

# Thermocouples according to DIN EN 50 446

**TTeKA**  
**TTeKAT**

Straight construction type with ceramic protection tube

## Application

The thermocouple models TTeKA and TTeKAT are designed for the measurement of high temperatures up to +1600 °C (+2912 °F). They consist of a ceramic 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 TTeKAT is available with several fitted transmitters with analogue or digital output.

For model TTeKA, we offer various connection heads. Model TTeKAT 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 and S according to DIN EN 60 584 as single or dual element

### Operating Temperature Ranges

| Protection tube material | Max. temperature    |
|--------------------------|---------------------|
| C610                     | +1500 °C (+2732 °F) |
| C799                     | +1600 °C (+2912 °F) |

Irrespective of the protection tube material, the types K and N are to be used up to max. +1200 °C (+2192 °F).

### Ambient Temperature Ranges<sup>1)</sup>

Model TTeKA: -40 °C to +100 °C (-40 °F to +212 °F)  
Model TTeKAT: -40 °C to +85 °C (-40 °F to +185 °F)

### Accuracy

Class 1 according to DIN EN 60 584

Tolerance value<sup>2)</sup> K, N: +1.5 °C or 0.004 · |t|  
in the range: -40 °C to +1000 °C (-40 °F to +1832 °F)  
Tolerance value<sup>2)</sup> S: +1.0 °C or (1+(t-1100)·0.003) °C  
in the entire operating temperature range

### Versions according to DIN 50 446

AK: size A, ceramic protection tube without inner tube  
AKK: size A, ceramic protection tube with inner tube  
BK: size B, ceramic protection tube without inner tube  
BKK: size B, ceramic protection tube with inner tube

### Temperature Sensor

Ceramic protection tube closed on one side made of C610 or C799 with ceramic insulated thermocouple(s)

### Ceramic Inner Protection Tube

Optionally available in ceramic C610 or C799

### Nominal Lengths

AK: 500, 710, 1000, 1400, 2000 mm (19.69, 27.95, 39.37, 55.12, 78.74")  
AKK: 500, 710, 1000, 1400 mm (19.69, 27.95, 39.37, 55.12")  
BK: 355, 500, 710, 1000 mm (13.98, 19.69, 27.95, 39.37")  
BKK: 355, 500 mm (13.98, 19.69")

<sup>1)</sup> permissible operating and storage temperature at the connection head

<sup>2)</sup> whichever value is higher



### Connection Heads

AK, AKK: types A, AUZ or AUZ-H  
BK, BKK: types B, BUZ or BUZ-H

**Degree of Protection** (DIN EN 60 529)  
IP54

### Output Signal

Model TTeKA: thermoelectric voltage according to DIN EN 60 584  
Model TTeKAT: 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

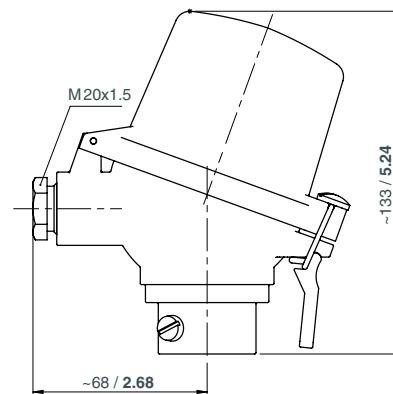
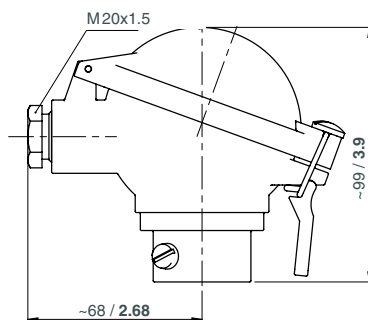
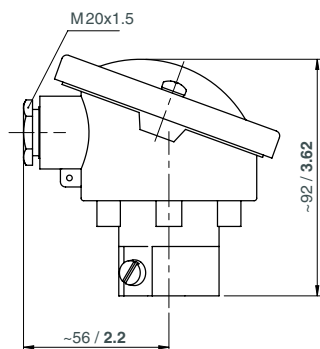
## Accessories

