IEC TR 62271-312

Edition 1.0 2021-01

TECHNICAL REPORT

colour inside

High-voltage switchgear and controlgear – Part 312: Guidance for the transferability of type tests of high-voltage/ low-voltage prefabricated substations

IEC TR 62271-312:2021-01(en)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 29.130.10

ISBN 978-2-8322-9228-0

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Part 312: Guidance for the transferability of type tests of high-voltage/low-voltage prefabricated substations

FOREWORD

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IEC TR 62271-312, which is a Technical Report, has been prepared by subcommittee 17C: Assemblies, of IEC technical committee 17: High-voltage switchgear and controlgear.

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

Draft TR	Report on voting
17C/737/DTR	17C/753B/RVDTR

Full information on the voting for the approval of this Technical Report 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 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 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- withdrawn,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 312: Guidance for the transferability of type tests of high-voltage/low-voltage prefabricated substations

1 Scope

This document refers to high-voltage / low-voltage prefabricated substations (hereinafter prefabricated substations) as specified in IEC 62271-202:2014.

This document, among other options as agreed between manufacturer and user, can be used for the transferability of type tests performed on one or more prefabricated substations with a defined set of ratings and arrangement of components to another prefabricated substation with a different set of ratings or different arrangement of components. It supports the selection of appropriate representative test objects for that purpose in order to optimize the type testing procedure for a consistent conformity assessment.

This document utilises a combination of sound technical and physical principles, manufacturer and user experience and mutually agreed upon methods of calculation to establish pragmatic guidance for the transferability of type test results, covering various design and rating aspects.

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

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

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

IEC 60076-7, *Power transformers – Part 7: Loading guide for mineral-oil-immersed power transformers*

IEC 60076-11, *Power transformers – Part 11: Dry-type transformers*

IEC 60076-12, *Power transformers – Part 12: Loading guide for dry-type power transformers*

IEC 60282-1:2020, *High-voltage fuses – Part 1: Current-limiting fuses*

IEC 61439-1:2020, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

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

IEC 62271-200:2011, *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 62271-202:2014, *High-voltage switchgear and controlgear – Part 202: High-voltage/low-voltage prefabricated substation*

IEC TR 62271-208:2009, *High-voltage switchgear and controlgear – Part 208: Methods to quantify the steady state, power-frequency electromagnetic fields generated by HV switchgear assemblies and HV/LV prefabricated substations*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-441, IEC 62271-202 and the following apply.

NOTE Some standard terms and definitions are recalled here for ease of reference.

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

3.1
prefabricated substation
prefabricated and type-tested assembly comprising an enclosure containing in general power transformers, high-voltage and low-voltage switchgear and controlgear, high-voltage and low-voltage interconnections, auxiliary equipment and circuits

Note 1 to entry: The term type-tested assembly includes prefabricated substations verified based on the transferability of type test results in accordance with this document.

[SOURCE: IEC 62271-202:2014, 3.101, modified – New Note 1 to entry.]

3.2
prefabricated substation under consideration
prefabricated substation being verified based on the transferability of type test results in accordance with this document

3.3
component
essential part of the prefabricated substation, which serves one or several specific functions

Note 1 to entry: Examples of components include power transformer, high-voltage switchgear and controlgear, low-voltage switchgear and controlgear, etc.

[SOURCE: IEC 62271-202:2014, 3.105, modified – Addition of "power" in Note 1 to entry.]

3.4
enclosure
part of a prefabricated substation providing protection against external influences to the components and a specified degree of protection for operators and the general public with respect to approach to, or contact with, live parts and against contact with moving parts

[SOURCE: IEC 62271-202:2014, 3.103, modified – Replacing “substation” by “components" in the definition.]

3.5
class of enclosure
difference of temperature rise between the power transformer in the enclosure and the same power transformer outside the enclosure at normal operating conditions