

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Low-voltage switchgear and controlgear assemblies –
Part 1: General rules**

**Ensembles d'appareillage à basse tension –
Partie 1: Règles générales**

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CONTENTS

FOREWORD.....	8
INTRODUCTION.....	11
1 Scope.....	12
2 Normative references.....	12
3 Terms and definitions.....	15
3.1 General terms.....	15
3.2 Constructional units of ASSEMBLIES.....	16
3.3 External design of ASSEMBLIES.....	17
3.4 Structural parts of ASSEMBLIES.....	18
3.5 Conditions of installation of ASSEMBLIES.....	20
3.6 Insulation characteristics.....	20
3.7 Protection against electric shock.....	23
3.8 Characteristics.....	24
3.9 Verification.....	27
3.10 Manufacturer.....	27
4 Symbols and abbreviations.....	27
5 Interface characteristics.....	29
5.1 General.....	29
5.2 Voltage ratings.....	29
5.2.1 Rated voltage (U_n) (of the ASSEMBLY).....	29
5.2.2 Rated operational voltage (U_e) (of a circuit of an ASSEMBLY).....	29
5.2.3 Rated insulation voltage (U_i) (of a circuit of an ASSEMBLY).....	29
5.2.4 Rated impulse withstand voltage (U_{imp}) (of the ASSEMBLY).....	29
5.3 Current ratings.....	29
5.3.1 Rated current of the ASSEMBLY (I_{nA}).....	29
5.3.2 Rated current of a circuit (I_{nC}).....	30
5.3.3 Rated diversity factor (RDF).....	30
5.3.4 Rated peak withstand current (I_{pk}).....	30
5.3.5 Rated short-time withstand current (I_{cW}) (of a circuit of an ASSEMBLY).....	30
5.3.6 Rated conditional short-circuit current of an ASSEMBLY (I_{CC}).....	30
5.4 Rated frequency (f_n).....	31
5.5 Other characteristics.....	31
6 Information.....	31
6.1 ASSEMBLY designation marking.....	31
6.2 Documentation.....	31
6.2.1 Information relating to the ASSEMBLY.....	31
6.2.2 Instructions for handling, installation, operation and maintenance.....	32
6.3 Device and/or component identification.....	33
7 Service conditions.....	33
7.1 Normal service conditions.....	33
7.1.1 Ambient air temperature.....	33
7.1.2 Atmospheric conditions.....	33
7.1.3 Pollution degree.....	33
7.1.4 Altitude.....	34
7.2 Special service conditions.....	34

7.3	Conditions during transport, storage and installation	35
8	Constructional requirements	35
8.1	Strength of materials and parts	35
8.1.1	General	35
8.1.2	Protection against corrosion	35
8.1.3	Thermal stability	35
8.1.4	Resistance to ultra-violet radiation	35
8.1.5	Resistance of insulating materials to heat and fire	35
8.1.6	Mechanical strength	36
8.1.7	Lifting provision	36
8.2	Degree of protection provided by an ASSEMBLY enclosure	36
8.2.1	Protection against mechanical impact	36
8.2.2	Protection against contact with live parts, ingress of solid foreign bodies and liquids	36
8.2.3	Degree of protection of removable parts	37
8.3	Clearances and creepage distances	37
8.3.1	General	37
8.3.2	Clearances	38
8.3.3	Creepage distances	38
8.4	Protection against electric shock	38
8.4.1	General	38
8.4.2	Basic protection	39
8.4.3	Fault protection	40
8.4.4	Limitation of steady-state touch current and charge	43
8.4.5	Operating and servicing conditions	43
8.5	Incorporation of switching devices and components	45
8.5.1	Fixed parts	45
8.5.2	Removable parts	45
8.5.3	Selection of switching devices and components	45
8.5.4	Installation of switching devices and components	46
8.5.5	Accessibility	46
8.5.6	Barriers	46
8.5.7	Direction of operation and indication of switching positions	46
8.5.8	Indicator lights and push-buttons	46
8.6	Internal electrical circuits and connections	47
8.6.1	Main circuits	47
8.6.2	Auxiliary circuits	47
8.6.3	Bare and insulated conductors	47
8.6.4	Selection and installation of non-protected live conductors to reduce the possibility of short-circuits	48
8.6.5	Identification of the conductors of main and auxiliary circuits	48
8.6.6	Identification of the protective conductor (PE, PEN) and of the neutral conductor (N) of the main circuits	48
8.7	Cooling	49
8.8	Terminals for external conductors	49
9	Performance requirements	50
9.1	Dielectric properties	50
9.1.1	General	50
9.1.2	Power-frequency withstand voltage	50

