
Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 12: Oscillatory waves immunity test - Basic EMC publication (IEC 1000-4-12:1995)

Electromagnetic compatibility (EMC) -- Part 4-12: Testing and measurement techniques - Oscillatory waves immunity test

Elektromagnetische Verträglichkeit (EMV) -- Teil 4-12: Prüf- und Meßverfahren - Prüfung der Störfestigkeit gegen gedämpfte Schwingungen

Compatibilité électromagnétique (CEM) -- Partie 4-12: Techniques d'essai et de mesure - Essai d'immunité aux ondes oscillatoires

Ta slovenski standard je istoveten z: EN 61000-4-12:1995

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61000-4-12

July 1995

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Descriptors: Electromagnetic compatibility, electric equipment, electronic equipment, tests, oscillatory waves

English version

**Electromagnetic compatibility (EMC)
Part 4: Testing and measurement techniques
Section 12: Oscillatory waves immunity test
Basic EMC publication
(IEC 1000-4-12:1995)**

Compatibilité électromagnétique (CEM)

Partie 4: Techniques d'essai et de mesure

Section 12: Essais d'immunité aux ondes oscillatoires

Publication fondamentale en CEM
(CEI 1000-4-12:1995)

Elektromagnetische Verträglichkeit

(EMV) - Teil 4: Prüf- und Meßverfahren

Hauptabschnitt 12: Prüfung der Störfestigkeit gegen gedämpfte Schwingungen

EMV-Grundnorm

(IEC 1000-4-12:1995)

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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.

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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

The text of document 77B/141/DIS, future edition 1 of IEC 1000-4-12, prepared by SC 77B, High-frequency phenomena, of IEC TC 77, Electromagnetic compatibility, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61000-4-12 on 1995-07-04.

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) 1996-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-04-01

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

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A, B, C and D are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

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The text of the International Standard IEC 1000-4-12:1995 was approved by CENELEC as a European Standard without any modification.

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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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 50(161)	1990	International electrotechnical vocabulary (IEV) Chapter 161: Electromagnetic compatibility	-	-
IEC 68-1	1988	Environmental testing Part 1: General and guidance	EN 60068-1 ¹⁾	1994
IEC 1010-1 (mod)	1990	Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements	EN 61010-1 ²⁾	1993

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1) EN 60068-1 includes the corrigendum October 1988 and A1:1992 to IEC 68-1.

2) EN 61010-1 includes A1:1992 to IEC 1010-1.

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NORME
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CEI
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1000-4-12

Première édition
First edition
1995-05

Compatibilité électromagnétique (CEM)

Partie 4:

Techniques d'essai et de mesure –

Section 12: Essai d'immunité aux ondes oscillatoires

Publication fondamentale en CEM

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Electromagnetic compatibility (EMC)

SIST EN 61000-4-12:1997

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Testing and measurement techniques –

Section 12: Oscillatory waves immunity test

Basic EMC Publication

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International Electrotechnical Commission
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4: Testing and measurement techniques –
Section 12: Oscillatory waves immunity test

Basic EMC Publication

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.

International Standard IEC 1000-4-12 has been prepared by subcommittee 77B: High frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

It forms section 12 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
77B/141/DIS	77B/151/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.

Annexes A, B, C and D 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

Mitigation methods and devices

Part 9: Miscellaneous

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

These standards and reports will be published in chronological order and numbered accordingly.

This section is an international standard which gives immunity requirements and test procedures related to "oscillatory waves".

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4: Testing and measurement techniques – Section 12: Oscillatory waves immunity test

Basic EMC Publication

1 Scope

This section of IEC 1000-4 relates to the immunity requirements and test methods for electrical and electronic equipment, under operational conditions, to oscillatory waves represented by:

- a) non-repetitive damped oscillatory transients (ring wave) occurring in low-voltage power, control and signal lines supplied by public and non-public networks;
- b) repetitive damped oscillatory waves occurring mainly in power, control and signal cables installed in high voltage and medium voltage (HV/MV) stations.

NOTE – According to the frequencies considered in this standard, it is only relevant for an insulated switchgear.

The object of this basic standard is to establish the immunity requirements and a common reference for evaluating in a laboratory the performance of electrical and electronic equipment intended for residential, commercial and industrial application, as well as of equipment intended for electrical stations, as applicable.

The purpose of this standard is to define:

- test voltage and current waveforms;
- ranges of test levels;
- test equipment;
- test set-up;
- test procedure.

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.

In order to impede the task of coordination and standardization, the product committees or users and manufacturers are strongly recommended to consider (in their future work or revision of old standards) the adoption of the relevant immunity tests specified in this standard.

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 68-1: 1988, *Environmental testing – Part 1: General and guidance*

IEC 1010-1: 1990, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

3 General

The oscillatory waves to which equipment is subjected may influence the reliable operation of equipment and systems.

The main parameters of the oscillatory waves are considered here, mainly the repetition rates: low repetition rate (single shot), or high repetition rate (bursts). The single-shot oscillatory transients are known by the term "ring wave" and the bursts of damped oscillatory transients by the term "damped oscillatory wave".

The ring wave appears at the terminals of equipment (equipment ports) as a consequence of switching in power and control lines, as well as a consequence of lightning. The single-event type and the decaying oscillatory waveform are the most significant parameters of this test.

The damped oscillatory wave appears at the terminals of equipment as a consequence of switching with restriking of the arc, typical of electrical plants, HV/MV stations, as well as of heavy industrial installations.

The relative fast rise time, the decaying oscillatory waveform, the high repetition rate and the duration of the burst are the most significant parameters of this test.

The test waveforms are defined in 6.1.1 and 6.1.2. Information on the primary phenomena and selection of the test is given in annex A.

It is the responsibility of the product committees to establish which phenomenon, among the ones considered in this standard, is relevant and to decide the applicability of the test.