

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

**High-voltage switchgear and controlgear - Part 100: Alternating
current circuit-breakers
(IEC 62271-100:2021)**

Appareillage à haute tension - Partie 100: Disjoncteurs à
courant alternatif
(IEC 62271-100:2021)

Hochspannungs-Schaltgeräte und -Schaltanlagen - Teil
100: Wechselstrom-Leistungsschalter
(IEC 62271-100:2021)

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European foreword

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60137:2017 NOTE Harmonized as EN 60137:2017 (not modified)

IEC 62271-110 NOTE Harmonized as EN IEC 62271-110

IEC 60296 NOTE Harmonized as EN IEC 60296

IEC 60376 NOTE Harmonized as EN IEC 60376

IEC 60480 NOTE Harmonized as EN IEC 60480

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-151	2001	International Electrotechnical Vocabulary (IEV) - Part 151: Electrical and magnetic devices	-	-
+A1	2013			
+A2	2014			
+A3	2019			
+A4	2020			
IEC 60050-441	1984	International Electrotechnical Vocabulary (IEV) - Part 441: Switchgear, controlgear and fuses	-	-
+A1	2000			
IEC 60050-442	1998	International Electrotechnical Vocabulary (IEV) - Part 442: Electrical accessories	-	-
+A1	2015			
+A2	2015			
+A3	2019			
IEC 60050-461	2008	International Electrotechnical Vocabulary (IEV) - Part 461: Electric cables	-	-
IEC 60050-601	1985	International Electrotechnical Vocabulary (IEV) - Part 601: Generation, transmission and distribution of electricity - General	-	-
+A1	1998			
+A2	2020			
IEC 60050-614	2016	International Electrotechnical Vocabulary (IEV) - Part 614: Generation, transmission and distribution of electricity - Operation	-	-
IEC 60059	-	IEC standard current ratings	EN 60059	-
IEC 60060-1	-	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	-

IEC 60255-151	2009	Measuring relays and protection equipment - Part 151: Functional requirements for over/under current protection	EN 60255-151	2009
IEC 60270	-	High-voltage test techniques - Partial discharge measurements	EN 60270	-
IEC 62271-1	2017	High-voltage switchgear and controlgear - Part 1: Common specifications for alternating current switchgear and controlgear	EN 62271-1	2017
IEC 62271-101	-	High-voltage switchgear and controlgear - Part 101: Synthetic testing	EN 62271-101	-
IEC 62271-102	2018	High-voltage switchgear and controlgear - Part 102: Alternating current disconnectors and earthing switches	EN IEC 62271-102	2018
IEC 62271-200	2021	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	EN IEC 62271-200	2021
IEC 62271-203	-	High-voltage switchgear and controlgear - Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52 kV	EN 62271-203	-

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

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



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INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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. The main document types developed by IEC are described in greater detail at 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 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 document using a colour printer.

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)