

Revised by 550-110-526/1290

# WEIL-McLAIN



## Boiler Manual CGM AND P-CG (Series 9) Gas-Fired



- Includes:**
- Installation
  - Start-up
  - Service
  - Parts

**Refer to Control Supplement  
for additional information**

**For Natural or Propane Gas**

### **BOILER MANUAL FOR USE BY A QUALIFIED CONTRACTOR**

- To the owner:** Regular service on this boiler is recommended and should be performed by a qualified contractor.
- To the installer:** Read all instructions and warranty before starting.

Any claims for damage or shortage in shipment must be filed immediately against the transportation company by the consignee.

Part No. 550-110-537/0687 WM



## Table of Contents

### Section I: Pre-Installation

|                                    |   |
|------------------------------------|---|
| Air Supply for Combustion .....    | 3 |
| Chimney or Vent Requirements ..... | 4 |
| Minimum Service Clearances .....   | 4 |
| Boiler Foundation .....            | 4 |

### Section II: Boiler Set-Up

|                                 |   |
|---------------------------------|---|
| Placement .....                 | 5 |
| Draft Diverter .....            | 5 |
| Breeching .....                 | 5 |
| Hydrostatic Pressure Test ..... | 5 |

### Section III: Piping

|  |   |
|--|---|
| Supply and Return .....                | 6 |
| Expansion Tank Sizing .....            | 6 |
| Multiple Zoning with Circulators ..... | 7 |
| Bypass Piping .....                    | 8 |
| Use with Refrigeration System .....    | 8 |

### Section IV: Gas Piping .....

9

### Section V: Wiring .....

10

### Section VI: Final Adjustments

|                               |    |
|-------------------------------|----|
| Water Treatment .....         | 11 |
| Filling the System .....      | 11 |
| Inspect Base Insulation ..... | 11 |
| To Place in Operation .....   | 11 |
| Check Burner Flames .....     | 12 |
| Inspect Venting System .....  | 12 |

### Section VII: Check-Out Procedure ...

12-13

### Section VIII: Maintenance

|  |       |
|--|-------|
| Suggested Minimum Maintenance .....      | 14-15 |
| Common Problems/Possible Solutions ..... | 16    |

### Section IX: Replacement Parts ...

17-21

### Ratings & Dimensions .....

22-23

**IMPORTANT: When calling or writing about the boiler, PLEASE GIVE THE MODEL, SERIES, AND C.P. NUMBER located on the boiler nameplate.**

**Any reuse or reproduction of the artwork and copy in this manual is strictly prohibited without the written consent of Weil-McLain.**

#### WARNING

**DO NOT USE PETROLEUM-BASED CLEANING OR SEALING COMPOUNDS IN BOILER SYSTEM.  
SEVERE DAMAGE TO THE BOILER WILL OCCUR.**

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.

**DANGER**

indicates presence of a hazard which *will* cause *severe* personal injury, death or substantial property damage if ignored.

**CAUTION**

indicates presence of a hazard which *will* or *can* cause minor personal injury or property damage if ignored.

**WARNING**

indicates presence of a hazard which *can* cause *severe* personal injury, death or substantial property damage if ignored.

**NOTICE**

indicates special instructions on installations, operation, or maintenance which are important but not related to personal injury hazards.

**WARNING**

FAILURE TO FOLLOW ALL INSTRUCTIONS IN PROPER ORDER CAN CAUSE PERSONAL INJURY OR DEATH. READ ALL INSTRUCTIONS BEFORE INSTALLING.

## Section I: Pre-Installation

### CODES

Installations must comply with all local codes, laws, regulations and ordinances, also United States National Fuel Gas Code ANSI Z223.1-1984. When required, installations must conform to American Society of Mechanical Engineers Safety Code for Controls and Safety Devices for Automatically Fired Boilers, No. CSD-1. Safe lighting and other performance criteria were met with the gas manifold and control assembly provided on boiler when boiler underwent tests specified in ANSI Z21.13a-1983 standard.

### AIR SUPPLY FOR COMBUSTION

**WARNING**

Adequate combustion and ventilation air must be provided to assure proper combustion and prevent the possibility of flue gas spillage.

1. In buildings of conventional frame, masonry or metal construction, infiltration is normally adequate to provide combustion air for boilers in unconfined rooms.

2. If the space is in a building of unusually tight construction, air should be obtained from outdoors or from spaces which freely connect with outdoors (see #4 below).
3. For boilers in confined rooms, two permanent openings shall be provided: one within 12 inches from the ceiling and one within 12 inches from the floor of the room. Each opening shall be at least one square inch per 1,000 BTUH boiler input, but must not be less than 100 sq. inches. These openings shall freely connect with areas having adequate infiltration from outside.
4. When all air is provided from outdoors the confined space shall be provided with two openings as outlined in #3 above. These openings shall connect directly or by ducts with outdoors or spaces (crawl or attic) that freely connect with the outdoors and shall be of the size listed below for that particular arrangement:
  - (a) One square inch per 4,000 BTUH of boiler input for direct outdoor air supply through an outside wall or through vertical ducting directly to outside.
  - (b) One square inch per 2,000 BTUH of boiler input for direct outdoor air through horizontal ducting.
  - (c) All ducting shall be of the same size as the opening to which it is connected with minimum dimensions of no less than 3 × 3 inches or 9 total square inches of area.
  - (d) Other size ducting must comply with local codes.

## CHIMNEY OR VENT REQUIREMENTS

Minimum chimney or vent sizes are on page 23 of these instructions. In most cases a chimney or vent extended at least 2 feet above highest part of roof or other structure within 30 feet will be sufficient to prevent downdrafts.

A lined chimney is preferred and must be used when required by federal, provincial, territorial, state, or local building codes. Vitreous tile linings with joints that prevent retention of moisture and linings made of noncorrosive materials are best. Advice for flue connections and chimney linings can be obtained from local gas utility.

### DANGER

Inspect existing chimney before installing boiler. Failure to clean or replace perforated pipe or tile lining will cause severe injury or death.

### WARNING

Do not alter boiler draft hood or place any obstruction or non-approved damper in the breeching or vent system. Flue gas spillage can occur. A.G.A. certification will become void.

Where two or more gas appliances vent into a common chimney or vent, the equivalent area 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.

## SELECT THE BOILER LOCATION

CONSIDER ALL CONNECTIONS TO THE BOILER BEFORE SELECTING A LOCATION.

### WARNING

To avoid personal injury, death or property damage, keep the boiler area clear and free from combustible materials, gasoline and other flammable vapors and liquids.

## MINIMUM SERVICE CLEARANCES

### Suggested for easy servicing:

24 inches for cleaning and servicing, left side.  
18 inches for access to controls and components, front.  
36 inches from top for cleaning flueways.  
7 inches on remaining sides.

The vent pipe must be at least 6 inches from combustible material.

Clearance from hot water piping to combustible material—1 inch.

Screwdriver clearance for removal of jacket screws should be provided. If not, unions and shut-off valves should be installed in system so boiler can be moved for servicing.

## Required clearances in confined spaces

Refer to plate located on inner jacket panel for required minimum clearances. Also see Figure 1.

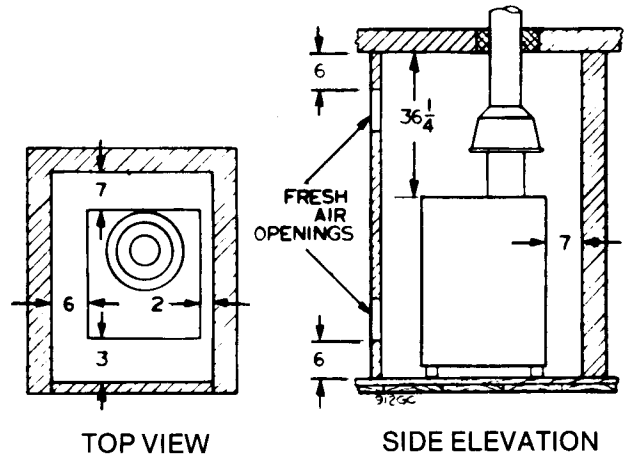


FIGURE 1

## RESIDENTIAL GARAGE INSTALLATION (ANSI Z223.1)

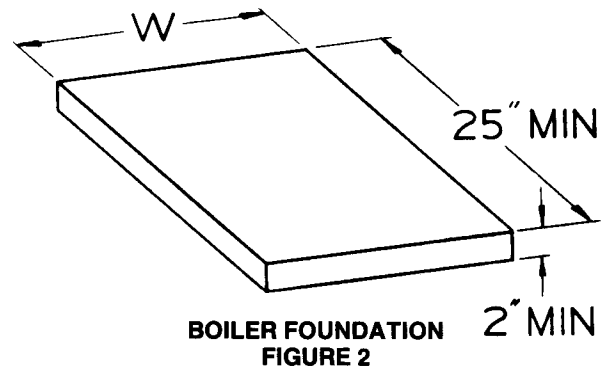
Install boiler so burners are at least 18 inches above the floor.

## BOILER FOUNDATION

Boilers are approved for use on combustible flooring but **MUST NOT BE INSTALLED ON CARPETING.**

1. Level concrete or solid brick pad foundation is required if:
  - a) Water could flood area.
  - b) Non-level conditions exist.

| 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"           |



BOILER FOUNDATION  
FIGURE 2

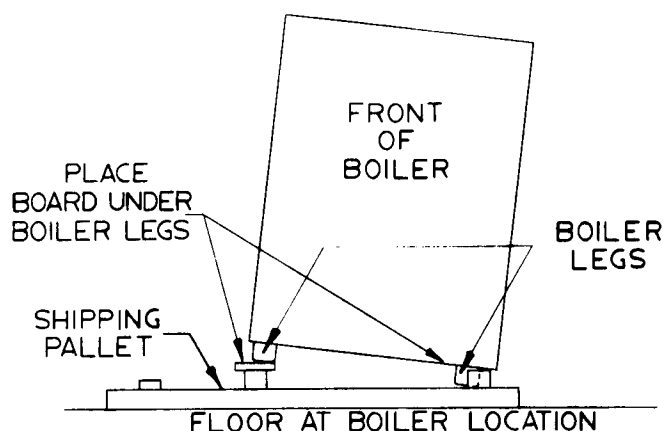
## Section II: Boiler Set-up

### PLACING THE BOILER

Leave boiler in crate and on pallet until installation site is ready.

1. Move entire crate and pallet next to selected location.
2. Remove crate.
3. Remove boiler from pallet as follows:
  - a. Tilt left side of boiler up and place a board under left legs.
  - b. Tilt boiler the other way and place a board under right legs.
  - c. Slide boiler backward off pallet and into position.

**DO NOT DROP BOILER OR BUMP JACKET ON FLOOR OR PALLET.**



**FIGURE 3**

4. Check level. Shim legs, if needed. Do not alter the legs.
5. Remove front jacket door. Remove burner access panel. Unscrew access panel screws; remove and discard shipping washers; reinstall screws.
6. Check for proper orifice sizing from chart below.

| ORIFICE DRILL SIZES |                            |                         |
|---------------------|----------------------------|-------------------------|
| Type of Gas         | Heating Value, BTU/cu. ft. | Std. Orifice Drill Size |
| Natural             | 1000                       | 46                      |
| Propane             | 2500                       | 56                      |

7. Level and straighten the burners.

#### WARNING

Burners must be properly seated in their locating slots with their openings facing up. Gas orifices must inject down the center of the burner.

8. Reinstall access panel.

### DRAFT DIVERTER INSTALLATION

Secure draft diverter to outlet at top of boiler with sheet metal screws. Bottom of draft diverter or "skirt" must have the clearance dimension above jacket top panel as indicated on draft diverter.

#### WARNING

Do not alter the draft diverter—flue gas spillage can occur. If draft diverter is altered, A.G.A. design certification becomes void.

### BREECHING ERECTION

Connect from draft diverter outlet to chimney or vent with same size breeching. Where possible, vertical venting to the outside from the draft diverter outlet will offer best performance at lowest total cost. Where horizontal breeching is used, slope upward at least 1/4 inch per lineal foot toward chimney or vent.

#### NOTICE

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 diverter. Long horizontal breechings, excessive numbers of elbows or tees, or other obstructions which restrict the flow of combustion gases should be avoided.

### HYDROSTATIC PRESSURE TEST

Pressure test before attaching piping or electrical supply.

#### CAUTION

Leaks must be repaired at once or damage to the boiler can result. NEVER use petroleum based stop-leak compounds or leakage between the sections will occur.

1. Remove shipping nipple from supply outlet. Plug tapings, including compression tank tapping.
2. Connect water supply. Fill boiler and purge all air. TEST AT 45 PSIG for more than 10 minutes.

#### WARNING

Do not leave the boiler unattended. A cold water fill could expand and cause excessive pressure.

3. Make sure gauge pressure has been maintained.
4. Check for leaks. Repair, if found.
5. Drain boiler and remove testing plugs.
6. On initial start-up, check for leaks in system piping. If found, repair at once.

## Section III: Piping

### CAUTION

Failure to properly pipe boiler may result in improper operation and damage to boiler or building.

1. Pipe as shown in Figures 4 or 5.

a. For P-CG boilers—

- 1) Pre-pressurized expansion tank is provided. Ensure tank pressure and size will handle system fill and water volume.
  - a) Fill pressure may be adjusted at tank for design conditions. Follow manufacturer's instructions.
  - b) Additional tanks may be connected to tees in system near boiler. See Table I.
- 2) Install provided air vent.

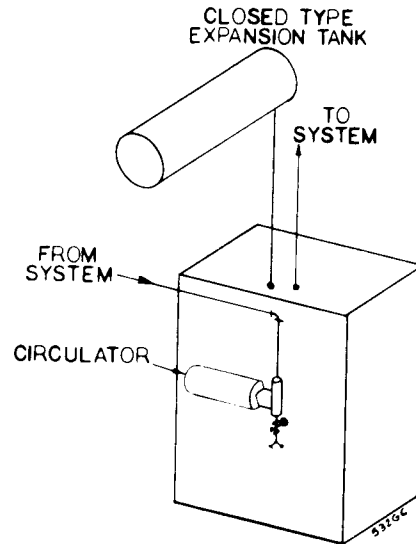
b. For CGM boilers—

- 1) Size tank to system requirements. Refer to tank manufacturer's instructions and Table I.
- 2) Closed diaphragm pre-pressurized expansion tank—locate near boiler.

### NOTICE

Install manual or automatic air vent in 1/2" tapping as shown in Figure 4 when using closed diaphragm pre-pressurized tank.

- 3) Closed type expansion tank—connection from 1/2" N.P.T. tapping (located behind supply outlet) to expansion tank. Use 1/2" piping. Any horizontal piping must pitch up towards tank 1" per 5 feet of piping. Built-in air elimination system is provided. No additional device is needed if tank is piped as shown in Figure 5.



**CLOSED TYPE EXPANSION TANK PIPING  
FIGURE 5**

**TABLE I—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 selections based on 220°F. average system water temperature.
- Standard equipment for P-CG boilers.
- \*\* Systems with unusually large volumes of water may require additional expansion capacity.

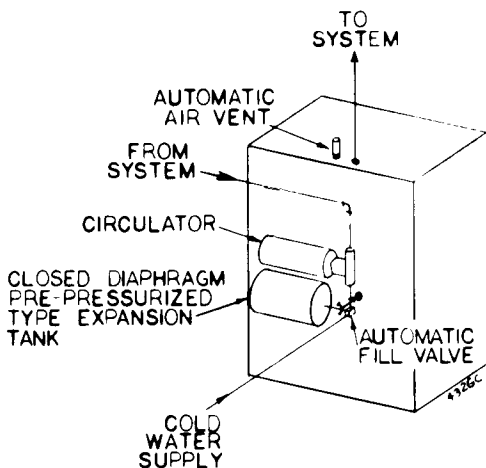
2. Use low water cut-off when:
  - a. boiler is located above radiation level.
  - b. required by certain state, local, or territorial codes or insurance companies.

Use low water cut-off designed for water installations. Electrode probe type is recommended. Install in tee in supply piping.

3. If the system is to comply with ASME codes, an additional high temperature limit is needed. Purchase and install in supply piping from the boiler.

4. **WARNING** Relief valve discharge piping must be piped near floor close to floor drain to eliminate potential of severe burns. Do not pipe to any area where freezing could occur.

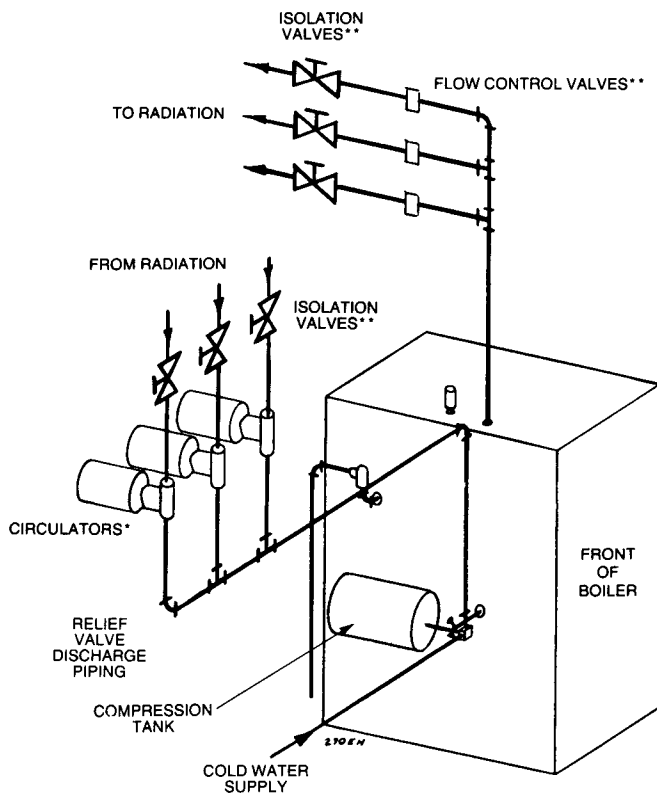
5. Connect supply, return, and cold water fill piping.



**CLOSED DIAPHRAGM PREPRESSURIZED  
EXPANSION TANK PIPING  
FIGURE 4**

## MULTIPLE ZONING WITH CIRCULATORS

1. If multiple zoning with circulators, boiler must be repiped. See Figure 6.
  - a) Remove provided circulator.
  - b) Determine if by-pass piping will be needed. See page 8.
  - c) Mount circulators as shown.
  - d) Install flow control valves.
  - e) Follow remaining piping instructions



\*DO NOT USE DRAIN COCK TAPPING  
 \*\*MAY BE INSTALLED IN ALTERNATE LOCATIONS

**MULTIPLE ZONING WITH CIRCULATORS  
 FIGURE 6**

## BYPASS PIPING

BYPASS PIPING IS NOT NORMALLY REQUIRED ON TYPICAL BASEBOARD SYSTEM.

Bypass piping should be used for the following installations. Bypass, supply, and return piping should be same size.

1. When return water temperature is 130°F or greater: to protect system radiant panels, plaster, etc. from high temperature water supplied from boiler, see Figure 7.

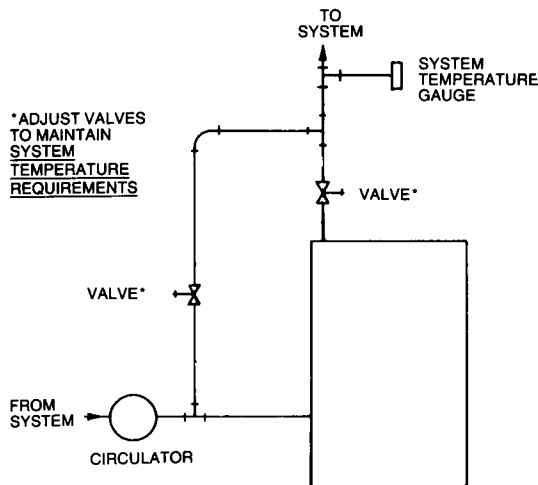


FIGURE 7

2. To protect boiler from condensation formed by low water temperature returned from large water content converted gravity systems, etc., see Figure 8.

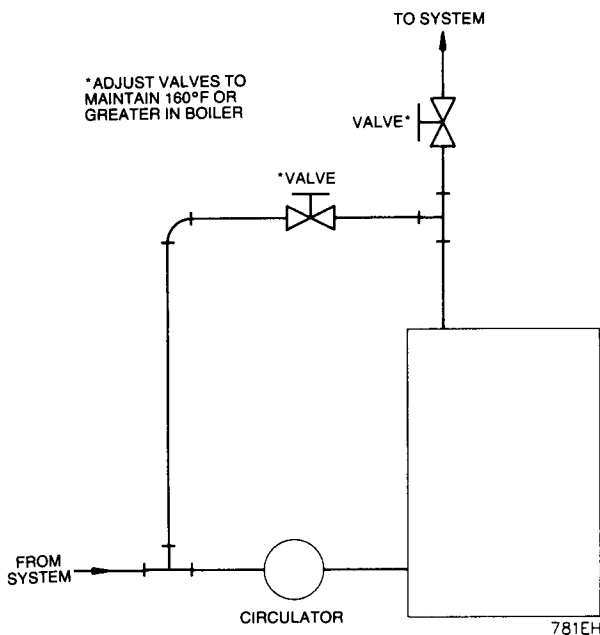


FIGURE 8

3. When return water temperature is below 130°F: to protect boiler from condensation while protecting system from high water temperatures, as in large water content radiant ceiling panels, see Figure 9.

