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## REDLINE VERSION

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### **Solceller – Konstruktions- och typgodkännande av solcellsmoduler och enheter med koncentrator (CPV)**

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

En så kallad "Redline version" (RLV) innehåller både den fastställda IEC-standardens och en ändringsmarkerad standard. Alla tillägg och borttagningar sedan den tidigare utgåvan är markerade med färg. Med en RLV sparar du mycket tid när du ska identifiera och bedöma aktuella ändringar i standarden. SEK Svensk Elstandard kan bara ge ut en RLV i de fall den finns tillgänglig från IEC.



IEC 62108

Edition 3.0 2022-06  
REDLINE VERSION

# INTERNATIONAL STANDARD



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

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 27.160

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## CONTENTS

FOREWORD .....	5
1 Scope <del>and object</del> .....	7
2 Normative references .....	7
3 Terms and definitions .....	9
4 Sampling .....	10
5 Marking .....	11
6 Testing .....	11
7 Pass criteria .....	12
8 Report .....	20
9 Modifications .....	21
10 Test procedures .....	21
10.1 Visual inspection .....	21
10.1.1 General .....	21
10.1.2 Procedure .....	21
10.1.3 Major visual defects .....	22
10.1.4 Requirements .....	22
10.2 Electrical performance measurement .....	22
10.2.1 Purpose .....	22
10.2.2 Outdoor side-by-side I-V measurement .....	22
10.2.3 Solar simulator I-V measurement .....	24
10.2.4 Dark I-V measurement .....	24
10.3 Ground path continuity test .....	25
10.3.1 General .....	25
10.3.2 Purpose .....	25
10.3.3 Procedure .....	25
10.3.4 Requirements .....	25
10.4 Electrical insulation test .....	26
10.4.1 Purpose .....	26
10.4.2 Procedure .....	26
10.4.3 Requirements .....	26
10.5 Wet insulation test .....	27
10.5.1 Purpose .....	27
10.5.2 Procedure .....	27
10.5.3 Requirements .....	27
10.6 Thermal cycling test .....	27
10.6.1 Purpose .....	27
10.6.2 Test sample .....	28
10.6.3 Procedure .....	28
10.6.4 Procedure for active cooling system .....	30
10.6.5 Requirements .....	30
10.7 Damp heat test .....	31
10.7.1 Purpose .....	31
10.7.2 Test sample .....	31
10.7.3 Procedure .....	31
10.7.4 Requirements .....	32

10.8	Humidity freeze test.....	32
10.8.1	Purpose.....	32
10.8.2	Test sample.....	32
10.8.3	Procedure.....	32
10.8.4	Requirements .....	32
10.9	Hail impact test.....	33
10.9.1	Purpose.....	33
10.9.2	Apparatus.....	33
10.9.3	Procedure.....	34
10.9.4	Requirements .....	34
<del>10.10</del>	<del>Water spray test.....</del>	<del>35</del>
<del>10.10.1</del>	<del>General .....</del>	<del>35</del>
<del>10.10.2</del>	<del>Purpose.....</del>	<del>35</del>
<del>10.10.3</del>	<del>Procedure.....</del>	<del>35</del>
<del>10.10.4</del>	<del>Requirements .....</del>	<del>35</del>
10.10	Dust and water ingress protection test .....	35
10.10.1	Purpose.....	35
10.10.2	Procedure.....	35
10.10.3	Requirements .....	35
10.11	Bypass/blocking diode thermal test.....	36
10.11.1	Purpose.....	36
10.11.2	Test sample.....	36
10.11.3	Apparatus.....	36
10.11.4	Procedure.....	36
10.11.5	Requirements .....	37
10.11.6	Procedure 2 – Alternate method .....	37
10.12	Robustness of terminations test.....	38
10.12.1	Purpose.....	38
<del>10.12.2</del>	<del>Types of terminations .....</del>	<del>35</del>
10.12.2	Procedure.....	39
10.12.3	Requirements .....	39
10.13	Mechanical load test.....	39
10.13.1	Purpose.....	39
10.13.2	Procedure.....	40
10.13.3	Requirements .....	40
10.14	Off-axis beam damage test .....	41
10.14.1	General .....	41
10.14.2	Purpose.....	41
10.14.3	Special case.....	41
10.14.4	Procedure.....	41
10.14.5	Requirements .....	41
10.15	Outdoor exposure test .....	42
10.15.1	Purpose.....	42
10.15.2	Procedure.....	42
10.15.3	Requirements .....	42
10.16	Hot-spot endurance test.....	42
Annex A (informative)	Summary of test conditions and requirements .....	43
Annex B (normative)	Retesting guideline .....	46