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

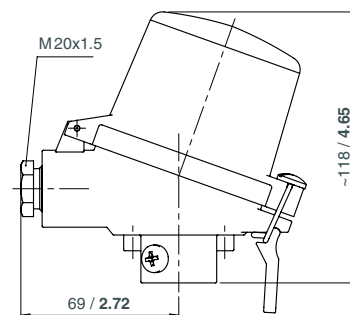
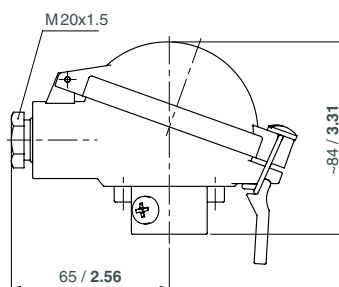
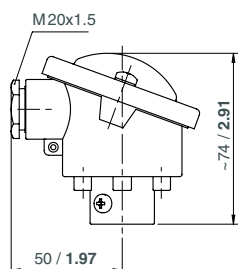
## Connection Heads, Dimensional Data (mm/inches)

### Connection Heads

|                                      | Head A                     | Head AUZ                   | Head AUZ-H   |
|--------------------------------------|----------------------------|----------------------------|--|
| <b>Material:</b>                     | die-cast aluminum          | die-cast aluminum          | die-cast aluminum  |
| <b>Lid:</b>                          | flanged lid with screws    | hinged lid                 | high lid, hinged   |
| <b>Degree of protection:</b>         | IP54                       | IP54                       | IP54   |
| <b>No. of transmitters:</b>          | 0                          | 0                          | 1  |
| <b>Max. installation dimensions:</b> | 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")<br>base Ø 56 x 13 mm (2.2 x 0.51") |



|                                      | Head B                      | Head BUZ                    | Head BUZ-H  |
|--------------------------------------|-----------------------------|-----------------------------|---|
| <b>Material:</b>                     | die-cast aluminum           | die-cast aluminum           | die-cast aluminum   |
| <b>Lid:</b>                          | flanged lid with screws     | hinged lid                  | high lid, hinged  |
| <b>Degree of protection:</b>         | IP54                        | IP54                        | IP54  |
| <b>No. of transmitters:</b>          | 0                           | 0                           | 1   |
| <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")<br>base Ø 45 x 16 mm (1.77 x 0.63") |



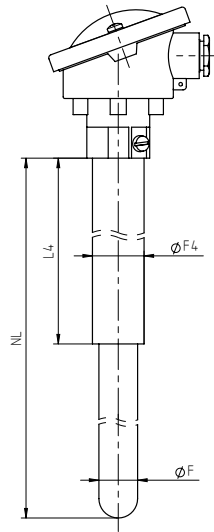
# Process Connections, Dimensional Data (mm/inches)

## 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: 10, 15, 22 mm (0.39, 0.59, 0.87")



|     | Calculation protection tube (Fxs <sup>1)</sup> ) |                            | Calculation inner tube (F2xs <sup>1)</sup> ) |                           | Dimensions retaining tube |                 | Wire diameter    |   |
|-----|--|----------------------------|--|---------------------------|---------------------------|-----------------|------------------|---|
|     | C610   | C799                       | C610   | C799                      | Ø F4 x s <sup>1)</sup>    | length L4       | type K, N        | type S  |
| AK  | 24 x 2.5 mm<br>0.94 x 0.1"                       | 24 x 3 mm<br>0.94 x 0.12"  | –  | –                         | 32 x 2 mm<br>1.26 x 0.08" | 200 mm<br>7.87" | 3 mm<br>0.12"    | 0.35 mm<br>0.01"<br>or<br>0.5 mm<br>0.02" <sup>2)</sup> |
|     | 15 x 2 mm<br>0.59 x 0.08"                        | 15 x 2.5 mm<br>0.59 x 0.1" | –  | –                         | 22 x 2 mm<br>0.87 x 0.08" | 150 mm<br>5.91" | 1.38 mm<br>0.05" |   |
| AKK | 15 x 2 mm<br>0.59 x 0.08"                        | 15 x 2.5 mm<br>0.59 x 0.1" | 10 x 1.5 mm<br>0.39 x 0.06"                  | 10 x 2 mm<br>0.39 x 0.08" | 22 x 2 mm<br>0.87 x 0.08" | 150 mm<br>5.91" | 1.38 mm<br>0.05" |   |
| BK  | 10 x 1.5 mm<br>0.39 x 0.06"                      | 10 x 2 mm<br>0.39 x 0.08"  | –  | –                         | 15 x 2 mm<br>0.59 x 0.08" | 80 mm<br>3.15"  | 1.38 mm<br>0.05" |   |
| BKK | 10 x 1.5 mm<br>0.39 x 0.06"                      | 10 x 2 mm<br>0.39 x 0.08"  | –  | 6 x 1 mm<br>0.24 x 0.04"  | 15 x 2 mm<br>0.59 x 0.08" | 80 mm<br>3.15"  | –                |   |

Process connections: Stop flange (E8)

