ICS 33.100.10, 33.100.20 SLOVENSKÁ TECHNICKÁ NORMA December 2014

STN	**Špecifikácia metód a meracích prístrojov na meranie rádiového rušenia a odolnosti proti nemu. Časť 1-2: Meracie prístroje na meranie rádiového rušenia a odolnosti proti nemu. Spájacie zariadenia pre meranie rušenia šíreného vedením.**	**STN EN 55016-1-2** 33 4216

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 11/14

Obsahuje: CISPR 16-1-2:2014, EN 55016-1-2:2014

Oznámením tejto normy sa od 25.04.2017 ruší
STN EN 55016-1-2 (33 4216) z mája 2005

119772

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 55016-1-2

July 2014

ICS 33.100.10; 33.100.20

Supersedes EN 55016-1-2:2004

English Version

Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-2: Radio disturbance and immunity measuring apparatus - Coupling devices for conducted disturbance measurements (CISPR 16-1-2:2014)

Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques - Partie 1-2: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques - Dispositifs de couplage pour la mesure des perturbations conduites (CISPR 16-1-2:2014)

Anforderungen an Geräte und Einrichtungen sowie Festlegung der Verfahren zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit - Teil 1-2: Geräte und Einrichtungen zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit - Koppeleinrichtungen zur Messung der leitungsgeführten Störaussendung (CISPR 16-1-2:2014)

This European Standard was approved by CENELEC on 2014-04-25. 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.

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

Foreword

The text of document CISPR/A/1051/FDIS, future edition 2 of CISPR 16-1-2, prepared by SC A "Radio-interference measurements and statistical methods" of IEC/TC CISPR "International special committee on radio interference" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 55016-1-2:2014.

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)	2015-01-25
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-04-25

This document supersedes EN 55016-1-2:2004.

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.

Endorsement notice

The text of the International Standard CISPR 16-1-2:2014 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 16-2 Series	NOTE	Harmonized as EN 55016-2 Series (not modified).
CISPR 16-4 Series	NOTE	Only Part 4-2 harmonized as EN 55016-4-2.
CISPR 22	NOTE	Harmonized as EN 55022.

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

Publication	Year	Title	EN/HD	Year
CISPR 16-1-1	2010	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	EN 55016-1-1	2010
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 16-4-2	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
IEC 61000-4-6	2008	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	2009
IEC 60050	Series	International Electrotechnical Vocabulary - Part 802: Ultrasonics	-	-

CISPR 16-1-2

Edition 2.0 2014-03

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

Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Coupling devices for conducted disturbance measurements

Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Partie 1-2: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Dispositifs de couplage pour la mesure des perturbations conduites

CISPR 16-1-2

Edition 2.0 2014-03

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

Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Coupling devices for conducted disturbance measurements

Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Partie 1-2: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Dispositifs de couplage pour la mesure des perturbations conduites

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX XD

ICS 33.100.10, 33.100.20

ISBN 978-2-8322-1412-1

CONTENTS

FOREWORD 7
1 Scope 9
2 Normative references 9
3 Terms, definitions and abbreviations 10
3.1 Terms and definitions 10
3.2 Abbreviations 12
4 Artificial mains networks 12
4.1 General 12
4.2 AMN impedance 12
4.3 50 Ω/50 μH + 5 Ω artificial mains V-network (V-AMN) for use in the frequency range 9 kHz to 150 kHz 13
4.4 50 Ω/50 μH artificial mains V-network (V-AMN) for use in the frequency range 0,15 MHz to 30 MHz 14
4.5 50 Ω/5 μH + 1 Ω artificial mains V-network (V-AMN) for use in the frequency range 150 kHz to 108 MHz 15
4.6 150 Ω artificial mains V-network (V-AMN) for use in the frequency range 150 kHz to 30 MHz 17
4.7 150 Ω artificial mains delta-network (Δ-AMN) for use in the frequency range 150 kHz to 30 MHz 17
4.7.1 General parameters 17
4.7.2 Balance of the 150 Ω artificial mains delta-network 17
4.8 Isolation 18
4.8.1 Requirement 18
4.8.2 Measurement procedure 18
4.9 Current carrying capacity and series voltage drop 19
4.10 Modified reference ground connection 19
4.11 Measurement of the voltage division factor of artificial mains V-networks 20
5 Current and voltage probes 21
5.1 Current probes 21
5.1.1 General 21
5.1.2 Construction 21
5.1.3 Characteristics 21
5.2 Voltage probe 22
5.2.1 High impedance voltage probe 22
5.2.2 Capacitive voltage probe 23
6 Coupling units for conducted current immunity measurement 25
6.1 General 25
6.2 Characteristics 25
6.2.1 General 25
6.2.2 Impedance 25
6.2.3 Insertion loss 25
7 Coupling devices for measuring signal lines 26
7.1 General 26
7.2 Requirements for AANs (or Y-networks) 26
7.3 Requirements for artificial networks for coaxial and other screened cables 30
8 The artificial hand and series RC element 30