B.1	Product or process modifications requiring limited retesting to maintain certification .....	46
B.2	Modifications of CPV cell technology .....	46
B.3	Modifications in optical encapsulation on the cell (Includes optical coupling between the cell and a glass secondary optical element bonded to the cell).....	47
B.4	Modification in cell encapsulation outside of intended light path .....	47
B.5	Modification of cell package substrate used for heat transfer .....	47
B.6	Accessible optics (primary or secondary) .....	48
B.7	Inaccessible optics (secondary) .....	48
B.8	Frame and/or mounting structure .....	48
B.9	Enclosure .....	49
B.10	Wiring compartment/junction box .....	49
B.11	Interconnection terminals .....	49
B.12	Interconnection materials or technique (to cells and between receivers) .....	50
B.13	Change in electrical circuit design in an identical package .....	50
B.14	Output power .....	50
B.15	Thermal energy transfer means .....	51
B.16	Adhesives .....	51
Figure 1 – Schematic of point-focus dish PV concentrator.....		14
Figure 2 – Schematic of linear-focus trough PV concentrator .....		15
Figure 3 – Schematic of point-focus Fresnel lens PV concentrator .....		16
Figure 4 – Schematic of linear-focus Fresnel lens PV concentrator .....		17
Figure 5 – Schematic of a heliostat CPV .....		18
Figure 6 – Qualification test sequence for CPV modules .....		19
Figure 7 – Qualification test sequence for CPV assemblies.....		20
Figure 8 – Temperature and current profile of thermal cycle test (not to scale) .....		31
Figure 9 – Profile of humidity-freeze test conditions .....		33
Figure 10 – Bypass diode thermal test .....		37
Table 1 – Terms used for CPV .....		10
Table 2 – Allocation of test samples to typical test sequences .....		12
Table 3 – Thermal cycle test options for sequence A .....		29
Table 4 – Humidity freeze test options for sequence B.....		32
Table 5 – Minimum wind loads .....		40
Table A.1 – Summary of test conditions and requirements .....		43

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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**This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62108:2016. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.**

IEC 62108 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems. It is an International Standard.

This third edition cancels and replaces the second edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Changes in the procedure of the thermal cycling test for the active cooling module.
- b) Solar simulator I-V measurement.

The text of this International Standard is based on the following documents:

Draft	Report on voting
82/2024/FDIS	82/2046/RVD

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 International Standard 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).

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

- 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 document 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 document 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 document ~~shall be~~ is used in conjunction with the retest guidelines described in Annex B.

### 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 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 60664-1:2020, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 60721-2-1, *Classification of environmental conditions – Part 2-1: Environmental conditions appearing in nature – Temperature and humidity*

IEC 60904-1:2020, *Photovoltaic devices – Part 1: Measurement of photovoltaic current-voltage characteristics*

IEC 60904-1-1:2017, *Photovoltaic devices – Part 1-1: Measurement of current-voltage characteristics of multi-junction photovoltaic (PV) devices*

IEC TS 60904-1-2:2019, *Photovoltaic devices – Part 1-2: Measurement of current-voltage characteristics of bifacial photovoltaic (PV) devices*

