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EMC –

Utrustning och metoder för mätning av radiostörningar och immunitet –

Del 1-1: Mätutrustning

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

Som svensk standard gäller europastandarden EN IEC 55016-1-1:2019. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 55016-1-1:2019.

Nationellt förord

Europastandarden EN IEC 55016-1-1:2019

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- **CISPR 16-1-1, Fifth edition, 2019 - Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 55016-1-1, utgåva 3, 2010, SS-EN 55016-1-1/A1, utgåva 1, 2010 och SS-EN 55016-1-1/A2, utgåva 1, 2014, gäller ej fr o m 2022-06-26.

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English Version

Specification for radio disturbance and immunity measuring
apparatus and methods - Part 1-1: Radio disturbance and
immunity measuring apparatus - Measuring apparatus
(CISPR 16-1-1:2019)

Spécification des méthodes et des appareils de mesure des
perturbations radioélectriques et de l'immunité aux
perturbations radioélectriques - Partie 1-1: Appareils de
mesure des perturbations radioélectriques et de l'immunité
aux perturbations radioélectriques - Appareils de mesure
(CISPR 16-1-1:2019)

Anforderungen an Geräte und Einrichtungen sowie
Festlegung der Verfahren zur Messung der hochfrequenten
Störaussendung (Funkstörungen) und Störfestigkeit - Teil 1-
1: Geräte und Einrichtungen zur Messung der
hochfrequenten Störaussendung (Funkstörungen) und
Störfestigkeit - Messgeräte
(CISPR 16-1-1:2019)

This European Standard was approved by CENELEC on 2019-06-26. 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.

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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/1290/FDIS, future edition 5 of CISPR 16-1-1, 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 IEC 55016-1-1:2019.

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) 2020-03-26
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-06-26

This document supersedes EN 55016-1-1:2010 and all of its amendments and corrigenda (if any).

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.

This document supports essential requirements of EU Directive(s).

Endorsement notice

The text of the International Standard CISPR 16-1-1:2019 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 15:2018	NOTE	Harmonized as EN 55015:2018 ¹ (not modified)
CISPR 25:2016	NOTE	Harmonized as EN 55025:2017 (not modified)
CISPR 32:2015	NOTE	Harmonized as EN 55032:2015 (not modified)
CISPR 16-2 (series)	NOTE	Harmonized as EN 55016-2-4 (series)

¹ Under preparation. Stage at the time of publication: FprEN 55015:2018

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
CISPR 11 (mod)	2015	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	2016
+ A1	2016		+ A1	2017
+ A2	2019		-	-
CISPR 14-1	2016	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission	EN 55014-1	2017
CISPR 16-2-1	2014	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements	EN 55016-2-1	2014
CISPR 16-2-2	2010	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-2: Methods of measurement of disturbances and immunity - Measurement of disturbance power	EN 55016-2-2	2011
CISPR 16-2-3	-	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	-
CISPR/TR 16-3:2010	2010	Specification for radio disturbance and immunity measuring apparatus and methods - Part 3: CISPR technical reports	-	-
+ A1	2012		-	-
+ A2	2015		-	-
IEC 60050-161	1990	International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility	-	-