9.1.3	Impulse withstand voltage	51
9.1.4	Protection of surge protective devices	51
9.2	Temperature rise limits	51
9.3	Short-circuit protection and short-circuit withstand strength	51
9.3.1	General	51
9.3.2	Information concerning short-circuit withstand strength	52
9.3.3	Relationship between peak current and short-time current	52
9.3.4	Co-ordination of protective devices	52
9.4	Electromagnetic compatibility (EMC)	53
10	Design verification	53
10.1	General	53
10.2	Strength of materials and parts	54
10.2.1	General	54
10.2.2	Resistance to corrosion	54
10.2.3	Properties of insulating materials	55
10.2.4	Resistance to ultra-violet (UV) radiation	57
10.2.5	Lifting	57
10.2.6	Mechanical impact	58
10.2.7	Marking	58
10.3	Degree of protection of ASSEMBLIES	58
10.4	Clearances and creepage distances	58
10.5	Protection against electric shock and integrity of protective circuits	59
10.5.1	Effectiveness of the protective circuit	59
10.5.2	Effective earth continuity between the exposed conductive parts of the ASSEMBLY and the protective circuit	59
10.5.3	Short-circuit withstand strength of the protective circuit	59
10.6	Incorporation of switching devices and components	60
10.6.1	General	60
10.6.2	Electromagnetic compatibility	60
10.7	Internal electrical circuits and connections	60
10.8	Terminals for external conductors	60
10.9	Dielectric properties	60
10.9.1	General	60
10.9.2	Power-frequency withstand voltage	60
10.9.3	Impulse withstand voltage	61
10.9.4	Testing of enclosures made of insulating material	63
10.10	Verification of temperature rise	63
10.10.1	General	63
10.10.2	Verification by testing with current	63
10.10.3	Derivation of ratings for similar variants	69
10.10.4	Verification by calculation	70
10.11	Short-circuit withstand strength	72
10.11.1	General	72
10.11.2	Circuits of ASSEMBLIES which are exempted from the verification of the short-circuit withstand strength	73
10.11.3	Verification by the application of design rules	73
10.11.4	Verification by comparison with a reference design	73
10.11.5	Verification by test	73
10.12	Electromagnetic compatibility (EMC)	78

