

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)**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC 61000-3-2
Edition 5.0 2018-01
Amendment 1 2020-07

ELECTROMAGNETIC COMPATIBILITY (EMC) –

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

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by subcommittee 77A: EMC – Low frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
77A/1106/DISH	77A/1114/RVDISH

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

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Interpretation of the second set of requirements applicable to Class C equipment with a rated power ≥ 5 W and ≤ 25 W according to 7.4.3 of IEC 61000-3-2:2018 and IEC 61000-3-2:2018/AMD1:2020.

Introduction

The second set of requirements of 7.4.3 of IEC 61000-3-2:2018 and IEC 61000-3-2:2018/AMD1:2020 requires that *“the waveform of the input current shall be such that it reaches the 5 % current threshold before or at 60°, has its peak value before or at 65° and does not fall below the 5 % current threshold before 90°, referenced to any zero crossing of the fundamental supply voltage”* and that *“Components of current with frequencies above 9 kHz shall not influence this evaluation (a filter similar to the one described in 5.3 of IEC 61000-4-7:2002 and IEC 61000-4-7:2002/AMD1:2008 may be used);”*

Testing laboratories and Class C equipment manufacturers concluded that several harmonics test systems with IEC 61000-4-7 compliant measurement equipment do not completely filter out the components of current with frequencies above 9 kHz, thus resulting in a non-accurate evaluation of the phase angles (see Figure 1). One of the reasons why filters are not used is that they can alter the phase angle itself by introducing a phase delay.

Question

When applying the second set of requirements in 7.4.3, what method shall be used to measure the phase angle in order to avoid the influence of components of current with frequencies above 9 kHz?

Interpretation

Given the issues reported by test laboratories, if the phase angle is measured with an IEC 61000-4-7 test system that doesn't remove the components above 9 kHz correctly, the measurements with a digital oscilloscope shall prevail, where the components above 9 kHz have been removed without affecting the phase angle at which the peak current occurs.

NOTE This can be achieved for example by using a synchronous averaging mode of the oscilloscope (see Figure 2).

Annex

Figure 1 and Figure 2 show an incorrect and the correct evaluation of the phase angle.

