Resistance Thermometer B

Screw-in type with interchangeable insert

Data Sheet 1403

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 600°C, max. 50 bar and flow velocity up to 25m/sec (air)
- Fields of application
  - Chemical process engineering
  - Power plants, boilers
  - Heat distribution (district heating)

Technical features

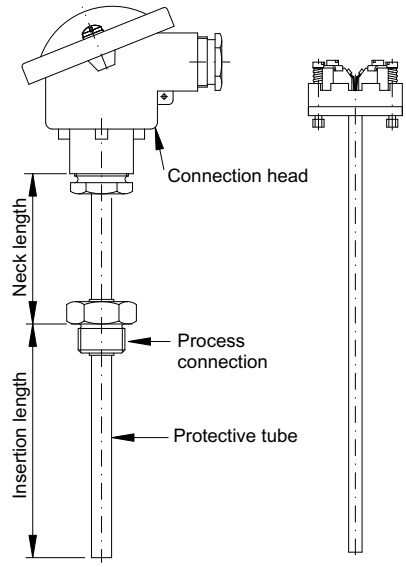
- Pt100 resistance thermometer acc. to IEC 751
- Permissible mechanical and thermal stress acc. to DIN 43763
- 3-wire connection is standard
- Connected to the process with a screwed attachment welded on the protective tube
- The measuring insert can be exchanged or calibrated without closing down the process
- Measuring insert in either ceramic powder filled tube M40, or mineral insulated MK40/60, vibrationproof
- Protective tube stainless and acidproof steel
- Can be supplied with head mounted transmitter as an option

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 1403- | **4mA: °C 20mA: °C** 1)

Protective tube

SS, acidproof steel, W.no. 1.4571 (AISI 316Ti)
Max. 800°C

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

Neck length (mm)

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

Insertion length (mm)

PS. for length > 400mm 15mm OD 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
BHS: Degree of protection IP 65	1
BHSH: Degree of protection IP 65, high cap for transmitter	2
Special:	s

Transmitter, 2-wire, 4-20mA output

0	None
1	FPTM as terminal block (Sensor only 3-wire)
2	FPTM in high cap, B-head. (Sensor only 3-wire)
3	FPTU standard version. As terminal block
4	FPTU standard version. In high cap, B-head
5	FPTU galvanic isolated. As terminal block
6	FPTU galvanic isolated. In high cap, B-head
7	FPTU galvanic isolated. EEXiallCT4/6. As terminal block
8	FPTU galvanic isolated. EEXiallCT4/6. In high cap, B-head
s	Special:

Note 1: Please specify measuring range in °C

Connection. Wiring configuration

0	3-wire
1	4-wire
2	2-wire

Tolerance acc. to IEC 751

0	Class B, i.e. ± (0.3°C + 0.005 x t_{actual})°C
1	Class A, i.e. ± (0.15°C + 0.002 x t_{actual})°C
2	1/3 Class B @ 0°C, i.e. ± (0.10°C + 0.005 x t_{actual})°C
3	1/6 Class B @ 0°C, i.e. ± (0.05°C + 0.005 x t_{actual})°C
4	Paired in groups, deviation ± 0.1°C @ 0°C og 100°C
5	Special, i.e. ± (0.045°C + 0.001x t_{actual})°C (Max 400 °C)
s	Special:

Resistance value (ohm) acc. to IEC 751

0	1 x Pt100
1	2 x Pt100
2	1 x Pt1000
s	Special:

Measuring insert: Type and measuring range

1	M40: -50 +400°C Std. version, tube w/powder. (All tolerances)
2	MK60: 0 +600°C Mineral insulated. (Only tolerance 0 and 1)
3	MK40:-50 +400°C Mineral insulated. (Only tolerance 2, 3, 4 or 5)
s	Special:

Accessesories

Measuring insert:	See data sheet 9108-02
Transmitter:	See data sheet 9168

Customer information

Name:
Tel.:

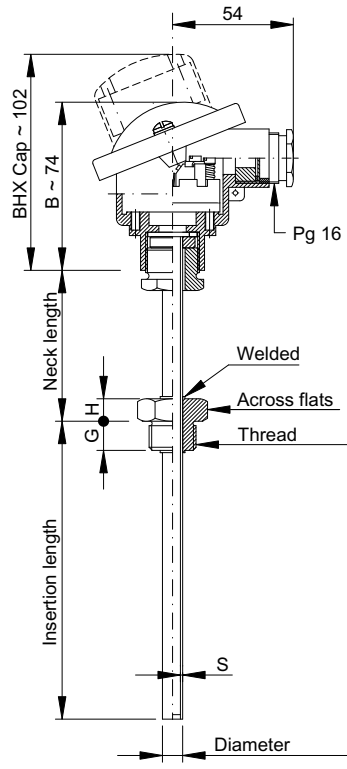
TECHNICAL DATA

All dimensions in mm

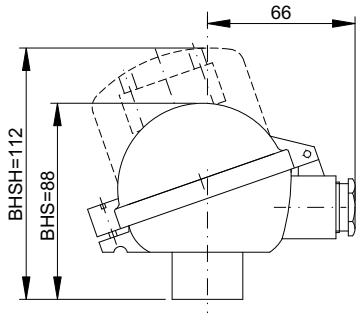
Dimensions

Assembly
Connection head

Type B / B+BHX Cap (for transmitter)