10.13	Mechanical operation.....	78
11	Routine verification.....	79
11.1	General	79
11.2	Degree of protection of enclosures	79
11.3	Clearances and creepage distances	79
11.4	Protection against electric shock and integrity of protective circuits	80
11.5	Incorporation of built-in components	80
11.6	Internal electrical circuits and connections.....	80
11.7	Terminals for external conductors.....	80
11.8	Mechanical operation.....	80
11.9	Dielectric properties.....	80
11.10	Wiring, operational performance and function	80
Annex A (normative)	Minimum and maximum cross-section of copper conductors suitable for connection to terminals for external conductors (see 8.8).....	88
Annex B (normative)	Method of calculating the cross-sectional area of protective conductors with regard to thermal stresses due to currents of short duration.....	89
Annex C (informative)	Items subject to agreement between the ASSEMBLY Manufacturer and the User	90
Annex D (informative)	Design verification	93
Annex E (informative)	Rated diversity factor	94
Annex F (normative)	Measurement of clearances and creepage distances	103
Annex G (normative)	Correlation between the nominal voltage of the supply system and the rated impulse withstand voltage of the equipment.....	109
Annex H (informative)	Operating current and power loss of copper conductors	111
Annex J (normative)	Electromagnetic compatibility (EMC).....	115
Annex K (normative)	Protection by electrical separation.....	122
Annex L (informative)	Clearances and creepage distances for North American region	125
Annex M (informative)	North American temperature rise limits	126
	Bibliography.....	127
	Figure E.1 – Typical ASSEMBLY.....	95
	Figure E.2 – Example 1: Table E.1 – Functional unit loading for an ASSEMBLY with a rated diversity factor of 0,8	97
	Figure E.3 – Example 2: Table E.1 – Functional unit loading for an ASSEMBLY with a rated diversity factor of 0,8	98
	Figure E.4 – Example 3: Table E.1 – Functional unit loading for an ASSEMBLY with a rated diversity factor of 0,8	99
	Figure E.5 – Example 4: Table E.1 – Functional unit loading for an ASSEMBLY with a rated diversity factor of 0,8	100
	Figure E.6 – Example of average heating effect calculation	101
	Figure E.7 – Example graph for the relation between the equivalent RDF and the parameters at intermittent duty at $t_1 = 0,5$ s, $I_1 = 7 \cdot I_2$ at different cycle times	102
	Figure E.8 – Example graph for the relation between the equivalent RDF and the parameters at intermittent duty at $I_1 = I_2$ (no starting overcurrent).....	102
	Figure F.1 – Measurement of ribs	104
	Figure J.1 – Examples of ports	115

Table 1 – Minimum clearances in air ^{a)} (8.3.2).....	82
Table 2 – Minimum creepage distances (8.3.3).....	82
Table 3 – Cross-sectional area of a copper protective conductor (8.4.3.2.2)	83
Table 4 – Conductor selection and installation requirements (8.6.4).....	83
Table 5 – Minimum terminal capacity for copper protective conductors (PE, PEN) (8.8)	83
Table 6 – Temperature-rise limits (9.2)	84
Table 7 – Values for the factor n ^{a)} (9.3.3).....	85
Table 8 – Power-frequency withstand voltage for main circuits (10.9.2)	85
Table 9 – Power-frequency withstand voltage for auxiliary and control circuits (10.9.2).....	85
Table 10 – Impulse withstand test voltages (10.9.3).....	85
Table 11 – Copper test conductors for rated currents up to 400 A inclusive (10.10.2.3.2).....	86
Table 12 – Copper test conductors for rated currents from 400 A to 4 000 A (10.10.2.3.2).....	86
Table 13 – Short-circuit verification by design rules: check list.....	87
Table 14 – Relationship between prospective fault current and diameter of copper wire	87
Table A.1 – Cross-section of copper conductors suitable for connection to terminals for external conductors	88
Table B.1 – Values of k for insulated protective conductors not incorporated in cables, or bare protective conductors in contact with cable covering.....	89
Table C.1 – Items subject to agreement between the ASSEMBLY manufacturer and the User.....	90
Table D.1 – List of design verifications to be performed.....	93
Table E.1 – Examples of loading for an ASSEMBLY with a rated diversity factor of 0,8	96
Table E.2 – Example of loading of a group of circuits (Section B – Figure E.1) with a rated diversity factor of 0,9	101
Table E.3 – Example of loading of a group of circuits (Subdistribution board – Figure E.1) with a rated diversity factor of 0,9.....	101
Table F.1 – Minimum width of grooves.....	103
Table G.1 – Correspondence between the nominal voltage of the supply system and the equipment rated impulse withstand voltage, in the case of overvoltage protection by surge-arresters according to IEC 60099-1	110
Table H.1 – Operating current and power loss of single-core copper cables with a permissible conductor temperature of 70 °C (ambient temperature inside the ASSEMBLY: 55 °C).....	111
Table H.2 – Reduction factor k_1 for cables with a permissible conductor temperature of 70 °C (extract from IEC 60364-5-52, table A.52-14)	112
Table H.3 – Operating current and power loss of bare copper busbars with rectangular cross-section, run horizontally and arranged with their largest face vertical, frequency 50 Hz to 60 Hz (ambient temperature inside the ASSEMBLY: 55 °C, temperature of the conductor 70 °C).....	113
Table H.4 – Factor k_4 for different temperatures of the air inside the ASSEMBLY and / or for the conductors.....	114
Table J.1 – Emission limits for Environment A.....	118
Table J.2 – Emission limits for Environment B.....	119
Table J.3 – Tests for EMC immunity for Environment A (see J.10.12.1)	119
Table J.4 – Tests for EMC immunity for Environment B (see J.10.12.1)	120
Table J.5 – Acceptance criteria when electromagnetic disturbances are present.....	121

