



**SLOVENSKI STANDARD**  
**SIST EN 60282-1:2010**  
**01-marec-2010**

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**Visokonapetostne varovalke - 1. del: Tokovno omejlne varovalke (IEC 60282-1:2009)**

High-voltage fuses - Part 1: Current-limiting fuses (IEC 60282-1:2009)

Hochspannungssicherungen - Teil 1: Strombegrenzende Sicherungen (IEC 60282-1:2009)

**iTeh STANDARD PREVIEW**

Fusibles à haute tension - Partie 1: Fusibles limiteurs de courant (CEI 60282-1:2009)

**Ta slovenski standard je istoveten z: EN 60282-1:2009**

SIST EN 60282-1:2010  
<https://standards.iteh.ai/catalog/standards/sist/17453ccb-6bd9-4770-acf2-0a03b78b8040/sist-en-60282-1-2010>

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**ICS:**

29.120.50 Xæ[ çæ ^ Ái ~ \* æ Fuses and other overcurrent protection devices  
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**SIST EN 60282-1:2010**

**en,fr**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60282-1**

December 2009

ICS 29.120.50

Supersedes EN 60282-1:2006

English version

**High-voltage fuses -  
Part 1: Current-limiting fuses  
(IEC 60282-1:2009)**

Fusibles à haute tension -  
Partie 1: Fusibles limiteurs de courant  
(CEI 60282-1:2009)

Hochspannungssicherungen -  
Teil 1: Strombegrenzende Sicherungen  
(IEC 60282-1:2009)

This European Standard was approved by CENELEC on 2009-11-01. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 32A/274/FDIS, future edition 7 of IEC 60282-1, prepared by SC 32A, High-voltage fuses, of IEC TC 32, Fuses, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60282-1 on 2009-11-01.

This European Standard supersedes EN 60282-1:2006.

The changes introduced by this new edition are only editorial.

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) 2010-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2012-11-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 60282-1:2009 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC/TR 60890	NOTE	Harmonized as CLC/TR 60890:2002 (not modified).
IEC 62271-1	NOTE	Harmonized as EN 62271-1:2008 (not modified).
IEC 62271-100	NOTE	Harmonized as EN 62271-100:2009 (not modified).

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## Annex ZA (normative)

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

The following referenced documents are indispensable for the application 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.

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 60060-1	1989	High-voltage test techniques - Part 1: General definitions and test requirements	HD 588.1 S1	1991
IEC 60071-1	2006	Insulation co-ordination - Part 1: Definitions, principles and rules	EN 60071-1	2006
IEC 60085	2007	Electrical insulation - Thermal evaluation and designation	EN 60085	2008
IEC 60265-1	1998	High-voltage switches - Part 1: Switches for rated voltages above 1 kV and less than 52 kV	EN 60265-1	1998
IEC 60549	1976	High-voltage fuses for the external protection of shunt power capacitors	-	-
IEC 60644	1979	Specification for high-voltage fuse-links for motor circuit applications	EN 60644	1993
IEC/TR 60787	2007	Application guide for the selection of high-voltage current-limiting fuse-links for transformer circuits	-	-
IEC 62271-105	2002	High-voltage switchgear and controlgear - Part 105: Alternating current switch-fuse combinations	EN 62271-105	2003
ISO 148-2	- <sup>1)</sup>	Metallic materials - Charpy pendulum impact test - Part 2: Verification of test machines	EN ISO 148-2	2008 <sup>2)</sup>
ISO 179	Series	Plastics - Determination of Charpy impact properties	EN ISO 179	Series

<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

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IEC 60282-1

Edition 7.0 2009-10

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

High-voltage fuses – **STANDARD PREVIEW**  
Part 1: Current-limiting fuses  
(standards.iteh.ai)

Fusibles à haute tension – **SIST EN 60282-1:2010**  
Partie 1: Fusibles limiteurs de courant  
https://standards.iteh.ai/catalog/standards/sist/17433ce6-bbd9-4770-acf2-0a03b78b8040/sist-en-60282-1-2010

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

PRICE CODE **XC**  
CODE PRIX

ICS 29.120.50

ISBN 2-8318-1064-6

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## HIGH-VOLTAGE FUSES –

## Part 1: Current-limiting fuses

## 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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International Standard IEC 60282-1 has been prepared by subcommittee 32A: High-voltage fuses, of IEC technical committee 32: Fuses.

This seventh edition cancels and replaces the sixth edition published in 2005. The changes introduced by this new edition are only editorial.

