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NSAI Standards

Irish Standard
I.S. EN 62477-1:2012&A11:2014&A1:2017&A12:2021

Safety requirements for power electronic converter systems and equipment - Part 1: General

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I.S. EN 62477-1:2012&A11:2014&A1:2017&A12:2021

Incorporating amendments/corrigenda/National Annexes issued since publication:

EN 62477-1:2012/A11:2014
EN 62477-1:2012/A1:2017
EN 62477-1:2012/A12:2021

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This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

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This document is based on:	*Published:*
EN 62477-1:2012	2012-10-05

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
2021-02-22	NOTE: If blank see CEN/CENELEC cover page

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National Foreword

I.S. EN 62477-1:2012&A11:2014&A1:2017&A12:2021 is the adopted Irish version of the European Document EN 62477-1:2012, Safety requirements for power electronic converter systems and equipment - Part 1: General

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In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62477-1:2012/A12

February 2021

ICS 29.200

English Version

Safety requirements for power electronic converter systems and equipment - Part 1: General

Exigences de sécurité applicables aux systèmes et matériels électroniques de conversion de puissance - Partie 1: Généralités

Sicherheitsanforderungen an Leistungshalbleiter-Umrichtersysteme und -betriebsmittel - Teil 1: Allgemeines

This amendment A12 modifies the European Standard EN 62477-1:2012; it was approved by CENELEC on 2020-11-17. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 62477-1:2012/A12:2021) has been prepared by CLC/TC 22X "Power electronics".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2021-08-05
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2023-11-17

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This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

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Annex ZZ
(informative)

Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European standard has been prepared under a Commission's standardisation request relating to harmonised standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

Table ZZ.1 – Correspondence between this European standard and Annex I of Directive 2014/35/EU [2014 OJ L96]

Safety objectives of Directive 2014/35/EU (Annex I)	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
1. General:	Ref. of all Clauses from the CLC/TC 22X Committee standard, that are linked to the Safety Objectives	Remarks & Notes from CLC/TC 22X Secretariat
1 a) the essential characteristics, the recognition and observance of which will ensure that electrical equipment will be used safely and in applications for which it was made, shall be marked on the electrical equipment, or, if this is not possible, on an accompanying document	6	
1 b) the electrical equipment, together with its component parts, shall be made in such a way as to ensure that it can be safely and properly assembled and connected;	4.3, 4.8, 4.11 6.3, 6.4, 6.5	
1 c) the electrical equipment shall be so designed and manufactured as to ensure that protection against the hazards set out in points 2 and 3 is assured, providing that the equipment is used in applications for which it was made and is adequately maintained.	1, 2, 3 6.2, 6.4, 6.5	refer to 2a to 2d and 3a to 3c in this table

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Safety objectives of Directive 2014/35/EU (Annex I)	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
2. Protection against hazards arising from the electrical equipment		
2 a) persons and domestic animals are adequately protected against the danger of physical injury or other harm which might be caused by direct or indirect contact;	4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.8, 4.9. Annex A, Annex D, Annex F 5.1, 5.2.1, 5.2.2, 5.2.3, 5.2.4	
2 b) temperatures, arcs or radiation which would cause a danger, are not produced;	4.1, 4.2, 4.3, 4.5, 4.6, 4.9, 4.11, 4.12 5.1, 5.2.3.9, 5.2.4, 5.2.3.10, 5.2.5, 5.2.6	Hazards arising from electric, magnetic and electromagnetic fields, other ionizing and non-ionizing radiation are covered by separate standards.
2 c) persons, domestic animals and property are adequately protected against non-electrical dangers caused by the electrical equipment which are revealed by experience;	4.1, 4.2, 4.7, 4.12 5.1, 5.2.1, 5.2.2, 5.2.4	
2 d) the insulation is suitable for foreseeable conditions.	4.1, 4.2, 4.4.7, 4.6.4 5.1, 5.2.1, 5.2.3, 5.2.4, 5.2.5, 5.2.3.10	
3. Protection against hazards which may be caused by external influences on the electrical equipment		
3 a) meets the expected mechanical requirements in such a way that persons, domestic animals and property are not endangered;	4.1, 4.2, 4.7, 4.9, 4.12 5.1, 5.2.1, 5.2.2, 5.2.4, 5.2.6	
3 b) is resistant to non-mechanical influences in expected environmental conditions, in such a way that persons, domestic animals and property are not endangered;	4.1, 4.2, 4.9 5.1, 5.2.1, 5.2.6, 5.2.7	EMC is not covered
3 c) does not endanger persons, domestic animals and property in foreseeable conditions of overload.	4.1, 4.2, 4.3 5.1, 5.2.1, 5.2.4	

