

Australian/New Zealand Standard™

**Low-voltage switchgear and controlgear assemblies**

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



## **AS/NZS 61439.1:2016**

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.  
This Standard was published on 24 May 2016.

---

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 Standards may also be withdrawn.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](http://www.standards.org.au) or Standards New Zealand web site at [www.standards.govt.nz](http://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.

---

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.  
Recently revised and redesignated as AS/NZS 61439.1:2016.

**COPYRIGHT**

© Standards Australia Limited/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

## 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 (ASSEMBLY), 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 61439, 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) Adaptation 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:

<i>Reference to International Standard</i>		<i>Australian/New Zealand Standard</i>	
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	High-voltage test techniques for (all parts) 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	Low-voltage electrical installations (all parts)	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.

## CONTENTS

1	Scope	12
2	Normative references	12
3	Terms and definitions	15
3.1	General terms	15
3.2	Constructional units of ASSEMBLIES	17
3.3	External design of ASSEMBLIES	18
3.4	Structural parts of ASSEMBLIES	18
3.5	Conditions of installation of ASSEMBLIES	20
3.6	Insulation characteristics	21
3.7	Protection against electric shock	23
3.8	Characteristics	25
3.9	Verification	27
3.10	Manufacturer/user	28
4	Symbols and abbreviations	28
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	30
5.3.1	Rated current of the ASSEMBLY ( $I_{nA}$ )	30
5.3.2	Rated current of a circuit ( $I_n$ )	30
5.3.3	Rated peak withstand current ( $I_{pk}$ )	30
5.3.4	Rated short-time withstand current ( $I_{cw}$ ) (of a circuit of an ASSEMBLY)	30
5.3.5	Rated conditional short-circuit current of an ASSEMBLY ( $I_{cc}$ )	30
5.4	Rated diversity factor (RDF)	31
5.5	Rated frequency ( $f_r$ )	31
5.6	Other characteristics	31
6	Information	32
6.1	ASSEMBLY designation marking	32
6.2	Documentation	32
6.2.1	Information relating to the ASSEMBLY	32
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	Humidity 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	Properties of insulating materials .....	35
8.1.4	Resistance to ultra-violet radiation .....	36
8.1.5	Mechanical strength .....	36
8.1.6	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 water .....	36
8.2.3	ASSEMBLY with 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 .....	39
8.4.1	General .....	39
8.4.2	Basic protection .....	39
8.4.3	Fault protection .....	40
8.4.4	Protection by total insulation .....	42
8.4.5	Limitation of steady-state touch current and charge .....	43
8.4.6	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 .....	46
8.5.4	Installation of switching devices and components .....	46
8.5.5	Accessibility .....	46
8.5.6	Barriers .....	47
8.5.7	Direction of operation and indication of switching positions .....	47
8.5.8	Indicator lights and push-buttons .....	47
8.6	Internal electrical circuits and connections .....	47
8.6.1	Main circuits .....	47
8.6.2	Auxiliary circuits .....	48
8.6.3	Bare and insulated conductors .....	48
8.6.4	Selection and installation of non-protected live conductors to reduce the possibility of short-circuits .....	49
8.6.5	Identification of the conductors of main and auxiliary circuits .....	49
8.6.6	Identification of the protective conductor (PE, PEN) and of the neutral conductor (N) of the main circuits .....	49
8.7	Cooling .....	49
8.8	Terminals for external conductors .....	49
9	Performance requirements .....	51
9.1	Dielectric properties .....	51
9.1.1	General .....	51
9.1.2	Power-frequency withstand voltage .....	51
9.1.3	Impulse withstand voltage .....	51

