

# CONSOLIDATED VERSION

# VERSION CONSOLIDÉE



GROUP SAFETY PUBLICATION  
PUBLICATION GROUPEE 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  
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ICS 29.200

ISBN 978-2-8322-3546-1

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## CONTENTS

FOREWORD .....	8
INTRODUCTION .....	10
1 Scope .....	11
2 Normative references .....	12
3 Terms and definitions .....	14
4 Protection against hazards .....	24
4.1 General .....	24
4.2 Fault and abnormal conditions .....	25
4.3 Short circuit and overload protection .....	26
4.3.1 General .....	26
4.3.2 Specification of input short-circuit withstand strength and output short circuit current ability .....	27
4.3.3 Short-circuit coordination (backup protection) .....	29
4.3.4 Protection by several devices .....	29
4.3.5 <i>Input ports short time withstand current, <math>I_{CW}</math></i> .....	29
4.4 Protection against electric shock .....	29
4.4.1 General .....	29
4.4.2 <i>Decisive voltage class</i> .....	30
4.4.3 Provision for <i>basic protection</i> .....	35
4.4.4 Provision for <i>fault protection</i> .....	37
4.4.5 <i>Enhanced protection</i> .....	43
4.4.6 Protective measures .....	44
4.4.7 Insulation .....	46
4.4.8 Compatibility with residual current-operated protective devices (RCD) .....	61
4.4.9 Capacitor discharge .....	62
4.5 Protection against electrical energy hazards .....	62
4.5.1 Operator access areas .....	62
4.5.2 Service access areas .....	63
4.6 Protection against fire and thermal hazards .....	63
4.6.1 Circuits representing a fire hazard .....	63
4.6.2 Components representing a fire hazard .....	63
4.6.3 <i>Fire enclosures</i> .....	64
4.6.4 Temperature limits .....	68
4.6.5 Limited power sources .....	71
4.7 Protection against mechanical hazards .....	72
4.7.1 General .....	72
4.7.2 Specific requirements for liquid cooled <i>PECS</i> .....	73
4.8 Equipment with multiple sources of supply .....	74
4.9 Protection against environmental stresses .....	75
4.10 Protection against sonic pressure hazards .....	76
4.10.1 General .....	76
4.10.2 Sonic pressure and sound level .....	76
4.11 Wiring and connections .....	76
4.11.1 General .....	76
4.11.2 Routing .....	76

4.11.3	Colour coding .....	77
4.11.4	Splices and connections .....	77
4.11.5	Accessible connections .....	77
4.11.6	Interconnections between parts of the <i>PECS</i> .....	77
4.11.7	Supply connections .....	78
4.11.8	Terminals .....	78
4.12	<i>Enclosures</i> .....	79
4.12.1	General .....	79
4.12.2	Handles and manual controls .....	80
4.12.3	Cast metal .....	80
4.12.4	Sheet metal .....	80
4.12.5	Stability test for <i>enclosure</i> .....	83
5	Test requirements .....	84
5.1	General .....	84
5.1.1	Test objectives and classification .....	84
5.1.2	Selection of test samples .....	84
5.1.3	Sequence of tests .....	84
5.1.4	Earthing conditions .....	84
5.1.5	General conditions for tests .....	84
5.1.6	Compliance .....	85
5.1.7	Test overview .....	86
5.2	Test specifications .....	87
5.2.1	Visual inspections ( <i>type test</i> , <i>sample test</i> and <i>routine test</i> ) .....	87
5.2.2	Mechanical tests .....	87
5.2.3	Electrical tests .....	91
5.2.4	Abnormal operation and simulated faults tests .....	105
5.2.5	Material tests .....	111
5.2.6	Environmental tests ( <i>type tests</i> ) .....	115
5.2.7	Hydrostatic pressure test ( <i>type test</i> and <i>routine test</i> ) .....	120
6	Information and marking requirements .....	120
6.1	General .....	120
6.2	Information for selection .....	122
6.3	Information for installation and commissioning .....	123
6.3.1	General .....	123
6.3.2	Mechanical considerations .....	123
6.3.3	Environment .....	123
6.3.4	Handling and mounting .....	123
6.3.5	<i>Enclosure</i> temperature .....	123
6.3.6	Connections .....	124
6.3.7	Protection requirements .....	124
6.3.8	Commissioning .....	126
6.4	Information for use .....	126
6.4.1	General .....	126
6.4.2	Adjustment .....	126
6.4.3	Labels, signs and signals .....	126
6.5	Information for maintenance .....	128
6.5.1	General .....	128
6.5.2	Capacitor discharge .....	129

