



SLOVENSKI STANDARD

SIST EN 50446:2007

01-januar-2007

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SIST EN 50112:2001

SIST EN 50113:2001

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Straight thermocouple assembly with metal or ceramic protection tube and accessories

Gerade Thermoelemente mit Metall- oder Keramik-Schutzrohr und Zubehör

iTeh STANDARD PREVIEW

Thermomètres à thermocouple droits avec tube de protection métallique ou en céramique, et accessoires
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ICS:

17.200.20

SIST EN 50446:2007

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50446

October 2006

ICS 17.200.20

Supersedes EN 50112:1994 and EN 50113:1994

English version

**Straight thermocouple assembly
with metal or ceramic protection tube
and accessories**

Thermomètres à thermocouple droits
avec tube de protection métallique
ou en céramique, et accessoires

Gerade Thermoelemente
mit Metall- oder Keramik-Schutzrohr
und Zubehör

This European Standard was approved by CENELEC on 2006-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.
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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by the CENELEC BTWG 109-2, Straight thermocouple thermometers.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50446 on 2006-09-01.

This European Standard supersedes EN 50112:1994 and EN 50113:1994.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2007-09-01
 - latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-09-01
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1 Scope

This standard applies to straight thermocouples for the nominal pressure level PN 1, which are made of standardized components (connection head, protection tube and thermocouple(s)).

Details regarding the operational areas of the thermocouples and the use of protection tubes are part of this standard.

Connection heads as well as stop flanges and threaded bushings for the mounting of the thermocouples are also part of this standard. Special designs are to be agreed upon between manufacturer and user.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- EN 50113 *Measurement, control, regulation - Electrical temperature sensors – Isolating tubes for thermocouples*
- EN 60529 *Degrees of protection provided by enclosures (IP code)* (IEC 60529)
- EN 60584-1 *Thermocouples - Part 1: Reference tables* (IEC 60584-1)
- EN 60672-1 *Ceramic and glass insulating materials - Part 1: Definitions and classification* (IEC 60672-1)
- EN 22768-1 *General tolerances - Part 1: Tolerances for linear and angular dimensions without individual tolerance indications* (ISO 2768-1)
- ISO 2944 *Fluid power systems and components - Nominal pressures*

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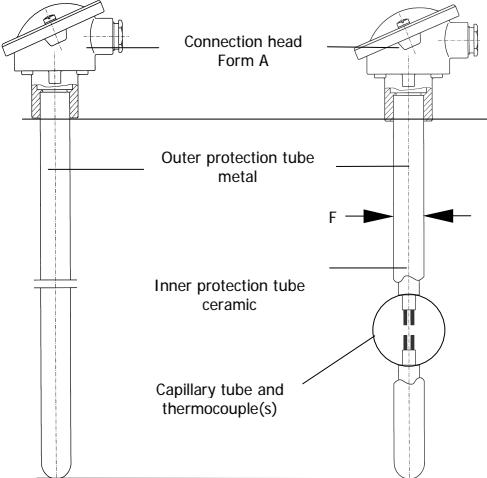
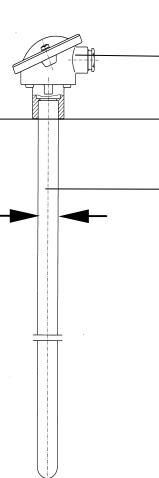
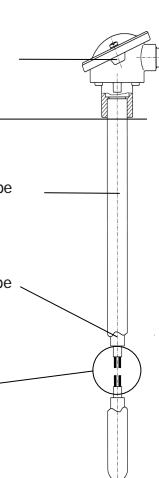
3 Thermocouples, dimensions and description

All dimensions in this standard are given in mm. If not stated differently the general tolerances according to EN 22768-1 apply. The thermocouples do not have to conform to the illustration, only the indicated dimensions must be adhered to.

