

SLOVENSKI STANDARD

SIST EN 50270:2007

01-november-2007

Nadomešča:
SIST EN 50270:2000

Elektromagnetna združljivost - Električne naprave za odkrivanje in merjenje vnetljivih plinov, strupenih plinov ali kisika

Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen

Elektromagnetische Verträglichkeit - Elektrische Geräte für die Detektion und Messung von brennbaren Gasen, toxischen Gasen oder Sauerstoff

Compatibilité électromagnétique - Appareils de détection et de mesure de gaz combustible, de gaz toxique et d'oxygène

Ta slovenski standard je istoveten z: **EN 50270:2006**

ICS:

13.320	Alarmni in opozorilni sistemi	Alarm and warning systems
33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50270

November 2006

ICS 13.320; 19.080; 33.100

Supersedes EN 50270:1999

English version

**Electromagnetic compatibility -
Electrical apparatus for the detection and measurement
of combustible gases, toxic gases or oxygen**

Compatibilité électromagnétique -
Appareils de détection et de mesure
de gaz combustible, de gaz toxique
et d'oxygène

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und Messung von brennbaren Gasen,
toxischen Gasen oder Sauerstoff

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This European Standard was approved by CENELEC on 2006-06-01. 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, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the 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

Foreword

This European Standard was prepared by SC 31-9, Electrical apparatus for the detection and measurement of combustible gases to be used in industrial and commercial potentially explosive atmospheres, of Technical Committee CENELEC TC 31, Electrical apparatus for explosive atmospheres.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50270 on 2006-06-01.

This European Standard supersedes EN 50270:1999.

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) 2007-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-06-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 89/336/EEC. See Annex ZZ.

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1 Scope

This European Standard specifies requirements for the electromagnetic compatibility (EMC) for electrical apparatus for the detection and measurement of combustible gases, toxic ¹⁾ gases or oxygen. This standard applies to apparatus intended for use in residential, commercial and light-industrial environments as well as to apparatus intended for use in industrial environments. The apparatus may be AC-, DC- or battery powered.

This European Standard is also applicable to apparatus which is intended for use in hazardous areas which may contain explosive or potentially explosive atmospheres. It covers only normal operation and does not cover safety requirements related to EMC phenomena.

This standard specifies requirements for immunity tests in relation to continuous and transient, conducted and radiated disturbances including electrostatic discharges and also for emission tests. The test requirements are specified for each port considered.

These requirements have been selected to ensure an adequate level of compatibility for apparatus at the appropriate locations. The levels do not, however, cover extreme cases, which may occur at any location, but with an extremely low probability of occurrence.

NOTE 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 industrial, scientific or medical (ISM) equipment as specified 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.

Apparatus falling within the scope of this European Standard is classified as follows by the following types.

- Type 1: apparatus intended for use in residential, commercial and light-industrial environments, as described in EN 61000-6-1 and EN 61000-6-3.
- Type 2: apparatus intended for use in industrial environments, as described in EN 61000-6-2 and EN 61000-6-4.

This European Standard does not apply to any of the following:

- apparatus intended for the detection of dusts or mists in air;
- scientific or laboratory based apparatus used only for analysis or measurement;
- apparatus used exclusively for process measurement purposes;
- apparatus for medical purposes;
- apparatus intended for the direct measurement of automotive exhaust gases.

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.

EN 45544 series	Workplace atmospheres - Electrical apparatus used for direct detection and direct concentration measurement of toxic gases and vapours
EN 50020	Electrical apparatus for potentially explosive atmospheres Intrinsic safety 'i'
EN 50104	Electrical apparatus for the detection and measurement of oxygen - Performance requirements and test methods
EN 50194	Electrical apparatus for the detection of combustible gases in domestic premises - Test methods and performance requirements
EN 50241 series	Specification for open path apparatus for the detection of combustible or toxic gases and vapours

¹⁾ The word 'toxic' is used in accordance with its dictionary definition and includes 'harmful', 'toxic' and 'very toxic' meanings.

EN 50291	Electrical apparatus for the detection of carbon monoxide in domestic premises: Test methods and performance requirements
EN 50379 Series	Specification for portable electrical apparatus designed to measure combustion flue gas parameters of heating appliances
EN 55011	Industrial, scientific and medical (ISM) radio-frequency equipment - Radiodisturbance characteristics - Limits and methods of measurement (CISPR 11, mod.)
EN 55022	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (CISPR 22, mod.)
EN 55024:1998	Information technology equipment - Immunity characteristics - Limits and methods of measurement (CISPR 24:1997, mod.)
EN 61000-4-2:1995	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measuring techniques - Electrostatic discharge immunity test (IEC 61000-4-2:1995)
EN 61000-4-3:2006	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test (IEC 61000-4-3:2006)
EN 61000-4-4:2004	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test (IEC 61000-4-4:2004)
EN 61000-4-5:2006	Electromagnetic Compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test (IEC 61000-4-5:2005)
EN 61000-4-6:1996	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measuring techniques - Immunity to conducted disturbances, induced by radio frequency fields (IEC 61000-4-6:1996)
EN 61000-4-8:1993	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measuring techniques - Power-frequency magnetic field immunity test (IEC 61000-4-8:1993)
EN 61000-4-11:2004	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measuring techniques - Voltage dips, short interruptions and voltage variations immunity tests (IEC 61000-4-11:2004)
EN 61000-6-1:2001	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments (IEC 61000-6-1:1997, mod.)
EN 61000-6-2:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2:2005)
EN 61000-6-3:2001	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments (CISPR/IEC 61000-6-3:1996, mod.)
EN 61000-6-4:2001	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:1997, mod.)
EN 61779 Series	Electrical apparatus for the detection and measurement of flammable gases (IEC 61779 series)
IEC 60050 -161	International Electrotechnical Vocabulary Chapter 161: Electromagnetic compatibility