6.5.3	Auto restart/bypass connection .....	129
6.5.4	Other hazards .....	129
6.5.5	Equipment with multiple sources of supply .....	129
Annex A (normative)	Additional information for protection against electric shock .....	130
Annex B (informative)	Considerations for the reduction of the pollution degree .....	150
Annex C (informative)	Symbols referred to in IEC 62477-1 .....	151
Annex D (normative)	Evaluation of clearance and creepage distances .....	152
Annex E (informative)	Altitude correction for clearances .....	160
Annex F (normative)	Clearance and creepage distance determination for frequencies greater than 30 kHz .....	161
Annex G (informative)	Cross-sections of round conductors .....	167
Annex H (informative)	Guidelines for RCD compatibility .....	168
Annex I (informative)	Examples of overvoltage category reduction .....	172
Annex J (informative)	Burn thresholds for touchable surfaces .....	179
Annex K (informative)	Table of electrochemical potentials .....	182
Annex L (informative)	Measuring instrument for <i>touch current</i> measurements .....	183
Annex M (informative)	Test probes for determining access .....	184
Annex N (informative)	Guidance regarding short-circuit current .....	187
Bibliography	.....	200

Figure 1 – Touch time - d.c. peak voltage zones of <i>ventricular fibrillation</i> in dry skin condition .....	33
Figure 2 – Touch time - d.c. peak voltage zones of <i>ventricular fibrillation</i> in water-wet skin condition .....	33
Figure 3 – Touch time - d.c. peak voltage zones of <i>ventricular fibrillation</i> in saltwater-wet skin condition .....	34
Figure 4 – Example of a <i>PECS</i> assembly and its associated <i>protective equipotential bonding</i> .....	39
Figure 5 – Example of a <i>PECS</i> assembly and its associated <i>protective equipotential bonding</i> .....	40
Figure 6 – <i>Fire enclosure</i> bottom openings below an unenclosed or partially enclosed fire-hazardous component .....	66
Figure 7 – <i>Fire enclosure</i> baffle construction .....	67
Figure 8 – Supported and unsupported <i>enclosure</i> parts .....	81
Figure 9 – Impact test using a steel ball .....	89
Figure 10 – Voltage test procedures .....	96
Figure 11 – Protective equipotential bonding impedance test for separate unit with power fed from the <i>PECS</i> with protection for the power cable .....	102
Figure 12 – Protective equipotential bonding impedance test for sub-assembly with accessible parts and with power fed from the <i>PECS</i> .....	103
Figure 13 – Circuit for high-current arcing test .....	112
Figure 14 – Test fixture for hot-wire ignition test .....	113
Figure A.1 – Protection by <i>DVC As</i> with <i>protective separation</i> .....	130
Figure A.2 – Protection by means of <i>protective impedance</i> .....	131
Figure A.3 – Protection by using limited voltages .....	132
Figure A.4 – Touch time- d.c. voltage zones for dry skin condition .....	135



