IEC 60143-4

Edition 2.0 2023-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Series capacitors for power systems – Part 4: Thyristor controlled series capacitors

Condensateurs série destinés à être installés sur des réseaux – Partie 4: Condensateurs série commandés par thyristors

IEC 60143-4:2023-12

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FOREWORD

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IEC 60143-4 has been prepared by IEC technical committee 33: Power capacitors and their applications. It is an International Standard.

This second edition cancels and replaces the first edition published in 2010. This edition constitutes a technical revision.

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

a) thyristor valve testing requirements refer to IEC 62823;
b) Formula (1) in Subclause 4.2 has been corrected;
c) Hardware-in-the-loop (HIL) tests, Subclause 7.5.4, replaces previously specified real time protection and control system test with network simulator.

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

Draft	Report on voting
33/696/FDIS	33/702/RVD

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

The language used for the development of this International Standard is English.

This part of IEC 60143 is to be used in conjunction with the following standards:

– IEC 60143-1:2015,
– IEC 60143-2:2012,
– IEC 60143-3:2015.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of IEC 60143 series, 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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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SERIES CAPACITORS FOR POWER SYSTEMS –

Part 4: Thyristor controlled series capacitors

1 Scope

This part of IEC 60143 specifies the testing of thyristor controlled series capacitor (TCSC) installations used in series with transmission lines. This document also addresses issues that consider ratings for TCSC thyristor valve assemblies, capacitors, and reactors as well as TCSC control characteristics, protective features, cooling system and system operation.

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.

NOTE If there is a conflict between this part of IEC 60143 and a standard listed below in Clause 2, this document prevails.

IEC 60050-436, *International Electrotechnical Vocabulary (IEV) – Part 436: Power capacitors*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests - Tests B: Dry heat*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60076-1, *Power transformers – Part 1: General*

IEC 60076-6:2007, *Power transformers – Part 6: Reactors*

IEC 60143-1:2015, *Series capacitors for power systems – Part 1: General*

IEC 60143-2:2012, *Series capacitors for power systems – Part 2: Protective equipment for series capacitor banks*

IEC 60143-3:2015, *Series capacitors for power systems – Part 3: Internal fuses*

IEC 60255-21 (all parts), *Electrical relays – Vibration, shock, bump and seismic tests on measuring relays and protection equipment*

IEC 60255-27, *Measuring relays and protection equipment − Part 27: Product safety requirements*

IEC 61000-4 (all parts), *Electromagnetic compatibility (EMC) − Part 4: Testing and measurement techniques*

IEC 61000-4-11, *Electromagnetic compatibility (EMC) − Part 4-11: Testing and measurement techniques − Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase*