TEMPERATURE SENSORS

CAPTEUR DE TEMPERATURE THERMOCOUPLE

Measure,
Control and Log Data

Contents

2 THERMOELECTRIC TEMPERATURE SENSORS

Head thermocouples

Type: **SCT100**
Type: **SCT101**
Type: **SCT102**
Type: **SCT103**
Type: **SCT104**
Type: **SCT105**
Type: **SCT106**
Type: **SCT107**
Type: **SCT108**
Type: **SCT109**

Cable thermocouples

Type: **SCT200**
Type: **SCT201**
Type: **SCT202**
Type: **SCT203**
Type: **SCT204**
Type: **SCT205**
Type: **SCT206**
Type: **SCT207**
Type: **SCT208**
Type: **SCT209**
Type: **SCT210**
Type: **SCT211**
Type: **SCT212**

Mineral insulated thermocouples

Type: **SCT300**

Ceramic thermocouples

Type: **SCT600**
Type: **SCT601**
Type: **SCT602**

3 TEMPERATURE SENSORS ACCESSORIES

Compensation cables
Plugs and sockets
Fittings and brackets
Protection tubes
Measuring inserts

4 ELECTRIC HEATERS

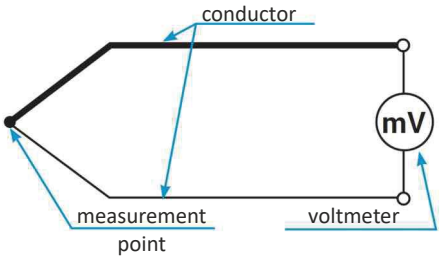
DIMELCO - 156/220 Rue des Famards - CTR2 - Zone Acticentre - Bâtiment H1 - CS 10210 - 59273 FRETIN - France
Tél : 03 20 62 06 80 - Fax : 03 20 96 95 62 - Email : contact@dimelco.com

2 THERMOELECTRIC TEMPERATURE SENSORS

Thermocouples are two conductors (thermocouple wires) made of different metals. Joined at one end, thermocouples constitute a part of the system that uses the thermoelectric effect for temperature measurement (the Seebeck effect).
The thermoelectric effect results in the creation of the thermo-electromotive force, due to the temperature difference between the two junctions: hot (joined thermocouple ends), which is under influence of the measured temperature, and cold (not joined, loose thermocouple ends), which is in the known (usually 0°C) temperature:

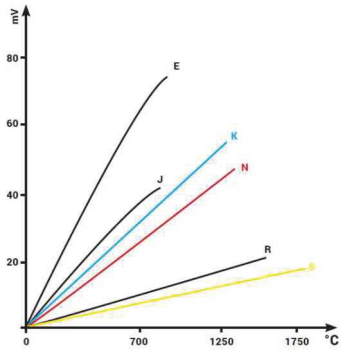
$$E_{12} = -\frac{1}{e} A_1 - A_2 + \frac{K_B T}{e} \ln \frac{n_1}{n_2}$$

A_1, A_2 : electron output operation of individual metals
E=1,602·10^{-19} C : electron charge
T : absolute temperature of metal contact
n_1, n_2 : number of free electrons



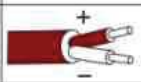
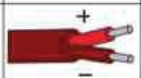
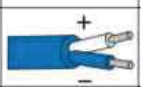
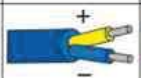
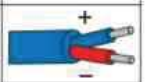
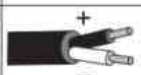
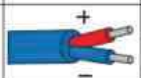
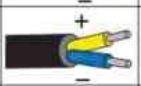
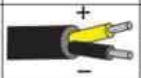
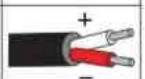
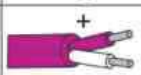
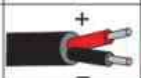
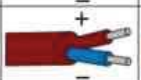
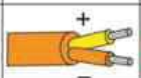
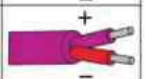
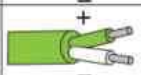
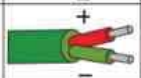
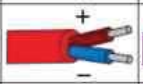
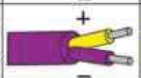
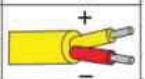
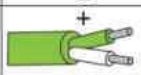
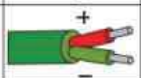
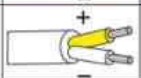
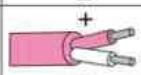
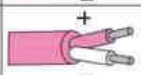
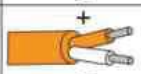
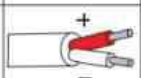
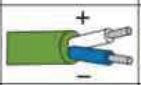
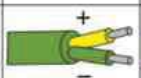
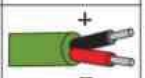
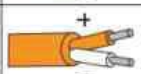
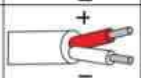
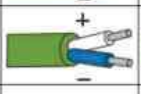
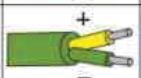
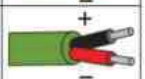
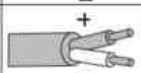
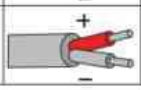
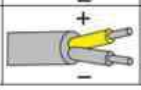
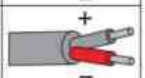
THERMOCOUPLES TYPES

From the multiplicity of possible wire pairings (over 300 combinations of material pairings for temperature measurement are known) some are used for industrial temperature measurement. The materials suitable for temperature measurement can be represented and arranged according to the thermoelectric voltage they generate. Below are the characteristics of the thermocouples and a table showing the ranges of each type.



Type	Element		C [µV/°C]⁸	Range [µV/°C]⁸
	+	-		
J	iron	constantan	52,7	-210 ÷ 1200
K	chrome-nickel	aluminum-nickel	41,0	-270 ÷ 1350
R, S	platinum-rod	platinum	6,5	0 ÷ 1750
T	copper	constantan	42,8	-210 ÷ 400
C	wolfram 5% ren	wolfram 26% ren	14,5	-210 ÷ 1200

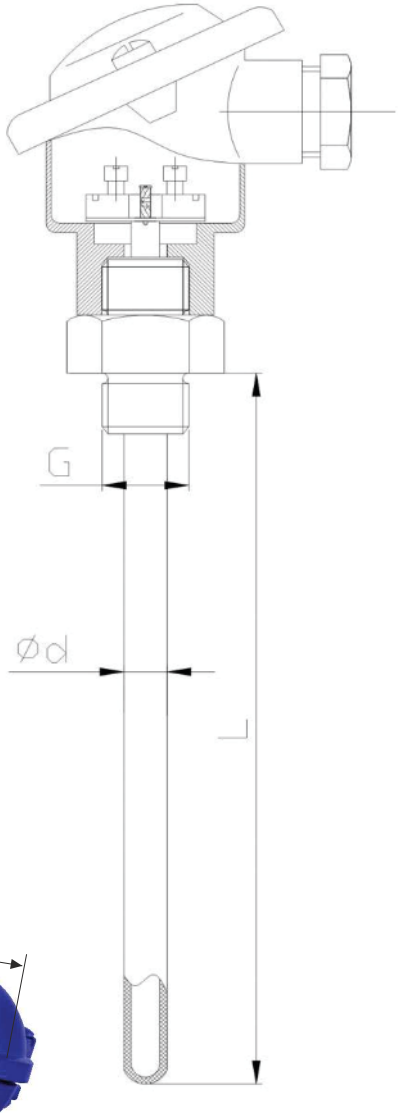
CONNECTION DIAGRAM FOR THERMOELECTRIC SENSORS

Type	compensation	thermoelectric	EU IEC 584-3	D DIN 43714	GB BS 1843	F NF C 42-324	USA ANSI/MC 96-1
T		TX					
J		JX					
E		EX					
K		KX					
	KCA						
N		NX					
	NC						
R	RCA/RCB						
S	SCA/SCB						
B	BC						

SCT100

- **temperature range -40 ÷ 1200°C depending on thermocouple**
- **operating temperature of connection heads max. 150°C**
- **stainless steel sheath**
- **optional: sensor with a replaceable measuring insert**
- **possibility of mounting a 4...20 mA or 0...10 V temperature transmitter**
- **connection head DANW with local display**

The thermocouple **SCT100** consists of an optional exchangeable measuring insert, outer protective tube (thermowell), and aluminum connection. Mounting a temperature transmitter with 4...20 mA or 0...10V output signal is possible. The measuring insert represents the replaceable element of the complete sensor, which reduces the time and costs of maintenance of the measuring apparatus installed in the object.

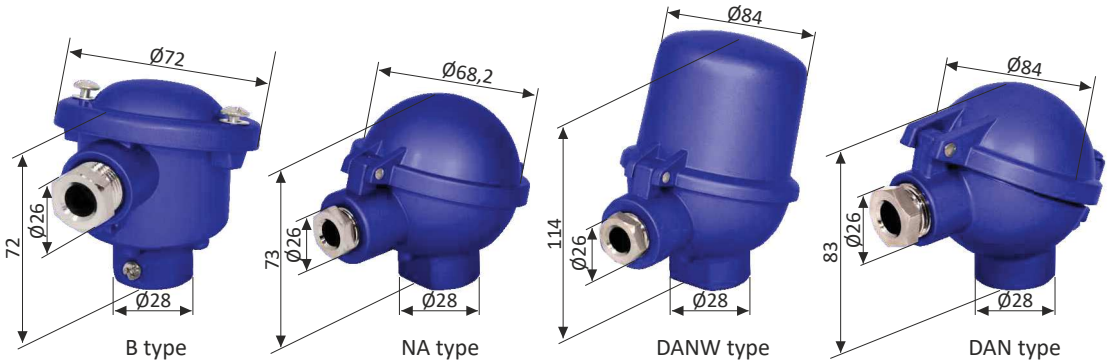


Application areas:
- machine construction, tanks or containers,
- fine chemical industry,
- light energy industry,
- general industrial services.

TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	B, NA or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 100 mm, 160 mm or other diameter: 4 ÷ 15 mm
Process connection	G1/2", M20x1,5 or other

CONNECTION HEAD TYPES



THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) **K (NiCr-Ni)** **N (NiCrSi-NiSi)**	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

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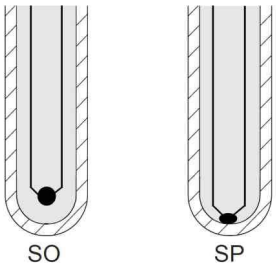
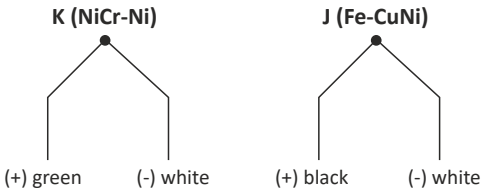
TYPES OF MEASURING HOT JUNCTION



SO
junction isolated from the sheath

SP
grounded junction

ELECTRICAL CONNECTION



ORDERING

SCT100-X-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

connection head:
B
NA
other, please specify

sheath length (L):
100 mm
160 mm
other, please specify [mm]

measuring insert:
BW : non-replaceable
W : replaceable

sensor measuring range or temperature transmitter settings:
please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

process connection:
G1/2"
M20x1,5
other, please specify

sheath diameter (Ød):
4 mm
6 mm
9 mm
other, please specify

Ordering example:
SCT100-1-J-B-100-W-9-M20x1,5-SO-1-250°C
Single TC temperature sensor, J thermocouple, 1 tolerance class, measuring insert replaceable, B head type, process connection: M20x1,5, sheath diameter ø9 mm and length L=100 mm, hot junction isolated from the sheath, sensor measuring range 250°C.

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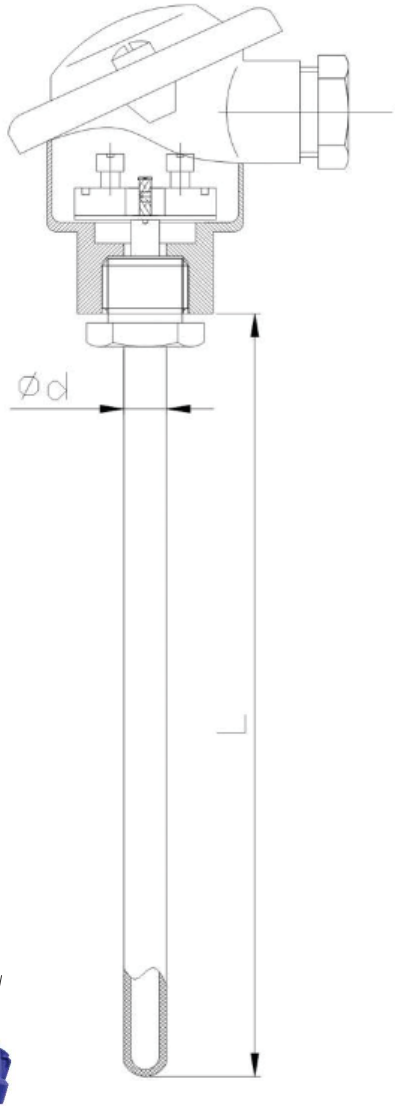
SCT101

- **temperature range -40 ÷ 1200°C depending on thermocouple**
- **operating temperature of connection heads max. 150°C**
- **stainless steel sheath**
- **optional: sensor with a replaceable measuring insert**
- **possibility of mounting a 4...20 mA or 0...10 V temperature transmitter**
- **connection head DANW with local display**

The thermocouple **SCT101** consists of an optional exchangeable measuring insert, outer protective tube (thermowell) and aluminum connection head. Mounting a temperature transmitter with 4...20 mA or 0...10V output signal is possible. The measuring insert represents the replaceable element of the complete sensor, which reduces the time and costs of maintenance of the measuring apparatus installed in the object. Compression fittings allow simple adaptation to the required insertion length at the installation point.

Application areas:

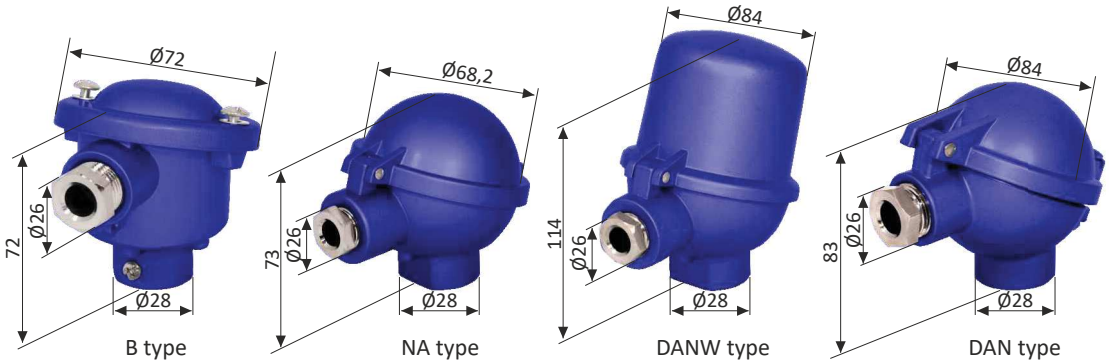
- machine construction, tanks or containers,
- fine chemical industry,
- light energy industry,
- food industry,
- general industrial services.



TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	B, NA or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 100 mm, 160 mm or other diameter: 4 ÷ 15 mm

CONNECTION HEAD TYPES



THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) **K (NiCr-Ni)** **N (NiCrSi-NiSi)**	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

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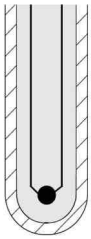
OPTIONAL ACCESORIES

S type flange
(stainless steel)

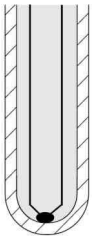
T type flange
(PTFE)

Threaded holder (fitting)
with a compression ferrule
(brass or stainless steel)

TYPES OF MEASURING HOT JUNCTION

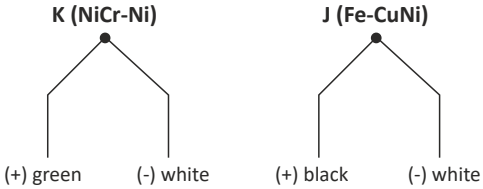


SO
junction isolated
from the sheath



SP
grounded
junction

ELECTRICAL CONNECTION



ORDERING

SCT101-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

connection head:
B
NA
other, please specify

sheath length (L):
100 mm
160 mm
other, please specify [mm]

sensor measuring range or temperature transmitter settings:
please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

sheath diameter (Ød):
4 mm
6 mm
9 mm
other, please specify

measuring insert:
BW : non-replaceable
W : replaceable

Ordering example:
SCT101-1-K-B-100-BW-6-SO-2-150°C
Single TC temperature sensor, K thermocouple, 2 tolerance class, non-replaceable measuring insert, B head type, sheath diameter ø9 mm and length L=100 mm, hot junction isolated from the sheath, sensor measuring range 250°C.

