SLOVENSKI STANDARD
SIST EN 55016-2-3:2017/A1:2019

01-november-2019

Specifikacija merilnih naprav in metod za merjenje radijskih motenj in odpornosti - 2-3. del: Metode za merjenje radijskih motenj in odpornosti - Merjenje sevanih motenj - Dopolnilo A1

Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements

Anforderungen an Geräte und Einrichtungen sowie Festlegung der Verfahren zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit - Teil 2-3: Verfahren zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit - Messung der gestrahlten Störaussendung

Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques - Partie 2-3: Méthodes de mesure des perturbations et de l'immunité - Mesures des perturbations rayonnées

Ta slovenski standard je istoveten z: **EN 55016-2-3:2017/A1:2019**

ICS:

17.240	Merjenje sevanja	Radiation measurements
33.100.20	Imunost	Immunity

SIST EN 55016-2-3:2017/A1:2019 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 55016-2-3:2017/A1

September 2019

ICS 33.100.10; 33.100.20

English Version

Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements (CISPR 16-2-3:2016/A1:2019)

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This amendment A1 modifies the European Standard EN 55016-2-3:2017; it was approved by CENELEC on 2019-07-30. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, 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: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document CIS/A/1278/FDIS, future CISPR 16-2-3/A1, prepared by CISPR SC A "Radio-interference measurements and statistical methods" of CISPR "International special committee on radio interference" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 55016-2-3:2017/A1:2019.

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) 2020-04-25
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-07-25

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

Endorsement notice

The text of the International Standard CISPR 16-2-3:2016/A1:2019 was approved by CENELEC as a European Standard without any modification.

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

CISPR 11:2015	NOTE	Harmonized as EN 55011:2016
CISPR 32:2015	NOTE	Harmonized as EN 55032:2015 (not modified)

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where 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.

Publication	Year	Title	EN/HD	Year
Replace:				
CISPR 16-1-4	2010	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-4: Radio disturbance and immunity measuring apparatus - Antennas and test sites for radiated disturbance measurements	EN 55016-1-4	2010
+ A1	2012		+ A1	2012
with:				
CISPR 16-1-4	2019	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-4: Radio disturbance and immunity measuring apparatus - Antennas and test sites for radiated disturbance measurements	EN IEC 55016-1-4	2019
Replace:				
CISPR 16-4-2	-	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	-
with:				
CISPR 16-4-2	2011	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	2011
+ A1	2014		+ A1	2014
+ A2	2018		+ A2	2018

CISPR 16-2-3

Edition 4.0 2019-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

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

BASIC EMC PUBLICATION
PUBLICATION FONDAMENTALE EN CEM

AMENDMENT 1
AMENDEMENT 1

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

Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Partie 2-3: Méthodes de mesure des perturbations et de l'immunité – Mesurages des perturbations rayonnées

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 33.100.10; 33.100.20

ISBN 978-2-8322-6524-6

FOREWORD

This amendment has been prepared by CISPR subcommittee A: Radio-interference measurements and statistical methods.

The text of this amendment is based on the following documents:

FDIS	Report on voting
CISPR/A/1278/FDIS	CISPR/A/1283/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Amendment of CISPR 16-2-3 regarding EUT volume specifications for radiated disturbance measurements depending on test method and on measurement distance

2 Normative references

Replace the undated reference to CISPR 16-4-2 by the following:

CISPR 16-4-2:2011[1], *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Measurement instrumentation uncertainty*
CISPR 16-4-2:2011/AMD1:2014
CISPR 16-4-2:2011/AMD2:2018

[1] A consolidated version of this publication exists, comprising CISPR 16-4-2:2011, CISPR 16-4-2:2011/AMD1:2014 and CISPR 16-4-2:2011/AMD2:2018.

Replace the dated reference to CISPR 16-1-4 by the following:

CISPR 16-1-4:2018, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Antennas and test sites for radiated disturbance measurements*

3.1 Terms and definitions

3.1.1
absorber-lined OATS/SAC

Add the following note:

Note 1 to entry: CISPR 16-1-4 uses the analogous term free-space open-area test site (FSOATS).

3.1.9
common-mode absorption device

Replace the existing source by the following:

[SOURCE: CISPR 16-1-4:2018, 3.1.7]

3.1.16
loop-antenna system
LAS

Replace the existing term by the following new term and new abbreviation (the definition does not change):

large loop-antenna system
LLAS

The instruction to replace the existing Note to entry only applies to the French language.

