

© Copyright SEK. Reproduction in any form without permission is prohibited.

Elektromagnetisk kompatibilitet (EMC) – Del 3-3: Gränsvärden – Begränsning av spänningsfluktuationer och flimmer i lågspänningsdistributionssystem förorsakade av apparater med märkström högst 16 A per fas utan särskilda anslutningsvillkor

Electromagnetic compatibility (EMC) –

Part 3-3: Limits –

*Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems,
for equipment with rated current ≤ 16 A per phase and not subject to conditional connection*

Som svensk standard gäller europastandarden EN 61000-3-3:2008. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61000-3-3:2008.

Nationellt förord

Europastandarden EN 61000-3-3:2008

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61000-3-3, Second edition, 2008 - Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61000-3-3, utgåva 1, 1995, SS-EN 61000-3-3 C1, utgåva 1, 1997, SS-EN 61000-3-3/A1, utgåva 1, 2001, SS-EN 61000-3-3/A2, utgåva 1, 2006 och SS-EN 61000-3-3 + A1/IS1, utgåva 1, 2007, gäller ej fr o m 2011-09-01.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

English version

**Electromagnetic compatibility (EMC) -
Part 3-3: Limits -
Limitation of voltage changes, voltage fluctuations and flicker in public
low-voltage supply systems, for equipment with rated current ≤ 16 A
per phase and not subject to conditional connection
(IEC 61000-3-3:2008)**

Compatibilité électromagnétique (CEM) -
Partie 3-3: Limites -
Limitation des variations de tension,
des fluctuations de tension
et du papillotement dans les réseaux
publics d'alimentation basse tension,
pour les matériels ayant un courant
assigné ≤ 16 A par phase et non soumis
à un raccordement conditionnel
(CEI 61000-3-3:2008)

Elektromagnetische Verträglichkeit (EMV) -
Teil 3-3: Grenzwerte -
Begrenzung von Spannungsänderungen,
Spannungsschwankungen und Flicker
in öffentlichen Niederspannungs-
Versorgungsnetzen für Geräte
mit einem Bemessungsstrom ≤ 16 A
je Leiter, die keiner
Sonderanschlussbedingung unterliegen
(IEC 61000-3-3:2008)

This European Standard was approved by CENELEC on 2008-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 77A/644/FDIS, future edition 2 of IEC 61000-3-3, 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 61000-3-3 on 2008-09-01.

This European Standard supersedes EN 1000-3-3:1995 + corrigendum July 1997 + A1:2001 + IS1:2005 + A2:2005.

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) 2009-06-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2011-09-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directives 2004/108/EC and 1999/5/EC. See Annex ZZ.

Annexes ZA and ZZ have been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61000-3-3:2008 was approved by CENELEC as a European Standard without any modification.

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-161	1990	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-
IEC/TR 60725	- ¹⁾	Consideration of reference impedances and public supply network impedances for use in determining disturbance characteristics of electrical equipment having a rated current ≤ 75 A per phase	-	-
IEC 60974-1	- ¹⁾	Arc welding equipment - Part 1: Welding power sources	EN 60974-1	2005 ²⁾
IEC 61000-3-2	2005	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)	EN 61000-3-2	2006
IEC 61000-3-11	- ¹⁾	Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection	EN 61000-3-11	2000 ²⁾
IEC 61000-4-15	- ¹⁾	Electromagnetic compatibility (EMC) - Part 4-15: Testing and measurement techniques - Flickermeter - Functional and design specifications	EN 61000-4-15	1998 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Definitions	7
4 Assessment of voltage changes, voltage fluctuations and flicker	8
4.1 Assessment of a relative voltage change, " d "	8
4.2 Assessment of the short-term flicker value, P_{st}	9
4.2.1 Flickermeter	9
4.2.2 Simulation method	9
4.2.3 Analytical method	9
4.2.4 Use of $P_{st} = 1$ curve.....	10
4.3 Assessment of long-term flicker value, P_{lt}	10
5 Limits	10
6 Test conditions	11
6.1 General.....	11
6.2 Measurement accuracy	12
6.3 Test supply voltage	12
6.4 Reference impedance.....	12
6.5 Observation period	12
6.6 General test conditions.....	13
Annex A (normative) Application of limits and type test conditions for specific equipment.....	18
Annex B (normative) Test conditions and procedures for measuring d_{max} voltage changes caused by manual switching	25
Figure 1 – Reference network for single-phase and three-phase supplies derived from a three-phase, four-wire supply.....	14
Figure 2 – Histogram evaluation of $U(t)$	15
Figure 3 – Relative voltage change characteristic	15
Figure 4 – Curve for $P_{st}=1$ for rectangular equidistant voltage changes	16
Figure 5 – Shape factors F for double-step and ramp-voltage characteristics.....	16
Figure 6 – Shape factors F for rectangular and triangular voltage characteristics	17
Figure 7 – Shape factor F for motor-start voltage characteristics having various front times	17
Table 1 – Assessment method	9
Table A.1 – Electrode parameters	23
Table A.2 – Frequency factor R related to repetition rate " r "	24

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

1 Scope

This part of IEC 61000 is concerned with the limitation of voltage fluctuations and flicker impressed on the public low-voltage system.

It specifies limits of voltage changes which may be produced by an equipment tested under specified conditions and gives guidance on methods of assessment.

This part of IEC 61000 is applicable to electrical and electronic equipment having an input current equal to or less than 16 A per phase, intended to be connected to public low-voltage distribution systems of between 220 V and 250 V line to neutral at 50 Hz, and not subject to conditional connection.

Equipment which does not comply with the limits of this part of IEC 61000 when tested with the reference impedance Z_{ref} of 6.4, and which therefore cannot be declared compliant with this part, may be retested or evaluated to show conformity with IEC 61000-3-11. Part 3-11 is applicable to equipment with rated input current ≤ 75 A per phase and subject to conditional connection.

The tests according to this part are type tests. Particular test conditions are given in annex A and the test circuit is shown in Figure 1.

NOTE The limits in this part of IEC 61000 are based mainly on the subjective severity of flicker imposed on the light from 230 V/60 W coiled-coil filament lamps by fluctuations of the supply voltage. For systems with nominal voltage less than 220 V line to neutral and/or frequency of 60 Hz, the limits and reference circuit values are under consideration.

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):1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC/TR 60725, *Consideration of reference impedances and public supply impedances for use in determining disturbance characteristics of electrical equipment having a rated current ≤ 75 A per phase*

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

IEC 61000-3-2:2005, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*