Table K.1 – Maximum disconnecting times for TN systems 124
Table L.1 – Minimum clearances in air 125
Table L.2 – Minimum creepage distances 125
Table M.1 – North American temperature rise limits 126

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –**Part 1: General rules**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61439-1 has been prepared by subcommittee 17D: Low-voltage switchgear and controlgear assemblies, of IEC technical committee 17: Switchgear and controlgear.

This first edition of IEC 61439-1 standard cancels and replaces the fourth edition of IEC 60439-1 (1999), and constitutes a technical revision.

This edition of IEC 61439-1 includes the following significant technical changes with respect to the last edition of IEC 60439-1:

- the dual role of IEC 60439-1 as a product standard in its own right, as well as a general rules standard for assemblies covered by a subsidiary product part of the IEC 60439 series, has been abandoned;
- consequently, IEC 61439-1 is a pure "general rules" standard to be referred to by subsidiary product parts of the IEC 61439 series;
- the product standard replacing IEC 60439-1 is IEC 61439-2;

- the discrimination between type-tested assemblies (TTA) and partially type-tested assemblies (PTTA) is eliminated by the verification approach;
- three different but equivalent types of verification of requirements are introduced: verification by testing, verification by calculation/measurement, or verification by satisfying design rules;
- the requirements regarding temperature rise have been clarified;
- the rated diversity factor (RDF) is covered in more detail;
- requirements from the standard for empty enclosures for assemblies (IEC 62208) have been incorporated;
- the whole structure of the standard is aligned with its new function as “general rules” standard.

However, when a dated reference to IEC 60439-1 is made in another Part of the IEC 60439 series of assembly standards not yet transferred into the new IEC 61439 series, the superseded IEC 60439-1 still applies (see also the Introduction below).

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

CDV	Report on voting
17D/357/CDV	17D/362A/RVC

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

In this standard, terms written in small capitals are defined in Clause 3.

The “in some countries” notes regarding differing national practices are contained in the following subclauses:

- 8.2.2
- 8.3.2
- 8.3.3
- 8.8
- 9.2
- 10.11.5.4
- 10.11.5.6.1
- Annex L
- Annex M

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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 publication will remain unchanged until the maintenance result date indicated on the IEC web site 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.



INTRODUCTION

The purpose of this standard is to harmonize as far as practicable all rules and requirements of a general nature applicable to low-voltage switchgear and controlgear assemblies (ASSEMBLIES) in order to obtain uniformity of requirements and verification for ASSEMBLIES and to avoid the need for verification to other standards. All those requirements for the various ASSEMBLIES standards which can be considered as general have therefore been gathered in this basic standard together with specific subjects of wide interest and application, e.g. temperature rise, dielectric properties, etc.

For each type of low-voltage switchgear and controlgear assembly only two main standards are necessary to determine all requirements and the corresponding methods of verification:

- this basic standard referred to as “Part 1” in the specific standards covering the various types of low-voltage switchgear and controlgear assemblies;
- the specific ASSEMBLY standard hereinafter also referred to as the relevant ASSEMBLY standard.

