BS EN 60143-1:2015+A1:2023

BSI Standards Publication

Series capacitors for power systems

Part 1: General

National foreword

This British Standard is the UK implementation of EN 60143-1:2015+A1:2023. It is identical to IEC 60143-1:2015, incorporating amendment 1:2023. It supersedes BS EN 60143-1:2015, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by ▌A1〉 〈A1▐.

The UK participation in its preparation was entrusted to Technical Committee W/-, Consumer Products and Services Sector Policy and Strategy Committee.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Date	Text affected
31 January 2024	Implementation of IEC amendment 1:2023 with CENELEC endorsement A1:2023

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60143-1

October 2015

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Supersedes EN 60143-1:2004

English Version

Series capacitors for power systems - Part 1: General (IEC 60143-1:2015)

Condensateurs série destinés à être installés sur des réseaux - Partie 1: Généralités
(IEC 60143-1:2015)

Reihenkondensatoren für Starkstromanlagen - Teil 1: Allgemeines
(IEC 60143-1:2015)

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

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 60143-1:2015 E

European foreword

The text of document 33/578/FDIS, future edition 5 of IEC 60143-1, prepared by IEC/TC 33 "Power capacitors and their applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60143-1:2015.

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)	2016-04-30
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2018-07-30

This document supersedes EN 60143-1:2004.

The main change with respect to EN is that the endurance test has been replaced by an ageing test because voltage cycling is already performed in the cold duty test. The guide section has been expanded regarding long line correction and altitude correction. In addition the insulation tables and references to other standards have been updated.

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Endorsement notice

The text of the International Standard IEC 60143-1:2015 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 60060-2:2010	NOTE	Harmonized as EN 60060-2:2011.
IEC 60110-1:1998	NOTE	Harmonized as EN 60110-1:1998.
IEC 60252-1:2010	NOTE	Harmonized as EN 60252-1:2011.
IEC 61048:2006	NOTE	Harmonized as EN 61048:2006.
IEC 61049:1991	NOTE	Harmonized as EN 61049:1993.
IEC 61071	NOTE	Harmonized as EN 61071.
IEC 60270:2000	NOTE	Harmonized as EN 60270:2001.
IEC 60909-0:2001	NOTE	Harmonized as EN 60909-0:2001.

European foreword to Amendment 1

The text of document 33/693/RVC, future IEC 60143-1/AMD1, prepared by IEC/TC 33 "Power capacitors and their applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60143-1:2015/A1:2023.

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) 2024-09-08
•	latest date by which the national standards conflicting with the document have to be withdrawn	(dow) 2026-12-08

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The text of the International Standard IEC 60143-1:2015/AMD1:2023 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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.

Publication	Year	Title	EN/HD	Year
IEC 60050	series	International Electrotechnical Vocabulary	-	series
IEC 60060-1	2010	High-voltage test techniques -- Part 1: General definitions and test requirements	EN 60060-1	2010
IEC 60071-1	2006	Insulation co-ordination -- Part 1: Definitions, principles and rules	EN 60071-1	2006
IEC 60071-2	1996	Insulation co-ordination -- Part 2: Application guide	EN 60071-2	1997
IEC 60143-2	2012	Series capacitors for power systems -- Part 2: Protective equipment for series capacitor banks	EN 60143-2	2013
IEC 60143-3	1998	Series capacitors for power systems -- Part 3: Internal fuses	EN 60143-3	1998
IEC 60143-4	2010	Series capacitors for power systems -- Part 4: Thyristor controlled series capacitors	EN 60143-4	2010
IEC 60549	2013	High-voltage fuses for the external protection of shunt capacitors	EN 60549	2013
IEC 60871-1	2014	Shunt capacitors for a.c. power systems having a rated voltage above 1 000 V - Part 1: General	EN 60871-1	2014
IEC 62271-1	2007	High-voltage switchgear and controlgear -- Part 1: Common specifications	EN 62271-1	2008
IEEE Std 693	-	IEEE Recommended Practice for Seismic Design of Substations	-	-

IEC 60143-1

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Series capacitors for power systems – Part 1: General

Condensateurs série destinés à être installés sur des réseaux – Partie 1: Généralités

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ÉLECTROTECHNICAL COMMISSION

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SERIES CAPACITORS FOR POWER SYSTEMS –

Part 1: General

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 60143-1 has been prepared by IEC technical committee 33: Power capacitors and their applications.

This fifth edition cancels and replaces the fourth edition, published in 2004. This edition constitutes a technical revision.

The main change with respect to the previous edition is that the endurance test has been replaced by an ageing test because voltage cycling is already performed in the cold duty test. The guide section has been expanded regarding long line correction and altitude correction. In addition the insulation tables and references to other standards have been updated.

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

FDIS	Report on voting
33/578/FDIS	33/580/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 parts in the IEC 60143 series, published under the general title *Series capacitors for power systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

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.

SERIES CAPACITORS FOR POWER SYSTEMS –

Part 1: General

1 Scope and object

This part of IEC 60143 applies both to capacitor units and capacitor banks intended to be used connected in series with an a.c. transmission or distribution line or circuit forming part of an a.c. power system having a frequency of 15 Hz to 60 Hz.

The primary focus of this standard is on transmission application.

The series capacitor units and banks are usually intended for high-voltage power systems. This standard is applicable to the complete voltage range.

This standard does not apply to capacitors of the self-healing metallized dielectric type.

The following capacitors, even if connected in series with a circuit, are excluded from this standard:

– capacitors for inductive heat-generating plants (IEC 60110-1);
– capacitors for motor applications and the like (IEC 60252 (all parts));
– capacitors to be used in power electronics circuits (IEC 61071);
– capacitors for discharge lamps (IEC 61048 and IEC 61049).

For standard types of accessories such as insulators, switches, instrument transformers, external fuses, etc. see the pertinent IEC standard.

NOTE 1 Additional requirements for capacitors to be protected by internal fuses, as well as the requirements for internal fuses, are found in IEC 60143-3. See also Annex C.

NOTE 2 Additional requirements for capacitors to be protected by external fuses, as well as the requirements for external fuses, are found in Annex A and Annex C.

NOTE 3 A separate standard for series capacitor accessories (spark-gaps, varistors, discharge reactors, current-limiting damping reactors, damping resistors, circuit-breakers, etc.), IEC 60143-2, has been revised and was completed in 2012. A separate standard for internal fuses for series capacitors, IEC 60143-3 has been revised and was completed in 2013.

NOTE 4 Some information regarding fuseless capacitor units and fuseless capacitor banks is found in Annex C.

The object of this standard is:

– to formulate uniform rules regarding performance, testing and rating;
– to formulate specific safety rules;
– to serve as a guide for installation and operation.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE If there is a conflict between this standard and a standard listed below, the text of IEC 60143-1 prevails.