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Utrustning för industriellt, vetenskapligt och medicinskt bruk (ISM-utrustning) – Radiostörningar – Gränsvärden och mätmetoder

Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement

Som svensk standard gäller europastandarden EN 55011:2009. Den svenska standarden innehåller den officiella engelska språkversionen av EN 55011:2009.

Nationellt förord

Europastandarden EN 55011:2009

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- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **CISPR 11, Fifth edition, 2009 - Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement**

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ICS 33.100.10

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English version

**Industrial, scientific and medical equipment -
Radio-frequency disturbance characteristics -
Limits and methods of measurement**
(CISPR 11:2009, modified)

Appareils industriels,
scientifiques et médicaux -
Caractéristiques
des perturbations radioélectriques -
Limites et méthodes de mesure
(CISPR 11:2009, modifiée)

Industrielle, wissenschaftliche
und medizinische Geräte -
Funkstörungen -
Grenzwerte und Messverfahren
(CISPR 11:2009, modifiziert)

This European Standard was approved by CENELEC on 2009-09-01. 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, Bulgaria, 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: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document CISPR/B/478/FDIS, future edition 5 of CISPR 11, prepared by CISPR SC B, Interference relating to industrial, scientific and medical radio-frequency apparatus, to other (heavy) industrial equipment, to overhead power lines, to high voltage equipment and to electric traction, was submitted to the IEC-CENELEC parallel vote.

A draft amendment (FprAA) covering common modifications towards the future edition 5 of CISPR 11 (CISPR/B/478/FDIS), prepared by the Technical Committee CENELEC TC 210, Electromagnetic compatibility (EMC), was submitted to the formal vote.

The combined texts were approved by CENELEC as EN 55011 on 2009-09-01.

This European Standard supersedes EN 55011:2007 + A2:2007.

This EN 55011:2009 got a more transparent structure, introduces another set of particular limits for conducted and radiated disturbances of "heavy duty" general purpose equipment of class A group 1 with a rated input power in excess of 20 kVA, in accordance with the needs of the industries and refers to the full approach in respect of the measurement instrumentation uncertainty specified in CISPR 16-4-4. Furthermore, any kind of "legal statements" were removed from the normative main body of this European Standard.

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) 2010-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2012-09-01

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 2004/108/EC. See Annex ZZ.

Annexes ZA, ZB and ZZ have been added by CENELEC.

The main content of this standard is based on CISPR Recommendation No. 39/2 given below:

RECOMMENDATION No. 39/2

Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment

The CISPR

CONSIDERING

- a) that ISM RF equipment is an important source of disturbance;
- b) that methods of measuring such disturbances have been prescribed by the CISPR;
- c) that certain frequencies are designated by the International Telecommunication Union (ITU) for unrestricted radiation from ISM equipment,

RECOMMENDS

that the latest edition of EN 55011 be used for the application of limits and methods of measurement of ISM equipment.

Endorsement notice

The text of the International Standard CISPR 11:2009 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

█ [REDACTED]

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█ [REDACTED]			

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
CISPR 16-1-1	2006	Specification for radio disturbance and immunity measuring apparatus and methods -	EN 55016-1-1	2007
A1	2006	Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	A1	2007
A2	2007		A2	2008
CISPR 16-1-2	2003	Specification for radio disturbance and immunity measuring apparatus and methods -	EN 55016-1-2	2004
A1	2004	Part 1-2: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Conducted disturbances	A1	2005
A2	2006		A2	2006
CISPR 16-1-4	2007	Specification for radio disturbance and immunity measuring apparatus and methods -	EN 55016-1-4	2007
A1	2007	Part 1-4: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Radiated disturbances	A1	2008
A2	2008		A2	2009
CISPR 16-2-3	2006	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements	EN 55016-2-3	2006
CISPR 16-4-2	2003	Specification for radio disturbance and immunity measuring apparatus and methods - Part 4-2: Uncertainties, statistics and limit modelling - Uncertainty in EMC measurements	EN 55016-4-2	2004
IEC 60050-161	1990	International Electrotechnical Vocabulary (IEV) -	-	-
A1	1997	Chapter 161: Electromagnetic compatibility		
A2	1998			
IEC 60601-1-2 (mod)	2007	Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic compatibility - Requirements and tests	EN 60601-1-2	2007
IEC 60601-2-2	2009	Medical electrical equipment - Part 2-2: Particular requirements for basic safety and essential performance of high frequency surgical equipment and high frequency surgical accessories	EN 60601-2-2	2009
IEC 60974-10	2007	Arc welding equipment - Part 10: Electromagnetic compatibility (EMC) requirements	EN 60974-10	2007
IEC 61307	2006	Industrial microwave heating installations - Test methods for the determination of power output	EN 61307	2006

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62135-2	2007	Resistance welding equipment - Part 2: Electromagnetic compatibility (EMC) requirements	EN 62135-2	2008
ITU Radio Regulations	2008	Radio Regulations, Volume 3 - Resolutions - and recommendations, resolution no. 63	-	-

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INTRODUCTION

This CISPR publication contains, amongst common requirements for the control of RF disturbances from equipment intended for use in industrial, scientific, and medical (ISM) electrical applications, specific requirements for the control of RF disturbances caused by ISM RF applications in the meaning of the definition of the International Telecommunication Union (ITU), see also Definition 3.1 in this International Standard. CISPR and ITU share their responsibility for the protection of radio services in respect of the use of ISM RF applications.