CONTENTS

FOREWORD.....	7
INTRODUCTION.....	10
1 Scope.....	11
2 Normative references	11
3 Terms and definitions	12
4 Fundamental characteristics of a measuring receiver.....	16
4.1 General.....	16
4.2 Input impedance	17
4.3 Sine-wave voltage-tolerance	17
4.4 Overall pass-band selectivity	17
4.5 Bandwidth.....	19
4.6 Frequency tuning-tolerance.....	20
4.7 Intermediate frequency rejection ratio	20
4.8 Image frequency rejection ratio	20
4.9 Other spurious responses	20
4.10 Limitation of intermodulation effects.....	21
4.11 Limitations of receiver noise and internally-generated spurious signals.....	22
4.11.1 Random noise	22
4.11.2 Continuous wave	22
4.12 Limitation of radio-frequency emissions from the measuring receiver.....	22
4.12.1 Conducted emissions.....	22
4.12.2 Radiated emissions	22
4.13 Facilities for connection to a discontinuous disturbance analyzer	23
5 Quasi-peak measuring receivers for the frequency range 9 kHz to 1 000 MHz	23
5.1 General.....	23
5.2 Response to pulses	23
5.2.1 Amplitude relationship (absolute calibration).....	23
5.2.2 Variation with repetition frequency (relative calibration)	23
6 Measuring receivers with peak detector for the frequency range 9 kHz to 18 GHz	27
6.1 General.....	27
6.2 Charge and discharge time constants ratio	27
6.3 Overload factor	28
6.4 Response to pulses	28
7 Measuring receivers with average detector for the frequency range 9 kHz to 18 GHz	28
7.1 General.....	28
7.2 Overload factor	29
7.3 Response to pulses	29
7.3.1 Amplitude relationship	29
7.3.2 Variation with repetition frequency.....	30
7.3.3 Response to intermittent, unsteady and drifting narrowband disturbances	30
8 Measuring receivers with RMS-average detector for the frequency range 9 kHz to 18 GHz	32
8.1 General.....	32
8.2 Overload factor	32

8.3	Response to pulses	32
8.3.1	Construction details	32
8.3.2	Amplitude relationship	33
8.3.3	Variation with repetition frequency	33
8.3.4	Response to intermittent, unsteady and drifting narrowband disturbances	34
9	Measuring receivers for the frequency range 1 GHz to 18 GHz with amplitude probability distribution (APD) measuring function	34
10	Discontinuous disturbance analyzers	35
10.1	General	35
10.2	Fundamental characteristics	36
10.3	Test method for the validation of the performance check for the click analyzer	43
10.3.1	Basic requirements	43
10.3.2	Additional requirements	44
Annex A (normative) Determination of response to repeated pulses of quasi-peak and RMS-average measuring receivers (see 3.6, 5.2.2, 8.2 and 8.3)		45
A.1	General	45
A.2	Response of the pre-detector stages	45
A.3	Response of the quasi-peak detector to the output of preceding stages	47
A.3.1	General	47
A.3.2	Response of the indicating instrument to the signal from the detector	48
A.4	Response of the RMS detector to the output voltage of preceding stages	49
A.4.1	Output voltage and amplitude relationship	49
A.4.2	Calculation of overload factor	50
A.5	Relationship between the indication of the RMS meter and the quasi-peak meter	50
Annex B (normative) Determination of pulse generator spectrum (See 5.2, 6.4, 7.2, 8.3)		52
B.1	Pulse generator	52
B.1.1	General	52
B.1.2	The spectrum of the generated pulses	52
B.2	General method of measurement	52
Annex C (normative) Accurate measurements of the output of nanosecond pulse generators (see 5.2, 6.4, 7.2, 8.3)		54
C.1	Measurement of impulse area (A_{imp})	54
C.1.1	General	54
C.1.2	Area method	54
C.1.3	Standard transmission line method	54
C.1.4	Harmonic measurement	55
C.1.5	Energy method	55
C.2	Pulse generator spectrum	55
Annex D (normative) Influence of the quasi-peak measuring receiver characteristics on its pulse response (see 5.2.2)		56
Annex E (normative) Response of average and peak measuring receivers (see 4.5)		57
E.1	Response of pre-detector stages	57
E.2	Overload factor	57
E.3	Relationship between the indication of an average and a quasi-peak measuring receiver	58
E.4	Peak measuring receivers	59

