IEC 62271-4

Edition 2.0 2022-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

High-voltage switchgear and controlgear – Part 4: Handling procedures for gases for insulation and/or switching

Appareillage à haute tension – Partie 4: Procédures de manipulation des gaz pour l'isolation et/ou la commutation

IEC 62271-4:2022-07(en-fr)

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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 4: Handling procedures for gases for insulation and/or switching

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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IEC 62271-4 has been prepared by IEC technical committee 17: High-voltage switchgear and controlgear. It is an International Standard.

This second edition cancels and replaces the first edition of IEC 62271-4 published in 2013. This edition constitutes a technical revision.

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

a) title has been modified;
b) handling procedures of alternatives to SF_6, which are used for insulation and/or switching, are added;
c) the main clauses are independent from the type of gas;
d) for each gas a separate annex describes gas specific information, handling procedures, safety measure, etc.;

e) information about SF_6 (former Annex E) and about environmental effects of SF_6 and its mixtures (former Annex F) has been moved to IEC 60376;

f) information about by-products of SF_6 and its mixtures (former Annex G), the procedure for evaluating the potential effects on health of by-products of SF_6 and its mixtures (former Annex H) and the cryogenic reclaim of SF_6 (former Annex I) have been moved to IEC 60480.

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

Draft	Report on voting
17/1124/FDIS	17/1125/RVD

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

The language used for the development of this International Standard is English.

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.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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.

IMPORTANT – The "colour inside" logo on the cover page of this document 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

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This document does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

The gases for insulation and/or switching which are the subjects of this document should be handled in compliance with local regulations, suppliers safety data-sheets, the operating instruction manual of the manufacturer and the safety guidance of the user of the electric power equipment.

Considering the limited information for some of the data which appear in the informative Annex E and Annex F, the reader should be aware that the information related with possible by-products and their possible toxicological effects on health and on the environment is still a matter of study.

Within IEC TC 10 new standards about specifications of technical grade (IEC 63360) and re-use (IEC 63359) for alternatives to SF_6 are being prepared. Therefore, in a later revision of this standard, some of the information will be moved to these new standards, similarly as it has been done for SF_6 and SF_6 mixtures.

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 4: Handling procedures for gases for insulation and/or switching

1 Scope

This part of IEC 62271 applies to the procedures for handling of gases for insulation and/or switching during installation, commissioning, repair, overhaul, normal and abnormal operations and disposal at the end-of-life of electric power equipment.

These procedures are regarded as minimum requirements to ensure the reliability of electric power equipment, the safety of personnel working with these gases and to minimize the impact on the environment. Additional requirements could be given or specified in the operating instruction manual of the manufacturer.

For each gas, which is known to be used in electric power equipment at the date of the publication of this document, a separate annex describes specifications, handling procedures, safety measures, etc. For gases not covered by these annexes the electric power equipment manufacturer should provide the information needed, following the structure of these annexes. Such gases should also be described in a next edition or in amendments to this edition.

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

NOTE 2 Throughout this document, the term “pressure” stands for “absolute pressure”.

NOTE 3 In this document, percentages of gaseous components, contaminants and by-products, are always percentages per volume, measured at 20 °C, if not otherwise indicated.

NOTE 4 Reference is also made to CIGRE Brochure 802 [1] [1].

NOTE 5 For further details on gases, e.g. ecotoxicology, also refer to the chemical database of the European Chemicals Agency, ECHA (www.echa.europa.eu), which takes the actual tonnage band into consideration.

NOTE 6 If gases for insulation and/or switching are regulated, their designation and regulation origin can be found in the IEC 62474 database (available at https://std.iec.ch/iec62474 [26]).

NOTE 7 When reference to circuit-breakers is made, only gas circuit-breakers are of interest. When vacuum circuit-breakers are of interest, they are explicitly mentioned.

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 60050-212:2010, *International Electrotechnical Vocabulary (IEV) – Part 212: Electrical insulating solids, liquids and gases* (available at www.electropedia.org)
IEC 60050-212:2010/AMD1:2015
IEC 60050-212:2010/AMD2:2015
IEC 60050-212:2010/AMD3:2020

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