Frode Pedersen temperature sensors

Thermocouple assembly AMK

With steel protective tube and ceramic inner tube

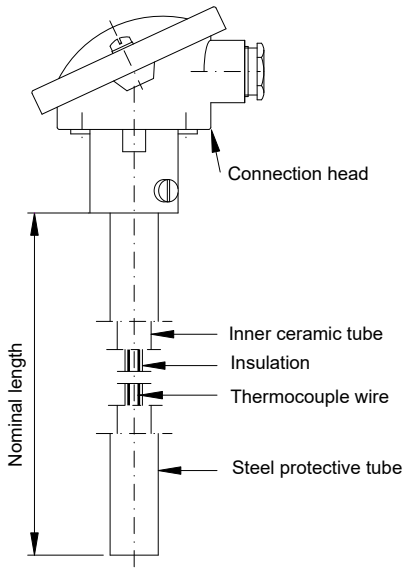
Data sheet 1101

Application

- Measurement of high temperature in big furnaces and ducts with combustion gasses and air
- The operating range is up to 1100°C
- Fields of application
  - Brickworks
  - Refuse and hazardous waste incineration plants
  - Furnaces

Technical features

- Thermocouple type K, N, R or S acc. to IEC 584-1 (EN60584-1)
- Built acc. to DIN 43733
- Connected to the process by adjustable flange or compression fitting
- Gas-tight ceramic inner tube for protecting the thermocouple against contamination
- Outer protective tube in heat-resistant steel
- Modular design and standard length minimize the necessary numbers of spares
- Optionally, it can be supplied with head mounted transmitter



Ordering

The requested sensor is selcted from the table below
The colour code means:

Standard: Built of standard modules (short delivery time)

Variant: Modified standard modules

We are specialist in temperature measurement.
Please contact us and we will do our best to solve to solve your specific measuring task

Ordering information

Specifications number	1101-	Sensor												Transmitter 4mA: °C 20mA: °C 3)

Protective tube

Heat resistant steel, W.no. 1.4749 (AISI 446)
Max. 1100°C (Continuosly)

21.3mm OD. 2.65 mm wall	0
26mm OD. 4 mm wall	1

Inner tube, ceramic acc. to DIN 43724

KER 610 (C610). Al_2O_3>60%	0
KER 710 (C799). Al_2O_3>99.7%.	1

Recommended f/ S/R T/C

Nominal length (mm)

500	0 5 0 0
710	0 7 1 0
1000	1 0 0 0
1400	1 4 0 0
2000	2 0 0 0
Interim lengths (Min. 250, max. 2000)	x x x x

Process connection (see page 2)

None		0
Fig. 1	Adjustable flange	1
Fig. 1+2	Adjustable flange + counter flange (only f/ 21.3 tube)	2
Fig. 3	1" BSP Compression fitting for 21.3mm OD protective tube	3
Fig. 3	1 1/4" BSP Compression fitting for 26mm OD protective tube	4

Connection head

A:	Degree of protection IP 53	0
AHSH:	Degree of protection IP 53, high cap for tranmitter	1

Electrical connection

0	Terminal block with screw terminals
1	Transmitter FPTU galvanic isolated. (In cap in AHSH head)
2	Transmitter FPTU galvanic isolated. EEXiallCT4/6. (In AHSH head)
a	Transmitter FPTT galvanic isolated. (In cap in AHSH head)
b	Transmitter FPTT galvanic isolated. EEXiallCT4/6. (In AHSH head)
c	Transmitter FPTH, galvanic isolated. Hart/SIL. (In cap in AHSH head).
d	Transmitter FPTH, galvanic isolated. Hart/SIL. EEXiallCT4/6. (In AHSH head))

Note 3: Please specify measuring range

Tolerance acc to IEC 584-1 (EN60584-1)

0	Class 2, for K and N, i.e. ±2.5°C or 0.0075 x t_{actual} (°C)	2)
1	Class 2, for R, S and B, i.e. ±1.5°C or 0.0025 x t_{actual} (°C)	2)

Note 2: The highest value apply

Number of thermocouples

0	1
1	2

Thermocouple

	Material	Type	Wire dia.	Max. temperature 1) Continuosly
0	NiCr-Ni	K	3.0mm	1000°C
1	NiCrosil-Nisil	N	3.0mm	1150°C
2	Pt10% Rh-Pt	S	0.3mm	1300°C
3	Pt10% Rh-Pt	S	0.5mm	1450°C
4	Pt13% Rh-Pt	R	0.3mm	1300°C
5	Pt13% Rh-Pt	R	0.5mm	1450°C
7	Pt10% Rh-Pt	S	0.35mm	1400°C
8	Pt13% Rh-Pt	R	0.35mm	1400°C
9	TK125T Insert	N	6mm MI	1200°C

Note 1: The values apply for the thermocouple

Accesessories

Process connection:	See data sheet 9113
Transmitter:	See data sheet 9168

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SENSORS, TEST & CALIBRATION

TECHNICAL DATA

All dimensions in mm

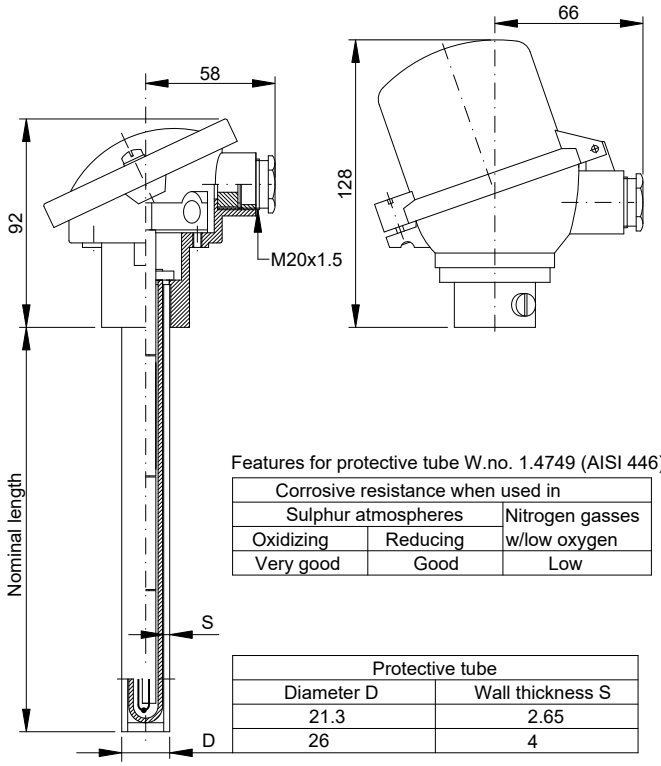
Dimensions

Thermocouple assembly AMK

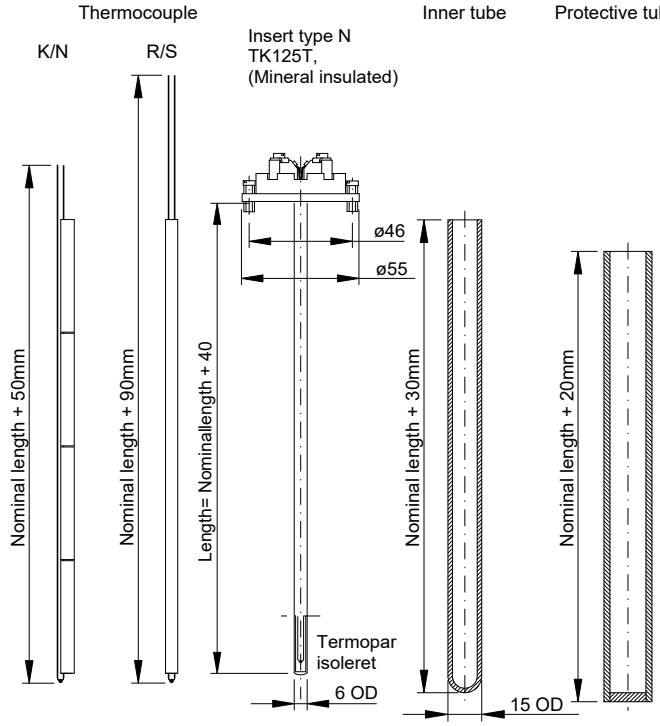
Type A

Connection head

Type AHSH (for transmitter)



