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

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**Photovoltaic system power conversion equipment - Design
qualification and type approval**

光伏系统用功率转换设备 设计鉴定和定型

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document adopts IEC 62093:2022 "Design qualification and type approval of power conversion equipment for photovoltaic systems".

The following minimal editorial changes have been made to this document.

---Move the terminology definitions and related explanatory information from Chapter 1 to the introduction;

---The reference "6.5.3d)" in 6.5.3.1a) is corrected to "6.5.2d)".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document is under the jurisdiction of the National Technical Committee on Standardization of Solar Photovoltaic Energy Systems (SAC/TC90).

Introduction

With the goal of "peak carbon and carbon neutrality" being proposed, photovoltaic power generation has gradually become an important support for global energy transition, practicing low-carbon development and promoting...

Promoting green transformation has become a general consensus in the international community. Power conversion equipment (PCE) is a core component of photovoltaic power generation systems.

The stable operation of these components directly affects the stability and reliability of the photovoltaic power generation system. To adapt to the rapid development of the photovoltaic industry, guidance is provided for product design...

This document is formulated to verify the reliability of the design phase and meet the requirements for long-term stable operation.

The power conversion equipment described in this document for ground-mounted photovoltaic applications refers to electronic power that converts electrical energy into another type of voltage, current, and frequency.

Power conversion equipment and components. This power conversion equipment is intended for use in indoor and outdoor applications as defined in IEC 60721-3-3 and IEC 60721-3-4.

Climate conditions. Such equipment may include, but is not limited to, grid-connected and off-grid DC-AC converters, DC-DC converters, and battery charging converters.

Device and battery charging controller.

Power conversion equipment may also be connected to systems with AC voltage not exceeding 1000V, off-grid AC loads, other DC power supplies or loads.

Circuitry (such as batteries). If the manual specifies the manufacturer and model of specific auxiliary components to be used with the power conversion equipment, then these...

The components can be tested together with the power conversion equipment.

Exceptions.

a) This document does not consider power source characteristics other than photovoltaic systems, such as wind turbines, fuel cells, and rotating machinery power sources.

b) This document does not consider power conversion devices that are fully integrated into photovoltaic modules; for this type of device, existing or developing regulations already exist or are underway.

Separate standards. However, if the manufacturer explicitly states that the equipment can be completely detached from the photovoltaic modules and then reinstalled into the photovoltaic array.

If the device has accessible input and output terminals and a power conversion device specification sheet is available, then this document can be used to evaluate the device.

Equipment. Equipment that meets these requirements can be tested as a separate sample, independent of the photovoltaic modules.

c) This document does not consider power conversion devices with internally integrated (built-in) electrochemical energy storage (such as lead-acid or lithium-ion). However, manufacturers...

This document can be used to evaluate the removal of energy storage units when regulations and permits the complete removal of electrochemical energy storage devices

from power conversion equipment.

The power conversion equipment afterwards.

The test procedures contained in this document are used to determine a basic level of durability and to demonstrate functionality to the greatest extent possible within reasonable cost and time constraints.

The rate conversion equipment maintains its performance after prolonged exposure to the simulated environmental stresses described in this document (based on manufacturer-specified expected usage conditions).

Performance. This document includes optional tests, depending on the intended installation location, market conditions, or specific environmental conditions the power conversion equipment is expected to experience.

The different test sequences and severity levels specified for different power conversion equipment types reflect the varying demands placed on mechanical and electrical components under different environments.

Require.

This document categorizes power conversion devices into different types based on size and installation environment. The actual expected lifespan of qualified components depends on their...

Due to the design, operating environment, and conditions, this document does not primarily involve estimations of lifespan and wear.

Power conversion equipment for photovoltaic systems Design evaluation and finalization

1 Scope

This document specifies the design qualification and type approval procedures and requirements for power conversion equipment (PCE) in ground-mounted photovoltaic systems.

This document applies to power supplies connected to photovoltaic arrays with a maximum nominal voltage not exceeding 1500V DC and an AC voltage not exceeding 1000V.

Rate conversion equipment.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this