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INTERNATIONAL STANDARD

colour inside

BASIC EMC PUBLICATION

Electromagnetic compatibility (EMC) – Part 4-10: Testing and measurement techniques – Damped oscillatory magnetic field immunity test

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-10: Testing and measurement techniques – Damped oscillatory magnetic field 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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This redline version of the official IEC Standard allows the user to identify the changes made to the 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 61000-4-10 has been prepared by subcommittee 77B: High frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

It forms Part 4-10 of the IEC 61000 series. 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 1993 and Amendment 1:2000. This edition constitutes a technical revision.

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

a) new Annex A on induction coil field distribution;

b) new Annex D on measurement uncertainty;

c) new Annex E for numerical simulations;

d) calibration using current measurement has been addressed in this edition.

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

CDV	Report on voting
77B/730/CDV	77B/746A/RVC

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

- reconfirmed,
- withdrawn,
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- 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

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).

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

This part is an international standard which gives immunity requirements and test procedures related to "damped oscillatory magnetic field".

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-10: Testing and measurement techniques – Damped oscillatory magnetic field immunity test

1 Scope and object

This part of IEC 61000 ~~relates to~~ specifies the immunity requirements ~~of equipment, only under operational conditions~~, test methods, and range of recommended test levels for equipment subjected to damped oscillatory magnetic disturbances related to medium voltage and high voltage sub-stations.

~~The applicability of this standard to equipment installed in different locations is determined by the presence of the phenomenon, as specified in clause 3.~~

The test defined in this standard is applied to equipment which is intended to be installed in locations where the phenomenon as specified in Clause 4 will be encountered.

This standard does not ~~consider~~ specify disturbances due to capacitive or inductive coupling in cables or other parts of the field installation. IEC 61000-4-18, which deals with conducted disturbances, covers these aspects.

The object of this standard is to establish a common and reproducible basis for evaluating the performance of electrical and electronic equipment for medium voltage and high voltage sub-stations when subjected to damped oscillatory magnetic fields.

The test is mainly applicable to electronic equipment to be installed in H.V. sub-stations. Power plants, switchgear installations, smart grid systems may also be applicable to this standard and may be considered by product committees.

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 ~~has the object to~~ defines:

– ~~recommended~~ a range of test levels;
– test equipment;
– test setups;
– test procedures.

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

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

IEC 61000-4-10

Edition 2.0 2016-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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BASIC EMC PUBLICATION

PUBLICATION FONDAMENTALE EN CEM

Electromagnetic compatibility (EMC) – Part 4-10: Testing and measurement techniques – Damped oscillatory magnetic field immunity test

Compatibilité électromagnétique (CEM) – Partie 4-10: Techniques d'essai et de mesure – Essai d'immunité du champ magnétique oscillatoire amorti

IEC 61000-4-10:2016-07(en-fr)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Part 4-10: Testing and measurement techniques – Damped oscillatory magnetic field immunity test

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This part is an international standard which gives immunity requirements and test procedures related to "damped oscillatory magnetic field".

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-10: Testing and measurement techniques – Damped oscillatory magnetic field immunity test

1 Scope and object

This part of IEC 61000 specifies the immunity requirements, test methods, and range of recommended test levels for equipment subjected to damped oscillatory magnetic disturbances related to medium voltage and high voltage sub-stations.

The test defined in this standard is applied to equipment which is intended to be installed in locations where the phenomenon as specified in Clause 4 will be encountered.

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SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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COMPATIBILITÉ ÉLECTROMAGNÉTIQUE (CEM) –

Partie 4-10: Techniques d'essai et de mesure – Essai d'immunité du champ magnétique oscillatoire amorti

AVANT-PROPOS

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La Norme internationale IEC 61000-4-10 a été établie par le sous-comité 77B: Phénomènes haute fréquence, du comité d'études 77 de l'IEC: Compatibilité électromagnétique.

Elle constitue la Partie 4-10 de la série IEC 61000. Elle a le statut d'une publication fondamentale en CEM conformément au Guide 107 de l'IEC.

