BRITISH STANDARD

BS EN
61000-6-4:2001

Electromagnetic compatibility (EMC) —

Part 6-4: Generic standards — Emission standard for industrial environments

The European Standard EN 61000-6-4:2001 has the status of a British Standard

ICS 33.100.10

National foreword

This British Standard is the official English language version of EN 61000-6-4:2001. It was derived by CENELEC from IEC 61000-6-4:1997. It supersedes BS EN 50081-2:1994 which will be withdrawn on 2004-07-01.

The CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by common modification tags C C

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 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.

From 1 January 1997, all IEC publications have the number 60000 added to the old number. For instance, IEC 27-1 has been numbered as IEC 60027-1. for a period of time during the change over from one numbering system to the other, publications may contain identifiers from both systems.

Cross-references

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

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This British Standard, having been prepared under the direction of the Electrotechnical Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 23 October 2001

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 9, and a back cover.

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EUROPEAN STANDARD **EN 61000-6-4**

NORME EUROPÉENNE

EUROPÄISCHE NORM October 2001

ICS 33.100

Supersedes EN 50081-2:1993

English version

Electromagnetic compatibility (EMC)
Part 6-4: Generic standards -
Emission standard for industrial environments
(IEC 61000-6-4:1997, modified)

Compatibilité électromagnétique (CEM)
Partie 6-4: Normes génériques -
Norme sur l'émission pour les
environnements industriels
(CEI 61000-6-4:1997, modifiée)

Elektromagnetische Verträglichkeit (EMV)
Teil 6-4: Fachgrundnormen -
Fachgrundnorm Störaussendung -
Industriebereich
(IEC 61000-6-4:1997, modifiziert)

This European Standard was approved by CENELEC on 2001-07-03. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 61000-6-4:2001 E

Foreword

The text of the International Standard IEC 61000-6-4:1997, prepared by CISPR, International special committee on radio interference, together with the common modifications prepared by the Technical Committee CENELEC TC 210, Electromagnetic compatibility (EDC), was submitted to the formal vote and was approved by CENELEC as EN 61000-6-4 on 2001-07-03.

This European Standard supersedes EN 50081-2:1993.

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)	2002-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2004-07-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.
Annex ZA has been added by CENELEC.

Endorsemenn nonice

The text of the International Standard IEC 61000-6-4:1997 was approved by CENELEC as a European Standard with agreed common modifications.

CONTENTS

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 6: Generic standards – Section 4: Emission standard for industrial environments

1 Scope

This International Standard for emission requirements applies to electrical and electronic apparatus intended for use in the industrial environment, as described in clause 5, for which no dedicated product or product-family emission standard exists. Apparatus designed to radiate electromagnetic energy for radio communication purposes is excluded from this standard.

Disturbances in the frequency range 0 Hz to 400 GHz are covered. Fault conditions of apparatus are not taken into account.

Where a relevant dedicated product or product-family EMC emission standard exists, it shall take precedence over all aspects of this generic standard.

The environments encompassed by this standard are industrial, both indoor and outdoor. Apparatus covered by this standard is not intended for connection to a public mains network but is intended to be connected to a power network supplied from a high or medium-voltage transformer dedicated for the supply of an installation feeding manufacturing or similar plant. This standard applies to apparatus intended to operate in industrial locations or in proximity to industrial power installations.

[C] [C]

2 Normative references

[C] NOTES

Normative references to international publications are listed in annex ZA (normative) [C]

3 Objective

The objective of this standard is to define limits and test methods for apparatus defined in the scope, in relation to electromagnetic emissions which may cause interference in other apparatus.

These emission limits represent essential electromagnetic compatibility requirements and have been selected to ensure that the disturbances generated by the apparatus operated normally at industrial locations do not exceed a level which could prevent other apparatus from operating as intended.

Test requirements are specified for each port considered.

NOTES

1 The limits in this standard may not, however, provide full protection against interference to radio and television reception when the apparatus is used closer than 30 m to the receiving antenna(e).

2 In special cases, for instance when highly susceptible apparatus is being used in proximity, additional mitigation measures may have to be employed to reduce the electromagnetic emission further below the specified levels.

4 Definitions

Definitions related to EMC and to relevant phenomena may be found in the EEC Directive, [C] in IEC 60050-161 and in IEC and CISPR publications. The definitions stated in the [C] Directive (89/336/EEC) take precedence.

The following particular definitions are used in this standard:

port: Particular interface of the specified apparatus with the external electromagnetic environment (see figure 1).

enclosure port: The physical boundary of the apparatus through which electromagnetic fields may radiate or impinge.

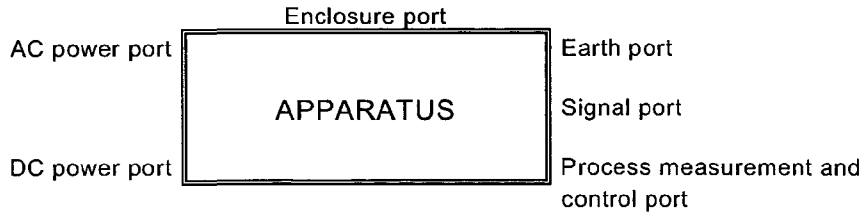

Figure 1 – Examples of ports

5 Industrial locations

Industrial locations are characterized by the existence of one or more of the following conditions:

- industrial, scientific and medical (ISM)[1)] apparatus is present;
- heavy inductive or capacitive loads are frequently switched;
- currents and associated magnetic fields are high.

