



SLOVENSKI STANDARD

SIST EN 62108:2017

01-februar-2017

Nadomešča:
SIST EN 62108:2008

Koncentratorski fotonapetostni (CPV) moduli in sestavi - Ocena zasnove in odobritev tipa

Concentrator photovoltaic (CPV) modules and assemblies - Design qualification and type approval

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EUROPEAN STANDARD
NORME EUROPÉENNE
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**Concentrator photovoltaic (CPV) modules and assemblies -
Design qualification and type approval
(IEC 62108:2016)**

Modules et ensembles photovoltaïques à concentration -
Qualification de la conception et homologation
(IEC 62108:2016)

Konzentrator-Photovoltaik(CPV)-Module und -Anordnungen -
Bauarteignung und Bauartzulassung
(IEC 62108:2016)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

The text of document 82/1142/FDIS, future edition 2 of IEC 62108, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62108:2016.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-07-31
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-10-31

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The text of the International Standard IEC 62108:2016 was approved by CENELEC as a European Standard without any modification.

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-21	2006	Environmental testing - Part 2-21: Tests - Test U: Robustness of terminations and integral mounting devices	EN 60068-2-21	2006
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529	-
IEC 61215-2	2016	Terrestrial photovoltaic (PV) modules - Design qualification and type approval Part 2: Test procedures	EN 61215-2	2016
IEC 62670-1	-	Photovoltaic concentrators (CPV) - Performance testing - Part 1: Standard conditions	EN 62670-1	-
ANSI/UL 1703	2002	Flat-Plate Photovoltaic Modules and Panels	-	-

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INTERNATIONAL STANDARD

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Concentrator photovoltaic (CPV) modules and assemblies – Design qualification and type approval

(standards.iteh.ai)

Modules et ensembles photovoltaïques à concentration – Qualification de la conception et homologation

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONCENTRATOR PHOTOVOLTAIC (CPV) MODULES AND ASSEMBLIES –
DESIGN QUALIFICATION AND TYPE APPROVAL****FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62108 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This second edition cancels and replaces the first edition, issued in 2007. It constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

- a) Changes in outdoor exposure from 1000 h to 500 h.
- b) Changes in current cycling during thermal cycling test.
- c) Added dust ingress test.
- d) Eliminated thermal cycling associated with damp heat test.
- e) Eliminated UV exposure test.

The text of this standard is based on the following documents:

FDIS	Report on voting
82/1142/FDIS	82/1161/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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CONCENTRATOR PHOTOVOLTAIC (CPV) MODULES AND ASSEMBLIES – DESIGN QUALIFICATION AND TYPE APPROVAL

1 Scope and object

This International Standard specifies the minimum requirements for the design qualification and type approval of concentrator photovoltaic (CPV) modules and assemblies suitable for long-term operation in general open-air climates as defined in IEC 60721-2-1. The test sequence is partially based on that specified in IEC 61215-1 for the design qualification and type approval of flat-plate terrestrial crystalline silicon PV modules. However, some changes have been made to account for the special features of CPV receivers and modules, particularly with regard to the separation of on-site and in-lab tests, effects of tracking alignment, high current density, and rapid temperature changes, which have resulted in the formulation of some new test procedures or new requirements.

The object of this test standard is to determine the electrical, mechanical, and thermal characteristics of the CPV modules and assemblies and to show, as far as possible within reasonable constraints of cost and time, that the CPV modules and assemblies are capable of withstanding prolonged exposure in climates described in the scope. The actual life of CPV modules and assemblies so qualified will depend on their design, production, environment, and the conditions under which they are operated.

This standard shall be used in conjunction with the retest guidelines described in Annex B.

2 Normative references

[SIST EN 62108:2017](https://standards.iteh.ai/catalog/standards/sist/5d35a1c1-ce99-4b96-bf1a-8d52a7abc945/sist-en-62108-2017)

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IEC 60068-2-21:2006, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61215-2:2016, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 2: Test procedures*

IEC 62670-1, *Photovoltaic concentrators (CPV) – Performance testing – Part 1: Standard conditions*

ANSI/UL 1703:2002, *Standard for Safety: Flat-Plate Photovoltaic Modules and Panels*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. See also Table 1.

3.1

concentrator

term associated with photovoltaic devices that use concentrated sunlight

3.2**concentrator cell**

basic photovoltaic device that is used under the illumination of concentrated sunlight

3.3**concentrator optics**

optical device that performs one or more of the following functions from its input to output: increasing the light intensity, filtering the spectrum, modifying light intensity distribution, or changing light direction. Typically, it is a lens or a mirror

Note 1 to entry: A primary optics receives unconcentrated sunlight directly from the sun. A secondary optics receives concentrated or modified sunlight from another optical device, such as primary optics or another secondary optics.

