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C22.2 No. 107.1-16

Power conversion equipment



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Standards Update Service

C22.2 No. 107.1-16

June 2016

Title: *Power conversion equipment*

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C22.2 No. 107.1-16
Power conversion equipment



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*Published in June 2016 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3*

*To purchase standards and related publications, visit our Online Store at shop.csa.ca
or call toll-free 1-800-463-6727 or 416-747-4044.*

ISBN 978-1-4883-0365-4

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Contents

Technical Committee on Industrial Products 8

Subcommittee on General Use Power Supplies 10

Preface 12

1 Scope 14

2 Reference publications 15

3 Definitions 18

4 Construction 23

4.1 General 23

4.2 Enclosures 24

4.2.1 General 24

4.2.2 Thickness of sheet metal enclosures for live parts 24

4.2.3 Thickness of cast metal enclosures for live parts 25

4.2.4 Polymeric enclosures 25

4.2.5 Openings in enclosures 25

4.2.6 Doors, covers, and guards 27

4.2.7 Special-purpose enclosures 28

4.2.8 Protection against corrosion 28

4.2.9 PCE mounting means 29

4.3 Mechanical assembly 29

4.4 Supply connections 29

4.4.1 Permanently connected PCE 29

4.4.2 Cord-connected PCE 30

4.5 Terminal parts and leads 31

4.6 Current-carrying parts 32

4.7 Internal wiring 32

4.8 Electrical insulation 33

4.9 Transformers 34

4.10 Motors 34

4.11 Capacitors 34

4.12 Fuses and fuseholders 35

4.13 Overload relays 35

4.14 Switches and controllers 35

4.15 Printed wiring boards 36

4.16 Spacings 36

4.17 Alternative approach to spacings 39

4.17.1 General 39

4.17.2 Overvoltage category (OVC) 39

4.17.3 Pollution degree (PD) 39

4.17.4 Installation instructions 39

4.18 Separation of circuits 39

4.19	Overcurrent protection	41
4.19.1	Circuits external to the PCE	41
4.19.2	Circuits internal to the PCE	42
4.19.3	Battery circuits	42
4.20	Disconnecting means	42
4.21	Protection of receptacles	44
4.22	Battery supplies	44
4.23	Bonding to ground	46
4.24	Dielectric-liquid-filled equipment	47
4.24.1	General	47
4.24.2	Liquid level	47
4.24.3	Liquid drain valve	47
4.24.4	Terminal compartment	47
4.24.5	Components	47
4.24.6	Lifting	47
4.24.7	Mounting	47
4.24.8	Gaskets	47
4.24.9	Dielectric liquid	47
4.24.10	Emergency pressure-relief device	47
4.24.11	Grounding	48
4.24.12	Conservator tank system	48
4.24.13	Sealed tank system	48
4.24.14	Nonsealed tank systems	48
4.25	Equipment with high voltage input or output circuits	48
4.25.1	General	48
4.25.2	Disconnecting means	49
4.25.3	Fuse access and interlocking	49
4.25.4	Installation instructions	49
4.26	External signal, control and communication circuits	49

5 Markings 50

6 Tests 58

6.1	Test conditions	58
6.1.1	General	58
6.1.2	Voltage	59
6.1.3	Frequency	59
6.1.4	Other test conditions	59
6.2	Ratings	60
6.3	Temperature (normal)	60
6.4	Leakage current	62
6.5	Dielectric strength	63
6.6	Abnormal operation	64
6.7	Overload (control devices)	66
6.8	Endurance (control devices)	67
6.9	Compression (metal enclosures)	67
6.10	Deflection (metal enclosures)	67
6.11	Flame (polymeric enclosures)	68
6.12	Resistance to impact	68

6.12.1	Polymeric enclosures	68
6.12.2	Covers over openings in enclosure	69
6.13	Conduit connections (polymeric enclosures)	70
6.13.1	General	70
6.13.2	Pullout	70
6.13.3	Torque	70
6.13.4	Bending	70
6.13.5	Knockouts	71
6.14	Flaming oil (perforated panels)	71
6.15	Printed wiring board coatings	71
6.15.1	General	71
6.15.2	Dielectric strength (new samples)	72
6.15.3	Dielectric strength (aged samples)	72
6.15.4	Dielectric strength (after humidity conditioning)	72
6.15.5	Adhesion	72
6.16	Securement of components	72
6.17	Strain relief	72
6.18	Insulating material	73
6.19	Capacitor discharge (energy and shock hazards)	73
6.20	Tank pressure test	73
6.21	Mounting bracket vertical loading test — Liquid filled equipment	73
6.22	Mounting means vertical loading test — Other than liquid filled equipment	73

7 Industrial dc PCE 74

7.1	Scope	74
7.2	Construction	74
7.3	Tests — Temperature (normal)	74

8 PCE for use in recreational vehicles 74

8.1	Scope	74
8.2	Construction	74
8.2.1	General	74
8.2.2	Supply cords	75
8.2.3	Transfer switches	75
8.2.4	Barriers	75
8.2.5	Bonding to ground	75
8.3	Marking	75
8.4	Tests	76
8.4.1	General	76
8.4.2	Rating	77
8.4.3	Output voltage	78
8.4.4	Temperature — Rated load	78
8.4.5	Temperature — Maximum continuous load	79
8.4.6	Abnormal	80
8.4.7	Vibration test	83

