SLOVENSKI STANDARD
SIST EN 50082-2:1997

01-marec-1997

Elektromagnetna združljivost - Splošni standard za odpornost – 2. del: Industrijsko okolje

Electromagnetic compatibility - Generic immunity standard -- Part 2: Industrial environment

Elektromagnetische Verträglichkeit - Fachgrundnorm Störfestigkeit -- Teil 2: Industriebereich

Compatibilité électromagnétique - Norme générique immunité -- Partie 2: Environnement industriel

Ta slovenski standard je istoveten z: **EN 50082-2:1995**

ICS:

33.100.20	Imunost	Immunity

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EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 50082-2

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ICS 29.020

Descriptors: Radio disturbances, electromagnetic compatibility, tests, equipment protection

English version

Electromagnetic compatibility
Generic immunity standard
Part 2: Industrial environment

Compatibilité électromagnétique
Norme générique immunité
Partie 2: Environnement industriel

Elektromagnetische Verträglichkeit
Fachgrundnorm Störfestigkeit
Teil 2: Industriebereich

This European Standard was approved by CENELEC on 1994-12-06. 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, 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

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 110, EMC.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50082-2 on 1994-12-06.

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) 1996-03-15
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-03-15

GENERIC IMMUNITY STANDARD

1 Scope

This standard for EMC immunity 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 immunity standard exists. Apparatus designed to radiate electromagnetic energy for radio communications purposes as defined by the ITU are excluded from this standard.

Immunity requirements in the frequency range 0 Hz to 400 GHz are covered.

Where a relevant dedicated product or product-family EMC immunity 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. This standard also applies to battery operated apparatus intended to be used in the locations described in Clause 5.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC Publication	Title	EN/HD
50(161)	International Electrotechnical Vocabulary Chapter 161: Electromagnetic compatibility	-
1000	Electromagnetic compatibility (EMC)	
1000-4-2	Part 4: Testing and measurement techniques Section 2: Electrostatic discharge immunity test	EN 61000-4-2
1000-4-4	Part 4: Testing and measurement techniques Section 4: Electrical fast transient/burst immunity test	EN 61000-4-4
1000-4-5	Part 4: Testing and measurement techniques Section 5: Surge immunity test	EN 61000-4-5

IEC Publication	Title	EN/HD
1000-4-8	Part 4: Testing and measurement techniques Section 8: Power frequency magnetic field immunity test	EN 61000-4-8
1000-4-11	Part 4: Testing and measurement techniques Section 11: Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11
CISPR 11 (mod)	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment	EN 55011
CISPR 22	Limits and methods of measurement of radio interference characteristics of information technology equipment	EN 55022
-	Radiated, radio-frequency electromagnetic field - immunity test	ENV 50140
-	Conducted disturbances induced by radio-frequency fields - immunity test	ENV 50141
-	Radiated electromagnetic field from digital radio telephones - Immunity test	ENV 50204

3 Objective

The objective of this standard is to define the immunity test requirements for apparatus defined in the scope in relation to continuous and transient, conducted and radiated disturbances including electrostatic discharges.

These test requirements represent essential electromagnetic compatibility immunity requirements and have been selected so as to ensure an adequate level of immunity for apparatus at industrial locations. The levels do not however cover extreme cases which may occur with an extremely low probability of occurrence in any location.

Test requirements are specified for each port considered.

NOTE 1: Safety considerations are not covered in this standard.

NOTE 2: In special cases situations will arise where the level of disturbances may exceed the levels specified in this standard e.g. where an apparatus is installed in proximity to ISM equipment as defined in EN 55011 or where a hand-held transmitter is used in close proximity to an apparatus. In these instances special mitigation measures may have to be employed.

4 Definitions

Definitions related to EMC and to relevant phenomena may be found in the EEC Directive, in chapter 161 of the IEV(IEC 50) and in CISPR Publications. The definitions stated in the EEC 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.

cable port: A point at which a conductor or a cable is connected to the apparatus. Examples are signal, control and power ports.

public mains network: Electricity lines to which all categories of consumers have access and which are operated by a supply or distribution undertaking for the purpose of supplying electrical energy.

