

# INTERNATIONAL STANDARD

# IEC 62271-100

Edition 1.1  
2003-05

Edition 1:2001 consolidated with amendment 1:2002

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## High-voltage switchgear and controlgear – Part 100: High-voltage alternating-current circuit-breakers

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*This **English-language** version is derived from the original **bilingual** publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.*



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## Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

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International Electrotechnical Commission  
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5.14	Creepage distances .....	115
5.15	Gas and vacuum tightness.....	115
5.16	Liquid tightness .....	115
5.17	Flammability .....	115
5.18	Electromagnetic compatibility .....	115
6	Type tests.....	119
6.1	General .....	123
6.2	Dielectric tests.....	123
6.3	Radio interference voltage (r.i.v.) tests .....	129
6.4	Measurement of the resistance of the main circuit .....	129
6.5	Temperature-rise tests.....	129
6.6	Short-time withstand current and peak withstand current tests.....	131
6.7	Verification of the degree of protection .....	133
6.8	Tightness tests .....	133
6.9	Electromagnetic compatibility (EMC) tests .....	133
6.101	Mechanical and environmental tests.....	133
6.102	Miscellaneous provisions for making and breaking tests.....	157
6.103	Test circuits for short-circuit making and breaking tests .....	197
6.104	Short-circuit test quantities.....	199
6.105	Short-circuit test procedure.....	225
6.106	Basic short-circuit test-duties.....	229
6.107	Critical current tests .....	239
6.108	Single-phase and double-earth fault tests .....	239
6.109	Short-line fault tests .....	243
6.110	Out-of-phase making and breaking tests.....	251
6.111	Capacitive current switching tests .....	253
6.112	Special requirements for making and breaking tests on class E2 circuit-breakers.....	281
7	Routine tests.....	283
7.1	Dielectric test on the main circuit .....	283
7.2	Dielectric test on auxiliary and control circuits .....	285
7.3	Measurement of the resistance of the main circuit .....	285
7.4	Tightness test.....	285
7.5	Design and visual checks .....	285
8	Guide to the selection of circuit-breakers for service.....	289
9	Information to be given with enquiries, tenders and orders.....	307
10	Rules for transport, storage, installation, operation and maintenance.....	313
10.1	Conditions during transport, storage and installation.....	313
10.2	Installation.....	313
10.3	Operation .....	325
10.4	Maintenance.....	327
11	Safety.....	327
	Annex A (normative) Calculation of transient recovery voltages for short-line faults from rated characteristics.....	433
	Annex B (normative) Tolerances on test quantities during type tests .....	449
	Annex C (normative) Records and reports of type tests .....	463
	Annex D (normative) Determination of short-circuit power factor .....	471

