



**Safety requirements for power  
electronic converter systems and  
equipment**

**Part 1: General**

**STANDARDS**  
Australia

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- Australian Industry Group
  - Bureau of Steel Manufacturers of Australia
  - Energy Networks Association
  - Engineers Australia
  - RMIT University
  - University of Newcastle
- 

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Australian Standard<sup>®</sup>

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

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## PREFACE

This Standard was prepared by the Standards Australia Committee EL-027, Power Electronics.

The objective of this Standard is to establish a common terminology and basis for the safety requirements of products that contain power electronic converters.

This Standard is identical with, and has been reproduced from IEC 62477-1, Ed 1.0 (2012), *Safety requirements for power electronic converter systems and equipment*, Part 1: *General*.

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

- (a) In the source text ‘this part of IEC 62477’ and ‘this International Standard’ should read ‘this Australian Standard’.
- (b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian or Australian/New Zealand Standard</i>	
IEC		AS	
60068	Environmental testing	60068	Environmental testing
60068-2-52	Part 2-52: Tests—Test Kb: Salt mist, cyclic (sodium chloride solution)	60068.2.52	Part 2.52: Tests—Test Kb: Salt mist, cyclic (sodium chloride solution)
60068-2-68	Part 2-68: Tests—Test L: Dust and sand	60068.2.68	Part 2.68: Tests—Test L: Dust and sand
60068-2-78	Part 2-78: Tests—Test Cab: Damp heat, steady state	60068.2-78	Part 2.78: Tests—Test Cab: Damp heat, steady state
IEC/TS		AS/NZS	
60479	Effects of current on human beings and livestock	60479	Effects of current on human beings and livestock
60479-1	Part 1: General aspects	60479.1	Part 1: General aspects
IEC			
60990	Methods of measurement of touch current and protective conductor current	60990	Methods of measurement of touch current and protective conductor current

Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex to which they apply. A ‘normative’ annex is an integral part of a Standard, whereas an ‘informative’ annex is only for information and guidance.

## CONTENTS

1	Scope .....	11
2	Normative references .....	12
3	Terms and definitions .....	14
4	Protection against hazards .....	23
4.1	General .....	23
4.2	Fault and abnormal conditions .....	24
4.3	Short circuit and overload protection .....	25
4.3.1	General .....	25
4.3.2	Specification of input short-circuit withstand strength and output short circuit current ability .....	26
4.3.3	Short-circuit coordination (backup protection) .....	27
4.3.4	Protection by several devices .....	27
4.4	Protection against electric shock .....	27
4.4.1	General .....	27
4.4.2	<i>Decisive voltage class</i> .....	27
4.4.3	Provision for <i>basic protection</i> .....	32
4.4.4	Provision for <i>fault protection</i> .....	34
4.4.5	<i>Enhanced protection</i> .....	40
4.4.6	Protective measures .....	41
4.4.7	Insulation .....	43
4.4.8	Compatibility with residual current operated protective devices (RCD) .....	58
4.4.9	Capacitor discharge .....	58
4.5	Protection against electrical energy hazards .....	59
4.5.1	Operator access areas .....	59
4.5.2	Service access areas .....	60
4.6	Protection against fire and thermal hazards .....	60
4.6.1	Circuits representing a fire hazard .....	60
4.6.2	Components representing a fire hazard .....	60
4.6.3	<i>Fire enclosures</i> .....	61
4.6.4	Temperature limits .....	65
4.6.5	Limited power sources .....	68
4.7	Protection against mechanical hazards .....	69
4.7.1	General .....	69
4.7.2	Specific requirements for liquid cooled <i>PECS</i> .....	70
4.8	Equipment with multiple sources of supply .....	71
4.9	Protection against environmental stresses .....	72
10	Protection against sonic pressure hazards .....	73
4.10.1	General .....	73
4.10.2	Sonic pressure and sound level .....	73
4.11	Wiring and connections .....	73
4.11.1	General .....	73
4.11.2	Routing .....	73
4.11.3	Colour coding .....	73
4.11.4	Splices and connections .....	74