Type BHS / BHSH (for transmitter)

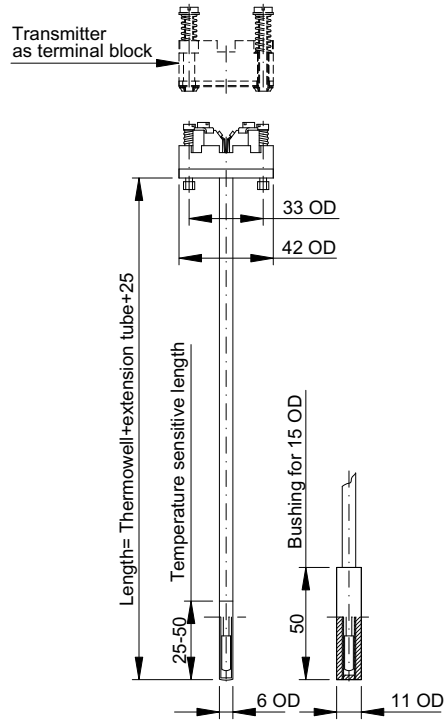


Process connection			
Thread	Across flats	G	H
1/2" BSP	27	13	10
3/4" BSP	32	14.5	12
1" BSP	41	17	14

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

Measuring insert

Type M40 / MK60



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

Fig.1
9 OD with 1/2" BSP

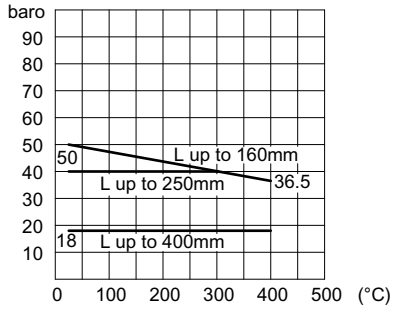


Fig.2
11 or 15 OD with 1/2" or 3/4" BSP

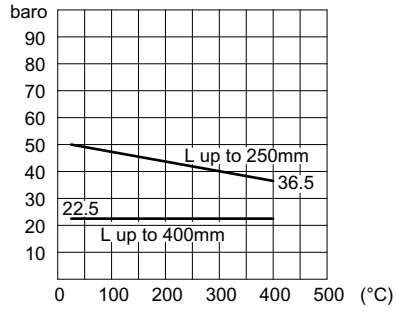
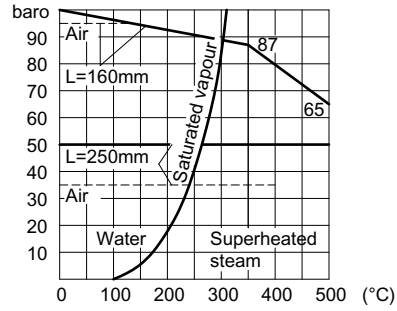


Fig.3
11 or 15 OD with 1" BSP



Permissible stress diagram		Fig.1	Fig.2		Fig.3	
Protective tube - OD/ID		9/7	9/7	15/11	11/7	15/11
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

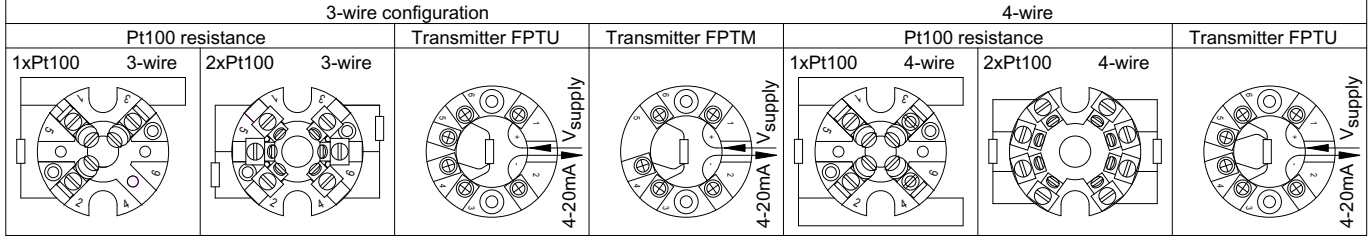
Response time

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	20	65	115	340
11	25	80	120	360
15	30	90	140	410

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



AMETEK DENMARK A/S GYDEVANG 32-34, DK - 3450 ALLERØD TEL: +45 48168000 FAX: + 45 48168080