BS EN 61000-4-34:2007+A2:2025
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BSI Standards Publication

Electromagnetic compatibility (EMC)

Part 4-34: Testing and measurement techniques — Voltage dips, short interruptions and voltage variations immunity tests for equipment with mains current more than 16 A per phase

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National foreword

This British Standard is the UK implementation of EN 61000-4-34:2007+A2:2025. It is identical to IEC 61000-4-34:2005, incorporating amendment 1:2009, corrigendum October 2009 and amendment 2:2025. It supersedes BS EN 61000-4-34:2007+A1:2009, which will be withdrawn on 31 October 2028.

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⟩.

The UK participation in its preparation was entrusted to Technical Committee GEL/210, EMC - Policy committee.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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28 February 2010	Implementation of IEC amendment 1:2009 with CENELEC endorsement A1:2009 and Implementation of IEC corrigendum October 2009; Replacement of Figures C.1, C.2 and C.3
31 October 2025	Implementation of IEC amendment 2:2025 with CENELEC endorsement A2:2025

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EUROPEAN STANDARD

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English version

Electromagnetic compatibility (EMC) - Part 4-34: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current more than 16 A per phase

(IEC 61000-4-34:2005)

Compatibilité électromagnétique (CEM) - Partie 4-34: Techniques d'essai et de mesure - Essais d'immunité aux creux de tension, coupures brèves et variations de tension pour matériel ayant un courant appelé de plus de 16 A par phase (CEI 61000-4-34:2005)

Elektromagnetische Verträglichkeit (EMV) - Teil 4-34: Prüf- und Messverfahren - Prüfungen der Störfestigkeit von Geräten und Einrichtungen mit einem Eingangsstrom > 16 A je Leiter gegen Spannungseinbrüche, Kurzzeitunterbrechungen und Spannungsschwankungen (IEC 61000-4-34:2005)

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CENELEC

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

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Foreword

The text of document 77A/498/FDIS, future edition 1 of IEC 61000-4-34, prepared by SC 77A, Low frequency phenomena, of IEC TC 77, Electromagnetic compatibility, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61000-4-34 on 2007-04-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2008-01-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2010-04-01

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 61000-4-34:2005 was approved by CENELEC as a European Standard without any modification.

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Foreword to amendment A1:2009

The text of document 77A/670/CDV, future amendment 1 to IEC 61000-4-34:2005, prepared by SC 77A, Low frequency phenomena, of IEC TC 77, Electromagnetic compatibility, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 61000-4-34:2007 on 2009-07-01.

The following dates were fixed:

– latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2010-04-01
– latest date by which the national standards conflicting with the amendment have to be withdrawn	(dow)	2012-07-01

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Endorsement notice

The text of amendment 1:2009 to the International Standard IEC 61000-4-34:2005 was approved by CENELEC as an amendment to the European Standard without any modification.

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European foreword to amendment A2

The text of document 77A/1233/CDV, future edition 1 of IEC 61000-4-34/AMD2, 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 61000-4-34:2007/A2:2025.

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) 2026-10-31
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2028-10-31

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a standardization request addressed to CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 61000-4-34:2005/AMD2:2025 was approved by CENELEC as a European Standard without any modification.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60050-161	- [1)]	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-
IEC/TR 61000-2-8	- [1)]	Electromagnetic compatibility (EMC) - Part 2-8: Environment - Voltage dips and short interruptions on public electric power supply systems with statistical measurement results	-	-
IEC 61000-4-30	- [1)]	Electromagnetic compatibility (EMC) - Part 4-30: Testing and measurement techniques - Power quality measurement methods	EN 61000-4-30	2003 [2)]

[1)] Undated reference.

[2)] Valid edition at date of issue.

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CONTENTS

FOREWORD 2
INTRODUCTION 5

1 Scope 6
2 Normative references 6
3 Terms and definitions 7
4 General 8
5 Test levels 9
5.1 Voltage dips and short interruptions 9
5.2 Voltage variations (optional) 10
6 Test instrumentation 12
6.1 Test generator 12
6.2 Power source 13
7 Test set-up 13
8 Test procedures 13
8.1 Laboratory reference conditions 14
8.2 Execution of the test 15
9 Evaluation of test results 17
10 Test report 17