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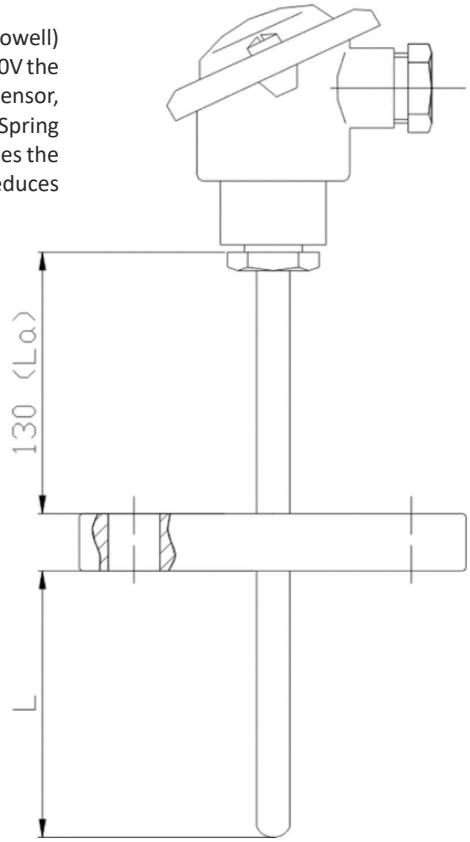
SCT102

- temperature range -40 ÷ 1200°C depending on thermocouple
- operating temperature of connection heads max. 150°C
- stainless steel sheath
- mounting flange
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter
- connection head DANW with local display

The thermocouple **SCT102** consists of an exchangeable measuring insert, outer protective tube (thermowell) with neck and aluminum connection head. Mounting a temperature transmitter with 4...20 mA or 0...10V the output signal is possible. The measuring insert represents the replaceable element of the complete sensor, which reduces the time and costs of maintenance of the measuring apparatus installed in the object. Spring fixation of the measuring insert provides perfect pressure to the bottom of the protecting tube, reduces the time of reaction to changes of temperature and increases the accuracy of measurement as well as reduces natural vibration thus mechanical, and electrical defects can be avoided.

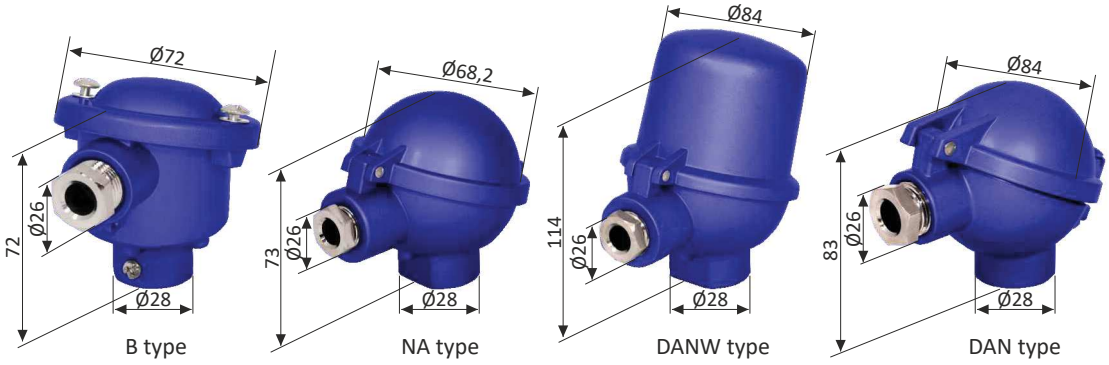


Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.

TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	B, NA or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 130 mm (standard) diameter: 4 ÷ 15 mm

CONNECTION HEAD TYPES



THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) K (NiCr-Ni) N (NiCrSi-NiSi)	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

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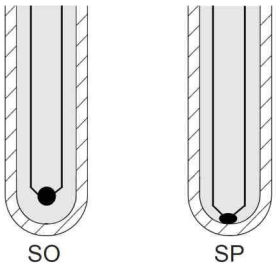
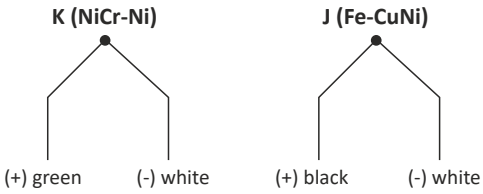
TYPES OF MEASURING HOT JUNCTION



SO
junction isolated from the sheath

SP
grounded junction

ELECTRICAL CONNECTION



ORDERING

SCT102-X-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

connection head:
B
NA
other, please specify

sheath length (L):
100 mm
160 mm
other, please specify [mm]

length La [mm]:
S : 130 mm (standard)
other, please specify

sensor measuring range or temperature transmitter settings:
please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

flange:
DN20 (PN100)
DN25 (PN100)
other, please specify

sheath diameter (Ød):
6 mm
9 mm
12 mm
other, please specify

Ordering example:
SCT102-1-K-NA-100-S-9-DN20(PN100)-SU-2-150°C
Single TC temperature sensor, K thermocouple, 2 tolerance class, with NA head type and DN20 mounting flange according to PN100, sheath diameter ø9 mm and length L=100 mm, hot junction grounded, sensor measuring range 150°C.

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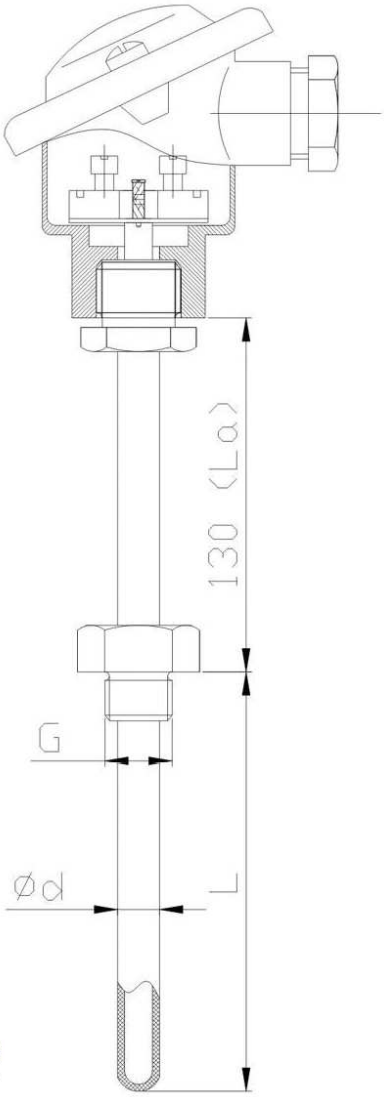
SCT103

- temperature range -40 ÷ 1200°C depending on thermocouple
- operating temperature of connection heads max. 150°C
- stainless steel sheath
- threaded process connection
- optional: sensor with a replaceable measuring insert
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter
- connection head DANW with local display

The thermocouple **SCT103** consists of an exchangeable measuring insert, outer protective tube (thermowell) with neck and aluminum connection head. Mounting a temperature transmitter with 4...20 mA or 0...10V the output signal is possible. The measuring insert represents the replaceable element of the complete sensor, which reduces the time and costs of maintenance of the measuring apparatus installed in the object. Spring fixation of the measuring insert provides perfect pressure to the bottom of the protecting tube, reduces the time of reaction to changes of temperature and increases the accuracy of measurement as well as reduces natural vibration thus mechanical, and electrical defects can be avoided.

Application areas:

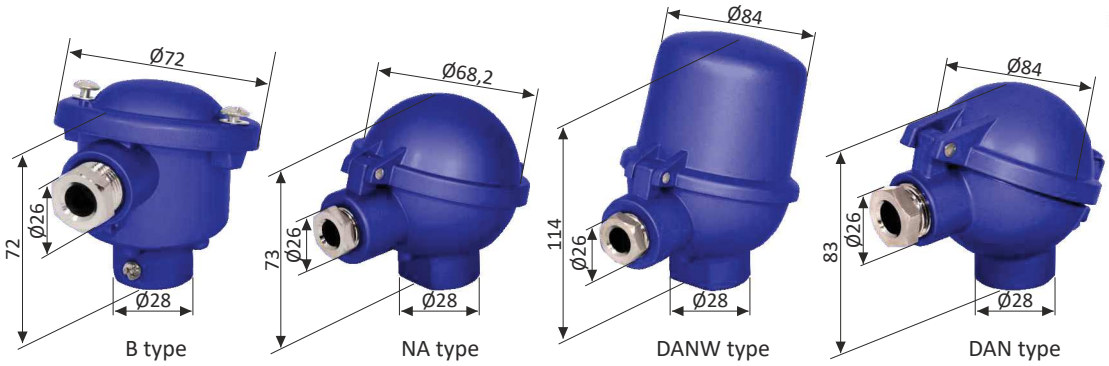
- fine chemical industry,
- light energy industry,
- general industrial services.



TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	B, NA or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 130 mm (standard) diameter: 4 ÷ 15 mm
Process connection	G1/2", M20x1,5 or other

CONNECTION HEAD TYPES



THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) **K (NiCr-Ni)** **N (NiCrSi-NiSi)**	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

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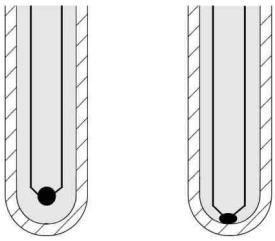
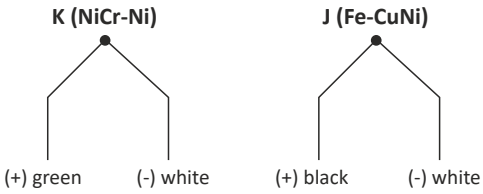
TYPES OF MEASURING HOT JUNCTION



SO
junction isolated from the sheath

SP
grounded junction

ELECTRICAL CONNECTION



ORDERING

SCT103-X-X-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

connection head:
B
NA
other, please specify

sheath length (L):
100 mm
160 mm
other, please specify [mm]

length La [mm]:
S : 130 mm (standard)
other, please specify

sensor measuring range or temperature transmitter settings:
please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

process connection:
G1/2"
M20x1,5
other, please specify

sheath diameter (Ød):
4 mm
6 mm
9 mm
other, please specify

measuring insert:
BW : non-replaceable
W : replaceable

Ordering example:
SCT103-1-K-B-100-S-W-9-G1/2"-SO-2-250°C
Single TC temperature sensor, K thermocouple, 2 tolerance class, measuring insert replaceable, B head type, process connection: G1/2", sheath diameter ø9 mm and length L=100 mm, hot junction isolated from the sheath, sensor measuring range 250°C.

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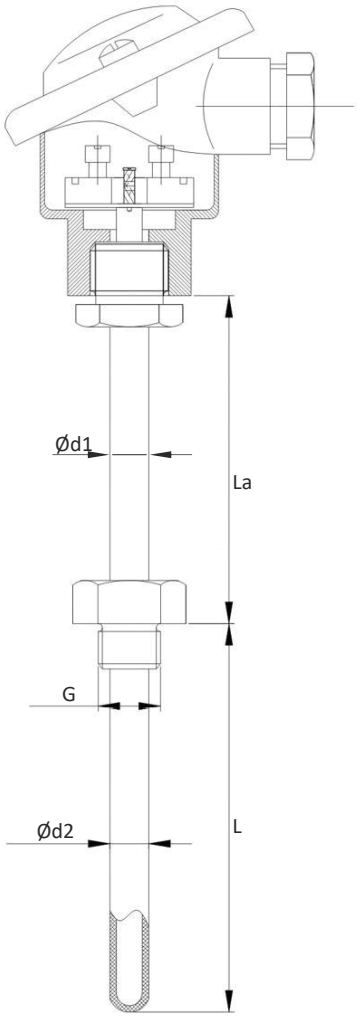
SCT104

- temperature range -40 ÷ 1200°C depending on thermocouple
- operating temperature of connection heads max. 150°C
- stainless steel sheath
- threaded process connection
- optional: sensor with a replaceable measuring insert
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter
- connection head DANW with local display

The thermocouple **SCT104** consists of an exchangeable measuring insert, outer protective tube (thermowell) with neck and aluminum connection head. Mounting a temperature transmitter with 4...20 mA or 0...10V the output signal is possible. The measuring insert represents the replaceable element of the complete sensor, which reduces the time and costs of maintenance of the measuring apparatus installed in the object. Spring fixation of the measuring insert provides perfect pressure to the bottom of the protecting tube, reduces the time of reaction to changes of temperature and increases the accuracy of measurement as well as reduces natural vibration thus mechanical, and electrical defects can be avoided.

Application areas:

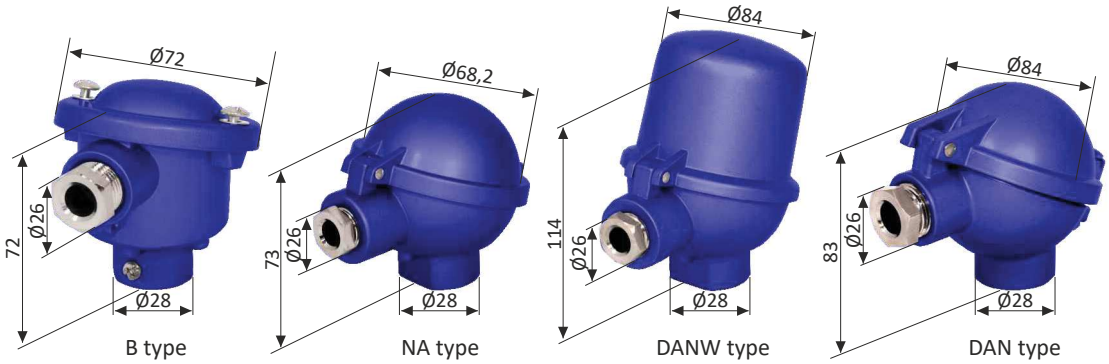
- fine chemical industry,
- light energy industry,
- general industrial services.



TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	B, NA or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 130 mm (standard) diameter: 4 ÷ 22 mm
Process connection	G1/2", M20x1,5, 1/2 NPT or other

CONNECTION HEAD TYPES



THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) K (NiCr-Ni) N (NiCrSi-NiSi)	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

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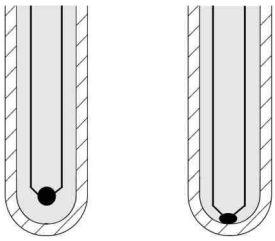
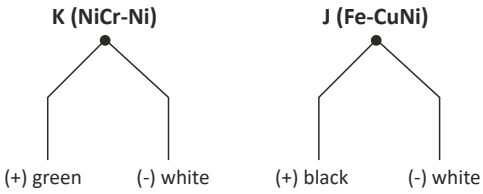
TYPES OF MEASURING HOT JUNCTION



SO
junction isolated from the sheath

SP
grounded junction

ELECTRICAL CONNECTION



ORDERING

SCT104-X-X-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

connection head:
B
NA
other, please specify

sheath length (L):
100 mm
160 mm
other, please specify [mm]

length La [mm]:
S : 130 mm (standard)
other, please specify

sensor measuring range or temperature transmitter settings:
please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

process connection:
G1/2"
M20x1,5
other, please specify

sheath diameter Ød2/Ød1:
4/6 : Ø 4/6 mm
6/8 : Ø 6/8 mm
7/9 : Ø 7/9 mm
other, please specify

measuring insert:
BW : non-replaceable
W : replaceable

Ordering example:
SCT104-1-J-MA-1-100-S-W-6/8-G1/2-SO-2-250°C
Single TC temperature sensor, J thermocouple, 2 tolerance class, measuring insert replaceable, MA head type, process connection: G1/2", sheath diameter ø9 mm and length L=100 mm, hot junction isolated from the sheath, sensor measuring range 250°C.

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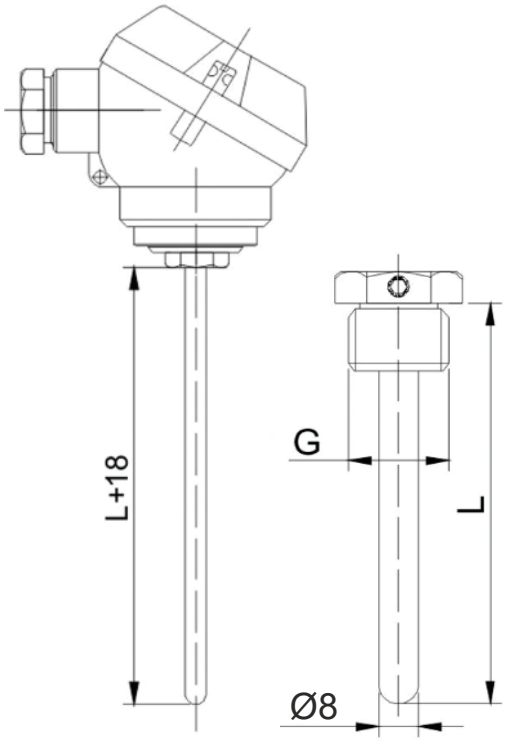
SCT105

- temperature range -40 ÷ 1200°C depending on thermocouple
- operating temperature of connection heads max. 100°C
- stainless steel sheath
- MA type connection head
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter
- outer thermowell with process connection

The thermocouple **SCT105** consists of a non-exchangeable measuring insert, outer protective tube with threaded process connection (thermowell), and aluminum connection head. Miniature connection head MA type reduces the size of complete sensor construction to make possible installation in confined areas.

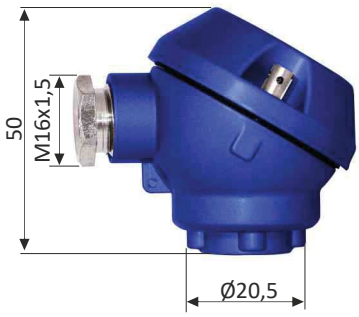
Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.



TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	MA type, aluminum, operating temperature -40 ÷ 100°C
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 100 mm (standard) diameter: 8 mm
Process connection	G1/2", M20x1,5 or other

CONNECTION HEAD



typ MA

THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) K (NiCr-Ni) N (NiCrSi-NiSi)	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

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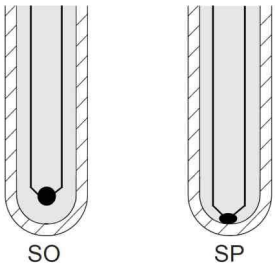
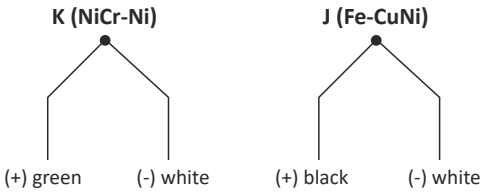
TYPES OF MEASURING HOT JUNCTION



SO
junction isolated from the sheath

SP
grounded junction

ELECTRICAL CONNECTION



ORDERING

SCT105-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

sheath length (L):
100 mm
other, please specify [mm]

sensor measuring range or temperature transmitter settings:
please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

process connection:
G1/2"
M20x1,5
other, please specify

Ordering example:
SCT105-1-K-100-G1/2"-SO-2-100°C
Single TC temperature sensor, K thermocouple, 2 tolerance class, process connection G1/2", sheath length L=100 mm, hot junction isolated from the sheath, sensor measuring range 100°C.

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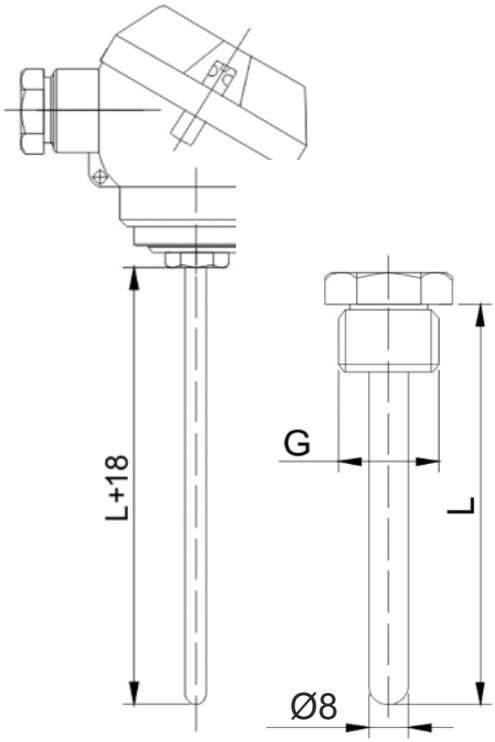
SCT106

- temperature range -40 ÷ 1200°C depending on thermocouple
- operating temperature of connection heads max. 100°C
- stainless steel sheath
- MA type connection head
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter
- outer thermowell with process connection

The thermocouple **SCT106** consists of a non-exchangeable measuring insert, outer protective tube with threaded process connection (thermowell), and aluminum connection head. Miniature connection head MA type reduces the size of complete sensor construction to make possible installation in confined areas.

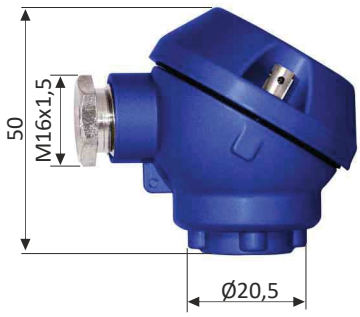
Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.



TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	MA type, aluminum, operating temperature -40 ÷ 100°C
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 100 mm (standard) diameter: 8 mm
Process connection	G1/2", M20x1,5 or other

CONNECTION HEAD



typ MA

THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) **K (NiCr-Ni)** **N (NiCrSi-NiSi)**	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

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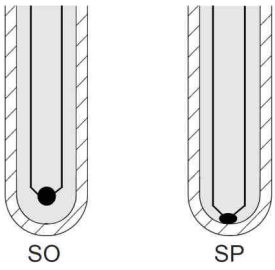
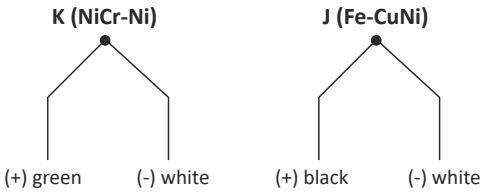
TYPES OF MEASURING HOT JUNCTION



SO
junction isolated from the sheath

SP
grounded junction

ELECTRICAL CONNECTION



ORDERING

SCT106-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

sheath length (L):
100 mm
other, please specify [mm]

sensor measuring range or temperature transmitter settings:
please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

process connection:
G1/2"
M20x1,5
other, please specify

Ordering example:
SCT106-1-K-100-G1/2"-SO-2-100°C
Single TC temperature sensor, K thermocouple, 2 tolerance class, process connection G1/2", sheath length L=100 mm, hot junction isolated from the sheath, sensor measuring range 100°C.

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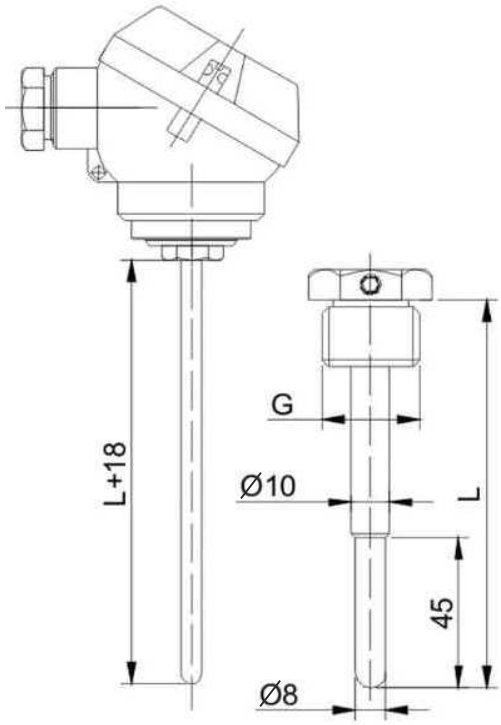
SCT107

- temperature range -40 ÷ 1200°C depending on thermocouple
- operating temperature of connection heads max. 100°C
- stainless steel sheath
- MA type connection head
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter
- outer thermowell with process connection

The thermocouple **SCT107** consists of a non-exchangeable measuring insert, outer protective tube with threaded process connection (thermowell), and aluminum connection head. Miniature connection head MA type reduces the size of complete sensor construction to make possible installation in confined areas.

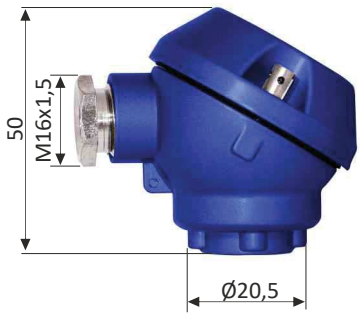
Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.



TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	MA type, aluminum, operating temperature -40 ÷ 100°C
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 100 mm (standard) diameter: 8 / 10 mm
Process connection	G1/2", M20x1,5 or other

CONNECTION HEAD



typ MA

THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) K (NiCr-Ni) N (NiCrSi-NiSi)	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

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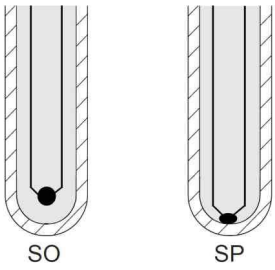
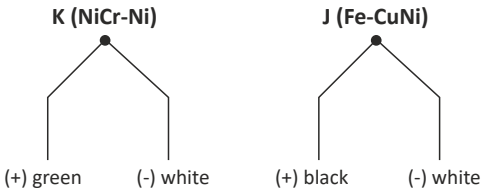
TYPES OF MEASURING HOT JUNCTION



SO
junction isolated from the sheath

SP
grounded junction

ELECTRICAL CONNECTION



ORDERING

SCT107-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

sheath length (L):
100 mm
other, please specify [mm]

process connection:
G1/2"
M20x1,5
other, please specify

junction type:
SO : junction isolated from the sheath
SU : junction grounded

accuracy class:
class **1**
class **2**

sensor measuring range or temperature transmitter settings:
please specify

Ordering example:
SCT107-1-K-100-G1/2"-SO-2-150°C
Single TC temperature sensor, K thermocouple, 2 tolerance class, process connection G1/2", sheath length L=100 mm, hot junction isolated from the sheath, sensor measuring range 150°C.

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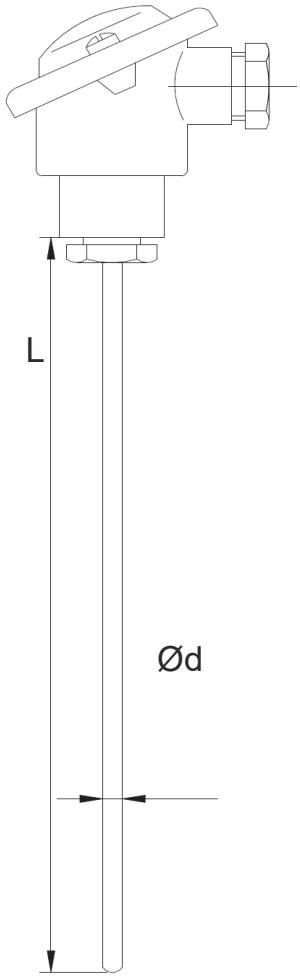
SCT108

- mineral insulated thermoelectric sensor
- temperature range -40 ÷ 1200°C depending on thermocouple
- connection head
- short response time for temperature change
- small dimensions for operation in hard-to-reach places
- resistance to vibrations and the possibility of bending
- thermowell made of nickel alloy (Inconel 600)

The mineral insulated thermocouple **SCT108** contains the flexible part of the probe. The probe consists of a stainless steel outer sheath, in which the inner conductors are insulated with compressed into a highly compacted ceramic mass. The outer sheath is made of stainless steel or Ni alloy. The inner conductors are welded together at the measuring end of the sheathed cable to form the 'thermocouple' junction. In designs, where the measuring element is not insulated, the sheath is also welded with the thermocouple junction. Connector cables are connected to the other end of the sheathed cable and hermetically sealed with a sealing compound. The connector wires are the basis of the electrical interface with cable, a connector, or a terminal block. Due to their flexibility and the small diameters in which they are available, sheathed thermocouples can be used in locations that are not easily accessible.

Application areas:

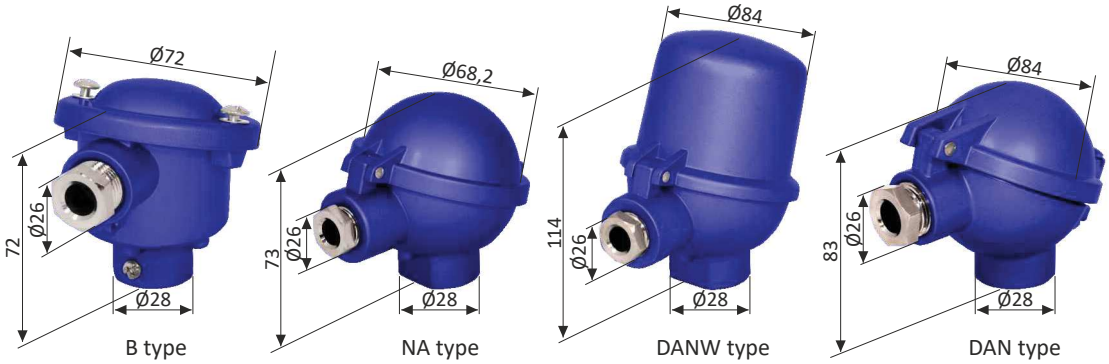
- general machinery and equipment design,
- measuring temperature of liquids, gases and solid bodies,
- all branches of industry,
- measurement laboratories.



TECHNICAL DATA

Sensing element	J, K or N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	B, NA, MA, DAN or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath	material: nickel alloy 2.4816 (Inconel 600) or other any nominal length (specified when ordering) diameter: 3 mm, 4,5 mm, 6 mm
Measuring junction	isolated, grounded or exposed

CONNECTION HEAD TYPES



THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) K (NiCr-Ni) N (NiCrSi-NiSi)	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

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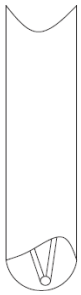
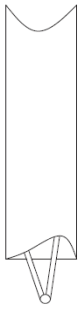
TYPES OF MEASURING HOT JUNCTION



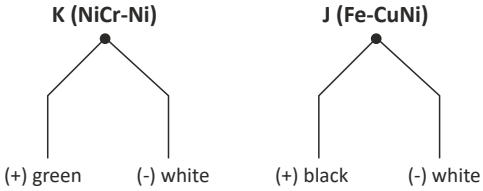
junction isolated from the sheath (SO)

grounded junction (SU)



exposed junction (SZ)

ELECTRICAL CONNECTION



ORDERING

SCT108-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

thermowell diameter (d):
3 : 3 mm
4,5 : 4,5 mm
6 : 6 mm

thermowell length (L):
please specify [mm]

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded
SSO : junction isolated from itself and from the sheath (for double sensor)
SZ : junction exposed

connection head:
MA
NA
DAN
B
other, please specify

Ordering example:
SCT108-1-K-3-500-B-SO-2
Mineral insulated single TC temperature sensor, K thermocouple, 2 tolerance class, sheath diameter 3.0 mm, length L=500 mm, connection head B type

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SCT109

- temperature range -40 ÷ 1200°C depending on thermocouple
- connection head
- operating temperature of connection heads max. 150°C
- acid-resistant steel sheath
- inner thermowell made of C610 (60% Al_2O_3), C799 (99,7% Al_2O_3)
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter

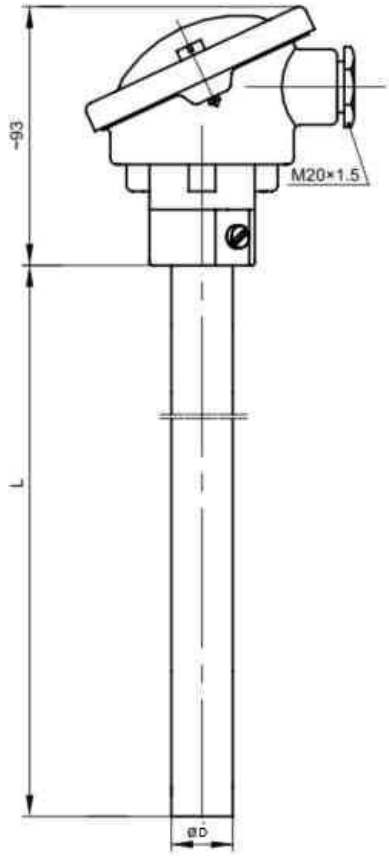
The thermocouple **SCT109** consists of a replaceable insert, an outer protective tube (thermowell) made of heat-resistant steel, additional protection tube made of ceramics and an aluminium connection head where a programmable temperature transmitter with a 4...20 mA output signal can be installed. Immersion length, compression fitting size (optional), material of the protective tube and connection head can be selected depending on the requirements of the application.

Application areas:

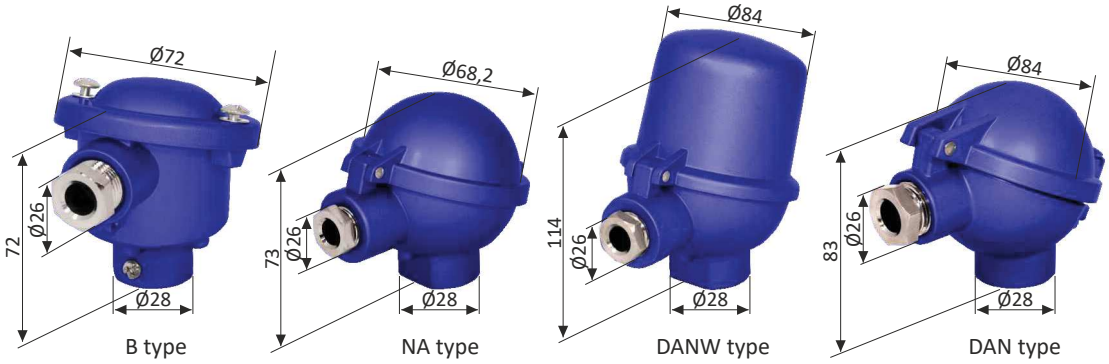
- general machinery and equipment design,
- measuring temperature of liquids, gases and solid bodies,
- all branches of industry.