These are the major contributors to the industrial electromagnetic environment and as such distinguish the industrial from other environments.

6 Conditions during measurement

The measurements shall be made in the operating mode producing the largest emission in the frequency band being investigated consistent with normal applications.

An attempt shall be made to maximize the emission by varying the configuration and the mode of operation of the test sample in accordance with the basic standard.

If the apparatus is part of a system, or can be connected to auxiliary apparatus, then the apparatus shall be tested while connected to the minimum configuration of auxiliary apparatus necessary to exercise the ports in a similar manner to that described in CISPR 22.

The configuration and mode of operation during measurement shall be precisely noted in the test report.

If the apparatus has a large number of similar ports or ports with many similar connections, then a sufficient number shall be selected to simulate actual operating conditions and to ensure that all the different types of termination are covered.

The tests shall be carried out within the specified operating conditions for the apparatus and at its rated supply voltage, unless otherwise indicated in the basic standard.

7 Documentation for the purchaser/user

7.1 *Documentation which shall be supplied to the purchaser/user*

The apparatus shall be supplied with a written warning indicating that the apparatus shall not be used in the residential, commercial and light-industrial environment unless the apparatus also conforms to the relevant standard (CISPR/IEC 1000-6-3).

The purchaser/user shall be informed if special measures have to be taken to achieve compliance, e.g. the use of shielded or special cables.

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1) As defined in CISPR 11, ISM class A.

7.2 *Documentation which shall be available to the purchaser/user upon request*

A list of auxiliary apparatuses which together with the apparatus comply with the emission requirements.

8 Applicability

The measurements in this standard are made on the relevant ports of the apparatus in accordance with table 1. Measurements shall only be carried out where the relevant ports exist.

It may be determined from consideration of the electrical characteristics and usage of a particular apparatus that some of the measurements are inappropriate and therefore unnecessary. In such a case it is required that the decision not to measure be recorded in the test report.

9 Emission limits

The emission limits for apparatus covered by this standard are given on a port-by-port basis.

Measurements shall be performed in well-defined and reproducible conditions for each type of disturbance.

The description of the test, the test methods, and the test set-up are given in basic standards which are referred to in table 1.

The contents of these basic standards are not repeated here; however, modifications or additional information needed for the practical application of the tests are given in this standard.

NOTE – The term "basic standards" has been used for want of a more suitable term. The standards referenced (CISPR 11, CISPR 14, CISPR 22) are stand-alone product-family standards. The reference to "basic standards" is intended to be limited to those parts of the standard that give the description of the test, the test methods and the test set-up.

Table 1 – Emission

Port	Frequency range	Limits	Basic standard	Applicability note	Remarks
Enclosure	30 MHz – 230 MHz	30 dB(μV/m) quasi-peak, measured at 30 m distance	CISPR 11	See note 1	May be measured at 10 m distance using the limits increased by 10 dB if the provisions of CISPR 11 are met.
	230 MHz – 1000 MHz	37 dB(μV/m) quasi-peak, measured at 30 m distance			
AC mains	0,15 MHz – 0,50 MHz	79 dB(μV) quasi-peak 66 dB(μV) average	CISPR 11	See note 2 See note 3	
	0,50 MHz – 5 MHz	73 dB(μV) quasi-peak 60 dB(μV) average			
	5 MHz – 30 MHz	73 dB(μV) quasi-peak 60 dB(μV) average			

NOTES

1 *In situ* measurements are excluded from this standard.

2 Impulse noise (clicks) which occur less than five times per minute is not considered. For clicks appearing more often than 30 times per minute the limits apply. For clicks appearing between 5 and 30 times per minute, a relaxation of the limits is allowed of 20 log 30/N dB (where N is the number of clicks per minute). Criteria for separated clicks may be found in CISPR 14.

3 Applies only to apparatus operating at less than 1000 V r.m.s. a.c.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter.

When there is an undated reference to a generic, product or product-family standard which has been listed in the OJEC, then either the latest edition or (if the date of cessation of presumption of conformity associated with the latest edition has not expired) the superseded edition may be applied. After the date of cessation of presumption of conformity, the latest edition shall be applied.

When there is an undated reference to a basic standard, then either the latest edition or (if the date of withdrawal of conflicting standards associated with the latest edition has not expired) the superseded edition may be applied. After the date of withdrawal, the latest edition shall be applied.

Publication	Title	EN/HD
IEC 60050-161	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-
IEC 61000-6-3	Electromagnetic compatibility (EMC) Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments	EN 61000-6-3
CISPR 11	Industrial, scientific and medical (ISM) radio-frequency equipment – Radio disturbance characteristics – Limits and methods of measurement	EN 55011
CISPR 14-1	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission	EN 55014-1
CISPR 22	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	EN 55022

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