ASME CSD-1–2006

(Revision of ASME CSD-1–2004)

Controls and Safety Devices for Automatically Fired Boilers

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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The American Society of Mechanical Engineers
Three Park Avenue • New York, NY 10016

Date of Issuance: December 29, 2006

The next edition of this Standard is scheduled for publication in 2008. There will be no addenda issued to this edition.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Interpretations are published on the ASME Web site under the Committee Pages at http://cstools.asme.org as they are issued.

The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

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FOREWORD

(06)

The major perils in operating automatically fired boilers are loss of water (low water), furnace explosion, overpressure, and overtemperature. Principal causes of accidents to automatically fired boilers are lack of proper controls and safety devices, lack of adequate maintenance, improperly trained operators, failure to test controls and safety devices, and complacency on the part of the operator due to long periods of trouble-free operation. It is believed that improved instrumentation, controls and safety devices, proper operating procedures, and a clearer understanding of installation requirements by the manufacturers, installers, and operators can greatly reduce the chances of personal injury, damage to property, and loss of equipment from accidents.

It should be pointed out that any governmental jurisdiction has authority over any particular installation. Inquiries dealing with problems of a local character should be directed to the proper authorities of such jurisdictions.

Safety codes and standards are intended to enhance public health and safety. Revisions result from the committee's consideration of factors such as technological advances, new data, and changing environmental and industry needs. Revisions do not imply that previous editions were inadequate.

The first edition of this Standard, which was approved by The American Society of Mechanical Engineers' Committee on Controls and Safety Devices for Automatically Fired Boilers, was approved and designated as an ASME Standard by The American Society of Mechanical Engineers on April 29, 1977.

The second edition, which was approved by the American National Standards Institute (ANSI) on October 4, 1982, was issued on December 31, 1982. An addenda to the edition, CSD-1a–1984, was approved on August 17, 1984 and issued on November 15, 1984.

The third edition, which was approved by ANSI on November 17, 1988, was issued on February 15, 1989. The CSD-1a–1989 Addenda was approved on October 3, 1989 and issued on February 15, 1990. The CSD-1b–1990 Addenda was approved on June 21, 1990 and issued on December 1, 1990.

The fourth edition, which was approved by ANSI on February 28, 1992, was issued on June 15, 1992. The CSD-1a–1993 Addenda was approved on August 18, 1993 and issued on November 30, 1993. The CSD-1b–1994 Addenda was approved on June 20, 1994 and issued on September 30, 1994.

The fifth edition, which was approved by ANSI on February 6, 1995, was issued on June 30, 1995. The CSD-1a–1996 Addenda was approved on February 5, 1996 and issued on July 31, 1996. The CSD-1b–1996 Addenda was approved on July 16, 1996 and issued on December 20, 1996.

The sixth edition, which was approved by ANSI on January 30, 1998, was issued on April 14, 1998. The CSD-1a–1999 Addenda was approved on November 2, 1999 and issued on March 10, 2000. The CSD-1b–2001 Addenda was approved on July 30, 2001 and issued on November 30, 2001.

The seventh edition, which was approved by ANSI on January 17, 2002, was issued on April 17, 2002.

The eighth edition, which was approved by ANSI on August 9, 2004, was issued on April 15, 2005.

This ninth edition was approved by ANSI on September 13, 2006.

COMMITTEE ON CONTROLS AND SAFETY DEVICES FOR AUTOMATICALLY FIRED BOILERS

(The following is the roster of the Committee at the time of approval of this Standard.)

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General. ASME Codes and Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, CSDAFB Standards Committee
The American Society of Mechanical Engineers
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Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal including any pertinent documentation.

Interpretations. Upon request, the CSDAFB Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and provide a concise description.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for approval of a proprietary design or situation. The inquirer may also include any plans or drawings which are necessary to explain the question; however, they should not contain any proprietary names or information.

Requests that are not in this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information which might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The CSDAFB Standards Committee regularly holds meetings that are open to the public. Persons wishing to attend any meeting should contact the Secretary of the Standards Committee.