TECHNICAL DATA

Sensing element	J, K, N, R, S or B thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple and material)
Connection head	B, NA or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath	material: heat-resistant steel H25N2OS2 (1.4841 / AISI314) or other any nominal length (specified when ordering) diameter: from 15 to 26 mm



CONNECTION HEAD TYPES



THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) **K (NiCr-Ni)** **N (NiCrSi-NiSi)**	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|
B (PtRh30-PtRh6)	-	-	600 ÷ 1700°C	± 0.0025°C x |t|
R (PtRh13-Pt) **S (PtRh10-Pt)**	0 ÷ 1100°C 1100 ÷ 1600°C	± 1.0°C ± [1+0.003(t-1100)]°C	0 ÷ 600°C 600 ÷ 1600°C	± 1.5°C ± 0.0025°C x |t|

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THERMOWELL MATERIAL - PROPERTIES

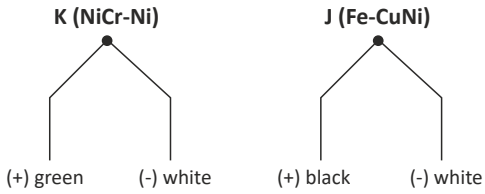
Material	Properties	Application
1.4404 AISI 316L	As a result of the addition of molybdenum, this material has higher corrosion resistance in non-oxidizing acids such as ethanolic acid, tartaric acid, phosphoric acid, sulphuric acid and others. Increased pitting resistance.	Sulphite, pulp, textile, dyeing, fatty acid, soap and pharmaceutical industries.
1.4841 AISI 314	Excellent resistance to corrosion, also at high temperatures. Also suitable in atmospheres containing carbon and sulphur. Resistant to oxidation in air up to 1000°C (interrupted service) or 1150°C (continuous service). Well suited with high thermal cycling. Recommended for long-term continuoususe in the temperature range from 425°C to 850°C.	Boilers and blast furnaces, cement and brick kilns, glass production, crude oil and petrochemical industries, furnace construction and power stations.
1.479 AISI 446	Extremely good resistance to reducing, sulphurous atmospheres. Very good resistance to oxidation and air. Good resistance to corrosion caused by incinerator slag and copper, lead and tin smelts.	Petrochemical industry, metallurgy, power technology, recuperators, heat treatment kilns, vortex firing installations, waste incinerators.
2.4816 Inconel 600	Good general resistance to corrosion, resistant to tension crack corrosion. Excellent resistance to oxidation. Not recommended with gases containing CO_2 and sulphur above 550°C and sodium above 750°C. In air, resistant up to 1100°C	PWR, nuclear power, furnace construction, plastics industry, heat treatment, paper and food processing industries, boilers, aircraft engines.
Kanthal AF	Good heat resistance, very good resistance in sulfur contact. Not recommended for work in nitrogen gases. In air resistant up to 1350°C.	Industrial furnaces, metallurgy industry, heat treatment

ACCESSORIES

Mounting bracket
SUZ11

Mounting bracket
SUZ21

ELECTRICAL CONNECTION



ORDERING

SCT109-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
K
N
S
other, please specify

connection head:
B
NA
other, please specify

thermocouple wire diameter:
2 : 2 mm
3 : 3 mm
other, please specify

ceramic inner isolatotion:
no isolator
C610
C799

thermowell material:
1.4404: acid-resistant steel
1.4841: heat-resistant steel
2.4816: nickel alloy INCONEL®600
Kanthal AF: FeCrAl alloy

thermowell diameter ØD:
please specify [mm]

thermowell length (L):
please specify [mm]

accuracy class:
class **1**
class **2**

sensor measuring range or temperature transmitter settings:
please specify

Ordering example:
SCT109-1-K-B-3-1.4404-20-300-2
Single TC temperature sensor, K thermocouple, B type connection head, 2 tolerance class. Thermocouple with a wire diameter of 3 mm, without inner isolation, steel 1.4404 sheath, diameter 20 mm, length L=300 mm.

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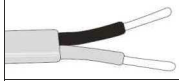
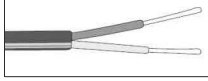
SCT200

- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **stainless steel sheath**
- **minimum sheath length: 15 mm**
- **any maximum sheath length**
- **thermowell spring protection against excessive cable bending**

The thermocouples **SCT200** are designed for fitting directly into a drilled hole or process. Consist of a thermocouple element, a protection tube made out of stainless steel, and a connection cable.

Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

ORDERING

SCT200-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

construction:
P : straight
K : angular

sheath diameter (Ød):
4 mm
5 mm
6 mm
other, please specify

sheath length (L):
50 mm (standard)
100 mm
other, please specify [mm]

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

Ordering example:
SCT200-1-J-6-50-WS-1500-SO-2
Single TC temperature sensor, J thermocouple, 2 tolerance class, thermowell diameter 6 mm and length 50 mm, fibreglass insulation, cable length 1500 mm, hot junction isolated from the sheath

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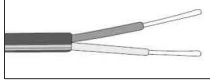
SCT201

- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **stainless steel sheath**
- **minimum sheath length: 15 mm, minimum sheath diameter: 2 mm**
- **any maximum sheath length**
- **thermowell spring protection against excessive cable bending**

The thermocouples **SCT201** are designed for fitting directly into a drilled hole or process. Consist of a thermocouple element, a protection tube made out of stainless steel, and a connection cable. Sensor insertion length, thermowell diameter, process connection thread, number of sensors, accuracy, cable length, and insulation can be selected individually for the respective application.

Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

ORDERING

SCT201-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

sheath diameter (Ød):
4 mm
5 mm
other, please specify

sheath length (L):
50 mm (standard)
100 mm
other, please specify [mm]

process connection:
G1/2"
M10x1
M14x1,5
other, please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

Ordering example:
SCT201-1-K-6-100-M14x1,5-TS-1500-SO-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, thermowell diameter 6 mm and length 100 mm, teflon/silicon insulation, process connection M14x1,5 mm, cable length 1500 mm, hot junction isolated from the sheath

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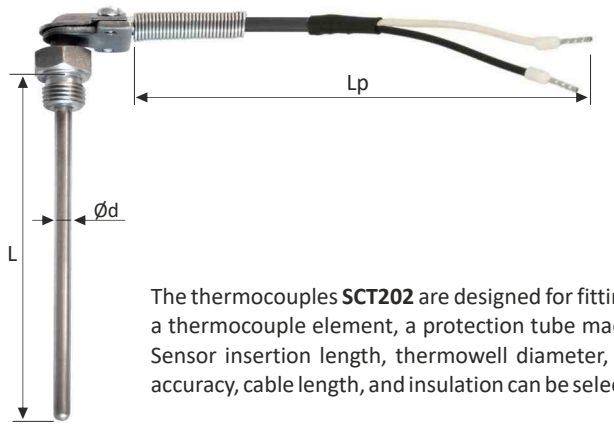
SCT202

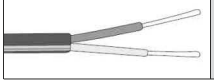


- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **stainless steel sheath**
- **minimum sheath length: 15 mm, minimum sheath diameter: 2 mm**
- **any maximum sheath length**
- **thermowell spring protection against excessive cable bending**

The thermocouples **SCT202** are designed for fitting directly into a drilled hole or process. Consist of a thermocouple element, a protection tube made out of stainless steel, and a connection cable. Sensor insertion length, thermowell diameter, process connection thread, number of sensors, accuracy, cable length, and insulation can be selected individually for the respective application.

Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

ORDERING

SCT202-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

sheath diameter (Ød):
4 mm
5 mm
other, please specify

sheath length (L):
50 mm (standard)
100 mm
other, please specify [mm]

process connection:
G1/2"
M10x1
M14x1,5
other, please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

Ordering example:
SCT202-1-K-4-100-M14x1,5-WS-1500-SO-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, thermowell diameter 4 mm and length 100 mm, fibreglass insulation, process connection M14x1,5 mm, cable length 1500 mm, hot junction isolated from the sheath

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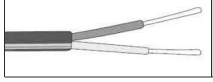
SCT203

- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **stainless steel sheath**
- **assembly screw hole in thermwell allows to mount sensor**
- **thermowell spring protection against excessive cable bending**

The thermocouples **SCT203** are designed for fitting directly into a drilled hole or process. Consist of a thermocouple element, a protection tube made out of stainless steel, and a connection cable. Sensor insertion length, thermowell diameter, process connection thread, number of sensors, accuracy, cable length, and insulation can be selected individually for the respective application.

Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

Sheath diameter	Mounting hole diameter (d1)	Width (d)
Ø 4 mm	Ø 3,2 mm	6 mm
Ø 6 mm	Ø 4,2 mm	8 mm
Ø 6 mm	Ø 5,2 mm	10 mm

ORDERING

SCT203-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

mounting hole diameter (Ød1):
Ø3,2 mm
Ø4,2 mm
other, please specify

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

Ordering example:
SCT203-1-K-3,2-WS-1500-SO-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, mounting hole diameter 3,2 mm, fibreglass insulation, cable length 1500 mm, hot junction isolated from the sheath

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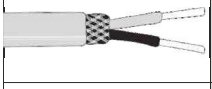
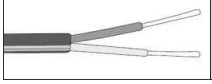
SCT204

- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **stainless steel sheath**
- **standard diameter and length process connection with table**
- **thermowell spring protection against excessive cable bending**

The thermocouples **SCT204** are designed for fitting directly into a drilled hole or process. Consists of a thermocouple element, a protection tube made out of stainless steel, and a connection cable. Sensor insertion length, thermowell diameter, process connection thread, number of sensors, accuracy, cable length, and insulation can be selected individually for the respective application.

Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

Thread (G)	Length (L1)
M8x1	10 mm
M10x1	10 mm
M12x1	10 mm
M16x1,5	15 mm
M20x1,5	20 mm
G1/8"	10 mm
G1/4"	12 mm
G1/2"	20 mm
1/8 NPT	11 mm
1/4 NPT	14 mm
1/2 NPT	18 mm

ORDERING

SCT204-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

process connection:
G1/2"
M10x1
M20x1,5
other, please specify

process connection length (L1):
standard (according to the table)
other, please specify [mm]

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

Ordering example:
SCT204-1-K-M10x1-WS-1500-SO-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, threaded thermowell connection M10x1 with standard length 10 mm, fibreglass insulation, cable length 1500 mm, hot junction isolated from the sheath

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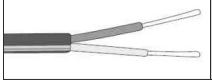
SCT205

- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **sheath made of aluminum, brass or stainless steel**
- **thermowell spring protection against excessive cable bending**

The thermocouples **SCT205** are designed for assembling directly onto machine parts or other construction elements. Consist of a thermocouple sensor, protection tube, made out of stainless steel, aluminum or brass, and connection cable.

Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

ORDERING

SCT205-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

sheath material:
A : aluminum (standard)
S : stainless steel
M : brass

sheath length (L):
50 mm (standard)
other, please specify [mm]

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

Ordering example:
SCT205-1-J-A-50-WS-1500-SO-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, aluminum thermowell with standard length 50 mm, fibreglass insulation, connection cable length 1500 mm, hot junction isolated from the sheath

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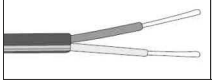
SCT206

- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **stainless steel or brass sheath**
- **mounting through the hole M4**
- **thermowell spring protection against excessive cable bending**

The thermocouples **SCT206** are designed for assembling directly onto machine parts or other construction elements. Consist of a thermocouple sensor, protection tube, made out of stainless steel or brass, and connection cable.

Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

ORDERING

SCT206-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

sheath material:
S : stainless steel
M : brass

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

Ordering example:
SCT206-1-J-M-WS-1500-SO-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, brass thermowell, fibreglass insulation, connection cable length 1500 mm, hot junction isolated from the sheath

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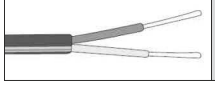
SCT207

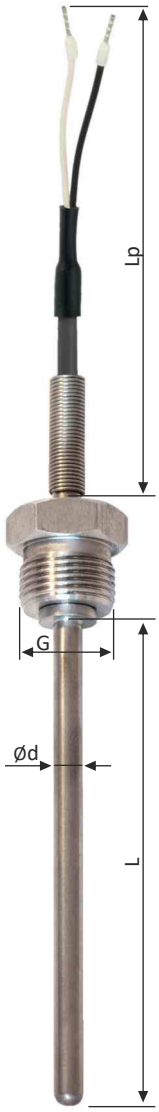
- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **stainless steel sheath**
- **minimum sheath length: 15 mm, minimum sheath diameter: 2 mm**
- **thermowell spring protection against excessive cable bending**

The thermocouples **SCT207** are designed for assembling directly onto machine parts or other construction elements. Consist of a thermocouple sensor, protection tube, made out of stainless steel and connection cable.

Application areas:
- fine chemical industry,
- light energy industry,
- general industrial services.

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT



ORDERING

SCT207-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

sheath diameter (Ød):
4 mm
5 mm
other, please specify

sheath length (L):
50 mm (standard)
100 mm
other, please specify [mm]

process connection:
M12x1 (standard)
G1/2"
M14x1,5
other, please specify

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

Ordering example:
SCT207-1-K-6-50-M14x1,5-WS-1500-SO-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, process connection M14x1,5, thermowell diameter Ø6 mm, length L=50 mm, fibreglass insulation, connection cable length 1500 mm, hot junction isolated from the sheath

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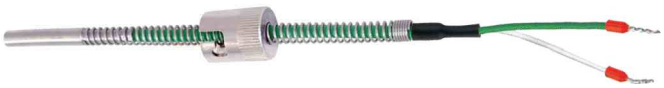
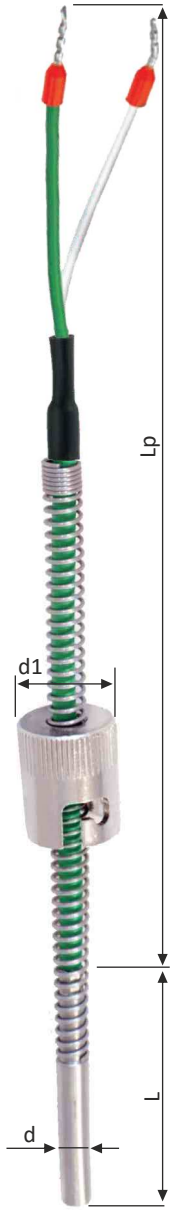
SCT208



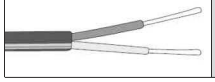
- temperature range -40 ÷ 400°C (depending on the cable used)
- stainless steel sheath
- adjustable spring force of sensor
- different types of sheath
- bayonet of any length

The thermocouples **SCT208** are designed for screw-fitting directly into the machine body or parts. The adjustable spring force of the sensor mounting provides optimum measurement conditions in the environment where vibrations appear. SCT208 sensor consists of a thermocouple element, protection tube made out of stainless steel, connection cable, adjustable bayonet cap with spring. The sensor can be additionally equipped with a bayonet adaptor.

Application areas:
- plastic industry,
- movable and replaceable machine parts.



CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

BAYONET TYPES

A type

B type

Thread (G)	Length (L1)
M20x1,5	15 mm
G1/2"	15 mm
M14x1,5	10 mm
M10x1	8 mm

COVER END TYPES

P type

S type

K type

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THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) K (NiCr-Ni) N (NiCrSi-NiSi)	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

ORDERING

SCT208-X-X-X-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

sheath diameter (Ød):
4 mm
5 mm
8 mm
other, please specify

sheath length (L):
10 mm (standard)
other, please specify [mm]

type of cover end:
P : flat
K : spherical
S : cone

bayonet type:
A
B

bayonet diameter Ød1:
12,5 mm (standard)

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

process connection:
M12x1 (standard)
G1/2"
M14x1,5
other, please specify

Ordering example:
SCT208-1-J-6-10-S-A-M14x1,5-WS-1500-SO-2-12,5
Single TC temperature sensor, K thermocouple, 2 tolerance class, sheath diameter 6 mm, length L=10 mm, connection cable length 1500 mm, fibreglass insulation, threaded bayonet A type with process connection M14x1,5 mm, bayonet cap diameter Ø12,5 mm, hot junction isolated from the sheath

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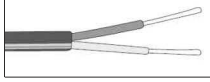
SCT209

- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **brass sheath with a specially contoured shape**
- **hose-clip with sensor**

The thermocouples **SCT209** are designed for assembling directly onto pipelines or other cylindrical elements. Hose-clip allows mounting sensors on a pipeline system. SCT209 consists of a thermometric resistor, protection tube made out of brass, hose-clip and connection cable.

Application areas:
- temperature measurement of pipelines and other cylindrical elements
- general industrial services

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

ORDERING

SCT209-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

junction type:
SO : junction isolated from the sheath
SU : junction grounded

accuracy class:
class **1**
class **2**

measuring element diameter:
22 mm
other, please specify

Ordering example:
SCT209-1-K-TS-1500-SU-2-22
Single TC temperature sensor, K thermocouple, 2 tolerance class, single conductors in teflon insulation, hose-clip match to Ø22 mm, connection cable length 1500 mm, junction grounded

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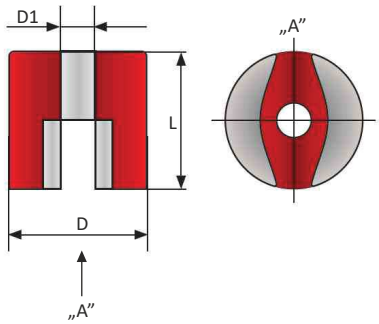
SCT210

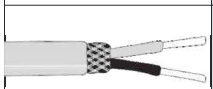
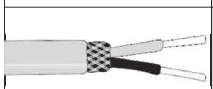
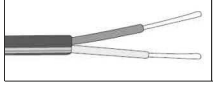
- **temperature range -10 ÷ 300°C (depending on the cable used)**
- **various magnetic surfaces**
- **thermowell spring protection against excessive cable bending**

The thermocouples **SCT210** are suitable for temperature measurement on the ferrous surface up to a maximum of 450°C.
SCT210 sensor consists of thermometric resistor, magnetic surface, and connection cable.

