Frode Pedersen temperature sensors

Thermocouple KT 1 and KT 2

with cable and bayonet socket

Data sheet 1701

Application

- For measurement and surveillance of temperature on f.inst plastic extruders, tools and machine constructions
- Can be used on surfaces up to 180°C.
- Fields of application
  - Plastic industry
  - Machinery- and tool industry

Technical features

- Thermocouple type J and K acc. to IEC 584-1 (EN60584-1)
- Very fast response time. Achieved by grounded hot junction and spring loaded contact to the surface
- Solid construction with high resistance against vibration
- Quick mounting and adjustment of insertion length by means of a bayonet socket on a spring.

Ordering

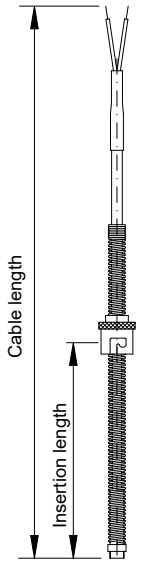
Please select the requested sensor from the table below
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Standard: Built of standard modules (short delivery time)

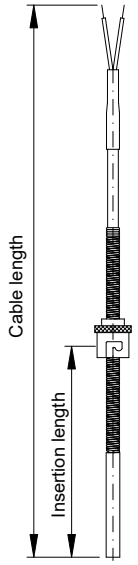
Variant: Modified standard modules

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KT 1



KT 2



Ordering information

Sensor

Specifications number 1701- [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Type

KT 1 Insertion length, adjustable 10-350mm 0
KT 2 Insertion length, adjustable 50-350mm 1

Cable length (meter)

01 1 meter
x x.x Special (Min 0.1 meter)

Cable type

0 . . . . . XGLGLO 2x0.22mm^2 . Fibreglass +steel braid, 200°C

Process connection (see page 2)

Material: Nickel plated brass

None 0
1/4" BSP Bayonet nipple: 1

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

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

Note 1: The highest value apply

Thermocouple and measuring range

Fe-CuNi type J Max. 400°C 0
NiCr-Ni type K Max. 400°C 1

Hot Junction

0 . . . . . Grounded (thermocouple bonded to outer sheath)
1 . . . . . Insulated from outer sheath

Number of thermocouples

1 0

Accessories

Compensation cable: See data sheet 9150

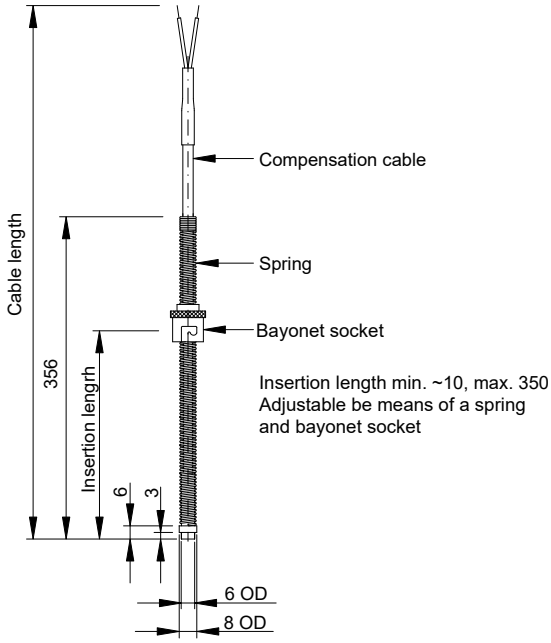
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TECHNICAL DATA