9.1.4	Protection of surge protective devices .....	51
9.2	Temperature rise limits .....	52
9.3	Short-circuit protection and short-circuit withstand strength .....	52
9.3.1	General .....	52
9.3.2	Information concerning short-circuit withstand strength .....	52
9.3.3	Relationship between peak current and short-time current .....	53
9.3.4	Co-ordination of protective devices .....	53
9.4	Electromagnetic compatibility (EMC) .....	53
10	Design verification .....	54
10.1	General .....	54
10.2	Strength of materials and parts .....	55
10.2.1	General .....	55
10.2.2	Resistance to corrosion .....	55
10.2.3	Properties of insulating materials .....	56
10.2.4	Resistance to ultra-violet (UV) radiation .....	58
10.2.5	Lifting .....	58
10.2.6	Mechanical impact .....	59
10.2.7	Marking .....	59
10.3	Degree of protection of ASSEMBLIES .....	59
10.4	Clearances and creepage distances .....	59
10.5	Protection against electric shock and integrity of protective circuits .....	60
10.5.1	Effectiveness of the protective circuit .....	60
10.5.2	Effective earth continuity between the exposed conductive parts of the ASSEMBLY and the protective circuit .....	60
10.5.3	Short-circuit withstand strength of the protective circuit .....	60
10.6	Incorporation of switching devices and components .....	61
10.6.1	General .....	61
10.6.2	Electromagnetic compatibility .....	61
10.7	Internal electrical circuits and connections .....	61
10.8	Terminals for external conductors .....	61
10.9	Dielectric properties .....	61
10.9.1	General .....	61
10.9.2	Power frequency withstand voltage .....	61
10.9.3	Impulse withstand voltage .....	62
10.9.4	Testing of enclosures made of insulating material .....	64
10.9.5	External operating handles of insulating material .....	64
10.10	Verification of temperature rise .....	64
10.10.1	General .....	64
10.10.2	Verification by testing .....	64
10.10.3	Derivation of ratings for similar variants .....	70
10.10.4	Verification assessment .....	71
10.11	Short-circuit withstand strength .....	74
10.11.1	General .....	74
10.11.2	Circuits of ASSEMBLIES which are exempted from the verification of the short-circuit withstand strength .....	74
10.11.3	Verification by comparison with a reference design – Utilising a check list .....	75
10.11.4	Verification by comparison with a reference design – Utilising calculation .....	75
10.11.5	Verification by test .....	75

10.12 Electromagnetic compatibility (EMC) .....	80
10.13 Mechanical operation .....	80
11 Routine verification .....	80
11.1 General .....	80
11.2 Degree of protection of enclosures .....	81
11.3 Clearances and creepage distances .....	81
11.4 Protection against electric shock and integrity of protective circuits .....	81
11.5 Incorporation of built-in components .....	81
11.6 Internal electrical circuits and connections .....	81
11.7 Terminals for external conductors .....	81
11.8 Mechanical operation .....	82
11.9 Dielectric properties .....	82
11.10 Wiring, operational performance and function .....	82
Annex A (normative) Minimum and maximum cross-section of copper conductors suitable for connection to terminals for external conductors (see 8.8) .....	90
Annex B (normative) Method of calculating the cross-sectional area of protective conductors with regard to thermal stresses due to currents of short duration .....	91
Annex C (informative) User information template .....	92
Annex D (informative) Design verification .....	96
Annex E (informative) Rated diversity factor .....	97
Annex F (normative) Measurement of clearances and creepage distances .....	106
Annex G (normative) Correlation between the nominal voltage of the supply system and the rated impulse withstand voltage of the equipment .....	111
Annex H (informative) Operating current and power loss of copper conductors .....	113
Annex I (Void) .....	115
Annex J (normative) Electromagnetic compatibility (EMC) .....	116
Annex K (normative) Protection by electrical separation .....	123
Annex L (informative) Clearances and creepage distances for North American region .....	126
Annex M (informative) North American temperature rise limits .....	127
Annex N (normative) Operating current and power loss of bare copper bars .....	128
Annex O (informative) Guidance on temperature rise verification .....	130
Annex P (normative) Verification of the short-circuit withstand strength of busbar structures by comparison with a tested reference design by calculation .....	135
Bibliography .....	139
Figure F.1 – Typical ASSEMBLY .....	98
Figure E.2 – Example 1: Table E.1 – Functional unit loading for an ASSEMBLY with a rated diversity factor of 0,8 .....	100
Figure E.3 – Example 2: Table E.1 – Functional unit loading for an ASSEMBLY with a rated diversity factor of 0,8 .....	101
Figure E.4 – Example 3: Table E.1 – Functional unit loading for an ASSEMBLY with a rated diversity factor of 0,8 .....	102
Figure E.5 – Example 4: Table E.1 – Functional unit loading for an ASSEMBLY with a rated diversity factor of 0,8 .....	103
Figure E.6 – Example of average heating effect calculation .....	104
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 .....	105

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).....	105
Figure F.1 – Measurement of ribs .....	110
Figure J.1 – Examples of ports .....	116
Figure O.1 – Temperature rise verification methods .....	134
Figure P.1 – Tested busbar structure (TS) .....	135
Figure P.2 – Non tested busbar structure (NTS).....	136
Figure P.3 – Angular busbar configuration with supports at the corners .....	138
Table 1 – Minimum clearances in air <sup>a</sup> (8.3.2).....	82
Table 2 – Minimum creepage distances (8.3.3) .....	83
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).....	84
Table 5 – Minimum terminal capacity for copper protective conductors (PE, PEN) (8.8) .....	84
Table 6 – Temperature-rise limits (9.2) .....	85
Table 7 – Values for the factor $n^a$ (9.3.3) .....	86
Table 8 – Power-frequency withstand voltage for main circuits (10.9.2) .....	86
Table 9 – Power-frequency withstand voltage for auxiliary and control circuits (10.9.2).....	86
Table 10 – Impulse withstand test voltages (10.9.3).....	87
Table 11 – Copper test conductors for rated currents up to 400 A inclusive (10.10.2.3.2).....	87
Table 12 – Copper test conductors for rated currents from 400 A to 4 000 A (10.10.2.3.2).....	88
Table 13 – Short-circuit verification by comparison with a reference design: check list (10.5.3.3, 10.11.3 and 10.11.4).....	88
Table 14 – Relationship between prospective fault current and diameter of copper wire .....	89
Table A.1 – Cross-section of copper conductors suitable for connection to terminals for external conductors .....	90
Table B.1 – Values of $k$ for insulated protective conductors not incorporated in cables, or bare protective conductors in contact with cable covering.....	91
Table C.1 – Template .....	92
Table D.1 – List of design verifications to be performed .....	96
Table E.1 – Examples of loading for an ASSEMBLY with a rated diversity factor of 0,8 .....	99
Table E.2 – Example of loading of a group of circuits (Section B – Figure E.1) with a rated diversity factor of 0,9 .....	104
Table E.3 – Example of loading of a group of circuits (Sub-distribution board – Figure E.1) with a rated diversity factor of 0,9.....	104
Table F.1 – Minimum width of grooves.....	106
Table G.1 – Correspondence between the nominal voltage of the supply system and the equipment rated impulse withstand voltage .....	112
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).....	113
Table H.2 – Reduction factor $k_1$ for cables with a permissible conductor temperature of 70 °C (extract from IEC 60364-5-52:2009, Table B.52.14).....	114
Table J.1 – Tests for EMC immunity for environment A (see J.10.12.1).....	120
Table J.2 – Tests for EMC immunity for environment B (see J.10.12.1).....	121

Table J.3 – Acceptance criteria when electromagnetic disturbances are present.....	122
Table K.1 – Maximum disconnecting times for TN systems .....	125
Table L.1 – Minimum clearances in air .....	126
Table L.2 – Minimum creepage distances .....	126
Table M.1 – North American temperature rise limits .....	127
Table N.1 – Operating current and power loss of bare copper bars 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).....	128
Table N.2 – Factor $k_4$ for different temperatures of the air inside the ASSEMBLY and/or for the conductors .....	129

## 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*