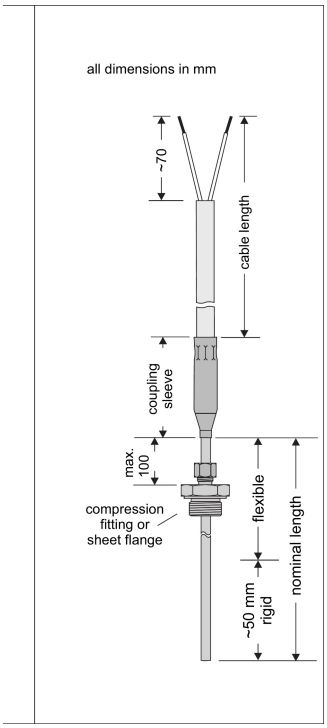
OCTOGON

MANUAL

TBMA

MINERAL INSULATED THERMOCOUPLE

Mounting and installation manual



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

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1 About this manual

This manual describes mounting, electrical connection, testing and maintenance of the TBMA (MINERAL INSULATED THERMOCOUPLE). Manufacturer type: TE-MK1.

The device data in chapter 3 and the connection in 5.1 are taken from the TBMA datasheet (TBMA 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, cable 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

Mineral insulated thermocouple with a flexible sheath and a fixed cable. The operating range is set by the cable: PVC ends at 70 °C.

3.2 Sensing element

Characteristic	Value
Thermocouple	type J (Fe-CuNi) · type K (NiCr-Ni)
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	metal oxide

3.3 Sheath and length

Characteristic	Value
Material	2.4816 (Inconel 600)
Connecting sleeve	1.4571 (316Ti)
Ø sheath	1.5 · 3 · 4.5 · 6 mm
Nominal length	standard 100 mm · option on request
Maximum length	2000 mm
Bend radius	min. 5 × Ø sheath
Connection	open ends 70 mm stripped · TC plug
	standard or mini · without cable 20 mm stripped
Sleeve to cable	hexagonal crimp · option ring crimp
Strain relief	none

3.4 Connecting cable

Characteristic	Value
Connecting cable	PVC-PVC · PTFE-silicone · PTFE-PTFE ·
	PTFE-braided screen-PTFE ·
	glass silk-glass silk-braided screen
Cable length	standard 2 m · option on request
Protection	IP 65 (up to 250 °C) (1)
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 2.4816	up to 1100 °C
Compression fitting	-75 ... +250 °C
Response Ø 3 mm	t90 5 s · t50 2 s
Cable PVC	-5 ... +70 °C
Cable silicone	-45 ... +180 °C
Cable PTFE	-75 ... +250 °C
Cable glass silk	-60 ... +550 °C

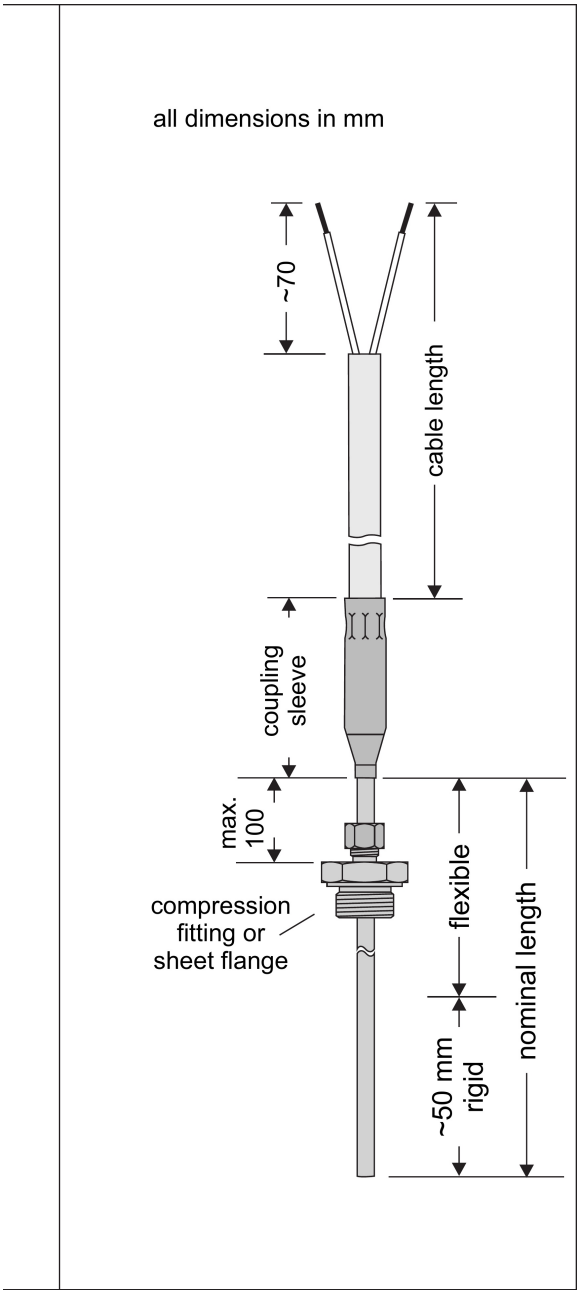
(1) IP 65 does not apply to the braided-screen version.

3.6 Conformity and accessories

Characteristic	Value
Accuracy standard	DIN EN 60584-2 class 1 — it governs the tolerance of the sensing element, it is not a product approval
Type approval	None. The GL version is a product of its own — data sheet TBMB
Protection	IP 65 up to 250 °C, not for the braided-screen version

Accessories: compression fitting and sheet metal flange.

3.7 Dimensions



Dimensions in mm

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

The sheath is flexible and can be adapted to the installation point. Bend radius according to the datasheet: min. 5 × Ø sheath. Do not bend the section marked as rigid in the drawing and do not bend the same point back and forth repeatedly. Fasten it with the accessories according to 3.6.

Temperature of the cable

The operating range is also determined by the cable (3.5). Route the cable so that it does not become hotter at any point than stated for the cable material, and fasten it with strain relief.

5 Electrical connection

5.1 Connection according to the datasheet

Cable with open ends, 70 mm; the transition to the cable is a hexagonal crimp, optionally a ring crimp.

5.2 Installation notes

- Connect only with the evaluation electronics switched off.
- Protect open cable ends against moisture; the protection rating of the sensor does not apply to the open cable end.
- 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.

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 and cable transition 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.