SLOVENSKI STANDARD
SIST EN 61000-4-25:2003

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Electromagnetic compatibility (EMC) -- Part 4-25: Testing and measurement techniques - HEMP immunity test methods for equipment and systems (IEC 61000-4-25:2001)

Electromagnetic compatibility (EMC) -- Part 4-25: Testing and measurement techniques - HEMP immunity test methods for equipment and systems

Elektromagnetische Verträglichkeit (EMV) -- Teil 4-25: Prüf- und Messverfahren - Prüfung der Störfestigkeit von Einrichtungen und Systemen gegen HEMP-Störgrößen

Compatibilité électromagnétique (CEM) -- Partie 4-25: Techniques d'essai et de mesure - Méthodes d'essai d'immunité à l'IEMN-HA des appareils et des systèmes

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Electromagnetic compatibility (EMC)
Part 4-25: Testing and measurement techniques – HEMP immunity test methods for equipment and systems
(IEC 61000-4-25:2001)

Compatibilité électromagnétique (CEM)
Partie 4-25: Techniques d'essai
et de mesure –
Méthodes d'essai d'immunité
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(CEI 61000-4-25:2001)

Elektromagnetische Verträglichkeit (EMV)
Teil 4-25: Prüf- und Messverfahren -
Prüfung der Störfestigkeit von
Einrichtungen und Systemen
gegen HEMP-Störgrößen
(IEC 61000-4-25:2001)

This European Standard was approved by CENELEC on 2002-03-05. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, 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

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Foreword

The text of document 77C/113/FDIS, future edition 1 of IEC 61000-4-25, prepared by SC 77C, High power transient phenomena, of IEC TC 77, Electromagnetic compatibility, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61000-4-25 on 2002-03-05.

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) 2002-12-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-03-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes D and ZA are normative and annexes A, B and C are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61000-4-25:2001 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding 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 (including amendments).

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

Publication	Year	Title	EN/HD	Year
IEC 60050-161	- [1]	International Electrotechnical Vocabulary (IEV) Chapter 161: Electromagnetic compatibility	-	-
IEC 60038 (mod)	- [1]	IEC standard voltages [2]	HD 472 S1	1989 [3]
IEC 60068-1	1988	Environmental testing Part 1: General and guidance	EN 60068-1 [4]	1994
IEC 61000-2-5	- [1]	Electromagnetic compatibility (EMC) Part 2-5: Environment - Classification of electromagnetic environments - Basic EMC publication	-	-
IEC 61000-2-9	- [1]	Part 2: Environment - Section 9: Description of HEMP environment - Radiated disturbance	EN 61000-2-9	1996 [3]
IEC 61000-2-10	- [1]	Part 2-10: Environment - Description of HEMP environment - Conducted disturbance	EN 61000-2-10	1999 [3]
IEC 61000-2-11	- [1]	Part 2-11: Environment - Classification of HEMP environments	-	-
IEC 61000-4-4	- [1]	Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	1995 [3]
IEC 61000-4-5	- [1]	Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	1995 [3]

1) Undated reference.

2) The title of HD 472 S1 is: Nominal voltages for low-voltage public electricity supply systems.

3) Valid edition at date of issue.

4) EN 60068-1 includes corrigendum October 1988 + A1:1992 to IEC 60068-1.

Publication	Year	Title	EN/HD	Year
IEC 61000-4-11	- [1]	Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11	1994 [3]
IEC 61000-4-12	- [1]	Part 4-12: Testing and measurement techniques - Oscillatory waves immunity test	EN 61000-4-12	1995 [3]
IEC 61000-4-13	- [5]	Part 4-13: Testing and measurement techniques - Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests - Basic EMC publication	EN 61000-4-13	- [5]
IEC 61000-4-20	- [5]	Part 4-20: Testing and measurement techniques – Emission and immunity testing in transverse electromagnetic (TEM) waveguides	-	-
IEC 61000-5-3	- [1]	Part 5: Installation and mitigation guidelines - Section 3: HEMP protection concepts	-	-
IEC/TR 61000-5-4	- [1]	Part 5: Installation and mitigation guidelines - Section 4: Immunity to HEMP - Specifications for protective devices against HEMP radiated disturbance	-	-
IEC 61024-1 (mod)	- [1]	Protection of structures against lightning Part 1: General principles	-	-
ISO 7137	- [1]	Aircraft - Environmental conditions and test procedures for airborne equipment	-	-

5) To be published.

NORME INTERNATIONALE

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BASIC EMC PUBLICATION

Compatibilité électromagnétique (CEM) –

Partie 4-25:
Techniques d'essai et de mesure –
Méthodes d'essai d'immunité à l'IEMN-HA des appareils et des systèmes

Electromagnetic compatibility (EMC) –

Part 4-25:
Testing and measurement techniques –
HEMP immunity test methods for equipment and systems

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-25: Testing and measurement techniques – HEMP immunity test methods for equipment and systems

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 express, as nearly as possible, an international consensus of opinion on relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, 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.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61000-4-25 has been prepared by subcommittee 77C: High power transient phenomena, of IEC technical committee 77: Electromagnetic compatibility.

It forms part 4-25 of IEC 61000. 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:

FDIS	Report on voting
77C/113/FDIS	77C/117/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 3.

