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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**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	9
1 Scope.....	10
2 Normative references	11
3 Terms and definitions	11
3.1 General terms and definitions	11
3.2 Assemblies of switchgear and controlgear	11
3.3 Parts of assemblies	12
3.4 Switching devices	12
3.5 Parts of switchgear and controlgear	12
3.6 Operational characteristics of switchgear and controlgear.....	13
3.7 Characteristic quantities	13
3.101 Fuses	16
4 Normal and special service conditions	16
5 Ratings.....	17
5.1 General.....	17
Rated normal current and temperature rise	
Rated normal current (I_r).....	
Temperature rise	
Rated maximum thermal current (I_{th}).....	
Rated supply voltage of closing and opening devices and of auxiliary and control circuits (U_a).....	
Rated supply frequency of closing and opening devices and of auxiliary circuits.....	
Rated filling levels for insulation and/or operation.....	
Rated transient recovery voltage.....	
5.2 Rated voltage (U_r)	18
5.3 Rated insulation level (U_d , U_p , U_s)	18
5.4 Rated frequency (f_r).....	18
5.5 Rated continuous current (I_r)	18
5.6 Rated short-time withstand current (I_k)	18
5.7 Rated peak withstand current (I_p)	18
5.8 Rated duration of short-circuit (t_k).....	18
5.9 Rated supply voltage of auxiliary and control circuits (U_a)	19
5.10 Rated supply frequency of auxiliary and control circuits	19
5.11 Rated pressure of compressed gas supply for controlled pressure systems	19
5.101 Rated short-circuit breaking current (I_{SC})	19
5.102 Rated short-circuit making current (I_{ma})	19
5.103 Rated take-over current (I_{to}).....	20
6 Design and construction	21
6.1 Requirements for liquids in fused circuit-switchers	21
6.2 Requirements for gases in fused circuit-switchers.....	21
6.3 Earthing of fused circuit-switchers	21

6.4	Auxiliary and control equipment and circuits	21
6.5	Dependent power operation	21
6.6	Stored energy operation.....	21
6.7	Independent unlatched operation (independent manual or power operation)	21
6.8	Manually operated actuators	21
6.9	Operation of releases.....	21
6.10	Low and high pressure interlocking and monitoring devices Pressure/level indication	21
6.11	Nameplates	21
6.12	Interlocking Locking devices	24
6.13	Position indication.....	24
6.14	Degrees of protection provided by enclosures.....	24
6.15	Creepage distances for outdoor insulators	24
6.16	Gas and vacuum tightness.....	24
6.17	Liquid tightness for liquid systems	24
6.18	Fire hazard (flammability)	24
6.19	Electromagnetic compatibility (EMC).....	24
6.20	X-ray emission.....	24
6.21	Corrosion	25
6.22	Filling levels for insulation, switching and/or operation	25
6.101	Basic requirements for fuses.....	25
6.102	Linkages between the fuse striker(s) and the circuit-switcher release	25
6.103	Low over-current conditions (long fuse-pre-arcing time conditions)	25
6.104	Rated continuous current values	26
7	Type tests	26
7.1	General.....	26
	— Grouping of tests	
	— Information for identification of specimens	
	— Information to be included in type test reports	
7.2	Dielectric tests	27
7.3	Radio interference voltage (RIV) test	27
7.4	Measurement of the resistance of circuits Resistance measurement	27
	— Temperature rise tests	
7.5	Continuous current tests	27
7.6	Short-time withstand current and peak withstand current tests.....	27
7.7	Verification of the protection	28
7.8	Tightness tests	28
7.9	Electromagnetic compatibility tests (EMC)	28
7.10	Additional tests on auxiliary and control circuits	28
7.11	X-radiation test procedure for vacuum interrupters.....	28
7.101	Making and breaking tests	28
7.101.1	General	28
7.101.2	Conditions for performing the tests	29
7.101.3	Test duty procedures	34
7.101.4	Behaviour of the fused circuit-switcher during tests	41
7.101.5	Condition of the apparatus after tests	41
7.102	Mechanical operation tests	42
7.102.1	General	42
7.102.2	Test procedure	43

