



SLOVENSKI STANDARD

SIST EN 55011:2016

01-junij-2016

Nadomešča:

SIST EN 55011:2010

SIST EN 55011:2010/A1:2010

Industrijska, znanstvena in medicinska oprema - Karakteristike občutljivosti za radijske motnje - Mejne vrednosti in merilne metode

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

iTeh STANDARD PREVIEW

Industrielle, wissenschaftliche und medizinische Geräte - Funkstörungen - Grenzwerte und Messverfahren

SIST EN 55011:2016

Appareils industriels, scientifiques et médicaux - Caractéristiques de perturbations radioélectriques - Limites et méthodes de mesure

Ta slovenski standard je istoveten z: EN 55011:2016

ICS:

33.100.10 Emisija Emission

SIST EN 55011:2016 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 55011:2016

<https://standards.iteh.ai/catalog/standards/sist/cddc2c92-4e05-47d4-96a9-528f7b1607ed/sist-en-55011-2016>

EUROPEAN STANDARD

EN 55011

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2016

ICS 33.100.10

Supersedes EN 55011:2009

English Version

Industrial, scientific and medical equipment -
Radio-frequency disturbance characteristics -
Limits and methods of measurement
(CISPR 11:2015 , modified)

Appareils industriels, scientifiques et médicaux -
Caractéristiques de perturbations radioélectriques -
Limites et méthodes de mesure
(CISPR 11:2015 , modifiée)

Industrielle, wissenschaftliche und medizinische Geräte -
Funkstörungen - Grenzwerte und Messverfahren
(CISPR 11:2015 , modifiziert)

This European Standard was approved by CENELEC on 2016-02-15. 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.

<https://standards.iteh.ai/catalog/standards/sist/cddc2c92-4e05-47d4-96a9-528f7b1607ed/sist-en-55011-2016>

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 55011:2016 (E)

Contents	Page
European foreword	3
Annex ZA (normative) Normative references to international publications with their corresponding European publications	5
Annex ZB (normative) Frequencies designated on a national basis in CENELEC countries for use as fundamental ISM frequencies	7
Annex ZZ (informative) Coverage of Essential Requirements of EU Directives	8
Bibliography	9

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 55011:2016](https://standards.iteh.ai/catalog/standards/sist/cddc2c92-4e05-47d4-96a9-528f7b1607ed/sist-en-55011-2016)

<https://standards.iteh.ai/catalog/standards/sist/cddc2c92-4e05-47d4-96a9-528f7b1607ed/sist-en-55011-2016>

European foreword

The text of document CISPR/B/628/FDIS, future edition 6 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" of CISPR "International special committee on radio interference" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 55011:2016.

A draft amendment, which covers common modifications to CISPR 11:2015 (CISPR/B/628/FDIS), was prepared by CLC/TC 210, "Electromagnetic Compatibility (EMC)" and approved by CENELEC.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-02-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-02-15

This document supersedes EN 55011:2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in CISPR 11:2015 are prefixed "Z".

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.

Endorsement notice

The text of the International Standard CISPR 11:2015 was approved by CENELEC as a European Standard with agreed common modifications.

COMMON MODIFICATIONS

4 Frequencies designated for ISM use

Replace Clause 4 by the following:

4 National measures and frequencies designated for ISM use

Certain frequencies are designated by the International Telecommunication Union (ITU) for use as fundamental frequencies for ISM RF applications (see also definition 3.13). These frequencies are listed in Table 1.

