SIST

SLOVENSKI STANDARD
SIST EN 55016-1-6:2015/A1:2017

01-julij-2017

Specifikacija za merilne naprave in metode za merjenje radijskih motenj in odpornosti - 1-6. del: Merilne naprave za merjenje radijskih motenj in odpornosti - Umerjanje EMC antene - Dopolnilo A1

Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-6: Radio disturbance and immunity measuring apparatus - EMC antenna calibration

Anforderungen an Geräte und Einrichtungen sowie Festlegung der Verfahren zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit - Teil 1-6: Geräte und Einrichtungen zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit - Kalibrierung von Antennen für EMV-Messungen

Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques - Partie 1-6: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques - Étalonnage des antennes CEM

Ta slovenski standard je istoveten z: EN 55016-1-6:2015/A1:2017

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
33.100.20	Imunost	Immunity

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 55016-1-6:2015/A1

May 2017

ICS 33.100.10; 33.100.20

English Version

Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-6: Radio disturbance and immunity measuring apparatus - EMC antenna calibration (CISPR 16-1-6:2014/A1:2017)

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(CISPR 16-1-6:2014/A1:2017)

This amendment A1 modifies the European Standard EN 55016-1-6:2015; it was approved by CENELEC on 2017-02-17. 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.

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CENELEC

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

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European foreword

The text of document CISPR/A/1195/FDIS, future CISPR 16-1-6:2014/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 55016-1-6:2015/A1:2017.

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)	2017-11-26
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-05-26

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 16-1-6:2014/A1:2017 was approved by CENELEC as a European Standard without any modification.

CISPR 16-1-6

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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 1-6: Radio disturbance and immunity measuring apparatus – EMC antenna calibration**

**Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques –
Partie 1-6: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Étalonnage des antennes CEM**

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FOREWORD

This amendment has been prepared by CISPR subcommittee A: Radio-interference measurements and statistical methods, of IEC technical committee CISPR: International special committee on radio interference.

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

FDIS	Report on voting
CISPR/A/1195/FDIS	CISPR/A/1204/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.

6.3.4 Radiation patterns of an antenna

Add, after the last paragraph of this subclause, the following new paragraph:

Annex I introduces a method for antenna pattern measurement in the frequency range above 1 GHz.

Add, after the existing Annex H, the following new Annex I:

Annex I
(normative)

Antenna pattern measurement method in the frequency range above 1 GHz, with measurement uncertainty budget

I.1 General

All measurement methods in the CISPR 16 series need an estimation of the measurement uncertainty. A common approach is to list all contributions and to determine the influence of each one. This works very well if the uncertainty contributions are independent from the EUT itself. In case of antenna pattern measurements above 1 GHz uncertainty contributions are NOT independent from the EUT.

The major uncertainty contributions are:

a) reflections inside the antenna chamber;

b) reflections from the transmit antenna mast and the receive antenna mast;

c) positioning uncertainty of the turntable leading to azimuth drift;

d) alignment of the antennas;

e) reflections between antennas.

All of these contributions are dependent on the antenna pattern to be measured as follows:

1) The nature of the pattern of omnidirectional antennas will lead to stronger reflections from objects around the antenna and from all surfaces of the anechoic chamber.

2) Coupling with the antenna mast is more significant if omnidirectional antennas or directional antennas with a strong back lobe are measured.

3) Uncertainty of the turntable positioning can be seen if directional antennas with a high-gradient antenna pattern are measured.

4) Alignment is more critical if directive antennas are measured.

5) Unwanted coupling between measurement antennas exists if the dimensions of the antennas are electrically large.

To account for these effects on uncertainty this measurement method includes a statistical estimation of the measurement uncertainty. The following subclauses describe the set-up and test method. Because a combined method is used, the problem of separately performing site validation and antenna mast validation is solved. It is easy for calibration labs to implement, and the effort is reasonable because the procedure is applied for the following cases:

a) for a new and/or modified chamber and/or turntable;

b) if the receive antenna model is changed;

c) for each manufacturer and model of AUC.

