SLOVENSKI STANDARD
SIST EN 60099-1:1998/A1:2002

01-november-2002

Prenapetostni odvodniki - 1. del: Prenapetostni odvodniki z iskrišči z nelinearnimi upori za sisteme z izmenično napetostjo (IEC 60099-1:1991/A1:1999)

Surge arresters - Part 1: Non-linear resistor type gapped surge arresters for a.c. systems

Überspannungsableiter - Teil 1: Überspannungsableiter mit nichtlinearen Widerständen und Funkenstrecken für Wechselspannungsnetze

Parafoudres - Partie 1: Parafoudres à résistance variable avec éclateurs pour réseaux à courant alternatif

Ta slovenski standard je istoveten z: **EN 60099-1:1994/A1:1999**

ICS:

29.120.50	Varovalke in druga medtokovna zaščita	Fuses and other overcurrent protection devices
29.240.10	Transformatorske postaje. Prenapetostni odvodniki	Substations. Surge arresters

SIST EN 60099-1:1998/A1:2002 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60099-1/A1

December 1999

ICS 29.120.50; 29.240.10
UDC 621.316.933.1:620.1

English version

Surge arresters
Part 1: Non-linear resistor type gapped surge arresters for a.c. systems
(IEC 60099-1:1991/A1:1999)

Parafoudres
Partie 1: Parafoudres à résistance variable avec éclateurs pour réseaux à courant alternatif
(CEI 60099-1:1991/A1:1999)

Überspannungsableiter
Teil 1: Überspannungsableiter mit nichtlinearen Widerständen für Wechselspannungsnetze
(IEC 60099-1:1991/A1:1999)

This amendment A1 modifies the European Standard EN 60099-1:1994; it was approved by CENELEC on 1999-12-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 37/223/FDIS, future amendment 1 to IEC 60099-1, prepared by IEC TC 37, Surge arresters, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60099-1:1994 on 2002-12-01.

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) 2000-09-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2002-12-01

Endorsement notice

The text of amendment 1:1999 to the International Standard IEC 60099-1:1991 was approved by CENELEC as an amendment to the European Standard without any modification.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60099-1

1991

AMENDEMENT 1
AMENDMENT 1
1999-09

Amendement 1

Parafoudres –

Partie 1:
Parafoudres à résistance variable avec éclateurs pour réseaux à courant alternatif

Amendment 1

Surge arresters –

Part 1:
Non-linear resistor type gapped arresters for a.c. systems

International Electrotechnical Commission 3, rue de Varembé Geneva, Switzerland
Telefax: +41 22 919 0300 e-mail: inmail@iec.ch IEC web site http://www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE K

Pour prix, voir catalogue en vigueur
For price, see current catalogue

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
37/223/FDIS	37/229/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.

Page 25

3.1 Arrester identification

Replace the 5th dash "pressure-relief class (for arresters fitted with pressure-relief devices)" *by the following new text:*

– the rated short-circuit withstand current in kiloamperes shall be stated on the nameplate of the surge arrester. Arresters without a claimed short-circuit withstand capability shall have this indicated on the nameplate, see 8.7.

Page 29

5.4 Switching impulse sparkover voltage

Replace the second sentence of this clause by the following new text:

There are limits only for heavy-duty arresters with rated voltages above 200 kV. For these arresters the limits are given in table 8 (column 7).

Page 31

5.8 Long-duration current withstand

Replace the second sentence of this clause by the following new text:

For both types the lightning residual voltage (8.4.1) recorded before and after this test shall not have changed by more than ±10 %. For heavy surge arresters, the dry power frequency sparkover voltage (8.2) recorded before and after the test shall not have changed by more than ±10 %.

Page 35

Table 2 – Parameters for wet tests

Replace characteristics 4 and 5 including the note, as follows:

4. Type of nozzle	See figures 2a, 2b, 2c*	See figure 2d*
5. Water pressure	See figures 2a, 2b, 2c*	See figure 2d*
* Figures refer to IEC 60060-1.		

Page 45

8.3.5 Switching impulse sparkover-voltage/time curve test

Replace the second sentence in the subclause by the following new text:

There are limits only for heavy-duty arresters with rated voltages above 200 kV. For these arresters the limits are given in table 8 (column 7).

Page 63

8.7 Pressure-relief tests

Replace the existing title and text of this clause by the following:

8.7 Short-circuit tests

8.7.1 General

Arresters, for which a short-circuit withstand is claimed by the manufacturer, shall be tested in accordance with this subclause. The test is made to show that an arrester failure is not likely to cause an explosive failure. Each arrester type is tested at three different values of short-circuit currents; the rated short-circuit current and two reduced short-circuit currents. Another test is used to verify the capability of the pressure-relief device or of the surge arrester withstanding, for a low magnitude fault current. If the arrester is equipped with some other arrangement, as a substitute for a conventional pressure-relief device, this arrangement shall be included in the test.

The frequency of the short-circuit test current supply shall be no less than 48 Hz and no more than 62 Hz.

In addition, some re-closing cycles can be performed after agreement between the manufacturer and the purchaser. For this special test, the procedure and the acceptance criteria shall be agreed between the manufacturer and the purchaser.

8.7.2 Preparation of the test samples

For the high-current tests the test samples shall be the longest arrester unit, with the highest rated voltage of each different design of arrester. For the low current test the test sample may be an arrester unit of any length of each different design. The test sample shall be of the highest rated voltage used for the tested length. The samples shall be prepared with a fuse wire for conducting the required short-circuit current.

The external fuse wire shall be placed along the surface of the active part (non-linear resistor and gaps) inside the arrester housing, such that the entire active part is short-circuited. If the space between the active part and the arrester housing is filled with a combination of solid material and a channel of gas or liquid, the fuse wire shall be located as far as possible from this gas or liquid channel. Figure 2 shows some examples of such cases. The actual location of the fuse wire in the test shall be reported.

The fuse wire material and size shall be selected so that the wire will melt within the first 30 electrical degrees after the initiation of the test current.

According to table 9 a total of four test samples is required for the rated short-circuit current test, one for the high-current test, one for each of the two reduced short-circuit current tests and one for the low current test.

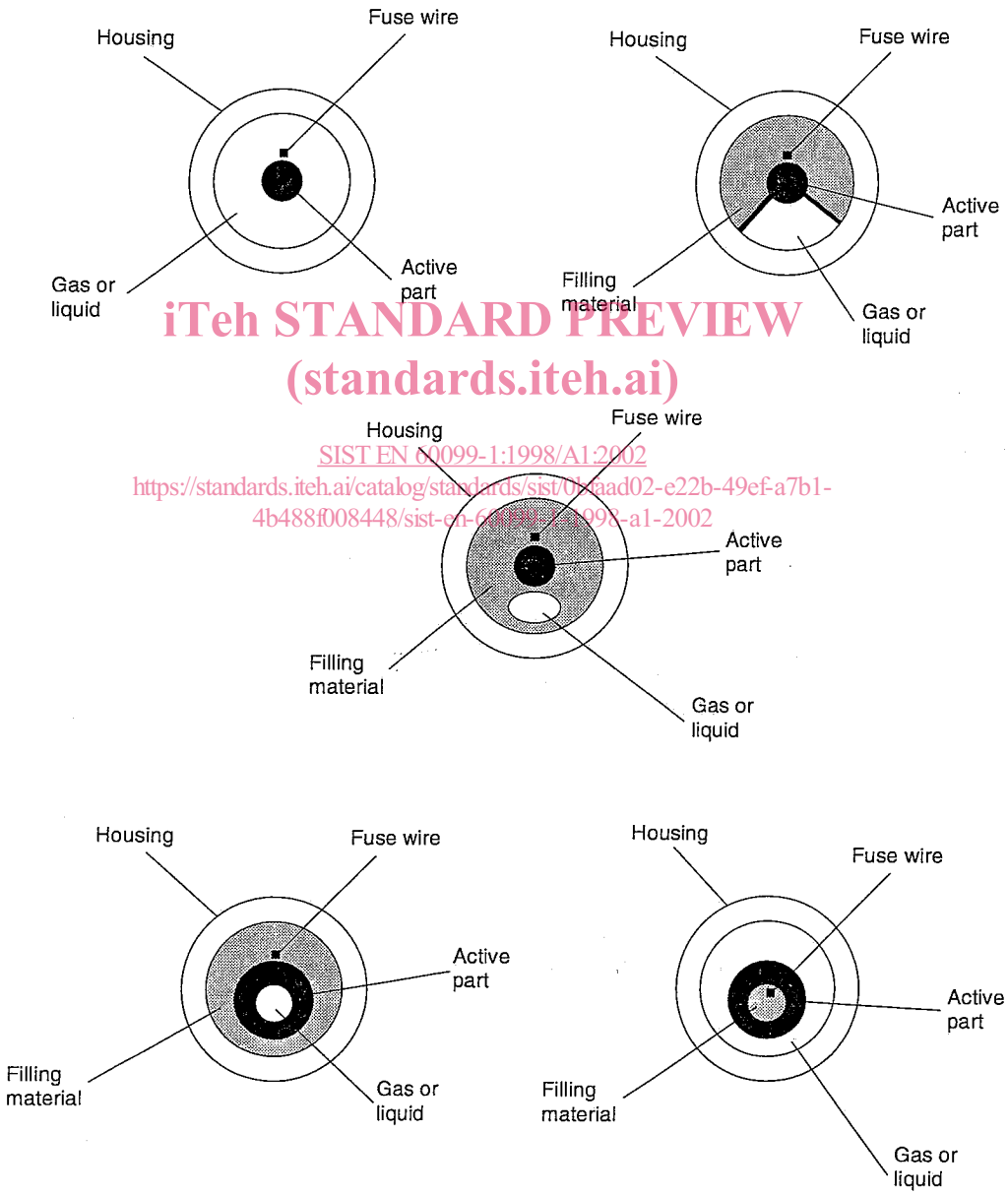

Figure 2 – Position of the fuse wire in different cases

Table 9 – Required currents for short-circuit tests

Arrester class = nominal discharge current	Rated short-circuit current	Reduced short-circuit currents		Low short-circuit current with a duration of 1 s*
A	A	A		A
20 000 or 10 000	80 000	50 000	25 000	600 ± 200
20 000 or 10 000	63 000	25 000	12 000	600 ± 200
20 000 or 10 000	50 000	25 000	12 000	600 ± 200
20 000 or 10 000	40 000	25 000	12 000	600 ± 200
20 000 or 10 000	31 500	12 000	6 000	600 ± 200
20 000, 10 000 or 5 000	20 000	12 000	6 000	600 ± 200
10 000 or 5 000	16 000	6 000	3 000	600 ± 200
10 000, 5 000, 2 500 or 1 500	10 000	6 000	3 000	600 ± 200
10 000, 5 000, 2 500 or 1 500	5 000	3 000	1 500	600 ± 200

* For surge arresters to be installed in resonant earthed or unearthed neutral systems, the increase of the test duration to longer than 1 s, up to 30 min, may be permitted after agreement between the manufacturer and the purchaser. Then the low short-circuit current shall be reduced to 50 A ± 20 A. For this special test, the test sample and acceptance criteria shall be agreed between the manufacturer and the purchaser.

NOTE 1 If an existing type of an arrester, already qualified for one of the nominal currents in table 9, is being qualified for a higher nominal current value than available in this table, it shall be tested only at the new nominal value. Any extrapolation can only be extended by two steps of rated short-circuit current.

NOTE 2 If a new arrester type is to be qualified for a higher nominal current value than available in this table it shall be tested at the proposed nominal current, at 50 % and at 25 % of this nominal current.

NOTE 3 If an existing arrester is qualified for one of the rated short-circuit currents in this table, it is deemed to have passed the test for any value of rated current lower than this one.

8.7.3 Mounting of the test sample

Test samples shall be mounted to simulate installation conditions. For a base-mounted arrester, a mounting arrangement is shown in figures 3a and 3b. The distance to the ground of the insulating platform and the conductors shall be as indicated in figures 3a and 3b.

For non-base mounted arresters (e.g. pole mounted arresters), the test sample shall be mounted to a non-metallic pole using mounting brackets and hardware typically used for service installation. For the purpose of this test, the mounting bracket shall be considered as a part of the arrester base. In cases where the foregoing is in variance with the manufacturer's instructions, the arrester shall be mounted in accordance with the installation recommendations of the manufacturer. The entire lead between the base and the current sensor shall be insulated for at least 1 000 V. The top end of the test sample shall be fitted with the base assembly of the same design as that of an arrester or with the top cap.

For base-mounted arresters, the bottom end fitting of the test sample shall be mounted on an insulating support that is the same height as a surrounding circular or square enclosure. The insulating support and the enclosure shall be placed on top of an insulating platform, as shown in figures 3a and 3b. For non-base mounted arresters, the same requirements apply to the bottom of the arrester. The arcing distance between the top end cap and any other metallic