9 Transfer switches 84

9.1	Scope	84
9.2	Backfeed protection	84

9.3	Construction	85
9.3.1	General	85
9.3.2	Static transfer switches	85
9.4	Tests	85
9.4.1	Backfeed protection test	85
9.4.2	Load transfer test	86
9.4.3	Dielectric strength tests	86
9.5	Markings — Transfer switch transition type	86
10	Inverters	87
10.1	Scope	87
10.2	Performance characteristics	87
10.3	Construction	87
10.3.1	DC input overcurrent protection	87
10.3.2	DC injection onto the AC output	87
10.4	Marking	87
10.5	Tests	88
10.5.1	AC output voltage for stand-alone inverters	88
10.5.2	Harmonic distortion for stand-alone inverters	88
10.5.3	DC injection	90
10.5.4	Frequency	90
10.5.5	Stand-alone inverter dc output short-circuit current contribution	90
11	Telecommunication equipment PCE	90
11.1	Scope	90
11.2	Construction	90
11.2.1	Input/Output configurations	90
11.3	Markings	91
11.4	Tests — Dielectric strength	91
12	Cable TV PCE	92
12.1	Scope	92
12.2	Construction	92
12.2.1	Enclosures	92
12.2.2	Input connections	92
12.2.3	Wiring	92
12.2.4	Bonding and grounding	92
12.3	Marking	93
13	PCE for use in photovoltaic (PV) systems	93
13.1	Scope	93
13.2	General	93
13.3	Construction	94
13.3.1	Bipolar PV systems	94
13.3.2	Manual disconnecting means for PV circuits	95
13.3.3	PV input overcurrent protection	95
13.3.4	PV array ground fault detection and interruption (GFDI)	96
13.3.5	PV array system grounding	98
13.3.6	Fault indication for ground fault detection/interruption systems	99

13.4	Tests	100
13.4.1	Test conditions	100
13.4.2	DC input reverse polarity test	100
13.4.3	Array ground fault detection/interruption tests	100
13.4.4	Bipolar PCE tests	103
13.5	Markings	104
13.5.1	Product markings	104
13.5.2	Installation, operating, and servicing instructions	105
14	Interactive inverters and PCE	107
14.1	Scope	107
14.2	Construction	107
14.2.1	Output provisions	107
14.2.2	Utility disconnect functions and islanding protection	108
14.2.3	Automatic disconnecting means for non-isolated interactive inverters	109
14.3	Tests	109
14.3.1	Test conditions	109
14.3.2	Output ratings	110
14.3.3	Harmonic current distortion	110
14.3.4	Utility voltage and frequency variation test	110
14.3.5	Anti-islanding test	111
14.3.6	Loss of control circuit power	112
14.3.7	Maximum backfeed current into the PCE input circuit	112
14.3.8	Testing of automatic disconnecting means for non-isolated inverters	112
14.3.9	AC output short circuit current contribution tests	113
14.3.10	Current unbalance test	114
14.4	Markings	114
14.4.1	Product markings	114
14.4.2	Installation, operating, and servicing instructions	115
15	DC charge controllers	116
15.1	Scope	116
15.2	Construction	116
15.2.1	General	116
15.2.2	Galvanic isolation	117
15.3	Tests	117
15.3.1	Test conditions	117
15.3.2	Normal operation	118
15.3.3	Temperature compensation	118
15.3.4	Low-voltage disconnect	118
15.3.5	Input failure	119
15.3.6	Charge controller miswiring	119
15.4	Marking	119
15.4.1	Product marking	119
15.4.2	Installation instructions	120
16	Electric vehicle chargers	121
16.1	Scope	121
16.2	Construction	121

16.2.1	Frame and enclosure	121
16.2.2	Supply connections for cord-connected units	121
16.2.3	External output connections and wiring	122
16.2.4	EV bonding	122
16.2.5	Output circuit insulation for conductively coupled units	122
16.2.6	Output circuit insulation for inductively coupled units	123
16.3	Tests	123
16.3.1	Vibration test	123
16.3.2	Harmonic distortion test	124
16.4	Marking	124
16.5	Instructions	127
16.5.1	Important safety instructions	127
16.5.2	Operating instructions	127
17	PV modules with integrated power conversion equipment (PVIPCE)	127
17.1	Scope	127
17.2	Construction	128
17.2.1	General	128
17.2.2	PCE input voltage rating	129
17.2.3	Disconnecting means	129
17.2.4	PV ground fault detection/interruption	129
17.2.5	Backfeed protection	129
17.2.6	Input circuit voltage	129
17.3	Tests	129
17.3.1	PV module component tests	129
17.3.2	PCE component tests	130
17.3.3	Combined PVIPCE — Sequence of tests	131
17.3.4	Conductor deflection test	131
17.3.5	Functional test	131
17.3.6	Simplified functional test for frame mounted PCE	132
17.3.7	Accessibility test	132
17.3.8	Hot spot test	132
17.3.9	Temperature test	134
17.3.10	Temperature test procedure	134
17.3.11	Wet leakage current test	136
17.4	Marking	136
17.4.1	General	136
17.4.2	Product markings	136
17.4.3	Instruction manuals	137
18	Inverters for use in vehicles	138
18.1	Scope	138
18.2	Construction	138
18.3	Markings	141
18.4	Tests	142
19	PCE for use in marine applications	143
19.1	Scope	143
19.2	Construction	143

