

**Madalpingelised sulavkaitsmed. Osa 6: Lisanõuded
solaar-fotoelektriliste energiapaigaldiste
sulavkaitsmetele**

Low-voltage fuses - Part 6: Supplementary requirements for
fuse-links for the protection of solar photovoltaic energy
systems

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60269-6:2011 sisaldab Euroopa standardi EN 60269-6:2011 ingliskeelset teksti.

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**Low-voltage fuses -
Part 6: Supplementary requirements for fuse-links for the protection of
solar photovoltaic energy systems**
(IEC 60269-6:2010 + corrigendum Dec. 2010)

Fusibles basse tension
Partie 6: Exigences supplémentaires
concernant les éléments de remplacement
utilisés pour la protection des systèmes
d'énergie solaire photovoltaïque
(CEI 60269-6:2010 + corrigendum Dec.
2010)

Niederspannungssicherungen -
Teil 6: Zusätzliche Anforderungen an
Sicherungseinsätze für den Schutz von
solaren photovoltaischen
Energieerzeugungssystemen
(IEC 60269-6:2010 + corrigendum Dec.
2010)

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CENELEC

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

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Foreword

The text of document 32B/561/FDIS, future edition 1 of IEC 60269-6, prepared by IEC/SC 32B, Low-voltage fuses, of IEC TC 32, Fuses, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60269-6 on 2011-04-01.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level on publication of an identical national standard or by endorsement | (dop) | 2012-01-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2014-04-01 |

This part is to be used in conjunction with EN 60269-1:2007, Low-voltage fuses, Part 1: General requirements.

This Part 6 supplements or modifies the corresponding clauses or subclauses of Part 1.

Where no change is necessary, this Part 6 indicates that the relevant clause or subclause applies.

Tables and figures which are additional to those in Part 1 are numbered starting from 101.

Additional annexes are lettered AA, BB, etc.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60269-6:2010 + corrigendum December 2010 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 60269 series	NOTE	Harmonized in EN 60269 series (partially modified).
IEC 60269-3	NOTE	Harmonized as HD 60269-3.
IEC 60269-4	NOTE	Harmonized as EN 60269-4.
IEC 60364-7-712	NOTE	Harmonized as HD 60364-7-712.
IEC 61215	NOTE	Harmonized as EN 61215.
IEC 61646	NOTE	Harmonized as EN 61646.
IEC/TS 61836:2007	NOTE	Harmonized as CLC/TS 61836:2009 (not modified).

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 60269-1 + A1	2006 2009	Low-voltage fuses - Part 1: General requirements	EN 60269-1 + A1	2007 2009
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 J	HD 60269-2	-
ISO 3	-	Preferred numbers - Series of preferred numbers	-	-

CORRIGENDUM 1

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Insert the following note after 8.4.3.1:

NOTE The tests in IEC 60269-6 are deemed to give satisfactory results for operation at $1,35 I_n$ within two hours in typical applications. If this test arrangement is not applicable, special tests shall be performed according to the manufacturer's instructions and all pertinent data shall be recorded in the test report.

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Introduire la note suivante après 8.4.3.1:

NOTE Les essais de la CEI 60269-6 sont considérés donner des résultats satisfaisants pour un fonctionnement à $1,35 I_n$ en deux heures dans une application pratique. Si ce dispositif d'essai n'est pas applicable, des essais spéciaux doivent être exécutés selon les instructions du constructeur et toutes les données pertinentes doivent être enregistrées dans le rapport d'essai.

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LOW-VOLTAGE FUSES –

Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems

1 General

IEC 60269-1 applies with the following supplementary requirements.

Fuse-links for the protection of solar photovoltaic (PV) energy systems shall comply with all requirements of IEC 60269-1, if not otherwise indicated hereinafter, and shall also comply with the supplementary requirements laid down below.

NOTE The abbreviation "PV" (photovoltaic) is used in this document.

1.1 Scope and object

These supplementary requirements apply to fuse-links for protecting PV strings and PV arrays in equipment for circuits of nominal voltages up to 1 500 V d.c.

Their rated voltage may be up to 1 500 V d.c.

NOTE 1 Such fuse-links are commonly referred to as "PV fuse-links".

NOTE 2 In most cases, a part of the associated equipment serves the purpose of a fuse-base. Owing to the great variety of equipment, no general rules can be given; the suitability of the associated equipment to serve as a fuse-base should be subject to agreement between the manufacturer and the user. However, if separate fuse-bases or fuse-holders are used, they should comply with the appropriate requirements of IEC 60269 series.

NOTE 3 PV fuse-links protect down stream inverter components such as capacitors or the discharge of capacitors back into the arrays or array wiring up to the rated breaking capacity.

The object of these supplementary requirements is to establish the characteristics of PV fuse-links in such a way that they can be replaced by other fuse-links having the same characteristics, provided that their dimensions are identical. For this purpose, this standard refers in particular to

a) the following characteristics of fuses:

- 1) their rated values;
- 2) their utilisation category;
- 3) their temperature rises in normal service;
- 4) their power dissipation;
- 4) their time-current characteristics;
- 6) their breaking capacity;
- 7) their dimensions or size (if applicable).

b) type tests for verification of the characteristics of fuses;

c) the markings on fuses.

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 60269-1:2006, *Low-voltage fuses – Part 1: General requirements*¹
Amendment 1 (2009)

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 J*

ISO 3, *Preferred numbers – Series of preferred numbers*

2 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60269-1 as well as the following apply.

2.2 General terms

2.2.101

photovoltaic fuse-link

fuse-link capable of breaking, under specific conditions, any current value within the breaking range (see 7.5)

NOTE A PV fuse-link operates under two main conditions:

- Short-circuit in a string or in an array which leads to a very low over-current.
- Short-circuit current supplied by the discharge of the PV inverter through a very low inductance. This short-circuit condition leads to a very high rate of rise of current equivalent to a low value of time constant, corresponding to Table 104.

2.2.102

photovoltaic cell

most elementary photovoltaic device which generates d.c. voltage by the absorption of photons

[IEC 61836, 3.1.43 a) and d) modified]

2.2.103

photovoltaic module

complete and environmentally protected assembly of interconnected PV cells

[IEC 61836, 3.1.43 f)]

2.2.104

photovoltaic array, array field, assembly, generator, panel, string, sub-array

2.2.104.1

photovoltaic array

assembly of mechanically integrated and electrically interconnected PV modules, PV panels or PV sub-array and its support structure

2.2.104.2

photovoltaic array field

aggregate of all PV arrays within a given PV system focusing on the mechanical arrangement of the PV technology

2.2.104.3

photovoltaic assembly

PV components that are installed outdoors and remote from its loads, including modules, support structure, foundation, wiring, tracking apparatus, and thermal control (where specified),

¹ There is a consolidated edition 4.1 (2009) that includes IEC 60269-1(2006) and its amendment 1 (2009).