Annex E (normative) Method of drawing the envelope of the prospective transient recovery voltage of a circuit and determining the representative parameters .....	475
Annex F (normative) Methods of determining prospective transient recovery voltage waves .....	483
Annex G (normative) Rationale behind introduction of circuit-breakers class E2 .....	517
Annex H (informative) Inrush currents of single and back-to-back capacitor banks .....	519
Annex I (informative) Explanatory notes .....	529
Annex J (informative) Test current and line length tolerances for short-line fault testing .....	563
Annex K (informative) List of symbols and abbreviations used in IEC 62271-100.....	567
Figure 1 – Typical oscillogram of a three-phase short-circuit make-break cycle .....	329
Figure 2 – Circuit-breaker without switching resistors. Opening and closing operations .....	333
Figure 3 – Circuit breaker without switching resistors – Close-open cycle .....	335
Figure 4 – Circuit-breaker without switching resistors – Reclosing (auto-reclosing) .....	337
Figure 5 – Circuit-breaker with switching resistors. Opening and closing operations .....	339
Figure 6 – Circuit-breaker with switching resistors – Close-open cycle .....	341
Figure 7 – Circuit-breaker with switching resistors – Reclosing (auto-reclosing) .....	343
Figure 8 – Determination of short-circuit making and breaking currents, and of percentage d.c. component .....	345
Figure 9 – Percentage d.c. component in relation to the time interval ( $T_{op} + T_r$ ) for the standard time constant $\tau_1$ and for the special case time constants $\tau_2$ , $\tau_3$ and $\tau_4$ .....	347
Figure 10 – Representation of a specified four-parameter TRV and a delay line for T100, short-line fault and out-of-phase condition with a four-parameter reference line .....	349
Figure 11 – Representation of a specified TRV by a two-parameter reference line and a delay line .....	351
Figure 12a – Basic circuit for terminal fault with ITRV .....	353
Figure 12b – Representation of ITRV in relationship to TRV .....	353
Figure 13 – Three-phase short-circuit representation .....	355
Figure 14 – Alternative representation of figure 13 .....	357
Figure 15 – Basic short-line fault circuit .....	359
Figure 16 – Example of a line-side transient voltage with time delay and rounded crest showing construction to derive the values $u^*_L$ , $t_L$ and $t_{dL}$ .....	359
Figure 17 – Test sequences for low and high temperature tests .....	361
Figure 18 – Humidity test .....	363
Figure 19 – Static terminal load forces .....	365
Figure 20 – Directions for static terminal load tests .....	367
Figure 21 – Permitted number of samples for making, breaking and switching tests, illustrations of the statements in 6.102.2 .....	369
Figure 22 – Definition of a single test specimen in accordance with 3.2.2 of IEC 60694 .....	371
Figure 23a – Reference mechanical travel characteristics (idealised curve) .....	373
Figure 23b – Reference mechanical travel characteristics (idealised curve) with the prescribed envelopes centered over the reference curve (+5 %, –5 %), contact separation in this example at time $t = 20$ ms .....	373

Figure 23c – Reference mechanical travel characteristics (idealised curve) with the prescribed envelopes fully displaced upward from the reference curve (+10 %, –0 %), contact separation in this example at time $t = 20$ ms.....	375
Figure 23d – Reference mechanical travel characteristics (idealised curve) with the prescribed envelopes fully displaced downward from the reference curve (+0 %, –10 %), contact separation in this example at time $t = 20$ ms .....	375
Figure 24 – Equivalent testing set-up for unit testing of circuit-breakers with more than one separate interrupter units.....	377
Figure 25a – Preferred circuit.....	379
Figure 25b – Alternative circuit.....	379
Figure 25 – Earthing of test circuits for three-phase short-circuit tests, first-pole-to-clear factor 1,5 .....	379
Figure 26a – Preferred circuit.....	381
Figure 26b – Alternative circuit.....	381
Figure 26 – Earthing of test circuits for three-phase short-circuit tests, first-pole-to-clear factor 1,3 .....	381
Figure 27a – Preferred circuit.....	383
Figure 27b – Alternative circuit not applicable for circuit-breakers where the insulation between phases and/or to earth is critical (e.g. GIS or dead tank circuit-breakers) .....	383
Figure 27 – Earthing of test circuits for single-phase short-circuit tests, first-pole-to-clear factor 1,5 .....	383
Figure 28a – Preferred circuit.....	385
Figure 28b – Alternative circuit, not applicable for circuit-breakers where the insulation between phases and/or to earth is critical (e.g. GIS or dead tank circuit-breakers) .....	385
Figure 28 – Earthing of test circuits for single-phase short-circuit tests, first-pole-to-clear factor 1,3 .....	385
Figure 29 – Graphical representation of the three valid symmetrical breaking operations for three-phase tests in a non-solidly earthed neutral system (first-pole-to-clear factor 1,5).....	387
Figure 30 – Graphical representation of the three valid symmetrical breaking operations for three-phase tests in a solidly earthed neutral system (first-pole-to-clear factor 1,3).....	389
Figure 31 – Graphical representation of the three valid asymmetrical breaking operations for three-phase tests in a non-solidly earthed neutral system (first-pole-to-clear factor 1,5).....	391
Figure 32 – Graphical representation of the three valid asymmetrical breaking operations for three-phase tests in a solidly earthed neutral system (first-pole-to-clear factor 1,3).....	393
Figure 33 – Graphical representation of the three valid symmetrical breaking operations for single-phase tests in substitution of three-phase conditions in a non-solidly earthed neutral system (first-pole-to-clear factor 1,5).....	395
Figure 34 – Graphical representation of the three valid asymmetrical breaking operations for single-phase tests in substitution of three-phase conditions in a non-solidly earthed neutral system (first-pole-to-clear factor 1,5).....	397
Figure 35 – Graphical representation of the three valid symmetrical breaking operations for single-phase tests in substitution of three-phase conditions in a solidly earthed neutral system (first-pole-to-clear factor 1,3).....	399

