



*The sensor
makes the difference!*



Power & Energy Temperature Sensors



Screw-In Thermocouple

Thermocouple:

according to
DIN EN 60584



☐ Type K (NiCr-Ni) ☐ others _____

Number of TC's:

☐ single ☐ double

Hot Junction:

standard welded in insulated

Probe Diameter:

☐ 0.5 mm ☐ 1.0 mm ☐ 1.5 mm
☐ 2.0 mm ☐ 3.0 mm ☐ 3.2 mm
☐ others _____

Probe Length "A":

please specify _____ mm

Sheath Material

standard Inconel 600 (mat.-no. 2.4816)

☐ others _____

Process Connection:

please specify thread
 thread type A _____ B _____
 thread length A _____ B _____

Lead Wire:

flexible thermocouple wire, individually and overall insulated with

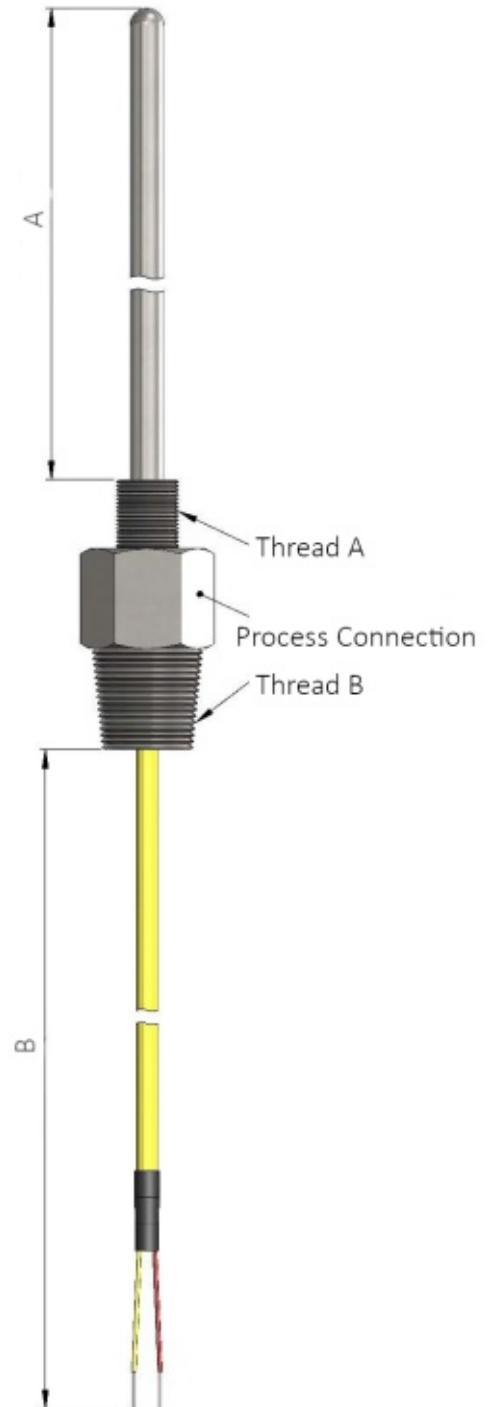
☐ silicone, Ø approx. 3.8 mm (-50 °C - 180 °C)
☐ teflon, Ø approx. 2.35 mm x 1.45 mm
 (-100 °C - 205 °C, for a short time up to 230 °C)
☐ fiberglass, Ø approx. 2,1 mm x 1,3 mm (400 °C,
 for a short time up to 500 °C)
☐ others _____

Wire Length "B":

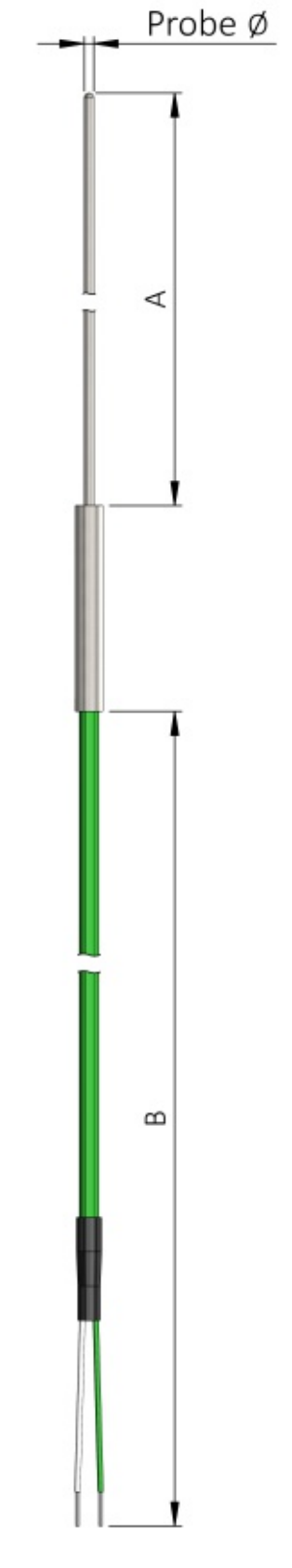
please specify _____ mm

Termination:

☐ standard plug ☐ standard jack
☐ miniature plug ☐ miniature jack
☐ micro plug ☐ micro jack
☐ high-temperature standard plug
☐ high-temperature standard jack
☐ high-temperature miniature plug
☐ high-temperature miniature jack
☐ Lemo plug ☐ Lemo jack
☐ size 0 (max. probe diameter 3.2 mm)
☐ size 1 (max. probe diameter 6.0 mm)
☐ size 2 (max. probe diameter 6.4 mm)
☐ bare ends ☐ others _____



