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**C22.2 No. 107.1-16**

# **Power conversion equipment**

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***Power conversion equipment***



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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 uninterruptible 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.”

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- 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.*
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  - relevant clause, table, and/or figure number;
  - wording of the proposed change; and
  - 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.