

Electromagnetic compatibility (EMC) —

Part 5: Installation and mitigation guidelines —

Section 5. Specification of protective devices for HEMP conducted disturbance.

Basic EMC publication

The European Standard EN 61000-5-5:1996 has the status of a
British Standard

ICS 33.100

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This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 December 1996

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The following BSI references relate to the work on this standard:
Committee reference GEL/210
Draft for comment 92/34648 DC

ISBN 0 580 26381 9

Amendments issued since publication

Amd. No.	Date	Comments

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National foreword

This British Standard has been prepared by Technical Committee GEL/210 and is the English language version of EN 61000-5-5:1996 *Electromagnetic compatibility (EMC) — Part 5: Installation and mitigation guidelines — Section 5: Specification of protective devices for HEMP conducted disturbance. Basic EMC publication* published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 1000-5-5:1996, published by the International Electrotechnical Commission (IEC).

Annexes A, B, C, D and E are for information only.

IEC 1000 has been designated a Basic EMC publication for use in the preparation of dedicated product, product family and generic EMC standards.

IEC 1000 will be published in separate Parts in accordance with the following structure.

- *Part 1: General;*
- *Part 2: Environment;*
- *Part 3: Limits;*
- *Part 4: Testing and measuring techniques;*
- *Part 5: Installation and mitigation guidelines;*
- *Part 6: Generic standards;*
- *Part 9: Miscellaneous.*

Cross-references

Publication referred to	Corresponding British Standard
IEC 50 (161):1990	BS 4727 <i>Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms</i> Part 1 <i>Terms common to power, telecommunications and electronics</i>
HD 588.1 51:1991 (IEC 60-1:1989)	Group 09:1991 <i>Electromagnetic compatibility</i> BS 923 <i>Guide on high-voltage testing techniques</i> Part 1:1990 <i>General</i>
EN 60099-1:1994 (IEC 99-1:1991)	BS EN 60099 <i>Surge arresters</i> BS EN 60099-1:1994 <i>Non-linear resistor type gapped surge arresters for a.c. systems</i>
IEC 617	BS 3939 <i>Graphical symbols for electrical power, telecommunications and electronics diagrams</i>
IEC 1051-1:1991	BS QC 420000:1992 <i>Harmonized system of quality assessment for electronic components. Varistors for use in electronic equipment: generic specification</i>
IEC 1051-2:1991	BS QC 420100:1992 <i>Harmonized system of quality assessment for electronic components. Varistors for use in electronic equipment. Sectional specification for surge suppression varistors</i>
CISPR 17:1981	BS 6299:1982 <i>Methods of measurement of the suppression characteristics of passive radio interference filters and suppression components</i>

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, the EN title page, pages 2 to 23, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

ICS 33.100

Descriptors: Environments, pulses, electromagnetism, explosions, nuclear reactivity, nuclear energy, electromagnetic compatibility, electromagnetic interference, protection devices

English version

Electromagnetic compatibility (EMC)
Part 5: Installation and mitigation guidelines
Section 5: Specification of protective devices for HEMP
conducted disturbance
Basic EMC Publication

(IEC 1000-5-5:1996)

Compatibilité électromagnétique (CEM)
Partie 5: Guides d'installation et d'atténuation
Secton 5: Spécification des dispositifs de
protection pour perturbations conduites
IEMN-HA
Publication fondamentale en CEM
(CEI 1000-5-5:1996)

Elektromagnetische Verträglichkeit (EMV)
Teil 5: Installationsrichtlinien und
Abhilfemaßnahmen
Hauptabschnitt 5: Festlegung von
Schutzeinrichtungen gegen leitungsgeführte
HEMP-Störgrößen
EMV-Grundnorm
(IEC 1000-5-5:1996)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 77C/29/FDIS, future edition 1 of IEC 1000-5-5, prepared by SC 77C, Immunity to high altitude nuclear electromagnetic pulse (HEMP), of IEC TC 77, Electromagnetic compatibility, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61000-5-5 on 1996-03-05.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1996-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-12-01

Annexes designated “normative” are part of the body of the standard.

Annexes designated “informative” are given for information only.

In this standard, annex ZA is normative and annexes A, B, C, D and E are informative.

Annex ZA has been added by CENELEC.

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Introduction

The IEC has initiated the preparation of standardized methods to protect civilian society from the effects of high altitude nuclear bursts. Such effects could disrupt systems for communications, electric power, information technology, etc.

This section of IEC 1000-5 is part of a complete set of standards that covers the entire category of immunity to high altitude nuclear electromagnetic pulse. The appropriate acronym is either HA-NEMP or more simply HEMP.

The application of this section is, however, not dependent on access to other sections and parts of the IEC 1000, except for those specifically referred to.

IEC/DIS 1000-4-24¹⁾ indicates the projects running in parallel with this work.

1 Scope

This part of IEC 1000-5 defines how protective devices for conducted disturbance proposed for HEMP protection shall be specified. It is intended to be used for the harmonization of existing or future specifications issued by protective device manufacturers, electronic equipment manufacturers, administrations and other ultimate buyers. Performance requirements shall be given in future IEC documents.

This section covers protective devices currently being used for protection against induced HEMP transients on signal and low voltage power lines (nominal voltage up to 1 kV a.c.).

General information can be applied also to high voltage lines. However, in these cases, the additional requirements for the protection levels of existing lightning arresters (especially gapless MO-arresters) are under consideration.

In general, HEMP-relevant parameters, i.e. parameters related to very fast changes of electromagnetic field, voltage (u) and current (i) as a function of time, are of interest. For basic specifications, reference is made to other relevant standards (see annex E) dealing with phenomena other than HEMP. When such standards do not adequately consider the requirements of modern electronics, additional specifications, modifications or extensions based on non-HEMP-relevant standards are defined.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this section of IEC 1000-5. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this section of IEC 1000-5 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50 (161):1990, *International Electrotechnical Vocabulary (IEV) — Chapter 161: Electromagnetic compatibility*.

IEC 60-1:1989, *High-voltage test techniques — Part 1: General definitions and test requirements*.

IEC 99-1:1991, *Surge arresters — Part 1: Non-linear resistor type gapped surge arresters for a.c. systems*.

IEC 617, *Graphical symbols for diagrams*.

IEC 939-1:1988, *Complete filter units for radio interference suppression — Part 1: Generic specification*.

IEC 939-2:1988, *Complete filter units for radio interference suppression — Part 2: Sectional specification — Selection of methods of test and general requirements*.

IEC 1051-1:1991, *Varistors for use in electronic equipment — Part 1: Generic specification*.

IEC 1051-2:1991, *Varistors for use in electronic equipment — Part 2: Sectional specification for surge suppression varistors*.

CISPR 17:1991, *Methods of measurement of the suppression characteristics of passive radio interference filters and suppression components*.

3 Definitions

For the purpose of this section of IEC 1000-5, the following definitions apply:

3.1

avalanche-junction transient voltage suppressor (protective diode)

a semiconductor diode that suppresses transient voltages in either the forward or reverse direction of its voltage-current characteristic

3.2

clamping voltage

the peak voltage across the device terminals measured under conditions of a specified current waveform

¹⁾ IEC/DIS 1000-4-24: *Electromagnetic compatibility (EMC) — Part 4: Testing and measurement techniques — Section 24: Test methods for protective devices for HEMP conducted disturbance* (at present at the stage of final draft international standard)