IEC 60904-2:2015, *Photovoltaic devices – Part 2: Requirements for photovoltaic reference devices*



IEC 60904-3:2019, *Photovoltaic devices – Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data*

IEC 60904-4:2019, *Photovoltaic devices – Part 4: Photovoltaic reference devices – Procedures for establishing calibration traceability*

IEC 60904-5:2011, *Photovoltaic devices – Part 5: Determination of the equivalent cell temperature (ECT) of photovoltaic (PV) devices by the open-circuit voltage method*

IEC 60904-7:2019, *Photovoltaic devices – Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices*

IEC 60904-8:2014, *Photovoltaic devices – Part 8: Measurement of spectral responsivity of a photovoltaic (PV) device*

IEC 60904-8-1:2017, *Photovoltaic devices – Part 8-1: Measurement of spectral responsivity of multi-junction photovoltaic (PV) devices*

IEC 61140:2016, *Protection against electric shock – Common aspects for installation and equipment*

IEC 61210:2010, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

IEC 61215-1:2021, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 1: Test requirements*

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

IEC TS 61836:2016, *Solar photovoltaic energy systems – Terms, definitions and symbols*

IEC 61853-1:2011, *Photovoltaic (PV) module performance testing and energy rating – Part 1: Irradiance and temperature performance measurements and power rating*

IEC 61853-2:2016, *Photovoltaic (PV) module performance testing and energy rating – Part 2: Spectral responsivity, incidence angle and module operating temperature measurements*

IEC 61853-3:2018, *Photovoltaic (PV) module performance testing and energy rating – Part 3: Energy rating of PV modules*

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

IEC 62670-3:2017, *Photovoltaic concentrators (CPV) – Performance testing – Part 3: Performance measurements and power rating*

IEC 62790:2020, *Junction boxes for photovoltaic modules – Safety requirements and tests*

IEC 62852:2014, *Connectors for DC-application in photovoltaic systems – Safety requirements and tests*

IEC 62852:2014/AMD1:2020

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

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## Solceller – Konstruktions- och typgodkännande av solcellsmoduler och enheter med koncentrator (CPV)

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

Som svensk standard gäller europastandarden EN IEC 62108:2022. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 62108:2022.

### Nationellt förord

Europastandarden EN IEC 62108:2022

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 62108, Third edition, 2022 - Concentrator photovoltaic (CPV) modules and assemblies - Design qualification and type approval**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 62108, utg 2:2017, gäller ej fr o m 2025-07-07.

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Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

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Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

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### **SEK Svensk Elstandard**

Box 1284  
164 29 Kista  
Tel 08-444 14 00  
[www.elstandard.se](http://www.elstandard.se)

English Version

Concentrator photovoltaic (CPV) modules and assemblies -  
Design qualification and type approval  
(IEC 62108:2022)

Modules et ensembles photovoltaïques à concentration -  
Qualification de la conception et homologation  
(IEC 62108:2022)

Konzentrator-Photovoltaik(CPV)-Module und -Anordnungen  
- Bauartegnung und Bauartzulassung  
(IEC 62108:2022)

This European Standard was approved by CENELEC on 2022-07-07. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

## **European foreword**

The text of document 82/2024/FDIS, future edition 3 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 IEC 62108:2022.

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) 2023-04-07
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-07-07

This document supersedes EN 62108:2016 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

## **Endorsement notice**

The text of the International Standard IEC 62108:2022 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 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.