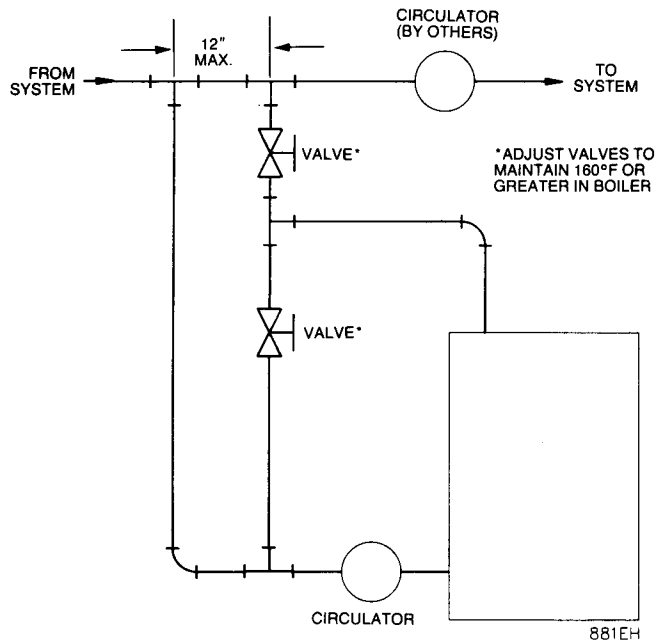
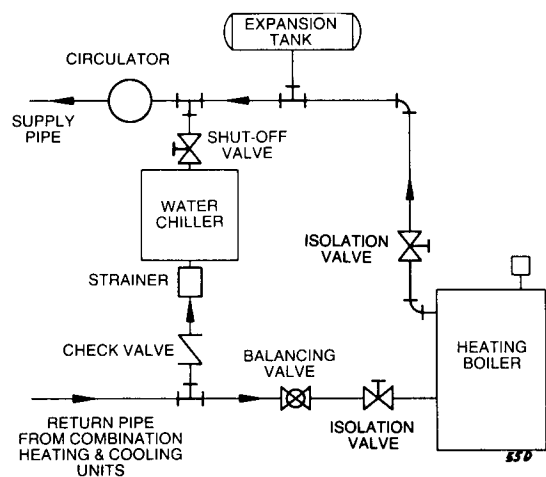


FIGURE 9

## USE WITH REFRIGERATION SYSTEM

The boiler must be installed so that chilled medium is piped in parallel with the heating boiler with appropriate valves to prevent the chilled medium from entering the boiler. Consult I=B=R Installation and Piping Guides.



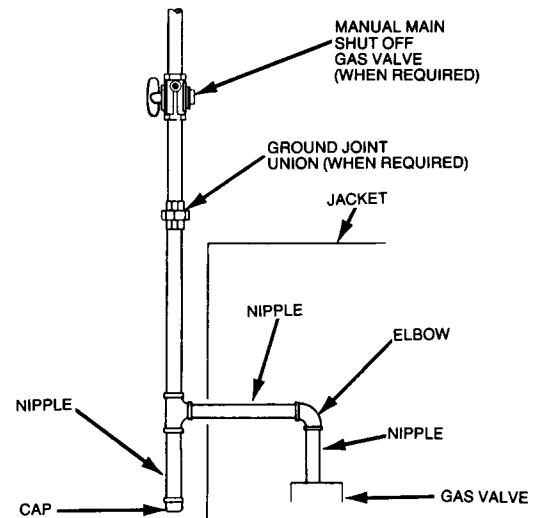
RECOMMENDED PIPING FOR COMBINATION HEATING & COOLING (REFRIGERATION) SYSTEMS  
FIGURE 10



## Section IV: Gas Piping

Size gas piping considering:

- a. Diameter and length of gas supply piping.
  - b. Number of fittings.
  - c. Maximum gas consumption (including any possible future expansion).
  - d. Allowable loss in gas pressure from gas meter outlet to boiler. This is specified as three-tenths of an inch water column. For additional pressure drops, see ANSI Z223.1.
1. For natural gas:
    - a) Refer to following tables. To obtain cubic feet per hour, divide the input by 1000.
    - b) Size for rated boiler input.
    - c) Inlet gas pressure: 5" W.C. minimum  
13" W.C. maximum
    - d) Manifold gas pressure: 3½" W.C.
    - e) Install 100% lock-up gas pressure regulator in supply line if inlet pressure exceeds 13" W.C. Adjust for 13" W.C. maximum.



**GAS SUPPLY PIPING  
FIGURE 11**

### PIPE DELIVERY SCHEDULE

| Length of Pipe<br>in Feet | *CAPACITY OF PIPE<br>IN CUBIC FEET OF GAS PER HOUR |     |     |      |      |
|---------------------------|--|-----|-----|------|------|
|                           | ½"   | ¾"  | 1"  | 1¼"  | 1½"  |
| 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—0.60 Specific Gravity, 0.30 inches water column pressure drop.

NOTE: For additional piping schedules, see ANSI Z223.1.

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

| Pipe Size, Inches | Additional Length, Feet |
|-------------------|-------------------------|
| ½                 | 1.3                     |
| ¾                 | 1.7                     |
| 1                 | 2.2                     |
| 1¼                | 2.9                     |
| 1½                | 3.3                     |

2. For propane gas:
  - a) Inlet gas pressure: 11" W.C. minimum  
13" W.C. maximum
  - b) Manifold gas pressure: 10" W.C.
  - c) Gas pressure regulator provided by gas supplier must be adjusted for maximum pressure of 13" W.C.
  - d) Contact gas supplier to size pipes, tanks and regulator.
3. Remove jacket door and refer to Figure 11 for gas piping.

4. Follow good piping practices.
5. Pipe joint compound (pipe dope) must be resistant to corrosive action of liquified petroleum gases and applied sparingly only to male threads of pipe joints.
6. Install drip leg at inlet of gas connection to boiler. Where local utility requires drip leg be extended to the floor, use an appropriate length of pipe between the cap and tee.
7. Install ground joint union to provide for servicing, when required.
8. Install manual shut-off valve in gas supply piping outside boiler jacket when required by local codes or utility requirements.
9. Support piping by hangers, not by the boiler or its accessories.
10. Purge all air from supply piping.
11. Check factory installed piping and field installed piping for leaks—BUBBLE TEST.

### CAUTION

- a) **DO NOT** check for gas leaks with an open flame—BUBBLE TEST.
- b) Close manual main shut-off valve during any pressure testing at less than 13 inches water column.
- c) Disconnect boiler and gas valve from gas supply piping during any pressure test greater than 13 inches water column.

Refer to wiring diagram label on jacket door and Control Supplement for specific wiring details.

## WIRING

### WARNING

**For your safety, turn off electrical power supply at service entrance panel before making any electrical connections to avoid possible electrical shock hazard.**

All wiring must be installed in accordance with requirements of the National Electrical Code and any additional national, state, or local code requirements having jurisdiction. All safety circuit wiring must be N.E.C. Class 1.

The boiler must be electrically grounded in accordance with the National Electrical Code, ANSI/NFPA No. 70-1984. Use 90°C Thermoplastic Wire, or equivalent, if any original wire must be replaced.

The boiler is shipped with the control components completely wired.

A separate electrical circuit should be used for the boiler with a fused disconnect switch (15 amp. recommended). Bring electrical supply through proper opening in jacket left end panel and into electrical junction box. Wire electrical supply to leads in junction box as shown on the diagram.

### INSTALL ROOM THERMOSTAT

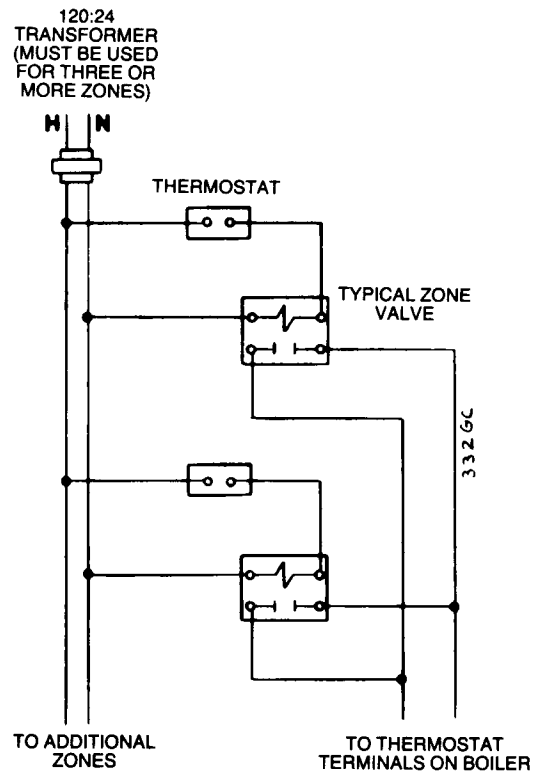
Install room thermostat on an inside wall. Never install where it will be influenced by drafts, hot or cold water pipes, lighting fixtures, television, sun rays or near a fireplace.

Heat anticipator in thermostat must be set to match power requirements of primary control to which it is connected.

Refer to wiring diagram on jacket door or in Control Supplement for recommended heat anticipator setting with standard equipment. Wire thermostat as shown.

## WIRING MULTIPLE ZONES

Refer to zone valve manufacturer's literature for wiring and application. A separate transformer is required to power zone valves. Zoning with circulators requires a relay for each circulator.



**TYPICAL WIRING—ZONING  
WITH ZONE VALVES  
FIGURE 12**

## Section VI: Final Adjustments

### WATER TREATMENT

**Never use petroleum based stop-leak compounds.** Water seal deterioration will occur, resulting in leakage between sections.

Continual make-up water will reduce boiler life. Minerals can build up in the sections, reducing heat transfer, overheating the cast iron, and causing section failure.

For unusually hard water areas or low pH conditions (less than 7.0) consult local water treatment company.

#### Freeze protection (when used):

Use antifreeze especially made for hydronic systems. Inhibited propylene glycol is recommended. **DO NOT** use undiluted or automotive type antifreeze.

50% solution provides maximum protection to about  $-30^{\circ}\text{F}$ . Local codes may require a back-flow preventer or actual disconnect from city water supply.

Determine quantity according to system water content. Boiler water content is listed on page 23.

Follow antifreeze manufacturer's instructions.

### FILLING SYSTEM

1. Close manual air vents, drain cock, and automatic air vent, if used.
2. Fill to correct system pressure. Correct pressure will vary with each application. Residential systems are often designed for 12 pounds of cold fill pressure.
3. Open automatic air vent two turns, if used.
4. Open manual water feed valve.
5. a) Starting on the lowest floor, open air vents one at a time until water squirts out. Close vent.  
b) Repeat with remaining vents.
6. Close manual water feed valve when correct boiler pressure is reached.

### INSPECT BASE INSULATION

Check to make sure refractory is secure against all four sides of the base.

#### WARNING

If refractory material is damaged or displaced, call serviceman immediately. **DO NOT** operate boiler.

#### CAUTION

Ceramic fiber material used in boiler base insulation and gaskets can cause temporary skin, eye, and upper respiratory irritation.

Use NIOSH or MSHA approved protection when installing or removing this material.

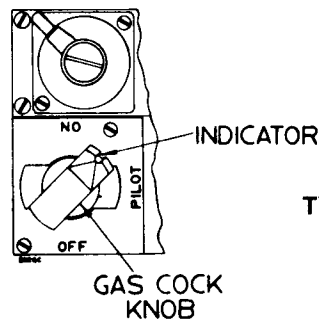
### TO PLACE IN OPERATION

#### CAUTION

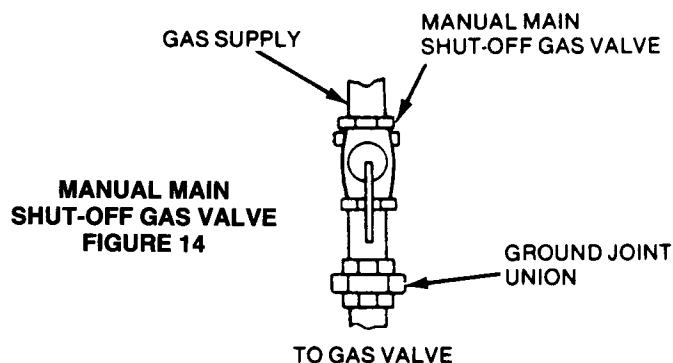
The manual gas cock knob and manual main shut-off gas valve (when used) must be closed for at least five (5) minutes before lighting.

1. Turn thermostat or operating control to OFF position or lowest position on dial. Be sure boiler has been correctly filled with water.

2. Turn OFF electric power.
3. For boiler with electronic spark ignition systems:
  - a) Open manual gas cock knob.
  - b) Open manual main gas valve, when used.
  - c) Go to Step 5.
4. For boilers with constant burning pilots:
  - a) Remove front access panel.
  - b) Open manual pilot gas valve, when used.
  - c) Open manual main gas valve, when used.
  - d) Place lighted match next to pilot burner.
  - e) Turn gas cock knob to pilot and depress. Pilot should ignite. Hold in for 60 seconds.
  - f) Release knob after 60 seconds. Pilot should continue burning.
  - g) Turn knob to ON position.
5. Move thermostat or operating control to call for heat.
6. Turn ON electric power.
7. If boiler starts, go to Step 9.  
If boiler fails to start, go to Step 8.
8. If boiler fails to start, check for following conditions:
  - a) Loose connection or blown fuse?
  - b) Limit setting below boiler water temperature or pressure?
  - c) Thermostat set below room temperature?
  - d) Gas not turned on at meter and boiler?
  - e) Incoming natural gas pressure less than 5" W.C. or propane less than 10" W.C.?
  - f) Access panel not secured in place?
  - g) If above fails to eliminate the trouble, call a trained serviceman.
9. Make sure boiler goes through several normal operating cycles.
10. Turn thermostat or operating control to desired setting.



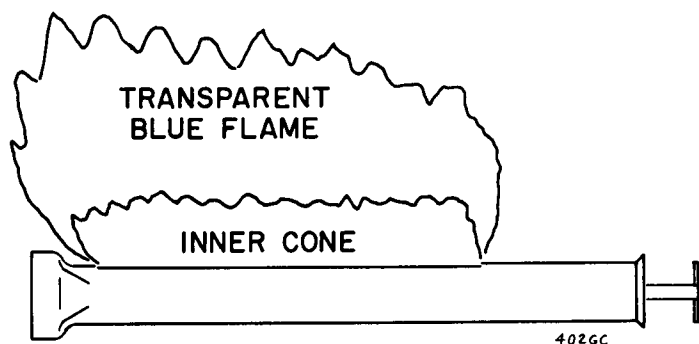
TYPICAL GAS COCK DIAL  
FIGURE 13



MANUAL MAIN  
SHUT-OFF GAS VALVE  
FIGURE 14

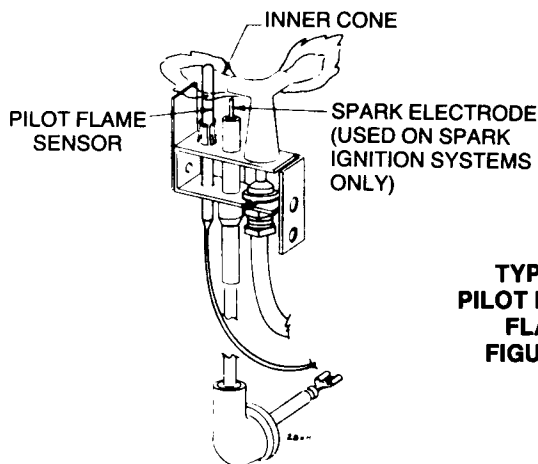
### CHECK BURNER FLAMES

1. Proper burner flame, see Figure 15. Yellow-orange streaks may appear—caused by dust.
2. Improper flame:
  - a) Overfired—Flames large.
  - b) Underfired—Flames small.
  - c) Lack of primary air—Yellow tipping on flames; sooting will occur.
3. If improper burner flames are suspected, contact a trained serviceman or local gas utility.



**TYPICAL MAIN BURNER FLAME  
FIGURE 15**

- b) Underfired—flame small; pilot flame sensor not engulfed by inner cone.
  - c) Lack of primary air—flame tip yellow.
  - d) Pilot flame sensor not heated properly.
3. If improper flames are suspected, contact a trained serviceman or local gas utility to inspect the condition.



**TYPICAL  
PILOT BURNER  
FLAME  
FIGURE 16**

#### Check pilot burner flame:

1. Proper pilot flame
  - a) Blue flame.
  - b) Inner cone engulfing pilot flame sensor
  - c) Pilot flame sensor glows cherry red.
2. Improper pilot flame
  - a) Overfired—flame is large and lifting or blowing past pilot flame sensor.

#### INSPECT VENTING SYSTEM

1. Check venting system at least once a month during heating season. With boiler firing, hold a candle or match below lower edge of draft hood "skirt". If the flame does not blow out, but burns undisturbed, the vent system is functioning properly. If flame blows out or flickers drastically, vent system must be checked for obstructions or other causes of improper venting.
2. Inspect all parts of venting systems for deterioration from corrosion, physical damage, sagging, etc. Correct all conditions found.

## Section VII: Check-out Procedure

Check-off steps as completed.

- 1. Boiler and heat distribution units filled with water?
- 2. Automatic air vent, if used, open one turn?
- 3. Air purged from system?
- 4. Air purged from gas piping? Piping checked for leaks?
- 5. Follow operating instruction label on boiler for proper start-up. Also refer to "To Place in Operation", page 11.

For boilers with spark ignition: Electronic control will light pilot burner (if vent damper is installed, the damper must first be fully open). When pilot flame is proven, main gas valve will open and main burners will ignite. **NOTE:** If pilot flame isn't proven, main gas valve will not open and boiler will not operate until properly serviced.

- 6. Proper burner flame? Refer to "Check Main Burner Flames" and "Check Pilot Burner Flame", page 12.
- 7. Test safety controls: If boiler is equipped with a low water cut-off or additional safety controls, test for operation as outlined by the manufacturer. Burners should be operating and should go off when controls are tested. When safety devices are restored, burners should reignite.
- 8. Test limit control: While burners are operating, move the indicator of the high limit control below actual boiler water temperature. Burners should go off while the circulator continues to operate. Raise limit control above the boiler water temperature and burners should reignite.

- 9. Test ignition system safety shut-off device:
  - a. For 24V and MV standing pilot—Turn gas cock knob to PILOT position and extinguish pilot flame. Pilot gas flow should stop in less than 2 minutes. Put system back into operation (see page 11).
  - b. For intermittent ignition systems—Connect a manometer to outlet side of gas valve. Start the boiler, allowing for normal start-up cycle to occur and main burners to ignite. With main burners on, manually shut off gas supply at manual main shut-off gas valve. Burners should go off. Immediately open manual main shut-off gas valve. The manometer should confirm there is no gas flow until the flame sensing element has sufficient time to cool. Only after this delay should the boiler cycle and the main burners reignite.
- 10. High limit control set to the design temperature requirements of the system? Maximum high limit setting—240°F.
- 11. For multiple zones, flow adjusted so it is about the same in each zone?
- 12. Thermostat heat anticipator is set properly? Refer to "Room Thermostat" page 10, and wiring diagram on jacket door.
- 13. Boiler cycled with the thermostat? Raise to highest setting. Boiler should go through normal start-up cycle. Lower to lowest setting. Boiler should go off.
- 14. Measure gas input (natural gas only):
  - a. Operate boiler 10 minutes.
  - b. Turn off other appliances.
  - c. At natural gas meter, measure time (in seconds) required to use one cubic foot of gas.
  - d. Calculate gas input:
 
$$\frac{3600 \times 1000}{\text{number seconds from step C}} = \text{Btuh}$$
  - e. Btuh calculated should approximate input rating on rating plate.
- 15. Check manifold gas pressure by connecting a manometer to the downstream test tapping on the main gas valve. Manifold gas pressure for natural gas should be 3½ inches water column and for propane gas should be 10 inches water column.
- 16. Several operating cycles observed for proper operation?
- 17. Room thermostat set to desired room temperature?
- 18. Installation and Service Certificate on this page completed?
- 19. All instructions shipped with this boiler reviewed with owner or maintenance person, returned to envelope and given to owner or displayed near boiler?

---

## Installation and Service Certificate

---

BOILER MODEL \_\_\_\_\_ SERIES \_\_\_\_\_ CP NUMBER \_\_\_\_\_ DATE INSTALLED \_\_\_\_\_

BTU INPUT \_\_\_\_\_

- Installation instructions have been followed.
- Check-out sequence has been performed.
- Above information is certified to be correct.
- Information received and left with owner/maintenance person.

Installer \_\_\_\_\_  
 (Company) (Address) (Phone) (Installer's Signature)

### Also Refer to Additional Instructions Shipped With The Boiler For Specific Control Operation and Troubleshooting

#### NOTICE

Your boiler should be inspected, cleaned and, if necessary, adjusted once a year. A qualified service agency should be called.

#### WARNING

##### TO AVOID PERSONAL INJURY, BEFORE SERVICING:

1. Disconnect electrical supply.
2. Shut-off gas supply.
3. Allow boiler to cool.

#### WARNING

To avoid personal injury, death or property damage, keep boiler area clear and free from combustible materials, gasoline and other flammable vapors and liquids.

Do not block flow of air to boiler. Incomplete combustion and flue gas spillage can occur.

Do not store sources of hydrocarbons (i.e., bleaches, cleaners, chemicals, sprays, paint removers, fabric softeners, etc.) in boiler area. This can contribute to shortened boiler/vent system life.

## Suggested Minimum Maintenance Schedule

#### Beginning of each heating season:

1. Annual service call by a qualified service agency.
2. Check burners and flueways and clean if necessary. Reference "Clean Boiler Heating Surfaces" and "Cleaning Main Burners", page 15.
3. Follow procedure "To Place in Operation", page 11.
4. Visually inspect pilot and burner flames. Reference "Check Main Burner Flames" and "Check Pilot Burner Flame", page 12.
5. Visually inspect venting system for proper function, deterioration or leakage. Reference "Inspect Venting System", page 12.
6. Visually inspect base insulation. Reference "Inspect Base Insulation," page 11.
7. Check operation of low-water cut-off, if used, and additional safety devices. Refer to manufacturer's instructions.
8. Check that boiler area is free from combustible materials, gasoline and other flammable vapors and liquids.
9. Check for and remove any obstruction to flow of combustion or ventilation air.
10. Follow instructions on circulator to oil, if oil lubricated. Overoiling will damage the circulator. Water lubricated circulators do not need oiling.

#### Daily during heating season:

1. Check that boiler area is free from combustible materials, gasoline and other flammable vapors and liquids.
2. Check for and remove any obstruction to the flow of combustion or ventilation air.

#### Periodically during heating season:

1. Check safety relief valve. Reference manufacturer's instructions on relief valve tag.
2. Test low water cut-off, if used. Blowdown if low water cut-off is float type. Reference manufacturer's instructions.

#### Monthly during heating season:

1. Check for leaks in the boiler and piping. If found, repair at once.

#### CAUTION

Continuous use of make-up water can damage boiler sections due to addition of minerals. DO NOT use petroleum based stop-leak compounds—leakage between the sections will occur.

2. Check any gaskets for leakage. Tighten or replace, if needed. Do not overtighten bolts—damage to the gasket can occur.
3. Visually inspect pilot and burner flames. Reference "Check Main Burner Flames" and "Check Pilot Burner Flame," page 12.
4. Visually inspect venting system for proper function, deterioration or leakage. Reference "Inspect Venting System", page 12.
5. Check automatic air vent for leakage. If leaking, remove vent cap and push valve core in to wash off sediment that may have accumulated on the valve seat. Release valve, replace cap and open one turn.