Add, after the existing term and definition 3.1.28, the following new terms and definitions:

3.1.29
compliance test site
COMTS
environment that assures valid, reproducible measurement results of the disturbance field strength from equipment under test for comparison to a compliance limit

3.1.30
far-field region
region of the electromagnetic field of a radiating EUT or antenna where the predominant components of the field represent a propagation of energy and where the radiation pattern is essentially independent of the distance from the radiating EUT or antenna

Note 1 to entry: In the far-field region, all the components of the electromagnetic field change with an inverse proportion to the distance from the radiating EUT or antenna.

[SOURCE: IEC 60050-712:1992 [14], 712-02-02, modified – Replacement of "far field region" by "far-field region" in the term itself, replacement of "antenna" by "radiating EUT or antenna", replacement of "angular field distribution" by "radiation pattern" and deletion of Note 2 to entry.]

3.1.31
near-field effect
deviation of the field propagation from far-field propagation

Note 1 to entry: The near-field effect occurs in the zone close to the EUT where reactive (non-radiating) field-strength components exist. Although not contributing to far-field radiation, they are real measurable field strengths.

Note 2 to entry: A criterion can be set to limit the deviation from far-field propagation, e.g. 1 dB. If E_1 and E_2 are field-strength levels in dB(µV/m) at distances d_1 and d_2 from an EUT, then e.g. the following inequality describes the criterion: (20lg(d_2/d_1) − 1 dB) ≤ (E_1 − E_2) ≤ (20lg(d_2/d_1) + 1 dB), which can be reduced to −1 dB ≤ [(E_1 − E_2) − 20lg(d_2/d_1)] ≤ 1 dB, where (E_1 − E_2) ≥ 6 dB.

3.1.32
test volume
validated volume within a test facility in which an EUT may be positioned

Note 1 to entry: Validation procedures in CISPR 16-1-4 are used to determine the test volume.

Note 2 to entry: The test volume as defined in this document is cylindrical in shape. Different test volume shapes have been defined in other documents, e.g. in a cubic form in IEC 61000-4-20 (TEM waveguides).

3.1.33
EUT volume
cylinder defined by EUT boundary diameter and height that fully encompasses all portions of the actual EUT, including cable racks and 1,6 m of cable length (for 30 MHz to 1 GHz), or 0,3 m of cable length (for 1 GHz and above)

Note 1 to entry: The test volume is one of several criteria limiting the EUT volume.

Note 2 to entry: The EUT volume has a diameter D (boundary diameter) and a height h.

3.1.34
protection distance
distance between the source of a radiated disturbance and the victim receiver at the edge-of-service area used for the derivation of a specific CISPR radiated disturbance limit

Note 1 to entry: The edge-of-service area is defined by the minimum value of the wanted field strength of a radio service or application derived from ITU-R specifications.

Note 2 to entry: This definition can vary in other publications, when conducted disturbances are concerned.

Note 3 to entry: Every limit has an associated protection distance; the protection distance can vary with frequency.

3.1.35
small EUT
equipment under test, including its cables, either positioned on a tabletop or standing on the floor, that fits in a cylindrical volume of 1,5 m (2,0 m) in diameter and 1,5 m (2,0 m) in height measured from the floor with a measurement distance of 3 m (5 m) at an OATS/SAC

3.2 Abbreviated terms

*Delete from the existing list the abbreviation "*RGP*".*

Add to the existing list the following new abbreviations:

AF	Antenna factor
FSOATS	free-space OATS
GP	ground plane
HPBW	Half-power beamwidth
RE	radiated emission
RI	radiated immunity

6.2.2 Compliance (conformity assessment) testing

*Replace in the 1st sentence "*test site*" by "*compliance test site (COMTS)*"*

6.4.1.1 General

Replace in the existing twelfth paragraph the abbreviation **"**RGP**"** *by* **"**GP**".**

6.4.1.2 Tabletop arrangement

Replace in the existing third paragraph the abbreviation "RGP" *by* "GP".

6.4.1.3 Floor-standing arrangement

Replace in the existing first three paragraphs the abbreviation "RGP" *by* "GP".

6.4.1.4 Combinations of tabletop and floor-standing equipment arrangement

Replace in this subclause the abbreviation "RGP" *by* "GP".

