

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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**Low-voltage switchgear and controlgear assemblies  
Part 2: Power switchgear and controlgear assemblies**

**Ensembles d'appareillage à basse tension –  
Partie 2: Ensembles d'appareillage de puissance**





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**LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –****Part 2: Power switchgear and controlgear assemblies**

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International Standard IEC 61439-2 has been prepared by subcommittee 121B: Low-voltage switchgear and controlgear assemblies, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage.

This third edition cancels and replaces the second edition published in 2011. It constitutes a technical revision.

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

- a) addition of Annexes DD, EE and FF for assemblies for use in photovoltaic installation;
- b) clarification of the requirements for forms of internal separation and the addition of the requirement, when the form of separation is higher than 1, all parts within the functional unit compartment that remain live when the functional unit is switched off shall be protected to at least IPXXB;
- c) alignment with the structure of IEC 61439-1:2020;

- d) addition of temperature-rise verification for; (i) temperature-rise verification of assemblies with natural cooling and circuits rated above 1 600 A by a combination of comparison with a reference design and calculation, and; (ii) temperature-rise verification of assemblies with active cooling and rated currents up to 1 600 A.
- e) consideration of IP with active cooling.

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

FDIS	Report on voting
121B/104/FDIS	121B/109/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 1.

In this document, general terms and definitions are defined in Clause 3. Further terms and definitions specific to Annex DD are given in this annex to facilitate easier reading.

The reader's attention is drawn to the fact that Annex GG lists all the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this document.

This document is to be read in conjunction with IEC 61439-1:2020. The provisions of the general rules dealt with in IEC 61439-1 are only applicable to this document insofar as they are specifically cited. When this document states "addition", "modification" or "replacement", the relevant text in IEC 61439-1 is to be adapted accordingly.

Subclauses that are numbered with a 101 (102, 103, etc.) suffix are additional to the same subclause in IEC 61439-1.

Tables and figures in this document that are new are numbered starting with 101.

New annexes in this document are lettered AA, BB, etc.

In this document, the term PSC assembly is defined in 3.1.101.

NOTE Throughout the IEC 61439 series of standards, the term assembly (see 3.1.1 of IEC 61439-1:2020) is used for a low-voltage switchgear and controlgear assembly.

A list of all parts of the IEC 61439 series, under the general title *Low-voltage switchgear and controlgear assemblies* can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stipulated date indicated on the IEC website under "<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.

# LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –

## Part 2: Power switchgear and controlgear assemblies

### 1 Scope

This part of IEC 61439 defines the specific requirements for the power switchgear and controlgear assembly (abbreviated 'PSC-assembly' throughout this document see 3.1.10<sup>1</sup>) as follows:

- assemblies for which the rated voltage does not exceed 1 000 V AC or 1 500 V DC;
- assemblies designed for a nominal frequency of the incoming supply or supplies not exceeding 1 000 Hz;

NOTE 1 Frequencies above 1 kHz are considered as high frequencies, see also IEC 60071-1:2007, 5.3.3.2.5 to take into account additional constraints to insulation coordination.

- assemblies intended for indoor and outdoor applications;
- stationary or movable assemblies with or without enclosures;
- assemblies intended for use in connection with the generation, transmission, distribution and conversion of electrical energy, and for the control of equipment consuming electrical energy and for associated data processing;
- assemblies designed for use under special service conditions, for example in ships and in rail vehicles, provided that the other relevant specific requirements are complied with;

NOTE 2 Supplementary requirements for assemblies in ships are covered by IEC 60092-302-2.

This document also applies to assemblies for use in photovoltaic installations, designated as photovoltaic assemblies (PVA). The particular characteristics, specific service conditions and the requirements for PVA's are included in annexes DD, EE and FF.

This document provides supplementary requirements for PSC-assemblies intended for use as part of the electrical equipment of machines and can be applied in addition to the requirements given in IEC 60094-1.

This document applies to all assemblies whether they are designed, manufactured and verified on a one-off basis or fully standardised and manufactured in quantity.

The manufacturing and/or assembly can be carried out by an entity other than the original manufacturer (see 3.10.1 of IEC 61439-1:2020).

This document does not apply to individual devices, for example, circuit-breakers, fuse switches and self-contained components such as, motor starters, power electronic converter systems and equipment (PECS), switch mode power supplies (SMPS), uninterruptible power supplies (UPS), basic drive modules (BDM), complete drive modules (CDM), adjustable speed power drives systems (PDS), stand-alone energy storage systems (battery and capacitor systems), and other electronic equipment which comply with their relevant product standards. This document describes their integration into a PSC-assembly or an empty enclosure used as a part of a PSC-assembly.

For some applications, such as, explosive atmospheres, functional safety, there may be a need to comply with the requirements of other standards or legislation in addition to those specified in the IEC 61439 series.