AS 62271.202:2019

Australian STANDARD®

High-voltage switchgear and controlgear

Part 202: High-voltage/low-voltage prefabricated substation (IEC 62271-202:2014, MOD)

STANDARDS Australia

AS 62271.202:2019

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Australian Industry Group
Energy Networks Australia
Engineers Australia
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Preface

This Standard was prepared by the Standards Australia Committee EL-007, Power Switchgear, to supersede AS 62271.202—2008, *High-voltage switchgear and controlgear, Part 202: High-voltage/low-voltage prefabricated substation.*

The objective of this Standard is to specify the service conditions, rated characteristics, general structural requirements and test methods of the following:

(a) High voltage/low voltage or low voltage/high voltage prefabricated substations, which are cable-connected, to be operated from inside (walk-in type) or outside (non-walk-in type) for alternating current of rated voltages above 1 kV and up to and including 52 kV on the high voltage side.

(b) One or more transformers for service frequencies up to and including 60 Hz for outdoor installation at locations with public accessibility and where protection of personnel is provided.

In general, a prefabricated substation comprises an enclosure containing the following electrical components:

(i) Power transformers.

(ii) High voltage and low voltage switchgear and controlgear.

(iii) High voltage and low voltage interconnections.

(iv) Auxiliary equipment and circuits.

However, relevant provisions of this standard are applicable to designs where not all these electrical components exist (for example, an installation consisting of power transformer and low voltage switchgear).

This Standard is an adoption with national modifications, and has been reproduced from, IEC 62271-202:2014, *High-voltage switchgear and controlgear — Part 202: High-voltage/low-voltage prefabricated substation*. 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 62271-202:2014 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 202: High-voltage/low-voltage prefabricated substation

FOREWORD

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International Standard IEC 62271-202 has been prepared by subcommittee 17C: High-voltage switchgear and controlgear assemblies, of IEC technical committee 17: Switchgear and controlgear.

This second edition cancels and replaces the first edition published in 2006. This edition constitutes a technical revision.

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

a) regarding temperature-rise test an alternative method for liquid filled transformers is (re)introduced and the temperature-rise test method for dry-type transformers is specified more precisely;
b) testing procedure for short time and peak withstand current tests are specified more precisely;
c) assessment of electromagnetic fields is considered including a type test (optional) according IEC/TR 62271-208:2009;

d) influence of the product on the environment is considered (Clause 12);

e) internal arc test requirements have been adapted to IEC 62271-200:2011 and requirements for the assessment of pressure relief volumes below the floor / ground has been assigned;

f) the method for defining the load factor in an enclosure for liquid filled transformers is extended with different temperature rises for the transformer outside the enclosure (Annex DD);

g) for the calculation of the load factor of dry-type transformers in an enclosure the insulation systems according to IEC 60076-1:2011, Tables B.1 and B.2 are worked out in detail.

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

FDIS	Report on voting
17C/595/FDIS	17C/598/RVD

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

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

This standard should be read in conjunction with IEC 62271-1:2007 and its Amendment 1:2011, to which it refers and which is applicable, unless otherwise specified. In order to simplify the indication of corresponding requirements, the same numbering of clauses and subclauses is used as in IEC 62271-1. Amendments to these clauses and subclauses are given under the same numbering, whilst additional subclauses are numbered from 101.

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

The committee has decided that the contents of this publication will remain unchanged until the stability 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.

The contents of the corrigendum of April 2015 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Prefabricated substations are defined as a type-tested assembly comprising an enclosure containing in general transformers, low-voltage and high-voltage switchgear, connections and auxiliary equipment to supply low-voltage energy from a high-voltage system or vice versa. These substations are in locations accessible to the public and should ensure protection to persons according to the specified service conditions.

This means that, in addition to the specified characteristics, ratings and relevant test procedures, particular attention has been paid to the specification concerning the protection of persons, both operators and general public. Use of type-tested components and suitable design and construction of the enclosure ensure this protection. The correct design and performance of the prefabricated substation are verified by means of relevant type tests described in this standard, including internal arc tests.

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 202: High-voltage/low-voltage prefabricated substation

1 General

1.1 Scope

This part of IEC 62271 specifies the service conditions, rated characteristics, general structural requirements and test methods of high voltage/low voltage or low voltage/high voltage prefabricated substations, which are cable-connected, to be operated from inside (walk-in type) or outside (non-walk-in type) for alternating current of rated voltages above 1 kV and up to and including 52 kV on the high voltage side, and for one or more transformers for service frequencies up to and including 60 Hz for outdoor installation at locations with public accessibility and where protection of personnel is provided.

Prefabricated substations can be situated at ground level or partially or completely below ground level.

In general a prefabricated substation comprises an enclosure containing the following electrical components:

– power transformers;

– high voltage and low voltage switchgear and controlgear;

– high voltage and low voltage interconnections;

– auxiliary equipment and circuits.

However, relevant provisions of this standard are applicable to designs where not all these electrical components exist (for example, an installation consisting of power transformer and low voltage switchgear).

Non-prefabricated substations should comply with the applicable requirements of IEC 61936-1:2010.

1.2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-461 (all parts), *International Electrotechnical Vocabulary* (available at www.electropedia.org)

IEC 60068-2-75, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60076-1:2011, *Power transformers – Part 1: General*

IEC 60076-2:2011, *Power transformers – Part 2: Temperature rise for liquid-immersed transformers*

IEC 60076-3:2013*, Power transformers – Part 3: Insulation levels, dielectric tests and external clearances in air*