7.1 Introductory remarks

Replace the existing title by the following new title:

7.1 General

Replace the existing content of this subclause (including Table 3), by the following new 7.1.1, and 7.1.2:

7.1.1 General remarks and overview of test methods

Clause 7 sets forth the general procedures for the measurement of the field strength of radio disturbance produced by devices and systems. Most experience with radiated disturbance measurements exists for OATS/SAC with 10 m distance in the frequency range 30 MHz to 1 000 MHz. In this frequency range this is therefore called the established test method to which other test methods are compared regarding the level of radio protection (see also CISPR TR 16-4-5). The effects of leads and cables associated with the EUT in terms of length, layout, and termination shall be taken into account (see Garbe and Battermann [21], Garbe [22]). Table 8 provides a summary list of CISPR radiated disturbance test sites and measurement methods, and the related cross-references to subclauses within this document or to other documents. Tables 9, 10, 11 and 12 provide information on maximum EUT volumes associated with the various measurement methods. Background on the criteria for EUT volumes is given in Annex F.

For some products, it can be required to measure the electric field strength, the magnetic field strength, or both components of the radiated disturbance. Sometimes a measurement of a quantity related to radiated power is more appropriate. Normally measurements should be made of both the horizontal and vertical components of the disturbance relative to the installation floor or ground plane. The results of measurements of either the electric field-strength component or magnetic field-strength component may be expressed in peak, quasi-peak, average, or rms-average values.

The magnetic field-strength component of a disturbance is normally measured at frequencies up to 30 MHz. In magnetic field-strength measurements, only the horizontal component of the field at the position of the receive antenna is measured when using the distant single antenna procedure. If an LLAS is used, the three orthogonal magnetic dipole moments of the EUT are measured.

NOTE 1 In the magnetic field-strength measurement method using a distant single antenna (e.g. 60 cm loop antenna), the horizontal components of the field at the position of the antenna are determined by the horizontal and vertical dipole moments of the EUT.

NOTE 2 A future amendment to this document (CISPR 16-2-3/AMD2[2]) is under consideration for modifying the magnetic field-strength measurement method such that measurements of all three orthogonal components (using three orthogonal positions of a single receive antenna) will be required for measurement distances of 3 m and 5 m,

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2 Under preparation. Stage at the time of publication: CISPR/CDM 16-2-3/AMD2:2018.

whereas the present measurement method (where only the horizontal components of the field strength are measured) will continue to be used for larger measurement distances.

Table 8 – Applicable frequency ranges and document references for CISPR radiated disturbance test sites and measurement methods

Site / method	9 kHz to 30 MHz	30 MHz to 1 000 MHz	1 GHz to 18 GHz
Outdoor site	tbd	7.3.8	n/a
LLAS	7.2	n/a	n/a
OATS or SAC	tbd	7.3	n/a
FAR	n/a	7.4	7.6
Common RE/RI	n/a	7.5 (RI starts 80 MHz)	n/a
Absorber-lined OATS/SAC	n/a	n/a	7.6
In situ	7.7.2	7.7.3, 7.7.4.2	7.7.3, 7.7.4.3
Substitution method	n/a	7.8	7.8
Reverberation chamber	n/a	7.9 (Starts 80 MHz)	7.9
TEM waveguide	IEC 61000-4-20	7.10	7.10
n/a = not applicable; tbd = to be determined or is under consideration			

7.1.2 Overview of maximum EUT volumes depending on measurement method, frequency range, and measurement distance

7.1.2.1 Frequency range 9 kHz to 30 MHz

a) Maximum EUT dimensions for large-loop antenna system (LLAS) measurements are listed in Table 9.

It is recommended to use a 3 m LLAS for 1,6 m < EUT dimensions ≤ 2,4 m, and to use a 4 m LLAS for 2,4 m < EUT dimensions ≤ 3,2 m.

Table 9 – Maximum EUT dimensions for different LLAS diameters, 9 kHz to 30 MHz

LLAS diameter	2 m	3 m	4 m
EUT dimension[a]	1,6 m	2,4 m	3,2 m

[a] The specified EUT dimension applies for the diameter of a sphere that fully encompasses the EUT; e.g. for an EUT in the form of a cube, the maximum cube side length for a 2 m LLAS will be (1,6 m)/√3 = 0,92 m; for a 3 m LLAS: (2,4 m)/√3 = 1,39 m; and for a 4 m LLAS: (3,2 m)/√3 = 1,85 m. These maximum EUT dimensions are the same as specified in CISPR 16-1-4.

b) Recommended maximum EUT dimensions for an OATS/SAC or an outdoor site are listed in Table 10.

NOTE At present this document does not include a measurement method for magnetic field strength using a distant single antenna (e.g. 60 cm loop antenna), so these recommended EUT dimensions apply for product standards containing limits for magnetic field strength, e.g. CISPR 11.