Figure 36 – Graphical representation of the three valid asymmetrical breaking operations for single-phase tests in substitution of three-phase conditions in a solidly earthed neutral system (first-pole-to-clear factor 1,3).....	401
Figure 37 – Graphical representation of the interrupting window and the voltage factor $k_p$ , determining the TRV of the individual pole, for systems with a first-pole-to-clear factor of 1,3 .....	403
Figure 38 – Graphical representation of the interrupting window and the voltage factor $k_p$ , determining the TRV of the individual pole, for systems with a first-pole-to-clear factor of 1,5 .....	403
Figure 39 – Example of prospective test TRV with four-parameter envelope which satisfies the conditions to be met during type test – Case of specified TRV with four-parameter reference line.....	405
Figure 40 – Example of prospective test TRV with two-parameter envelope which satisfies the conditions to be met during type test: case of specified TRV with two-parameter reference line .....	407
Figure 41 – Example of prospective test TRV with four-parameter envelope which satisfies the conditions to be met during type-test – Case of specified TRV with two-parameter reference line .....	409
Figure 42 – Example of prospective test TRV with two-parameter envelope which satisfies the conditions to be met during type-test – Case of specified TRV with four-parameter reference line.....	409
Figure 43 – Example of prospective test TRV-waves and their combined envelope in two-part test.....	411
Figure 44 – Determination of power frequency recovery voltage.....	413
Figure 45 – Necessity of additional single-phase tests and requirements for testing.....	415
Figure 46 – Basic circuit arrangement for short-line fault testing and prospective TRV-circuit-type a) according to 6.109.3: Source side and line side with time delay .....	417
Figure 47 – Basic circuit arrangement for short-line fault testing – circuit type b1) according to 6.109.3: Source side with ITRV and line side with time delay .....	419
Figure 48 – Basic circuit arrangement for short-line fault testing – circuit type b2) according to 6.109.3: Source side with time delay and line side without time delay .....	421
Figure 49 – Flow-chart for the choice of short-line fault test circuits .....	423
Figure 50 – Compensation of deficiency of the source side time delay by an increase of the excursion of the line side voltage.....	425
Figure 51 – Test circuit for single-phase out-of-phase tests.....	427
Figure 52 – Test circuit for out-of-phase tests using two voltages separated by 120 electrical degrees .....	427
Figure 53 – Test circuit for out-of-phase tests with one terminal of the circuit-breaker earthed (subject to agreement of the manufacturer) .....	429
Figure 54 – Recovery voltage for capacitive current breaking tests .....	431
Figure A.1 – Typical graph of line and source side TRV parameters – Line side and source side with time delay .....	447
Figure A.2 – Typical graph of line and source side TRV parameters – Line side and source side with time delay, source side with ITRV.....	447
Figure E.1– Representation by four parameters of a prospective transient recovery voltage of a circuit – Case E.2 c) 1).....	479
Figure E.2 – Representation by four parameters of a prospective transient recovery voltage of a circuit – Case E.2 c) 2).....	479
Figure E.3 – Representation by four parameters of a prospective transient recovery voltage of a circuit – Case E.2. c) 3) i) .....	481



Figure E.4 – Representation by two parameters of a prospective transient recovery voltage of a circuit – Case E.2. c) 3) ii).....	481
Figure F.1 – Effect of depression on the peak value of the TRV .....	503
Figure F.2 – TRV in case of ideal breaking.....	503
Figure F.3 – Breaking with arc-voltage present .....	505
Figure F.4 – Breaking with pronounced premature current-zero.....	505
Figure F.5 – Breaking with post-arc current.....	505
Figure F.6 – Relationship between the values of current and TRV occurring in test and those prospective to the system .....	507
Figure F.7 – Schematic diagram of power-frequency current injection apparatus.....	509
Figure F.8 – Sequence of operation of power-frequency current injection apparatus .....	511
Figure F.9 – Schematic diagram of capacitance injection apparatus.....	513
Figure F.10 – Sequence of operation of capacitor-injection apparatus.....	515
Figure H.1 – Circuit diagram for example 1 .....	521
Figure H.2 – Circuit diagram for example 2 .....	523
Figure H.3 – Equations for the calculation of capacitor bank inrush currents .....	527
Figure 1 – Typical short-circuit testing station parameter combinations .....	553
Table 1a – Standard values of transient recovery voltage – Rated voltages below 100 kV – Representation by two parameters .....	79
Table 1b – Standard values of transient recovery voltage – Rated voltages of 100 kV to 170 kV for solidly earthed systems – Representation by four parameters .....	81
Table 1c – Standard values of transient recovery voltage – Rated voltages of 100 kV to 170 kV for non-solidly earthed systems – Representation by four parameters .....	83
Table 1d – Standard values of transient recovery voltage – Rated voltages 245 kV and above for solidly earthed systems – Representation by four parameters.....	85
Table 2 – Standard multipliers for transient recovery voltage values for second and third clearing poles for rated voltages above 72,5 kV.....	87
Table 3 – Standard values of initial transient recovery voltage – Rated voltages 100 kV and above.....	89
Table 4 – Standard values of line characteristics for short-line faults.....	93
Table 5 – Preferred values of rated capacitive switching currents.....	99
Table 6 – Nameplate information.....	113
Table 7 – Type tests.....	121
Table 8 – Number of operating sequences .....	143
Table 9 – Examples of static horizontal and vertical forces for static terminal load test .....	157
Table 10 – Current peak values and current loop durations during the arcing period for 50 Hz operation in relation with short-circuit test-duty T100a .....	189
Table 11 – Current peak values and current loop durations during the arcing period for 60 Hz operation in relation with short-circuit test-duty T100a .....	191
Table 12 – Interrupting window for tests with symmetrical current .....	195

Table 13 – Standard values of prospective transient recovery voltage – Rated voltages below 100 kV – Representation by two parameters .....	215
Table 14a – Standard values of prospective transient recovery voltage – Rated voltages of 100 kV to 800 kV for solidly earthed systems – Representation by four parameters (T100, T60, OP1 and OP2) or two parameters (T30, T10) .....	219
Table 14b – Standard values of prospective transient recovery voltage – Rated voltages of 100 kV to 170 kV for non-solidly earthed systems – Representation by four parameters (T100, T60, OP1 and OP2) or two parameters (T30 and T10) .....	223
Table 15 – Invalid tests .....	229
Table 16 – TRV parameters for single-phase and double earth fault tests .....	241
Table 17 – Test-duties to demonstrate the out-of-phase rating .....	253
Table 18 – Class C2 test-duties .....	265
Table 19 – Class C1 test-duties .....	273
Table 20 – Specified values of $u_1$ , $t_1$ , $u_c$ and $t_2$ .....	279
Table 21 – Operating sequence for electrical endurance test on class E2 circuit-breakers intended for auto-reclosing duty according to 6.112.2 .....	283
Table 22 – Application of voltage for dielectric test on the main circuit .....	285
Table 23 – Relationship between short-circuit power factor, time constant and power frequency .....	299
Table A.1 – Ratios of voltage-drop and source-side TRV .....	437
Table B.1 – Tolerances on test quantities for type tests .....	451
Table F.1 – Methods for determination of prospective TRV .....	499
Table 1 – Circuit specific fault level study results for 275 kV transmission substation .....	555
Table J.1 – Actual percentage short-line fault breaking currents .....	565

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –****Part 100: High-voltage alternating-current circuit-breakers**

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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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International Standard IEC 62271-100 has been prepared by subcommittee 17A: High-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This consolidated version of IEC 62271-100 is based on the first edition (2001) [documents 17A/589/FDIS and 17A/594/RVD] its amendment 1 (2002) [documents 17A/625/FDIS and 17A/635/RVD] and corrigenda 1 (2002) and 2 (2003) to amendment 1.

It bears the edition number 1.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

This standard shall be read in conjunction with IEC 60694, second edition, published in 1996, 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 60694. Amendments to these clauses and subclauses are given under the same references whilst additional subclauses are numbered from 101.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annexes A, B, C, D, E, F and G form an integral part of this standard.

Annexes H, I, J and K are for information only.

The committee has decided that the contents of the base publication and its amendment 1 will remain unchanged until 2003. At this date, the publication will be

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

### COMMON NUMBERING OF STANDARDS FALLING UNDER THE RESPONSIBILITY OF SC 17A AND SC 17C

In accordance with the decision taken at the joint SC 17A/SC 17C meeting in Frankfurt (item 20.7 of 17A/535/RM) a common numbering system will be established of the standards falling under the responsibility of SC 17A and SC 17C. IEC 62271 (with title High-voltage switchgear and controlgear) is the basis of the common standard.

Numbering of the standards will follow the following principle:

- a) Common standards prepared by SC 17A and SC 17C will start with IEC 62271-001;
- b) Standards of SC 17A will start with IEC 62271-100;
- c) Standards of SC 17C will start with number IEC 62271-200;
- d) Guides prepared by SC 17A and SC 17C will start with number IEC 62271-300.

The table below relates the new numbers to the old numbers:

Part	Title	Old number
1	Common specifications	IEC 60694 IEC 60516
100	High-voltage alternating current circuit-breakers	IEC 60056
101	Synthetic testing	IEC 60427
102	High-voltage alternating current disconnectors and earthing switches	IEC 60129
103	High-voltage switches for rated voltages above 1 kV and less than 52 kV	IEC 60265-1
104	High-voltage switches for rated voltages of 52 kV and above	IEC 60265-2
105	High voltage alternating current switch-fuse combinations	IEC 60420
106	High-voltage alternating current contactors and contactor based motor-starters	IEC 60470
200	Metal enclosed switchgear and controlgear for rated voltages up to and including 38 kV	IEC 60298
201	Insulation-enclosed switchgear and controlgear for rated voltages up to and including 52 kV	IEC 60466
202	High-voltage/low voltage prefabricated substations	IEC 61330
203	Gas-insulated metal enclosed switchgear for rated voltages above 52 kV	IEC 60517 IEC 61259
204	High-voltage gas-insulated transmission lines for rated voltages of 72,5 kV and above	IEC 61640
300	Guide for seismic qualification	IEC 61166
301	Guide for inductive load switching	IEC 61233
302	Guide for short-circuit and switching test procedures for metal-enclosed and dead tank circuit-breakers	IEC 61633
303	Use and handling of sulphur hexafluoride (SF <sub>6</sub> ) in high-voltage switchgear and controlgear	IEC 61634
304	Additional requirements for enclosed switchgear and controlgear from 1 kV to 72,5 kV to be used in severe climatic conditions	IEC 60932
305	Cable connections for gas-insulated metal-enclosed switchgear for rated voltages above 52 kV	IEC 60859
306	Direct connection between power transformers and gas-insulated metal-enclosed switchgear for rated voltages above 52 kV	IEC 61639
307	The use of electronic and associated technologies in auxiliary equipment of switchgear and controlgear	IEC 62063
308	Guide for asymmetrical short-circuit breaking test duty T100a	-

## HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

### Part 100: High-voltage alternating-current circuit-breakers

#### 1 General

##### 1.1 Scope

This International Standard is applicable to a.c. circuit-breakers designed for indoor or outdoor installation and for operation at frequencies of 50 Hz and 60 Hz on systems having voltages above 1 000 V.