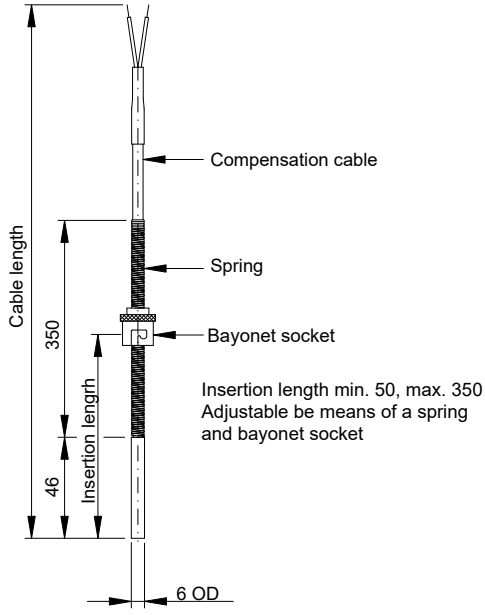
All dimensions in mm

Dimensions

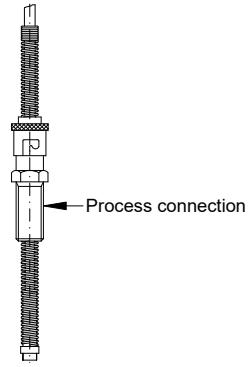
Type KT 1



Type KT 2



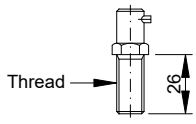
Mounting



Compensation cable

XGLGLO 2x0,22 mm^2. Fibreglass +steel braid, 200°C

Proces connection



Bayonet nipple
Nickel plated brass
Thread
1/4" BSP

Connection diagram

XGLGLO	
1xJ	1xK
Black + – White	Green + – White

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Web: www.jofra.com

Frode Pedersen temperature sensors

Thermocouple KT 4

Cable sensor

Datablad 1704

Application

- Measurement of temperature in ducts, pockets, machine construction, containers, enviromental chambers and test
- Operating range is in solid, fluid and gaseous medias up to 400°C
- Fields of application
  - Containers, pipelines, chemical apparatus
  - Machinery
  - Laboratories and experimental plants

Technical features

- Thermocouple type J and K acc. to IEC 584-1 (EN60584-1)
- Different types of cable types adapted to the actual application
- The protective tube is in stainless and acid proof steel
- Connected to the process by adjustable fittings or other mechanical brackets

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

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Fig. 1



Fig. 2

Ordering information

Specification number 1704- Sensor

Type

Fig. 1 for max. 70°C 0
Fig. 2 for application greater than 70°C 1

Protective tube

SS, acidproof steel, W.no. 1.4571 (AISI 316Ti)
6mm OD. 0.3mm wall 0

Nominal length (mm)

60 060
120 120
200 200
Interim lengths (Min. 40, max. 400mm) xxx

Process connection (see page 2)

Type and thread

Ingen 0
Fig. 3 1/4" BSP (tapered). Compression fittings 1
Fig. 3 3/8" BSP (tapered). Compression fittings 2
Fig. 3 1/2" BSP (tapered). Compression fittings 3
Fig. 4 Adjustable flange 4

Material

None 0
Stainless steel AiSi 316 1

Sealing

None (allways for flange) 0
Steel ferrule, max. 40 bar 1
Teflon olive, max. 10 bar and 100°C 2

Cable length (meter)

01 1 meter
xx.x Special (Min 0.1 meter)

Measuring range and cable type

	Temp. 2)	Type	mm²	Insulation	For T/C
0	-5 +70°C	XPP	0.22	PVC	J and K
1	-50 +180°C	XSS	0.22	Silicone	J and K
2	-20 +400°C	XGLGLO	0.22	Fibreglass+steel braid	J
3	-20 +400°C	XGLGLO	0.22	Fibreglass+steel braid	K

Note 2: The temperature range is limited of the insulation of the cable

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

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

Note 1: The highest value apply

Hot Junction

0 . . . . . Grounded (thermocouple bonded to outer sheath)
1 . . . . . Insulated from outer sheath

Number of thermocouples

0 1

Thermocouple

0 . . . . . Fe-CuNi type J
1 . . . . . NiCr-Ni type K

Accessesories

Process connection: See data sheet 9113
Compensation cable: Se data sheet 9150

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TECHNICAL DATA

All dimensions in mm

Dimensions

Fig. 1

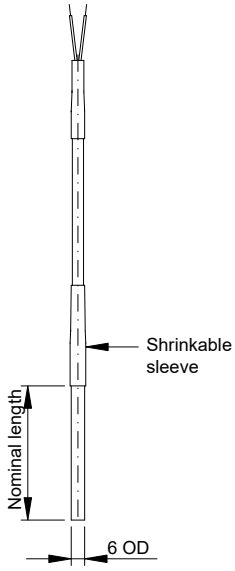
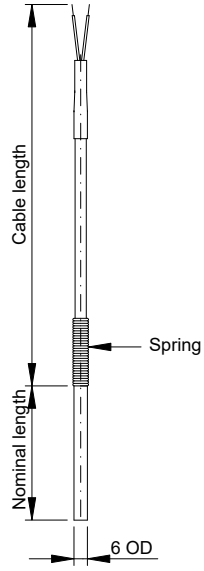


Fig. 2

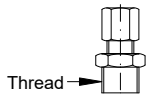


Properties for cable

Insulation	Temperature range	Application
PVC	- 5 + 70°C	General use
Silicone	-50 +180°C	Flexible, heat resistance
GLGLO	-20 +400°C	High temperature, not water tight

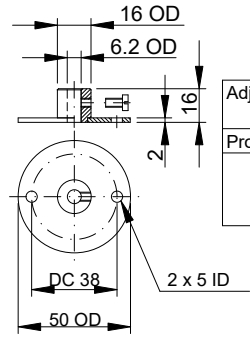
Process connection

Fig. 3



Compression fitting				
Protective tube	Thread	Material	Sealing	
6 OD	1/4" BSP 3/8" BSP 1/2" BSP	Steel, SS AISI 316	Steel olive Teflon olive	max. 400°C, max. 40 bar max. 100°C, max. 10 bar

Fig. 4



Adjustable flange	
Protective tube	Material
6 OD	Steel AISI 316

Response time

Protective tube	Response time in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
6 OD	3	10	30	90

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 - cable

1xJ	1xK
Black + − White	Green + − White

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Frode Pedersen temperature sensors

Resistance Thermometer KM 1

with cable and bayonet socket

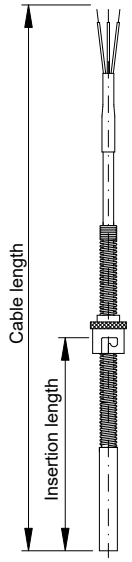
Data sheet
1706

Application

- For measurement and surveillance of temperature on f.inst plastic extruders, tools and machine constructions
- Can be used on surfaces up to 200°C.
- Fields of application
  - Plastic industry
  - Machinery- and tool industry

Technical features

- Pt100 resistance thermometer acc. to IEC 751 (EN60751)
- 3-wire connection is standard
- Spring loaded contact to the surface ensures fast response time
- Solid construction with high resistance against vibration
- Quick mounting and adjustment of insertion length by means of a bayonet socket on a spring.



Ordering

Built of standard modules (short delivery time)
The colour code means:

	Standard:	Built of standard modules (short delivery time)
	Variant:	Modified standard modules

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do our utmost to solve your specific measuring tasks

Ordering information

Sensor

Specification number **1706-**

Protective tube

SS, acidproof steel, W.no. 1.4571 (AISI 316Ti)

8mm OD. Wall 1mm. Length: 46mm	0

Cable length (meter)

0 2	2 meter
x x.x	Special (Min 0.1 meter)

Cable type

0	0,382mm^2 . Teflon insulated with inner braided shield
1	0,14mm^2 . Teflon insulated with inner braided shield

Process connection (see page 2)

Material: Nickel plated brass

None	0
1/4" BSP Bayonet nipple:	1

Tolerance acc. to IEC 751 (EN60751)