NOTE 1 Where 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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-
IEC 60664-1	2020	Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests	EN IEC 60664-1	2020
IEC 60721-2-1	-	Classification of environmental conditions - Part 2-1: Environmental conditions appearing in nature - Temperature and humidity	EN 60721-2-1	-
IEC 60904-1	2020	Photovoltaic devices - Part 1: Measurement of photovoltaic current-voltage characteristics	EN IEC 60904-1	2020
IEC 60904-1-1	2017	Photovoltaic devices - Part 1-1: Measurement of current-voltage characteristics of multi-junction photovoltaic (PV) devices	EN 60904-1-1	2017
IEC/TS 60904-1-2	2019	Photovoltaic devices - Part 1-2: Measurement of current-voltage characteristics of bifacial photovoltaic (PV) devices	-	-
IEC 60904-2	2015	Photovoltaic devices - Part 2: Requirements for photovoltaic reference devices	EN 60904-2	2015
IEC 60904-3	2019	Photovoltaic devices - Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data	EN IEC 60904-3	2019
IEC 60904-4	2019	Photovoltaic devices - Part 4: Reference solar devices - Procedures for establishing calibration traceability	EN IEC 60904-4	2019
IEC 60904-5	2011	Photovoltaic devices - Part 5: Determination of the equivalent cell temperature (ECT) of photovoltaic (PV) devices by the open-circuit voltage method	EN 60904-5	2011

## EN IEC 62108:2022 (E)

IEC 60904-7	2019	Photovoltaic devices - Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices	EN IEC 60904-7	2019
IEC 60904-8	2014	Photovoltaic devices - Part 8: Measurement of spectral responsivity of a photovoltaic (PV) device	EN 60904-8	2014
IEC 60904-8-1	2017	Photovoltaic devices - Part 8-1: Measurement of spectral responsivity of multi-junction photovoltaic (PV) devices	EN 60904-8-1	2017
IEC 61140	2016	Protection against electric shock - Common aspects for installation and equipment	EN 61140	2016
IEC 61210 (mod)	2010	Connecting devices - Flat quick-connect terminations for electrical copper conductors - Safety requirements	EN 61210	2010
IEC 61215-1	2021	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1: Test requirements	EN IEC 61215-1	2021
IEC 61215-2	2021	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 2: Test procedures	EN IEC 61215-2	2021
IEC/TS 61836	2016	Solar photovoltaic energy systems - Terms, definitions and symbols		-
IEC 61853-1	2011	Photovoltaic (PV) module performance testing and energy rating - Part 1: Irradiance and temperature performance measurements and power rating	-	-
IEC 61853-2	2016	Photovoltaic (PV) module performance testing and energy rating - Part 2: Spectral responsivity, incidence angle and module operating temperature measurements	EN 61853-2	2016
IEC 61853-3	2018	Photovoltaic (PV) module performance testing and energy rating – Part 3: Energy rating of PV modules	EN IEC 61853-3	2018
IEC 62670-1	-	Photovoltaic concentrators (CPV) - Performance testing - Part 1: Standard conditions	EN 62670-1	-
IEC 62670-3	2017	Photovoltaic concentrators (CPV) - Performance testing – Part 3: Performance measurements and power rating	EN 62670-3	2017
IEC 62790	2020	Junction boxes for photovoltaic modules - Safety requirements and tests	EN IEC 62790	2020
IEC 62852	2014	Connectors for DC-application in photovoltaic systems - Safety requirements and tests	EN 62852	2015
+ A1	2020		+ A1	2020
-	-		+ AC	2019-02

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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

