

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



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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references.....	9
3 Terms and definitions	10
4 Frequencies designated for ISM use	11
5 Classification of ISM equipment	12
5.1 Information for the user	12
5.2 Separation into groups.....	12
5.3 Division into classes	12
6 Limits of electromagnetic disturbances.....	13
6.1 General	13
6.2 Group 1 equipment measured on a test site	13
6.2.1 Limits of terminal disturbance voltage	13
6.2.2 Limits of electromagnetic radiation disturbance	14
6.3 Group 2 equipment measured on a test site	17
6.3.1 Limits of terminal disturbance voltage	17
6.3.2 Limits of electromagnetic radiation disturbance	19
6.4 Group 1 and group 2 class A equipment measured <i>in situ</i>	27
6.4.1 Limits of terminal disturbance voltage	27
6.4.2 Limits of electromagnetic radiation disturbance	27
7 Measurement requirements.....	29
7.1 General	29
7.2 Ambient noise.....	29
7.3 Measuring equipment	29
7.3.1 Measuring instruments.....	29
7.3.2 Artificial mains network	30
7.3.3 Voltage probe	30
7.3.4 Antennas	30
7.3.5 Artificial hand.....	31
7.4 Frequency measurement	31
7.5 Configuration of equipment under test.....	31
7.5.1 General	31
7.5.2 Interconnecting cables	31
7.5.3 Connection to the electricity supply network on a test site.....	32
7.6 Load conditions of equipment under test	33
7.6.1 General	33
7.6.2 Medical equipment.....	33
7.6.3 Industrial equipment	34
7.6.4 Scientific, laboratory and measuring equipment.....	35
7.6.5 Microwave cooking appliances	35
7.6.6 Other equipment in the frequency range 1 GHz to 18 GHz.....	35
7.6.7 Single and multiple-zone induction cooking appliances	36
7.6.8 Electric welding equipment.....	36
7.7 Recording of test-site measurement results	37
7.7.1 General	37

7.7.2	Conducted emissions.....	37
7.7.3	Radiated emissions.....	37
8	Special provisions for test site measurements (9 kHz to 1 GHz)	37
8.1	Ground planes.....	37
8.2	Measurement of mains terminal disturbance voltage	37
8.2.1	General	37
8.2.2	Handheld equipment which are normally operated without an earth connection.....	38
8.3	Radiation test site for 9 kHz to 1 GHz.....	38
8.3.1	General	38
8.3.2	Validation of the radiation test site (9 kHz to 1 GHz).....	39
8.3.3	Disposition of equipment under test (9 kHz to 1 GHz).....	39
8.3.4	Radiation measurements (9 kHz to 1 GHz).....	39
8.4	Alternative radiation test sites for the frequency range 30 MHz to 1 GHz	39
9	Radiation measurements: 1 GHz to 18 GHz	40
9.1	Test arrangement	40
9.2	Receiving antenna	40
9.3	Validation and calibration of test site.....	40
9.4	Measuring procedure	40
10	Measurement <i>in situ</i>	40
11	Safety precautions	41
12	Assessment of conformity of equipment	41
12.1	General	41
12.2	Statistical assessment of compliance of series produced equipment.....	41
12.3	Equipment in small-scale production	42
12.4	Equipment produced on an individual basis.....	42
12.5	Measurement uncertainty.....	42
13	Figures and flowcharts.....	42
	Annex A (informative) Examples of equipment classification	46
	Annex B (informative) Precautions to be taken in the use of a spectrum analyzer (see 7.3.1)	48
	Annex C (normative) Measurement of electromagnetic radiation disturbance in the presence of signals from radio transmitters	49
	Annex D (informative) Propagation of interference from industrial radio-frequency equipment at frequencies between 30 MHz and 300 MHz.....	50
	Annex E (informative) Recommendations of CISPR for protection of certain radio services in particular areas.....	51
	Annex F (informative) Frequency bands allocated for safety-related radio services	52
	Annex G (informative) Frequency bands allocated for sensitive radio services	53
	Bibliography.....	54
	Figure 1 – Test site	42
	Figure 2 – Minimum size of metal ground plane	43
	Figure 3 – Disposition of medical (capacitive type) and dummy load (see 7.6.2.1).....	43
	Figure 4 – Circuit for disturbance voltage measurements on mains supply (see 7.3.3).....	44

