



IEC 61000-3-2

Edition 5.0 2018-01
REDLINE VERSION

INTERNATIONAL STANDARD



**Electromagnetic compatibility (EMC) –
Part 3-2: Limits – Limits for harmonic current emissions (equipment input
current ≤ 16 A per phase)**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.100.10

ISBN 978-2-8322-5332-8

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	4
INTRODUCTION	7
1 Scope	8
2 Normative references	8
3 Terms and definitions	9
4 General	14
5 Classification of equipment	14
5.1 General	14
5.2 Description of lighting equipment	15
6 General requirements	16
6.1 General	16
6.2 Control methods	16
6.3 Harmonic current measurement	17
6.3.1 Test configuration	17
6.3.2 Measurement procedure	17
6.3.3 General requirements	18
6.3.4 Test observation period	20
6.4 Equipment in a rack or case	20
7 Harmonic current limits	20
7.1 General	20
7.2 Limits for Class A equipment	21
7.3 Limits for Class B equipment	22
7.4 Limits for Class C equipment	22
7.4.1 General	22
7.4.2 Rated power > 25 W	22
7.4.3 Rated power ≥ 5 W and ≤ 25 W	23
7.5 Limits for Class D equipment	24
Annex A (normative) Measurement circuit and supply source	26
A.1 Test circuit	26
A.2 Supply source	26
Annex B (normative) Requirements for measurement equipment	26
Annex B (normative) Type test conditions	30
B.1 General	30
B.2 Test conditions for television receivers (TV)	30
B.2.1 General conditions requirements	30
B.2.2 Conditions for Measurement conditions	30
B.2.3 Test report	31
B.3 Test conditions for audio amplifiers	31
B.3.1 Conditions	31
B.3.2 Input signals and loads	32
B.4 Test conditions for video-cassette recorders	32
B.5 Test conditions for lighting equipment	32
B.5.1 General conditions	32
B.5.2 Lamps	32
B.5.3 Luminaires	33

Ballasts and step-down converters		
B.5.4	Lighting control gear	33
B.5.5	DLT control devices	34
B.6	Test conditions for independent and built-in incandescent lamp phase control dimmers for lighting equipment	34
B.7	Test conditions for vacuum cleaners	34
B.8	Test conditions for washing machines	35
B.9	Test conditions for microwave ovens	35
B.10	Test conditions for information technology equipment (ITE)	35
B.10.1	General conditions	35
B.10.2	Optional conditions for measuring emissions of IT equipment with external power supplies or battery chargers	36
B.11	Test conditions for induction hobs cooking appliances	37
B.11.1	Induction hobs and hotplates	37
B.11.2	Hobs and hotplates other than induction cooking appliances	37
B.12	Test conditions for air conditioners	38
B.13	Test conditions for kitchen machines as defined in IEC 60335-2-14	38
B.14	Test conditions for arc welding equipment which is not professional equipment	38
B.15	Test conditions for high pressure cleaners which are not professional equipment	39
B.16	Test conditions for refrigerators and freezers	39
B.16.1	General	39
B.16.2	Refrigerators and freezers with VSD	39
B.16.3	Refrigerators and freezers without VSD	40
Bibliography		41
Figure 1 – Flowchart for determining conformity		21
Figure 2 – Illustration of the relative phase angle and current parameters described in 7.4.3		23
Figure A.1 – Measurement circuit for single-phase equipment		27
Figure A.2 – Measurement circuit for three-phase equipment		28
Table 1 – Limits for Class A equipment		24
Table 2 – Limits for Class C equipment		25
Table 3 – Limits for Class D equipment		25
Table 4 – Test observation period		25
Table B.1 – Conventional load for arc welding equipment tests		38

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –**Part 3-2: Limits – Limits for harmonic current emissions
(equipment input current ≤ 16 A per phase)**

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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 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.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 61000-3-2 has been prepared by sub-committee 77A: EMC – Low frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

It forms part 3-2 of the IEC 61000 series. It has the status of a product family standard.

This fifth edition cancels and replaces the fourth edition published in 2014. This edition constitutes a technical revision.

