IEC TS 62271-304

Edition 2.0 2019-03

TECHNICAL SPECIFICATION

SPECIFICATION TECHNIQUE

colour inside

High-voltage switchgear and controlgear –
Part 304: Classification of indoor enclosed switchgear and controlgear for rated voltages above 1 kV up to and including 52 kV related to the use in special service conditions with respect to condensation and pollution

Appareillage à haute tension –
Partie 304: Classification de l'appareillage d'intérieur sous enveloppe pour tensions assignées supérieures à 1 kV et jusqu'à 52 kV inclus relatives à l'utilisation dans des conditions spéciales de service en ce qui concerne la condensation et la pollution

IEC TS 62271-304:2019-03(en-fr)

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62771-304, which is a Technical Specification, has been prepared by subcommittee 17C: Assemblies, of IEC technical committee 17: High-voltage switchgear and controlgear.

This second edition cancels and replaces the first edition published in 2008. This edition constitutes a technical revision.

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

a) the description of the several service conditions under condensation and pollution;
b) the classification of enclosed switchgear and controlgear, according to the testing procedure does not cover polluted service conditions P_L and P_H;
c) a wider description in Annex B of typical indoor environments based on ISO/IEC standards;
d) a new Annex C giving guidance on precautions to improve indoor operating conditions;
e) a new Annex D dedicated to the optional items such as records of mechanical characteristics;
f) a new Annex E, giving additional combinations of environments with condensation and pollution, as well as a proposal of testing procedure of ageing test, is provided to create experience on correlation between ageing effects in laboratory and ageing effects at site conditions.

The text of this Technical Specification is based on the following documents:

Draft TS	Report on voting
17C/679/DTS	17C/691/RVDTS

Full information on the voting for the approval of this Technical Specification 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.

A list of all the parts in 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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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 304: Classification of indoor enclosed switchgear and controlgear for rated voltages above 1 kV up to and including 52 kV related to the use in special service conditions with respect to condensation and pollution

1 Scope

This part of IEC 62271, which is a Technical Specification, applies to indoor enclosed switchgear and controlgear complying with IEC 62271-200 and IEC 62271-201, intended to be used in special service conditions with respect to condensation and pollution deviating from the normal service conditions specified in IEC 62271-1.

The test detailed in this document has been designed primarily to classify the electrical insulation performance of equipment having high-voltage electrical insulation exposed to indoor service conditions, mainly in presence of condensation. The assessment of mechanical components, such as mechanisms, interlocks and enclosure is also considered.

In this document, the term "equipment" is used in accordance with the scope for an "enclosed assembly of switchgear and controlgear" (see IEC 60050-441:2000, 441-12- 02).

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

IEC 60721-3-3, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 3: Stationary use at weatherprotected locations*

IEC TS 60815-1, *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions – Part 1: Definitions, information and general principles*

IEC 62271-1:2017, *High-voltage switchgear and controlgear – Part 1: Common specifications for alternating current switchgear and controlgear*

IEC 62271-200, *High-voltage switchgear and controlgear – Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV*

IEC 62271-201, *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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62271-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Definition of indoor service conditions under condensation and pollution

Indoor equipment is designed to be installed in an operating room inside a building or other housing and thus has a certain level of protection from the outdoor environmental conditions.

In addition of the protection given by the building or other housing construction, precautions (see Annex C) to minimize the amount of deposits inside the switchgear and controlgear can be taken by the choice of an appropriate degree of protection of the enclosed switchgear and controlgear.

Condensation can occur due to rapid temperature changes inside the operating room. Pollution inside the operating room can be present depending on location and surrounding activity. In addition, the occurrence of condensation and the site pollution severity inside the operating room depend on the layout and the protection given by the building or other housing construction.

The presence of condensation and pollution has the potential to impact the voltage withstand capability of clearances and creepage distances, and possibly the insulating material itself. The concern is that there may be the creation of a full or partial conductive path between live parts or between live parts and conductive parts not intended to be live (enclosure, etc.).

In this document, the indoor service conditions with respect to condensation and pollution around the enclosed switchgear and controlgear are defined, with typical examples:

C_0: Condensation does not normally occur (not more than twice a year)

- Rooms with continuous humidity and/or temperature control in order to avoid condensation. The building or other housing provides protection from daily variations in outside climate.
- Rooms not having humidity or temperature control. Nevertheless, the building or other housing construction provides protection from daily variations in outside climate, and condensation is not more than twice a year.

C_L: Non-frequent condensation (not more than twice a month)

- Rooms not having humidity or temperature control. The building or other housing construction provides protection from daily variations in outside climate, but condensation cannot be excluded.

C_H: Frequent condensation (more than twice a month)

- Rooms not having humidity nor temperature control. The building or other housing provides only minimal protection from daily variations of outside climate, so that frequent condensation may occur.

P_0: Very light pollution (as given in 4.1.2, item d), of IEC 62271-1:2017). The ambient air of the operating room is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt and would be considered as having site pollution severity class (SPS) “very light” according to IEC TS 60815-1.

- Rooms in areas without significant pollution.