7.102.3	Condition of fused circuit-switcher during and after mechanical operation tests.....	43
7.102.4	Condition of the fuses during and after mechanical operation tests.....	44
7.103	Extension of validity of type tests.....	44
7.103.1	General.....	44
7.103.2	Dielectric properties.....	44
7.103.3	Continuous current tests.....	44
7.103.4	Making and breaking.....	44
8	Routine tests.....	45
8.1	General.....	45
8.2	Dielectric test on the main circuit.....	45
8.3	Tests on auxiliary and control circuits.....	45
8.4	Measurement of the resistance of the main circuit.....	45
8.5	Tightness test.....	45
8.6	Design and visual checks.....	45
8.101	Mechanical operating tests.....	45
9	Guide to the selection of fused circuit-switchers (informative).....	46
9.1	General.....	46
9.2	Selection of rated values.....	46
9.3	Cable-interface consideration.....	46
9.4	Continuous or temporary overload due to changed service conditions.....	46
9.5	Environmental aspects.....	46
9.101	Additional criteria.....	47
9.102	Rated short-circuit breaking current.....	47
9.103	Rated maximum thermal continuous current.....	47
9.104	Currents between thermal rated continuous current and I_3 of the fuses.....	47
9.105	Transfer current.....	48
9.106	Take-over current.....	48
9.107	Extension of the validity of type tests.....	48
9.108	Operation.....	48
9.109	Comparison of performances of fused circuit-switchers with performances of switch-fuse combinations and circuit-breakers.....	49
10	Information to be given with enquiries, tenders and orders (informative).....	50
10.1	General.....	50
10.2	Information to be given with enquiries and orders.....	50
10.3	Information with tenders.....	50
11	Rules for Transport, storage, installation, operation operating instructions and maintenance.....	51
12	Safety.....	51
13	Influence of the product on the environment.....	51
Annex A	(informative) Applicability of the rated take-over current test duty.....	52
A.1	Problem formulation.....	52
A.2	Background.....	52
A.3	Terms, definitions and symbols.....	53
A.4	Assumptions about the fuse melting process.....	54
A.5	Mathematical expression of the application requirements.....	55
A.6	Analysis.....	57
A.7	Conclusions.....	59

Annex B (informative) Particular conditions existing in certain countries	60
Bibliography.....	61
Figure 1 – Characteristics for determining the take-over current	20
Figure 2 – Arrangement of test circuits for test duties TD_{th} , TD _{lr} , TD _{isc} , TD _{lto} and TD _{llow}	31
Figure 3 – Representation of a specified TRV by a two-parameter reference line and a delay line	33
Figure 4 – Example of a two parameters envelope for a TRV	34
Figure 5 – Measurement of the power frequency recovery voltage with striker operation.....	36
Figure A.1 – Visualization of the application margin for a given fuse	54
Table 1 – Nameplate markings information	22
Table 2 – Summary of test parameters for test duties	39
Table 3 – Comparison between switch-fuse combination and fused circuit-switcher	49
Table 4 – Comparison between fused circuit-switcher and circuit breaker	50
Table A.1 – Minimum application margin <i>Am</i> according to fuse characteristic.....	58
Table A.2 – Minimum protection time delay.....	58
Table A.3 – Examples of possible need for time delay	59
Table B.1 – Voltages used in the Czech Republic	60
Table B.2 – Rated insulation levels for voltage ratings of Table B.1	60

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

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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, $TD_{I_{t0}}$ and $TD_{I_{low}}$ 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,
- replaced by a revised edition, or amended.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

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].

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~~

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Appareillage à haute tension –
Partie 107: Circuits-switchers à fusibles pour courant alternatif de tension
assignée supérieure à 1 kV et jusqu'à 52 kV inclus**

CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	10
3.1 General terms and definitions	10
3.2 Assemblies of switchgear and controlgear	10
3.3 Parts of assemblies	10
3.4 Switching devices	10
3.5 Parts of switchgear and controlgear.....	10
3.6 Operational characteristics of switchgear and controlgear.....	11
3.7 Characteristic quantities	11
3.101 Fuses	14
4 Normal and special service conditions	14
5 Ratings.....	15
5.1 General.....	15
5.2 Rated voltage (U_r)	15
5.3 Rated insulation level (U_d, U_p, U_s)	15
5.4 Rated frequency (f_r).....	15
5.5 Rated continuous current (I_r).....	15
5.6 Rated short-time withstand current (I_k)	15
5.7 Rated peak withstand current (I_p).....	15
5.8 Rated duration of short-circuit (t_k).....	16
5.9 Rated supply voltage of auxiliary and control circuits (U_a)	16
5.10 Rated supply frequency of auxiliary and control circuits	16
5.11 Rated pressure of compressed gas supply for controlled pressure systems	16
5.101 Rated short-circuit breaking current (I_{sc})	16
5.102 Rated short-circuit making current (I_{ma})	16
5.103 Rated take-over current (I_{to}).....	17
6 Design and construction	18
6.1 Requirements for liquids in fused circuit-switchers	18
6.2 Requirements for gases in fused circuit-switchers.....	18
6.3 Earthing of fused circuit-switchers	18
6.4 Auxiliary and control equipment and circuits	18
6.5 Dependent power operation	18
6.6 Stored energy operation.....	18
6.7 Independent unlatched operation (independent manual or power operation)	18
6.8 Manually operated actuators	18
6.9 Operation of releases.....	18
6.10 Pressure/level indication	18
6.11 Nameplates	18
6.12 Locking devices	20
6.13 Position indication.....	20

6.14	Degrees of protection provided by enclosures.....	20
6.15	Creepage distances for outdoor insulators	20
6.16	Gas and vacuum tightness.....	20
6.17	Tightness for liquid systems.....	20
6.18	Fire hazard (flammability)	20
6.19	Electromagnetic compatibility (EMC).....	20
6.20	X-ray emission.....	20
6.21	Corrosion.....	21
6.22	Filling levels for insulation, switching and/or operation.....	21
6.101	Basic requirements for fuses.....	21
6.102	Linkages between the fuse striker(s) and the circuit-switcher release	21
6.103	Low over-current conditions (long fuse-pre-arcing time conditions)	21
6.104	Rated continuous current values	21
7	Type tests	22
7.1	General.....	22
7.2	Dielectric tests	22
7.3	Radio interference voltage (RIV) test	22
7.4	Resistance measurement.....	22
7.5	Continuous current tests	22
7.6	Short-time withstand current and peak withstand current tests.....	22
7.7	Verification of the protection	22
7.8	Tightness tests	23
7.9	Electromagnetic compatibility tests (EMC)	23
7.10	Additional tests on auxiliary and control circuits.....	23
7.11	X-radiation test for vacuum interrupters	23
7.101	Making and breaking tests	23
7.101.1	General	23
7.101.2	Conditions for performing the tests	23
7.101.3	Test duty procedures	29
7.101.4	Behaviour of the fused circuit-switcher during tests	35
7.101.5	Condition of the apparatus after tests	35
7.102	Mechanical operation tests	36
7.102.1	General	36
7.102.2	Test procedure	36
7.102.3	Condition of fused circuit-switcher during and after mechanical operation tests.....	37
7.102.4	Condition of the fuses during and after mechanical operation tests.....	37
7.103	Extension of validity of type tests.....	37
7.103.1	General	37
7.103.2	Dielectric properties.....	38
7.103.3	Continuous current tests.....	38
7.103.4	Making and breaking	38
8	Routine tests	38
8.1	General.....	38
8.2	Dielectric test on the main circuit	38
8.3	Tests on auxiliary and control circuits	38
8.4	Measurement of the resistance of the main circuit.....	39
8.5	Tightness test	39
8.6	Design and visual checks.....	39

