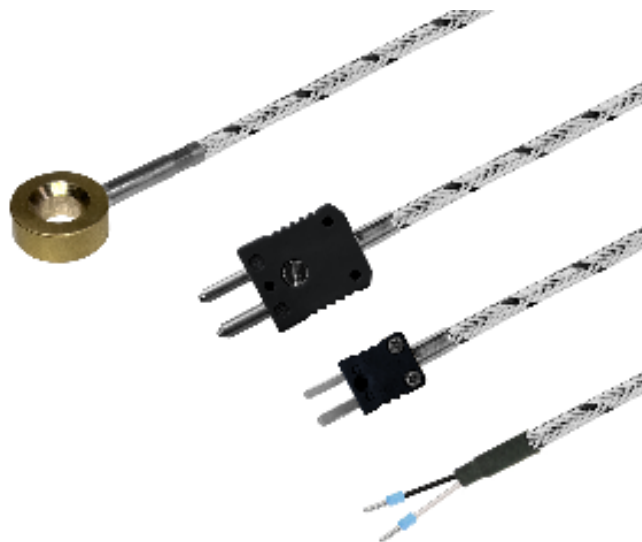


User Manual

Thermocouple with ring Type J with glass fibre cable

Article no.802082 1111



HP / CK 03.07.2025

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🌐 Please find our whole temperature probe and transmitter portfolio in our webshop at: www.testo-sensor.shop

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1. General

- The temperature probe described in the operating instructions is manufactured according to the current state of the art. All components are subject to strict quality and environmental criteria during manufacture. Our management systems are certified according to ISO 9001 and ISO 14001. The general terms and conditions in the sales documents apply, subject to technical changes.
- These operating instructions are an important part of the product. It must be available to qualified personnel and must be carefully read and understood before starting any work. Please be sure to comply with all the safety and handling instructions given. In particular, observe the local accident prevention regulations and general safety regulations applicable to the area of use of the product.
- The manufacturer's liability expires in the event of damage caused by improper use, non-observance of the instructions, use of insufficiently qualified personnel and unauthorised modifications to the product.

1.1. Security

WARNING! Before installation, commissioning and operation, please make absolutely sure that the correct temperature probe has been selected with regard to design and specific measuring conditions. Failure to do so may result in serious personal injury and/or damage to property.

- The selection of the products and, in particular, the determination of their suitability for a specific purpose are the sole responsibility of the purchaser, who must also ensure that incorrect planning, operation or installation does not cause any further damage and that compliance with the relevant construction and safety guidelines is observed and guaranteed.
- No liability or warranty is expressly accepted for damage caused by incorrect planning, operation, installation or malfunction of the products.
- The technical data and connection conditions in the supplied installation and operating instructions apply exclusively. Changes are possible in the interests of technical progress and the continuous improvement of our products.

1.2. Intended use

- For the intended use of the probe, please refer to the technical data and the commissioning instructions in the operating instructions. The product is designed and built exclusively for the intended use described there and may only be used accordingly. The technical specifications must be observed. Claims due to improper use are excluded.
- This product must not be used for safety-relevant tasks, such as monitoring or protecting persons against danger or injury, as an emergency stop switch on systems or machines, etc.
- This type of temperature probe has been developed, qualified and manufactured to the highest quality standards. Application-specific environmental or stress conditions can influence the behaviour and lead to deviations from the specifications in the data sheet. To avoid this, we recommend application-specific advice.

Application-specific environmental or stress conditions can be in particular:

- Ingress of humidity, which can lead to falsification of measured values
- Vibration, which causes high acceleration forces
- UV irradiation, which can lead to embrittlement of the cable insulation
- Tensile forces acting on the cable, which can damage the probe's internal structure
- Insufficient thermal coupling to the measured medium, with increased response times as a result
- impact with excessively high temperatures, which can change or destroy the built-in measuring resistor or electronic components
- corrosion at the cable ends or the connector contacts, so that measured value falsifications can occur

1.3. Personnel qualification

WARNING! - Risk of injury due to insufficient professional qualification! Improper handling can lead to considerable personal injury and damage to property.

