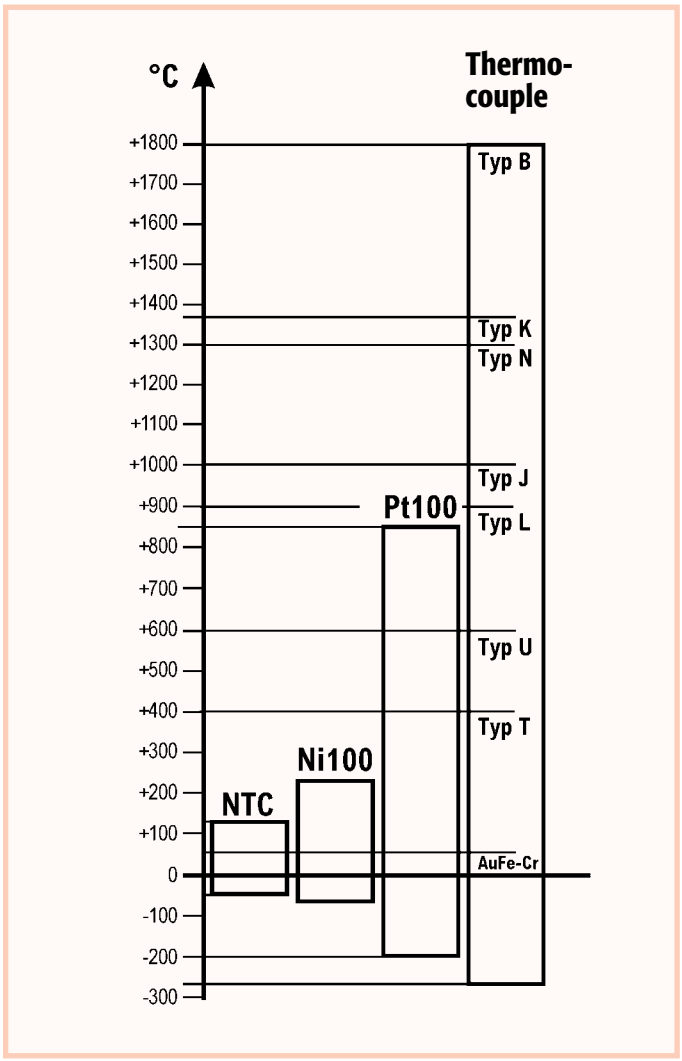
TEMPERATURE

The Right Temperature Sensor For Any Measuring Task



Selecting the right type of temperature sensor depends on your measuring task. For example, thermocouples, resistor-based sensors (Pt100 and Ntc) and pyrometers (infrared sensors) are available.

Rule of Thumb:

- Thermocouples are very fast and provide a large measuring range.
- Resistor-based sensors are more accurate but slower.
- Ntc sensors are very fast, accurate, but they have a limited measuring range.
- Infrared sensors do not contact the device under test and they have very small time constants, but they depend on the emission grade.
- The larger the measuring range, the more universal the possible range of applications.

Selection Criteria:

Select the temperature sensor that suits your measuring task according to the criteria below:

- Meas. range
- Accuracy
- Response time
- Stability
- Type of construction

Note:

Non-contact temperature measurement with AMiR infrared devices can be found in section 18

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Thermocouples

Thermocouples consist of two spot-welded wires of different metals or alloys. The thermoelectric effect at the contact surface is used to measure temperatures. A relatively small thermoelectric voltage is caused, which depends on the temperature difference between the measuring point and the connecting terminals.

Accuracy, Operating Temperatures:

The basic values for the thermoelectric voltages and for the permissible tolerances of thermocouples are specified in standard DIN/IEC 584. Our thermocouple sensors are available in two tolerance classes as per DIN/IEC 584-2. For type K the following limit values apply (highest value in each case) :

Class 1 : ±1.5 °C or ±0.004 x | t | (-40 to +1000 °C)
Class 2 : ±2.5 °C or ±0.0075 x | t | (-40 to +1200 °C)

Our thermocouple sensors generally comply with Class 2 as per DIN/IEC 584-2. The specified T_{max} values refer to the tip of the sensor. The specified T_{90} times refer to measuring operations in a moving liquid. The sensor handles and cables are usually resistant to temperatures up to +80 °C. Heat-resistant silicon or Teflon cables are also available on request.
Various types of thermocouples are available; these can be distinguished in terms of their temperature range, sensitivity, and in particular their compatibility with the test substance. The most popular thermocouple is the NiCr-Ni (type K).

New Connecting cable with thermal line (stranded wire)

There is no adverse temperature effect at the juncture from measuring element to cable.

With immediate effect, the sensor connecting cables for many sensor types will use a new thermal line (stranded wire, thermal line class 2) instead of the conventional compensation line. The transition from measuring element (sensor tip) to connecting cable (in the cable sleeve or in the handle) thus remains, even over a wide temperature span (up to 200 °C), unaffected by temperature error; the usual measuring errors caused by temperature differences at the juncture when using a conventional compensation line can thus with the new thermal line be avoided.

For just a few sensor types and extension cables a compensation line will continue to be used as previously. The compensation lines generally comply with Class 2 as per DIN 43722. For type K the operating temperature range of the compensation line is 0 to 150 °C.

Resistor-Based Sensors (Pt100 Sensors)

When measuring the temperature the increase in resistance at increasing temperatures is utilised at the Pt100 sensors. The measuring resistor is fed with a constant current and the voltage drop at the resistor is measured as a function of the temperature. Due to the small resistance variation (0.3 to 0.4Ω/°C) the 4-conductor circuit should always be used to exclude any influences from the lead wires.

Accuracy, Operating Temperatures:

Pt100 sensors are, as standard, used with Class B (DIN/IEC 751) measuring resistors (surcharge for DIN Class A or 1/5 DIN Class B accuracy). The specified T_{max} values relate to the tip of the sensor. The specified T_{90} times are related to measurements in a moving liquid. The sensor handles and cables are usually resistant to temperatures up to +80 °C. Heat-resistant silicon or teflon cables are available on request.

Measuring ranges, resolution

PT100 probes FP Axxx are by default assigned measuring range PT100-1 (resolution 0.1 K). Measuring range PT100-2 (resolution 0.01K) can be programmed as alternative on the 1st channel or in addition on the 2nd channel. *New* Measuring range PT100-3 (resolution 0.001K) in range 0 to 65 °C (for V6 devices, with effect from 2690-8, 2890-9, 85/8690-9, 5690-1/2)

Measurement Accuracies of Resistor-Based Temperature Sensors

Designation	Range	Maximum Deviation		
Test resistances		Class B	DIN Class A	1/5 DIN Class B
Pt 100Ω	at –200°C	±1.3 K		
	at –100°C	±0.8 K		
	at –50°C		±0.25 K*	
	at 0°C	±0.3 K	±0.15 K	±0.06 K
	at +100°C	±0.8 K	±0.35 K	±0.16 K
	at +200°C	±1.3 K	±0.55 K	±0.26 K
	at +300°C	±1.8 K	±0.75 K	±0.36 K
	at +400°C	±2.3 K		
higher accuracies for an additional charges			Order no. OPG2	Order no. OPG5

* Range -50 °C only for sheathed sensors with 2mm diameter and bigger

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Thermistors (NTC Sensors)

NTC sensors (thermistors) have a significantly higher resistance than Pt100 sensors. When measuring temperatures their negative temperature coefficient is utilised, i.e. the resistance is decreasing with increasing temperatures.

Accuracy, Operating Temperatures:

The accuracy data of the normalised NTC sensors are based on manufacturer specifications. The specified T_{ma} values relate to the tip of the sensor. The specified T_{90} times are related to measurements in a moving liquid. The sensor handles and cables are resistant to temperatures up to 90°C.

Accuracies

Designation	Range	Maximum Deviation
NTC element	–20 to 0°C	±0.4 K
(10K at 25°C)	0 to 70°C	±0.1 K
	70 to 125°C	±0.6 K

Types and Fields of Application

The construction variants of temperature sensors are as many and diverse as the measuring tasks.

T_{max} is the maximum operating temperature of the sensor tip.

T_{90} is the time required by the sensor to reach 90% of the step response after a jump in temperature . The specified T_{90} times refer to measuring operations in a moving liquid.

The temperature sensors listed are also available, on request, with other lengths and diameters.

Surface sensors with flat measuring tip
For measurements on good heat conductors, on even and plain surfaces.

Surface sensor with spring-type thermocouple band
For quick measurements, also on non-plain surfaces.

Immersion probes
For measurements in liquids, as well as powdery substances, air and gases.

Sensors with heat-resistant measuring tip
For measurements at extremely high temperatures.

Sensor with penetrating tip
For measurements in plastic and pasty substances.

Sword probe
For measurements in paper, cardboard and textile stacks.

Transducer with free sensor
For measurements in air and gases.

If you do not find a suitable sensor in this catalogue, we can manufacture it according to your specifications (technical drawing or detailed specification) and supply you with a customised sensor!

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Temperature Measurement à la ALMEMO®

All ALMEMO® sensors can be adjusted, i.e. the correction values of the sensor can be stored in the connector. This considerably increases the accuracy of measurement.

As a result of the DKD and factory-set calibrations performed by us, the corrective factors are automatically determined, stored in the connector plug and locked. Maximum accuracy can then be achieved.

Ordering Information

ALMEMO® sensors are available in different designs. The type designation can be identified by:

"P" = temperature sensor with Pt100W test resistance
"N" = temperature sensor with NTC element
"T" = temperature sensor with NiCr-Ni element

All temperature sensors with an ALMEMO® flat connector can be identified by the "A" in the order no.
Naturally, they are also available for the measuring instruments of our THERM series. In this case they will have a circular connector. When ordering please replace the letter "A" by the number "9".

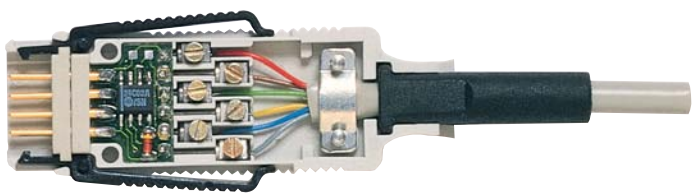
Example: FT**A**1201 (with ALMEMO® connector) **>>** FT**9**1201 (with circular connector for THERM devices)

Describe your measuring task to us!
We can provide you with comprehensive advice and find the most cost-effective solution for you.
Please do not hesitate to ask!

Use Your Existing Sensor Technology!

The patented idea of the intelligent connector makes the ALMEMO® system an extraordinarily flexible measuring system.
Instead of our pre-configured ALMEMO® sensors you can also use your own, existing sensors.