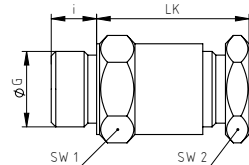
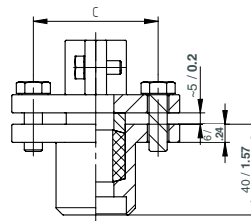
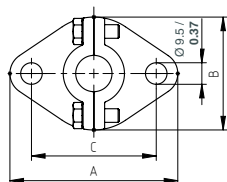
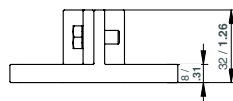
Stop flange with counter flange (E8.1)

Threaded bushing (E9)

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

alloy steel  
1 bar max.  
welding

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<br>0.71 | ~60<br>~2.36 | 32<br>1.26 | 27<br>1.06 |
| 1"   | 20<br>0.79 | ~65<br>~2.56 | 41<br>1.61 | 41<br>1.61 |

<sup>1)</sup> s = wall thickness protection tube

<sup>2)</sup> the construction type BKK contains as dual thermocouple always wire with a diameter of 0.35 mm (0.01")

## Ordering Information

| Basic Model: Thermocouple According to DIN EN 50 446 |   | TTeKA   |
|--|---|---|
| <b>Transmitter:</b>                                  | without<br>with fitted transmitter  | without code letter<br><b>T</b>   |
| <b>Thermocouple:</b>                                 | type K, NiCr-Ni<br>type N, NiCrSi-NiSi<br>type S, Pt10Rh-Pt   | <b>K</b><br><b>N</b><br><b>S</b>  |
| <b>No. of thermocouples:</b>                         | 1<br>2  | <b>1</b><br><b>2</b>  |
| <b>Connection head:</b>                              | type A, aluminum, with screws <sup>1)</sup><br>type AUZ, aluminum, hinged lid <sup>1)</sup><br>type AUZ-H, aluminum, with screws <sup>1)</sup><br>type B, aluminum, with screws <sup>2)</sup><br>type BUZ, aluminum, hinged lid <sup>2)</sup><br>type BUZ-H, aluminum, high lid <sup>2)</sup> | <b>A</b><br><b>AUZ</b><br><b>AUZ-H</b><br><b>B</b><br><b>BUZ</b><br><b>BUZ-H</b>                            |
| <b>Versions according to DIN 50 446:</b>             | size A, ceramic protection tube without inner tube<br>size A, ceramic protection tube with inner tube<br>size B, ceramic protection tube without inner tube<br>size B, ceramic protection tube with inner tube  | <b>AK</b><br><b>AKK</b><br><b>BK</b><br><b>BKK</b>  |
| <b>Wire diameter for noble metal thermocouples:</b>  | 0.35 mm (0.01")<br>0.5 <sup>3)</sup> mm (0.02")   | e.g. <b>0.35 mm</b>   |
| <b>Protection tube material:</b>                     | C610, C799  | e.g. <b>C610</b>  |
| <b>Material inner tube:</b>                          | C610, C799  | e.g. <b>C799</b>  |
| <b>Nominal length NL:</b>                            | 335 <sup>2)</sup> , 500, 710 <sup>3)</sup> , 1000, 1400 <sup>1)</sup> , 2000 <sup>1)</sup> mm (13.98, 19.69, 27.95, 39.37, 55.12, 78.74")   | e.g. <b>NL = 500 mm</b>   |
| <b>Process connection:</b>                           | without screw fitting<br>stop flange<br>stop flange with counter flange<br>threaded bushing   | <b>E1</b><br><b>E8</b><br><b>E8.1</b><br><b>E9</b>  |
| <b>With fitted transmitter:</b>                      | TT5334: 4...20 mA<br>TT5337: 4...20 mA + HART 7<br>TT5350: PROFIBUS® PA/FOUNDATION™ Fieldbus  | <b>5334-A, 5334-B</b><br><b>5337-A, 5337-D</b><br><b>5350-A, 5350-B</b>                                     |
| <b>Measuring range:</b>                              | scaling of the 4...20 mA signal to the temperature range  | e.g. <b>0 °C to +250 °C</b>   |
| <b>Options:</b>                                      | neck tube length h<br>instrument tag  | other lengths, min. 20 mm (0.79")<br>stainless steel plate 12 x 55 mm (0.47 x 2.17")<br>sticker on the case |

**Example:** TTeKAT, K, 1, BUZ, AKK, C610, C799, NL = 500 mm, E1, 5334-A, 0 °C to +300 °C

**Special Versions:** Please describe your requirements in cleartext!

<sup>1)</sup> only version AK or AKK  
<sup>2)</sup> only version BK and BKK  
<sup>3)</sup> not for version BKK