Mineral-Insulated Thermocouple bendable execution



Thermocouple:

according to
DIN EN 60584



☐ Type K (NiCr-Ni)



☐ Type J (Fe-CuNi)



☐ Type T (Cu-CuNi)



☐ Type N (NiCrSi-NiSi)

☐ others _____

Number of TC's:

☐ single

☐ double

Hot Junction:

☐ insulated

☐ not insulated

☐ exposed

Probe Diameter:

☐ 0.15 mm (only Type K) ☐ 0.25 mm (only Type K)

☐ 0.5 mm (only Type K, J and N)

☐ 1.0 mm

☐ 1.5 mm

☐ 2.0 mm

☐ 3.0 mm

☐ 4.8 mm

☐ 6.0 mm

☐ 6.4 mm

☐ others _____

☐ swaged (only possible for certain diameters)

Ø D1 _____ mm Ø D2 _____ mm

L _____ mm

Probe Length "A":

please specify _____ mm

Sheath Material:

standard Inconel 600 (mat.-no. 2.4816)

☐ others _____

Transition Sleeve:

standard stainless steel; diameter x length: 4.0 x 30.0 mm

☐ others _____

Lead Wire:

flexible thermocouple wire, individually and overall insulated with

☐ silicone, Ø approx. 3.8 mm (-50 °C - 180 °C)

☐ teflon, Ø approx. 2.35 mm x 1.45 mm

(-100 °C - 205 °C, for a short time up to 230 °C)

☐ fiberglass, Ø approx. 2,1 mm x 1,3 mm (400 °C, for a short time up to 500 °C)

☐ others _____

Wire Length "B":

please specify _____ mm

Termination:

☐ standard plug

☐ standard jack

☐ miniature plug

☐ miniature jack

☐ micro plug

☐ micro jack

☐ ht standard plug

☐ ht standard jack

☐ ht miniature plug

☐ ht miniature jack

☐ Lemo plug

☐ Lemo jack

☐ size 0 (max. probe diameter 3.2 mm)

☐ size 1 (max. probe diameter 6.0 mm)

☐ size 2 (max. probe diameter 6.4 mm)

☐ bare ends

☐ others _____

Screw-In Thermocouple bent and swaged

Thermocouple:

according to
DIN EN 60584



☐ Type K (NiCr-Ni) ☐ others _____

Number of TC's:

☐ single ☐ double

Hot Junction:

standard welded in insulated

Probe Diameter:

4.6 mm, swaged to 1.6 mm
☐ others _____

Probe Length "A":

please specify _____ mm

Execution:

please specify probe bent and swaged
bent _____

swaged

Ø D1 _____ mm Ø D2 _____ mm

L _____ mm

Sheath Material

standard Inconel 600 (mat.-no. 2.4816)

☐ others _____

Process Connection:

thread type / length _____
compression fitting _____

Lead Wire:

flexible thermocouple wire, individually and overall
insulated with

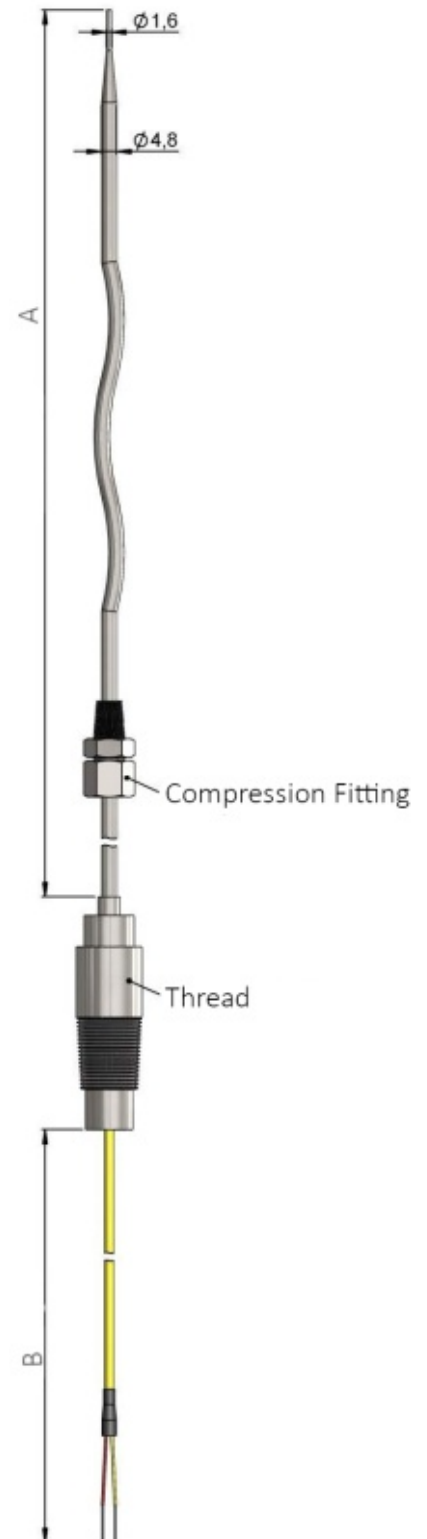
- ☐ silicone, Ø approx. 3.8 mm (-50 °C - 180 °C)
☐ teflon, Ø approx. 2.35 mm x 1.45 mm
(-100 °C - 205 °C, for a short time up to 230 °C)
☐ fiberglass, Ø approx. 2,1 mm x 1,3 mm (400 °C,
for a short time up to 500 °C)
☐ others _____

Wire Length "B":

