

REDLINE VERSION



BASIC EMC PUBLICATION

**Electromagnetic compatibility (EMC) –
Part 4-16: Testing and measurement techniques – Test for immunity to
conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –**Part 4-16: Testing and measurement techniques –
Test for immunity to conducted, common mode disturbances
in the frequency range 0 Hz to 150 kHz**

FOREWORD

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This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 61000-4-16 has been prepared by subcommittee 77A: Low-frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

It forms part 4-16 of IEC 61000. It has the status of a basic EMC publication in accordance with IEC Guide 107.

This second edition cancels and replaces the first edition published in 1998, Amendment 1:2001 and Amendment 2:2009. This edition constitutes a technical revision.

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

- a) clarification and complement of test generators' specifications and performances.

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

FDIS	Report on voting
77A/905/FDIS	77A/917/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 website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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- amended.

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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 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 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 conducted, common mode disturbances in the range d.c. to 150 kHz.

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-16: Testing and measurement techniques – Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz

1 Scope

This part of IEC 61000 relates to the immunity requirements and test methods for electrical and electronic equipment to conducted, common mode disturbances in the range d.c. to 150 kHz.

The object of this standard is to establish a common and reproducible basis for testing electrical and electronic equipment with the application of common mode disturbances to power supply, control, signal and communication ports.

This standard defines

- test voltage and current waveform;
- range of test levels;
- test equipment;
- test set-up;
- test procedures.

For some types of ports, for example ports intended to be used with highly balanced lines, additional test provisions may be established by product committee specifications.

The test is intended to demonstrate the immunity of electrical and electronic equipment when subjected to conducted, common mode disturbances such as those originating from power line currents and return leakage currents in the earthing/grounding system.

The disturbances produced by 400 Hz mains systems are not included in the scope of this standard.

Actual interference due to these disturbance phenomena is relatively rare, except in industrial plants. Product committees should therefore consider whether there is a justification for applying this standard in their product/product family standards (see also Clause 4).

This test is not relevant for equipment ports intended to be connected to short cables, having a length less than 20 m or less.

The immunity to harmonics and interharmonics, including mains signalling, on a.c. power ports (in differential mode) is not included in the scope of this standard and is covered by IEC 61000-4-13 and IEC 61000-4-19.

The immunity to conducted disturbances generated by intentional radio-frequency transmitters is not included in the scope of this standard and is covered by IEC 61000-4-6.

~~Some ITU-T Recommendations, e.g. K17, K20 and K21, establish similar methods for testing the resistibility of equipment; however, they are dedicated to telecommunication ports and deal with power induction at frequency of the a.c. mains or electric railways.~~

~~Product Committees are advised to consider the Recommendations above, as far as applicable, in preparing their product standards.~~

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

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

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NORME INTERNATIONALE



BASIC EMC PUBLICATION

PUBLICATION FONDAMENTALE EN CEM

**Electromagnetic compatibility (EMC) –
Part 4-16: Testing and measurement techniques – Test for immunity to
conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz**

**Compatibilité électromagnétique (CEM) –
Partie 4-16: Techniques d'essai et de mesure – Essai d'immunité aux
perturbations conduites en mode commun dans la plage de fréquences de 0 Hz
à 150 kHz**

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Part 4-16: Testing and measurement techniques – Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz

1 Scope

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Void.

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

COMPATIBILITÉ ÉLECTROMAGNÉTIQUE (CEM) –

Partie 4-16: Techniques d'essai et de mesure – Essai d'immunité aux perturbations conduites en mode commun dans la plage de fréquences de 0 Hz à 150 kHz

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Elle constitue la partie 4-16 de l'IEC 61000. Elle a le statut de publication fondamentale en CEM conformément au Guide 107 de l'IEC.

Cette deuxième édition annule et remplace la première édition parue en 1998, l'Amendement 1:2001 et l'Amendement 2:2009. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) clarification et complément des caractéristiques et performances des générateurs d'essai.

Le texte de cette norme est issu des documents suivants:

FDIS	Rapport de vote
77A/905/FDIS	77A/917/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 61000, publiées sous le titre général *Compatibilité électromagnétique (CEM)*, peut être consultée sur le site web de l'IEC.

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INTRODUCTION

La présente norme fait partie de la série IEC 61000, structurée comme suit:

Partie 1: Généralités

Considérations générales (introduction, principes fondamentaux)

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Techniques de mesure

Techniques d'essai

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Principes d'installation

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Chaque partie est à son tour subdivisée en plusieurs parties, publiées soit sous forme de normes internationales, soit sous forme de spécifications ou de rapports techniques, dont certaines ont déjà été publiées en tant que sections. D'autres seront publiées avec un tiret à la suite du numéro de partie suivi d'un second numéro pour identifier la subdivision (exemple: IEC 61000-6-1).

La présente partie constitue une Norme internationale indiquant les exigences en matière d'immunité et les modes opératoires d'essai relatifs aux perturbations conduites en mode commun, dans la plage du courant continu à 150 kHz.

COMPATIBILITÉ ÉLECTROMAGNÉTIQUE (CEM) –

Partie 4-16: Techniques d'essai et de mesure – Essai d'immunité aux perturbations conduites en mode commun dans la plage de fréquences de 0 Hz à 150 kHz

1 Domaine d'application

La présente partie de l'IEC 61000 traite des exigences en matière d'immunité et des méthodes d'essai relatives aux équipements électriques et électroniques soumis à des perturbations conduites en mode commun dans la plage du courant continu à 150 kHz.

L'objet de la présente Norme est d'établir une base commune et reproductible destinée à soumettre à essai les performances des équipements électriques et électroniques lorsque ceux-ci sont soumis à des perturbations conduites en mode commun, appliquées aux accès d'alimentation, de commande, de signal et de communication.

La présente Norme définit

- la tension d'essai et la forme d'onde du courant;
- les plages de niveaux d'essai;
- l'équipement d'essai;
- le montage d'essai;
- les modes opératoires d'essais.

Pour certains types d'accès, concernant, par exemple, des accès prévus pour être utilisés avec des lignes fortement symétriques, des dispositions d'essais supplémentaires peuvent être définies dans les spécifications des comités de produit.

L'essai vise à démontrer l'immunité des équipements électriques et électroniques soumis à des perturbations conduites en mode commun telles que celles provenant des courants de lignes d'alimentation et des retours de courants de fuite dans les dispositifs de mise à la terre/à la masse.

Les perturbations dues au réseau 400 Hz ne font pas partie du domaine d'application de la présente Norme.

De réelles interférences dues à ces phénomènes de perturbations sont relativement rares, excepté dans les installations industrielles. Il convient donc que les comités de produit étudient si l'application de la présente Norme à leurs normes de produit/famille de produits est justifiée (voir aussi l'Article 4).

Cet essai n'est pas pertinent pour les accès d'équipements destinés à être raccordés à des câbles courts (20 m au maximum).

L'immunité aux harmoniques et interharmoniques, y compris les signaux transmis sur le réseau, sur les accès d'alimentation en courant alternatif (en mode différentiel) ne fait pas partie du domaine d'application de la présente Norme, mais est traitée par l'IEC 61000-4-13 et l'IEC 61000-4-19.

L'immunité aux perturbations conduites provenant d'émetteurs radioélectriques intentionnels ne fait pas partie du domaine d'application de la présente Norme, mais est traitée par l'IEC 61000-4-6.

2 Références normatives

Les documents suivants sont cités en référence de manière normative, en intégralité ou en partie, dans le présent document et sont indispensables pour son application. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

Vide.