

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Low-voltage fuses –
Part 1: General requirements**

**Fusibles basse tension –
Partie 1: Exigences générales**

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IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.120.50

ISBN 978-2-8322-9108-5

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE FUSES –

Part 1: General requirements

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IEC 60269-1 has been prepared by subcommittee 32B: Low-voltage fuses, of IEC technical committee 32: Fuses. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2006, Amendment 1:2009 and Amendment 2:2014. This edition constitutes a technical revision.

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

- a) New numbering, editorial corrections and normative references updated;
- b) Term "discrimination" replaced by "selectivity" and "utilization category" by "utilization class";
- c) Term "fuses for authorized and unskilled persons" updated;
- d) Replacement of fuse-link added;

- e) Standard values for AC and DC voltages updated;
- f) Rated currents 425A, 355A, and 1 600A added;
- g) Marking: requirements and tests separated to the relevant subclauses;
- h) Requirements for temperature rise limited to terminal temperature rise only;
- i) Graphic symbol for fuse-base updated,

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

Draft	Report on voting
32B/748/FDIS	32B/756/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. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

IEC 60269 consists of the following parts, under the general title *Low-voltage fuses*:

- Part 1: General requirements
- Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) – Examples of standardized systems of fuses A to I
- Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household or similar application) – Examples of standardized systems of fuses A to F
- Part 4: Supplementary requirements for fuse-links for the protection of semiconductor devices
- Part 5: Guidance for the application of low-voltage fuses
- Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems
- Part 7: Battery Fuses

For reasons of convenience, when a part of this publication has come from other publications, a remark to this effect has been inserted in the text.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

LOW-VOLTAGE FUSES –

Part 1: General requirements

1 Scope

This part of IEC 60269 is applicable to fuses incorporating enclosed current-limiting fuse-links with rated breaking capacities of not less than 6 kA, intended for protecting power-frequency AC circuits of nominal voltages not exceeding 1 000 V or DC circuits of nominal voltages not exceeding 1 500 V.

Subsequent parts of this standard, referred to herein, cover supplementary requirements for such fuses intended for specific conditions of use or applications.

Fuse-links intended to be included in fuse-switch combinations according to IEC 60947-3 should also comply with the following requirements.

As far as not stated in subsequent parts for fuse-links, details of performance (see 3.2.4) on DC circuits should be stated in the manufacturer's literature.

NOTE 1 Modifications of, and supplements to, this document required for certain types of fuses for particular applications – for example, certain fuses for rolling stock, or fuses for high-frequency circuits – will be covered, if necessary, by separate standards.

NOTE 2 This document does not apply to miniature fuses, these being covered by IEC 60127.

The object of this standard series is to establish the characteristics of fuses or parts of fuses (fuse-base, fuse-carrier, fuse-link) in such a way that they can be replaced by other fuses or parts of fuses having the same characteristics provided that they are interchangeable as far as their dimensions are concerned. For this purpose, this standard series refers in particular to

- the following characteristics of fuses:
 - rated values;
 - insulation;
 - temperature rise in normal service;
 - power dissipation and acceptable power dissipation;
 - time/current characteristics;
 - breaking capacity;
 - cut-off current characteristics and their I^2t characteristics.
- type test for verification of the characteristics of fuses;
- the marking of fuses.

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 60269-2, *Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) – Examples of standardized systems of fuses A to K*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60584-1:2013, *Thermocouples – Part 1: EMF specifications and tolerances*

IEC 60617, *Graphical symbols for diagrams*

IEC 60664-1:2002, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

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>

NOTE For general definitions concerning fuses, see also IEC 60050-441.

3.1 Fuses and their component parts

3.1.1 fuse

device that by the fusing of one or more of its specially designed and proportioned components opens the circuit in which it is inserted by breaking the current when this exceeds a given value for a sufficient time. The fuse comprises all the parts that form the complete device

[SOURCE: IEC 60050-441:1984, 441-18-01]

3.1.2 fuse-holder

combination of the fuse-base with its fuse-carrier

Note 1 to entry: Where, in this document, the term "fuse-holder" is used, it covers fuse-bases and/or fuse-carriers, if no clearer distinction is necessary.

[SOURCE: IEC 60050-441:1984, 441-18-14]

3.1.2.1 fuse-base (fuse-mount)

fixed part of a fuse provided with contacts and terminals

Note 1 to entry: Where applicable, covers are considered as part of the fuse-base.

[SOURCE: IEC 60050-441:1984, 441-18-02]

3.1.2.2 fuse-carrier

movable part of a fuse designed to carry a fuse-link

[SOURCE: IEC 60050-441:1984, 441-18-13]

3.1.3**fuse-link**

part of a fuse including the fuse-element(s), intended to be replaced after the fuse has operated

[SOURCE: IEC 60050-441:1984, 441-18-09]

3.1.4**fuse-contact**

two or more conductive parts designed to ensure circuit continuity between a fuse-link and the corresponding fuse-holder

3.1.5**fuse-element**

part of the fuse-link designed to melt under the action of current exceeding some definite value for a definite period of time

Note 1 to entry: The fuse-link may comprise several fuse-elements in parallel.

[SOURCE: IEC 60050-441:1984, 441-18-08]

3.1.6**indicating device (indicator)**

part of a fuse provided to indicate whether the fuse has operated

[SOURCE: IEC 60050-441:1984, 441-18-17]

3.1.7**striker**

mechanical device forming part of a fuse-link which, when the fuse operates, releases the energy required to cause operation of other apparatus or indicators or to provide interlocking

[SOURCE: IEC 60050-441:1984, 441-18-18] [269-1:2024](https://standards.iteh.ai/catalog/standards/iec/73a85e9f-e87d-4acf-8154-66c43f6ba52f/iec-60269-1-2024)

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3.1.8**terminal**

conductive part of a fuse provided for electric connection to external circuits

Note 1 to entry: Terminals may be distinguished according to the kind of circuits for which they are intended (for example, main terminal, earth terminal, etc.) and also according to their design (for example, screw terminal, plug terminal, etc.).

3.1.9**dummy fuse-link**

test fuse-link with defined power dissipation and dimensions

3.1.10**test rig**

defined test fuse-base

3.1.11**gauge-piece**

additional part of a fuse-base intended to achieve a degree of non-interchangeability

3.1.12**linked fuse-carrier**

fuse-carrier which is mechanically linked to the fuse-base and gives a defined insertion and withdrawal movement to the fuse-link

3.2 General terms

3.2.1

enclosed fuse-link

fuse-link in which the fuse-element(s) is (are) totally enclosed, so that during operation within its rating it cannot produce any harmful external effects, for example, due to development of an arc, the release of gas or the ejection of flame or metallic particles

[SOURCE: IEC 60050-441:1984, 441-18-12]

3.2.2

current-limiting fuse-link

fuse-link that during and by its operation in a specified current range, limits the current to a substantially lower value than the peak value of the prospective current

[SOURCE: IEC 60050-441:1984, 441-18-10]

3.2.3

"g" fuse-link

<full-range breaking-capacity fuse-link, formerly general purpose fuse-link>

current-limiting fuse-link capable of breaking under specified conditions all currents, which cause melting of the fuse-element up to its rated breaking capacity

3.2.4

"a" fuse-link

<partial-range breaking-capacity fuse-link, formerly back-up fuse-link>

current-limiting fuse-link capable of breaking under specified conditions all currents between the lowest current indicated on its operating time-current characteristic ($k_2 I_n$ in Figure 2) and its rated breaking capacity

Note 1 to entry: "a" fuse-links are generally used to provide short-circuit protection. Where protection is required against over-currents less than $k_2 I_n$ in Figure 2, they are used in conjunction with another suitable switching device designed to interrupt such small overcurrents.

3.2.5

temperatures

3.2.5.1

ambient air temperature

T_a

temperature of the air surrounding the fuse (at a distance of about 1 m from the fuse or its enclosure, if any)

3.2.5.2

fuse-component temperature

T

<fuse-component (contact, terminal, etc.)>

temperature of the relevant part

3.2.6

overcurrent selectivity

coordination of the relevant characteristics of two or more overcurrent protective devices such that, on the occurrence of overcurrents within stated limits, the device intended to operate within these limits does so, while the other(s) do(es) not

[SOURCE: IEC 60050-441:1984, 441-17-15, modified – "discrimination" replaced by "selectivity" in term, "operating" replaced by "relevant" and "incidence" replaced by "occurrence" in definition]