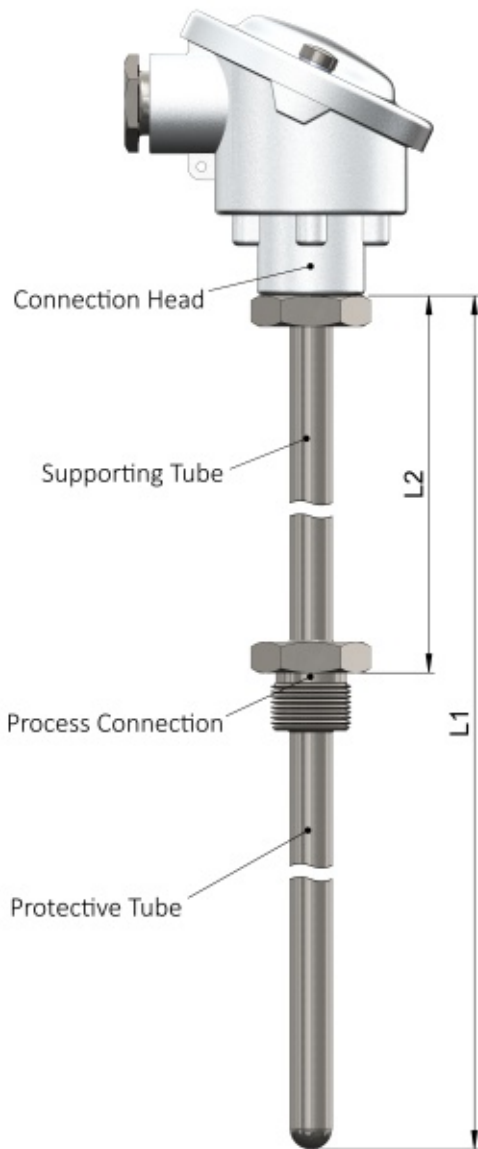
please specify _____ mm

Termination:

- | | |
|--|--|
| ☐ standard plug | ☐ standard jack |
| ☐ miniature plug | ☐ miniature jack |
| ☐ micro plug | ☐ micro jack |
| ☐ ht standard plug | ☐ ht standard jack |
| ☐ ht miniature plug | ☐ ht miniature jack |
| ☐ Lemo plug | ☐ Lemo jack |
| ☐ size 0 (max. probe diameter 3.2 mm) | |
| ☐ size 1 (max. probe diameter 6.0 mm) | |
| ☐ size 2 (max. probe diameter 6.4 mm) | |
| ☐ bare ends | ☐ others _____ |



Mineral-Insulated Thermocouple screw-in thermocouple



Thermocouple:

according to
DIN EN 60584



☐ Type K (NiCr-Ni)



☐ Type J (Fe-CuNi)



☐ Type N (NiCrSi-NiSi) ☐ others _____

Number of TC's:

☐ single

☐ double

☐ triple

Measuring Insert:

☐ 1.5 mm

☐ 1.6 mm

☐ 2.0 mm

☐ 3.0 mm

☐ 3.2 mm

☐ 4.8 mm

☐ 6.0 mm

☐ 8.0 mm

☐ others _____

Connection Head:

☐ A

☐ AUS

☐ AUZ

☐ AUSH

☐ AUZH

☐ B

☐ BUS

☐ BUZ

☐ BUSH

☐ BUZH

☐ MA

☐ others _____

Transmitter:

☐ without transmitter

☐ with transmitter

please specify _____

Probe Diameter:

☐ 3.0 mm

☐ 3.2 mm

☐ 4.8 mm

☐ 6.0 mm

☐ 6.4 mm

☐ 8.0 mm

☐ others _____

Supporting Tube "L2": steel ☐ mat.-no. 1.0305 ☐ mat.-no. 1.4571
please specify _____ mm

Protection Tube:

☐ without

☐ with

steel ☐ mat.-no. 1.0305

☐ mat.-no. 1.4571

heat resistant steel

☐ mat.-no. 1.4749

☐ mat.-no. 1.4762

☐ mat.-no. 1.4841

☐ mat.-no. 2.4816

protective tube dimensions:

☐ 9.0 x 1.0 mm

☐ 11.0 x 1.0 mm

☐ 11.0 x 2.0 mm

☐ 15.0 x 2.0 mm

☐ 22.0 x 2.0 mm

☐ others _____

Nominal Length "L1": please specify _____ mm

Termination:

ceramic pedestal with sheath terminals

Process Connection:

please specify thread type/length _____

☐ head connection, probe length "A" _____

☐ neck connection, please specify nominal length
"L1" and supporting tube "L2"

Straight Thermocouple with ceramic protection tube

Thermocouple:

according to
DIN EN 60584

	☐ Type K (NiCr-Ni)		☐ Type J (Fe-CuNi)
	☐ Type N (NiCrSi-NiSi)		☐ Type S (Pt10Rh-Pt)
	☐ Type R (Pt13Rh-Pt)		☐ Type B (Pt30Rh-Pt6Rh)
☐ others _____			

Number of TC's:

☐ single ☐ double ☐ triple

Wire Strength:

☐ 0.35 mm ☐ 0.5 mm ☐ 1.5 mm
☐ 3.0 mm ☐ others _____

Connection Head:

☐ A	☐ AUS	☐ AUZ	☐ AUSH	☐ AUZH
☐ B	☐ BUS	☐ BUZ	☐ BUSH	☐ BUZH
☐ MA	☐ others _____			

Flange:

☐ without
☐ with
 please specify DN/PN _____

Supporting Tube "L2": steel

☐ mat.-no. 1.0305 ☐ mat.-no. 1.4571
 heat resistant steel
☐ mat.-no. 1.4749 ☐ mat.-no. 1.4762
☐ mat.-no. 1.4841 ☐ mat.-no. 2.4816
 please specify _____ mm