- We can supply you with pre-programmed ALMEMO® connectors that contain the corresponding sensor parameters and matching measuring ranges. They have six screw terminals and can be easily connected.
- You can correct the errors of the sensors, which means that even simple sensors become precision transducers
- Listing all the combinations and application options would be beyond the scope of this catalogue. Special programming, range extensions and linearisations for other sensor technology are always available for ALMEMO® devices.
- The pricing for this results from the efforts and the number of devices required.



ALMEMO®sensor connector with 6 terminal screws and EEPROM in original size

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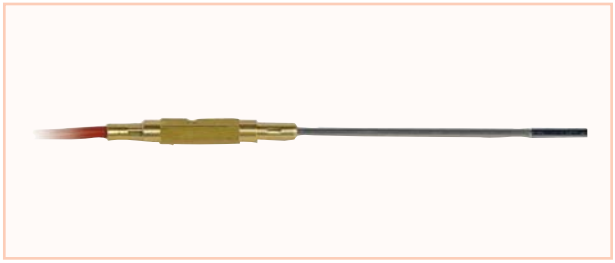
Sheathed sensors



- These reasonably priced sensors are for universal use (-200 to +1100 °C) and suitable for immersion measurements in liquids, air, and gases. The sheathed line, depending on diameter, can be bent - within certain limits.
- Different connection variants :
  With cable and ALMEMO® connector Order no. FxAxx,
  with LEMO socket (direct, without cable) Order no. FxLxx,
  with cable and free ends, Order no. Fx0xx.
  Connector options :
  With THERM circular connector : Option OT9020RS,
  with miniature Thermo flat connector : Option OT9020FS.

Thermocouple sheathed sensors Txx

Measuring element :	NiCr-Ni thermocouple, type K, DIN class 1 (see 08.03)
Sensor tip, sheathed line :	diameter, length, operating temperature; see table; material Inconel Here the sensor tip and sheathed line are of the same diameter. These types are therefore also suitable for mounting with clamped screw connections.
Cable sleeve :	Brass, hexagonal, L = 65 mm, circumdiameter = 9 mm, operating temp. –40 to +160 °C
Standard cable :	*New* 1.5 meter Teflon / silicone thermal line (stranded wire)* Operating temp. -50 to +200°C There is no adverse temperature effect at the juncture from measuring element to cable.
Cable options :	Compensation line, PVC / PVC, insulated, operating temperature –20 to +105 °C The compensation line is also available, on request, with Teflon / Teflon, insulated.
ALMEMO® connector	NiCr-Ni, ZA9020FS, with resolution 0.1 K

Pt100 sheathed sensors Pxx

Measuring element :	Pt100 4L, DIN class B (see 08.03)
Options :	DIN class A, 1/5 DIN class B (see 08.03)
Sensor tip :	diameter, length, operating temperature; see table; material stainless steel
Sheathed line :	diameter, length; see table; material stainless steel On certain types the sensor tip and sheathed line are of different diameter; (i.e. the sensor tip is thicker). These types are therefore not suitable for mounting with clamped screw connections. Types suitable for clamped screw connections are available on request.
Cable sleeve :	Brass, hexagonal, L = 65 mm, circumdiameter = 9 mm, operating temp. –40 to +160 °C
Standard cable :	1.5 meters line, Teflon / silicone, insulated, operating temperature –50 to +200 °C
Cable options :	Line, PVC / PVC, insulated, operating temperature –20 to +105 °C The line is also available, on request, with Teflon / Teflon, insulated.
ALMEMO® connector	Pt100, ZA9030FS1, with resolution 0.1 K Option : Pt100 ZA9030FS2 with resolution 0.01 K (standard with 1/5 DIN class B)

NTC sheathed sensors Nxx

Measuring element :	NTC type N (see 08.03)
Sensor tip :	diameter, length, operating temperature; see table; material stainless steel
Sheathed line :	diameter, length; see table; material stainless steel On certain types the sensor tip and sheathed line are of different diameter; (i.e. the sensor tip is thicker). These types are therefore not suitable for mounting with clamped screw connections. Types suitable for clamped screw connections are available on request.
Cable sleeve :	Brass, hexagonal, L = 65 mm, circumdiameter = 9 mm, operating temp. –40 to +160 °C
Standard cable :	1.5 meters line, PVC / PVC, insulated, operating temperature –20 to +105 °C
Cable options :	Line, Teflon / silicone, insulated, operating temperature –50 to +200 °C The line is also available, on request, with Teflon / Teflon, insulated.
ALMEMO® connector	NTC, ZA9040FS, with resolution 0.01 K

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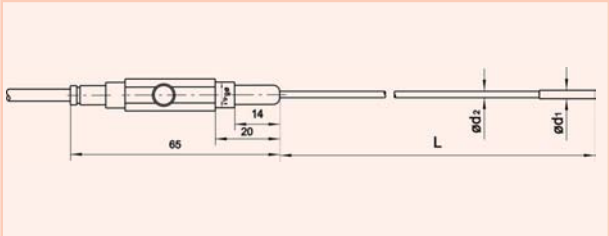
Sheathed sensors



Sensor with :
Sensor tip, dimensions d_1,
sheathed line, dimensions d_2,
overall length (including sensor tip) L,
Cable sleeve, Cable sleeve, dimensions length = 65 mm,
circumdiameter = 9 mm, Cable

Operative ranges and dimensions

	Thermocouples NiCr-Ni			Resistor-based sensors Pt100 4L			Resistor-based sensors NTC		
Sensor tip Diameter mm	Order no. FTAxxLyyyy d_1 = x . x mm L = yyyy mm	d_2 mm	Operat. temp. Sensor tip	Order no. FPAxxLyyyy d_1 = x . x mm L = yyyy mm	d_2 mm	Operat. temp. Sensor tip	Order no. FNAxxLyyyy d_1 = x . x mm L = yyyy mm	d_2 mm	Operat. temp. Sensor tip
0.5 to 1.0	FTA05L0050 FTA05L0100 FTA05L0250 FTA05L0500 FTA05L1000	0.5	-200 to +900°C	FPA10L0100 ** FPA10L0250 ** FPA10L0500 **	1.0	-200 to +600°C			
1.5 to 2.2	FTA15L0100 FTA15L0250 FTA15L0500 FTA15L1000	1.5	-200 to +1100°C	FPA22L0100* FPA22L0250* FPA22L0500*	2.0	-70 to +500°C	FNA20L0100 FNA20L0250 FNA20L0500	2.0	-20 to +100°C
3.0 to 3.2	FTA30L0100 FTA30L0250 FTA30L0500 FTA30L1000	3.0	-200 to +1100°C	FPA32L0100* FPA32L0250* FPA32L0500*	2.8	-70 to +500°C	FNA32L0100* FNA32L0250* FNA32L0500*	2.8	-20 to +100°C

* This sensor type (reinforced tip) is not suitable for clamped screw connections.
Suitable types with same end-to-end diameter are available on request. FPA16L (Ø 1.6 mm), FPA20L (Ø 2.0 mm), FPA30L / FNA30L (Ø 3.0 mm).
** The sensor type with diameter 1.0 mm incorporates a highly sensitive miniature Pt 100 ceramic precision resistor. When using this sensor it must not be subjected to even the slightest shock or vibration and its measuring tip must not be bent by even the slightest amount; this is critically important; there is a risk otherwise that the precision resistor may be damaged. If the user fails to heed this warning we cannot accept any liability under the terms of warranty.

Options

	Thermocouples NiCr-Ni Order no.		Resistor-based sensors Pt100 4L Order no		Resistor-based sensors NTC Order no	
Standard-cable		1.5 m Teflon/silicone		1.5 m Teflon/silicone		1.5 m PVC / PVC
Option cable	OTK01L0050	5 m Teflon/silicone	OPK01L0050	5 m Teflon/silicone		
Option cable	OTK02L0015	1.5 m PVC / PVC	OPK02L0015	1.5 m PVC / PVC		
Option cable	OTK02L0050	5 m PVC / PVC	OPK02L0050	5 m PVC / PVC	OPK02L0050	5 m PVC / PVC
Opion cable*	OFS0017	1.4 m ** Teflon/silicone	OFS0017	1.4 m ** PVC	OFS0017	1.4 m ** PVC
Accuracy option			OPG2	DIN class A		
Accuracy option			OPG5	1/5 DIN class B		
option Ceramics measuring resistor			OPM1	Operating temperature probe tip -200 to +600°C		

* Cable with spray-coated ALMEMO® connector (protection against damp)
** No other cable types or cable lengths are available.

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Sheathed thermocouple sensor NiCroSil-NiSil type N

new!

Measuring element Thermocouple NiCroSil-NiSil type N
DIN class 1
Sheathed line Material : "Inconel"
Application Especially good long-term stability at high temperatures
Cable *New* 1.5 meter Teflon / silicone thermal line (stranded wire)
Operating temp. -50 to +200 °C
There is no adverse temperature effect at the juncture from measuring element to cable.
ALMEMO® connector NiCroSil-NiSil ZA9021FSN
Other data / image / dimensional drawing see page 08.06/08.07

Operative ranges and dimensions
Sheathed thermocouple sensor NiCroSil-NiSil

Sensor tip, diameter mm	Order. No. FTANxxLyyyy d_1 = x , x mm L = yyyy mm	d_2 mm	Operating temp. Sensor tip
1,5	FTAN15L0500 FTAN15L0750 FTAN15L1000	1,5	-200 bis +1150°C
3,0	FTAN30L0500 FTAN30L0750 FTAN30L1000	3,0	-200 bis +1150°C
6,0	FTAN60L0500 FTAN60L0750 FTAN60L1000	6,0	-200 bis +1150°C

Option
Cable 5 meters Teflon / silicone thermal line Order no. OTNK01L0050

Sheathed thermocouple sensor Cu-CuNi type T

new!

