TEMPERATURE PROBES

DESCRIPTION AND APPLICATION

The temperature probes are designed to be used for contact temperature measurements of solid, liquid or gaseous substances in various branches of industry, e. g. in the food-processing industry, chemical industry, cooling technique etc.

By their structure, these temperature probes can be classified as follows:

1. Contact probes – S x031/150, S x033/250
2. Room probes – 200-80/x, 100-60/x, S x042/150
3. Stick-in probes – S x051/150, S x061/200, Sx061/250, S x301/220, S x091/200, S x091/260
4. Special probes – S x071, S x081

In the standard version these probes are fitted with the sensing elements given in the table of the common specifications. The temperature probes use the two-wire connection. All probes using the Ni 1000/6180 resistance-type sensing element (accuracy class A) can be used in combination with the SENSITEST 204C or SENSITEST 2004C digital thermometers.
The probes are meant for operation in a chemically non-aggressive environment. They cannot be used for temperature measurements on equipment under electric voltage (alive).

DECLARATION, CERTIFICATES, CALIBRATION

Declaration of Conformity – in accordance with EN ISO/IEC 17050-1 standard as amended for sensors with resistance output.
Calibration – we perform standard calibration of resistance temperature sensors in accordance with EN ISO/IEC 17025 standard in the temperature range of the stated type of sensor.

SPECIFICATIONS

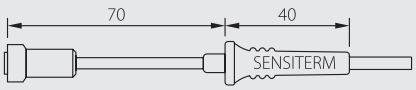
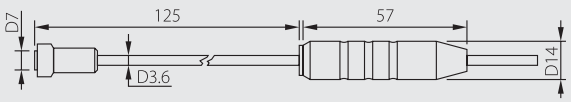
COMMON SPECIFICATIONS

Type of sensing element	Ni 1000/5000, Ni 1000/6180, Ni 891, Pt 100, Pt 500, Pt 1000, NTC 20 kΩ (specified for individual probes)
Accuracy class	Ni sensing elements: B class, $\Delta t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $\Delta t = \pm (0.4 + 0.028\|t\|)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to IEC 751, $\Delta t = \pm (0.3 + 0.005\|t\|)$ in °C NTC 20 kΩ: ± 1 °C for the range 0 to 70 °C
Maximum measuring DC current	Pt 100 – 3 mA; Pt 500 – 1.5 mA; Pt 1000, Ni 1000, Ni 891 – 1 mA; T1 = Ni 2226 – 0.7 mA; Ni 10000 – 0.3 mA; NTC 20 kΩ– kW - maximum power dissipation 1 mW
Connection of probes	2-wire
Cable lengths	1, 2, 5, 10 m

Contact probes S x031, S x033

These temperature probes are intended to measure the contact temperature of solid substances having a plane and smooth surface. The probes consist of a metal case terminated by a special bowl to contact the surface to be measured, further of a grip with the lead-in cable of a standard length of 1 m. The resistance-type sensing element is located in brass bowl, which is firmly inserted in a special rubber case, reducing the influence of the ambient on the measurement results. The design of the individual probes is illustrated in the following drawings.

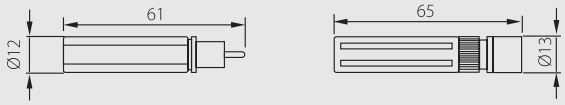
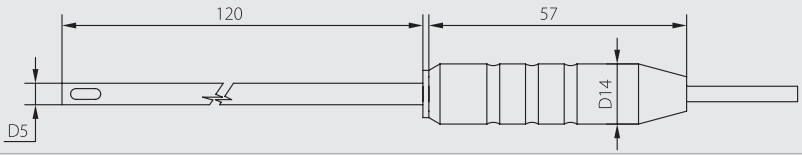
Type of sensing element	Ni 1000/5000, Ni 1000/6180, Pt 100, Pt 1000
Material of the contact brass	Aluminium alloy
Material of the pipe	S x031, S x033 stainless steel 1.4301
Material of the grip	S x031 polypropylene S x033 teflon
Lead-in cable	S x031 shielded, silicone insulation 2 x 0.07 mm² S x033 shielded, silicone insulation 2 x 0.22 mm²

