

Thermocouples according to DIN EN 50 446

TTeMA
TTeMAT

Straight construction type with metal protection tube

Application

The thermocouple models TTeMA and TTeMAT are designed for the measurement of high temperatures up to +1200 °C (+2192 °F). They consist of a heat-resisting steel protection tube, which houses the thermocouple wires with ceramic insulators. Additionally, a gas-tight ceramic inner tube can be installed.

For both models, we offer various thermocouple materials according to DIN EN 60 584. In addition, model TTeMAT is available with several fitted transmitters with analogue or digital output.

For model TTeMA, we offer various connection heads. Model TTeMAT is always executed with high lid (connection heads BUZ-H and AUZ-H), in which the transmitter is mounted.

Standard Versions

Measuring Element

Thermocouple types K, N, J and S according to DIN EN 60 584 as single or dual element

Operating Temperature Ranges

Protection tube material	Max. temperature
1.4571	+800 °C (+1472 °F)
1.4841	+1150 °C (+2102 °F)
1.4762	+1200 °C (+2192 °F)
1.4749	+1150 °C (+2102 °F)

Irrespective of the protection tube material, the type J (Fe-CuNi) is to be used up to max. +750 °C (+1382 °F).

Ambient Temperature Ranges¹⁾

Model TTeMA: -40 °C to +100 °C (-40 °F to +212 °F)
Model TTeMAT: -40 °C to +85 °C (-40 °F to +185 °F)

Accuracy

Class 1 according to DIN EN 60 584

Tolerance value²⁾ J, K, N: +1.5 °C or 0.004 · |t|

for type J in the range: -40 °C to +750 °C (-40 °F to +1382 °F)

for type K, N in the range: -40 °C to +1000 °C (-40 °F to +1832 °F)

Tolerance value²⁾ S: +1.0 °C or (1+(t-1100)·0.003) °C

in the entire operating temperature range

Versions according to DIN 50 446

AM: size A, metal protection tube
AMK: size A, metal protection tube with ceramic inner tube
BM: size B, metal protection tube
BMK: size B, metal protection tube with ceramic inner tube

Temperature Sensor

Metal protection tube closed on one side with ceramic insulated thermocouple(s)

	Ø protection tube	Ø wire
AM, AMK	22 x 2 mm (0.87 x 0.08")	3 mm (0.12")
BM, BMK	15 x 2 mm (0.59 x 0.08")	1.38 mm (0.05")

Noble metal thermocouples are supplied with a wire diameter of 0.5 or 0.35 mm (0.02 or 0.014") irrespective of the version according to customer request.

¹⁾ permissible operating and storage temperature at the connection head

²⁾ whichever value is higher

³⁾ the length 2000 mm (78.74") with noble metal thermocouple is not suitable for vertical installation

⁴⁾ the length 1400 mm (55.12") is not available as version BMK



Ceramic Inner Protection Tube

	C610	C799
AMK	15 x 2 mm (0.59 x 0.08")	15 x 2.5 mm (0.59 x 0.1")
BMK	10 x 1.5 mm (0.39 x 0.06")	10 x 2 mm (0.39 x 0.08")

Nominal Lengths

AM, AMK: 500, 710, 1000, 1400, 2000³⁾ mm
(19.69, 27.95, 39.37, 55.12, 78.74")
BM, BMK: 355, 500, 710, 1000, 1400⁴⁾ mm
(13.98, 19.69, 27.95, 39.37, 55.12")

Connection Heads

AM, AMK: types A, AUZ or AUZ-H
BM, BMK: types B, BUZ or BUZ-H

Degree of Protection (DIN EN 60 529)

IP54

Output Signal

Model TTeMA: thermoelectric voltage according to DIN EN 60 584
Model TTeMAT: 4...20 mA, HART® or PROFIBUS® PA/FOUNDATION™ Fieldbus

Ordering Information

See page 4

Special Versions (Upon Request)

- Other thermocouples
- Threaded bushing in stainless steel
- Special thermowell materials
- Special features, e.g. purging with inert gas
- Version with measuring insert made of sheathed, mineral insulated cable
- Solid tips, also made of cemented carbide

Accessories

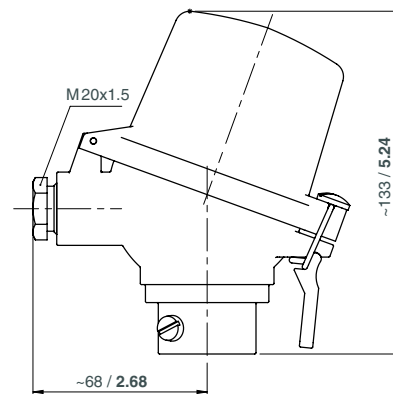
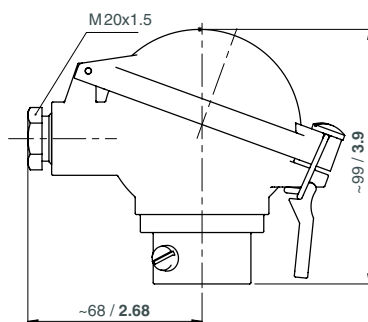
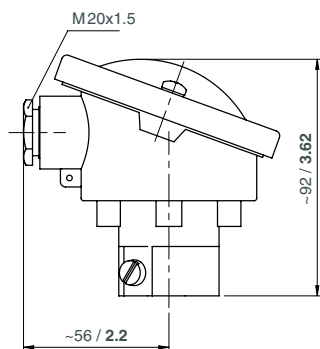
- Transmitters for rail mounting
- Digital displays for switch panel mounting or wall mounting
- Compensating cables and extension cables

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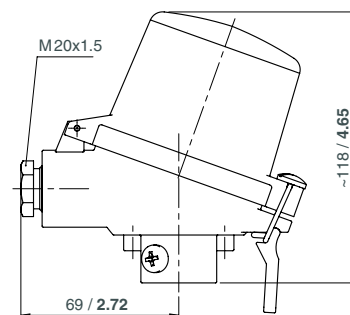
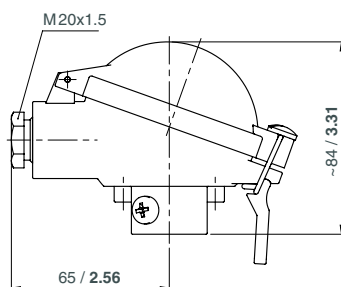
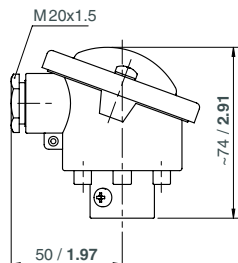
Connection Heads, Dimensional Data (mm/inches)

Connection Heads

	Head A	Head AUZ	Head AUZ-H
Material:	die-cast aluminum	die-cast aluminum	die-cast aluminum
Lid:	flanged lid with screws	hinged lid	high lid, hinged
Degree of protection:	IP54	IP54	IP54
No. of transmitters:	0	0	1
Max. installation dimensions:	Ø 56 x 20 mm (2.2 x 0.79")	Ø 56 x 13 mm (2.2 x 0.51")	lid Ø 60 x 40 mm (2.36 x 1.57") base Ø 56 x 13 mm (2.2 x 0.51")



	Head B	Head BUZ	Head BUZ-H
Material:	die-cast aluminum	die-cast aluminum	die-cast aluminum
Lid:	flanged lid with screws	hinged lid	high lid, hinged
Degree of protection:	IP54	IP54	IP54
No. of transmitters:	0	0	1
Max. installation dimensions:	Ø 44 x 21 mm (1.73 x 0.82")	Ø 45 x 40 mm (1.77 x 1.57")	lid Ø 60 x 40 mm (2.36 x 1.57") base Ø 45 x 16 mm (1.77 x 0.63")



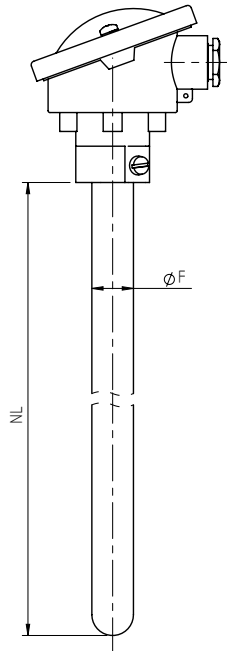
Process Connections, Dimensional Data (mm/inches)

Dimensional Data

Process connection: Without screw fitting (E1)

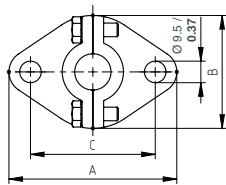
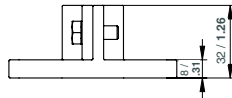
Nominal length NL: 355, 500, 710, 1000, 1400, 2000 mm (13.98, 19.69, 27.95, 39.37, 55.12, 78.74")

Protection tube Ø F: 15, 22 mm (0.59, 0.87")



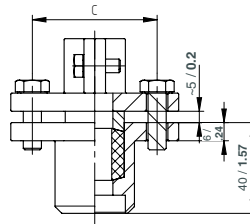
Process connections: Stop flange (E8)

Material: grey cast iron
 Gas tightness: none
 Mounting: flanging



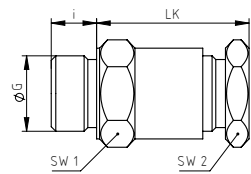
Stop flange with counter flange (E8.1)

alloy steel
 1 bar max.
 welding



Threaded bushing (E9)

alloy steel
 1 bar max.
 screwing



Protection tube Ø dF	A	B	C
15	75	50	55
0.59	2.95	1.97	2.17
22	90	65	70
0.87	3.54	2.56	2.76

G	i	LK	SW1	SW2
3/4"	18	~60	32	27
	0.71	~2.36	1.26	1.06
1"	20	~65	41	41
	0.79	~2.56	1.61	1.61

Ordering Information

Basic Model: Thermocouple According to DIN EN 50 446		TTeMA
Transmitter:	without with fitted transmitter	without code letter T
Thermocouple:	type K, NiCr-Ni type N, NiCrSi-NiSi type J, Fe-CuNi type S, Pt10Rh-Pt	K N J S
No. of thermocouples:	1 2	1 2
Connection head:	type A, aluminum, with screws ¹⁾ type AUZ, aluminum, hinged lid ¹⁾ type AUZ-H, aluminum, with screws ¹⁾ type B, aluminum, with screws ²⁾ type BUZ, aluminum, hinged lid ²⁾ type BUZ-H, aluminum, high lid ²⁾	A AUZ AUZ-H B BUZ BUZ-H
Versions according to DIN 50 446:	form A, metal protection tube form A, metal protection tube with ceramic inner tube form B, metal protection tube form B, metal protection tube with ceramic inner tube	AM AMK BM BMK
Wire diameter for noble metal thermocouples:	0.35 mm (0.01") 0.5 mm (0.02")	e.g. 0.35 mm
Protection tube material:	1.4571, 1.4749, 1.4762, 1.4841	e.g. 1.4841
Material inner tube³⁾:	C610, C799	e.g. C610
Nominal length NL:	335 ²⁾ , 500, 710, 1000, 1400, 2000 ¹⁾ mm (13.98, 19.69, 27.95, 39.37, 55.12, 78.74")	e.g. NL = 1000 mm
Process connection:	without screw fitting stop flange stop flange with counter flange threaded bushing	E1 E8 E8.1 E9
With fitted transmitter:	TT5334: 4...20 mA TT5337: 4...20 mA + HART 7 TT5350: PROFIBUS® PA/FOUNDATION™ Fieldbus	5334-A, 5334-B 5337-A, 5337-D 5350-A, 5350-B
Measuring range:	scaling of the 4...20 mA signal to the temperature range	e.g. 0 °C to +250 °C
Options:	instrument tag stainless steel plate 12 x 55 mm (0.47 x 2.17") sticker on the case	

Example: TTeMaT, K, 1, A, AM, 1.4841, C610, NL = 500 mm, E1, 5333-A, 0 °C to +250 °C

Special Versions: Please describe your requirements in cleartext!

¹⁾ only version AM and AMK

²⁾ only version BM and BMK

³⁾ only version AMK and BMK