BS EN IEC 61000-3-2:2019+A1:2021
Incorporating corrigendum August 2021

BSI Standards Publication

Electromagnetic compatibility (EMC)

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

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Full document details: BS EN IEC 61000-3-2:2019+A1:2021

National foreword

This British Standard is the UK implementation of EN IEC 61000-3-2:2019+A1:2021. It is identical to IEC 61000-3-2:2018, incorporating amendment 1:2020 and corrigendum August 2021. It supersedes BS EN IEC 61000-3-2:2019, which will be withdrawn on 9 April 2024.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by A1 A1.

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Amendments/corrigenda issued since publication

Date	Text affected
30 April 2021	Implementation of IEC amendment 1:2020 with CENELEC endorsement A1:2021
30 September 2021	Implementation of IEC corrigendum August 2021: Interpretation Sheet 1 added

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61000-3-2:2019+A1

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Supersedes EN 61000-3-2:2014

English Version

Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase) (IEC 61000-3-2:2018)

Compatibilité électromagnétique (CEM) - Partie 3-2: Limites - Limites pour les émissions de courant harmonique (courant appelé par les appareils ≤ 16 A par phase) (IEC 61000-3-2:2018)

Elektromagnetische Verträglichkeit (EMV) - Teil 3-2: Grenzwerte - Grenzwerte für Oberschwingungsströme (Geräte-Eingangsstrom ≤ 16 A je Leiter) (IEC 61000-3-2:2018)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

The text of document 77A/986/FDIS, future edition 5 of IEC 61000-3-2, prepared by SC 77A "EMC - Low frequency phenomena" of IEC/TC 77 "Electromagnetic compatibility" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61000-3-2:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2019-09-01
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-03-01

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IEC 60107-1:1997	NOTE	Harmonized as EN 60107-1:1997 (not modified).
IEC 60268-1:1985/A1:1988	NOTE	Harmonized as HD 483.1 S2:1989 (not modified).
IEC 60335-2-2	NOTE	Harmonized as EN 60335-2-2.
IEC 60335-2-14	NOTE	Harmonized as EN 60335-2-14.
IEC 60335-2-79	NOTE	Harmonized as EN 60335-2-79.
IEC 60335-2-17	NOTE	Harmonized as EN 60335-2-17.
IEC 60974-1	NOTE	Harmonized as EN 60974-1.
IEC 60974-6	NOTE	Harmonized as EN 60974-6.
IEC 61000-2-2	NOTE	Harmonized as EN 61000-2-2.
IEC 61000-3-12	NOTE	Harmonized as EN 61000-3-12.
IEC 62756-1	NOTE	Harmonized as EN 62756-1.

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European foreword to amendment A1

The text of document 77A/1077/FDIS, future IEC 61000-3-2/A1, prepared by SC 77A "EMC - Low frequency phenomena" of IEC/TC 77 "Electromagnetic compatibility" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61000-3-2:2019/A1:2021.

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• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2021-10-09
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2024-04-09

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IEC 61000-2-2	NOTE	Harmonized as EN 61000-2-2
IEC 61000-3-12	NOTE	Harmonized as EN 61000-3-12

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60050-161	1990	International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility	-	-
IEC 60107-1	1997	Methods of measurement on receivers for television broadcast transmissions - Part 1: General considerations - Measurements at radio and video frequencies	EN 60107-1	1997
IEC 60155	1993	Glow-starters for fluorescent lamps	EN 60155	1995
IEC 60268-1	1985	Sound system equipment. Part 1: General	HD 483.1 S2	1989
+ A1	1988		-	-
+ A2	1988		-	-
IEC 60268-3	2018	Sound system equipment - Part 3: Amplifiers	EN IEC 60268-3	2018
IEC 60335-2-2	2019		-	-
IEC 60335-2-14 (mod)	2016	Household and similar electrical appliances - Safety - Part 2-14: Particular requirements for kitchen machines	EN 60335-2-14	2017
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	EN 60335-2-24	2010
+ A1 (mod)	2012		+ A1	2019
+ A2	2017		+ A2	2019
-	-		+ A11	2020
IEC 60335-2-79	2016	Household and similar electrical appliances - Safety - Part 2-79: Particular requirements for high pressure cleaners and steam cleaners	-	-

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Publication	Year	Title	EN/HD	Year
IEC 60598-2-17	2012	Luminaires - Part 2-17: Particular requirements - Luminaires for stage lighting, television and film studios (outdoor and indoor)	EN IEC 60598-2-17	2012
+ A1	2015		-	-
IEC 60974-1	2017	Arc welding equipment - Part 1: Welding power sources	EN IEC 60974-1	2018
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	EN 61000-4-7	2002
+ A1	2008		+ A1	2009
IEC 62756-1	2015	Digital load side transmission lighting control (DLT) - Part 1: Basic requirements	EN 62756-1	2015

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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)

I N T E RP RE T AT I O N S HE E T 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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IEC 61000-3-2:2018-01/AMD1:2020-07/ISH1:2021-08(en-fr)

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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).

