Service and Accessories

Customer orientation as self-understanding

"Customer orientation" has become more and more popular these days. For **hotset,** there are no reasons to change mentalities, because **hotset** has been customer-oriented from the very beginning.

A self-understanding, which is known in all important markets worldwide:

hot —

vicarious for the product range as there are

- High Watt Density Cartridge Heaters type HHP
- Coil Heaters type WRP
- Heated Machine Nozzles type BMD
- Sealed Heaters type GMH
- Tubular Heaters type RHK
- Air Stream Heater type LSE

and many more, partially high-specialised heating elements.

set —

as a seizable formula for

- **the comprehensive advice,**

Each industrial heating problem is an individual one, because a multitude of different parameters have to be adjusted precisely to each other. The used material and its flowing characteristics play the same important part as the tool construction, the cycle times or the general question of economy, just to mention some examples.

hotset advises you already before purchasing which heating element is the best for your demands. And **hotset** creates – if there is no solution in the standard range – exactly the required heating element.

- **the complete accessory range,**

The heating element is in the centre – the adjusted periphery guarantees a maximum of operating security and installation handling. **hotset** offers ,,service in total": whether cable shoes, plugs and leads in small or installation aids, tools and complete assembly kits in great – we always consider the solution of a heating problem as a whole.

And you can rely on ready-for-installation systems, which result in a bit more than the sum of the single parts.

- **competent care during the application phase.**

Many questions concerning the heating of tools and materials can be answered during the development phase. However when operating, there occur deviations, on which you have to react.

hotset stands again by your side: In case of those deviations, we will look for possibilities to adjust and to improve – in a partnership together with you. Until you – and your customers – are really satisfied. And in conclusion to this, we can offer you even more user-oriented solutions for your individual heating problem.

hotset —

a name, which has become a range out of this combination.

And which can be summarised for the users of industrial heating elements in only one sentence:

hotset — a good feeling !

Contents

Thermocouples and Resistance Sensors

hotset thermocouples and resistance sensors are available in various standard versions, or they can be manufactured specially and precisely to a drawing or sample as requested by the customer to correspond with the application.

Thermocouples to DIN 43710 (1/2 DIN tolerance on request) for iron-constantan (Fe-CuNi) are delivered in red/blue, type L, for NiCr-Ni to DIN 43710 in red/green, type K.

On request, thermocouples are available according to IEC 584: Fe-CuNi, type J, in black/white, NiCr-Ni according to IEC 584, part 1 (part 2 on request) in green/white, type K.

Resistance sensors to DIN IEC 751 are available in three versions: type PT 100 as well as 2 x PT 100 respectively 2 x PT 50 (2 sensors in one e. g. for the separate connection to a temperature registration printer).

Which sensor type will be chosen depends on the temperature controller and the actual temperature of the application. Commonly thermocouples NiCr-Ni or Fe-CuNi and resistance sensors PT 100 are used.

Both types feature a very accurate measurement and at the same time a very good mechanical durability. This is acquired by a metal construction, which is firmly fixed to the metal sleeving of the compensation line and if applicable to length adjustment springs or bend-protection springs.

Where the sensor hole is not very deep, this firm construction leads to a very high conduction of heat at the measuring point, therefore the installation instructions should be followed to achieve the best possible measuring accuracy.

material:

sensor tips, screwing, nipples:
- steel chromed (stainless steel for TEF 14)

compensation line:

standard:
- 2 x 1 mm glass silk insulated with braided metal sleeving

on request:
- special insulations in silicon or teflon, with and without braided protective sleeving, also available in stainless steel

connection:

standard:
- 2000 mm without braided protective sleeving but with end sleeves

on request:
- with cable shoes, spades or plugs

tests for surface thermocouples:

thermal voltage:
- 300 °C, tolerance to DIN 43710 for Fe-CuNi, to DIN IEC 584 part 1 for NiCr-Ni

test pressure:
- 40 bar if measuring point is leakproof

insulation resistance:
- thermocouple against sheath 10^9 Ohm at room temperature

test voltage:
- 100 V for insulated construction

Surface Thermocouple

MT 1.0

surface thermocouple MT 1.0 for placing into a slot of 1.0 mm

- sensor tube (D) Ø 1.0 mm
- length (L): 90 or 150 mm
- with bend-protection spring (B) and strengthening sleeve (material-no. 1.4571)
- compensation line (A) with protective metal sleeving, FeCu-Ni, 2000 mm long
  2 x 0.25 □ SN 6479
- bendable with a minimum radius of 10 mm
- max. operating temperature:
  supply line: 350 °C,
  thermocouple: 800 °C
- FeCu-Ni: DIN 43710,
  sheath: Inox

A: compensation line

B: bend-protection spring

D: sensor tube

E: strengthening sleeve (material-no. 1.4571)

MT 1.5

surface thermocouple MT 1.5 for placing into a slot of 1.5 mm

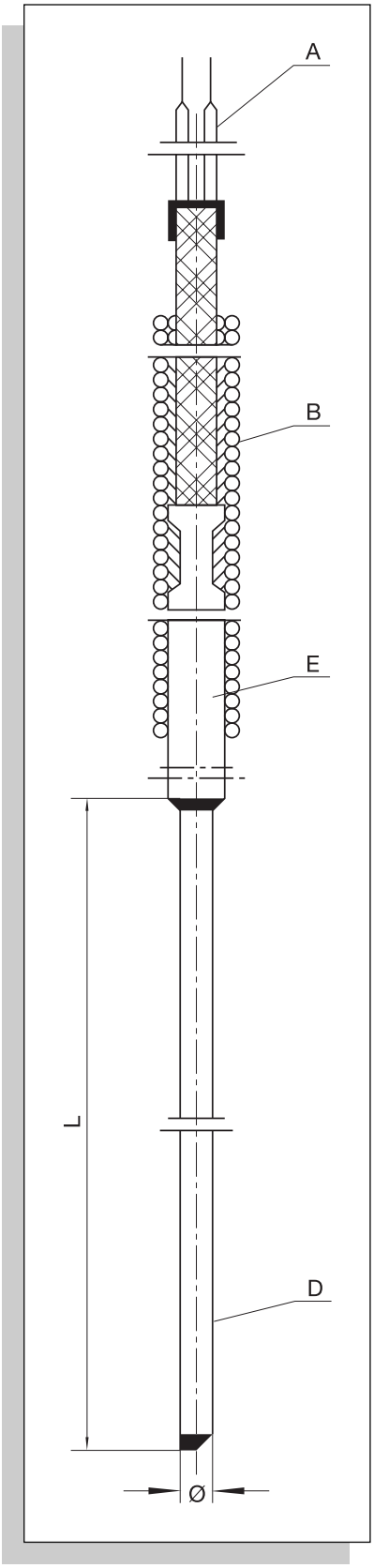
- sensor tube (D) Ø 1.5 mm
- length (L): 90, 150 or 240 mm
- with bend-protection spring (B) and strengthening sleeve (material-no. 1.4571)
- compensation line (A) with protective metal sleeving, FeCu-Ni, NiCr-Ni, 2000 mm long
  2 x 0.25 □ SN 6479
- bendable with a minimum radius of 10 mm
- max. operating temperature:
  supply line: 350 °C,
  thermocouple: 800 °C
- FeCu-Ni: DIN 43710,
  sheath: Inox
  or
  NiCr-Ni: DIN IEC 584 part 1,
  sheath: Inconel