E.5	Relationship between indication of a peak and a quasi-peak measuring receiver	59
E.6	Test of measuring receiver response above 1 GHz to pulses	60
E.7	Measurement of the impulse bandwidth of a measuring receiver	62
E.7.1	General	62
E.7.2	Method 1: Measurement by comparison of the responses of B_{imp} to two pulses with identical amplitude and width with low and high pulse repetition frequencies (PRF)	62
E.7.3	Method 2: Measurement by comparison of the response of B_{imp} to an impulsive signal with the response of a narrow bandwidth to the same signal	64
E.7.4	Method 3: Integration of the normalized linear selectivity function	64
Annex F (normative)	Performance check of the exceptions from the definitions of a click according to 5.4.3 of CISPR 14-1:2016	66
Annex G (informative)	Rationale for the specifications of the APD measuring function	73
Annex H (informative)	Characteristics of a quasi-peak measuring receiver	76
Annex I (informative)	Example of EMI receiver and swept spectrum analyzer architecture	77
Annex J (normative)	Requirements when using an external preamplifier with a measuring receiver	79
J.1	General	79
J.2	Considerations for optimum emission measurement system design	79
J.3	Linearity specifications and precautions in measurement	82
J.4	Detecting the overload of an external preamplifier in a wideband FFT-based measuring system	89
Annex K (normative)	Calibration requirements for measuring receivers	90
K.1	General	90
K.2	Calibration and verification	90
K.3	Calibration and verification specifics	90
K.4	Measuring receiver specifics	91
K.4.1	General	91
K.4.2	Demonstration of compliance with CISPR 16-1-1	92
K.5	Partial calibration of measuring receivers	92
K.6	Determination of compliance of a measuring receiver with applicable specifications	93
Annex L (normative)	Verification of the RF pulse amplitude (See 7.3.1, 8.3.2)	94
Bibliography	95
Figure 1	– Limits of overall selectivity – Pass-band (Band A)	18
Figure 2	– Limits of overall selectivity – Pass-band (Band B)	18
Figure 3	– Limits of overall selectivity – Pass-band (Bands C and D)	19
Figure 4	– Limits for the overall selectivity – Pass-band (Band E)	19
Figure 5	– Arrangement for testing intermodulation effects	22
Figure 6	– Pulse response curve (Band A)	24
Figure 7	– Pulse response curve (Band B)	25
Figure 8	– Pulse response curve (Bands C and D)	25
Figure 9	– Theoretical pulse response curve of quasi-peak detector receivers and average detector receiver	26
Figure 10	– Block diagram of an average detector	31

Figure 11 – Screenshot showing the response of the meter-simulating network to an intermittent narrowband signal	31
Figure 12 – Example of a disturbance analyzer	38
Figure 13 – Graphical presentation of test signals used in the test of the analyzer for the performance checks against the definition of a click according to Table 14	39
Figure E.1 – Correction factor for estimating the ratio B_{imp}/B_6 for other tuned circuits	58
Figure E.2 – Pulse rectification coefficient P	60
Figure E.3 – Example (spectrum screenshot) of a pulse-modulated signal with a pulse width of 200 ns	61
Figure E.4 – Pulse-modulated RF signal applied to a measuring receiver	63
Figure E.5 – Filtering with a B_{imp} much smaller than the PRF	63
Figure E.6 – Filtering with a B_{imp} much wider than the PRF	63
Figure E.7 – Calculation of the impulse bandwidth	64
Figure E.8 – Example of a normalized linear selectivity function	65
Figure F.1 – Graphical presentation of the test signals used for the performance checks of the analyzer with the additional requirements according to Table F.1	72
Figure G.1 – Block diagram of APD measurement circuit without A/D converter	74
Figure G.2 – Block diagram of APD measurement circuit with A/D converter	74
Figure G.3 – Example of display of APD measurement results versus equipment-under-test (EUT) state	75
Figure I.1 – Example of block diagram of an EMI receiver consisting of a swept spectrum analyzer with added preselector, preamplifier and quasi-peak/average detector	77
Figure J.1 – Receiver with preamplifier	81
Figure J.2 – Example of the transfer function of an amplifier	83
Figure J.3 – Response of the amplifier of Figure J.2 for a sinusoidal signal	83
Figure J.4 – Response of the amplifier of Figure J.2 for an impulse	83
Figure J.5 – Deviation from linear gain for an unmodulated sine-wave (example)	84
Figure J.6 – Deviation from linear gain for a broadband impulsive signal as measured with the quasi-peak detector (example)	85
Figure J.7 – Screenshot of a band-stop filter test for a preamplifier at around 818 MHz	86
Figure J.8 – Band-stop filter test result with the measuring receiver at 818 MHz	86
Figure J.9 – Band-stop filter test results for the same 10 dB preamplifier but a different receiver with preselection (black) and without preselection (blue)	87
Figure J.10 – Band-stop filter test results for the same 10 dB preamplifier but with the receiver of Figure J.9 with preselection (black) and without preselection (green)	87
Figure J.11 – Weighting functions of the various CISPR detectors with a noise curve to illustrate the remaining operating ranges for broadband impulsive signals (example)	88
Figure K.1 – Compliance determination process with application of measurement uncertainty	93
Table 1 – VSWR requirements for receiver input impedance	17
Table 2 – Combined selectivity of CISPR measuring receiver and high-pass filter	17
Table 3 – Bandwidth requirements for measuring receivers	20
Table 4 – Bandwidth characteristics for intermodulation test of quasi-peak measuring receivers	21
Table 5 – Test pulse characteristics for quasi-peak measuring receivers	23

