ANSI Z21.93-2017 • CSA 6.30-2017

CSA Group

Excess flow valves for natural gas and propane gas with pressures up to 5 psig

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Revision History

ANSI Z21.93-2017 • CSA 6.30-2017, Excess flow valves for natural gas and propane gas with pressures up to 5 psig

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ANSI Z21.93-2017 • CSA 6.30-2017

Excess flow valves for natural gas and propane gas with pressures up to 5 psig

American National Standards Institute, Inc.

International Gas Advisory Council

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Preface

This is the second edition of ANSI Z21.93 • CSA 6.30, *Excess flow valves for natural gas and propane gas with pressures up to 5 psig*. It supersedes the previous edition published in 2013.

This Standard was prepared by the Z21/CSA Joint Technical Subcommittee on Standards for Manual Valves, under the jurisdiction of the CSA and Z21/83 Technical Committees on the Performance and Installation of Gas Burning Appliances and Related Accessories and the Strategic Steering Committee on Standards for Gas Appliances and Related Accessories, and 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 Gas Appliances and Related Accessories 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 committee interpretation has not already been published, CSA'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.*

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c) *wording of the proposed change; and*
d) *rationale for the change.*

History of development of ANSI Z21.93 • CSA 6.30

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

CSA America, Inc. assumed responsibilities for the CSA Requirements / A.G.A. Requirements to create a managed system, and where appropriate, develop a national standard. The first draft harmonized standard for excess flow valves was based on the A.G.A. Requirement for Excess Flow Valves, No. 3-92. The draft document was prepared by the Z21/CSA Joint Technical Advisory Group (TAG) on Standards for Manually Operated Gas Valves in 2003.

The proposed draft standard for excess flow valves for natural and LP gas with pressures up to 5 psig was distributed for review and comment during 2007. Following reconsideration and modification of the proposed standard, based on comments received, the Z21/CSA Joint Manually Operated Gas Valves TAG, at its June 26, 2012 meeting, recommended the proposed standard to the Z21/83 Committee and the CSA Technical Committee for approval.

The proposed harmonized standard for excess flow valves for natural and LP gas with pressures up to 5 psig was approved by the Z21/83 Committee on September 12, 2012. The CSA Technical Committee approved the proposed harmonized standard on November 19, 2012.

The first edition of the harmonized standard was approved by the Canadian Interprovincial Gas Advisory Council on December 21, 2012, and by the American National Standards Institute Inc. on February 19, 2013.

The second edition of the harmonized standard was approved by the Canadian Interprovincial Gas Advisory Council on April 11, 2017 and by the American National Standards Institute, Inc. on April 21, 2017.

The following identifies the designation and year of the harmonized standard:

ANSI Z21.93-2017 • CSA 6.30-2017

ANSI Z21.93-2017 • CSA 6.30-2017
Excess flow valves for natural gas and propane gas with pressures up to 5 psig

1 Scope

1.1
This Standard applies to excess flow valves constructed entirely of new unused parts and materials intended for use after the service meter or second stage regulator (see Clause 3, Definitions), hereinafter referred to as valves, not to exceed 2 in (50 DN) nominal pipe size.

1.2
Valves covered by this Standard automatically limits the downstream flow of gas in the event that the flow reaches the valve's trip flow.

1.3
This Standard applies to valves for use with natural, manufactured and mixed gases, propane gas, and LP gas-air mixtures at pressures not to exceed 5 psi (35 kPa).

1.4
Valves are to have a minimum operating pressure of no greater than 5 in wc (1.24 kPa).

1.5
Valves are to be capable of operation within an ambient temperature range of -20°F to 150°F (-29 °C to 66 °C). Valves also are to be capable of operation at temperatures outside this specified range when so specified by the manufacturer.

1.6
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.

1.7
All references to pressure throughout this Standard are to be considered gauge pressures, unless otherwise specified.

1.8
This Standard contains SI (Metric) corresponding to the yard/pound quantities, the purpose being to allow the standard to be used in SI (Metric) units. (Standard for use of the International System of Units (SI): The Modern Metric System, IEEE/ASTM SI 10 or ISO 80000-1:2009 Quantities and units– Part 1: General are 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 shall be provided.

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 thereto.

