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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Low-voltage fuses – Part 1: General requirements

Fusibles basse tension – Partie 1: Exigences générales

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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LOW-VOLTAGE FUSES –

Part 1: General requirements

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60269-1:2006+AMD1:2009+AMD2:2014 CSV. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

~~INTRODUCTION~~

~~A reorganization of the different parts of the IEC 60269 series has been carried out, in order to simplify its use, especially by the laboratories which test the fuses.~~

~~IEC 60269-1, IEC 60269-2, IEC 60269-3 and IEC 60269-3-1 have been integrated into either the new part 1 or the new parts 2 or 3, according to the subjects considered, so that the clauses which deal exclusively with "fuses for authorized persons" are separated from the clauses dealing with "fuses for unauthorized persons".~~

~~As far as IEC 60269-4 and IEC 60269-4-1 are concerned, they have been integrated into the new part 4 which deals with the fuse-links used for semiconductor protection.~~

LOW-VOLTAGE FUSES –

Part 1: General requirements

~~1 General~~

1 Scope ~~and object~~

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 For "a" fuse-links, details of performance (see 2.2.4) on d.c. circuits should be subject to agreement between user and manufacturer.~~

NOTE ~~2~~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 ~~3~~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 60038:1983, *IEC standard voltages*~~

~~IEC 60050(441):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 441: Switchgear, controlgear and fuses*~~
~~Amendment 1 (2000)~~

~~IEC 60228:2004, *Conductors of insulated cables*~~

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 ~~I)~~ K*

~~IEC 60269-3, *Low-voltage fuses – 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*~~

~~IEC 60269-4, *Low-voltage fuses – Part 4: Supplementary requirements for fuse-links for the protection of semiconductor devices*~~

~~IEC 60269-5, *Low-voltage fuses – Part 5: Guidance for the application of low-voltage fuses*~~

~~IEC 60269-6, *Low-voltage fuses – Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems*~~

~~IEC 60364-3:1993, *Electrical installations of buildings – Part 3: Assessment of general characteristics*~~

~~IEC 60364-5-52:2001, *Electrical installations of buildings – Part 5-52: Selection and erection of electrical equipment – Wiring system*~~

IEC 60529~~:1989~~, *Degrees of protection provided by enclosures (IP Code)*

IEC 60584-1:~~1995~~2013, *Thermocouples – Part 1: ~~Reference tables~~ 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*

~~IEC 60695-2-10, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*~~

~~IEC 60695-2-11:2000, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products*~~

~~IEC 60695-2-12:2000, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods – Glow-wire flammability index (GWFI) test method for materials*~~

~~IEC 60695-2-13:2000, *Fire hazard testing – Part 2-13: Glowing/hot-wire based test methods – Glow-wire ignition temperature (GWIT) test method for materials*~~

~~ISO 3:1973, *Preferred numbers – Series of preferred numbers*~~

~~ISO 478:1974, *Paper – Untrimmed stock sizes for the ISO-A series – ISO primary range*~~

~~ISO 593:1974, *Paper – Untrimmed stock size for the ISO-A series – ISO supplementary range*~~

~~ISO 4046:1978, *Paper, board, pulp and related terms – Vocabulary – Bilingual edition*~~

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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LOW-VOLTAGE FUSES –

Part 1: General requirements

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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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*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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FUSIBLES BASSE TENSION –

Partie 1: Exigences générales

AVANT-PROPOS

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9) L'IEC attire l'attention sur le fait que la mise en application du présent document peut entraîner l'utilisation d'un ou de plusieurs brevets. L'IEC ne prend pas position quant à la preuve, à la validité et à l'applicabilité de tout droit de brevet revendiqué à cet égard. À la date de publication du présent document, l'IEC n'avait pas reçu notification qu'un ou plusieurs brevets pouvaient être nécessaires à sa mise en application. Toutefois, il y a lieu d'avertir les responsables de la mise en application du présent document que des informations plus récentes sont susceptibles de figurer dans la base de données de brevets, disponible à l'adresse https://patents.iec.ch. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 60269-1 a été établie par le sous-comité 32B: Coupe-circuits à fusibles à basse tension, du comité d'études 32 de l'IEC: Coupe-circuits à fusibles. Il s'agit d'une Norme internationale.