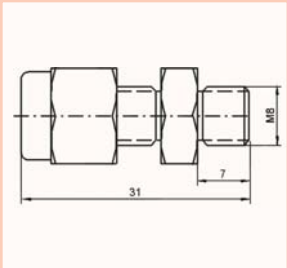
Measuring element Thermocouple Cu-CuNi type T,
DIN class 1
Sheathed line Material : Stainless steel
Application up to 400 °C
Cable *New* 1.5 meter Teflon / silicone thermal line (stranded wire)
Operating temperature -50 to +200 °C
There is no adverse temperature effect at the juncture from measuring element to cable.
ALMEMO® connector Cu-CuNi ZA9021FSTT
Other data / image / dimensional drawing see page 08.06/08.07

Operative ranges and dimensions
Sheathed thermocouple sensor Cu-CuNi

Sensor tip, diameter mm	Order. No. FTATxxLyyyy d_1 = x , x mm L = yyyy mm	d_2 mm	Operating temp. Sensor tip
1,5	FTAT15L0100 FTAT15L0250 FTAT15L0500 FTAT15L1000	1,5	-200 bis +400°C

Option
Cable 5 meters Teflon / silicone thermal line Order no. OTNK01L0050

Clamp screw connection ZT 943 xKV



Operative range
For sheath elements

Option:
Notched steel ring
(once fitted, cannot be removed),
T_{max} = 800 °C
For ZT9431KV
Order no. OT9431ST
For ZT9432KV
Order no. T9432ST

Variants (with Teflon clamping ring)
fFor types
FTA15Lxxxx, FPA16Lxxxx Order no. ZT9431KV
For types
FTA30Lxxxx, FPA30Lxxxx, and FNA30Lxxxx
Order no. ZT9432KV

Technical data

Operating temperature	up to maximum 250 °C with option up to 800 °C
Thread	M8x1, 14 AF

Heat-conducting paste ZB 9000 WP

For surface measurement, operative range -30 to +200 °C, heat-conducting paste, tube, 12 ml **Order no. ZB9000WP**

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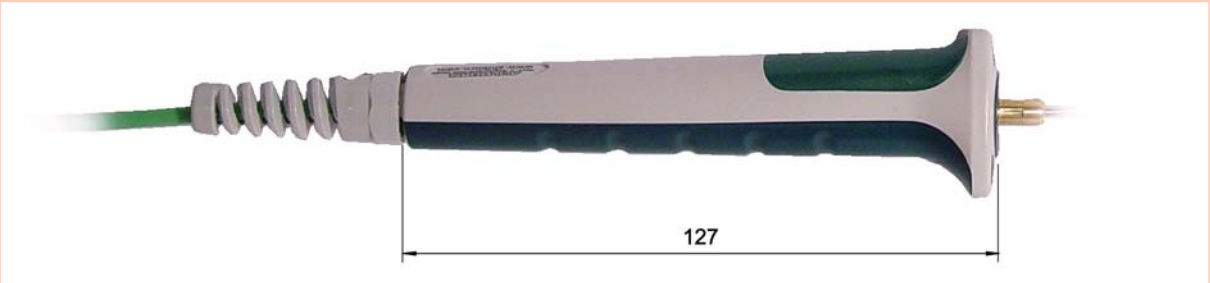
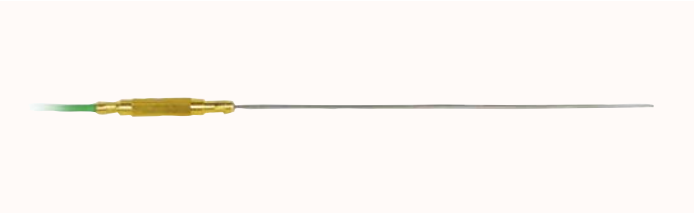
Handle for sensors with hexagonal cable sleeve



Option Handle including fitting **Order no. OFH**

NiCr-Ni-sensor FTA 15 P



For immersion measurement

Meas. element:	NiCr-Ni class 1 *
Measuring tip:	Operative range -200...+1100 °C 200x1.5 mm, sheathed line, Inconel
T_{90}: *	1.5 s
Cable:	approx. 1.4 m Teflon / silicone with spray-coated ALMEMO® connector

L = 200 mm **Order no FTA15P**
Sensor with handle **Order no FTA15PH**
(No variants available)

Pt100 sensor FPA 32 P

For immersion measurement

Meas. element:	Pt100, class B *
Measuring tip:	Operative range -70...+500 °C 200 x 2.8/3.2 mm, sheathed line
T_{90}: *	10 s
Cable:	approx. 1.4 m PVC with spray-coated ALMEMO® connector

L = 200 mm **Order no FPA32P**
Sensor with handle **Order no FPA32PH**
(No variants available)

NTC sensor FNA 305

new!

for Indoor air measurements

Meas. element	NTC*
Measuring tip	Operative range -10 to +60 °C (non-condensing) Protective tube in stainless steel Diameter = 2.4mm, length = 50 mm mounted directly on ALMEMO® connector
T_{90}	8 s

L = 50 mm **Order no FNA305**
(No variants available)

* For general technical data, see page 08.03.

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new!

Pt100 cable sensor

Inexpensive resistance-based temperature sensors, for universal use

For immersion measurements in air and gases

Rigid protective tube made from stainless steel

Also water-proof variant - with Teflon hot-melt adhesive shrink-fit sleeve

A wide variety of cable variants

Operating temperature (depending on variant) -70 to +400 °C

Technical features

Measuring element : Pt100 4L, DIN class B, For technical data see page 08.03.

Option: Greater accuracy DIN class A Order no. OPG2, 1/5 DIN class B Order no. OPG5

Protective tube: Diameter, length see Variants, stainless steel 1.4301

Junction of protective tube / connecting cable: Direct, hard-crimped for dry uses, option of tight shrink-fit (for water-proof)

Cables: Length = 1.5 meters, Other lengths are available as options. Cable diameter is never larger than the diameter of the protective tube.

Operating temperature: see variants, Always for whole sensor (i.e. sensor tip and cable)

ALMEMO® connector: Pt100 ZA9030FS2 with resolution 0.01 K .

Variants

With Teflon / Teflon cable (black),

Operative range -70...+250°C:

Diameter	Length	Order no.
3,0 mm	50 mm	FPA30K03L0050
3,0 mm	100 mm	FPA30K03L0100
4,0 mm	50 mm	FPA40K03L0050
4,0 mm	100 mm	FPA40K03L0100

A longer cable is available as an option, see below.

Inside water-proof,

Inside in protective tube: Teflon hot-melt adhesive shrink-fit sleeve, completely covering the precision resistor and line, also moisture-proof outside thanks to Teflon hot-melt adhesive shrink-fit sleeve covering the cable exit.

Diameter	Length	Order no.
4,0 mm (sensor tip)	50 mm	FPA40K03L0050W
4,0 mm (sensor tip)	100 mm	FPA40K03L0100W

A longer cable is available as an option see below

Completely water-proof, both inside and outside,

Inside in protective tube: Teflon hot-melt adhesive shrink-fit sleeve, completely covering the precision resistor and line Outside completely enclosed in shrink-fit: Teflon hot-melt adhesive shrink-fit sleeve covering the line (approx. 50 mm) and beyond this at front tight shrink-fit covering the protective tube.

Diameter +shrink-fit sleeve	Length +shrink-fit sleeve	Order no.
4,0 mm	50 mm	FPA40K03L0050W2
4,0 mm	100 mm	FPA40K03L0100W2

A longer cable is available as an option

Total length 5 m	OPK03L0050
Total length 10 m	OPK03L0100

With Teflon / silicone cable (red),

Operative range -50...+200°C:

Diameter	Length	Order no.
5,0 mm	50 mm	FPA50K01L0050
5,0 mm	100 mm	FPA50K01L0100
6,0 mm	50 mm	FPA60K01L0050
6,0 mm	100 mm	FPA60K01L0100

A longer cable is available as an option

Total length 5 m	OPK01L0050
Total length 10 m	OPK01L0100

Cable with glass-fiber / glass-fiber / VA wire shielding,

Operative range -50...+400°C:

Diameter	Length	Order no.
5,0 mm	50 mm	FPA50K06L0050
5,0 mm	100 mm	FPA50K06L0100
6,0 mm	50 mm	FPA60K06L0050
6,0 mm	100 mm	FPA60K06L0100

A longer cable is available as an option

Total length 5 m	OPK06L0050
Total length 10 m	OPK06L0100

Other designs are available on request:

Pt100 cable sensors, vapor-tight (protective class IP69K), inter alia for temperature measuring in autoclaves, sterilizing units,, high-temperature steam applications, vacuum applications, freeze drying units, -30. to +150 °C, protective tube in stainless steel with Teflon cable.

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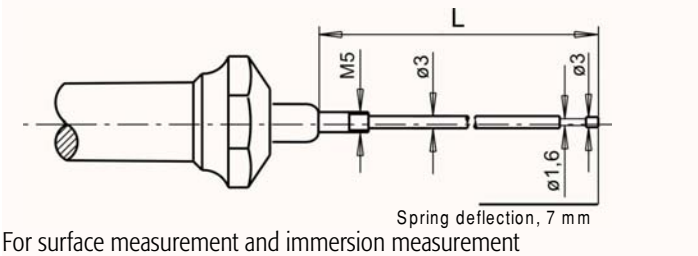
NiCr-Ni sensor with handle FTA 120 x

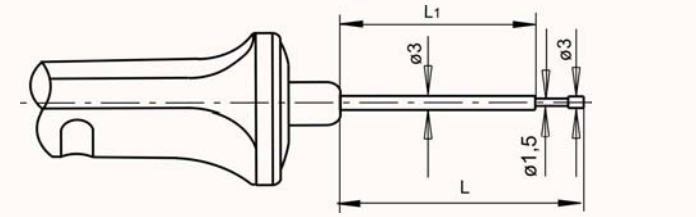


For surface measurement and immersion measurement

Meas. element:	NiCr-Ni class 1 *
Measuring tip:	Operative range -200...+400 °C Silver rivet, level, spring-loaded, not electrically isolated
T_{90}: *	3 s
Handle *	138 mm
Cable	1.5 m PVC

L = 30 mm	**Order no. FTA1201**
L = 150 mm	**Order no. FTA1202**

NiCr-Ni sensor with handle FTA 122 LxxxxH

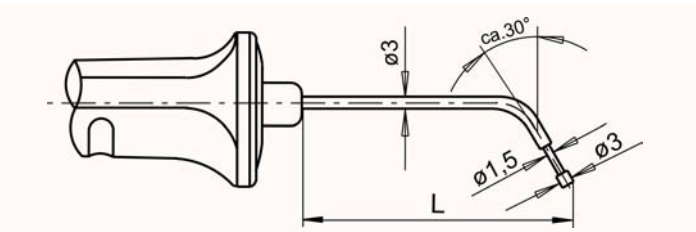


For surface measurement and immersion measurement

Meas. element	NiCr-Ni class 1 *
Measuring tip	Operative range -200...+400 °C Silver rivet, level, not electr. isolated
T_{90}: *	3 s
Handle *	127 mm
Cable	*New* 1.5 m Teflon / silicone thermal line**

L = 50 mm	**Order no. FTA122L0050H**
L = 100 mm	**Order no. FTA122L0100H**
L = 200 mm	**Order no. FTA122L0200H**

