

INTERNATIONAL STANDARD



Lightning and surge voltage protection for photovoltaic (PV) power supply systems



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Lightning and surge voltage protection for photovoltaic (PV) power supply systems

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LIGHTNING AND SURGE VOLTAGE PROTECTION FOR PHOTOVOLTAIC (PV) POWER SUPPLY SYSTEMS

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IEC TR 63227 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems. It is a Technical Report.

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Draft	Report on voting
82/1501/DTR	82/1554A/RVDTR

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

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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LIGHTNING AND SURGE VOLTAGE PROTECTION FOR PHOTOVOLTAIC (PV) POWER SUPPLY SYSTEMS

1 Scope

This document deals with the protection of PV power supply systems against detrimental effects of lightning strikes and surge voltages of atmospheric origin. In the event that a lightning and/or surge voltage protection is required to be erected, this document describes requirements and measures for maintaining the safety, functionality, and availability of the PV power supply systems.

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 60364-4-44:2007/AMD1:2015, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

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 61643-11:2011, *Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power systems – Requirements and test methods*

IEC 61643-21, *Low voltage surge protective devices – Part 21: Surge protective devices connected to telecommunications and signalling networks – Performance requirements and testing methods*

IEC 61643-31, *Low-voltage surge protective devices – Part 31: Requirements and test methods for SPDs for photovoltaic installations*

IEC 62305-1, *Protection against lightning – Part 1: General principles*

IEC 62305-2, *Protection against lightning – Part 2: Risk management*

IEC 62305-3:2010, *Protection against lightning – Part 3: Physical damage to structures and life hazard*

IEC 62305-4, *Protection against lightning – Part 4: Electrical and electronic systems within structures*

IEC 62561-1, *Lightning Protection System Components (LPSC) – Part 1: Requirements for connection components*

IEC 62561-2, *Lightning Protection System Components (LPSC) – Part 2: Requirements for conductors and earth electrodes*

IEC 62561-3, *Lightning Protection System Components (LPSC) – Part 3: Requirements for isolating spark gaps (ISG)*

IEC 62561-4, *Lightning protection system components (LPSC) – Part 4: Requirements for conductor fasteners*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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>

3.1

photovoltaic PV

relating to the conversion of light directly into electrical energy

[SOURCE: IEC 62109-1:2011, 3.55]

3.2

PV module

smallest complete and environmentally protected assembly of interconnected PV cells

[SOURCE: IEC 60364-7-712:2017, 712.3.2]

3.3

PV inverter

device which converts DC voltage and DC current into AC voltage and AC current

3.4

PV string

circuit in which PV modules are connected in series to a PV sub-generator in order to achieve the specified output voltage

3.5

PV sub-generator

mechanically and electrically assembled combination of PV modules and other necessary components in order to form a DC power supply unit

3.6

PV generator

combination of PV sub-generators

3.7

surge protective device

SPD

device that contains at least one non-linear component and is intended to limit surge voltages and divert surge currents

Note 1 to entry: An SPD is a complete assembly having appropriate connecting means.

[SOURCE: IEC 61643-11:2011, 3.1.1]