

# TECHNICAL SPECIFICATION



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## Simulators used for testing of photovoltaic power conversion equipment – Recommendations – Part 2: DC power simulators

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SIMULATORS USED FOR TESTING OF PHOTOVOLTAIC POWER  
CONVERSION EQUIPMENT – RECOMMENDATIONS –****Part 2: DC power simulators**

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The text of this Technical Specification is based on the following documents:

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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 Specification 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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

A list of all parts in the IEC TS 63106 series, published under the general title *Simulators used for testing of photovoltaic power conversion equipment – Recommendations*, can be found on the IEC web site.

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

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## INTRODUCTION

The objective of this document is to establish terminology, create a framework for, and provide guidance regarding the electrical performance of DC power simulators used to test photovoltaic (PV) power conversion equipment (PCE) for compliance with grid interconnection or PV performance standards.

Along with IEC TS 63106-1, it provides guidance for the selection or development of power simulators used within a test and evaluation system for PV PCEs.

Testing laboratories are responsible for selecting the appropriate test items and procedures as well as defining the required performance for adequate evaluation of utility interactive PV PCEs, considering utility power requirements, local codes and regulations.

It is intended for this document to be used in conjunction with parallel PCE standards developed for specific performance or grid-interaction requirements.

# SIMULATORS USED FOR TESTING OF PHOTOVOLTAIC POWER CONVERSION EQUIPMENT – RECOMMENDATIONS –

## Part 2: DC power simulators

### 1 Scope

The purpose of this part of IEC TS 63106 is to provide recommendations for Low Voltage (LV) DC power simulators used for testing photovoltaic (PV) power conversion equipment (PCE) to utility interconnection or PV performance standards.

NOTE Low Voltage refers to DC voltage 1 500 V and less.

In this document, the term “DC power simulator” refers to any source that is used during testing to provide DC power to the Equipment Under Test (EUT). That includes, but is not limited to, PV array simulators designed to simulate the DC output I-V curve of a photovoltaic array operating in real-world conditions.

This document primarily addresses DC power simulators used for testing of grid-interactive PCE, also referred to as grid-connected power converters (GCPCs). It also addresses some uses of DC power simulators for testing stand-alone and multi-mode PCEs.

There are many types of tests that can be conducted by utilizing a DC power simulator. Certain tests require the use of a PV array or PV array simulator, such as measurements of the PCE's PV input static and dynamic characteristics related to maximum power point tracking, while other tests may be appropriate to conduct with a static DC power supply. Test requirements and procedures are specified in IEC standards and local utility grid requirements, selected by the system integrator, PCE manufacturer, network operator, utility, or third-party inspector.

### 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 61683, *Photovoltaic systems – Power conditioners – Procedure for measuring efficiency*

IEC TS 61836, *Solar photovoltaic energy systems – Terms, definitions and symbols*

IEC 62116, *Utility-interconnected photovoltaic inverters – Test procedure of islanding prevention measures*

IEC 62891, *Maximum power point tracking efficiency of grid connected photovoltaic inverters*

IEC TS 62910:2020, *Utility-interconnected photovoltaic inverters – Test procedure for under voltage ride-through measurements*

IEC TS 63106-1:2020, *Simulators used for testing of photovoltaic power conversion equipment – Recommendations – Part 1: AC power simulators*

EN 50530, *Overall efficiency of grid connected photovoltaic inverters*