

**High-voltage switchgear and controlgear - art 103:  
Switches for rated voltages above 1 kV up to and  
including 52 kV**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 62271-103:2011 sisaldab Euroopa standardi EN 62271-103:2011 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 30.09.2011 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

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This standard is ratified with the order of Estonian Centre for Standardisation dated 30.09.2011 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

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The standard is available from Estonian standardisation organisation.

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English version

**High-voltage switchgear and controlgear -  
Part 103: Switches for rated voltages above 1 kV  
up to and including 52 kV  
(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  
(CEI 62271-103:2011)

Hochspannungs-Schaltgeräte und -  
Schaltanlagen -  
Teil 103: Lastschalter für  
Bemessungsspannungen über 1 kV bis  
einschließlich 52 kV  
(IEC 62271-103:2011)

This European Standard was approved by CENELEC on 2011-07-21. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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**CENELEC**

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 17A/961/FDIS, future edition 1 of IEC 62271-103, prepared by SC 17A, High-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62271-103 on 2011-07-21.

This European Standard supersedes EN 60265-1:1998.

EN 62271-103:2011 includes the following significant technical changes with respect to EN 60265-1:1998:

- the rated voltage of 52 kV is now included;
- the document is aligned with EN 62271-1 and EN 62271-100;
- addition of a test procedure for short-circuit making tests;
- introduction of notion of NSDD (non-sustained disruptive discharge) as defined in EN 62271-1 and restrikes;
- new classes C1 and C2 for capacitive switching;
- new Annex A defining tolerances.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- |  |       |            |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2012-04-21 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn   | (dow) | 2014-07-21 |

Annexes ZA and ZB have been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 62271-103:2011 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 60059	NOTE Harmonized as EN 60059.
IEC 60071-1:2006	NOTE Harmonized as EN 60071-1:2006 (not modified).
IEC 62271-105	NOTE Harmonized as EN 62271-105.
IEC 60507	NOTE Harmonized as EN 60507.

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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-441	1984	International Electrotechnical Vocabulary (IEV) - Chapter 441: Switchgear, controlgear and fuses	-	-
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 62271-1	2007	High-voltage switchgear and controlgear - Part 1: Common specifications	EN 62271-1	2008
IEC 62271-100	2008	High-voltage switchgear and controlgear - Part 100: Alternating current circuit-breakers	EN 62271-100	2009
IEC 62271-102	2001	High-voltage switchgear and controlgear - Part 102: Alternating current disconnectors and earthing switches	EN 62271-102 + corr. July + corr. March	2002 2008 2005
IEC 62271-110	2009	High-voltage switchgear and controlgear - Part 110: Inductive load switching	EN 62271-110	2009

## **Annex ZB** (informative)

### **A-deviations**

**A-deviation:** National deviation due to regulations, the alteration of which is for the time being outside the competence of the CENELEC member.

This European Standard does not fall under any Directive of the EC.

In the relevant CENELEC countries these A-deviations are valid instead of the provisions of the European Standard until they have been removed.

<u>Clause</u>	<u>Deviation</u>
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<b>1.1</b>	<b>Italy</b>
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(I.S.P.E.S.L. (\*) Rules, 95 revision: VSR.8.B.1; VSR.8.B.2; M.15.D.2 to .4.)

For high-voltage alternating current circuit-breakers containing gas-filled compartments, the design pressure is limited to a maximum of 0,5 bar (gauge) and the volume is limited to a maximum of 2 m<sup>3</sup>. Gas filled compartments having a design pressure exceeding 0,5 bar (gauge) or a volume exceeding 2 m<sup>3</sup> shall be designed according to Italian pressure vessel code for electrical switchgear (DM 1 December 1980 and DM 10 September 1981 published on Gazzetta Ufficiale n° 285 dated 16.10.1981). This requirement is not applicable for gas filled compartments having a design pressure exceeding 0,5 bar (gauge) but a volume not exceeding 25 dm<sup>3</sup>.

Italian laws apply to gas pressurized enclosures made of both insulating and metallic materials with a capacity of 25 liters or above, a design pressure higher than 0,05 kg/cm<sup>2</sup> and a temperature range: -25 °C/+100 °C (only for insulating materials).