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

- a) an update of the emission limits for lighting equipment with a rated power ≤ 25 W to take into account new types of lighting equipment;
- b) the addition of a threshold of 5 W under which no emission limits apply to all lighting equipment;
- c) the modification of the requirements applying to the dimmers when operating non-incandescent lamps;
- d) the addition of test conditions for digital load side transmission control devices;
- e) the removal of the use of reference lamps and reference ballasts for the tests of lighting equipment;
- f) the simplification and clarification of the terminology used for lighting equipment;
- g) the classification of professional luminaires for stage lighting and studios under Class A;
- h) a clarification about the classification of emergency lighting equipment;
- i) a clarification for lighting equipment including one control module with an active input power ≤ 2 W;
- j) an update of the test conditions for television receivers;
- k) an update of the test conditions for induction hobs, taking also into account the other types of cooking appliances;
- l) for consistency with IEC 61000-3-12, a change of the scope of IEC 61000-3-2 from equipment with an input current ≤ 16 A to equipment with a rated input current ≤ 16 A.

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

FDIS	Report on voting
77A/986/FDIS	77A/990/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.

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

A list of all parts in the IEC 61000 series, published under the general title, *Electromagnetic compatibility (EMC)*, can be found on the IEC website.

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.

INTRODUCTION

IEC 61000 is published in separate parts, according to the following structure:

Part 1: General

General considerations (introduction, fundamental principles)

Definitions, terminology

Part 2: Environment

Description levels

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, technical specifications, or as technical reports.~~

~~These standards and reports will be published in chronological order and numbered accordingly (for example, 61000-6-1).~~

~~This part is an international standard which gives emission limits for harmonic currents from equipment having an input current up to and including 16 A per phase.~~

~~This part is a Product Family Standard.~~

Each part is further subdivided into several parts, published either as international standards or as technical specifications or technical reports, some of which have already been published as sections. Others will be published with the part number followed by a dash and a second number identifying the subdivision (example: IEC 61000-6-1).

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

1 Scope

This part of IEC 61000 deals with the limitation of harmonic currents injected into the public supply system.

It specifies limits of harmonic components of the input current which ~~may~~ can be produced by equipment tested under specified conditions.

~~Harmonic components are measured according to Annexes A and B.~~

This part of IEC 61000 is applicable to electrical and electronic equipment having an ~~rated~~ input current up to and including 16 A per phase, and intended to be connected to public low-voltage distribution systems.

Arc welding equipment which is not professional equipment, with a ~~rated~~ input current up to and including 16 A per phase, is included in this document. Arc welding equipment intended for professional use, as specified in IEC 60974-1, is excluded from this document and ~~may~~ can be subject to installation restrictions as indicated in ~~IEC/TR 61000-3-4 or~~ IEC 61000-3-12.

The tests according to this document are type tests. ~~Test conditions for particular equipment are given in Annex C.~~

For systems with nominal voltages less than but not equal to 220 V (line-to-neutral), the limits have not yet been considered.

NOTE The words apparatus, appliance, device and equipment are used throughout this document. They have the same meaning for the purposes of this document.

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.

~~IEC 60050-131, International Electrotechnical Vocabulary (IEV) – Part 131: Electric and magnetic circuits~~

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

~~IEC 60107-1, Methods of measurement on receivers for television broadcast transmissions – Part 1: General considerations – Measurements at radio and video frequencies~~

IEC 60155, Glow-starters for fluorescent lamps

~~IEC 60268-1:1985, Sound system equipment – Part 1: General~~

IEC 60268-3, *Sound system equipment – Part 3: Amplifiers*

~~IEC 60335-2-2, Household and similar electrical appliances – Safety – Part 2-2: Particular requirements for vacuum cleaners and water suction cleaning appliances~~

~~IEC 60335-2-14, Household and similar electrical appliances – Safety – Part 2-14: Particular requirements for kitchen machines~~

IEC 60335-2-24:2010, *Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers*

~~IEC 60335-2-79, Household and similar electrical appliances – Safety – Part 2-79: Particular requirements for high pressure cleaners and steam cleaners~~

~~IEC 60974-1, Arc welding equipment – Part 1: Welding power sources~~

~~IEC 61000-2-2, Electromagnetic compatibility (EMC) – Part 2-2: Environment – Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems~~

~~IEC/TR 61000-3-4, Electromagnetic compatibility (EMC) – Part 3-4: Limits – Limitation of emission of harmonic currents in low-voltage power supply systems for equipment with rated current greater than 16 A~~

~~IEC 61000-3-12, Electromagnetic compatibility (EMC) – Part 3-12: Limits – Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase~~

IEC 61000-4-7:2002, *Electromagnetic compatibility (EMC) – Part 4-7: Testing and measurement techniques – General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto*
IEC 61000-4-7:2002/AMD1:2008

