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Interested committees:

Title: Draft BS EN IEC 61643-11 Low-voltage surge protective devices. Part 11: Surge protective devices connected to AC low-voltage power systems - Requirements and test methods.

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

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- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



37A/368/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER: IEC 61643-11 ED2	
DATE OF CIRCULATION: 2022-01-07	CLOSING DATE FOR COMMENTS: 2022-04-29
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IEC SC 37A : LOW-VOLTAGE SURGE PROTECTIVE DEVICES	
SECRETARIAT: United States of America	SECRETARY:
OF INTEREST TO THE FOLLOWING COMMITTEES: SC 37B, TC 64, TC 81, TC 82, TC 109	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Low-voltage surge protective devices - Part 11: Surge protective devices connected to AC low-voltage power systems - Requirements and test methods

NOTE FROM TC/SC OFFICERS:

Part 11 refers to part 01 (see IEC 37A/366/CD: IEC 61643-01 ED1)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

**Part 11: Surge protective devices connected
to AC low-voltage power systems –
Requirements and test methods**

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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 - 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.
- International Standard IEC 61643-11 has been prepared by subcommittee 37A: Low-voltage surge protective devices, of IEC technical committee 37: Surge arresters.

This second edition cancels and replaces the first edition published in 2011-03-09, whereby the common requirements for all SPDs are now contained in IEC 61643-01, and this second edition only contains the specific requirements for SPDs for AC applications. This edition constitutes a technical revision.

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

- a) Clarification on test application either to a complete SPD, to a "mode of protection", or to a complete "SPD assembly"

- b) Additional measurement of voltage protection level on “combined modes of protection” between live conductors and PE
- c) Additional duty test for T1 SPD and T2 SPD with follow current to check for increased follow current at lower impulse current amplitude
- d) Modified and amended short circuit current test requirements to better cover up to date internal SPD disconnecter technologies
- e) Improved dielectric test requirements for the SPD’s main circuits and added dielectric test requirements for “electrically separated circuits”
- f) Additional clearance requirements for “electrically separated circuits”

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

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

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

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

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

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

The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for national implementation not earlier than 12 months and not later than 36 months from the date of publication.

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

The National Committees are requested to note that for this document the stability date is 20XX.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of SPDs when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the SPD is connected to the supply mains. However, national wiring rules may differ.

If the intended applications of an SPD are covered by different parts of the IEC 61643-X1 (X = 1,2,3,4, etc.) series, all relevant parts shall be applied, as far as is reasonable.

NOTE to entry: Throughout this publication, when "part 01" is mentioned, it refers to IEC 61643-01, and when "part 11" is mentioned, it refers to this standard.

This part of the IEC 61643 series addresses safety and performance tests for surge protective devices (SPDs) for AC applications in conjunction with part 01.

This part 11 addresses T1 SPD, T2 SPD and T3 SPD according to part 01.

The requirements of this part 11 supplement, modify or replace certain of the general requirements contained in part 01 and shall be read and applied together with the latest edition of part 01, as indicated by the undated normative reference in the normative references of this document.

Numbering of clauses follows the numbering of part 01, but, dependent on the application of clauses from part 01, does not necessarily follow sequentially.

If a clause in part 01 is not explicitly called up or referred to in this part 11, then this clause does not apply to SPDs covered by this part 11. Any instructions in this standard calling up clauses from part 01 are written in *Italic type*.

NOTE to entry: In other words, if e.g. clause 4 is called up in this document all subclauses of clause 4 of part 01 shall be applied without modification. But, if e.g. some modifications are required on subclauses of clause 9 of part 01, then the relevant second level subclauses of part 01 (e.g. 9.3, 9.5 etc.) are called up separately and it is indicated how they shall be applied.

The numbering of figures and tables in this document takes the number of this part 11 followed by a sequential number.

The numbering of additional subclauses to part 01 in this document starts with the number 100 in the last section of the subclause added (see e.g. 4.100)

IEC 61643-12 addresses the selection and application principles of SPDs.

A list of all parts of the IEC 61643 series can be found, under the general title *Low-voltage surge protective devices*, on the IEC website.

LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

Part 11: Surge protective devices connected to AC low-voltage power systems – Requirements and test methods

1 Scope

This part of the IEC 61643 series is applicable to devices for surge protection against indirect and direct effects of lightning or other transient overvoltages.

These devices are intended to be connected to 50/60 Hz AC power circuits and equipment rated up to 1 000 V RMS. Performance characteristics, standard methods for testing and ratings are established. These devices contain at least one nonlinear component and are intended to limit surge voltages and divert surge currents.

The test requirements provided by this standard are based on the assumption that the SPD is connected to an AC power circuit fed by a power source providing a linear voltage-current characteristic. When the SPD is to be connected to a different kind of source or to a different frequency, careful consideration is required. This mainly applies with regard to system and fault conditions to be expected in such a system (e.g. expected short circuit current, TOV-stresses).

