ANSI Z21.10.3-2017 • CSA 4.3-2017

Gas-fired water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous

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ANSI Z21.10.3-2017 • CSA 4.3-2017, Gas-fired water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous

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Clause E.2	ΔΔ

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Preface

This is the eighth edition of ANSI Z21.10.3 • CSA 4.3, *Gas-fired water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*. It supercedes the previous editions published in 2015, 2014, 2013, 2011, 2004, 2001, and 1998.

This Standard was prepared by the Z21/CSA Joint Technical Advisory Group on Standards for Gas-Fired Water 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.

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History of the development of ANSI Z21.10.3 • CSA 4.3

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 applications. 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. The harmonization of these standards was also seen as a step toward harmonization with international standards. Joint subcommittees were established to facilitate the standards harmonization process between the United States and Canada.

The draft harmonized standard was based on current coverage from the American National Standard for Gas Water Heaters, Volume III, Storage Water Heaters, with Input Rating above 75,000 Btu Per Hour, Circulating and Instantaneous, ANSI Z21.10.3-1993 and Addenda Z21.10.3a-1994, Z21.10.3b-1994, Z21.10.3c-1996 and the Canadian Standard for Circulating Tank, and Instantaneous and Large Automatic Storage Type Gas Water Heaters, CAN1-4.3-M85. The draft was subsequently issued for public review and comment during April 1996.

Following reconsideration and modification of the proposed draft standard, in light of comments received, the joint water heater subcommittee, at its July 24-25, 1996 meeting, recommended the proposed draft to the Z21 Committee and the CGA Standards Steering Committee for approval.

The proposed draft of the harmonized standard for gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous, as modified by the joint subcommittee at its meeting of July 24-25, 1996, was approved by the Z21/83 Committee by at its April 17, 1997 meeting and by the CGA Standards Steering Committee on May 6, 1997.

The first edition of the harmonized Z21/CSA Standard for Gas water heaters, volume III, storage water heaters, with input rating above 75,000 Btu per hour, circulating and instantaneous, was approved by the Canadian Interprovincial Gas Advisory Council on September 10, 1997 and by the American National Standards Institute Inc. on March 19, 1998.

The second edition of the harmonized Z21/CSA Standard for Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, instantaneous and circulating, was approved by the Canadian Interprovincial Gas Advisory Council on August 1, 2001 and by the American National Standards Institute, Inc. on December 20, 2001.

The third edition of the harmonized Z21/CSA Standard for Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous, was approved by the Canadian Interprovincial Gas Advisory Council on September 7, 2004 and by the American National Standards Institute, Inc. on July 2, 2004.

The fourth edition of the harmonized Z21/CSA Standard for Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous, was approved by the Canadian Interprovincial Gas Advisory Council on September 7, 2004 and by the American National Standards Institute, Inc. on July 2, 2004.

The fifth edition of the harmonized Z21/CSA Standard for Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous, was approved by the Canadian Interprovincial Gas Advisory Council on March 25, 2013 and by the American National Standards Institute, Inc. on February 25, 2013.

The sixth edition of the harmonized Z21/CSA Standard for Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous, was approved by the Canadian Interprovincial Gas Advisory Council on August 7, 2014 and by the American National Standards Institute, Inc. on July 2, 2014.

The seventh edition of the harmonized Z21/CSA Standard for Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous, was approved by the Canadian Interprovincial Gas Advisory Council on August 7, 2015 and by the American National Standards Institute, Inc. on October 5, 2015.

This, the eighth edition of the harmonized Z21/CSA Standard for Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous, was approved by the Canadian Interprovincial Gas Advisory Council on August 18, 2017 and by the American National Standards Institute, Inc. on August 21, 2017.

