PD IEC TR 61000-5-1:2023

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# Electromagnetic compatibility (EMC)

Part 5-1: Installation and mitigation guidelines — General considerations

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# National foreword

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The UK participation in its preparation was entrusted to Technical Committee GEL/210, EMC - Policy committee.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2023

ISBN 978 0 580 51226 1

ICS 33.100.01

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 March 2023.

**Amendments/corrigenda issued since publication**

| Date | Text affected |
|---|---|

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Full document details: PD IEC TR 61000-5-1:2023

IEC TR 61000-5-1

Edition 2.0 2023-02

# TECHNICAL REPORT

BASIC EMC PUBLICATION

## Electromagnetic compatibility (EMC) – Part 5-1: Installation and mitigation guidelines – General considerations

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 33.100.01

ISBN 978-2-8322-6481-2

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# ELECTROMAGNETIC COMPATIBILITY (EMC) –

# Part 5-1: Installation and mitigation guidelines – General considerations

## 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 VV (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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IEC TR 61000-5-1 has been prepared by IEC technical committee 77: Electromagnetic compatibility. It is a Technical Report.

It forms Part 5-1 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 1996. This edition constitutes a technical revision.

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

a) restructuring of clauses and subclauses with amending of technical content;
b) alignment of the terminology with other parts of the IEC 61000 series, for example with IEC TR 61000-2-5;
c) addition of an overview regarding the IEC 61000-5 series in Annex A.

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The text of this Technical Report is based on the following documents:

| Draft | Report on voting |
|---|---|
| 77/585/DTR | 77/588/RVDTR |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 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**

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 parts which are to be published either as international standards or as technical specifications or as 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 parts of IEC 61000-5 will be published in chronological order and numbered accordingly.

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# ELECTROMAGNETIC COMPATIBILITY (EMC) –

# Part 5-1: Installation and mitigation guidelines – General considerations

## 1 Scope

This part of IEC 61000-5, which is a technical report, covers general considerations and guidelines on mitigation methods aimed at ensuring electromagnetic compatibility (EMC) among electrical and electronic apparatus or systems used in industrial, commercial, and residential installations. This document is intended for use by all using and installing sensitive electrical or electronic installations and systems, and equipment with high emission levels that could degrade the overall electromagnetic (EM) environment. It applies primarily to new installations, but also applies during modifications or enhancements of legacy installations.

Specific topics, such as recommendations on the design and implementation of the earthing system, including the earth electrode and the earth network, the design and implementation of bonding apparatus or systems to earth or to the earth network, the selection and installation of appropriate cables, and the design and implementation mitigation means involving shielded enclosures, high-frequency filters, isolating transformers, surge-protective devices, etc., will be addressed in other parts of IEC 61000-5. Within this document the fundamental measures will be described.

The practices presented in this document address the EMC concerns of the installation, not the safety aspects of the installation nor the efficient transportation of power within the installation. Nevertheless, these two prime objectives are taken into consideration in the technical observations concerning EMC. These two primary objectives can be implemented concurrently for enhanced EMC of the installed sensitive apparatus or systems without conflict by applying the practices presented in this document and the relevant safety requirements. It is the responsibility of the designer and the installer to select the relevant technique most appropriate to a particular installation.

## 2 Normative references

There are no normative references in this document.

## 3 Terms, definitions, and abbreviated terms

### 3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

**3.1.1**
**bonding**
act of connecting together exposed conductive parts and extraneous conductive parts of equipment, systems, or installations that are at essentially the same potential

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