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 cable and free ends, Order no. Fx0xx.
  Connector options :
  With THERM circular connector : Option T9020RS,
  with miniature Thermo flat connector : Option OT9020FS.

Thermocouple sheathed sensors FTAxx and FTANxx

Accuracy:	FTAxx; NiCr-Ni thermocouple, type K, DIN class 1* FTANxx; NiCrSi-NiSi thermocouple, type N, DIN class 1*
Sensor tip, sheathed line :	diameter, length, operating temperature; see table; material Inconel 2.4816 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 :	1.5 meter FEP / 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 FEP / FEP, insulated.
ALMEMO® connector	FTAxx NiCr-Ni ZA9020FS with resolution 0.1 K FTANxx NiCrSi-NiSi ZA9021FSN with resolution 0.1 K

Pt100 sheathed sensors FPAxx

Accuracy :	Pt100 film resistor, DIN class B*
Options :	DIN class A, 1/5 DIN class B Pt100 wire wound measuring resistor
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, FEP / 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 FEP / FEP, 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)

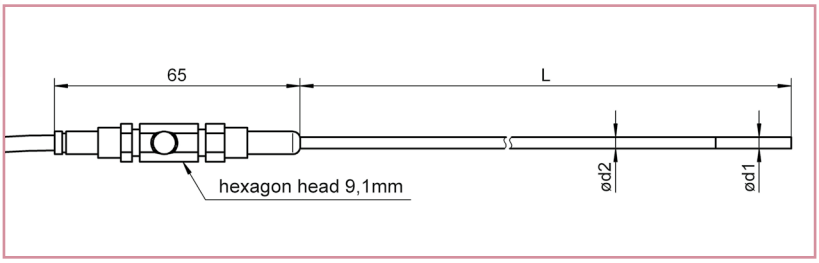
NTC sheathed sensors FNAxx

Accuracy :	NTC type N (see page 148)
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, FEP / silicone, insulated, operating temperature –50 to +200 °C The line is also available, on request, with FEP / FEP, insulated.
ALMEMO® connector	NTC, ZA9040FS, with resolution 0.01 K.

* Range of validity see page 147
** No temperature influence at the transition from the measuring element to the cable (see page 147)

DAkkS or factory calibration KT90xx temperature for sensor or measuring chain (sensor + device), see chapter „Calibration certificates“.
DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.

Sheathed sensors



Sensor with:
Sensor tip, dimensions d1,
sheathed line, dimensions d2,
overall length (including sensor tip) L,
Cable sleeve, dimensions length = 65 mm,
circumdiameter = 9 mm, Cable

Thermocouple sheathed sensors NiCr-Ni, type K

Typical Application: universal, in range -40 °C to 900 °C

Diameter d1=d2	Operating temperature Sensor tip	Length L	Order no
0.5 mm	-200...900°C	50 mm	FTA05L0050
0.5 mm	-200...900°C	100 mm	FTA05L0100
0.5 mm	-200...900°C	250 mm	FTA05L0250
0.5 mm	-200...900°C	500 mm	FTA05L0500
0.5 mm	-200...900°C	1000 mm	FTA05L1000
1.5 mm	-200...1100°C	100 mm	FTA15L0100
1.5 mm	-200...1100°C	250 mm	FTA15L0250
1.5 mm	-200...1100°C	500 mm	FTA15L0500
1.5 mm	-200...1100°C	1000 mm	FTA15L1000
3.0 mm	-200...1100°C	100 mm	FTA30L0100
3.0 mm	-200...1100°C	250 mm	FTA30L0250
3.0 mm	-200...1100°C	500 mm	FTA30L0500
3.0 mm	-200...1100°C	1000 mm	FTA30L1000

Connection cable	Operative range	Length	Order no
FEP/silicone Thermal line (stranded wire)	-50...200°C	1.5 m	default
		5 m	OTK01L0050
PVC/PVC Compensation line	-20...105°C	1.5 m	OTK02L0015
		5 m	OTK02L0050

Thermocouple sheathed sensors NiCrSi-NiSi, type N

Typical application: in the range -200 ° C to 1150 ° C, long-term stability at high temperatures

Diameter d1=d2	Operating temperature Sensor tip	Length L	Order no
1.5 mm	-200...1150°C	500 mm	FTAN15L0500
1.5 mm	-200...1150°C	750 mm	FTAN15L0750
1.5 mm	-200...1150°C	1000 mm	FTAN15L1000
3.0 mm	-200...1150°C	500 mm	FTAN30L0500
3.0 mm	-200...1150°C	750 mm	FTAN30L0750
3.0 mm	-200...1150°C	1000 mm	FTAN30L1000
6.0 mm	-200...1150°C	500 mm	FTAN60L0500
6.0 mm	-200...1150°C	750 mm	FTAN60L0750
6.0 mm	-200...1150°C	1000 mm	FTAN60L1000

Connection cable	Operative range	Length	Order no
FEP/silicone Thermal line (stranded wire)	-50...200°C	1.5 m	default
		5 m	OTNK01L0050

DAkkS or factory calibration KT90xx temperature for sensor or measuring chain (sensor + device), see chapter „Calibration certificates“.
DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.