8.101	Mechanical operating tests	39
9	Guide to the selection of fused circuit-switchers (informative).....	40
9.1	General.....	40
9.2	Selection of rated values.....	40
9.3	Cable interface consideration.....	40
9.4	Continuous or temporary overload due to changed service conditions.....	40
9.5	Environmental aspects.....	40
9.101	Additional criteria.....	40
9.102	Rated short-circuit breaking current	41
9.103	Rated continuous current	41
9.104	Currents between rated continuous current and I_3 of the fuses	41
9.105	Transfer current	41
9.106	Take-over current	41
9.107	Extension of the validity of type tests	42
9.108	Operation.....	42
9.109	Comparison of performances of fused circuit-switchers with performances of switch-fuse combinations and circuit-breakers	43
10	Information to be given with enquiries, tenders and orders (informative).....	43
10.1	General.....	43
10.2	Information with enquiries and orders	43
10.3	Information with tenders.....	43
11	Transport, storage, installation, operating instructions and maintenance	44
12	Safety.....	44
13	Influence of the product on the environment	44
Annex A	(informative) Applicability of the rated take-over current test duty	45
A.1	Problem formulation.....	45
A.2	Background	45
A.3	Terms, definitions and symbols.....	46
A.4	Assumptions about the fuse melting process.....	47
A.4.1	General	47
A.4.2	First phase	47
A.4.3	Second phase.....	47
A.4.4	Modelling of the "application margin"	48
A.5	Mathematical expression of the application requirements.....	48
A.5.1	General	48
A.5.2	First pole-to-clear	48
A.5.3	Second pole-to-clear	48
A.6	Analysis	50
A.6.1	Applications with fuse strikers.....	50
A.6.2	Applications with protection relays.....	51
A.7	Conclusions	52
Annex B	(informative) Particular conditions existing in certain countries	53
Bibliography	54
Figure 1	– Characteristics for determining the take-over current	17
Figure 2	– Arrangement of test circuits for test duties TD_{Ir} , TD_{ISC} , TD_{Ito} and TD_{Ilow}	26

Figure 3 – Representation of a specified TRV by a two-parameter reference line and a delay line	28
Figure 4 – Example of a two parameters envelope for a TRV	29
Figure 5 – Measurement of the power frequency recovery voltage with striker operation.....	31
Figure A.1 – Visualization of the application margin for a given fuse	47
Table 1 – Nameplate information	19
Table 2 – Summary of test parameters for test duties	34
Table 3 – Comparison between switch-fuse combination and fused circuit-switcher	43
Table 4 – Comparison between fused circuit-switcher and circuit breaker	43
Table A.1 – Minimum application margin A_m according to fuse characteristic.....	51
Table A.2 – Minimum protection time delay.....	51
Table A.3 – Examples of possible need for time delay	52
Table B.1 – Voltages used in the Czech Republic	53
Table B.2 – Rated insulation levels for voltage ratings of Table B.1	53

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

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- 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, $TD_{I_{t0}}$ and $TD_{I_{low}}$ 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,
- replaced by a revised edition, or
- amended.

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].

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 Scope

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.

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

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

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 62271-1:2017, *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 62271-103:2011, *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*

SOMMAIRE

AVANT-PROPOS.....	60
INTRODUCTION.....	62
1 Domaine d'application	63
2 Références normatives	63
3 Termes et définitions	64
3.1 Termes généraux et définitions	64
3.2 Ensembles d'appareillage	64
3.3 Parties d'ensemble	64
3.4 Appareils de connexion.....	64
3.5 Parties d'appareillage	64
3.6 Caractéristiques opérationnelles d'un appareillage	65
3.7 Grandeurs caractéristiques	65
3.101 Fusibles	68
4 Conditions normales et spéciales de service	69
5 Caractéristiques assignées.....	69
5.1 Généralités	69
5.2 Tension assignée (U_r).....	69
5.3 Niveau d'isolement assigné (U_d , U_p , U_s)	69
5.4 Fréquence assignée (f_r).....	69
5.5 Courant permanent assigné (I_r)	69
5.6 Courant de courte durée admissible assigné (I_k)	70
5.7 Valeur de crête du courant admissible assignée (I_p).....	70
5.8 Durée de court-circuit assignée (t_k)	70
5.9 Tension d'alimentation assignée des circuits auxiliaires et de commande (U_a).....	70
5.10 Fréquence d'alimentation assignée des circuits auxiliaires et de commande	70
5.11 Pression d'alimentation assignée en gaz comprimé pour les systèmes à pression entretenue	70
5.101 Courant coupé assigné en court-circuit (I_{sc})	70
5.102 Courant établi assigné en court-circuit (I_{ma}).....	71
5.103 Courant d'intersection assigné (I_{t0})	71
6 Conception et construction	72
6.1 Exigences pour les liquides utilisés dans les circuits-switchers à fusibles	72
6.2 Exigences pour les gaz utilisés dans les circuits-switchers à fusibles.....	72
6.3 Raccordement à la terre des circuits-switchers à fusibles	72
6.4 Equipements et circuits auxiliaires et de commande	72
6.5 Manœuvre dépendante à source d'énergie extérieure	73
6.6 Manœuvre à accumulation d'énergie.....	73
6.7 Manœuvre indépendante sans accrochage mécanique (manœuvre indépendante manuelle ou manœuvre indépendante à source d'énergie extérieure)	73
6.8 Organes de commande à manœuvre manuelle	73
6.9 Fonctionnement des déclencheurs.....	73
6.10 Indication de la pression/du niveau	73

