SVENSK STANDARD SS-EN 60137

Fastställd	Utgåva	Sida	Ansvarig kommitté
2018-02-21	4	1 (1+63)	SEK TK 36

Isolatorer – Genomföringar för växelspänning över 1000 V

Insulated bushings for alternating voltages above 1000 V

Som svensk standard gäller europastandarden EN 60137:2017. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60137:2017.

Nationellt förord

Europastandarden EN 60137:2017

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 60137, Seventh edition, 2017 - Insulated bushings for alternating voltages above 1000 V**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60137, utgåva 3, 2009, gäller ej fr o m 2020-11-17.

ICS 29.080.20

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60137

November 2017

ICS 29.080.20

Supersedes EN 60137:2008

English Version

Insulated bushings for alternating voltages above 1 000 V (IEC 60137:2017)

Traversées isolées pour tensions alternatives supérieures à 1 000 V (IEC 60137:2017)

Isolierte Durchführungen für Wechselspannungen über 1 000 V (IEC 60137:2017)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 60137:2017 E

SEK Svensk Elstandard

European foreword

The text of document 36A/187/FDIS, future edition 7 of IEC 60137, prepared by SC 36A "Insulated Bushings" of IEC/TC 36 "Insulators" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60137:2017.

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)	2018-05-17
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-11-17

This document supersedes EN 60137:2008.

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

Endorsement notice

The text of the International Standard IEC 60137:2017 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 60076-1	NOTE	Harmonized as EN 60076-1.
IEC 60076-2	NOTE	Harmonized as EN 60076-2.
IEC 60076-3	NOTE	Harmonized as EN 60076-3.
IEC 60507	NOTE	Harmonized as EN 60507.
IEC 60836	NOTE	Harmonized as EN 60836.
IEC 60867	NOTE	Harmonized as EN 60867.
IEC 62271-203:2011	NOTE	Harmonized as EN 62271-203:2012 (not modified).
IEC 62271-211:2014	NOTE	Harmonized as EN 62271-211:2014 (not modified).

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.

Publication	Year	Title	EN/HD	Year
IEC 60038 (mod)	-	IEC standard voltages	EN 60038	-
IEC 60050-212	2010	International Electrotechnical Vocabulary - Part-212: Electrical insulating solids, liquids and gases	-	-
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 60068-2-17	1994	Basic environmental testing procedures - Part 2-17: Tests - Test Q: Sealing	EN 60068-2-17	1994
IEC 60071-1	-	Insulation co-ordination - Part 1: Definitions, principles and rules	EN 60071-1	-
IEC 60076-5	-	Power transformers - Part 5: Ability to withstand short circuit	EN 60076-5	-
IEC 60076-7	-	Power transformers - Part 7: Loading guide for oil-immersed power transformers	-	-
IEC 60216-2	-	Electrical insulating materials - Thermal endurance properties - Part 2: Determination of thermal endurance properties of electrical insulating materials - Choice of test criteria	EN 60216-2	-
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 60422	-	Mineral insulating oils in electrical equipment - Supervision and maintenance guidance	EN 60422	-
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 60505	-	Evaluation and qualification of electrical insulation systems	EN 60505	-
IEC 61099	-	Insulating liquids - Specifications for unused synthetic organic esters for electrical purposes	EN 61099	-

IEC 61462	-	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	-
IEC 62155 (mod)	2003	Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V	EN 62155	2003
IEC 62217	-	Polymeric HV insulators for indoor and outdoor use - General definitions, test methods and acceptance criteria	EN 62217	-
IEC 62271-1	-	High-voltage switchgear and controlgear - Part 1: Common specifications	EN 62271-1	-
IEC Guide 109	-	Environmental aspects - Inclusion in electrotechnical product standards	-	-
IEC/TS 60815-1	-	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 1: Definitions, information and general principles	-	-
IEC/TS 60815-2	-	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	-	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 3: Polymer insulators for a.c. systems	-	-
CISPR 16-1	series	Specification for radio disturbance and immunity measuring apparatus and methods	EN 55016-1	series
CISPR 18-2	-	Radio interference characteristics of overhead power lines and high-voltage equipment - Part 2: Methods of measurement and procedure for determining limits	-	-
IEC TS 61463	-	Bushings - Seismic qualification	-	-

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INSULATED BUSHINGS FOR ALTERNATING VOLTAGES ABOVE 1 000 V

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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International Standard IEC 60137 has been prepared by sub-committee 36A: Insulated bushings, of IEC technical committee 36: Insulators.