NiCr-Nisensor with handle FTA 121 LxxxxH

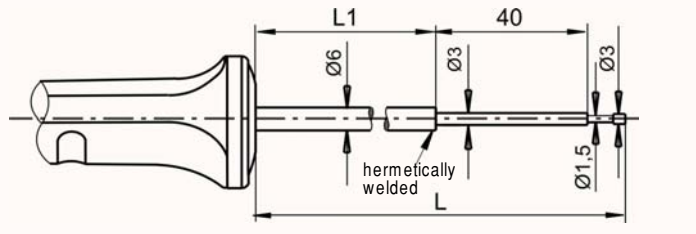


For surface measurement and immersion measurement

Meas. element	NiCr-Ni class 1 *
Measuring tip	Operative range -200...+400 °C Silver rivet, level, angled, not electrically isolated
T_{90}: *	3 s
Handle *	127 mm
Cable	*New* 1.5 m Teflon / silicone thermal line**

L = appr. 50 mm	**Order no. FTA121L0050H**
L = appr. 200 mm	**Order no. FTA121L0200H**

NiCr-Ni sensor with handle FTA 150 LxxxxH



For surface measurement and immersion measurement

Meas. element	NiCr-Ni class 1 *
Measuring tip	Operative range -200...+800 °C (for brief periods1000°C) Stainless-steel rivet, level, electrically isolated
T_{90}: *	3 s
Handle *	127 mm
Cable	*New* 1.5 m Teflon / silicone thermal line**

L = 350 mm	**Order no. FTA150L0350H**
L = 700 mm	**Order no. FTA150L0700H**
L = 1250 mm	**Order no. FTA150L1250H**

* For general technical data, see page 08.03.
** There is no adverse temperature effect at the juncture from measuring element to cable. see page 08.03

TEMPERATURE

NiCr-Ni sensor FTA 109 P

For surface measurement

Meas. element:	NiCr-Ni class 2 *
Measuring tip:	Operative range -50...+500 °C Thermal ribbon, not electr. isolated
Measuring head	approx. 15 mm diameter
T_{90}: *	1 s
Cable:	appr. 1.5 m PVC

L = appr. 180 mm **Order no FTA109P**
Sensor with handle **Order no FTA109PH**
(No variants available)

NiCr-Ni sensor FTA 104 P

For surface measurement

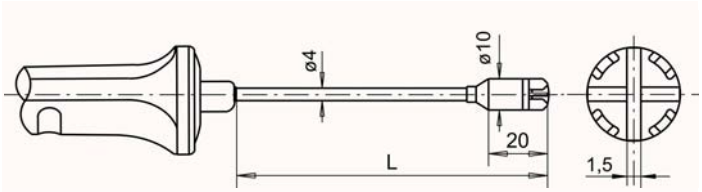
Meas. element:	NiCr-Ni class 2 *
Measuring tip:	Operative range -50...+500 °C Thermal ribbon, not electr. isolated
Measuring head	approx. 15 mm diameter
T_{90}: *	1 s
Cable:	appr. 1.5 m PVC

L = total approx. 180 mm
with 90° angle, approx. 50 mm **Order no FTA104P**
Sensor with handle **Order no FTA104PH**
(No variants available)

* For general technical data, see page 08.03.

TEMPERATURE

NiCr-Ni sensor with handle FTA 153 LxxxxH

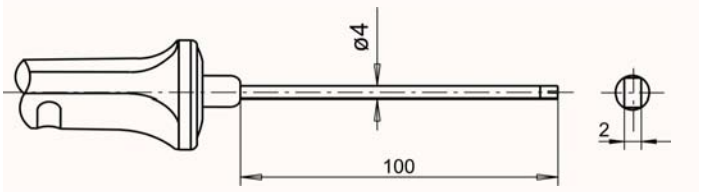


For surface measurement

Meas. element:	NiCr-Ni class 2 *
Measuring tip:	Operative range -200...+250 °C Thermal ribbon, crossed, not electrically isolated
T_{90}: *	1.5 s
Handle: *	127 mm
Cable:	1.5 m PVC

L = 100 mm **Order no FTA153L0100H**
L = 200 mm **Order no FTA153L0200H**
L = appr. 180 mm angled 45°, 160/50mm **Order no FTA1533L0180H**

NiCr-Ni sensor with handle FTA 1535 LxxxxH

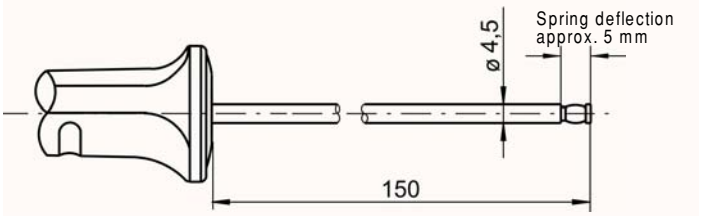


For surface measurement

Meas. element:	NiCr-Ni class 2 *
Measuring tip:	Operative range -200...+250 °C Thermal ribbon, not electr. isolated
T_{90}: *	2 s
Handle: *	127 mm
Cable:	1.5 m PVC

L = 100 mm **Order no FTA1535L0100H**

NiCr-Ni sensor with handle FTA 420 LxxxxH



For surface measurement on level, metallic surfaces

Meas. element:	NiCr-Ni class 1 *
Measuring tip:	Operative range -50...+500 °C Silver disc, spring-loaded, not electrically isolated
T_{90}: *	2 s
Handle: *	127 mm
Cable:	1.5 m PVC

L = 150 mm **Order no FTA420L0150H**

NiCr-Ni sensor with handle FTA 102P

new!

For surface measurement

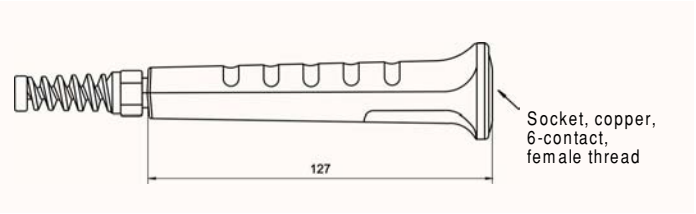
Meas. element	NiCr-Ni class 2*
Measuring tip	Operative range -50 to +400 °C Meas. tip flat, approx. 7 x 40 mm Thermal ribbon, not electr. isolated
T90 *	2 s
Plastic ring	After approx. 65 mm (sensor tip up to ring), fixture for protective cap used for transport purposes
Handle	Small plastic handle
Cable(s)	Retractile cable PVC, approx. 1 m

L = approx. 130 mm
(No variants available) **Order no. FTA102P**

* For general technical data, see page 08.03.

TEMPERATURE

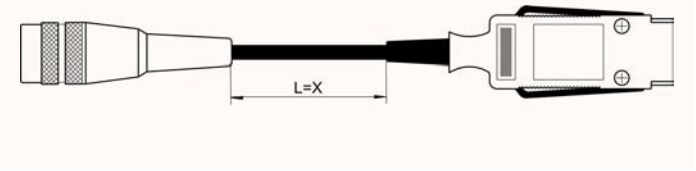
Handle HTA 301 G for NiCr-Ni measuring tips



Built-in socket	For circular connectors with screw connection
Handle: *	127 mm
Cable:	1.5 m PVC

Order no HTA301G

Connecting cable ZA 9020 BK for NiCr-Ni measuring tips

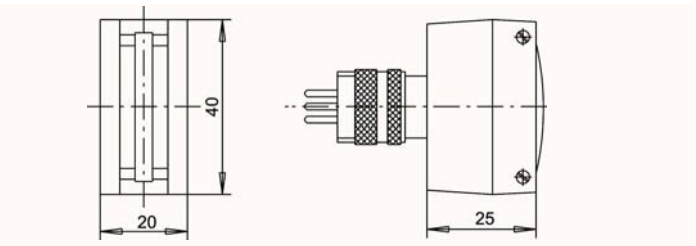


For surface measurement

Coupling	For circular connectors with screw connection
Cable	Length L, PVC

L = 0.2 m	**Order no ZA9020BK0**
L = 1 m	**Order no ZA9020BK1**
L = 2 m	**Order no ZA9020BK2**
L = 4 m	**Order no ZA9020BK4**

NiCr-Ni measuring tip FT 9306 xG



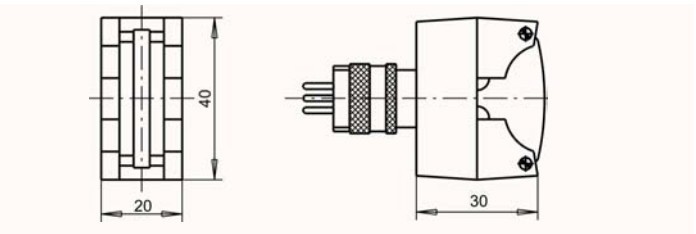
For surface measurement on level surfaces

Meas. element:	NiCr-Ni class 2 *
Measuring tip:	Thermal ribbon, not electrically isolated
T_{90}: *	3 s
Connector	Circular connector with screw connection

Operative range -50...+220 °C **Order no FT9306TG**

Spare measuring strip **Order no ZT9306TB**
Please always specify sensor type !

NiCr-Ni measuring tip FT 9307 xG



For surface measurement on convex / concave surfaces

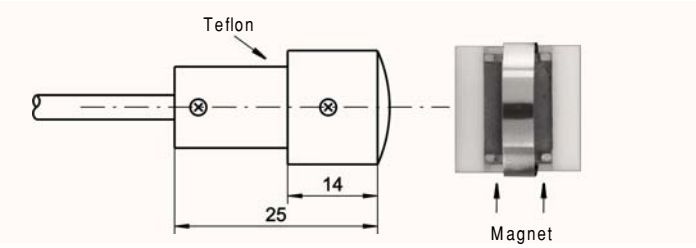
Meas. element:	NiCr-Ni class 2 *
Measuring tip:	Thermal ribbon, not electrically isolated
T_{90}: *	3 s
Connector	Circular connector with screw connection

Operative range -50...+220 °C **Order no FT9307TG**

Spare measuring strip **Order no ZT9307TB**
Please always specify sensor type !

* For general technical data, see page 08.03.

NiCr-Ni sensor FTA 025 P



Magnet sensor for surface measurement

Meas. element:	NiCr-Ni class 2 *
Measuring tip:	Operative range -50...+300 °C Thermal ribbon, not electr. isolated Fastened by magnet
T_{90}: *	1.5 s
Cable:	appr. 2 m PVC

Magnet sensor (No variants available) **Order no FTA025P**

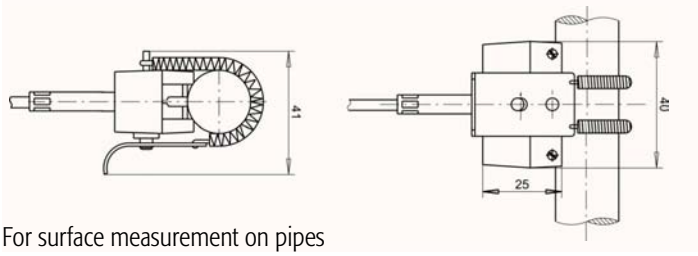
Magnet sensor with Velcro fastener e.g. for pipework

new!

