



**CSA
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C22.2 No. 165-17

Electric boilers

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Preface

This is the second edition of CSA C22.2 No. 165, *Electric boilers*, one of a series of Standards issued by CSA Group under Part II of the *Canadian Electrical Code*. This edition supersedes the first edition published in 1992.

This Standard applies to stationary hot-water and steam boilers for residential, commercial, and industrial use that utilize metal-sheathed immersion-type heater elements and are intended for permanent connection to the source of supply. It does not apply to electrode-type boilers.

The changes to this edition are as follows:

- a) reference documents updated;
- b) requirements modified for plated and unplated parts;
- c) references to transformer standards updated;
- d) references to IEC-based standards added; and
- e) Table 8 updated and reformatted.

This Standard sets minimum requirements that are not intended to conflict with or supersede the requirements of CSA B51 or other applicable standards for boilers that fall under the provisions of the *Boilers and Pressure Vessels Act* of the provinces or territories of Canada.

For general information on the standards of the Committee on *Canadian Electrical Code, Part II*, see the Preface of CAN/CSA-C22.2, No. 0, *General Requirements — Canadian Electrical Code, Part II*.

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

This Standard was prepared by the Subcommittee on Electric Boilers, 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.
- 4) To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include “Request for interpretation” in the subject line:
 - a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
 - b) provide an explanation of circumstances surrounding the actual field condition; and
 - c) where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at standardsactivities.csa.ca.

- 5) *This Standard is subject to review within five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include "Proposal for change" in the subject line:*
- a) *Standard designation (number);*
 - b) *relevant clause, table, and/or figure number;*
 - c) *wording of the proposed change; and*
 - d) *rationale for the change.*

C22.2 No. 165-17

Electric boilers

1 Scope

1.1

This Standard applies to stationary, permanently connected, hot-water and steam boilers for use with nominal system voltages of 600 V and less, for residential, commercial, and industrial use in nonhazardous locations in accordance with the Rules of the *Canadian Electrical Code, Part I*.

1.2

This Standard applies to boilers utilizing metal-sheathed-type heater elements.

1.3

This Standard does not apply to

- a) storage-type water heaters as covered in CAN/CSA-C22.2 No. 110;
- b) swimming pool and spa hot-water heaters;
- c) electrode-type boilers;
- d) industrial heating equipment covered in CSA C22.2 No. 88; or
- e) electric heating equipment for medical and dental use.

1.4

This Standard sets minimum requirements. It is not intended that the requirements of this Standard conflict with or supersede the requirements of CSA B51 or any other applicable standard for boilers that fall under the provisions of the *Boilers and Pressure Vessels Act* of the provinces or territories of Canada.

1.5

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.

2 Reference publications

This Standard refers to the following publications, and such reference is made, it shall be the edition below, including all amendments published thereto.

CSA Group

B51-14

Boiler, Pressure Vessel, and Pressure Piping Code

C22.1-15

Canadian Electrical Code, Part I

CAN/CSA-C22.2 No. 0-10 (R2015)

General requirements — Canadian Electrical Code, Part II

C22.2 No. 0.4-04 (R2013)

Bonding of electrical equipment

C22.2 No. 0.5-16

Threaded conduit entries

C22.2 No. 0.8-12 (R2016)

Safety functions incorporating electronic technology

C22.2 No. 0.12-M1985 (R2016)

Wiring space and wire bending space in enclosures for equipment rated 750 V or less

CAN/CSA-C22.2 No. 14-13

Industrial control equipment

C22.2 No. 24-15

Temperature-indicating and -regulating equipment

C22.2 No. 55-15

Special use switches

C22.2 No. 66.2-06 (R2015)

Low voltage transformers — Part 2: General purpose transformers

C22.2 No. 66.3-06 (R2015)

Low voltage transformers — Part 3: Class 2 and Class 3 transformers

C22.2 No. 72-10 (R2014)

Heater elements

C22.2 No. 77-14

Motors with inherent overheating protection

C22.2 No. 88-1958 (R2013)

Construction and test of industrial heating equipment

C22.2 No. 100-14

Motors and generators