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OSA 1: VAHELDUVVOOLU LÜLITUS- JA  
JUHTIMISAPARATUURI ÜLDLIIGITUS

High-voltage switchgear and controlgear - Part 1:  
Common specifications for alternating current  
switchgear and controlgear

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 62271-1:2017 sisaldab Euroopa standardi EN 62271-1:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 62271-1:2017 consists of the English text of the European standard EN 62271-1:2017.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
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English Version

## High-voltage switchgear and controlgear - Part 1: Common specifications for alternating current switchgear and controlgear (IEC 62271-1:2017)

Appareillage à haute tension - Partie 1: Spécifications communes pour appareillage à courant alternatif (IEC 62271-1:2017)

Hochspannungs-Schaltgeräte und -Schaltanlagen - Teil 1: Gemeinsame Bestimmungen für Wechselstrom-Schaltgeräte und -Schaltanlagen (IEC 62271-1:2017)

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## European foreword

The text of document 17/1033/FDIS, future edition 2 of IEC 62271-1, prepared by IEC/TC 17 "High-voltage switchgear and controlgear" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62271-1:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-05-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-08-16

This document supersedes EN 62271-1:2008.

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## Endorsement notice

The text of the International Standard IEC 62271-1:2017 was approved by CENELEC as a European Standard without any modification.

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

IEC 60447	NOTE	Harmonized as EN 60447.
IEC 60721-2-4	NOTE	Harmonized as prEN 60721-2-4 <sup>1)</sup> .
IEC 60721-2-2	NOTE	Harmonized as EN 60721-2-2.
IEC 60721-3-3	NOTE	Harmonized as EN 60721-3-3.
IEC 60721-3-4	NOTE	Harmonized as EN 60721-3-4.
IEC 60664-1	NOTE	Harmonized as EN 60664-1.
IEC/TS 62271-304	NOTE	Harmonized as CLC/TS 62271-304.
IEC 62271-207	NOTE	Harmonized as EN 62271-207.
IEC 60721-1	NOTE	Harmonized as EN 60721-1.
IEC 60721-2 (series)	NOTE	Harmonized as EN 60721-2 (series).
IEC 60721-3 (series)	NOTE	Harmonized as EN 60721-3 (series).
IEC 61936-1:2010	NOTE	Harmonized as EN 61936-1:2010.
IEC 61936-1:2010/AMD1:2014	NOTE	Harmonized as EN 61936-1:2010/A1:2014.
IEC 61850 (series)	NOTE	Harmonized as EN 61850 (series).

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1) At draft stage.

IEC 62271-3	NOTE	Harmonized as EN 62271-3.
IEC 60073	NOTE	Harmonized as EN 60073.
IEC 60695-3 (series)	NOTE	Harmonized as EN 60695-3 (series).
IEC 60695-7 (series)	NOTE	Harmonized as EN 60695-7 (series).
IEC 60068-2-17:1994	NOTE	Harmonized as EN 60068-2-17:1994.
CISPR 16-1 (series)	NOTE	Harmonized as EN 55016-1 (series).
IEC 60909-0	NOTE	Harmonized as EN 60909-0.
IEC 60228	NOTE	Harmonized as EN 60228.
IEC 60445	NOTE	Harmonized as EN 60445.
IEC 60947-7-1	NOTE	Harmonized as EN 60947-7-1.
IEC 60947-7-2	NOTE	Harmonized as EN 60947-7-2.
IEC 61810 (series)	NOTE	Harmonized as EN 61810 (series).
IEC 61810-1	NOTE	Harmonized as EN 61810-1.
IEC 61810-2	NOTE	Harmonized as EN 61810-2.
IEC 60947-4-1	NOTE	Harmonized as EN 60947-4-1.
IEC 60947-2	NOTE	Harmonized as EN 60947-2.
IEC 60947-4-2	NOTE	Harmonized as EN 60947-4-2.
IEC 60947-3	NOTE	Harmonized as EN 60947-3.
IEC 60947-5-1	NOTE	Harmonized as EN 60947-5-1.
IEC 60730-2-13	NOTE	Harmonized as EN 60730-2-13.
IEC 60669-1	NOTE	Harmonized as EN 60669-1.
IEC 60730-2-9	NOTE	Harmonized as EN 60730-2-9.
IEC 61020-1	NOTE	Harmonized as EN 61020-1.
IEC 60269-1	NOTE	Harmonized as EN 60269-1.
IEC 60269-2	NOTE	Harmonized as EN 60269-2.
IEC 60034-1	NOTE	Harmonized as EN 60034-1.
IEC 60051-1	NOTE	Harmonized as EN 60051-1.
IEC 60051-2	NOTE	Harmonized as EN 60051-2.
IEC 60051-4	NOTE	Harmonized as EN 60051-4.

