IEC 62271-201

Edition 2.0 2014-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

High-voltage switchgear and controlgear – Part 201: AC solid-insulation enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV

Appareillage à haute tension – Partie 201: Appareillage sous enveloppe isolante solide pour courant alternatif de tensions assignées supérieures à 1 kV et inférieures ou égales à 52 kV

IEC 62271-201:2014-03(en-fr)

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CONTENTS

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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 201: AC solid-insulation enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV

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International Standard IEC 62271-201 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) apart from updating with the second edition of IEC 62271-200 (issued in 2011), definitions, classifications and testing procedures have been specified more precisely;
b) access to the solid-insulation enclosed switchgear and controlgear is now restricted to authorized personnel only. This implies that "accessibility class B" (public access) has been deleted throughout the document;

c) the term “protection category” has been introduced to replace the term “protection grade” (PA, PB1 and PB2)

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

FDIS	Report on voting
17C/594/FDIS	17C/597/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.

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

A list of all parts in the IEC 62271 series, published 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 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
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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 201: AC solid-insulation enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV

1 General

1.1 Scope

This part of IEC 62271 specifies requirements for prefabricated solid-insulation enclosed switchgear and controlgear for alternating current of rated voltages above 1 kV and up to and including 52 kV for indoor installation and for service frequencies up to and including 60 Hz.

Access to the switchgear and controlgear is restricted to authorized personnel.

NOTE 1 For the use of this document high-voltage (IEC 60050-601:1985, 601-01-27) is the rated voltage above 1 000 V. However, medium voltage (IEC 60050-601:1985, 601-01-28) is commonly used for distribution systems with voltages above 1 kV and generally applied up to and including 52 kV; refer to [1] of Bibliography.

NOTE 2 Although primarily dedicated to three-phase systems, this standard can also be applied to single-phase or two-phase systems.

Enclosures may include fixed and removable components and may be filled with fluid (liquid or gas) to provide an extra insulation. For switchgear and controlgear containing gas-filled compartments, the design pressure is limited to a maximum of 300 kPa (relative pressure).

Solid-insulation enclosed switchgear and controlgear complying with this standard can be safely touched when energised.

Solid-insulation enclosed switchgear and controlgear for special use, for example, in flammable atmospheres, in mines or on board ships, may be subject to additional requirements.

Components contained in solid-insulation enclosed switchgear and controlgear are designed and tested in accordance with their various relevant standards. This standard supplements the standards for the individual components regarding their installation in switchgear and controlgear assemblies.

This standard does not preclude that other equipment may be included in the same enclosure. In such a case, any possible influence of that equipment on the switchgear and controlgear should be taken into account.

NOTE 3 Switchgear and controlgear assemblies having a metal enclosure are covered by IEC 62271-200 refer to [9] of Bibliography.

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 (all parts), *International Electrotechnical Vocabulary (IEV)* (available at www.electropedia.org)

IEC 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60270:2000, *High-voltage test techniques – Partial discharge measurements*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

IEC 62262:2002, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

IEC 62271-1:2007, *High-voltage switchgear and controlgear – Part 1: Common specifications*
Amendment 1:2011

IEC 62271-100:2008, *High-voltage switchgear and controlgear – Part 100: Alternating current circuit-breakers*

IEC 62271-102:2001, *High-voltage switchgear and controlgear – Part 102: Alternating current disconnectors and earthing switches*
Amendment 1:2011
Amendment 2:2013

IEC 62271-103:2011, *High-voltage switchgear and controlgear – Part 103: Switches for rated voltages above 1 kV up to and including 52 kV*

IEC 62271-105:2012, *High-voltage switchgear and controlgear – Part 105: Alternating current switch-fuse combinations for rated voltages above 1 kV up to and including 52 kV*

IEC 62271-106:2011, *High-voltage switchgear and controlgear – Part 106: Alternating current contactors, contactor-based controllers and motor-starters*

ISO/IEC Guide 51:1999, *Safety aspects – Guidelines for their inclusion in standards*

2 Normal and special service conditions

Clause 2 of IEC 62271-1:2007 is applicable with the following addition:

Unless otherwise specified in this standard, the solid-insulation enclosed switchgear and controlgear is designed to be used under normal indoor service conditions.

Solid-insulation enclosed switchgear and controlgear, under the scope of IEC/TS 62271-304 and intended to be used in service conditions more severe with respect to condensation and pollution than the normal service conditions specified in this standard, may be classified with a "Design Class" 1 or 2 according to IEC/TS 62271-304 to demonstrate its ability to withstand such severe conditions.