Cette deuxième édition annule et remplace la première édition parue en 1993 et l'Amendement 1:2000. Cette édition constitue une révision technique.

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

a) nouvelle Annexe A relative à la distribution du champ de bobine d'induction;

b) nouvelle Annexe D relative à l'incertitude de mesure;

c) nouvelle Annexe E pour les simulations numériques;

d) l'étalonnage par la mesure du courant a été abordé dans la présente édition.

Le texte de cette norme est issu des documents suivants:

CDV	Rapport de vote
77B/730/CDV	77B/746A/RVC

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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- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

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INTRODUCTION

L'IEC 61000 est publiée en plusieurs parties, conformément à la structure suivante:

Partie 1: Généralités

Considérations générales (introduction, principes fondamentaux)

Définitions, terminologie

Partie 2: Environnement

Description de l'environnement

Classification de l'environnement

Niveaux de compatibilité

Partie 3: Limites

Limites d'émission

Limites d'immunité (dans la mesure où elles ne relèvent pas de la responsabilité des comités de produits)

Partie 4: Techniques d'essai et de mesure

Techniques de mesure

Techniques d'essai

Partie 5: Guide d'installation et d'atténuation

Guide d'installation

Méthodes et dispositifs d'atténuation

Partie 6: Normes génériques

Partie 9: Divers

Chaque partie est à son tour subdivisée en plusieurs parties, publiées soit comme normes internationales, soit comme spécifications techniques ou rapports techniques, dont certaines ont déjà été publiées en tant que sections. D'autres sont publiées avec le numéro de la partie suivi d'un tiret et d'un second chiffre identifiant la subdivision (exemple: IEC 61000-6-1).

La présente partie constitue une norme internationale qui traite des exigences en matière d'immunité et des procédures d'essai qui s'appliquent au "champ magnétique oscillatoire amorti".

COMPATIBILITÉ ÉLECTROMAGNÉTIQUE (CEM) –

Partie 4-10: Techniques d'essai et de mesure – Essai d'immunité du champ magnétique oscillatoire amorti

1 Domaine d'application et objet

La présente partie de l'IEC 61000 spécifie les exigences en matière d'immunité, les méthodes d'essai et la plage des niveaux d'essai recommandés des équipements soumis aux perturbations magnétiques oscillatoires amorties dans les postes moyenne et haute tension.

L'essai défini dans la présente norme s'applique aux équipements destinés à être installés à des emplacements où les phénomènes spécifiés à l'Article 4 sont rencontrés.

La présente norme ne spécifie pas les perturbations provoquées par le couplage capacitif ou inductif sur les câbles ou autres parties de l'installation. L'IEC 61000-4-18, qui porte sur les perturbations conduites, couvre ces aspects.

La présente norme a pour objet d'établir une base commune et reproductible pour évaluer la performance des équipements électriques et électroniques des postes moyenne et haute tension lorsqu'ils sont soumis à des champs magnétiques oscillatoires amortis.

L'essai s'applique principalement aux équipements électroniques destinés à être installés dans des postes haute tension. Les centrales électriques, les installations d'appareillage et les réseaux intelligents peuvent également être concernés par la présente norme et peuvent être pris en compte par les comités de produits.

NOTE Comme indiqué dans le Guide 107 de l'IEC, il s'agit d'une publication fondamentale en CEM destinée à être utilisée par les comités de produits de l'IEC. Comme l'indique également le Guide 107, les comités de produits de l'IEC ont la responsabilité de déterminer si cette norme d'essai d'immunité est appliquée ou non, et si elle l'est, ils ont la responsabilité de déterminer les niveaux d'essai et critères de performances appropriés. Le comité d'études 77 et ses sous-comités sont prêts à coopérer avec les comités de produits dans le cadre de l'évaluation de la valeur des essais d'immunité particuliers pour leurs produits.

La présente norme définit:

– une plage de niveaux d'essai;
– l'équipement d'essai;
– les montages d'essai;
– les procédures d'essai.

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).

IEC 60050 (toutes les parties), *Vocabulaire Électrotechnique International (VEI)* (disponible à l'adresse www.electropedia.org)