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Annex

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

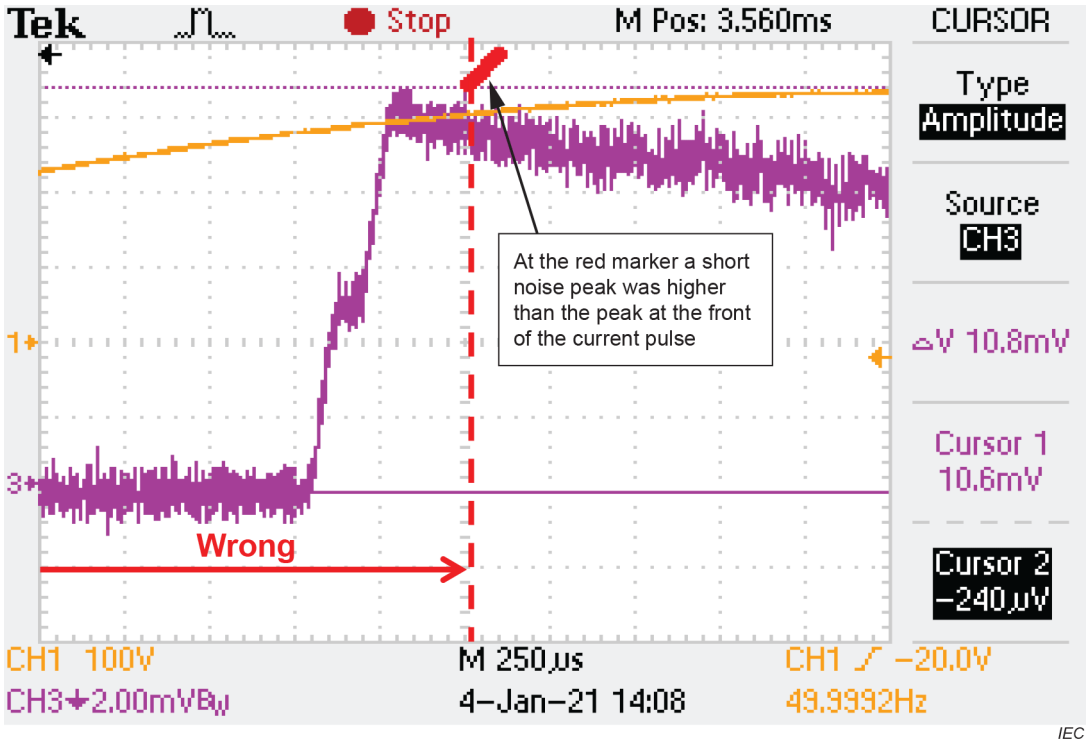

Figure 1 – Incorrect measurement

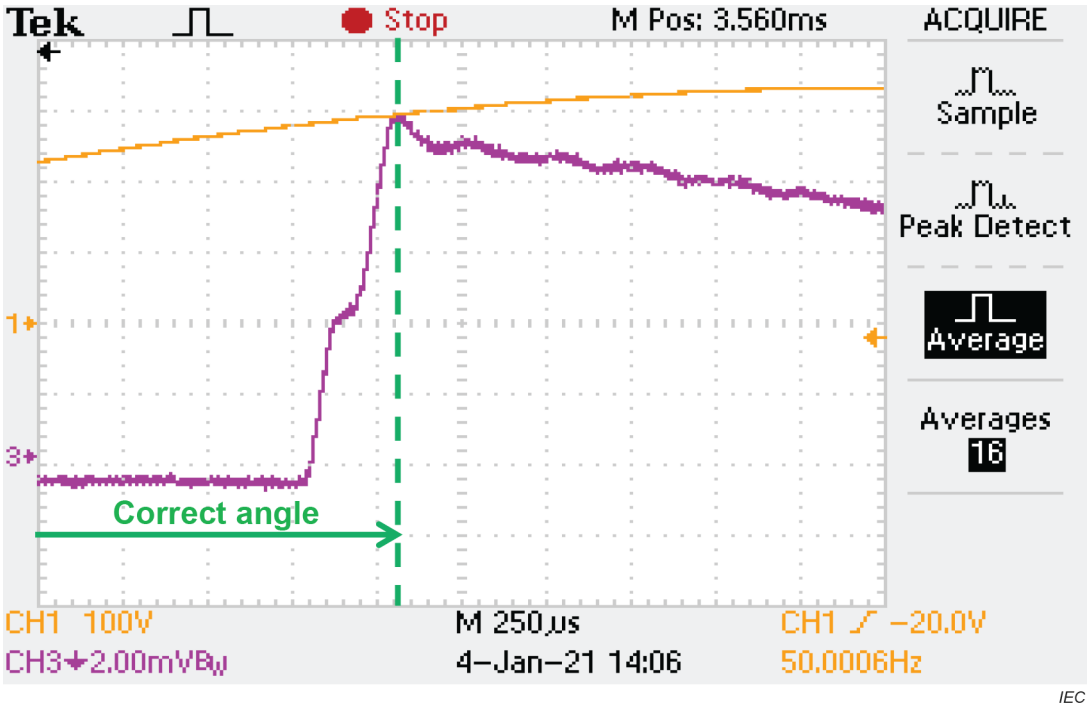

Figure 2 – Correct measurement with averaged waveform

Documents
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Full document details: BS EN IEC 61000-3-2:2019+A1:2021

CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms and definitions 8
4 General 12
5 Classification of equipment 12
5.1 General 12
5.2 Description of lighting equipment 13
5.3 External power supplies 14
6 General requirements 14
6.1 General 14
6.2 Control methods 14
6.3 Harmonic current measurement 15
6.3.1 Test configuration 15
6.3.2 Measurement procedure 16
6.3.3 General requirements 16
6.3.4 Test observation period 18
6.4 Equipment in a rack or case 18
6.5 Multifunction equipment 18
7 Harmonic current limits 19
7.1 General 19
7.2 Limits for Class A equipment 20
7.3 Limits for Class B equipment 21
7.4 Limits for Class C equipment 21
7.4.1 General 21
7.4.2 Rated power > 25 W 21
7.4.3 Rated power ≥ 5 W and ≤ 25 W 22
7.5 Limits for Class D equipment 23
8 Compliance with this document 24
Annex A (normative) Measurement circuit and supply source 25
A.1 Test circuit 25
A.2 Supply source 25
Annex B (normative) Type test conditions 28
B.1 General 28
B.2 Television receivers (TV) 28
B.2.1 General requirements 28
B.2.2 Measurement conditions 28
B.2.3 Test report 29
B.3 Audio amplifiers 29
B.3.1 Conditions 29
B.3.2 Input signals and loads 29
B.4 Video-cassette recorders 30
B.5 Lighting equipment 30
B.5.1 General conditions 30

AVA Documents
Document Sharing Hub
Full document details: BS EN IEC 61000-3-2:2019+A1:2021

B.5.2 Light sources 30
B.5.3 Luminaires 30
B.5.4 Lighting control gear 31
B.5.5 DLT control devices 31
B.6 Independent phase control dimmers for lighting equipment 31
B.7 Vacuum cleaners 32
B.8 Washing machines 32
B.9 Microwave ovens 33
B.10 Information technology equipment (ITE) 33
B.10.1 General conditions 33
B.10.2 IT equipment with external power supplies 33
