Thermocouple assembly B

Screw-in type with interchangeable insert

Data sheet 1304

FRODE PEDERSEN

Application

- Measurement of temperature in pipes and containers with gaseous and liquids media, such as air, vapour, gasses, water and oil
- The operating range is up to 800°C, max. 50 bar and flow velocity up to 25m/sec (air)
- Fields of application
  - Petro- and chemical process engineering
  - Power plants
  - Boilers

Technical features

- Thermocouple type J, K and N acc. to IEC-584-1
- Permissible mechanical and thermal stress acc. to DIN 43763
- Connected to the process with a screwed attachment welded on the protective tube
- The measuring insert can be exchanged or calibrated without closing down the process
- Measuring insert is a mineral insulated type, vibrationproof
- Protective tube stainless and acidproof steel
- Optionally, can be supplied with head mounted transmitter

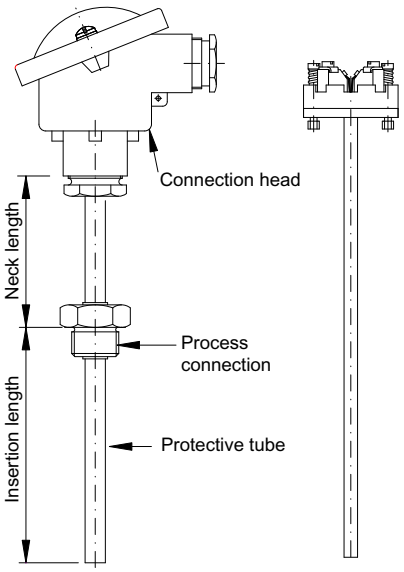
Ordering

The requested sensor is selected from the table below

The colour code means:

Standard:	Built of standard modules (short delivery time)
Variant:	Modified standard modules
Special:	Special versions and material. We are specialist in temperature measurement. Please contact us and we shall do our utmost to solve your specific measuring task

Assembly **Measuring insert**



Ordering information

Sensor **Transmitter**

Specification number 1304- **4mA: °C 20mA: °C** 4)

Protective tube

SS and acidproof steel,W.no.1.4571(AISI316Ti)

Max. 800°C

9mm OD. 1mm wall	0
11mm OD. 2mm wall	1
15mm OD. 1.5mm wall (3/4" BSP recom.)	2
Special:	s

Neck length (mm)

25 (min.)	0
50	1
100	2
150	3
Special:	9

Insertion length (mm)

PS. for length > 400mm 15 OD mm protective tube and 3/4"BSP are recommended

100	0 1 0 0
150	0 1 5 0
200	0 2 0 0
250	0 2 5 0
400	0 4 0 0
Interim lengths (Min.50, max. 3000)	x x x x

Process connection (see page 2)

1/2" BSP	0
3/4" BSP	1
1" BSP	2
Special:	s

Connection head

B:	Degree of protection IP 65	0 1
BHS:	Degree of protection IP 65	1 2
BHSH:	Degree of protection IP 65, high cap for transmitter	2 s
Special		s

Transmitter, 2-wire, 4-20mA output

0	None
1	FPTU Standard version. As terminal block
2	FPTU Standard version. In high cap (B-head)
3	FPTU galvanic isolated. As terminal block
4	FPTU galvanic isolated. In high cap (B-head)
5	FPTU galvanic isolated. EEXiallCT4/6. As terminal block
6	FPTU galvanic isolated. EEXiallCT4/6. In high cap (B-head)
a	FPTT galvanic isolated. As terminal block
b	FPTT galvanic isolated. In high cap (B-head)
c	FPTT galvanic isolated. EEXiallCT4/6. As terminal block
d	FPTT galvanic isolated. EEXiallCT4/6. In high cap (B-head)
s	Special

Note 4: Please specify measuring range

Tolerance acc to IEC 584-2

0	Class 2, for J, K and N, i.e. ±2.5°C or 0.0075 x t_{actual} (°C) 3)
1	Class 1, for J, K and N, i.e. ±1.5°C or 0.0040 x t_{actual} (°C) 3)

Note 3: The highest value apply

Number of thermocouples

0	1
1	2

Measuring insert

Model	Thermocouple	Type	Diam./type	Max. temperature 1) Continuously	Shortly
TK80	Fe-CuNi	J	6 MI 2)	800°C	850°C
TK115	NiCr-Ni	K	6 MI 2)	1000°C	1150°C
TK125	Nicrosil-Nisil	N	6 MI 2)	1100°C	1250°C
Special:					

Note 1: The values apply for the thermocouple.

Note 2: MI= Mineral insulated.

Accessesories

Measuring insert: See data sheet 9108

Transmitter: See data sheet 9168

Customer information

Name:

Tel.:

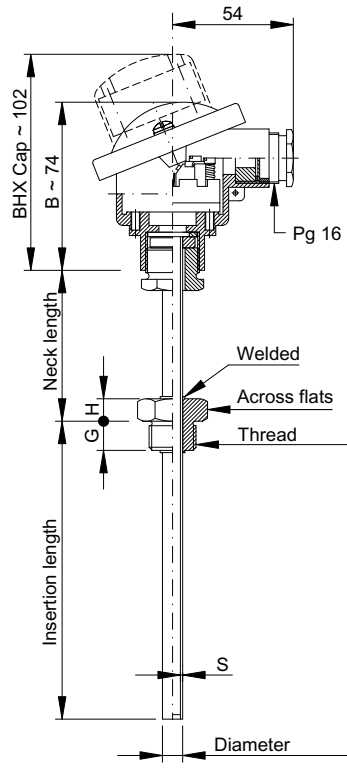
TECHNICAL DATA

All dimensions in mm

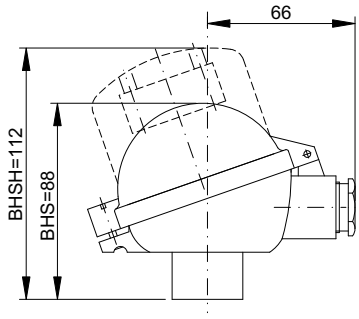
Dimensions

Assembly
Connection head

Type B / B+BHX Cap (for transmitter)



Type BHS / BHSH (for transmitter)

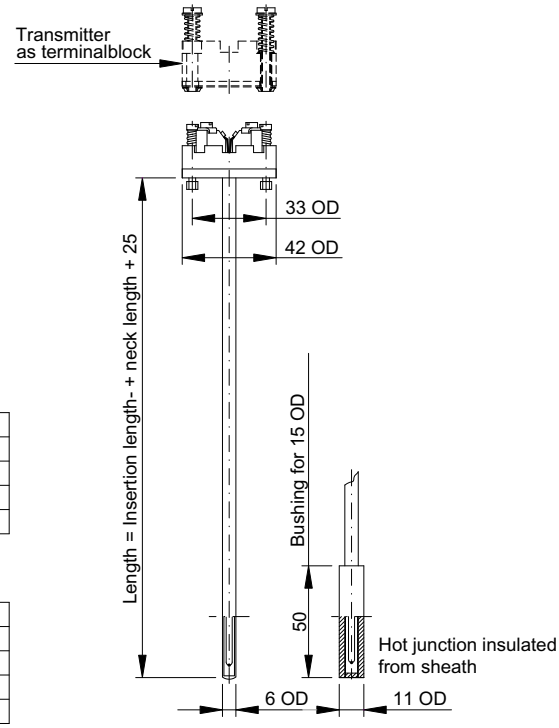


Process connection			
Thread	Across flats	G	H
1/2" BSP	27	13	10
3/4" BSP	32	14.5	12
1" BSP	41	17	14

Protective tube W.no. 1.4571	
Diameter	Wall thickness S
OD 9	1
OD 11	2
OD 15	1.5

Measuring insert

Type TK, mineral insulated



Stress diagram for protective tube acc. to DIN 43763, material W.no. 1.4571

Fig.1
9 OD with 1/2" BSP

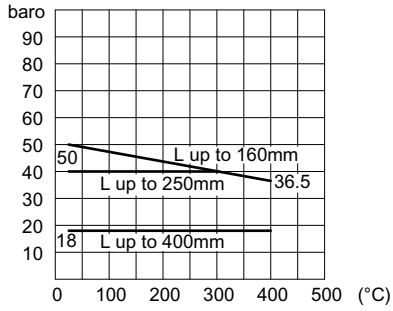


Fig.2
11 OD or 15 OD with 1/2" or 3/4" BSP

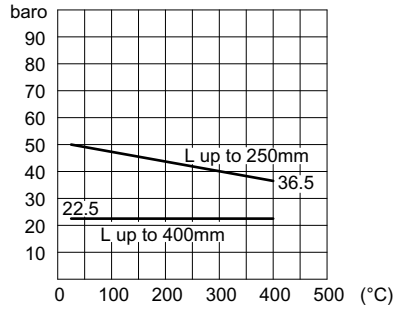
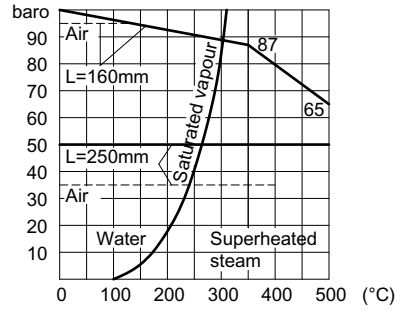


Fig.3
11 OD or 15 OD with 1" BSP



Permissible stress diagram		Fig.1	Fig.2		Fig.3	
Protective tube - diameter OD/ID		9/7	11/7	15/12	11/7	15/12
Process connection		1/2" BSP	1/2" or 3/4" BSP		1" BSP	
Torque on installation,max.		50Nm	50Nm	50Nm	100Nm	100Nm
Maximum flow velocity (m/sec)	Air	25	25	25	40	40
	Superheated steam	25	25	25	40	40
	Water	3	3	3	5	5

L=Insertion length

Response time

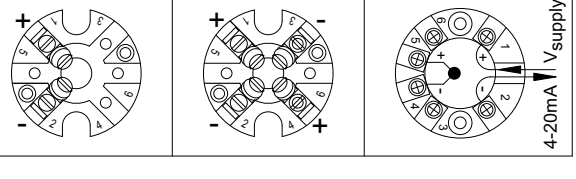
Protective tube Diameter	Response time in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
9	17	55	98	290
11	22	70	102	310
15	26	77	120	350

Note:

The 0.5/0.9 time is the time that it takes the sensor to reach 50%/90% of the final value of a temperature change of a medium.
If media and velocity are different from the ones stated, the time can change significantly.

Connection diagram

Thermocouple		Transmitter FPTU/FPTT
Single TC	Duplex TC	



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