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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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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

Ensembles d'appareillage à basse tension – Partie 7: Ensembles pour les applications spécifiques comme les marinas, les terrains de camping, les marchés et pour les bornes de charge de véhicules électriques

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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

FOREWORD

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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 second edition cancels and replaces the first edition published in 2018. It constitutes a technical revision.

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

a) a general editorial review and a technical revision.

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

Draft	Report on voting
121B/138/CDV	121B/150/RVC

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

Subclauses that are numbered with a 701 (702, 703, etc.) suffix are additional to the same subclause in IEC 61439-1:2020.

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 document, the term assembly is defined in 3.1.1 of IEC 61439-1:2020.

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

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 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. The main document types developed by IEC are described in greater detail at 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 in the data related to the specific document. At this date, the document will be

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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 61439-1:2020 is applicable except as follows.

Replacement:

This part of IEC 61439 defines the specific requirements for assemblies for the following applications: marinas, camping sites, market squares and electric vehicle charging stations as follows:

- assemblies for which the rated voltage does not exceed 1 000 V AC or 1 500 V 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. to plug and unplug of electrical equipment);
- assemblies intended to be installed and used in market squares, marinas, camping sites and other similar sites accessible to the public including temporary installations;
- 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.

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), camping sites 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 document is not applicable to assemblies intended to be installed on board of ships, houseboats, pleasure crafts and similar vessels.

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

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 an energy 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 61439-1:2020 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 61439-1:2020, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

IEC 62262:2002, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*
IEC 62262:2002/AMD1:2021

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61439-1:2020 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 61439-1:2020 is applicable except as follows.

3.1 General terms

Additional terms:

3.1.701
low-voltage switchgear and controlgear assembly for marinas and harbour 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

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

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

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

3.3 External design of assemblies

Modification:

3.3.1
open-type assembly
This term of IEC 61439-1:2020 does not apply.

3.3.2
dead-front assembly
This term of IEC 61439-1:2020 does not apply.

3.5 Conditions of installation of assemblies

3.5.3
stationary assembly

Additional terms and definitions:

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 61439-1:2020 does not apply.

Additional terms and definitions:

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 3.6.9 of IEC 61851-1:2017.

3.5.702
transportable assembly
assembly intended for use in a place where it is not permanently fixed

Note 1 to entry: 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 3.6.3 of 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 3.6.4 of IEC 61851-1:2017.

3.5.706
water and other fluids system
part of the assembly which contains water tubes, valves, joins and taps as service to connected user

EXAMPLE 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 mean
accessory 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 61439-1:2020 is applicable except as follows.

Addition:

Symbol/ Abbreviation	Term	Subclause
AMHS	low-voltage switchgear and controlgear assembly for marinas and harbour 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 61439-1:2020 is applicable except as follows.

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.

The specification schedule detailed in the informative Annex AA is intended to help the user and the assembly manufacturer to meet this objective, whether the user:

- selects catalogue products, the characteristics of which meet their needs, and the requirements of this document; and/or,
- makes a specific agreement with the manufacturer.

5.4 Rated diversity factor (RDF)

Addition:

In the absence of an agreement between the assembly manufacturer and the user concerning the actual load currents, the assumed loading of the outgoing circuits of AMHS, ACCS, AMPS assembly or group of outgoing circuits can be based on the values in Table 701.

The assumed load current is the rated current of the protective device I_n as required by the user, multiplied with the loading factor of Table 701.

Table 701 does not apply for AEVCS. For AECVS it is assumed that all circuits can be loaded continuously and simultaneously. Therefore, the assumed loading factor of the outgoing circuits shall be taken as equal to 1 and can be reduced if a load control is available.

NOTE Values in Table 701 represent minimum values which are reached or exceeded in tests.

5.6 Other characteristics

Replacement of the item g):

g) intended for use by ordinary persons (see 3.7.16 of IEC 61439-1:2020);

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 mechanical resistance

5.702.2 Medium mechanical resistance

5.702.3 High mechanical resistance

6 Information

Clause 6 of IEC 61439-1:2020 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 61439-1:2020 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 61439-1:2020);
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) rated current of the assembly I_{nA} (see 3.8.10.7 and 5.3.1 of IEC 61439-1:2020);
e) rated voltage of the assembly U_n (see 3.8.9.1 and 5.2.1 of IEC 61439-1:2020);
f) rated frequency of the assembly f_n (see 3.8.12 and 5.5 of IEC 61439-1:2020);
g) IEC 61439-7;
h) degree of protection against contact with hazardous live parts, ingress of solid foreign bodies and water, IP code (see 8.2.2 of IEC 61439-1:2020);