- The activities described in these operating instructions may only be carried out by adequately qualified personnel. Special operating conditions may require additional, appropriate knowledge, e.g. about aggressive media, possible dangers or country-specific regulations, standards or guidelines. Please keep unqualified personnel away from the danger areas.

1.4. Signage, safety labels, type plate

Products are labelled as follows. (Exemplary representation)

Label for temperature probes with housing/head



Label for cable probes (attached to the cable as a flag)



2. Transport, packaging and storage

Transport: Please inspect the product for any transport damage immediately after delivery. Please notify us immediately of any obvious damage.

Packaging: Please remove the packaging only immediately before assembly and keep it, as the packaging provides optimum protection during transport.

Storage: The permissible storage temperature is -20 ... +70 °C and the ambient humidity conditions at the storage location should preferably be approx. 20% ... 85% relative humidity; condensation should be avoided.

The following influences should be avoided:

- Direct sunlight or proximity to hot objects
- Mechanical vibration, mechanical shock (hard impact)
- Exposure to soot, steam, dust or corrosive gases
- Explosive environment, flammable atmospheres

Original packaging: Please store the product in the original packaging in a place that meets the conditions listed above. If the original packaging is not available, please pack and store the product as follows:

- Wrap the product in an antistatic plastic sheet.
- Place the product with the insulation material in the packaging.
- For longer storage (more than 30 days), add a bag of desiccant to the packaging.

3. Commissioning

3.1. Assembly

- The products may only be connected in a de-energised state, only to safety extra-low voltages and only by suitably qualified personnel.
- Please observe the safety regulations of the VDE, the federal states, their monitoring bodies, the TÜV and the local EVU. The installation instructions in the data sheet must be observed.
- Please observe EMC guidelines to prevent damage, faults on the product or measured value deviations.

3.2. Requirements for achieving the protection class (IP 65)

- Only use the cable gland in the specified clamping range (select the cable Ø to match the cable gland).
- Do not use the lower clamping area when using very soft cable types.
- Only use round cables (a slightly oval cross-section may also be suitable).
- Do not twist the cable.
- Multiple opening/closing is possible, but can have a negative effect on the protection class.
- For cables with pronounced cold flow behaviour, please tighten the screw connection if necessary.

3.3. Drilling template

You will find the drilling template, if available, in the technical data.

3.4. Pin assignment

The characteristics of our sensors can be found on our website or in the appendix to these operating instructions.

- The products are designed for operation on safety extra-low voltages (SELV).
- For the electrical connection of the products, the technical data of the products apply.
- Especially for passive probes (e.g. Pt100 etc.) in a two-wire circuit, the lead resistance of the supply line must be taken into account in order to correct measured value deviations (offset).
- If necessary, the lead resistance must be corrected in the subsequent electronics.
- Due to self-heating, the measuring current influences the measuring accuracy. Therefore, the measuring current should not be greater than 1 mA.

Wiring diagram



3.5. Maintenance

The product is maintenance-free. Repairs may only be carried out by the manufacturer or by qualified personnel.

3.6. Disposal

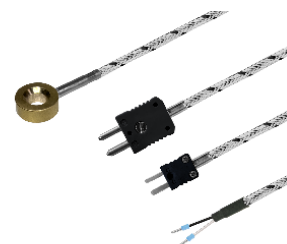
The product is to be classified as electrical and electronic equipment, so that it must be disposed of as electrical / electronic waste. Alternatively, you can return the product to us for proper disposal. The product should not be disposed of as household waste. Special treatment for special components may be legally mandatory and ecologically sensible. Please also observe the local legislation applicable to disposal.

4. Technical data and assembly instructions

Thermocouple with ring Type J with glass fibre cable

Article no.802082 1111

Our contact thermocouple with ring type J and glass fiber cable is used for temperature measurements on smooth surfaces in machine and apparatus construction. The sensor is attached via a screw connection and can be mounted directly onto the surface with the ring. The glass fiber cable is crimped and offers less sealing compared to other cable materials due to the insulation material used. However, it is ideally suited for use in temperature ranges up to +400 °C. We offer various cable lengths and connection plugs so that you can adapt the thermocouple optimally to your installation situation. You will find suitable plugs and connection cables in our accessories.