ASME CSD-1–2006
SUMMARY OF CHANGES

Following approval by the ASME CSDAFB Standards Committee, and after public review, ASME CSD-1–2006 was approved by the American National Standards Institute on September 13, 2006.

The 2006 edition of ASME CSD-1 includes editorial changes, revisions, and corrections introduced in ASME CSD-1–2004, as well as the following changes identified by **(06)**.

Page	*Location*	*Change*
v	Foreword	Revised
1–5	Definitions	(1) Definition of *burner, mechanical draft, atmospheric* added (2) Definitions of *draft, mechanical* and *draft, natural*, added (3) Definition of *maximum fixed stop limit* revised (4) Definition of *recycle* revised (5) Definition of *relight* revised (6) Definition of *sediment trap* added (7) Definition of *upper set point limit* revised (8) Definition of *water heater* revised
	Figure 1	Added
6	CG-110	Revised
	CG-130	Subparagraph (a) revised
	CG-140	Title revised
	CF-110(b)	References to Tables CF-4 and CF-5 revised to Tables CF-1 and CF-2, respectively
	CF-1[illegible]	Revised in its entirety
18	Table CF-1	Table CF-4 redesignated as Table CF-1 and revised
19	Table CF-2	Table CF-5 redesignated as Table CF-2 and revised
20–25	CF-161	Subparagraph (d) added
	CF-162(a)	References to Tables CF-1 and CF-2 revised to Tables CF-3 and CF-4
	CF-180	(1) Subparagraph (b)(2) revised (2) Subparagraph (e), table references revised (3) Subparagraph (f) revised
	Table CF-3	Table CF-1 redesignated as Table CF-3 and revised
	Table CF-4	Table CF-2 redesignated as Table CF-4 and revised

Page	*Location*	*Change*
	CF-210	(1) Table references in title revised (2) Subparagraph (b) revised
	CF-220	Revised
	CF-310	Subparagraphs (b) and (f), table references revised
	CF-320	Table references revised
	CF-330	Revised
	CF-410	Subparagraph (b), table reference revised
26–28	CF-460	Subparagraph (d), table reference revised
	CF-470	Title revised
	CF-480	Revised
	CF-510	(1) Subparagraphs (b) and (d), table references revised (2) Subparagraph (e) revised
	CF-520	Subparagraph (b), table reference revised
	CF-530	Revised
	Table CF-5	Table CF-3 redesignated as Table CF-5 and revised
	CF-910	Second paragraph, table references revised
	CF-920	Second paragraph, table reference revised
30	Figure B-1	Revised
31	Figure B-2	Revised
32	Figure B-3	Revised
33	Figure B-4	Revised
34	Figure B-5	Revised
39	D-6	Subparagraph (c) revised
42	Table D-1	Under “Recommended Test,” last entry revised
43	Nonmandatory Appendix E	(1) Title revised (2) References revised
44	Index	Revised

SPECIAL NOTE

The interpretations to ASME CSD-1 are included in this edition as a separate section for the user’s convenience.

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CONTROLS AND SAFETY DEVICES FOR AUTOMATICALLY FIRED BOILERS

(06)

DEFINITIONS

accepted: a boiler unit, equipment, or device is accepted when listed, labeled, or otherwise determined to be suitable and safe by a nationally recognized testing agency. Field installations are accepted when approved by the authority having jurisdiction.

air change: the quantity of air necessary to completely replace the air contained in the combustion chamber and associated flue passages.

air shutter: an adjustable device for varying the flow of air.

alarm: an audible or visible signal indicating an off-standard or abnormal condition.

alarm circuit: a circuit that includes an alarm.

annunciator: a device that indicates a condition, either normal or abnormal, by visual signals, audible signals, or both.

ANSI: American National Standards Institute.

approved: acceptable to the authority having jurisdiction.

ASME: the American Society of Mechanical Engineers.

atomizing media: a supplementary medium, such as steam or air, that assists in breaking the fuel oil into a fine spray.

authorized inspection agency: the inspection agency approved by the appropriate authority of a state or municipality of the United States or a Province of Canada that has adopted this Standard.