~~Recommendation ITU-R BT.471-1, Nomenclature and description of colour bar signals~~

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Electromagnetic compatibility (EMC) –
Part 3-2: Limits – Limits for harmonic current emissions (equipment input
current ≤ 16 A per phase)**

**Compatibilité électromagnétique (CEM) –
Partie 3-2: Limites – Limites pour les émissions de courant harmonique
(courant appelé par les appareils ≤ 16 A par phase)**

CONTENTS

FOREWORD	4
INTRODUCTION	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	8
4 General	11
5 Classification of equipment	12
5.1 General	12
5.2 Description of lighting equipment	12
6 General requirements	13
6.1 General	13
6.2 Control methods	13
6.3 Harmonic current measurement	14
6.3.1 Test configuration	14
6.3.2 Measurement procedure	15
6.3.3 General requirements	15
6.3.4 Test observation period	17
6.4 Equipment in a rack or case	17
7 Harmonic current limits	17
7.1 General	17
7.2 Limits for Class A equipment	18
7.3 Limits for Class B equipment	19
7.4 Limits for Class C equipment	19
7.4.1 General	19
7.4.2 Rated power > 25 W	19
7.4.3 Rated power ≥ 5 W and ≤ 25 W	20
7.5 Limits for Class D equipment	21
Annex A (normative) Measurement circuit and supply source	23
A.1 Test circuit	23
A.2 Supply source	23
Annex B (normative) Type test conditions	26
B.1 General	26
B.2 Test conditions for television receivers (TV)	26
B.2.1 General requirements	26
B.2.2 Measurement conditions	26
B.2.3 Test report	27
B.3 Test conditions for audio amplifiers	27
B.3.1 Conditions	27
B.3.2 Input signals and loads	27
B.4 Test conditions for video-cassette recorders	28
B.5 Test conditions for lighting equipment	28
B.5.1 General conditions	28
B.5.2 Lamps	28
B.5.3 Luminaires	28
B.5.4 Lighting control gear	28

B.5.5	DLT control devices	29
B.6	Test conditions for independent phase control dimmers for lighting equipment	29
B.7	Test conditions for vacuum cleaners	29
B.8	Test conditions for washing machines	29
B.9	Test conditions for microwave ovens	30
B.10	Test conditions for information technology equipment (ITE)	30
B.10.1	General conditions	30
B.10.2	Optional conditions for measuring emissions of IT equipment with external power supplies or battery chargers	31
B.11	Test conditions for cooking appliances	31
B.11.1	Induction hobs and hotplates	31
B.11.2	Hobs and hotplates other than induction cooking appliances	32
B.12	Test conditions for air conditioners	32
B.13	Test conditions for kitchen machines as defined in IEC 60335-2-14	32
B.14	Test conditions for arc welding equipment which is not professional equipment	32
B.15	Test conditions for high pressure cleaners which are not professional equipment	33
B.16	Test conditions for refrigerators and freezers	33
B.16.1	General	33
B.16.2	Refrigerators and freezers with VSD	33
B.16.3	Refrigerators and freezers without VSD	34
	Bibliography	35
	Figure 1 – Flowchart for determining conformity	18
	Figure 2 – Illustration of the relative phase angle and current parameters described in 7.4.3	20
	Figure A.1 – Measurement circuit for single-phase equipment	24
	Figure A.2 – Measurement circuit for three-phase equipment	25
	Table 1 – Limits for Class A equipment	21
	Table 2 – Limits for Class C equipment ^a	21
	Table 3 – Limits for Class D equipment	22
	Table 4 – Test observation period	22
	Table B.1 – Conventional load for arc welding equipment tests	33

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 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 IEC 61000-3-2 has been prepared by sub-committee 77A: EMC – Low frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

It forms part 3-2 of the IEC 61000 series. It has the status of a product family standard.

This fifth edition cancels and replaces the fourth edition published in 2014. This edition constitutes a technical revision.

