

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Low-voltage switchgear and controlgear assemblies –
Part 7: Assemblies for specific applications such as marinas, camping sites,
market squares, electric vehicle charging stations**

**Ensembles d'appareillage à basse tension –
Partie 7: Ensembles pour installations publiques particulières telles que les
marinas, les terrains de camping, les marchés et les emplacements analogues et
pour bornes de charge de véhicules électriques**



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CONTENTS

FOREWORD	3
1 Scope	5
2 Normative references	6
3 Terms and definitions	6
4 Symbols and abbreviations	8
5 Interface characteristics	9
6 Information	12
7 Service conditions	13
8 Constructional requirements	13
9 Performance requirements	15
10 Design verification	15
11 Routine verification	24
Annexes	25
Annex AA (informative) Items subject to agreement between the ASSEMBLY manufacturer and the user	26
Annex BB (informative) Design verification	30
Annex CC (normative) Endurance of the individual switching device	31
Annex DD (informative) Examples of ASSEMBLIES in accordance with 5.701.1.1	35
Annex EE (informative) List of notes concerning certain countries	36
Bibliography	38
Figure 701 – Diagram of test to verify the resistance to static load	17
Figure 702 – Diagram of test to verify the mechanical strength of doors	18
Figure 703 – Sandbag for test to verify the resistance to shock load	19
Figure 704 – Diagram of test to verify resistance to shock load	20
Figure 705 – Diagram of test to verify resistance to torsional stress	22
Figure 706 – Striker element for test of resistance to mechanical shock impacts induced by sharp-edged objects	23
Figure CC.1 – Test circuit for endurance of the individual switching device test	33
Figure CC.2 – Informative wave shape of inrush current for tests in accordance with Annex CC	34
Figure DD.1 – Examples of ASSEMBLIES according to 5.701.1.1	35
Table 701 – Values of assumed loading	9
Table 702 – Mechanical tests	11
Table AA.1 – Items subject to agreement between the ASSEMBLY manufacturer and the user	26
Table BB.1 – List of design verifications to be performed	30

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –**Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicle charging stations**

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International Standard IEC 61439-7 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 first edition cancels and replaces the relevant technical specification published in 2014. It constitutes a technical revision.

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

- a) a new classification of the stationary ASSEMBLIES in accordance with their mechanical resistance (5.702);
- b) a new Table 702 with the list of tests and relevant severities to which the ASSEMBLIES have to be subjected according to the classification mentioned at point a);

- c) a new Annex (CC) with a new endurance test for the individual switching devices intended to be used in AEVSC, if they have not already been tested against this requirement;
- d) a general editorial review and a technical revision.

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

FDIS	Report on voting
121B/74/FDIS	121B/77/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 standard is to be read in conjunction with IEC 61439-1:2011. The provisions of the general rules dealt with in IEC 61439-1:2011 are applicable to this standard where they are specifically cited. When this document states "addition", "modification" or "replacement", the relevant text in IEC 61439-1:2011 is to be adapted accordingly.

Subclauses that are numbered with a 701 (702, 703, etc.) suffix are additional to the same subclause in IEC 61439-1:2011.

Tables and figures in this document that are new are numbered starting with 701.

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

In this standard, the term ASSEMBLY, written in small capitals is defined in 3.1.1 of IEC 61439-1:2011.

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

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.

This document 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.

The contents of the corrigendum of August 2019 have been included in this copy.

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –

Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicle charging stations

1 Scope

Clause 1 of IEC 61439-1:2011 is applicable except as follows.

Replacement:

NOTE 1 Throughout this document, the terms AMHS (see 3.1.701), ACCS (see 3.1.702), AMPS (see 3.1.703), AEVCS (see 3.1.704) are used for low-voltage switchgear and controlgear assemblies intended for use respectively in marinas and similar locations (AMHS), campsites and similar locations (ACCS), market squares and other similar external public sites (AMPS) and charging stations (AEVCS). The term ASSEMBLIES is used for indicating all these boards.

This Part of IEC 61439 defines the specific requirements of ASSEMBLIES as follows:

- ASSEMBLIES for which the rated voltage does not exceed 1 000 V in the case of AC or 1 500 V in the case of DC;
- ASSEMBLIES intended for use in connection with the generation, transmission, distribution and conversion of electric energy, and for the control of electric energy consuming equipment;
- ASSEMBLIES operated by ordinary persons (e.g. plug and unplug of electrical equipment);
- ASSEMBLIES intended to be installed and used in market squares, marinas, campsites and other similar outdoor public sites;
- ASSEMBLIES intended for charging stations for electric vehicles (AEVCS) for Mode 3 and Mode 4. They are designed to integrate the functionality and additional requirements for electric vehicle conductive charging systems according to IEC 61851-1:2017.