4.11.5	Accessible connections	74
4.11.6	Interconnections between parts of the <i>PECS</i>	74
4.11.7	Supply connections	75
4.11.8	Terminals	75
4.12	<i>Enclosures</i>	76
4.12.1	General	76
4.12.2	Handles and manual controls	76
4.12.3	Cast metal	77
4.12.4	Sheet metal	77
4.12.5	Stability test for <i>enclosure</i>	80
5	Test requirements	81
5.1	General	81
5.1.1	Test objectives and classification	81
5.1.2	Selection of test samples	81
5.1.3	Sequence of tests	81
5.1.4	Earthing conditions	81
5.1.5	General conditions for tests	81
5.1.6	Compliance	82
5.1.7	Test overview	83
5.2	Test specifications	84
5.2.1	Visual inspections ( <i>type test, sample test and routine test</i> )	84
5.2.2	Mechanical tests	84
5.2.3	Electrical tests	88
5.2.4	Abnormal operation and simulated faults tests	102
5.2.5	Material tests	106
5.2.6	Environmental tests ( <i>type tests</i> )	110
5.2.7	Hydrostatic pressure test ( <i>type test and routine test</i> )	115
6	Information and marking requirements	115
6.1	General	115
6.2	Information for selection	117
6.3	Information for installation and commissioning	118
6.3.1	General	118
6.3.2	Mechanical considerations	118
6.3.3	Environment	118
6.3.4	Handling and mounting	118
6.3.5	<i>Enclosure</i> temperature	118
6.3.6	Connections	119
6.3.7	Protection requirements	119
6.3.8	Commissioning	121
6.4	Information for use	121
6.4.1	General	121
6.4.2	Adjustment	121
6.4.3	Labels, signs and signals	121
6.5	Information for maintenance	123
6.5.1	General	123
6.5.2	Capacitor discharge	124
6.5.3	Auto restart/bypass connection	124
6.5.4	Other hazards	124
6.5.5	Equipment with multiple sources of supply	124

Annex A (normative) Additional information for protection against electric shock .....	125
Annex B (informative) Considerations for the reduction of the pollution degree.....	145
Annex C (informative) Symbols referred to in IEC 62477-1.....	146
Annex D (normative) Evaluation of clearance and creepage distances .....	147
Annex E (informative) Altitude correction for clearances .....	155
Annex F (normative) Clearance and creepage distance determination for frequencies greater than 30 kHz.....	156
Annex G (informative) Cross-sections of round conductors .....	162
Annex H (informative) Guidelines for RCD compatibility.....	163
Annex I (informative) Examples of overvoltage category reduction .....	167
Annex J (informative) Burn thresholds for touchable surfaces .....	174
Annex K (informative) Table of electrochemical potentials .....	177
Annex L (informative) Measuring instrument for <i>touch current</i> measurements .....	178
Annex M (informative) Test probes for determining access .....	179
Bibliography .....	182
Figure 1 – Touch time-d.c. peak voltage zones of <i>ventricular fibrillation</i> in dry skin condition .....	30
Figure 2 – Touch time- d.c. peak voltage zones of <i>ventricular fibrillation</i> in water-wet skin condition.....	31
Figure 3 – Touch time- d.c. peak voltage zones of <i>ventricular fibrillation</i> in saltwater-wet skin condition.....	31
Figure 4 – Example of a <i>PECS</i> assembly and its associated <i>protective equipotential bonding</i> .....	36
Figure 5 – Example of a <i>PECS</i> assembly and its associated <i>protective equipotential bonding</i> .....	37
Figure 6 – <i>Fire enclosure</i> bottom openings below an unenclosed or partially enclosed fire-hazardous component.....	63
Figure 7 – <i>Fire enclosure</i> baffle construction .....	64
Figure 8 – Supported and unsupported <i>enclosure</i> parts .....	78
Figure 9 – Impact test using a steel ball.....	86
Figure 10 – Voltage test procedures .....	93
Figure 11 – Protective equipotential bonding impedance test for separate unit with power fed from the <i>PECS</i> with protection for the power cable .....	99
Figure 12 – Protective equipotential bonding impedance test for sub-assembly with accessible parts and with power fed from the <i>PECS</i> .....	100
Figure 13 – Circuit for high-current arcing test .....	107
Figure 14 – Test fixture for hot-wire ignition test .....	108
Figure A.1 – Protection by <i>DVC As</i> with <i>protective separation</i> .....	125
Figure A.2 – Protection by means of <i>protective impedance</i> .....	126
Figure A.3 – Protection by using limited voltages .....	127
Figure A.4 – Touch time- d.c. voltage zones for dry skin condition .....	130
Figure A.5 – Touch time- d.c. voltage zones for water-wet skin condition .....	130
Figure A.6 – Touch time- d.c. voltage for saltwater-wet skin condition.....	131
Figure A.7 – Touch time- d.c. voltage zones of dry skin condition.....	132
Figure A.8 – Touch time- d.c. voltage zones of water-wet skin condition .....	132