AWG: American Wire Gauge.

bleed line: a line used to relieve pressure to the atmosphere, either manually or automatically.

boiler: a closed vessel in which water is heated, steam is generated, steam is superheated, or any combination thereof, under pressure or vacuum by the direct application of heat. The term *boiler* shall include fired units for heating or vaporizing liquids other than water where these systems are complete within themselves.

boiler, automatically fired: a boiler that cycles automatically in response to a control system.

boiler, high-pressure: a boiler in which steam or vapor is generated at a pressure greater than 15 psig (103.4 kPa gage).

boiler, hot-water heating: a boiler in which no steam is generated and from which hot water is circulated for heating purposes, then returned to the boiler.

boiler, hot-water supply: a boiler that furnishes hot water to be used externally to itself at a pressure less than or equal to 160 psig (1 100 kPa gage) or a temperature less than or equal to 250°F (120°C) at or near the boiler outlet.

boiler, low-pressure: a boiler in which steam or vapor is generated at a pressure less than or equal to 15 psig (103.4 kPa gage).

boiler, miniature: a boiler that does not exceed any of the following limits:

(a) 16 in. (406.4 mm) inside diameter of shell

(b) 20 ft^2 (1.86 m^2) heating surface

(c) 5 ft^3 (0.142 m^3) gross volume,[1] exclusive of casing and insulation

(d) 100 psig (689.5 kPa gage) maximum allowable working pressure.

boiler, modular: a steam or hot water heating assembly consisting of a grouping of individual boilers called modules intended to be installed as a unit with no intervening stop valves. Modules may be under one jacket or may be individually jacketed. The individual modules shall be limited to a maximum input of 400,000 Btu/hr (117 228 W) (gas), 3 gph (11.4 L/h) (oil), or 115 kW (electric).

boiler manufacturer: an organization that manufactures pressure parts for boilers or that shop-assembles parts into completed boilers.

boiler system: a system comprised of the boiler(s), its controls, safety devices, and interconnected piping, vessels, valves, fittings, and pumps.

boiler unit: a complete assembly comprised of the boiler, the apparatus used to produce heat, and associated controls and safety devices.

branch circuit: that portion of the wiring system between the final overcurrent device protecting the circuit and the utilization equipment.

[1] The gross volume is intended to include such gas passages as are integral with the assembled pressure parts. Gross volume is defined as the volume of a rectangular or cylindrical enclosure into which all the pressure parts of the boiler in their final assembled positions could be fitted. Projecting nozzles or fittings need not be considered in the volume.

Btu (British thermal unit): a quantity of heat required to raise the temperature of 1 lb (0.45 kg) of water 1°F (0.56°C).

Btu/hr: a unit of power equal to one British thermal unit/hr.

building code: an ordinance that sets forth requirements for building design and construction, and equipment installation, or where such an ordinance has not been enacted, one of the following model codes:

(a) National Building Code;
(b) Standard Building Code; or
(c) Uniform Building Code.

burner: a device for the introduction of fuel and air into the combustion zone at the desired velocities, turbulence, and concentration to establish and maintain ignition and combustion of the fuel (see also *burner assembly*).

burner, atmospheric: a gas burner in which air for combustion is supplied by natural draft, the inspirating force being created by gas velocity through the orifices.

burner, mechanical draft, atmospheric: an atmospheric gas burner including a mechanical draft device, such as a forced draft or induced draft fan to provide sufficient air for completing the combustion process.

burner, natural draft type: a burner that depends primarily on the natural draft created in the flue to induce the air required for combustion into the burner.

burner, power: a burner in which all air for combustion is supplied by a power-driven fan that overcomes the resistance through the burner.

burner assembly: a burner that is factory-built as a single assembly or as two or more subassemblies that include all essential parts necessary for its normal function when installed as intended.

combined feeder/cutoff: a device that regulates makeup water to a boiler in combination with a low-water fuel cutoff.

combustion: the rapid oxidation of fuel, producing heat or heat and light.

