



SLOVENSKI STANDARD

SIST EN 50164-6:2009

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Lightning Protection Components (LPC) -- Part 6: Requirements for lightning strike counters

Blitzschutzbauteile - Teil 6: Anforderungen an Blitzzähler

Composants de protection contre la foudre (CPF) -- Partie 6 : Compteur de coups de foudre

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91.120.40 Zæ äæ]!^åÁd^[] Lightning protection

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EUROPEAN STANDARD
NORME EUROPÉENNE
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English version

Lightning Protection Components (LPC) - Part 6: Requirements for lightning strike counters

Composants de protection
contre la foudre (CPF) -
Partie 6: Compteur de coups de foudre

Blitzschutzbauteile -
Teil 6: Anforderungen
an Blitzzähler

This European Standard was approved by CENELEC on 2008-11-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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 European Standard 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

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 81X, Lightning protection.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50164-6 on 2008-11-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2009-11-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2011-11-01

EN 50164 series is a family standard under the generic title “*Lightning Protection Components (LPC)*” and consists of the following parts:

- Part 1: Requirements for connection components
- Part 2: Requirements for conductors and earth electrodes
- Part 3: Requirements for isolating spark gaps
- Part 4: Requirements for conductor fasteners
- Part 5: Requirements for earth electrode inspection housings and earth electrode seals
- Part 6: Requirements for lightning strike counters
- Part 7: Requirements for earth enhancing compounds

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1 Scope

This European Standard specifies the requirements and tests for devices intended to count the number of lightning strike pulses flowing in a conductor. This conductor may be part of a lightning protection system (LPS) or part of a surge protective device (SPD) installation.

NOTE Lightning strike counters may also be suitable for use in hazardous atmospheres. Regard should then be taken of the extra requirements necessary for the components to be installed in such conditions.

2 Normative references

The following referenced documents are indispensable for the application 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.

Publication	Year	Title
EN 60068-2-75	1997	Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests (IEC 60068-2-75:1997)
EN 62305-1	2006	Protection against lightning – Part 1: General principles (IEC 62305-1:2006)
EN 62305-3	2006	Protection against lightning – Part 3: Physical damage to structures and life hazard (IEC 62305-3:2006, mod.)
EN 62305-4	2006	Protection against lightning – Part 4: Electrical and electronic systems within structures (IEC 62305-4:2006)
EN 60529	1991	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 61180-1	1994	High-voltage test techniques for low-voltage equipment – Part 1: Definitions, test and procedure requirements (IEC 61180-1:1992)

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3 Definitions

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

3.1

lightning strike counter

device intended to count the number of lightning strikes based on current flowing in a conductor

3.2

threshold current (I_{tc})

peak value of the discharge current with an 8/20 waveform that the counter will count in 100 % of the cases

NOTE Values of current lower than $I_{tc}/3$ should not be counted by the counter.

3.3

maximum counting and withstand discharge current (I_{mcw})

peak value of a current through the conductor having an 8/20 or 10/350 waveform and magnitude according to the current counting and withstand test

NOTE 8/20 waveform can be used only for counters connected to SPDs Type 2.

3.4

impulse current (I_{imp})

defined by three parameters, a current peak value I_{peak} , a charge Q and a specific energy W/R . This is used for the current counting and withstand test

3.5**8/20 current impulse**

current impulse with a virtual front time of 8 μs and a time to half-value of 20 μs

NOTE 1 The front time is defined according to HD 588.1/EN 60060-1 to be $1,25 \times (t_{90} - t_{10})$, where t_{90} and t_{10} are the 90 % and 10 % points on the leading edge of the waveform.

NOTE 2 The time to half-value is defined as the time between the virtual origin and the 50 % point on the tail. The virtual origin is the point where a straight line, drawn through the 10 % and 90 % points on the leading edge of the waveform, intersects the $I = 0$ line.

4 Requirements

The lightning strike counter shall be designed in such a way that in normal use their performance is reliable and without danger to persons and the surrounding.

The choice of a material depends on its ability to match the particular application requirements.

4.1 Documentation

The manufacturer or supplier of the lightning strike counter shall provide adequate information in his literature to ensure that the installer can select and install the counter in a suitable and safe manner, in accordance with EN 62305-3 and EN 62305-4.

Compliance is checked by inspection.

4.2 Marking

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All products complying with this standard shall be marked at least with the following:

- the name of the manufacturer or his trademark;
- the reference of the type or the serial number;
- the position of the assembly if necessary;
- the degree of protection (IP) if applicable;
- conformity to the present standard (of which in particular I_{tc} and I_{mcw} if applicable).

If for small devices, the place available is not sufficient for all the indications which must appear on it, the indications in items a) and b) above must be at least reproduced on the apparatus and be visible when this one is installed. The indications aimed at in c), d) and e) can be carried on the packing and/or in the installation data sheet and/or the catalogue of the manufacturer.

NOTE Marking may be applied for example by moulding, pressing, engraving, printing adhesive labels, or water slide transfers.

Compliance is checked in accordance with 6.7.