0	Class B, i.e. ± (0.3°C + 0.005 x t $_{actual}$)°C

Measuring range

-50 +200°C	0

Connection. Wiring configuration

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

Resistance value (Ω) acc. to IEC 751 (EN60751)

1xPt100	0

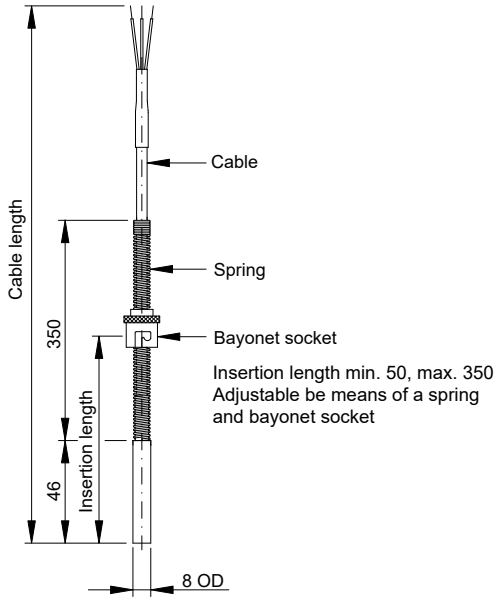
Accessesories

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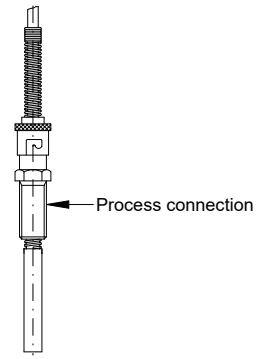
TECHNICAL DATA All dimensions in mm

Dimensioner

Type KM 1



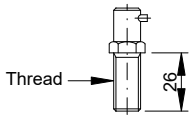
Mounting



Properties for cable

Insulation	Temperature range	Application
Teflon (FEP)	-50 +200°C	Corrosion and heat resistance

Process connection



Bayonet nipple Nickel plated brass
Thread
1/4" BSP

Teflon w/shield Shield connected to outer sheath	
1xPt100 2- 3- 4-wire	2xPt100 2-wire
Red Red/green Wh/green White	Red Red/green Wh/green White

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Frode Pedersen temperature sensors

Resistance Thermometer KM4

Cable sensor

Data sheet
1710

Application

- Measurement of temperature in ducts, pockets, machine construction, containers, enviromental chambers and test
- Operating range is in solid, fluid and gaseous medias from -100 up to 400°C
- Fields of application
  - Containers, pipelines, chemical apparatus
  - Machinery, pharmaceutical
  - Laboratories and experimental plants

Technical features

- Pt100 resistance thermometer acc. to IEC 751 (EN60751)
- 3-wire connection is standard
- Different types of cable types adapted to the actual application
- The protective tube is in stainless and acid proof steel
- Connected to the process by adjustable fittings or other mechanical brackets

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

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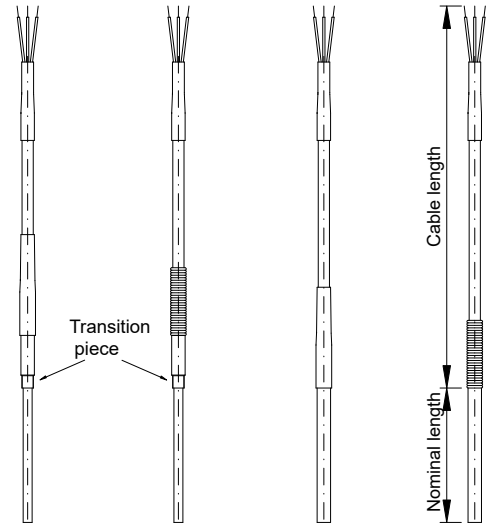