Annex D forms an integral part of this standard.

Annexes A, B and C are for information only.

The committee has decided that the content of this publication will remain unchanged until 2008. At this date, the publication will be

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

INTRODUCTION

This standard is part of the IEC 61000 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 product committees)

Part 4: Testing and measurement techniques

Measurement techniques

Testing techniques

Part 5: Installation and mitigation guidelines

Installation guidelines

Mitigation methods and devices

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 completed by a second number identifying the subdivision (example: 61000-6-1).

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-25: Testing and measurement techniques – HEMP immunity test methods for equipment and systems

1 Scope

This part of IEC 61000 describes the immunity test levels and related test methods for electrical and electronic equipment and systems exposed to high-altitude electromagnetic pulse (HEMP) environments. It defines ranges of immunity test levels and establishes test procedures. Specifications for test equipment and instrumentation test set-up, test procedures, pass/fail criteria, and test documentation requirements are also defined by this standard. These tests are intended to demonstrate the immunity of electrical and electronic equipment when subjected to HEMP radiated and conducted electromagnetic disturbances. For radiated disturbance immunity tests, specifications are defined in this standard both for small test facilities and large HEMP simulators.

This part of IEC 61000 defines specifications for laboratory immunity tests. On-site tests performed on equipment in the final installation to verify immunity are also specified. These verification tests use the same specifications as laboratory tests, except for the climatic environmental specifications.

The objective of this part of IEC 61000 is to establish a common and reproducible basis for evaluating the performance of electrical and electronic equipment, when subjected to HEMP radiated environments and the associated conducted transients on power, antenna, and input/output (I/O) signal and control lines.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61000. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61000 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050(161), *International Electrotechnical Vocabulary – Chapter 161: Electromagnetic compatibility*

IEC 60038, *IEC standard voltages*

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 61000-2-5, *Electromagnetic compatibility (EMC) – Part 2: Environment – Section 5: Classification of electromagnetic environments.* Basic EMC publication

IEC 61000-2-9, *Electromagnetic compatibility (EMC) – Part 2: Environment – Section 9: Description of HEMP environment – Radiated disturbance.* Basic EMC publication

IEC 61000-2-10, *Electromagnetic compatibility (EMC) – Part 2: Environment – Section 10: Description of HEMP environment – Conducted disturbance*

IEC 61000-2-11, *Electromagnetic compatibility (EMC) – Part 2: Environment – Section 11: Classification of HEMP environments.* Basic EMC publication

IEC 61000-4-4, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test.* Basic EMC Publication

IEC 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 5: Surge immunity test*

IEC 61000-4-11, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 11: Voltage dips, short interruptions and voltage variations immunity tests*

IEC 61000-4-12, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 12: Oscillatory waves immunity test*

IEC 61000-4-13, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests* – Basic EMC Publication [1]

IEC 61000-4-20, *Electromagnetic compatibility (EMC) – Part 4-20: Testing and measurement techniques – Emission and immunity testing in transverse electromagnetic (TEM) waveguides*[1]

IEC 61000-5-3, *Electromagnetic compatibility (EMC) – Part 5-3: Installation and mitigation guidelines – HEMP protection concepts*

IEC 61000-5-4/TR, *Electromagnetic compatibility (EMC) – Part 5: Installation and mitigation guidelines – Section 4: Immunity to HEMP – Specifications for protective devices against HEMP radiated disturbance.* Basic EMC Publication

IEC 61024-1, *Protection of structures against lightning – Part 1: General principles*

ISO 7137, *Aircraft – Environmental conditions and test procedures for airborne equipment*

3 Definitions

For the purpose of this part of IEC 61000, the following definitions apply.

3.1
compatibility level
specified electromagnetic disturbance level used as a reference level for co-ordination in the setting of emission and immunity limits

[IEV 161-03-10]

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[1] To be published

3.2
coupling (HEMP)
interaction of electromagnetic fields with a system to produce currents and voltages on system surfaces and cables

3.3
coupling clamp
device of defined dimensions and characteristics for common mode coupling of the disturbance signal to the circuit under test without any galvanic connection to it

3.4
coupling network
electrical circuit for the purpose of transferring energy from one circuit to another

3.5
decoupling network
electrical circuit for the purpose of preventing over-voltages applied to the EUT from affecting other devices, equipment or systems, which are not under test

3.6
degradation (of performance)
undesired departure in the operational performance of any device, equipment or system from its intended performance

NOTE The term "degradation" can apply to a temporary or permanent failure.

[IEV 161-01-19]

3.7
electromagnetic disturbance
any electromagnetic phenomenon which may degrade the performance of a device, equipment or system

[IEV 161-01-05, modified]

3.8
electromagnetic interference
degradation of the performance of a device, transmission channel or system caused by an electromagnetic disturbance

[IEV 161-01-06]

3.9
electromagnetic susceptibility
inability of a device, equipment or system to perform without degradation in the presence of an electromagnetic disturbance

NOTE Susceptibility is a lack of immunity.

[IEV 161-01-21]

3.10
EUT (equipment under test)
the equipment under test can be a single unit or multiple units interconnected by cables, data links, etc.

NOTE Multiple units interconnected by cables, etc. are also called a system [see 3.27 below].