Parts for AMK termocouple assembly



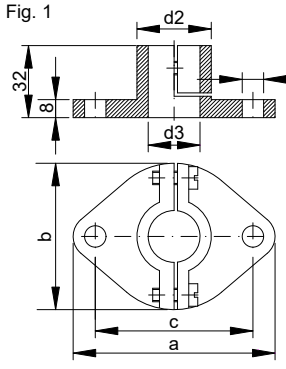
Features for protective tube W.no. 1.4749 (AISI 446)

Corrosive resistance when used in		
Sulphur atmospheres		Nitrogen gasses
Oxidizing	Reducing	w/low oxygen
Very good	Good	Low

Protective tube	
Diameter D	Wall thickness S
21.3	2.65
26	4

Process connection

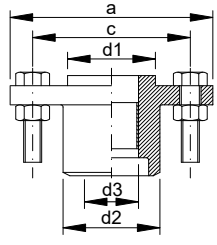
Fig. 1



Adjustable flange DIN 43734
Steel W.no. 1.0401

Protective tube Diameter	Dimensions				
	a	b	c	d2	d3
21.3	90	65	70	33	23
26	90	65	70	43	33

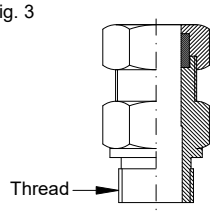
Fig. 2



Counter flange DIN 43734
Steel W.no. 1.0401
Max. 1 bar, teflon ferrule olive sealing

Protective tube Diameter	Dimensions				
	a	c	d1	d2	d3
21.3	90	70	39	43	24

Fig. 3



Compression fitting
Steel W.no. 1.0718
Max. 1 bar, teflon ferrule olive sealing

Protection tube (dia.)	Thread
21.3	1" BSP
26	1 1/4" BSP

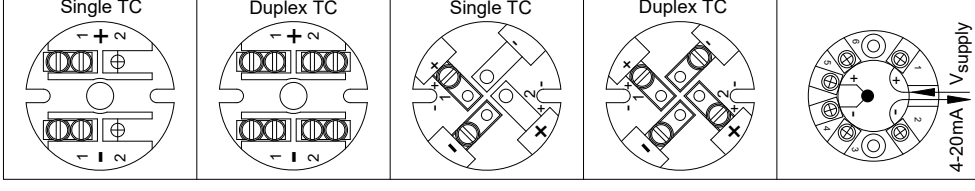
Response time

Protective tube Diameter	Response time in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
21.3	200	440	400	1330
26	230	475	560	1840

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 R/S/B		Thermocouple K/N		Transmitter FPTU/FPTT *)
Single TC	Duplex TC	Single TC	Duplex TC	



*) for model FPTH see separate datasheet

SS-FP-1101-UK Version 202401

AMETEK DENMARK A/S Gydevang 32-34, 3450 Allerød, DK, Tel: +45 48168000, E-mail: jofra@ametek.com, Web: www.jofra.com

Frode Pedersen temperature sensors

Thermocouple assembly AKK

with outer and ceramic protection tube (double protection)

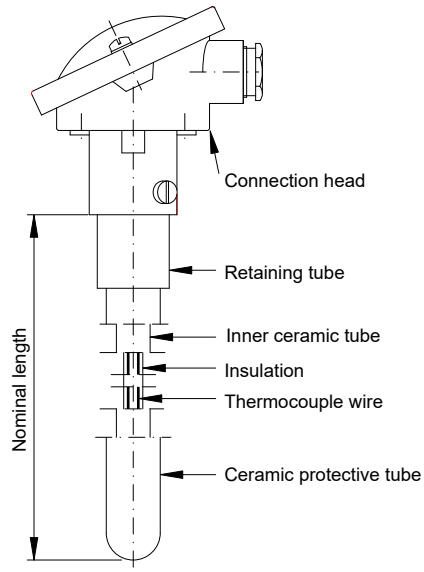
Data sheet 1102

Application

- Measurement of high temperature in big furnaces and ducts with combustion gasses, especially in places where there are risks of abrasion and corrosive gasses
- The operating range is up to 1450°C
- Fields of application
  - Brickworks, porcelain factories
  - Refuse and hazardous waste incineration
  - Chemical process engineering

Technical features

- Thermocouple type K, N, R or S acc. to IEC 584-1 (EN60581-1)
- Built acc. to DIN 43733
- Connected to the process by adjustable flange, gas-tight flange or compression fitting
- Gas-tight ceramic inner protective tube in KER 710 (C799)
- Gas-tight ceramic outer protective tube in KER 710 (C799) acc. to DIN 43724
- Modular design and standard length minimize the necessary numbers of spares
- Optionally, It 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

We are specialist in temperature measurement.
Please contact us and we will to our best do solve your specific measuring task.

Ordering information

Sensor | **Transmitter**

Specifications number 1102- | **4mA: °C 20mA: °C** 3)

Protective tube, ceramic

KER 710 (C799). Al_2O_3>99.7% max. 1600°C

24mm OD. 3mm wall. KER 710 (C799). Recommended for S and R T/C . . . 1

Inner tube, ceramic

15mm OD. 2.5 mm wall. KER 710 (C799) . . . 1

Nominal length (mm)

500	0500
710	0710
1000	1000
1400	1400
Interim lengths (Min. 250, max. 1400)	xxxx

Retaining tube

32mm OD. 2mm wall. L=200mm	steel 35	0
32mm OD. 2mm wall. L=500mm	steel 35	1
32mm OD. 2mm wall. L=1000mm	steel 35	2
32mm OD. 2mm wall. L=xxxxmm	steel 35	9

Process connection (see page 2)

None		0
Fig. 1	Adjustable flange	1
Fig. 3	1 1/4" BSP Compression fitting for 32 mm OD retaining tube	3

Connection head

A:	Degree of protection IP 53	0
AHSH:	Degree of protection IP 53, high cap for transmitter	1

Electrical connection

0	Terminal block with screw terminals
1	Transmitter FPTU galvanic isolated. (In cap in AHSH head)
2	Transmitter FPTU galvanic isolated. EEXiaIICT4/6. (In AHSH head)
a	Transmitter FPTT galvanic isolated. (In cap in AHSH head)
b	Transmitter FPTT galvanic isolated. EEXiaIICT4/6. (In AHSH head)
c	Transmitter FPTH, galvanic isolated. Hart/SIL. (In cap in AHSH head).
d	Transmitter FPTH, galvanic isolated. Hart/SIL. EEXiaIICT4/6. (In AHSH head))