Fig. 1 Fig. 2 Fig. 3 Fig. 4

Ordering information

Sensor

Specification number 1710-

Type

Fig. 1, 4 OD w/shrinkable sleeve at tube and cable	0
Fig. 2, 4 OD w/spring at tube and cable	1
Fig. 3, 6 OD w/shrinkable sleeve at tube and cable	2
Fig. 4, 6 OD w/spring at tube and cable	3
Spec., 4 OD, without pot seals (tube 2, cable code 4)	4
Spec., 6 OD, without sleeve or spring. Rolled (2x)	5

Protective tube

Diameter OD	Material	
4mm. 0.5 wall	AiSi 304 (w.no 1.4301)	0
6mm. 0.3 wall	AiSi 316 (w.no 1.4571)	1
4mm. 0.2 wall (type 4)	AiSi 304 (w.no 1.4301)	2

Nominal length (mm)

60	0 6 0
120	1 2 0
200	2 0 0
Interim lengths (Min. 40, max. 400mm)	x x x

Process connection (see page 2)

Type and thread

None	0
Fig. 5 1/4" BSP (tapered). Compression fittings	1
Fig. 5 3/8" BSP (tapered). Compression fittings (only for 6mm OD)	2
Fig. 5 1/2" BSP (tapered). Compression fittings (only for 6mm OD)	3
Fig. 6 Adjustable flange (only for 6mm OD)	4

Material

None	0
Stainless steel AiSi 316	1

Sealing

None (allways for flange)	0
Steel ferrule, max. 40 bar, (only for 6mm OD)	2
Teflon olive, max. 10 bar and 100°C (allways for 4mm OD)	3

Cable length (meter)

0 2	2 meter
x x.x	Special (Min 0.1 meter)

Measuring range and cable type

	Temp.	mm²	Insulation	Shield	2)
0	-5 +70°C	0.25	PVC, grey	Yes	
1	-50 +180°C	0.25	Silicone, red	No	
2	-50 +200°C	0.382	Teflon FEP, black	Yes	
3	-20 +400°C	0.22	Fibreglass+steel braid	No	
4	-50 +200°C	0.14	Teflon FEP, black	Yes	
6	-100 +200°C	0.24	Teflon+silicone jacket,white	No	3)
7	-100 +200°C	0.382	Teflon FEP, black	Yes	3)

Note 2 braided inner shield

Note 3: Only type 5 (6 OD) +tolerance class A or Special

Tolerance acc. to IEC 751 (EN60751)

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
5	Special, i.e. ± (0.05°C + 0.0013x t_{actual})°C

Connection. Wiring configuration

0	3-wire (only 1xPt100)
1	4-wire (only 1xPt100)
2	2-wire (allways for 2xPt100)

Resistance value (Ω) acc. IEC 751 (EN60751)

0	1xPt100
1	2xPt100 1)
2	1xPt1000

Note 1: 2xPt100 only 6mm OD

Accessesories

Process connection: See data sheet 9113

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TECHNICAL DATA

All dimensions in mm

Dimensions

Fig. 1

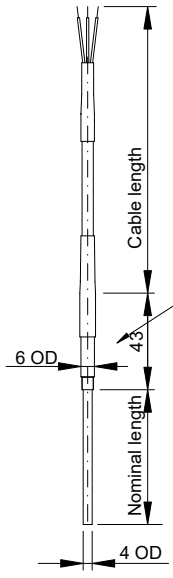


Fig. 2

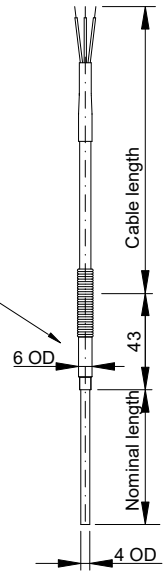


Fig. 3

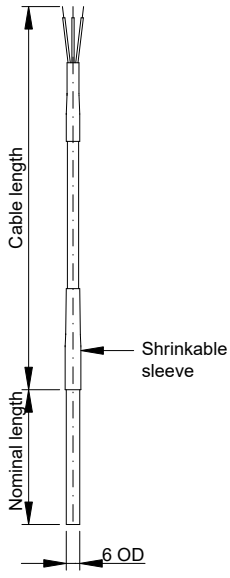
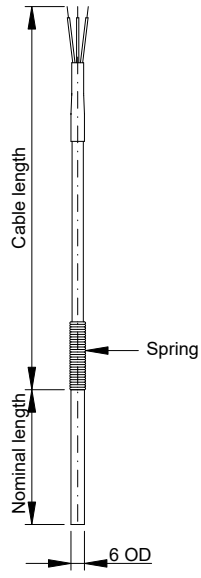
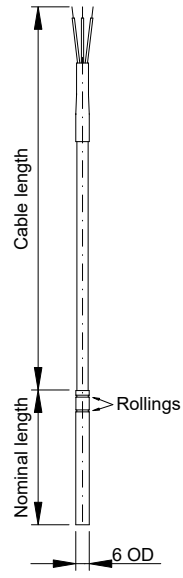


Fig. 4



Spec

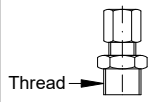


Properties for cable

Insulation	Temperature range	Application
PVC	- 5 + 70°C	General use
Silicone	-60 +180°C	Flexible, heat and cold resistance
Teflon (FEP)	-100 +200°C	Chemical corrosion, heat and cold resistance
GLGLO, Fiberglass+steel braid	-20 +400°C	High temperature, not water tight

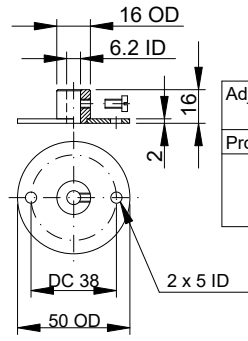
Process connection

Fig. 5



Compression fitting				
Protective tube	Thread	Material	Sealing	
4 OD	1/4" BSP	Steel, SS AISI 316	Teflon olive	max. 100°C, max. 10 bar
6 OD	1/4" BSP	Steel, SS AISI 316	Steel ferrule	max. 400°C, max. 40 bar
	3/8" BSP		Teflon olive	max. 100°C, max. 10 bar
	1/2" BSP			

Fig. 6



Adjustable flange	
Protective tube	Material
6 OD	Steel AISI 316

Response time

Protective tube Diameter	Response time in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
4	3	15	40	120
6	5	15	60	180

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 - cable

PVC w/screen Screen connected to outer sheath		Teflon w/screen Screen connected to outer sheath		Silicone		GLGLO	
1xPt100 2- 3- 4-wire	2xPt100 2-wire	1xPt100 2- 3- 4-wire	2xPt100 2-wire	1xPt100 2- 3- 4-wire	2xPt100 2-wire	1xPt100 2- 3- 4-wire	2xPt100 2-wire
Green Yellow White Brown	Green Yellow White Brown	Red Red White White	Red Red White White	Blue Yellow Red White	Blue Yellow Red White	White White White White	White White White White

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Frode Pedersen temperature sensors

Resistance Thermometer KM5

cable sensor with fixed thread or swivel

Data sheet 1711

Application

- Measurement of temperature in ducts, pockets, machine construction, containers, enviromental chambers and test
- Operating range is in solid, fluid and gaseous medias up to 400°C
- Fields of application
  - Cooling systems, pipelines, chemical apparatus
  - Energy
  - Machinery

Technical features

- Pt100 resistance thermometer acc. to IEC 751 (EN60751)
- 3-wire connection is standard
- Different types of cable types adapted to the actual application
- The protective tube is in stainless and acid proof steel
- Connected to the process by fixed thread or swivel- male or female

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 do our best to solve your specific measuring task