	Thermocouple EN 50446 - AKK 24 t y - 1 S 1 - 050-1000
Description	<input type="text"/>
EN main number	<input type="text"/>
Type	<input type="text"/>
Diameter F of the outer protection tube	<input type="text"/>
Ident letter for the outer protection tube material	<input type="text"/>
Ident letter for the inner protection tube material	<input type="text"/>
No. of thermocouples	<input type="text"/>
Ident letter for the thermocouple material	<input type="text"/>
Permitted deviation of the thermo-EMF (class)	<input type="text"/>
Diameter of the thermocouple	<input type="text"/>
Nominal length NL of the thermocouple	<input type="text"/>

4 Straight thermocouples with metal protection tube

Table 1 – Types and dimensions, metal protection tube

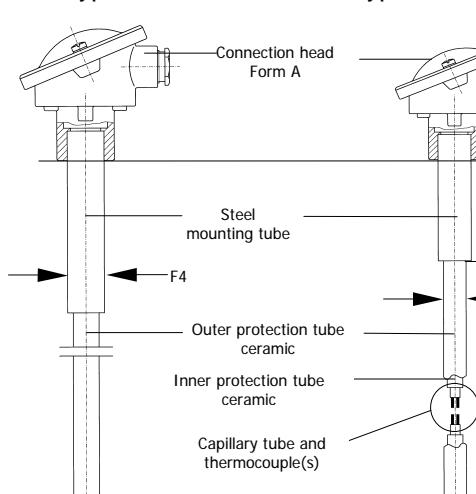
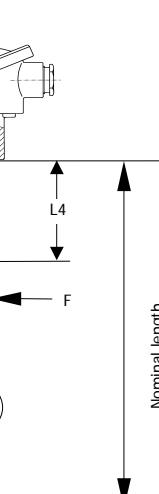
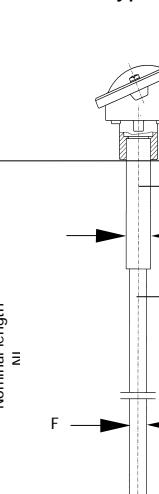
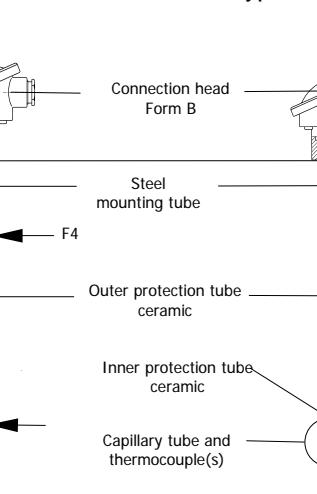
Type AM	Type AMK	Type BM	Type BMK						
									
Code for straight thermocouples	AM	AMK	BM						
Connection head	Form	A	B						
iTeh STANDARD PREVIEW (standards.itech.ai)		22 x 2	15 x 2						
Metal outer protection tubes		24 x 3	–						
Protection tube F x s ^a		26 x 4	–						
Ceramic inner protection tubes		C 610	10 x 1,5						
SIST EN 50446:2007 d469edbe9767/C-79950446-2007		–	10 x 2						
1 TC=1 thermocouple 2 TC=2 thermocouples Thermocouple acc. to EN 60584-1 Capillary tubes acc. to EN 50113	Ident letter	Diam.	–	–	–	–	–	–	–
	E, J, K, N ^{*)}	3,0	1 TC	2 TC	1 TC	2 TC	–	–	–
	E, J, K, N ^{*)}	2,5	1 TC	2 TC	1 TC	2 TC	–	–	–
	E, J, K, N ^{*)}	1,38	1 TC	2 TC	1 TC	2 TC	1 TC	2 TC	1 TC
	E, J, K, N ^{*)}	1,0	1 TC	2 TC	1 TC	2 TC	1 TC	2 TC	1 TC
	*) Thermocouple(s) preferably form A or B acc. to EN 50113.								
R, S, B ^{**)}	0,5; 0,35	–	–	1 TC	2 TC	–	–	1 TC	2 TC
	**) Thermocouple(s) preferably form C or D acc. to EN 50113.								
	Nominal length NL				–	355	500	710	1 000
	NOTE Depending on diameter, nominal length and design an additional support must be provided by the user in the case of horizontal mounting.				500	500	710	1 000	1 400
					710	710	1 400	–	–
					1 000	1 000	–	–	–
				1 400	1 400	–	–	–	–
				2 000 ^b	–	–	–	–	–

^a s = wall thickness of the protection tube.

