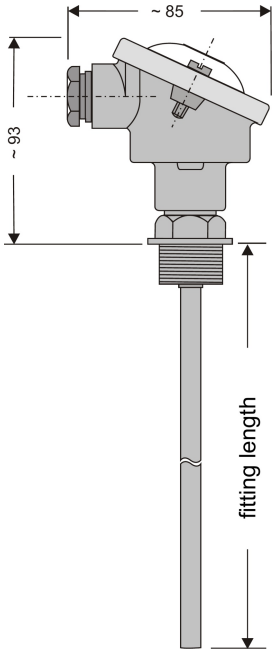
OCTOGON

MANUAL

TKMA

THERMOCOUPLE, HEAD B

Mounting and installation manual



Document	Version	Date	Applies to
Mounting and installation manual	V00x	11/2026	TKMA, all versions according to the datasheet

octogon GmbH · Roseggerstrasse 16 · 8700 Leoben · Austria · office@octogon.org

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1 About this manual

This manual describes mounting, electrical connection, testing and maintenance of the TKMA (THERMOCOUPLE, HEAD B). Manufacturer type: TE-MR1.

The device data in chapter 3 and the connection in 5.1 are taken from the TKMA datasheet (TKMA Datasheet V01x EN). Ordering options are given there. The other chapters contain general instructions for thermocouples; they do not replace the design of the respective system.

Important Read this manual completely before mounting and commissioning and keep it for later reference.

2 Safety

– The sensor measures temperatures. It may only be used within the limits given in chapter 3: operating range of the sensing element, temperature of sheath, terminal head and accessories, and protection rating.
– Mounting, connection and commissioning only by qualified personnel familiar with this manual.
– Install and remove the sensor in pipes, vessels and plant only when they are depressurised, cooled down and drained. Sheath, process connection and fastening must be suitable for the pressure, temperature, flow and medium of the plant.
– Sheath and connection parts may be hot after operation: risk of burns.
– Do not carry or pull the sensor by its cable, do not use it as a lever or step and do not modify it.
– Do not put a damaged sensor or a damaged cable into operation.

3 Device

3.1 Description

Thermocouple with terminal head B for temperature measurement in pipes, vessels and plant. One head, two forms and twelve sheath diameters; the sensing element is either type J or type K, single or double.

3.2 Sensing element

Characteristic	Value
Thermocouple	1× type J (Fe-CuNi) · 1× type K (NiCr-Ni)
	2× type J · 2× type K
Type	standard element (S) · M.I. element (M)
Form	screw-in sensor (ES) · dip-in sensor (ET)
Accuracy	according to DIN EN 60584-2 class 1
Type J	±1.5 °C (-40 ... 375 °C)
	±0.004|t| (375 ... 750 °C)
Type K	±1.5 °C (-40 ... 375 °C)
	±0.004|t| (375 ... 1000 °C)
Insulator	standard: aluminium oxide
	M.I. element: metal oxide

3.3 Sheath and length

Characteristic	Value
Material	1.4571 (316Ti) for standard element
	2.4816 (Inconel 600) for M.I. element
Ø standard element	ES 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11 · 15 mm
	ET 5 · 6 · 7 · 8 · 9 · 10 · 11 · 15 mm
Ø M.I. element	ES 1.5 · 3 · 4.5 · 6 mm · ET 6 mm
Fitting, nominal length	50 · 100 · 160 · 200 · 250 · 400 ·
	600 · 1000 mm · option on request
Maximum length	2000 mm
Process connection	1/4″ · 3/8″ · 1/2″ · 1″ ·
	1/4NPT · 3/8NPT · 1/2NPT
Bend radius	min. 5 × Ø sheath (M.I. element)

3.4 Terminal head

Characteristic	Value
Material	aluminium
Process connection	M24x1.5
Cable connection	M20x1.5
Connection	ceramic block with terminal posts
Protection	IP 54
Insulation resistance	test voltage 500 VDC

3.5 Temperature and response

Characteristic	Value
Thermocouple type J	-200 … +700 °C
Thermocouple type K	-200 … +1000 °C
Sheath 1.4571	up to 600 °C
Sheath 2.4816	up to 1100 °C
Terminal head	up to 480 °C (1)
Response 6×0.5 mm	t90 30.9 s · t50 12 s (2)
Response 6×1 mm	t90 22.1 s · t50 7.6 s
Accessories	connection cable · transmitter ·
	compression fitting

(1) The terminal head limits the application: 480 °C at its own surroundings, not at the medium.

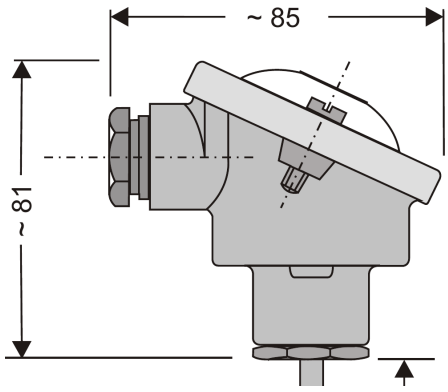
(2) The response times apply to the stated sheath geometry.