A: compensation line

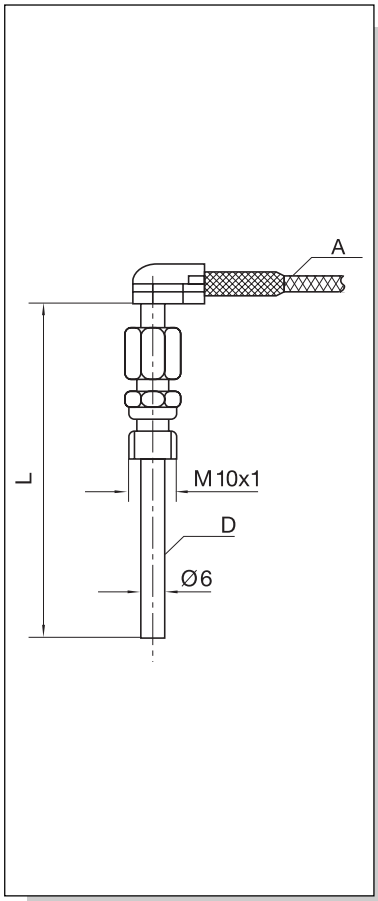
B: bend-protection spring

D: sensor tube

E: strengthening sleeve (material-no. 1.4571)



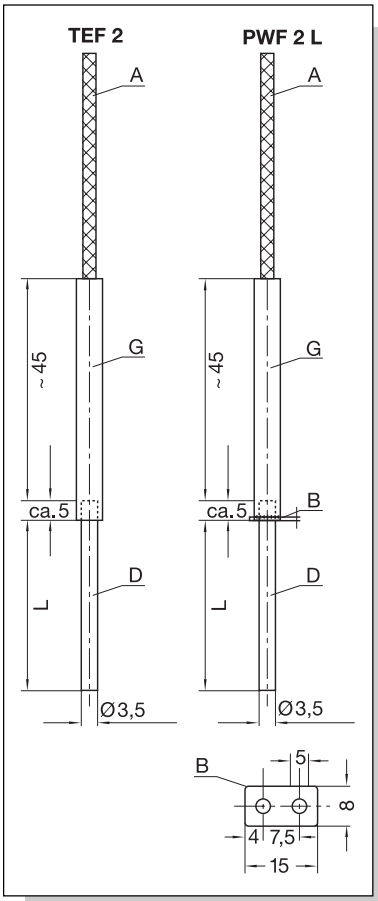
Thermocouples (TEF), Resistance Sensors (PWF)



TEF 1, PWF 1

cylindrical sensor with right angle exit

- sensor tube (D) Ø 6 mm
- length (L): 60, 100 or 150 mm, other lengths on request
- with Ermeto-screwing M 10 x 1
- compensation line (A) 2 x 1.0 mm², 2000 mm long
- FeCu-Ni, NiCr-Ni, PT 100

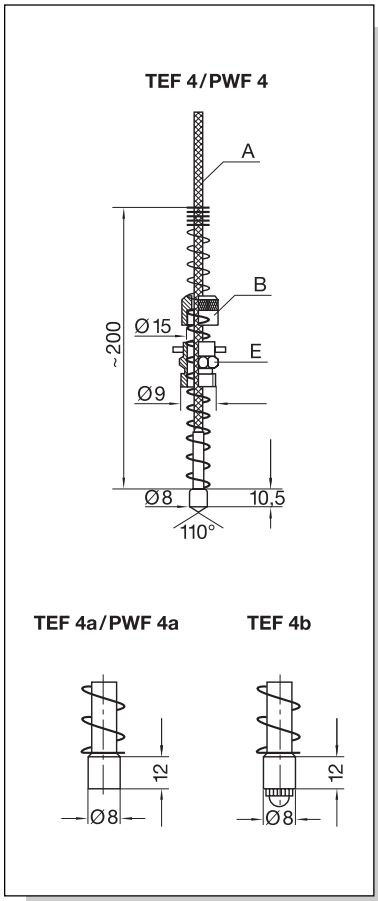


TEF 2, PWF 2

cylindrical sensor

- sensor tube (D) Ø 3.5 mm ± 0.05 mm
- length (L) 30 or 40 mm (without screwing)
- sheath from stainless steel (material-no. 1.4301)
- compensation line (A) glass silk insulated, 2 x 0.5 mm², approx. 3 mm Ø (without braided protection), 2000 mm long (standard), longer connections on request
- with GLS-sleeving (G), approx. 45 mm long
- FeCu-Ni, NiCr-Ni, PT 100
- TEF 2 L / PWF 2 L with fixing plate (B), material-no. 1.4301

installation instruction:
when assembling it is important to take care of the tight fit between bore bottom and sensor bottom



TEF 4, PWF 4

the most frequently used sensor

- sensor tube Ø 8 mm, length 10.5 mm
- with sensor tip 110°
- fitting depth of bayonet-cap (B) can be adjusted with screws on a 200 mm long compression spring
- with screw-in nipple (E) R 3/8", on request M 14 x 1.5 or R 1/4"
- compensation line (A) 2 x 1.0 mm², 2000 mm long
- FeCu-Ni, NiCr-Ni, PT 100