Table 6 – Pulse response of quasi-peak measuring receivers	27
Table 7 – Relative pulse response of peak and quasi-peak measuring receivers for the same bandwidth (frequency range 9 kHz to 1 000 MHz).....	28
Table 8 – Specification of pulse-modulated carrier (e.m.f.).....	30
Table 9 – Maximum reading of average measuring receivers for a pulse-modulated sine-wave input in comparison with the response to a continuous sine-wave having the same amplitude.....	31
Table 10 – Minimum pulse repetition rate without overload	32
Table 11 – Specification of pulse-modulated carrier (e.m.f.) for testing RMS-average detectors	33
Table 12 – Pulse response of the RMS-average measuring receiver.....	34
Table 13 – Maximum reading of RMS-average measuring receivers for a pulse-modulated sine-wave input in comparison with the response to a continuous sine-wave having the same amplitude	34
Table 14 – Disturbance analyzer performance test – Test signals used for the check against the definition of a click.....	40
Table E.1 – B_{imp} and A_{imp} values for a peak measuring receiver	60
Table E.2 – Carrier level for pulse-modulated signal of 1,4 nVs	61
Table F.1 – Disturbance analyzer test signals.....	67
Table H.1 – Characteristics of quasi-peak measuring receivers	76
Table J.1 – Examples of preamplifier and measuring receiver data and resulting system noise figures	82
Table K.1 – Verification parameter summary.....	92

INTERNATIONAL ELECTROTECHNICAL COMMISSION
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

**SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY
MEASURING APPARATUS AND METHODS –**

**Part 1-1: Radio disturbance and immunity measuring apparatus –
Measuring apparatus**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard CISPR 16-1-1 has been prepared by CISPR subcommittee A: Radio-interference measurements and statistical methods.

This fifth edition cancels and replaces the fourth edition published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Reorganization of the document structure to remove common elements of receiver performance from Clauses 4, 5, 6, and 7 and create a new clause that applies across all of these clauses. Key common parameters include:

- 1) Input impedance
 - 2) CW amplitude accuracy
 - 3) Limitations of intermodulation effects
 - 4) Limitation of receiver noise and internally generated spurious signals
- b) Rewording of Subclause B.1.1 for the purpose of correcting existing errors
 - c) Amendments to Subclause 7.5.2 to modify the definition of the test signal to be used for calibrating and verifying the required RMS-average detector response to pulses of the receiver. This section will include a note requiring that the amplitude of the pulsed signal be verified prior to the calibration, and will include several verification methods.
 - d) Amendments to Subclause 6.5.2 to modify the definition of the test signal to be used for calibrating and verifying the required average detector response to pulses. The purpose of this proposed change is the alignment of the test signal type with that of the newly proposed signal used to verify the RMS-average detector, allowing the use of a pulsed RF signal. This section will include a note requiring that the amplitude of the pulsed signal be verified prior to the calibration and will include several verification methods.
 - e) Implementation and use of Gaussian filters
 - f) Amendments to Clause 9 on discontinuous disturbance analyzers (DDAs) to allow the use of measuring receivers with built-in DDAs, to clarify which signal is used for click time parameter determination and to allow the use of FFT-based measuring instruments with internal DDAs.
 - g) Amendments to Subclauses 4.2, 5.2, 6.2 and 7.2 to remove the mention of a symmetric input for measuring receivers.
 - h) Deletion of Subclause 4.8.1 "Screening Effectiveness".
 - i) add a frequency accuracy specification to the proposed reorganized clause mentioned in a) above.
 - j) Amend Subclause 6.5.3 to adjust the allowable tolerance for the variation with repetition frequency for the linear average detector.
 - k) Add interpretation information to Clause K.4 based on CISPR-A-1188-INF.
 - l) Indicate that the 31,6 Hz pulse repetition frequency for the RMS-Average test requirement for Bands C and D in Table 15 is optional. For the RMS-Average overload requirement in Table 13, change the minimum pulse repetition frequency to 100 Hz and the associated Peak to RMS-Average ratio to 30,6 dB.
 - m) Improve the phrasing used for the tolerance statements in Subclauses 4.4.1, 5.5, 6.5.2, 6.5.3, 6.5.4 and 7.5.2.
 - n) Remove a note from Clause E1.
 - o) Add a reference for FFT-based discontinuous disturbance analyzers