6.11	Plaques signalétiques	73
6.12	Dispositifs de verrouillage	75
6.13	Indication de position	75
6.14	Degrés de protection procurés par les enveloppes	75
6.15	Lignes de fuite pour les isolateurs d'extérieur	75
6.16	Étanchéité au gaz et au vide	75
6.17	Étanchéité des systèmes de liquide	75
6.18	Risque de feu (inflammabilité).....	75
6.19	Compatibilité électromagnétique (CEM)	75
6.20	Émission de rayons X	75
6.21	Corrosion	76
6.22	Niveaux de remplissage pour l'isolement, la coupure et/ou la manœuvre	76
6.101	Exigences de base pour les fusibles	76
6.102	Tringlages entre le(s) perceur(s) des fusibles et le déclencheur du circuit-switcher	76
6.103	Conditions de faible courant de défaut (conditions de longue durée de préarc des fusibles)	76
6.104	Valeurs de courant permanent assigné	77
7	Essais de type	77
7.1	Généralités	77
7.2	Essais diélectriques	77
7.3	Essais de tension de perturbation radioélectrique	77
7.4	Mesurage de la résistance	77
7.5	Essais au courant permanent.....	77
7.6	Essais au courant de courte durée admissible et à la valeur de crête du courant admissible	78
7.7	Vérification de la protection	78
7.8	Essais d'étanchéité	78
7.9	Essais de compatibilité électromagnétique (CEM).....	78
7.10	Essais complémentaires sur les circuits auxiliaires et de commande.....	78
7.11	Essai des rayonnements X pour les ampoules à vide	78
7.101	Essais d'établissement et de coupure	78
7.101.1	Généralités	78
7.101.2	Conditions pour la réalisation des essais	79
7.101.3	Procédures des séries d'essais	84
7.101.4	Comportement du circuit-switcher à fusibles pendant les essais	90
7.101.5	Etat de l'appareil après les essais	90
7.102	Essais de fonctionnement mécanique	91
7.102.1	Généralités	91
7.102.2	Procédure d'essai	92
7.102.3	État du circuit-switcher à fusibles pendant et après les essais de fonctionnement mécanique	92
7.102.4	État des fusibles pendant et après les essais de fonctionnement mécanique.....	93
7.103	Extension de la validité des essais de type	93
7.103.1	Généralités	93
7.103.2	Propriétés diélectriques	93
7.103.3	Essais au courant permanent	93
7.103.4	Établissement et coupure	93
8	Essais individuels de série	94