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

- a) an update of the emission limits for lighting equipment with a rated power ≤ 25 W to take into account new types of lighting equipment;
- b) the addition of a threshold of 5 W under which no emission limits apply to all lighting equipment;

- c) the modification of the requirements applying to the dimmers when operating non-incandescent lamps;
- d) the addition of test conditions for digital load side transmission control devices;
- e) the removal of the use of reference lamps and reference ballasts for the tests of lighting equipment;
- f) the simplification and clarification of the terminology used for lighting equipment;
- g) the classification of professional luminaires for stage lighting and studios under Class A;
- h) a clarification about the classification of emergency lighting equipment;
- i) a clarification for lighting equipment including one control module with an active input power ≤ 2 W;
- j) an update of the test conditions for television receivers;
- k) an update of the test conditions for induction hobs, taking also into account the other types of cooking appliances;
- l) for consistency with IEC 61000-3-12, a change of the scope of IEC 61000-3-2 from equipment with an input current ≤ 16 A to equipment with a rated input current ≤ 16 A.

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

FDIS	Report on voting
77A/986/FDIS	77A/990/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.

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

A list of all parts in the IEC 61000 series, published under the general title, *Electromagnetic compatibility (EMC)*, can be found on the IEC website.

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.

INTRODUCTION

IEC 61000 is published in separate parts, according to the following structure:

Part 1: General

General considerations (introduction, fundamental principles)

Definitions, terminology

Part 2: Environment

Description levels

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 several parts, published either as international standards or as technical specifications or technical reports, some of which have already been published as sections. Others will be published with the part number followed by a dash and a second number identifying the subdivision (example: IEC 61000-6-1).

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

1 Scope

This part of IEC 61000 deals with the limitation of harmonic currents injected into the public supply system.

It specifies limits of harmonic components of the input current which can be produced by equipment tested under specified conditions.

This part of IEC 61000 is applicable to electrical and electronic equipment having a rated input current up to and including 16 A per phase, and intended to be connected to public low-voltage distribution systems.

Arc welding equipment which is not professional equipment, with a rated input current up to and including 16 A per phase, is included in this document. Arc welding equipment intended for professional use, as specified in IEC 60974-1, is excluded from this document and can be subject to installation restrictions as indicated in IEC 61000-3-12.

The tests according to this document are type tests.

For systems with nominal voltages less than but not equal to 220 V (line-to-neutral), the limits have not yet been considered.

NOTE The words apparatus, appliance, device and equipment are used throughout this document. They have the same meaning for the purposes of this document.

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.

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

IEC 60155, *Glow-starters for fluorescent lamps*

IEC 60268-3, *Sound system equipment – Part 3: Amplifiers*

IEC 60335-2-24:2010, *Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers*

IEC 61000-4-7:2002, *Electromagnetic compatibility (EMC) – Part 4-7: Testing and measurement techniques – General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto*
IEC 61000-4-7:2002/AMD1:2008

SOMMAIRE

AVANT-PROPOS	38
INTRODUCTION	41
1 Domaine d'application	42
2 Références normatives	42
3 Termes et définitions	43
4 Généralités	47
5 Classification des appareils	47
5.1 Généralités	47
5.2 Description des appareils d'éclairage	48
6 Exigences générales	49
6.1 Généralités	49
6.2 Principes de commande	49
6.3 Mesure des courants harmoniques	50
6.3.1 Configuration d'essai	50
6.3.2 Procédure de mesure	50
6.3.3 Exigences générales	51
6.3.4 Période d'observation pour les essais	53
6.4 Appareil en rack ou en boîtier	53
7 Limites des courants harmoniques	53
7.1 Généralités	53
7.2 Limites pour les appareils de classe A	55
7.3 Limites pour les appareils de classe B	56
7.4 Limites pour les appareils de classe C	56
7.4.1 Généralités	56
7.4.2 Puissance assignée > 25 W	56
7.4.3 Puissance assignée ≥ 5 W et ≤ 25 W	57
7.5 Limites pour les appareils de classe D	58
Annexe A (normative) Circuit de mesure et source d'alimentation	60
A.1 Circuit d'essai	60
A.2 Source d'alimentation	60
Annexe B (normative) Conditions des essais de type	63
B.1 Généralités	63
B.2 Conditions d'essai des récepteurs de télévision (TV)	63
B.2.1 Exigences générales	63
B.2.2 Conditions de mesure	63
B.2.3 Rapport d'essai	64
B.3 Conditions d'essai des amplificateurs audio	64
B.3.1 Conditions	64
B.3.2 Signaux d'entrée et charges	64
B.4 Conditions d'essai des magnétoscopes	65
B.5 Conditions d'essai des appareils d'éclairage	65
B.5.1 Conditions générales	65
B.5.2 Lampes	65
B.5.3 Luminaires	65
B.5.4 Appareillage destiné à l'éclairage	66

