



BSI Standards Publication

# High-voltage switchgear and controlgear

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Part 101: Synthetic testing

## National foreword

This British Standard is the UK implementation of EN IEC 62271-101:2021. It is identical to IEC 62271-101:2021. It supersedes BS EN 62271-101:2013+A1:2018, which will be withdrawn on 28 March 2022.

The UK participation in its preparation was entrusted to Technical Committee PEL/17, High voltage switchgear, controlgear and assemblies.

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## **European foreword**

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The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-05-31 level by publication of an identical national standard or by endorsement
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# IEC 62271-101

Edition 3.0 2021-07

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



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**High-voltage switchgear and controlgear –  
Part 101: Synthetic testing**

**Appareillage à haute tension –  
Partie 101: Essais synthétiques**

INTERNATIONAL  
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## CONTENTS

FOREWORD.....	9
1 Scope.....	11
2 Normative references.....	11
3 Terms and definitions .....	11
4 Synthetic testing techniques and methods for short-circuit breaking tests.....	13
4.1 Basic principles and general requirements for synthetic breaking test methods.....	13
4.1.1 General .....	13
4.1.2 High-current interval.....	14
4.1.3 Interaction interval .....	15
4.1.4 High-voltage interval .....	15
4.2 Synthetic test circuits and related specific requirements for breaking tests .....	18
4.2.1 Current injection methods.....	18
4.2.2 Voltage injection method .....	19
4.2.3 Duplicate circuit method (transformer or Skeats circuit).....	20
4.2.4 Other synthetic test methods .....	20
4.3 Three-phase synthetic test methods .....	20
5 Synthetic testing techniques and methods for short-circuit making tests.....	24
5.1 Basic principles and general requirements for synthetic making test methods .....	24
5.1.1 General .....	24
5.1.2 High-voltage interval .....	27
5.1.3 Pre-arcing interval.....	27
5.1.4 Latching interval and fully closed position .....	27
5.2 Synthetic test circuit and related specific requirements for making tests .....	27
5.2.1 General .....	27
5.2.2 Test circuit and test requirements.....	27
5.2.3 Alternative test method with reduced voltage .....	32
7 Type tests .....	33
7.102 General.....	33
7.104 Demonstration of arcing times .....	34
7.107 Terminal fault tests.....	45
7.109 Short-line fault tests .....	49
7.110 Out-of-phase making and breaking tests .....	50
7.111 Capacitive current tests.....	50
Annex A (normative) Correction of $di/dt$ and TRV for test duty T100a .....	53
A.1 General.....	53
A.2 Reduction in $di/dt$ .....	53
A.3 Corrected TRV for the first-pole-to-clear with required asymmetry .....	53
A.4 Correction of the $di/dt$ and TRV of the first-pole-to-clear for tests with intermediate asymmetry .....	60
A.5 Correction of the $di/dt$ and TRV of the second- or last-pole-to-clear with major extended loop with required asymmetry during three-phase tests.....	61
A.6 Correction of the $di/dt$ and TRV during tests with a subsequent minor loop .....	61
A.7 Calculation of the $di/dt$ and TRV of the first-pole-to-clear .....	61
A.7.1 General .....	61
A.7.2 Calculation of $di/dt$ .....	61

