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Irish Standard
I.S. EN 62271-205:2008

High-voltage switchgear and controlgear -- Part 205: Compact switchgear assemblies for rated voltages above 52 kV (IEC 62271 -205:2008 (EQV))

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62271-205

April 2008

ICS 29.130.10; 29.130.99

Incorporates corrigendum August 2008

English version

High-voltage switchgear and controlgear - Part 205: Compact switchgear assemblies for rated voltages above 52 kV

(IEC 62271-205:2008)

Appareillage à haute tension -
Partie 205: Ensembles d'appareillages compacts de tensions assignées supérieures à 52 kV
(CEI 62271-205:2008)

Hochspannungs-Schaltgeräte und -Schaltanlagen -
Teil 205: Kompakte Schaltgerätekombinationen für Bemessungsspannungen über 52 kV
(IEC 62271-205:2008)

This European Standard was approved by CENELEC on 2008-03-01. 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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Ref. No. EN 62271-205:2008 E

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Foreword

The text of document 17C/418/FDIS, future edition 1 of IEC 62271-205, prepared by SC 17C, High-voltage switchgear and controlgear assemblies, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62271-205 on 2008-03-01.

This standard is to be used in conjunction with EN 62271-1:2007, to which it refers and which is applicable, unless otherwise specified. In order to simplify the indication of corresponding requirements, the same numbering of clauses and subclauses is used as in EN 62271-1. Amendments to these clauses and subclauses are given under the same numbering, whilst additional subclauses are numbered from 101.

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)	2008-12-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2011-03-01

Annexes ZA and ZB have been added by CENELEC.

The contents of the corrigendum of August 2008 have been included in this copy.

Endorsement notice

The text of the International Standard IEC 62271-205:2008 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 60044-6	NOTE	Harmonized as EN 60044-6:1999 (not modified).
IEC 60516	NOTE	Harmonized as HD 357 S2:1987 (not modified).
IEC 62271-2	NOTE	Harmonized as EN 62271-2:2003 (not modified).

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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.

Publication	Year	Title	EN/HD	Year
IEC 60044-1 (mod)	-[1]	Instrument transformers - Part 1: Current transformers	EN 60044-1	1999[2]
IEC 60044-2 (mod)	-[1]	Instrument transformers - Part 2: Inductive voltage transformers	EN 60044-2	1999[2]
IEC 60044-3	-[1]	Instrument transformers - Part 3: Combined transformers	EN 60044-3	2003[2]
IEC 60044-5	-[1]	Instrument transformers - Part 5: Capacitor voltage transformers	EN 60044-5	2004[2]
IEC 60044-7	-[1]	Instrument transformers - Part 7: Electronic voltage transformers	EN 60044-7	2000[2]
IEC 60044-8	-[1]	Instrument transformers - Part 8: Electronic current transformers	EN 60044-8	2002[2]
IEC 60050-441	-[1]	International Electrotechnical Vocabulary (IEV) - Chapter 441: Switchgear, controlgear and fuses	-	-
IEC 60099-4 (mod)	-[1]	Surge arresters - Part 4: Metal-oxide surge arresters without gaps for a.c. systems	EN 60099-4	2004[2]
IEC 60137	-[1]	Insulated bushings for alternating voltages above 1 000 V	EN 60137	2003[2]
IEC 60265-2	-[1]	High-voltage switches - Part 2: High-voltage switches for rated voltages of 52 kV and above	EN 60265-2	1993[2]
IEC 61462	-[1]	Composite hollow insulators - Pressurized and unpressurized insulators for use in electrical equipment with rated voltage greater than 1 000 V - Definitions, test methods, acceptance criteria and design recommendations	EN 61462	2007[2]
IEC/TS 61639	-[1]	Direct connection between power transformers and gas-insulated metal-enclosed switchgear for rated voltages of 72,5 kV and above	-	-
IEC 61936-1	-[1]	Power installations exceeding 1kV a.c. - Part 1: Common rules	-	-

[1] Undated reference.

[2] Valid edition at date of issue.

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Publication	Year	Title	EN/HD	Year
IEC 62155 (mod)	-[1)]	Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V	EN 62155	2003[2)]
IEC 62271-1	-[1)]	High-voltage switchgear and controlgear - Part 1: Common specifications	-	-
IEC 62271-100	-[1)]	High-voltage switchgear and controlgear - Part 100: High-voltage alternating-current circuit-breakers	EN 62271-100	2001[2)]
IEC 62271-102	-[1)]	High-voltage switchgear and controlgear - Part 102: Alternating current disconnectors and earthing switches	EN 62271-102 + corr. March	2002[2)] 2005
IEC 62271-108	-[1)]	High-voltage switchgear and controlgear - Part 108: High-voltage alternating current disconnecting circuit-breakers for rated voltages of 72,5 kV and above	EN 62271-108	2006[2)]
IEC 62271-203	-[1)]	High-voltage switchgear and controlgear - Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52 kV	EN 62271-203	2004[2)]
IEC 62271-209	-[1)]	High-voltage switchgear and controlgear - Part 209: Cable connections for gas-insulated metal-enclosed switchgear for rated voltages above 52 kV - Fluid-filled and extruded insulation cables - Fluid-filled and dry-type cable-terminations	EN 62271-209	2007[2)]

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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 national 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.

Clause	Deviation
5	**Italy**

- (I.S.P.E.S.L.*) Rules, 95 revision: VSR.8.B.1; VSR.8.B.2; M.15.D.2)

Italian laws apply to gas pressurized enclosures made of both insulating and metallic materials with a capacity of 25 litres or above, a design pressure higher than 0,05 kg/cm^2 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.