Cette cinquième édition annule et remplace la quatrième édition parue en 2006, l'Amendement 1:2009 et l'Amendement 2:2014. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) nouvelle numérotation, corrections rédactionnelles et références normatives mises à jour;
b) le terme "discrimination" a été remplacé par "selectivity" en anglais (aucune incidence sur le terme français "sélectivité") et le terme "catégorie d'emploi" a été remplacé par "classe d'emploi";
c) le terme "fusibles destinés à être utilisés par des personnes habilitées et non qualifiées" a été mis à jour;
d) le paragraphe "Remplacement des éléments de remplacement" a été ajouté;
e) les valeurs normalisées pour les tensions en courant alternatif et en courant continu ont été mises à jour;
f) les valeurs de courant assigné 425A, 355A et 1 600A ont été ajoutées;
g) marquages: les exigences et les essais ont été séparés dans les paragraphes appropriés;
h) les exigences relatives à l'échauffement se limitent à l'échauffement des bornes uniquement;
i) le symbole graphique pour le socle a été mis à jour.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
32B/748/FDIS	32B/756/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

La version française de cette norme n'a pas été soumise au vote.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

L'IEC 60269, publiée sous le titre général *Fusibles basse tension*, est composée des parties suivantes:

Partie 1: Exigences générales
Partie 2: Exigences supplémentaires pour les fusibles destinés à être utilisés par des personnes habilitées (fusibles pour usages essentiellement industriels) – Exemples de systèmes de fusibles normalisés A à I
Partie 3: Exigences supplémentaires pour les fusibles destinés à être utilisés par des personnes non qualifiées (fusibles pour usages essentiellement domestiques et analogues) – Exemples de systèmes de fusibles normalisés A à F
Partie 4: Exigences supplémentaires concernant les éléments de remplacement utilisés pour la protection des dispositifs à semiconducteurs
Partie 5: Lignes directrices pour l'application des fusibles basse tension
Partie 6: Exigences supplémentaires concernant les éléments de remplacement utilisés pour la protection des systèmes d'énergie solaire photovoltaïque
Partie 7: Fusibles pour batteries

Pour des raisons de commodité, lorsqu'une partie de cette publication est issue d'autres publications, une remarque a été insérée dans le texte.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé, ou
- révisé.

FUSIBLES BASSE TENSION –

Partie 1: Exigences générales

1 Domaine d'application

La présente partie de l'IEC 60269 s'applique aux fusibles qui incorporent des éléments de remplacement limiteurs de courant à fusion enfermée dont le pouvoir de coupure assigné est supérieur ou égal à 6 kA, destinés à assurer la protection des circuits à courant alternatif à fréquence industrielle dont la tension nominale ne dépasse pas 1 000 V ou des circuits à courant continu dont la tension nominale ne dépasse pas 1 500 V.

Les autres parties de la présente norme, citées dans le présent document, établissent des exigences supplémentaires pour les fusibles destinés à des conditions d'utilisation ou des applications spécifiques.

Il convient que les éléments de remplacement destinés à être utilisés dans des combinaisons fusibles/interrupteurs selon l'IEC 60947-3 respectent également les exigences suivantes.

Sauf indication contraire dans les autres parties relatives aux éléments de remplacement, il convient d'indiquer les caractéristiques de fonctionnement (voir le 3.2.4) sur les circuits à courant continu dans la documentation technique du fabricant.

NOTE 1 Les modifications et compléments au présent document, exigés pour certains types de fusibles destinés à des applications particulières – par exemple, fusibles destinés au matériel roulant ou aux circuits à haute fréquence – sont traités dans des normes distinctes, si nécessaire.

NOTE 2 Le présent document ne s'applique pas aux fusibles miniatures, qui sont couverts par l'IEC 60127.

Cette série de normes a pour objet d'établir les caractéristiques des fusibles ou de leurs parties (socle, porte-élément de remplacement, élément de remplacement) de sorte qu'ils puissent être remplacés par d'autres fusibles ou parties de fusibles possédant les mêmes caractéristiques, sous réserve qu'ils soient interchangeables du point de vue de leurs dimensions. À cette fin, cette série de normes traite en particulier des points suivants:

– les caractéristiques suivantes des fusibles:
  - valeurs assignées;
  - isolement;
  - échauffement en service normal;
  - puissance dissipée et puissance dissipée acceptable;
  - caractéristiques temps/courant;
  - pouvoir de coupure;
  - caractéristiques de courant coupé limité et caractéristiques I^2t;
– un essai de type destiné à vérifier les caractéristiques des fusibles;
– le marquage des fusibles.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60269-2*, Fusibles basse tension – Partie 2: Exigences supplémentaires pour les fusibles destinés à être utilisés par des personnes habilitées (fusibles pour usages essentiellement industriels) – Exemples de systèmes de fusibles normalisés A à K*

IEC 60529, *Degrés de protection procurés par les enveloppes (Code IP)*

IEC 60584-1:2013, *Couples thermoélectriques – Partie 1: Spécifications et tolérances en matière de FEM*

IEC 60617, *Symboles graphiques pour schémas*

IEC 60664-1:2002, *Coordination de l'isolement des matériels dans les réseaux d'énergie électrique à basse tension – Partie 1: Principes, exigences et essais*