Figure A.9 – Touch time- d.c. voltage zones of saltwater-wet skin condition .....	133
Figure A.10 – Touch time- d.c. voltage zones of dry skin condition .....	134
Figure A.11 – Touch time- d.c. voltage zones of water-wet skin condition.....	134
Figure A.12 – Touch time- a.c. voltage zones for dry skin condition .....	135
Figure A.13 – Touch time- a.c. voltage zones of water-wet skin condition.....	136
Figure A.14 – Touch time- a.c. voltage of saltwater-wet skin condition .....	136
Figure A.15 – Touch time- a.c. voltage zones of dry skin condition.....	137
Figure A.16 – Touch time- a.c. voltage zones of water-wet skin condition.....	138
Figure A.17 – Touch time- a.c. voltage zones of saltwater-wet skin condition .....	138
Figure A.18 – Touch time- a.c. voltage zones of dry skin condition.....	139
Figure A.19 – Touch time- a.c. voltage zones of water-wet skin condition.....	140
Figure A.20 – Typical waveform for a.c. <i>working voltage</i> .....	141
Figure A.21 – Typical waveform for d.c. <i>working voltage</i> .....	141
Figure A.22 – Typical waveform for pulsating <i>working voltage</i> .....	142
Figure F.1 – Diagram for dimensioning of clearances .....	157
Figure F.2 – Diagram for dimensioning of creepage distances .....	159
Figure F.3 – Permissible field strength for dimensioning of solid <i>insulation</i> according to Equation (1).....	161
Figure H.1 – Flow chart leading to selection of the RCD type upstream of a <i>PECS</i> .....	163
Figure H.2 – Fault current waveforms in connections with or without electronic converter devices .....	165
Figure I.1 – <i>Basic insulation</i> evaluation for circuits connected to the origin of the <i>installation mains supply</i> .....	167
Figure I.2 – <i>Basic insulation</i> evaluation for circuits connected to the <i>mains supply</i> .....	168
Figure I.3 – <i>Basic insulation</i> evaluation for single and three phase equipment not permanently connected to the <i>mains supply</i> .....	168
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.....	168
Figure I.5 – <i>Basic insulation</i> evaluation for circuits connected to the <i>mains supply</i> where internal <i>SPDs</i> are used .....	169
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 .....	169
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 .....	170
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 .....	170
Figure I.9 – <i>Basic insulation</i> evaluation for circuits not connected directly to the <i>mains supply</i> .....	170
Figure I.10 – <i>Basic insulation</i> evaluation for circuits not connected directly to the supply <i>mains</i> .....	171
Figure I.11 – Functional <i>insulation</i> evaluation within circuits affected by external transients.....	171
Figure I.12 – <i>Basic insulation</i> evaluation for circuits both connected and not connected directly to the <i>mains supply</i> .....	172
Figure I.13 – <i>Insulation</i> evaluation for accessible circuit of DVC A .....	172
Figure I.14 – <i>PEC</i> with mains and non- <i>mains supply</i> without galvanic separation.....	173

