C748-13

Performance of direct-expansion (DX) ground-source heat pumps

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Preface

This is the second edition of CSA C748, *Performance of direct-expansion (DX) ground-source heat pumps*. It supersedes the previous edition published in 1994.

The new edition of this Standard has been completely revised since the previous edition. This edition incorporates test methods used in CAN/CSA-C13256-1 and CAN/CSA-C13256-2, which have been adapted for the purposes of C748. The new edition incorporates changes to improve ease of use and include changes that reflect current industry practices.

Changes introduced in this edition include the following:

(a) A summary of the symbols used in this Standard;
(b) Part 1 and Part 2 address DX-to-air and water separately, with both including requirements for rating, performance, testing, marking, installation, and publication of ratings;
(c) The reference publications have been updated to reflect references to ISO standards;
(d) New definitons have been added since the previous edition; and
(e) New annexes related to test procedures, indoor/outdoor test methods, and instrumentation and measurements have also been added.

CSA Group gratefully acknowledges the financial assistance provided by Natural Resources Canada, the Ontario Ministry of Energy, the Canadian Electricity Association, B.C. Hydro, and Manitoba Hydro in the development of this Standard.

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 Earth Energy Systems, under the jurisdiction of the Technical Committee on Heating, Ventilation, Air Conditioning and Refrigeration and the Strategic Steering Committee on Performance, Energy Efficiency, and Renewables, and has been formally approved by the Technical Committee.

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 periodic review, and 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.

C748-13, Part 1

Testing and rating for performance — Part 1: DX-to-air heat pumps

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C748-13, Part 1
Testing and rating for performance — Part 1: DX-to-air heat pumps

1 Scope

1.1
Part 1 of this Standard covers heating and cooling systems that are generally referred to as "direct-expansion-to-air heat pumps" ("DX-to-air heat pumps"). These systems generally include an indoor coil with air-moving means, a compressor, and a refrigerant-to-earth heat exchanger. A system may provide both heating and cooling, cooling-only, or heating-only functions.

1.2
Part 1 of this Standard establishes performance testing and rating criteria for factory-made, electrically-driven, mechanical-compression type, DX-to-air heat pumps for residential, commercial and industrial use. The requirements for testing and rating contained in Part 1 of this Standard are based on the use of matched assemblies.

1.3
Part 1 of this Standard does not apply to the testing and rating of individual assemblies for separate use, nor to the testing and rating of heat pumps covered in ISO 5151 or ISO 13253..
Note: *In this Standard, the terms "equipment" or "heat pumps" may be used to mean "DX-to-air heat pumps".*

1.4
The values given in SI units are the units of record for the purposes of this Standard. The values given in parentheses are for information and comparison only.

1.5
In CSA Standards, "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; "may" is used to express an option or that which is permissible within the limits of the standard; and "can" is used to express possibility or capability.

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 where such reference is made, it shall be to the edition listed below, including all amendments published hereto.

ISO (International Organization for Standardization)
817:2005
Refrigerants — Designation system