

# INTERNATIONAL STANDARD



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## Concentrator photovoltaic (CPV) modules and assemblies – Safety qualification





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MODULES AND ASSEMBLIES – SAFETY QUALIFICATION**

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## CONCENTRATOR PHOTOVOLTAIC (CPV) MODULES AND ASSEMBLIES – SAFETY QUALIFICATION

### 1 Scope

This document describes the fundamental construction and testing requirements for Concentrator Photovoltaic (CPV) modules and assemblies in order to provide safe electrical and mechanical operation during their expected lifetime. Specific topics are provided to assess the prevention of electrical shock, fire hazards, and personal injury due to mechanical and environmental stresses.

This document attempts to define the basic requirements for various application classes of concentrator photovoltaic modules and assemblies, but it cannot be considered to encompass all national and regional codes.

This document is designed so that its test sequence can coordinate with those of IEC 62108, so that a single set of samples may be used to perform both the safety and performance evaluation of a CPV module and assembly.

CPV modules that are constructed in the flat plate module format and operate at 3X and less geometric concentration ratio are considered for evaluation to IEC 61730-1 and IEC 61730-2.

### 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 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60065, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60216-5, *Electrical insulating materials – Thermal endurance properties – Part 5: Determination of relative thermal endurance index (RTE) of an insulating material*

IEC 60243-2, *Electric strength of insulating materials – Test methods – Part 2: Additional requirements for tests using direct voltage*

IEC 60417, *Graphical symbols for use on equipment – 12-month subscription to regularly updated online database comprising all graphical symbols published in IEC 60417*

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

IEC 60664-1:2007, *Insulation co-ordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC TR 60664-2-1:2011, *Insulation coordination for equipment within low-voltage systems – Part 2-1: Application guide – Explanation of the application of the IEC 60664 series, dimensioning examples and dielectric testing*