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

Addition:

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

a) rated impulse withstand voltage (U_{imp}) (see 5.2.4 of IEC 61439-1:2020);
b) rated insulation voltage (U_i) (see 5.2.3 of IEC 61439-1:2020);
c) rated current of each circuit (I_{nc}) (see 5.3.2 of IEC 61439-1: 2020);
d) rated diversity factor(s) (RDF) (see 5.4);
e) all necessary information relating to the other declared classifications and characteristics (see 5.6, 5.701 and 5.702);
f) overall dimensions (including projections e.g. handles, covers, doors);
g) AMHS (see 3.1.701), ACCS (see 3.1.702), AMPS (see 3.1.703), AEVCS (see 3.1.704) or equivalent terms;
h) for mobile assemblies according to 3.5.703, the mounting position during operation.

7 Service conditions

Clause 7 of IEC 61439-1:2020 is applicable.

8 Constructional requirements

Clause 8 of IEC 61439-1:2020 is applicable except as follows.

8.2 Degree of protection and mechanical strength provided by an assembly enclosure

8.2.1 Mechanical strength for assemblies

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) can 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).

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 criteria's, see Table 702.

8.2.2 Protection against contact with live parts, ingress of solid foreign bodies and water (IP code)

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 60529:1989, IEC 60529:1989/AMD1:1999 and IEC 60529:1989/AMD2:2013.

The degree of protection shall be ensured also when the supply cables 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.

8.4 Protection against electric shock

8.4.3.1 Installation conditions

Replacement of the whole text of this subclause:

The assembly shall include protective measures and be suitable for installations designed to be in accordance with IEC 60364-4-41:2005 and IEC 60364-4-41:2005/AMD1:2017 as well as the applicable wiring standards.

NOTE 1 The applicable wiring standards are IEC 60364-7-709:2007 and IEC 60364-7-709:2007/AMD1:2012 (AMHS) or IEC 60364-7-708:2017 (ACCS) or IEC 60364-7-740:2000 (AMPS) or IEC 60364-7-722:2018 (AEVCS).

NOTE 2 For AEVCS, see also 8.5 of IEC 61851-1:2017.

8.5 Incorporation of switching devices and components

8.5.3 Selection of switching devices and components

Addition:

The need for overvoltage protection (SPDs) to prevent possible damage to the installation should be considered.

8.5.6 Barriers

This subclause of IEC 61439-1:2020 does not apply.

Additional subclauses:

8.701 Supports and securing devices of assembly

8.701.1 Handling provisions

In case of mobile assemblies, handles (or any other equivalent system) shall be provided on the assembly and be firmly attached to the enclosure or supporting framework.

The assembly shall be verified according to 10.2.5 of IEC 61439-1:2020.

8.701.2 Water and other fluid systems

The assembly in a common enclosure with water and other fluids shall be designed according to the requirements of this document for outdoor installation.

The compartment containing the fluid system shall be separated in such a way that an improper fluid ingress is prevented.

Compliance is checked by inspection.

NOTE In the case that the fluid system could lead to a risk of explosion, additional requirements can be applicable. For details, see IEC 60364-5-52:2009, Chapter 528.

Provisions for the using of other fluids could be subject to an agreement between the manufacturer and users.

8.701.3 Other services

As other services (e.g. telecommunication, internet) can be installed in the same enclosure, the assembly shall enable segregation between power circuits and this other services.

NOTE For details, see IEC 60364-5-52:2009, Chapter 528.

9 Performance requirements

Clause 9 of IEC 61439-1:2020 is applicable except as follows.

Additional subclause:

9.701 Inrush current withstand strength for AEVCS

In AEVCS intended for AC, if not already tested against this requirement, the individual switching device shall withstand an inrush current of an electric vehicle as defined in Annex CC.

NOTE 1 The requirement for the inrush current of an electric vehicle is based on ISO 17409.

NOTE 2 The requirements for the AEVCS intended for DC are described in IEC 61851-23.

10 Design verification

Clause 10 of IEC 61439-1:2020 is applicable except as follows. See also Annex BB.

10.2.6 Verification of protection against mechanical impact (IK code)

This subclause of IEC 61439-1:2020 does not apply.

Additional subclauses:

10.2.701 Verification of mechanical strength for assemblies

10.2.701.1 General

The tests shall be carried out at an ambient temperature of between +10 °C and +40 °C.

With the exception of the test of 10.2.701.5, a new sample assembly can be used for each of the independent tests. If the same sample assembly is used for more than one test of 10.2.701, the compliance check for the second numeral of the degree of protection (IP code) shall only be applied when the tests on that sample have been completed.