| General Information | |
|----------------------|--|
| Measuring range | -40 °C to +400 °C depending on chosen connection cable |
| Perm. °C range cable | -50 °C to +400 °C |
| Accuracy | -40 °C to +375 °C: ±1,5 °C 375 °C to 750 °C: ±0,004 t according to DIN IEC 60584 Class 1 |

| Supply and output | |
|--------------------|--------------------------|
| Measuring element | Thermocouple Type J |
| Measuring point | Measuring point isolated |
| Measurement signal | Thermovoltage |

| Ambient conditions | |
|---|--|
| Protection class | IP20 according to DIN 60529 (depending on cable) |
| Humidity and moisture condensation resistance | according to application-specific qualification |

| Certificates and Standards | |
|----------------------------|--|
| Standards | DIN EN 61326-1:2013 DIN EN IEC 63000:2019-05 |
| Directive | RoHS 2011/65/EU 2014/30/EU |



Customizable options

- E - Material connection cable
- F - Length connection cable
- G - Connector
- H - Bend protection

| Contact body | | | | |
|--------------|---|-------|-------------------|---------|
| Picture | Contact body | | Dimensioning | Drawing |
| | Contact geometry | Ring | Height (mm) | 6 |
| | Material | Brass | Total length (mm) | 36 |
| | Mounting hole (mm) | 6,8 | Ø (mm) | 16 |
| | We offer other contact bodies on request. | | | |
| | | | | |

| E - Cable material and configuration connection cable | | | | | | | | | | | |
|--|-------|--------------------|----------------------|------|-------------------------|-----------------------|------------------|-----------------|----------------------|----------------------|--------------|
| Picture | Code | Type | Color | IP | From (°C) ¹⁾ | To (°C) ¹⁾ | Outside material | Material strand | Ø (mm) ²⁾ | Q (mm ²) | Color strand |
| | E8310 | Thermocouple cable | Type J ³⁾ | IP20 | -50 | +400 | Varnish | Glass fibre | 3,0 | 0,22 | bk, wt |
| Insulation resistance: ≥ 100 MOhm a min. 100 VDC ¹⁾ Perm. range °C ²⁾ Tolerance ± 0,2 mm ³⁾ Color according to IEC 584 ⁴⁾ per thermocouple | | | | | | | | | | | |

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| F - Length | | | | | | | | |
|------------|------|------|------|------|------|------|------|------|
| Code | F010 | F020 | F030 | F040 | F050 | F100 | F150 | F200 |
| m | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 |

Other lengths on request

| G - Connector | | | |
|---------------|------|--------------------------------|-----------------------------|
| Picture | Code | Feature | Technical drawing - Stecker |
| | G01 | Insulated end ferrules (50 mm) | |
| | G11 | Mini-TC connector Type J bk | |
| | G31 | TC connector Type J bk | |

| H - Bend protection | | | | |
|---------------------|-------------|---|------|-----------------------|
| Picture | Length (mm) | Material | Code | Feature |
| | 50 | Stainless steel spring 1.4310 SUS 302 | H0 | Without (Standard) |
| | | | H1 | Metal bend protection |

| Your order code | | | | |
|-----------------|---------------------------|-------------------------|-----------|-----------------|
| Article no. | Material connection cable | Length connection cable | Connector | Bend protection |
| 802082 1111 | E_____ | F_____ | G_____ | H_____ |

| Delivery and Assembly | |
|------------------------|--------------------------------------|
| Assembly instructions | by means of screw fastening |
| Delivery and Packaging | Probe, separately packaged in PE bag |

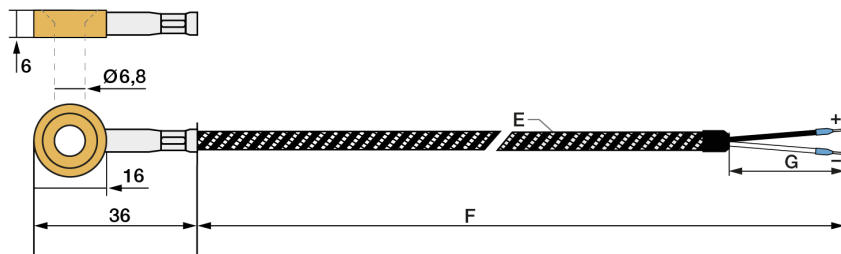
| Important assembly advices | |
|--|--|
| <p>The surface must be brightly polished and free of residues. Please attach the probe firmly. Please ensure good thermal contact, use thermal paste if necessary. Depending on the requirements, it may be useful to insulate the probe to minimize the influence of the ambient temperature.</p> | |