CSA Group

CSA B149.1-10 (R2015)
International fuel gas code

CSA C22.2 No. 0.15-15
Standard for adhesive labels

American Society of Mechanical Engineers (ASME)

ASME B.1-2003
Unified inch screw threads (UN and UNR thread form)

ASME B1.20.1 NPT-2013
Standard for pipe threads, general purpose (Inch)

ASME B1.20.3 NPTF-1976
Standard for dryseal pipe threads (Inch)

American Society for Testing and Materials (ASTM)

B117-11
Standard practice for operating salt spray (fog) apparatus

B858-06 (2012)
Test method for ammonia vapor test for determination susceptibility to stress corrosion cracking in copper alloys

D471-12a
Standard test method for rubber property effect of liquids

International Association of Plumbing and Mechanical Officials (IAPMO)

Uniform plumbing code — 2015

International Organization for Standardization (ISO)

ISO 68:1998
Standard for ISO general purpose screw threads-basic profile

ISO 261:1998
Standard for ISO general purpose metric screw threads-general plan

ISO 1817:2015
Rubber, vulcanized-determination of the effects of liquids

National Fire Protection Association (NFPA)

NFPA 54-2015
Natural gas and propane installation code

Society of Automotive Engineers (SAE)
SAE J512-1997
Standard for automotive tube fittings

SAE J513-1999
Standard for refrigeration tube fittings-general specifications

Underwriters Laboratories (UL)
UL 969-1995
Marking and labeling systems

3 Definitions

The following definitions shall apply in this Standard:

Body — The principal structure of a device that contains and supports an actuating mechanism and constitutes the main gas passage.

BTU — Abbreviation for British Thermal Unit. The quantity of heat required to raise the temperature of 1 pound of water 1°F.

Excess flow valve, (EFV) — A device installed in a fuel gas piping system to automatically trip when the rate of passage of fuel gas through the device exceeds a predetermined level (trip flow).

Excess flow valve bypass, (EFVB) — An excess flow valve designed to limit the flow of fuel gas after trip of the excess flow valve to a predetermined level and to reset automatically after the pressure is equalized across the valve.

Excess flow valve non-bypass, (EFVNB) — An excess flow valve designed to stop the flow of fuel gas after trip of the excess flow valve and to be reset manually.

Bypass flow — An internal rate of passage of fuel gas through an bypass excess flow valve after trip of the bypass excess flow valve, which will allow upstream and downstream pressure to equalize across the device to automatically reset to the open position.

Liquefied petroleum gases — The terms "Liquefied Petroleum Gases," "LPG" and "LP-Gas" as used in this standard means and includes any material that is composed predominantly of any of the following hydrocarbons, or mixtures of them; propane, propylene, butanes (normal butanes or isobutane), and butylenes.

Maximum flow capacity — The highest rate of passage of fuel gas through an excess flow valve specified by the manufacturer that allows for normal operation of the appliance(s) the excess flow valve serves. This shall not be more than 90 percent of rated trip flow.

Orifice — The opening in a cap, spud, or other device whereby the flow of gas is limited and through which the gas is discharged to the burner.

Rated trip flow — The minimum trip value as specified by the manufacturer that will cause the excess flow valve to stop of limit the flow of fuel gas.

Reset — Changing the position of an excess flow valve from a closed to an open position.

Specific gravity — As applied to gas, specific gravity is the ratio of the weight of a given volume to that of the same volume of air, both measured under the same conditions.

Tools, special — Tools not available on the open retail market.

Trip — Activation of the mechanism of an excess flow valve to stop or limit the flow of fuel gas.

Trip flow — The rate of passage of fuel gas through an excess flow valve that will cause an excess flow valve to stop or limit the flow of fuel gas.

Valve — (See Excess flow valve)

4 Construction

4.1 General

4.1.1
The construction of parts not covered by this Standard shall be in accordance with reasonable concepts of safety, substantiality and durability. All specifications as to construction set forth herein may be satisfied by the construction actually prescribed or such other construction as will provide at least equivalent performance.

4.1.2
Materials, assembly, workmanship and design should be of a good quality with parts well fitted.

4.1.3
The mechanisms of valves shall be protected by substantial housing so as to prevent interference with the safe operation of the devices.

4.1.4
Pins, stems or other linkages passing through the valve body or housing shall be sealed to provide gas tight construction.

4.1.5
Valves shall be constructed to discourage disassembly in the field. Construction that requires the use of a special tool for disassembly is considered to meet this provision.

4.1.6
Moving parts shall be protected against abrasion and shall be guided or arranged to minimize binding, buckling or other interference with their free movement.

4.2 Equipment and data to be furnished by the manufacturer
The manufacturer shall furnish the following equipment and data to the testing agency:

a) Representative valves, as specified by the testing agency;
b) Drawings, blueprints, photographs which describe each model valve as specified by the testing agency;
c) Minimum and maximum operating pressure (in appropriate units, inches of water, pounds per square inch, and metric equivalents);