Australian Standard™

Semiconductor converters

Part 1.3: General requirements and line commutated converters—Transformers and reactors

Standards Australia

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.

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Australian Communications Authority

Australian Electrical and Electronic Manufacturers Association

Bureau of Steel Manufacturers of Australia

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Part 1.3: General requirements and line commutated converters—Transformers and reactors

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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 the special characteristics of converter transformers with respect to ordinary power transformers.

This Standard is the third part 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
AS 60146.1.3	Part 1.3: General requirements and line commutated converters—Transformers and reactors (this Standard)

This Standard is technically identical with, and has been reproduced from, IEC 60146-1-3:1991, *Semiconductor convertors,* Part 1-3: *General requirements and line commutated convertors—Transformers and reactors*.

Minor editorial changes have been made to the text such as use of 'converter' throughout the document (to standardize spelling across this series of Standards).

A reference to an International Standard identified in the Normative References Clause 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 'normative' has been used in this Standard to define the application of the annex to which it applies. A 'normative' annex is an integral part of a Standard.

CONTENTS

Page

Clause

1 Scope 1
2 Normative references 1
3 Rated values for converter transformers 2
3.1 Rated current values 2
3.1.1 Single converter or double converter supplied from one common cell winding 2
3.1.2 Double converter where each thyristor assembly has separate cell windings 2
3.2 Temperature limits of cooling media 2
3.2.1 Air cooled outdoor equipment 2
3.2.2 Air cooled indoor equipment 2
3.2.3 Water cooled equipment 2
4 Losses and voltage drops in transformers and reactors 2
4.1 Losses in the transformer windings 2
4.2 Losses in interphase transformers, current balancing reactors, series-smoothing reactors, transductors and other current regulating accessories 3
4.2.1 Interphase transformers 3
4.2.2 Current balancing reactors 3
4.2.3 Series-smoothing reactors 3
4.2.4 Transductors and other current regulating accessories 3
4.3 Voltage drops in transformers and reactors 4
5 Tests for converter transformers 4
5.1 Measurement of commutating reactance and determination of inductive voltage drop (type test) 4
5.1.1 Commutating reactance 4
5.1.2 Inductive voltage regulation 4
5.2 Short-circuit test (type test and routine test) 5
5.3 Temperature rise test (type test) 5

Annex

A Corrections to be applied when cooling medium temperature is higher than standard 9

Table

1 Temperature rise limits 6
2 Connections and calculation factors 7

NOTES

STANDARDS AUSTRALIA

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Australian Standard

Semiconductor converters

Part 1.3: General requirements and line commutated converters—Transformers and reactors

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1 Scope

This Part 1-3 of the International Standard relates, in general, to those characteristics wherein converter transformers differ from ordinary power transformers. In all other respects, the rules specified in IEC 76 shall apply to converter transformers also, as far as they are not in contradiction with this Standard.

It should be borne in mind that a rectifier transformer operates with non-sinusoidal current waveshape. In single-way connection, the current in each cell winding contains a d.c. component which calls for special attention in design and testing. In some cases, a special design is necessary when external short-circuits and coil failures would cause abnormal stress.

For certain types of transformers, the waveshape of the normal operating voltage is non-sinusoidal. The core loss of such equipment is to be determined by applying a sinusoidal voltage having the same half-cycle arithmetic mean value and the same fundamental frequency as the voltage applied in service.

2 Normative references

The following Standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All Standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

References to International Standards that are struck through in this Clause are replaced by references to equivalent Australian or Australian/New Zealand Standards that are listed immediately hereafter and identified by shading. Any Australian or Australian/New Zealand Standard that is identical to the International Standard it replaces is appropriately identified.

IEC 76: 1967, Power transformers.

~~IEC 146-1-1: 1991, *Semiconductor converters - General requirements and line commutated converters - Part 1 –1: Specifications of basic requirements.*~~

AS 60146.1.1, *Semiconductor converters* Part 1.1: *General requirements and line commutated converters—Specifications of basic requirements*