SVENSK STANDARD SS-EN 61800-3

Fastställd	Utgåva	Sida	Ingår i
2005-01-24	2	1 (1+119)	SEK Område 22

Svenska Elektriska Kommissionen, SEK

Varvtalsstyrda elektriska drivsystem – Del 3: EMC-fordringar och speciella provningsmetoder

Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods

Som svensk standard gäller europastandarden EN 61800-3:2004. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61800-3:2004.

Nationellt förord

Europastandarden EN 61800-3:2004

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC

– **IEC 61800-3, Second edition, 2004 - Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61800-3, utgåva 1, 1996, SS-EN 61800-3/A11, utgåva 1, 2000 och SS-EN 61800-3/A11 C1, utgåva 1, 2001, gäller ej fr o m 2007-10-01.

ICS 29.200; 33.100

Denna standard är fastställd av Svenska Elektriska Kommissionen, SEK,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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EUROPEAN STANDARD **EN 61800-3**

NORME EUROPÉENNE

EUROPÄISCHE NORM December 2004

ICS 29.200 ; 33.100 Supersedes EN 61800-3:1996 + A11:2000

English version

Adjustable speed electrical power drive systems
Part 3: EMC requirements and specific test methods
(IEC 61800-3:2004)

Entraînements électriques de puissance à vitesse variable
Partie 3: Exigences de CEM et méthodes d'essais spécifiques
(CEI 61800-3:2004)

Drehzahlveränderbare elektrische Antriebe
Teil 3: EMV-Anforderungen einschließlich spezieller Prüfverfahren
(IEC 61800-3:2004)

This European Standard was approved by CENELEC on 2004-10-01. 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and 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

Ref. No. EN 61800-3:2004 E

Foreword

The text of document 22G/127/FDIS, future edition 2 of IEC 61800-3, prepared by SC 22G, Adjustable speed electric drive systems incorporating semiconductor power converters, of IEC TC 22, Power electronic systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61800-3 on 2004-10-01.

This European Standard supersedes EN 61800-3:1996 + A11:2000 + corrigendum May 2001.

This European Standard introduces three main changes:

a) the classes of distribution (unrestricted and restricted) of the PDS have been replaced by categories of PDS (C1 to C4) with definitions related to the product itself and its intended use;

b) better coverage of emission limits;

c) an EMC plan is generalized for category C4.

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)	2005-07-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2007-10-01

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 Directive 89/336/EEC. See Annex ZZ.

Annexes ZA and ZZ have been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 61800-3:2004 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60038	NOTE	Harmonized as HD 472 S1:1989 (modified).
IEC 60146-1-3	NOTE	Harmonized as EN 60146-1-3:1993 (not modified).
IEC 60146-2	NOTE	Harmonized as EN 60146-2:2000 (not modified).
IEC 61000-2-12	NOTE	Harmonized as EN 61000-2-12:2003 (not modified).
IEC 61000-4-1	NOTE	Harmonized as EN 61000-4-1:2000 (not modified).
IEC 61000-4-7	NOTE	Harmonized as EN 61000-4-7:2000 (not modified).
IEC 61000-4-9	NOTE	Harmonized as EN 61000-4-9:1993 (not modified).
IEC 61000-4-10	NOTE	Harmonized as EN 61000-4-10:1993 (not modified).
IEC 61000-6-1	NOTE	Harmonized as EN 61000-6-1:2001 (modified).
IEC 61000-6-2	NOTE	Harmonized as EN 61000-6-2:1999 (not modified).
IEC 61000-6-4	NOTE	Harmonized as EN 61000-6-4:2001 (modified).
IEC 61800-5-1	NOTE	Harmonized as EN 61800-5-1:2003 (not modified).

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

Publication	Year	Title	EN/HD	Year
IEC 60050-131	2002	International Electrotechnical Vocabulary Part 131: Circuit theory	-	-
IEC 60050-151	2001	Part 151: Electrical and magnetic devices	-	-
IEC 60050-161	1990	Chapter 161: Electromagnetic compatibility	-	-
IEC 60146-1-1	1991	Semiconductor convertors - General requirements and line commutated convertors Part 1-1: Specifications of basic requirements	EN 60146-1-1	1993
IEC 60364-1	2001	Electrical installations of buildings Part 1: Fundamental principles, assessment of general characteristics, definitions	-	-
IEC 60664-1	1992	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	EN 60664-1 [1)]	2003
IEC/TR 61000-1-1	– [2)]	Electromagnetic compatibility (EMC) Part 1: General - Section 1: Application and interpretation of fundamental definitions and terms	-	-
IEC/TR 61000-2-1	1990	Part 2: Environment - Section 1: Description of the environment - Electromagnetic environment for low-frequency conducted disturbances and signalling in public power supply systems	-	-

1) EN 60664-1 includes A1:2000 + A2:2002 to IEC 60664-1.

2) Undated reference.

Publication	Year	Title	EN/HD	Year
IEC 61000-2-2	2002	Part 2-2: Environment - Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems	EN 61000-2-2	2002
IEC 61000-2-4	2002	Part 2-4: Environment - Compatibility levels in industrial plants for low-frequency conducted disturbances	EN 61000-2-4	2002
IEC 61000-2-6	1995	Part 2-6: Environment - Assessment of the emission levels in the power supply of industrial plants as regards low-frequency conducted disturbances	-	-
IEC 61000-3-2 (mod)	2000	Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)	EN 61000-3-2	2000
IEC 61000-3-3	1994	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	EN 61000-3-3 + corr. July	1995 1997
IEC/TS 61000-3-4	1998	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 61000-3-7	1996	Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen - Requirements and tests for apparatus using software and/or digital technologies	-	-
IEC 61000-3-11	2000	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
IEC 61000-4-2	– [2)]	Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	1995 [3)]
IEC 61000-4-3	2002	Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	2002

3) Valid edition at date of issue.