3.4**concentrator receiver**

group of one or more concentrator cells and secondary optics (if present) that accepts concentrated sunlight and incorporates the means for thermal and electric energy transfer. A receiver could be made of several sub-receivers. The sub-receiver is a physically stand-alone, smaller portion of the full-size receiver

3.5**concentrator module**

group of receivers, optics, and other related components, such as interconnection and mounting, that accepts unconcentrated sunlight. All above components are usually prefabricated as one unit, and the focus point is not field adjustable

Note 1 to entry: A module could be made of several sub-modules. The sub-module is a physically stand-alone, smaller portion of the full-size module.

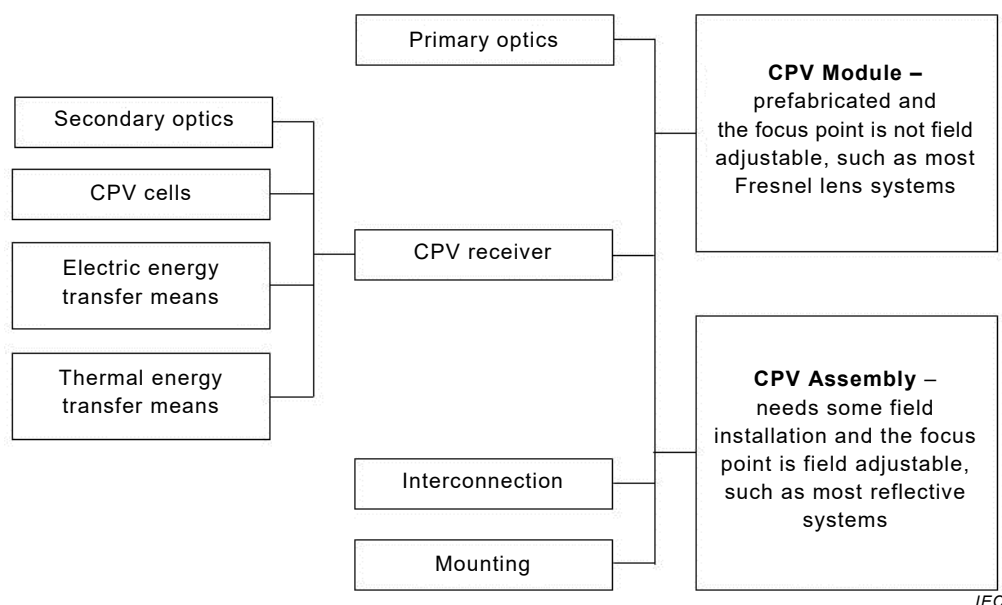
3.6**concentrator assembly**

group of receivers, optics, and other related components, such as interconnection and mounting, that accepts unconcentrated sunlight. All above components would usually be shipped separately and need some field installation, and the focus point is field adjustable

Note 1 to entry: An assembly could be made of several sub-assemblies. The sub-assembly is a physically stand-alone, smaller portion of the full-size assembly.

3.7**control unit**

hardware that is not stressed, but is included in each measurement to enable greater confidence in consistent measurements

Table 1 – Terms used for CPV

4 Sampling

Figures 1 to 5 are schematics of cells, receivers, modules, and assemblies.

For non-field-adjustable focus-point CPV systems or modules, 7 modules and 2 receivers are required to complete all the specified tests, plus one receiver for the bypass/blocking diode thermal test (intrusive or non-intrusive). For details, see Figure 6. For field-adjustable focus-point CPV systems or assemblies, 9 receivers (including secondary optics sections, if applicable) and 7 primary optics sections are required to complete all the specified tests, plus one receiver for the bypass/blocking diode thermal test (intrusive or non-intrusive). For details, see Figure 7.

In the case that a full-size module or assembly is too large to fit into available testing equipment, such as environmental chambers, or a full-size module or assembly is too expensive (e.g., for a 20 kW reflective dish concentrator system, 9 receiver samples account for 180 kW of PV cells), a smaller representative sample can be used. However, even if representative samples are used for the other test, a full-size module or assembly shall be installed and tested for outdoor exposure. This can be conducted either in the testing lab, or through on-site witness.

Representative samples shall include all components, except some repeated parts. If possible, the representative samples shall use sub-receivers, sub-modules, or sub-assemblies. During the design and manufacturing of the representative samples, much attention shall be paid to reach the maximum similarity to the full-size component in all electrical, mechanical, and thermal characteristics related to quality and reliability.

Specifically, the cell string in representative samples shall be long enough to include at least two bypass diodes, but in no case less than ten cells. The encapsulations, interconnects, terminations, and the clearance distances around all edges shall be the same as on the actual full-size products. Other representative components, including lens/housing joints, receiver/housing joints, and end plate/lens shall also be included and tested.

Test samples should be taken at random from a production batch or batches. When the samples to be tested are prototypes of a new design and not from production, or representative samples are used, these facts should be noted in the test report (see Clause 8).