Table 1 – Frequencies in the radio-frequency (RF) range designated by ITU for use as fundamental ISM frequencies

Centre frequency MHz	Frequency range MHz	Maximum radiation limit ^b	Number of appropriate footnote to the table of frequency allocation of the ITU Radio Regulations ^a
6,780	6,765 – 6,795	Under consideration	5.138
13,560	13,553 – 13,567	Unrestricted	5.150
27,120	26,957 – 27,283	Unrestricted	5.150
40,680	40,66 – 40,70	Unrestricted	5.150
433,920	433,05 – 434,79	Under consideration	5.138 in Region 1, except countries mentioned in 5.280
915,000	902 – 928	Unrestricted	5.150 in Region 2 only
2 450	2 400 – 2 500	Unrestricted	5.150
5 800	5 725 – 5 875	Unrestricted	5.150
24 125	24 000 – 24 250	Unrestricted	5.150
61 250	61 000 – 61 500	Under consideration	5.138
122 500	122 000 – 123 000	Under consideration	5.138
245 000	244 000 – 246 000	Under consideration	5.138

^a Resolution No. 63 of the ITU Radio Regulations applies.

^b The term “unrestricted” applies to the fundamental and all other frequency components falling within the designated band. Outside of ITU designated ISM bands the limits for the disturbance voltage and radiation disturbance in this standard apply.

In some CENELEC countries, different or additional frequencies may be designated for use with ISM RF applications in the meaning of the definition found in the ITU Radio Regulations, see definition 3.13. These frequencies are listed in Table ZB.1 (see Annex ZB).

The limits for the disturbance voltage and radiation disturbance defined in this standard do also not apply to the fundamental ISM frequencies listed in Table ZB.1. If ISM RF applications use fundamental frequencies other than the ITU or nationally designated frequencies, then the limits for the disturbance voltage and radiation disturbance of this standard apply also to these fundamental frequencies.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
CISPR 16-1-1	2010	Specification for radio disturbance and immunity measuring apparatus and methods -	EN 55016-1-1	2010
+ A1	2010		+ A1	2010
+ A2	2014	Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	+ A2	2014
CISPR 16-1-2	2014	Specification for radio disturbance and immunity measuring apparatus and methods -	EN 55016-1-2	2014
		Part 1-2: Radio disturbance and immunity measuring apparatus - Coupling devices for conducted disturbance measurements		
CISPR 16-1-4	2010	Specification for radio disturbance and immunity measuring apparatus and methods -	EN 55016-1-4	2010
+ A1	2012	Part 1-4: Radio disturbance and immunity measuring apparatus - Antennas and test sites for radiated disturbance measurements	+ A1	2012
CISPR 16-2-1	2014	Specification for radio disturbance and immunity measuring apparatus and methods -	EN 55016-2-1	2014
		Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements		
CISPR 16-2-3	2010	Specification for radio disturbance and immunity measuring apparatus and methods -	EN 55016-2-3	2010
-	-		+ AC	2013
+ A1	2010	Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements	+ A1	2010
+ A2	2014		+ A2	2014

EN 55011:2016 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
CISPR 16-4-2 + A1	2011 2014	Specification for radio disturbance and immunity measuring apparatus and methods - Part 4-2: Uncertainties, statistics and limit modelling - Measurement instrumentation uncertainty	EN 55016-4-2 + A1	2011 2014
IEC 60050-161	1990	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-
IEC 60601-1-2	2014	Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic disturbances - Requirements and tests	EN 60601-1-2	2015
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	EN 60601-2-2 + A11	2009 2011
IEC 60974-10	2014	Arc welding equipment - Part 10: Electromagnetic compatibility (EMC) requirements	EN 60974-10	2014
IEC 61307	2011	Industrial microwave heating installations - Test methods for the determination of power output	EN 61307	2011
IEC 62135-2	2007	Resistance welding equipment - Part 2: Electromagnetic compatibility (EMC) requirements	EN 62135-2	2008
ITU Radio regulations, Vol 3	2012	Radio Regulations - Volume 3: Resolutions and Recommendations	-	-

Annex ZB
(normative)