Figure A.5 – Touch time- d.c. voltage zones for water-wet skin condition.....	135
Figure A.6 – Touch time- d.c. voltage for saltwater-wet skin condition .....	136
Figure A.7 – Touch time- d.c. voltage zones of dry skin condition .....	137
Figure A.8 – Touch time- d.c. voltage zones of water-wet skin condition.....	137
Figure A.9 – Touch time- d.c. voltage zones of saltwater-wet skin condition .....	138
Figure A.10 – Touch time- d.c. voltage zones of dry skin condition .....	139
Figure A.11 – Touch time- d.c. voltage zones of water-wet skin condition.....	139
Figure A.12 – Touch time- a.c. voltage zones for dry skin condition.....	140
Figure A.13 – Touch time- a.c. voltage zones of water-wet skin condition .....	141
Figure A.14 – Touch time- a.c. voltage of saltwater-wet skin condition.....	141
Figure A.15 – Touch time- a.c. voltage zones of dry skin condition .....	142
Figure A.16 – Touch time- a.c. voltage zones of water-wet skin condition .....	143
Figure A.17 – Touch time- a.c. voltage zones of saltwater-wet skin condition.....	143
Figure A.18 – Touch time- a.c. voltage zones of dry skin condition .....	144
Figure A.19 – Touch time- a.c. voltage zones of water-wet skin condition .....	145
Figure A.20 – Typical waveform for a.c. <i>working voltage</i> .....	146
Figure A.21 – Typical waveform for d.c. <i>working voltage</i> .....	146
Figure A.22 – Typical waveform for pulsating <i>working voltage</i> .....	147
Figure F.1 – Diagram for dimensioning of clearances .....	162
Figure F.2 – Diagram for dimensioning of creepage distances .....	164
Figure H.1 – Flow chart leading to selection of the RCD type upstream of a <i>PECS</i> .....	168
Figure H.2 – Fault current waveforms in connections with power electronic converter devices.....	170
Figure F.3 – Permissible field strength for dimensioning of solid <i>insulation</i> according to Equation (1).....	166
Figure I.1 – <i>Basic insulation</i> evaluation for circuits connected to the origin of the <i>installation mains supply</i> .....	172
Figure I.2 – <i>Basic insulation</i> evaluation for circuits connected to the <i>mains supply</i> .....	173
Figure I.3 – <i>Basic insulation</i> evaluation for single and three phase equipment not <i>permanently connected</i> to the <i>mains supply</i> .....	173
Figure I.4 – <i>Basic insulation</i> evaluation for circuits connected to the origin of the <i>installation mains supply</i> where internal <i>SPDs</i> are used .....	173
Figure I.5 – <i>Basic insulation</i> evaluation for circuits connected to the <i>mains supply</i> where internal <i>SPDs</i> are used.....	174
Figure I.6 – Example of <i>protective separation</i> evaluation for circuits connected to the <i>mains supply</i> where internal <i>SPDs</i> are used.....	174
Figure I.7 – Example of <i>protective separation</i> evaluation for circuits connected to the <i>mains supply</i> where internal <i>SPDs</i> are used.....	175
Figure I.8 –Example of <i>protective separation</i> evaluation for circuits connected to the <i>mains supply</i> where internal <i>SPDs</i> are used.....	175
Figure I.9 – <i>Basic insulation</i> evaluation for circuits not connected directly to the <i>mains supply</i> .....	175
Figure I.10 – <i>Basic insulation</i> evaluation for circuits not connected directly to the supply mains .....	176
Figure I.11 – Functional <i>insulation</i> evaluation within circuits affected by external transients .....	176

Figure I.12 – <i>Basic insulation</i> evaluation for circuits both connected and not connected directly to the <i>mains supply</i> .....	177
Figure I.13 – <i>Insulation</i> evaluation for accessible circuit of <i>DVC A</i> .....	177
Figure I.14 – <i>PEC</i> with <i>mains</i> and <i>non-mains supply</i> without galvanic separation .....	178
Figure I.15 – Transformer (basic) isolated <i>PEC</i> inverter with <i>SPD</i> and transformer to reduce impulse voltage for functional and <i>basic insulation</i> .....	178
Figure J.1 – Burn threshold spread when the skin is in contact with a hot smooth surface made of bare (uncoated) metal .....	179
Figure J.2 – Rise in the burn threshold spread from Figure J.1 for metals which are coated by shellac varnish of a thickness of 50 µm, 100 µm and 150 µm.....	180
Figure J.3 – Rise in the burn threshold spread from Figure J.1 for metals coated with the specific materials .....	180
Figure J.4 – Burn threshold spread when the skin is in contact with a hot smooth surface made of ceramics, glass and stone materials .....	181
Figure J.5 – Burn threshold spread when the skin is in contact with a hot smooth surface made of plastics .....	181
Figure K.1 – Electrochemical potentials (V) .....	182
Figure L.1 – Measuring instrument .....	183
Figure M.1 – Sphere 50 mm probe (IPXXA).....	184
Figure M.2 – Jointed test finger (IPXXB) .....	185
Figure M.3 – Test rod 2,5 mm (IP3X) .....	186
Figure N.1 – Example of short-circuit current curve under specification of $I_{CC}$ .....	189
Figure N.2 – Example of tripping characteristic of a circuit breaker .....	190
Figure N.3 – Example of tripping characteristic of a current-limiting fuse .....	190
Figure N.4 – Example of short-circuit current curve under specification of $I_{CW}$ .....	191
Figure N.5 – Two <i>PECS</i> with different specifications .....	192
Figure N.6 – One <i>PECS</i> with different specification for each input <i>mains supply port</i> .....	194
Figure N.7 – Flowchart for classification of $I_{CC}$ or $I_{CW}$ .....	197
Table 1 – Alphabetical list of terms .....	15
Table 2 – Selection of <i>DVC</i> for touch voltage to protect against <i>ventricular fibrillation</i> .....	31
Table 3 – Selection of body contact area.....	31
Table 4 – Selection of humidity condition of the skin .....	31
Table 5 – Steady state voltage limits for the <i>decisive voltage classes</i> .....	32
Table 6 – Protection requirements for circuit under consideration .....	35
Table 7 – <i>PE conductor</i> cross-section <sup>a</sup> .....	41
Table 8 – Definitions of pollution degrees.....	47
Table 9 – Impulse withstand voltage and <i>temporary overvoltage</i> versus system voltage.....	49
Table 10 – Clearance distances for <i>functional, basic</i> or <i>supplementary insulation</i> .....	54
Table 11 – Creepage distances (in millimetres) .....	56
Table 12 – Generic materials for the direct support of uninsulated <i>live parts</i> .....	58
Table 13 – Permitted openings in <i>fire enclosure</i> bottoms .....	67
Table 14 – Maximum measured total temperatures for internal materials and components.....	69
Table 15 – Maximum measured temperatures for accessible parts of the <i>PECS</i> .....	71