For the correct SELECTION of the switching devices and components, the following standards apply:

- IEC 60364-7-709 (AMHS) OR
- IEC 60364-7-708 (ACCS) OR
- IEC 60364-7-740 (AMPS) OR
- IEC 60364-7-722 (AEVCS).

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 manufacture and/or assembly may be carried out other than by the original manufacturer (see 3.10.1 of IEC 61439-1:2011).

This document does not apply to individual devices and self-contained components such as circuit breakers, fuse switches, electronic equipment, which comply with their relevant product standards.

NOTE 2 Where electrical equipment is directly connected to public low voltage supply system and equipped with a meter for billing of the legal provider of the low voltage supply, additional particular requirements based on national regulations apply, if any.

This document does not apply to boxes and enclosures for electrical accessories for household and similar fixed electrical installations as defined in IEC 60670-24.

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.

Clause 2 of IEC 61439-1:2011 is applicable except as follows.

Addition:

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-75, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 61439-1:2011, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61439-1:2011 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

Clause 3 of IEC 61439-1:2011 is applicable except as follows.

3.1 General terms

Additional terms:

3.1.701

low voltage switchgear and controlgear ASSEMBLY for marinas and harbors sites AMHS

combination of one or more transforming or switching devices together with associated control, measuring, signaling, protective and regulating equipment, with all their internal electrical and mechanical interconnections and structural parts, designed and built for use in all marinas, harbors and similar sites

Note 1 to entry: This note applies to the French language only.

3.1.702

low voltage switchgear and controlgear ASSEMBLY for camping and caravan sites ACCS

combination of one or more transforming or switching devices together with associated control, measuring, signaling, protective and regulating equipment, with all their internal electrical and mechanical interconnections and structural parts, designed and built for use in all camping, caravan and similar sites

Note 1 to entry: This note applies to the French language only.

3.1.703**low voltage switchgear and controlgear ASSEMBLY for markets and other outdoor public sites****AMPS**

combination of one or more transforming or switching devices together with associated control, measuring, signaling, protective and regulating equipment, with all their internal electrical and mechanical interconnections and structural parts, designed and built for use in all market squares and other similar outdoor public sites

Note 1 to entry: This note applies to the French language only.

3.1.704**low voltage switchgear and controlgear ASSEMBLY for electric vehicles charging stations****AEVCS**

combination of one or more transforming or switching devices together with associated control, measuring, signaling, protective and regulating equipment, with all their internal electrical and mechanical interconnections and structural parts, designed and built for electric vehicle charging stations

Note 1 to entry: This note applies to the French language only.

3.3 External design of ASSEMBLIES

Modification:

3.3.1**open-type ASSEMBLY**

This term of IEC 61439-1:2011 does not apply.

3.3.2**dead-front ASSEMBLY**

This term of IEC 61439-1:2011 does not apply.

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3.5 Conditions of installation of ASSEMBLIES**3.5.3****stationary ASSEMBLY**

Additional terms:

3.5.3.701**ground and floor mounted ASSEMBLY**

stationary ASSEMBLY permanently connected to the supply with a part embedded in the ground or intended to be fixed directly on the floor or a base

Note 1 to entry: This type of ASSEMBLY includes poles and columns.

3.5.3.702**wall mounted ASSEMBLY**

stationary ASSEMBLY intended to be fixed directly on the wall while being permanently fixed to the supply

3.5.4**movable ASSEMBLY**

This term of IEC 61439-1:2011 does not apply.

Additional terms:

3.5.701

permanently connected ASSEMBLY

ASSEMBLY that can only be connected to, or disconnected from, the AC or DC supply network by the use of a tool

Note 1 to entry: This ASSEMBLY corresponds to the definition of permanently connected EV supply equipment provided in IEC 61851-1:2017.

3.5.702

transportable ASSEMBLY

ASSEMBLY intended for use in a place where it is not permanently fixed. When the equipment is to be moved to another place, it is first disconnected from the supply network

3.5.703

mobile ASSEMBLY

ASSEMBLY which is capable to be moved while in operation or which can easily be moved from one place to another while connected to the supply network

3.5.704

ASSEMBLY for locations with restricted access

ASSEMBLY accessible to all persons who are authorized to have access to the location (e.g. equipment located in private housing, private parking areas or similar places)

Note 1 to entry: This ASSEMBLY corresponds to the definition of "equipment" for locations with restricted access provided in IEC 61851-1:2017.