8.1	Généralités	94
8.2	Essai diélectrique du circuit principal	94
8.3	Essais des circuits auxiliaires et de commande	94
8.4	Mesurage de la résistance du circuit principal	94
8.5	Essai d'étanchéité	94
8.6	Contrôles visuels et de conception	94
8.101	Essais de fonctionnement mécanique	94
9	Guide pour le choix des circuits-switchers à fusibles (informatif)	95
9.1	Généralités	95
9.2	Choix des valeurs assignées	95
9.3	Considérations sur les interfaces avec les câbles	95
9.4	Surcharge continue ou temporaire due à une modification des conditions de service	95
9.5	Aspects d'environnement	95
9.101	Critères additionnels	95
9.102	Courant coupé assigné en court-circuit	96
9.103	Courant permanent assigné	96
9.104	Courants entre le courant permanent assigné et le courant I_3 des fusibles	96
9.105	Courant de transition	97
9.106	Courant d'intersection	97
9.107	Extension de la validité des essais de type	97
9.108	Fonctionnement	97
9.109	Comparaison des performances des circuits-switchers à fusibles avec les performances des combinés interrupteurs-fusibles et des disjoncteurs	98
10	Renseignements à donner dans les appels d'offres, les soumissions et les commandes (informatif)	99
10.1	Généralités	99
10.2	Renseignements dans les appels d'offres et les commandes	99
10.3	Renseignements à donner dans les soumissions	99
11	Transport, stockage, installation, instructions de fonctionnement et maintenance	99
12	Sécurité	99
13	Influence du produit sur l'environnement	100
Annexe A (informative) Applicabilité de la série d'essais au courant d'intersection assigné		101
A.1	Formulation du problème	101
A.2	Contexte	101
A.3	Termes, définitions et symboles	102
A.4	Hypothèses sur le mode de fusion du fusible	103
A.4.1	Généralités	103
A.4.2	Première phase	103
A.4.3	Deuxième phase	103
A.4.4	Modélisation de la "marge applicative"	104
A.5	Expression mathématique des exigences de l'application	104
A.5.1	Généralités	104
A.5.2	Premier pôle qui coupe	104
A.5.3	Deuxième pôle qui coupe	104
A.6	Analyse	106
A.6.1	Application avec des perceurs	106
A.6.2	Applications avec relais de protection	107

A.7 Conclusions	108
Annexe B (informative) Conditions particulières propres à certains pays.....	109
Bibliographie.....	110
Figure 1 – Caractéristiques pour déterminer le courant d'intersection	72
Figure 2 – Disposition des circuits d'essais pour les séries d'essais TD_{I_r} , $TD_{I_{sc}}$, $TD_{I_{to}}$ et $TD_{I_{low}}$	81
Figure 3 – Représentation d'une TTR spécifiée par un tracé de référence à deux paramètres et un retard	83
Figure 4 – Exemple d'enveloppe à deux paramètres pour une TTR.....	84
Figure 5 – Mesurage de la tension de rétablissement à fréquence industrielle avec action du percuteur	87
Figure A.1 – Visualisation de la marge applicative pour un fusible donné.....	103
Tableau 1 – Informations de la plaque signalétique.....	74
Tableau 2 – Résumé des paramètres d'essais pour les séries d'essais.....	89
Tableau 3 – Comparaison entre combiné interrupteur-fusibles et circuit-switcher à fusibles	98
Tableau 4 – Comparaison entre un circuit-switcher à fusibles et un disjoncteur	98
Tableau A.1 – Marge applicative minimale A_m selon les caractéristiques des fusibles.....	107
Tableau A.2 – Temporisation de fonctionnement minimale du relais	107
Tableau A.3 – Exemples de besoins possibles de temporisation	108
Tableau B.1 – Tensions utilisés en République tchèque.....	109
Tableau B.2 – Niveaux d'isolement assignés pour les tensions données au Tableau B.1	109

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

APPAREILLAGE À HAUTE TENSION –

Partie 107: Circuits-switchers à fusibles pour courant alternatif de tension assignée supérieure à 1 kV et jusqu'à 52 kV inclus

AVANT-PROPOS

- 1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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- 8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
- 9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et de ne pas avoir signalé leur existence.

La Norme internationale IEC 62271-107 a été établie par le sous-comité 17A: Appareils de connexion, du comité d'études 17 de l'IEC: Appareillage haute tension.

Cette troisième édition annule et remplace la deuxième édition parue en 2012. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) les modifications techniques introduites par la deuxième édition de l'IEC 62271-1 sont appliquées, lorsqu'elles sont pertinentes;
- b) la TTR assignée est supprimée et la TTR est maintenant traitée comme un paramètre d'essai, comme dans l'IEC 62271-100;

