

**SLOVENSKI  
STANDARD**

**SIST EN 60269-1:2000**

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april 2000

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Low-voltage fuses - Part 1: General requirements (IEC 60269-1:1998)

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English version

**Low-voltage fuses**  
**Part 1: General requirements**  
(IEC 60269-1:1998)

Fusibles basse tension  
Partie 1: Règles générales  
(CEI 60269-1:1998)

Niederspannungssicherungen  
Teil 1: Allgemeine Anforderungen  
(IEC 60269-1:1998)

This European Standard was approved by CENELEC on 1998-10-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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

The text of document 32B/308/FDIS, future amendment to IEC 60269-1:1986, prepared by SC 32B, Low-voltage fuses, of IEC TC 32, Fuses, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A3 to EN 60269-1:1989 on 1998-10-01.

The text of this document, together with that of IEC 60269-1:1986 and its amendments 1:1994 and 2:1995, was published by IEC as the third edition of IEC 60269-1 in December 1998. According to a decision of principle taken by the Technical Board of CENELEC, the approval of EN 60269-1:1989/A3 has been converted into the approval of a new EN 60269-1.

This European Standard supersedes EN 60269-1:1989 + A1:1994 + A2:1998.

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) 1999-07-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2001-07-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A, B, C and D are informative.

Annex ZA has been added by CENELEC.

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### Endorsement notice

The text of the International Standard IEC 60269-1:1998 was approved by CENELEC as a European Standard without any modification.

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**Annex ZA (normative)**

**Normative references to international publications  
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60038 (mod)	1983	IEC standard voltages <sup>1)</sup>	HD 472 S1	1989
IEC 60050(441)	1984	International Electrotechnical Vocabulary (IEV) Chapter 441: Switchgear, controlgear and fuses	-	-
IEC 60127	series	Miniature fuses	EN 60127	series
IEC 60269-2	1986	Low-voltage fuses Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application)	EN 60269-2	1995
IEC 60291	1969	Fuse definitions	-	-
IEC 60291A	1974	First supplement	-	-
IEC 60364-3 (mod)	1993	Electrical installations of buildings Part 3: Assessment of general characteristics	HD 384.3 S2	1995
IEC 60364-5-523 (mod)	1983	Part 5: Selection and erection of electrical equipment Chapter 52: Wiring systems Section 523: Current-carrying capacities	HD 384.5.523 S1	1991
IEC 60417	1973	Graphical symbols for use on equipment Index, survey and compilation of the single sheets	HD 243 S12 <sup>2)</sup>	1995

1) The title of HD 472 S1 is: *Nominal voltages for low-voltage public electricity supply systems.*

2) HD 243 S12 includes supplements A:1974 to M:1994 to IEC 60417.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 60584-1	1995	Thermocouples Part 1: Reference tables	EN 60584-1	1995
IEC 60695-2-1/0	1994	Fire hazard testing Part 2: Test methods Section 1/sheet 0: Glow-wire test methods General	EN 60695-2-1/0	1996
IEC 60695-2-1/1 + corr. May	1994 1995	Section 1/sheet 1: Glow-wire end-product test and guidance	EN 60695-2-1/1	1996
IEC 60695-2-1/2	1994	Section 1/sheet 2: Glow-wire flammability test on materials	EN 60695-2-1/2	1996
IEC 60695-2-1/3	1994	Section 1/sheet 3: Glow-wire ignitability test on materials	EN 60695-2-1/3	1996
IEC 60947-3 + corr. December A1 A2	1990 1991 1994 1997	Low-voltage switchgear and controlgear Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units	EN 60947-3 + corr. June A1 + corr. June A2	1992 1997 1995 1997 1997
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	-	-

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IEC**

**60269-1**

Troisième édition  
Third edition  
1998-12

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**Fusibles basse tension –**

**Partie 1:  
Règles générales**

**Low-voltage fuses –**

**Part 1:  
General requirements**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## LOW-VOLTAGE FUSES –

## Part 1: General requirements

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

This third edition cancels and replaces the second edition published in 1986, amendment 1 (1994) and amendment 2 (1995), and constitutes a technical revision.

The text of this standard is based on the second edition, amendments 1 and 2 and the following documents:

FDIS	Report on voting
32B/308/FDIS	32B/316/RVD

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

Annexes A, B, C and D are for information only.

