SLOVENSKI STANDARD
SIST EN 62146-1:2014/A1:2016

01-december-2016

Kondenzatorji za izravnavo potenciala pri visokonapetostnih odklopnikih za izmenični tok - 1. del: Splošno (IEC 62146-1:2013/A1:2016) - Dopolnilo A1

Grading capacitors for high-voltage alternating current circuit-breakers - Part 1: General (IEC 62146-1:2013/A1:2016)

Ta slovenski standard je istoveten z: **EN 62146-1:2014/A1:2016**

ICS:

31.060.70 Močnostni kondenzatorji Power capacitors

SIST EN 62146-1:2014/A1:2016 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62146-1:2014/A1

October 2016

ICS 31.060.01; 31.060.70

English Version

Grading capacitors for high-voltage alternating current circuit-breakers - Part 1: General (IEC 62146-1:2013/A1:2016)

Condensateurs de répartition pour disjoncteurs à courant alternatif haute tension - Partie 1: Généralités (IEC 62146-1:2013/A1:2016)

Spannungsausgleichskondensatoren für Hochspannungs-Wechselstrom-Leistungsschalter - Teil 1: Allgemeines (IEC 62146-1:2013/A1:2016)

This amendment A1 modifies the European Standard EN 62146-1:2014; it was approved by CENELEC on 2016-07-28. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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This amendment 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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European foreword

The text of document 33/583/FDIS, future IEC 62146-1:2013/A1, prepared by IEC/TC 33 “Power capacitors and their applications” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62146-1:2014/A1:2016.

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)	2017-04-28
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2019-07-28

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Endorsement notice

The text of the International Standard IEC 62146-1:2013/A1:2016 was approved by CENELEC as a European Standard without any modification.

IEC 62146-1

Edition 1.0 2016-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 31.060.01; 31.060.70

ISBN 978-2-8322-3476-1

FOREWORD

This amendment has been prepared by IEC technical committee 33: Power capacitors and their applications.

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

FDIS	Report on voting
33/583/FDIS	33/586/RVD

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

The committee has decided that the contents of this amendment and the base 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.

1 Scope

Add, after the last dashed point of Clause 1, the following new note and paragraph:

NOTE CIGRE Technical Brochure 368 [2] presents a study about the operating environment of voltage grading capacitors applied to high-voltage circuit-breakers.

This standard does not apply to phase-to-earth capacitors installed on the circuit-breaker to modify the Transient Recovery Voltage.

7.4 Minimum withstand value of mechanical bending load

Replace existing Subclause 7.4 by the following new text:

7.4.1 Capacitors mounted on air insulated circuit -breaker

The test bending moment M_c shall be calculated as follows:

$$M_C = \left(100 + \frac{m}{2}\right) \times g \times \frac{1}{0{,}7} \times l$$

where

M_c is in Nm;

l is the length of the capacitor in m;

m is the mass of the capacitor in kg;

g is the gravitational acceleration 9,81 m/s^2.

NOTE The factor 0,7 comes from figure 1 of IEC 62155 (relation between type test and routine test value).

M_c shall have a minimum value of 2 500 Nm.

7.4.2 Immersed capacitors

The test bending moment M_c shall be calculated as follows:

$$M_C = \frac{m}{2} \times g \times \frac{1}{0,7} \times l$$

8.1 Information for identification of specimens

Replace the first paragraph of Subclause 8.1 by the following new text:

The manufacturer shall submit to the testing laboratory, drawings and other data containing sufficient information to unambiguously identify the type with essential details and parts of the capacitor presented for test, containing at least the following information:

8.4.1 General

Replace the first paragraph of Subclause 8.4.1 by the following new text:

The objective of the dielectric tests is to test the withstand capability of the internal part of the capacitor. It is assumed that the wet tests are performed with the grading capacitor mounted on the circuit-breaker as part of the circuit-breaker type tests. For that reason, the wet tests can be omitted for the grading capacitor alone.

8.4.2 Capacitance measurement at power frequency

Replace the third paragraph of Subclause 8.4.2 by the following new text:

The initial and final capacitance measurement shall be carried out at a voltage between 1 and 1,2 times the voltage U_{cr} before and after the voltage tests (see 8.4.7).

8.4.7 Power frequency voltage test

Replace the third paragraph of Subclause 8.4.7 by the following new text:

The capacitor has passed the test if:

– no flashover occurs external to the grading capacitor,

– no internal breakdown occurs, which shall be verified by a measurement of the capacitance, tanδ and partial discharges of the units before and after the test (see 8.4.2, 8.4.3 and 8.4.4).

8.5 Voltage test at low and high temperature

Replace the first paragraph of Subclause 8.5 by the following new text:

The test can be carried out on a sample or a full size capacitor. The dielectric routine tests (see Figure 2) shall be carried out before the test.

Replace the fourth paragraph of Subclause 8.5 by the following new text:

After these tests, the capacitor shall pass the dielectric routine tests (see Figure 2) at ambient temperature.

8.8 Mechanical bending test

Replace the second paragraph of Subclause 8.8 by the following new text and note:

The value of the test force F_c is calculated from the bending moment M_c defined in 7.4.

NOTE In case of completely axis symmetrical construction, the bending test needs to be performed in one direction only.

9.6.2.2 Immersed capacitors

Replace existing Subclause 9.6.2.2 by the following new text:

The capacitor shall be placed in an enclosure at the maximum ambient temperature, according to the temperature range; the following program has to be applied:

- the ambient pressure in the enclosure is reduced until max 10 Pa (abs) during 12 h;
- the ambient pressure in the enclosure is increased up to 0,7 MPa (abs) during 18 h; in case of an intended application in a circuit breaker with a higher service pressure than 0,7 MPa (abs), a type test shall be performed, with an ambient pressure in the enclosure increased accordingly;
- the ambient pressure in the enclosure is reduced to a value between 100 Pa (abs) and 500 Pa (abs) during 6 h.

The tightness of the capacitor shall be checked when it is removed from the enclosure and 48 h later.

The capacitor shall be considered to have passed the test if there is no evidence of leakage. The method of detection shall be the one of IEC 60068-2-17:1994, C.2.

NOTE Other test methods according to IEC 60068-2-17 can be applied following an agreement between the capacitor manufacturer and purchaser.

9.6.3 Tightness test for gas filled grading capacitors

Replace existing Subclause 9.6.3 by the following new text:

9.6.3.1 Air insulated grading capacitors

The test is applicable to all the type of gas filled grading capacitors intended for use with permanent gas pressure higher than 0,05 MPa relative, having an internal volume equal to or greater than 1 l (1 000 cm^3).

The capacitor shall be assembled as for normal operation and filled with gas at maximum operating pressure at ambient temperature. The capacitor shall be enclosed in an envelope, for example a plastic bag. The concentration of gas in the air inside the envelope shall be measured twice at an interval of equal to or greater than 8 h.

The capacitor shall be considered to have passed the test if the calculated escape of gas is equal to or less than 0,5 % per year of the amount of gas contained inside the capacitor.

9.6.3.2 Immersed capacitors

The tightness test is not required for ceramic capacitors that are not sealed from the insulating fluid.