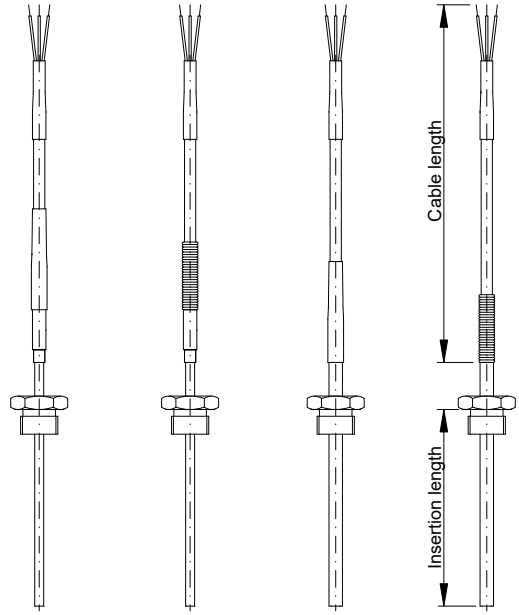


Fig. 1 Fig. 2 Fig. 3 Fig. 4

Ordering information

Sensor

Specification number 1711- | | | | | | | | | | | | | |

Type

Fig. 1, 4 OD w/shrinkable sleeve at tube and cable	0
Fig. 2 4 OD w/spring at tube and cable	1
Fig. 3, 6 OD w/shrinkable sleeve at tube and cable	2
Fig. 4, 6 OD w/spring at tube and cable	3

Cable length (meter)

0 2	1 meter
x x.x	Special (Min 0.1 meter)

Measuring range and cable type

	Temp.	mm2	Insulation	Screened 1)
0	-5 +70°C	0,25	PVC, grey	Yes
1	-50 +180°C	0,25	Silicone, red	No
2	-50 +200°C	0,382	Teflon FEP, black	Yes
3	-20 +400°C	0,22	Fibreglass+steel braid	No
4	-50 +200°C	0,14	Teflon FEP, black	Yes

Note 1: Braided inner screen

Protective tube

Diameter OD	Material	
4mm. 0.5mm wall	AiSi 304 (w.no 1.4301)	0
6mm. 1.0mm wall	AiSi 316 (w.no 1.4571)	1

Insertion length (mm)

60	0 6 0
120	1 2 0
200	2 0 0
Interim lengths (Min. 40, max. 400mm)	x x x

Tolerance acc. to IEC 751 (EN60751)

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
5	Special, i.e. ± (0.05°C + 0.0013 t_{actual})°C

Process connection (see page 2)

Fig. 5	1/4" BSP. Fixed thread	0
Fig. 5	3/8" BSP. Fixed thread	1
Fig. 5	1/2" BSP. Fixed thread (only for 6mm OD)	2
Fig. 6	3/8" BSP. Swivel nipple	4
Fig. 7	3/8" BSP. Swivel socket	7
Fig. 7	1/2" BSP. Swivel socket (only for 6mm OD)	8

Connection. Wiring configuration

0	3-wire (only 1xPt100)
1	4-wire (only 1xPt100)
2	2-wire (allways for 2xPt100)

Resistance value (Ω) acc. to IEC 751 (EN60751)