8.1 General 30
8.2 Construction of the artificial hand and RC element 30
8.3 The use of the artificial hand 31
9 CDNE for measurement of disturbance voltage in frequency range 30 MHz to 300 MHz 34
9.1 Instrumentation 34
9.1.1 General 34
9.1.2 Description of the CDNE measurement 35
9.1.3 Description of the RGP 35
9.2 Technical requirements for the CDNE-*X* 36
9.2.1 Mechanical and electrical parameters 36
9.2.2 Validation of the CDNE 36
9.3 Technical requirement for the RGP 39
Annex A (normative) AMNs 40
A.1 General 40
A.2 An example of the 50 Ω/50 μH + 5 Ω artificial mains V-network 40
A.3 An example of the 50 Ω/50 μH artificial mains V-network 41
A.4 Examples of the 50 Ω/5 μH + 1 Ω artificial mains V-network 41
A.5 An example of the 150 Ω artificial mains V-network 42
A.6 Example of the 150 Ω artificial mains delta-network 43
A.7 Example design for an AMN with a 50 μH inductor 44
A.7.1 The inductor 44
A.7.2 The case of the inductor 45
A.7.3 Isolation of the inductor 46
A.8 Measurement of the voltage division factor of an artificial mains V-network 46
Annex B (informative) Construction, frequency range, and calibration of current probes 49
B.1 Physical and electrical considerations for current probes 49
B.2 Equivalent electrical circuit of current probe 51
B.3 Detrimental effects of current probe measurements 51
B.4 Typical frequency response characteristics of current probes 52
B.5 A shielding structure for use with current probes 53
B.5.1 General 53
B.5.2 Theoretical model 54
B.5.3 Construction of the shielding structure 55
B.5.4 High-pass filter 55
B.6 Calibration of current probes 55
Annex C (informative) Construction of the coupling units for current injection for the frequency range 0,15 MHz to 30 MHz 59
C.1 Coupling unit type A for coaxial antenna input 59
C.2 Coupling unit type M, for mains leads 59
C.3 Coupling unit type L, for loudspeaker leads 62
C.4 Coupling unit type Sw, for audio-frequency signals 63
C.5 Coupling unit type Sw, for audio, video, and control signals 63
Annex D (informative) Principle of operation and examples of coupling units for conducted current immunity measurements 65
D.1 Principle of operation 65
D.2 Types of unit and their construction 65

Annex E (normative) Example and measurement of the parameters of the asymmetric artificial network (AAN) 69
E.1 Description of an example of an AAN: the T-network 69
E.2 Measurements of the parameters of an asymmetric artificial network (AAN) 69
Annex F (normative) Example and measurement of the parameters of the AN for coaxial and other screened cables 75
F.1 Description of ANs for coaxial and other screened cables 75
F.2 Measurements of parameters of an AN for coaxial and other screened cables 75
Annex G (informative) Construction and evaluation of capacitive voltage probe 77
G.1 General 77
G.2 Physical and electrical considerations for CVP 77
G.3 Determination of the frequency response of the voltage division factor 77
G.4 Method of measurement to determine the influence of external electric fields 78
G.4.1 Influence of external electric field 78
G.4.2 Method of measurement to determine the influence of the external electric field 78
G.5 Pulse response 78
G.6 Voltage division factor dependence 79
Annex H (informative) Rationale for the introduction of a minimum decoupling factor between mains and EUT/receiver ports for the V-AMN 84
Annex I (informative) Rationale for the introduction of a phase tolerance for the V-AMN input impedance 85
Annex J (informative) Example CDNE set-up diagrams 87
J.1 CDNE-M2 and CDNE-M3 87
J.2 CDNE-S*x* 89
Bibliography 90