3 Definitions

Definitions related to EMC and to relevant phenomena may be found in the EEC Directives (89/336/EEC and 2004/108/EC), in Chapter 161 of IEC 60050 and in CISPR Publications. The definitions stated in the EEC Directives take precedence.

For the purposes of this standard the following definitions apply.

3.1

port

particular interface of the specified apparatus with the external electromagnetic environment (see Figure 1)

3.2

enclosure port

physical boundary of the apparatus through which electromagnetic fields may radiate or impinge on

3.3

signal port

port at which a conductor or cable intended to carry signals is connected to the apparatus

NOTE Examples are analog inputs, outputs and control lines; data busses; communication networks etc.

3.4

power port

port at which a conductor or cable carrying the primary electrical power needed for the operation (functioning) of an apparatus or associated apparatus is connected to the apparatus

3.5

intrinsically safe circuit

circuit in which any spark or any thermal effect produced in the conditions as specified in EN 50020, which include normal operation and specified fault conditions, is not capable of causing ignition of a given explosive gas atmosphere

3.6

intrinsically safe port

port connected to an intrinsically safe circuit

3.7

sensor

assembly in which the sensing element is housed and which may contain associated circuit components

3.8

remote sensor

sensor which is not integral with the main body of the apparatus

3.9

potentially explosive atmosphere

an atmosphere which could become explosive

3.10

safety barrier

a device for obtaining intrinsic safety of electrical apparatus for potentially explosive atmospheres (see 8.1 of EN 50020)

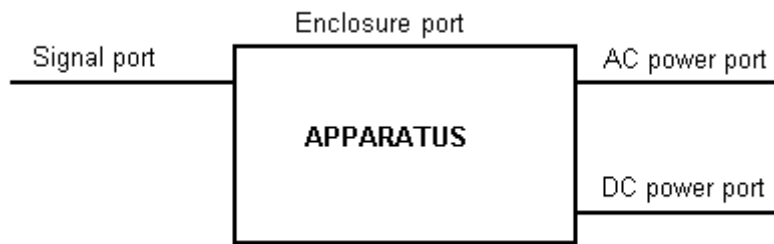


Figure 1 - Examples of ports

4 Immunity tests

4.1 Test conditions

4.1.1 The description of the tests, the test generator, the test methods, and the test set-up are given in the basic standards which are referenced in Tables 1 to 4.

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

For portable battery powered apparatus which may also be operated when connected to an external power supply both operational modes (battery powered as well as externally supplied) shall be tested.

4.1.3 In cases where a manufacturer's specification requires external protection devices or measures which are clearly specified in the users manual, the test requirements of this standard shall be applied with the external protection devices or measures in use.

4.1.4 The configuration and mode of operation during the tests shall be precisely noted in the test report. If the apparatus has different sensor types (e.g. electrochemical sensors or catalytic sensors) the apparatus shall be tested with each type of sensor. If the apparatus has more than one measuring range for a particular sensor the most sensitive specified by the manufacturer shall be tested. If the apparatus is designed for the detection of a variety of gases where the target gas can be changed by changing the sensor of a given type only (e.g. electrochemical sensors) a representative sensor shall be tested.

4.1.5 The tests shall be applied to the relevant ports of the apparatus according to Tables 1 to 4. The tests shall only be carried out where the relevant ports exist.

If the apparatus has a large number of similar ports or ports with 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.

Connections between e.g. remote sensors or hand held terminals with the respective apparatus shall be considered as I/O lines respectively.

4.1.6 If a system consists of a central unit and additional separate equipment (e.g. remote sensors or printer) the control unit and the separate equipment may be tested separately if possible.

4.1.7 The tests shall be carried out under the normal operating conditions for temperature, humidity and pressure of the appropriate product standards and at the rated supply voltage, unless otherwise indicated in Tables 1 to 4.

4.1.8 The tests shall be performed with the apparatus showing a reading at the standard test gas concentrations. The alarm set points shall be set at the standard test gas concentrations minus the values given in Table 5 for the performance requirements, so that the alarm messages are given, if applicable.