AS/NZS 61439.1:2016

Australian/New Zealand Standard™

Low-voltage switchgear and controlgear assemblies

Part 1: General rules (IEC 61439-1, Ed 2.0 (2011), MOD)

STANDARDS Australia

STANDARDS NEW ZEALAND PAEREWA AOTEAROA

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-006, Industrial Switchgear and Controlgear. It was approved on behalf of the Council of Standards Australia on 16 March 2016 and by the New Zealand Standards Approval Board on 4 May 2016.
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The following are represented on Committee EL-006:

Association of Accredited Certification Bodies
Australian Industry Group
Bureau of Steel Manufacturers of Australia
Business New Zealand
Electrical Contractors Association of New Zealand
Engineers Australia
National Electrical and Communications Association
National Electrical Switchboard Manufacturers Association
Rail Industry Safety and Standards Board

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Australia Web Site at www.standards.org.au or Standards New Zealand web site at www.standards.govt.nz and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of Standards Australia or the New Zealand Standards Executive at the address shown on the back cover.

This Standard was issued in draft form for comment as DR AS/NZS 61439.1:2014.

Australian/New Zealand Standard™

Low-voltage switchgear and controlgear assemblies

Part 1: General rules (IEC 61439-1, Ed. 2.0 (2011), MOD)

Originated in Australia as AS 1136—1974.
Previous and first joint edition AS/NZS 3439.1:2002.
Jointly revised and redesignated as AS/NZS 61439.1:2016.

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-006, Industrial Switchgear and Controlgear, to supersede AS/NZS 3439.1:2012 five years from the date of publication.

The AS/NZS 61439 series will supersede the AS/NZS 3439 series five years from the date of publication. During this period, low-voltage switchgear and controlgear assemblies may comply with either series. After five years it is anticipated that the AS/NZS 3439 series will be withdrawn.

The objective 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 avoid the need for verification to other Standards.

This Standard is an adoption with national modifications. It has been reproduced from IEC 61439-1, Ed. 2.0 (2011), *Low-voltage switchgear and controlgear assemblies*, Part 1: *General rules* and has been varied as indicated to take account of Australian/New Zealand conditions.

Where tests on the ASSEMBLY have been conducted in accordance with the IEC 60439, IEC 61439 or AS/NZS 3439 series and the test results fulfil the requirements of the relevant part of AS/NZS 61439, the verification of these requirements need not be repeated (see Clause 10.1).

Variations made to IEC 61439-1:2011 form the Australian/New Zealand variations for the purposes of the CB scheme for recognition of testing to standards for safety of electrical equipment. These variations are listed in Appendix ZA for easy reference.

NOTE: This Appendix has been designated ZA instead of the usual ZZ so that other Appendices have the same designations as those in AS/NZS 3439.1:2002.

This Standard is structured as follows:

(a) Preface.

(b) IEC 61439-1, Ed. 2.0 (2011) (unedited from the contents page to the final clause of the source document).

(c) Appendix ZA—Australian/New Zealand variations to the source document.

(d) Appendices ZB to ZE contain additional requirements and information referred to from Appendix ZA.

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

(i) Revision of service conditions in Clause 7.

(ii) Numerous changes regarding verification methods in Clause 10.

(iii) Modification of routine verification in respect of clearances and creepage distances (see Clause 11.3).

(iv) Adaption of the tables in Annex C and Annex D to the revised requirements and Verification methods.

(v) Revision of the EMC requirements in Annex J.

(vi) Shifting of tables from Annex H to new Annex N.

(vii) New Annex O with guidance on temperature rise verification.

(viii) New Annex P with a verification method for short-circuit withstand strength (integration of the content of IEC/TR 61117).

(ix) Update of normative references.

(x) General editorial review.

NOTE: It should be noted that 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).

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:

(A) 5.4.

(B) 8.2.2.

(C) 8.3.2.

(D) 8.3.3.

(E) 8.4.2.3.

(F) 8.5.5.

(G) 8.6.6.

(H) 8.8.

(I) 9.2.

(J) 10.11.5.4.

(K) 10.11.5.6.1.

(L) Annex L.

(M) Annex M.

As this Standard is reproduced from an International Standard, the following applies:

(1) In the source text 'this part of IEC 61439' should read 'this Australian/New Zealand Standard'.