It has the status of a basic EMC publication in accordance with IEC Guide 107, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications*.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
CIS/A/1290/FDIS	CIS/A/1295/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the CISPR 16 series, published under the general title *Specification for radio disturbance and immunity measuring apparatus and methods*, can be found on the IEC website.

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

The CISPR 16 series, published under the general title *Specification for radio disturbance and immunity measuring apparatus and methods*, is comprised of the following sets of documents:

- CISPR 16-1 – six parts covering measurement instrumentation specifications;
- CISPR 16-2 – five parts covering methods of measurement;
- CISPR TR 16-3 – a single publication containing various technical reports (TRs) with further information and background on CISPR and radio disturbances in general;
- CISPR 16-4 – five parts covering uncertainties, statistics and limit modelling.

CISPR 16-1 consists of the following parts, under the general title *Specification for radio disturbance and immunity measuring apparatus and methods – Radio disturbance and immunity measuring apparatus*:

- Part 1-1: Measuring apparatus
- Part 1-2: Coupling devices for conducted disturbance measurements
- Part 1-3: Ancillary equipment – Disturbance power
- Part 1-4: Antennas and test sites for radiated disturbance measurements
- Part 1-5: Antenna calibration sites and reference test sites for 5 MHz to 18 GHz
- Part 1-6: EMC antenna calibration

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning the measuring receiver with RMS-average detector (patent no DE 10126830) given in Clause 7.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

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SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY MEASURING APPARATUS AND METHODS –

Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus

1 Scope

This part of CISPR 16 specifies the characteristics and performance of equipment for the measurement of radio disturbance in the frequency range 9 kHz to 18 GHz. In addition, requirements are provided for specialized equipment for discontinuous disturbance measurements.

NOTE In accordance with IEC Guide 107, CISPR 16-1-1 is a basic electromagnetic compatibility (EMC) standard for use by product committees of the IEC. As stated in Guide 107, product committees are responsible for determining the applicability of a basic EMC standard. CISPR and its subcommittee are prepared to co-operate with product committees in the evaluation of the value of particular EMC tests for specific products.

The specifications in this document apply to electromagnetic interference (EMI) receivers and spectrum analyzers. The term “measuring receiver” used in this document refers to both EMI receivers and spectrum analyzers (see also 3.7). The calibration requirements for measuring receivers are detailed in Annex J.

Further guidance on the use of spectrum analyzers can be found in Annex B of any one of the following documents: CISPR 16-2-1:2014, CISPR 16-2-2:2010, or CISPR 16-2-3:2016.

2 Normative references

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.

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

CISPR 11:2015/AMD1:2016

CISPR 11:2015/AMD2:2019

CISPR 14-1:2016, *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission*

CISPR 16-2-1:2014, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements*

CISPR 16-2-1:2014/AMD1:2017

CISPR 16-2-2:2010, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-2: Methods of measurement of disturbances and immunity - Measurement of disturbance power*

CISPR 16-2-3:2016, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements*

CISPR TR 16-3:2010, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 3: CISPR technical reports*

CISPR TR 16-3:2010/AMD1:2012

CISPR TR 16-3:2010/AMD2:2015

IEC 60050-161:1990, *International Electrotechnical Vocabulary (IEV) – Part 161: Electromagnetic compatibility* (available at www.electropedia.org)