IEC 62146-1

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Grading capacitors for high-voltage alternating current circuit-breakers – Part 1: General

Condensateurs de répartition pour disjoncteurs à courant alternatif haute tension – Partie 1: Généralités

IEC 62146-1:2013

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GRADING CAPACITORS FOR HIGH-VOLTAGE ALTERNATING CURRENT CIRCUIT-BREAKERS –

Part 1: General

FOREWORD

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International Standard IEC 62146-1 has been prepared by IEC technical committee 33: Power capacitors and their applications.

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

FDIS	Report on voting
33/535/FDIS	33/541/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 62146 series, published under the general title *Grading capacitators for high-voltage alternating current circuit-breakers*, 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 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- withdrawn,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.

GRADING CAPACITORS FOR HIGH-VOLTAGE ALTERNATING CURRENT CIRCUIT-BREAKERS –

Part 1: General

1 Scope

This part of the IEC 62146 series is applicable to grading capacitors used on circuit-breakers. Their function is to control the voltage distribution across the individual interrupter units of a multi-break circuit-breaker.

Grading capacitors can also be used in parallel to the interrupter unit on single break circuit-breakers to modify the Transient Recovery Voltage (TRV).

The grading capacitor is a sub-component for the circuit-breaker and shall be specified in accordance with the circuit-breaker specifications.

This standard applies to grading capacitors falling into one or both of the following categories for:

– mounting on air-insulated circuit-breakers;

– mounting on enclosed circuit-breakers (for example immersed in SF_6, in oil, etc.).

The testing for each of the above applications is in some cases different.

The object of this standard is:

– to define uniform rules regarding performances, testing and rating;

– to define specific safety rules;

– to provide a guidance 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.

IEC 60050 (all parts), *International electrotechnical vocabulary* (available at http://www.electropedia.org)

IEC 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

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

IEC 60071-1:2006, *Insulation co-ordination – Part 1: Definitions, principles and* rules

IEC 60270:2000, *High-voltage test techniques – Partial discharge measurements*

IEC 60376:2005, *Specification of technical grade sulfur hexafluoride (SF_6) for use in electrical equipment*

IEC 60507-1:1991, *Artificial pollution tests on high-voltage insulators to be used on a.c. systems*

IEC 60567:2011, *Oil-filled electrical equipment – Sampling of gases and analysis of free and dissolved gases – Guidance*

IEC 60721-1:2002, *Classification of environmental conditions – Part 1: Environmental parameters and their severities*

IEC 60815 (all parts), *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions*

IEC 61462:2007, *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 62155:2003, *Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V*

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 62271-203:2003, *High-voltage switchgear and controlgear – Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52 kV*

IEC 62271-300:2006, *High-voltage switchgear and controlgear – Part 300: Seismic qualification of alternating current circuit-breakers*

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

CISPR 18-2:1986, *Radio interference characteristics of overhead power lines and high-voltage equipment – Part 2: Methods of measurement and procedure for determining limits*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
arcing distance
shortest distance in the air external to the insulator between the metallic parts which normally have the operating voltage between them

[SOURCE: IEC 60050-471:2007, 471-01-01]

3.2
capacitor element
device consisting essentially of two electrodes separated by a dielectric

[SOURCE: IEC 60050-436:1990, 436-01-03]