AS 62271.1:2019

Australian STANDARD®

High-voltage switchgear and controlgear

Part 1: Common specifications for alternating current switchgear and controlgear (IEC 62271-1:2017, MOD)

STANDARDS Australia

AS 62271.1:2019

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Energy Networks Australia
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High-voltage switchgear and controlgear

Part 1: Common specifications for alternating current switchgear and controlgear (IEC 62271-1:2017, MOD)

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Preface

This Standard was prepared by the Standards Australia Committee EL-007, Power Switchgear, to supersede AS 62271.1—2012, *High-voltage switchgear and controlgear, Part 1: Common specifications*.

The objective of this Standard is to specify the applications of AC switchgear and controlgear designed for indoor and/or outdoor installation and for operation at service frequencies up to and including 60 Hz and having rated voltages above 1 000 V.

This document applies to all high-voltage switchgear and controlgear except as otherwise specified in the relevant IEC standards for the particular type of switchgear and controlgear.

NOTE For the use of this document, high-voltage is defined as the rated voltage above 1 000 V. However, the term medium voltage is commonly used for distribution systems with voltages above 1 kV and generally applied up to and including 52 kV.

This Standard is an adoption with national modifications, and has been reproduced from, IEC 62271-1:2017, *High-voltage switchgear and controlgear — Part 1: Common specifications for alternating current switchgear and controlgear*. The modifications are additional requirements and are set out in Appendix ZZ, which has been added at the end of the source text.

Appendix ZZ lists the variations to IEC 62271-1:2017 for the application of this Standard in Australia.

As this document has been reproduced from an International Standard, the following applies:

(a) In the source text “this part of IEC 62271” should read “this Australian Standard”.

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

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 1: Common specifications for alternating current switchgear and controlgear

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 62271-1 has been prepared by technical committee 17: High-voltage switchgear and controlgear.

This second edition cancels and replaces the first edition published in 2007 and Amendment 1:2011. This edition constitutes a technical revision.

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

New numbering in accordance with ISO/IEC directives, Part 2 (2016) and IEEE Std. C37.100.1.

4.1.2 a) The normal service condition for indoor switchgear is limited to one range of 40 °C to –5 °C.

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4.1.3 a) The normal service condition for outdoor switchgear is limited to one range of 40 °C to –25 °C.

4.2.2: The specifications from IEC 60071-2:1996 are adopted for altitude correction factors above 1 000 m.

5.2.2: Range I, the rated voltage of 40,5 kV is added Series I Table 1; Table 2 and Table 4 are updated on recommendation of the US National Committee.

6.8: New subclause added for manual operated actuators consistent with “Man Machine Interface” recommendations of IEC 60447 [1] [1].

7.2.6.1: Insert the wording regarding preliminary impulses across open vacuum interrupters according to the result of IEC 17/1026/RQ.

7.3: Changed the requirement for radio interference voltage to a rated voltage level of 245 kV and above, instead of 123 kV and above. This change is based on reported positive test and service experience of utility representatives in the maintenance team of this standard.

7.5.6, Table 14:

a) Introduced the distinction of parts in “OG” (oxidizing gas) or in “NOG” (not oxidizing gas) replacing the former “air” and “SF_6”;

b) Increased the allowable temperature rise for some parts in groups 1 and 2 of Table 14 according to IEC TR 60943 [2];

c) Expanded the definition of allowable temperature rise for categories of accessible surfaces with reference to IEC Guide 117 [3]. See also point 15 in 7.5.6.2.

7.5.6.2: Point 5 is modified to clarify the introduction of “OG” and “NOG” gas.

7.10: Some tests were removed because the relevant test standards of IEC 60068 series were modified or withdrawn.

7.11.3: The acceptance criteria for X-radiation testing are modified to recognize higher rated vacuum interrupters.

Former informative Annex H: Corrosion is deleted, the content is part of IEC TR 62271-306 [4].

New Annex J (informative): Added informative guidelines for the extension of validity of type tests

New Annex K (informative): Added informative guidelines about exposure to pollution

The text of this International Standard is based on the following documents:

FDIS	Report on voting
17/1033/FDIS	17/1037/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 document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The reader’s attention is drawn to the fact that Annex I lists all of the “in-some-country” clauses on differing practices of a less permanent nature relating to the subject of this standard.

[1] Numbers in square brackets refer to the Bibliography.

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The list of all parts of the IEC 62271 series under the general title, *High-voltage switchgear and controlgear*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

In the preparation of this FDIS draft for the general revision of IEC 62271-1:2007 and IEC 62271-1:2007/AMD1:2011, the maintenance team was motivated by the following principles:

– Application of horizontal standards – such application is mandatory for product standards, (reference IEC Guide 108 [5]). A typical example is the application of IEC 60071 (all parts) dealing with insulation coordination.

– Application of the "principle of verifiability" – as defined in the Directives, Part 2, 5.5 (2016) "...Only those requirements which can be verified shall be included.".

– Organizing information in the proper clause, e.g. terms and definitions in Clause 3, rated values in Clause 5. For example, the values of rated continuous current are specified in Clause 5 but the conditions of test and acceptance criteria (e.g. temperature rise limits) are moved to Clause 7.

– Normal service conditions in Clause 4 are unambiguous statements of conditions under which the switchgear and controlgear is expected to operate. For example: "Solar radiation does not exceed a level of 1 000 W/m^2" rather than "Solar radiation up to a level of 1 000 W/m^2 should be considered".

– Ratings in Clause 5 have been limited to reflect the common specifications of the switchgear and controlgear that are specified by the user and are necessary for operation on the user's network. See the last paragraph of 5.1 for addition clarification.

– Statements or informative NOTES that reflect design guides (not requirements) or application (not standard requirements) are either removed or moved to Clause 9.

  For example, the following former NOTE contains both a design guide and an application issue, neither of which belongs to normal service conditions:
  "Under certain levels of solar radiation, appropriate measures, for example roofing, forced ventilation, test simulating solar gain, etc., may be necessary, or derating may be used, in order not to exceed the specified temperature rises and pressure rise limits".

– Specifications for design and construction in Clause 6 have been limited to requirements that can be verified by test or inspection.

– References to tests and procedures that relate to transportation, installation, commissioning and maintenance have been moved to Clause 11.

– Improve wording to minimize the possibility of miss-interpretation or conflicting interpretations of the specifications, methods or criteria.

– Elimination of hanging paragraphs and actual or potential circular references. Reference to ISO/IEC Directives, Part 2, 22.3.3 (2016).

As a result of the application of these principles or objectives, the FDIS draft includes more revisions that might otherwise be expected.

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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 1: Common specifications for alternating current switchgear and controlgear

1 Scope

This part of IEC 62271 applies to AC switchgear and controlgear designed for indoor and/or outdoor installation and for operation at service frequencies up to and including 60 Hz and having rated voltages above 1 000 V.

This document applies to all high-voltage switchgear and controlgear except as otherwise specified in the relevant IEC standards for the particular type of switchgear and controlgear.

NOTE For the use of this document, high-voltage is defined as the rated voltage above 1 000 V. However, the term medium voltage is commonly used for distribution systems with voltages above 1 kV and generally applied up to and including 52 kV.

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.

IEC 60038:2009, *IEC standard voltages*

IEC 60050-131:2002, *International Electrotechnical Vocabulary (IEV) – Part 131: Circuit theory*

IEC 60050-151:2001, *International Electrotechnical Vocabulary (IEV) – Part 151: Electrical and magnetic devices*

IEC 60050-192:2015, *International Electrotechnical Vocabulary (IEV) – Part 192: Dependability*

IEC 60050-351, *International Electrotechnical Vocabulary (IEV) – Part 351: Control technology*

IEC 60050-441:1984, *International Electrotechnical Vocabulary (IEV) – Part 441: Switchgear, controlgear and fuses*
IEC 60050-441:1984/AMD1:2000

IEC 60050-551, *International Electrotechnical Vocabulary (IEV) – Part 551: Power electronics*

IEC 60050-581:2008, *International Electrotechnical Vocabulary (IEV) – Part 581: Electromechanical components for electronic equipment*

IEC 60050-601, *International Electrotechnical Vocabulary (IEV) – Chapter 601: Generation, transmission and distribution of electricity – General*

IEC 60050-605, *International Electrotechnical Vocabulary (IEV) – Chapter 605: Generation, transmission and distribution of electricity – Substations*

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