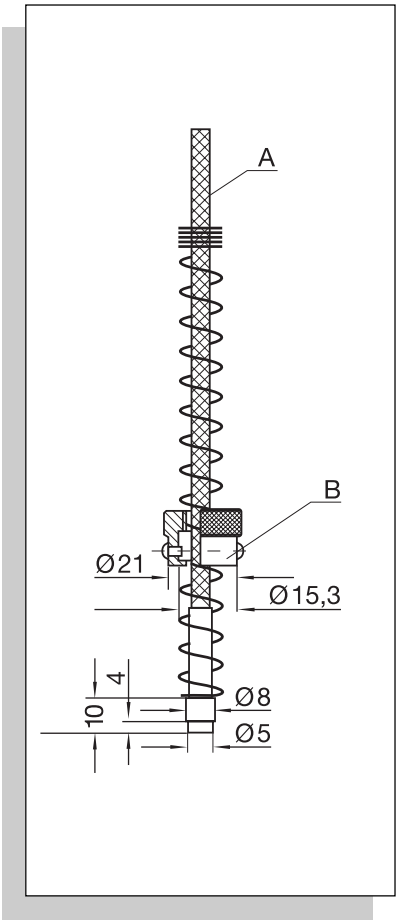
TEF 4a, PWF 4a

- as TEF 4 / PWF 4, but with flat sensor tip

TEF 4b

- as TEF 4 but with round sensor tip and ceramic insulation

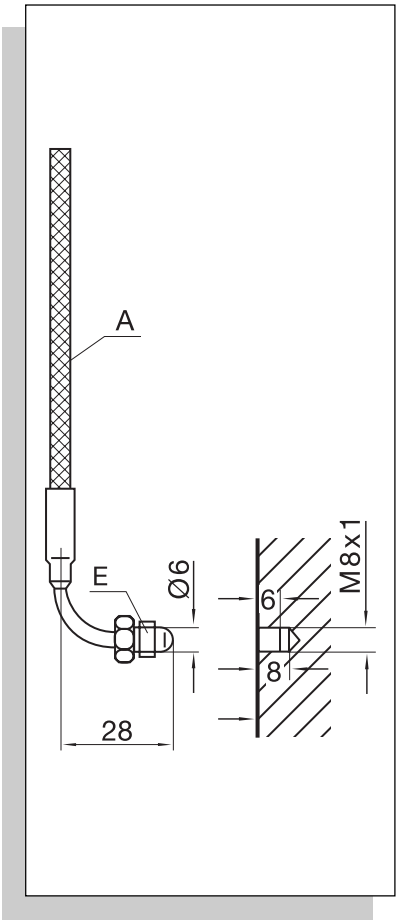
Thermocouples (TEF), Resistance Sensors (PWF)



TEF 11, PWF 11

cylindrical sensor

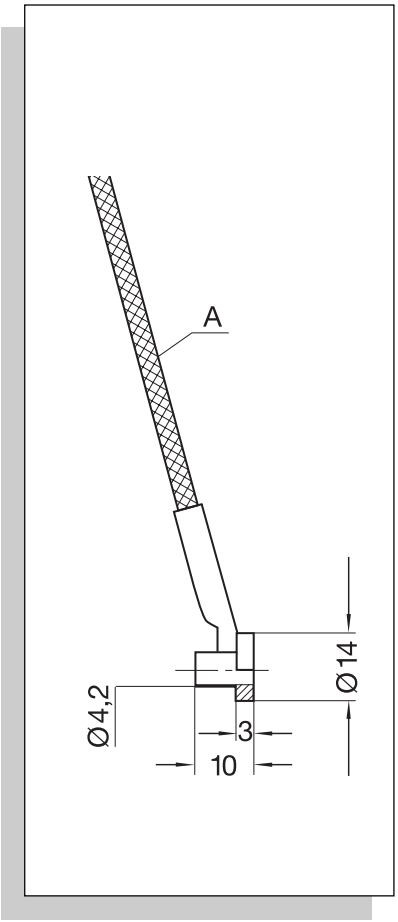
- sensor tube Ø 8 mm, length 6 mm; sensor plane Ø 5 mm, length 4 mm
- pinned cap (B) Ø 15.3 mm
- by turning the 200 mm long compression spring, the fitting depth can be adjusted
- for bayonet-screw-nipple Ø 14 mm, type N 11
- FeCu-Ni, NiCr-Ni
- PT 100 (PWF 11)
- compensation line (A) 2 x 1.0 mm², 2000 mm long



TEF 12

cylindrical sensor in angular shape

- sensor tube Ø 6 mm, length 5 mm
- with screw-in nipple (E) M 8 x 1
- FeCu-Ni, NiCr-Ni
- compensation line (A) 2 x 1.0 mm², 2000 mm long

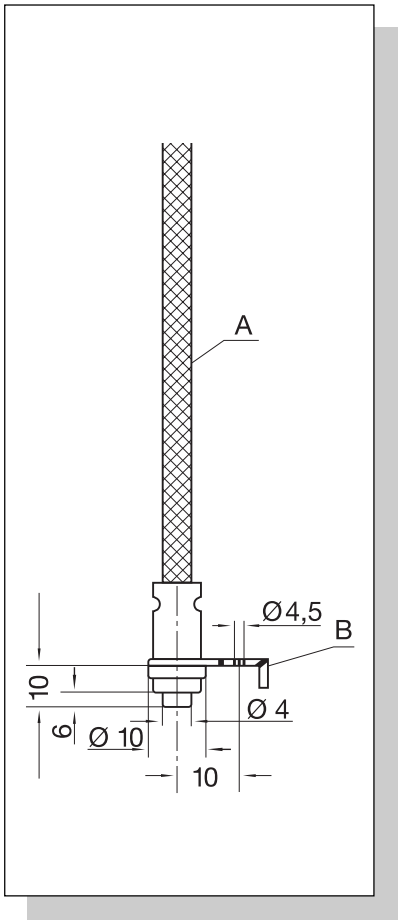


TEF 13

surface sensor

- sensor plane Ø 14 mm
- for installation with a central screw M 4
- FeCu-Ni, NiCr-Ni
- compensation line (A) 2 x 1.0 mm², 2000 mm long

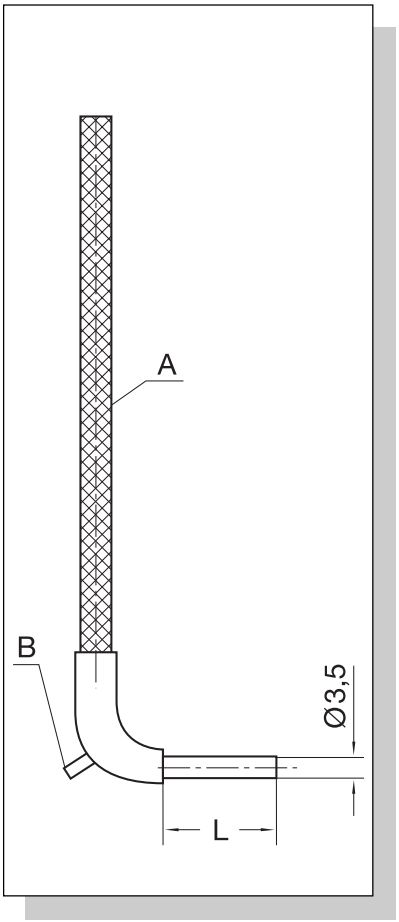
Thermocouples (TEF), Resistance Sensors (PWF)