^b This nominal length with built-in precious-metal thermocouple is not suitable for vertical mounting.

5 Straight thermocouples with ceramic protection tube

Table 2 – Types and dimensions, ceramic protection tube

Type AK	Type AKK	Type BK	Type BKK							
										
Code for straight thermocouples	AK	AKK	BK							
Connection head	Form	A	B							
Mounting tube, type of steel at the discretion of the manufacturer	$F_4 \times s / L_4$	32 x 2 / 200 22 x 2 / 150	15 x 2 / 80							
Protection tube F x s ^a	C 530	26 x 4	–							
	C 610	24 x 2,5	10 x 1,5							
	C 799	24 x 3	10 x 2,5 ^f							
	C 610N 50446 ^b	(15(16) x 2)	–							
Types AKK and BKK only										
Ident letter	Diam.									
K, N ^c)	3,0	1 TC	2TC ^d	1TC ^d	2TC ^d	–	–	–	–	
K, N ^c)	2,5	1 TC	2 TC	1 TC	2TC ^e	–	–	–	–	
Thermocouple acc. to EN 60584-1	K, N ^c)	1,38	1 TC	2 TC	1 TC	2 TC	1 TC	2 TC	–	–
Capillary tubes acc. to EN 50113	K, N ^c)	1,0	1 TC	2 TC	1 TC	2 TC	1 TC	2 TC	–	–
*) Thermocouple(s) preferably form A or B acc. to EN 50113.										
R, S, B ^{**})	0,5; 0,35	– g	– g	1 TC	2 TC	– g	– g	1 TC	2TC ^c	
**) Thermocouple(s) preferably form C or D acc. to EN 50113.										
Nominal length NL NOTE Depending on diameter, nominal length and design an additional support is to be provided by the user in the case of horizontal mounting.					–	355				
					500	500				
					710	710	–			
					1 000	1 000	–			
					1 400	–	–			
					2 000 ^b	–	–			

^a s = wall thickness of the support resp. the protection tube.

^b This nominal length with built-in precious-metal thermocouple is not suitable for vertical mounting.

^c Only thermocouples with 0,35 mm diam. can be installed.

^d Thermocouple(s) cannot be installed in ceramic protection tubes 15(16) x 2 and 15 x 2,5.

^e Thermocouples cannot be installed in ceramic inner protection tubes 10 x 2.

^f Ceramic inner protection tube is not possible.

^g Design without inner protection tube is not recommended.

Table 3 – Ident letters for metal protection tubes¹⁾

Ident. letter	Brief description	Material No.
H	St 35.8	1.0305
D	X 10 CrAl 24	1.4762
Q	X 15 CrNiSi 2520	1.4841
F	X 18 Cr Ni 28	1.4749
U	X 10 NiCrAlTi 3220 ^a	1.4876

^a Detailed material specifications as well as the available diameters and lengths are to be agreed upon between manufacturer and user.

Table 4 – Ident letters for ceramic protection tubes

Ident. letter	Material
T	C 530
U	C 610
Y	C 799
X	SiC re-crystallized, porous ^{a, b}
Z	SiC reaction-bonded, gas-tight ^{a, b}

^a Detailed material specifications as well as the available diameters and lengths are to be agreed upon between manufacturer and user.
^b For deviating dimensions see Table 6 and footnotes.

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Table 5 – Ident letters for thermocouples

Ident. letter	Thermocouple EN 60584-1
E	NiCr – CuNi
J	Fe – CuNi
K	NiCr – Ni
N	NiCrSi – NiSi
S	Pt 10 % Rh – Pt
R	Pt 13 % Rh – Pt
B	Pt 30 % Rh – Pt 6 % Rh

¹⁾ Coatings on metal protection tubes are to be agreed upon between manufacturer and user.