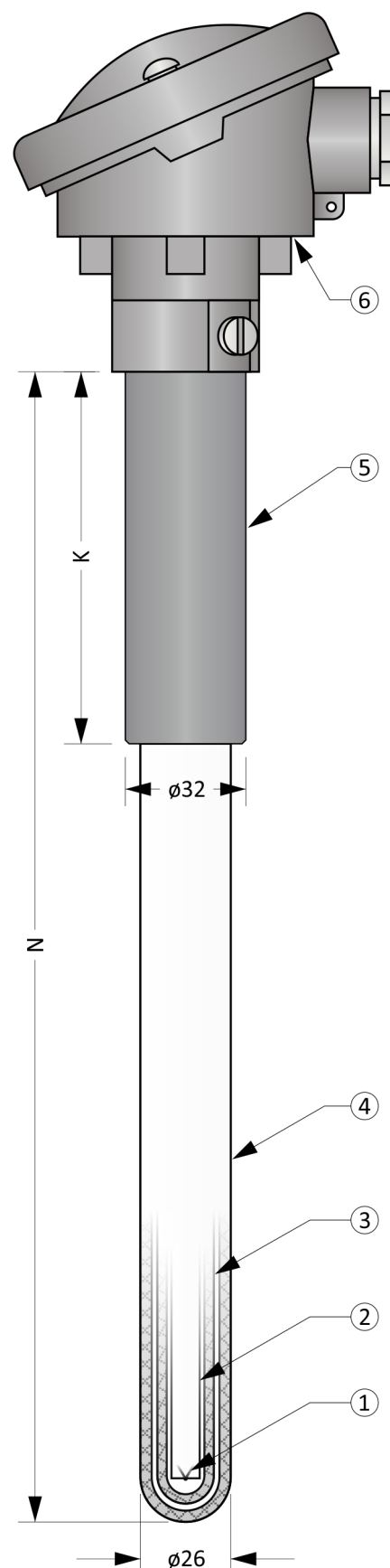


Figure 1L.1: MTC1L

Optional Parameters Including the Creation of an Order Code (Table 1L.2)

Pos.	Code	MTC1L - ① - ② - ③ ④
①	Nominal length N [mm]	
	xxx	Selectable range from 250 mm to 1600 mm (in 10 mm increments)
②	Holding pipe length K [mm]	
	xxx	Selectable range from 50 mm to (N-30) mm (in 5 mm increments)
③	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
④	Transmitter (transmitters are designed for assemblies with AUZH head and one thermocouple)	
	0	Without transmitter
	3	INOR miniPAQ - HLP
	5	NOR IPAQ C520
	6	INOR IPAQ C330
	7	INOR IPAQ C530
	A	With another transmitter (e.g. supplied by the customer)

Recommended lengths of holding pipe:
 K = 150 mm pro N < 800 mm
 K = 200 mm pro 800 ≤ N < 1000 mm
 K = 400 mm pro 1000 ≤ N mm

Order code example: MTC1L-800-200-00

... Nominal length N = 800 mm

... Holding pipe length K = 200 mm

... Head A

... Without transmitter

Approximate weight of the product: MTC1L-800-200-00 ... 1,5 kg

Length Tolerances (Table 1L.3)

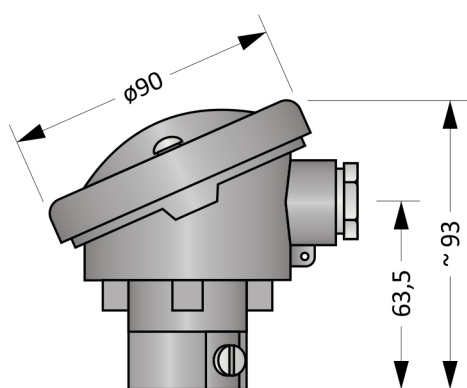
Nominal length N	Length tolerance N	Length tolerance K
$N \leq 1000$ mm	± 3 mm	± 2 mm
$1000 < N$ mm	± 5 mm	± 2 mm

Recommended Maximum Temperatures of Sensor Parts (Table 1L.4)