Inner Protection Tube:

☐ ceramic C610 ☐ ceramic C799
☐ without

Protection Tube:

☐ ceramic C530 ☐ ceramic C610
☐ ceramic C799

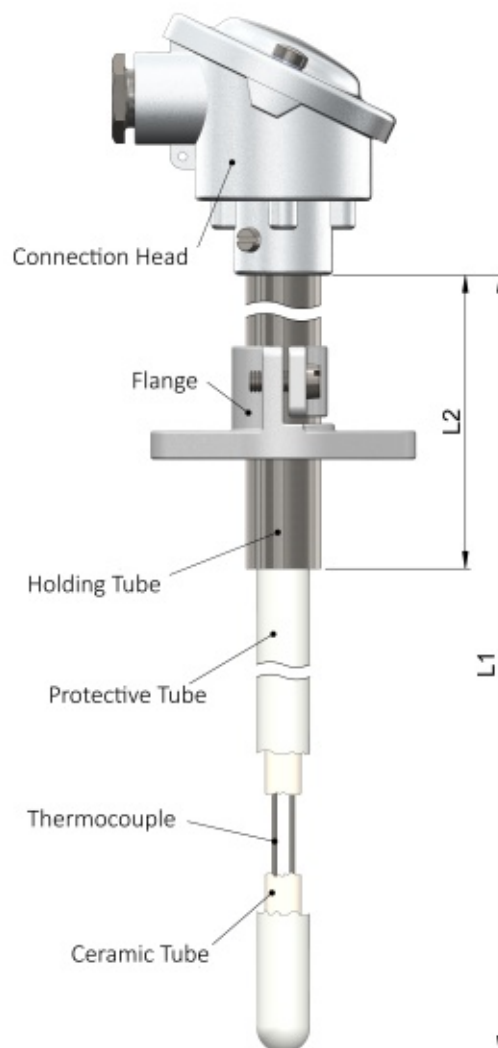
Protection Tube Dim.:

☐ 10.0 x 1.5 mm	☐ 10.0 x 2.0 mm
☐ 15.0 x 2.0 mm	☐ 15.0 x 2.5 mm
☐ 24.0 x 2.5 mm	☐ 24.0 x 3.0 mm
special dimensions on request	

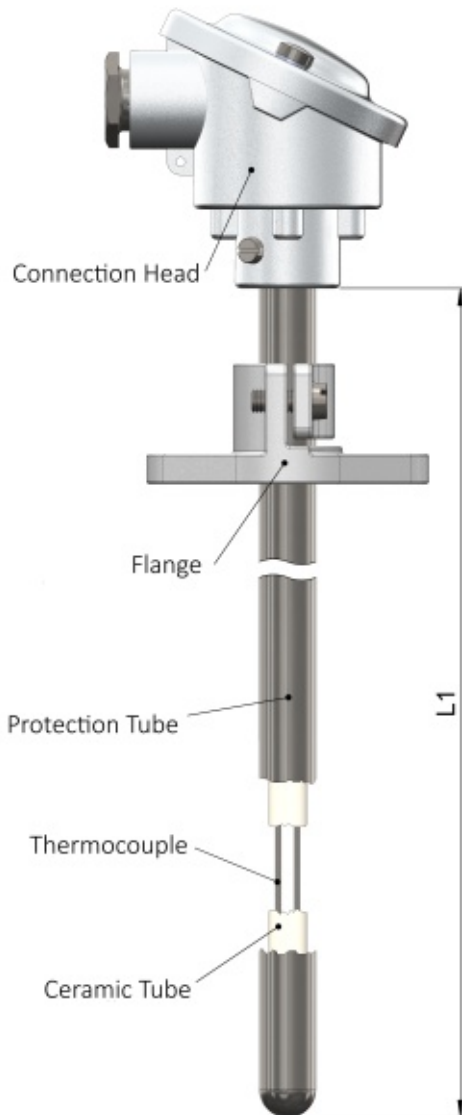
Nominal Length "L1": please specify _____ mm

Accessories:

☐ gas-tight threaded sleeve
☐ vacuum flange KF
☐ measuring insert vacuum-sealed



Straight Thermocouple with metallic protection tube



Thermocouple:

according to
DIN EN 60584



☐ Type K (NiCr-Ni)



☐ Type J (Fe-CuNi)



☐ Type N (NiCrSi-NiSi)



☐ Type S (Pt10Rh-Pt)



☐ Type R (Pt13Rh-Pt)



☐ Type B (Pt30Rh-Pt6Rh)

☐ others _____

Number of TC's:

☐ single

☐ double

☐ triple

Wire Strength:

☐ 0.35 mm

☐ 0.5 mm

☐ 1.5 mm

☐ 3.0 mm

☐ others _____

Connection Head:

☐ A

☐ AUS

☐ AUZ

☐ AUSH

☐ AUZH

☐ B

☐ BUS

☐ BUZ

☐ BUSH

☐ BUZH

☐ MA

☐ others _____

Transmitter:

☐ without transmitter

☐ with transmitter

please specify _____

Flange:

☐ without

☐ with

please specify DN/PN _____

Inner Protection Tube:

☐ ceramic C610

☐ ceramic C799

☐ without

Protection Tube:

steel

☐ mat.-no. 1.0305

☐ mat.-no. 1.4571

heat resistant steel

☐ mat.-no. 1.4749

☐ mat.-no. 1.4762

☐ mat.-no. 1.4841

☐ mat.-no. 2.4816

Protection Tube Dim.:

☐ 15.0 x 2.0 mm

☐ 22.0 x 2.0 mm

special dimensions on request

Nominal Length "L1": please specify _____ mm

Accessories:

☐ gas-tight threaded sleeve

Straight Thermocouple

with metallic protection tube and mineral insulated measuring insert

Thermocouple:

according to
DIN EN 60584



☐ Type K (NiCr-Ni)



☐ Type J (Fe-CuNi)



☐ Type N (NiCrSi-NiSi) ☐ others _____

Number of TC's:

☐ single

☐ double

☐ triple

Measuring Insert:

☐ 3.0 mm

☐ 6.0 mm

☐ 8.0 mm

☐ others _____

Connection Head:

☐ A

☐ AUS

☐ AUZ

☐ AUSH

☐ AUZH

☐ B

☐ BUS

☐ BUZ

☐ BUSH

☐ BUZH

☐ MA

☐ others _____

Protection Tube:

steel

☐ mat.-no. 1.0305

☐ mat.-no. 1.4571

heat resistant steel

☐ mat.-no. 1.4749

☐ mat.-no. 1.4762

☐ mat.-no. 1.4841

☐ mat.-no. 2.4816

Protection Tube Dim.:

☐ 15.0 x 2.0 mm

☐ 22.0 x 2.0 mm

special dimensions on request

Inner Protection Tube:

☐ ceramic C610

☐ ceramic C799

☐ without

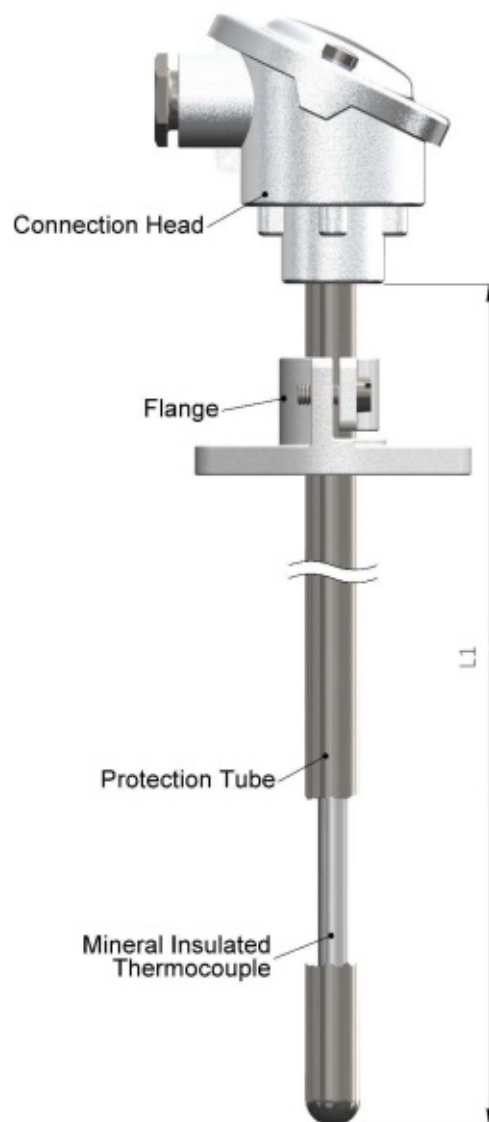
Nominal Length "L1": please specify _____ mm

Accessories:

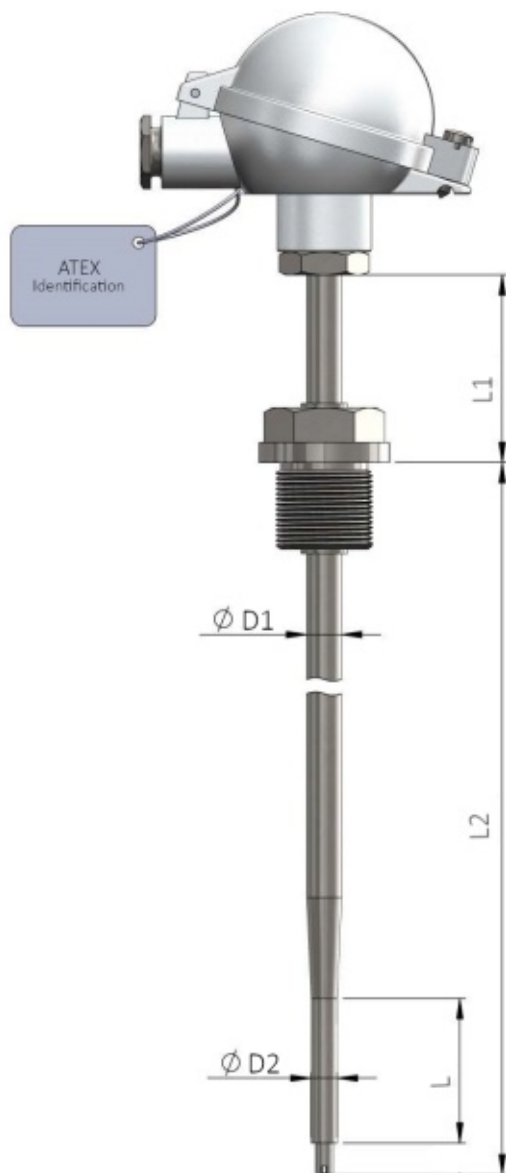
☐ gas-tight threaded sleeve

☐ flange

please specify DN/PN _____



Duplex-Resistance-Thermometer



Sensor:
according to
DIN EN 60584

- ☐ 2 x Pt100 ☐ 2 x Pt1000
☐ others _____

Tolerance:

- ☐ class B ☐ class 1/3 B
☐ class 1/10 B ☐ class A

Circuit:

- ☐ 2-wire ☐ 3-wire
☐ 4-wire

Connection Head:

- ☐ A ☐ AUS ☐ AUZ ☐ AUSH ☐ AUZH
☐ B ☐ BUS ☐ BUZ ☐ BUSH ☐ BUZH
☐ MA ☐ others _____

Process Connection:

- ☐ without ☐ M24x1.5
☐ G1/2" ☐ others _____

Probe Diameter:

- ☐ 3.0 mm ☐ 6.0 mm ☐ 9.0 mm
☐ others _____

Supporting Tube "L1": please specify _____ mm

Protection Tube:

- steel ☐ mat.-no. 1.0305 ☐ mat.-no. 1.4571
heat resistant steel
☐ mat.-no. 1.4749 ☐ mat.-no. 1.4762
☐ mat.-no. 1.4841 ☐ mat.-no. 2.4816

Protection Tube Diameter:

swaged (only possible for certain diameters)

Ø D1 _____ mm Ø D2 _____ mm
L _____ mm

Insertion Length "L2": please specify _____ mm

Construction:

unsealed and slotted at the bottom



Mineral-Insulated Thermocouple with seal and compression fitting

Thermocouple:

according to
DIN EN 60584



☐ Type K (NiCr-Ni) ☐ others _____

Number of TC's:

☐ single ☐ double

Hot Junction:

standard welded in insulated

Probe Diameter:

☐ 0.5 mm ☐ 1.0 mm ☐ 1.5 mm
☐ 2.0 mm ☐ 3.0 mm ☐ 3.2 mm
☐ others _____

Probe Length "A":

please specify _____ mm

Sheath Material

standard Inconel 600 (mat.-no. 2.4816)
☐ others _____

Process Connection:

compression fitting _____

Lead Wire:

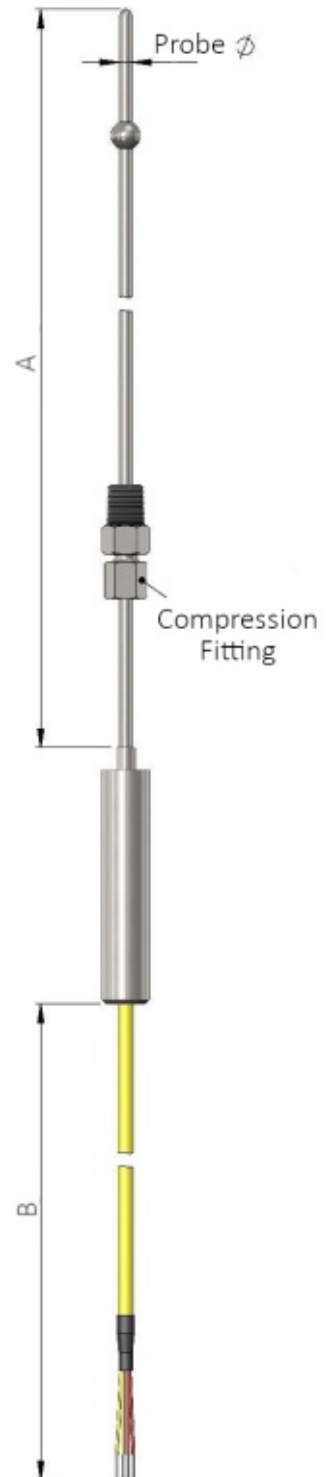
flexible thermocouple wire, individually and overall insulated with
☐ silicone, Ø approx. 3.8 mm (-50 °C - 180 °C)
☐ teflon, Ø approx. 2.35 mm x 1.45 mm
 (-100 °C - 205 °C, for a short time up to 230 °C)
☐ fiberglass, Ø approx. 2,1 mm x 1,3 mm (400 °C, for a short time up to 500 °C)
☐ others _____

Wire Length "B":

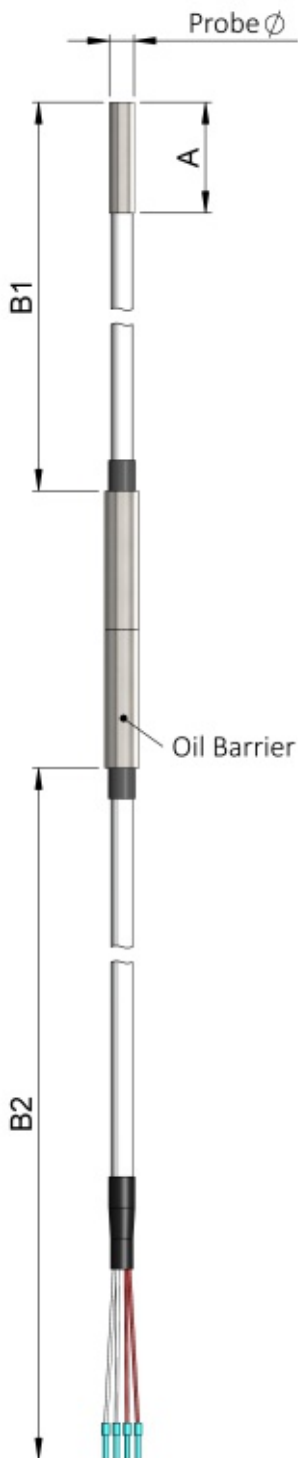
please specify _____ mm

Termination:

☐ standard plug ☐ standard jack
☐ miniature plug ☐ miniature jack
☐ micro plug ☐ micro jack
☐ ht standard plug ☐ ht standard jack
☐ ht miniature plug ☐ ht miniature jack
☐ Lemo plug ☐ Lemo jack
☐ size 0 (max. probe diameter 3.2 mm)
☐ size 1 (max. probe diameter 6.0 mm)
☐ size 2 (max. probe diameter 6.4 mm)
☐ bare ends ☐ others _____



Resistance Thermometer with oil barrier



Sensor:
according to
DIN EN 60584

☐ Pt100

☐ Pt1000

☐ others _____

Tolerance:

☐ class B

☐ class 1/3 B

☐ class 1/10 B

☐ class A

Circuit:

☐ 2-wire

☐ 3-wire

☐ 4-wire

Probe Diameter:

☐ 3.0 mm

☐ 3.2 mm

☐ 4.0 mm

☐ 6.0 mm

☐ others _____

Probe Length "B1":

please specify _____ mm

Lead Wire:

flexible thermocouple wire, individually and overall insulated with

☐ silicone, Ø approx. 3.8 mm (-50 °C - 180 °C)

☐ teflon, Ø approx. 2.35 mm x 1.45 mm

☐ fiberglass, Ø approx. 2,1 mm x 1,3 mm (400 °C, for a short time up to 500 °C)

☐ others _____

Wire Length "B2":

please specify _____ mm

Termination:

☐ plug

☐ jack

☐ Lemo: please specify size _____

☐ Tuchel: please specify size _____

☐ Binder: please specify size _____

☐ Fischer: please specify size _____

☐ bare ends

☐ others _____

Protection-Tube for weld-in Form 4 acc. to DIN 43772

Length (L, D, U):

- | | |
|--|--|
| ☐ 110, 105, 65 | ☐ 110, 105, 73 |
| ☐ 140, 135, 65 (Form D1) | ☐ 170, 165, 133 (Form D1) |
| ☐ 200, 195, 65 (Form D4) | |
| ☐ 200, 195, 125 (Form D2) | |
| ☐ 260, 255, 125 (Form D5) | ☐ 410, 405, 275 (Form D5) |
| ☐ others _____ | |

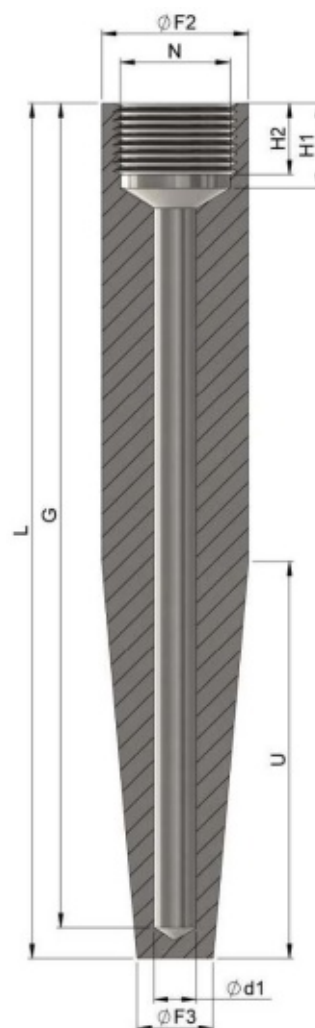
Diameter

(d1, F2, N, F3, H1, H2):

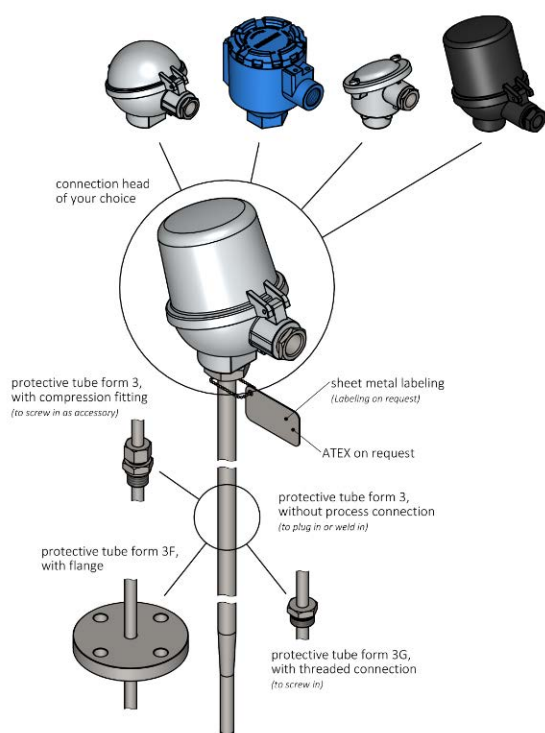
- | |
|--|
| ☐ 7, 24 h7, M18x1,5, 12,5, 19, 15 |
| ☐ 7, 26 h7, G1/2, 12,5, 19, 15 |
| ☐ 9, 26 h7, G1/2, 15, 19, 15 |
| ☐ 11, 32 h11, G3/4, 17, 22, 17 |
| ☐ 13, 32 h11, G3/4, 19, 22, 17 |
| ☐ 14, 32 h11, G3/4, 20, 22, 17 |
| ☐ others _____ |

Material:

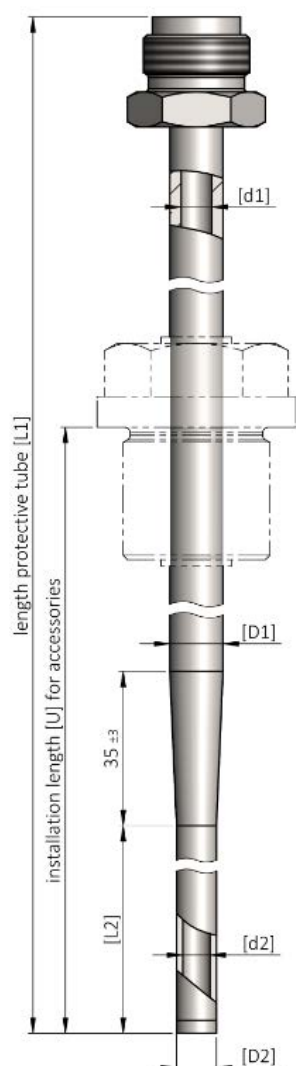
- | | |
|---|---|
| ☐ mat.-no. 1.5415 (16 Mo 3) | ☐ mat.-no 1.7380 (10 Cr Mo 9-10) |
| ☐ mat.-no 1.7335 (13CrMo4-5) | ☐ mat.-no 1.4571 (X6CrNiMoTi17-12-2) |
| ☐ others _____ | |



Tapered thermowells



For our thermowells, which are manufactured in-house with German precision and highest quality standards at our modern headquarters in Werne, we offer customized solutions that are flexibly adapted to our customers' needs. Optionally, the thermowells can be supplied with or without temperature sensors. Our product range is complemented by our high-quality tapered thermowells for thermocouples and resistance sensors according to DIN 43772. A variety of connection options, such as compression fittings, flanges or threaded connections, are available to meet individual requirements.



Length

	Protective tube (length max. 1000mm)	rejuvenation (max. 100 mm)	Measuring insert length	Installation length form 3G	Installation length form 3F
Standardised version (acc. to DIN 43772)	307 mm	50 mm	315 mm	160 mm	225 mm
	367 mm		375 mm	220 mm	285 mm
	427 mm		435 mm	280 mm	345 mm

Diameter

	diameter Tube outside	diameter Tube inside	diameter tapering	diameter Tube inside over the tapered length
Standardised version(acc. to DIN 43772)	Ø 12 mm	Ø 9 mm	Ø 7 mm	Ø 6,1 (+0,1) mm
further version	Ø 14 mm	Ø 11 mm	Ø 9 mm	Ø 8,1 (+0,1) mm
possible on request	Ø 5- 45 mm	on request	on request	on request

Properties and fields of application of different metallic protection tubes acc. to DIN EN 50446:2007-04

Resistance of metal protection tubes to contact with gases

Material- No.	Use in air up to °C	Resistance to				field of application
		Gases containing sulphur		Nitrogen-containing, low-oxygen gases	carburisation	
		oxidizing	reducing			
1.0305	550	low	low	medium	low	Tempering furnaces
1.4571	800	low	low	medium	medium	Chemically corrosive vapours, excluding hydrochloric acid and sulphur dioxide vapours
1.4762	1.200	very high	very high	low	medium	Annealing or hardening furnaces with gases containing sulphur and carbon
1.4749	1.150	very high	very high	low	medium	
1.4841	1.150	very low	very low	high	low	Ovens with nitrogen-containing, low-oxygen gases
1.4876	1.100	low	low	high	very high	

acc. to DIN EN 50446:2007-04

International Colour Coding

Code letter Material
+ - DIN IEC 584 Temperature Range

Type J	Fe - CuNi		-40 °C .. 750 °C
Type K	NiCr - NiAl		-40 °C .. 1.000 °C
Type N	NiCrSi - NiSi		-40 °C .. 1.000 °C
Type T	Cu - CuNi		-40 °C .. 350 °C
Type E	NiCr - CuNi		-40 °C .. 800 °C
Type R	Pt13%Rh - Pt		0 °C .. 1.600 °C
Type S	Pt10%Rh - Pt		0 °C .. 1.600 °C
Type B	Pt30%Rh - Pt6%Rh		600 °C .. 1.700 °C

DAkkS-Calibration



DAkkS-Calibration

calibration of:

- Resistance thermometer (-196°C, - 80°C to 660°C)
- Thermocouples (-40°C to 1600°C)
- Direct display thermometers

The DAkkS accreditation stands for highest quality standards and reliability!

Benefit from our DAkkS calibration and ensure precise measurement results!



- Calibrations according to AMS 2750 or CQI-9 and factory calibrations between -196 °C to +1600 °C Highest
- precision with measurement uncertainties from 5 mK to 25 mK
- Full range calibration at temperature fixed points from -38.8 °C to +660.3 °C.
- Short sensors with an immersion depth of 200 mm or more can be calibrated
- Professional aging methods improve temperature sensor stability
- Implementation of leak tests

Calibrations can be carried out within 2 working days



Thermo Sensor GmbH

customer oriented • innovative • flexible

Please contact us. We will be happy to assist you!

For more than 25 years, our name has stood for high-quality products for all areas of temperature, measurement and control technology. At our location in Werne (NRW) we develop and produce temperature sensors in standard, special and explosion-proof designs as well as numerous accessories for temperature measurement, which come into operation worldwide on all continents.

Our wide product range, our extensive stock of raw parts and our efficient organisational structure have a great influence on our flexibility: short delivery times and demand-oriented, customer-specific production are not contradictory for us. A delivery within 5 days is not a rarity - it is our standard!

Since 1996 Thermo Sensor has been continuously certified according to the respective valid quality management standard; currently according to ISO 9001:2015. Since 2021 we are also certified according to ISO 14001:2015 (environmental management system).

State-of-the-art manufacturing processes, combined with the specialist knowledge of our employees, are the cornerstone for a product quality that meets the highest demands. No matter how complex your measuring task seems - make your problem our challenge!

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