TEF 14

surface sensor

- sensor plane Ø 10 mm
- with tab Ø 4 mm, length 6 mm and fixing bracket (B) for installation with screw M 4
- FeCu-Ni, NiCr-Ni
- compensation line (A) 2 x 1.0 mm², 2000 mm long

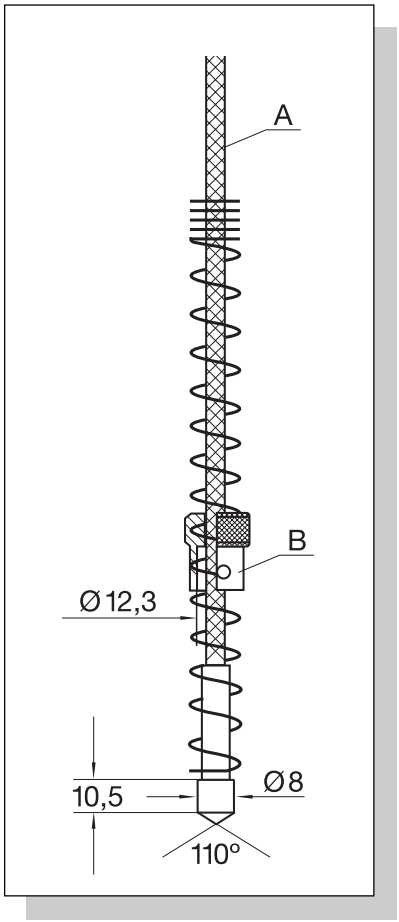


TEF 15

plug sensor for bores of Ø 3.6 mm

- sensor tube Ø 3.5 mm
- sensor is fixed in the bore hole with a tension spring
- length (L) 20 mm or any other length on request
- FeCu-Ni, NiCr-Ni
- compensation line (A) 2 x 1.0 mm², 2000 mm long

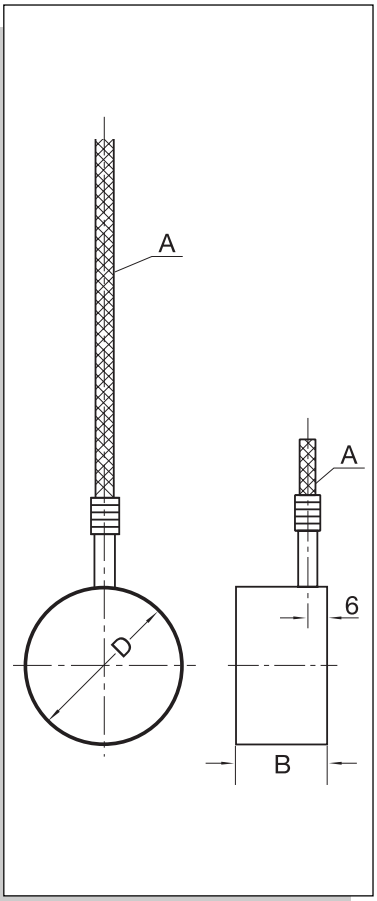
B: tension spring



TEF 16, PWF 16

- sensor tube Ø 8 mm, length 10.5 mm
- with sensor tip 110°
- fitting depth of bayonet-cap (B) Ø 12.3 mm can be adjusted with screws on a 200 mm long compression spring
- FeCu-Ni, NiCr-Ni
- PT 100 (PWF 16)
- compensation line (A) 2 x 1.0 mm², 2000 mm long

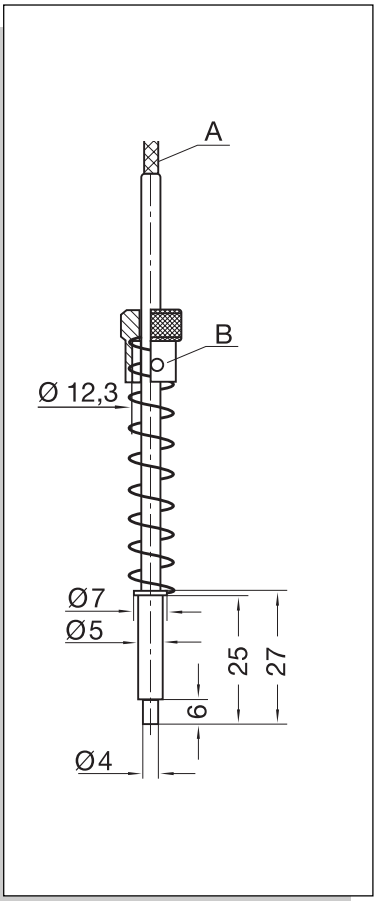
Thermocouples (TEF), Resistance Sensors (PWF)



TEF 19 Fe-CuNi

- Ø 6 mm
- with brass heat conductor sheet
- 1 mm thick
- for placing underneath small heater bands
- the enlargement of the diameter opens the clamping gap of the heater band to incorporate the sensor
- compensation line (A) 2 x 1.0 mm², 2000 mm long

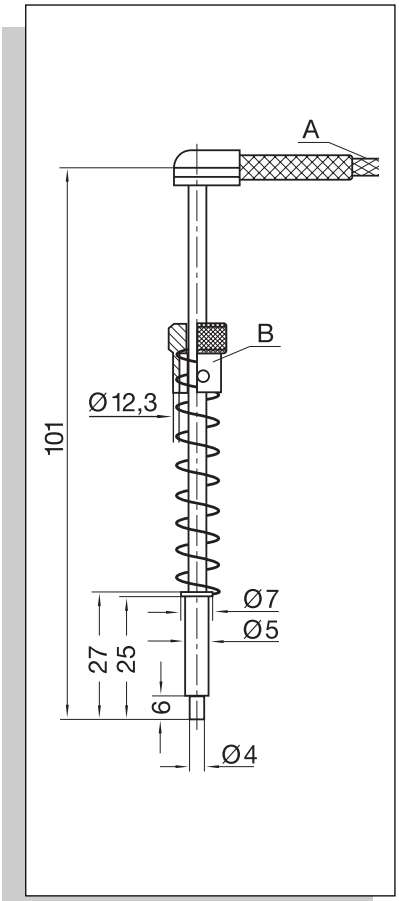
order information:
please state diameter (D) and width of heater band (B).