Note 3: Please specify measuring range

Tolerance acc to IEC 584-1 (EN60584-1)

0	Class 2, for K and N, i.e. ± 2.5°C or 0.0075 x t_{actual} (°C)	2)
1	Class 2, for R, S and B, i.e. ±1.5°C or 0.0025 x t_{actual} (°C)	2)

Note 2: The highest value apply

Number of thermocouples

0	1
1	2

Thermocouple / Max. temperature

	Material	Type	Wire diam.	Continuosly	1)
0	NiCr-Ni	K	3.0mm	1000°C	
1	NiCrosil-Nisil	N	3.0mm	1150°C	
2	Pt10% Rh-Pt	S	0.3mm	1300°C	
3	Pt10% Rh-Pt	S	0.5mm	1450°C	
4	Pt13% Rh-Pt	R	0.3mm	1300°C	
5	Pt13% Rh-Pt	R	0.5mm	1450°C	
7	Pt10% Rh-Pt	S	0.35mm	1400°C	
8	Pt13% Rh-Pt	R	0.35mm	1400°C	

Note 1: The values apply for the thermocouple

Accesessories

Process connection: See data sheet 9113 Protective tube: See data sheet 9111
Transmitter: See data sheet 9168 Thermocouple: See data sheet 9107

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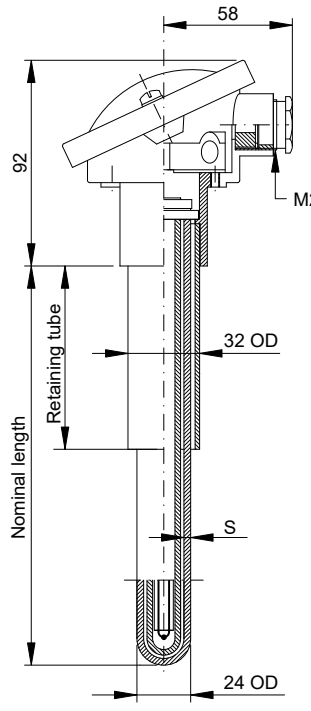
TECHNICAL DATA

All dimensions in mm

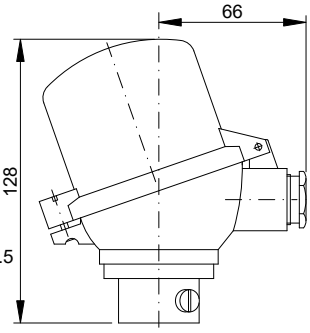
Dimensions

Themocouple assembly AKK
Connection head

Type A



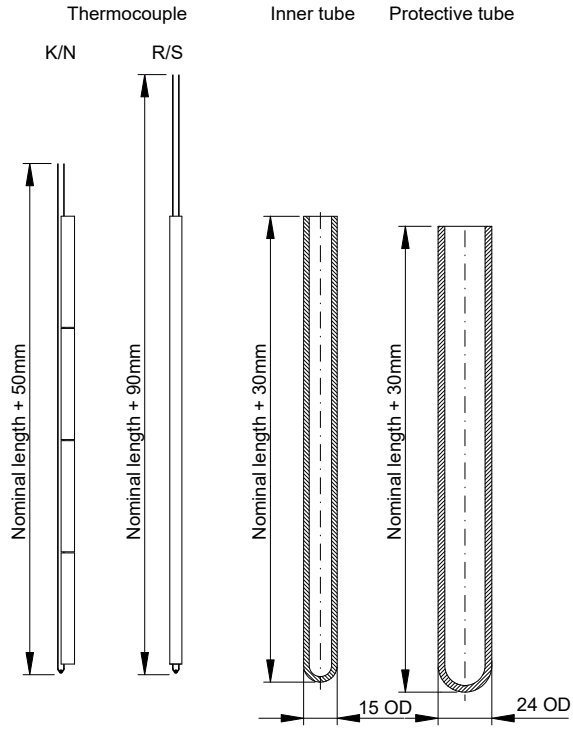
Type AHSH (for transmitter)



Protective tube

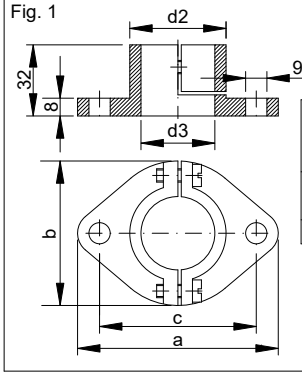
Features	KER 710 (C799) Al_2O_3 > 99,7%
Wall thicknes S	3.0 mm
Gas-tight	Yes, very much
Resistance to thermal shocks	Minor good
Mechanical strength	Very good, sen-sitive to impact

Parts for AKK thermocouple assembly



Process connection

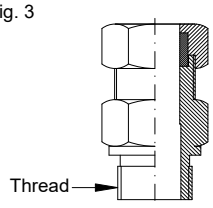
Fig. 1



Adjustable flange DIN 43734
Steel W.no. 1.0401

Retaining tube Diameter	Dimensions				
	a	b	c	d2	d3
32	90	65	70	43	33

Fig. 3



Compression fitting for steel tube
Steel W.no. 1.0718
Max. 1 bar, gas-tight, teflon sealing

Retaining tube (dia.)	Thread
32	1 1/4" BSP

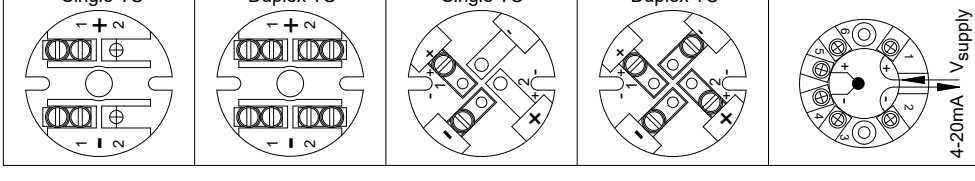
Response time

Protective tube Diameter	Response times in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
24	–	–	490	1300

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 R/S		Thermocouple K/N		Transmitter FPTU/FPTT *)
Single TC	Duplex TC	Single TC	Duplex TC	



*) for model FPTH see separate datasheet

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SS-FP-1102-UK-Version 202401

Frode Pedersen temperature sensors

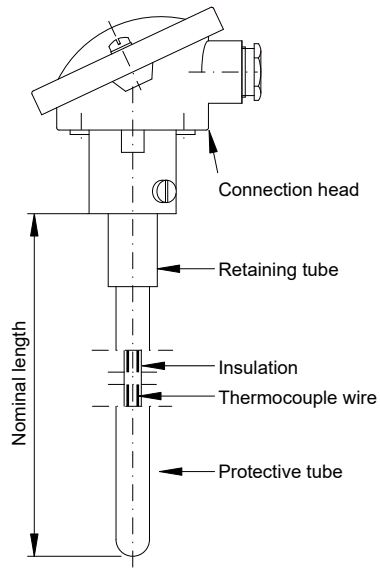
Thermocouple assembly AK

with ceramic protective tube

Data Sheet 1103

Application

- For technical temperature measurements in combustion processes and hot-gas environments, primarily in all types of furnaces up to 1450°C
- Fields of application
  - Brickworks, porcelain factories
  - Refuse and hazardous waste incineration
  - Glass annealing ovens, ceramic baking ovens



Technical features

- Thermocouple type K, N, R or S acc. to IEC 584-1 (EN60584-1)
- Built acc. to DIN 43733
- Connected to the process by adjustable flange, gas-tight flange or compression fitting
- Gas-tight ceramic protective tube in KER 610 (C610) or KER 710 (C799)
- Modular design and standard length minimize the necessary numbers of spares
- 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

We are specialist in temperature measurement.
Please contact us and we will to our best do solve your specific measuring task.