Probe	Dimensional draft of contact probes	Temperature range of usage/ Temperature resistance of the grip
S x031/150		-30 to 150 °C / -15 to 120 °C
S x033/250		-30 to 250 °C / -30 to 250 °C

Room probes 200-80/x, 100-60/x, S x042/150

These temperature probes are intended for contact temperature measurement of gaseous substances. The S x042 probe is characterised by a metal case provided with openings, by a grip and a lead-in cable of a standard length of 1 m. Regarding to the materials used for its fabrication, the S x042 probe can be utilised to measure temperature in the **food- processing industry**.
The resistance-type sensing element is placed in the probe portion provided with openings, whereby a direct contact to the gaseous substance to be measured, and a fast response to temperature changes are secured. The design of the individual probes is illustrated in the following drawings.

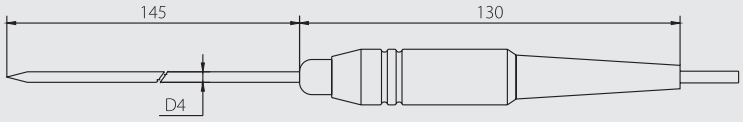
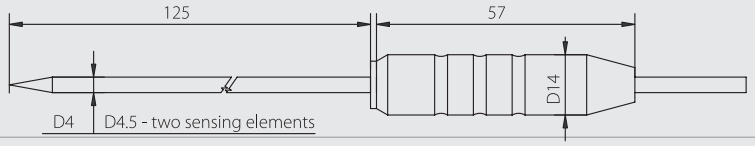
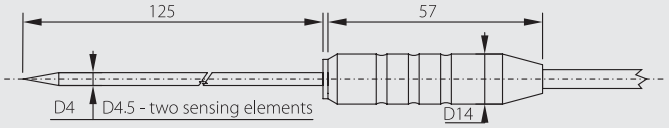
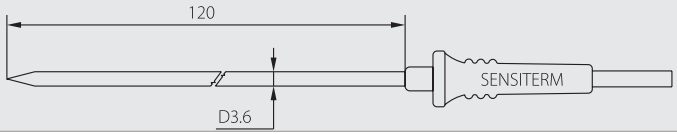
Type of sensing element	Ni 1000/5000, Ni 1000/6180, Pt 100, Pt 1000
Material of the cavity	Nickel plated copper
Material of the metal case	S x042 stainless steel 1.4301
Material of the grip	S x042 teflon
Type of connector	200-80/E ELKA K1321 200-80/C CINCH
Lead-in cable	shielded silicone 2 x 0.22 mm^2

Probe	Dimensional draft of room probes	Temperature operating range
200-80/x 100-60/x		-30 to 80 °C
S x042/150		-30 to 150 °C

Stick-in probes for temperature measurement in the food-processing industry S x051, S x061/200, S x061/250, S x091/200, S x091/260 and universal S x301/220

These temperature probes are intended to measure the contact temperature of solid substances. They can be used also for temperature measurement of liquid and gaseous substances. These probes consist of a metal case terminated by a tip, further of a grip with the lead-in cable of a standard length of 1 m. Regarding to the materials used for its fabrication, the S x051, S x061 and the S x091 probes can be utilised to measure temperature in the **food-processing industry.**
The resistance-type sensing element is placed in the tip of the metal case. The design of the individual probes is illustrated in the following drawings.

Type of sensing element	All types of resistance sensing elements
Ingress protection	S x061, S x051, S x091 - IP 68 h 1 m, S x301 - IP 65
Material of the metal case	stainless steel 1.4301
Material of the grip	S x051 silicone S x061 teflon S x301 polypropylene S x091/260 PEEK
Lead-in cable	S x061/250, S x091/260 – shielded teflon 2 x 0.14 mm^2 others – shielded silicone 2 x 0.22 mm^2

Probe	Dimensional draft of stick-in probes	Temperature operating range
S x051/150		-30 to 150 °C
S x061/200		-30 to 200 °C
S x061/250		-30 to 250 °C (for a short period to 300°C)
S x301/220		-30 to 220 °C Temperature resistance of the grip -15 to 120 °C