Figure 5 – Decision tree for the measurement of emissions from 1 GHz to 18 GHz of class B, group 2 ISM equipment operating at frequencies above 400 MHz	44
Figure 6 – Artificial hand, RC element (see 7.3.5)	45
Table 1 – Frequencies in the radio-frequency (RF) range designated by ITU for use as fundamental ISM frequencies	12
Table 2 – Mains terminal disturbance voltage limits for class A group 1 equipment measured on a test site	14
Table 3 – Mains terminal disturbance voltage limits for class B group 1 equipment measured on a test site	14
Table 4 – Electromagnetic radiation disturbance limits for class A group 1 equipment measured on a test site	15
Table 5 – Electromagnetic radiation disturbance limits for class B group 1 equipment measured on a test site	16
Table 6 – Mains terminal disturbance voltage limits for class A group 2 equipment measured on a test site	18
Table 7 – Mains terminal disturbance voltage limits for class B group 2 equipment measured on a test site	18
Table 8 – Mains terminal disturbance voltage limits for induction cooking appliances	19
Table 9 – Electromagnetic radiation disturbance limits for class A group 2 equipment measured on a test site	21
Table 10 – Electromagnetic radiation disturbance limits for class A EDM and arc welding equipment measured on a test site	22
Table 11 – Electromagnetic radiation disturbance limits for class B group 2 equipment measured on a test site	23
Table 12 – Limits of the magnetic field strength for induction cooking appliances intended for commercial use	24
Table 13 – Limits of the magnetic field induced current in a 2 m loop antenna for induction cooking appliances for domestic use	25
Table 14 – Electromagnetic radiation disturbance peak limits for group 2 equipment producing CW type disturbances and operating at frequencies above 400 MHz	26
Table 15 – Electromagnetic radiation disturbance peak limits for class B group 2 equipment producing fluctuating disturbances other than CW and operating at frequencies above 400 MHz	26
Table 16 – Electromagnetic radiation disturbance weighted limits for class B group 2 equipment producing fluctuating disturbances other than CW and operating at frequencies above 400 MHz	27
Table 17 – Electromagnetic radiation disturbance limits for class A group 1 equipment measured <i>in situ</i>	27
Table 18 – Electromagnetic radiation disturbance limits for class A group 2 equipment measured <i>in situ</i>	28
Table 19 – The non-central <i>t</i> -distribution factor <i>k</i> as a function of the sample size <i>n</i>	41
Table E.1 – Limits for electromagnetic radiation disturbances for <i>in situ</i> measurements to protect specific safety-related radio services in particular areas	51

INTERNATIONAL ELECTROTECHNICAL COMMISSION
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

**INDUSTRIAL, SCIENTIFIC AND MEDICAL EQUIPMENT –
RADIO-FREQUENCY DISTURBANCE CHARACTERISTICS –
LIMITS AND METHODS OF MEASUREMENT**

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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This consolidated version of CISPR 11 consists of the fifth edition (2009) [documents CISPR/B/478/FDIS and CISPR/B/482/RVD] and its amendment 1 (2010) [documents CISPR/B/492/FDIS and CISPR/B/496/RVD]. It bears the edition number 5.1.

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience. A vertical line in the margin shows where the base publication has been modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through.

International Standard CISPR 11 has been prepared by CISPR Subcommittee 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.

This fifth edition of CISPR 11 got a more transparent structure, introduces another set of particular limits for conducted and radiated disturbances of "heavy duty" general purpose equipment of class A group 1 with a rated input power in excess of 20 kVA, in accordance with the needs of the industries and refers to the full approach in respect of the measurement instrumentation uncertainty specified in CISPR-~~16-4-4~~ 16-4-2. Furthermore, any kind of "legal statements" were removed from the normative main body of this International Standard.

It has the status of a Product Family EMC standard in accordance with IEC Guide 107, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications* (2009).

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

The committee has decided that the contents of the base publication and its amendments 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 publication using a colour printer.

The main content of this standard is based on CISPR Recommendation No. 39/2 given below:

RECOMMENDATION No. 39/2

Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment

The CISPR

CONSIDERING

- a) that ISM RF equipment is an important source of disturbance;
- b) that methods of measuring such disturbances have been prescribed by the CISPR;
- c) that certain frequencies are designated by the International Telecommunication Union (ITU) for unrestricted radiation from ISM equipment,

RECOMMENDS

that the latest edition of CISPR 11 be used for the application of limits and methods of measurement of ISM equipment.