Ordering information — **Sensor** — **Transmitter**

Specifications number 1103- | **4mA: °C 20mA: °C** 4)

Protective tube, ceramic

KER 610 (C610). Al_2O_3>60% max. 1400°C	
KER 710 (C799). Al_2O_3>99.7% max. 1600°C	
15mm OD. 2 mm wall. KER 610 /C610)	0
15mm OD. 2.5mm wall. KER 710 (C799)	1

Recommended for S and R TC

Nominal length (mm)

500	0500
710	0710
1000	1000
1400	1400
2000	2000
Interim lengths (Min. 250, max. 2000)	xxxx

Retaining tube

22 OD. L=150 mm steel 35	0	22 OD. L=150 mm steel 1.4841 1)	3
22 OD. L=500 mm steel 35	1	22 OD. L=500 mm steel 1.4841	4
22 OD. L=1000 mm steel 35	2	22 OD. L=1000 mm steel 1.4841	5
22 OD. L=xxxx mm steel 35	9a	22 OD. L=xxxx mm steel 1.4841	9h

Note 1: High heat resistance steel

Process connection (see page 2)

None	0
Fig. 1 Adjustable flange	1
Fig. 3 1" BSP Compression fitting for 22mm OD retaining tube	3

Connection head

A: Degree of protection IP 53	0
AHSH: Degree of protection IP 53, high cap for transmitter	1

Electrical connection

0	Terminal block with screw terminals
1	Transmitter FPTU galvanic isolated. (In cap in AHSH head)
2	Transmitter FPTU galvanic isolated. EEXiaIICT4/6. (In AHSH head)
a	Transmitter FPTT galvanic isolated. (In cap in AHSH head)
b	Transmitter FPTT galvanic isolated. EEXiaIICT4/6. (In AHSH head)
c	Transmitter FPTH, galvanic isolated. Hart/SIL. (In cap in AHSH head).
d	Transmitter FPTH, galvanic isolated. Hart/SIL. EEXiaIICT4/6. (In AHSH head))

Note 3: Please specify measuring range

Tolerance acc to IEC 584-1 (EN60584-1)

0	Class 2, for K and N, i.e. ± 2.5°C or 0.0075 x t_{actual} (°C)	3)
1	Class 2, for R and S, i.e. ±1.5°C or 0.0025 x t_{actual} (°C)	3)

Note 3: The highest value apply

Number of thermocouples

0	1
1	2

Thermocouple — Max. temperature 2)

	Material	Type	Wire diam.	Continuosly
0	NiCr-Ni	K	3.0mm	1000°C
1	NiCrosil-Nisil	N	3.0mm	1150°C
2	Pt10% Rh-Pt	S	0.3mm	1300°C
3	Pt10% Rh-Pt	S	0.5mm	1450°C
4	Pt13% Rh-Pt	R	0.3mm	1300°C
5	Pt13% Rh-Pt	R	0.5mm	1450°C
7	Pt10% Rh-Pt	S	0.35mm	1400°C
8	Pt13% Rh-Pt	R	0.35mm	1400°C

Note 2: The values apply for the thermocouple

Accesessories

Process connection:	See data sheet 9113
Transmitter:	See data sheet 9168

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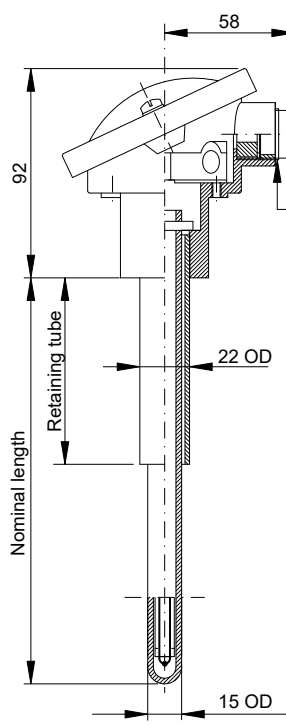
TECHNICAL DATA

All dimensions in mm

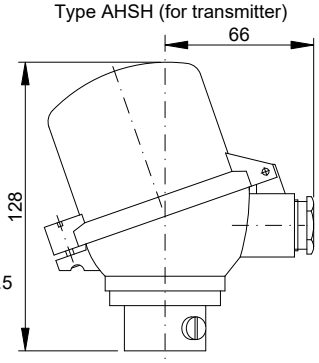
Dimensions

Themocouple assembly AK
Connection head

Type A



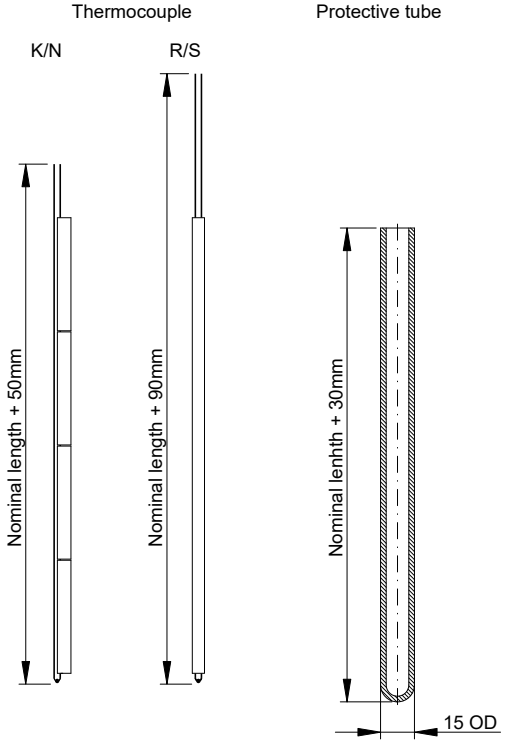
Type AHSH (for transmitter)



Protective tube

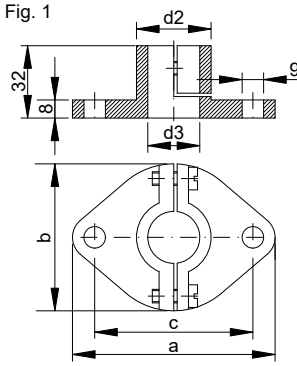
Features	KER 610 (C610) Al_2O_3 > 60%	KER 710 (C799) Al_2O_3 >99,7%
Wall thicknes S	2 mm	2.5 mm
Gas-tight	Yes	Yes, very much
Resistance to thermal shocks	Good	Minor good
Mechanical strength	Good, sensitive to impact	Very good, sensitive to impact