**Frequencies designated on a national basis in CENELEC countries
for use as fundamental ISM frequencies**

**Table ZB.1 — Frequencies designated on a national basis in CENELEC countries
for use as fundamental ISM frequencies**

Frequency MHz	Maximum radiation limit	Notes
0,009 - 0,010	not limited	Germany only
83,996 - 84,004	not limited	United Kingdom only ^a
167,992 - 168,008	not limited	United Kingdom only ^a
886,000 - 906,000	not limited	United Kingdom only ^a

^a Radio communication services must accept harmful interference from ISM apparatus operating in accordance with the WT (Control of Interference from RF Heating Apparatus) Regulations 1971. The WT (Control of Interference from RF Heating Apparatus) Regulations 1971 specify the limits of levels of radiation permitted outside the ISM bands.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 55011:2016](#)

<https://standards.iteh.ai/catalog/standards/sist/cddc2c92-4e05-47d4-96a9-528f7b1607ed/sist-en-55011-2016>

Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and within its scope the Standard covers only the following essential requirements out of those given in Annex 1 of EC Directive 2004/108/EC.

Table ZZ.1 — Correspondence between this European Standard and Directive 2004/108/EC

Essential Requirements of Directive 2004/108/EC, Annex 1	Clauses and subclauses of this EN
1(a)	Clause 6 (Limits for electromagnetic disturbances), 8.2 (Conducted disturbances (at power ports)), 8.3 (Requirement for radiated disturbances (9 kHz to 1 GHz)), Clause 9 (Requirement for radiated disturbances (1 GHz to 18 GHz))

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive concerned.

[SIST EN 55011:2016](https://standards.iteh.ai/catalog/standards/sist/cddc2c92-4e05-47d4-96a9-5281761607cd/sist-en-55011-2016)

WARNING: Other requirements and other EU Directives can be applied to the products falling within the scope of this standard.

Bibliography

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

CISPR 14-1	NOTE	Harmonized as EN 55014-1.
CISPR 15:2013	NOTE	Harmonized as EN 55015:2013 (not modified).
IEC 60364-1	NOTE	Harmonized as HD 60364-1.
IEC 60364-5-51:2005	NOTE	Harmonized as HD 60364-5-51:2009 (modified) and HD 60364-5-51:2009/A11:2013.
IEC 60705:2010	NOTE	Harmonized as EN 60705:2012 (modified).
IEC 61308:2005	NOTE	Harmonized as EN 61308:2006 (not modified).
IEC 61689:2013	NOTE	Harmonized as EN 61689:2013 (not modified).
IEC 61922:2002	NOTE	Harmonized as EN 61922:2002 (not modified).

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 55011:2016](https://standards.iteh.ai/catalog/standards/sist/cddc2c92-4e05-47d4-96a9-528f7b1607ed/sist-en-55011-2016)

<https://standards.iteh.ai/catalog/standards/sist/cddc2c92-4e05-47d4-96a9-528f7b1607ed/sist-en-55011-2016>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 55011:2016

<https://standards.iteh.ai/catalog/standards/sist/cddc2c92-4e05-47d4-96a9-528f7b1607ed/sist-en-55011-2016>



INTERNATIONAL STANDARD

NORME INTERNATIONALE



INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE
COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES

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

Appareils industriels, scientifiques et médicaux – Caractéristiques de perturbations radioélectriques – Limites et méthodes de mesure