A.7.3	Calculation of TRV .....	62
A.7.4	Examples of calculation of $di/dt$ and TRV.....	64
Annex B (normative)	Tolerances on test quantities for type tests.....	66
Annex C (normative)	Information to be given and results to be recorded for synthetic tests .....	69
C.1	General.....	69
C.2	Auxiliary circuit-breaker .....	69
C.3	Test conditions.....	69
C.4	Quantities to be recorded .....	69
C.4.1	General .....	69
C.4.2	Voltages .....	69
C.4.3	Currents .....	69
Annex D (normative)	Test procedure using a three-phase current circuit and one voltage circuit .....	70
D.1	Test circuit .....	70
D.2	Test method .....	71
D.2.1	General .....	71
D.2.2	Test duty T100s(b).....	71
D.2.3	Test duty T100a .....	80
D.2.4	Combination of first-pole-to-clear factors 1,3 and 1,5 .....	89
Annex E (normative)	Splitting of test duties in test series taking into account the associated TRV for each pole-to-clear.....	92
E.1	General.....	92
E.2	Test-duties T10, T30, T60, T100s(b), OP1 and OP2(b).....	92
E.2.1	Test procedure for first-pole-to-clear factors 1,5 and 2,5 .....	92
E.2.2	Test procedure for first-pole-to-clear factors 1,3 and 2,0 .....	93
E.2.3	Test procedure for first-pole-to-clear factor 1,2 .....	94
E.3	Test duty T100a .....	95
E.3.1	General .....	95
E.3.2	Test procedure for first-pole-to-clear factor 1,5 .....	96
E.3.3	Test procedure for first-pole-to-clear factor 1,3 .....	97
E.3.4	Test procedure for first-pole-to-clear factor 1,2 .....	99
E.4	Combination of first-pole-to-clear factors .....	100
E.4.1	General .....	100
E.4.2	Combination of first-pole-to-clear factors 1,3 and 1,5 for test duties T10, T30, T60 and T100s(b).....	100
E.4.3	Combination of first-pole-to-clear factors 2,0 and 2,5 for test duties OP1 and OP2(b).....	101
E.4.4	Combination of first-pole-to-clear factors 1,3 and 1,5 for test duty T100a.....	102
Annex F (informative)	Three-phase synthetic test circuits .....	114
F.1	General.....	114
F.2	Three-phase synthetic combined circuit .....	114
F.3	Three-phase synthetic circuit with injection in all phases .....	117
F.4	Three-phase synthetic circuit with injection in two phases .....	118
Annex G (informative)	Examples of test circuits for metal-enclosed and dead tank circuit-breakers.....	122
Annex H (informative)	Step-by-step method to prolong arcing .....	133
Annex I (informative)	Synthetic methods for capacitive current tests .....	135
I.1	General.....	135

I.2	Recovery voltage .....	135
I.3	Combined current and voltage circuits .....	135
I.4	Making tests .....	136
I.5	Current chopping .....	136
I.6	Examples test circuits .....	136
Annex J (normative)	Synthetic test methods for circuit-breakers with opening resistors .....	145
J.1	General.....	145
J.2	Conditions.....	145
J.2.1	General .....	145
J.2.2	Transient recovery voltage interval .....	145
J.2.3	Power-frequency recovery voltage interval.....	145
J.3	Multiple step test procedure .....	145
J.3.1	General .....	145
J.3.2	Test to verify the re-ignition behaviour of the making and breaking unit .....	146
J.3.3	Test to verify the re-ignition behaviour of the making and breaking unit during short circuit test duties with any test method .....	147
J.3.4	Tests on resistor switch(s).....	148
J.4	Test requirements .....	149
J.4.1	General .....	149
J.4.2	Testing of the making and breaking unit.....	150
J.4.3	Testing of the resistor switch .....	151
J.4.4	Test of the resistor stack .....	151
Annex K (informative)	Combination of current injection and voltage injection methods.....	152
K.1	Current injection methods.....	152
K.2	Voltage injection methods .....	152
K.3	Combined current and voltage injection circuits.....	152
K.3.1	General .....	152
K.3.2	Combined current and voltage injection circuit with application of full test voltage to earth .....	152
K.3.3	Combined current and voltage injection circuit with separated application of test voltage.....	152
Bibliography	.....	155
Figure 1	– Interrupting process – Basic time intervals .....	14
Figure 2	– Examples of evaluation of initial recovery voltage.....	17
Figure 3	– Equivalent surge impedance of the voltage circuit for the current injection method.....	19
Figure 4	– Reference lines of TRV with four-parameter for $k_{pp} = 1,5$ .....	22
Figure 5	– Reference lines of TRV with four-parameter for $k_{pp} = 1,3$ .....	23
Figure 6	– Reference lines of TRV with four-parameter for $k_{pp} = 1,2$ .....	24
Figure 7	– Making process – Basic time intervals.....	26
Figure 8	– Example of synthetic making circuit for single-phase tests.....	29
Figure 9	– Example of synthetic making circuit for out-of-phase tests .....	30
Figure 10	– Example of synthetic making circuit for three-phase tests ( $k_{pp} = 1,5$ ).....	31
Figure 11	– Comparison of arcing time settings during three-phase direct tests (left) and three-phase synthetic (right) for T100s with $k_{pp} = 1,5$ .....	37



Figure 12 – Comparison of arcing time settings during three-phase direct tests (left) and three-phase synthetic (right) for T100s with $k_{pp} = 1,3$ .....	38
Figure 13 – Comparison of arcing time settings during three-phase direct tests (left) and three-phase synthetic tests (right) for T100a with $k_{pp} = 1,5$ .....	41
Figure 14 – Comparison of arcing time settings during three-phase direct tests (left) and three-phase synthetic tests (right) for T100a with $k_{pp} = 1,3$ .....	42
Figure 15 – Evaluation of recovery voltage during synthetic capacitive current switching testing .....	52
Figure D.1 – Example of a three-phase current circuit with single-phase synthetic injection.....	71
Figure D.2 – Representation of the testing conditions of Table D.1.....	73
Figure D.3 – Representation of the testing conditions of Table D.2.....	75
Figure D.4 – Representation of the testing conditions of Table D.3.....	77
Figure D.5 – Representation of the testing conditions of Table D.4.....	79
Figure D.6 – Representation of the testing conditions of Table D.5.....	82
Figure D.7 – Representation of the testing conditions of Table D.6.....	84
Figure D.8 – Representation of the testing conditions of Table D.7.....	86
Figure D.9 – Representation of the testing conditions of Table D.8.....	88
Figure E.1 – Example of graphical representation of the tests shown in Table E.6 .....	97
Figure E.2 – Example of graphical representation of the tests shown in Table E.7 and Table E.8.....	99
Figure F.1 – Three-phase synthetic combined circuit .....	115
Figure F.2 – Waveshapes of currents, phase-to-ground and phase-to phase voltages during a three-phase synthetic test (T100s; $k_{pp} = 1,5$ ) performed according to the three-phase synthetic combined circuit.....	116
Figure F.3 – Three-phase synthetic circuit with injection in all phases for $k_{pp} = 1,5$ .....	117
Figure F.4 – Waveshapes of currents and phase-to-ground voltages during a three-phase synthetic test (T100s; $k_{pp} = 1,5$ ) performed according to the three-phase synthetic circuit with injection in all phases.....	118
Figure F.5 – Three-phase synthetic circuit for terminal fault tests with $k_{pp} = 1,3$ (current injection method) .....	119
Figure F.6 – Waveshapes of currents and phase-to-ground voltages during a three-phase synthetic test (T100s; $k_{pp} = 1,3$ ) performed according to the three-phase synthetic circuit shown in Figure F.5.....	120
Figure F.7 – TRV voltages waveshapes of the test circuit described in Figure F.5 .....	121
Figure G.1 – Example of a test circuit for unit testing (circuit-breaker with interaction due to gas circulation).....	123
Figure G.2 – Oscillogram corresponding to Figure G.1 – Example of the required TRVs to be applied between the terminals of the unit(s) under test and between the live parts and the insulated enclosure .....	124
Figure G.3 – Example of test circuit using two voltage circuits for breaking tests .....	125
Figure G.4 – Example of test circuit using two voltage circuits for breaking tests .....	126
Figure G.5 – Example of a synthetic test circuit for unit testing (if unit testing is allowed as per 7.102.4.2 of IEC 62271-100:2021) .....	127
Figure G.6 – Oscillogram corresponding to Figure G.3 – Example of the required TRVs to be applied between the terminals of the unit(s) under test and between the live parts and the insulated enclosure .....	128