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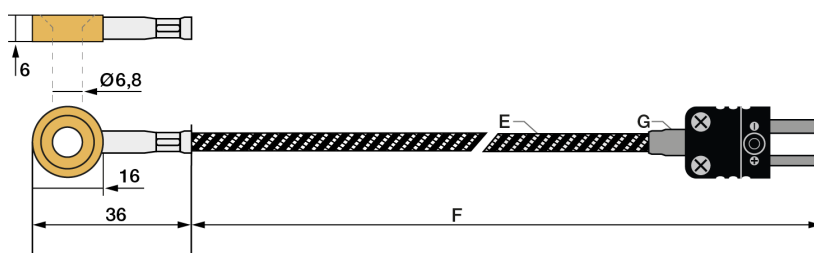
Technical drawing

| | | | |
|-----------------------------|-------------------------------|---------------------|----------------------|
| Customizable options | E - Material connection cable | G - Connector | All dimensions in mm |
| | F - Length connection cable | H - Bend protection | |

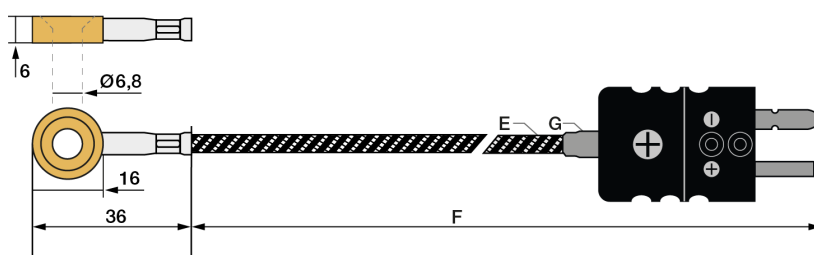
Version with insulated end ferrules



Version with Mini TE connector



Version with TE connector



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Matching accessories: Thermocouple cables

Thermocouple cables - Please select your desired cable first.

| Order code | Type | Color | IP | From (°C) ¹⁾ | To (°C) ¹⁾ | Outside material | Material strand | Ø (mm) ²⁾ | Q (mm ²) | Color strand | Ω / m ⁴⁾ |
|------------|--------------------|----------------------|------|-------------------------|-----------------------|------------------|-----------------|----------------------|----------------------|--------------|---------------------|
| 809340 1 | Thermocouple cable | Type J ³⁾ | IP20 | -50 | +400 | Varnish | Glass fibre | 3,0 | 0,22 | bk, wt | 2,50 |

Insulation resistance: ≥ 100 MOhm at min. 100 VDC | ¹⁾per. °C range | ²⁾Tolerance ± 0.2 mm | ³⁾ Color according to IEC 584 | ⁴⁾per thermocouple

Now please select the length and add the code to the article no. of the cable.

| | | | | | |
|------------|-----|-----|-----|-----|-----|
| Length (m) | 1 | 2 | 5 | 10 | 20 |
| Code | 010 | 020 | 050 | 100 | 200 |

Please append these digits to the part number of your desired cable.

Matching accessories: Connector

G - Connector

| Picture | Code | Feature | Picture | Code | Feature |
|---------|-------------|-----------------------------|---------|-------------|----------------------------|
| | 809140 1000 | Mini-TC connector Type J bk | | 809100 1000 | Mini-TC coupling Type J bk |
| | 809150 1000 | TC connector Type J bk | | 809110 1000 | TC coupling Type J bk |

Technical drawing - Connector

| | | | |
|--|-------------------|--|------------------|
| | Mini-TC connector | | Mini-TC coupling |
| | TC connector | | TC coupling |