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> .....	173
Figure J.1 – Burn threshold spread when the skin is in contact with a hot smooth surface made of bare (uncoated) metal .....	174
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 $\mu\text{m}$ , 100 $\mu\text{m}$ and 150 $\mu\text{m}$ .....	175
Figure J.3 – Rise in the burn threshold spread from Figure J.1 for metals coated with the specific materials .....	175
Figure J.4 – Burn threshold spread when the skin is in contact with a hot smooth surface made of ceramics, glass and stone materials .....	176
Figure J.5 – Burn threshold spread when the skin is in contact with a hot smooth surface made of plastics .....	177
Figure K.1 – Electrochemical potentials (V) .....	177
Figure L.1 – Measuring instrument .....	178
Figure M.1 – Sphere 50 mm probe (IPXXA) .....	179
Figure M.2 – Jointed test finger (IPXXB) .....	180
Figure M.3 – Test rod 2,5 mm (IP3X) .....	181
Table 1 – Alphabetical list of terms .....	15
Table 2 – Selection of <i>DVC</i> for touch voltage to protect against <i>ventricular fibrillation</i> .....	28
Table 3 – Selection of body contact area .....	29
Table 4 – Selection of humidity condition of the skin .....	29
Table 5 – Steady state voltage limits for the <i>decision voltage classes</i> .....	29
Table 6 – Protection requirements for circuit under consideration .....	32
Table 7 – <i>PE conductor</i> cross-section <sup>a</sup> .....	38
Table 8 – Definitions of pollution degree .....	43
Table 9 – Impulse withstand voltage for <i>temporary overvoltage</i> versus system voltage .....	46
Table 10 – Clearance distances for <i>functional, basic or supplementary insulation</i> .....	51
Table 11 – Creepage distances (in millimetres) .....	53
Table 12 – Generic materials for the direct support of uninsulated <i>live parts</i> .....	55
Table 13 – Permitted openings in <i>fire enclosure</i> bottoms .....	64
Table 14 – Maximum measured total temperatures for internal materials and components .....	66
Table 15 – Maximum measured temperatures for accessible parts of the <i>PECS</i> .....	68
Table 16 – Limits for sources without an overcurrent protective device .....	69
Table 17 – Limits for power sources with an overcurrent protective device .....	69
Table 18 – Environmental service conditions .....	72
Table 19 – Wire bending space from terminals to <i>enclosure</i> .....	76
Table 20 – Thickness of sheet metal for <i>enclosures</i> : carbon steel or stainless steel .....	79
Table 21 – Thickness of sheet metal for <i>enclosures</i> : aluminium, copper or brass .....	80
Table 22 – Test overview .....	83
Table 23 – Pull values for handles and manual control securement .....	88
Table 24 – Impulse voltage test .....	89
Table 25 – Impulse test voltage .....	90
Table 26 – AC or d.c. test voltage for circuits connected directly to <i>mains supply</i> .....	91

Table 27 – A.c. or d.c. test voltage for circuits connected to <i>non-mains supply</i> without <i>temporary overvoltages</i> .....	92
Table 28 – Partial discharge test .....	95
Table 29 – Test duration for <i>protective equipotential bonding</i> test .....	101
Table 30 – Environmental tests .....	111
Table 31 – Dry heat test (steady state) .....	112
Table 32 – Damp heat test (steady state) .....	113
Table 33 – Vibration test .....	114
Table 34 – Salt mist test.....	114
Table 35 – Dust and sand test.....	115
Table 36 – Information requirements .....	116
Table A.1 – Selection of touch voltage sets to protect against <i>ventricular fibrillation</i> .....	128
Table A.2 – Selection of touch voltage sets to protect against <i>muscular reaction</i> .....	129
Table A.3 – Selection of touch voltage sets to protect against <i>startle reaction</i> .....	129
Table A.4 – Examples for protection against electrical shock .....	144
Table C.1 – Symbols used.....	146
Table D.1 – Width of grooves by pollution degree .....	147
Table E.1 – Correction factor for clearances at altitudes between 2 000 m and 20 000 m .....	155
Table E.2 – Test voltages for verifying clearances at different altitudes.....	155
Table F.1 – Minimum values of clearances in air at atmospheric pressure for inhomogeneous field conditions (Table 1 of IEC 60664-1:2005) .....	158
Table F.2 – Multiplication factors for clearances in air at atmospheric pressure for approximately homogeneous field conditions .....	158
Table F.3 – Minimum values of creepage distances for different frequency ranges (Table 2 of IEC 60664-4:2005) .....	160
Table G.1 – Standard cross-sections of round conductors .....	162

## 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.

## AUSTRALIAN STANDARD

**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.