ASME CSD-1–2018
(Revision of ASME CSD-1–2015)

Controls and Safety Devices for Automatically Fired Boilers

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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Two Park Avenue • New York, NY • 10016 USA

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The next edition of this Standard is scheduled for publication in 2021.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Periodically certain actions of the ASME CSDAFB Committee may be published as Cases. Cases and interpretations are published on the ASME website under the Committee Pages at http://cstools.asme.org/ as they are issued.

Errata to codes and standards may be posted on the ASME website under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

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

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FOREWORD

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 15, 2002.

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

The ninth edition, which was approved by ANSI on September 13, 2006, was issued on December 29, 2006.

The tenth edition, which was approved by ANSI on February 24, 2009, was issued on May 8, 2009.

The eleventh edition, which was approved by ANSI on January 13, 2012, was issued on May 10, 2012.

The twelfth edition of CSD-1, which was approved by ANSI on December 21, 2015, was issued on March 24, 2016.

This thirteenth edition of CSD-1, which was approved by ANSI on August 23, 2018, was issued on October 12, 2018.

ASME CSDAFB COMMITTEE
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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CORRESPONDENCE WITH THE CSDAFB COMMITTEE

General. ASME 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 or a case, and attending Committee meetings. Correspondence should be addressed to:

Secretary, CSDAFB Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990
http://go.asme.org/Inquiry

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.

Proposing a Case. Cases may be issued to provide alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard and the paragraph, figure, or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

Interpretations. Upon request, the CSDAFB Standards 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 CSDAFB Standards Committee.

Requests for interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at http://go.asme.org/InterpretationRequest. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt.

If the Inquirer is unable to use the online form, he/she may mail the request to the Secretary of the CSDAFB Standards Committee at the above address. The request for an 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 the topic of the inquiry in one or two words.
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 an approval of a proprietary design or situation. Please provide a condensed and precise question, composed in such a way that a "yes" or "no" reply is acceptable.
Proposed Reply(ies):	Provide a proposed reply(ies) in the form of "Yes" or "No," with explanation as needed. If entering replies to more than one question, please number the questions and replies.
Background Information:	Provide the Committee with any background information that will assist the Committee in understanding the inquiry. The Inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

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

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

ASME procedures provide for reconsideration of any interpretation when or if additional information that 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 and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the CSDAFB Standards Committee.

ASME CSD-1–2018
SUMMARY OF CHANGES

Following approval by the ASME CSDAFB Committee and ASME, and after public review, ASME CSD-1–2018 was approved by the American National Standards Institute on August 23, 2018.

ASME CSD-1–2018 includes the following changes identified by a margin note, **(18)**.

Page	*Location*	*Change*
2	CG-230	Revised
3	CG-700	(1) Term *gas-pressure regulator, main* deleted (2) Definitions for *branch burner*; *may*; *multiple-burner boiler unit*; *pressure regulator, gas, main*; *pressure regulator, zero governor*; *shall*; and *should* added
11	CE-170	Added
12	CW-110	Subparagraphs (c) and (d) revised
12	CW-120	Title and subparagraph (a) revised
14	CW-210	Revised
15	CW-410	Subparagraphs (a), (b), and (c) revised
19	Table CF-2	Title revised
20	CF-162	Revised in its entirety
21	Table CF-3	Tenth entry in third column revised
24	CF-180	Revised in its entirety
28	CF-330	Subparagraphs (a), (b), and (c) revised
30	CF-470	Revised
29	Table CF-5	First entry of second column and Note (1) revised
30	CF-480	Revised
31	CF-530	Revised
33	Nonmandatory Appendix B	Revised in its entirety
47	Nonmandatory Appendix D	Revised

Part CG
General

CG-100 GENERAL REQUIREMENTS

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 of other listings in CG-120, CG-130, and CG-140, respectively. Burner or burner assemblies 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 and burner assemblies, 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

CG-130 Exclusions

The following are excluded from the requirements of this Standard:

(a) boilers with fuel input ratings greater than or equal to 12,500,000 Btu/hr (3 663 kW), falling within the scope of NFPA 85, Boiler and Combustion Systems Hazard Code

(b) water heaters (see CG-700)

(c) direct gas-fired swimming pool heaters that are labeled and 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

CG-140 Acceptance of Other Listings

The following other listings are acceptable:

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

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

(2) are labeled and listed 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 (see Nonmandatory Appendix A)

(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(b), and CE-110(j)

(2) are labeled and listed 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, CE-110(a), and CE-110(b)

(2) are labeled and listed 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-150 Jurisdictional Adoption of ASME CSD-1

Adoption of ASME CSD-1 by a jurisdiction shall not preclude the jurisdiction adopting and accepting boilers listed or certified to other safety standards or codes acceptable to the jurisdiction beyond the limitations contained in CG-140. Where other such safety codes and/or standards are adopted/accepted and overlap with the scope of ASME CSD-1, it shall be the responsibility of the jurisdiction to define the application of this Standard and those other codes and/or standards.

CG-160 Metric (SI) Units

This edition of the Standard uses U.S. Customary units. The acceptable equivalent SI units are shown in parentheses for information only and have been directly (soft) converted from the U.S. Customary units.