The new edition of IEC 60269: Low-voltage fuses, is divided into the following parts:

- Part 1: General requirements (IEC 60269-1)
- Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) (IEC 60269-2)

- Part 2-1: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) – Sections I to V: Examples of types of standardized fuses (IEC 6029-2-1)
- Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications) (IEC 60269-3)
- Part 3-1: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications) – Sections I to IV (IEC 60629-3-1)
- Part 4: Supplementary requirements for fuse-links for the protection of semiconductor devices (IEC 60269-4)

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## LOW-VOLTAGE FUSES –

### Part 1: General requirements

#### 1 General

##### 1.1 Scope and object

This standard 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 a.c. circuits of nominal voltages not exceeding 1 000 V or d.c. 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.

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 – Modifications of, and supplements to, this standard 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 – This standard does not apply to miniature fuses, these being covered by IEC 60127.

The object of this standard 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 refers in particular to:

- the following characteristics of fuses:
  - a) their rated values;
  - b) their insulation;
  - c) their temperature rise in normal service;
  - d) their power dissipation and acceptance;
  - e) their time/current characteristics;
  - f) their breaking capacity;
  - g) their cut-off current characteristics and their  $I^2t$  characteristics.
- type test for verification of the characteristics of fuses;
- the marking of fuses.

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## 1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60269. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60269 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60038:1983, *IEC standard voltages*

IEC 60050(411):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 441: Switchgear, controlgear and fuses*

IEC 60127, *Cartridge fuse-links for miniature fuses*

IEC 60269-2:1986, *Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application)*

IEC 60291:1969, *Fuse definitions*

IEC 60291A:1974, *First supplement*

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

IEC 60364-5-523:1983, *Electrical installations of buildings – Part 5: Selection and erection of electrical equipment – Chapter 52: Wiring system – Section 523: Current-carrying capacities*

IEC 60947-3:1998, *Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

IEC 60417:1973, *Graphical symbols for use on equipment – Index, survey and compilation of the single sheets*

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

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

IEC 60695-2-1/0:1994, *Fire hazard testing – Part 2: Test methods – Section 1/sheet 0: Glow-wire test methods – General*

IEC 60695-2-1/1:1994, *Fire hazard testing – Part 2: Test methods – Section 1/sheet 1: Glow-wire end-product test and guidance*

IEC 60695-2-1/2:1994, *Fire hazard testing – Part 2: Test methods – Section 1/sheet 2: Glow-wire flammability test on materials*

IEC 60692-2-1/3:1994, *Fire hazard testing – Part 2: Test methods – Section 1/sheet 3: Glow-wire ignitability test on 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*



## 2 Definitions

NOTE – For general definitions concerning fuses, see also IEC 60291 and IEC 60050-441.

For the purpose of this standard, the following definitions shall apply.

### 2.1 Fuses and their component parts

#### 2.1.1

##### **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

#### 2.1.2

##### **fuse-holder**

combination of the fuse-base with its fuse-carrier. (Where in this standard the term "fuse-holder" is used, it covers fuse-bases and/or fuse-carriers, if no clearer distinction is necessary)

##### 2.1.2.1

##### **fuse-base (fuse-mount)**

fixed part of a fuse provided with contacts, terminals and covers, where applicable

##### 2.1.2.2

##### **fuse-carrier**

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

#### 2.1.3

##### **fuse-link**

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

#### 2.1.4

##### **fuse-contact**

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

#### 2.1.5

##### **fuse-element**

part of a fuse-link designed to melt when the fuse operates. The fuse-link may comprise several fuse-elements in parallel

#### 2.1.6

##### **indicating device (indicator)**

device provided to indicate whether the fuse has operated

#### 2.1.7

##### **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

**2.1.8****terminal**

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

NOTE – Terminals may be distinguished according to the kind of circuits for which they are intended (e.g. main terminal, earth terminal, etc.) and also according to their design (e.g. screw terminal, plug terminal, etc.).

**2.1.9****dummy fuse-link**

test fuse-link with defined power dissipation and dimensions

**2.1.10****test rig**

defined test fuse-base

**2.1.11****gauge-piece**

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

**2.2 General terms****2.2.1****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, e.g. due to development of an arc, the release of gas or the ejection of flame or metallic particles

**2.2.2****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

**2.2.3****"g" 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

**2.2.4****"a" 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 – "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.

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**2.2.5****temperatures****2.2.5.1****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)