Electromagnetic compatibility (EMC) –

Part 4:
Testing and measurement techniques –
Section 15: Flickermeter – Functional and design specifications

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International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11  Telefax: +41 22 919 03 00  E-mail: inmail@iec.ch  Web: www.iec.ch

Commission Electrotechnique Internationale
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Международная Электротехническая Комиссия

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FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 IEC 61000-4-15 has been prepared by subcommittee 77A: Low-frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

It forms section 15 of part 4 of the IEC 61000 series. It has the status of a basic EMC publication in accordance with IEC guide 107.

This consolidated version of IEC 61000-4-15 consists of the first edition (1997) [documents 77A/180/FDIS and 77A/190/RVD and its amendment 1 (2003) [documents 77A/389/FDIS and 77A/399/RVD.

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 1.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

Annex A forms an integral part of this standard.

Annex B is for information only.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until 2006. At this date, the publication will be

• reconfirmed;
• withdrawn;
• replaced by a revised edition, or
• amended.
INTRODUCTION

IEC 61000-4 is a part of the IEC 61000 series, according to the following structure:

Part 1: General
   General consideration (introduction, fundamental principles)
   Definitions, terminology

Part 2: Environment
   Description of the environment
   Classification of the environment
   Compatibility levels

Part 3: Limits
   Emission limits
   Immunity limits (in so far as they do not fall under the responsibility of the product committees)

Part 4: Testing and measurement techniques
   Measurement techniques
   Testing techniques

Part 5: Installation and mitigation guidelines
   Installation guidelines
   Mitigation methods and devices

Part 6: Generic standards

Part 9: Miscellaneous

Each part is further subdivided into sections which are to be published either as International Standards or as technical reports.

These sections of IEC 61000-4 will be published in chronological order and numbered accordingly.
1 Scope and object

This section of IEC 61000-4 gives a functional and design specification for flicker measuring apparatus intended to indicate the correct flicker perception level for all practical voltage fluctuation waveforms. Information is presented to enable such an instrument to be constructed. A method is given for the evaluation of flicker severity on the basis of the output of flickermeters complying with this standard.

This section is based partly on work by the "Disturbances" Working Group of the International Union for Electroheat (UIE), partly on work of the IEEE, and partly on work within IEC itself. The flickermeter specifications in this section relate only to measurements of 230 V, 50 Hz inputs and 120 V, 60 Hz inputs; specifications for other voltages and other frequencies are under consideration.

The object of this section is to provide basic information for the design and the instrumentation of an analogue or digital flicker measuring apparatus. It does not give tolerance limit values of flicker severity.

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.


IEC 61000-4-2:1995, Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test
IEC 61000-4-3:1995, Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 3: Radiated, radio-frequency, electromagnetic field immunity test
IEC 61000-4-4:1995, Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test
3 Description of the instrument
3.1 General
The description given below is based on an analogue implementation. The flickermeter architecture is described by the block diagram of figure 1, and can be divided into two parts, each performing one of the following tasks:

– simulation of the response of the lamp-eye-brain chain;
– on-line statistical analysis of the flicker signal and presentation of the results.

The first task is performed by blocks 2, 3 and 4 of figure 1, while the second task is accomplished by block 5.

3.2 Block 1 – Input voltage adaptor and calibration checking circuit
This block contains a signal generator to check the calibration of the flickermeter on site and a voltage adapting circuit that scales the mean r.m.s. value of the input mains frequency voltage down to an internal reference level. In this way flicker measurements can be made independently of the actual input carrier voltage level and expressed as a per cent ratio. Taps on the input transformer establish suitable input voltage ranges to keep the input signal to the voltage adaptor within its permissible range.

* To be published.