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Priključki za termoelektrične senzorje

Connectors for thermoelectric sensors

Steckverbindungen für Thermoelemente

Connecteurs pour capteurs thermoélectriques

Ta slovenski standard je istoveten z: EN 50212:2020

ICS:

17.200.20	Instrumenti za merjenje temperature	Temperature-measuring instruments

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English Version

Connectors for thermoelectric sensors

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European Committee for Electrotechnical Standardization
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Contents

Page

European foreword

This document (EN 50212:2020) has been prepared by CLC/TC 65X “Industrial-process measurement, control and automation”.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2021-03-09
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2023-03-09

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1 Scope

The object of this document is to determine the composition, nature of materials, manufacturing tests and thermoelectronic behaviour of connectors for sensors using thermocouples according to EN 60584-3:2008.

This document does not cover such special thermocouples as U, L and W types; nevertheless, the user of such special thermocouples can use the connectors described hereafter with some restrictions mentioned in the relevant paragraphs.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60584 (series), *Thermocouples*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 General

4.1 Connector types

4.1.1 Connectors with specified dimensional characteristics

They are defined in this standard by their dimensional, physical, electrical and chemical characteristics.

The types retained in this standard are:

— A type: connectors with cylindrical pins and cylindrical sockets;

— B type: connectors with flat pins and flat sockets.

4.1.2 Other connectors

The electrical characteristics are identical to those defined for connectors described in 4.1.1. Withdrawal tests, waterproof and dustproof tests, corrosion tests, test for resistance to heat will be stated by the manufacturer as list of technical characteristics.

The dimensional, physical and chemical characteristics peculiar to each manufacturer are not specified.

4.2 Marking for identification and polarities

The connectors shall comprise a permanent colour marking, e.g. either indelible superficial or mass colouring, or recessed coloured dots or coloured rings, etc.

At least the + polarity shall be indicated be permanent marking. Though non-compulsory, to avoid confusion with previous markings, or markings in other standards, the thermocouple type may be also additionally indicated, see Table 1.

Table 1 — Marking of thermocouple types

CODE	COLOUR
T	brown
J	black
E	violet
K	green
S	orange
R	orange
B	grey
N	pink

5 Electrical characteristics

5.1 Maximum allowable error when a temperature gradient is present

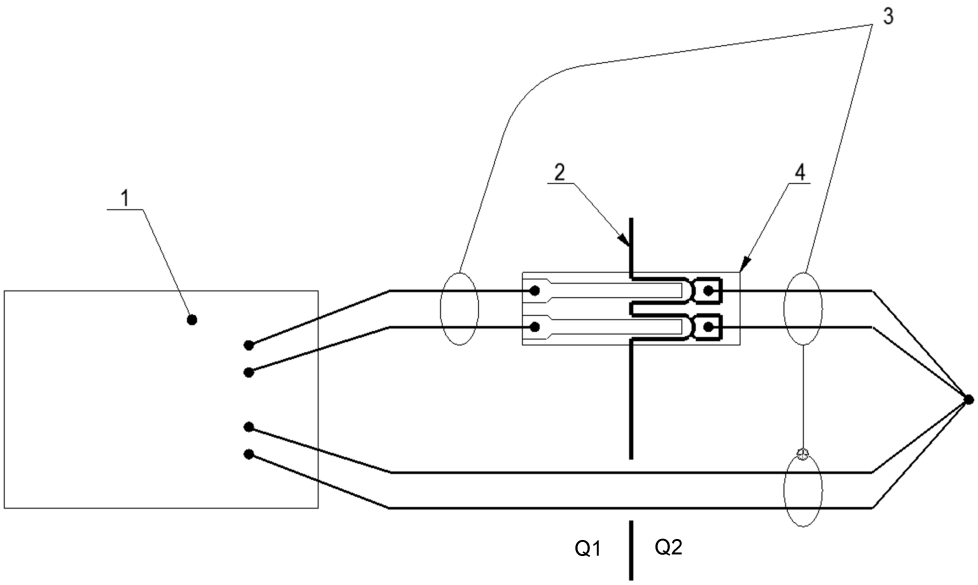
This test is only performed as a type test and is only relevant to a plug and socket assembly.

The maximum allowable errors with a temperature gradient of 40 K between temperatures Q_1 and Q_2 (see Figure 1) are stated in IEC 60584 series.

To measure them, the following methods shall be used:

a) Schematic representation

Refer to Figure 1.



Key

1 millivoltmeter
2 insulating barrier
3 connections cut out of the same reel of thermocouple corresponding to the nature of the connector to be tested
4 Pair of connectors

NOTE 1 $Q_2 - Q_1 = 40\ K \pm 2\ K$ (see 5.1).

NOTE 2 $0\ °C \leq Q_1 \leq 100\ °C$.

Figure 1 — Test set up for insertion error verification

b) Results

The measurements shall be made using a millivoltmeter having a metrological quality related to the error to be measured. The temperature/millivolt correspondence is stated in the relevant standard[1].

— The first measurement is made by direct connection by the thermocouple.

— The second measurement is made through the connector.

— The insertion error is the difference between the two values noted down one when directly connected by the thermocouple, and the other when connected through the connector.

5.2 Contact quality stability test

The error shall remain within the limits stated in Clause 5.1 after 250 plugging in and 250 plugging out of connector.

5.3 Insulation resistance

5.3.1 The insulation resistance between each pin and the other(s) and between each socket and the other(s) shall be at least 10 Mohms measured with 100 V DC, at the maximum temperature of the housing as specified by the manufacturer.

[1] IEC 60584.

5.3.2 The insulation resistance between each positive and negative pin or each positive and negative socket and an aluminium foil wrapping the connector housing shall be at least 10 Mohms measured with 100 V DC. This test may not apply to the earth pin or the earth socket.

5.4 Earth connection continuity

The earth connection continuity shall be maintained after 250 plugging in and 250 plugging out of the connector.

6 Dimensional characteristics

The dimensional characteristics:

— on the one hand A type connectors with 2 or 3 pins;

— on the other hand of B type connectors with 2 or 3 pins,

are given in the following Figures 2, 3 and 4, 5.

As to B type connectors with 3 pins, no dimensional characteristics are presently standardized, but such connectors shall fulfil the following prescriptions:

— it shall be possible to plug any B type plug with 3 pins, into a standardized B type socket with two socket contacts, a faulty insertion leading to a thermoelectric error being prevented. Removal of the earth-pin prior to such a plugging in is allowed;

— it shall be possible to plug into any B type socket with 3 socket contacts, a standardized B type plug with 2 pins, a faulty insertion leading to a thermoelectric error being prevented.