combustion air: the air required for combustion of the fuel. This does not include the air used for atomization.

conductor: a body that may be used to conduct electric current.

continuous duty: the design feature of an electrical device, such as a motor, enabling the device to operate at the rated load for an indefinite period.

control: a device designated to regulate the fuel, air, water, steam, or electrical supply to the controlled equipment. It may be automatic, semiautomatic, or manual.

control, operating: an automatic control, other than a safety control, to start or regulate input according to demand, and to stop or regulate input on satisfaction of demand.

control, primary safety: a control directly responsive to flame properties, sensing the presence of flame and, in event of ignition failure or loss of flame, causing safety shutdown.

control, safety (also known as *limit*): a control responsive to changes in liquid level, pressure, or temperature, and set beyond the operating range to prevent the operation beyond designed limits.

control manufacturer: an organization that manufactures operating and safety controls for use on boilers.

CSA: CSA International.

damper: a valve or plate for regulating combustion air or flue gases.

draft: the difference in pressure between atmospheric and some other pressure in the furnace or gas passages.

draft, mechanical: the draft caused by a mechanical device, such as a forced draft or induced draft fan.

draft, natural: the draft caused by the difference in the temperature of the hot flue gases and the outside atmosphere.

drip leg: the container placed at a low point in a system of piping to collect condensate and from which condensate may be removed.

fan, forced draft: a fan used to supply air, under pressure, to the fuel-burning equipment of the boiler.

fan, induced draft: a fan used to exhaust gases, under suction, from the boiler.

firing rate: the rate at which air, fuel, or an air-fuel mixture is supplied to a burner, expressed in volume or heat units supplied per unit of time.

flame failure response time: the time interval between the loss of flame and deenergizing the safety shutoff valve.

FM: Factory Mutual system.

fuel train: a series of valves, regulators, and controls, between the burner and the source of fuel, that regulates and controls the flow of fuel to the burner.

gas: one of the following fuel gases: natural gas, liquefied petroleum (LP) gas, LP-air mixture, manufactured gas, or mixed gas.

gas-pressure regulator, main: a device for controlling and maintaining a predetermined gas pressure for the main burner.

gas-pressure regulator, pilot: a device for controlling and maintaining a predetermined gas pressure for the pilot burner.

ground: a conducting connection, whether intentional or accidental, between an electrical circuit or equipment and either the earth or a conducting body that serves in place of the earth.

grounded: connected to earth or to some conducting body that serves in place of the earth.

grounded conductor: a system or circuit conductor that is intentionally grounded.

grounding conductor, equipment: the conductor used to connect noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system-grounded conductor at the service and/or the grounding electrode conductor.

guarded: covered, shielded, fenced, enclosed, or otherwise protected by means of covers, casings, barriers, rails, screens, mats, or platforms to prevent contact by persons or objects.

high fire: the rate of a burner at or near design maximum fuel input.

ignition system, direct: an automatic ignition system that uses an electrically energized device to ignite fuel at a main burner.

input rating: the fuel-burning capacity of a burner at sea level in Btu/hr (W) as specified by the manufacturer.

installing contractor: an organization that installs a boiler, combustion controls, burners, and protective equipment in the field.

labeled: equipment or materials to which has been attached a label of a nationally recognized testing agency that maintains periodic inspection of production of labeled equipment or materials. Labeling indicates compliance with nationally recognized standards.

liquefied-petroleum gas: fuel gases, including commercial propane, predominantly propane or propylene or commercial butane, predominantly butane, isobutane, and/or butylene.

listed: equipment or materials included in a list published by a nationally recognized testing agency that maintains periodic inspection of production of listed equipment or materials. Listing indicates compliance with nationally recognized standards.

local: within physical sight and sound of the affected equipment (see also *lockout).*

lockout: a safety shutdown that requires a local, manual procedure to restart the equipment (see also *shutdown, safety*).

low fire start: the lightoff ignition of a burner with the fuel controls in a low fire position. In a system with guaranteed low fire start, interlocks are used to prevent startup if the burner is not in the low fire position.

low-water fuel cutoff: a device that shuts off the fuel when the boiler water falls to an unsafe level.