Other connectors available on request

Matching accessories: Heat-conducting paste

Heat-conducting paste

| Picture | Article no. | 809540 1000 |
|---------|----------------------|-------------------|
| | Content | 10 ml |
| | Thermal conductivity | >2.5 W/mK |
| | Min / Max °C | -30 °C to +280 °C |
| | Thermal resistance | < 0.126 |

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5. Characteristics

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Characteristic Thermocouple Type J

Measuring range: -40 °C to +750 °C

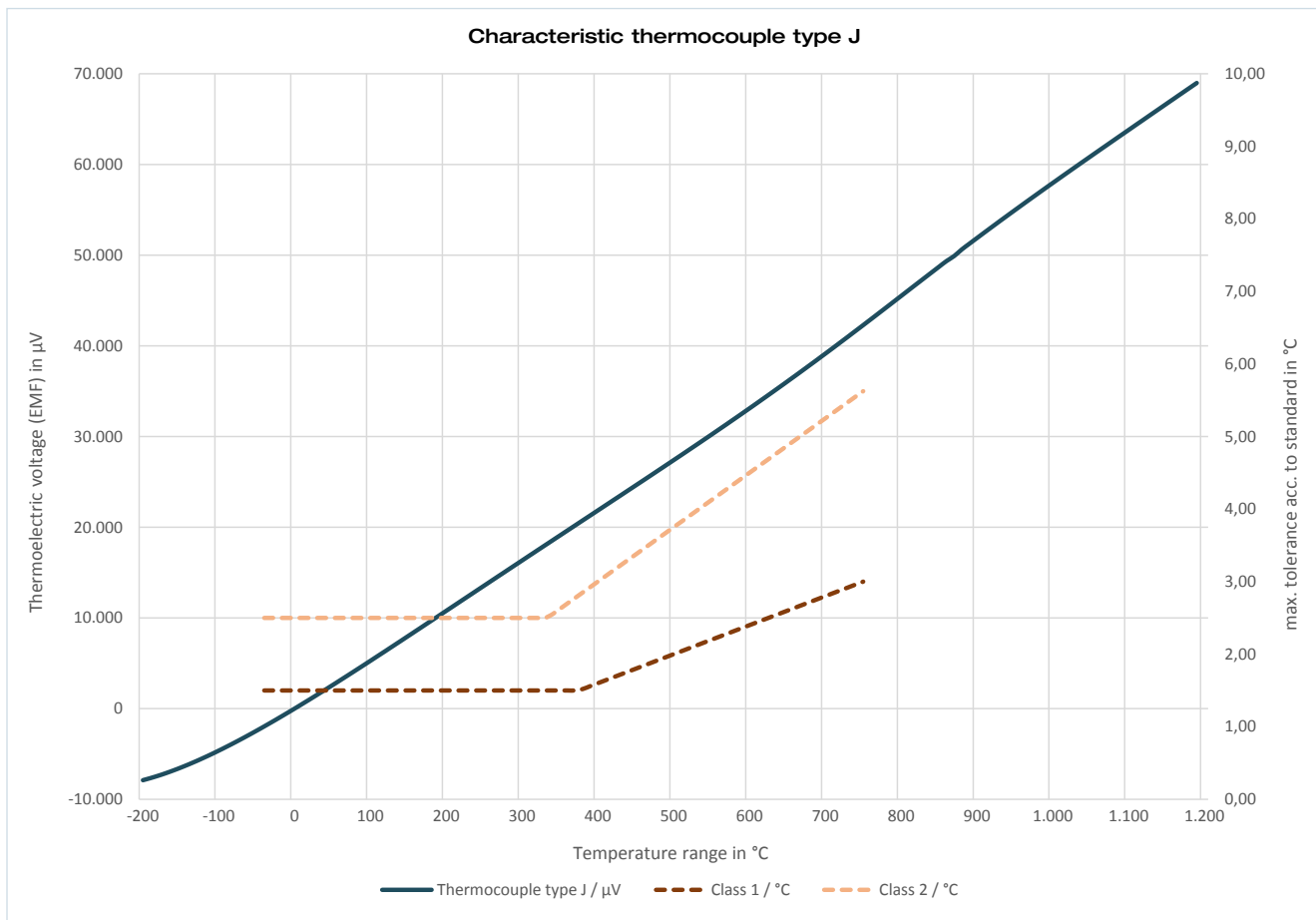
| Accuracy class Thermocouple Type J according DIN IEC 60584 | |
|--|--|
| Class | Formula |
| Cl. 1 | -40 °C to +375 °C: $\pm 1,5 \text{ °C}$ +375 °C to +750 °C: $\pm 0,004 t $ |
| Cl. 2 | -40 °C to +333 °C: $\pm 2,5 \text{ °C}$ +333 °C to +750 °C: $\pm 0,0075 t $ |