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-151, IEC 60050-441 and IEC 62271-1 as well as the following apply.

NOTE Additional definitions are classified so as to be aligned with the classification system used in IEC 60050-441.

3.101
switchgear and controlgear
general term covering switching devices and their combination with associated control, measuring, protective and regulating equipment, also assemblies of such devices and equipment with associated interconnections, accessories, enclosures and supporting structures

[SOURCE: IEC 60050-441:1984, 441-11-01]

3.102
assembly (of switchgear and controlgear)
combination of switchgear and/or controlgear completely assembled with all internal electrical and mechanical interconnections

[SOURCE: IEC 60050-441:1984, 441-12-01]

3.103
solid-insulation enclosed switchgear and controlgear
switchgear and controlgear assemblies with an external solid insulating enclosure and completely assembled, except for external connections

Note 1 to entry: The external insulation may be supplied with a (semi-)conducting layer.

[SOURCE: IEC 60050-441:1984, 441-12-06, modified – modification of the wording]

3.104
functional unit (of an assembly)
part of solid-insulation enclosed switchgear and controlgear comprising all the components of the main circuits and auxiliary circuits that contribute to the fulfilment of a single function

Note 1 to entry: Functional units may be distinguished according to the function for which they are intended, for example, incoming unit, outgoing unit, etc.

[SOURCE: IEC 60050-441:1984, 441-13-04, modified – modification of the wording]

3.105
multi-tier design
design of metal-enclosed switchgear in which the main switching devices of two or more functional units are arranged vertically (one above the other) within a common enclosure

3.106
transport unit
part of solid-insulation enclosed switchgear and controlgear suitable for shipment without being dismantled

3.107
solid insulating enclosure
part of solid-insulation enclosed switchgear and controlgear providing a specified degree of protection of equipment against external influences and a specified degree of protection against electric shock by limiting the approach to or contact with live parts and against contact with moving parts

Note 1 to entry: The main part of the enclosure is of solid insulating material, and may have added (semi-) conductive layers.

Note 2 to entry: If the resistance of the enclosure of the switchgear and controlgear to the earthing point provided is everywhere less than, or equal to, 100 mΩ, IEC 62271-200 is applicable.

[SOURCE: IEC 60050-441:1984, 441-13-01, modified – modification of the wording]

3.108
high-voltage compartment
compartment of solid-insulation enclosed switchgear and controlgear containing high-voltage conducting parts, enclosed except for openings necessary for interconnection, control or ventilation.

Note 1 to entry: General definition of "compartment" is provided by IEC 60050-441:1984, 441-13-05, as "a part of an assembly enclosed except for openings necessary for interconnection, control or ventilation".

Note 2 to entry: A compartment may contain barriers, structures or components that are intended to provide various functions, such as mechanical or dielectrical, but not to function as a partition or enclosure.

Note 3 to entry: High-voltage compartments are identified according to the main component(s) contained therein (refer to 5.103.1).

Note 4 to entry: Four types of high-voltage compartments are distinguished, three that can be opened, called accessible (see 3.108.1 to 3.108.3) and one that cannot be opened, called non-accessible (see 3.108.4)

3.108.1
interlock-controlled accessible compartment
high-voltage compartment, intended to be opened for normal operation and/or normal maintenance as stated by the manufacturer, in which access is controlled by integral design of the switchgear and controlgear

Note 1 to entry: Installation, extension, repairing, etc. are not considered as normal maintenance.

3.108.2
procedure-based accessible compartment
high-voltage compartment, intended to be opened for normal operation and/or normal maintenance as stated by the manufacturer, in which access is controlled by a suitable procedure combined with locking

Note 1 to entry: Installation, extension, repairing, etc. are not considered as normal maintenance.

3.108.3
tool-based accessible compartment
high-voltage compartment that may be opened only through the use of tools, but not intended for opening during normal operation and maintenance

Note 1 to entry: Tool-based accessible compartment are submitted to special procedures.

3.108.4
non-accessible compartment
high-voltage compartment, that must not be opened

Note 1 to entry: Opening may destroy the integrity of the compartment.

3.109
connection compartment
high-voltage compartment in which electrical connections are made between the main circuit of the switchgear assembly and the external conductors (cables or bars) to the electrical network or high-voltage apparatus of the installation

Note 1 to entry: A connection compartment is not needed for a solid insulation enclosed switchgear, if the external connection can be safely touched.

3.110
partition
part of solid-insulation enclosed switchgear and controlgear separating one high-voltage compartment from other compartments and providing a specified degree of protection

Note 1 to entry: Movable shutters intended for shielding may become an integral part of the partition.