This seventh edition cancels and replaces the sixth edition, published in 2008, and constitutes a technical revision.

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

- Resin-impregnated synthetic (RIS) bushings has been introduced.
- Bushings with U_m ≤ 1,1 kV, U_m = 1 100 kV and U_m = 1 200 kV have been introduced.
- Temperature rise testing has been included for liquid-insulated bushings according to clause to 3.4.
- Introducing dry lightning impulse testing as a routine test for all transformer bushings with U_m > 72,5 kV.
- The altitude correction procedure has been revised (> 1 000 m).

- An explanation about Very Fast Transient (VFT) phenomenon and its impact on bushings has been included.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
36A/187/FDIS	36A/189/RVD

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

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://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.

INTRODUCTION

In the preparation of the current edition of this standard further consideration has been given to the test requirements for power transformers as described in IEC 60076-3:2013.

INSULATED BUSHINGS FOR ALTERNATING VOLTAGES ABOVE 1 000 V

1 Scope

This International Standard specifies the characteristics and tests for insulated bushings.

This standard is applicable to bushings, as defined in Clause 3, intended for use in electrical apparatus, machinery, transformers, switchgear and installations for three-phase alternating current systems, having highest voltage for equipment above 1 000 V and power frequencies of 15 Hz up to and including 60 Hz.

Subject to special agreement between purchaser and supplier, this standard may be applied, in part or as a whole, to the following:

- bushings used in other than three-phase systems;
- bushings for high-voltage direct current systems;
- bushings for testing transformers;
- bushings for capacitors.

Special requirements and tests for transformer bushings in this standard apply also to reactor bushings.

This standard is applicable to bushings made and sold separately. Bushings which are a part of an apparatus and which cannot be tested according to this standard should be tested with the apparatus of which they form part.

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 60038, *IEC standard voltages*

IEC 60050-212:2010, *International Electrotechnical Vocabulary – Part 212: Electrical insulating solids, liquids and gases*

IEC 60059, *IEC standard current ratings*

IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60068-2-17:1994, *Basic environmental testing procedures – Part 2-17: Tests – Test Q: Sealing*

IEC 60071-1, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60076-5, *Power transformers – Part 5: Ability to withstand short circuit*

IEC 60076-7, *Power transformers – Part 7: Loading guide for oil-immersed power transformers*

IEC 60216-2, *Electrical insulating materials – Thermal endurance properties – Part 2: Determination of thermal endurance properties of electrical insulating materials – Choice of test criteria*

IEC 60270, *High-voltage test techniques – Partial discharge measurements*

IEC 60296, *Fluids for electrotechnical applications – Unused mineral insulating oils for transformers and switchgear*

IEC 60376, *Specification of technical grade sulfur hexafluoride (SF_6) for use in electrical equipment*

IEC 60422, *Mineral insulating oils in electrical equipment – Supervision and maintenance guidance*

IEC 60480, *Guidelines for the checking and treatment of sulfur hexafluoride (SF_6) taken from electrical equipment and specification for its re-use*

IEC 60505, *Evaluation and qualification of electrical insulation systems*

IEC TS 60815-1, *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions – Part 1: Definitions, information and general principles*

IEC TS 60815-2, *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, *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions – Part 3: Polymer insulators for a.c. systems*

IEC 61099, *Insulating liquids – Specifications for unused synthetic organic esters for electrical purposes*

IEC 61462, *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*

IEC TS 61463, *Bushings – Seismic qualification*

IEC 62155:2003, *Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V*

IEC 62217, *Polymeric HV insulators for indoor and outdoor use – General definitions, test methods and acceptance criteria*

IEC 62271-1, *High-voltage switchgear and controlgear – Part 1: Common specifications*

IEC Guide 109, *Environmental aspects – Inclusion in electrotechnical product standards*

CISPR 16-1 (all parts), *Specification for radio disturbance and immunity measuring apparatus and methods*

CISPR 18-2, *Radio interference characteristics of overhead power lines and high-voltage equipment – Parts 2: Methods of measurement and procedure for determining limits*