WARNING 1: Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2: Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62477-1:2012/A1

February 2017

ICS 29.200

English Version

Safety requirements for power electronic converter systems and equipment - Part 1: General (IEC 62477-1:2012/A1:2016)

Exigences de sécurité applicables aux systèmes et matériels électroniques de conversion de puissance - Partie 1: Généralités (IEC 62477-1:2012/A1:2016)

Sicherheitsanforderungen an Leistungshalbleiter-Umrichtersysteme und -betriebsmittel - Teil 1: Allgemeines (IEC 62477-1:2012/A1:2016)

This amendment A1 modifies the European Standard EN 62477-1:2012; it was approved by CENELEC on 2016-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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Ref. No. EN 62477-1:2012/A1:2017 E

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European foreword

The text of document 22/270A/FDIS, future IEC 62477-1:2012/A1, prepared by IEC/TC 22 “Power electronic systems and equipment” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62477-1:2012/A1:2017.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2017-08-10
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-02-10

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Endorsement notice

The text of the International Standard IEC 62477-1:2012/A1:2016 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:

Addition:

IEC 60865 (series)	NOTE	Harmonized as EN 60865 (series).
IEC 60865-1	NOTE	Harmonized as EN 60865-1.
IEC 60909 (series)	NOTE	Harmonized as EN 60909 (series).
IEC 60909-0:2016	NOTE	Harmonized as EN 60909-0:2016.
IEC 60947-1:2007	NOTE	Harmonized as EN 60947-1:2007.
IEC 60947-6-1:2005	NOTE	Harmonized as EN 60947-6-1:2005.
IEC 60947-6-1:2005/AMD1:2013	NOTE	Harmonized as EN 60947-6-1:2005/A1:2014.
IEC 61439-1:2011	NOTE	Harmonized as EN 61439-1:2011.

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IEC 62477-1

Edition 1.0 2016-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

GROUP SAFETY PUBLICATION
PUBLICATION GROUPÉE DE SÉCURITÉ

AMENDMENT 1
AMENDEMENT 1

Safety requirements for power electronic converter systems and equipment – Part 1: General

Exigences de sécurité applicables aux systèmes et matériels électroniques de conversion de puissance – Partie 1: Généralités

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

GROUP SAFETY PUBLICATION
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AMENDMENT 1
AMENDEMENT 1

Safety requirements for power electronic converter systems and equipment – Part 1: General

Exigences de sécurité applicables aux systèmes et matériels électroniques de conversion de puissance – Partie 1: Généralités

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FOREWORD

This amendment has been prepared by the IEC technical committee TC22: Power electronic systems and equipment.

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

FDIS	Report on voting
22/270A/FDIS	22/274/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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3 Terms and definitions

Replace the existing term and definition 3.35 by the following new term and definition:

3.35
prospective short-circuit current
I_{cp}
r.m.s. value of the current which would flow if the supply conductors to the circuit are short-circuited by a conductor of negligible impedance located as near as practicable to the supply terminals of the *PECS*

[SOURCE: IEC 61439-1:2011, 3.8.7], modified – "ASSEMBLY" is replaced by "*PECS*".]

Add the following new terms and definitions:

3.66
conditional short-circuit current
I_{cc}
r.m.s. value of a *prospective short-circuit current* available from a supply source, declared by the *PECS* manufacturer under specified conditions, using a specific type of *short-circuit protective device* protecting the *PECS*

Note 1 to entry: See also Figure N.1.