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.100.10

ISBN 978-2-8322-2707-7

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	7
INTRODUCTION.....	10
1 Scope.....	11
2 Normative references	11
3 Terms and definitions	12
4 Frequencies designated for ISM use.....	15
5 Classification of equipment.....	16
5.1 Separation into groups.....	16
5.2 Division into classes	16
5.3 Documentation for the user.....	16
6 Limits of electromagnetic disturbances	17
6.1 General.....	17
6.2 Group 1 equipment measured on a test site	17
6.2.1 Limits for conducted disturbances.....	17
6.2.2 Limits of electromagnetic radiation disturbance.....	20
6.3 Group 2 equipment measured on a test site	21
6.3.1 Limits for conducted disturbances.....	21
6.3.2 Limits of electromagnetic radiation disturbance.....	22
6.4 Group 1 and group 2 class A equipment measured in situ	27
6.4.1 Limits for conducted disturbances.....	27
6.4.2 Limits of electromagnetic radiation disturbance.....	28
7 Measurement requirements.....	30
7.1 General.....	30
7.2 Ambient noise.....	30
7.3 Measuring equipment.....	31
7.3.1 Measuring instruments.....	31
7.3.2 Artificial network (AN).....	31
7.3.3 Voltage probe	32
7.3.4 Antennas	32
7.3.5 Artificial hand	33
7.4 Frequency measurement.....	33
7.5 Configuration of equipment under test.....	33
7.5.1 General	33
7.5.2 Interconnecting cables.....	36
7.5.3 Connection to the electricity supply network on a test site	37
7.6 Load conditions of equipment under test.....	39
7.6.1 General	39
7.6.2 Medical equipment.....	40
7.6.3 Industrial equipment	41
7.6.4 Scientific, laboratory and measuring equipment.....	41
7.6.5 Microwave cooking appliances.....	42
7.6.6 Other equipment in the frequency range 1 GHz to 18 GHz.....	42
7.6.7 Electric welding equipment	42
7.6.8 ISM RF lighting equipment.....	42
7.6.9 Medium voltage (MV) and high voltage (HV) switchgear	42

7.6.10	Grid connected power converters	42
7.7	Recording of test-site measurement results	43
7.7.1	General	43
7.7.2	Conducted emissions.....	43
7.7.3	Radiated emissions	43
8	Special provisions for test site measurements (9 kHz to 1 GHz)	44
8.1	Ground planes	44
8.2	Measurement of conducted disturbances	44
8.2.1	General	44
8.2.2	Measurements on grid connected power converters.....	45
8.2.3	Handheld equipment which are normally operated without an earth connection.....	49
8.3	Radiation test site for 9 kHz to 1 GHz	49
8.3.1	General	49
8.3.2	Validation of the radiation test site (9 kHz to 1 GHz).....	50
8.3.3	Disposition of equipment under test (9 kHz to 1 GHz).....	50
8.3.4	Radiation measurements (9 kHz to 1 GHz)	51
8.4	Alternative radiation test sites for the frequency range 30 MHz to 1 GHz	51
9	Radiation measurements: 1 GHz to 18 GHz.....	51
9.1	Test arrangement.....	51
9.2	Receiving antenna.....	51
9.3	Validation and calibration of test site.....	51
9.4	Measuring procedure	52
9.4.1	General	52
9.4.2	Operating conditions of the EUT	52
9.4.3	Preliminary measurement	53
9.4.4	Final measurement	53
10	Measurement <i>in situ</i>	55
11	Safety precautions for emission measurements on ISM RF equipment	55
12	Measurement uncertainty	55
Annex A (informative)	Examples of equipment classification	56
Annex B (informative)	Precautions to be taken in the use of a spectrum analyzer (see 7.3.1).....	58
Annex C (normative)	Measurement of electromagnetic radiation disturbance in the presence of signals from radio transmitters	59
Annex D (informative)	Propagation of interference from industrial radio-frequency equipment at frequencies between 30 MHz and 300 MHz	60
Annex E (informative)	Recommendations of CISPR for protection of certain radio services in particular areas.....	61
E.1	General.....	61
E.2	Recommendations for protection of safety-related radio services	61
E.3	Recommendations for protection of specific sensitive radio services	61
Annex F (informative)	Frequency bands allocated for safety-related radio services	62
Annex G (informative)	Frequency bands allocated for sensitive radio services	63
Annex H (informative)	Statistical assessment of series produced equipment against the requirements of CISPR standards.....	65
H.1	Significance of a CISPR limit	65
H.2	Type tests.....	65