IEC 60051-5	NOTE	Harmonized as EN 60051-5.
IEC 60309-1	NOTE	Harmonized as EN 60309-1.
IEC 60309-2	NOTE	Harmonized as EN 60309-2.
IEC 60130 (series)	NOTE	Harmonized as EN 60130 (series).
IEC 62326-1	NOTE	Harmonized as EN 62326-1.
IEC 60393-1	NOTE	Harmonized as EN 60393-1.
IEC 60081	NOTE	Harmonized as EN 60081.
IEC 60064	NOTE	Harmonized as EN 60064.
IEC 60059	NOTE	Harmonized as EN 60059.
IEC 60068-2 (series)	NOTE	Harmonized as EN 60068-2 (series).

## 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 When 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](http://www.cenelec.eu).

Publication	Year	Title	EN/HD	Year
IEC 60038 (mod)	2009	IEC standard voltages	EN 60038	2011
IEC 60050-131	2002	International Electrotechnical Vocabulary (IEV) -- Part 131: Circuit theory	-	-
IEC 60050-151	2001	International Electrotechnical Vocabulary (IEV) -- Part 151: Electrical and magnetic devices	-	-
IEC 60050-192	2015	International electrotechnical vocabulary - Part 192: Dependability	-	-
IEC 60050-351	-	International Electrotechnical Vocabulary - Part 351: Control technology	-	-
+ A1	2000		-	-
IEC 60050-441	1984	International Electrotechnical Vocabulary (IEV) -- Chapter 441: Switchgear, controlgear and fuses	-	-
IEC 60050-551	-	International Electrotechnical Vocabulary (IEV) -- Part 551: Power electronics	-	-
IEC 60050-581	2008	International Electrotechnical Vocabulary - Part 581: Electromechanical components for electronic equipment	-	-
IEC 60050-601	-	International Electrotechnical Vocabulary (IEV) -- Chapter 601: Generation, transmission and distribution of electricity - General	-	-
IEC 60050-605	-	International electrotechnical vocabulary - Chapter 605: Generation, transmission and distribution of electricity - Substations	-	-
IEC 60050-614	2016	International electrotechnical vocabulary - Part 614: Generation, transmission and distribution of electricity - Operation	-	-
IEC 60050-811	-	International electrotechnical vocabulary (IEV) -- Chapter 811: Electric traction	-	-
IEC 60050-826	2004	International Electrotechnical Vocabulary - Part 826: Electrical installations	-	-
IEC 60060-1	2010	High-voltage test techniques -- Part 1: General definitions and test requirements	EN 60060-1	2010
IEC 60068-2-1	2007	Environmental testing -- Part 2-1: Tests - Test A: Cold	EN 60068-2-1	2007
IEC 60068-2-2	2007	Environmental testing -- Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	2007
IEC 60068-2-30	2005	Environmental testing -- Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	EN 60068-2-30	2005
IEC 60071-1	2006	Insulation co-ordination -- Part 1: Definitions, principles and rules	EN 60071-1	2006
+ A1	2010		+ A1	2010

IEC 60071-2	1996	Insulation co-ordination -- Part 2: Application guide	EN 60071-2	1997
IEC 60085	2007	Electrical insulation - Thermal evaluation and designation	EN 60085	2008
IEC 60255-21-1	1988	Electrical relays -- Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment -- Section 1: Vibration tests (sinusoidal)	EN 60255-21-1	1995
IEC 60270	-	High-voltage test techniques - Partial discharge measurements	EN 60270	-
IEC 60296	-	Fluids for electrotechnical applications - Unused mineral insulating oils for transformers and switchgear	EN 60296	-
IEC 60376	-	Specification of technical grade sulfur hexafluoride (SF6) for use in electrical equipment	EN 60376	-
IEC 60480	-	Guidelines for the checking and treatment of sulphur hexafluoride (SF6) taken from electrical equipment and specification for its re-use	EN 60480	-
IEC 60507	-	Artificial pollution tests on high-voltage ceramic and glass insulators to be used on a.c. systems	EN 60507	-
IEC 60512-2-2	-	Connectors for electronic equipment - Tests and measurements -- Part 2-2: Electrical continuity and contact resistance tests - Test 2b: Contact resistance - Specified test current method	EN 60512-2-2	-
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
-	-		+ corrigendum May 1993	
IEC 60529 AMD 1	1999	Degrees of protection provided by enclosures (IP_code); Amendment_1	-	-
IEC 60529 AMD 2	2013	Degrees of protection provided by enclosures (IP_code); Amendment_2	-	-
IEC 61000-4-4	-	Electromagnetic compatibility (EMC) -- Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	-
IEC 61000-4-11	-	Electromagnetic compatibility (EMC) -- Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11	-
IEC 61000-4-17	-	Electromagnetic compatibility (EMC) - Part 4-17: Testing and measurement techniques - Ripple on d.c. input power port immunity test	-	-
IEC 61000-4-18	-	Electromagnetic compatibility (EMC) -- Part 4-18: Testing and measurement techniques - Damped oscillatory wave immunity test	EN 61000-4-18	-
IEC 61000-4-29	-	Electromagnetic compatibility (EMC) -- Part 4-29: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests	EN 61000-4-29	-
IEC 61000-6-2	-	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments	EN 61000-6-2	-