TEF 20, PWF 20

cylindrical sensor

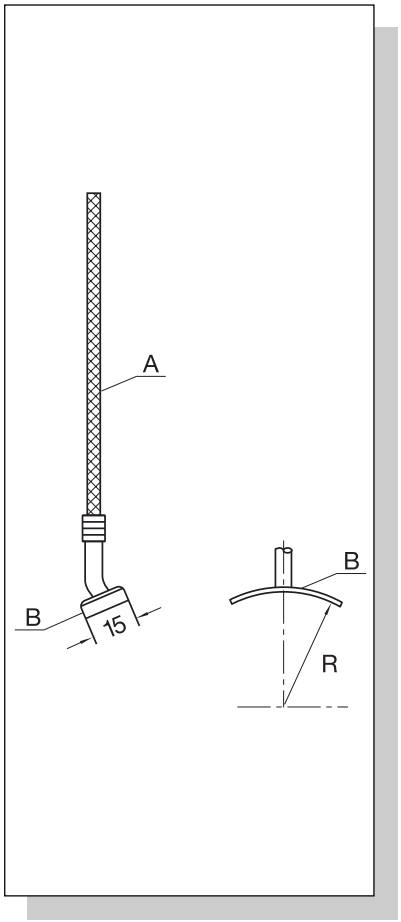
- sensor tube Ø 5 mm, length 19 mm; sensor plane Ø 4 mm, length 6 mm
- bayonet-cap (B) Ø 12.3 mm for variable installation length, for screw-in nipple type EN 20/21
- FeCu-Ni, NiCr-Ni
- PT 100 (PWF 20)
- compensation line (A) 2 x 1.0 mm², 2000 mm long



TEF 21, PWF 21

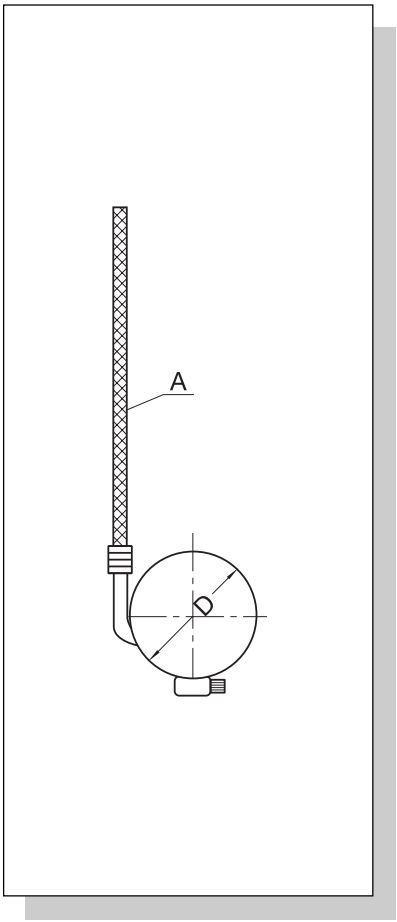
- sensor exactly as TEF 20, but angled

Thermocouples (TEF), Resistance Sensors (PWF)



TEF A Fe-CuNi

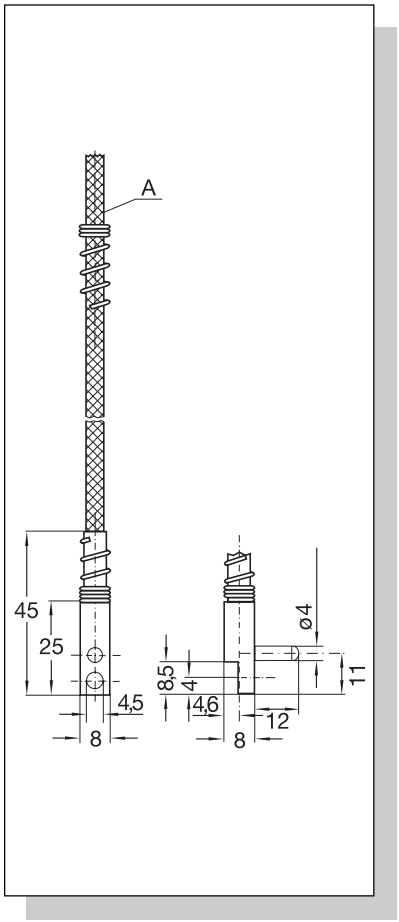
- Ø 6 mm
- with fixing plate (B) 15 x 30 mm, 0.30 mm thick, radius (R) can be chosen
- can be slipped under a heater band
- heater band should have a cut out of Ø 6 x 6 mm on the edge or the clamping gap may be used if 6 mm wide
- compensation line (A) 2 x 1.0 mm², 2000 mm long



TEF Sp Fe-CuNi

clamping band sensor

- band width of 9 mm for range of clamping diameters (D) as shown in the list below
- sensor is fixed onto the cylinder, which has to be measured, like a wide clip
- compensation line (A) 2 x 1.0 mm², 2000 mm long
- clamping diameters (D): 12-20 mm, 16-25 mm, 20-32 mm, 23-35 mm, 25-40 mm, 32-50 mm, 40-60 mm, 50-70 mm, 60-80 mm, 70-90 mm, 80-100 mm, 90-110 mm



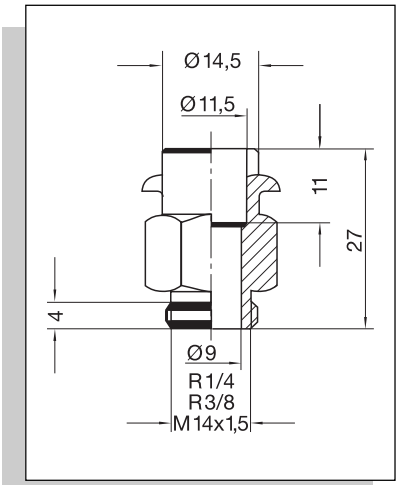
TEF 68 Fe-CuNi

small cylindrical sensor

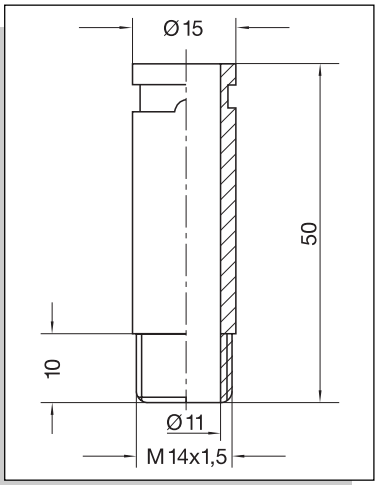
- sensor tube Ø 4 mm ± 0.03 mm, length 12 mm (standard, other lengths on request)
- for installation with screw M 4
- sensor protection tube from stainless steel (material-no. 1.4541)
- compensation line (A) with braided metal sleeving 2 x 1.0 mm², 2000 mm long