Application areas:
- temperature measurement of ferrous material,
- general industrial services.



CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

ORDERING

SCT210-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N
other, please specify

magnetic surface (with table):
M1
M2
M3
M4

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
T : single cond teflon (260°C max.)
WS1 : single cond fibreglass (400°C max.)
other, please specify

MAGNETIC SURFACE

Magnetic surface	Diameter D	Diameter D1	Length L	Adhesion force
M1	Ø 13 mm	Ø 4,2 mm	10 mm	7 [N]
M2	Ø 19 mm	Ø 5,4 mm	13 mm	19 [N]
M3	Ø 25 mm	Ø 5,4 mm	16 mm	29 [N]
M4	Ø 32 mm	Ø 7 mm	25 mm	66 [N]

Ordering example:
SCT210-1-K-M1-T-1500-SO-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, magnet type M1, single conductors in teflon insulation, connection cable length 1500 mm, hot junction isolated from the sheath

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SCT211

- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **stainless steel sheath**
- **minimum sheath diameter: 3 mm**
- **any length of the sheath**
- **stainless steel grooved handle**
- **spring protection against excessive cable bending**
- **sensor connection standard or mini plug**

The thermocouples **SCT211** are industrial standard sensors with high accuracy and stability. They are intended for industrial and laboratory applications. Thanks to their design of tight thermowell with a stainless steel handle, they can be used in a dry environment as well as in wet baths. Lead wire can be with the insulated bare ends ready for being assembled to a connector or directly to a measuring device.

Application areas:
- food industry, warehouses,
- general industrial services.

TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 400°C (depending on the cable used)
Process connection	standard or mini plug
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 100 mm (standard) diameter: 3,5 or 4 mm
Cable	type with table, standard length 1500 mm or other according to order

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

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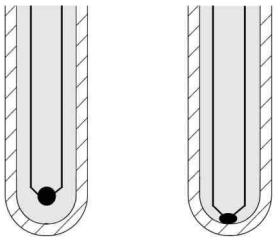
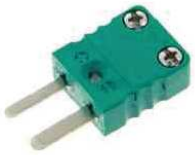
TYPES OF MEASURING HOT JUNCTION



SO
junction insulated from the sheath

SP
grounded junction

OPTIONAL EQUIPMENT



„mini"plug

„standard" plug

ORDERING

SCT211-X-X-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

sheath diameter (Ød):
3,5 mm
4 mm
other, please specify

sheath length (L):
100 mm (standard)
other, please specify [mm]

cable design:
P : straight
S : twisted (PVC-105°C)

sensor measuring range or temperature transmitter settings:
please specify

process connection:
WS : standard plug
WM : mini plug
- : no process connection

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

Ordering example:
SCT211-1-K-4-100-P-WS-1500-SO-2-WM-150°C
Single TC temperature sensor, K thermocouple, 2 tolerance class, sheath diameter 4 mm and length 100 mm, straight connection cable, length 1500 mm with fibreglass insulation and „mini" plug, hot junction isolated from the sheath, sensor measuring range 150°C.

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SCT212

- **temperature range -40 ÷ 400°C (depending on the cable used)**
- **stainless steel sheath**
- **minimum sheath diameter: 3 mm**
- **any length of the sheath**
- **stainless steel smooth handle**
- **spring protection against excessive cable bending**
- **sensor connection standard or mini plug**

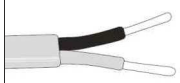
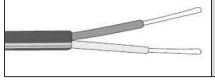
The thermocouples **SCT212** are industrial standard sensors with high accuracy and stability. They are intended for industrial and laboratory applications. Thanks to their design of tight thermowell with a stainless steel handle, they can be used in a dry environment as well as in wet baths. Lead wire can be with the insulated bare ends ready for being assembled to a connector or directly to a measuring device.

Application areas:
- food industry, warehouses,
- general industrial services.

TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 400°C (depending on the cable used)
Process connection	standard or mini plug
Class	1 or 2
Sheath	material: stainless steel 1.4541 or other nominal length: 100 mm (standard) diameter: 3,5 or 4 mm
Cable	type with table, standard length 1500 mm or other according to order

CONNECTION CABLES

Diagram	Insulation design	Temperature range	Code
	- double fibreglass - stainless steel - cond: nickel plated copper	-40 ÷ 400°C	WS
	- PVC - cond: nickel plated copper	-10°C ÷ 105°C	PVC
	- teflon - stainless steel - teflon - cond: nickel plated copper	260°C max.	TOT
	- teflon - stainless steel - cond: nickel plated copper	260°C max.	TO
	- silicon - stainless steel - silicon - cond: nickel plated copper	180°C max.	SOS
	- silicon - silicon - cond: nickel plated copper	-40°C ÷ 250°C	SS
	- teflon - teflon - cond: nickel plated copper	-40°C ÷ 205°C	TT

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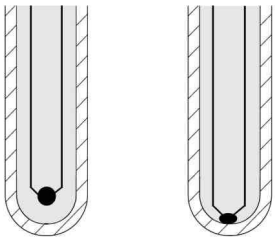
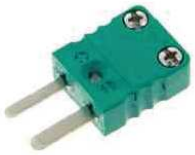
TYPES OF MEASURING HOT JUNCTION



SO
junction insulated from the sheath

SP
grounded junction

OPTIONAL EQUIPMENT



„mini"plug

„standard" plug

ORDERING

SCT212-X-X-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
J
K
N
other, please specify

sheath diameter (Ød):
3,5 mm
4 mm
other, please specify

sheath length (L):
100 mm (standard)
other, please specify [mm]

cable design:
P : straight
S : twisted (PVC-105°C)

sensor measuring range or temperature transmitter settings:
please specify

process connection:
WS : standard plug
WM : mini plug
- : no process connection

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

Ordering example:
SCT212-1-K-4-100-P-WS-1500-SO-2-WM-150°C
Single TC temperature sensor, K thermocouple, 2 tolerance class, sheath diameter 4 mm and length 100 mm, straight connection cable, length 1500 mm with fibreglass insulation and „mini" plug, hot junction isolated from the sheath, sensor measuring range 150°C.

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SCT300

with „mini” plug or socket

- **mineral insulated thermoelectric sensor**
- **different types of sensor connections**
- **accurate measurement and short reaction time to temperature changes**
- **small dimensions enable working in hard-to-reach places**
- **resistance to vibrations and the possibility of bending**
- **thermowell made of nickel alloy (Inconel 600)**

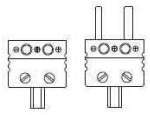
The mineral insulated thermocouple **SCT300** contains the flexible part of the probe. The probe consists of a stainless steel outer sheath, in which the inner conductors are insulated with compressed into a highly compacted ceramic mass. The outer sheath is made of stainless steel or Ni alloy. The inner conductors are welded together at the measuring end of the sheathed cable to form the 'thermocouple' junction. In designs, where the measuring element is not insulated, the sheath is also welded with the thermocouple junction. Connector cables are connected to the other end of the sheathed cable and hermetically sealed with a sealing compound. The connector wires are the basis of the electrical interface with cable, a connector, or a terminal block. Due to their flexibility and the small diameters in which they are available, sheathed thermocouples can be used in locations that are not easily accessible.

Application areas:

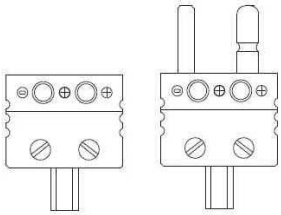
- general machinery and equipment design,
- measuring temperature of liquids, gases and solid bodies, measurement laboratories.

TECHNICAL DATA

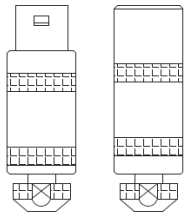
Sensing element	J or K thermocouple (single, double)
Measuring range	-40 ÷ 1200°C
Process connection	standard / mini / Lemo plug or socket
Class	1 or 2
Sheath	material: 2.4816 alloy (Inconel 600) or other any nominal length according to order diameter: 3 mm, 4,5 mm, 6 mm
Cable	double isolation: teflon, silicon or fibreglass, standard length 1500 mm or other according to order
Junction	isolated from the sheath, grounded or exposed



MINI plug or socket



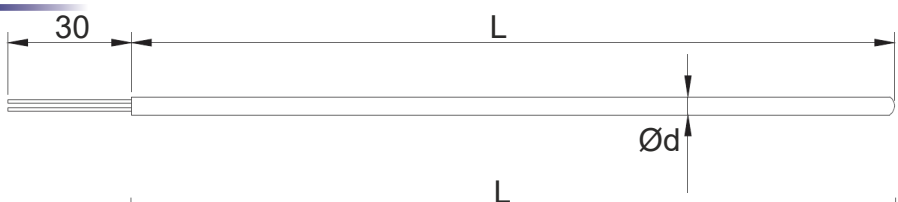
STANDARD plug or socket



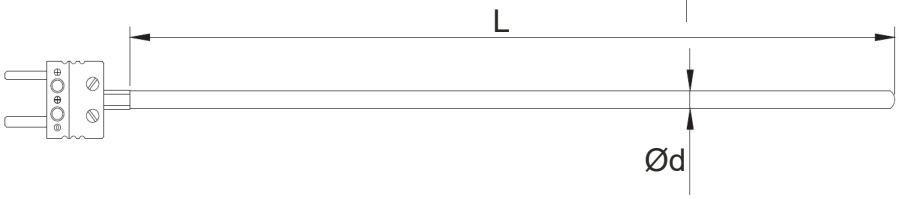
LEMO type plug or socket

CONSTRUCTIONS

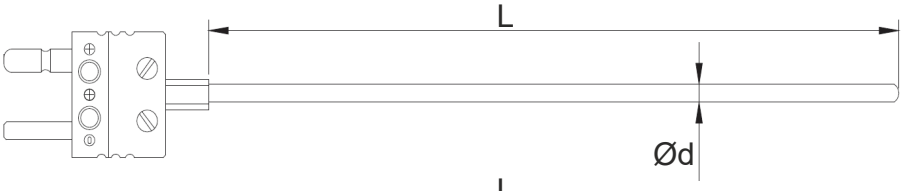
with free isolated wires



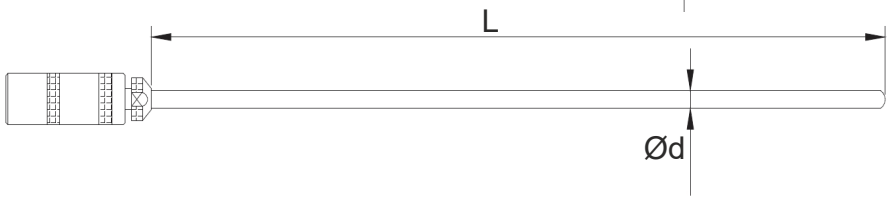
with MINI plug or socket



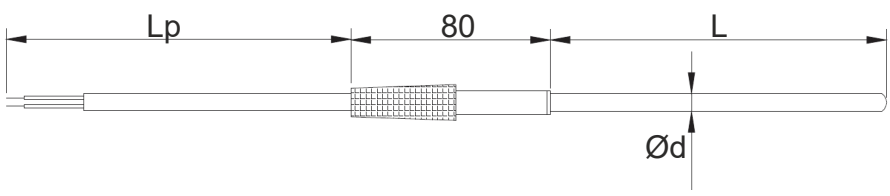
with STANDARD plug or socket



with LEMO type plug or socket



with pot seal and compensating cable



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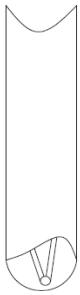
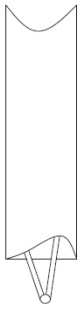
TYPES OF MEASURING HOT JUNCTION



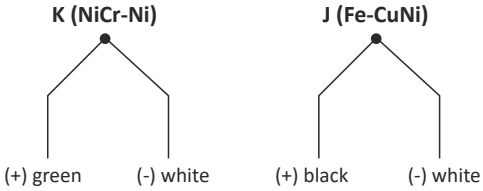
junction isolated from the sheath (SO)

grounded junction (SU)



exposed junction (SZ)

ELECTRICAL CONNECTION



ORDERING

SCT300-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

construction:
A : MINI plug or socket
B : STANDARD plug or socket
C : LEMO type plug or socket
D : with pot seal and compensating cable
E : with free isolated wires

sensing element:
J
K
other, please specify

sheath diameter (Ød):
3 mm
6 mm
other, please specify

sheath length (L):
please specify [mm]

accuracy class:
class **1**
class **2**

junction type:
SO : junction isolated from the sheath
SU : junction grounded
SSO : junction isolated from itself and from the sheath (for double sensor)
SZ : junction exposed

connection type:
G : socket
W : plug

connecting cable length:
1500 : 1,5 linear meter
other, please specify [mm]

insulation types of connection cable:
PVC : PVC / PVC (110°C max.)
TS : teflon / silicon (180°C max.)
SS : silicon / silicon (250°C max.)
WS : double fibreglass / stainless steel (400°C max.)

Ordering example:
SCT300-1-B-K-3-500-TS-1500-W-SO-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, thermowell diameter Ø3 mm, length L=500 mm, teflon/silicon insulation, connection cable with standard size plug, length 1500 mm, hot junction isolated from the sheath

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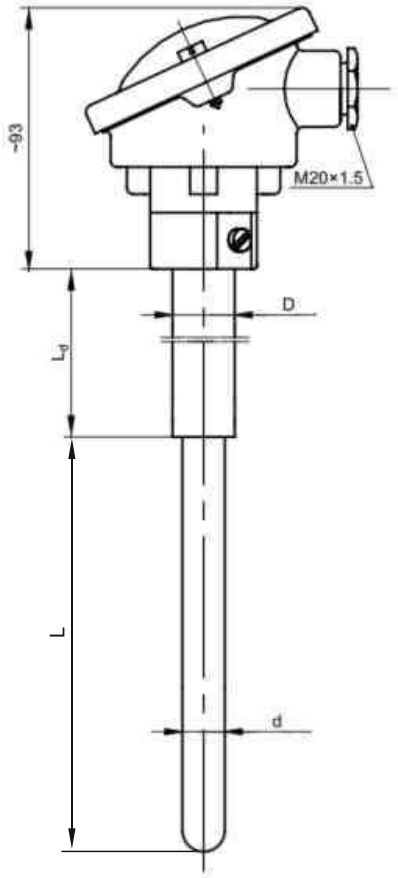
SCT600

- thermoelectric sensor with ceramic protection tube
- temperature range max. 1800°C (depending on thermocouple used)
- operating temperature of connection heads max. 150°C
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter
- tube made of C610 (60% Al_2O_3), C799 (99,7% Al_2O_3) or C530 (75% Al_2O_3)
- mounting by threaded fittings and flanges

Thermocouple **SCT600** with a ceramic protection tube is designed for industrial furnaces, the glass industry, etc. The sensor consists of a replaceable insert, a ceramic protective tube (thermowell) and an aluminum connection head, where a programmable temperature transmitter with 4-20 mA output signal can be installed. Sensors with the ceramic protective tube can be mounted with a flanged mounting bracket or threaded compression fitting. Sensor immersion length, compression fitting size (optional), the material of the protection tube, and connection head can be selected depending on the requirements of the application.

Application areas:
- glass and ceramics industry,
- heat-treating furnaces,
- boiler houses,
- air and gas ducts.