Parts for AK thermocouple assembly



Process connection

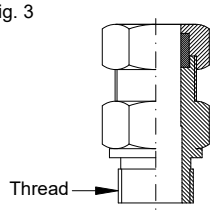
Fig. 1



Adjustable flange DIN 43734
Steel W.no. 1.0401

Retaining tube Diameter	Dimensions				
	a	b	c	d2	d3
22	90	65	70	33	23

Fig. 3



Compression fitting for steel tube
Steel W.no. 1.0718
Max. 1 bar, teflon ferrule olive sealing

Retaining tube (dia.)	Thread
22	1"BSP

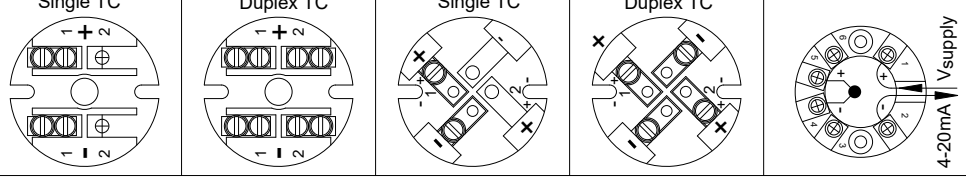
Response time

Protective tube Diameter	Response times in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
15	–	–	250	700

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 R/S/B		Thermocouple K/N		Transmitter FPTU/FPTT *)
Single TC	Duplex TC	Single TC	Duplex TC	



*) for model FPTH see separate datasheet

AMETEK DENMARK A/S Gydevang 32-34, 3450 Allerød, DK, Tel: 48168000, E-mail: jofra@ametek.com, Web: www.jofra.com

SS-FP-1103-UK. Version 202401

Frode Pedersen temperature sensors

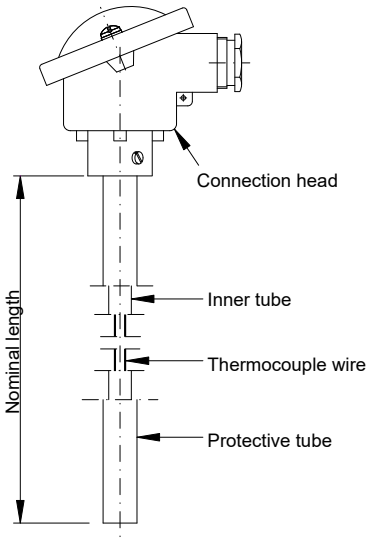
Thermocouple assembly BMK

With steel protective tube and ceramic inner tube

Data Sheet 1104

Application

- Measurement of high temperature in furnaces and ducts with combustion gasses and air
- The operating range is up to 900°C
- Fields of application
  - Power plants
  - Energy and furnaces
  - Annealing and thermal treatment proceses



Technical features

- Thermocouple type K and N acc. to IEC 584-1 (EN60584-1)
- Built acc. to DIN 43733
- Connected to the process by adjustable flange or compression fitting
- Gas-tight ceramic inner tube for protecting the thermocouple against contamination
- Outer protective tube in heat-resistant steel
- Modular design and standard length minimize the necessary numbers of spares
- Optionally, can be supplied with head mounted transmitter

Ordering

The requested sensor is selcted from the table below
The colour code means:

Standard: Built of standard modules (short delivery time)

Variant: Modified standard modules

We are specialist in temperature measurement.
Please contact us and we will do our best to solve to solve your specific measuring task

Ordering information — **Sensor** — **Transmitter**

Specification number 1104-															4mA: °C	20mA: °C	3)

Protective tube

Heat resistant steel, W.no. 1.4841 (AISI 314)
Max. 1150°C (Continuosly)

15mm OD. 1.5 mm wall	0

Inner tube, ceramic

KER 610 (C610). Al_2O_3>60%	0

Nominal length (mm)

500	0	5	0	0
710	0	7	1	0
1000	1	0	0	0
1400	1	4	0	0
Interim lengths (Min. 250, max. 1400)	x	x	x	x

Process connection (see page 2)

None		0
Fig. 1	Adjustable flange	1
Fig. 1+2	Adjustable flange + counter flange	2
Fig. 3	3/4" BSP compression fitting w/teflon sealing	3

Conection head

B:	Degree of protection IP 53	0	0
BHS:	Degree of protection IP 53	1	1
BHSH:	Degree of protection IP 53, high cap for tranmitter	2	
B:	Degree of protection IP 53, BHX high cap for tranmitter	3	

Electrical connection

0	Terminalblock with screws
1	Transmitter FPTU galvanic isolated. As terminal block
3	Transmitter FPTU galvanic isolated. EEXiallCT4/6. As terminal block
a	Transmitter FPTT galvanic isolated. As terminal block
c	Transmitter FPTT galvanic isolated. EEXiallCT4/6. As terminal block
d	Transmitter FPTH, galvanic isolated. Hart/SIL. As terminal block
e	Transmitter FPTH, galvanic isolated. Hart/SIL.EEXiallCT4/6. As terminal
9	None. Without terminal block, flying ends for transmitter

Note 3: Please specify measuring range in °C

Tolerance acc to IEC 584-1 (EN60584-1)

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

Note 2: The highest value apply

Number of thermocouples

0	1
1	2

Thermocouple

Material	Type	Wire dia.	Max. temperatur 1) Continuosly
NiCr-Ni	K	1.5mm	900°C
NiCrosil-Nisil	N	1.5mm	1050°C

Note 1: The values apply for the thermocouple

Accesessories

Process connection:	See data sheet 9113
Transmitter:	See data sheet 9168

AMETEK® SENSORS, TEST & CALIBRATION

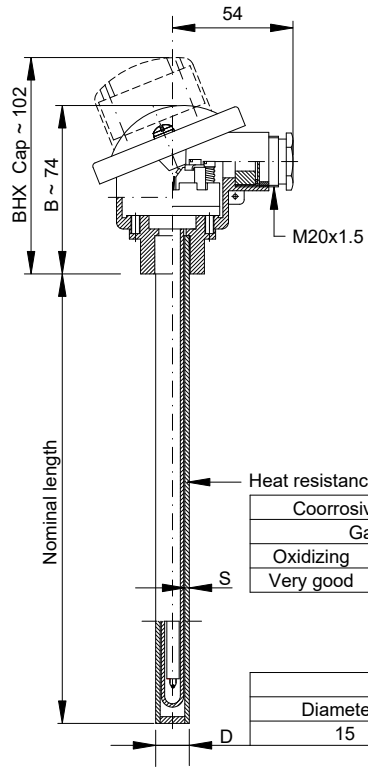
TECHNICAL DATA

All dimensions in mm

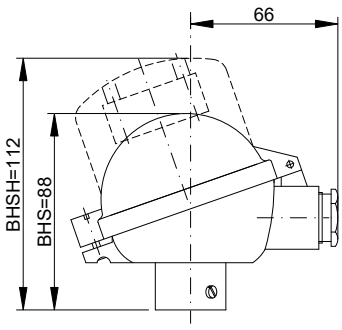
Dimensions

Thermocouple assembly BMK
Connection head

Type B / B+BHX Cap (for transmitter)



Type BHS / BHSH (for transmitter)

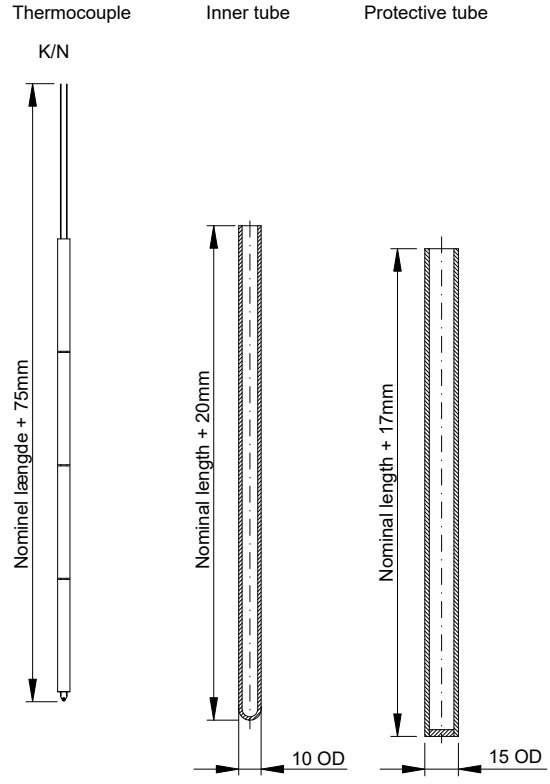


Heat resistance steel W.no. 1.4841 (AISI 314)

Coorrosive resistance when used in		
Gasses		Nitrogen gasses
Oxidizing	Reducing	w/low oxygen
Very good	Minor good	Very good

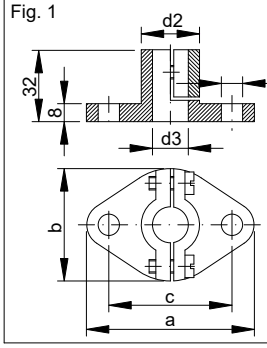
Protective tube	
Diameter D	Wall thickness S
15	1.5

Parts for BMK thermocouple assembly



Process connection

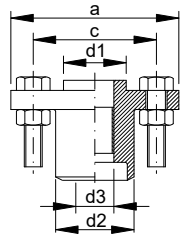
Fig. 1



Adjustable flange DIN 43734
Steel W.no. 1.0401

Protective tube Diameter	Dimensions				
	a	b	c	d2	d3
15	75	50	55	26	16

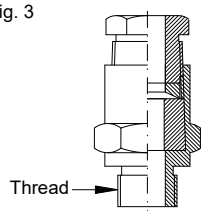
Fig. 2



Counter flange DIN 43734
Steel W.no. 1.0401
Max. 1 bar, teflon ferrule olive sealing

Protective tube Diameter	Dimensioner				
	a	c	d1	d2	d3
15	75	55	28	35	17

Fig. 3



Compression fitting
Steel W.no. 1.0718
Max. 1 bar, teflon ferrule olive sealing

Protection tube (dia.)	Thread
15	3/4" BSP

Response time

Protective tube Diameter	Response time in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
15	35	105	160	480

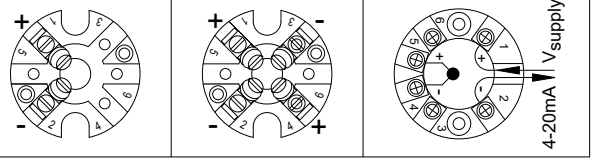
Note:

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	



*) for model FPTH see separate datasheet

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Frode Pedersen temperature sensors

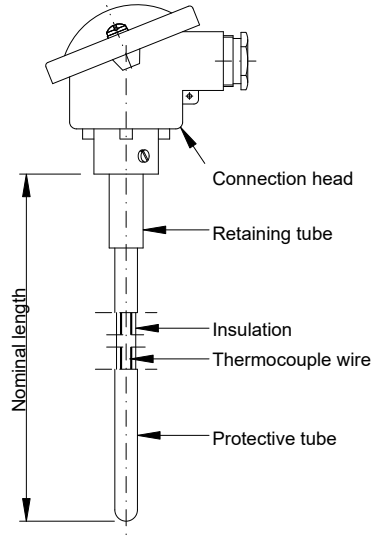
Thermocouple assembly BK

with ceramic protective tube

Data Sheet 1105

Application

- For temperature measurements in combustion processes and hot-gas environment
- The operating range is up to 1450°C
- Fields of application
  - Ceramic industry
  - Research and test plants
  - Process industry - combustion, furnaces and heat treatment



Technical features

- Thermocouple type K, N, R or S acc. IEC 584-1 (EN60584-1)
- Built acc. to DIN 43733
- Connected to the process by adjustable flange or gas-tight compression fitting
- Gas-tight ceramic protective tube in KER 610 (C610) or KER 710 (C799)
- Modular design and standard length minimize the necessary numbers
- 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

We are specialist in temperature measurement.
Please contact us and we will to our best do solve your specific measuring task.

Ordering information

Sensor | **Transmitter**

Specification number 1105- | **4mA: °C 20mA: °C** 3)

Protective tube, ceramic

KER 610 (C610) . Al_2O_3>60% max. 1400°C
KER 710 (C799). Al_2O_3>99.7% max. 1600°C

0 10mm OD. 1.5mm wall. KER 610 (C610)
1 15mm OD. 2.5mm wall. KER 710 (C799).
Recommended for S and R TC

Nominal length (mm)

0500 500
0710 710
1000 1000
1400 1400
xxxx Interim lengths (Min. 250, max. 1400)

Retaining tube

0 15mm OD. L = 80mm SS W.no. 1.4571 (AiSi 316)
1 15mm OD. L = 500mm SS W.no. 1.4571 (AiSi 316)
2 15mm OD. L = 1000mm SS W.no. 1.4571 (AiSi 316)
9 15mm OD. L = xxxxmm SS W.no. 1.4571 (AiSi 316)

Process connection (see page 2)

0 None
1 Fig. 1 Adjustable flange
3 Fig. 3 3/4" BSP Compression fitting for 15mm OD retaining tube

Connection head

0 B: Degree of protection IP 53
1 BHS: Degree of protection IP 53
2 BHSH: Degree of protection IP 65, high cap for transmitter
3 B: Degree of protection IP 53, BHX high cap for tranmitter

Electrical connection

0 Terminalblock with screws
1 Transmitter FPTU galvanic isolated. As terminal block
3 Transmitter FPTU galvanic isolated. EEXiallCT4/6. As terminal block
a Transmitter FPTT galvanic isolated. As terminal block
c Transmitter FPTT galvanic isolated. EEXiallCT4/6. As terminal block
d Transmitter FPTH, galvanic isolated. Hart/SIL. As terminal block
e Transmitter FPTH, galvanic isolated. Hart/SIL.EEXiallCT4/6. As terminal
9 None. Without terminal block, flying ends for transmitter

Note 3: Please specify measuring range in °C

Tolerance acc to IEC 584-1 (EN60584-1)

0 Class 2, for K and N, i.e. ± 2.5°C or 0.0075 x t_{actual} (°C) 2)
1 Class 2, for R, S and B, i.e. ±1.5°C or 0.0025 x t_{actual} (°C) 2)