4.3 Design

The design of the lightning counter shall be such it carries out its function of counting the number of lightning strikes flowing in a conductor.

These devices shall detect and record lightning strikes regardless of the polarity of the discharge current.

Lightning strike counters intended to be used outdoor must be able to withstand environmental conditions including temperature, dust and humidity. The minimum index of protection is IP43 obtained by itself or in combination with a box in accordance with EN 60529.

The threshold current I_{tc} and the maximum counting and withstand current I_{mcw} are both declared by the manufacturer. At $I_{tc}/3$ the surge counter shall not operate. Compliance is checked in accordance with 6.4.1, 6.4.2 and 6.4.3.

The size of display if any, must allow a normal reading of the number of lightning strikes recorded, when it is installed in accordance with the instructions of the manufacturer.

The fixing system of the counter should not apply an unacceptable stress to the conductor.

Its material must be compatible with that of the conductor (galvanic coupling).

5 Classification

Lightning strike counters are classified according to their application, threshold currents and maximum counting and withstand current.

Application: for connection on LPS conductors, for connection on SPD conductors and for connection on both conductors.

I_{tc} and I_{mcw} values should comply with Table 1.

Table 1 - Typical values for I_{tc} and I_{mcw}

Application	Values for I_{tc}		Values for I_{mcw}				
Connection on LPS conductors	-	1 kA 8/20	-	-	-	-	100 kA 10/350
Connection on SPD conductors	500 A 8/20	-	20 kA 8/20	40 kA 8/20	60 kA 8/20	80 kA 8/20	100 kA 8/20
Connection on LPS and SPD conductors	-	1 kA 8/20	-	-	-	-	100 kA 10/350
NOTE All current waveforms according to EN 62305-1.							

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6 Tests

6.1 General

The tests in accordance with this standard are type tests.

6.1.1 Unless otherwise specified, tests are carried out with the specimens assembled and installed as in normal use according to the manufacturer's or supplier's instructions.

6.1.2 All tests are carried out on new specimens.

6.1.3 Unless otherwise specified, three specimens are subjected to the tests and the requirements are satisfied if all the tests are met. If only one of the specimens does not satisfy a test due to an assembly or a manufacturing fault, that test and any preceding one which may have influenced the results of the test shall be repeated and also the tests which follow shall be carried out in the required sequence on another full set of specimens, all of which shall comply with the requirements.

NOTE The applicant, when submitting a set of specimens, may also submit an additional set of specimens which may be necessary should one specimen fail. The testing laboratory will then, without further request, test the additional set of specimens and will reject only if a further failure occurs. If the additional set of specimens is not submitted at the same time, the failure of one specimen will entail rejection.

6.2 General conditions for the tests

6.2.1 Identification of the counters submitted for testing

The counters submitted for testing must be identified by means of the following elements:

- marks and indications specified in 4.2;
- assembly instructions with reference and date.

6.2.2 Assembly of the lightning strike counters

The counters must be mounted in accordance with the instructions specified by the manufacturer in his assembly instructions.

6.2.3 Number of samples submitted for testing

The number of samples is 3 for the electric tests and 1 for the other tests.

NOTE The use of the same sample for several tests is possible after agreement of the manufacturer.

6.2.4 Conditions of ambient temperature and moisture

Unless otherwise specified, the tests are carried out at an ambient temperature ranging between 5 °C and 35 °C and not to vary during the duration of test of more than 3 K. The lightning strikes counters must be protected from a heating or an excessive external cooling.

6.3 Mechanical tests

The test is carried out on the part accessible from the lightning strikes counter, assembled under the normal operating conditions.

The samples are subjected to mechanical impacts.

6.3.1 Testing device

The lightning strikes counter is mounted on an impact test apparatus according to Clause 4 of EN 60068-2-75:1997, as shown in Figure 1. The impact test apparatus is mounted on a solid wall or structure providing sufficient support.

The striking part has a mass of 150 g ± 1 g and is fixed rigidly at the lower end of a steel tube of 9 mm diameter external and 0,5 mm thickness, swiveling at its higher end in order to be driven only in one vertical plane. The axis of the pivot is at 1 000 mm ± 1 mm above the axis of the striking part.

To determine Rockwell hardness of the polyamide striking part, one uses a ball with a diameter 12,7 mm ± 0,002 5 mm, the central load being of 100 N ± 2 N and the additional load 500 N ± 2,5 N.

NOTE Further information concerning the establishment of Rockwell hardness of the plastics is indicated in publication ASTM D 785-65 (70). The testing device is such as it is necessary to apply a force between 1,9 N and 2,0 N on the face of the part of striking to maintain the tube in horizontal position.

The lightning strike counter is assembled on a plywood plate of 8 mm thickness, of square form with 175 mm side, fixed on its higher and lower corners than the support of assembly (see Figure 1).

This support must have a mass of 10 kg ± 1 kg and must be assembled on a rigid frame via pivots. This frame is fixed to solid wall.

The design of the testing device is such as:

- the counter can be moved horizontally and can turn around an axis perpendicular to the surface of plywood;
- plywood can turn around a vertical axis.