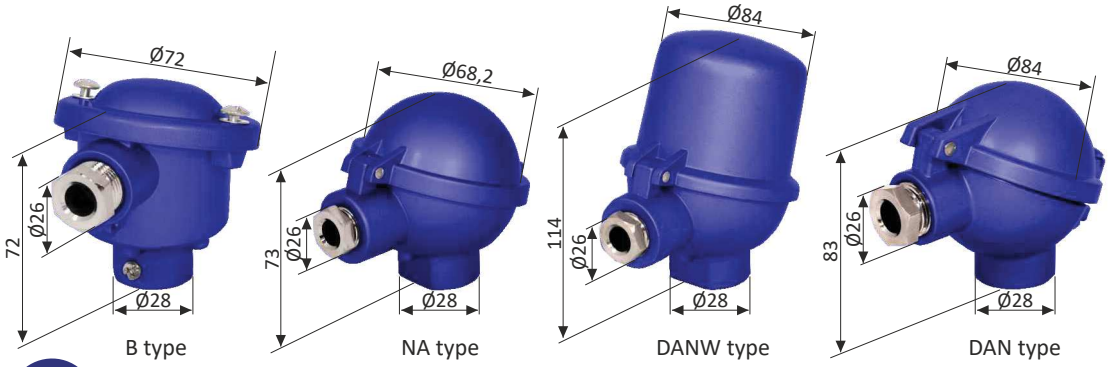
TECHNICAL DATA

Sensing element	K, N, R, S, B thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (TC K, N), 0 ÷ 1600°C (TC S, R), 600 ÷ 1700°C (TC B)
Connection head	B, NA, MA, DAN or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath	material: C530, C610, C799 nominal length: any (acc. to order) diameter: 10 mm, 15 mm, 24 mm or other
Process connection	flange, welding adapter

THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
K (NiCr-Ni) **N (NiCrSi-NiSi)**	-40 ÷ 1000°C -40 ÷ 1000°C	± 1.5°C ± 0.0040°C x |t|	-40 ÷ 1200°C -40 ÷ 1200°C	± 2.5°C ± 0.0075°C x |t|
B (PtRh30-PtRh6)	-	-	600 ÷ 1700°C	± 0.0025°C x |t|
R (PtRh13-Pt) **S (PtRh10-Pt)**	0 ÷ 1100°C 1100 ÷ 1600°C	± 1.0°C ± [1+0.003(t-1100)]°C	0 ÷ 600°C 600 ÷ 1600°C	± 1.5°C ± 0.0025°C x |t|

CONNECTION HEAD TYPES



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CERAMIC PROTECTION TUBE - FEATURES

Material	Operation temperature	Advantages	Disadvantages	Application
C530 (73-75% Al_2O_3)	max. 1600°C	resistant to temperature shock	low resistance to mechanical load	electric furnaces up to 1300°C or others
C610 (60% Al_2O_3)	max. 1500°C	gas-tight, average thermal shock resistance, high flame resistance	low resistance to mechanical load, low Al_2O_3 content	gas-tight furnaces, diffusion furnaces
C799 (99,7% Al_2O_3)	max. 1800°C	gas-proof, acid resistant, steam resistant, very high flame resistance	low resistance to mechanical load, low resistance to temperature shock	gas-tight furnaces up to 1800°C (liquid glass tanks), chemical industry, manufacturing of concrete

ACCESSORIES

Mounting bracket
SUZ11

Mounting bracket
SUZ21

ORDERING

SCT600-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
K
N
R
other, please specify

diameter of platinum wire (for S, R, B):
0,35 : 0,35 mm
0,5 : 0,5 mm

connection head:
NA
B
other, please specify

handle sheath diameter ØD:
22 : 22 mm
32 : 32 mm
other, please specify

handle sheath length Ld:
150 : 150 mm (standard)
other, please specify [mm]

accuracy class:
class **1**
class **2**

ceramic thermowell material:
C530
C610
C799
other, please specify

ceramic thermowell length L:
500 : 500 mm
1000 : 1000 mm
other, please specify [mm]

ceramic thermowell diameter Ød:
10 : 10 mm
15 : 15 mm
24 : 24 mm

Ordering example:
SCT600-1-K-B-22-150-15-500-C799-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, B head type, ceramic protection tube made of C799, 15 mm diameter, 500 mm length, handle sheath diameter 22 mm and length 150 mm

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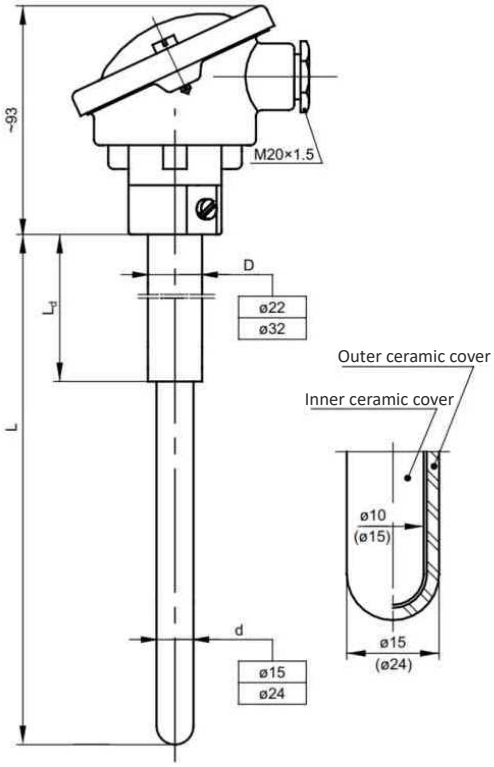
SCT601

- thermoelectric sensor with double ceramic protection tube
- temperature range max. 1800°C (depending on thermocouple used)
- operating temperature of connection heads max. 150°C
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter
- tube made of C610 (60% Al_2O_3), C799 (99,7% Al_2O_3) or C530 (75% Al_2O_3)
- mounting by threaded fittings and flanges

Thermocouple **SCT601** with a ceramic protection tube is designed for industrial furnaces, the glass industry, etc. The sensor consists of a replaceable insert, a ceramic protective tube (thermowell) and an aluminum connection head, where a programmable temperature transmitter with 4-20 mA output signal can be installed. Sensors with the ceramic protective tube can be mounted with a flanged mounting bracket or threaded compression fitting. Sensor immersion length, compression fitting size (optional), the material of the protection tube, and connection head can be selected depending on the requirements of the application.

Application areas:
- glass and ceramics industry,
- heat-treating furnaces,
- boiler houses,
- air and gas ducts.



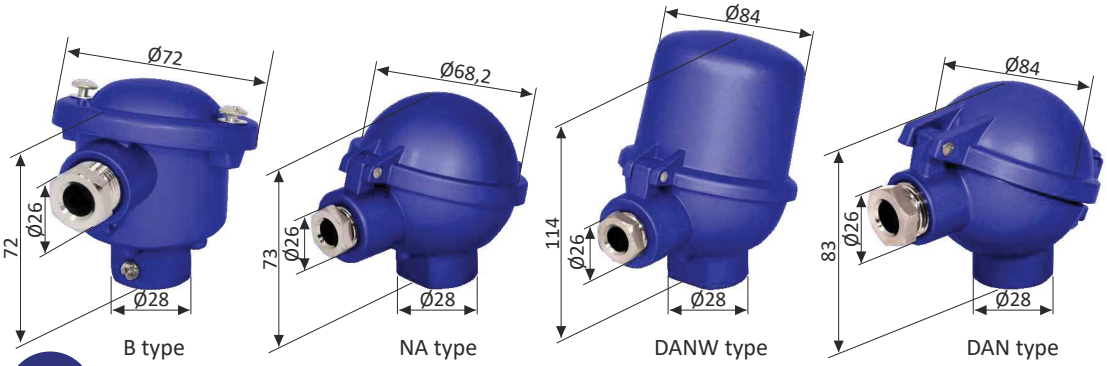
TECHNICAL DATA

Sensing element	K, N, R, S, B thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (TC K, N), 0 ÷ 1600°C (TC S, R), 600 ÷ 1700°C (TC B)
Connection head	B, NA, MA, DAN or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath	material: C530, C610, C799 nominal length: any (acc. to order) diameter: double (outer 15 or 24 mm / inner 10 or 15 mm)
Process connection	flange, welding adapter

THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
K (NiCr-Ni) **N (NiCrSi-NiSi)**	-40 ÷ 1000°C -40 ÷ 1000°C	± 1.5°C ± 0.0040°C x |t|	-40 ÷ 1200°C -40 ÷ 1200°C	± 2.5°C ± 0.0075°C x |t|
B (PtRh30-PtRh6)	-	-	600 ÷ 1700°C	± 0.0025°C x |t|
R (PtRh13-Pt) **S (PtRh10-Pt)**	0 ÷ 1100°C 1100 ÷ 1600°C	± 1.0°C ± [1+0,003(t-1100)]°C	0 ÷ 600°C 600 ÷ 1600°C	± 1.5°C ± 0.0025°C x |t|

CONNECTION HEAD TYPES



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CERAMIC PROTECTION TUBE - FEATURES

Material	Operation temperature	Advantages	Disadvantages	Application
C530 (73-75% Al_2O_3)	max. 1600°C	resistant to temperature shock	low resistance to mechanical load	electric furnaces up to 1300°C or others
C610 (60% Al_2O_3)	max. 1500°C	gas-tight, average thermal shock resistance, high flame resistance	low resistance to mechanical load, low Al_2O_3 content	gas-tight furnaces, diffusion furnaces
C799 (99,7% Al_2O_3)	max. 1800°C	gas-proof, acid resistant, steam resistant, very high flame resistance	low resistance to mechanical load, low resistance to temperature shock	gas-tight furnaces up to 1800°C (liquid glass tanks), chemical industry, manufacturing of concrete

ACCESSORIES

Mounting bracket
SUZ11

Mounting bracket
SUZ21

ORDERING

SCT601-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
PP : with transmitter

sensing element:
K
N
R
other, please specify

diameter of platinum wire (for S, R, B):
0,35 : 0,35 mm
0,5 : 0,5 mm

connection head:
NA
B
other, please specify

handle sheath diameter ØD:
22 : 22 mm
32 : 32 mm
other, please specify

handle sheath length Ld:
150 : 150 mm (standard)
other, please specify [mm]

accuracy class:
class **1**
class **2**

ceramic thermowell material:
C530
C610
C799
other, please specify

ceramic thermowell length L:
500 : 500 mm
1000 : 1000 mm
other, please specify [mm]

ceramic thermowell diameter Ød:
15/10 : 15 mm outer / 10 mm inner
24/15 : 24 mm outer /15 mm inner
other, please specify [mm]

Ordering example:
SCT601-1-K-B-22-150-15/10-500-C799-2
Single TC temperature sensor, K thermocouple, 2 tolerance class, B head type, ceramic protection tube made of C799, 15 mm outer, 10 mm inner diameter, 500 mm length, handle sheath diameter 22 mm and length 150 mm

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SCT602

- thermoelectric sensor with platinium thimble and ceramic protection tube
- temperature range max. 1700°C (depending on thermocouple used)
- operating temperature of connection heads max. 150°C
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter
- tube made of C799 (99,7% Al_2O_3)
- mounting by threaded fittings and flanges

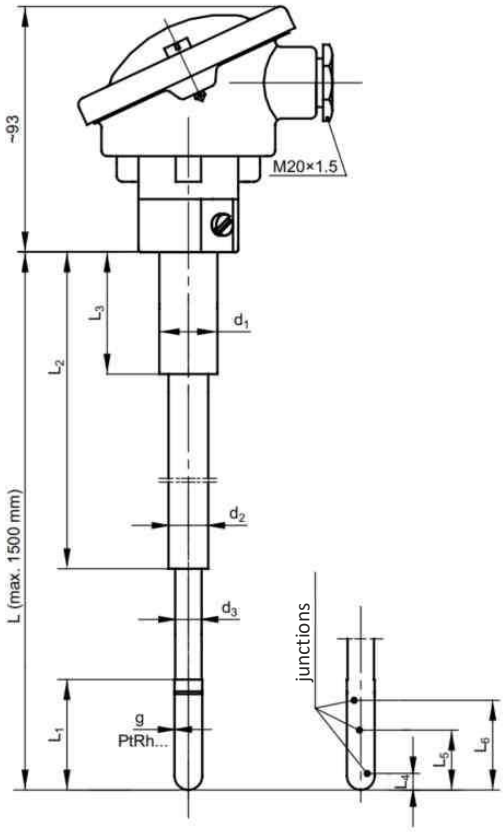
Thermocouple **SCT602** with a ceramic protection tube is designed for industrial furnaces, the glass industry, etc. The sensor consists of a replaceable insert, a ceramic protective tube (thermowell) and an aluminum connection head, where a programmable temperature transmitter with 4-20 mA output signal can be installed. Sensors with the ceramic protective tube can be mounted with a flanged mounting bracket or threaded compression fitting. Sensor immersion length, compression fitting size (optional), the material of the protection tube, and connection head can be selected depending on the requirements of the application.

Application areas:

- glass and ceramics industry.

TECHNICAL DATA

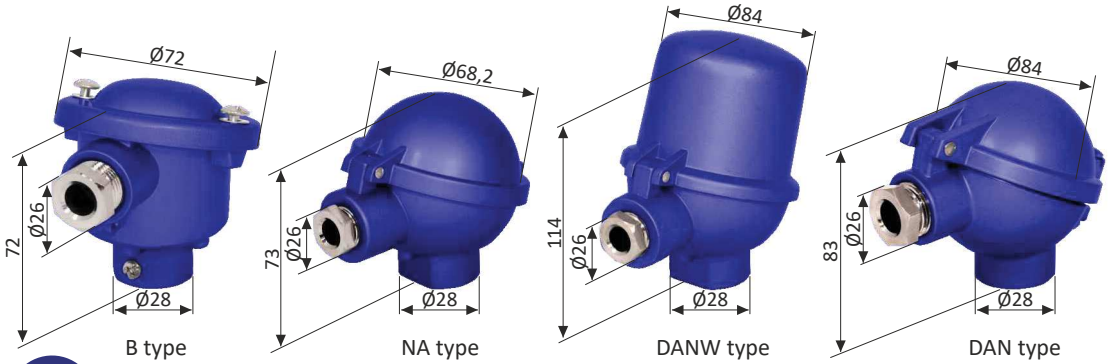
Sensing element	R, S, B thermocouple (single, double, triple)
Measuring range	0 ÷ 1600°C (TC S, R), 600 ÷ 1700°C (TC B)
Connection head	B, NA, MA, DAN or other, operating temperature -40 ÷ 150°C
Class	1 or 2
Sheath material	ceramic C799
Thimble	material: Pt, PtRh10, PtRh20 wall thickness: 0,3 mm; 0,4 mm; 0,5 mm
Process connection	flange, welding adapter



THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
K (NiCr-Ni) N (NiCrSi-NiSi)	-40 ÷ 1000°C -40 ÷ 1000°C	± 1.5°C ± 0.0040°C x |t|	-40 ÷ 1200°C -40 ÷ 1200°C	± 2.5°C ± 0.0075°C x |t|
B (PtRh30-PtRh6)	-	-	600 ÷ 1700°C	± 0.0025°C x |t|
R (PtRh13-Pt) S (PtRh10-Pt)	0 ÷ 1100°C 1100 ÷ 1600°C	± 1.0°C ± [1+0,003(t-1100)]°C	0 ÷ 600°C 600 ÷ 1600°C	± 1.5°C ± 0.0025°C x |t|

CONNECTION HEAD TYPES



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CERAMIC PROTECTION TUBE - FEATURES

Material	Operation temperature	Advantages	Disadvantages	Application
C530 (73-75% Al_2O_3)	max. 1600°C	resistant to temperature shock	low resistance to mechanical load	electric furnaces up to 1300°C or others
C610 (60% Al_2O_3)	max. 1500°C	gas-tight, average thermal shock resistance, high flame resistance	low resistance to mechanical load, low Al_2O_3 content	gas-tight furnaces, diffusion furnaces
C799 (99,7% Al_2O_3)	max. 1800°C	gas-proof, acid resistant, steam resistant, very high flame resistance	low resistance to mechanical load, low resistance to temperature shock	gas-tight furnaces up to 1800°C (liquid glass tanks), chemical industry, manufacturing of concrete

ACCESSORIES

Mounting bracket
SUZ11

Mounting bracket
SUZ21

ORDERING

SCT602-X-X-X-X-X-X-X-X-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double
3 : triple
PP : with transmitter

sensing element:
R
S
B
other, please specify

diameter of platinum wire:
0,5 : 0,5 mm

connection head:
NA
B
other, please specify

handle sheath diameter ØD:
22 : 22 mm
32 : 32 mm
other, please specify

handle sheath length Ld:
150 : 150 mm (standard)
other, please specify [mm]

ceramic thermowell diameter Ød:
15/10 : 15 mm outer / 10 mm inner
24/15 : 24 mm outer /15 mm inner
other, please specify [mm]

accuracy class:
class **1**
class **2**

junction position (acc. to requirements) (for double and triple sensor):
L4 : please specify in mm
L5 : please specify in mm
L6 : please specify in mm

thimble wall thickness:
0,3 : 0,3 mm
0,4 : 0,4 mm
0,5 : 0,5 mm

thimble diameter Ød3:
10 : 10 mm
other, please specify [mm]

thimble length L1:
50 : 50 mm
other, please specify [mm]

ceramic thermowell material:
C799
other, please specify

ceramic thermowell length L2:
500 : 500 mm
1000 : 1000 mm
other, please specify [mm]

Ordering example:
SCT602-1-R-0,5-B-22-150-15/10-500-C799-50-10-0,3-2
Single TC temperature sensor, R thermocouple, 2 tolerance class, B head type, ceramic protection tube made of C799, 15 mm outer, 10 mm inner diameter, 500 mm length, handle sheath diameter 22 mm and length 150 mm, thimble diameter 10 mm, length 50 mm, wall thickness 0,3 mm.

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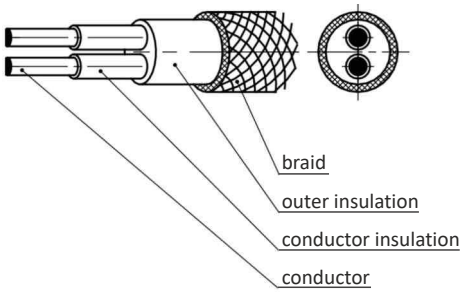
COMPENSATION AND THERMOCOUPLE CABLES

- **insulation resistance: min 10 MΩ x km**
- **range of execution: up to 25 pairs**
- **voltage testing: 1000V**

Compensation and extension (thermocouple) cables are the elements of measuring installation connecting thermocouple sensor with measuring devices such as a controller, indicator, or temperature recorder. Extension cables are made of the same materials as thermocouples, whereas compensation cables are made of substitute materials with properties similar to thermocouples. The cable insulation is selected according to ambient conditions and operating temperature.



