

TYPES P-CG AND CGM GAS-FIRED BOILERS (Series 7)

GENERAL INSTRUCTIONS AND REQUIREMENTS

All instructions shipped with this boiler are to be returned to their envelope and given to owner or displayed adjacent to the boiler.

Attached to the boiler crate and certain other control boxes is a Consumer Protection (CP) tag stamped with that item's CP number. Be sure to put these self adhesive tags on the item in that crate or box. For the boiler, the CP tag should be placed next to the boiler ratings plate.

The side of the boiler to your left as you face the front of the boiler will be referred to in these instructions as the Left End (LE); the side to your right will be referred to as the Right End (RE).

NOTE: Installations must conform with the requirements of local utilities, or any local, state, or insurance requirements or codes having jurisdiction and with the National Fuel Gas Code, ANSI Z223.1-1974. Boilers must be installed in accordance with our instructions so as not to void our warranty.

CHIMNEY OR VENT REQUIREMENTS (also refer to Breeching Erection)

The chimney or vent should not be smaller than the size recommended on the last page of these instructions under Ratings—Dimensions—Engineering Data. The chimney or vent should extend high enough above the building or any other obstruction so that wind from any direction will not strike from an angle above horizontal and thus produce down drafts. In most cases a chimney or vent extended at least 2 feet above the highest part of the roof or other structure within 30 feet will be sufficient.

A lined chimney is preferred and must be used when required by federal, state, or local building codes. Vitreous tile linings with joints which prevent the retention of moisture and linings made of noncorrosive materials are advantageous. Advice regarding recommended practice and material for flue connections and chimney linings can usually be obtained from the local gas utility and should be given careful consideration. If a Type B or Type C vent is acceptable and is used, the instructions relative to the size and height contained in the American National Standard National Fuel Gas Code Z223.1-1974 in the United States and CGAB149 Installation Code for Gas Burning Appliances and Equipment in Canada should be followed. The chimney should be examined before the gas boiler is installed to be certain that it is properly constructed, clear, and will freely conduct the products of combustion to the atmosphere.

The breeching connection must be above the extreme bottom of the chimney to avoid stoppage. The breeching must not enter the chimney so far as to obstruct the chimney. A thimble or slip joint should be used where the breeching enters the chimney to allow removal for cleaning. Do not place a damper or any other obstruction in the breeching.

Where two or more gas appliances vent into a common chimney or vent, the equivalent area of the common chimney or vent should be at least equal to the area of the vent outlet on the largest appliance plus 50 percent of the area of the vent outlet on the additional appliance.

CAUTION AIR SUPPLY FOR BOILER ROOM

Provisions must be made to supply sufficient clean air to the boiler room at all times. In buildings of conventional frame, brick, or stone construction without enclosed utility rooms, basement storm windows, or tight stair doors, infiltration is normally adequate to provide air for combustion and dilution of combustion gases at the draft hood.

For installation in an enclosed utility or boiler room without an outside wall, two fresh air openings are required (one near the top and one near the bottom of the room). When all the air comes from inside of the building, each opening should have a minimum free cross sectional area of at least 1 square inch for each 1,000 BTU per hour of boiler input. When all the air comes from outside and is directly connected to the boiler room or is connected to the boiler room with vertical ducts of equal area, each opening should have a minimum free cross sectional area of at least 1 square inch for each 4,000 BTU per hour of boiler input. When all the air comes from outside and is connected to the boiler room with horizontal ducts of equal area, each opening should have a minimum free cross sectional area of at least 1 square inch for each 2,000 BTU per hour of boiler input.

CAUTION IMPORTANT PRECAUTIONS

Follow the wiring diagram furnished with the boiler or the wiring diagram label located on the inside of the jacket door. The operating instruction plate is located on the jacket interior panel and should be carefully followed.

The Types P-CG and CGM boilers are A.G.A. design certified and C.G.A. approved for natural and propane gases. For natural gas, the inlet gas pressure to the boiler should be 5 inches to 14 inches water column. If the inlet gas pressure exceeds 14 inches water column, a pressure regulator should be installed upstream of the boiler hand valve; the pressure regulator should be of the 100 percent lock-up type and should not permit gas pressures in excess of 14 inches water column. For propane, the inlet gas pressure to the boiler gas valve should be 11 inches to 13 inches water column; the pressure regulator (furnished by the gas-supplier) must provide lock-up pressures not exceeding 14 inches water column.

The gas orifices assembled on the gas manifold at the factory are for the type of gas specified on the boiler order. See the chart below.

Type Gas	Heating Valve BTU/cu. ft.	Standard Orifice Size
Natural	1,000	46
Propane	2,500	56

BOILER FOUNDATION

If a boiler foundation is desired, it should be constructed according to the dimensions shown in the chart on the next page, these dimensions allow about 1 inch

clearance all around the boiler. If the boiler is to be located in a confined space, refer to Figures 1a and 1b for minimum clearances.

BOILER FOUNDATION SIZES		
Number of Boiler Sections	Foundation Width	Foundation Length
3	12"	25 1/4"
4	15"	25 1/4"
5	18"	25 1/4"
6	21"	25 1/4"
7	24"	25 1/4"
8	27"	25 1/4"

CAUTION EXPANSION TANK SIZING

The most common cause of lime deposits in boilers is caused by inadequate expansion tank volume. Too small an expansion tank causes repeated loss of system water from the relief valve and the subsequent addition of makeup water thru the fill valve with eventual boiler failure. Follow the sizing table below and obtain additional sizing assistance for old gravity water systems or radiant panel systems. NOTE: When additional expansion tank capacity is required, do not replace the tank furnished with the boiler. Instead, an additional tank(s) should be connected to a tee(s) in the system piping adjacent to the boiler.

EXPANSION TANK SIZING*

Number of Boiler Sections	Standard Fill-Trol Tank—Adequate for Series Loop Piping Systems with Convactor Baseboard	Additional Ex-Trol Tank Required for One Pipe Systems with Convactor Baseboard	Additional Ex-Trol Tank(s) Required for Cast-Iron Radiators	Additional Ex-Trol Tank(s) Required for Cast-Iron Baseboard
3	No. 109	—	No. 15	No. 15
4	No. 109	No. 15	No. 15	No. 30
5	No. 109	No. 15	No. 15	No. 30
6	No. 110	—	No. 15	No. 30
7	No. 110	—	No. 30	No. 30
8	No. 110	No. 15	No. 30	No. 15 & 30

* Tank selection based on 220°F. average system water temperature.

RECOMMENDED INSTALLATION CLEARANCES (Applicable to U.S.A. Installations Only)

Where the boiler is to be located in a closet or confined space, minimum clearances must be provided all around the boiler as illustrated in Figure 1a. The vent pipe must be at least 6 inches from combustible material.

RECOMMENDED INSTALLATION CLEARANCES (Applicable to Canadian Installations Only)

Where the boiler is to be located in a confined space, minimum clearances must be provided all around the boiler as illustrated in Figure 1b. The vent pipe must be at least 6 inches from combustible material.

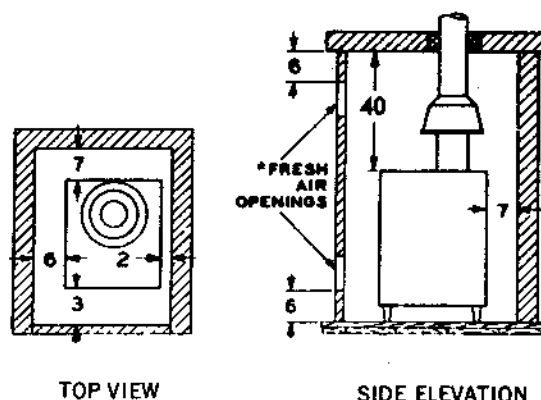


FIGURE 1a

*Refer to Column Heading Air Supply For Boiler Room For Sizing Required Fresh Air Openings.

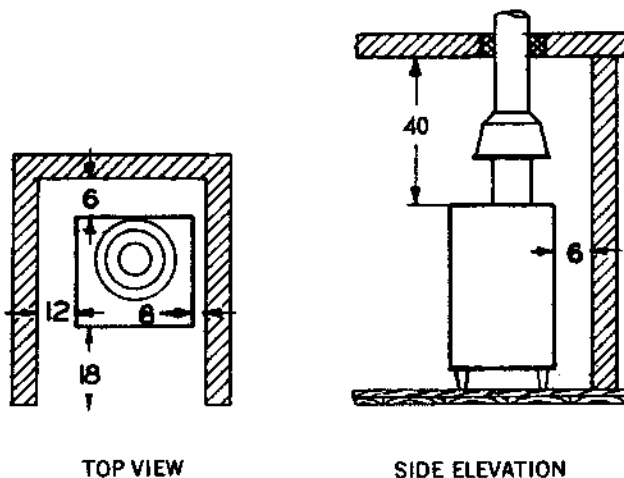


FIGURE 1b

CAUTION LOCATING THE BOILER

The boiler is A.G.A. design certified and C.G.A. approved for installation on a combustible floor. Be sure to remove the boiler from the shipping pallet. Do not alter or remove legs from the boiler. Be sure the unit is level so that air can be separated from the circulating water. Place shims under the boiler legs where necessary. Remove the access panel and discard the washers which held the access panel in place during shipment. Level and straighten the burners, with equal space between each burner and make sure the gas orifices will inject gas down the centerline of the burner mixer tubes. Re-install the access panel by slipping the holes in the access panel over the screw heads which secured the panel during shipment.

HYDROSTATIC PRESSURE TEST OF BOILER

The individual sections and the complete boiler have been pressure tested at the factory; however, the boiler

should be tested at the job to insure that the water-tight seal was maintained during shipment.

1. Remove and discard the shipping nipple from the top of the boiler and plug all tappings.
2. Fill the boiler with water. Completely purge all air. Test the boiler with water pressure not exceeding 30 psi.
3. Inspect the boiler for leaks.
4. Drain the boiler and remove plugs from tappings that will be used for controls and accessories.

**SUGGESTED BOILER PIPING CONNECTIONS
TO THE HEATING SYSTEM**

The boiler is provided with a built-in air elimination system.

For P-CG boilers, install the Float Type Automatic Air Vent. No additional boiler air eliminating device will be required. For proper operation and venting of the float type automatic air vent, unscrew the vent cap at least two full turns.

1. For CGM boilers used with a closed type expansion tank, connect from the compression tank tapping on the left end section (located just behind the supply outlet tapping) to the compression tank using 1/2" N.P.T. piping. Any horizontal compression tank piping must pitch upward at least 1 inch for each 5 feet of piping toward the tank. For CGM boilers used with a closed diaphragm pre-pressurized type compression tank, install a manual or automatic type air vent in the 1/2" N.P.T. tapping.

2. Pipe from the relief valve outlet to a floor drain or near the floor. Do not pipe the relief valve discharge to any area where freezing temperatures could occur.

3. Connect the system supply piping to the supply outlet tapping at the left end of the boiler.

4. For Type P-CG and CGM boilers, connect the system return piping to the circulator counter flange (see Figure 3). Be sure not to overheat the gasket between the flanges when soldering fittings.

5a. For Type CGM boilers, connect the cold water fill supply piping close to the boiler in the compression tank piping.

5b. For Type P-CG boilers, connect the cold water fill supply piping to the union on the combination automatic fill valve and manual shut-off valve. Before making this connection, refer to the separate instructions on the tag attached to the handle of the valve.

6. For type P-CG boilers, attach the No. 110 Fill-Trol Tank to the Combination Fill Valve and Manual Shut-Off Valve.

Where the boiler is to be used with low water temperature applications (i.e. converted gravity systems, etc.) a boiler bypass piping arrangement should be used to assure higher boiler water temperature for optimum boiler operation. Locate a tee in the return piping between the circulator and the boiler and another tee in the supply piping as illustrated in Figure 2. Use the same size bypass piping as the supply and return piping. Locate a valve in the bypass piping and in the supply piping between the supply outlet tapping and the tee as illustrated in Figure 2 so the water flow through the boiler and through the bypass can be regulated to maintain a higher boiler water temperature. Adjust the

valves to provide 200 degree to 200 degree F. boiler water temperature when the system water temperature is at the maximum desired.

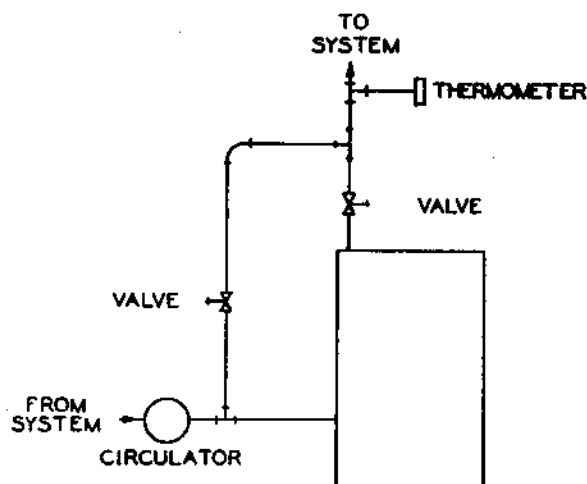


FIGURE 2

CAUTION DRAFT HOOD INSTALLATION

Secure the draft hood to the outlet of the flue collector hood at the top of the boiler with sheet metal screws. For proper combustion the bottom of the draft hood "skirt" must have the clearance dimension above the jacket top panel as indicated on the draft hood. If the draft hood is altered, the A.G.A. design certification and CGA approval become void.

**CAUTION BREECHING ERECTION
(Also Refer to Chimney or Flue)**

Connect from the draft hood outlet to the chimney or vent with full-sized (same diameter as draft hood outlet) breeching. Where the installation permits, vertical venting of the combustion gases to the outside from the draft hood outlet will afford best performance at lowest total cost. Where the boiler must be connected to a chimney or remote vent the horizontal breeching should slope upward at least 1/4 inch per lineal foot toward the chimney or vent. A vertical height of 3 feet to 5 feet of breeching before any elbow or horizontal breeching is recommended to reduce chances of flue gas spillage at the draft hood. Long horizontal breechings, excessive numbers of elbows or tees, or other obstructions which restrict the flow of combustion gases should be avoided.

CONNECT THE BOILER TO THE GAS SUPPLY

If the gas supply piping is to be located at the right side of the boiler, remove the knockout disc from the Jacket Right Side Panel; if the gas supply piping is to be located at the left side of the boiler, remove the knockout disc from the Jacket Left Side Panel.

The gas supply piping should be installed in accordance with the American National Standard National Fuel Gas Code Z223.1 in the U.S.A. or CGAB149 Installation Code for Gas Burning Appliances and Equipment in Canada. The pipe joint compound (pipe dope) employed should be resistant to the corrosive action of liquefied petroleum gases and should be applied sparingly only to the male threads of the pipe joints. The boiler must be disconnected from the gas supply piping

TYPES P-CG AND CGM GAS-FIRED BOILERS (Series 7)

system during any pressure test of the gas supply piping system.

1. Remove the Jacket Door and Connect from the gas valve to the gas meter (see Size of Piping to Gas Boilers). Use an elbow and nipple at the inlet connection of the gas valve to allow the gas piping through the opening in the Jacket Side Panel. If the boiler is to be propane fired, make sure the pressure regulator or pressure regulator cover plate is installed on the main (automatic) gas valve.

If the manual main shut-off gas valve is required it must be located in the gas supply piping according to the local utility requirements.

2. A drip leg must be installed at the inlet of the gas connection to the boiler to comply with ANSI Standard and C.G.A. requirements. Where the local utility requires that the drip leg be extended all the way to the floor, place an appropriate length of pipe between the cap and tee. A ground joint must be installed in the piping to provide for servicing. Gas supply piping must be supported by external hangers, not by the boiler or its accessories.

3. Purge all air from the gas supply piping.

4. Check all gas connections for leaks using a soapy solution. Liability for damage done through the use of a flame can not be assumed by the manufacturer.

SIZE OF PIPING TO GAS BOILER

In sizing the gas piping, the following factors should be considered:

- Diameter and length of the gas supply piping and number of fittings.
- Maximum gas consumption (including any possible future expansion)
- Allowable loss in gas pressure from the gas meter outlet to the boiler. This is specified as three-tenths on an inch water column.

The volume of gas (in cubic feet per hour) should be determined, whenever possible, directly from the input rating (in BTU per hour) of the boiler and the heating value of the gas. To obtain the cubic feet per hour, divide the input (in BTU per hour) by the BTU heating value per cubic foot of gas.

PIPE DELIVERY SCHEDULE

Length of Pipe in Feet	CAPACITY OF PIPE IN CUBIC FEET OF GAS PER HOUR				
	1/2"	3/4"	1"	1 1/4"	1 1/2"
10	132	278	520	1050	1600
20	92	190	350	730	1100
30	73	152	285	590	890
40	63	130	245	500	760
50	56	115	215	440	670
75	45	93	175	360	545
100	38	79	150	305	460
150	31	64	120	250	380

*Flow determined by Dr. Pole's Formula-Specific Gravity: .60 Pressure Loss: 3/10" water.

ADDITIONAL LENGTH OF PIPE TO BE ADDED FOR EACH
ELBOW OR TEE BEND IN THE LINE

Pipe Size, inches	Additional Length, Feet
1/2	1.3
3/4	1.7
1	2.2

CAUTION WIRING THE BOILER

Pages 9 and 10 contain standard wiring diagrams for 24 volt and millivolt applications. The boiler is shipped with the combination relay-transformer, limit control, circulator and main (automatic) gas valve completely wired. Bring the electrical supply through the proper opening in the jacket left side panel (see Figure 4 item 16) and into the junction box; wire the electrical supply as shown on the appropriate wiring diagram. Bring the thermostat wiring through the opening in the jacket left side panel and wire the thermostat across the terminals on the combination relay-transformer as shown on the wiring diagram label. All safety circuit wiring should be N.E.C. Class-1 for installations in the United States and must conform to the Canadian Electrical Code for Canadian installations. All wiring should also be installed in compliance with any local or state codes or requirements having jurisdiction. The boiler must be electrically grounded in accordance with the National Electrical Code, ANSI CI-1975.

When using multiple zone valves with the boiler, follow the separate wiring diagram packaged with the control.

CAUTION OPERATING AND SAFETY CHECK OUT SEQUENCE

- Be sure the boiler and the heat distributing units are filled with water (see Filling Water Boilers in these instructions). For P-CG boilers, open the vent cap on the Float Type Automatic Air Vent two full turns.
- Be sure the air is purged from the gas supply piping and the piping has been checked for gas leaks.
- Caution: Make sure that the manual main shut-off gas valve and/or the manual gas cock knob on the main (automatic) gas valve have been closed for at least five minutes before attempting to light the safety pilot burner.
- Follow "Lighting The Boiler" as given further on in these instructions.
- Set the adjustable heat anticipator on the room thermostat according to the appropriate wiring diagram notes.

BURNERS

No primary air adjustment is required on burners for natural or propane gases.

MEASURE GAS INPUT TO BOILER

Measure the gas input to the boiler by reading the gas meter. Be sure all other appliances connected to the same meter are shut-off. Rate of gas flow (cubic feet per hour) multiplied by the BTU value (per cubic foot) of the gas used should check with the A.G.A. design

certified or C.G.A. input shown on the rating plate of the boiler. If the actual input is within 5 per cent of the rated input, adjust the gas pressure regulator to obtain the required gas flow. For boilers equipped with the combination type gas control valve, the gas pressure regulator is located on the main gas valve body. To adjust the gas input, remove the regulator adjustment screw cap and turn the adjustment screw clockwise to increase or counter-clockwise to decrease the gas flow. If the actual input is more than 5 per cent off the rated boiler input, change orifice sizes.

NOTE: For proper aspiration, the Manifold Gas Pressure should be at least $3\frac{1}{2}$ inches water column for natural gas and 10 inches water column for propane gas.

CAUTION ADDITIONAL INSTRUCTIONS

Before leaving the job, make sure the unit checks electrically. Be sure the room thermostat is set to the desired room temperature and that the limit control is set according to the requirements of the heating system. For additional information on controls, refer to the manufacturer's instructions supplied with the controls.

WHEN BOILER IS USED WITH REFRIGERATION SYSTEM

If the boiler is used in connection with a refrigeration system, the chilled medium shall be piped in parallel with the boiler and with valves to prevent the chilled medium from entering the boiler; see figure 3.

If the boiler is connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation, the boiler piping system shall be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

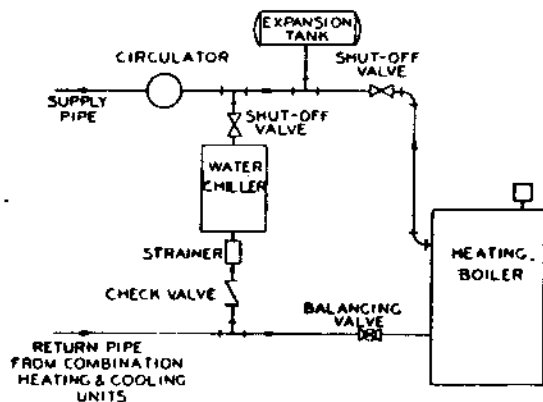


FIGURE 3

BOILER SERVICE AND MAINTENANCE

Review this information and the Homeowners Information manual with the owner and be sure he receives all instructions.

CAUTION FILLING WATER BOILERS

In hard water areas we recommend filling the boiler and heating system with softened water.

The boiler and the entire system should be filled and heated to approximately 210 Deg. F for about 15 minutes to drive off dissolved gases. Before filling the system, make sure all the system air vents are closed. Open the hand water feed valve and beginning on the lower floor, open the air vents (one at a time) until water starts to flow; then, close the vent. Repeat this throughout the building until all heat distributing units are filled with water. Close the hand water feed valve when the correct boiler pressure is reached. After the system is in operation, keep the system filled with water by occasionally opening the air vents allowing any entrapped air to escape and adding enough make up water to maintain the correct system pressure. If your system is provided with a purge valve located in the system return piping, connect a garden hose to the drain valve located above the purge valve. Close the purge valve and open the hand water feed valve and allow the system to purge all air. Where the system has more than one circuit, purge each circuit separately by opening each balancing valve one at a time. When the system is purged of all air, close the drain cock located above the purge valve and open the purge valve. Fill the boiler and the entire system to the correct pressure. Air in the system can interfere with circulation of water and prevent the heat distributing units from properly heating.

Leaks in the boiler and piping system must be repaired at once. The use of makeup water in large quantities is undesirable and may damage the boiler after an extended period of time. If serious leaks occur, stop the burners and gradually reduce boiler temperature. Do not attempt to make repairs while hot water boiler temperatures are above 130 Deg. F.

Any problem in regard to large amounts of makeup water, scale in the boiler, or internal corrosion or pitting, should be referred to a company specializing in boiler water chemistry.

Periodically, check the seal afforded by any gasket installed on the boiler or heating system. If necessary, thoroughly tighten all bolts to restore the watertight seal.

DO NOT DRAIN BOILER during periods of shutdown unless heating system is exposed to freezing temperatures. Open boiler drain cock to remove impurities that have settled to the bottom of the boiler. Refill as required to the correct pressure for water boilers. Turn off all electrical power connections to the boiler and its auxiliaries. Clean all carbon, rust, and other deposits from the fire-side of the boiler heating surfaces in order to protect the boiler from the corrosive action of combustion deposits (see Cleaning Boiler Heating Surfaces). If the water side of the boiler must be cleaned or inspected, open the boiler drain valve and drain the boiler. Hose the inside of the boiler with high pressure water to remove sludge and sediment, flush again. Replace plugs and jacket panels when all traces of sludge and sediment have been removed. Dry insides of boiler thoroughly, or refill with fresh water and heat to release dissolved gases (see Filling Water Boilers). Repeated draining and filling of the boiler and/or the heating system can lead to the same consequences as adding too much makeup water — this is mainly true where the makeup water is "hard" and the same

TYPES P-CG AND CGM GAS-FIRED BOILERS (Series 7)

precautions must be used as indicated in an earlier paragraph.

CAUTION CLEANING BOILER HEATING (fire-side) SURFACES

At the end of every heating season, it is advisable to inspect and if necessary clean the flues in the boiler. Soot is an effective insulator and prevents the hot gases from heating the boiler water as efficiently as possible. Normally this boiler will be cleaned from the top as described below.

1. Remove the top jacket panel of the boiler.
2. Remove the flue opening cover at the top of the boiler sections and take out the baffle plates from between the boiler sections.
3. Remove the burners, if not already removed for cleaning, to avoid brushing soot and dirt into the burner openings, or extinguish the pilot and cover all the main burners with heavy papers.
4. Insert a wire flue brush vertically through openings between sections and scrub all flue surfaces vigorously.
5. Replace the clean burners or remove papers which covered the main burners.
6. Replace the cleaned baffle plates and flue opening cover making sure the original gas-tight seal is maintained between the cover and the boiler sections.
7. Replace jacket top panel.
8. Start the boiler according to the procedures outlined in these instructions.

WATER BOILER CONTROLS

CIRCULATOR CARE

Never operate the circulator without water

- A. Follow lubricating instructions on circulators that are provided with oil cups or oil holes.
- B. Follow venting instruction on circulators with water lubricated bearings which require no oil.

BOILER PRESSURE

The initial fill pressure of the boiler and entire system should be according to the design requirements of the heating system (in general, the fill pressure for most heating systems would be to 12 pounds per square inch). Normal system pressure will fluctuate between the fill pressure, when the system is cold; and rise to maximum pressure (just below the relief valve opening pressure), when the system is hot.

BOILER WATER TEMPERATURE

Modern hot water heating systems with "closed" type expansion tanks may operate at water temperatures up to 250 Deg. F. The high limit control must be set according to the design requirements of the heating system during severe winter weather, you may find that this temperature setting needs to be raised or lowered depending upon characteristics of your system.

EXPANSION TANK

An expansion tank is employed with hot water heating systems to accept the increased water volume which results from heating the system water. The expansion tank on a closed hot water heating system should provide adequate pressurization under all system operating

conditions. Frequent opening of the pressure relief valve can be the result of an undersized expansion tank because provisions for the necessary expanded water volume has not been provided, or the tank has become "waterlogged" and must be charged with air or drained of water, or the tank has developed a leak.

PRESSURE-TEMPERATURE GAUGE

This gauge indicates the boiler pressure in pounds-per-square-inch by the upper hand. The lower hand indicates the boiler water temperature in degrees fahrenheit.

CAUTION WATER RELIEF VALVE

Check the relief valve at least once a year by pulling the handle and allowing a small quantity of water to flow. Be sure the relief valve reseats properly and is entirely free from seepage. If the relief valve sticks or appears to be clogged, it should be replaced immediately. The relief valve outlet should be piped to a floor drain or near the floor. The relief valve discharge must not be piped to any area where freezing temperatures could occur.

CAUTION BURNER FLAMES

Periodically inspect main burner and pilot flames visually for proper appearance. The tips of the flames should not be yellow in color; orange color in the flames is acceptable.

CAUTION VENTING SYSTEM

Periodically inspect the boiler venting system in accordance with the procedure in the Homeowners Information Manual.

BOILER ROOM HOUSEKEEPING

There should be no obstructions to the flow of an adequate amount of combustion and ventilation air. The area surrounding the boiler must be kept clean, and no combustible materials, gasoline or other flammable vapors or liquids should be permitted nearby.

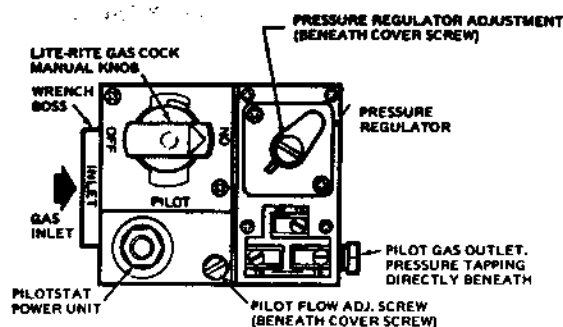
BOILER WIRING DIAGRAM

The wiring diagram for this boiler is mounted either on the inside of the jacket door or on the jacket inner panel. Standard wiring diagrams may also be found on pages 9 and 10.

CAUTION LIGHTING THE BOILER

1. Be sure the main electric switch in the boiler electrical circuit is turned to the off position.
2. Remove jacket door.
3. Remove access panel.
4. Locate pilot burner and gas valve.
5. Locate gas valve knob and make sure it has been OFF for at least 5 minutes (see illustration of gas Valve on following page).
6. Turn valve knob to PILOT and push in completely. While holding knob all the way in, light pilot burner with a match.
7. With pilot burning, hold valve knob all the way in for about one minute, then release knob. Pilot flame should remain lighted.

TYPES P-CG AND CGM GAS-FIRED BOILERS (Series 7)



TOP VIEW OF TYPICAL GAS VALVE

SHUT DOWN OF BOILER

1. Turn off main electric switch in the boiler electrical circuit.
2. Depress gas valve knob slightly and turn to OFF position.
3. Open the boiler drain cock to remove impurities that may have settled to the bottom of the boiler. Close boiler drain cock. Refill the boiler to the proper water pressure.

8. Turn valve knob counterclockwise to ON.
9. Replace access panel.
10. Replace jacket door.
11. Turn main boiler electric switch ON.
12. Set thermostat to desired room temperature.

TYPES P-CG AND CGM GAS-FIRED BOILERS (Series 7)

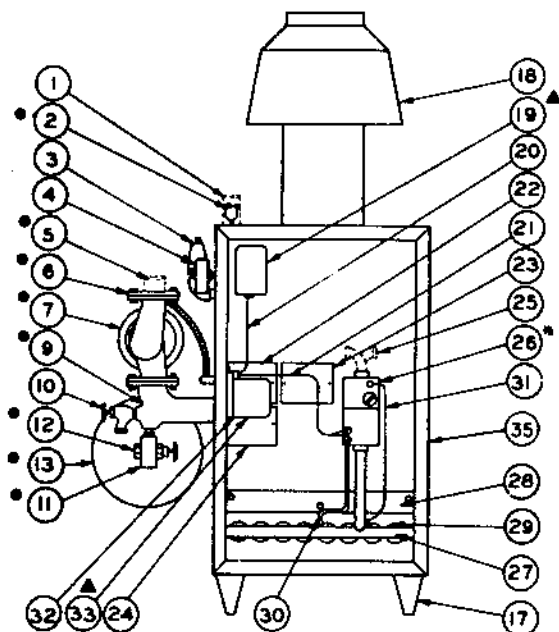
Weil-McLain

PARTS LIST

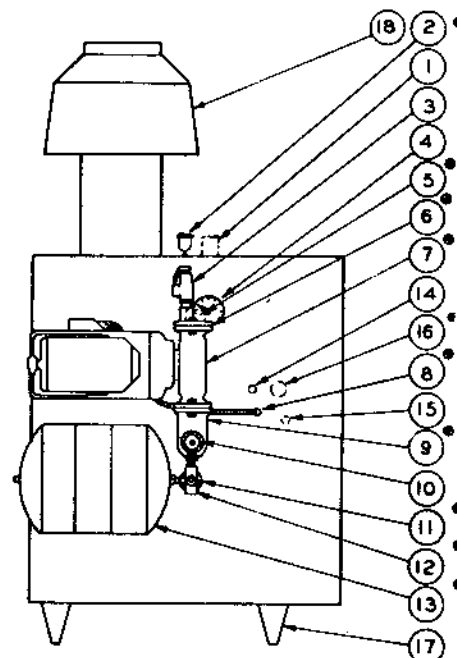
Well McLain will endeavor to stock major boiler replacement parts for at least 20 years; items manufactured by others will normally have an equivalent part available for at least the same time period. Do not order replacement parts directly from Weil-McLain; your serviceman must provide our distributor with the type of fuel, boiler size, type and series for proper parts replacement.

Those replacement parts likely to be available locally from your installer, serviceman or local heating supply or store are identified in Figure 4 as items: 1, 2, 3, 4, 5, 6, 7, 8, 10, 19, 20, 21, 25, 26, 30, 31, 32 and 33.

Those replacement parts which may have to be ordered from your installer or serviceman and their Weil McLain distributor from Weil McLain will be items: 4, 9, 12, 13, 17, 18, 22, 23, 24, 27, 28, 29, 33, 34 and 35.



FRONT



LEFT SIDE

FIGURE 4

- 1. Supply Outlet
- 2. Float Type Automatic Air Vent
- 3. ASME Pressure Relief Valve
- 4. Combination Pressure-Temperature-Altitude Gauge
- 5. Return Inlet (for P-CG and CGM boilers)
- 6. Circulator Counter Flange
- 7. Circulator
- 8. Circulator Wiring Harness
- 9. Angle Circulator Flange
- 10. Drain Cock
- 11. Combination Automatic Fill Valve and Manual Shut-off Valve
- 12. Cold Water Fill Connection
- 13. Air Cushion Tank (closed diaphragm type)
- 14. Thermostat Wiring Inlet

- 15. Electrical Supply Inlet
- *16. Knockout for Gas Supply Piping (jacket right end and left end panels)
- 17. Boiler Leg (four used)
- 18. Draft Hood
- ▲19. High Limit Control
- 20. Safety Circuit Wiring
- 21. Gas Valve Wiring
- 22. AGA Rating Plate
- 23. Operating Instruction Plate
- 24. Closet Clearance Plate
- 25. Street Elbow, or Elbow and Close Nipple (not furnished)
- *26. Combination Manual Main Shut-Off Gas Valve, Main Automatic Gas Valve, and Pressure Regulator

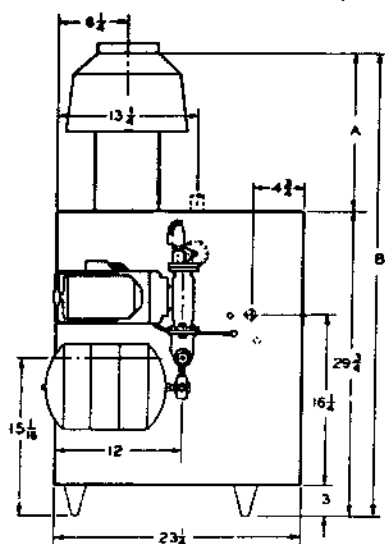
- 27. Gas Manifold
- 28. Access Panel
- 29. Main Burners
- 30. Safety Pilot Burner Gas Supply Tubing
- 31. Thermocouple
- 32. Wiring Junction Box (not furnished with boilers equipped with self generating controls)
- ▲33. Combination Relay with 40VA Transformer (for boilers equipped with 24 volt controls, not furnished when boiler is equipped with self generating controls)
- 34. Boiler Section Assembly (not shown); varies by boiler size.
- 35. Boiler Jacket Assembly; varies by boiler size.

● Not furnished with Model CGM boilers.

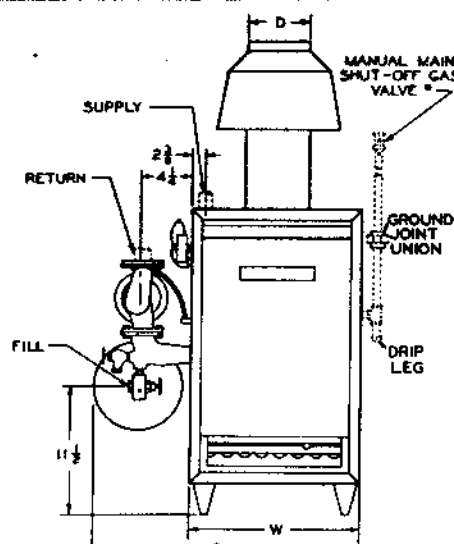
* The gas supply piping may be located at the left side or right side of the boiler. If an additional manual main shut-off gas valve is required, it should be located in the gas supply piping according to the local utility requirements.

▲ For boiler ordered with self generating controls, the combination high limit control, relay and 40VA transformer (with manual switch to permit gas valve operation with limit protection in the event of power failure) will be furnished in place of the separate high limit control and combination relay with 40VA transformer.

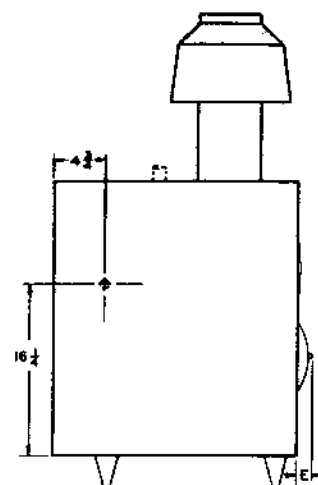
TYPES P-CG AND CGM GAS-FIRED BOILERS (Series 7)



LEFT SIDE



FRONT



RIGHT SIDE

* Locate manual main Shut-Off Gas Valve (where required) according to utility requirements. Gas Supply Piping may be located at the left side or right side of the boiler.



Design
Certified by
American Gas
Association



Approved by
Canadian Gas
Association



Net ratings approved by
Institute of Boiler and
Radiator Mfrs.



Built to
ASME
specifications

RATINGS — DIMENSIONS

Boiler Number	Input BTU/Hr.	D.O.E. Heating Capacity	Net I-B-R Ratings BTU/Hr.*	Dimensions					
				A	B	C	D	E	W
◆P-CG-3	70,000	55,000	47,800	15"	44 3/4"	18 1/4"	4"	1 1/2"	10"
◆P-CG-4	105,000	83,000	72,200	17 3/8"	47 3/8"	21 1/4"	5"	1 1/2"	13"
◆P-CG-5	140,000	110,000	95,700	21 1/4"	51"	24 1/4"	6"	1 1/2"	16"
◆P-CG-6	175,000	138,000	120,000	25 1/4"	55"	30 3/8"	6"	4"	19"
◆CGM-7	210,000	165,000	143,500	25 1/4"	55"	33 3/8"	7"	4"	22"
◆CGM-8	245,000	192,000	167,000	30 1/4"	60"	36 3/8"	7"	4"	25"

ENGINEERING DATA

Boiler Number	Supply Outlet		Return Inlet		Boiler Water Content Gallons	Maximum Allowable System Water Content in Gallons with Standard Fill-Trol ▲	Gas Connection Pipe Size		Gas Manifold Pipe Size All Gases	Chimney and Breeching Size *
	No.	Pipe Size	No.	Pipe Size			Natural Gas	Propane Gas		
◆P-CG-3	1	1 1/4"	1	1"	1.54	18	1/2"	1/2"	1/2"	4" I.D.
◆P-CG-4	1	1 1/4"	1	1"	2.11	18	1/2"	1/2"	1/2"	5" I.D.
◆P-CG-5	1	1 1/4"	1	1"	2.69	18	1/2"	1/2"	1/2"	6" I.D.
◆P-CG-6	1	1 1/4"	1	1 1/4"	3.26	44	1/2"	1/2"	1/2"	6" I.D.
CGM-7	1	1 1/4"	1	1 1/4"	3.84	44	1/2"	1/2"	3/4"	7" I.D.
CGM-8	1	1 1/2"	1	1 1/4"	4.42	44	3/4"	3/4"	3/4"	7" I.D.

◆ Delete "P" and add suffix "M" to designator for package unit without Fill-Trol (example CGM-3).

* Net I-B-R Water Ratings are based on net installed radiation of sufficient quantity for the requirements of the building and nothing need be added for normal piping and pick-up. Ratings are computed on an allowance factor of 1.15. For usual piping and pick-up loads, consult Weil-McLain Customer Services Department.

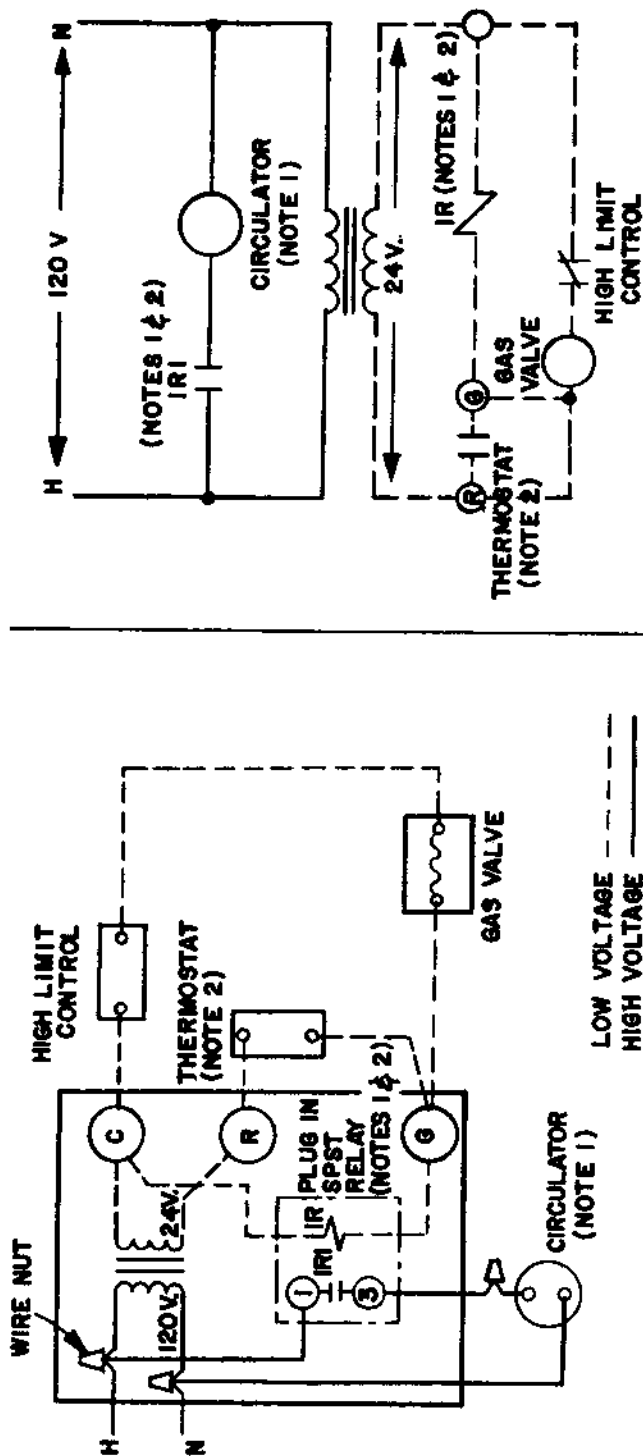
▲ Includes boiler water volume. For piping systems which have a higher water content, additional compression tank capacity must be provided (see table in text).

* In special cases where surrounding conditions permit, chimney height may be 10 ft.

TYPES P-CG AND CGM GAS-FIRED BOILERS (Series 7)

Well-
Clair

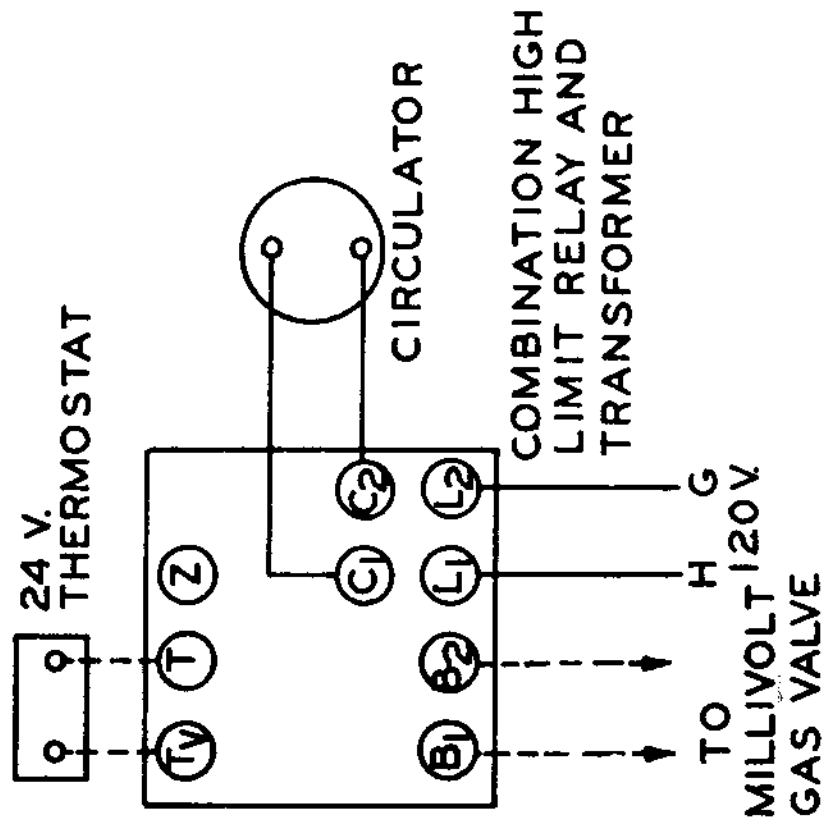
24 VOLT APPLICATION



NOTES:

1. Not required for gravity hot water boilers.
2. Where plug-in relay is used, thermostat heat anticipator setting must be .65 amps. When relay is not used, heat anticipator setting must equal amperage indicated on gas valve.
3. All wiring must be installed in accordance with the requirements of the National Electrical Code and any additional state or local code requirements having jurisdiction.
4. All safety circuit wiring must be N.E.C. Class 1.
5. For multiple zoning using either zone valves or circulators, refer to the component manufacturer's instructions for applications and wiring.
6. Should any standard equipment wiring necessitate replacement, 90°C thermoplastic conductors or its equivalent must be employed.

MILLIVOLT APPLICATION



HEAT ANTICIPATOR SETTING .2 AMPS.

