



SLOVENSKI STANDARD
SIST EN 61000-4-5:1997

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SIST ENV 50142:1997

Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 5: Surge immunity test (IEC 1000-4-5:1995)

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

Elektromagnetische Verträglichkeit (EMV) -- Teil 4-5: Prüf- und Meßverfahren - Prüfung der Störfestigkeit gegen Stoßspannungen

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

Ta slovenski standard je istoveten z: EN 61000-4-5:1995

ICS:

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 61000-4-5

March 1995

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English version

Electromagnetic compatibility (EMC)
Part 4: Testing and measurement techniques
Section 5: Surge immunity test
(IEC 1000-4-5:1995)

Compatibilité électromagnétique (CEM)
Partie 4: Techniques d'essai et de mesure
Section 5: Essai d'immunité aux ondes de choc
(CEI 1000-4-5:1995)

Elektromagnetische Verträglichkeit (EMV)
Teil 4: Prüf- und Meßverfahren
Hauptabschnitt 5: Prüfung der Störfestigkeit gegen Stoßspannungen
(IEC 1000-4-5:1995)

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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, 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 65A/77B(CO)41/25, future edition 1 of IEC 1000-4-5, prepared by SC 65A, System aspects, of IEC TC 65, Industrial-process measurement and control, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61000-4-5 on 1995-03-06.

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) 1996-03-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1996-03-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A and ZA are normative and annexes B and C are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 1000-4-5:1995 was approved by CENELEC as a European Standard without any modification.

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ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

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

IEC Publication	Date	Title	EN/HD	Date
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50(161)	1990	International Electrotechnical Vocabulary (IEV) Chapter 161: Electromagnetic compatibility	-	-
60-1	1989	High-voltage test techniques Part 1: General definitions and test requirements (corrigenda March 1990 + March 1992)	HD 588.1 S1	1991
469-1	1987	Pulse techniques and apparatus Part 1: Pulse terms and definitions		-

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1000-4-5

Première édition
First edition
1995-02

Compatibilité électromagnétique (CEM) –

Partie 4:

Techniques d'essai et de mesure –

Section 5: Essai d'immunité aux ondes de choc

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Electromagnetic compatibility (EMC) –

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Part 4:

Testing and measurement techniques –

Section 5: Surge immunity test

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –

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

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

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International Standard IEC 1000-4-5 has been prepared by sub-committee 65A: System aspects, of IEC technical committee 65: Industrial-process measurement and control.

It forms section 5 of part 4 of IEC 1000. It has the status of a basic EMC publication in accordance with IEC Guide 107.

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

DIS	Report on voting
65A ₄₁ 77B (CO) ₂₅	65A/168/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.

Annex A forms an integral part of this standard.

Annexes B and C are for information only.

INTRODUCTION

This standard is part of the IEC 1000 series, 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 (in so far 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 (standards.iteh.ai)

Mitigation methods and devices

Part 9: Miscellaneous

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Each part is further subdivided into sections which are to be published either as international standards or as technical reports.

This section is an international standard which gives immunity requirements and test procedures related to surge voltages and surge currents.

ELECTROMAGNETIC COMPATIBILITY (EMC) –

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

1 Scope and object

This section of IEC 1000-4 relates to the immunity requirements, test methods, and range of recommended test levels for equipment to unidirectional surges caused by overvoltages 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 section is to establish a common reference for evaluating the performance of equipment when subjected to high-energy disturbances on the power and inter-connection lines.

This standard defines:

- range of test levels;
- test equipment;
- test set-up;
- test procedure.

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The task of the described laboratory test is to find the reaction of the EUT under specified operational conditions caused by surge voltages from switching and lightning effects at certain threat levels.

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It is not intended to test the capability of the insulation to withstand high-voltage stress. Direct lightning is not considered in this standard.

This standard does not intend to specify the tests to be applied to particular apparatus or systems. Its main aim is to give a general basic reference to all concerned product committees of the IEC. The product committees (or users and manufacturers of equipment) remain responsible for the appropriate choice of the tests and the severity level to be applied to their equipment.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this section of IEC 1000-4. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this section of IEC 1000-4 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50(161): 1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 60-1: 1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 469-1: 1987, *Pulse techniques and apparatus – Part 1: Pulse terms and definitions*

3 General

3.1 Switching transients

System switching transients can be separated into transients associated with:

- a) major power system switching disturbances, such as capacitor bank switching;
- b) minor switching activity near the instrumentation or load changes in the power distribution system;
- c) resonating circuits associated with switching devices, such as thyristors;
- d) various system faults, such as short circuits and arcing faults to the earthing system of the installation.

3.2 Lightning transients

The major mechanisms by which lightning produces surge voltages are the following:

- a) a direct lightning stroke to an external circuit (outdoor) injecting high currents producing voltages by either flowing through earth resistance or flowing through the impedance of the external circuit;
- b) an indirect lightning stroke (i.e. a stroke between or within clouds or to nearby objects which produces electromagnetic fields) that induces voltages/currents on the conductors outside and/or inside a building;
- c) lightning earth current flow resulting from nearby direct-to-earth discharges coupling into the common earth paths of the earthing system of the installation.

The rapid change of voltage and flow of current which may occur when a protector is excited may couple into internal circuits.

3.3 Simulation of the transients

- a) The characteristics of the test generator are such that it simulates the above-mentioned phenomena as closely as possible;
- b) if the source of interference is in the same circuit, e.g. in the power supply network (direct coupling), the generator may simulate a low impedance source at the ports of the equipment under test;
- c) if the source of interference is not in the same circuit (indirect coupling) as the ports of the victim-equipment, then the generator may simulate a higher impedance source.