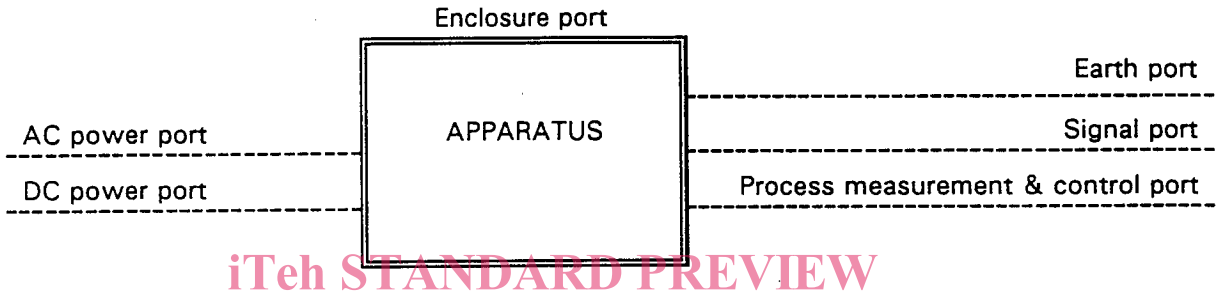

Figure 1

5 Description of locations

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

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

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

> **Warning.** In order to allow normal market equipment to operate in proximity to ISM equipment the external radiation from ISM equipment may have to be limited or special mitigation measures taken.

6 Performance criteria

The variety and the diversity of the apparatus within the scope of this document makes it impossible to define precise criteria for the evaluation of the immunity test results.

Apparatus shall not become dangerous or unsafe as a result of the application of the tests defined in this standard.

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[1] as defined in EN 55011, ISM class A.

A functional description and a definition of performance criteria, during or as a consequence of the EMC testing, shall be provided by the manufacturer and noted in the test report, based on the following criteria:

Performance criterion A: The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer then either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer then either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criterion C: Temporary loss of function is allowed, provided the loss of function is self recoverable or can be restored by the operation of the controls.

7 Conditions during testing

The tests shall be made in the most susceptible operating mode in the frequency bands being investigated consistent with normal applications. The configuration of the test sample shall be varied to achieve maximum susceptibility.

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 representative configuration of auxiliary apparatus necessary to exercise the ports in a similar manner to that described in EN 55022.

In cases where a manufacturers specification specifically requires external protection devices or measures which are clearly specified in the users manual, then the test requirements of this standard shall be applied with the external protection devices or measures in place unless the manufacturer specifies that for a particular test or tests they are not required.

The configuration and mode of operation during the tests shall be precisely noted in the test report. It is not always possible to test every function of the apparatus, in such cases the most critical mode of operation shall be selected.

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 operating ranges of temperature, humidity and pressure specified for the product and at the rated supply voltage, unless otherwise indicated in the basic standard.

8 Product documentation

If the manufacturer is using his own specification for an acceptable level of EMC performance or degradation of EMC performance during or after the testing required by this standard, then this specification shall be made available upon request.

9 Applicability

The application of tests for evaluation of immunity shall depend on the particular apparatus, its configuration, its ports, its technology and its operating conditions.

Tests are applied to the relevant ports of the apparatus according to tables 1 to 6. Tests 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 tests are inappropriate and therefore unnecessary. In such a case it is required that the decision and justification not to test shall be recorded in the test report.

The industrial environment may be changed by special mitigation measures. Where such measures can be shown to produce an electromagnetic environment equivalent to the residential, commercial or light-industrial environment then EN 50082-1 or a relevant product standard shall be applied. The apparatus together with its installation shall however have essential electromagnetic compatibility.

10 Immunity test requirements

The immunity test requirements for apparatus covered by this standard are given on a port by port basis.

Tests shall be conducted in a well-defined and reproducible manner.

The tests shall be carried out as single tests in sequence. The sequence of testing is optional.

The description of the test, the test generator, the test methods, and the test set-up are given in the basic standards which are referred to in tables 1 to 6 and tables A.1 to A.4.

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.