Velcro strip	approx. 400 mm for pipe diameter appr. 10 to 75 mm T_{max} 110 °C mounted on sensor tip

Magnet sensor, including Velcro fastener
Order no FTA025PKB

NiCr-Ni sensor FTA 8068

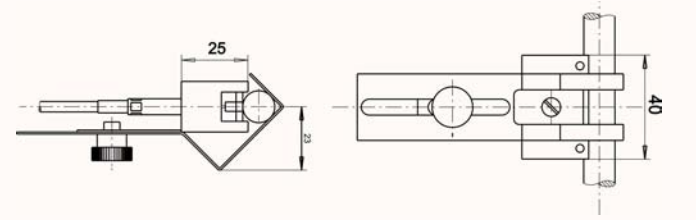


For surface measurement on pipes

Meas. element:	NiCr-Ni class 2 *
Measuring tip:	Operative range -50...+120 °C Thermal ribbon, not electr. isolated Fastened by pipe clamp (spring-loaded)
T_{90}: *	3 s
Pipe diameter	12...25 mm
Cable:	1.2 m PVC

Pipe clamp sensor **Order no FTA8068**

NiCr-Ni sensor FTA 8069



For surface measurement on pipes

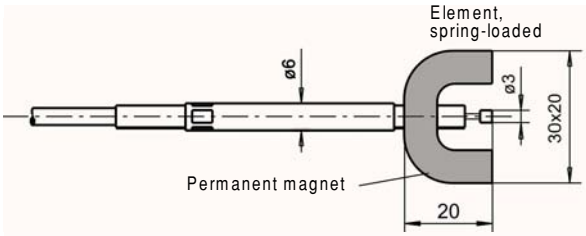
Meas. element:	NiCr-Ni class 2 *
Measuring tip:	Operative range -50...+120 °C Thermal ribbon, not electr. isolated Fastened by pipe clamp
T_{90}: *	3 s
Pipe diameter	12...30 mm
Cable:	1.2 m PVC

Pipe clamp sensor **Order no FTA8069**

* For general technical data, see page 08.03.

TEMPERATURE

NiCr-Ni sensor FTA 131

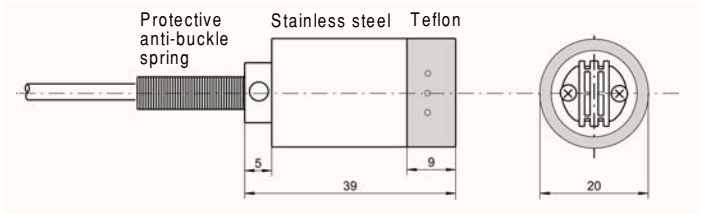


For surface measurement

Meas. element: NiCr-Ni class 2 *
Measuring tip: Operative range -50...+100 °C
Silver rivet, level, spring-loaded,
not electrically isolated
Fastened by magnet
T_{90}: * 3 s
Cable: 3 m teflon / silicone

Magnet sensor **Order no FTA131**

NiCr-Ni sensor FTA 026 P



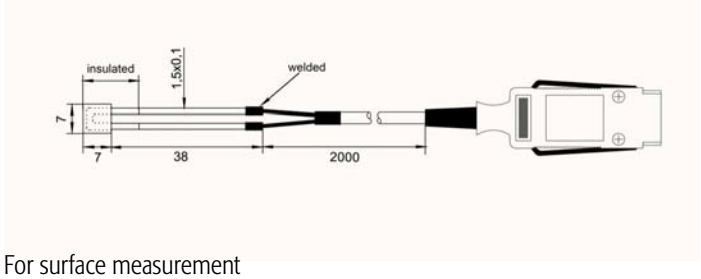
For surface measurement

Meas. element: NiCr-Ni class 1 *
Measuring tip: Operative range -50...+300 °C
Thermal ribbon,
not electrically isolated
T_{90}: * 1.5 s
Cable: appr. 0.9 m line, fabric insulation

Ribbon sensor **Order no FTA026P**
(No variants available)

NiCr-Ni film thermocouple FTA 683

new!



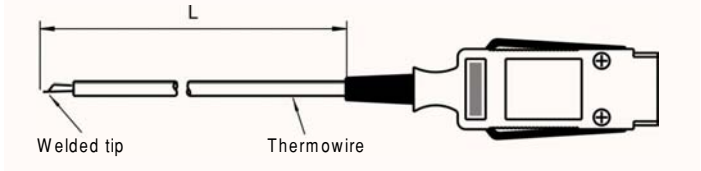
For surface measurement

Meas. element: NiCr-Ni class 2 *
Measuring tip: Operative range -100...+200 °C
Film, cresol insulation
T_{90}: * 2 s

New With permanently connected Teflon / silicone thermal line (stranded wire)**
-50 to +200°C, 2 meters, with ALMEMO® connector
Order no FTA683

Measuring element without cable, free ends
(for your own sensors) **Order no FT0683**

NiCr-Ni sensor FTA 390x



For surface measurement and immersion measurement

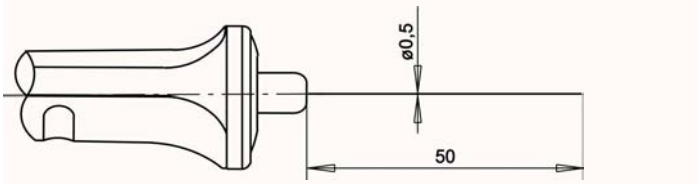
Meas. element: NiCr-Ni class 2 *
Measuring tip: Thermowire, welded,
not electrically isolated
T_{90}: * 3 s
Draht: 1.5 m

Insulation, glass fiber,
Operative range -25...+400 °C **Order no FTA3900**
Insulation, Teflon,
Operative range -200...+205 °C **Order no FTA39010**

* For general technical data, see page 08.03.
** There is no adverse temperature effect at the juncture from measuring element to cable. see page 08.03

TEMPERATURE

NiCr-Ni sensor with handle FTA 05 L0050H

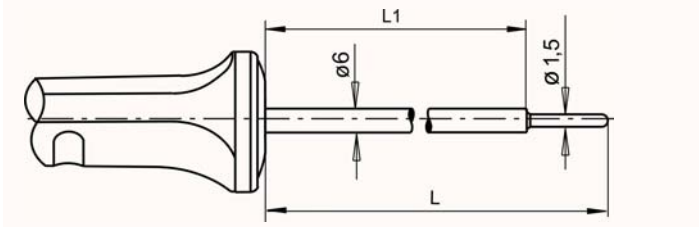


For immersion measurement

Meas. element: NiCr-Ni class 1 *
Measuring tip: Operative range -200...+500 °C
Sheathed line, Inconel
T_{90}: * 0.8 s
Handle: * 127 mm
Cable *New* 1.5 m Teflon / silicone thermal line**

L = 50 mm **Order no FTA05L0050H**

NiCr-Ni sensor with handle FTA 125 LxxxxH

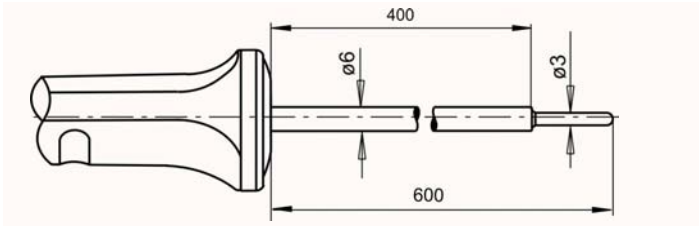


For immersion measurement

Meas. element: NiCr-Ni class 1 *
Measuring tip: Operative range -200...+800 °C
Sheathed line, Inconel
T_{90}: * 1.5 s
Handle: * 127 mm
Cable *New* 1.5 m Teflon / silicone thermal line**

L = 300 mm **Order no FTA125L0300H**
L = 500 mm **Order no FTA125L0500H**

NiCr-Ni sensor with handle FTA 126 LxxxxH

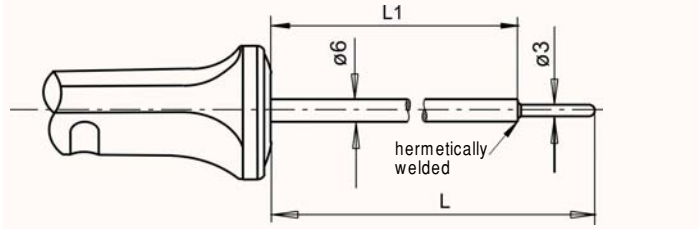


For immersion measurement

Meas. element: NiCr-Ni class 1 *
Measuring tip: Operative range -200...+900 °C
Sheathed line, Inconel
T_{90}: * 2.5 s
Handle: * 127 mm
Cable *New* 1.5 m Teflon / silicone thermal line**

L = 600 mm **Order no FTA126L0600H**

NiCr-Ni sensor with handle FTA 1261 LxxxxH



For immersion measurement in plastic and pasty substances, e.g. bitumen

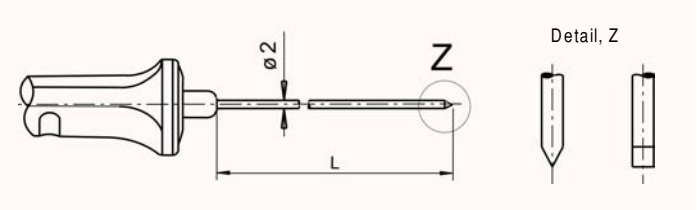
Meas. element: NiCr-Ni class 1 *
Measuring tip: Operative range -200...+500 °C
Sheathed line, Inconel
T_{90}: * 3 s
Handle: * 127 mm
Cable *New* 1.5 m Teflon / silicone thermal line**

L = 150 mm **Order no FTA1261L0150H**
L = 300 mm **Order no FTA1261L0300H**

* For general technical data, see page 08.03.
** There is no adverse temperature effect at the juncture from measuring element to cable. see page 08.03