Screw-In Nipples

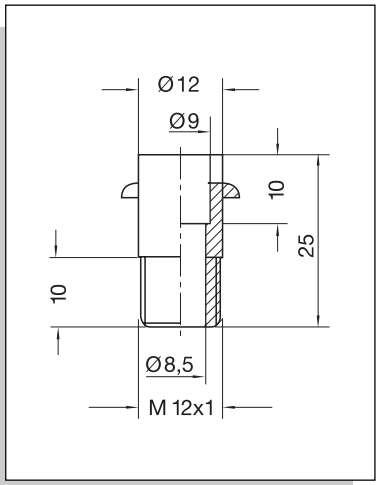
type N 4 (for TEF 4)



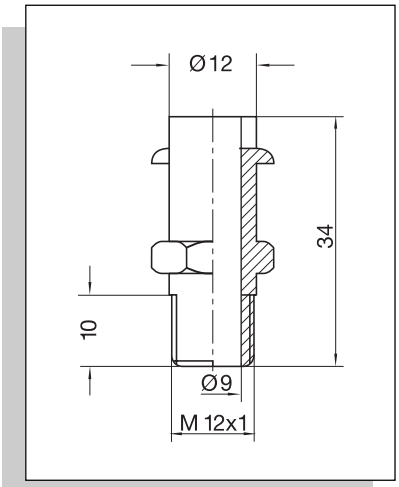
type N 11 (for TEF 11)



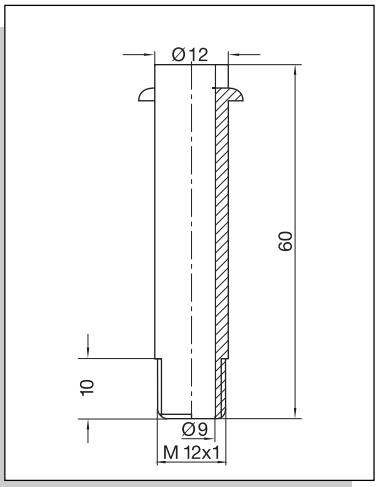
type N 16 (for TEF 16)



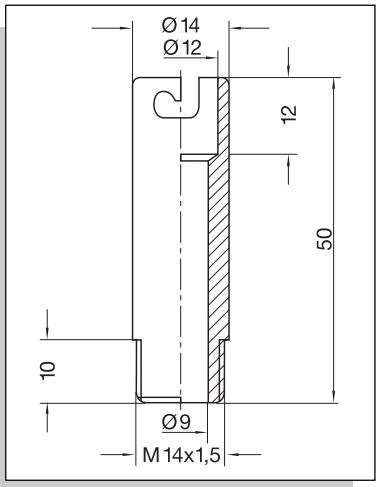
type N 20/21 (for TEF 20/21)



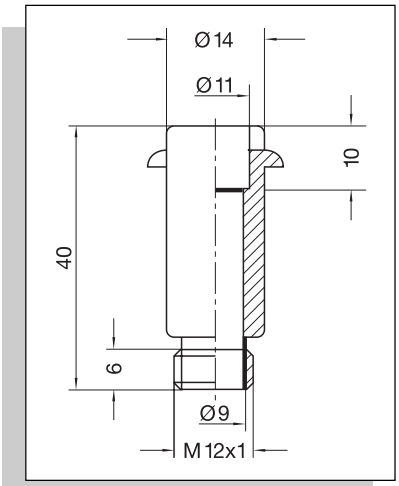
type EN 30



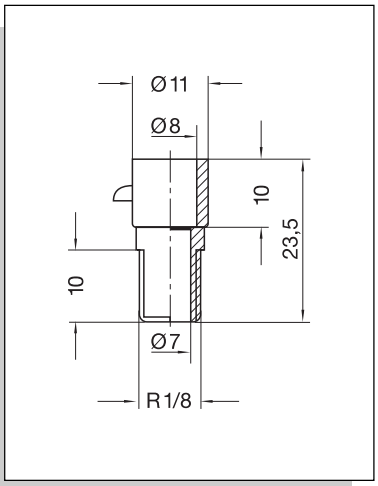
type EN 31



type EN 32



type EN 33



Plug Connections, Flange Sockets, Cables

plugs:

corresponding flange sockets:

small, round plug connectors
Ø 13 mm, with thread
T 3200 / 2 poles
T 3260 / 3 poles
T 3300 / 4 poles

angular plug
T 3303-06 / 4 poles

small, round plug connectors
Ø 21 mm, with thread
T 3079 / 3 poles

small, round plug connectors
Ø 21 mm, with thread
T 3083 / 5 poles

small, round plug connectors
Ø 21 mm, with bayonet-locking
T 3008 / 3 poles
T 3012 / 5 poles

cable with end sleeves

cable with cable shoes

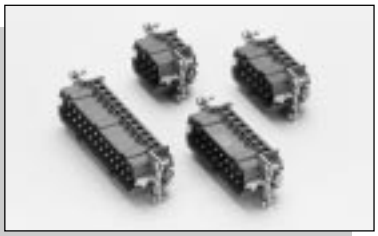
Plug Connections

housing top part (left)
with strain relief, without locking
art.-no.
9610600 (6 poles), 9611000 (10 poles),
9611600 (16 poles), 9612400 (24 poles)

housing bottom part (right)
art.-no.
9620600 (6 poles), 9621000 (10 poles),
9621600 (16 poles), 9622400 (24 poles)

plug insert (left)
art.-no.
9640600 (6 poles), 9641000 (10 poles),
9641600 (16 poles), 9642400 (24 poles)

socket insert (right)
art.-no.
9630600 (6 poles), 9631000 (10 poles),
9631600 (16 poles), 9632400 (24 poles)



cable for
plug connections

Controller Cart on Castors

controller cart on castors

art.-no. 8850000

- for a safe and comfortable put down and transport of multiple or multiple zones temperature controllers within the production area
- on castors
- load capacity 150 kg
- measures of the position area (w x d) 507 x 412 mm
- adjustable angle of inclination of the position area: horizontal, 15° or 30°
- height-adjustable from 490 - 776 mm

Ceramic Terminal Connector

ceramic terminal connector

for each tubular heater Ø 8.0 - 8.5 mm

- no additional insulation necessary
- heat resistant up to 230 °C in continuous operation (max. up to 280 °C)
- nominal voltage 400 V
- ready for installation
- dimensions (w x h x d) approx. 14 x 21 x 25 mm