It is only applicable to three-pole circuit-breakers for use in three-phase systems and single-pole circuit-breakers for use in single-phase systems. Two-pole circuit-breakers for use in single-phase systems and application at frequencies lower than 50 Hz are subject to agreement between manufacturer and user.

This standard is also applicable to the operating devices of circuit-breakers and to their auxiliary equipment. However, a circuit-breaker with a closing mechanism for dependent manual operation is not covered by this standard, as a rated short-circuit making-current cannot be specified, and such dependent manual operation may be objectionable because of safety considerations.

This standard does not cover circuit-breakers intended for use on motive power units of electrical traction equipment; these are covered by IEC 60077 [4]<sup>1)</sup>.

Generator circuit-breakers installed between generator and step-up transformer are not within the scope of this standard.

Switching of inductive loads is covered by IEC 61233.

Circuit-breakers with an intentional non-simultaneity between the poles, with the exception of circuit-breakers providing single-pole auto-reclosing, are not within the scope of this standard.

This standard does not cover self-tripping circuit-breakers with mechanical tripping devices or devices which cannot be made inoperative.

By-pass circuit-breakers installed in parallel with line series capacitors and their protective equipment are not within the scope of this standard, these are covered by IEC 60143-2 [6].

NOTE Tests to prove the performance under abnormal conditions should be subject to agreement between manufacturer and user. Such abnormal conditions are, for instance, cases where the voltage is higher than the rated voltage of the circuit-breaker, conditions which may occur due to sudden loss of load on long lines or cables.

##### 1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

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<sup>1)</sup> Figures in square brackets refer to the bibliography.

IEC 60050(151):1978, *International Electrotechnical Vocabulary – Chapter 151: Electrical and magnetic devices*

IEC 60050(441):1984, *International Electrotechnical Vocabulary – Chapter 441: Switchgear, controlgear and fuses*

IEC 60050(601):1985, *International Electrotechnical Vocabulary – Chapter 601: Generation, transmission and distribution of electricity – General*

IEC 60050(604):1987, *International Electrotechnical Vocabulary – Chapter 604: Generation, transmission and distribution of electricity – Operation*

IEC 60059: 1999, *IEC standard current ratings*

IEC 60060: *all parts, High-voltage test techniques*

IEC 60071-2:1996, *Insulation co-ordination – Part 2: Application guide*

IEC 60129:1984, *Alternating current disconnectors and earthing switches*

IEC 60137:1995, *Bushings for alternating voltages above 1 000 V*

IEC 60255-3:1989, *Electrical relays – Part 3: Single output energizing quantity measuring relays with dependent or independent time*

IEC 60296:1982, *Specification for unused mineral insulating oils for transformers and switchgear*

IEC 60376:1971, *Specification and acceptance of new sulphur hexafluoride*

IEC 60427:1989, *Synthetic testing of high-voltage alternating current circuit-breakers*

IEC 60480:1974, *Guide to the checking of sulphur hexafluoride (SF<sub>6</sub>) taken from electrical equipment*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP code)*

<https://www.ies.com> IEC 60694:1996, *Common specifications for high-voltage switchgear and controlgear standards* 600-2001

IEC 61233:1994, *High-voltage alternating current circuit-breakers – Inductive load switching*

IEC 61633:1995, *High-voltage alternating current circuit-breakers – Guide for short-circuit and switching test procedures for metal-enclosed and dead tank circuit-breakers*

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