CABLE STRUCTURE AND COLOURS ACC. TO EU IEC 584-3

Type	Compensation cable	Extension cable	Composition		Insulation colour	
			Conductor +	Conductor -	Conductor +	Conductor -
T		TX	Cu	CuNi	Brown	White
J		JX	Fe	CuNi	Black	White
E		EX	NiCr	CuNi	Violet	White
K		KX	NiCr	NiAl	Green	White
K	KCA		Fe	410 Alloy	Green	White
N		NX	Nicrosil	Nisil	Pink	White
R	RCA		Cu	11 Alloy	Orange	White
S	SCA		Cu	11 Alloy	Orange	White
B	BC		Cu	Cu	Grey	White

ORDERING

SP88X-X-X-X-X-X-XxX

thermocouple type:
TX : TC T, extension cable
JX : TC J, extension cable
KX : TC K, extension cable
EX : TC E, extension cable
NX : TC N, extension cable
KCA : TC K, compensation cable
RCA : TC R, compensation cable
SCA : TC S, compensation cable
BC : TC B, compensation cable

conductor insulation:
Yc : PVC (-20 ÷ 105°C)
Si : silicon (-50 ÷ 200°C)
F : teflon (-50 ÷ 260°C)
WS : fiberglass (-50 ÷ 400°C)

conductor type:
D : solid wire
L : standed wire

conductor cross section:
2x0,22 : 0,22 mm^2
2x0,50 : 0,50 mm^2
2x0.70 : 0,70 mm^2
2x1,00 : 1,00 mm^2
2x1,50 : 1,50 mm^2

number of conductor pairs:
2 : 2 pairs
3 : 3 pairs
4 : 4 pairs
5 : 5 pairs

braid:
- : none
ek : zinc-plated copper wire
u : steel wire

outer insulation:
Yc : PVC (-20 ÷ 105°C)
Si : silicon (-50 ÷ 200°C)
F : teflon (-50 ÷ 260°C)
WS : fiberglass (-50 ÷ 400°C)

Ordering example:
KX-Si-L-u-2x0,22

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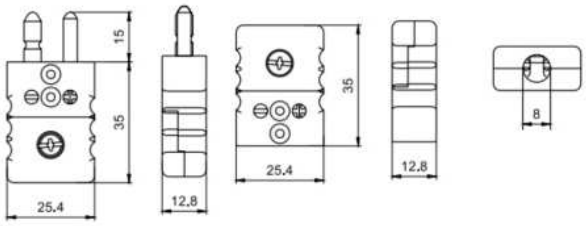
SZS99 - STANDARD PLUG AND SOCKET CONNECTORS FOR TEMPERATURE SENSORS

Plugs and sockets are elements of measuring systems used to connect temperature sensors to measuring devices such as controllers, indicators, and recorders. The variety of types allows to apply them to the majority of thermocouples and resistance thermometers under various environmental conditions and operating temperatures. Solid pins ensure a reliable connection.

1. SZS99 Standard plug / socket (200°C max.)

Temperature range	200°C max.
Lead wire diameter	8 mm max.
Conductor cross-section	from Ø0.2 mm to Ø2 mm
Casing colour	acc. to IEC-584: J: black, K: green, N: pink, T: brown, R and S: orange




coupler


plug

ORDERING

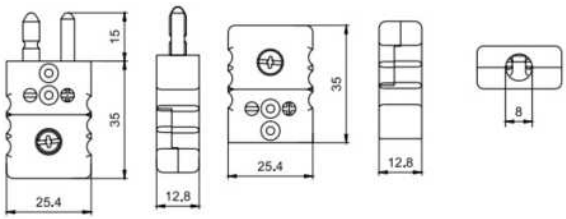
SZS99-X-X

sensing element:
J : TC J (Fe-CuNi)
K : TC K (Ni-CrNi)
N : TC N (NiCrSi-NiSi)
T : TC T (Cu-CuNi)
R : TC R (PtRh13%-Pt)
S : TC S (PtRh10%-Pt)
Pt100 : Cu type (for resistance sensors)
other, please specify

connector type:
W : plug
G : coupler
WG : set

2. SZS99HT Standard high-temperature plug / socket (350°C max.)

Temperature range	350°C max.
Lead wire diameter	8 mm max.
Conductor cross-section	from Ø0.2 mm to Ø2 mm
Casing colour	brown




high-temperature coupler


high-temperature plug

ORDERING

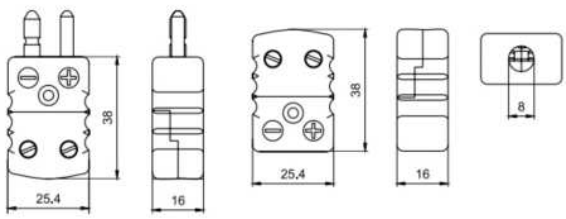
SZS99HT-X-X

sensing element:
J : TC J (Fe-CuNi)
K : TC K (Ni-CrNi)
N : TC N (NiCrSi-NiSi)
T : TC T (Cu-CuNi)
R : TC R (PtRh13%-Pt)
S : TC S (PtRh10%-Pt)
Pt100 : Cu type (for resistance sensors)
other, please specify

connector type:
W : plug
G : coupler
WG : set

3. SZS99C Standard ceramic plug / socket (650°C max.)

Temperature range	650°C max.
Lead wire diameter	8 mm max.
Conductor cross-section	from Ø0.2 mm to Ø2 mm
Casing colour	white




ceramic coupler


ceramic plug

ORDERING

SZS99C-X-X

sensing element:
J : TC J (Fe-CuNi)
K : TC K (Ni-CrNi)
N : TC N (NiCrSi-NiSi)
T : TC T (Cu-CuNi)
R : TC R (PtRh13%-Pt)
S : TC S (PtRh10%-Pt)
other, please specify

connector type:
W : plug
G : coupler
WG : set

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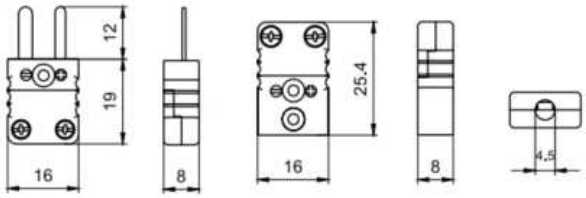
SZM99 - MINIATURE PLUG AND SOCKET CONNECTORS FOR TEMPERATURE SENSORS

Plugs and sockets are elements of measuring systems used to connect temperature sensors to measuring devices such as controllers, indicators, and recorders. The variety of types allows to apply them to the majority of thermocouples and resistance thermometers under various environmental conditions and operating temperatures. Solid pins ensure a reliable connection.

1. SZM99 Miniature plug / socket (200°C max.)

Temperature range	200°C max.
Lead wire diameter	4.5 mm max.
Conductor cross-section	from Ø0.002 mm to Ø0.6 mm
Casing colour	acc. to IEC-584: J: black, K: green, N: pink, T: brown, R and S: orange




coupler


plug

ORDERING

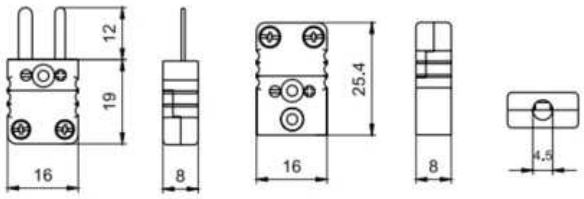
SZM99-X-X

sensing element:
J : TC J (Fe-CuNi)
K : TC K (Ni-CrNi)
N : TC N (NiCrSi-NiSi)
T : TC T (Cu-CuNi)
R : TC R (PtRh13%-Pt)
S : TC S (PtRh10%-Pt)
Pt100 : Cu type (for resistance sensors)
other, please specify

connector type:
W : plug
G : coupler
WG : set

2. SZM99HT Miniature high-temperature plug / socket (350°C max.)

Temperature range	350°C max.
Lead wire diameter	4.5 mm max.
Conductor cross-section	from Ø0.002 mm to Ø0.6 mm
Casing colour	brown




high-temperature coupler


high-temperature plug

ORDERING

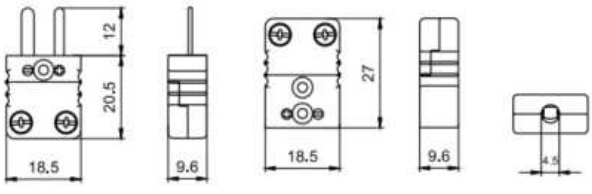
SZM99HT-X-X

sensing element:
J : TC J (Fe-CuNi)
K : TC K (Ni-CrNi)
N : TC N (NiCrSi-NiSi)
T : TC T (Cu-CuNi)
R : TC R (PtRh13%-Pt)
S : TC S (PtRh10%-Pt)
Pt100 : Cu type (for resistance sensors)
other, please specify

connector type:
W : plug
G : coupler
WG : set

3. SZM99C Miniature ceramic plug / socket (650°C max.)

Temperature range	650°C max.
Lead wire diameter	4.5 mm max.
Conductor cross-section	from Ø0.002 mm to Ø0.6 mm
Casing colour	white




ceramic coupler


ceramic plug

ORDERING

SZM99C-X-X

sensing element:
J : TC J (Fe-CuNi)
K : TC K (Ni-CrNi)
N : TC N (NiCrSi-NiSi)
T : TC T (Cu-CuNi)
R : TC R (PtRh13%-Pt)
S : TC S (PtRh10%-Pt)
other, please specify

connector type:
W : plug
G : coupler
WG : set

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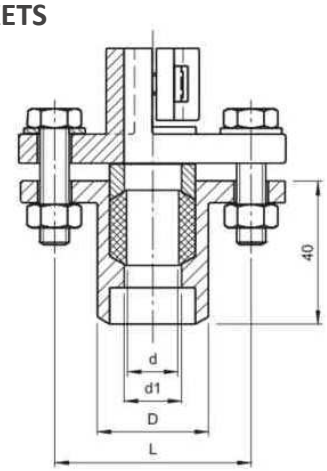
FASTENERS FOR FASTENING THE TEMPERATURE SENSORS

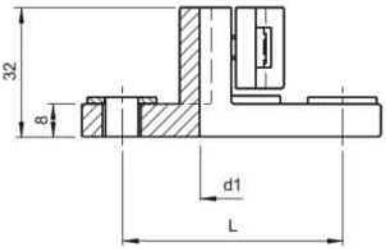
Compression fittings and mounting brackets are used as accessories for temperature sensors without threaded fittings and flanges. They are used for sensor mounting in a place of measurement, they allow immersion length adjustment since they can be mounted anywhere along the sheath. Compression fittings assure an excellent seal up to 0,1 MPa.

SUZ - MOUNTING BRACKETS

SUZ11



SUZ21



ORDERING

SUZX-X-X

bracket type:
11 : counter flange
21 : stop flange

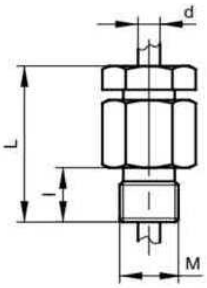
sheath diameter:
15 : Ø 15 mm
22 : Ø 22 mm
32 : Ø 32 mm

seal:
T : teflon
SC : ceramic rope

Bracket type	d [mm]	d1 [mm]	D [mm]	L [mm]
SUZ11-15	Ø15	16	35	55
SUZ21-15	Ø15	16	-	55
SUZ11-22	Ø22	23	40	70
SUZ21-22	Ø22	23	-	70
SUZ11-32	Ø32	33	50	70
SUZ21-32	Ø32	33	-	70

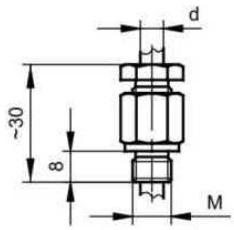
SUG - COMPRESSION FITTINGS

SUG-1



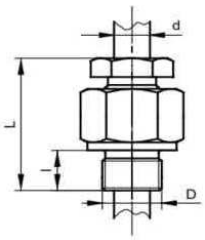
Fitting type	Thread	d [mm]
SUG-1-6	M16x1,5	Ø6
SUG-1-8	M16x1,5	Ø8
SUG-1-12	M20x1,5	Ø12
SUG-1-15	M24x2	Ø15
SUG-1-20	M30x2	Ø20

SUG-3



Fitting type	Thread	d [mm]
SUG-3-1	M8x1	Ø1
SUG-3-1,5	M8x1	Ø1,5
SUG-3-2	M8x1	Ø2
SUG-3-3	M10x1	Ø3
SUG-3-45	M10x1	Ø4,5
SUG-3-6	M10x1	Ø6
SUG-3-8	M12x1	Ø8

SUG-8



Fitting type	Thread	d [mm]	L [mm]	l [mm]	SW
SUG-8-6	M20x1,5 G1/2	Ø6	50	15	30
SUG-8-8		Ø8			
SUG-8-10		Ø10			
SUG-8-12		Ø12			
SUG-8-14	M27x2 G3/4	Ø14	55	20	36
SUG-8-15		Ø15			

ORDERING

SUGX-X

version:
1 : material: zinc-coated steel A10, seal: ceramic rope
3 : material: stainless steel 1.4541, seal: stainless steel ring 1.4541
8 : material: stainless steel 1.4541, seal: stainless steel ring 1.4541, teflon

sheath diameter:
6 : Ø 6 mm
8 : Ø 8 mm
other, acc. to the tables

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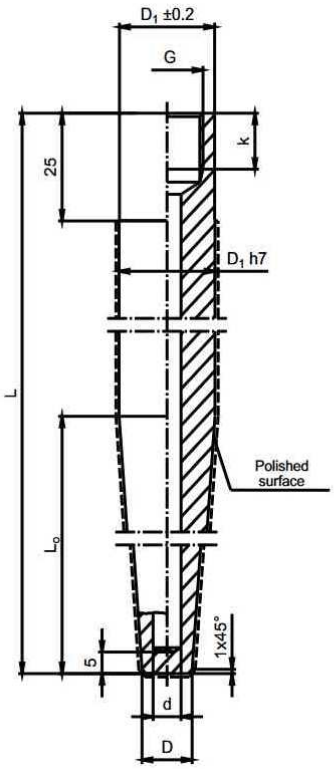
THERMOWELLS, CERAMIC TUBES AND INSULATION RODS FOR THERMOCOUPLES

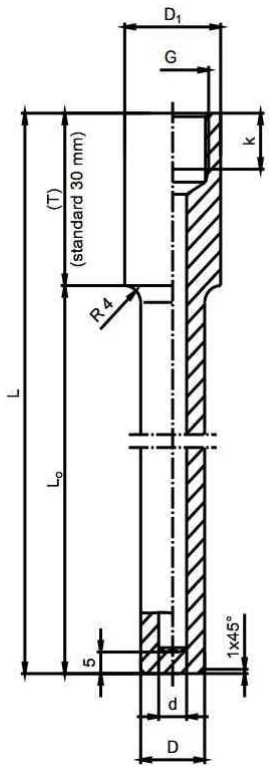
SOW - DRILLED THERMOWELLS

Drilled thermowells are used as security elements to protect temperature sensors in harsh applications where high pressure occurs.
The whole element is made of one piece of the material with deep drilling over the entire length. They are used in heavy industry, food, chemical, and power industry.

SOW1
polished thermowell



SOW2
straight thermowell



Bore diameter d	Min. thermowell diameter D	Max. thermowell length L
Ø3,5	Ø10	400
Ø7	Ø12	700
Ø9	Ø15	600
Ø12	Ø18	700
Ø12	-	1400
Ø14	Ø20	600

Thread type G	Thread length k	Min. diameter of lagging extension D_1
M14x1,5	13	Ø18
M18x1,5	15	Ø24
M20x1,5	15	Ø26
G1/2	15	Ø26
M27x2	20	Ø32
G3/4	20	Ø32

TECHNICAL DATA

Max. temperature	depends on material and dimension
Bore diameter	from 3.5 mm to 14 mm
Thread	M14x1,5; M18x1,5; M20x1,5; M27x2; G1/2; G3/4
Material	1.4404, 1.4541, 1.4571, 1.7335

ORDERING

SOWX-X-X-X-X-X-X-X-X

thermowell type:
1 : polished
2 : straight

thermowell diameter D:
15 mm
other, please specify

weaning diameter D_1:
24 mm
other, please specify

bore diameter d:
7 mm
other, please specify

material:
A : 1.4541 steel
B : 1.4571 steel
C : 1.4404 steel
D : 1.7335 steel
other, please specify

length L_o:
100 mm
other, please specify

total length L:
300 mm
other, please specify

thread length k:
acc. to the table

thread type G:
M18x1,5
other, acc. to the table

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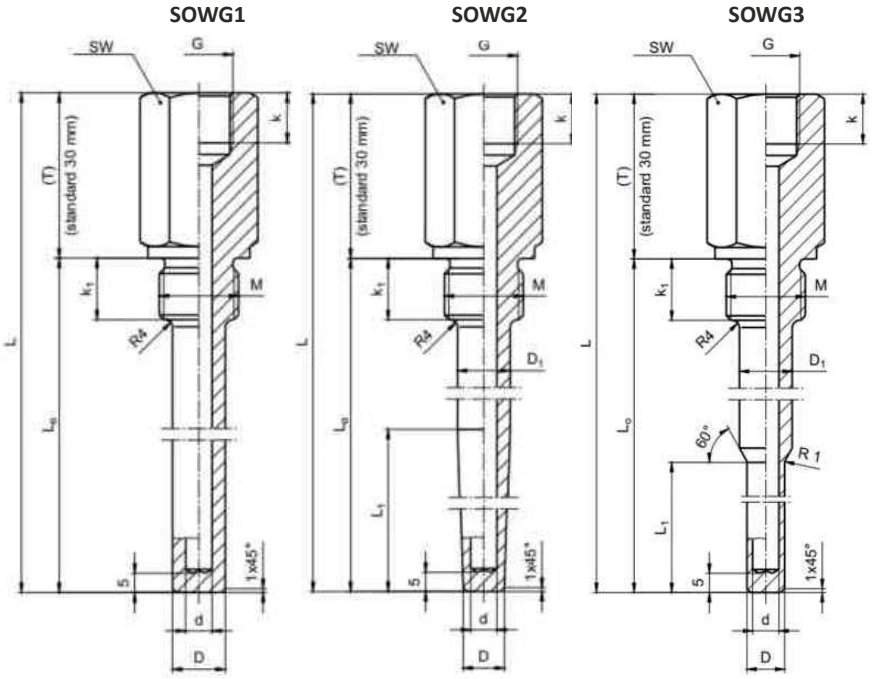
SOWG - THREADED DRILLED THERMOWELLS

Drilled thermowells are used as security elements to protect temperature sensors in harsh applications where high pressure occurs.
The whole element is made of one piece of the material with deep drilling over the entire length. They are used in heavy industry, food, chemical, and power industry. The thermowell is screwed in a place of measurement via the threaded connector.