Figure 1 – Impedance (magnitude and phase) of the V-network for Band A (see 4.3, the relevant frequency range is from 9 kHz to 150 kHz) 16
Figure 2 – Impedance (magnitude and phase) of the V-network for Band B (see 4.4) 16
Figure 3 – Impedance (magnitude and phase) of the V-network for Bands B and C (from 150 kHz to 108 MHz; see 4.5) 17
Figure 4 – Method for checking the balance of the arrangement for the measurement of symmetrical voltages 18
Figure 5 – Example of artificial mains 50 Ω/50 μH + 5 Ω V-network (see 4.3 and A.2) 20
Figure 6 – Example of artificial mains V-networks, 50 Ω/50 μH, 50 Ω /5 μH + 1 Ω or 150 Ω (see 4.4, 4.5, 4.6, A.3, A.4 and A.5, respectively) 20
Figure 7 – Circuit for RF voltage measurement on supply mains 23
Figure 8 – Circuit used to make voltage measurements between a cable and reference ground 24
Figure 9 – Measuring set-up to check the insertion loss of the coupling units in the frequency range 30 MHz to 150 MHz 26
Figure 10 – Principal circuit and LCL requirements of an AAN 28
Figure 11 – Application of the artificial hand 33
Figure 12 – Examples of application of artificial hand to ITE 34
Figure 13 – Arrangement for validation of a CDNE 37

Figure 14 – IMA arrangement for correcting the electrical length 38
Figure 15 – Test arrangement for the measurement of the symmetric impedance (Z_{DM}) 39
Figure A.1 – Example of an alternative 50 Ω/5 μH + 1 Ω V-AMN for devices used with low impedance power sources 42
Figure A.2 – Example of a Δ-AMN for a measuring receiver with unbalanced input 43
Figure A.3 – Schematic of 50 μH inductor 45
Figure A.4 – General view of an AMN 45
Figure A.5 – Attenuation of an AMN filter 46
Figure A.6 – Test set-up for determining the voltage division factor 47
Figure B.1 – Typical current probe configuration 50
Figure B.2 – High-pass filter with cut-off frequency of 9 kHz 52
Figure B.3 – Transfer impedance of typical current probes 53
Figure B.4 – Set-up for current measurement using the AMN 54
Figure B.5 – Shield configuration used with current transformer 55
Figure B.6 – Schematic diagram of circuit with coaxial adaptor and current probe transfer admittance Y_T measurement 56
Figure B.7 – Transfer admittance Y_T as a function of frequency 57
Figure B.8 – Return loss of the coaxial adaptor terminated with 50 Ω and with the current probe (also terminated with 50 Ω) inside 57
Figure B.9 – Current probe between the two halves of the coaxial adaptor 58
Figure C.1 – Example of coupling unit type A, for coaxial input schematic diagram and construction details (see C.1 and D.2) 60
Figure C.2 – Example of coupling unit type M, for mains leads, schematic diagram and construction details (see C.2 and D.2) 61
Figure C.3 – Example of coupling unit type L for loudspeaker leads, schematic diagram and simplified construction drawing (see D.2) 62
Figure C.4 – Example of coupling unit type Sw, for audio signals. Schematic diagram and simplified construction drawing (see D.2) 63
Figure C.5 – Example of coupling unit type Sw, for audio, video and control signals, schematic diagram and simplified construction drawing (see D.2) 64
Figure D.1 – General principle of the current-injection method (see D.1) 67
Figure D.2 – Coupling unit type Sr with load resistances – Schematic diagram and simplified construction drawing (see D.2) 68
Figure E.1 – Example of a T-network circuit for one pair of wires 70
Figure E.2 – Arrangement for the termination impedance measurement 71
Figure E.3 – Arrangement for LCL probe verification 71
Figure E.4 – Arrangement for the LCL probe calibration using an L-circuit 72
Figure E.5 – LCL measurement of the AAN using an LCL probe 72
Figure E.6 – Test set-up for the decoupling attenuation (isolation) of the AAN $a_{decoup} = 20\lg\left|\frac{V_1}{V_2}\right| - a_{vdiv}$ in dB for asymmetric signals between AE port and EUT port 73
Figure E.7 – Test set-up for the insertion loss (symmetric) of the AAN 73
Figure E.8 – Calibration test set-up for the AAN voltage division factor of the asymmetric circuit: $F_{AAN} = a_{vdiv} = 20\lg\left|\frac{V_1}{V_2}\right|$ in dB 74
Figure F.1 – Example of a coaxial cable AN 75

