

INTERNATIONAL STANDARD



High-voltage switchgear and controlgear –
Part 107: Alternating current fused circuit-switchers for rated voltages
above 1 kV up to and including 52 kV

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 107: Alternating current fused circuit-switchers for rated voltages above 1 kV up to and including 52 kV

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 62271-107 has been prepared by subcommittee 17A: Switching devices, of IEC technical committee 17: High-voltage switchgear and controlgear

This third edition cancels and replaces the second edition published in 2012. This edition constitutes a technical revision.

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

- a) technical changes introduced by the second edition of IEC 62271-1 are applied, where relevant;
- b) rated TRV is removed and TRV is now treated as a test parameter, as in IEC 62271-100;
- c) the term "thermal current" is no longer used; the rated continuous current is linked to the installed fuse-links, and values shall be provided by the manufacturer together with the list of the acceptable fuse-links; for tests purpose, the highest rated continuous current listed is referred, where previously the wording was "rated maximum thermal current", for consistency with IEC 62271-105;
- d) making and breaking test duties are independent type tests (as some may be omitted if the switching device has been validated as a load-break switch). However, TD_{It0} and TD_{Ilow} are kept as a sequence as they are linked to the same rated value (I_{t0});
- e) differentiation has been introduced between requirements expressed for fulfilling the function expected from a fused circuit-switcher, from requirements only relevant when the function is performed by a stand-alone device. The goal is to avoid duplication or conflicts of requirements with a standard dealing with assemblies, when the function is implemented within such an assembly.

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

FDIS	Report on voting
17A/1216/FDIS	17A/1227/RVD

Full information on the voting for the approval of this International Standard 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.

This International Standard is to be read in conjunction with IEC 62271-1:2017, 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.

Particular conditions existing in certain countries are listed in Annex B.

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,
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INTRODUCTION

Earthing switches forming an integral part of a circuit-switcher are covered by IEC 62271-102 [1]¹.

Installation in enclosure, if any, is covered either by IEC 62271-200 [2] or by IEC 62271-201 [3].

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¹ Numbers in square brackets refer to the Bibliography.

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 107: Alternating current fused circuit-switchers for rated voltages above 1 kV up to and including 52 kV

~~1 General~~

1 Scope

~~Subclause 1.1 of IEC 62271-1:2007 is not applicable, and is replaced as follows.~~

~~This part of IEC 62271 applies to three-pole operated units for distribution systems that are functional assemblies of a circuit-switcher and current-limiting fuses designed so as to be capable of:~~

- ~~— breaking, at the rated recovery voltage, any load or fault current up to and including the rated short-circuit breaking current;~~
- ~~— making, at the rated voltage, circuits to which the rated short-circuit breaking current applies.~~

This part of IEC 62271 applies to three-pole-operated fused circuit-switchers designed with rated voltages above 1 kV up to and including 52 kV for use on three-phase alternating current systems of either 50 Hz or 60 Hz.

They can be designed either as stand-alone devices, or be embedded in a switchgear and controlgear assembly.

They are intended to be used for circuits or applications requiring only a normal mechanical and electrical endurance capability. Such applications cover protection of HV/LV transformers for instance, but exclude distribution lines or cables, as well as motor circuits and capacitor bank circuits.

Short-circuit conditions with low currents, up to the fused circuit-switcher rated take-over current, are dealt with by supplementary devices (strickers, relays, etc.), properly arranged, tripping the circuit-switcher. Current-limiting fuses are incorporated in order to ensure that the short-circuit breaking capacity of the device is above that of the circuit-switcher alone.

NOTE 1 In this document, the term "fuse" is used to designate either the fuse or the fuse-link where the general meaning of the text does not result in ambiguity.

~~This standard applies to fused circuit-switchers designed with rated voltages above 1 kV up to and including 52 kV for use on three-phase alternating current systems of either 50 Hz or 60 Hz. Comparison with other existing switching devices is provided in Clause 8.~~

NOTE 2 Other circuit-switchers exist; see reference [4].

Devices that require a dependent manual operation are not covered by this document.

~~Fuses are covered by IEC 60282-1.~~

~~Earthing switches forming an integral part of a circuit-switcher are covered by IEC 62271-102.~~

~~Installation in enclosure, if any, is covered either by IEC 62271-200 or by IEC 62271-201.~~

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 60282-1:2009, *High-voltage fuses – Part 1: Current-limiting fuses*
IEC 60282-1:2009/AMD1:2014

IEC 62271-1:~~2007~~2017, *High-voltage switchgear and controlgear – Part 1: Common specifications*

IEC 62271-100:2008, *High-voltage switchgear and controlgear – Part 100: Alternating-current circuit-breakers*
IEC 62271-100:2008/AMD1:2012
IEC 62271-100:2008/AMD2:2017

~~IEC 62271-102:2001, High-voltage switchgear and controlgear – Part 102: Alternating-current disconnectors and earthing switches~~

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 62271-200, 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 insulation enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV~~

3 Terms and definitions

~~Clause 3 of IEC 62271-1:2007 is applicable with the following additions:~~

For the purposes of this document, the following terms and definitions 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>

NOTE IEC Electropedia lists the terms defined in the IEC 60050 [5].

3.1 General terms and definitions

Subclause 3.1 of IEC 62271-1:~~2007~~2017 applies.

3.2 Assemblies of switchgear and controlgear

Subclause 3.2 of IEC 62271-1:~~2007~~2017 applies.

3.3 Parts of assemblies

Subclause 3.3 of IEC 62271-1:~~2007~~2017 applies.

3.4 Switching devices

Subclause 3.4 of IEC 62271-1:~~2007~~2017 applies, with the following additions.

3.4.101 circuit-switcher

mechanical switching device suitable for making, carrying and interrupting currents under normal circuit conditions and for interrupting specified fault currents that ~~may be less~~ are usually smaller than its short-time withstand current

Note 1 to entry: Other circuit-switchers exist; see reference [4].

3.4.102 fused circuit-switcher

~~device comprising a three pole circuit-switcher and three current limiting fuses, capable of making and breaking any load or fault current up to its short circuit breaking current, under TRV and power factor conditions defined in this standard~~
combination, in a single device or function, of a circuit-switcher and fuses, one fuse being placed in series with each pole of the circuit-switcher intended to be connected to a phase conductor

Note 1 to entry: the term "one fuse" does not preclude the use of several fuse-links in parallel.

3.4.103 fused circuit-switcher base ~~device base~~

fused circuit-switcher without fuse-links mounted

3.5 Parts of switchgear and controlgear

Subclause 3.5 of IEC 62271-1:~~2007~~2017 applies, with the following additions.

3.5.101 release

<of a mechanical switching device> device, mechanically connected to a mechanical switching device, which releases the holding means and permits the opening or the closing of the switching device

[SOURCE: IEC 60050-441:~~2007~~2000, 441-15-17]

3.5.102 over-current release

~~release which permits a mechanical switching device to open with or without time delay when the current in the release exceeds a predetermined value~~

[SOURCE: IEC 60050-441: 2007, 441-16-33]

3.5.102 shunt release

release energized by a source of voltage

Note 1 to entry: The source of voltage may be independent of the voltage of the main circuit.

[SOURCE: IEC 60050-441:~~2007~~2000, 441-16-41]