
Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods (IEC 1800-3:1996)

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English version

**Adjustable speed electrical power drive systems
Part 3: EMC product standard including specific test methods
(IEC 1800-3:1996)**

Entraînements électriques de
puissance à vitesse variable
Partie 3: Norme de produit relative
à la CEM incluant des méthodes
d'essais spécifiques
(CEI 1800-3:1996)

Drehzahlveränderbare elektrische
Antriebe
Teil 3: EMV-Produktnorm einschließlich
spezieller Prüfverfahren
(IEC 1800-3:1996)

This European Standard was approved by CENELEC on 1996-07-02. 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.

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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 22G/31/FDIS, future edition 1 of IEC 1800-3, prepared by SC 22G, Semiconductor power converters for adjustable speed electric drive systems, of IEC TC 22, Power electronics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61800-3 on 1996-07-02.

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) 1997-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-04-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A, B, C, D and E are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 1800-3:1996 was approved by CENELEC as a European Standard without any modification.

In the official version, for annex E, Bibliography, the following notes have to be added, under E.3, for the standards indicated:

- IEC 38 NOTE: Harmonized as HD 472 S1:1989 (modified).
- IEC 146-1-3 NOTE: Harmonized as EN 60146-1-3:1993 (not modified).
- IEC 1000-4-1 NOTE: Harmonized as EN 61000-4-1:1994 (not modified).
- IEC 1000-4-7 NOTE: Harmonized as EN 61000-4-7:1993 (not modified).

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Annex ZA (normative)

**Normative references to international publications
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 50(131)	1978	International Electrotechnical Vocabulary (IEV) Chapter 131: Electric and magnetic circuits	-	-
IEC 50(151)	1978	Chapter 151: Electrical and magnetic devices	-	-
IEC 50(161)	1990	Chapter 161: Electromagnetic compatibility	-	-
IEC 146-1-1	1991	Semiconductor convertors - General requirements and line commutated convertors Part 1-1: Specifications of basic requirements	EN 60146-1-1	1993
IEC 364-3 (mod)	1993	Electrical installations of buildings Part 3: Assessment of general characteristics	HD 384.3 S2	1995
IEC 664-1 (mod)	1992	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	HD 625.1 S1	1996
IEC 1000-2-1	1990	Electromagnetic compatibility (EMC) Part 2: Environment Section 1: Description of the environment Electromagnetic environment for low-frequency conducted disturbances and signalling in public power supply systems	-	-
IEC 1000-2-2 (mod)	1990	Section 2: Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems	ENV 61000-2-2	1993

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 1000-2-4	1994	Section 4: Compatibility levels in industrial plants for low-frequency conducted disturbances	EN 61000-2-4 ¹⁾	1994
IEC 1000-2-6	1995	Section 6: Assessment of the emission levels in the power supply of industrial plants as regards low-frequency conducted disturbances	-	-
IEC 1000-3-2	1995	Part 3: Limits Section 2: Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)	EN 61000-3-2 A12	1995 1996
IEC 1000-3-3	1994	Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to and including 16 A	EN 61000-3-3	1995
IEC 1000-3-5	1994	Section 5: Limitation of voltage fluctuations and flicker in low-voltage power supply systems for equipment with rated current greater than 16 A	-	-
IEC 1000-4-2	1995	Part 4: Testing and measurement techniques Section 2: Electrostatic discharge immunity test - Basic EMC publication	EN 61000-4-2	1995
IEC 1000-4-3 (mod)	1995	Section 3: Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	1996
IEC 1000-4-4	1995	Section 4: Electrical fast transient/burst immunity test - Basic EMC publication	EN 61000-4-4	1995
IEC 1000-4-5	1995	Section 5: Surge immunity test	EN 61000-4-5	1995
IEC 1000-4-6	1996	Section 6: Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	1996
IEC 1000-4-8	1993	Section 8: Power frequency magnetic field immunity test - Basic EMC publication	EN 61000-4-8	1993
IEC 1000-4-9	1993	Section 9: Pulse magnetic field immunity test - Basic EMC publication	EN 61000-4-9	1993
IEC 1000-4-10	1993	Section 10: Damped oscillatory magnetic field immunity test - Basic EMC publication	EN 61000-4-10	1993

1) EN 61000-2-4 includes the corrigendum August 1994 to IEC 1000-2-4.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
CISPR 11 (mod)	1990	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment	EN 55011	1991
CISPR 16-1	1993	Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus	-	-

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INTERNATIONALE
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STANDARD

CEI
IEC
1800-3

Première édition
First edition
1996-06

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à vitesse variable –**

**Partie 3:
Norme de produit relative à la CEM incluant
des méthodes d'essais spécifiques**

**Adjustable speed electrical
power drive systems –**

**Part 3:
EMC product standard including specific
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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ADJUSTABLE SPEED ELECTRICAL POWER
DRIVE SYSTEMS –**
**Part 3: EMC product standard
including specific test methods**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 1800-3 has been prepared by IEC technical subcommittee 22G: Semiconductor power converters for adjustable speed electric drive systems, of IEC technical committee 22: Power electronics.

The text of this standard is based on the following documents:

FDIS	Report on voting
22G/31/FDIS	22G/34/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.

Annexes A, B, C, D and E are for information only.

ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS -

Part 3: EMC product standard including specific test methods

1 Scope and object

This International Standard specifies electromagnetic compatibility (EMC) requirements for power drive systems (PDSs). These are adjustable speed a.c. or d.c. motor drives. Requirements are stated for PDSs which are connected to mains supplies with a rated voltage of up to 1 000 V a.c. r.m.s. For supply voltages higher than 1 000 V a.c. r.m.s. EMC requirements are under consideration and, until a new publication is produced, they will result from agreement between manufacturer/supplier and user.

PDSs covered by this standard are those installed in industrial and residential environments 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. 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).

PDSs covered by this standard 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 an adequate level of electromagnetic compatibility (EMC) for PDSs in industrial and public locations. The levels cannot, however, cover extreme cases which are most unlikely to occur. 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. It includes immunity requirements and requirements against electromagnetic emissions. 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. For evident economic reasons, the emission and immunity requirements should be balanced against each other and against the actual environment of the PDS.

This standard defines the minimum electromagnetic compatibility requirements for a PDS.

This standard does not specify all 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.