INTRODUCTION

This CISPR publication contains, amongst common requirements for the control of RF disturbances from equipment intended for use in industrial, scientific, and medical (ISM) electrical applications, specific requirements for the control of RF disturbances caused by ISM RF applications in the meaning of the definition of the International Telecommunication Union (ITU), see also Definition 3.1 in this International Standard. CISPR and ITU share their responsibility for the protection of radio services in respect of the use of ISM RF applications.

The CISPR is concerned with the control of RF disturbances from ISM RF applications by means of an assessment of these disturbances, either at a standardised test site or, for an individual ISM RF application which cannot be tested at such a site, at its place of operation. Consequently, this CISPR publication covers requirements for conformity assessment of both, equipment assessed by means of type tests at standardised test sites or of individual equipment under *in situ* conditions.

The ITU is concerned with the control of RF disturbances from ISM RF applications during normal operation and use of the respective equipment at its place of operation. There, use of radio-frequency energy decoupled from the ISM RF application by radiation, induction or capacitive coupling is restricted to the location of that individual application.

This CISPR publication contains, in 6.2 and 6.3, the essential emission requirements for an assessment of RF disturbances from ISM RF applications at standardised test sites. These requirements allow for type testing of ISM RF applications operated at frequencies up to 18 GHz. It further contains, in 6.4, the essential emission requirements for an *in situ* assessment of RF disturbances from individual ISM RF applications in the frequency range up to 18 GHz. All requirements were established in close collaboration with the ITU and enjoy approval of the ITU.

However, for operation and use of several types of ISM RF applications, the manufacturer, installer and/or customer should be aware of additional national provisions regarding possible licensing and particular protection needs of local radio services and applications. Depending on the country concerned, such additional provisions may apply to individual ISM RF applications operated at frequencies outside designated ISM bands (see Table 1). They also may apply to ISM RF applications operated at frequencies above 18 GHz. For the latter type of applications, local protection of radio services and appliances requires an accomplishment of the conformity assessment by application of the relevant national provisions in the frequency range above 18 GHz in accordance with vested interests of the ITU and national administrations. These additional national provisions may apply to spurious emissions, emissions appearing at harmonics of the operation frequency, and to wanted emissions at the operation frequency allocated outside a designated ISM band in the frequency range above 18 GHz.

Recommendations of CISPR for the protection of radio services in particular areas are found in Annex E of this International Standard.

INDUSTRIAL, SCIENTIFIC AND MEDICAL EQUIPMENT – RADIO-FREQUENCY DISTURBANCE CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT

1 Scope

This International Standard applies to industrial, scientific and medical electrical equipment operating in the frequency range 0 Hz to 400 GHz and to domestic and similar appliances designed to generate and/or use locally radio-frequency energy.

This standard covers emission requirements related to radio-frequency (RF) disturbances in the frequency range of 9 kHz to 400 GHz. Measurements need only be performed in frequency ranges where limits are specified in Clause 6.

For ISM RF applications in the meaning of the definition found in the ITU Radio Regulations (see Definition 3.1), this standard covers emission requirements related to radio-frequency disturbances in the frequency range of 9 kHz to 18 GHz.

Requirements for ISM RF lighting apparatus and UV irradiators operating at frequencies within the ISM frequency bands defined by the ITU Radio Regulations are contained in this standard.

Equipment covered by other CISPR product and product family emission standards are excluded from the scope of this standard.

NOTE Induction cooking appliances are in the process of being transferred from CISPR 11 to CISPR 14-1. Until the removal of induction cooking appliances from the scope of CISPR 11, users of the standards may choose either CISPR 11 or CISPR 14-1 for testing.

2 Normative references

The following referenced documents are indispensable for the application 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 16-1-1:2006, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

Amendment 1 (2006)

Amendment 2 (2007)

CISPR 16-1-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Conducted disturbances*

Amendment 1 (2004)

Amendment 2 (2006)

CISPR 16-1-4:2007, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radiated disturbances*

Amendment 1 (2007)

Amendment 2 (2008)

CISPR 16-2-3:2006, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements*