SLOVENSKI STANDARD
SIST EN 60099-4:2005/A2:2009

01-oktober-2009

Prenapetostni odvodniki - 4. del: Kovinsko-oksidni prenapetostni odvodniki brez iskrišč za sisteme z izmenično napetostjo (IEC 60099-4:2004/A2:2009)

Surge arresters -- Part 4: Metal-oxide surge arresters without gaps for a.c. systems

Überspannungsableiter -- Teil 4: Metalloxidableiter ohne Funkenstrecken für Wechselspannungsnetze

Parafoudres -- Partie 4: Parafoudres à oxyde métallique sans éclateurs pour réseaux à courant alternatif

Ta slovenski standard je istoveten z: **EN 60099-4:2004/A2:2009**

ICS:

29.240.10	Transformatorske postaje. Prenapetostni odvodniki	Substations. Surge arresters

SIST EN 60099-4:2005/A2:2009 **en,fr**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60099-4/A2

May 2009

ICS 29.240.10; 29.120.50

English version

Surge arresters - Part 4: Metal-oxide surge arresters without gaps for a.c. systems

(IEC 60099-4:2004/A2:2009)

Parafoudres -
Partie 4: Parafoudres à oxyde métallique sans éclateurs pour réseaux à courant alternatif
(CEI 60099-4:2004/A2:2009)

Überspannungsableiter -
Teil 4: Metalloxidableiter ohne Funkenstrecken für Wechselspannungsnetze
(IEC 60099-4:2004/A2:2009)

This amendment A2 modifies the European Standard EN 60099-4:2004; it was approved by CENELEC on 2009-05-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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 Central Secretariat has the same status as the official versions.

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

CENELEC

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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

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Foreword

The text of document 37/354/FDIS, future amendment 2 to IEC 60099-4:2004, prepared by IEC TC 37, Surge arresters, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A2 to EN 60099-4:2004 on 2009-05-01.

The following dates were fixed:

– latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2010-02-01
– latest date by which the national standards conflicting with the amendment have to be withdrawn	(dow)	2012-05-01

Endorsement notice

The text of amendment 2:2009 to the International Standard IEC 60099-4:2004 was approved by CENELEC as an amendment to the European Standard without any modification.

IEC 60099-4

Edition 2.0 2009-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 2
AMENDEMENT 2

Surge arresters –
Part 4: Metal-oxide surge arresters without gaps for a.c. systems

Parafoudres –
Partie 4: Parafoudres à oxyde métallique sans éclateurs pour réseaux à courant alternatif

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

This amendment has been prepared by IEC technical committee 37: Surge arresters.

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

FDIS	Report on voting
37/354/FDIS	37/357/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 maintenance result 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.

Replace definitions 3.66, 3.67 and 3.68 with the following new definitions:

3.66
specified long-term load
SLL
force perpendicular to the longitudinal axis of an arrester, allowed to be continuously applied during service without causing any mechanical damage to the arrester

3.67
specified short-term load
SSL
greatest force perpendicular to the longitudinal axis of an arrester, allowed to be applied during service for short periods and for relatively rare events (for example, short-circuit current loads and extreme wind gusts) without causing any mechanical damage to the arrester

NOTE SSL does not relate to mechanical strength requirements for seismic loads. See M.2.

3.68
mean breaking load
MBL
the average breaking load for porcelain or cast resin-housed arresters determined from tests

6.14.1 Bending moment

Change NOTE 1 of Subclause 6.14.1 as follows:

NOTE 1 When determining the mechanical load applied to a surge arrester, the user should consider, for example, wind, ice and electromagnetic forces likely to affect the installation.

Add the following subclause to 6.14:

6.14.4 Mean value of breaking load (MBL)

The MBL shall be ≥ 1,2 times the specified short-term load (SSL) (see 8.9.4).

Replace the existing Subclause 8.9 by the following new Subclause 8.9:

8.9 Test of the bending moment

This test applies to porcelain and cast-resin housed arresters for U_m > 52 kV. It also applies to porcelain and cast-resin housed arresters for U_m ≤ 52 kV for which the manufacturer claims cantilever strength.

The complete test procedure is shown by the flow chart in Annex M.

8.9.1 General

This test demonstrates the ability of the arrester to withstand the manufacturer's declared values for bending loads. Normally, an arrester is not designed for torsional loading. If an arrester is subjected to torsional loads, a specific test may be necessary by agreement between manufacturer and user.

The test shall be performed on complete arrester units without internal overpressure. For single-unit arrester designs, the test shall be performed on the longest unit of the design. Where an arrester contains more than one unit or where the arrester has different specified bending moments in both ends, the test shall be performed on the longest unit of each different specified bending moment, with loads determined according to M.1.

The test shall be performed in two parts that may be done in any order:

– a bending moment test to determine the mean value of breaking load (MBL);
– a static bending moment test with the test load equal to the specified short-term load (SSL), i.e. the 100 % value of M.3.

8.9.2 Sample preparation

One end of the sample shall be firmly fixed to a rigid mounting surface of the test equipment, and a load shall be applied to the other (free) end of the sample to produce the required bending moment at the fixed end. The direction of the load shall pass through and be perpendicular to the longitudinal axis of the arrester. If the arrester is not axi-symmetrical with respect to its bending strength, the manufacturer shall provide information regarding this non-symmetric strength, and the load shall be applied in an angular direction that subjects the weakest part of the arrester to the maximum bending moment.

8.9.3 Test procedure

8.9.3.1 Test procedure to determine mean value of breaking load (MBL)

Three samples shall be tested. If the test to verify the SSL (see 8.9.3.2) is performed first, then samples from that test may be used for determination of MBL. The test samples need not contain the internal parts. On each sample, the bending load shall be increased smoothly until breaking occurs within 30 s to 90 s. “Breaking” includes fracture of the housing and damages that may occur to fixing device or end fittings.

The mean breaking load, MBL, is calculated as the mean value of the breaking loads for the test samples.

NOTE Care should be taken because the housing of an arrester can splinter while under load.

8.9.3.2 Test procedure to verify the specified short-term load (SSL)

Three samples shall be tested. The test samples shall contain the internal parts. Prior to the tests, each test sample shall be subjected to a leakage check (see 9.1 d)) and an internal partial discharge test (see 9.1 c)). If these tests have been performed as routine tests, they need not be repeated at this time.

On each sample, the bending load shall be increased smoothly to SSL, tolerance $^{+5}_{-0}\%$, within 30 s to 90 s. When the test load is reached, it shall be maintained for 60 s to 90 s. During this time the deflection shall be measured. Then the load shall be released smoothly and the residual deflection shall be recorded. The residual deflection shall be measured in the interval 1 min to 10 min after the release of the load.

NOTE 1 Care should be taken because the housing of an arrester may break and splinter while under load.

NOTE 2 Agreement must be made with the manufacturer if it is necessary for any reason to apply a load that is more than 5 % above SSL.

8.9.4 Test evaluation

The arrester shall have passed the test if

- the mean value of breaking load, MBL, is ≥ 1,2 x SSL;
- for the SSL test
  - there is no visible mechanical damage;
  - the remaining permanent deflection is ≤ 3 mm or ≤ 10 % (whichever is greater) of maximum deflection during the test;
  - the test samples pass the leakage test in accordance with 9.1 d);
  - the internal partial discharge level of the test samples does not exceed the value specified in 9.1 c);

Replace the existing Subclause 8.10 by the following new Subclause 8.10:

8.10 Environmental tests

These tests apply to porcelain and cast resin-housed arresters.

8.10.1 General

The environmental tests demonstrate by accelerated test procedures that the sealing mechanism and the exposed metal combinations of the arrester are not impaired by environmental conditions.

The test shall be performed on complete arrester units of any length.

For arresters with an enclosed gas volume and a separate sealing system, the internal parts may be omitted.

Arresters whose units differ only in terms of their lengths, and which are otherwise based on the same design and material, and have the same sealing system in each unit, are considered to be the same type of arrester.

8.10.2 Sample preparation

Prior to the tests, the test sample shall be subjected to the leakage check of 9.1 d).

8.10.3 Test procedure

The tests specified below shall be performed on one sample in the sequence given.

8.10.3.1 Temperature cycling test

The test shall be performed according to test Nb of IEC 60068-2-14.

The hot period shall be at a temperature of at least +40 °C, but not higher than +70 °C. The cold period shall be at least 85 K below the value actually applied in the hot period; however, the lowest temperature in the cold period shall not be lower than –50 °C:

– temperature change gradient: 1 K/min;
– duration of each temperature level: 3 h;
– number of cycles: 10.

8.10.3.2 Salt mist test

The test shall be performed according to Clauses 4 and Subclause 7.6, as applicable, of IEC 60068-2-11:

– salt solution concentration: 5 % ± 1 % by weight;
– test duration: 96 h.

8.10.4 Test evaluation

The arrester shall have passed the tests if the sample passes the leakage check in accordance with 9.1 d).