
Elementi za zaščito pred strelo (LPC) - 3. del: Zahteve za iskrišča

Lightning protection components (LPC) - Part 3: Requirements for isolating spark gaps

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**Lightning Protection Components (LPC)
Part 3: Requirements for isolating spark gaps**

Composants de protection
contre la foudre (CPF)
Partie 3: Prescriptions pour les éclateurs
d'isolement

Blitzschutzbauteile -
Teil 3: Anforderungen
an Trennfunkenstrecken

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This European Standard was approved by CENELEC on 2006-03-01. 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.

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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

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

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50164-3 on 2006-03-01.

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) 2007-03-01
 - latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-03-01
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1 Scope

This European Standard specifies the requirements and tests for isolating spark gaps (ISG) for lightning protection systems.

ISG's can be used to indirectly bond a lightning protection system to other nearby metalwork where a direct bond is not permissible for functional reasons.

Typical applications include the connection to

- earth termination systems of power installations,
- earth termination systems of telecommunication systems,
- auxiliary earth electrodes of voltage operated earth fault circuit breakers,
- rail earth electrode of AC and DC railways,
- measuring earth electrodes for laboratories,
- installations with cathodic protection and stray current systems,
- service entry masts for low- voltage overhead cables,
- bypassing insulated flanges and insulated couplings of pipelines.

NOTE ISG's may also be suitable for use in hazardous conditions such as fire and explosive atmosphere. Due regard should be taken of the extra requirements necessary for the components to be installed in such conditions.

This does not cover applications where follow currents occur.

Protective devices according to EN 50122-1 and EN 50123-5 are not part of this European Standard.

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.

EN 60068-2-52	1996	Environmental testing - Part 2: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution) (IEC 60068-2-52:1996)
EN 60529	1991	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN ISO 6988	1994	Metallic and other non-organic coatings - Sulfur dioxide test with general condensation of moisture (ISO 6988:1985)
ISO 6957	1988	Copper alloys - Ammonia test for stress corrosion resistance

3 Definitions

For the purpose of this standard, the following definitions apply:

3.1

Isolating Spark Gap (ISG)

component with discharge distance for isolating electrically conductive installation sections

NOTE In the event of a lightning strike, the installation sections are temporarily connected conductively as the result of response of the discharge.

3.2

electrodes

those parts where sparkover occurs

3.3

sparkover voltage

maximum voltage value before disruptive discharge between the electrodes of the ISG

3.4

withstand voltage

value of a voltage that the ISG can withstand during tests made under specified conditions and for a specified time

3.4.1

power frequency withstand voltage

r.m.s value of a sinusoidal power frequency voltage that the ISG can withstand during tests made under specified conditions and for a specified time

3.4.2

DC withstand voltage

value of a DC voltage that the ISG can withstand during tests made under specified conditions and for a specified time

3.5

rated withstand voltage

value of a withstand voltage declared by the manufacturer to characterise the isolating behaviour of an ISG

3.5.1

rated power frequency withstand voltage

value of a power frequency withstand voltage declared by the manufacturer to characterise the isolating behaviour of an ISG

3.5.2

rated DC withstand voltage

value of a DC withstand voltage declared by the manufacturer to characterise the isolating behaviour of an ISG

3.6

impulse sparkover voltage

the impulse voltage of the waveshape 1,2/50 to classify the sparkover behaviour of the ISG

3.7

rated impulse sparkover voltage

manufacturers declaration of the ISG sparkover voltage

3.8

isolating resistance

ohmic resistance of the ISG between the active parts

3.9

lightning impulse current [I_{imp}]

an impulse current that classifies an ISG. Five parameters are to be considered; the peak value, the charge, the duration, the specific energy and the rate of rise of the impulse current

4 Classification

According to its capability to withstand lightning current, as per Table 1:

- class H for heavy duty;
- class N for normal duty;
- class 1L for light duty;
- class 2L for light duty;
- class 3L for light duty.

5 Requirements

5.1 General

ISG's shall be designed in such a manner that when they are installed in accordance with the manufacturer's instructions its performance shall be reliable, stable and safe to persons and surrounding equipment.

5.2 Environmental requirements

ISG shall be designed in such way that they operate satisfactorily under the environmental conditions given by the normal service conditions. Outdoors ISG's shall be contained in a weather shield of glass glazed ceramic or other acceptable material that is resistant to UV radiation, corrosion and erosion.

5.3 Installation instructions (standards.iteh.ai)

The manufacturer of the ISG shall provide adequate instructions in his literature to ensure that the installer of the ISG can select and install them in a suitable and safe manner.

These instructions shall contain at least the following information:

- classification and the lightning current capability [I_{imp}];
- rated withstand voltage;
- rated impulse sparkover voltage;
- assembly instructions with installation location (if crucial to the function);
- appropriate connection components for the installation if not part of the ISG.

Compliance is checked by inspection.

5.4 Lightning current carrying capability

ISG's shall have sufficient lightning current carrying capability.

Compliance is checked in accordance with Clause 6 following the manufacturer's declaration for the class of the ISG in accordance with Clause 4.

5.5 Rated impulse spark over voltage

The ISG shall always spark over at this value during the tests.

NOTE ISG may experience some variation of sparkover characteristic before and after the lightning current test. This shall be included in the rated impulse sparkover voltage defined by the manufacturer.

5.6 Rated withstand voltage

5.6.1 Rated DC withstand voltage

The ISG shall never spark over at this value during the tests even after performance of lightning current test.

5.6.2 Rated AC withstand voltage

The ISG shall never spark over at this value during the tests even after performance of lightning current test.

5.7 Isolation resistance

Before the lightning current test the isolation resistance shall be higher than 100 M Ω and after the lightning current test isolation resistance shall not be lower than 500 k Ω .

5.8 Marking

The ISG shall be marked at least with the following:

- a) manufacturer's or responsible vendor's name or trade mark;
- b) identifying symbol;
- c) the classification in accordance with Clause 4.

In case if the marking in accordance with b) is not practical it may be given on the smallest package unit.

The marking shall be durable and legible.

Compliance is checked in accordance with 6.3.

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

5.9 UV resistance

ISG housings shall be made of UV resistant material specified by the material's supplier.

Compliance is checked by inspection of the documentation.

6 Tests

6.1 General

6.1.1 The tests in accordance with this standard are type tests.

6.1.2 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.

6.1.3 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 1 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 station 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.

NOTE 2 If the ISG has an integral connection component part with its design the ISG shall be subjected to the testing regime of EN 50164-1 using the appropriate lightning current given in Table 1 of this standard.