| Type J | | Max. Tol. \pm in °C** | | Type J | | Max. Tol. \pm in °C** | | Type J | | Max. Tol. \pm in °C** | | Type J | | Max. Tol. \pm in °C** | |
|---------|-----------------------|-------------------------|-------|---------|-----------------------|-------------------------|-------|---------|-----------------------|-------------------------|-------|---------|-----------------------|-------------------------|-------|
| T in °C | EMF* in μV | Cl. 1 | Cl. 2 | T in °C | EMF* in μV | Cl. 1 | Cl. 2 | T in °C | EMF* in μV | Cl. 1 | Cl. 2 | T in °C | EMF* in μV | Cl. 1 | Cl. 2 |
| -210 | -8.095 | | | 150 | 8.010 | 1,5 | 2,5 | 510 | 27.953 | 2,0 | 3,8 | 870 | 49.898 | | |
| -200 | -7.890 | | | 160 | 8.562 | 1,5 | 2,5 | 520 | 28.516 | 2,1 | 3,9 | 880 | 50.622 | | |
| -190 | -7.659 | | | 170 | 9.115 | 1,5 | 2,5 | 530 | 29.080 | 2,1 | 4,0 | 890 | 51.251 | | |
| -180 | -7.403 | | | 180 | 9.669 | 1,5 | 2,5 | 540 | 29.647 | 2,2 | 4,1 | 900 | 51.877 | | |
| -170 | -7.123 | | | 190 | 10.224 | 1,5 | 2,5 | 550 | 30.216 | 2,2 | 4,1 | 910 | 52.500 | | |
| -160 | -6.821 | | | 200 | 10.779 | 1,5 | 2,5 | 560 | 30.788 | 2,2 | 4,2 | 920 | 53.119 | | |
| -150 | -6.500 | | | 210 | 11.334 | 1,5 | 2,5 | 570 | 31.362 | 2,3 | 4,3 | 930 | 53.735 | | |
| -140 | -6.159 | | | 220 | 11.889 | 1,5 | 2,5 | 580 | 31.939 | 2,3 | 4,4 | 940 | 54.347 | | |
| -130 | -5.801 | | | 230 | 12.445 | 1,5 | 2,5 | 590 | 32.519 | 2,4 | 4,4 | 950 | 54.956 | | |
| -120 | -5.426 | | | 240 | 13.000 | 1,5 | 2,5 | 600 | 33.102 | 2,4 | 4,5 | 960 | 55.561 | | |
| -110 | -5.037 | | | 250 | 13.555 | 1,5 | 2,5 | 610 | 33.689 | 2,4 | 4,6 | 970 | 56.164 | | |
| -100 | -4.633 | | | 260 | 14.110 | 1,5 | 2,5 | 620 | 34.279 | 2,5 | 4,7 | 980 | 56.763 | | |
| -90 | -4.215 | | | 270 | 14.665 | 1,5 | 2,5 | 630 | 34.873 | 2,5 | 4,7 | 990 | 57.360 | | |
| -80 | -3.786 | | | 280 | 15.219 | 1,5 | 2,5 | 640 | 35.470 | 2,6 | 4,8 | 1.000 | 57.953 | | |
| -70 | -3.344 | | | 290 | 15.773 | 1,5 | 2,5 | 650 | 36.071 | 2,6 | 4,9 | 1.010 | 58.545 | | |
| -60 | -2.893 | | | 300 | 16.327 | 1,5 | 2,5 | 660 | 36.675 | 2,6 | 5,0 | 1.020 | 59.134 | | |
| -50 | -2.431 | | | 310 | 16.881 | 1,5 | 2,5 | 670 | 37.284 | 2,7 | 5,0 | 1.030 | 59.721 | | |
| -40 | -1.961 | 1,5 | 2,5 | 320 | 17.434 | 1,5 | 2,5 | 680 | 37.896 | 2,7 | 5,1 | 1.040 | 60.307 | | |
| -30 | -1.482 | 1,5 | 2,5 | 330 | 17.986 | 1,5 | 2,5 | 690 | 38.512 | 2,8 | 5,2 | 1.050 | 60.890 | | |