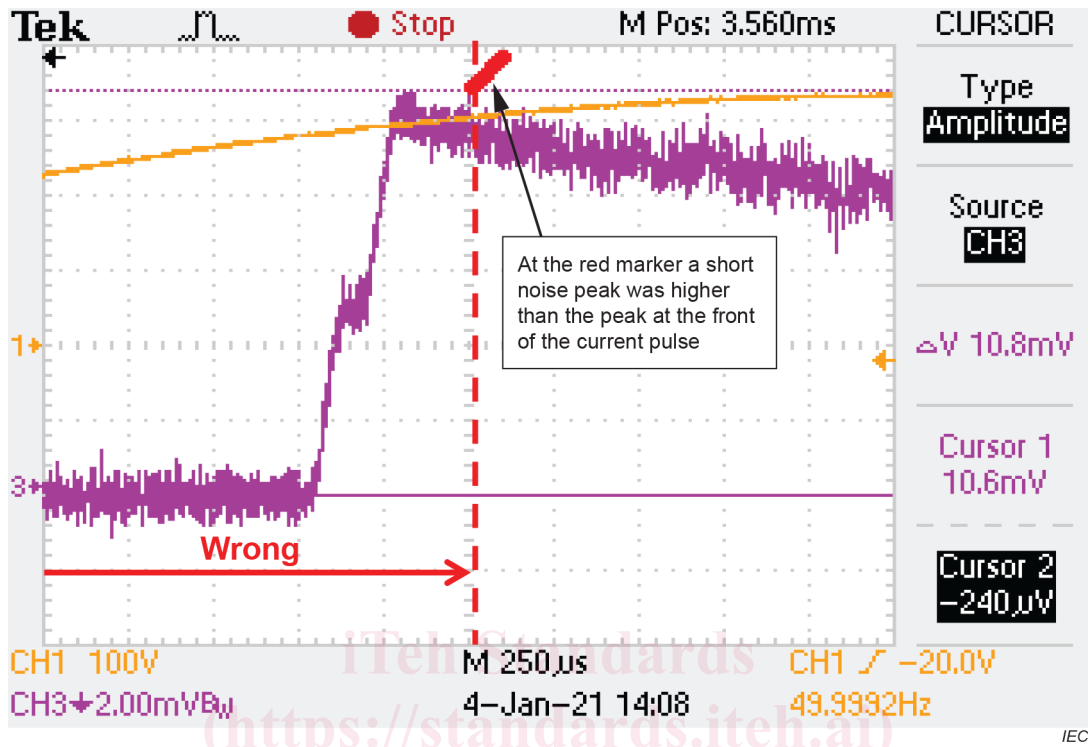


Figure 1 – Incorrect measurement

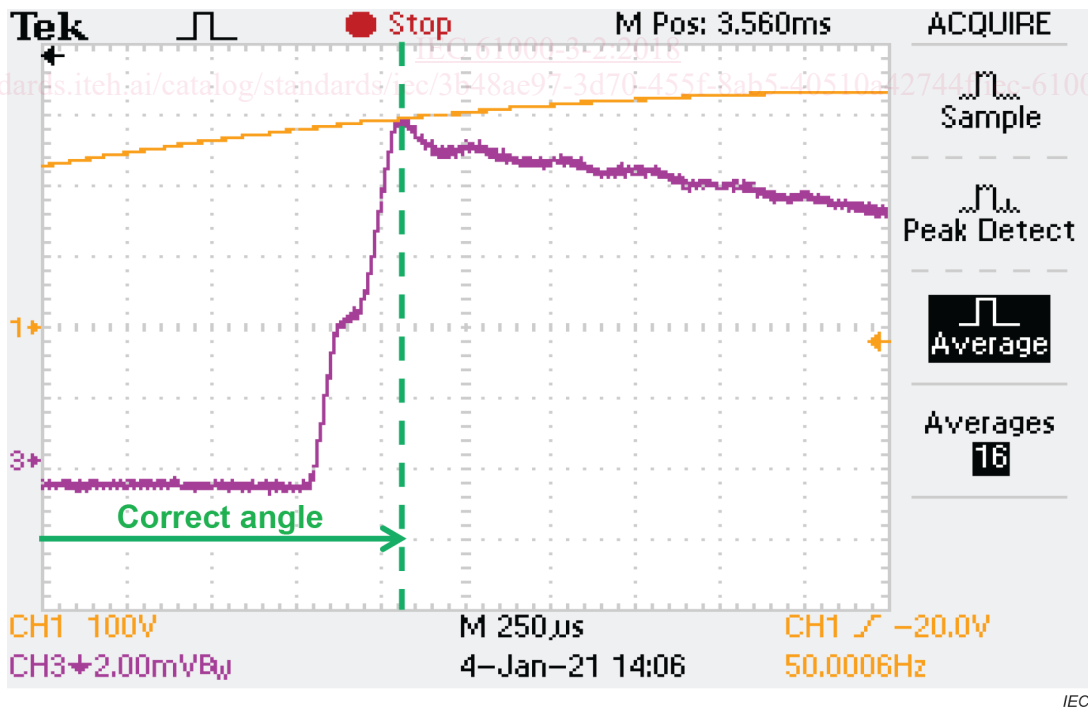


Figure 2 – Correct measurement with averaged waveform

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
INTRODUCTION to Amendment 2	8
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	10
4 General	15
5 Classification of equipment.....	16
5.1 General.....	16
5.2 Description of lighting equipment	17
5.3 External power supplies	17
6 General requirements	17
6.1 General.....	17
6.2 Control methods	18
6.3 Harmonic current measurement	19
6.3.1 Test configuration	19
6.3.2 Measurement procedure	20
6.3.3 General requirements and recommendations	21
6.3.4 Test observation period	22
6.4 Equipment in a rack or case.....	22
6.5 Multifunction equipment	23
7 Harmonic current limits.....	23
7.1 General.....	23
7.2 Limits for Class A equipment.....	24
7.3 Limits for Class B equipment.....	25
7.4 Limits for Class C equipment	25
7.4.1 General	25
7.4.2 Rated power > 25 W	25
7.4.3 Rated power ≥ 5 W and ≤ 25 W	26
7.5 Limits for Class D equipment	27
8 Compliance with this document	28
8.1 Use of test methods	28
8.2 Decision rules and measurement uncertainty	28
8.2.1 Measurements with an instrument in accordance with IEC 61000-4-7, class I.....	28
8.2.2 Measurements with an instrument in accordance with IEC 61000-4-7, class II.....	29
Annex A (normative) Measurement circuit and supply source.....	30
A.1 Test circuit.....	30
A.2 Supply source	30
Annex B (normative) Type Special test conditions.....	33
B.1 General.....	33
B.2 Test conditions for Television receivers (TV).....	33
B.2.1 General requirements	33
B.2.2 Measurement conditions	33
B.2.3 Test report.....	34