Note 2: The highest value apply

Number of thermocouples

0 1
1 2

Thermocouple

	Material	Type	Wire diam.	Max. temperature 1) Continuosly
0	NiCr-Ni	K	1.5mm	900°C
1	NiCrosil-Nisil	N	1.5mm	1050°C
2	Pt10% Rh-Pt	S	0.3mm	1300°C
3	Pt10% Rh-Pt	S	0.5mm	1450°C
4	Pt13% Rh-Pt	R	0.3mm	1300°C
5	Pt13% Rh-Pt	R	0.5mm	1450°C
7	Pt10% Rh-Pt	S	0.35mm	1400°C
8	Pt13% Rh-Pt	R	0.35mm	1400°C

Note 1: The values apply for the thermocouple

Accessesories

Process connection:	See data sheet 9113	Protective tube:	See data sheet 9111
Transmitter:	See data sheet 9168	Thermocouple:	See data sheet 9107

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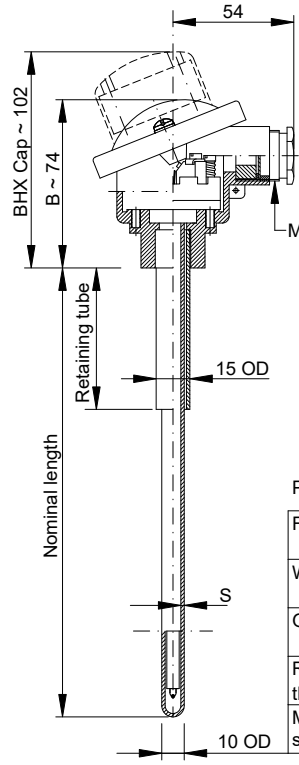
TECHNICAL DATA

All dimensions in mm

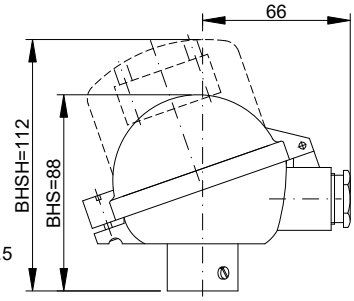
Dimensions

Themocouple assembly BK
Connection head

Type B / B+BHX Cap (for transmitter)



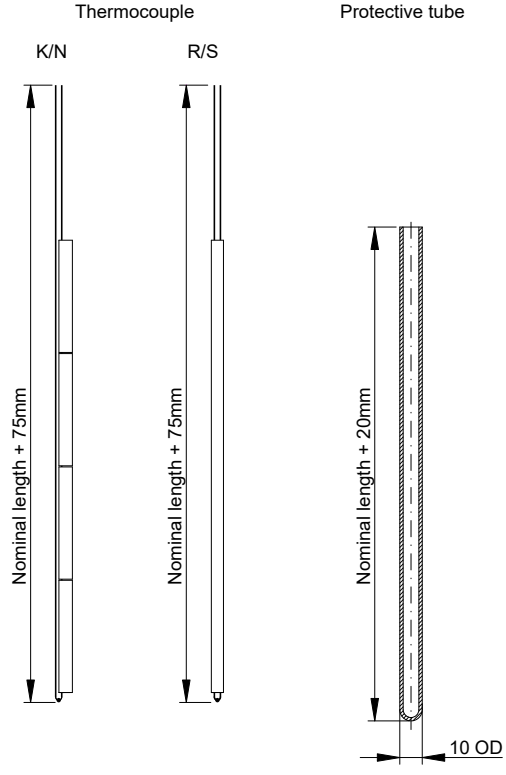
Type BHS / BHSH (for transmitter)



Protective tube

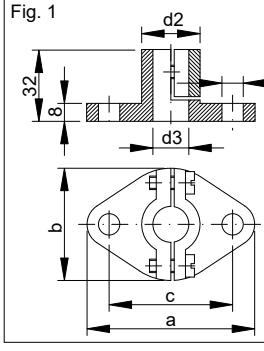
Features	KER 610 (C610) Al_2O_3 >60%	KER 710 (C799) Al_2O_3 >99.97%
Wall thicknes S	1.5 mm	2 mm
Gas-tight	Yes	Yes, very much
Resistance to thermal shocks	Good	Minor good
Mechanical strength	Good, sensitive to impact	Very good, sensitive to impact

Parts for BK thermocouple assembly



Process connection

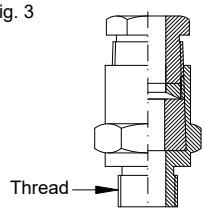
Fig. 1



Adjustable flange DIN 43734
Steel W.no. 1.0401

Retaining tube Diameter	Dimensions				
	a	b	c	d2	d3
15	75	50	55	26	16

Fig. 3



Compression fitting for steel tube
Steel W.no. 1.0718
Max. 1 bar, teflon ferrule olive sealing

Retaining tube (dia.)	Thread
15	3/4" BSP

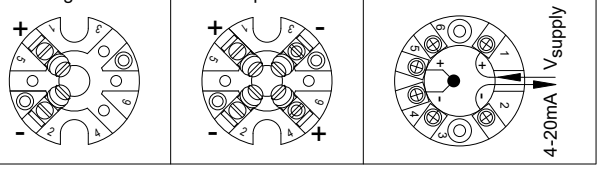
Response time

Protective tube Diameter	Response times in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
10	–	–	175	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

Thermocouple		Transmitter FPTU/FPTT *)
Single TC	Duplex TC	



*) for model FPTH see separate datasheet

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SS-FP-1105-UK. Version 202401

Frode Pedersen temperature sensors

Thermocouple assembly AKT

with measuring insert and ceramic outer protective tube

Data sheet 1106

Application

- For technical temperature measurements in combustion processes and hot-gas environments,
- primarily in all types of furnaces up to 1200°C (shortly 1300°C)
- The sensor is special developed for use in
  - Refuse and hazardous waste incinerations plants.
    The combination of high temperature, corrosive gasses and particles demands special features in relation to life-time for the sensor and minimize process down-time

Technical features

- Thermocouple type N and K acc to IEC584-1 (EN60584-1)
- Interchangeable measuring insert, mineral insulated with high heat and corrosive resistance sheath
- Connected to the process by adjustable flange or compression fitting
- Gas-tight ceramic protective tube in KER 610 (C610) or KER 710 (C799)
- Modular design and standard length minimize the necessary numbers of spares
- Optionally, can be supplied with head mounted transmitter

Ordering

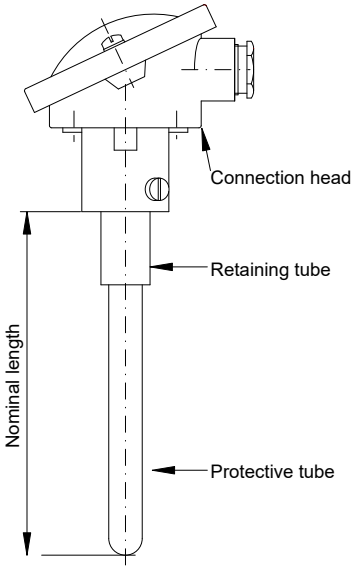
The requested sensor is selected from the table below
The colour code means:

Standard: Built of standard modules

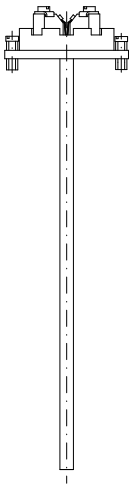
Variant: Modified standard modules

We are specialist in temperature measurement.
Please contact us and we will to our best do solve your specific measuring task.