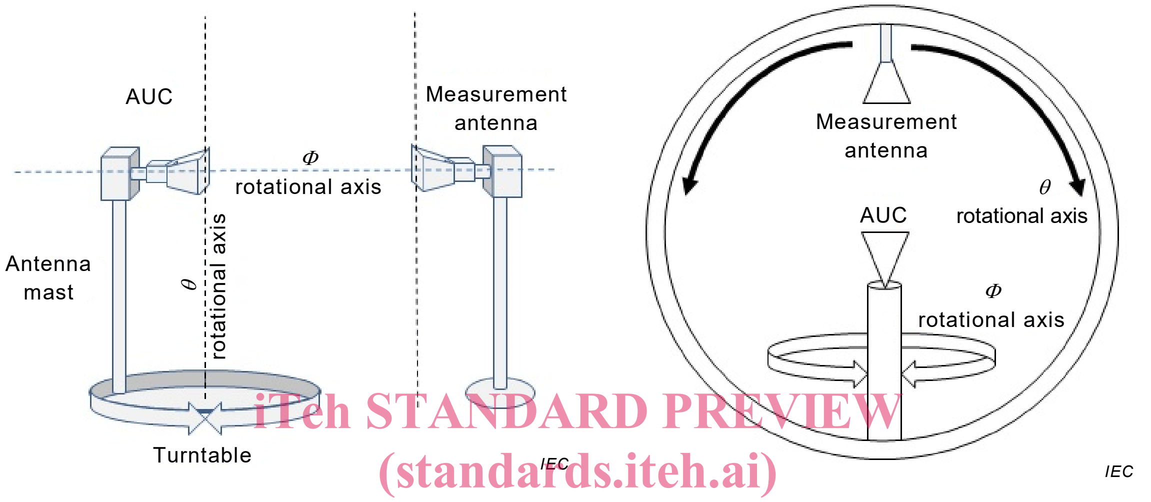
This method is similar to the method given in 5.3.3 of CISPR 16-1-5:2014.

I.2 Test set-up

In a typical test set-up, the receive or transmit antenna under test is mounted in front of a vertical mast placed on a turntable. A change between the E-plane and the H-plane is easily done by rotating the antenna by 90°.

For the purposes of these tests, two principal categories of positioning systems are defined based on known methods of performing spherical antenna pattern tests. These are the distributed-axis system and the combined-axis system.

Combined-axis systems mount the Φ-axis positioner on the θ-axis, as shown in Figure I.1 a), to rotate the AUC around two axes, while the distributed axis systems move the measurement antenna about the AUC on the Φ-axis positioner, as shown in Figure I.1 b). With the combined axis system the height is not critical but half the chamber height is recommended. With the distributed axis system the radius of the ring is determined by using the maximum size of the AUC and calculating the far-field criteria.

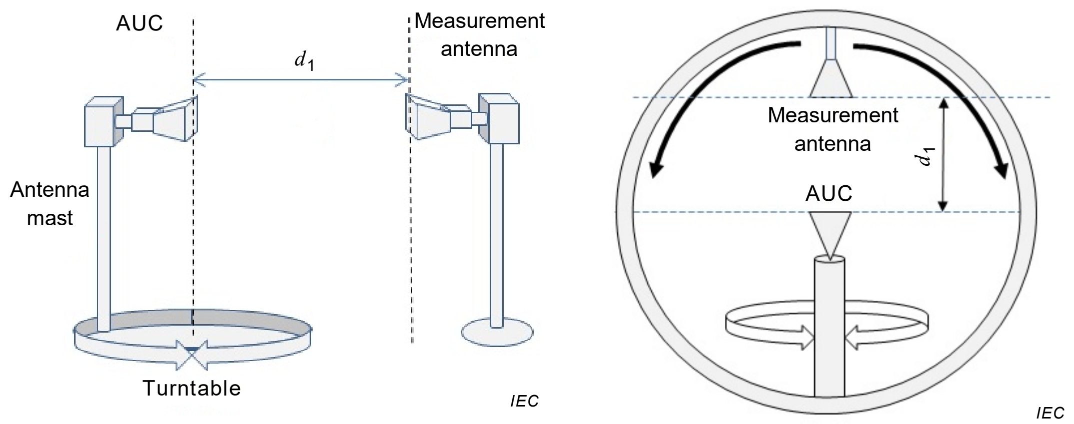


a) Combined axis system b) Distributed axis system

Figure I.1 – Typical set-up for antenna pattern measurement

Two distances are defined as follows:

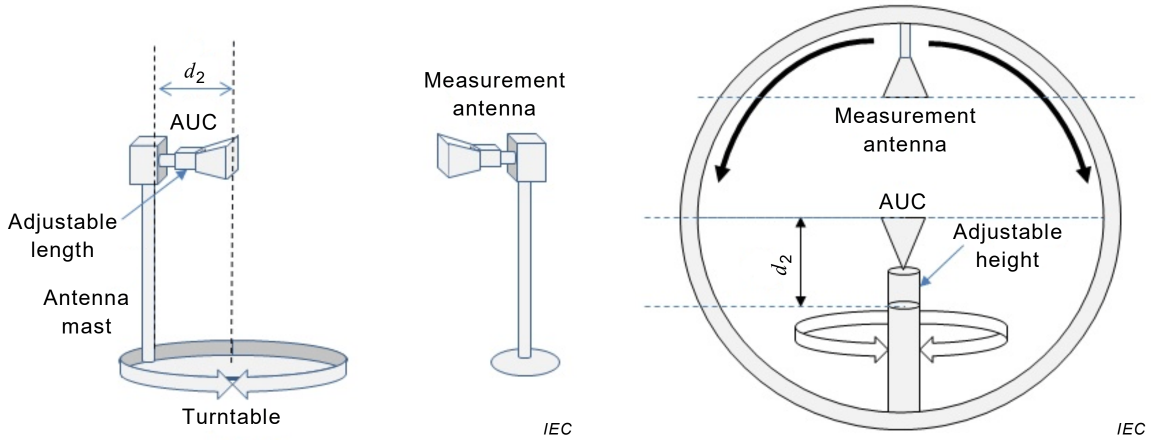
d_1 is the distance between the centre of the turntable and the reference point of the measurement antenna; a distance of 3 m or longer is recommended (see Figure I.2);



a) Combined axis system b) Distributed axis system

Figure I.2 – Definition of d_1

d_2 is the distance between the antenna mast and the reference point of the AUC (see Figure I.3); because only the antenna can be moved, and not the positioner. Adjustment of d_2 is possible using for example different length adaptors.



a) Combined axis system b) Distributed axis system

Figure I.3 – Definition of d_2

The AUC is the antenna mounted on the rotational positioner of the combined axis system and on the rotating pedestal for the distributed axis system. Only one of either system needs to be used.

For an element type antenna, see 7.5.2.1.

I.3 Test method

The test method is based on changing the phase condition of direct and reflected waves, similar to S_{VSWR} (see CISPR 16-1-4).

The antenna pattern is measured a total of 12 times while the distances d_1 and d_2 are varied as follows.

a) Influence of the antenna mast – with d_1 held constant, d_2 is increased in the following steps (see Figure I.4):
   1) d_2 + 0,0 cm,
   2) d_2 + 0,3 cm,
   3) d_2 + 3,0 cm,
   4) d_2 + 6,0 cm,
   5) d_2 + 7,5 cm,
   6) d_2 + 9,0 cm.

   The spacing between d_2 positions above is unequal, i.e. similar to S_{VSWR}. The physical lower limit is defined by the lowest frequency used, at least $\lambda/4$.

   NOTE The reference point and phase centre in this case mean the same thing. The phase centre can change as a function of frequency and has to be known for the application of the antenna, i.e. the antenna factor, to be valid. For LPDA antennas either the manufacturer's mark or the antenna midpoint for calibration is used. For DRG horn antennas the plane of the aperture is used.