Table 16 – Limits for sources without an overcurrent protective device .....	72
Table 17 – Limits for power sources with an overcurrent protective device .....	72
Table 18 – Environmental service conditions.....	75
Table 19 – Wire bending space from terminals to <i>enclosure</i> .....	79
Table 20 – Thickness of sheet metal for <i>enclosures</i> : carbon steel or stainless steel.....	82
Table 21 – Thickness of sheet metal for <i>enclosures</i> : aluminium, copper or brass .....	83
Table 22 – Test overview .....	86
Table 23 – Pull values for handles and manual control securement .....	91
Table 24 – Impulse voltage test .....	92
Table 25 – Impulse test voltage .....	93
Table 26 – AC or d.c. test voltage for circuits connected directly to <i>mains supply</i> .....	94
Table 27 – A.c. or d.c. test voltage for circuits connected to <i>non-mains supply</i> without <i>temporary overvoltages</i> .....	95
Table 28 – Partial discharge test.....	98
Table 29 – Test duration for <i>protective equipotential bonding</i> test .....	104
Table 30 – Environmental tests.....	116
Table 31 – Dry heat test (steady state) .....	117
Table 32 – Damp heat test (steady state) .....	118
Table 33 – Vibration test.....	119
Table 34 – Salt mist test .....	119
Table 35 – Dust and sand test .....	120
Table 36 – Information requirements.....	121
<b>Table 37 – A.c. short time withstand current test, minimum PECS requirements .....</b>	<b>111</b>
Table A.1 – Selection of touch voltage sets to protect against <i>ventricular fibrillation</i> .....	133
Table A.2 – Selection of touch voltage sets to protect against <i>muscular reaction</i> .....	134
Table A.3 – Selection of touch voltage sets to protect against <i>startle reaction</i> .....	134
Table A.4 – Examples for protection against electrical shock.....	149
Table C.1 – Symbols used .....	151
Table D.1 – Width of grooves by pollution degree.....	152
Table E.1 – Correction factor for clearances at altitudes between 2 000 m and 20 000 m .....	160
Table E.2 – Test voltages for verifying clearances at different altitudes .....	160
Table F.1 – Minimum values of clearances in air at atmospheric pressure for inhomogeneous field conditions (Table 1 of IEC 60664-4:2005).....	163
Table F.2 – Multiplication factors for clearances in air at atmospheric pressure for approximately homogeneous field conditions .....	163
Table F.3 – Minimum values of creepage distances for different frequency ranges (Table 2 of IEC 60664-4:2005).....	165
Table G.1 – Standard cross-sections of round conductors .....	167

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**SAFETY REQUIREMENTS FOR POWER ELECTRONIC  
CONVERTER SYSTEMS AND EQUIPMENT –****Part 1: General**

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**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.**

International Standard IEC 62477-1 has been prepared by IEC technical committee 22: Power electronic systems and equipment.

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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.

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- replaced by a revised edition, or
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**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 document using a colour printer.**

## 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.

# 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;