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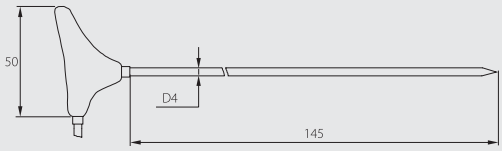
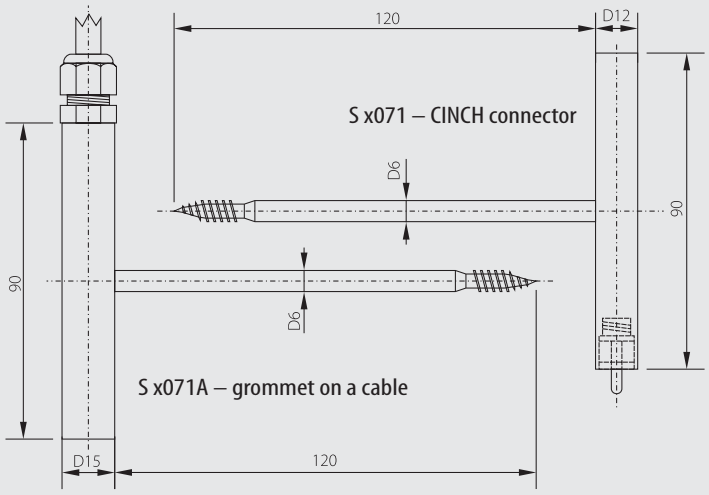
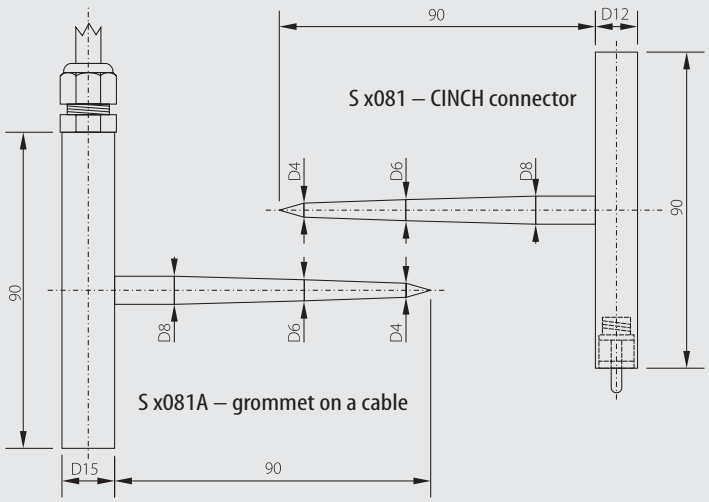
Probe	Dimensional draft of stick-in probes	Temperature operating range
S x091/200		-30 to 200 °C
S x091/260		-30 to 260 °C (for a short period to 300°C)

Special temperature probes: S x071, S x081

The temperature probe **S x071** is intended to measure temperature of solids. Regarding to the special probe tip and the used stainless steel material the probe can be used in the food- processing industry to measure temperatures of deep frozen foodstuffs down to -30 °C. The temperature probe **S x081** is intended to measure temperature of solids. Regarding to the special probe design and the used stainless steel material the probe can be used in the food- processing industry to measure temperature in blast chillers or in deep freezing equipment. The operating temperature range is -20 to 80 °C.

Type of sensing element	S x071, S x081 S x071A, S x081A	all types all types
Ingress protection	IP 67	
Material of the metal case	stainless steel 1.4301	
Material of the grip	S x071, S x081	stainless steel 1.4301
Lead-in cable	S x071A, S x081A	shielded silicone 2 x 0.22 mm^2
Type of connedtion	S x071, S x081 S x071A, S x081A	CINCH grommet for cable

Probe	Dimensional draft of room probes	Temperature range of usage
S x071 S x071A		-30 to 50 °C
S x081 S x081A		-20 to 80 °C

DEFINING THE SENSING ELEMENT TYPE IN THE PROBE DESIGNATION

x (in the probe designation)	1	P	2	3	6	7	0	9	TCK
Sensing element type	Pt 100	Pt 500	Pt 1000	2 x Pt 100	NTC 20 kΩ	Ni 1000/5000	Ni 1000/6180	Ni 891	TCK J