



ANSI Z83.8-2016 • CSA 2.6-2016
(reaffirmed 2021)

Gas unit heaters, gas packaged heaters, gas utility heaters, and gas-fired duct furnaces



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ANSI Z83.8-2016 • CSA 2.6-2016, Gas unit heaters, gas packaged heaters, gas utility heaters, and gas-fired duct furnaces

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IGAC

Interprovincial Gas Advisory Council



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Preface

This is the sixth edition of ANSI Z83.8 • CSA 2.6, Gas unit heaters, gas packaged heaters, gas utility heaters, and gas-fired duct furnaces. It supersedes the previous editions published in 2013, 2009, 2006, 2002, and 1996.

This Standard was prepared by the Z83/CSA Joint Technical Advisory Group on Standards for Gas-Fired Heavy Duty Forced Air Heaters under the jurisdiction of the Technical Committee on Gas Appliances and Related Accessories, the Z21/83 Technical Committee on Performance and Installation of Gas Burning Appliances and Related Accessories, and the Strategic Steering Committee on Standards for Fuel Burning Appliances, and had been formally approved by the Technical Committee(s), American National Standards Institute, and the Interprovincial Gas Advisory Council.

Interpretations: The Strategic Steering Committee on Standards for Fuel Burning Appliances 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 of construction, and when a relevant 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) This Standard contains SI (Metric) units corresponding to the yard/pound quantities, the purpose being to allow the standard to be used in SI (Metric) units. (IEEE/ASTM SI 100 American National Standard for Metric Practice, or ISO 80000-1:2009, Quantities and units – Part 1: General, is used as a guide in making metric conversion from yard/pound quantities.) If a value for a measurement and a corresponding value in other units are stated, the first stated value is to be regarded as the requirement. The given corresponding value may be approximate. If a value for a measurement and a corresponding value in other units are both specified as a quoted marking requirement, the first stated unit, or both, are to be provided.
- 3) 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.
- 4) This publication 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 and yet not be in full agreement with all clauses of this publication.
- 5) This Standard is subject to review at least every five years; 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
- 6) 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.

History of Development of the ANSI Z83.8-2016 • CSA 2.6-2016

Note: *This history is informative and is not part of the standard.*

With the onset of the Free Trade Agreement between the United States and Canada on January 2, 1988, significant attention was given to the harmonization of the United States and Canadian safety standards addressing gas-fired equipment for residential, commercial, and industrial equipment.

It was believed that the elimination of the differences between the standards would remove potential trade barriers and provide an atmosphere in which North American manufacturers could market more freely in the United States and Canada.

A Z83/CGA joint Subcommittee on Standards for Heavy Duty Heaters was then established, based on memberships of the Z83 subcommittee for Gas-Fired Heavy Duty Forced Air Heaters, and the CGA committees for Unit Heaters/Duct Furnaces, Make-up Air Heaters, and Door Heaters.

Membership on the joint heavy duty heaters subcommittee encompasses representatives from the U.S. and Canadian manufacturing industry, gas suppliers (natural and LP), regulatory authorities, and general interest.

To facilitate the reporting structure of joint subcommittees, a CGA Standards Steering Committee on Gas Burning Appliances and Related Accessories was established to parallel Accredited Standards Committees Z21 and Z83.

The first meeting of the Z83/CGA joint heavy duty heaters subcommittee was held on July 14-16, 1992 in Toronto.

During the standards development process, a total of four drafts were circulated for public review.

The fourth draft of the proposed harmonized standard was issued for public review in March 1994. All comments relating to the fourth draft were duly considered by the joint heavy duty heaters subcommittee at its meeting of June 21-22, 1994. The resulting fifth draft of the proposed harmonized standard (fourth draft as revised at the June 21-22, 1994 subcommittee meeting) was submitted for approval by the Z83 Committee and the CGA Steering Committee.

The first edition of the harmonized Z83/CGA standard for Unit Heaters and Gas-Fired Duct Furnaces was approved by the Interprovincial Gas Advisory Council on June 7, 1996, and by the American National Standards Institute, Inc. on August 19, 1996.

The second edition of the harmonized Z83/CGA Standard for Gas Unit Heaters and Gas-Fired Duct Furnaces was approved by the Interprovincial Gas Advisory Council on February 8, 2002 and by the American National Standards Institute, Inc., on April 24, 2002.

The third edition was approved by the Interprovincial Gas Advisory Council on January 13, 2006 and by the American National Standards Institute, Inc. on October 7, 2005.

With the fourth edition, the title of the Standard for Gas Unit Heater and Gas-Fired Duct Furnace was changed. The American National Standard/CSA Standard for Gas Unit Heaters, Gas Packaged Heaters, Gas Utility Heaters, or Gas-Fired Duct Furnaces was approved by the International Gas Advisory Council on December 29, 2008, and by the American National Standards Institute on December 15, 2009.

The fifth edition was approved by the International Gas Advisory Council on February 5, 2013, and by the American National Standards Institute on February 22, 2013.

The sixth edition was approved by the International Gas Advisory Council on December 4, 2015 and by the American National Standards Institute on December 11, 2015.

