

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Electromagnetic compatibility (EMC) –  
Part 4-18: Testing and measurement techniques – Damped oscillatory wave  
immunity test**

**Compatibilité électromagnétique (CEM) –  
Partie 4-18: Techniques d'essai et de mesure – Essai d'immunité à l'onde  
oscillatoire amortie**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTROMAGNETIC COMPATIBILITY (EMC) –****Part 4-18: Testing and measurement techniques –  
Damped oscillatory wave immunity test**

## FOREWORD

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International Standard IEC 61000-4-18 has been prepared by subcommittee 77B: High frequency phenomena, of IEC Technical Committee 77: Electromagnetic compatibility.

It forms Part 4-18 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 2006 and its Amendment 1:2010. This edition constitutes a technical revision.

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

- a) addition of a mathematical modelling of damped oscillatory wave waveform;
- b) new Annex B on measurement uncertainty;
- c) addition high speed CDN;

- d) addition of calibration procedures for CDNs;
- e) addition of the use of the capacitive coupling clamp on interconnection lines for fast damped oscillatory waves;
- f) addition of a test procedure for DC/DC converters in case the CDN does not work;
- g) new Annex C on issues relating to powering EUTs having DC/DC converters at the input.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
77B/797/FDIS	77B/799/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document 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 document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- 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 (in so far as they do not fall under the responsibility of the product committees)

### **Part 4: Testing and 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 damped oscillatory waves.

# ELECTROMAGNETIC COMPATIBILITY (EMC) –

## Part 4-18: Testing and measurement techniques – Damped oscillatory wave immunity test

### 1 Scope

This part of IEC 61000 focuses on the immunity requirements and test methods for electrical and electronic equipment, under operational conditions, with regard to:

- a) repetitive slow damped oscillatory waves occurring mainly in power, control and signal cables installed in high voltage and medium voltage (HV/MV) substations;
- b) repetitive fast damped oscillatory waves occurring mainly in power, control and signal cables installed in gas insulated substations (GIS) and in some cases also air insulated substations (AIS) or in any installation due to high-altitude electromagnetic pulse (HEMP) phenomena.

The object of this document is to establish a common and reproducible reference for evaluating the immunity of electrical and electronic equipment when subjected to damped oscillatory waves on supply, signal, control and earth ports. The test method documented in this part of IEC 61000 describes a consistent method to assess the immunity of an equipment or system against a defined phenomenon.

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. <sup>1</sup>

The document defines:

- test voltage and current waveforms;
- ranges of test levels;
- test equipment;
- calibration and verification procedures of test equipment;
- test setups;
- test procedure.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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, *International Electrotechnical Vocabulary (IEV) – Part 161: Electromagnetic compatibility* (available at [www.electropedia.org](http://www.electropedia.org))

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<sup>1</sup> TC 77 and its sub-committees are prepared to co-operate with product committees in the evaluation of the value of particular immunity tests for their products.