Resistor-based sensors Pt100 4L

Typical Application: universal, in range -40°C to 400°C

Diameter d1 Sensor tip	Diameter d2, Sheathed line	Operating temp. Sensor tip	Length L	Order no.
1.5 mm	1.5 mm**	-40...400°C	100 mm	FPA15L0100
1.5 mm	1.5 mm**	-40...400°C	250 mm	FPA15L0250
1.5 mm	1.5 mm**	-40...400°C	500 mm	FPA15L0500
2.2 mm*	2.0 mm	-40...400°C	100 mm	FPA22L0100
2.2 mm*	2.0 mm	-40...400°C	250 mm	FPA22L0250
2.2 mm*	2.0 mm	-40...400°C	500 mm	FPA22L0500
3.2 mm*	2.8 mm	-40...400°C	100 mm	FPA32L0100
3.2 mm*	2.8 mm	-40...400°C	250 mm	FPA32L0250
3.2 mm*	2.8 mm	-40...400°C	500 mm	FPA32L0500

* This sensor type (reinforced tip) is not suitable for clamped screw connections.
Suitable types FPA20Lx or FPA30Lx with same end-to-end diameter are available on request.
** Too strong bending of / kinking of the sheathed line should be avoided.

Options	Order no.
Accuracy class B	default
Accuracy class A	OPG2
Accuracy class 1/5 DIN Class B*	OPG5
Wire-wound measuring resistor	
operating range -100 ... 450 ° C	OPM1
* at 0 °C	

Connection cable	Operative range	Length	Order no.
FEP/silicone	-50...200°C	1.5 m	default
		5 m	OPK01L0050
PVC/PVC	-20...105°C	1.5 m	OPK02L0015
		5 m	OPK02L0050

Resistor-based sensors NTC

Typical Application: universal, in range 0°C to typ. 70°C

Diameter d1 Sensor tip	Diameter d2, Sheathed line	Operating temp. Sensor tip	Length L	Order no.
2.0 mm	2.0 mm	-20...100°C	100 mm	FNA20L0100
2.0 mm	2.0 mm	-20...100°C	250 mm	FNA20L0250
2.0 mm	2.0 mm	-20...100°C	500 mm	FNA20L0500
3.2 mm*	2.8 mm	-20...100°C	100 mm	FNA32L0100
3.2 mm*	2.8 mm	-20...100°C	250 mm	FNA32L0250
3.2 mm*	2.8 mm	-20...100°C	500 mm	FNA32L0500

* This sensor type (reinforced tip) is not suitable for clamped screw connections.
Suitable types with same end-to-end diameter are available on request.

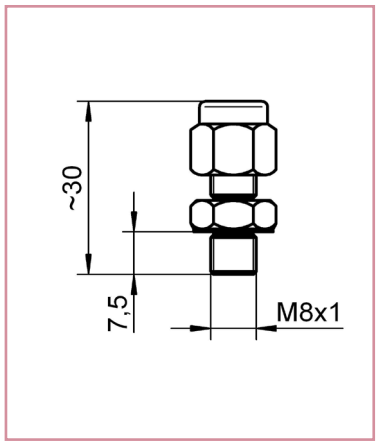
Connection cable	Operative range	Length	Order no.
PVC/PVC	-20...105°C	1.5 m	default
		5 m	OPK02L0050

DAkkS or factory calibration KT90xx temperature for sensor or measuring chain (sensor + device), see chapter „Calibration certificates“.
DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.

Handle for sensors with hexagonal cable sleeve

Option Handle including fitting **Order no. OFH1**

Clamp srew connection ZT943xKV



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. OT9432ST

Variants (with PTFE clamping ring)	**Order no.**
for types FTA15Lxxxx, FPA16Lxxxx	**ZT9431KV**
for types FTA30Lxxxx, FPA30Lxxxx and FNA30Lxxxx	**ZT9432KV**

Technical data

Operating temperature	up to maximum 250 °C with option up to 800 °C
Thread	M8x1, 13 AF

Heat-conducting paste ZB9000WP

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

DAkkS or factory calibration KT90xx temperature for sensor or measuring chain (sensor + device), see chapter „Calibration certificates“.
DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.

NiCr-Ni-sensor FTA 15 P1

For immersion measurement

Accuracy:	NiCr-Ni class 1*
Measuring tip:	Operative range -200...+1100 °C 200x1.5 mm, sheathed line, Inconel
T_{90}: *	1.5 s
Cable:	1.5 m FEP/silicone thermal line** with ALMEMO® connector

L = 200 mm **Order no. FTA15P1**
(No variants available)
Option: Handle mounted **Order no. OFH1**

Pt100-sensor FPA 32 P1

For immersion measurement

Accuracy:	Pt100 film resistor, class B*
Measuring tip:	Operative range -40...+400 °C 200 x 2.8 Measuring tip reinforced 3.2 mm, sheathed line stainless steel
T_{90}: *	10 s
Cable:	1.5 m PVC / PVC with ALMEMO® connector

L = 200 mm **Order no. FPA32P1**
(No variants available)
Option: Handle mounted **Order no. OFH1**

NTC-sensor FNA 305

For Indoor air measurements

Accuracy:	NTC, see page 148
Measuring tip	Operative range -10 to +60 °C (non-condensing) Protective tube in stainless steel Diameter = 3.0mm, length = 50 mm mounted directly on ALMEMO® connector
T_{90}	8 s

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

* Range of validity see page 147
** There is no adverse temperature effect at the juncture from measuring element to cable. see page 147

DAkkS or factory calibration KT90xx temperature for sensor or measuring chain (sensor + device), see chapter „Calibration certificates“.
DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.