SOWG1
straight thermowell

SOWG2
tapered thermowell

SOWG3
stepped thermowell



TECHNICAL DATA

Max. temperature	depends on material and dimension
Bore diameter	from 3.5 mm to 14 mm
Thread	M20x1,5; M27x2; G1/2; G3/4, 1/2 NPT, 3/4 NPT
Material	1.4404, 1.4541, 1.4571, 1.7335

Bore diameter d	Min. thermowell diameter D	Max. thermowell length L
Ø3,5	Ø10	400
Ø7	Ø12	700
Ø9	Ø15	600
Ø12	Ø18	700
Ø12	-	1400
Ø14	Ø20	600

ORDERING

SOWGX-X-X-X-X-X-X-X-X-X-X-X-X

thermowell type:
1 : straight
2 : tapered
3 : stepped

thread type M:
M20x1,5
other, acc. to the table

thread length k_1:
acc. to the table

thermowell diameter D:
15 mm
other, please specify

thermowell diameter D_1*:
24 mm
other, please specify

bore diameter d:
7 mm
other, please specify

material:
A : 1.4541
B : 1.4571
C : 1.4404
D : 1.7335
other, please specify

length L_1*:
100 mm
other, please specify

length L_o:
100 mm
other, please specify

total length L:
300 mm
other, please specify

thread length k:
acc. to the table

thread type G:
M20x1,5
other, acc. to the table

** does not apply to the straight thermowell*

Thread type M	Thread length k_1	Hexagon dimensions SW	Thread type G	Thread length k
M20x1,5	14	27	M20x1,5 G1/2 1/2 NPT	15
G1/2	14	27		
1/2 NPT	20	27		
M27x2	16	32		
G3/4	16	32		
3/4 NPT	20	27		
G1	18	41		

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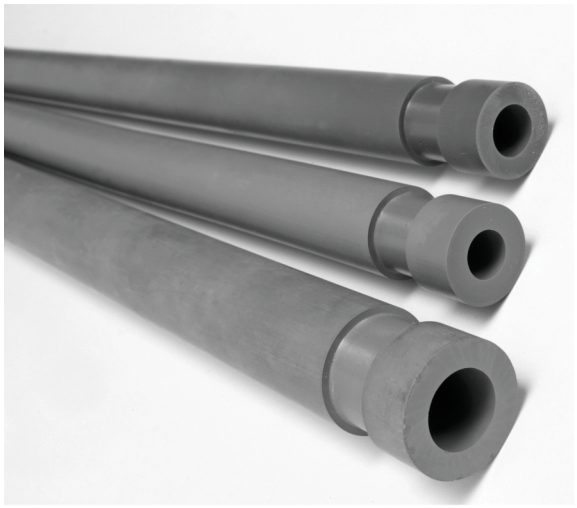
CERAMIC SYALON THERMOWELL



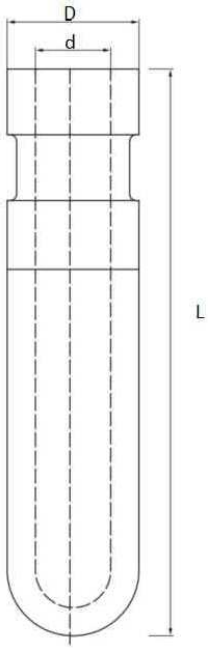
SOCS

- made of special ceramic - syalon
- very long time working in liquid aluminum
- thermal shock resistance
- very high wear resistance
- low coefficient of thermal expansion (no need for preheating)

Syalon **SOCS** is a silicon nitride alloy with unique properties such as high strength, low weight, excellent thermal shock resistance. It is also corrosion and erosion-resistant. Moreover, syalon thermowell is vacuum-tight and is high electrical resistant. It exhibits high mechanical strength at extremely high temperatures (above 1000°C in the air). These properties combined with very high wear resistance make syalon thermowell an excellent application choice for molten aluminum, zinc, tin, and lead.

TECHNICAL DATA

Max. operating temperature	1400°C
Density	> 3.2 g/cm^3
HRA hardness	> 92
Porosity	0 %
Thermal conductivity	22 W/MxK
Flexural strength	930 MPa



ORDERING

SOCS-X-X

outer diameter D:
16 mm
22 mm
28 mm
30 mm
45 mm

length L:
specify in mm

DIMENSIONS

Outer diameter D [mm]	Inner diameter d [mm]	Max. length L [mm]
Ø16	Ø8	900
Ø22	Ø12	1000
Ø28	Ø16	1400
Ø30	Ø18	1400
Ø45	Ø25	1400

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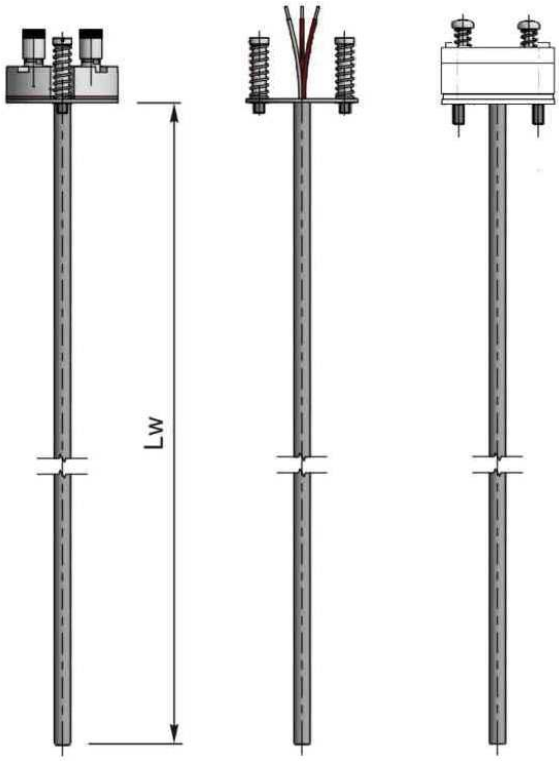
MEASURING INSERTS FOR TEMPERATURE SENSORS

SWP1

- measuring insert for resistance thermometers
- MgO isolator
- measuring range -50 ÷ 550°C
- metal sheath made of stainless steel
- resistance to vibrations
- short reaction time to temperature changes
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter

The measuring inserts **SWP1** for resistance thermometers are designed for installation in a protection thermowell. Operation without thermowell is only recommended in certain applications. These measuring inserts are made from flexible, mineral-insulated sheathed cable. The sensor is fitted in a rigid tube on the end of the measuring insert. Apart from being flexible, this model has outstanding vibration resistance.



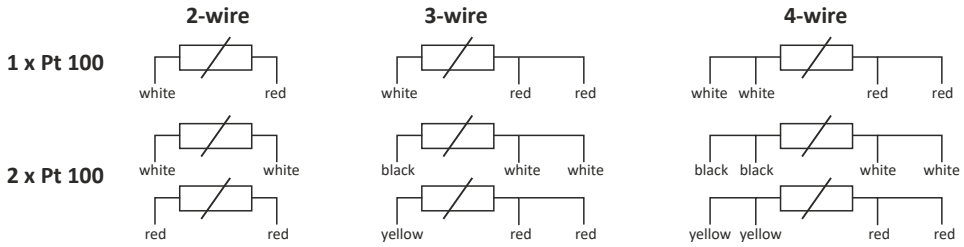
TECHNICAL DATA

Sensing element	Pt 100
Measurement range	-50 ÷ 550°C
Class	A or B
Material	stainless steel

RESISTOR TOLERANCE ACC. TO PN-EN 60751

Class	Tolerance [°C]
A	t = 0,15 + 0,002 x |t|
B	t = 0,30 + 0,005 x |t|

ELECTRICAL CONNECTION



ORDERING

SWP1-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

construction:
A : with ceramic block
B : without ceramic block
PP : with transmitter

insert diameter:
3 mm
4.5 mm
6 mm
8 mm
other, please specify

insert length L_w:
100 mm
150 mm
240 mm
other, please specify

accuracy class:
A
B

measuring circuit:
2 : 2-wire
3 : 3-wire
4 : 4-wire

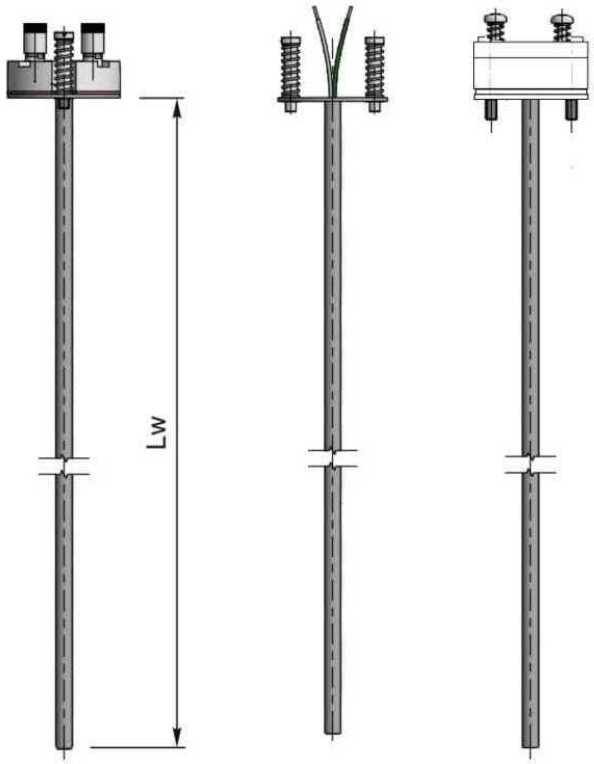
sensor measuring range or temperature transmitter settings:
please specify

MEASURING INSERTS FOR TEMPERATURE SENSORS

SWP2

- measuring insert for thermocouples
- MgO isolator
- measuring range -40 ÷ 1200°C depending on thermocouple
- metal sheath made of Incotel 600 alloy
- resistance to corrosion and vibrations
- short reaction time to temperature changes
- possibility of mounting a 4...20 mA or 0...10 V temperature transmitter

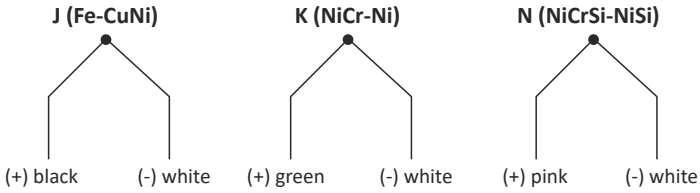
The measuring insert **SWP2** for thermocouple thermometers is made of metal sheathed cable with internal wires insulated from each other and from the outer sheath with magnesium oxide (MgO) powder. This provides the sensor with high vibration resistance, flexibility as well as resistance to temperature and electrical insulation.



TECHNICAL DATA

Sensing element	J, K, N thermocouple (single, double)
Measuring range	-40 ÷ 1200°C (depending on thermocouple)
Class	1 or 2
Material	Inconel 600

ELECTRICAL CONNECTION



THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	I Class		II Class	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi) K (NiCr-Ni) N (NiCrSi-NiSi)	-40 ÷ 750°C -40 ÷ 1000°C -40 ÷ 1000°C	± 1,5°C ± 0,0040°C x |t|	-40 ÷ 750°C -40 ÷ 1200°C -40 ÷ 1200°C	± 2,5°C ± 0,0075°C x |t|

ORDERING

SWP2-X-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
J
K
N

construction:
A : with ceramic block
B : without ceramic block
PP : with transmitter

insert diameter:
3 mm
4.5 mm
8 mm
other, please specify

insert length L_w:
100 mm
150 mm
240 mm
other, please specify

junction type:
SO : junction isolated from the sheath
SU : junction grounded

accuracy class:
class **1**
class **2**

sensor measuring range or temperature transmitter settings:
please specify

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MEASURING INSERTS FOR TEMPERATURE SENSORS

SWP3

- measuring insert for thermocouples
- ceramic isolator
- measuring range +1800°C depending on thermocouple
- sheath made of C610 (60% Al_2O_3)
- long-term measurement of high temperatures
- short reaction time to temperature changes

Measuring insert **SWP3**, in a ceramic cover (C610), for thermocouple thermometers, is made of internal thermocouple wires insulated from each other with ceramic insulation. This provides the sensor with high temperature resistance as well as electrical insulation.

TECHNICAL DATA

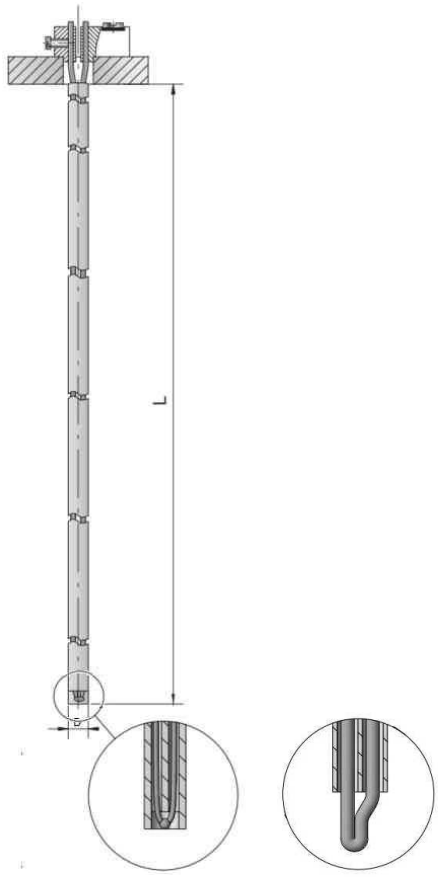
Sensing element	J, K, N, R, S, B thermocouple (single, double)
Measuring range	0 ÷ 1200°C thermocouples of common metals 0 ÷ 1800°C thermocouples of precious metals
Class	1 or 2
Material	mullite 610 ceramics

CERAMIC ISOLATOR DIMENSIONS

Wire diameter	thermocouple type / isolator dimensions				
	K	**N**	**J**	**R/S**	**B**
0.35 mm	-	-	-	Ø3.5 mm; Ø8.5 mm	-
0.50 mm	-	-	-	Ø8.5 mm	Ø8.5 mm
2.00 mm	Ø9x50 mm	Ø9x50 mm	Ø9x50 mm	-	-
3.00 mm	12x8x100 mm Ø16x100 mm	12x8x100 mm Ø16x100 mm	-	-	-

THERMOCOUPLES TOLERANCE ACC. TO PN-EN 60584

Thermocouple	Class 1		Class 2	
	Temperature range	Tolerance	Temperature range	Tolerance
J (Fe-CuNi)	-40 ÷ 750°C	± 1,5°C	-40 ÷ 750°C	± 2,5°C
K (NiCr-Ni)	-40 ÷ 1000°C	± 0,0040°C x |t|	-40 ÷ 1200°C	± 0,0075°C x |t|
N (NiCrSi-NiSi)	-40 ÷ 1000°C		-40 ÷ 1200°C	
B (PtRh30-PtRh6)	-	-	600 ÷ 1700°C	± 0.0025°C x |t|
R (PtRh13-Pt)	0 ÷ 1100°C	± 1.0°C	0 ÷ 600°C	± 1.5°C
S (PtRh10-Pt)	1100 ÷ 1600°C	± [1+0,003(t-1100)]°C	600 ÷ 1600°C	± 0.0025°C x |t|



ORDERING

SWP3-X-X-X-X-X-X

temperature sensor:
1 : single
2 : double

sensing element:
K
R
B
other, please specify

construction:
A : with ceramic block
B : without ceramic block

thermocouple wire diameter:
0.35 mm
0.5 mm
2 mm
3 mm
other, please specify

accuracy class:
class **1**
class **2**

insert length L_w:
100 mm
150 mm
240 mm
other, please specify

ceramic isolator dimensions:
3.5 : Ø3,5 mm
8.5 : Ø8,5 mm
9x50 : Ø9x50 mm
12x8x100 : 12x8x100 mm
16:100 : Ø16x100 mm
other, please specify

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Rue des Famards - CRT2 - CS 10210 - 59273 FRETIN
Tél. 03 20 62 06 80 Télécopie : 03 20 96 95 62
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