

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**High-voltage switchgear and controlgear –
Part 105: Alternating current switch-fuse combinations for rated voltages above
1 kV up to and including 52 kV**

**Appareillage à haute tension –
Partie 105: Combinés interrupteurs-fusibles pour courant alternatif de tensions
assignées supérieures à 1 kV et jusqu'à 52 kV inclus**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

**Part 105: Alternating current switch-fuse combinations
for rated voltages above 1 kV up to and including 52 kV**

FOREWORD

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International Standard IEC 62271-105 has been prepared by subcommittee 17A, High-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This second edition cancels and replaces the first edition of IEC 62271-105, published in 2002, and constitutes a technical revision.

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

- implementation of figures at the place where they are cited first;
- renumbering of tables;
- addition of some of the proposals from IEC paper 17A/852/INF;
- addition of missing subclauses of IEC 62271-1;
- implementation of 6.105 "Extension of validity of type tests" and consequently removing of the relevant parts in the different existing clauses;

- change of 7th paragraph of 6.101.4 as there is now a definition of NSDD given in 3.7.4 of IEC 62271-1:2007. Harmonization with IEC 62271-107;
- some referenced clauses in other standards like IEC 60282-1 were changed and therefore changed the editions under 1.2 to the ones referred to;
- addition of a new Annex C defining tolerances.

The text of this standard is based the following documents:

FDIS	Report on voting
17A/1013/FDIS	17A/1022/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This standard is to be read in conjunction with IEC 62271-1:2007, to which it refers and which is applicable, unless otherwise specified in this standard. 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.

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 publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 105: Alternating current switch-fuse combinations for rated voltages above 1 kV up to and including 52 kV

1 General

1.1 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 units for public and industrial distribution systems which are functional assemblies of switches including switch-disconnectors and current-limiting fuses designed so as to be capable of

- breaking, at the rated recovery voltage, any 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.

It does not apply to fuse-circuit-breakers, fuse-contactors, combinations for motor-circuits or to combinations incorporating single capacitor bank switches.

In this standard, the word “combination” is used for a combination in which the components constitute a functional assembly. Each association of a given type of switch and a given type of fuse defines one type of combination.

In practice, different types of fuses may be combined with one type of switch, which give several combinations with different characteristics, in particular concerning the rated currents. Moreover, for maintenance purposes, the user should know the types of fuses that can be combined to a given switch without impairing compliance to the standard, and the corresponding characteristics of the so-made combination.

A switch-fuse combination is then defined by its type designation and a list of selected fuses is defined by the manufacturer, the so-called “reference list of fuses”. Compliance with this standard of a given combination means that every combination using one of the selected fuses is proven to be in compliance with this standard.

The fuses are incorporated in order to extend the short-circuit breaking rating of the combination beyond that of the switch alone. They are fitted with strikers in order both to open automatically all three poles of the switch on the operation of a fuse and to achieve a correct operation at values of fault current above the minimum melting current but below the minimum breaking current of the fuses. In addition to the fuse strikers, the combination may be fitted with either an over-current release or a shunt release.

NOTE In this standard 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 combinations 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.

Fuses are covered by IEC 60282-1.

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

Switches, including their specific mechanism, shall be in accordance with IEC 62271-103 except for the short-time current and short-circuit making requirements where the current-limiting effects of the fuses are taken into account.

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

1.2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Subclause 1.2 of IEC 62271-1:2007 is applicable with the following additions:

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

IEC/TR 60787:2007, *Application guide for the selection of high-voltage current-limiting fuse-links for transformer circuits*

IEC 62271-1:2007, *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 62271-102:2001, *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*

2 Normal and special service conditions

Clause 2 of IEC 62271-1:2007 is applicable.

3 Terms and definitions

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

3.1 General terms

Subclause 3.1 of IEC 62271-1:2007 is applicable.

3.2 Assemblies of switchgear and controlgear

Subclause 3.2 of IEC 62271-1:2007 is applicable.

3.3 Parts of assemblies

Subclause 3.3 of IEC 62271-1:2007 is applicable.

3.4 Switching devices

Subclause 3.4 of IEC 62271-1:2007 is applicable, with the following additions

3.4.101**switch-fuse combination**

combination of a three-pole switch with three fuses provided with strikers, the operation of any striker causing all three poles of the switch to open automatically

Note 1 to entry: The switch-fuse combination includes fuse-switch combination.

3.4.102**switch-fuse combination base
combination base**

switch-fuse combination without fuse-links mounted

3.4.103**switch-fuse**

switch in which one or more poles have a fuse in series in a composite unit

[SOURCE: IEC 60050-441:2007, 441-14-14]

3.4.104**fuse-switch**

switch in which a fuse-link or a fuse-carrier with fuse-link forms the moving contact

[SOURCE: IEC 60050-441:2007, 441-14-17]

3.4.105**switch-disconnector**

switch which, in the open position, satisfies the isolating requirements specified for a disconnector

[SOURCE: IEC 60050-441:2007, 441-14-12]

3.4.106**release operated combination**

combination in which automatic opening of the switch can also be initiated by either an over-current release or a shunt release

3.5 Parts of switchgear and controlgear

Subclause 3.5 of IEC 62271-1:2007 is applicable, 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, 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

Note 1 to entry: This value can in some cases depend upon the rate-of-rise of current.

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

3.5.103**shunt release**

release energized by a source of voltage