ELEKTROMAGNETILINE ÜHILDUVUS. ELEKTRISEADMED PÕLEVATE GAASIDE, TOKSILISTE GAASIDE JA HAPNIKU AVASTAMISEKS JA MÕÕTMISEKS

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

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

See Eesti standard EVS-EN 50270:2015 sisaldab Euroopa standardi EN 50270:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 50270:2015 consists of the English text of the European standard EN 50270:2015.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 16.01.2015.	Date of Availability of the European standard is 16.01.2015.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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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

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

This European Standard was approved by CENELEC on 2014-10-20. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre 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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Contents

Foreword

This document (EN 50270:2015) has been prepared by CLC/SC 31-9 "Electrical apparatus for the detection and measurement of combustible gases to be used in industrial and commercial potentially explosive atmospheres" of CLC/TC 31, "Electrical apparatus for explosive atmospheres" and by CLC/TC 216 "Gas detectors".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2015-10-20
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2017-10-20

This document supersedes EN 50270:2006.

EN 50270:2015 includes the following significant technical changes with respect to EN 50270:2006:

– requirements updated according to EN 61326–1:2013;

– aspects related to functional safety considered;

– several requirements of EN 61326–3–2 implemented;

– the hierarchical level between criteria B and C re-inserted by modifying the requirements for B;

– Tables 1 to 4 updated according to above mentioned points;

– Table 5 modified according to new and updated performance standards;

– Table 5 now includes also the requirements for criterion B.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

1 Scope

This European Standard specifies requirements for the electromagnetic compatibility (EMC) for electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen which are subject to the performance standards for gas detection apparatus, for example EN 45544 (all parts), EN 50104, EN 50194 (all parts), EN 50291 (all parts), EN 50379 (all parts), EN 50543, EN 50545-1, EN 60079-29-1 or EN 60079-29-4.

NOTE For the purpose of this standard the word ‘toxic’ covers ‘very toxic’, ‘toxic’, ‘harmful’, ‘corrosive‘, ‘irritating‘, ‘sensitising‘, ‘carcinogenic‘, ‘mutagenic‘ and ‘teratogenic‘.

This European 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 is a product standard which is based on the product family standard EN 61326-1. This product standard takes precedence over the product family standard and over generic standards.

This standard applies to electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen that include functions specified by the manufacturer as being safety functions and can include functions specified as not being safety functions.

All performance standards for the detection and measurement of combustible gases, toxic gases or oxygen include the minimum requirements for functional safety specified in EN 50271. There are also gas detectors and gas detection systems which are intended to be used with safety integrity levels SIL 1 to SIL 3 according to EN 50402 and EN 61508 (all parts). For functional safety in industrial applications, this standard has taken into account those aspects of EN 61326–3–2 relating to the measuring and warning function of the apparatus defined as safety function.

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.

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.

Apparatus of type 1 where the manufacturer claims a safety integrity level should be considered as type 2 apparatus with regard to immunity requirements.

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 used for breath alcohol measurement
- apparatus intended for the direct measurement of automotive exhaust gases.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 45544-1, *Workplace atmospheres - Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours - Part 1: General requirements and test methods*

EN 50271, *Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen - Requirements and tests for apparatus using software and/or digital technologies*

EN 50291-1, *Electrical apparatus for the detection of carbon monoxide in domestic premises - Part 1: Test methods and performance requirements*

EN 50291-2, *Electrical apparatus for the detection of carbon monoxide in domestic premises - Part 2: Electrical apparatus for continuous operation in a fixed installation in recreational vehicles and similar premises including recreational craft - Additional test methods and performance requirements*

EN 50402, *Electrical apparatus for the detection and measurement of combustible or toxic gases or vapours or of oxygen - Requirements on the functional safety of fixed gas detection systems*

EN 50545-1, *Electrical apparatus for the detection and measurement of toxic and combustible gases in car parks and tunnels - Part 1: General performance requirements and test methods for the detection and measurement of carbon monoxide and nitrogen oxides*

EN 60079-11:2012, *Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" (IEC 60079-11:2011)*

EN 61000-4-2, *Electromagnetic compatibility (EMC) - Part 4-2: Testing and measuring techniques - Electrostatic discharge immunity test (IEC 61000-4-2)*

EN 61000-4-3:2006 + A1:2008 + A2:2010, *Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test (IEC 61000-4-3:2006 A1:2007 + A2:2010)*

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

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, *Electromagnetic compatibility (EMC) - Part 4-6: Testing and measuring techniques - Immunity to conducted disturbances, induced by radio frequency fields (IEC 61000-4-6)*

EN 61000-4-8, *Electromagnetic compatibility (EMC) - Part 4-8: Testing and measuring techniques -: Power-frequency magnetic field immunity test (IEC 61000-4-8)*

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

EN 61000-4-29, *Electromagnetic compatibility (EMC) - Part 4-29: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests (IEC 61000-4-29)*

EN 61000-6-1, *Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments (IEC 61000-6-1)*

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

EN 61000-6-3, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3)*

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

EN 61326-3-2:2008, *Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 3-2: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) - Industrial applications with specified electromagnetic environment (IEC 61326-3-2:2008)*

EN 61508-1, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1: General requirements (IEC 61508-1)*

EN 61508-2, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems (IEC 61508-2)*

EN 61508-3, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3: Software requirements (IEC 61508-3)*

EN 61508-4, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4: Definitions and abbreviations (IEC 61508-4)*

IEC 60050-161, *International Electrotechnical Vocabulary - Chapter 161: Electromagnetic compatibility*

3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply plus those found in IEC 60050-161.

3.1
Type 1 apparatus
apparatus intended for use in residential, commercial and light-industrial environments, as described in EN 61000-6-1 and EN 61000-6-3

3.2
Type 2 apparatus
apparatus intended for use in industrial environments, as described in EN 61000-6-2 and EN 61000-6-4

3.3
port
particular interface of the specified apparatus with the external electromagnetic environment (see Figure 1)

3.4
enclosure port
physical boundary of the apparatus through which electromagnetic fields may radiate or impinge on

3.5
signal port
port at which a conductor or cable intended to carry signals is connected to the apparatus

Note 1 to entry: Examples are analog inputs, outputs and control lines; data busses; communication networks etc.

Note 2 to entry: Within this document, ports intended to be connected with earth potential for functional reasons (functional earth ports) are considered as I/O ports.

3.6
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

3.7
intrinsically safe circuit
circuit in which any spark or any thermal effect produced in the conditions as specified in EN 60079-11, which include normal operation and specified fault conditions, is not capable of causing ignition of a given explosive atmosphere