

INTERNATIONAL STANDARD

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**Low-voltage surge protective devices –
Part 32: Surge protective devices connected to the d.c. side of photovoltaic
installations – Selection and application principles**

**Parafoudres basse tension –
Partie 32: Parafoudres connectés au côté courant continu des installations
photovoltaïques – Principes de choix et d'application**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

Part 32: Surge protective devices connected to the d.c. side of photovoltaic installations – Selection and application principles

FOREWORD

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International Standard IEC 61643-32 has been prepared by subcommittee 37A: Low-voltage surge protective devices, of IEC technical committee 37: Surge arresters.

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

FDIS	Report on voting
37A/302/FDIS	37A/303/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 following differing practices of a less permanent nature exist in the countries indicated below.

Annex D: Class I tested SPDs are not required (United States)

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

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- withdrawn,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.

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INTRODUCTION

This part of IEC 61643 provides useful information for the selection of SPDs connected to photovoltaic installations.

This part of IEC 61643 provides information to evaluate, with reference to the IEC 62305 series, IEC 60364 series and IEC 61643-12, the additional needs for surge protective devices (SPDs) to be installed on the DC side of a photovoltaic (PV) system, to protect against induced and direct lightning effects. It gives guidance for selection, operation and installation of SPDs, including the selection of SPD test class, surge current values and cross section of bonding conductors. Guidance for selection of SPDs connected to the AC side is also given.

The specific electrical parameters of a PV array or a PV source require specific SPDs on the DC side.

This part of IEC 61643 considers SPDs used in different locations and in different kinds of PV systems. It gives examples and provides a simplified and common approach to determine impulse discharge current values for the DC side of different PV installations.

LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

Part 32: Surge protective devices connected to the DC side of photovoltaic installations – Selection and application principles

1 Scope

This part of IEC 61643 describes the principles for selection, installation and coordination of SPDs intended for use in Photovoltaic (PV) systems up to 1 500 V DC and for the AC side of the PV system rated up to 1 000 V rms 50/60 Hz.

The photovoltaic installation extends from a PV array or a set of interconnected PV-modules to include the associated cabling and protective devices and the inverter up to the connection point in the distribution board or the utility supply point.

This part of IEC 61643 considers SPDs used in different locations and in different kinds of PV systems:

- PV systems located on the top of a building.
- PV systems located on the ground like free field power plants characterized by multiple earthing and a meshed earthing system.

The term PV installation is used to refer to both kinds of PV systems. The term PV power plant is only used for extended free-field multi-earthed power systems located on the ground.

For PV installations including batteries additional requirements may be necessary.

NOTE 1 IEC 60364 series, IEC 62305 series and IEC 61643-12 also apply.

NOTE 2 This standard deals only with SPDs and not with surge protective components integrated inside equipment (e.g. inverters, (PCE) power conversion equipment).

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 60364-4-41:2007, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

IEC 60364-4-44:2007/AMD1:2015

IEC 60364-5-53:2015, *Electrical installations of buildings – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control*

IEC 60364-5-54, *Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors*

IEC 60364-7-712:2017, *Low voltage electrical installations – Part 7-712: Requirements for special installations or locations – Solar photovoltaic (PV) power supply systems*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*