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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18802.32-2021

**Low-voltage surge protective devices - Part 32: Surge
protective devices connected to photovoltaic installations -
Selection and application principles**

低压电涌保护器 第32部分：用于光伏系统的电涌保护器 选择和使用导则

(English Translation)

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1 Scope

This part of GB/T 18802 shows that the effective value of the voltage connected to the AC side does not exceed 1000V (50Hz or 60Hz) and the DC side Guidelines for the selection, installation and coordination of SPD for photovoltaic systems with a voltage not exceeding 1500V.

The scope of photovoltaic systems extends from photovoltaic arrays or a set of interconnected photovoltaic modules to include related cables, protection devices and inverters.

All the way to the connection point of the power distribution cabinet or the public grid connection point.

This section considers the following SPDs used in different locations and different types of photovoltaic systems.

---The photovoltaic system located on the top of the building;

---The photovoltaic system located on the ground, similar to the ground power station, is characterized by the use of multi-point grounding and a mesh grounding system.

The term "photovoltaic system" is used to refer to the above two photovoltaic systems; the term "photovoltaic power plant" is only used to refer to the Multi-grounded power system.

For the protection of photovoltaic systems containing energy storage cells, additional requirements may need to be met.

Note 1: GB/T 16895 (all parts), GB/T 21714 (all parts) and IEC 61643-12 are also applicable.

Note 2: This section only relates to SPD, and does not involve surge protection components integrated in the device [for example, in the inverter, power conversion equipment (PCE)].

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article. For undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 16935.1-2008 Insulation coordination of equipment in low-voltage systems Part 1: Principles, requirements and tests (IEC 60664-1: 2007, IDT)

GB/T 17626.5-2019 Electromagnetic compatibility test and measurement technology surge (impact) immunity test (IEC 61000-4-5: 2014, IDT)

GB/T 21714.3-2015 Lightning Protection Part 3: Physical Damage and Life Danger of Buildings (IEC 62305-3:2010, IDT)

IEC 60364-4-44:2007/AMD1:2015 Low-voltage electrical installations Part 4-44. Safety protection against voltage disturbances and electromagnetic disturbances Interference protection (Low-voltage electrical installations-Part 4-44. Protection for safety-Protection against voltage disturbances and electromagnetic disturbances)

IEC 60364-5-53:2015 Electrical Installations of Buildings Part 5-53. Selection and Installation of Electrical Equipment-Isolation, Switching and Control Equipment (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 installation of electrical equipment, grounding arrangements and protective conductors (Low-voltage electrical installations-Part 5-54. Selection and erection of electrical equipment-Earth arrangements and protective conductors)

IEC 60364-7-712:2017 Low-voltage electrical installations Part 7-712. Requirements for special installations or places (VLT) power supply system
(Low-voltage electrical installations - Part 7-712. Requirements for special installations)

3.3 PV string

A circuit of one or more photovoltaic modules connected in series. [IEC 60364-7-712:2017, definition 712.3.3]

3.4 Photovoltaic system PV installation

The equipment that constitutes the photovoltaic power supply system. [IEC 60364-7-712:2017, definition 712.3.14]

3.5 Origin of the electrical installation point of the electrical installation

The point at which electrical energy is fed into electrical equipment. [GB/T 2900.71-2008, definition 826-10-02]

3.6 Lightning protection system; LPS

The whole system used to reduce the physical damage caused by lightning strikes to buildings.

Note 1: LPS consists of two parts, an external and internal lightning protection system.

Note 2: In this section, "buildings" refer to "photovoltaic systems". [GB/T 21714.1-2015, definition 3.42]

3.7 Independent external LPS

The air-termination and down-conductor installation positions make the lightning current channel and the LPS not in contact with the building to be protected.

Note 1: An independent LPS can avoid dangerous sparks between the LPS and the photovoltaic system.

Note 2: In this section, "buildings" refer to "photovoltaic systems". [GB/T 21714.3-2015, definition 3.3]

3.8 Surge protector

An electrical appliance used to limit transient overvoltage and discharge surge current, which contains at least one non-linear element.

Note: SPD has an appropriate connection device and is a fully assembled part. [IEC 61643-11:2011, definition 3.1.1]

3.9 Separation distance

The distance so that no dangerous sparks will appear between the two conductors. [GB/T 21714.3-2015, definition 3.27]

3.10 Lightning equipotential bonding

In order to reduce the potential difference caused by the lightning current, the separated conductive parts are connected to the LPS directly with a conductor or through a surge protector. [GB/T 21714.3-2015, definition 3.22]

3.11 Bondingbar

Metal connection bar, metal devices that need to be grounded, external conductive parts, power lines, communication cables and other cables can be connected with LPS connection. [GB/T 21714.3-2015, definition 3.23]

3.12 Bonding conductor

A conductor used to connect separate conductive parts with LPS. [GB/T 21714.3-2015,3.24]

3.13 Standard test conditions

Used as a reference condition for photovoltaic cells and modules testing and rating series standards.

Note 1: Refer to product standards (such as IEC 61215).

Note 2: The standard test conditions for photovoltaic modules given in IEC 61215 are.

- a) The temperature of the photovoltaic cell is 25°C;
- b) The plane irradiance of the photovoltaic cell or module is 1000W/m²;
- c) Atmospheric solar spectrum corresponding to AM1.5. [IEC 60364-7-712:2017, definition 712.3.12]

3.14 Open-circuit voltage under standard test conditions open-circuit voltage under standard test conditions

UOC STC No load (open circuit) on the DC side of photovoltaic modules, photovoltaic strings, photovoltaic arrays, photovoltaic inverters or power conversion equipment under standard test conditions Voltage.

Note: Rewrite IEC 60364-7-712:2017 and define 712.3.13.