



# SLOVENSKI STANDARD

## SIST EN 62305-1:2011

01-maj-2011

Nadomešča:  
SIST EN 62305-1:2006

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**Zaščita pred delovanjem strele - 1. del: Splošna načela (IEC 62305-1:2010, spremenjen)**

Protection against lightning - Part 1: General principles

Blitzschutz - Teil 1: Allgemeine Grundsätze

Protection contre la foudre - Partie 1: Principes généraux

**Ta slovenski standard je istoveten z: EN 62305-1:2011**

SIST EN 62305-1:2011  
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**ICS:**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 62305-1**

February 2011

ICS 29.020; 91.120.40

Supersedes EN 62305-1:2006 + corr. Nov.2006

English version

**Protection against lightning -  
Part 1: General principles  
(IEC 62305-1:2010, modified)**

Protection contre la foudre -  
Partie 1: Principes généraux  
(CEI 62305-1:2010, modifiée)

Blitzschutz -  
Teil 1: Allgemeine Grundsätze  
(IEC 62305-1:2010, modifiziert)

This European Standard was approved by CENELEC on 2011-01-13. 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.

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**CENELEC**

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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 81/370/FDIS, future edition 2 of IEC 62305-1, prepared by IEC TC 81, Lightning protection, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62305-1 on 2011-01-13.

This European Standard supersedes EN 62305-1:2006 + corr. Nov.2006.

This EN 62305-1:2011 includes the following significant technical changes with respect to EN 62305-1:2006 + corr. Nov.2006:

- 1) It no longer covers protection of services connected to structures.
- 2) Isolated interfaces are introduced as protection measures to reduce failure of electric and electronic systems.
- 3) First negative impulse current is introduced as a new lightning parameter for calculation purposes.
- 4) Expected surge overcurrents due to lightning flashes have been more accurately specified for low voltage power systems and for telecommunication systems.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

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) 2011-10-13
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2014-01-13

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 62305-1:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

- |                      |  |
|----------------------|--|
| [1] IEC 60664-1:2007 | NOTE Harmonized as EN 60664-1:2007 (not modified). |
| [2] IEC 61000-4-5    | NOTE Harmonized as EN 61000-4-5.                   |
| [7] IEC 61643-1      | NOTE Harmonized as EN 61643-11.                    |
| [8] IEC 61643-21     | NOTE Harmonized as EN 61643-21.                    |
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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62305-2	2010	Protection against lightning - Part 2: Risk management	EN 62305-2	2011
IEC 62305-3	2010	Protection against lightning - Part 3: Physical damage to structures and life hazard	EN 62305-3	2011
IEC 62305-4	2010	Protection against lightning - Part 4: Electrical and electronic systems within structures	EN 62305-4	2011

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# INTERNATIONAL STANDARD

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PROTECTION AGAINST LIGHTNING –****Part 1: General principles**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62305-1 has been prepared by IEC technical committee 81: Lightning protection.

This second edition cancels and replaces the first edition, published in 2006, and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- 1) It no longer covers protection of services connected to structures.
- 2) Isolated interfaces are introduced as protection measures to reduce failure of electric and electronic systems.
- 3) First negative impulse current is introduced as a new lightning parameter for calculation purposes.
- 4) Expected surge overcurrents due to lightning flashes have been more accurately specified for low voltage power systems and for telecommunication systems.

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

FDIS	Report on voting
81/370/FDIS	81/380/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 62305 series, under the general title *Protection against lightning*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability 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.

A bilingual version of this standard may be issued at a later date.

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## INTRODUCTION

There are no devices or methods capable of modifying the natural weather phenomena to the extent that they can prevent lightning discharges. Lightning flashes to, or nearby, structures (or lines connected to the structures) are hazardous to people, to the structures themselves, their contents and installations as well as to lines. This is why the application of lightning protection measures is essential.