TEMPERATURE

NiCr-Ni sensor with handle FTA 123 LxxxxH

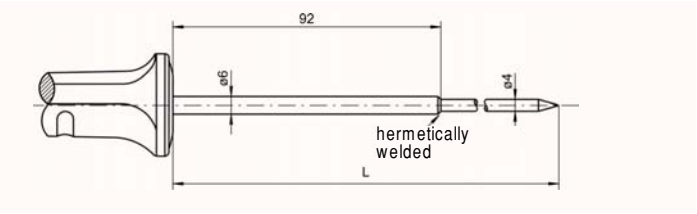


For immersion measurement in plastic and pasty substances

Meas. element:	NiCr-Ni class 1 *
Measuring tip:	Operative range -200...+800 °C Penetrating tip
T_{90}: *	3 s
Handle: *	127 mm
Cable	*New* 1.5 m Teflon / silicone thermal line**

L = 50 mm	**Order no FTA123L0050H**
L = 100 mm	**Order no FTA123L0100H**

NiCr-NiNiCr-Ni sensor with handle FTA 1231 LxxxxH



For immersion measurement in plastic and pasty substances

Meas. element:	NiCr-Ni class 1 *
Measuring tip:	Operative range -200...+400 °C Penetrating tip, cone stainless steel 1.4541
T_{90}: *	6 s
Handle: *	127 mm
Cable	*New* 1.5 m Teflon / silicone thermal line**

L = 250 mm	**Order no FTA1231L0250H**

* For general technical data, see page 08.03.
** There is no adverse temperature effect at the juncture from measuring element to cable. see page 08.03

TEMPERATURE

ALMEMO® connector for thermocouples (see Chapter 03)

For Types K, N, L, J, T
(no thermo-electric transition / with thermal material)

NiCr-Ni (K)	**Order no ZA9020FS**
NiCroSil-NiSil (N)	**Order no ZA9021FSN**
Fe-CuNi (L)	**Order no ZA9021FSL**
Fe-CuNi (J)	**Order no ZA9021FSJ**
Cu-CuNi (T)	**Order no ZA9021FST**

For Typec U, S, R, B, AuFe-Cr

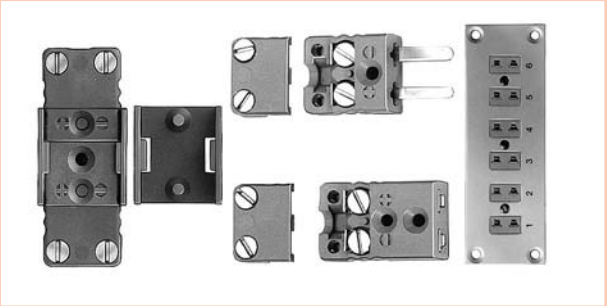
Cu-CuNi (U)	**Order no ZA9000FSU**
PtRh10-Pt (S)	**Order no ZA9000FSS**
PtRh13-Pt (R)	**Order no ZA9000FSR**
PtRh30-PtRh6 (B)	**Order no ZA9000FSB**
AuFe-Cr (A)	**Order no ZA9000FSA**

ALMEMO® adapter plug with miniature flat socket

Für Typen K, J, T, S

NiCr-Ni (K)	**Order no ZKA029RA**
Fe-CuNi (J)	**Order no ZJA029RA**
Cu-CuNi (T)	**Order no ZTA029RA**
PtRh-Pt (S)	**Order no ZSA029RA**

Miniature flat connectors for thermocouples types K, J, T, S, E



Examples for NiCr-Ni (K):

NiCr-Ni flat socket	**Order no ZK9029FB**
NiCr-Ni flat connector	**Order no ZK9029FS**
Locking plate (10 pieces)	**Order no ZB9026VP**
NiCr-Ni single built-in socket	**Order no ZK9029FE**
1-row panel with NiCr-Ni socket	**Order no ZK9029FB1**
6-row panel with NiCr-Ni socket	**Order no ZK9029FB6**

- Connectors with thermo contacts for avoiding voltage corruption at thermocouple junctions.
- For ambient temperatures –183 to +200 °C.
- Locking plate for complete coupling.

Order numbers for the above examples are compiled from the following coding elements : Z①9029F②③.
The coding elements can be taken from the table below.

Ordering

Type ①	Color (IEC 584)	Variant ②	Panel ③	Panel dimensions
NiCr-Ni (K)	green	Male connector = S	1-er (1-rhg)	38 x 38 x 2.5 mm
Fe-CuNi (J)	black	Female connector = B	6-er (1-rhg)	113 x 38 x 2.5 mm
Cu-CuNi (T)	brown		12-er (1-rhg)	203 x 38 x 2.5 mm
NiCr-CuNi (E)	lilac		24-er (2-rhg)	203 x 76 x 2.5 mm
PtRh-Pt (S)	orange			mounting depth: 25.4 mm

TEMPERATURE

NiCr-Ni thermowire T190-0

Thermowire NiCr-Ni class 2*
Insulation Glass fiber (wires and sheath)
Operating temp. -25 to +400 °C
Wire diameter 0.5 mm
External diameter approx. 1.3 x 2.1 mm

NiCr-Ni thermowire per meter with glass fiber covering **Order no. LT01900**

NiCr-Ni thermowire sensor, welded tip, with ALMEMO® connector
1.5 meters long **Order no. FTA3900**
5 meters long **Order no. FTA3900L05**

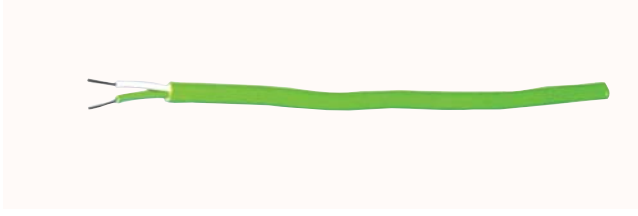
NiCr-Ni thermowire T190-1

Thermowire NiCr-Ni class 2*
Insulation Glass fiber (wires and sheath)
Operating temp. -25 to +400 °C
Wire diameter 0.2 mm
External diameter approx. 0.6 x 1.0 mm

NiCr-Ni thermowire per meter with glass fiber covering **Order no LT01901**

NiCr-Ni thermowire sensor, welded tip, with ALMEMO® connector, 1.5 meters long **Order no FTA3901**
5 meters long **Order no FTA3901L05**

NiCr-Ni thermowire T190-2

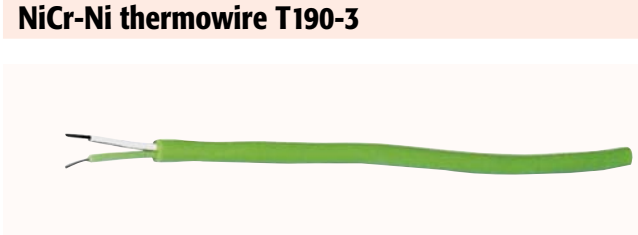


Thermowire NiCr-Ni class 2*
Insulation PVC (wires and sheath)
Operating temp. -10 to +105 °C
Wire diameter 0.5 mm
External diameter approx. 2.2 x 3.4 mm

NiCr-Ni thermowire per meter with PVC insulation **Order no LT01902**

NiCr-Ni thermowire sensor, welded tip, with ALMEMO® connector
1.5 meters long **Order no FTA3902**
5 meters long **Order no FTA3902L05**

NiCr-Ni thermowire T190-3



Thermowire NiCr-Ni class 2*
Insulation Silicone (wires and sheath)
Operating temp. -45 to +200 °C
Wire diameter 0.5 mm
External diameter approx. 4 mm

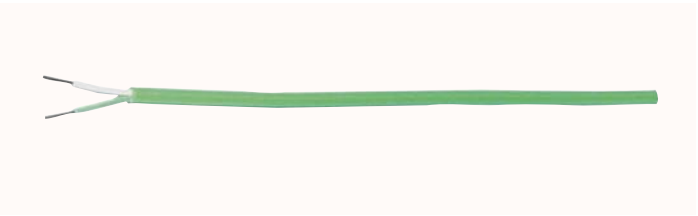
NiCr-Ni thermowire per meter with silicone insulation **Order no LT01903**

NiCr-Ni thermowire sensor, welded tip, with ALMEMO® connector
1.5 meters long **Order no FTA3903**
5 meters long **Order no FTA3903L05**

* For general technical data, see page 08.03.

TEMPERATURE

NiCr-Ni thermowire T190-10

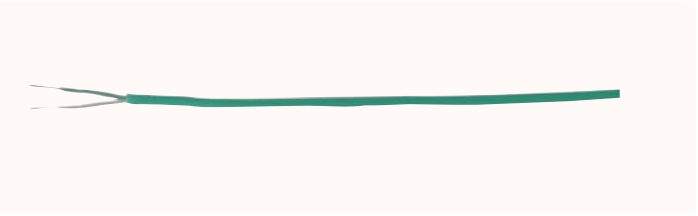


Thermowire NiCr-Ni class 2*
Insulation Teflon (wires and sheath)
Operating temp. -200 to +205 °C
Wire diameter 0.5 mm
External diameter approx. 1.5 x 2.5 mm

NiCr-Ni thermowire per meter
with Teflon insulation **Order no LT019010**
NiCr-Ni thermowire sensor, welded tip,
with ALMEMO® connector
1.5 meters long **Order no FTA39010**
5 meters long **Order no FTA39010L05**

NiCr-Ni thermowire T190-11

new!



Thermowire NiCr-Ni class 2*
Insulation Teflon (wires and sheath)
Wire diameter 0.2 mm
External diameter approx. 1.3 x 2.0 mm

NiCr-Ni thermowire per meter with Teflon insulation
Order no. LT019011
NiCr-Ni thermowire sensor, welded tip, with ALMEMO®
connector, 1.5 meters **Order no. FTA39011**
ALMEMO® connector, 5 m **Order no. FTA39011L05**

NiCr-Ni thermowire T190-7

Thermowire NiCr-Ni class 2*
Insulation Ceramic fiber (wires and sheath)
Operating temp. -40 to +1200 °C
Wire diameter 0.8 mm
External diameter approx. 3 x 4 mm

NiCr-Ni thermowire per meter
with ceramic fiber insulation **Order no LT01907**
NiCr-Ni thermowire sensor, welded tip,
with ALMEMO® connector
1.5 meters long **Order no FTA3907**
5 meters long **Order no FTA3907L05**

NiCr-Ni compensation line T191-1

Other types are available on request.
LT01912 Insulation Silicone / silicone / glass filament, up to 200 °C
LT01913 Insulation PVC / screening film / PVC, up to 105 °C

Compensation line NiCr-Ni
Insulation PVC (wires and sheath)
Operating temp. -10 to +105 °C
Wire diameter 0.5 mm
External diameter approx. 3.6 mm

NiCr-Ni bunched conductor
with PVC insulation,
for each meter **Order no LT01911**

NiCr-Ni Thermal line (stranded wire) T 191-6

new!

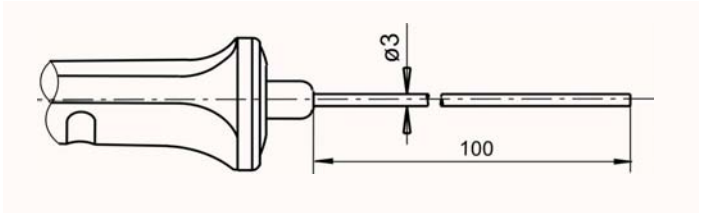
Thermal line (stranded wire)** NiCr-Ni*
Insulation Wires : Teflon, sheath : silicone
Operating temp. -50 to +200 °C
Wire diameter 0.7 mm
External diameter approx. 3.8 mm

NiCr-Ni thermal line (stranded wire) with Teflon /
silicone insulation, per meter **Order no. LT01916**

* For general technical data, see page 08.03.

TEMPERATURE

Pt100 sensor with handle FPA 106 LxxxxH

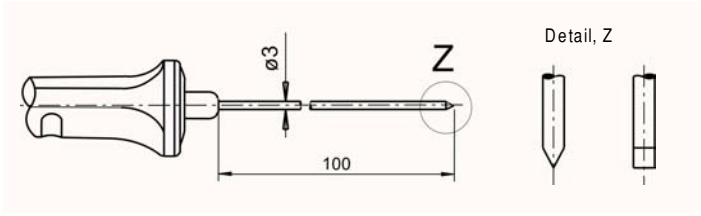


For immersion measurement

Meas. element:	Pt100, class B *
Measuring tip:	Operative range -70...+500 °C Sheath element, Inconel
T_{90}: *	8 s
Handle: *	127 mm
Cable:	1.5 m Teflon/Silicone

L = 100 mm **Order no FPA106L0100H**

Pt100 sensor with handle FPA 123 LxxxxH

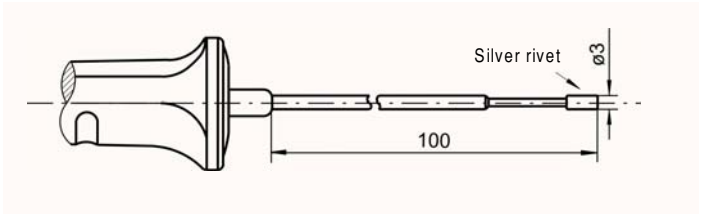


For immersion measurement in plastic and pasty substances

Meas. element:	Pt100, class B *
Measuring tip:	Operative range -70...+500 °C Penetrating tip
T_{90}: *	8 s
Handle: *	127 mm
Cable:	1.5 m Teflon / silicone

L = 100 mm **Order no FPA123L0100H**

Pt100 sensor with handle FPA 124 LxxxxH



For surface measurement and immersion measurement

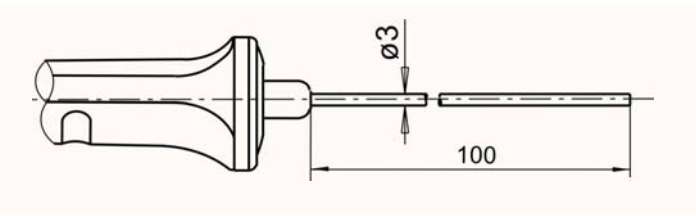
Meas. element:	Pt100, class B *
Measuring tip:	Operative range -50...+300 °C Silver rivet, level
T_{90}: *	10 s
Handle: *	127 mm
Cable:	1.5 m Teflon / silicone

L = 100 mm **Order no FPA124L0100H**

* For general technical data, see page 08.03.

TEMPERATURE

NTC sensor with handle FNA 106 LxxxxH

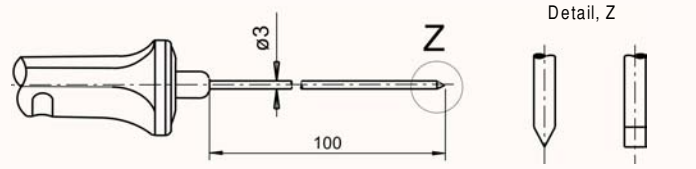


For immersion measurement

Meas. element:	NTC *
Measuring tip:	Operative range -20...+100 °C Sheath element, Inconel
T_{90}: *	8 s
Handle: *	127 mm
Cable:	1.5 m PVC

L = 100 mm **Order no FNA106L0100H**

NTC sensor with handle FNA 123 LxxxxH

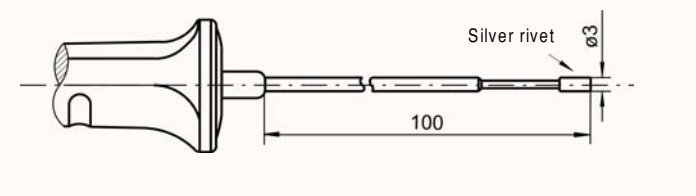


For immersion measurement in plastic and pasty substances

Meas. element:	NTC *
Measuring tip:	Operative range -20...+100 °C Penetrating tip
T_{90}: *	8 s
Handle: *	127 mm
Cable:	1.5 m PVC

L = 100 mm **Order no FNA123L0100H**

NTC sensor with handle FNA 124 LxxxxH



For surface measurement and immersion measurement

Meas. element:	NTC *
Measuring tip:	Operative range -20...+100 °C Silver rivet, level
T_{90}: *	10 s
Handle: *	127 mm
Cable:	1.5 m PVC

L = 100 mm **Order no FNA124L0100H**

NTC sensor FNA 305

new!

For room air measurement

Meas. element	NTC*
Measuring tip	Operative range -10 to +60 °C (non-condensing) Protective tube in stainless steel diameter = 2.4mm, length = 50mm mounted directly on ALMEMO® connector
T_{90}	8 s

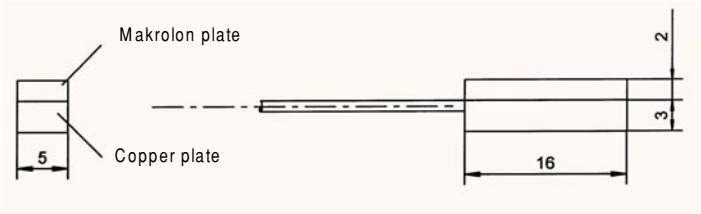
L = 50 mm **Order no FNA305**
(No variants available)

* For general technical data, see page 08.03.

TEMPERATURE

new!

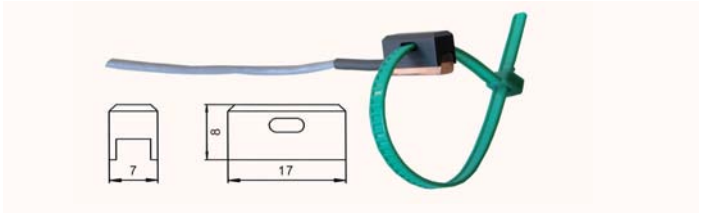
Pt100 sensor FPA 611 x



For surface measurement

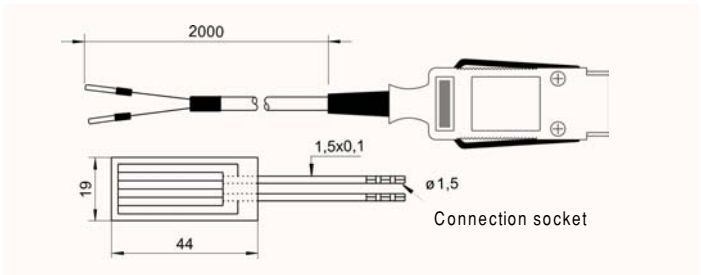
Meas. element	Pt100 class B *
Measuring tip	Operative range see below Copper, level
New	Improved thermal transfer thanks to innovative sensor element and new contact technology
T_{90} *	20 s
Cable	2 meters, insulation see below

Surface sensor
-10 to +90 °C Cable, PVC **Order no. FPA611**
-10 to +110 °C Cable, Teflon
for more demanding mechanical stress
ALMEMO® connector, resolution 0.01 K
Order no. FPA611S01



Accessories
Fixture for fastening with cable ties
Order no. ZB9611RM

Pt100 film sensor FPx 685

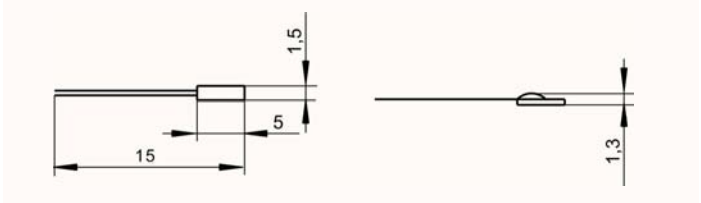


For surface measurement

Meas. element:	Pt100, class B *
Measuring tip:	Operative range -80...+180 °C Foil, 0.3 mm thick, polyimide insulation
T_{90}: *	2 s

With free ends **Order no FP0685**
With connection socket **Order no FP96852**
ALMEMO® connecting cable, PVC (-20 to +80 °C),
2 meters, with connection pins **Order no ZTA685AK**

Pt100 ceramic chip sensor element FP 0802



Unprotected sensor element for constructing your own sensors

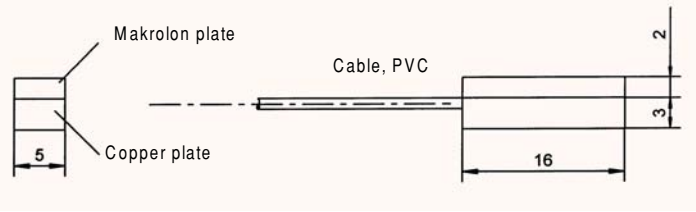
Meas. element:	Pt100, class B *
Measuring tip:	Operative range -50...+400 °C Ceramic chip sensor
Connection wires	10 mm, bare

Ceramic chip sensor **Order no FP0802**

* For general technical data, see page 08.03.

TEMPERATURE

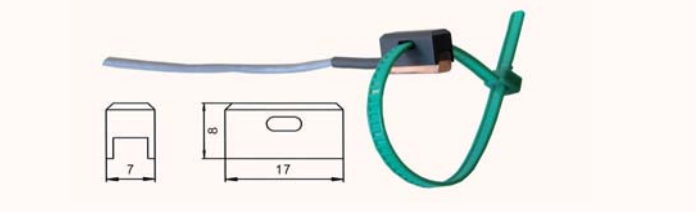
NTC sensor FNA 611x



For surface measurement

Meas. element: NTC *
Measuring tip: Operative range -10...+90 °C
Copper, level
T_{90}: * 20 s
Cable: 2 m PVC

Surface sensor **Order no FNA611**



new!

Accessories
Fixture for fastening with cable ties
Order no. ZB9611RM

NTC sensor FN 0001 K

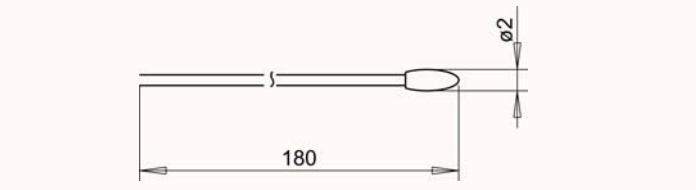
new!

Unprotected sensor element with cable

Meas. element NTC*
Measuring tip Sensor element, unprotected
Operative range -20 to +100 °C
Connection wires approx. 180 mm, Teflon insulation
Connecting cable 2 meters, PVC, thin stranded pick-up wire, Operative range -10 to +90 °C
Cable juncture, in shrink-fit

NTC sensor with cable
Free ends **Order no. FN0001K**
Option
ALMEMO® connector including assembly
Single connectors for 1 sensor Order no. OT9040AS
Double connector for 2 sensors Order no. OT9040AS2

NTC sensor element FN 0801



Unprotected sensor element for constructing your own sensors

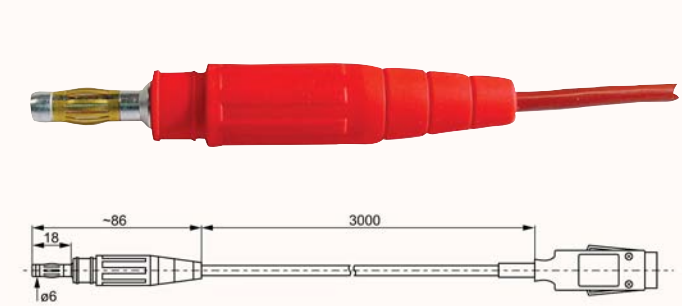
Meas. element: NTC *
Measuring tip: Operative range -20...+100 °C
Sensor
Connection wires 180 mm, Teflon insulation

Sensor **Order no FN0001**

* For general technical data, see page 08.03.

TEMPERATURE

Pt100 Plug-in laboratory sensor FPA 416

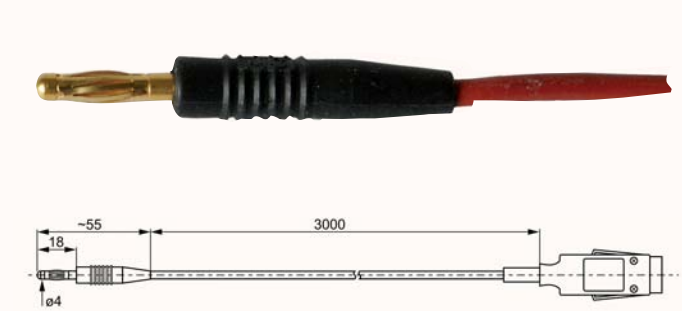


Meas. element:	Pt100, Kl. B *
Measuring tip:	Operative range -40...+150 °C
T_{90}:*	15 s
Cable:	Silikone / FEP 3m
ALMEMO®-connector:	resolution 0,01 °C

Plug-in laboratory sensor **Order no FPA416**

Measuring element PT100, 4-conductor class B, integrated in the socket of a 6 mm laboratory connector made of brass (nickel-plated).

Pt100 Plug-in laboratory sensor FPA 414



Meas. element:	Pt100, Kl. B *
Measuring tip:	Operative range -40...+150 °C
T_{90}:*	15 s
Cable:	Silikone / FEP 3m
ALMEMO®-connector:	resolution 0,01 °C

Plug-in laboratory sensor **Order no FPA414**

Measuring element PT100, 4-conductor class B, integrated in the socket of a 4 mm laboratory connector made of brass (gold-plated).

Plug-in laboratory sensor, examples of use
Measuring object with hole for inserted PT100 plug-in laboratory sensor.

* For general technical data, see page 08.03.

new!

Pt100 glass thermometer with immersion depths as per ASTM

Operative range

For immersion measurement in liquid media at low immersion depths.

Variants

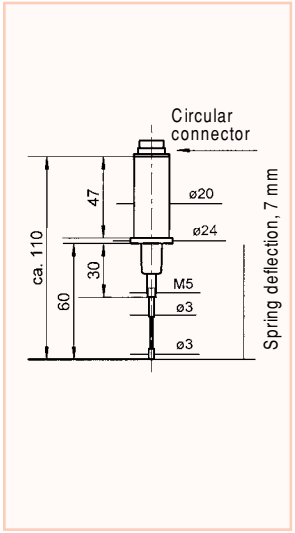
Pt100 glass thermometer with immersion depths as per ASTM specifications, with ALMEMO® connector (including 2-meter Teflon / silicone cable) **Order no: FPA910**

Technical data

Measuring element	Pt100 class A
Measuring tip	Operative range -50 to +310 °C Glass, tapered Diameter = 3 mm, length = 15 mm
Shaft	Glass, Diameter = 6 mm NL= 250 mm (total nominal length) Labeling codes for immersion depths : identification rings on the shaft as per ASTM specifications (American Society for Testing and Materials)
T_{90}	2.5 seconds
Cable junction sleeve	Stainless steel, 8 x 40 mm Cable exit secured with shrink-fit sleeve
Cables	2 meters, Teflon / silicone
ALMEMO® connector	Resolution 0.01 K Also available on request Resolution 0.001 K, in range -8 to +65 °C On devices with effect from ALMEMO® 2690

TEMPERATURE

Insertable sensor NiCr-Ni with round mounting plug T 820-6



Operative range:

Measuring tip, spring-loaded, for surface and immersion measurement

Accessories

ALMEMO® connecting cable, 2 meters

Order no ZA9020BK2

Types

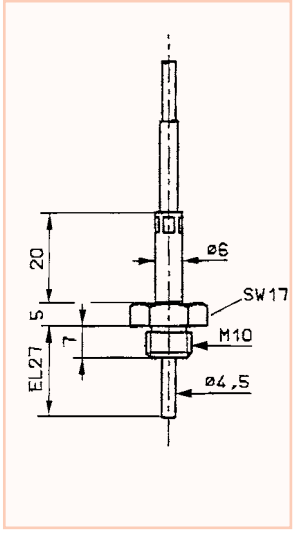
Insertable sensor NiCr-Ni with round mounting plug — **Order no FT98206**

Technical data

Measuring element	NiCr-Ni class 2*
Measuring tip	Operative range -40 to +400 °C Silver rivet, level, spring-loaded not electrically isolated
T_{90} *	3 s
Insert length	60 mm (see layout drawing)
Fixture	Plastic, Ø 20 mm, resistant up to +120 °C
Connection	Round mounting plug

Screw-fit sensor NiCr-Ni, Pt100, NTC, with fitted cable Fx 0710 L27M10

new!



Operative range:

For immersion measurement

Options

ALMEMO® connector, including assembly, for NiCr-Ni sensors Order no. OT9020AS

For Pt100 sensors
Order no. OT9030AS

For NTC sensors
Order no. OT9040AS

Variants

Screw-fit sensor, with cable, free ends

NiCr-Ni class 2*, -100 to +400 °C Thermal line
Glass filament / glass filament / VA wire shielding
Order no. FT0710L27M10
Option Cable length 5 meters Order no. OTK06L0050

Pt100 class B* -50 to +200 °C Cable Teflon / silicone
Cable juncture, in shrink-fit **Order no. FP0710L27M10**
Option Cable length 5 meters Order no. OPK01L0050

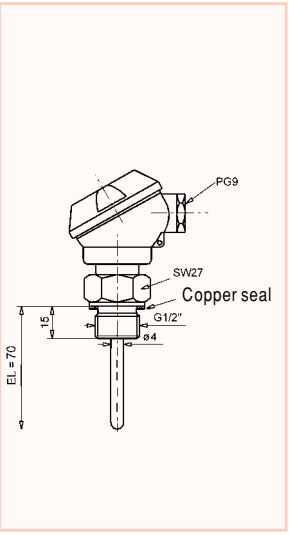
NTC*, -20 to +100 °C Cable, PVC,
Cable juncture, in shrink-fit **Order no. FN0710L27M10**
Option Cable length 5 meters Order no. OPK02L0050

Technical data

Measuring element	see under variants
Sensor materials	Stainless steel
Operative range	see under variants
Thread	M10
Insert length	27 mm (see layout drawing)
Cable	3 meters, free ends see under variants

TEMPERATURE

Insertable sensor NiCr-Ni, Pt100, NTC, with terminal head Fx 0463



Operative range:
For immersion measurements, pressure-sealed up to 15 bar

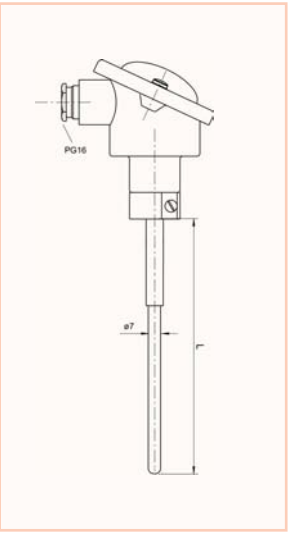
Variants (on request with cable and ALMEMO® connector)
Insertable sensor with terminal head

NiCr-Ni class 2* -40 to +400 °C	**Order no. FT0463**
Pt100 class B* -50 to +350 °C	**Order no. FP0463**
NTC* -20 to +100 °C	**Order no. FN0463**

Technical data

Measuring element	see under variants
Sensor tube	Stainless steel
Operative range	see under variants
Thread	1/2", with copper ring seal, pressure-sealed up to 15 bar
Insert length	70 mm (see layout drawing)
Terminal head	Clamp connector

Insertable sensor PtRh-Pt (S) with terminal head FT 0425



Operative range:
For immersion measurements, up to 1400 or 1600 °C

Variants (including 2-meter compensation line)

PtRh-Pt (S), Tmax = 1 400 °C, element Ø = 0.35 mm, ceramic 610	**Order no. FT04251**
PtRh-Pt (S), Tmax = 1 600 °C, element Ø = 0.5 mm, ceramic 710	**Order no. FT04252**

Accessories

Ceramic protective tube for FT04251
Order no. ZB9425SR1

Ceramic protective tube for FT04252

Order no. ZB9425SR2

Options
ALMEMO® connector with assembly
Order no. OT9020AS

Technical data

Measuring element	Thermowire PtRh-Pt (S) see under variants
Measuring tip	Ceramic tube see under variants
Operative range	see under variants
Insert length	500 mm
Protective tube	Ceramic, replaceable, 7 x 1 mm
Cable	2-meter compensation line silicone insulation, free ends