Note 2 to entry: The supply source might be a mains or non-mains supply.

Note 3 to entry: The declared I_{cc} is the minimum current value used for calibration of the supply source.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62477-1:2012/A11

August 2014

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English Version

Safety requirements for power electronic converter systems and equipment - Part 1: General

Exigences de sécurité applicables aux systèmes et matériels électroniques de conversion de puissance - Partie 1: Généralités

Sicherheitsanforderungen an Leistungshalbleiter-Umrichtersysteme und -betriebsmittel - Teil 1: Allgemeines

This amendment A11 modifies the European Standard EN 62477-1:2012; it was approved by CENELEC on 2014-07-18. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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Foreword

This document (EN 62477-1:2012/A11:2014) has been prepared by CLC/TC 22X "Power electronics".

The aim behind this Amendment is to link EN 62477-1:2012 to the Low Voltage Directive 2006/95/EC, further to a CLC/TC 22X request, approved by the Technical Board by the decision D146/C017.

In addition, a recent Technical Board decision (D147/C061), confirmed that EN 62477-1:2012 partially supersedes EN 50178:1997.

Add to the Foreword of EN 62477-1:2012:
"This document partially supersedes EN 50178:1997."

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2015-07-18
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2017-07-18

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

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NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62477-1

October 2012

ICS 29.200

English version

Safety requirements for power electronic converter systems and equipment - Part 1: General

(IEC 62477-1:2012)

Exigences de sécurité applicables aux systèmes et matériels électroniques de conversion de puissance - Partie 1: Généralités (CEI 62477-1:2012)

Sicherheitsanforderungen an Leistungshalbleiter-Umrichtersysteme und -betriebsmittel - Teil 1: Allgemeines (IEC 62477-1:2012)

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Ref. No. EN 62477-1:2012 E

Foreword

The text of document 22/200/FDIS, future edition 1 of IEC 62477-1, prepared by IEC/TC 22 "Power electronic systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62477-1:2012.

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IEC 60085	NOTE	Harmonised as EN 60085.
IEC 60216 Series	NOTE	Harmonised as EN 60216 Series (not modified).
IEC 60309-1	NOTE	Harmonised as EN 60309-1.
IEC 60664-5:2007	NOTE	Harmonised as EN 60664-5:2007 (not modified).
IEC 60695-11-5	NOTE	Harmonised as EN 60695-11-5.
IEC 60721 Series	NOTE	Harmonised as EN 60721 Series (not modified).
IEC 60947-7-1	NOTE	Harmonised as EN 60947-7-1.
IEC 60947-7-2	NOTE	Harmonised as EN 60947-7-2.
IEC 60950-1	NOTE	Harmonised as EN 60950-1.
IEC 61008 Series	NOTE	Harmonised as EN 61008 Series (partly modified).
IEC 61009 Series	NOTE	Harmonised as EN 61009 Series (partly modified).
IEC 61082-1	NOTE	Harmonised as EN 61082-1.
IEC 61140:2001	NOTE	Harmonised as EN 61140:2002 (not modified).
IEC 61508 Series	NOTE	Harmonised as EN 61508 Series (not modified).
IEC 61558-1	NOTE	Harmonised as EN 61558-1.
IEC 61558-2-16	NOTE	Harmonised as EN 61558-2-16.
IEC 61643-12	NOTE	Harmonised as CLC/TS 61643-12.
IEC 62079:2001	NOTE	Harmonised as EN 62079:2001 (not modified).
IEC 62423:2009	NOTE	Harmonised as EN 62423:2012 (modified).