LP-gas air mixture: liquefied-petroleum gases distributed at relatively low pressures and normal atmospheric temperatures that have been diluted with air to produce a desired heating value and utilization characteristic.

main burner flame-establishing period: the interval of time the main burner fuel safety shutoff valves are permitted to be open before the primary safety control is required to prove the presence of the main burner flame.

main manifold gas pressure: the gas pressure measured at a location that is specified by the burner/boiler unit manufacturer, that is taken downstream of the main gas pressure regulator.

manifold, gas: the conduit of an appliance that supplies gas to the individual burners.

manual reset device: a component of a control that requires resetting by hand to restart the burner after safe operating conditions have been restored.

maximum fixed stop limit: on a temperature or pressure control having an adjustable set point, the maximum fixed stop limit is the maximum setting to which the control can be adjusted and still perform its intended function (i.e., safety shutdown), but not be exceeded due to a mechanical or electrical stop device.

NEMA: National Electric Manufacturers Association.

NFPA: National Fire Protection Association.

oil: any commercial grade fuel oil as defined by ASTM D 396.

pilot: a small burner that is used to lightoff (ignite) the main burner.

pilot, continuous (also known as constant burning pilot): a pilot that burns without turndown throughout the entire time the burner assembly is in service, whether the main burner is firing or not.

pilot, intermittent: a pilot that is automatically lighted each time there is a call for heat. It burns during the entire period the main burner is firing.

pilot, interrupted: a pilot that is automatically lighted each time there is a call for heat. The pilot fuel is cut off automatically at the end of the main burner flame-establishing period.

pilot, proved: a pilot flame supervised by a primary safety control.

pilot flame-establishing period: the interval of time that fuel is permitted to be delivered to a pilot burner before the primary safety control is required to prove the pilot flame.

pilot manifold gas pressure: the gas pressure measured at a location that is specified by the burner/boiler unit manufacturer, that is taken downstream of the pilot gas-pressure regulator.

point of gas delivery: for other than undiluted liquefied-petroleum gas systems, the point of gas delivery shall be considered the outlet of the service meter assembly, or the outlet of the service regulator or service shutoff valve when no meter is provided. For undiluted liquefied-petroleum gas systems, the point of gas delivery shall be considered the outlet of the first stage LP-gas-pressure regulator.

pool heater: an appliance designed for heating nonpotable water stored at atmospheric pressure such as water in swimming pools, spas, hot tubs, and similar applications.

postpurge period: a period of time after the fuel valves close, during which the burner motor or fan continues to run to supply air to the combustion chamber.

prepurge period: a period of time on each startup during which air is introduced into the combustion chamber and associated flue passages in volume and manner as to completely replace the air or fuel-air mixture contained therein prior to initiating ignition.

pressure regulator, LP-gas, first stage: on undiluted LP-gas systems, a pressure regulator designed to reduce pressure from the container to 10.0 psi (69 kPa) or less.

pressure regulator, LP-gas, second stage: a pressure regulator for service on undiluted LP-gas systems designed to reduce first stage regulator outlet pressure to 14.0 in. W.C. (4.0 kPa) or less.

pressure regulator, service: a pressure regulator installed by the serving gas supplier to reduce and limit the service line gas pressure to delivery pressure.

proven prepurge: a provision of the control system for preventing burner operation until prescribed air flow is proven to be established during prepurge.

qualified individual: a boiler service technician who is engaged in and is responsible for installation, replacement, repair, or service of the boiler, fuel burning system controls, and safety devices and is experienced in such work.

readily accessible: having direct unimpeded access without the need of a ladder or removing or moving any panel, door, or similar covering of the item described.

recycle: the process of sequencing a normal burner start following safety shutdown before the establishment of lockout.

relay: a device that is operative by a variation in the conditions of one electric circuit to start the operation of other devices in the same or another electric circuit, such as pressure or temperature relay.

relight: the action upon loss of main flame to reestablish the ignition source without recycle.

sediment trap: a device in a gas line that collects and prevents solid debris (such as pipe dope, slag, dirt, etc.) from traveling downstream into the gas controls. (See Fig. 1.)