B.5.5	Dispositifs de commande DLT	66
B.6	Conditions d'essai des variateurs de lumière indépendants à commande de phase pour les appareils d'éclairage	66
B.7	Conditions d'essai des aspirateurs	66
B.8	Conditions d'essai des lave-linge	67
B.9	Conditions d'essai des fours à micro-ondes	67
B.10	Conditions d'essai des appareils de traitement de l'information (ATI)	68
B.10.1	Conditions générales	68
B.10.2	Conditions optionnelles pour mesurer les émissions produites par les appareils de traitement de l'information ayant des alimentations de puissance ou des chargeurs de batterie externes	68
B.11	Conditions d'essai des appareils de cuisson	69
B.11.1	Tables de cuisson et plaques chauffantes à induction	69
B.11.2	Tables de cuisson et plaques chauffantes autres que les appareils de cuisson à induction	70
B.12	Conditions d'essai des climatiseurs	70
B.13	Conditions d'essai des machines de cuisine telles que définies dans l'IEC 60335-2-14	70
B.14	Conditions d'essai du matériel de soudage à l'arc qui n'est pas du matériel professionnel	70
B.15	Conditions d'essai des appareils de nettoyage à haute pression qui ne sont pas du matériel professionnel	71
B.16	Conditions d'essai des réfrigérateurs et congélateurs	71
B.16.1	Généralités	71
B.16.2	Réfrigérateurs et congélateurs avec entraînement(s) à vitesse variable	72
B.16.3	Réfrigérateurs et congélateurs sans entraînement à vitesse variable	72
	Bibliographie	73
	Figure 1 – Organigramme pour déterminer la conformité	55
	Figure 2 – Illustration des paramètres en déphasage relatif et en courant décrits en 7.4.3	57
	Figure A.1 – Circuit de mesure pour les appareils monophasés	61
	Figure A.2 – Circuit de mesure pour les appareils triphasés	62
	Tableau 1 – Limites pour les appareils de classe A	58
	Tableau 2 – Limites pour les appareils de classe C ^a	58
	Tableau 3 – Limites pour les appareils de classe D	59
	Tableau 4 – Période d'observation pour les essais	59
	Tableau B.1 – Charge conventionnelle pour les essais du matériel de soudage à l'arc	71

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

COMPATIBILITÉ ÉLECTROMAGNÉTIQUE (CEM) –

Partie 3-2: Limites – Limites pour les émissions de courant harmonique (courant appelé par les appareils ≤ 16 A par phase)

AVANT-PROPOS

- 1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
- 2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
- 3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
- 4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
- 5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
- 6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
- 7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
- 8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
- 9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et de ne pas avoir signalé leur existence.

La Norme internationale IEC 61000-3-2 a été établie par le sous-comité 77A: CEM – Phénomènes basse fréquence, du comité d'études 77 de l'IEC: Compatibilité électromagnétique.

Elle constitue la partie 3-2 de la série IEC 61000. Elle a le statut d'une norme de famille de produit.

Cette cinquième édition annule et remplace la quatrième édition parue en 2014. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) une mise à jour des limites d'émission pour les appareils d'éclairage ayant une puissance assignée ≤ 25 W afin de tenir compte des nouveaux types d'appareils d'éclairage;
- b) l'ajout d'un seuil de 5 W en dessous duquel aucune limite d'émission ne s'applique à l'ensemble des appareils d'éclairage;
- c) la modification des exigences qui s'appliquent aux variateurs de lumière lorsqu'ils font fonctionner des lampes qui ne sont pas à incandescence;
- d) l'ajout de conditions d'essai applicables aux dispositifs de commande d'éclairage par transmission numérique côté charge;
- e) la suppression de l'emploi de lampes de référence et de ballasts de référence pour les essais des appareils d'éclairage;
- f) la simplification et la clarification de la terminologie employée pour les appareils d'éclairage;
- g) la classification en classe A des luminaires professionnels pour l'éclairage des scènes de théâtre et pour les studios;
- h) une clarification de la classification des appareils d'éclairage de secours;
- i) une clarification pour les appareils d'éclairage comportant un module de commande ayant une puissance active d'entrée ≤ 2 W;
- j) une mise à jour des conditions d'essai des récepteurs de télévision;
- k) une mise à jour des conditions d'essai des tables de cuisson à induction, tenant compte également des autres types d'appareils de cuisson;
- l) en cohérence avec l'IEC 61000-3-12, une modification du domaine d'application de l'IEC 61000-3-2, qui couvrait les appareils ayant un courant d'entrée ≤ 16 A, et qui couvre maintenant les appareils ayant un courant d'entrée assigné ≤ 16 A.