| -20 | -995 | 1,5 | 2,5 | 340 | 18.538 | 1,5 | 2,6 | 700 | 39.132 | 2,8 | 5,3 | 1.060 | 61.473 | | |
| -10 | -501 | 1,5 | 2,5 | 350 | 19.090 | 1,5 | 2,6 | 710 | 39.755 | 2,8 | 5,3 | 1.070 | 62.054 | | |
| 0 | 0 | 1,5 | 2,5 | 360 | 19.642 | 1,5 | 2,7 | 720 | 40.382 | 2,9 | 5,4 | 1.080 | 62.634 | | |
| 10 | 507 | 1,5 | 2,5 | 370 | 20.194 | 1,5 | 2,8 | 730 | 41.012 | 2,9 | 5,5 | 1.090 | 63.214 | | |
| 20 | 1.019 | 1,5 | 2,5 | 380 | 20.745 | 1,5 | 2,9 | 740 | 41.645 | 3,0 | 5,6 | 1.100 | 63.792 | | |
| 30 | 1.537 | 1,5 | 2,5 | 390 | 21.297 | 1,6 | 2,9 | 750 | 42.281 | 3,0 | 5,6 | 1.110 | 64.370 | | |
| 40 | 2.059 | 1,5 | 2,5 | 400 | 21.848 | 1,6 | 3,0 | 760 | 42.919 | | | 1.120 | 64.948 | | |
| 50 | 2.585 | 1,5 | 2,5 | 410 | 22.400 | 1,6 | 3,1 | 770 | 43.559 | | | 1.130 | 65.525 | | |
| 60 | 3.116 | 1,5 | 2,5 | 420 | 22.952 | 1,7 | 3,2 | 780 | 44.203 | | | 1.140 | 66.102 | | |
| 70 | 3.650 | 1,5 | 2,5 | 430 | 23.504 | 1,7 | 3,2 | 790 | 44.848 | | | 1.150 | 66.679 | | |
| 80 | 4.187 | 1,5 | 2,5 | 440 | 24.057 | 1,8 | 3,3 | 800 | 45.494 | | | 1.160 | 67.255 | | |
| 90 | 4.726 | 1,5 | 2,5 | 450 | 24.610 | 1,8 | 3,4 | 810 | 46.141 | | | 1.170 | 67.831 | | |
| 100 | 5.269 | 1,5 | 2,5 | 460 | 25.164 | 1,8 | 3,5 | 820 | 46.786 | | | 1.180 | 68.406 | | |
| 110 | 5.814 | 1,5 | 2,5 | 470 | 25.720 | 1,9 | 3,5 | 830 | 47.431 | | | 1.190 | 68.980 | | |
| 120 | 6.360 | 1,5 | 2,5 | 480 | 26.276 | 1,9 | 3,6 | 840 | 48.074 | | | | | | |
| 130 | 6.909 | 1,5 | 2,5 | 490 | 26.834 | 2,0 | 3,7 | 850 | 48.715 | | | | | | |
| 140 | 7.459 | 1,5 | 2,5 | 500 | 27.393 | 2,0 | 3,8 | 860 | 49.353 | | | | | | |

*Thermoelectric voltage (EMF) in μV

**Maximum tolerance according DIN IEC 60584

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The standard specifies measuring ranges for thermocouples in which the respective measuring accuracy of the tolerance class applies. For use outside this specified measuring range, it is not possible to specify the measuring accuracy. If the thermocouple is operated outside the specified measuring range of its respective tolerance class, irreversible damage to the thermocouple may occur, which will result in a measurement deviation (even within the specified range). Use beyond the measuring range of the tolerance class represents misuse and leads to a loss of warranty.

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