3.5.705

ASSEMBLY for locations with non-restricted access

ASSEMBLY accessible for all persons, e.g. the access is given in a public area

Note 1 to entry: This ASSEMBLY corresponds to the definition of "equipment" for locations with non-restricted access provided in IEC 61851-1:2017.

3.5.706

water and other fluids system

part of the ASSEMBLY which contains water tubes, valves, joints and taps as service to connected user

EXAMPLE 1 Possible other fluids are compressed air, natural gasses, drinkable water and wastewater.

3.5.707

base

additional part of the arrangement used to support the ASSEMBLY in any case of mounting intended to accommodate only cables

3.5.708

fixing means

accessories intended to fix the base or the ASSEMBLY to the ground, to the floor or to the wall etc.

4 Symbols and abbreviations

Clause 4 of IEC 61439-1:2011 is applicable except as follows.

Addition:

Symbol/Abbreviation	Term	Subclause
AMHS	low voltage switchgear and controlgear assembly for marinas and harbors sites	3.1.701
ACCS	low voltage switchgear and controlgear assembly for camping and caravan sites	3.1.702
AMPS	low voltage switchgear and controlgear assembly for markets and other outdoor public sites	3.1.703
AEVCS	low voltage switchgear and controlgear assembly for electric vehicles charging station	3.1.704

5 Interface characteristics

Clause 5 of IEC 61439-1:2011 is applicable except as follows. Items subject to agreement between the ASSEMBLY manufacturer and the user: see Annex AA.

5.1 General

Replacement:

The characteristics of the ASSEMBLY shall ensure compatibility with the ratings of the circuits to which it is connected and the installation conditions and shall be declared by the ASSEMBLY manufacturer using the criteria identified in 5.2 to 5.6, 5.701 and 5.702.

5.4 Rated diversity factor (RDF)

[IEC 61439-7:2018](https://standards.iteh.ai/catalog/standards/sist/d315ec51-2037-471c-a8c0-5a294c6595dc/iec-61439-7-2018)

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In the absence of information concerning the actual load currents, the assumed loading of the outgoing circuits of the ASSEMBLY or group of outgoing circuits, the factor in Table 701 below, may be used.

Table 701 does not apply for AEVCS. For AEVCS the rated diversity factor of the outgoing circuit supplying directly the connecting point shall be taken as equal to 1. The rated diversity factor of the distribution circuit supplying multiple connecting points may be reduced if a load control is available.

Table 701 – Values of assumed loading

Number of main circuits	Assumed loading factor
2 and 3	0,8
4 and 5	0,7
6 to 9 inclusive	0,6
10 (and above)	0,5

5.6 Other characteristics

Replacement of the item g):

g) intended for use by ordinary persons (see 3.7.14 of IEC 61439-1:2011);

Additional item:

q) locations with restricted access or non-restricted access (see 3.5.704 and 3.5.705).

Additional subclauses:

5.701 According to the method of mounting

5.701.1 Stationary ASSEMBLY

5.701.1.1 Ground and floor mounted ASSEMBLY (see Annex DD)

5.701.1.2 Wall mounted ASSEMBLY

5.701.2 Transportable ASSEMBLY

5.701.3 Mobile ASSEMBLY

5.702 According to the mechanical resistance for stationary ASSEMBLY (see Table 702)

5.702.1 Basic resistance

5.702.2 Medium resistance

5.702.3 High resistance

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Table 702 – Mechanical tests

Name of the test	Subclause	Sub test	Basic resistance (5.702.1)	Medium resistance (5.702.2)	High resistance (5.702.3)	Test of ASSEMBLIES
Resistance to mechanical impact (IK)	10.2.701.2		IK07	IK08	IK10	All type of ASSEMBLIES
Resistance to static load	10.2.701.3	Test 1: "Evenly distributed load test" "Lateral force test"	No	4 500 N/m ² shall be applied for 5 min 600 N applied for 5 min in turn	8 500 N/m ² shall be applied for 5 min 1200 N applied for 5 min in turn	Ground and floor mounted ASSEMBLY Ground and floor mounted ASSEMBLY
Mechanical strength of doors	10.2.701.4		No	A load of 50 N + load increased to 250 N	A load of 50 N + load increased to 450 N	All type of ASSEMBLIES
Resistance to shock load	10.2.701.5		No	No	total mass of 15 kg	Ground and floor mounted ASSEMBLY
Resistance to torsional stress	10.2.701.6		No	No	2 × 1 000 N applied for 30 s	Ground and floor mounted ASSEMBLY
Sharp edged objects	10.2.701.7		Optional	Optional	Optional	All type of ASSEMBLIES
Shock test	10.2.702.8			Mobile and transportable ASSEMBLIES		

NOTE Depending on the applications, ASSEMBLIES classified as medium resistance (5.702.2) can be used to increase the degree of safety in comparison with the basic resistance (5.702.1).

