

## **CISPR/TR 16-2-5**

Edition 1.0 2008-07

# TECHNICAL REPORT

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

Specification for radio disturbance and immunity measuring apparatus and methods –

Part 2-5: In situ measurements of disturbing emissions produced by physically large equipment

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 33.100.10 ISBN 2-8318-9894-3

### CONTENTS

FO	REW	ORD		3	
1	Scop	e		5	
2	Norn	Normative references			
3	Terms and definitions			6	
4	Methodology			7	
	4.1 Structure of each measurement				
	4.2				
	4.3	•			
	4.4		sment of measurement results		
5	Method of <i>in situ</i> measurement of conducted disturbance				
	5.1				
	5.2	Conducted emission measurement procedure			
		5.2.1	Connection conditions	10	
		5.2.2	Reference ground for in situ measurements	10	
		5.2.3	Disturbance voltage/current measurements on cables which carry wanted symmetrical signals	10	
		5.2.4	Disturbance voltage measurements on cables which do not carry wanted symmetrical signals	11	
6	Method of in situ measurement of radiated disturbance			11	
	6.1	1 General			
	6.2	6.2 Measurement conditions		12	
	6.3 Measurement methods		rement methods	12	
		6.3.1	Measurement parameters	12	
		6.3.2	Measurements in case of interference complaints		
		6.3.3	Measurements for compliance purposes		
		6.3.4	Measurements below 30 MHz		
7	Measurement report				
Bib	liogra	phy		15	
Fig	ure 1	– Enclo	sure port	8	

## INTERNATIONAL ELECTROTECHNICAL COMMISSION INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

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

## Part 2-5: *In situ* measurements of disturbing emissions produced by physically large equipment

#### **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.
- 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.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

CISPR 16-2-5, which is a technical report, has been prepared by CISPR subcommittee H: Limits for the protection of radio services.

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

Enquiry draft	Report on voting	
CISPR/H/161/DTR	CISPR/H/172/RVC	

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

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

A list of all parts of 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 publication will remain unchanged until the maintenance result 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.

A bilingual version of this publication may be issued at a later date.

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

## Part 2-5: *In situ* measurements of disturbing emissions produced by physically large equipment

#### 1 Scope

This part of CISPR 16 deals with *in situ* electromagnetic disturbance measurements in any environment from physically large equipment and systems excluding networks.

It covers both radiated and conducted emission phenomena, and does not deal with immunity tests.

This technical report is intended to be applied primarily to such physically large equipment which are not under the scope of any existing emission standards (as for example CISPR 11 and CISPR 22). It serves only as a guideline on how to deal with emissions of that equipment at the particular location of installation. It does not establish any emission requirements.

NOTE 1 Although this technical report is intended to be applied to equipment which is not under the scope of any existing emission standards, it may be used also in such cases in order to serve as additional information for carrying out *in situ* measurements for any type of large equipment.

NOTE 2 Examples of large equipment are: production machines, conveyors, large displays, aircraft simulators, traffic control equipment, etc.

Due to the severe impact of the conditions existing at a particular location of operation and the use of the respective large equipment, however, it is not intended to use the measurements in the frame of type testing.

NOTE 3 In general, type testing on large equipment is only possible at standardized test sites in a controlled environment. The assessment results obtained under in situ conditions are only valid for the respective individual large equipment actually measured at its particular place of installation. These results cannot be transposed to other equipment of the same type, but installed at other locations.

Reference in-situ measurement distances will be given. This allows comparison of the measurement results with limits from existing relevant standards.

The frequency range under consideration is from 9 kHz to 18 GHz.

Dealing with biological effects on living matter is excluded from this document.

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

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

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

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

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

NOTE See also the Bibliography