Figure G.7 – Example of a capacitive current injection circuit with enclosure of the circuit-breaker energized .....	129
Figure G.8 – Example of a capacitive synthetic circuit using two power-frequency circuits and with the enclosure of the circuit-breaker energized .....	130
Figure G.9 – Example of a capacitive synthetic current injection circuit – Unit testing on half a pole of a circuit-breaker with two units per pole – Enclosure energized with DC voltage .....	131
Figure G.10 – Example of a synthetic making circuit for out-of-phase tests .....	132
Figure H.1 – Example of a re-ignition circuit diagram for prolonging arc-duration .....	133
Figure H.2 – Example of waveforms obtained during a symmetrical test using the circuit in Figure H.1 .....	134
Figure I.1 – Power-frequency circuits in parallel .....	138
Figure I.2 – Current injection circuit .....	139
Figure I.3 – Power-frequency current injection circuit .....	140
Figure I.4 – Current injection circuit, recovery voltage applied to both terminals of the circuit-breaker .....	141
Figure I.5 – Current injection circuit with decay compensation .....	142
Figure I.6 – LC oscillating circuit .....	143
Figure I.7 – Inrush making current test circuit .....	144
Figure J.1 – Test circuit to verify re-ignition behaviour of the making and breaking unit using current injection method .....	147
Figure J.2 – Test circuit to verify re-ignition behaviour of the making and breaking unit .....	148
Figure J.3 – Test circuit on the resistor switch .....	149
Figure J.4 – Example of test circuit for capacitive current switching tests on the making and breaking unit .....	150
Figure J.5 – Example of test circuit for capacitive current switching tests on the resistor switch .....	151
Figure K.1 – Example of combined current and voltage injection circuit with application of full test voltage to earth .....	153
Figure K.2 – Example of combined current and voltage injection circuit with separated application of test voltage .....	154
Table 1 – Tolerances and limits required during the high-current interval .....	15
Table 2 – Test circuits for test duties T100s and T100a .....	21
Table 3 – Test parameters during three-phase interruption for test-duties T10, T30, T60 and T100s, $k_{pp} = 1,5$ .....	21
Table 4 – Test parameters during three-phase interruption for test-duties T10, T30, T60 and T100s, $k_{pp} = 1,3$ .....	22
Table 5 – Test parameters during three phase interruption for test-duties T10, T30, T60 and T100s, $k_{pp} = 1,2$ .....	23
Table 6 – Symbols and abbreviated terms used for operation during synthetic tests .....	33
Table 7 – Synthetic test methods for test duties T10, T30, T60, T100s, T100a, SP, DEF, OP and SLF .....	46
Table A.1 – Corrected TRV values for the first-pole-to-clear for $k_{pp} = 1,3$ and $f_r = 50$ Hz .....	54
Table A.2 – Corrected TRV values for the first-pole-to-clear for $k_{pp} = 1,3$ and $f_r = 60$ Hz .....	55

Table A.3 – Corrected TRV values for the first-pole-to-clear for $k_{pp} = 1,5$ and $f_r = 50$ Hz .....	57
Table A.4 – Corrected TRV values for the first-pole-to-clear for $k_{pp} = 1,5$ and $f_r = 60$ Hz .....	58
Table A.5 – Corrected TRV values for the first-pole-to-clear for $k_{pp} = 1,2$ and $f_r = 50$ Hz .....	58
Table A.6 – Corrected TRV values for the first-pole-to-clear for $k_{pp} = 1,2$ and $f_r = 60$ Hz .....	59
Table A.7 – Percentage of DC component and $di/dt$ at current zero for first-pole-to-clear for $f_r = 50$ Hz .....	59
Table A.8 – Percentage of DC component and $di/dt$ at current zero for first-pole-to-clear for $f_r = 60$ Hz .....	60
Table B.1 – Tolerances on test quantities for type tests .....	67
Table D.1 – Demonstration of arcing times for $k_{pp} = 1,5$ .....	72
Table D.2 – Alternative demonstration of arcing times for $k_{pp} = 1,5$ .....	74
Table D.3 – Demonstration of arcing times for $k_{pp} = 1,3$ .....	76
Table D.4 – Alternative demonstration of arcing times for $k_{pp} = 1,3$ .....	78
Table D.5 – Demonstration of arcing times for $k_{pp} = 1,5$ .....	81
Table D.6 – Alternative demonstration of arcing times for $k_{pp} = 1,5$ .....	83
Table D.7 – Demonstration of arcing times for $k_{pp} = 1,3$ .....	85
Table D.8 – Alternative demonstration of arcing times for $k_{pp} = 1,3$ .....	87
Table D.9 – Procedure for combining $k_{pp} = 1,5$ and 1,3 during test-duties T10, T30, T60 and T100s(b) .....	89
Table D.10 – Procedure for combining $k_{pp} = 1,5$ and 1,3 during test-duty T100a .....	90
Table E.1 – Test procedure for $k_{pp} = 1,5$ and 2,5 .....	92
Table E.2 – Test procedure for $k_{pp} = 1,3$ and 2,0 .....	93
Table E.3 – Simplified test procedure for $k_{pp} = 1,3$ and 2,0 .....	94
Table E.4 – Test procedure for $k_{pp} = 1,2$ .....	95
Table E.5 – Simplified test procedure for $k_{pp} = 1,2$ .....	95
Table E.6 – Test procedure for asymmetrical currents for $k_{pp} = 1,5$ .....	96
Table E.7 – Test procedure for asymmetrical currents for $k_{pp} = 1,3$ .....	98
Table E.8 – Test procedure for asymmetrical currents for $k_{pp} = 1,2$ .....	100
Table E.9 – Procedure for combining $k_{pp} = 1,3$ and 1,5 for test-duties T10, T30, T60 and T100s(b) .....	101
Table E.10 – Procedure for combining $k_{pp} = 2,0$ and 2,5 for test-duties OP1 and OP2(b) .....	102
Table E.11 – Procedure for combining $k_{pp} = 1,5$ and 1,3 for test-duty T100a .....	103
Table E.12 – Required test parameters for different asymmetrical conditions in the case of $k_{pp} = 1,5$ , $f_r = 50$ Hz .....	104

