

Electromagnetic compatibility (EMC) —

Part 6-6: Generic standards — HEMP immunity for indoor equipment

ICS 33.100.10; 33.100.20

National foreword

This British Standard reproduces verbatim IEC 61000-6-6:2003 and implements it as the UK national standard.

The UK participation in its preparation was entrusted by Technical Committee GEL/210, EMC — Policy, to Subcommittee GEL/210/12, EMC — Basic and generic standards, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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Summary of pages

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**Partie 6-6:
Normes génériques –
Immunité contre l'ITEMN-HA pour les appareils
situés à l'intérieur des bâtiments**

Electromagnetic compatibility (EMC) –

**Part 6-6:
Generic standards –
HEMP immunity for indoor equipment**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 6-6: Generic standards – HEMP immunity for indoor equipment

FOREWORD

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International Standard IEC 61000-6-6 has been prepared by subcommittee 77C: High power transient phenomena, of IEC technical committee 77: Electromagnetic compatibility.

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

FDIS	Report on voting
77C/135/FDIS	77C/138/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.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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 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: 61000-6-1).

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 6-6: Generic standards – HEMP immunity for indoor equipment

1 Scope

This part of IEC 61000 sets high-altitude electromagnetic pulse (HEMP) immunity requirements for electrical and electronic equipment intended for use indoors. The indoor HEMP environment depends on the electromagnetic shielding quality of a facility and the level of protection against the conducted environment. This standard is intended for all facility types including residential, commercial, light industrial, hospitals, heavy industrial, power substations and power generation facilities. This standard includes indoor equipment intended to be connected to a low-voltage (1 kV or less) power network, to the telecom network and/or to external antennas.

Immunity test values are based on the 90 % severity levels in IEC 61000-4-25. All telecom lines are assumed to have gas-tube protectors at the point where they enter the building and insulation flashover on low-voltage lines are assumed at three times that of lightning. For signal ports connected to internal cables, severity test levels are based on cables that have a total length of 10 m and a procedure is provided for longer cables.

Large and small indoor equipment are covered by this part of IEC 61000. Small-sized equipment is defined in IEC 61000-4-25 as an object with cubical dimensions of less than $1\text{ m} \times 1\text{ m} \times 1\text{ m}$. Examples of small-sized equipment are rack-mounted equipment and desktop personal computers (PCs). Large equipment includes an apparatus with cubical dimensions equal to or greater than $1\text{ m} \times 1\text{ m} \times 1\text{ m}$.

No dedicated IEC product or product-family immunity standard for HEMP is currently published for indoor equipment. When a relevant dedicated product or product-family immunity standard is developed, it will take precedence over all aspects of this generic standard. It should be noted that the HEMP environment is a very low probability occurrence, and therefore it is not recommended that this generic standard be made mandatory except through agreements between facility owners and equipment manufacturers.

This part of IEC 61000 does not specify safety requirements for equipment, such as protection against shock, insulation coordination, and related dielectric tests. Nevertheless, the immunity tests described in this part of IEC 61000 involve hazardous voltages. High-voltage precautions are necessary to protect the health and safety of test personnel.

2 Normative references

The following referenced documents are indispensable for the application 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 – Chapter 161: Electromagnetic compatibility*

IEC 61000-4-2, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test* – Basic EMC publication

IEC 61000-4-4, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test* – Basic EMC publication

IEC 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test* – Basic EMC publication

IEC 61000-4-11, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measuring techniques – Voltage dips, short interruptions and voltage variations immunity tests* – Basic EMC publication

IEC 61000-4-13, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests* – Basic EMC publication

IEC 61000-4-25, *Electromagnetic compatibility (EMC) – Part 4-25: Testing and measurement techniques – HEMP immunity test methods for equipment and systems* – Basic EMC publication

IEC 61000-6-2, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments*

IEC 61000-6-5, *Electromagnetic compatibility (EMC) – Part 6-5: Generic standards – Immunity for power station and substation environments*

3 General

For the purpose of this part of IEC 61000, the nuclear high-altitude electromagnetic pulse environment consists of two major parts: a radiated environment and a conducted environment. The standard HEMP radiated environment is defined in IEC 61000-2-9 and the conducted environment is defined in IEC 61000-2-10. Both types of environments are classified in IEC 61000-2-11. The conducted environment includes a very intense fast-rising short-duration surge. This transient is short relative to the standard lightning 1,2/50 μ s wave. Thus, equipment with immunity to the HEMP conducted environment is not necessarily immune to the standard lightning current waveform. Similarly, lightning protection will not assure protection against HEMP. However, it would be unwise to protect against HEMP and risk susceptibility to lightning. Therefore, lightning protection in the form of SPDs (see 4.13) on power, telecom, and antenna cables at the building entrance is highly recommended. Lightning protection will not provide adequate HEMP protection but it will usually reduce the peak HEMP overvoltages on long lines.

Immunity to the 1,2/50 μ s surge for additional protection against lightning is required by this generic standard. Also, the immunity requirements for industrial environments (IEC 61000-6-2) are used to establish minimal electrical fast transients (EFT) and 1,2/50 μ s surge test levels to assure immunity to transients in commercial and industrial buildings. If equipment has been qualified for industrial environments to the EFT and 1,2/50 μ s surge test levels specified in Tables 2 to 7, then such qualification is adequate to meet the requirements of this standard for those tests.