Complete assembly



Measuring insert



Ordering information

Sensor | **Transmitter**

Specifications number 1106-														4mA: °C 20mA: °C 4)

Protective tube, ceramic

KER 610 (C610). Al_2O_3>60% max. 1400°C	
KER 710 (C799). Al_2O_3>99.7% max. 1600°C	
15mm OD. 2mm wall. KER 610	0
15mm OD. 2.5mm wall. KER 710	1

Nominal length (mm)

500	0	5	0	0
710	0	7	1	0
1000	1	0	0	0
1400	1	4	0	0
2000	2	0	0	0
Interim lengths (Min. 250, max. 2000)	x	x	x	x

Retaining tube

				1)
22 OD. L=150 mm	steel 35	0	22 OD. L=150mm steel 1.4762	3
22 OD. L=500 mm	steel 35	1	22 OD. L=500mm steel 1.4762	4
22 OD. L=1000 mm	steel 35	2	22 OD. L=1000mm steel 1.4762	5
22 OD. L=xxxx mm	steel 35	9a	22 OD. L=xxxxmm steel 1.4762	9h

Note 1: Heat resistance steel

Process connection (see page 2)

None	0
Fig. 1 Adjustable flange	1
Fig. 3 1" BSP Compression fitting for 22mm OD retaining tube	3

Connection head

A:	Degree of protection IP 53	0
AHSH:	Degree of protection IP 53, high cap for transmitter	1

Electrical connection

0	Terminal block with screw terminals
1	Transmitter FPTU galvanic isolated. (In cap in AHSH head)
2	Transmitter FPTU galvanic isolated. EEXiaIICT4/6. (In AHSH head)
a	Transmitter FPTT galvanic isolated. (In cap in AHSH head)
b	Transmitter FPTT galvanic isolated. EEXiaIICT4/6. (In AHSH head)
c	Transmitter FPTH, galvanic isolated. Hart/SIL. (In cap in AHSH head).
d	Transmitter FPTH, galvanic isolated. Hart/SIL. EEXiaIICT4/6. (In AHSH head))

Note 3: Please specify measuring range

Tolerance acc to IEC 584-1 (EN60584-1)

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

Measuring insert

	Thermocouple	Type	Diameter	Sheath material	Max. temp. 2)
0	Nicrosil-Nisil	N	6.0mm	Pyrosil D (AlloyTD)	1200°C
1	NiCr-Ni	K	6.0mm	W.no.1.4841	1000°C

Note 2: The values apply for the thermocouple

Accesessories

Process connection:	See data sheet 9113
Transmitter:	See data sheet 9168

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TECHNICAL DATA

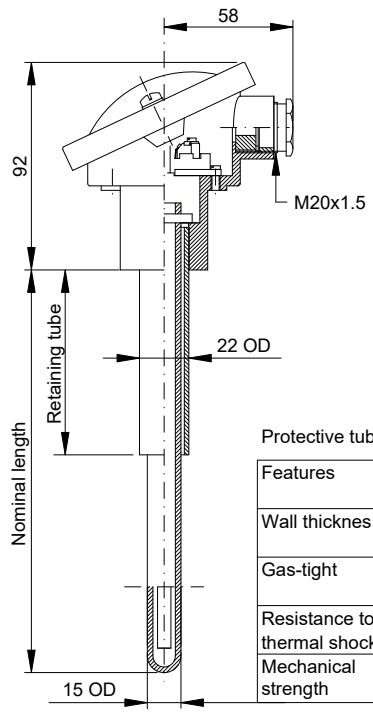
All dimensions in mm

Dimensions

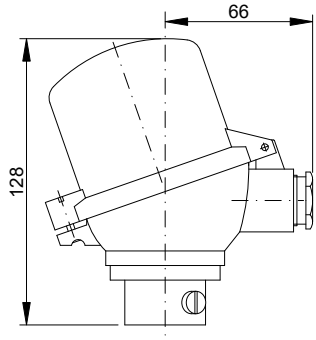
Complete themocouple assembly AKT

Connection head

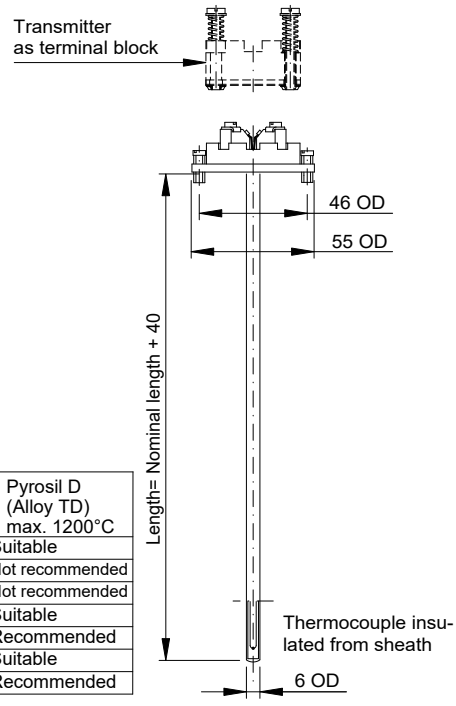
Type A



Type AHSH (for transmitter)



Measuring insert
Mineral insulated



Protective tube

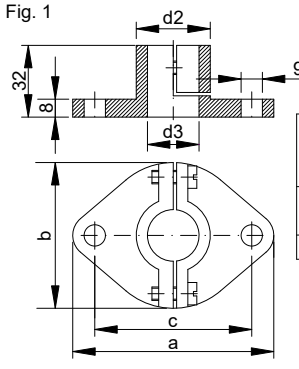
Features	KER 610 (C610) Al_2O_3>60%	KER 710 (C799) Al_2O_3>99,7%
Wall thicknes S	2 mm	2.5 mm
Gas-tight	Yes	Yes, very much
Resistance to thermal shocks	Good	Minor good
Mechanical strength	Good, sensitive to impact	Very good, sensitive to impact

Properties for MI sheath

Application	Pyrosil D (Alloy TD) max. 1200°C
Liquids	Suitable
Acid	Not recommended
Sulphur atmospheres	Not recommended
Clorine atmospheres	Suitable
Oxidizing atmospheres	Recommended
Reducing atmospheres	Suitable
Carburising atmospheres	Recommended

Process connection

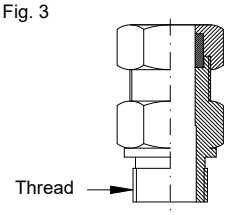
Fig. 1



Adjustable flange DIN 43734
Steel W.no. 1.0401

Retaining tube Diameter	Dimensions				
	a	b	c	d2	d3
22	90	65	70	33	23

Fig. 3



Compression fitting for steel tube
Steel W.no. 1.0718
Max. 1 bar, teflon ferrule olive sealing

Retaining tube (dia.)	Thread
22	1" BSP

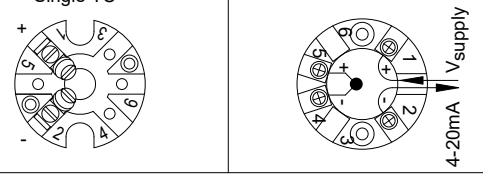
Response time

Protective tube Diameter	Response times in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
15	–	–	250	700

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	



*) for model FPTH see separate datasheet

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