- c) le terme "courant thermique" n'est plus employé; le courant permanent assigné est lié aux éléments de remplacement installés, et les valeurs doivent être fournies par le constructeur ainsi que la liste des éléments de remplacement acceptables; pour les besoins des essais, le courant continu assigné le plus élevé est indiqué dans la liste, en lieu et place du terme "valeur de courant thermique maximal assignée" à des fins de cohérence avec l'IEC 62271-105;
- d) les séries d'essais d'établissement et de coupure sont des essais de type indépendants (certains peuvent être omis si l'appareil de coupure a été validé en tant qu'interrupteur de charge). Cependant, TD_{It0} et TD_{Ilow} sont conservés sous forme de séquence car ils sont liés à la même valeur assignée (I_{t0});
- e) une distinction est désormais faite entre les exigences formulées pour remplir la fonction attendue d'un circuit-switcher à fusibles, et celles uniquement pertinentes lorsque la fonction est assurée par un appareil autonome. L'objectif est d'éviter la duplication ou les conflits d'exigences avec une norme traitant des ensembles, lorsque la fonction est mise en œuvre au sein d'un tel ensemble.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
17A/1216/FDIS	17A/1227/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Cette norme doit être lue conjointement avec l'IEC 62271-1:2017, à laquelle elle se réfère et qui est applicable sauf indication contraire. Afin de simplifier l'indication des exigences correspondantes, la numérotation des articles et paragraphes utilisée est la même que celle de l'IEC 62271-1. Les amendements à ces articles et paragraphes reprennent la même numérotation, et les paragraphes supplémentaires sont numérotés à partir de 101.

Une liste des conditions particulières existant dans certains pays est donnée à l'Annexe B.

Une liste de toutes les parties de la série IEC 62271, publiées sous le titre général *Appareillage à haute tension*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

INTRODUCTION

Les sectionneurs de terre faisant partie intégrale d'un circuit-switcher sont couverts par l'IEC 62271-102 [1]¹.

L'installation sous enveloppe, le cas échéant, est couverte soit par l'IEC 62271-200 [2], soit par l'IEC 62271-201 [3].

¹ Les nombres entre crochets se réfèrent à la Bibliographie.

APPAREILLAGE À HAUTE TENSION –

Partie 107: Circuits-switchers à fusibles pour courant alternatif de tension assignée supérieure à 1 kV et jusqu'à 52 kV inclus

1 Domaine d'application

La présente partie de l'IEC 62271 s'applique aux circuits-switchers à fusibles à manœuvre tripolaire conçus avec des tensions assignées supérieures à 1 kV et inférieures ou égales à 52 kV, pour utilisation sur des réseaux alternatifs triphasés de fréquence 50 Hz ou 60 Hz.

Ils peuvent être soit conçus sous forme d'appareils autonomes, soit intégrés dans un ensemble d'appareillage.

Ils sont destinés à être utilisés dans des circuits ou des applications qui ne nécessitent qu'une endurance mécanique et électrique normale. De telles applications couvrent, par exemple, la protection des transformateurs HT/BT, mais excluent les circuits de distribution en lignes ou en câbles ainsi que les circuits de moteurs et de bancs de condensateurs.

Les conditions de défaut de court-circuit avec de faibles courants, jusqu'au courant d'intersection assigné du circuit-switcher à fusibles, sont gérées par des dispositifs complémentaires (percuteurs, relais, etc.), correctement mis en œuvre, déclenchant le circuit-switcher. Les fusibles limiteurs de courant sont intégrés de manière à assurer que le pouvoir de coupure en court-circuit du dispositif est supérieur à celui du circuit-switcher seul.

NOTE 1 Dans le présent document, le mot "fusible" est utilisé pour désigner soit le fusible, soit l'élément de remplacement, quand le sens général du texte ne comporte aucune ambiguïté.

NOTE 2 Il existe d'autres circuits-switchers; voir référence [4].

Les dispositifs qui exigent une manœuvre manuelle dépendante ne sont pas couverts par le présent document.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60282-1:2009, *Fusibles à haute tension – Partie 1: Fusibles limiteurs de courant*
IEC 60282-1:2009/AMD1:2014

IEC 62271-1:2017, *Appareillage à haute tension – Partie 1: Spécifications communes pour appareillage à courant alternatif*

IEC 62271-100:2008, *Appareillage à haute tension – Partie 100: Disjoncteurs à courant alternatif*
IEC 62271-100:2008/AMD1:2012
IEC 62271-100:2008/AMD2:2017

IEC 62271-103:2011, *Appareillage à haute tension – Partie 103: Interrupteurs pour tensions assignées supérieures à 1 kV et inférieures ou égales à 52 kV*

IEC 62271-105:2012, *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*