Publication	Year	Title	EN/HD	Year
IEC 61000-4-4	1995	Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	1995
A1	2000		A1	2001
A2	2001		A2	2001
IEC 61000-4-5	1995	Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	1995
IEC 61000-4-6	2003	Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	-	-
IEC 61000-4-8	1993	Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8	1993
A1	2000		A1	2001
IEC 61800-1	1997	Adjustable speed electrical power drive systems Part 1: General requirements - Rating specifications for low voltage adjustable speed d.c. power drive systems	EN 61800-1	1998
IEC 61800-2	1998	Part 2: General requirements - Rating specifications for low voltage adjustable frequency a.c. power drive systems	EN 61800-2	1998
IEC 61800-4	2002	Part 4: General requirements - Rating specifications for a.c. power drive systems above 1 000 V a.c. and not exceeding 35 kV	EN 61800-4	2003
CISPR 11	2003	Industrial scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement	-	-
CISPR 14	Series	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus	EN 55014	Series
CISPR 16-1	1999	Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus	-	-
A1	2002		-	-
CISPR 22	2003	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	-	-

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ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –

Part 3: EMC requirements and specific test methods

1 Scope and object

This part of IEC 61800 specifies electromagnetic compatibility (EMC) requirements for power drive systems (PDSs). A PDS is defined in 3.1. These are adjustable speed a.c. or d.c. motor drives. Requirements are stated for PDSs with converter input and/or output voltages (line-to-line voltage), up to 35 kV a.c. r.m.s.

PDSs covered by this standard are those installed in residential, commercial and industrial locations with the exception of traction applications, and electric vehicles. PDSs may be connected to either industrial or public power distribution networks. Industrial networks are supplied by a dedicated distribution transformer, which is usually adjacent to or inside the industrial location, and supplies only industrial customers. Industrial networks can also be supplied by their own electric generating equipment. On the other hand, PDSs can be directly connected to low-voltage public mains networks which also supply domestic premises, and in which the neutral is generally earthed (grounded).

The scope of this part of IEC 61800, related to EMC, includes a broad range of PDSs from a few hundred watts to hundreds of megawatts. PDSs are often included in a larger system. The system aspect is not covered by this standard but guidance is provided in the informative annexes.

The requirements have been selected so as to ensure EMC for PDSs at residential, commercial and industrial locations. The requirements cannot, however, cover extreme cases which may occur with an extremely low probability. Changes in the EMC behaviour of a PDS, as a result of fault conditions, are not taken into account.

The object of this standard is to define the limits and test methods for a PDS according to its intended use. This standard includes immunity requirements and requirements for electromagnetic emissions.

NOTE 1 Emission can cause interference in other electronic equipment (for example radio receivers, measuring and computing devices). Immunity is required to protect the equipment from continuous and transient conducted and radiated disturbances including electrostatic discharges. The emission and immunity requirements are balanced against each other and against the actual environment of the PDS.

This standard defines the minimum EMC requirements for a PDS.

Immunity requirements are given according to the environment classification. Low-frequency emission requirements are given according to the nature of the supply network. High-frequency emission requirements are given according to four categories of intended use, which cover both environment and bringing into operation.

As a product standard, this standard may be used for the assessment of PDS. It may also be used for the assessment of CDM or BDM (see 3.1), which can be marketed separately.

This standard contains:

– conformity assessment requirements for products to be placed on the market;
– recommended engineering practice (see 6.5) for cases where high frequency emissions cannot be measured before the equipment is placed on the market (such PDSs are defined in 3.2.6 as category C4).

NOTE 2 The first edition of IEC 61800-3 identified that the intended use could require engineering for putting into service. This was done by the “restricted distribution mode”. Equipment that used to be covered by the “restricted distribution mode” is covered in the second edition by categories C2 and C4 (see 3.2).

This standard is intended as a complete EMC product standard for the EMC conformity assessment of products of categories C1, C2 and C3, when placing them on the market (see definitions 3.2.3 to 3.2.5).

Radio frequency emission of equipment of category C4 is only assessed when it is installed in its intended location. It is therefore treated as a fixed installation, for which this standard gives rules of engineering practice in 6.5 and annex E, although it gives no defined emission limits (except in case of complaint).

This standard does not specify any safety requirements for the equipment such as protection against electric shocks, insulation co-ordination and related dielectric tests, unsafe operation, or unsafe consequences of a failure. It also does not cover safety and functional safety implications of electromagnetic phenomena.

In special cases, when highly susceptible apparatus is being used in proximity, additional mitigation measures may have to be employed to reduce the electromagnetic emission further below the specified levels or additional countermeasures may have to be employed to increase the immunity of the highly susceptible apparatus.

As an EMC product standard for PDSs, this standard takes precedence over all aspects of the generic standards and no additional EMC tests are required or necessary. If a PDS is included as part of equipment covered by a separate EMC product standard, the EMC standard of the complete equipment applies.

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 (131):2002, *International Electrotechnical Vocabulary (IEV) – Chapter 131: Circuit theory*

IEC 60050 (151):2001, *International Electrotechnical Vocabulary (IEV) – Chapter 151: Electrical and magnetic devices*

IEC 60050 (161):1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 60146-1-1:1991, *Semiconductor convertors – General requirements and line commutated convertors – Part 1-1: Specifications of basic requirements*