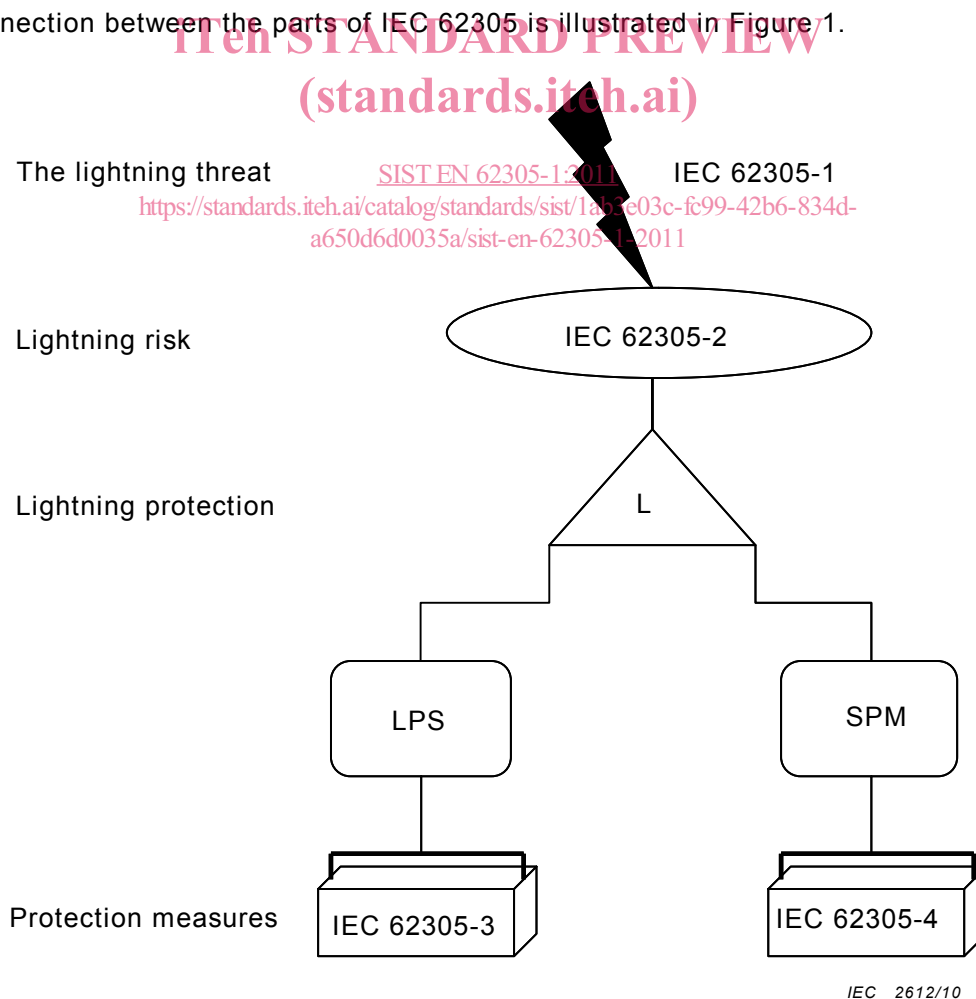
The need for protection, the economic benefits of installing protection measures and the selection of adequate protection measures should be determined in terms of risk management. Risk management is the subject of IEC 62305-2.

Protection measures considered in IEC 62305 are proved to be effective in risk reduction.

All measures for protection against lightning form the overall lightning protection. For practical reasons the criteria for design, installation and maintenance of lightning protection measures are considered in two separate groups:

- the first group concerning protection measures to reduce physical damage and life hazard in a structure is given in IEC 62305-3;
- the second group concerning protection measures to reduce failures of electrical and electronic systems in a structure is given in IEC 62305-4.

The connection between the parts of IEC 62305 is illustrated in Figure 1.



**Figure 1 – Connection between the various parts of IEC 62305**

## PROTECTION AGAINST LIGHTNING –

### Part 1: General principles

#### 1 Scope

This part of IEC 62305 provides general principles to be followed for protection of structures against lightning, including their installations and contents, as well as persons.

The following cases are outside the scope of this standard:

- railway systems;
- vehicles, ships, aircraft, offshore installations;
- underground high pressure pipelines;
- pipe, power and telecommunication lines placed outside the structure.

NOTE These systems usually fall under special regulations produced by various specialized authorities.

#### 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.

IEC 62305-2:2010, *Protection against lightning – Part 2: Risk management*

IEC 62305-3:2010, *Protection against lightning – Part 3: Physical damage to structures and life hazard*

IEC 62305-4:2010, *Protection against lightning – Part 4: Electrical and electronic systems within structures*

#### 3 Terms and definitions

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

##### 3.1

##### **lightning flash to earth**

electrical discharge of atmospheric origin between cloud and earth consisting of one or more strokes

##### 3.2

##### **downward flash**

lightning flash initiated by a downward leader from cloud to earth

NOTE A downward flash consists of a first impulse, which can be followed by subsequent impulses. One or more impulses may be followed by a long stroke.

##### 3.3

##### **upward flash**

lightning flash initiated by an upward leader from an earthed structure to cloud

NOTE An upward flash consists of a first long stroke with or without multiple superimposed impulses. One or more impulses may be followed by a long stroke.

### 3.4

#### lightning stroke

single electrical discharge in a lightning flash to earth

### 3.5

#### short stroke

part of the lightning flash which corresponds to an impulse current

NOTE This current has a time  $T_2$  to the half peak value on the tail typically less than 2 ms (see Figure A.1).

### 3.6

#### long stroke

part of the lightning flash which corresponds to a continuing current

NOTE The duration time  $T_{LONG}$  (time from the 10 % value on the front to the 10 % value on the tail) of this continuing current is typically more than 2 ms and less than 1 s (see Figure A.2).

### 3.7

#### multiple strokes

lightning flash consisting on average of 3-4 strokes, with typical time interval between them of about 50 ms

NOTE Events having up to a few dozen strokes with intervals between them ranging from 10 ms to 250 ms have been reported.

### 3.8

#### point of strike

point where a lightning flash strikes the earth, or protruding structure (e.g. structure, LPS, line, tree, etc.)

NOTE A lightning flash may have more than one point of strike.

### 3.9

#### lightning current

$i$

current flowing at the point of strike

### 3.10

#### current peak value

$I$

maximum value of the lightning current

### 3.11

#### average steepness of the front of impulse current

average rate of change of current within a time interval  $\Delta t = t_2 - t_1$

NOTE It is expressed by the difference  $\Delta i = i(t_2) - i(t_1)$  of the values of the current at the start and at the end of this interval, divided by the time interval  $\Delta t = t_2 - t_1$  (see Figure A.1).

### 3.12

#### front time of impulse current

$T_1$

virtual parameter defined as 1,25 times the time interval between the instants when the 10 % and 90 % of the peak value are reached (see Figure A.1)