
CSD-1 (2009 Edition)

Part CG - General



July 2009

CG-110 SCOPE

- Rules cover requirements for:
 - Assembly
 - Installation
 - Maintenance
 - Operation
- Of controls/safety devices on automatically operated directly fired boilers using :
 - Gas
 - Oil
 - Gas-oil
 - Electricity



CG-120 Service Limitations

- All automatically fired boilers and burner assemblies
- All burners field installed in automatically fired boilers

- EXCEPT exclusions of CG-130 and CG-140



CG-130(a) - Exclusions

- Boilers with fuel-input ratings **greater** than or **equal** to 12,500,000 BTU/HR (3,663,389 W) falling within the scope of NFPA 85: Boiler and Combustion Systems Hazards Code
 - 375 Boiler horsepower input @ 33,475 BTUs/BHP or $375 \times 34.5 \text{ lb/BHP} = 12,937 \text{ lb}$ of steam from 212 F.



CG-130(b) - Exclusions

- Water heaters (a closed vessel in which potable water is heated) are excluded from CSD-1's scope providing their design pressure does not exceed 160 PSIG and temperatures do not exceed 210°F
- Inspectors are cautioned that the CSD-1 definition is not the same as the jurisdictions for regulation and inspection requirements



CG-130(c) - Exclusions

- Direct gas-fired swimming pool heaters complying with ASNI Z21.56/CSA 4.7 Standard for Gas-Fired Swimming Pool Heaters



CSD-1 Acceptance by other Listings

- Automatic gas fired boilers 400,000BTUs/hr or less
 - Complying with Part CW and CE110 (a) [*disconnecting means*] and (i) [*auto reset devices*]



CG-210 – General Provisions

- Installation requirements shall apply to:
 - Controls
 - Safety Devices
 - Burners
- ...on Automatically Fired Boilers covered by this Code



CG-210 – General Provisions cont'd

- For information regarding boiler and/or burner installation, refer to local jurisdiction.
- In the absence of jurisdiction rules see:
 - NFPA-54/ANSI Z223.1 for gas-fired boilers
 - NFPA-31 for oil-fired boilers
 - NFPA-58 for L.P. gas-fired boilers



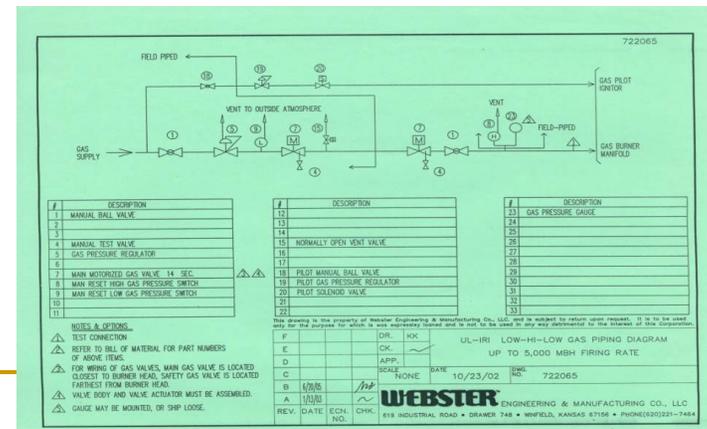
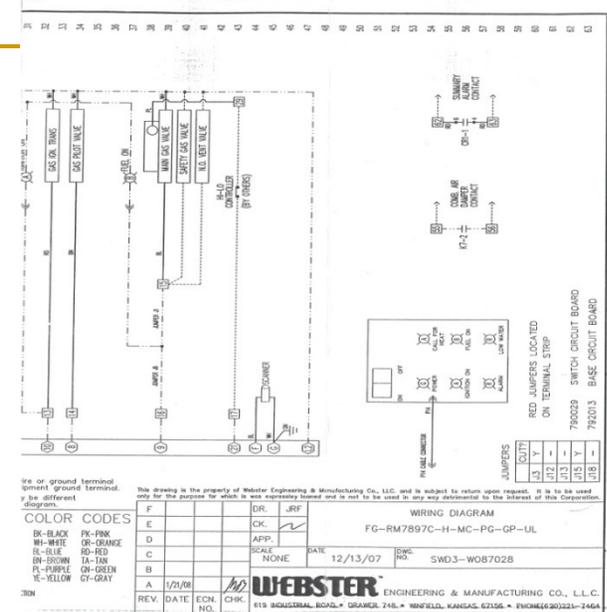
CG-220(a)

- Installation of:
 - Controls
 - Safety Devices
 - Burners
- ...shall be in accordance with manufacturers' instructions and applicable requirements of this code.



CG-220(a)

- Diagrams detailing the :
 - Wiring
 - Piping Connections
- For controls and safety devices shall be furnished by the unit manufacturer.
- [See CG-510(c)]



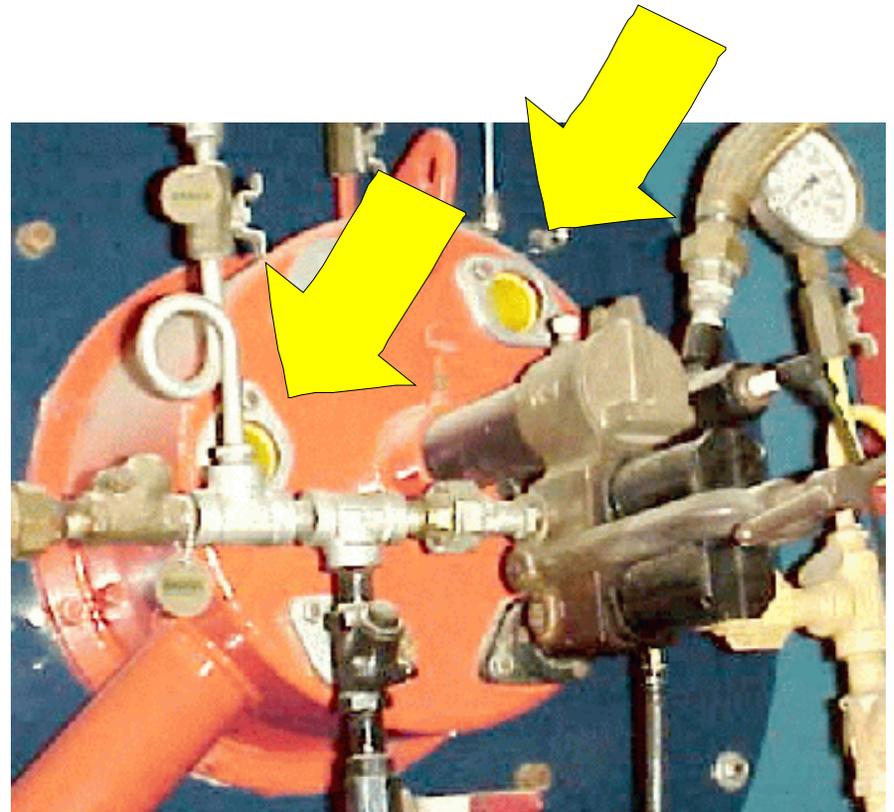
CG-220(a)

- Installations shall provide accessibility for:
 - ❑ Removing burners
 - ❑ Adjusting
 - ❑ Cleaning
 - ❑ Lubricating working parts
 - ❑ Replacing controls, safety devices, other control components



CG-230

- Observation ports shall be provided to permit direct visual inspection of the:
 - ❑ Pilot
 - ❑ Main burner flame
 - ❑ Combustion chamber



CG-240 - Guarding

- Guards shall be provided to protect personnel and to protect against damage to control equipment.
- Guarding shall conform to applicable regulations.



CG-250 – Annunciator Systems

- Annunciator Systems, where used, shall have all:
 - ❑ Contacts
 - ❑ Switches
 - ❑ Relays
 - ❑ Lights
- ...arranged so that the annunciator circuits do no bypass safety control functions



CG-260(a) – Combustion Air

- The requirements of combustion air shall be in accordance with:
 - ❑ ANSI/NFPA-54, National Fuel Gas Code, for gas fired boilers
 - ❑ ANSI/NFPA-31, Installation of Oil Burning Equipment, for oil fired boilers



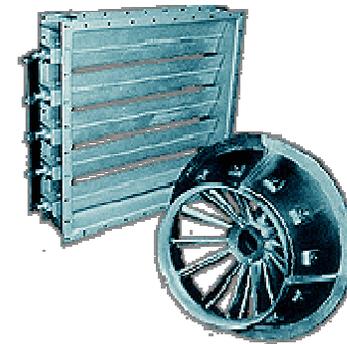
Boilers Installed In Confined Space -All Air From Outside	NFPA 54 Gas	NFPA 31 Oil	BOCA All	SBCCI Gas & Oil	SBCCI Solid
Minimum No. openings required	2	2	2	2	2
Outdoor opening, sq. in./Btuh	1/4000	1/4000	1/4000	1/4000	2/1000
Vertical ducts, sq. in./Btuh	1/4000	1/4000	1/4000	1/4000	-
Horizontal ducts, sq. in./Btuh	1/2000	1/2000	1/2000	1/2000	-
Ducts same as opening	yes	yes	-	yes	-
Minimum duct dimension, inches	3	3	3	3	3
Louver & grill free area	opening	opening	-	-	opening
Free area allowance, wood*	20-25%	20-25%	25%	-	-
Free area allowance, metal*	60-75%	60-75%	75%	-	-
Damper interlocked	yes	yes	yes	-	-

*use manufacturer's free area rating when available.



CG-260(b)

- Louvers and grilles shall be fixed in the open position or interlocked with the equipment so that they are opened automatically during equipment operation
- The interlock shall be placed on the driven member



CG-260(c)

- Fans supplying air to the boiler room for combustion shall be interlocked with the burner so that air flow is proven during equipment operation
 - Pressure Switch
 - Flow Switch



CG-310 - Components

- Each control and safety device covered by this code shall be accepted for the intended service by a nationally recognized testing agency such as, but not limited to: (see CG-320)
 - ❑ UL (Underwriters Laboratory)
 - ❑ FM (Factory Mutual)
 - ❑ AGA (American Gas Association)



CG-410 - Cleaning

- Manufacturers of controls and safety devices requiring periodic service shall furnish detailed instruction covering the :
 - Procedures
 - Frequency
- ...of cleaning and servicing [see CG-510(c)]



CG-430 - Maintenance

- Manufacturers shall furnish detailed instructions on maintenance and service procedures of the controls and safety devices installed.



INSTALLATION AND BURNER SERVICE MANUAL

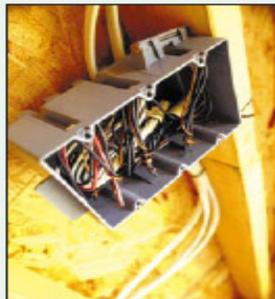
Serial Number: UL87028A
UL# AS-94346 & AS-94347
UL/ULC Number: JB1G-03-RM7897C-H-10-UL
Model Number: NATURAL GAS
Fuel Type: BRYAN BOILERS LLC
Customer: NBBPVI
Job Name: 222490
Location: 1/21/2008
PO Number: BRYAN #070819 BRYAN PO #222490
Date:
Tag Order:

This manual should be kept with the equipment at all times
for service and proper maintenance.



CG-430 - Maintenance

- These instructions shall specify that:
 - Cover Plates
 - Enclosures
 - Guards
- ...shall be maintained in place at all times except during maintenance.



Black and red wires are usually energized, and white wires are usually neutral.



CG-440(a) – Operational Testing

- The operation of control systems and safety devices installed in accordance with this code shall be tested by the installing contractor prior to release to owner/user.

WEBSTER WARRANTY VALIDATION
FIELD START-UP REPORT

CUSTOMER: _____ w.o. UL840287A
 BURNER MODEL: _____ BOILER MODEL: _____
 CONTROL CIRCUIT COMPONENT OPERATIONAL TESTING
 (Check If Okay)

Primary LWCO _____ High Limit _____ Firing Rate Control _____
 Secondary LWCO _____ Operating Control _____ Low Fire Start Switch _____
 High Gas Press. Switch _____ Oil Press. Switch _____ High Fire Purge Switch _____
 Low Gas Press. Switch _____ Air Flow Switch _____ Other _____

FIELD COMBUSTION SETTINGS	OIL FIRED			GAS FIRED		
	Low	Med.	High	Low	Med.	High
Firing Rate						
CO ₂						
O ₂						
Smoke or CO (ppm)						
NOx (ppm)						
Stack Temp. Net °F						
Room Temperature °F						
Overfire Draft " WC						
Breeching Draft " WC						
Water Temp. °F/Steam Press.						
Air Inlet Shutter (" Open)						
Flame Signal Pilot						
Flame Signal Main						
Oil Noz. Press./Mani. Gas Press.						
By-Pass Oil Pressure						
Atomizing Air Pressure						
Combustion Efficiency						
Running Motor Amps & Volts	L1		L2		L3	

Comments: _____

Having read the Manufacturers' Service Manual as to the proper installation, start-up and service of the above unit, I verify that the burner has been put into operation as specified, and that the above information and checks are complete and correct.

START-UP BY _____ Date _____
 Company _____ Phone No. _____
 Address _____

NOTE: Warranty Validation -- Field Start-up report must be completed, signed, dated and the top copy sent to Webster Engineering and Manufacturing Company, LLC, 619 Industrial Rd, Winfield, Kansas 67156, to validate equipment warranty.

w.o. _____ Form #113
4-02



CG-440(a)(1)

- Control systems and safety devices installed in accordance with this code by the boiler manufacturer on shop-assembled boiler units shall be operationally tested as close to specified field conditions as practicable prior to shipment from the manufacturer's facility



CG-510(a)

- Manufacturers of shop assembled boilers covered by this code shall maintain a report for each:
 - ❑ Boiler unit
 - ❑ Category (type, size or model) or boiler unit



CG-510(a)

- A report shall be maintained on each category for:
 - ❑ 400,000 BTU/HR or less for gas
 - ❑ 3 GPH or less for oil

ASME CSD-1-2006

NONMANDATORY APPENDIX C MANUFACTURER'S/INSTALLING CONTRACTOR'S REPORT FOR ASME CSD-1

Certification and Reporting (CG-500) for Controls and Safety Devices
(This Form is a guideline and is not part of ASME CSD-1-2006.)

Unit Manufacturer
Name _____
Address _____ Zip _____
Telephone _____ Fax _____

Unit Identification (Boiler)
Manufacturer's Model # _____ Year Built _____
ASME # _____ Nat. Bd. # _____
UL # _____ CSA # _____
Jurisdiction _____

Steam _____ Hot Water _____
Max. W.P. _____ psig Max. W.P. _____ psig
Min. Safety Valve Cap. _____ PPH Max. Temp. _____ °F
Min. Safety Relief Valve Cap. _____ PPH or Btu

Boiler Unit Description (type) _____
If Modular (no. of modules) _____
Boiler Unit Capacity (output) _____

Burner
Manufacturer _____ Model _____
UL or CSA # _____ Serial # _____

Fuels (as shipped) _____
Indicate Units (where not applicable, indicate "N/A")

Gas Manifold Pressure _____
Oil Nozzle/Delivery Pressure (at max. input) _____
High Gas Pressure Switch Setting _____
Low Oil Pressure Switch Setting _____

Installation Location (if known)
Customer Name _____
Address _____
City _____ State _____ Zip _____
Telephone _____ Fax _____

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CG-510(a)(1-3)

- This report shall list:
 - Each control and safety device installed in accordance with this code
 - Name of the manufacturer and model number of each control and safety device
 - Operational test performed (see CG-440)
- ...and shall be verified by signature of an authorized representative of the manufacturer on this report



Manufacturer/Installing Contractors Report

ASME CSD-1-2006

Certification and Reporting (CG-500) for Controls and Safety Devices (Cont'd)
(This Form is a guideline and is not part of ASME CSD-1-2006.)

Control/Device	Manufacturer	Model #	Operational Test Performed, Date
Appliance Controls			
Low-Water Fuel Cutoff CW-120(a), CW-140			
Forced Circulation CW-210(a)			
High Gas Pressure CG-162			
Water Temperature CW-410(a)			
Safety Controls			
Low-Water Fuel Cutoff CW-120(a), CW-120(b) CW-130, CW-140			
Forced Circulation CW-210(a)			
High Steam Pressure Limit CW-310(a)			
High Water Temperature Limit CW-410(a)			
Fuel Safety Shutoff Valve, Main CF-180(b)(2), CF-220(b)(2)			
Pilot Safety Shutoff Valve CF-300(a)			
Atomizing Medium Switch CF-400(a)			
Combustion Air Switch CF-220			
High Gas Pressure CG-162			
Low Gas Pressure CF-162			
Low Oil Pressure CF-450(a)			
High Oil Temperature CF-450(a)			
Low Oil Temperature CF-450(a)			
Purge Air Flow CF-210			
Flame Safeguard (Primary) CF-310, CF-320			
Flame Detector CF-310, CF-320			
Low Fire Start Low-Fire Start Switch CF-610			
Safety or Safety Relief Valve(s) CW-510, CW-520			

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ASME CSD-1-2006

Certification and Reporting (CG-500) for Controls and Safety Devices (Cont'd)
(This Form is a guideline and is not part of ASME CSD-1-2006.)

Manufacturer _____ Operational Test Performed, Date ____ / ____ / ____

Model _____

Size _____

Capacity _____ PPH/Btu/hr

Representing Equipment Manufacturer, Name _____

Signature _____ Date _____

Representing Installing Contractor, Name _____

Signature _____ Date _____

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CG-510(b)

- Installing contractors shall maintain or obtain from the manufacturer a data report for each installation completed.
- The report shall list:
 - ❑ Each control and safety device, including the manufacturer and model number of each control and safety device
 - ❑ Operation test performed (see CG-440)



CG-510(c)

- Installing contractors shall obtain from the boiler manufacturer pertinent:
 - ❑ Operating instructions
 - ❑ Testing instructions
 - ❑ Servicing instructions
 - ❑ Cleaning instructions
- ...for the controls and safety devices:



CG-510(c)

- Installing contractor shall deliver the following to the owner/user and obtain a receipt which shall be filed with the installation report:
 - These instructions
 - Complete piping diagrams
 - Complete wiring diagrams
 - Written precautions that operating, testing and servicing shall only be performed by qualified personnel

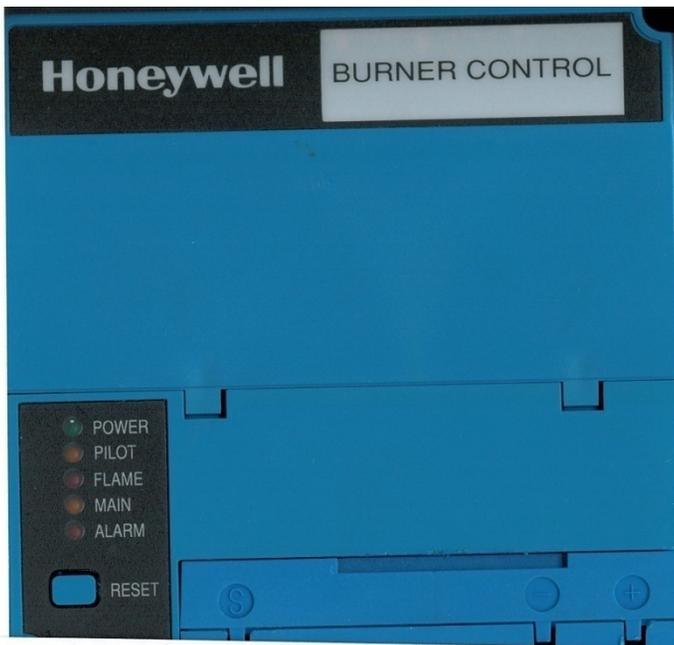


CG-610 - Lockout

- The manual procedure required for effecting the restart of the equipment subsequent to a lockout shall be accomplished from a location where the cause of the lockout may be determined so that the necessary corrective action may be performed to assure that safe operating conditions prevail before restarting the boiler.



Manual Resets



Questions/Comments