The previous editions of the gas unit heaters and gas unit heaters, gas packaged heaters, gas utility heaters and gas-fired duct furnaces, and addenda thereto, approved by the Interprovincial Gas Advisory Council and American National Standards Institute, Inc. are as follows:

ANSI Z83.8-1996 (R2001) • CGA 2.6-M96
ANSI Z83.8a-1998 (R2001) • CGA 2.6a-M98
ANSI Z83.8b-2000 (R2001) • CGA 2.6b-2000

ANSI Z83.8-2002 • CSA 2.6-2002
ANSI Z83.8a-2003 • CSA 2.6a-2003
ANSI Z83.8b-2004 • CSA 2.6b-2004

ANSI Z83.8-2006 • CSA 2.6-2006
ANSI Z83.8a-2009 • CSA 2.6a-2009

ANSI Z83.8-2009 • CSA 2.6-2009

ANSI Z83.8-2013 • CSA 2.6-2013

The following identifies the designation and year of this edition of the standard:

ANSI Z83.8-2016 • CSA 2.6-2016

Note: *This edition of ANSI Z83.8 • CSA 2.6 incorporates changes to the 2013 edition. Changes, other than editorial, are denoted by a delta symbol in the margin.*

ANSI Z83.8-2016 • CSA 2.6-2016

Gas unit heaters, gas packaged heaters, gas utility heaters, and gas-fired duct furnaces

1 Scope

1.1

This Standard applies to newly produced gas fired-duct furnaces, packaged heaters, and unit heaters with input rates up to and including 10,000,000 Btu/h (2 931 kW) and utility heaters with inputs up to and including 400,000 Btu/hr (117.2 kW) constructed entirely of new, unused parts and materials:

- a) for use with natural gas with inlet gas pressures up to and including 5.0 psi (34.5 kPa); unit heaters, packaged heaters, and duct furnace with burners having inputs rates over 400,000 Btu/hr (117 228 kW) may have higher inlet pressures;
- b) for use with liquefied petroleum gases; and
- c) convertible for use with natural gas and liquefied petroleum gases, when provision is made for the conversion from one gas to the other.

1.2

The term “appliance”, when used herein, applies to gas-fired duct furnaces, packaged heaters, utility heaters, and unit heaters. Duct furnaces, unit heaters, and package heaters may be factory-built as a single unit or as a package system intended to be disassembled for shipping and reassembled for installation and may be combined with a cooling unit. (See Clause [3](#)).

1.3

Duct furnaces, unit heaters, and packaged heaters may be factory-built as a single unit or as a package system intended to be disassembled for shipping and reassembled for installation, and may be combined with a cooling unit. (See Clause [3](#)).

1.4

The construction of appliances for use with the above-mentioned gases is covered under Clause [4](#).

1.5

The performance of appliances for use with the above-mentioned gases is covered under Clause [5](#).

1.6

This Standard applies to Category I, Category II, Category III, and Category IV Appliances. (See Clause [3](#)).

1.7

This Standard covers self-contained, automatically controlled, vented unit heaters, packaged heaters, utility heaters, and duct furnaces. These appliances are intended for installation in locations where flammable gases or vapors are not generally present.

Unit heaters, packaged heaters, and utility heaters have an integral means for circulation of air. Unit heaters, unless for outdoor installation are intended for installation in the space being heated. Unit heaters may be either suspended or floor-mounted and of either the low- or high-static pressure type as defined in Clause 3. Utility heaters may be suspended or floor-mounted and of the low static type as defined in Clause 3. Packaged heaters may be either suspended, floor-mounted, or roof mounted and may be located within or external to the heated space as defined in Clause 3.

These appliances are suitable for use in aircraft hangars, parking structures, and repair garages when marked and installed, as applicable, in accordance with:

- a) Standard on Aircraft Hangars, ANSI/NFPA 409;
- b) Standard for Parking Structures, ANSI/NFPA 88A;
- c) Standard for Repair Garages, ANSI/NFPA 88B; and
- d) Installation Code for Natural Gas and Propane Installation Code, CSA B149.1.

1.8

This Standard also applies to appliances with draft hoods which are factory equipped with automatic vent damper devices (see Clause 3), hereinafter referred to as vent damper devices.

1.9

A separated combustion system appliance anticipated by this Standard is essentially a balanced flue appliance with the air intake and vent outlet in close proximity. Other designs are subject to such additional tests as believed necessary at the discretion of the testing agency.

1.10

Clause 2 contains a list of standards specifically referenced in this Standard, and sources from which these referenced standards may be obtained.

1.11

If a value for measurement as given in this Standard is followed by an equivalent value in other units, the first stated value is to be regarded as the specification. (See Annex M for Temperature Scales and Conversions).

1.12

Special construction provisions applicable to an appliance designed for use with an optional listed gas conversion kit are outlined under Annex C.

1.13

This Standard also applies to newly produced automatic intermittent-pilot ignition systems (see Clause 3), constructed entirely of new, unused parts and materials, to be adapted in the field to a unit heater or duct furnace equipped with an existing continuous pilot burner and which has been examined and tested for compliance with this Standard when installed on the appliance. (See Annex D).

1.14

All references to psi (kPa) throughout this Standard are to be considered “gauge” pressures unless otherwise specified.