

# Thermocouples for the Installation into Thermowells

With neck tube, replaceable measuring insert

**TTeHrA**  
**TTeHrAT**

## Application

The thermocouple models TTeHrA and TTeHrAT are designed for the installation into solid drilled or fabricated thermometer thermowells (e.g. according to DIN 43 772). Without thermowell, this version must not be applied in pressurised media.

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

## 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

Type K (NiCr-Ni): -40 °C to +1175 °C (-40 °F to +2147 °F)<sup>1)</sup>  
Type N (NiCrSi-NiSi): -40 °C to +1175 °C (-40 °F to +2147 °F)<sup>1)</sup>  
Type J (Fe-CuNi): -40 °C to +750 °C (-40 °F to +1382 °F)  
Type S (Pt10Rh-Pt): 0 °C to +1175 °C (+32 °F to +2147 °F)<sup>1)</sup>

### Ambient Temperature Ranges<sup>2)</sup>

Model TTeHrA: -40 °C to +100 °C (-40 °F to +212 °F)  
Model TTeHrAT: -40 °C to +85 °C (-40 °F to +185 °F)

### Accuracy

Class 1 according to DIN EN 60 584

Tolerance value<sup>3)</sup> 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 value<sup>3)</sup> S: +1.0 °C or (1+(t-1100)·0.003) °C

in the entire operating temperature range

### Measuring Insert

According to DIN 43 735

Spring-loaded in the connection head

Spring travel approximately 7 mm (0.28")

Insertion tube made of sheathed, mineral insulated cable

### Sheath Material

Material: Inconel 600 (2.4816) for type K, N, S  
1.4401 for type J

Insulation: MgO

### Measuring Insert Diameter

dF: 3±0.05 or 6±0.06 mm (0.12±0.002 or 0.24±0.0024")

### Neck Tube

Material: stainless steel 316Ti (1.4571)

Standard length h: 120 mm (4.7")

### Process Connection

Various thread spigots (E4.1) or union nuts (E3)

### Connection Heads

Types B, BUZ, BUZ-H, BUZ-H-W, BEG, NS or GG



**Degree of Protection** (DIN EN 60 529)  
IP65 (when mounted in a thermowell)

### Output Signal

Model TTeHrA: thermoelectric voltage according to DIN EN 60 584

Model TTeHrAT: 4...20 mA, HART® or PROFIBUS® PA/ FOUNDATION™ Fieldbus

## Ordering Information

See page 4

## Special Versions (Upon Request)

- Measuring insert diameter 4.5 or 8 mm (0.18 or 0.31")
- Other thermocouples
- Special sheath materials
- Other head-mount transmitters, also with voltage output
- Version for the subsequent mounting of transmitters
- Other connection heads
- Higher degree of protection up to IP68
- Other connection threads

## Accessories

- Thermowells, see data sheets 8.8110 ff.
- Transmitters for rail mounting
- Digital displays for switch panel mounting or wall mounting
- Compensating cables and extension cables
- For models with thermowell form 2, 2G and 2F according to DIN 43 772 see data sheet 8631

<sup>1)</sup> application range limited due to the sheath material Inconel 600

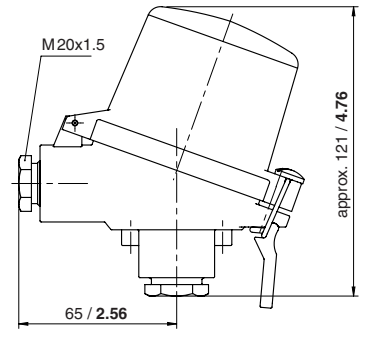
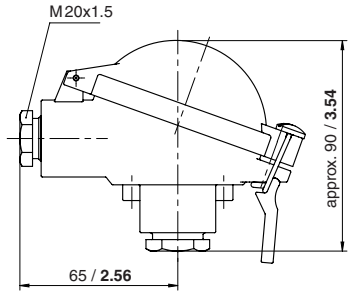
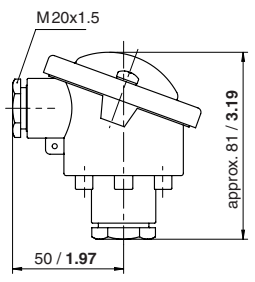
<sup>2)</sup> permissible operating and storage temperature at the connection head