(2) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
IEC		AS	
60529	Degrees of protection provided by enclosures (IP Code)	60529	Degrees of protection provided by enclosures (IP Code)
60865	Short-circuit currents—Calculation of effects	3865	Calculation of the effects of short-circuit currents
60865-1	Part 1: Definitions and calculation methods		
61180 (all parts)	High-voltage test techniques for low-voltage equipment	4362	High-voltage test techniques for low-voltage equipment
		4362.1	Part 1: Definitions, test and procedure requirements
		4362.2	Part 2: Test equipment
		AS/NZS	
60364 (all parts)	Low-voltage electrical installations	3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
60439	Low-voltage switchgear and controlgear assemblies (series)	3439	Low-voltage switchgear and controlgear assemblies (series)

IEC		AS/NZS	
60695	Fire hazard testing	60695	Fire hazard testing
60695-2-10	Part 2-10: Glowing/hot-wire based test methods—Glow-wire apparatus and common test procedure	60695.2.10	Part 2.10: Glowing/hot-wire based test methods—Glow-wire apparatus and common test procedure
60695-2-11	Part 2-11: Glowing/hot-wire based test methods—Glow-wire flammability test method for end-products	60695.2.11	Part 2.11: Glowing/hot-wire based test methods—Glow-wire flammability test method for end-products
60695-11-5	Part 11-5: Test flames—Needle-flame test method—Apparatus, confirmatory test arrangement and guidance	60695.11.5	Part 11.5: Test flames—Needle-flame test method—Apparatus, confirmatory test arrangement and guidance
61000	Electromagnetic compatibility (EMC)	61000	Electromagnetic compatibility (EMC)
61000-4-2	Part 4-2: Testing and measurement techniques—Electrostatic discharge immunity test	61000.4.2	Part 4.2: Testing and measurement techniques—Electrostatic discharge immunity test
61000-4-3	Part 4-3: Testing and measurement techniques—Radiated, radio frequency, electromagnetic field immunity test	61000.4.3	Part 4.3: Testing and measurement techniques—Radiated, radio-frequency, electromagnetic field immunity test
61000-4-11	Part 4-11: Testing and measurement techniques—Voltage dips, short interruptions and voltage variations immunity tests	61000.4.11	Part 4.11: Testing and measurement techniques—Voltage dips, short interruptions and voltage variations immunity tests (IEC61000-4-11, Ed.2.0(2004) MOD)
61000-4-13	Part 4-13: Testing and measurement techniques—Harmonics and interharmonics including mains signalling at a.c. power port, low-frequency immunity tests	61000.4.13	Part 4.13: Testing and measurement techniques—Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests
		AS/NZS IEC	
60947	Low-voltage switchgear and controlgear	60947	Low-voltage switchgear and controlgear
60947-1	Part 1: General rules	60947.1	Part :1 General rules

Only normative references that have been adopted as Australian or Australian/New Zealand Standard have been listed.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annexes or appendices to which they apply. A ‘normative’ annex or appendix is an integral part of a Standard, whereas an ‘informative’ annex or appendix is only for information and guidance.

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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.

Where in this standard a cross-reference is made to another clause, the reference is to be taken to apply to that clause as amended by the specific ASSEMBLY standard, where applicable.

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:

a) IEC 61439-1: General rules
b) IEC 61439-2: Power switchgear and controlgear ASSEMBLIES (PSC-ASSEMBLIES)
c) IEC 61439-3: Distribution boards (to supersede IEC 60439-3)
d) IEC 61439-4: ASSEMBLIES for construction sites (to supersede IEC 60439-4)
e) IEC 61439-5: ASSEMBLIES for power distribution (to supersede IEC 60439-5)
f) IEC 61439-6: Busbar trunking systems (to supersede IEC 60439-2)
g) IEC/TR 61439-0: Guidance to specifying ASSEMBLIES.

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

AUSTRALIAN/NEW ZEALAND STANDARD

Low-voltage switchgear and controlgear assemblies

Part 1:
General rules (IEC 61439-1, Ed. 2.0 (2011), MOD)

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 the IEC 61439 series 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 cannot be used alone to specify an ASSEMBLY or used for a purpose of determining conformity. ASSEMBLIES shall comply with the relevant part of the IEC 61439 series; Parts 2 onwards.

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 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.

- ASSEMBLIES designed for electrical equipment of machines provided that the other relevant specific requirements are complied with.

  NOTE 3 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 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 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*