#### End of each heating season:

1. Follow "Annual Shutdown Procedures", page 15.

**Clean boiler heating surfaces:**

1. Follow shut-down procedure.
2. Remove upper rear jacket panel. Turn back jacket insulation to expose collector hood.
3. Remove collection hood. Clean excess boiler cement from collector hood and cast iron sections.
4. Remove radiation plates that hang between sections.
5. Remove burners from base of boiler. Follow "Cleaning main burners," page 15.
6. Place newspaper in base of boiler to collect soot that will fall.
7. With a wire flue brush, clean between the sections.
8. Remove paper and soot. Vacuum or brush base and surrounding area.
9. Replace radiation plates.
10. Replace collector hood. Seal with boiler cement.
11. Replace insulation and jacket panel.
12. Replace main burners.

**NOTE:** Excessive sooting indicates improper combustion of the gas. If found, call a qualified service agency or your local gas utility to check for proper combustion and make any necessary adjustments.

**Cleaning main burners:**

1. Vacuum or brush burners to remove dust and lint.

**WARNING**

When replacing, burner tubes must be seated in the slots in the back with the openings facing up.

**Annual shut-down procedure:**

1. Close manual main shut-off valve (when used) and gas cock on gas valve. Close pilot valve, when used.
2. Disconnect electric power supply.
3. Move thermostat indicator to low setting.
4. **DO NOT** drain system unless exposure to freezing temperatures will occur. If antifreeze is used in the system, do not drain.
5. Open boiler drain cock to remove impurities that may have settled in the boiler (about a quart is all that is necessary to drain out). Refill to correct pressure.

## COMMON PROBLEMS AND POSSIBLE SOLUTIONS

| COMMON SYMPTOMS                                      | COMMON CAUSES   | POSSIBLE CORRECTIONS   |
|--|---|--|
| Rapid cycling—burners turn on and off frequently.    | Thermostat installed where drafts or heat affect reading.                   | Locate thermostat on inner wall away from heat sources or cool drafts.   |
|  | Heat anticipator in thermostat adjusted incorrectly.                        | Adjust heat anticipator to match current draw. Refer to boiler wiring diagram.   |
|  | Incorrect limit setting.  | Set limit according to system design. Maximum setting is 240° F. Increase limit setting to decrease cycling.   |
| Frequent release of water through the relief valve.  | Insufficient expansion tank size.   | Call installer to check expansion tank operation.  |
|  | Flooded expansion tank.   | Call installer to check expansion tank operation.  |
| Need to frequently add make-up water.                | Leaks in boiler or piping.  | Have installer repair leaks at once to avoid constant use of make-up water. Make-up water can cause mineral deposits which, in turn, can cause boiler section failure. Do not use petroleum based stop-leak chemicals. |
|  | Leaking gasket.   | Evenly tighten gasket. Do not overtighten.   |
| Popping or percolating noise heard in boiler.        | Mineral deposits in the sections due to the constant use of make-up water.  | Call installer to delime the boiler, if necessary. In some cases the deposits will be too heavy to remove with deliming.   |
|  |   | Have installer repair leaks to eliminate the need for constant make-up water.  |
|  | Incorrect pH of boiler water  | pH should be maintained at 7.0 to 8.5  |
| Metal flakes found in boiler base—flueway corrosion. | Halogenated hydrocarbons from environment contaminating the combustion air. | Locate and remove sources of hydrocarbons (i.e., bleaches, cleaners, chemicals, sprays, fabric softeners, paint remover, etc.).  |
|  | Condensation of combustion gases.   | Raise high limit setting. If problem continues, call installer for assistance.   |
| Isolated radiation does not heat                     | Air in system.  | Bleed air from system through vents in radiation.  |
|  | Low system pressure.  | Fill to correct pressure.  |
|  |   | Check for leaks in boiler or piping. Have installer repair at once.  |
| High limit set too low.                              | Adjust high limit to a higher setting.                                      |  |
| Black Water Condition                                | Oxygen corrosion due to leaks in piping.                                    | Check for leaks in piping. Have installer repair at once. Maintain pH between 7.0–8.5.   |



**Section IX: Replacement Parts**

**Parts Lists**  
**Component-Assemblies Replacement**  
 (Refer to Control Supplement for control replacement)

|                            |    |
|----------------------------|----|
| Section Assembly .....     | 18 |
| Base Assembly .....        | 19 |
| Jacket Assembly .....      | 20 |
| Boiler Trim Assembly ..... | 21 |

**COMPONENT REPLACEMENT INSTRUCTIONS**

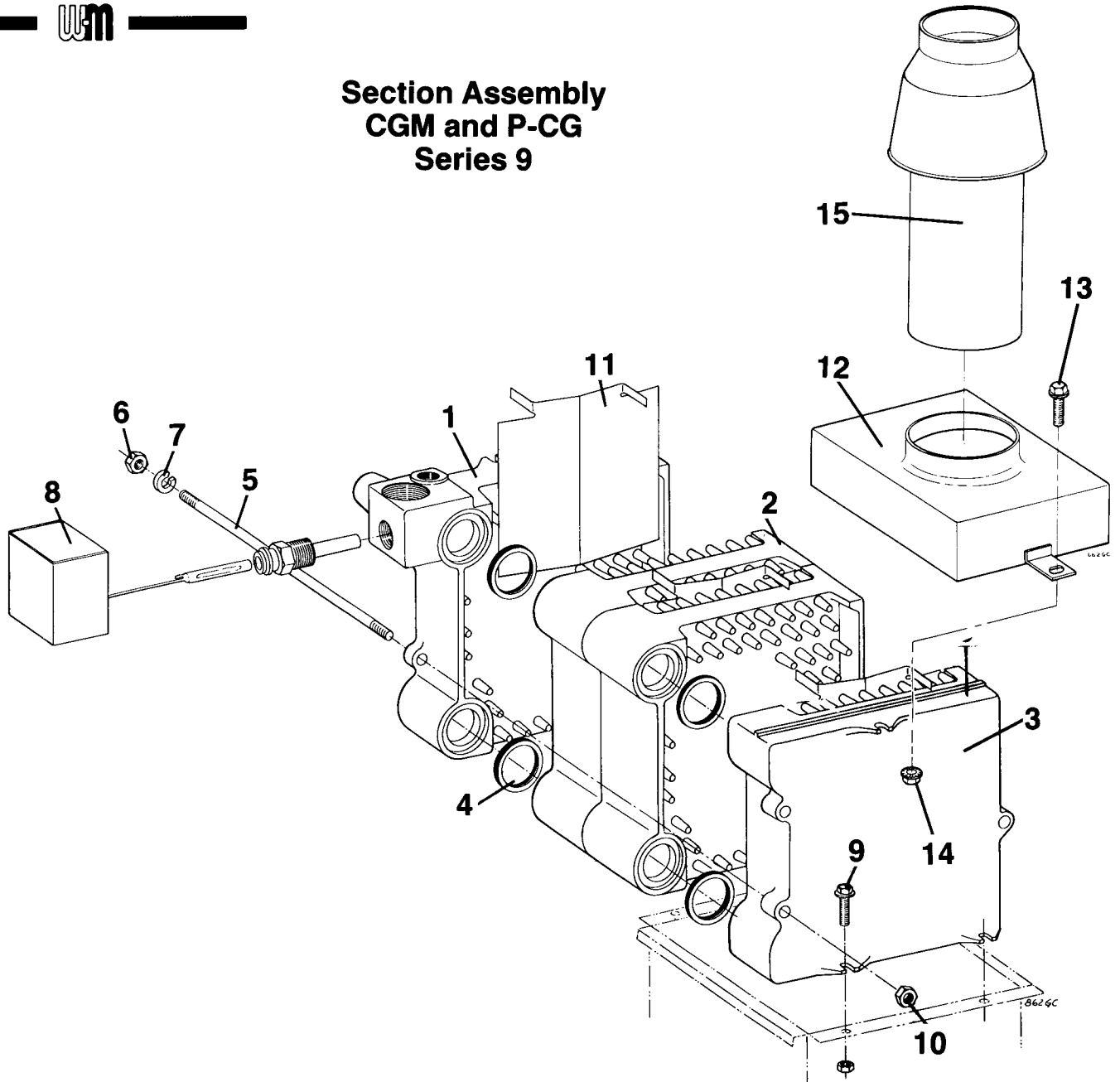
**Before replacing any parts on the boiler:**