For a general rule to apply to a specific ASSEMBLY standard, it should be explicitly referred to by quoting the relevant clause or sub-clause number of this standard followed by “Part 1” e.g. “9.1.3 of Part 1”.

A specific ASSEMBLY standard may not require and hence need not call up a general rule where it is not applicable, or it may add requirements if the general rule is deemed inadequate in the particular case but it may not deviate from it unless there is substantial technical justification detailed in the specific ASSEMBLY standard.

Requirements in this standard that are subject to agreement between the ASSEMBLY manufacturer and the user are summarised in Annex C (informative). This schedule also facilitates the supply of information on basic conditions and additional user specifications to enable proper design, application and utilization of the ASSEMBLY.

For the new re-structured IEC 61439 series, the following parts are envisaged:

- IEC 61439-1: General rules
- IEC 61439-2: Power switchgear and controlgear ASSEMBLIES (PSC-ASSEMBLIES)
- IEC 61439-3: Distribution boards (to supersede IEC 60439-3)
- IEC 61439-4: ASSEMBLIES for construction sites (to supersede IEC 60439-4)
- IEC 61439-5: ASSEMBLIES for power distribution (to supersede IEC 60439-5)
- IEC 61439-6: Busbar trunking systems (to supersede IEC 60439-2).

This list is not exhaustive; additional Parts may be developed as the need arises.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –

Part 1: General rules

1 Scope

NOTE 1 Throughout this standard, the term ASSEMBLY (see 3.1.1) is used for a low-voltage switchgear and controlgear assembly.

This part of IEC 61439 lays down the definitions and states the service conditions, construction requirements, technical characteristics and verification requirements for low-voltage switchgear and controlgear assemblies.

This standard applies to low-voltage switchgear and controlgear assemblies (ASSEMBLIES) only when required by the relevant ASSEMBLY standard as follows:

- ASSEMBLIES for which the rated voltage does not exceed 1 000 V in case of a.c. or 1 500 V in case of d.c.;
- stationary or movable ASSEMBLIES with or without enclosure;
- 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 designed for use under special service conditions, for example in ships, in rail vehicles, for equipment in explosive atmospheres, and for domestic applications (operated by unskilled persons), provided that the relevant specific requirements are complied with;

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

NOTE 3 Supplementary requirements for ASSEMBLIES in explosive atmospheres are covered by the IEC 60079 series and the IEC 61241 series.

- ASSEMBLIES designed for electrical equipment of machines. Supplementary requirements for ASSEMBLIES forming part of a machine are covered by the IEC 60204 series.

This standard 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).

This standard cannot be used alone to specify an ASSEMBLY or used for a purpose of determining conformity.

This standard does not apply to individual devices and self-contained components, such as motor starters, fuse switches, electronic equipment, etc. which will comply with the relevant product standards.

2 Normative references

The following referenced documents are indispensable for the application 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 60038:1983, *IEC standard voltages*

IEC 60073:2002, *Basic and safety principles for man-machine interface, marking and identification – Coding principles for indicators and actuators*

IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-11:1981, *Environmental testing – Part 2-11: Tests – Test Ka: Salt mist*

IEC 60068-2-30:2005, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 + 12-hour cycle)*

IEC 60085:2007, *Electrical insulation – Thermal evaluation and designation*

IEC 60099-1:1991, *Surge arresters – Part 1: Non-linear resistor type gapped surge arresters for a.c. systems*

IEC 60204 (all parts), *Safety of machinery – Electrical equipment of machines*

IEC 60216 (all parts), *Electrical insulating materials – Properties of thermal endurance*

IEC 60228:2004, *Conductors of insulated cables*

IEC 60364 (all parts), *Low-voltage electrical installations*

IEC 60364-4-41:2005, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-44:2007, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

IEC 60364-5-52:2001, *Low-voltage electrical installations – Part 5-52: Selection and erection of electrical equipment – Wiring systems*

IEC 60364-5-53:2001, *Low-voltage electrical installations – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control*

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