Table E.13 – Required test parameters for different asymmetrical conditions in the case of a $k_{pp} = 1,3, f_r = 50$ Hz .....	106
Table E.14 – Required test parameters for different asymmetrical conditions in the case of $k_{pp} = 1,2, f_r = 50$ Hz .....	108
Table E.15 – Required test parameters for different asymmetrical conditions in the case of $k_{pp} = 1,5, f_r = 60$ Hz .....	109
Table E.16 – Required test parameters for different asymmetrical conditions in the case of $k_{pp} = 1,3, f_r = 60$ Hz .....	111
Table E.17 – Required test parameters for different asymmetrical conditions in the case of $k_{pp} = 1,2, f_r = 60$ Hz .....	113

# INTERNATIONAL ELECTROTECHNICAL COMMISSION

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## HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

### Part 101: Synthetic testing

#### FOREWORD

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International Standard IEC 62271-101 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 and Amendment 1:2017. This edition constitutes a technical revision.

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

- a) alignment with the third edition of IEC 62271-100:2021;
- b) update this document with the last methods and techniques used for synthetic tests;

The text of this document is based on the following documents:

FDIS	Report on voting
17A/1312/FDIS	17A/1315/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

This publication shall be read in conjunction with IEC 62271-100:2021, to which it refers. The numbering of the subclauses of Clause 7 is the same as in IEC 62271-100. However, not all subclauses of IEC 62271-100 are addressed; merely those where synthetic testing has introduced changes.

A list of all the parts in the IEC 62271 series, 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 [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

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# HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

## Part 101: Synthetic testing

### 1 Scope

This part of IEC 62271 mainly applies to AC circuit-breakers within the scope of IEC 62271-100. It provides the general rules for testing AC circuit-breakers, for making and breaking capacities over the range of test duties described in 7.102 to 7.111 of IEC 62271-100:2021, by synthetic methods.

It has been proven that synthetic testing is an economical and technically correct way to test high-voltage AC circuit-breakers according to the requirements of IEC 62271-100 and that it is equivalent to direct testing.

The methods and techniques described are those in general use. The purpose of this document is to establish criteria for synthetic testing and for the proper evaluation of results. Such criteria will establish the validity of the test method without imposing restraints on innovation of test circuitry.

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

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62271-100 and the following 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>

#### 3.1

##### **direct test**

test in which the applied voltage, the current and the transient and power-frequency recovery voltages are all obtained from a circuit having a single-power source, which can be a power system or special alternators as used in short-circuit testing stations or a combination of both

#### 3.2

##### **synthetic test**

test in which all of the current, or a major portion of it, is obtained from one source (current circuit), and in which the applied voltage and/or the recovery voltages (transient and power frequency) are obtained wholly or in part from one or more separate sources (voltage circuits)