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

INTERNATIONAL  
ELECTROTECHNICAL  
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## CONTENTS

FOREWORD .....	5
1 Scope .....	7
2 Normative references .....	7
3 Terms and definitions .....	9
4 Sampling .....	10
5 Marking .....	11
6 Testing .....	11
7 Pass criteria .....	12
8 Report .....	20
9 Modifications .....	21
10 Test procedures .....	21
10.1 Visual inspection .....	21
10.1.1 General .....	21
10.1.2 Procedure .....	21
10.1.3 Major visual defects .....	22
10.1.4 Requirements .....	22
10.2 Electrical performance measurement .....	22
10.2.1 Purpose .....	22
10.2.2 Outdoor side-by-side I-V measurement .....	22
10.2.3 Solar simulator I-V measurement .....	24
10.2.4 Dark I-V measurement .....	24
10.3 Ground path continuity test .....	25
10.3.1 General .....	25
10.3.2 Purpose .....	25
10.3.3 Procedure .....	25
10.3.4 Requirements .....	25
10.4 Electrical insulation test .....	26
10.4.1 Purpose .....	26
10.4.2 Procedure .....	26
10.4.3 Requirements .....	26
10.5 Wet insulation test .....	27
10.5.1 Purpose .....	27
10.5.2 Procedure .....	27
10.5.3 Requirements .....	27
10.6 Thermal cycling test .....	27
10.6.1 Purpose .....	27
10.6.2 Test sample .....	28
10.6.3 Procedure .....	28
10.6.4 Procedure for active cooling system .....	30
10.6.5 Requirements .....	30
10.7 Damp heat test .....	31
10.7.1 Purpose .....	31
10.7.2 Test sample .....	31
10.7.3 Procedure .....	31
10.7.4 Requirements .....	32

10.8	Humidity freeze test .....	32
10.8.1	Purpose .....	32
10.8.2	Test sample .....	32
10.8.3	Procedure .....	32
10.8.4	Requirements .....	32
10.9	Hail impact test .....	33
10.9.1	Purpose .....	33
10.9.2	Apparatus .....	33
10.9.3	Procedure .....	34
10.9.4	Requirements .....	34
10.10	Dust and water ingress protection test .....	34
10.10.1	Purpose .....	34
10.10.2	Procedure .....	35
10.10.3	Requirements .....	35
10.11	Bypass/blocking diode thermal test .....	35
10.11.1	Purpose .....	35
10.11.2	Test sample .....	35
10.11.3	Apparatus .....	35
10.11.4	Procedure .....	36
10.11.5	Requirements .....	36
10.11.6	Procedure 2 – Alternate method .....	36
10.12	Robustness of terminations test .....	37
10.12.1	Purpose .....	37
10.12.2	Procedure .....	38
10.12.3	Requirements .....	38
10.13	Mechanical load test .....	38
10.13.1	Purpose .....	38
10.13.2	Procedure .....	39
10.13.3	Requirements .....	39
10.14	Off-axis beam damage test .....	39
10.14.1	General .....	39
10.14.2	Purpose .....	39
10.14.3	Special case .....	39
10.14.4	Procedure .....	40
10.14.5	Requirements .....	40
10.15	Outdoor exposure test .....	40
10.15.1	Purpose .....	40
10.15.2	Procedure .....	40
10.15.3	Requirements .....	41
10.16	Hot-spot endurance test .....	41
Annex A (informative)	Summary of test conditions and requirements .....	42
Annex B (normative)	Retesting guideline .....	45
B.1	Product or process modifications requiring limited retesting to maintain certification .....	45
B.2	Modifications of CPV cell technology .....	45
B.3	Modifications in optical encapsulation on the cell (Includes optical coupling between the cell and a glass secondary optical element bonded to the cell) .....	46
B.4	Modification in cell encapsulation outside of intended light path .....	46
B.5	Modification of cell package substrate used for heat transfer .....	46

