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High-voltage switchgear and controlgear –
Part 37-013: Alternating current generator circuit-breakers

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FOREWORD

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IEC/IEEE 62271-37-013 was prepared by subcommittee 17A: High-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear, in cooperation with the Switchgear Committee of the IEEE Power and Energy Society[1], under the IEC/IEEE Dual Logo Agreement between IEC and IEEE. It is an International Standard.

This document is published as an IEC/IEEE Dual Logo standard.

The IEEE Std C37.013™-1997 (R2008) was revised and converted into the first edition of the IEC/IEEE Dual Logo International Standard IEC/IEEE 62271-37-013 published in 2015.

This second edition cancels and replaces the first edition published in 2015. This edition constitutes a technical revision.

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

a) content has been added to address the requirements of the other components of the generator circuit breaker system;
b) requirements for the application of generator circuit-breakers in power plants with multiple generators connected to one step-up transformer have been added;
c) requirements for testing and application of Tee-OFF generator circuit-breakers have been added;
d) requirements for application of generator circuit-breakers in power plants with doubly-fed induction machines, pumped-storage power plants, and wind farms have been added;
e) the clause numbering has been aligned with the numbering in IEC 62271-1:2017;
f) the topic of reference mechanical characteristics has been revised to improve clarity;
g) the modifying effects of capacitors on the prospective TRVs for out-of-phase and load current switching has been addressed in Annex M and in Annex N with use of the tool named "GenCB TRV calculator". This tool provides the values of K_{E2}, $RRRV_0$, $K_{\mathrm{RRRV\text{-}U}}$, $K_{\mathrm{RRRV\text{-}I}}$, t_{d0}, $K_{\mathrm{td\text{-}U}}$, $K_{\mathrm{td\text{-}I}}$, as well as the values of the parameters of the prospective TRV modified by the capacitors of the generator circuit-breaker.

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

FDIS	Report on voting
17A/1318/FDIS	17A/1327/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.

This document was drafted in accordance with the rules given in the ISO/IEC Directives, Part 2, 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.

1 A list of IEEE participants can be found at the following address: http://standards.ieee.org/downloads/62271/62271-37-013-2015/62271-37-013-2015_wg-participants.pdf.

This document is to be read in conjunction with IEC 62271-1, 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, while additional subclauses are numbered from 101.

This document contains attached files in the form of Excel spreadsheets ("GenCB TRV calculator"). These files are intended to be used as a complement and do not form an integral part of the document.

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 IEC Technical Committee and IEEE Technical Committee have 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.

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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 37-013: Alternating current generator circuit-breakers

1 Scope

This part of IEC 62271 is applicable to three-phase AC high-voltage generator circuit-breakers, hereafter called generator circuit-breakers, designed for indoor or outdoor installation and for operation at frequencies of 50 Hz and 60 Hz on systems having voltages above 1 kV and up to 38 kV.

It is applicable to generator circuit-breakers that are installed between the generator and the transformer terminals. Requirements relative to generator circuit-breakers intended for use with generators and transformers rated 10 MVA or more are covered specifically. Generator circuits rated less than 10 MVA and pumped-storage installations are considered special applications, and their requirements are not completely covered by this document.

This document is also applicable to the operating mechanisms of generator circuit-breakers and to their auxiliary equipment.

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.

If not otherwise specified throughout this document, the relevant IEC or IEEE standards for the particular components or functions of a generator circuit-breaker system apply.

IEC 60050-441, *International Electrotechnical Vocabulary (IEV) – Part 441: Switchgear, controlgear and fuses* (available at http://www.electropedia.org)

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

IEC 60071-1:2019, *Insulation co-ordination – Part 1: Definition, principles and rules*

IEC 60071-2:2018, *Insulation co-ordination – Part 2: Application guidelines*

IEC 60296, *Fluids for electrotechnical applications – Mineral insulating oils for electrical equipment*

IEC 60480, *Specifications for the re-use of sulphur hexafluoride (SF6) and its mixtures in electrical equipment*

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

IEC 60664-1, *Insulation co-ordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

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

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

IEC IEEE 62271-37-082, *High-voltage switchgear and controlgear – Part 37-082: Standard practice for the measurement of sound pressure levels on alternating current circuit-breakers*

IEC 62271-100:2021, *High-voltage switchgear and controlgear – Part 100: Alternating current circuit-breakers*

IEC 62271-101:2021, *High-voltage switchgear and controlgear – Part 101: Synthetic testing*

IEC 62271-102:2018, *High-voltage switchgear and controlgear – Part 102: Alternating current disconnectors and earthing switches*

IEC TR 62271-306, *High-voltage switchgear and controlgear – Part 306: Guide to IEC 62271-100, IEC 62271-1 and other IEC standards related to alternating current circuit-breakers*

IEEE Std C37.011™, *IEEE Guide for the Application of Transient Recovery Voltage for AC High-Voltage Circuit Breakers with Rated Maximum Voltage above 1000 V*[2]

IEEE Std C37.59™, *IEEE Standard Requirements for Conversion of Power Switchgear Equipment*

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