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**Elektromagnetna združljivost (EMC) - 4-5. del: Preskusne in merilne tehnike -
Preskus odpornosti proti napetostnemu udaru (IEC 61000-4-5:2014)**

Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques -
Surge immunity test

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EUROPEAN STANDARD

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Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test (IEC 61000-4-5:2014)

Compatibilité électromagnétique (CEM) - Partie 4-5:
Techniques d'essai et de mesure - Essai d'immunité aux
ondes de choc
(CEI 61000-4-5:2014)

Elektromagnetische Verträglichkeit (EMV) - Teil 4-5: Prüf-
und Messverfahren - Prüfung der Störfestigkeit gegen
Stoßspannungen
(IEC 61000-4-5:2014)

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Foreword

The text of document 77B/711/FDIS, future edition 3 of IEC 61000-4-5, prepared by SC 77B "High frequency phenomena", of IEC/TC 77 "Electromagnetic compatibility" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61000-4-5:2014.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-03-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-06-19

This document supersedes EN 61000-4-5:2006.

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The text of the International Standard IEC 61000-4-5:2014 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:

IEC 60060-2	NOTE	Harmonized as EN 60060-2.
IEC 60364-4-44	NOTE	Harmonized as HD 60364-4-442 and HD 60364-4-444.
IEC 60664-1	NOTE	Harmonized as EN 60664-1.
IEC 61000-4-4	NOTE	Harmonized as EN 61000-4-4.
IEC 61643	NOTE	Harmonized in EN 61643 series and in CLC/TS 61643 series (partly modified).
IEC 61643-11	NOTE	Harmonized as EN 61643-11.
IEC 61643-12	NOTE	Harmonized as CLC/TS 61643-12.
IEC 61643-21:2000 + A1:2008 + A2:2012	NOTE	Harmonized as EN 61643-21:2000 (not modified). + A1:2009 (modified) + A2:2013 (not modified)
IEC 62305-1	NOTE	Harmonized as EN 62305-1.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050	series	International Electrotechnical Vocabulary (IEV)	-	-

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Part 4-5: Testing and measurement techniques – Surge immunity test

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Partie 4-5: Techniques d'essai et de mesure – Essai d'immunité aux ondes de choc

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ELECTROMAGNETIC COMPATIBILITY (EMC) –**Part 4-5: Testing and measurement techniques –
Surge immunity test**

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 61000-4-5 has been prepared by subcommittee 77B: High frequency phenomena, of IEC technical Committee 77: Electromagnetic compatibility.

It forms Part 4-5 of IEC 61000. It has the status of a basic EMC publication in accordance with IEC Guide 107.

This third edition cancels and replaces the second edition published in 2005, and constitutes a technical revision.

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

- a) new Annex E on mathematical modelling of surge waveforms;
- b) new Annex F on measurement uncertainty;
- c) new Annex G on method of calibration of impulse measuring systems;

- d) new Annex H on coupling/decoupling surges to lines rated above 200 A;
- e) moreover while surge test for ports connected to outside telecommunication lines was addressed in 6.2 of the second edition (IEC 61000-4-5:2005), in this third edition (IEC 61000-4-5:2014) the normative Annex A is fully dedicated to this topic. In particular it gives the specifications of the 10/700 μ s combined wave generator.

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

FDIS	Report on voting
77B/711/FDIS	77B/715/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 parts in the IEC 61000 series, published under the general title *Electromagnetic compatibility (EMC)*, 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

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- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

IEC 61000 is published in separate parts according to the following structure:

Part 1: General

General considerations (introduction, fundamental principles)

Definitions, terminology

Part 2: Environment

Description of the environment

Classification of the environment

Compatibility levels

Part 3: Limits

Emission limits

Immunity limits (insofar as they do not fall under the responsibility of the product committees)

Part 4: Testing and measurement techniques

Measurement techniques

Testing techniques

Part 5: Installation and mitigation guidelines

Installation guidelines

Mitigation methods and devices

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Part 6: Generic standards

Part 9: Miscellaneous

Each part is further subdivided into several parts, published either as international standards or as technical specifications or technical reports, some of which have already been published as sections. Others will be published with the part number followed by a dash and a second number identifying the subdivision (example: IEC 61000-6-1).

This part is an International Standard which gives immunity requirements and test procedures related to surge voltages and surge currents.

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-5: Testing and measurement techniques – Surge immunity test

1 Scope and object

This part of IEC 61000 relates to the immunity requirements, test methods, and range of recommended test levels for equipment with regard to unidirectional surges caused by over-voltages from switching and lightning transients. Several test levels are defined which relate to different environment and installation conditions. These requirements are developed for and are applicable to electrical and electronic equipment.

The object of this standard is to establish a common reference for evaluating the immunity of electrical and electronic equipment when subjected to surges. The test method documented in this part of IEC 61000 describes a consistent method to assess the immunity of an equipment or system against a defined phenomenon.

NOTE As described in IEC Guide 107, this is a basic EMC publication for use by product committees of the IEC. As also stated in Guide 107, the IEC product committees are responsible for determining whether this immunity test standard is applied or not, and if applied, they are responsible for determining the appropriate test levels and performance criteria. TC 77 and its sub-committees are prepared to co-operate with product committees in the evaluation of the value of particular immunity test levels for their products.

This standard defines:

- a range of test levels;
- test equipment;
- test setups;
- test procedures.

The task of the described laboratory test is to find the reaction of the equipment under test (EUT) under specified operational conditions to surge voltages caused by switching and lightning effects.

It is not intended to test the capability of the EUT's insulation to withstand high-voltage stress. Direct injections of lightning currents, i.e. direct lightning strikes, are not considered in this standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts), *International Electrotechnical Vocabulary (IEV)* (available at www.electropedia.org)