- (I.S.P.E.S.L. Rules, 95 revision: VSR.8.B.1 and M.15.D.3. Table I for porcelain)

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

- (I.S.P.E.S.L. Rules, 95 revision: VSR.8.B.1 Clause 2)

The type test shall be performed in the presence of the Authority Supervisor.

- (I.S.P.E.S.L. Rules, 95 revision: VSR.8.B.2 Clause 2; M.15.D.4)

An additional pressure test shall be performed on a complete pressurized enclosure. This has to withstand 1,5 times the design pressure without failure for five minutes.

Temperature cycles test and electrical test shall be made; after these tests shall be carried out consecutively the pressure test at pressure p ≥ 4,25 times the design pressure.

- (I.S.P.E.S.L. Rules, 95 revision: VSR.8.B.1 Subclause 4.1.2)

For a homogeneous batch of 100 pieces max., one hollow insulator shall be subjected to the failure test with a pressure 4,25 times the design pressure.

- (Italian pressure vessel code for electrical switchgear DM 1 December 1980 and DM 10 September 1981 published in Gazzetta Ufficiale n° 285 dated 16.10.1981)

For metal-enclosed switchgear and controlgear 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 m³. Gas filled compartments having a design pressure exceeding 0,5 bar (gauge) or a volume exceeding 2 m³ shall be designed according to the Italian pressure vessel code for electrical switchgear.

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 205: Compact switchgear assemblies for rated voltages above 52 kV

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62271-205 has been prepared by subcommittee 17C: High-voltage switchgear and controlgear assemblies, of IEC technical committee 17: Switchgear and controlgear.

This standard should be read in conjunction with IEC 62271-1, first edition, to which it refers and which is applicable, unless otherwise specified. In order to simplify the indication of corresponding requirements, the same numbering of clauses and subclauses is used as in IEC 62771-1. Amendments to these clauses and subclauses are given under the same numbering, whilst additional subclauses are numbered from 101.

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

FDIS	Report on voting
17C/418/FDIS	17C/423/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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 publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 205: Compact switchgear assemblies for rated voltages above 52 kV

1 General

1.1 Scope

This part of IEC 62271 applies to compact switchgear assemblies consisting of at least one switching device directly connected to, or sharing components with, one or more other devices such that there is an interaction between the functions of the individual devices. Such assemblies are made up of devices defined in 1.101 and are designed, tested and supplied for use as a single unit. The interaction between devices may be due to proximity, sharing of components or a combination of both. The assemblies may contain components of air insulated switchgear (AIS) only or a combination of AIS and gas insulated switchgear (GIS), so called mixed technology switchgear (MTS) and may be delivered entirely prefabricated or partially assembled.

It is not possible to define all potential arrangements of compact switchgear assemblies however four examples are shown for information in Annex A.

These compact switchgear assemblies are for indoor and/or outdoor installations in systems having rated voltages above 52 kV and service frequencies of 50 Hz and 60 Hz.

This standard covers the influence on performance of the interactions between devices within compact switchgear assemblies and defines ratings and test procedures for these assemblies.

IEC 62271-1 is applicable if not stated otherwise.

This standard does not apply to switchgear assemblies consisting solely of GIS which are covered by 62271-203.

1.101 Objective

The objective of this standard is to respond to the increasing use of compact switchgear assemblies that perform the functions of a number of separate devices and their controlgear. Numerous arrangements are possible and this standard provides guidance on basic types of assemblies which might be envisaged.

As there are potential interactions between devices within such assemblies, it is necessary to consider the standardization requirements for the assembly in its entirety.

The devices, defined by IEC standards, which may form part of a compact switchgear assembly are listed below:

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Switching devices:

- Circuit-breakers IEC 62271-100
- Disconnectors/Earthing switches IEC 62271-102
- Switches IEC 60265-2
- Disconnecting circuit-breakers IEC 62271-108

Devices:

- Instrument transformers
  - Current transformers IEC 60044-1, IEC 60044-8
  - Voltage transformers IEC 60044-2, IEC 60044-5, IEC 60044-7
  - Combined transformers IEC 60044-3
- Surge arresters IEC 60099-4
- Bushings IEC 60137
- Insulators IEC 61462, IEC 62155
- Cable connections IEC 62271-209
- Transformer connections IEC 61639

Each switching device, device and their controlgear forming part of a compact switchgear assembly shall comply with the relevant individual standard. If part of the compact switchgear assembly is formed by metal enclosed switchgear devices the requirements of IEC 62271-203 apply.

Compact switchgear assemblies, as defined in this standard, are considered to be a single product with a single serial number and one set of documentation.

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 60044-1, *Instrument transformers – Part 1: Current transformers*

IEC 60044-2, *Instrument transformers – Part 2: Inductive voltage transformers*

IEC 60044-3, *Instrument transformers – Part 3: Combined transformers*

IEC 60044-5, *Instrument transformers – Part 5: Capacitor voltage transformers*

IEC 60044-7, *Instrument transformers – Part 7: Electronic voltage transformers*

IEC 60044-8, *Instrument transformers – Part 8: Electronic current transformers*

IEC 60050-441, *International Electrotechnical Vocabulary – Chapter 441: Switchgear, controlgear and fuses*

IEC 60099-4, *Surge arresters – Part 4: Metal-oxide surge arresters without gaps for a.c. systems*

IEC 60137, *Insulated bushings for alternating voltages above 1 000 V*

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