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Halvledarströmriktare – Del 2: Självkommuterande strömriktare inklusive likströmsomriktare utan växelströmsmellanled

Semiconductor convertors –

Part 2: Self-commutated semiconductor convertors including direct d.c. convertors

Som svensk standard gäller europastandarden EN 60146-2:2000. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60146-2:2000.

Nationellt förord

Europastandarden EN 60146-2:2000^{*)}

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 60146-2, Second edition, 1999 - Semiconductor convertors - Part 2: Self-commutated semiconductor convertors including direct d.c. convertors**

utarbetad inom International Electrotechnical Commission, IEC.

^{*)} EN 60146-2:2000 ikraftsattes 2000-04-20 som SS-EN 60146-2 genom offentliggörande, d v s utan utgivning av något svenskt dokument.

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SEK Svensk Elstandard

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

English version

Semiconductor converters
Part 2: Self-commutated semiconductor converters
including direct d.c. converters
(IEC 60146-2:1999)

Convertisseurs à semiconducteurs
Partie 2: Convertisseurs autocommutés
à semiconducteurs y compris les
convertisseurs à courant continu directs
(CEI 60146-2:1999)

Halbleiter-Stromrichter
Teil 2: Selbstgeführte
Halbleiter-Stromrichter einschließlich
Gleichstrom-Direktumrichter
(IEC 60146-2:1999)

This European Standard was approved by CENELEC on 2000-01-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, 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

Foreword

The text of document 22B/126/FDIS, future edition 2 of IEC 60146-2, prepared by SC 22B, Semiconductor converters, of IEC TC 22, Power electronics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60146-2 on 2000-01-01.

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) 2000-10-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2003-01-01

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 annex A is informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60146-2:1999 was approved by CENELEC as a European Standard without any modification.

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 60050-101	1998	International Electrotechnical Vocabulary (IEV) Part 101: Mathematics	-	-
IEC 60050-161	1990	Chapter 161: Electromagnetic compatibility	-	-
IEC 60050-551	1998	Part 551: Power electronics	-	-
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 60146-1-2	1991	Semiconductor convertors - General requirements and line commutated convertors Part 1-2: Application guide	-	-
IEC 60664-1 (mod)	1992	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	HD 625.1 S1 + corr. November 1996	1996
IEC 60747-1	1983	Semiconductor devices - Discrete devices Part 1: General	-	-
A3	1996		-	-
IEC 61000-2-2 (mod)	1990	Electromagnetic compatibility (EMC) Part 2: Environment 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 61000-2-4 + corr. August	1994 1994	Section 4: Compatibility levels in industrial plants for low-frequency conducted disturbances	EN 61000-2-4	1994
IEC 61000-4	series	Part 4: Testing and measurement techniques	EN 61000-4	series
IEC 61010-1 (mod)	1990	Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements		
+ A1 (mod)	1992		EN 61010-1	1993

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR CONVERTERS –**Part 2: Self-commutated semiconductor converters
including direct d.c. converters**

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.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60146-2 has been prepared by subcommittee 22B: Semiconductor converters, of IEC technical committee 22: Power electronics.

This second edition of IEC 60146-2 cancels and replaces the first edition of IEC 60146-2 published in 1974 and the first edition of IEC 60146-3 published in 1977, and constitutes a technical revision.

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

FDIS	Report on voting
22B/126/FDIS	22B/129/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 3.

Annex A is for information only.

The committee has decided that this publication remains valid until 2005. At this date, in accordance with the committee's decision, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

SEMICONDUCTOR CONVERTERS –

Part 2: Self-commutated semiconductor converters including direct d.c. converters

1 Scope

This part of IEC 60146 applies to all types of semiconductor converters of the self-commutated type including power converters which contain at least one part of a self-commutated type, for example a.c. converters, indirect d.c. converters, direct d.c. converters.

The requirements of IEC 60146-1-1 apply also to self-commutated converters as far as they are not in contradiction with this standard. For some special applications, for example, uninterruptible power systems, variable speed a.c. and d.c. drives and electric traction equipment, additional standards may apply.

NOTE Test restrictions may apply to special applications, for example high-power reactive power converters.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60146. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60146 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

IEC 60050-101:1998, *International Electrotechnical Vocabulary (IEV) – Part 101: Mathematics*

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

IEC 60050-551:1998, *International Electrotechnical Vocabulary (IEV) – Part 551: Power electronics*

IEC 60146-1-1:1991, *Semiconductor converters – General requirements and line commutated converters – Part 1-1: Specifications of basic requirements*
Amendment 2¹⁾

IEC 60146-1-2:1991, *Semiconductor converters – General requirements and line commutated converters – Part 1-2: Application guide*

IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

¹⁾ To be published.

IEC 60747-1:1983, *Semiconductor devices – Discrete devices – Part 1: General*
Amendment 3 (1996)

IEC 61000-2-2:1990, *Electromagnetic compatibility (EMC) – Part 2: Environment – Section 2: Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems*

IEC 61000-2-4:1994, *Electromagnetic compatibility (EMC) – Part 2: Environment – Section 4: Compatibility levels in industrial plants for low-frequency conducted disturbances*

IEC 61000-4 (all parts), *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques*

IEC 61010-1:1990, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*
Amendment 1 (1992)