B.3	Test conditions for Audio amplifiers	34
B.3.1	Conditions	34
B.3.2	Input signals and loads	34
B.4	Test conditions for Video-cassette recorders and similar equipment	35
B.5	Test conditions for Lighting equipment	35
B.5.1	General conditions	35
B.5.2	Lamps Light sources	35
B.5.3	Luminaires	35
B.5.4	Separate lighting control gear (SLCG)	36
B.5.5	DLT control devices	36
B.6	Test conditions for Independent phase control dimmers for lighting equipment	37
B.7	Test conditions for Vacuum cleaners	37
B.8	Test conditions for Washing machines	37
B.9	Test conditions for Microwave ovens	38
B.10	Test conditions for Information technology equipment (ITE)	38
B.10.1	General conditions	38
B.10.2	Optional conditions for measuring emissions of IT equipment with external power supplies or battery chargers	39
B.11	Test conditions for Cooking appliances	39
B.11.1	Induction hobs and hotplates	39
B.11.2	Hobs and hotplates other than induction cooking appliances	40
B.12	Test conditions for Air conditioners	40
B.13	Test conditions for Kitchen machines as defined in IEC 60335-2-14	40
B.14	Test conditions for Arc welding equipment which is not professional equipment	40
B.15	Test conditions for High pressure cleaners which are not professional equipment	41
B.16	Test conditions for Refrigerators and freezers	41
B.16.1	General	41
B.16.2	Refrigerators and freezers with VSD	42
B.16.3	Refrigerators and freezers without VSD	42
B.17	External power supplies (EPS)	42
B.17.1	EPS designated for specific models of equipment	42
B.17.2	EPS not designated for specific models of equipment	42
Annex C (normative)	POHC calculation	44
C.1	General	44
C.2	Calculation of the POHC from the final values of the harmonic currents, averaged over the complete observation time	44
C.3	Calculation of the final POHC from single POHC values for each DFT time window	44
Annex D (informative)	Symmetry of mains current waveforms	45
Bibliography	52
Figure 1	– Flowchart for determining conformity	24
Figure 2	– Illustration of the relative phase angle and current parameters described in 7.4.3	26
Figure A.1	– Measurement circuit for single-phase equipment	31
Figure A.2	– Measurement circuit for three-phase equipment	32

Figure D.1 – Three cycles symmetry – Example 1	45
Figure D.2 – Three cycles symmetry – Example 2	46
Figure D.3 – Five cycles symmetry – Example 1	46
Figure D.4 – Five cycles symmetry – Example 2	47
Figure D.5 – Four cycles symmetry	47
Figure D.6 – One cycle symmetry	48
Figure D.7 – Three cycles symmetry – Example 3	48
Figure D.8 – Three cycles symmetry – Example 4	49
Figure D.9 – Three cycles symmetry – Example 5	49
Figure D.10 – Three cycles symmetry – Example 6	50
Figure D.11 – Three cycles symmetry – Example 7	50
Figure D.12 – Three cycles symmetry – Example 8	51
Table 1 – Limits for Class A equipment	27
Table 2 – Limits for Class C equipment ^a	27
Table 3 – Limits for Class D equipment	28
Table 4 – Test observation period	28
Table B.1 – Conventional load for arc welding equipment tests	41

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –

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

FOREWORD

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IEC 61000-3-2 edition 5.2 contains the fifth edition (2018-01) [documents 77A/986/FDIS and 77A/990/RVD], its amendment 1 (2020-07) [documents 77A/1077/FDIS and 77A/1084/RVD] and its Interpretation Sheet (2021-08), and its amendment 2 (2024-03) [documents 77A/1161/CDV and 77A/1181/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

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 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.

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.

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