IEC 61000-6-5	-	Electromagnetic compatibility (EMC) - Part 6-5: Generic standards - Immunity for equipment used in power station and substation environment	EN 61000-6-5	-
IEC 61180	-	High-voltage test techniques for low-voltage equipment - Definitions, test and procedure requirements, test equipment	EN 61180	-
IEC 61810-7	2006	Electromechanical elementary relays -- Part 7: Test and measurement procedures	EN 61810-7	2006
IEC 62262	2002	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)	EN 62262	2002
IEC 62271-4	-	High-voltage switchgear and controlgear -- Part 4: Handling procedures for sulphur hexafluoride (SF6) and its mixtures	EN 62271-4	-
IEC/TS 60815-1	2008	Selection and dimensioning of high-voltage-insulators intended for use in polluted conditions - Part 1: Definitions, information and general principles		-
IEC/TS 60815-2	2008	Selection and dimensioning of high-voltage-insulators intended for use in polluted conditions - Part 2: Ceramic and glass insulators for a.c. systems		-
IEC/TS 60815-3	2008	Selection and dimensioning of high-voltage-insulators intended for use in polluted conditions - Part 3: Polymer insulators for a.c. systems		-
CISPR 11 (mod)	2015	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	2016
CISPR/TR 18-2	-	Radio interference characteristics of overhead power lines and high-voltage equipment - Part 2: Methods of measurement and procedure for determining limits		-

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## INTRODUCTION

In the preparation of this FDIS draft for the general revision of IEC 62271-1:2007 and IEC 62271-1:2007/AMD1:2011, the maintenance team was motivated by the following principles:

- Application of horizontal standards – such application is mandatory for product standards, (reference IEC Guide 108 [5]). A typical example is the application of IEC 60071 (all parts) dealing with insulation coordination.
- Application of the "principle of verifiability" – as defined in the Directives, Part 2, 5.5 (2016) "...Only those requirements which can be verified shall be included."
- Organizing information in the proper clause, e.g. terms and definitions in Clause 3, rated values in Clause 5. For example, the values of rated continuous current are specified in Clause 5 but the conditions of test and acceptance criteria (e.g. temperature rise limits) are moved to Clause 7.
- Normal service conditions in Clause 4 are unambiguous statements of conditions under which the switchgear and controlgear is expected to operate. For example: "Solar radiation does not exceed a level of 1 000 W/m<sup>2</sup>" rather than "Solar radiation up to a level of 1 000 W/m<sup>2</sup> should be considered".
- Ratings in Clause 5 have been limited to reflect the common specifications of the switchgear and controlgear that are specified by the user and are necessary for operation on the user's network. See the last paragraph of 5.1 for addition clarification.
- Statements or informative NOTES that reflect design guides (not requirements) or application (not standard requirements) are either removed or moved to Clause 9.  
For example, the following former NOTE contains both a design guide and an application issue, neither of which belongs to normal service conditions:  
"Under certain levels of solar radiation, appropriate measures, for example roofing, forced ventilation, test simulating solar gain, etc., may be necessary, or derating may be used, in order not to exceed the specified temperature rises and pressure rise limits".
- Specifications for design and construction in Clause 6 have been limited to requirements that can be verified by test or inspection.
- References to tests and procedures that relate to transportation, installation, commissioning and maintenance have been moved to Clause 11.
- Improve wording to minimize the possibility of miss-interpretation or conflicting interpretations of the specifications, methods or criteria.
- Elimination of hanging paragraphs and actual or potential circular references. Reference to ISO/IEC Directives, Part 2, 22.3.3 (2016).

As a result of the application of these principles or objectives, the FDIS draft includes more revisions that might otherwise be expected.