B.6	Accessible optics (primary or secondary) .....	47
B.7	Inaccessible optics (secondary) .....	47
B.8	Frame and/or mounting structure .....	47
B.9	Enclosure .....	48
B.10	Wiring compartment/junction box .....	48
B.11	Interconnection terminals .....	48
B.12	Interconnection materials or technique (to cells and between receivers) .....	49
B.13	Change in electrical circuit design in an identical package .....	49
B.14	Output power .....	49
B.15	Thermal energy transfer means .....	50
B.16	Adhesives .....	50
Figure 1 – Schematic of point-focus dish PV concentrator.....		14
Figure 2 – Schematic of linear-focus trough PV concentrator .....		15
Figure 3 – Schematic of point-focus Fresnel lens PV concentrator .....		16
Figure 4 – Schematic of linear-focus Fresnel lens PV concentrator .....		17
Figure 5 – Schematic of a heliostat CPV .....		18
Figure 6 – Qualification test sequence for CPV modules .....		19
Figure 7 – Qualification test sequence for CPV assemblies.....		20
Figure 8 – Temperature and current profile of thermal cycle test (not to scale) .....		31
Figure 9 – Profile of humidity-freeze test conditions .....		33
Figure 10 – Bypass diode thermal test .....		37
Table 1 – Terms used for CPV.....		10
Table 2 – Allocation of test samples to typical test sequences .....		12
Table 3 – Thermal cycle test options for sequence A .....		29
Table 4 – Humidity freeze test options for sequence B.....		32
Table 5 – Minimum wind loads .....		38
Table A.1 – Summary of test conditions and requirements .....		42

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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IEC 62108 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems. It is an International Standard.

This third edition cancels and replaces the second edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Changes in the procedure of the thermal cycling test for the active cooling module.
- b) Solar simulator I-V measurement.

The text of this International Standard 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 International Standard 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).

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

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

### 1 Scope

This document 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 document 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 document is used in conjunction with the retest guidelines described in Annex B.

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

IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 60721-2-1, *Classification of environmental conditions – Part 2-1: Environmental conditions appearing in nature – Temperature and humidity*

IEC 60904-1:2020, *Photovoltaic devices – Part 1: Measurement of photovoltaic current-voltage characteristics*

IEC 60904-1-1:2017, *Photovoltaic devices – Part 1-1: Measurement of current-voltage characteristics of multi-junction photovoltaic (PV) devices*

IEC TS 60904-1-2:2019, *Photovoltaic devices – Part 1-2: Measurement of current-voltage characteristics of bifacial photovoltaic (PV) devices*

IEC 60904-2:2015, *Photovoltaic devices – Part 2: Requirements for photovoltaic reference devices*

IEC 60904-3:2019, *Photovoltaic devices – Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data*

IEC 60904-4:2019, *Photovoltaic devices – Part 4: Photovoltaic reference devices – Procedures for establishing calibration traceability*

IEC 60904-5:2011, *Photovoltaic devices – Part 5: Determination of the equivalent cell temperature (ECT) of photovoltaic (PV) devices by the open-circuit voltage method*

IEC 60904-7:2019, *Photovoltaic devices – Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices*

IEC 60904-8:2014, *Photovoltaic devices – Part 8: Measurement of spectral responsivity of a photovoltaic (PV) device*

IEC 60904-8-1:2017, *Photovoltaic devices – Part 8-1: Measurement of spectral responsivity of multi-junction photovoltaic (PV) devices*

IEC 61140:2016, *Protection against electric shock – Common aspects for installation and equipment*

IEC 61210:2010, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

IEC 61215-1:2021, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 1: Test requirements*

IEC 61215-2:2021, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 2: Test procedures*

IEC TS 61836:2016, *Solar photovoltaic energy systems – Terms, definitions and symbols*

IEC 61853-1:2011, *Photovoltaic (PV) module performance testing and energy rating – Part 1: Irradiance and temperature performance measurements and power rating*

IEC 61853-2:2016, *Photovoltaic (PV) module performance testing and energy rating – Part 2: Spectral responsivity, incidence angle and module operating temperature measurements*

IEC 61853-3:2018, *Photovoltaic (PV) module performance testing and energy rating – Part 3: Energy rating of PV modules*

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

IEC 62670-3:2017, *Photovoltaic concentrators (CPV) – Performance testing – Part 3: Performance measurements and power rating*

IEC 62790:2020, *Junction boxes for photovoltaic modules – Safety requirements and tests*

IEC 62852:2014, *Connectors for DC-application in photovoltaic systems – Safety requirements and tests*

IEC 62852:2014/AMD1:2020