The text of this standard is based on the following documents:

FDIS	Report on voting
32A/274/FDIS	32A/277/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 60282 series, under the general title *High-voltage fuses*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

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SIST EN 60282-1:2010

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## HIGH-VOLTAGE FUSES –

### Part 1: Current-limiting fuses

## 1 General

### 1.1 Scope

This part of IEC 60282 applies to all types of high-voltage current-limiting fuses designed for use outdoors or indoors on alternating current systems of 50 Hz and 60 Hz and of rated voltages exceeding 1 000 V.

Some fuses are provided with fuse-links equipped with an indicating device or a striker. These fuses come within the scope of this standard, but the correct operation of the striker in combination with the tripping mechanism of the switching device is outside the scope of this standard; see IEC 62271-105.

### 1.2 Normative references

The following referenced documents are indispensable for the application 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 60060-1:1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

[SIST EN 60282-1:2010](https://standards.iteh.ai/catalog/standards/sist/17433ce6-bbd9-4770-acf2-497e26650474/iec-60060-1-1989)

<https://standards.iteh.ai/catalog/standards/sist/17433ce6-bbd9-4770-acf2-497e26650474/iec-60060-1-1989>

IEC 60071-1:2006, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60085:2007, *Electrical insulation – Thermal evaluation and designation*

IEC 60265-1:1998, *High-voltage switches – Part 1: Switches for rated voltages above 1 kV and less than 52 kV*

IEC 60549:1976, *High-voltage fuses for the external protection of shunt power capacitors*

IEC 60644:1979, *Specification for high-voltage fuse-links for motor circuit applications*

IEC/TR 60787:2007, *Application guide for the selection of high-voltage current-limiting fuse-links for transformer circuits*

IEC 62271-105:2002, *High-voltage switchgear and controlgear – Part 105: Alternating current switch-fuse combinations*

ISO 148-2, *Metallic materials – Charpy pendulum impact test – Part 2: Verification of test machines*

ISO 179 (all parts), *Plastics – Determination of Charpy impact properties*

## 2 Normal and special service conditions

### 2.1 Normal service conditions

Fuses complying with this standard are designed to be used under the following conditions.

- a) The maximum ambient air temperature is 40 °C and its mean measured over a period of 24 h does not exceed 35 °C.

The minimum ambient air temperature is –25 °C.

NOTE 1 The time-current characteristics of fuses will be modified at the minimum and maximum temperatures.

- b) The altitude does not exceed 1 000 m.

NOTE 2 The rated voltages and insulation levels specified in this standard apply to fuses intended for use at altitudes not exceeding 1 000 m. When fuses incorporating external insulation are required for use at altitudes above 1 000 m, one or other of the following procedures should be adopted.

- a) The test voltages for insulating parts in air should be determined by multiplying the standard test voltages given in Tables 4 and 5 by the appropriate correction factor given in column (2) of Table 1.
- b) The fuses may be selected with a rated voltage which, when multiplied by the appropriate correction factor given in column (3) of Table 1 is not lower than the highest voltage of the system.

For altitudes between 1 000 m and 1 500 m and between 1 500 m and 3 000 m, the correction factors can be obtained by linear interpolation between the values in Table 1.

**Table 1 – Altitude correction factors – Test voltage and rated voltage**

Maximum altitude m (1)	Correction factor for test voltages referred to sea-level (2)	Correction factor for rated voltages (3)
1 000	1,0	1,0
1 500	1,05	0,95
3 000	1,25	0,80

Where the dielectric characteristics are identical at any altitude, no special precautions need to be taken.

NOTE 3 The rated current or the temperature rise specified in this standard can be corrected for altitudes exceeding 1 000 m by using the appropriate factors given in Table 2, columns (2) and (3) respectively. Use one correction factor from columns (2) or (3), but not both, for any one application.

For altitudes between 1 000 m and 1 500 m and between 1 500 m and 3 000 m, the correction factors can be obtained by linear interpolation between the values in Table 2.

**Table 2 – Altitude correction factors – Rated current and temperature rise**

Maximum altitude m (1)	Correction factor for rated current (2)	Correction factor for temperature rise (3)
1 000	1,0	1,0
1 500	0,99	0,98
3 000	0,96	0,92

- c) The ambient air is not excessively (or abnormally) polluted by dust, smoke, corrosive or flammable gases, vapour or salt.
- d) For indoor installations, the conditions of humidity are under consideration but, in the meantime, the following figures can be used as a guidance:
- the average value of the relative humidity, measured during a period of 24 h, does not exceed 95 %;
  - the average value of the vapour pressure, for a period of 24 h, does not exceed 22 hPa;
  - the average value of the relative humidity, for a period of one month, does not exceed 90 %;