3.6 Conformity and accessories

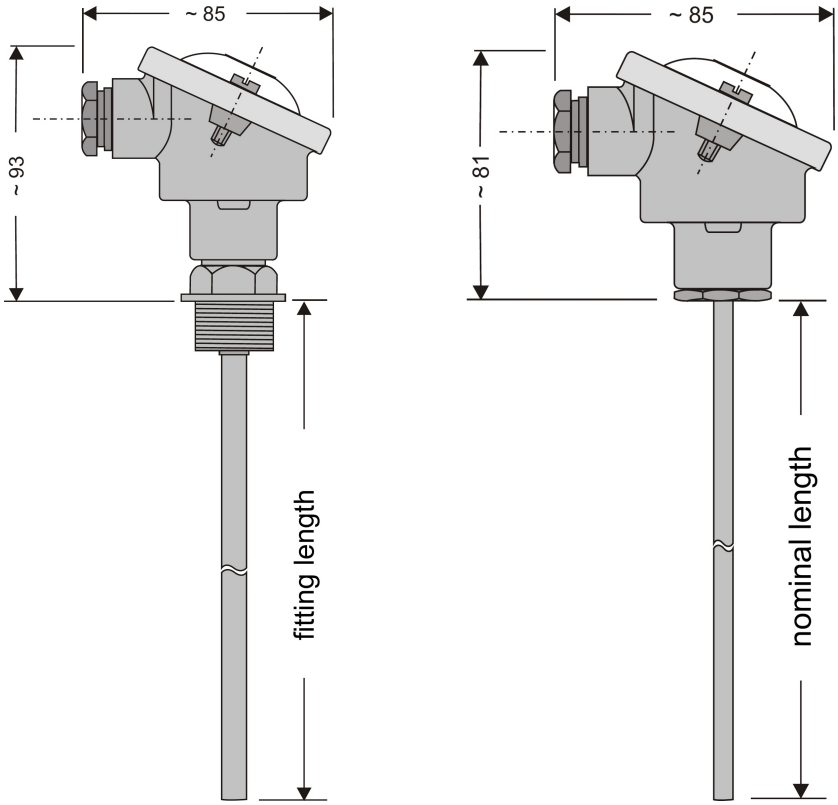
Characteristic	Value
Accuracy standard	DIN EN 60584-2 class 1 — it governs the tolerance of the thermocouple, it is not a product approval
Type approval	None. The GL type approval TAA00002H3 applies to the version TKMB
Protection	IP 54 at the terminal head

Connection cable · transmitter · compression fitting.

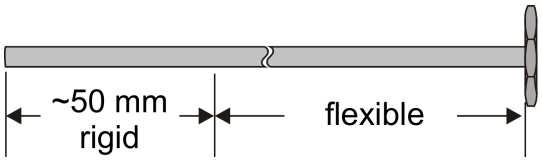
3.7 Dimensions



Terminal head B, dimensions in mm



Left form screw-in sensor (ES), right form immersion sensor (ET)



Mineral insulated element: rigid and flexible section

4 Mounting

Transport and storage

Transport and store the sensor in its packaging, dry and protected against shocks. Do not kink the sheath or the cable.

Installation point and immersion depth

The sensor measures the temperature at its tip. It must be installed so deep that the tip fully takes on the temperature to be measured; if the immersion depth is too small, heat dissipation via sheath and fastening falsifies the reading. In pipes, install it against the flow or in a pipe bend where possible.

The response times in chapter 3 apply to the sheath geometry stated there. Additional thermowells and air gaps increase them.

Fastening

Screw-in sensor (ES): screw in the process connection with a suitable seal and tighten it only at the spanner flats of the process connection; do not turn it by the terminal head. Immersion sensor (ET): fasten it with the accessories according to 3.6.

For the mineral insulated element, the rigid and the flexible section are shown in 3.7; keep to the bend radius according to 3.3.

Temperature of cable and terminal head

The surroundings of the terminal head must not become hotter than stated in 3.5. With hot surfaces and media, place the head at a sufficient distance and protect it against radiant heat.

5 Electrical connection

5.1 Connection according to the datasheet

Terminal head B holds a ceramic block with terminal posts; the cable enters through the M20x1.5 gland.

Sheath of the mineral insulated element: the first approx. 50 mm from the terminal head are rigid, the rest is flexible. The bend radius is limited to at least five times the sheath diameter.

5.2 Installation notes

- Connect only with the evaluation electronics switched off.
- Lead the cable through the cable gland and connect it to the terminal posts of the ceramic block. Use a cable gland that suits the cable diameter and close it and the cover tightly so that the protection rating is maintained.
- Route measuring cables separately from power and control cables. Connect a shield according to the specifications of the evaluation electronics.
- Do not swap the positive and negative legs of the thermocouple; observe the marking of the wires or of the plug.
- For extension use only thermocouple or compensating cable of the same type (J or K). Keep transition points (terminals, plugs) at the same temperature.
- Set the thermocouple type on the evaluation electronics; it must compensate the reference junction.
- With double elements (2×), connect both measuring circuits separately and insulate unused wires.

6 Commissioning and testing

6.1 Commissioning

Check mounting and connection according to chapters 4 and 5, then switch on the evaluation electronics and check that a plausible reading is displayed (e.g. the ambient temperature before the plant heats up).

6.2 Troubleshooting

Disconnect the sensor from the evaluation electronics and check:

- Continuity: the measuring circuit of each thermocouple must not be interrupted.
- Polarity: if the reading falls when the tip is heated, the legs are swapped.
- Insulation resistance between all wires (connected together) and sheath or shield, with no more than the test voltage according to the datasheet (test voltage 500 VDC).

Note If a measuring circuit is interrupted or the reading deviates significantly, do not continue to use the sensor and contact octogon technical customer service.

7 Maintenance, cleaning and disposal

- The sensor is maintenance-free. Check regularly: cable gland, cover and seal of the terminal head for damage, tight fit of the fastening, deposits on the sheath.
- Check the reading against a reference thermometer at intervals appropriate to the application, especially after operation close to the upper limit of the operating range.
- Clean with a damp cloth and a cleaning agent that does not attack the materials according to chapter 3.
- Dispose of the sensor as electrical and metal scrap in accordance with the applicable local regulations.