Le texte de cette norme est issu des documents suivants.

FDIS	Rapport de vote
77A/986/FDIS	77A/990/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2

Une liste de toutes les parties de la série IEC 61000, publiées sous le titre général *Compatibilité électromagnétique (CEM)*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives à la publication recherchée. À cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

IMPORTANT – Le logo "*colour inside*" qui se trouve sur la page de couverture de cette publication indique qu'elle contient des couleurs qui sont considérées comme utiles à une bonne compréhension de son contenu. Les utilisateurs devraient, par conséquent, imprimer cette publication en utilisant une imprimante couleur.

INTRODUCTION

L'IEC 61000 est publiée sous forme de plusieurs parties séparées, conformément à la structure suivante:

Partie 1: Généralités

Considérations générales (introduction, principes fondamentaux)

Définitions, terminologie

Partie 2: Environnement

Description de l'environnement

Classification de l'environnement

Niveaux de compatibilité

Partie 3: Limites

Limites d'émission

Limites d'immunité (dans la mesure où elles ne relèvent pas des comités de produits)

Partie 4: Techniques d'essai et de mesure

Techniques de mesure

Techniques d'essais

Partie 5: Guides d'installation et d'atténuation

Guides d'installation

Méthodes et dispositifs d'atténuation

Partie 6: Normes génériques

Partie 9: Divers

Chaque partie est à son tour subdivisée en plusieurs parties, publiées soit comme Normes internationales, soit comme spécifications techniques ou rapports techniques, dont certaines ont déjà été publiées en tant que sections. D'autres seront publiées avec le numéro de partie, suivi d'un tiret et d'un second numéro identifiant la subdivision (exemple: IEC 61000-6-1).

COMPATIBILITÉ ÉLECTROMAGNÉTIQUE (CEM) –

Partie 3-2: Limites – Limites pour les émissions de courant harmonique (courant appelé par les appareils ≤ 16 A par phase)

1 Domaine d'application

La présente partie de l'IEC 61000 traite de la limitation des courants harmoniques injectés dans le réseau public d'alimentation.

Elle définit les limites des harmoniques du courant d'entrée qui peuvent être produits par les matériels soumis à l'essai dans des conditions spécifiées.

La présente partie de l'IEC 61000 est applicable aux appareils électriques et électroniques ayant un courant d'entrée assigné dont la valeur est inférieure ou égale à 16 A par phase et qui sont destinés à être raccordés à des réseaux publics de distribution à basse tension.

Le matériel de soudage à l'arc qui n'est pas du matériel professionnel, dont le courant d'entrée assigné est inférieur ou égal à 16 A par phase, relève du présent document. Le matériel de soudage à l'arc destiné à un usage professionnel, tel que spécifié dans l'IEC 60974-1, est exclu du domaine d'application du présent document et peut être sujet à des restrictions d'installation comme indiqué dans l'IEC 61000-3-12.

Les essais effectués conformément au présent document sont des essais de type.

Les limites applicables aux réseaux dont la tension nominale est strictement inférieure à 220 V (entre phase et neutre) n'ont pas encore été envisagées.

NOTE Les mots «appareil», «matériel» et «dispositif» sont utilisés dans le présent document. Ils ont la même signification pour les besoins du présent document.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60050-161, *Vocabulaire Electrotechnique International (VEI) – Partie 161: Compatibilité électromagnétique* (disponible sous www.electropedia.org)

IEC 60155, *Interrupteurs d'amorçage à lueur pour lampes à fluorescence (starters)*

IEC 60268-3, *Équipements pour systèmes électroacoustiques – Partie 3: Amplificateurs*

IEC 60335-2-24:2010, *Appareils électrodomestiques et analogues – Sécurité – Partie 2-24: Règles particulières pour les appareils de réfrigération, les sorbetières et les fabriques de glace*

IEC 61000-4-7:2002, *Compatibilité électromagnétique (CEM) – Partie 4-7: Techniques d'essai et de mesure – Guide général relatif aux mesures d'harmoniques et d'interharmoniques, ainsi qu'à l'appareillage de mesure, applicable aux réseaux d'alimentation et aux appareils qui y sont raccordés*

IEC 61000-4-7:2002/AMD1:2008