This standard may not be applicable for railway applications, specifically when related product standards exist for that area or for certain applications.

Based on a risk assessment it may not be necessary to apply all requirements of this standard to SPDs connected to circuits with a limited power capability up to 100 W.

Note: Such SPDs connected to circuits with a limited power capability up to 100 W may be covered by IEC 61643-21.

Note: Other exclusions based on national regulations are possible.

2 Normative references

For the purposes of this document the normative references given in part 01 apply.

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60038:2009, *IEC standard voltages*

IEC 60364-4-44:2018, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

IEC 60947-1:2014, *Low-voltage switchgear and controlgear - Part 1: General rules*

IEC 61643-01, *Low-voltage surge protective devices – Part 01: General requirements and test methods*

3 Terms, definitions and abbreviated terms

Clause 3 from part 01 applies.

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>



4 Classification

Clause 4 from part 01 applies with the following additions:

4.12 End of life mode of the SPD-assembly

Clause 4.12 from part 01 applies with the following additions:

For SPDs for AC power circuits fed by a power source providing a linear voltage-current characteristic, only the open circuit mode according 4.12.1 of part 01 is applicable.

Note: A short circuiting SPD, when used with its required SPD disconnectors (SPD-assembly), fulfils the conditions to be classified open circuit mode (OCM).

4.100 Power system

4.100.1 AC between 47 Hz and 63 Hz

4.100.2 AC other than the range of 47 Hz to 63 Hz

This may require additional and/or modified test procedures.

5 Void

6 Marking and other product information

Clause 6 from part 01 applies with the following additions.

6.2 List of items

Clause 6.2 from part 01 applies with the following additions:

The following information from the list of items in clause 6.2 of part 01 and any additional items specified shall be provided as required below.

6.2.100 Markings which are required on the body, or permanently attached to the body, of the SPD:

6.2.100.1 Markings which shall be visible after installation:

Items a1) to a4) from part 01 shall be visible after installation.

For portable SPDs and for pluggable SPDs it is sufficient that above markings are visible in the unplugged condition. This does not apply to the minimum marking requirements according 6.1 of part 01.

6.2.100.2 Markings which are not required to be visible after installation:

Items a5) to a9) from part 01 shall be visible on the SPD, but are not required to be visible after installation.

6.2.101 Information to be provided by the manufacturer:

Items a1) to a40) from part 01 shall be provided.

6.2.102 Information which shall be provided by the manufacturer for type testing, as applicable:

Items a41) to a46) from part 01 and in addition:

a100) prospective short-circuit current for conditioning according 9.3.6.4.101 shall be provided.

7 Service conditions

Clause 7 from part 01 applies with the following addition:

7.100 Frequency

The standard frequency range is from 47 Hz to 63 Hz AC

Other frequencies may require additional and/or modified test procedures

8 Requirements

Clause 8 from part 01 applies with the following additions and exemptions:

8.3 Electrical requirements

Clause 8.3 from part 01 applies with the following additions:

8.3.9 Behaviour under temporary overvoltages

Clause 8.3.9 from part 01 applies with the following additions:

SPD shall either withstand the overvoltages caused by faults or disturbances in the high or low voltage system, or fail in a manner not creating a hazard.

NOTE 2: This covers the requirements for fault protection from clause 534.4.6 of IEC 60364-5-53.

8.3.9.100 TOVs caused by faults or disturbances in the low voltage system

Compliance is checked by the test in accordance with 9.3.9.100.

8.3.9.101 TOVs caused by faults in the high (medium) voltage system

Compliance is checked by the test in accordance with 9.3.9.101.

SPDs, for which the manufacturer declares in his installation instructions that they may be installed in TT-systems between neutral and PE upstream of the main RCD, shall pass this test in withstand mode according 9.3.9.101.2, b).

8.5 Environmental and material requirements

Clause 8.5 from part 01 applies with the following exemption:

8.5.5 Ageing behaviour under damp heat

This clause 8.5.5 from part 01 does not apply.

9 Tests

Clause 9 from part 01 applies with the following additions:

9.1 General

Clause 9.1 from part 01 applies with the following additions:

9.1.1 General testing procedures

Clause 9.1.1 from part 01 applies with the following additions:

The test voltage U_{test} shall be selected from Annex B based on the information given by the manufacturer according to 6.2.101, a10, a11), a21) and a22).

The test frequency shall be 50Hz or 60 Hz unless otherwise specified.

For SPDs with a designated N terminal/connection, which may be applied in systems without distributed neutral according to the manufacturer's instructions, separate testing is required for the L-PE mode of protection with the neutral being unconnected.

All tests and the respective use of the tissue paper and/or the metallic screen as required for certain tests are shown in Table 1.

For products already compliant with IEC 61643-11:2011 the reduced test procedure according Annex D may be applied.