Moreover, the manufacturer of any electrical equipment, which comprehends gas-pressurized enclosures, must submit the design of the pressurized enclosures itself to a proper legal Authority indicating the stresses and the loads which have any influence on the design itself. For each of the stresses the manufacturer must indicate the design values and the relevant computations.

Only the use of porcelain type A or S (Aluminous or Siliceous) is permitted.

(\*) I.S.P.E.S.L.: Istituto Superiore per la Prevenzione e la Sicurezza del Lavoro.

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## HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

### Part 103: Switches for rated voltages above 1 kV up to and including 52 kV

#### 1 General

##### 1.1 Scope

This part of IEC 62271 is applicable to three-phase, alternating current switches and switch-disconnectors for their switching function, having making and breaking current ratings, for indoor and outdoor installations, for rated voltages above 1 kV up to and including 52 kV and for rated frequencies from  $16\frac{2}{3}$  Hz up to and including 60 Hz. This standard is also applicable to single-pole switches used on three phase systems.

This standard is also applicable to the operating devices of these switches and to their auxiliary equipment.

Switch-disconnectors are also covered by IEC 62271-102 for their disconnecting function.

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

General principles and provisions of this standard may also be applicable to single pole switches intended for application in single-phase systems. The requirements for dielectric tests and making and breaking tests should be in accordance with the requirements of the specific application.

This standard establishes requirements for general, limited and special purpose switches used in distribution systems.

It is assumed that opening and closing operations are performed according to the manufacturer's instructions. A making operation may immediately follow a breaking operation but a breaking operation should not immediately follow a making operation since the current to be broken may then exceed the rated breaking current of the switch.

NOTE 1 Except where special clarification is required, the term "switch" is used to refer to all kinds of switches and switch-disconnectors within the scope of this standard.

NOTE 2 Earthing switches are not covered by this standard. Earthing switches forming an integral part of a switch are covered by IEC 62271-102.

NOTE 3 This standard is not applicable to switching devices attached as an accessory to a high-voltage fuse assembly or its mounting and operated by opening and closing the fuse assembly.

##### 1.2 Normative references

The following referenced documents are indispensable for the application 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 60050-441:1984, *International Electrotechnical Vocabulary (IEV) – Chapter 441: Switchgear, controlgear and fuses*

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

IEC 62271-1:2007, *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 62271-102:2001, *High-voltage switchgear and controlgear – Part 102: Alternating current disconnectors and earthing switches*

IEC 62271-110:2009, *High-voltage switchgear and controlgear – Part 110: Inductive load switching*

## 2 Normal and special service conditions

Clause 2 of IEC 62271-1 is applicable.

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-441 and IEC 62271-1, as well as the following apply.

NOTE 1 Some terms and definitions are recalled hereunder for easier use or for the necessity of some precision or adaptation for the interpretation of this standard.

NOTE 2 The terms and definitions given below are classified in accordance with IEC 60050-441. The additional terms and definitions are classified so as to be aligned with the classification used in IEC 60050-441.

### 3.1 General terms

Subclause 3.1 of IEC 62271-1 is applicable with the following additions.

#### 3.1.101

##### **effectively earthed neutral system**

system earthed through a sufficiently low impedance such that for all system conditions the ratio of the zero-sequence reactance to the positive-sequence reactance ( $X_0/X_1$ ) is positive and less than 3, and the ratio of the zero-sequence resistance to the positive-sequence reactance ( $R_0/X_1$ ) is positive and less than 1. Normally such systems are solidly earthed (neutral) systems or low impedance earthed (neutral) systems

NOTE For the correct assessment of the earthing conditions not only the physical earthing conditions around the relevant location but the total system is to be considered.

#### 3.1.102

##### **non-effectively earthed neutral system**

system other than effectively earthed neutral system, not meeting the conditions given in 3.1.101. Normally such systems are isolated neutral systems, high impedance earthed (neutral) systems or resonant earthed (neutral) systems

NOTE For the correct assessment of the earthing conditions not only the physical earthing conditions around the relevant location but the total system is to be considered.

### 3.2 Assemblies of switchgear and controlgear

Subclause 3.2 of IEC 62271-1 applies.

### 3.3 Parts of assemblies

Subclause 3.3 of IEC 62271-1 applies.

### 3.4 Switching devices

Subclause 3.4 of IEC 62271-1 applies with the following addition.