6 Information

Clause 6 of IEC 61439-1:2011 is applicable except as follows.

6.1 ASSEMBLY designation marking

Replacement:

The ASSEMBLY manufacturer shall provide each ASSEMBLY with one or more labels, marked in a durable manner and located in a place such that they are visible and legible when the ASSEMBLY is installed.

Compliance is checked according to the test of 10.2.7 of IEC 61439-1:2011 and by inspection.

The following information regarding the ASSEMBLY shall be provided on the label(s):

- a) ASSEMBLY manufacturer's name or trade mark (see 3.10.2 of IEC 61439-1:2011);
- b) type designation or identification number or any other means of identification, making it possible to obtain relevant information from the ASSEMBLY manufacturer;
- c) means of identifying date of manufacture;
- d) IEC 61439-7;
- e) frequency in the case of AC (see 5.5 of IEC 61439-1:2011);
- f) rated voltage (U_n) of the ASSEMBLY (see 5.2.1 of IEC 61439-1:2011);
- g) rated current of the ASSEMBLY (I_{nA}) (see 5.3.1 of IEC 61439-1:2011);
- h) degree of protection;
- i) the weight, for **transportable and mobile ASSEMBLIES** (see 3.5.702 and 3.5.703), where it exceeds 30 kg.

6.2.1 Information relating to the ASSEMBLY

Replacement:

The following additional information, where applicable, shall be provided in the ASSEMBLY manufacturer's technical documentation supplied with the ASSEMBLY:

- a) rated operational voltage (U_e) of a circuit (see 5.2.2 of IEC 61439-1:2011);
- b) rated impulse withstand voltage (U_{imp}) (see 5.2.4 of IEC 61439-1:2011);
- c) rated insulation voltage (U_i) (see 5.2.3 of IEC 61439-1:2011);
- d) rated current of each circuit (I_{nC}) (see 5.3.2 of IEC 61439-1:2011);
- e) rated frequency (f_n) (see 5.5 of IEC 61439-1:2011);
- f) rated diversity factor(s) (RDF) (see 5.4);
- g) all necessary information relating to the other declared classifications and characteristics (see 5.6, 5.701 and 5.702);
- h) overall dimensions (including projections e.g handles, covers, doors);
- i) AMHS (see 3.1.701), ACCS (see 3.1.702), AMPS (see 3.1.703), AEVCS (see 3.1.704) or equivalent terms;
- j) for mobile ASSEMBLIES according 3.5.704, the mounting position during operation, if necessary.

7 Service conditions

Clause 7 of IEC 61439-1:2011 is applicable.

8 Constructional requirements

Clause 8 of IEC 61439-1:2011 is applicable except as follows.

8.2 Degree of protection provided by an ASSEMBLY enclosure

8.2.1 Protection against mechanical impact

Replacement of the whole text of this subclause:

8.2.1.701 ASSEMBLIES for locations with restricted access

The minimum mechanical resistance for ASSEMBLIES for locations with restricted access is the basic resistance (5.702.1).

Medium or high resistance (5.702.2 and 5.702.3) may be also required by the national installation rules.

For the relevant tests and severities see Table 702.

8.2.1.702 ASSEMBLIES for locations with non-restricted access

The minimum mechanical resistance for ground and floor mounting ASSEMBLIES for locations with non-restricted access is the high resistance (5.702.3).

<https://standards.iteh.ai/catalog/standards/sist/d315ec51-2037-471c-a8c0-52846595711c/iec-61439-7-2018>

The minimum mechanical resistance for wall mounting ASSEMBLIES for locations with non-restricted access is the high resistance (5.702.3).

In case of wall mounting ASSEMBLIES for locations with non-restricted access intended to be installed at a height where the bottom edge of the ASSEMBLIES is more or equal to 0,9 m from the ground or floor, the mechanical resistance can be decreased to medium resistance (5.702.2).

For the relevant tests and severities see Table 702.

8.2.2 Protection against contact with live parts, ingress of solid foreign bodies and water

Replacement of the 2nd, 3rd and 4th paragraph:

After installation in accordance with the manufacturer's instructions, the degree of protection of an indoor ASSEMBLY shall be at least IP41 and of an outdoor ASSEMBLY at least IP44, in accordance with IEC 60529.

The degree of protection shall be ensured also when the supply cords are plugged into the ASSEMBLY.

In case of specific and more severe conditions, a higher IP degree could be required according to the installation requirements.