<sup>3)</sup> whichever value is higher

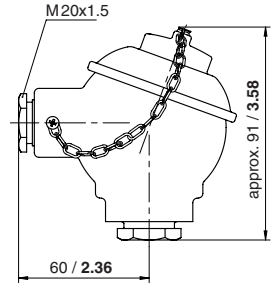
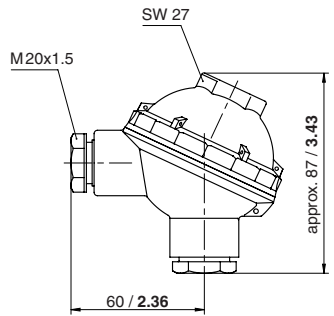
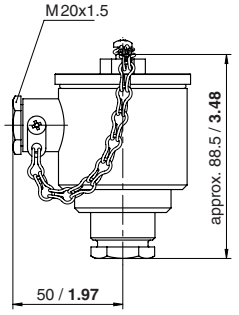
# Connection Heads, Dimensional Data (mm/inches)

## Connection Heads

	Head B	Head BUZ	Head BUZ-H <sup>1)</sup> , BUZ-H-W
<b>Material:</b>	die-cast aluminum	die-cast aluminum	die-cast aluminum
<b>Lid:</b>	flanged lid with screws	hinged lid	BUZ-H: high lid, hinged BUZ-H-W: high lid with LED display
<b>Degree of protection:</b>	IP65	IP65	IP65
<b>No. of transmitters:</b>	1	1	2
<b>Max. installation dimensions:</b>	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")



	Head BEG	Head NS	Head GG
<b>Material:</b>	stainless steel 1.4401	plastic polyphenylene oxide	grey cast iron
<b>Lid:</b>	screw-on lid	screw-on lid	screw-on lid
<b>Degree of protection:</b>	IP65	IP65	IP65
<b>No. of transmitters:</b>	1	1	1
<b>Max. installation dimensions:</b>	Ø 45 x 20 mm (1.77 x 0.79")	Ø 42 x 14 mm (1.65 x 0.55")	Ø 42 x 20 mm (1.65 x 0.79")



<sup>1)</sup> For connection head BUZ-H, the transmitter is fitted in the lid and the measuring insert is assembled with ceramic terminal block. Moreover, the head BUZ-H offers the possibility of installing two transmitters.

# Process Connections, Dimensional Data (mm/inches)

## Dimensional Data

### Process connections: Thread spigot (E4.1)

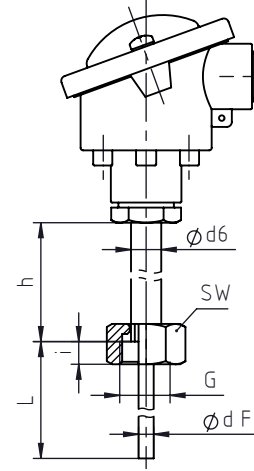
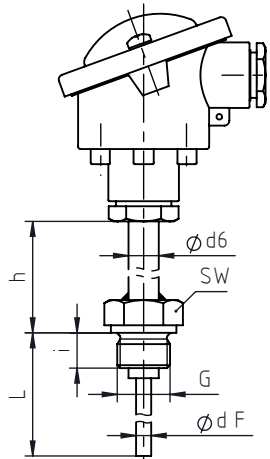
**Measuring insert Ø dF:** 3 or 6 mm (0.12 or 0.24")  
**Installation length L:** 30 – 2000 mm (1.18 – 78.74")<sup>1)</sup>  
**Neck tube length h:** 120 mm (4.72")<sup>2)</sup>  
**Measuring insert length:** L + h + 35 mm (1.38")<sup>3)</sup>  
**Connection thread:**

G	SW	i	d6
G ½ B (½" BSP)	27 1.06	14 0.55	12 0.47
M14x1.5	19 0.75	12 0.47	12 0.47
M18x1.5	24 0.94	14 0.55	12 0.47
M20x1.5	27 1.06	14 0.55	12 0.47

### Union nut (E3)

**Measuring insert Ø dF:** 3 or 6 mm (0.12 or 0.24")  
**Installation length L:** 30 – 2000 mm (1.18 – 78.74")<sup>1)</sup>  
**Neck tube length h:** 120 mm (4.72")<sup>2)</sup>  
**Measuring insert length:** L + h + 35 mm (1.38")<sup>3)</sup>