Figure F.2 – Test set-up for the coaxial and screened cable AN voltage division factor $F_{AN} = 20 \lg \left| \frac{V_1}{V_2} \right|$ in dB 76

Figure G.1 – Configuration of a CVP 80

Figure G.2 – Equivalent circuit of a CVP 81

Figure G.3 – Test set-up to measure the frequency response 81

Figure G.4 – Electrostatic coupling model and its equivalent circuit 82

Figure G.5 – Test set-up to measure the reduction, through the shielding effect, of the influence of the external electric field caused by electrostatic coupling 82

Figure G.6 – Conversion factor deviation when cable position is changed 83

Figure G.7 – Investigation result of the cable radius dependence 83

Figure H.1 – Isolation measurement arrangement 84

Figure I.1 – Definition of impedance magnitude and phase tolerances 85

Figure J.1 – CDNE-M3 with internal attenuator a_{meas} of at least 6 dB 87

Figure J.2 – CDNE-M2 with internal attenuator a_{meas} of at least 6 dB 88

Figure J.3 – CDNE-Sx for screened cable with x internal wires and an internal attenuator of at least 6 dB 89

Table 1 – Magnitudes and phase angles of the V-network (see Figure 1) 13

Table 2 – Magnitudes and phase angles of the V-network (see Figure 2) 14

Table 3 – Magnitudes and phase angles of the V-network (see Figure 3) 15

Table 4 – Values of minimum isolation for V-networks 18

Table 5 – Characteristics of the AAN for the measurement of asymmetric disturbance voltage 29

Table 6 – Characteristics of artificial networks for coaxial and other screened cables 30

Table 7 – Electrical parameters of the CDNE-X 36

Table A.1 – Component values of 50 Ω/50 μH + 5 Ω V-network 40

Table A.2 – Component values of 50 Ω/50 μH V-network 41

Table A.3 – Component values of 50 Ω/5 μH + 1 Ω V-network 42

Table A.4 – Component values of the 150 Ω V-network 43

Table A.5 – Component values of the 150 Ω delta-network 44

INTERNATIONAL ELECTROTECHNICAL COMMISSION
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY MEASURING APPARATUS AND METHODS –

Part 1-2: Radio disturbance and immunity measuring apparatus – Coupling devices for conducted disturbance measurements

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard CISPR 16-1-2 has been prepared by subcommittee A: Radio-interference measurements and statistical methods, of IEC technical committee CISPR: International special committee on radio interference.

This second edition cancels and replaces the first edition published in 2003 and its Amendment 1 (2004) and Amendment 2 (2006). This edition constitutes a technical revision.

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

a) requirements from CISPR 22 for the AAN have been copied to this standard;
b) the CDNE for measurement of disturbance voltage in the frequency range 30 MHz to 300 MHz is added;
c) additional maintenance is included.

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 standard is based on the following documents:

FDIS	Report on voting
CISPR/A/1051/FDIS	CISPR/A/1059/RVD

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

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

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

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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.

SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY MEASURING APPARATUS AND METHODS –

Part 1-2: Radio disturbance and immunity measuring apparatus – Coupling devices for conducted disturbance measurements

1 Scope

This part of the CISPR 16 series specifies the characteristics and performance of equipment for the measurement of radio disturbance voltages and currents in the frequency range 9 kHz to 1 GHz.

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

Specifications for ancillary apparatus are included for artificial mains networks, current and voltage probes and coupling units for current injection on cables.

It is intended that the requirements of this publication are fulfilled at all frequencies and for all levels of radio disturbance voltages and currents within the CISPR indicating range of the measuring equipment.

Methods of measurement are covered in the CISPR 16-2 series, and further information on radio disturbance is given in CISPR 16-3, while uncertainties, statistics and limit modelling are covered in the CISPR 16-4 series.

2 Normative references

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.

CISPR 16-1-1:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

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 16-4-2:2011, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Measurement instrumentation uncertainty*

IEC 60050 (all parts), *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org>)

IEC 61000-4-6:2008, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*