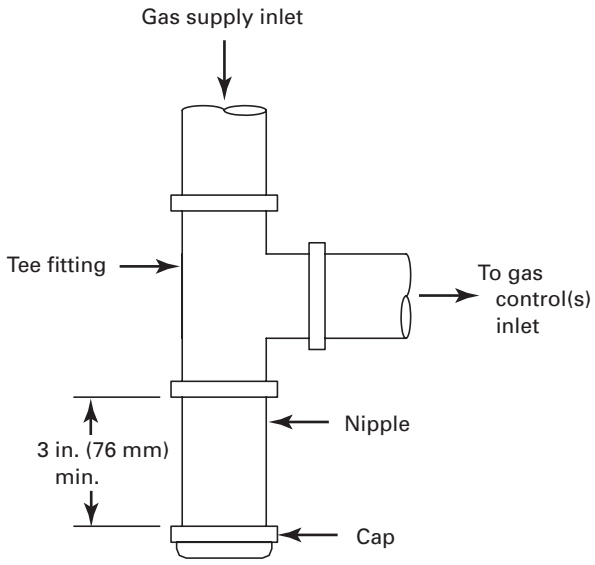
shutdown, normal: shutting off fuel and ignition energy to the burner by means of an operating control.

shutdown, safety: shutting off all fuel and ignition energy to the burner by means of a safety control or a primary safety control (see also *lockout*).

switch, air flow: a device used to prove the flow of air.

switch, high oil temperature: a temperature-actuated device arranged to stop the flow of fuel to a preheated oil burner or to prevent it from starting when the fuel oil temperature rises above a set point which shall be the upper end of the viscosity range recommended by the burner manufacturer.

Fig. 1 Sediment Trap (06)



switch, high-pressure: a pressure-actuated device to monitor liquid, steam, or gas pressure and arranged to stop the flow of fuel to the burner at a preset high pressure.

switch, low oil temperature: a temperature-actuated device arranged to stop the flow of fuel to a preheated oil burner or to prevent it from starting when the fuel oil temperature falls below a set point which shall be the lower end of the viscosity range recommended by the burner manufacturer.

switch, low-pressure: a pressure-actuated device to monitor liquid, steam, or gas pressure and arranged to stop the flow of fluid to the burner at a preset low pressure.

switch, pressure: a pressure-responsive device that makes or breaks an electrical circuit and may be automatically or manually reset.

time delay: a deliberate delay of a predetermined time in the action of a safety device or control.

UL: Underwriters Laboratories, Inc.

upper set point limit: on a temperature or pressure control having an adjustable range of set points, the upper set point limit is the maximum pressure or temperature set point in the range of the control, to which the control can be adjusted and still perform its intended function (i.e., safety shutdown).

valve, automatic: an automatic device consisting essentially of a valve and operator that controls the fuel supply to the burner(s) during normal operation of a boiler. It

may be actuated by application of electrical, mechanical, or other means.

valve, lubricated plug type: a valve of the plug and barrel type designed for maintaining a lubricant between the bearing surfaces.

valve, modulating control: a valve designed to regulate fuel input to the burner in response to demand.

valve, proof of closure: a safety shutoff valve equipped with an interlock switch that will be actuated only after the valve has fully closed.

valve, safety shutoff: a fast-closing valve that automatically and completely shuts off the fuel supply in response to a normal or safety shutdown signal.

vent limiter: a means that limits the flow of gas from the atmospheric diaphragm chamber to the atmosphere in the event of diaphragm rupture. This may be either a limiting orifice or a limiting device.

vent line: a line used to convey leakage gases to a safe point of discharge.

vent valve: a normally open, power-closed valve, piped between the two safety shutoff valves, vented to a safe point of discharge.

water heater: a vessel, which is closed except for openings through which water can flow, that includes the apparatus by which heat is generated and on which all controls and safety devices necessary to prevent pressures greater than 160 psig (1100 kPa gage) and water temperatures greater than 210°F (99°C) are provided, in which potable water is heated by the combustion of fuels, electricity, or any other heat source and withdrawn for external use.

Part CG
General

CG-100 GENERAL REQUIREMENTS

(06) CG-110 Scope

The rules of this Standard cover requirements for the assembly, installation, maintenance, and operation of controls and safety devices on automatically operated boilers directly fired with gas, oil, gas-oil, or electricity, subject to the service limitations, exclusions, and acceptance to other listings in CG-120, CG-130, and CG-140, respectively. A burner field-installed on boilers or as a replacement burner shall comply with the requirements of CF-110 and CF-410 for gas and oil firing, respectively. The use of a gaseous or oil fuel not listed in the definitions has not been evaluated and special considerations may be required.

CG-120 Service Limitations

The rules of this Standard are applicable to the following service:

(a) all automatically fired boilers regardless of fuel input ratings subject to the exclusions and acceptance to other listings of CG-130 and CG-140, respectively

(b) burners field-installed in automatically fired boilers

(06) CG-130 Exclusions

(a) Boilers with fuel input ratings greater than 12,500,000 Btu/hr (3 663 389 W), falling within the scope of NFPA 85, Boiler and Combustion Systems Hazard Code.

(b) Water heaters (see Definitions).

(c) Direct gas-fired swimming pool heaters that bear a label and/or are listed by a nationally recognized testing agency or other organization that is acceptable to the authority having jurisdiction as complying with ANSI Z21.56/CSA 4.7, Standard for Gas-Fired Pool Heaters.

(06) CG-140 Acceptance by Other Listings

(a) Automatically operated boilers fired with gas having inputs of 400,000 Btu/hr (117 228 W) or less that

(1) comply with Part CW, CE-110(a), CE-110(i)

(2) are listed and/or labeled by a nationally recognized testing agency or other organization that is acceptable to the authority having jurisdiction as complying with ANSI Z21.13/CSA 4.9, Standard for Gas-Fired Low Pressure Steam and Hot Water Boilers, meet the remaining requirements of this Standard

(b) Automatically operated boilers fired with oil having inputs of 3 gph (11.4 L/h) or less that

(1) comply with Part CW, CE-110(a), CE-110(i)

(2) are listed and/or labeled by a nationally recognized testing agency or other organization that is acceptable to the authority having jurisdiction as complying with UL 726, Standard for Oil-Fired Boiler Assemblies, meet the remaining requirements of this Standard

(c) Automatically operated, electrically heated boilers having inputs of 115 kW or less that

(1) comply with Part CW and CE-110(a)

(2) bear a label and/or are listed and/or labeled by a nationally recognized testing agency or other organization that is acceptable to the authority having jurisdiction as complying with UL 834, Standard for Heating, Water Supply, and Power Boilers – Electric, meet the remaining requirements of this Standard

CG-200 GENERAL PROVISIONS

CG-210 General Provisions

Installation requirements shall apply to controls, safety devices, and burners on automatically fired boilers covered by this Standard.

For information regarding boiler and/or burner installations, refer to local codes. In the absence of local codes, see NFPA 54/ANSI Z223.1 for gas-fired boilers and NFPA 31 for oil-fired boilers.

For boilers firing liquefied-petroleum gas or LP-gas air mixtures, the requirements pertaining to the storage container, the first stage and second stage LP-gas pressure regulators and all components upstream of the point of gas delivery (see Definitions) are covered by NFPA 58, Liquefied-Petroleum Gas Code.

CG-220 Installation

(a) Installation of controls, safety devices, and burners shall be in accordance with the manufacturer's instructions and the applicable requirements of this Standard. Diagrams detailing the wiring and piping connections for the controls and safety devices installed shall be furnished by the unit manufacturer [see CG-510(c)].

(b) Installations shall provide accessibility for removing burners; adjusting, cleaning, and lubricating working parts; and replacing controls, safety devices, and other control components.