B.11 Cooking appliances 34
B.11.1 Induction hobs and hotplates 34
B.11.2 Hobs and hotplates other than induction cooking appliances 34
B.12 Air conditioners 34
B.13 Kitchen machines as defined in IEC 60335-2-14 35
B.14 Arc welding equipment which is not professional equipment 35
B.15 High pressure cleaners which are not professional equipment 35
B.16 Refrigerators and freezers 36
B.16.1 General 36
B.16.2 Refrigerators and freezers with VSD 36
B.16.3 Refrigerators and freezers without VSD 36
B.17 External power supplies (EPS) 37
B.17.1 EPS designated for specific models of equipment 37
B.17.2 EPS not designated for specific models of equipment 37
Annex C (normative) POHC calculation 38
C.1 General 38
C.2 Calculation of the POHC from the final values of the harmonic currents, averaged over the complete observation time 38
C.3 Calculation of the final POHC from single POHC values for each DFT time window 38
Bibliography 39

Figure 1 – Flowchart for determining conformity 20
Figure 2 – Illustration of the relative phase angle and current parameters described in 7.4.3 22
Figure A.1 – Measurement circuit for single-phase equipment 26
Figure A.2 – Measurement circuit for three-phase equipment 27

Table 1 – Limits for Class A equipment 23
Table 2 – Limits for Class C equipment [a] 23
Table 3 – Limits for Class D equipment 24
Table 4 – Test observation period 24
Table B.1 – Conventional load for arc welding equipment tests 35

Documents
Document Sharing Hub
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ELECTROMAGNETIC COMPATIBILITY (EMC) –

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

FOREWORD

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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;

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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,
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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

〈A1〉 Description of the environment 〈A1〉

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).

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