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When 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	Series	International Electrotechnical Vocabulary (IEV)	-	-
IEC 60060-1	2010	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	2010
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	-
IEC 60068-2-6	-	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 60068-2-52	-	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)	EN 60068-2-52	-
IEC 60068-2-68	-	Environmental testing - Part 2: Tests - Test L: Dust and sand	EN 60068-2-68	-
IEC 60068-2-78	2001	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	2001
IEC 60112 + corr. June + corr. October	2003 2003 2003	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	2003
IEC 60216-4-1	-	Electrical insulating materials - Thermal endurance properties - Part 4-1: Ageing ovens - Single-chamber ovens	EN 60216-4-1	-
IEC 60364-1	-	Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions	HD 60364-1	-
IEC 60364-4-41 (mod)	2005	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41 + corr. July	2007 2007
IEC 60364-4-44 (mod)	2007	Low voltage electrical installations - Part 4-44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances	HD 60364-4-442	2012
IEC 60364-5-54	2011	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors	HD 60364-5-54	2011

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Publication	Year	Title	EN/HD	Year
IEC 60417-DB		Graphical symbols for use on equipment	-	-
IEC/TS 60479-1	-	Effects of current on human beings and livestock - Part 1: General aspects	-	-
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 60617-DB		Graphical symbols for diagrams	-	-
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60664-3	2003	Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	2003
IEC 60664-4	2005	Insulation coordination for equipment within low-voltage systems - Part 4: Consideration of high-frequency voltage stress	EN 60664-4 + corr. October	2006 2006
IEC 60695-2-10	-	Fire hazard testing - Part 2-10: Glowing/hot-wire based test methods - Glow-wire apparatus and common test procedure	EN 60695-2-10	-
IEC 60695-2-11 + corr. January	2000 2001	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products	EN 60695-2-11	2001
IEC 60695-2-13	-	Fire hazard testing - Part 2-13: Glowing/hot-wire based test methods - Glow-wire ignition temperature (GWIT) test method for materials	EN 60695-2-13	-
IEC 60695-10-2	-	Fire hazard testing - Part 10-2: Abnormal heat - Ball pressure test	EN 60695-10-2	-
IEC 60695-11-10	-	Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10	-
IEC 60695-11-20	-	Fire hazard testing - Part 11-20: Test flames - 500 W flame test methods	EN 60695-11-20	-
IEC 60721-3-3	-	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 3: Stationary use at weatherprotected locations	EN 60721-3-3	-
IEC 60721-3-4	-	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 4: Stationary use at non-weatherprotected locations	EN 60721-3-4	-

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Publication	Year	Title	EN/HD	Year
IEC 60730-1	-	Automatic electrical controls for household and similar use - Part 1: General requirements	EN 60730-1	-
IEC/TR 60755	-	General requirements for residual current operated protective devices	-	-
IEC 60949	-	Calculation of thermally permissible short-circuit currents, taking into account non-adiabatic heating effects	-	-
IEC 60990	1999	Methods of measurement of touch current and protective conductor current	EN 60990	1999
IEC 61032 + corr. January	1997 2003	Protection of persons and equipment by enclosures - Probes for verification	EN 61032	1998
IEC 61180-1	1992	High-voltage test techniques for low-voltage equipment - Part 1: Definitions, test and procedure requirements	EN 61180-1	1994
IEC Guide 104	2010	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-
IEC Guide 117	2010	Electrotechnical equipment - Temperatures of touchable hot surfaces	-	-
ISO 3746	-	Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane	EN ISO 3746	-
ISO 3864-1	-	Graphical symbols - Safety colours and safety signs - Part 1: Design principles for safety signs in workplaces and public areas	-	-
ISO 7000	-	Graphical symbols for use on equipment - Index and synopsis	-	-
ISO 7010	-	Graphical symbols - Safety colours and safety signs - Registered safety signs	EN ISO 7010	-
ISO 9614-1	-	Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 1: Measurement at discrete points	EN ISO 9614-1	-
ISO 9772	-	Cellular plastics - Determination of horizontal burning characteristics of small specimens subjected to a small flame	-	-
ANSI/ASTM E84-11b	-	Standard test method for surface burning characteristics of building materials	-	-
ASTM E162-11a	-	Standard test method for surface flammability of materials using a radiant heat energy source	-	-

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GROUP SAFETY PUBLICATION
PUBLICATION GROUPÉE DE SÉCURITÉ

Safety requirements for power electronic converter systems and equipment – Part 1: General

Exigences de sécurité applicables aux systèmes et matériels électroniques de conversion de puissance – Partie 1: Généralités

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY REQUIREMENTS FOR POWER ELECTRONIC CONVERTER SYSTEMS AND EQUIPMENT –

Part 1: General

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It has the status of a group safety publication in accordance with IEC Guide 104.