0	1xPt100
1	2xPt100
2	1xPt1000

Accessesories

AMETEK® SENSORS, TEST & CALIBRATION

TECHNICAL DATA

All dimensions in mm

Dimensions

Fig. 1

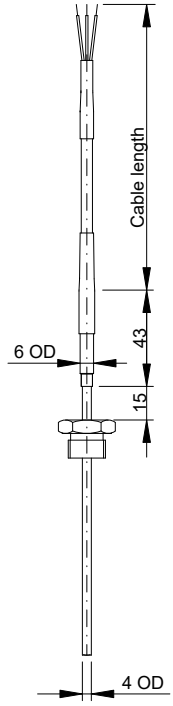


Fig. 2

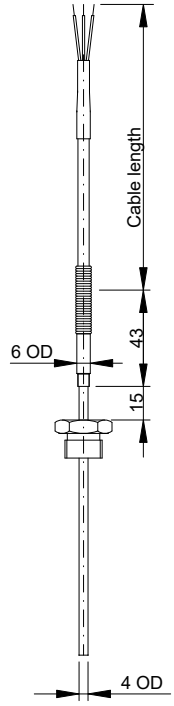


Fig. 3

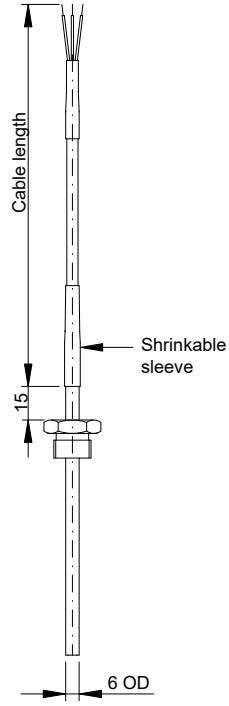
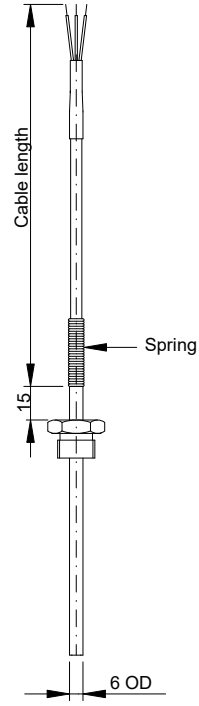
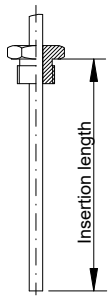


Fig. 4



Process connection

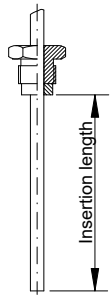
Fig. 5



Fixed screwed connection, brazed to the tube

Fixed screwed connection		
Diameter	Thread	A/F
4	1/4" BSP	19
4	3/8" BSP	22
6	1/4" BSP	19
6	3/8" BSP	22
6	1/2" BSP	27

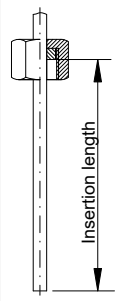
Fig. 6



Guard ring brazed to tube

Swivel nipple		
Diameter	Thread	A/F
4	3/8" BSP	22
6	3/8" BSP	22

Fig. 7



Guard ring brazed to tube

Swivel socket		
Diameter	Thread	A/F
4	3/8" BSP	22
6	1/4" BSP	19
6	3/8" BSP	22
6	1/2" BSP	27

Properties for cable

Insulation	Temperature range	Application
PVC	- 5 + 70°C	General use
Silicone	-50 +180°C	Flexible, heat and cold resistance
Teflon (FEP)	-50 +200°C	Chemical corrosion, heat and cold resistance
GLGLO, Fiberglass+steel braid	-20 +400°C	High temperature, not water tight

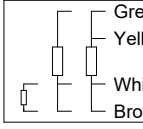
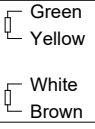
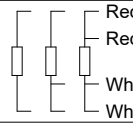
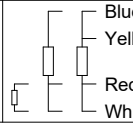
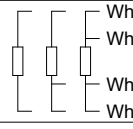
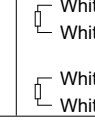
Response time

Protective tube Diameter	Response time in seconds (guidelines)			
	In water @ 0.4m/sec.		In air @ 3m/sec.	
	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
4	3	15	40	120
6	5	15	60	180

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 - cable

PVC w/screen Screen connected to outer sheath		Teflon w/screen Screen connected to outer sheath		Silicone		GLGLO	
1xPt100 2- 3- 4-wire	2xPt100 2-wire	1xPt100 2- 3- 4-wire	2xPt100 2-wire	1xPt100 2- 3- 4-wire	2xPt100 2-wire	1xPt100 2- 3- 4-wire	2xPt100 2-wire
							

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