19.2.1	General	143
19.2.2	Frame and enclosure	144
19.2.3	Input and output wiring connections	144
19.2.4	Ignition protection	144
19.2.5	Receptacles	145
19.2.6	Arcing parts	145
19.2.7	Vibration and shock	145
19.3	Marking	145
19.4	Installation and operating instructions	146
19.5	Tests	146
19.5.1	Vibration	146
19.5.2	Shock	147
19.5.3	Ignition protection	147

Annex A (informative)	— Factory (production line) dielectric strength tests	171
Annex B (informative)	— Factory (production line) interactive inverter utility voltage and frequency variation tests	173
Annex C (normative)	— Marking translations	175

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Preface

This is the fourth edition of CSA C22.2 No. 107.1, *Power conversion equipment*, one of a series of Standards issued by CSA Group under Part II of the *Canadian Electrical Code*. It supersedes the previous editions published in 2001, 1995, and 1991, under the title *General Use Power Supplies*.

This edition has been extensively rewritten to accommodate new technologies. The changes include

- a) increasing the scope of this Standard to 1500 V;
- b) modification of definitions;
- c) addition of requirements for high voltage equipment;
- d) addition of reference to CSA C22.2 No. 0.2 as an alternative approach for electrical spacings;
- e) updating the requirements for PV power conversion equipment, including new requirements for ground fault protection for grounded and floating arrays, equipment for bipolar systems, ac modules, and reference to CSA C22.2 No. 290 for combiners and recombiners;
- f) expansion and clarification of requirements for grid-tied inverters including requirements for non-isolated inverters, short circuit contribution, current unbalance, and alignment with IEEE 1547.1 by incorporation of TIL-43;
- g) revision of requirements for supplemental protectors for branch circuits;
- h) revision and updating of requirements for automatic and static transfer switches;
- i) incorporation of requirements for power conversion equipment for marine applications in line with those in CAN/CSA-C22.2 No. 107.2;
- j) removal of the section on uninterruptable ac power supplies (as this is now covered under CSA C22.2 No.107.3);
- k) incorporation of CSA TIL-35 and TIL-43;
- l) updating of reference standards together with their specific references and correction of minor editorial issues; and
- m) for product markings, replacement of the flag word “Caution” with “Warning” to align with CAN/CSA-C22.2 No. 0.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was prepared by the Subcommittee on General Use Power Supplies, under the jurisdiction of the Technical Committee on Industrial Products and the Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the Technical Committee.

Interpretations: The Strategic Steering Committee on Requirements for Electrical Safety has provided the following direction for the interpretation of standards under its jurisdiction: “The literal text shall be used in judging compliance of products with the safety requirements of this Standard. When the literal text cannot be applied to the product, such as for new materials or construction, and when a relevant CSA committee interpretation has not already been published, CSA Group’s procedures for interpretation shall be followed to determine the intended safety principle.”

Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
- 2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
- 3) *This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*

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 - rationale for the change.

C22.2 No. 107.1-16

Power conversion equipment

1 Scope

1.1

This Standard applies to ac and dc type power conversion equipment (PCE) that

- a) is of dry or liquid-filled construction;
- b) has a rated voltage not exceeding 1500 V; and
- c) is for commercial, industrial, and residential indoor and outdoor use in nonhazardous locations in accordance with the Rules of the *Canadian Electrical Code, Part I*.

1.2

Clauses 1 to 6 are general, and apply, unless otherwise noted, to all PCE.

Clauses 7 to 19 are specific to particular applications or types of PCE, apply to PCE or portions of PCE that include the aspects within the scope of the specific Clause, and supplement or amend the applicable requirements in all other Clauses.

1.3

This Standard does not apply to

- a) automotive and nonautomotive chargers as covered by CAN/CSA-C22.2 No. 107.2;
- b) power supplies intended to supply extra-low-voltage for the operation of household electronic equipment, telecommunication equipment, and motor-operated equipment as covered by CSA C22.2 No. 223;
- c) “built-in” component type power supplies forming an integral part of end use equipment such as telecommunication equipment, electronic data processing equipment, and office machines as covered by CAN/CSA-C22.2 No. 60950-1;
- d) rotating type generators or converters;
- e) uninterruptible ac power supplies (UPS) as covered by CSA C22.2 No. 107.3; and
- f) non-photovoltaic motor drives as covered by CSA C22.2 No. 14.

1.4

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the Standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.