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

FDIS	Report on voting
22/200/FDIS	22/204/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 2.

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A list of all the parts in the IEC 62477 series, published under the general title *Safety requirements for power electronic convertor systems and equipment* can be found on the IEC website.

In this standard, terms in *italic* are defined in Clause 3.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

IMPORTANT – The "colour inside" logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

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INTRODUCTION

This International Standard relates to products that include power electronic converters, with a rated system voltage not exceeding 1 000 V a.c. or 1 500 V d.c. It specifies requirements to reduce risks of fire, electric shock, thermal, energy and mechanical hazards, except functional safety as defined in IEC 61508. The objectives of this document are to establish a common terminology and basis for the safety requirements of products that contain power electronic converters across several IEC technical committees.

This standard has been developed with the intention:

- to be used as a reference document for product committees inside TC 22 in the development of product standards for power electronic converter systems and equipment;
- to replace IEC 62103 as a product family standard providing minimum requirements for safety aspects of power electronic converter systems and equipment in apparatus for which no product standard exists; and

NOTE The scope of IEC 62103 contains reliability aspects, which are not covered by this standard.

- to be used as a reference document for product committees outside TC 22 in the development of product standards of power electronic converter systems and equipment intended renewable energy sources. TC 82, TC 88, TC 105 and TC 114, in particular, have been identified as relevant technical committees at the time of publication.

Technical committees using this document should carefully consider the relevance of each paragraph in this document for the product under consideration and reference, add, replace or modify requirement as relevant. Product specific topics not covered by this document are in the responsibility of the technical committees using this document as reference document.

This group safety standard will not take precedence on any product specific standard according to IEC Guide 104. IEC Guide 104 provides information about the responsibility of product committees to use group safety standards for the development of their own product standards.

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SAFETY REQUIREMENTS FOR POWER ELECTRONIC CONVERTER SYSTEMS AND EQUIPMENT –

Part 1: General

1 Scope

This part of IEC 62477 applies to Power Electronic Converter Systems (PECS) and equipment, their components for *electronic power conversion* and electronic power switching, including the means for their control, protection, monitoring and measurement, such as with the main purpose of converting electric power, with rated system voltages not exceeding 1 000 V a.c. or 1 500 V d.c.

This document may also be used as a reference standard for product committees producing product standards for:

- adjustable speed electric power drive systems (PDS);
- standalone uninterruptible power systems (UPS);
- low voltage stabilized d.c. power supplies.

For PECS for which no product standard exists, this standard provides minimum requirements for safety aspects.

This part of IEC 62477 has the status of a group safety publication in accordance with IEC Guide 104 for power electronic converter systems and equipment for solar, wind, tidal, wave, fuel cell or similar energy sources.

According to IEC Guide 104, one of the responsibilities of technical committees is, wherever applicable, to make use of basic safety publications and/or group safety publications in the preparation of their product standards.

This International Standard:

- establishes a common terminology for safety aspects relating to PECS and equipment;
- establishes minimum requirements for the coordination of safety aspects of interrelated parts within a PECS;
- establishes a common basis for minimum safety requirements for the PEC portion of products that contain PEC;
- specifies requirements to reduce risks of fire, electric shock, thermal, energy and mechanical hazards, during use and operation and, where specifically stated, during service and maintenance;
- specifies minimum requirements to reduce risks with respect to pluggable and permanently connected equipment, whether it consists of a system of interconnected units or independent units, subject to installing, operating and maintaining the equipment in the manner prescribed by the manufacturer.

This International Standard does not cover:

- telecommunications apparatus other than power supplies to such apparatus;
- functional safety aspects as covered by e.g. IEC 61508;
- electrical equipment and systems for railways applications and electric vehicles.

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