Connection Boxes

version 1

- from stainless steel, without terminal strip, with plug connection (up to 10 A, 250 V)
- art.-no. 9604080, 40 x 80 mm

version 2

- from stainless steel, with or without terminal strip from 160 mm (increasing by 20 mm each), also with plug connection (up to 10 A, 250 V)
- art.-no. 9604160, 40 x 160 mm
- art.-no. 9604161, 40 x 160 mm, with PG-screwing at the side
- art.-no. 9604240, 40 x 240 mm

version 3

- from stainless steel, with or without terminal strip (see above), with plug socket for thermocouple connection

version 4

- from stainless steel, with terminal strip and plug connection (up to 16 A, 220 V)

"Isoleitspray"

"Isoleitspray"

high temperature lubricant
art.-no. 9400001

- heat conductive
- not electrically conductive
- corrosion protection
- less abrasion
- very good separation quality against metal, glass and slag melts as well as plastics
- temperature resistant up to 900 °C if exposed to air, up to 2000 °C in non-oxidizing atmosphere
- tin contains ~ 200 ml

Assembly Kit and Accessories for Installation

The hotset-assembly kit is a useful help for assembling heating elements. Only a few grasps - and the assembling of the original parts used by hotset is finished.

art.-no. 9100000, contents:

- assembly spray
- end sleeves
- crimp sleeves
- cable shoes
- crimping pliers
- electro insulation tape
- connection leads
- protective sleevings

All accessory parts are also available as single parts.

end sleeves

- art.-no. 222000
  100 pcs, up to 1.5 mm²
- art.-no. 222001
  100 pcs, up to 2.5 mm²

crimp sleeves

- art.-no. 221001 (for leads 0.22 mm²)
- art.-no. 221002 (for leads 0.5 mm²)
- art.-no. 221004 (3 x 0.6 x 12)
- art.-no. 221005 (for leads 1.0 mm²)
- art.-no. 221006 (3 x 0.3 x 12)
- art.-no. 221007 (4 x 0.5 x 7)
- art.-no. 221008 (4 x 0.5 x 12)
- art.-no. 221009 (for leads 1.5 mm²)
- art.-no. 221010 (5 x 0.5 x 6)
- art.-no. 221011 (for leads 2.5 mm²)

cable shoes

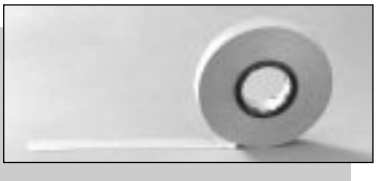
- art.-no. 228000
  (heat resistant up to 80 °C)
  100 pcs, red, 0.5-1.0 M4
- art.-no. 228003
  (heat resistant up to 350 °C)
  100 pcs, blue, 0.5-2.5 M5

crimping pliers

- art.-no. 9100010
  industry version

electro insulation tape

- art.-no. 9100020
  20 m, heat resistant up to 130 °C, resistant against rubbing off, humidity, lyes, solvent and other acids (insulation material class B - 180 °C)



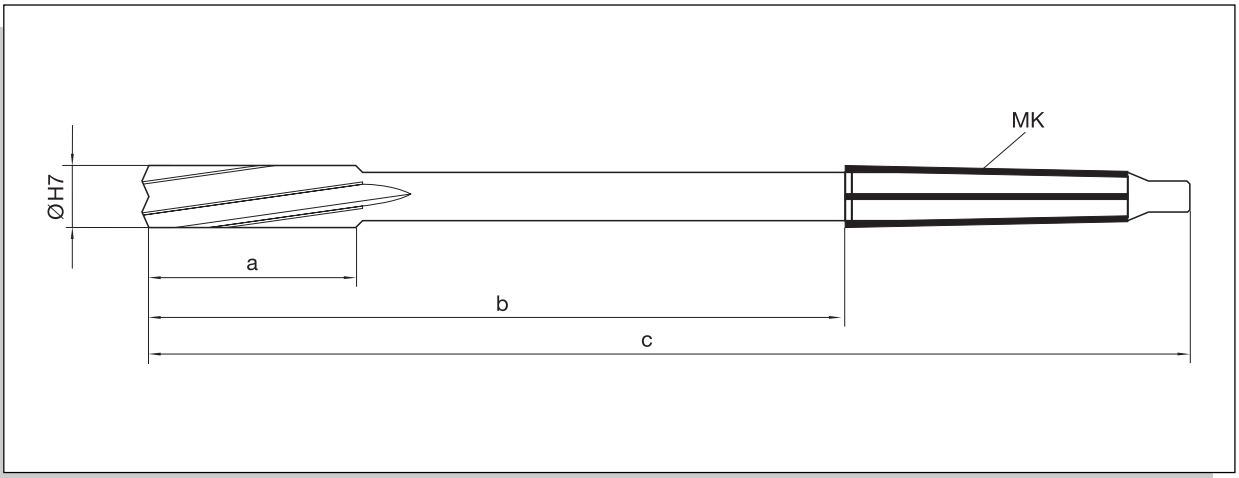
Cables and Connection Leads

	article number	cross-section	remarks
glass silk insulated leads up to 250 °C	271000 272000 271001 272001 271002 272002 271003 272003 271004 272004 271005 272005 272006 272007	0.22 mm² 0.22 mm² 0.50 mm² 0.50 mm² 0.75 mm² 0.75 mm² 1.00 mm² 1.00 mm² 1.50 mm² 1.50 mm² 2.50 mm² 2.50 mm² 4.00 mm² 6.00 mm²	with identity thread without identity thread with identity thread without identity thread with identity thread without identity thread with identity thread without identity thread with identity thread without identity thread with identity thread without identity thread
high heat resistant leads up to 600 °C	273100 273101 273102 273103 273104 273105	0.22 mm² 0.50 mm² 0.75 mm² 1.00 mm² 1.50 mm² 2.50 mm²	
kapton insulated leads up to 220 °C	291000 291001 291002	0.75 mm² 1.50 mm² 2.50 mm²	
teflon insulated leads up to 260 °C	301000 301004 301001 301007 301003	0.22 mm² 0.50 mm² 0.75 mm² 1.00 mm² 1.50 mm²	
high flexible silicon leads up to 180 °C	314004 314003 314002	0.25 mm² 0.50 mm² 0.75 mm²	

Protective Sleevings

	article number	diameter	remarks
glass silk protective sleeving 0.35 WS	381000 381001 381002 381004 381005 381006 381007 381008 381009	0.5 mm 1.0 mm 1.5 mm 2.0 mm 2.5 mm 4.0 mm 5.0 mm 6.0 mm 7.0 mm	
glass silk protective sleeving 1.0 WS	382000 382001 382002 382003 382008 382004 382005	2.0 mm 3.0 mm 4.0 mm 5.0 mm 5.5 mm 6.0 mm 8.0 mm	

