

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

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**Thermocouples –  
Part 3: Extension and compensating cables – Tolerances and identification  
system**

**Couples thermoélectriques –  
Partie 3: Câbles d'extension et de compensation – Tolérances et système  
d'identification**



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**THERMOCOUPLES –****Part 3: Extension and compensating cables –  
Tolerances and identification system****FOREWORD**

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International Standard IEC 60584-3 has been prepared by subcommittee 65B: Measurement and control devices, of IEC Technical Committee 65: Industrial-process measurement, control and automation.

This third edition cancels and replaces the second edition issued in 2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) revision of tolerance values to take recent technological advancement into account,
- b) addition of new colour coding for the thermocouple Type C and A in response to the newly revised IEC 60584-1 Edition 3: 2013,
- c) creation of an annex to provide examples of sizes for the rod, flat wire and strip of the compensating and extending conductors for thermocouples.

The text of this International Standard is based on the following documents:

| FDIS          | Report on voting |
|---------------|------------------|
| 65B/1189/FDIS | 65B/1191/RVD     |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## THERMOCOUPLES –

### Part 3: Extension and compensating cables – Tolerances and identification system

#### 1 Scope

It is necessary for thermocouple temperature measurement that the electro-motive force (abbreviated as e.m.f. hereafter) of the thermocouple circuit is precisely measured by a measuring instrument. A thermocouple is electrically connected to the instrument by a proper pair of electric cables. IEC 60584-3 standardizes these cables. It specifies identification and manufacturing tolerances for extension and compensating cables (mineral insulated extension and compensating cables are not included) provided directly to users of industrial processes. These tolerances are determined with respect to the e.m.f. versus temperature relationship of IEC 60584-1. The requirements for extension and compensating cables for use in industrial process control are specified.

Extension and compensating cables may consist of a single strand (solid) wire or multi-stranded wire for which this document is applied. Specification for extension and compensating conductors of forms of rods, flat wires or strips can be established by agreement between suppliers and users.

#### 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 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

#### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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>

##### 3.1

##### **extension cables**

cables manufactured from conductors having the same nominal composition as those of the corresponding thermocouple

Note 1 to entry: The cables are designated by the letter "X" following the designation of the thermocouple, for example "JX".

##### 3.2

##### **compensating cables**

cables manufactured from conductors having a composition different from the corresponding thermocouple