Annex A (normative) Test generator current drive capability 19
Annex B (informative) Electromagnetic environment classes 21
Annex C (informative) Vectors for three-phase testing 22
Annex D (informative) Test instrumentation 28
Annex E (informative) Dip immunity tests for equipment with large mains current 31
Annex F (informative) Interpretation of the rise-time and fall-time requirements during EUT testing 33

Bibliography 34

Figure 1 – Voltage dip – 70 % voltage dip sine wave graph 11
Figure 2 – Voltage variation 11
Figure 3a – Phase-to-neutral testing on three-phase systems 16
Figure 3b – Phase-to-phase testing on three-phase systems – Acceptable Method 1 phase shift 16
Figure 3c – Phase-to-phase testing on three-phase systems – Acceptable Method 2 phase shift 16
Figure 3d – Not acceptable – phase-to-phase testing without phase shift 16
Figure A.1 – Circuit for determining inrush current drive capability 20
Figure C.1 – Phase-to-neutral dip vectors 22
Figure C.2 – Acceptable Method 1 – phase-to-phase dip vectors 24
Figure C.3 – Acceptable Method 2 – phase-to-phase dip vectors 26
Figure D.1 – Schematic of example test instrumentation for voltage dips and short interruptions using tapped transformer and switches 28

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Full document details: BS EN 61000-4-34:2007+A2:2025

Figure D.2 – Applying the example test instrumentation of Figure D.1 to create the Acceptable Method 1 vectors of Figures C.1, C.2, 4a and 4b 29
Figure D.3 – Schematic of example test instrumentation for three-phase voltage dips, short interruptions and voltage variations using power amplifier.....30

Table 1 – Preferred test level and durations for voltage dips 10
Table 2 – Preferred test level and durations for short interruptions 10
Table 3 – Timing of short-term supply voltage variations.....10
Table 4 – Generator specifications.....12
Table A.1 – Minimum peak inrush current capability.....19
Table C.1 – Vector values for phase-to-neutral dips.....23
Table C.2 – Acceptable Method 1 – vector values for phase-to-phase dips 25
Table C.3 – Acceptable Method 2 – vector values for phase-to-phase dips 27

Documents
Document Sharing Hub
Full document details: BS EN 61000-4-34:2007+A2:2025

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 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 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: 61000-6-1).

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INTRODUCTION to Amendment 2

This amendment contains the following main changes in comparison with IEC 61000-4-34:2005 and IEC 61000-4-34:2005/AMD1:2009:

- Addition of a note in Annex C: The sign of phase angles of three-phase systems can differ depending on the convention used. It should be noted that phase angles opposite to those used in the figures and tables in this annex (i.e. -120° for L2 instead of +120°) are also common. It is not intended to specify the direction of rotation of the three-phase system used for testing.
- Add UL1-N = √(1+3P^2)/2 in Annex C.3,
- Add a new annex "Interpretation of the rise-time and fall-time requirements during EUT testing" (Annex F), as in IEC 61000-4-11:2020, Clause D.4:

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ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-34: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with mains current more than 16 A per phase

1 Scope

This part of IEC 61000 defines the immunity test methods and range of preferred test levels for electrical and electronic equipment connected to low-voltage power supply networks for voltage dips, short interruptions, and voltage variations.

This standard applies to electrical and electronic equipment having a rated mains current exceeding 16 A per phase. (See Annex E for guidance on electrical and electronic equipment rated at more than 200 A per phase.) It covers equipment installed in residential areas as well as industrial machinery, specifically voltage dips and short interruptions for equipment connected to either 50 Hz or 60 Hz a.c. networks, including 1-phase and 3-phase mains.

NOTE 1 Equipment with a rated mains current of 16 A or less per phase is covered by publication IEC 61000-4-11.

NOTE 2 There is no upper limit on rated mains current in this publication. However, in some countries, the rated mains current may be limited to some upper value, for example 75 A or 250 A, because of mandatory safety standards.

It does not apply to electrical and electronic equipment for connection to 400 Hz a.c. networks. Tests for equipment connected to these networks will be covered by future IEC standards.

The object of this standard is to establish a common reference for evaluating the immunity of electrical and electronic equipment when subjected to voltage dips, short interruptions and voltage variations.

NOTE 1 Voltage fluctuations are covered by publication IEC 61000-4-14.

NOTE 2 For equipment under test with rated currents above 250 A, suitable test equipment may be difficult to obtain. In these cases, the applicability of this standard should be carefully evaluated by committees responsible for generic, product and product-family standards. Alternatively, this standard might be used as a framework for an agreement on performance criteria between the manufacturer and the purchaser.

The test method documented in this part of IEC 61000 describes a consistent method to assess the immunity of equipment or a system against a defined phenomenon. As described in IEC Guide 107, this is a basic EMC publication for use by product committees of the IEC. As also stated in Guide 107, the IEC product committees are responsible for determining whether this immunity test standard should be applied or not, and if applied, they are responsible for defining the appropriate test levels. Technical committee 77 and its sub-committees are prepared to co-operate with product committees in the evaluation of the value of particular immunity tests for their products.

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 60050-161, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

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Full document details: BS EN 61000-4-34:2007+A2:2025

IEC 61000-2-8, *Electromagnetic compatibility (EMC) – Part 2-8: Environment – Voltage dips and short interruptions on public electric power supply systems with statistical measurement results*

IEC 61000-4-30, *Electromagnetic compatibility (EMC) – Part 4-30: Testing and measurement techniques – Power quality measurement methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-161 as well as the following definitions apply:

3.1
basic EMC standard (ACEC)[1)]
standard giving general and fundamental conditions or rules for the achievement of EMC, which are related or applicable to all products and systems, and serve as reference documents for product committees

3.2
immunity (to a disturbance)
ability of a device, equipment or system to perform without degradation in the presence of an electromagnetic disturbance

[IEV 161-01-20]

3.3
voltage dip
sudden reduction of the voltage at a particular point of an electricity supply system below a specified dip threshold followed by its recovery after a brief interval

NOTE 1 Typically, a dip is associated with the occurrence and termination of a short circuit or other extreme current increase on the system or installations connected to it.

NOTE 2 A voltage dip is a two-dimensional electromagnetic disturbance, the level of which is determined by both voltage and time (duration).

3.4
short interruption
sudden reduction of the voltage on all phases at a particular point of an electric supply system below a specified interruption threshold followed by its restoration after a brief interval

NOTE Short interruptions are typically associated with switchgear operation related to the occurrence and termination of short circuits on the system or installations connected to it.

3.5
residual voltage (of voltage dip)
minimum value of r.m.s. voltage recorded during a voltage dip or short interruption

NOTE The residual voltage may be expressed as a value in volts or as a percentage or per unit value relative to the reference voltage.

Text deleted 〈A1〉

1) Advisory Committee on Electromagnetic Compatibility (ACEC).

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3.6
malfunction
termination of the ability of equipment to carry out intended functions or the execution of unintended functions by the equipment

3.7
calibration
set of operations which establishes, by reference to standards, the relationship which exists, under specified conditions, between an indication and a result of a measurement

NOTE 1 This term is based on the "uncertainty" approach.

NOTE 2 The relationship between the indications and the results of measurement can be expressed, in principle, by a calibration diagram.

[IEV 311-01-09]

3.8
verification
set of operations which is used to check the test equipment system (e.g. the test generator and the interconnecting cables) and to demonstrate that the test system is functioning within the specifications given in Clause 6

NOTE 1 The methods used for verification may be different from those used for calibration.

NOTE 2 The procedure of 6.1.2 is meant as a guide to insure the correct operation of the test generator, and other items making up the test set-up so that the intended waveform is delivered to the EUT.

NOTE 3 For the purpose of this basic EMC standard this definition is different from the definition given in IEV 311-01-13.

4 General

Electrical and electronic equipment may be affected by voltage dips, short interruptions or voltage variations of power supply.

Voltage dips and short interruptions are caused by faults in the network, primarily short circuits (see also IEC 61000-2-8), in installations or by sudden large changes of load. In certain cases, two or more consecutive dips or interruptions may occur. Voltage variations are caused by continuously varying loads connected to the network.

Voltage dips at equipment terminals are influenced by the transformer connections between the fault location on the supply system and the equipment connection point. The transformer connections will influence both the magnitude and the phase relationship of the voltage dip experienced by the equipment.

These phenomena are random in nature and can be minimally characterized for the purpose of laboratory simulation in terms of the deviation from the rated voltage, and duration.

Consequently, different types of tests are specified in this standard to simulate the effects of abrupt voltage change. These tests are to be used only for particular and justified cases, under the responsibility of product specification or product committees.

It is the responsibility of the product committees to establish which phenomena among the ones considered in this standard are relevant and to decide on the applicability of the test.

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