The CISPR is concerned with the control of RF disturbances from ISM RF applications by means of an assessment of these disturbances, either at a standardised test site or, for an individual ISM RF application which cannot be tested at such a site, at its place of operation. Consequently, this CISPR publication covers requirements for conformity assessment of both, equipment assessed by means of type tests at standardised test sites or of individual equipment under *in situ* conditions.

The ITU is concerned with the control of RF disturbances from ISM RF applications during normal operation and use of the respective equipment at its place of operation. There, use of radio-frequency energy decoupled from the ISM RF application by radiation, induction or capacitive coupling is restricted to the location of that individual application.

This CISPR publication contains, in 6.2 and 6.3, the essential emission requirements for an assessment of RF disturbances from ISM RF applications at standardised test sites. These requirements allow for type testing of ISM RF applications operated at frequencies up to 18 GHz. It further contains, in 6.4, the essential emission requirements for an *in situ* assessment of RF disturbances from individual ISM RF applications in the frequency range up to 18 GHz. All requirements were established in close collaboration with the ITU and enjoy approval of the ITU.

However, for operation and use of several types of ISM RF applications, the manufacturer, installer and/or customer should be aware of additional national provisions regarding possible licensing and particular protection needs of local radio services and applications. Depending on the country concerned, such additional provisions may apply to individual ISM RF applications operated at frequencies outside designated ISM bands (see Table 1). They also may apply to ISM RF applications operated at frequencies above 18 GHz. For the latter type of applications, local protection of radio services and appliances requires an accomplishment of the conformity assessment by application of the relevant national provisions in the frequency range above 18 GHz in accordance with vested interests of the ITU and national administrations. These additional national provisions may apply to spurious emissions, emissions appearing at harmonics of the operation frequency, and to wanted emissions at the operation frequency allocated outside a designated ISM band in the frequency range above 18 GHz.

Recommendations of CISPR for the protection of radio services in particular areas are found in Annex E of this International Standard.

INDUSTRIAL, SCIENTIFIC AND MEDICAL EQUIPMENT – RADIO-FREQUENCY DISTURBANCE CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT

1 Scope

This International Standard applies to industrial, scientific and medical electrical equipment operating in the frequency range 0 Hz to 400 GHz and to domestic and similar appliances designed to generate and/or use locally radio-frequency energy.

This standard covers emission requirements related to radio-frequency (RF) disturbances in the frequency range of 9 kHz to 400 GHz. Measurements need only be performed in frequency ranges where limits are specified in Clause 6.

For ISM RF applications in the meaning of the definition found in the ITU Radio Regulations (see Definition 3.1), this standard covers emission requirements related to radio-frequency disturbances in the frequency range of 9 kHz to 18 GHz.

Requirements for ISM RF lighting apparatus and UV irradiators operating at frequencies within the ISM frequency bands defined by the ITU Radio Regulations are contained in this standard.

Equipment covered by other CISPR product and product family emission standards are excluded from the scope of this standard.

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.

CISPR 16-1-1:2006, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

Amendment 1 (2006)

Amendment 2 (2007)

CISPR 16-1-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Conducted disturbances*

Amendment 1 (2004)

Amendment 2 (2006)

CISPR 16-1-4:2007, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radiated disturbances*

Amendment 1 (2007)

Amendment 2 (2008)

CISPR 16-2-3:2006, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements*

CISPR 16-4-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements*

IEC 60050-161:1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*
Amendment 1 (1990)
Amendment 2 (1998)

IEC 60601-1-2:2007, *Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral standard: Electromagnetic compatibility – Requirements and tests*

IEC 60601-2-2:2009, *Medical electrical equipment – Part 2-2: Particular requirements for the basic safety and essential performance of high frequency surgical equipment and high frequency surgical accessories*

IEC 60974-10:2007, *Arc welding equipment – Part 10: Electromagnetic compatibility (EMC) requirements*

IEC 61307:2006, *Industrial microwave heating installations – Test methods for the determination of power output*

IEC 62135-2:2007, *Resistance welding equipment – Part 2: Electromagnetic compatibility (EMC) requirements*

ITU Radio Regulations (2008), *Radio regulations, Volume 3 – Resolutions and recommendations, resolution no. 63*

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