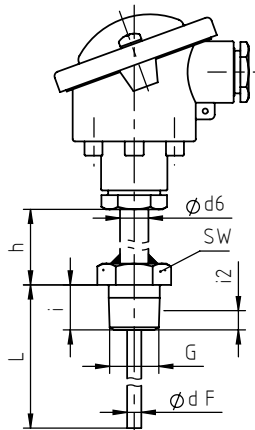
G	SW	i	d6
G ½ B (½" BSP)	27 1.06	10 0.39	12 0.47
G ¾ B (¾" BSP)	32 1.26	12 0.47	12 0.47
M18x1.5	27 1.06	10 0.39	12 0.47
M20x1.5	32 1.26	12 0.47	12 0.47
M27x2	32 1.26	12 0.47	12 0.47



### Process connection: Thread spigot conical (E4.1)

**Measuring insert Ø dF:** 3 or 6 mm (0.12 or 0.24")  
**Installation length L:** 30 – 2000 mm (1.18 – 78.74")<sup>1)</sup>  
**Neck tube length h:** 120 mm (4.72")<sup>2)</sup>  
**Measuring insert length:** L + h + 35 mm (1.38")<sup>4)</sup>  
**Connection thread:**

G	SW	i	d6	i2
½" NPT	27 1.06	19 0.75	12 0.47	8.13 0.32



<sup>1)</sup> For lengths exceeding 2000 mm, the measuring insert is supplied as coil.

<sup>2)</sup> Other lengths are available upon request. The minimum length is 20 mm.

<sup>3)</sup> The measuring insert length should be selected according to DIN 43 735 so that the installation dimension (L) is 3 ± 1 mm longer than the drilling depth of the thermowell.

<sup>4)</sup> The measuring insert length should be selected according to DIN 43 735 so that the installation dimension (L - i + i2) is 3 ± 1 mm longer than the drilling depth of the thermowell. Please also note our technical information sheet T08-000-032.

## Ordering Information

Basic Model:		Thermocouple for the Installation into Thermowells	TTeHrA
<b>Transmitter:</b>	without		without code letter
	with fitted transmitter		T
<b>Thermocouple:</b>	type K, NiCr-Ni		K
	type N, NiCrSi-NiSi		N
	type J, Fe-CuNi		J
	type S, Pt10Rh-Pt		S
<b>No. of thermocouples:</b>	1		1
	2		2
<b>Measuring insert Ø dF:</b>	3 mm (0.12")		dF = 3 mm
	6 mm (0.24")		dF = 6 mm
<b>Connection head:</b>	type B, aluminum, with screws		B
	type BUZ, aluminum, hinged lid		BUZ
	type BUZ-H, aluminum, high lid		BUZ-H
	type BUZ-H-W, aluminum, high lid with LED display		BUZ-H-W
	type BEG, stainless steel, screw-on lid		BEG
	type NS, polyphenylene oxide, screw-on lid		NS
<b>Process connection:</b>	thread spigot		E4.1
	union nut		E3
<b>Connection thread:</b>	see page 3	e.g.	G ½ B
<b>Installation length:</b>	L in mm	e.g.	L = 200 mm
<b>With fitted transmitter:</b>	TT5334: 4...20 mA		5334-A, 5334-B
	TT5337: 4...20 mA + HART 7		5337-A, 5337-D
	TT5350: PROFIBUS® PA/ FOUNDATION™ Fieldbus		5350-A, 5350-B
<b>Measuring range:</b>	scaling of the 4...20 mA signal to the temperature range	e.g.	0 °C to +600 °C
<b>Options:</b>	crimped-on tube sleeve 50 mm (1.97") for alignment to the internal thermowell diameter	Ø 8 mm (0.31")	
	neck tube length h	other lengths, min. 20 mm (0.79")	
	instrument tag	stainless steel plate 12 x 55 mm (0.47 x 2.17") sticker on the case	
<b>Example:</b>	TTeHrAT, K, 1, dF = 6 mm, BUZ, E4.1, G ½ B, L = 500 mm, 5334-A, 0 °C to +600 °C		
<b>Special Versions:</b> Please describe your requirements in cleartext!			