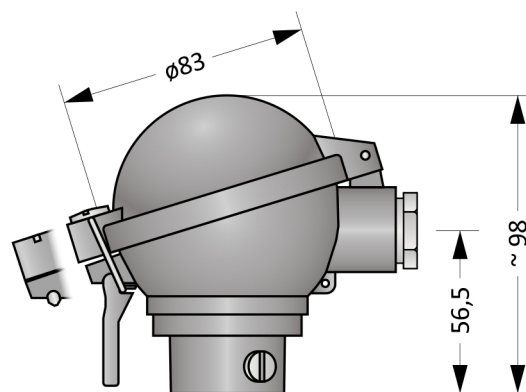
Sensor part	Continuous operation	Short-term operation
Head / head with transmitter	< 100 °C / < 85 °C	-
Holding pipe	< 500 °C	-
Ceramic parts (measuring part)	< 1350 °C	-
„S“, wire diameter 0,5 mm	< 1400 °C	< 1600 °C
„S“, wire diameter 0,35 mm	< 1300 °C	< 1400 °C
„B“, wire diameter 0,5 mm	< 1500 °C	< 1700 °C
„R“, wire diameter 0,5 mm	< 1400 °C	< 1600 °C

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

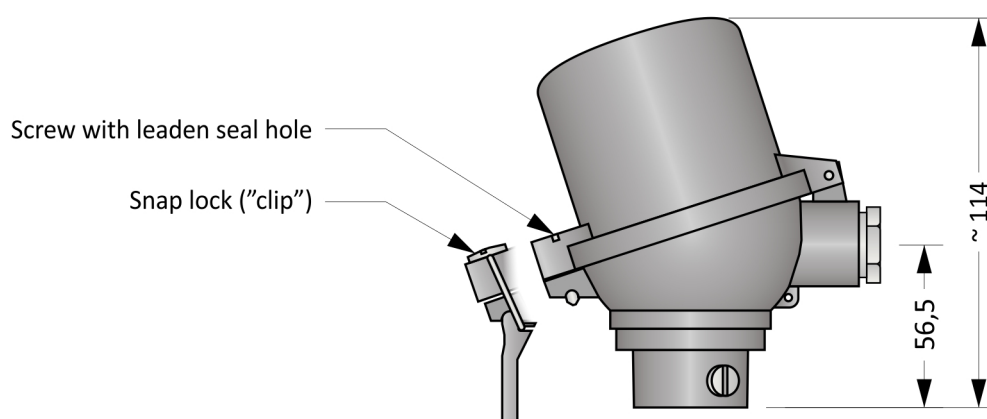
Head types



Head type A



Head type AUZ



Head type AUZH

Figure 1L.2: Head types

Head mounted transmitter (Table 1L.5)

Typ	Input	Output	Setting	Notes
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 may be exposed to a temperature gradient of up to 60 °C/min. Exceeding this value may cause damage.

The electrical connection of sensor with the transmitter is shown in Figure 1L.3.

Electrical connection of the sensor without transmitter is shown in the Figures 1L.4 and 1L.5. The output signal is thermoelectric voltage. The dependence of temperature on thermoelectric voltage is given by the standard ČSN EN 60584-1 ed. 2.

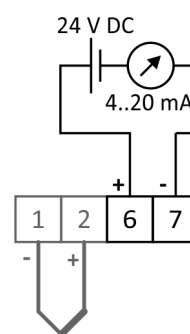


Figure 1L.3: Transmitter wiring diagram

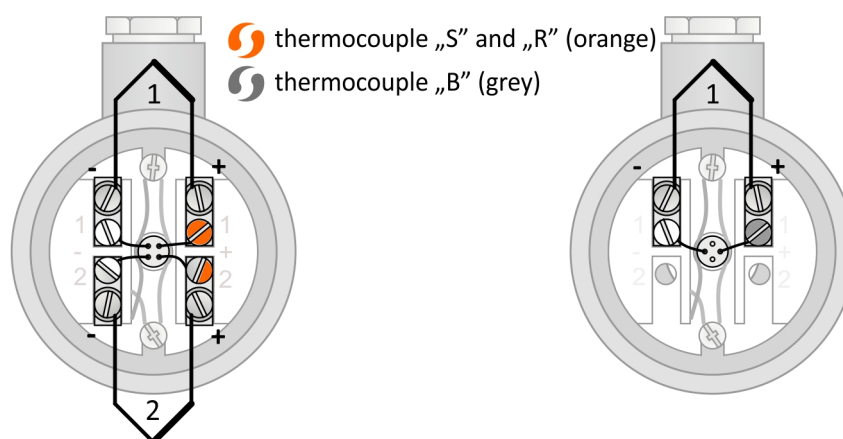


Figure 1L.4: Double thermocouple wiring diagram

Figure 1L.5: Single thermocouple wiring diagram