

Australian Standard™

Semiconductor converters

**Part 1.2: General requirements and line
commutated converters—Application
guide**

This Australian Standard was prepared by Committee EL-027, Power Electronics. It was approved on behalf of the Council of Standards Australia on 4 June 2002 and published on 4 July 2002.

The following are represented on Committee EL-027:

Australian Communications Authority
Australian Electrical and Electronic Manufacturers Association
Bureau of Steel Manufacturers of Australia
Electricity Supply Association of Australia
Monash University
University of Wollongong

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Australian Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

Australian Standard™

Semiconductor converters

Part 1.2: General requirements and line commutated converters—Application guide

Originated as part of AS 1995.1—1977.
Revised and redesignated in part as AS 60146.1.2—2002.

COPYRIGHT

© Standards Australia International

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia International Ltd
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 4487 7

PREFACE

This Standard was prepared by the Standards Australia Committee EL-027, Power Electronics to partially supersede AS 1955.1—1977, *Semiconductor converters*, Part 1: *General* six months after publication.

The objective of this Standard is to provide designers, manufacturers and users with information on extending the requirements of AS 60146.1.1 to special cases and types of line commutated converters.

This Standard is the second of a three part Standard; the parts of which are as follows:

AS 60146	Semiconductor converters
AS 60146.1.1	Part 1.1: General requirements and line commutated converters—Specifications of basic requirements
AS 60146.1.2	Part 1.2: General requirements and line commutated converters—Application guide (this Standard)
AS 60146.1.3	Part 1.3: General requirements and line commutated converters—Transformers and reactors

This Standard is technically identical with, and has been reproduced from, IEC 60146-1-2:1991, *Semiconductor converters—General requirements and line commutated converters*, Part 1-2: *Application guide*. Minor editorial changes have been made to the text such as the use of the word ‘converter’ throughout the document (to standardize spelling across this series of Standards).

A reference to an International Standard identified in the Bibliography by strikethrough (~~example~~) is replaced by a reference to the Australian or Australian/New Zealand Standard(s) listed immediately thereafter and identified by shading (example). Where the struck-through referenced document and the referenced Australian or Australian/New Zealand Standard are identical, this is indicated in parenthesis after the title of the latter.

In January 1997, the IEC commenced numbering its Standards from 60000 by adding 60000 to the number of each existing Standard. This coordinates IEC numbering with ISO numbering. During the transition period an IEC Standard might be identified by its new number or its old number (for example, IEC 60050 or IEC 50).

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text ‘this International Standard’ should read ‘this Australian Standard’.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

CONTENTS

Clause	<i>Page</i>
Section 1 - General	
1.1	Scope 1
1.2	Application of semiconductor power converters..... 1
1.2.1	Conversion equipment..... 1
1.2.2	Supply source conditioning (active and reactive power)..... 2
1.3	Equipment specification data 2
1.3.1	Main items of the specification..... 2
1.3.2	Additional information..... 2
1.3.3	Unusual service conditions 3
1.4	Converter transformers and reactors..... 3
1.5	Calculation factors 3
1.5.1	Voltage ratios 3
1.5.2	Line side transformer current factor 4
1.5.3	Valve-side transformer current factor..... 4
1.5.4	Voltage regulation 4
1.5.5	Magnetic circuit 7
1.5.6	Power loss factor..... 7
1.6	Parallel and series connections..... 7
1.6.1	Parallel or series connection of valve devices..... 7
1.6.2	Parallel or series connection of assemblies and equipment units..... 7
1.7	Power factor 8
1.7.1	General 8
1.7.2	Symbols used in the determination of displacement factor 9
1.7.3	Circle diagram for the approximation of the displacement factor $\cos \varphi_{1N}$ and of the reactive power Q_{1LN} for rectifier and inverter operation..... 10
1.7.4	Calculation of the displacement factor $\cos \varphi_1$ 10
1.7.5	Conversion factor 12
1.8	Direct voltage regulation 13
1.8.1	Inherent direct voltage regulation 13
1.8.2	Direct voltage regulation due to a.c. system impedance..... 15
1.8.3	Information to be exchanged between supplier and purchaser about direct voltage regulation of the converter 18
1.9	Voltage limits for reliable commutation in inverter mode..... 18
1.10	A.C. voltage waveform 19

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-