Machine Reamer



standard details

- material HSS
- for bore holes according to ISO H7
- morse cone (MK)

variable specifications

- for heater length and diameter according to the High Watt Density Cartridge Heaters stock measurements

options

- special manufactures are possible in each required diameter and lengths

order details

- art.-no. 9201001
- type: Rb1

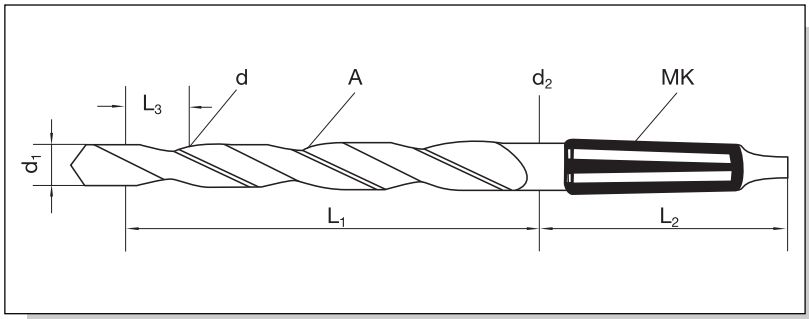
drawing:

a: cutting length
b: drilling depth
c: total length

stock measurements:

article number	type	heater-nom.-Ø mm / inch	reamer Ø H7	cutting length (a) mm	max. ream depth (b) mm / inch	total length (c) mm
9201001 9201002	Rb 1 Rb 2	6.5	6.50	28 28	80 100	200 220
9202003 9202004	Rb 3 Rb 4	8.0	8.00	40 40	80 130	200 250
9203005 9203006	Rb 5 Rb 6	10.0	10.00	40 40	80 160	220 250
9205007 9205008	Rb 7 Rb 8	12.5	12.50	45 45	80 200	220 300
9206009 9206010 9206011	Rb 9 Rb 10 Rb 11	16.0	16.00	40 45 45	170 200 300	260 300 400
9207012 9207014	Rb 12 Rb 14	20.0	20.00	45 45	100 300	220 400
9211021 9211022	Rb 21 Rb 22	1/4"	6.32	28 28	3" 4"	200 220
9213023 9213024	Rb 23 Rb 24	3/8"	9.48	40 40	3" 6"	220 250
9215025 9215026	Rb 25 Rb 26	1/2"	12.63	45 45	3" 6"	220 300
9216028 9216030	Rb 28 Rb 30	5/8"	15.83	45 45	4" 10"	260 400

Drill Reamer



standard details

- material HSS
- morse cone (MK)
- cone (A) 1 : 50

variable specifications

- for heater length and diameter according to the heater insert stock measurements

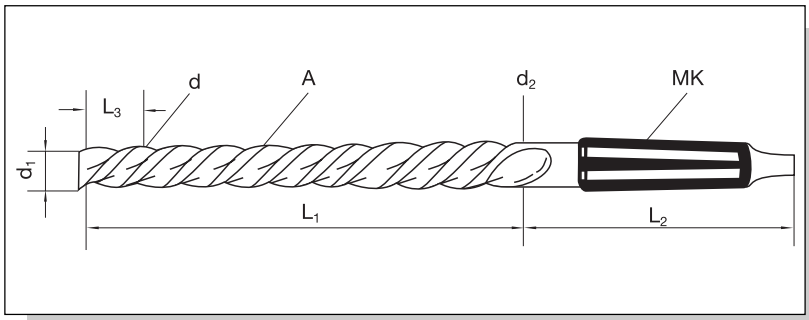
order details

- art.-no. 9310156

stock measurements:

art.-no.	max. Ø sleeve	MK	L_1	L_2	L_3	d	d_1	d_2	type
9310156	10.7-12.3 mm	1	200	80	27	9.0	8.46	12.0	1
9310357	14.6-15.7 mm	2	200	100	27	12.5	11.96	15.7	2
9310358	16.5-17.6 mm	2	280	100	27	12.5	11.96	17.3	3
9310359	17.1-18.3 mm	2	200	100	27	15.0	14.46	18.0	4
9310560	19.1-20.0 mm	2	280	100	27	15.0	14.46	19.7	5

Conical Reamer



standard details

- material HSS
- morse cone (MK)
- cone (A) 1 : 50

variable specifications

- for heater length and diameter according to the heater insert stock measurements

order details

- art.-no. 9220156

stock measurements:

art.-no.	max. Ø sleeve	MK	L_1	L_2	L_3	d	d_1	d_2	type
9220156	10.7-12.3 mm	1	180	80	5	9.0	8.9	12.0	6
9220357	14.6-15.7 mm	2	180	100	5	12.5	12.4	15.7	7
9220358	16.5-17.6 mm	2	270	100	5	12.5	12.4	17.6	8
9220559	17.1-18.3 mm	2	180	100	5	15.0	14.9	18.3	9
9220560	19.1-20.0 mm	2	270	100	5	15.0	14.9	20.0	10

Casting Compound and Binding Agent

casting compound VM 1000

for Tubular Heaters type RHK

- art.-no. 9410000
  500 g / 1000 g
- on copper base
  art.-no. 9410001
  500 g / 1000 g

binding agent BM 1000

for Tubular Heaters type RHK

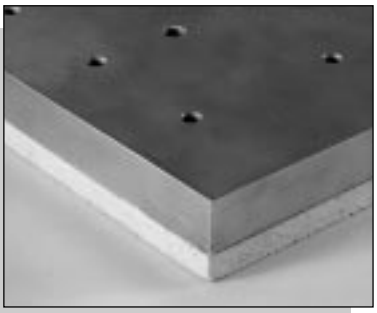
- art.-no. 9420000
  0.5 l / 1.0 l

Heat Insulation Plates, Insulation Tubes

heat insulation plates

cement-binded silicate fire-protective building plates, insensitive to humidity, self-carrying, for the universal application in the technical heat insulation

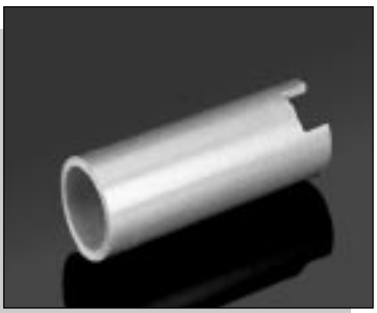
- measurements: 500 x 500 mm (standard, others on request)
- thickness: 6 mm
- not flammable to DIN 4102
- temperature resistant: 400 °C
- raw density ρ: approx. 870 kg/m³
- heat conductivity λ: 0.175 W/mK



insulation tubes

reduction of the heat radiation due to heat damming, resulting in considerable energy savings

- for Sealed Heaters type GMH (stock measurements, others on request)
- for Heated Machine Nozzles type BMD (stock measurements, other on request)



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