The previous editions of the Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, instantaneous and circulating, and addenda thereto, approved by the Interprovincial Gas Advisory Council and American National Standards Institute, Inc. are as follows:

Z21.10.3-1998 • CSA 4.3-M98
Z21.10.3a-2000 • CSA 4.3a-M00
Z21.10.3b-2000 • CSA 4.3b-2000

Z21.10.3-2001 • CSA 4.3-2001
Z21.10.3a-2003 • CSA 4.3a-2003
Z21.10.3b-2004 • CSA 4.3b-2004

ANSI Z21.10.3-2004 • CSA 4.3-2004
ANSI Z21.10.3a-2007 • CSA 4.3a-2007
ANSI Z21.10.3b-2008 • CSA 4.3b-2008

Z21.10.3-2011 • CSA 4.3-2011

Z21.10.3-2013 • CSA 4.3-2013

Z21.10.3-2014 • CSA 4.3-2014

Z21.10.3-2015 • CSA 4.3-2015

The following identifies the designation and year of the seventh edition of the Standard:

Z21.10.3-2017 • CSA 4.3-2017

Note: *This, the 2015 edition of ANSI Z21.10.3 • CSA 4.3, incorporates changes to the 2015 edition. Changes, other than editorial, are denoted by a delta in the margin.*

ANSI Z21.10.3-2017 • CSA 4.3-2017
Gas-fired water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous

1 Scope

1.1

This Standard applies to newly produced, large automatic storage water heaters having input ratings above 75,000 Btu/hr (21 980 W), instantaneous water heaters, circulating water heaters including booster water heaters (see Clause 3, Definitions), hereinafter referred to as water heaters or appliances, constructed entirely of new, unused parts and materials:

a) for use with natural gas;
b) for use with manufactured gas;
c) for use with mixed gas;
d) for use with liquefied petroleum gases;
e) for use with LP gas-air mixtures;
f) for recreational vehicle installation for use with liquefied petroleum gases only (see Clause 4.1.27);
g) for manufactured home (mobile home) installation convertible for use with natural gas and liquefied petroleum gases when provision is made for the simple conversion from one gas to the other (see Clause 4.1.26);
h) for recreational vehicle installation convertible for use with natural gas and liquefied petroleum gases when provision is made for the simple conversion from one gas to the other (see Clause 4.1.27); and
i) for use with combination potable water/space heating applications (see Clauses 3, Definitions, and 4.1.30).

Automatic storage water heaters having input ratings of 75,000 Btu/hr (21 980 W) or less are covered in Volume I.

1.2

Instantaneous water heaters with input ratings of 200,000 Btu/h (58 614 W) or less, which are designed to deliver water at a controlled temperature of less than 180 °F (82 °C), are subject to Federal minimum efficiency requirements for residential water heaters or covered in Clause 8, Items unique to Canada, are exempt from recovery, thermal efficiencies and standby loss, and related markings required by this Standard.

1.3

Direct vent water heaters anticipated by this Standard are essentially balanced flue appliances with the air intake and vent outlet in close proximity. Other designs are to be subjected to such additional tests as believed necessary at the discretion of the testing agency.

1.4
Water heaters for installation in recreational vehicles are to be of the direct vent type.

1.5
This Standard also applies to water heaters with draft hoods which are factory equipped with automatic vent damper devices (see Clause 3, Definitions), hereinafter referred to as vent damper devices.

1.6
This Standard also applies to water heaters of other than the direct vent type which are factory equipped with electrically operated or mechanically actuated automatic flue damper devices (see Clause 3, Definitions), hereinafter referred to as flue damper devices.

1.7
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, except as noted in Clauses 4.30.2 and 4.31.2.

1.8
All references to “psi” throughout this Standard are to be considered gauge pressures unless otherwise specified.

1.9
Clause 7 contains provisions that are unique to the United States.

1.10
Clause 8 contains provisions that are unique to Canada.

1.11
Special construction provisions applicable to a water heater designed for use with an optional listed conversion kit are outlined under Annex D, Optional provisions for listed gas appliance conversion kits.

1.12
Clause 2, Reference publications, contains a list of standards specifically referenced in this Standard, and sources from which these reference standards may be obtained.

1.13
In this Standard, “shall” is used to express a requirement, i.e., a provision that the user shall 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.