- 1. Turn off power**
- 2. Shut off gas supply**

**Refer to the appropriate exploded diagram for parts replacement.**

**Replacement parts can be ordered or purchased through a local Weil-McLain distributor. When ordering, specify boiler model and series and include description and number of replacement part. Some parts are stock items and can be purchased from a local supply house.**

## Section Assembly CGM and P-CG Series 9

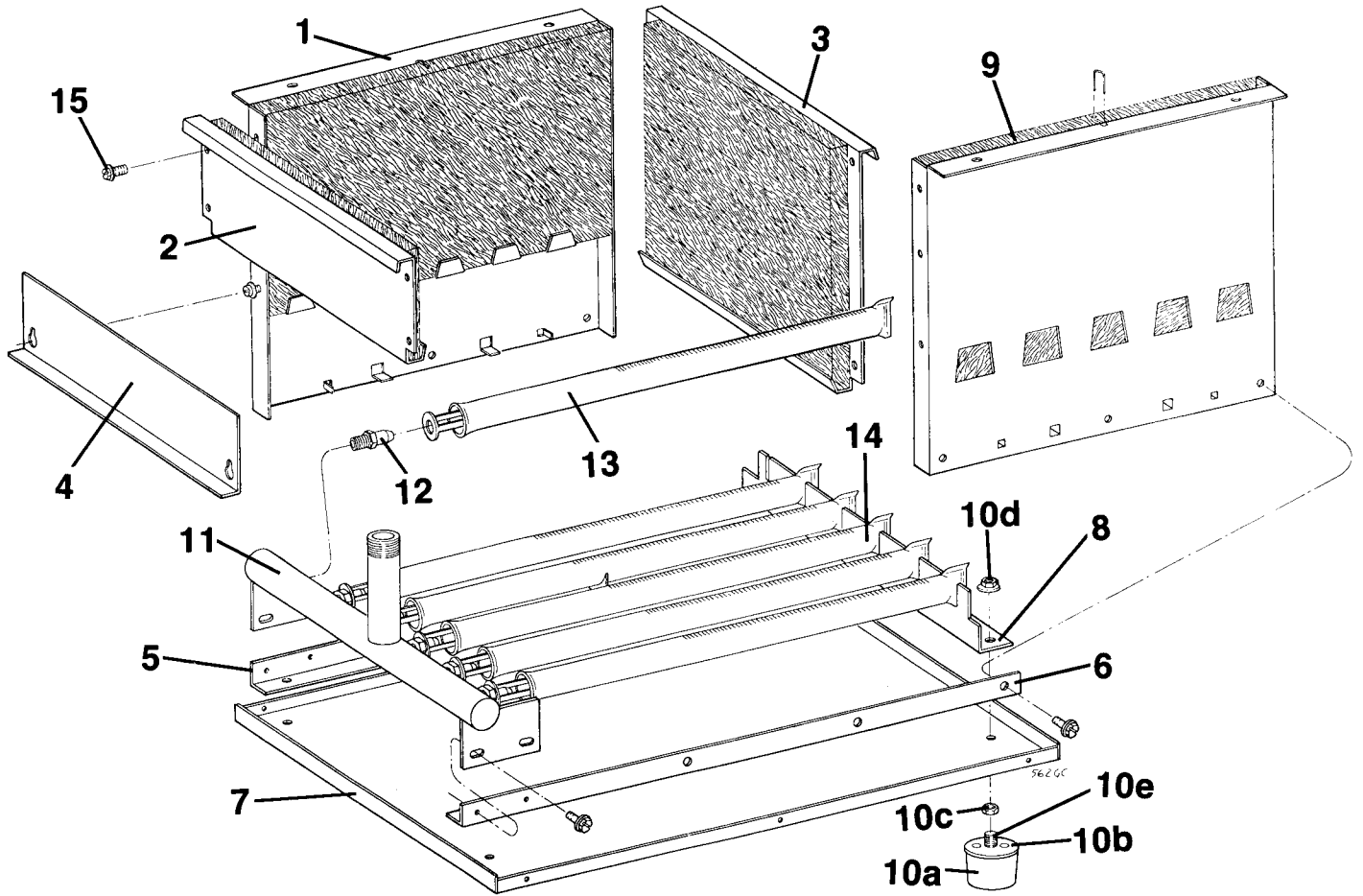


| FIG. NO. | DESCRIPTION   | VENDOR/PART NUMBER           | W-M PART NUMBER  |
|----------|---|------------------------------|--|
| 1        | Left End Section 51124  | W-M                          | 311-103-815  |
| 2        | Intermediate Section 51125  | W-M                          | 311-103-818  |
| 3        | Right End Section 51128   | W-M                          | 311-103-821  |
| 4        | Square Cut Seal, 2"   | W-M                          | 592-800-011  |
| 5        | Tie Rod—CG25/CG-3 7/16×9<br>CG4 7/16×12<br>CG5 7/16×15<br>CG6 7/16×18<br>CG7 7/16×21<br>CG8 7/16×24 |                              | 560-234-500<br>560-234-501<br>560-234-502<br>560-234-503<br>560-234-504<br>560-234-505 |
| 6        | Nut, 7/16-14 Reg. Hex   |                              | ■  |
| 7        | Washer, 7/16 Reg. Helical Spring Lock   |                              | ■  |
| 8        | Limit Control—24V<br>—MV  | W-R 11B81-3<br>W-R 11B81-703 | 510-310-253<br>510-310-140   |

| FIG. NO. | DESCRIPTION   | VENDOR/PART NUMBER                            | W-M PART NUMBER   |
|----------|---|---|---|
| 9        | Screw, 5/16-18×1 Whiz-Lock  |   | ■   |
| 10       | Nut, 5/16-18 2-way Lock   |   | ■   |
| 11       | Radiation Plate   | W-M   | 460-003-695   |
| 12       | Flue Collector Hood—CG-25<br>—CG-3<br>—CG-4<br>—CG-5<br>—CG-6<br>—CG-7<br>—CG-8 | W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M | 450-020-493<br>450-020-487<br>450-020-488<br>450-020-489<br>450-020-490<br>450-020-491<br>450-020-492 |
| 13       | Screw, 1/4-20×1/4 Whiz-Lock<br>Nut, 1/4-20 Whiz-Lock                            |   | ■<br>■  |
| 15       | Draft Hood—CG-25<br>—CG-3<br>—CG-4<br>—CG-5<br>—CG-6<br>—CG-7<br>—CG-8          | W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M | 450-021-222<br>450-021-223<br>450-021-224<br>450-021-225<br>450-021-226<br>450-021-227<br>450-021-228 |

■ LISTED PART OR EQUIVALENT CAN BE PURCHASED AT LOCAL SUPPLY HOUSE.

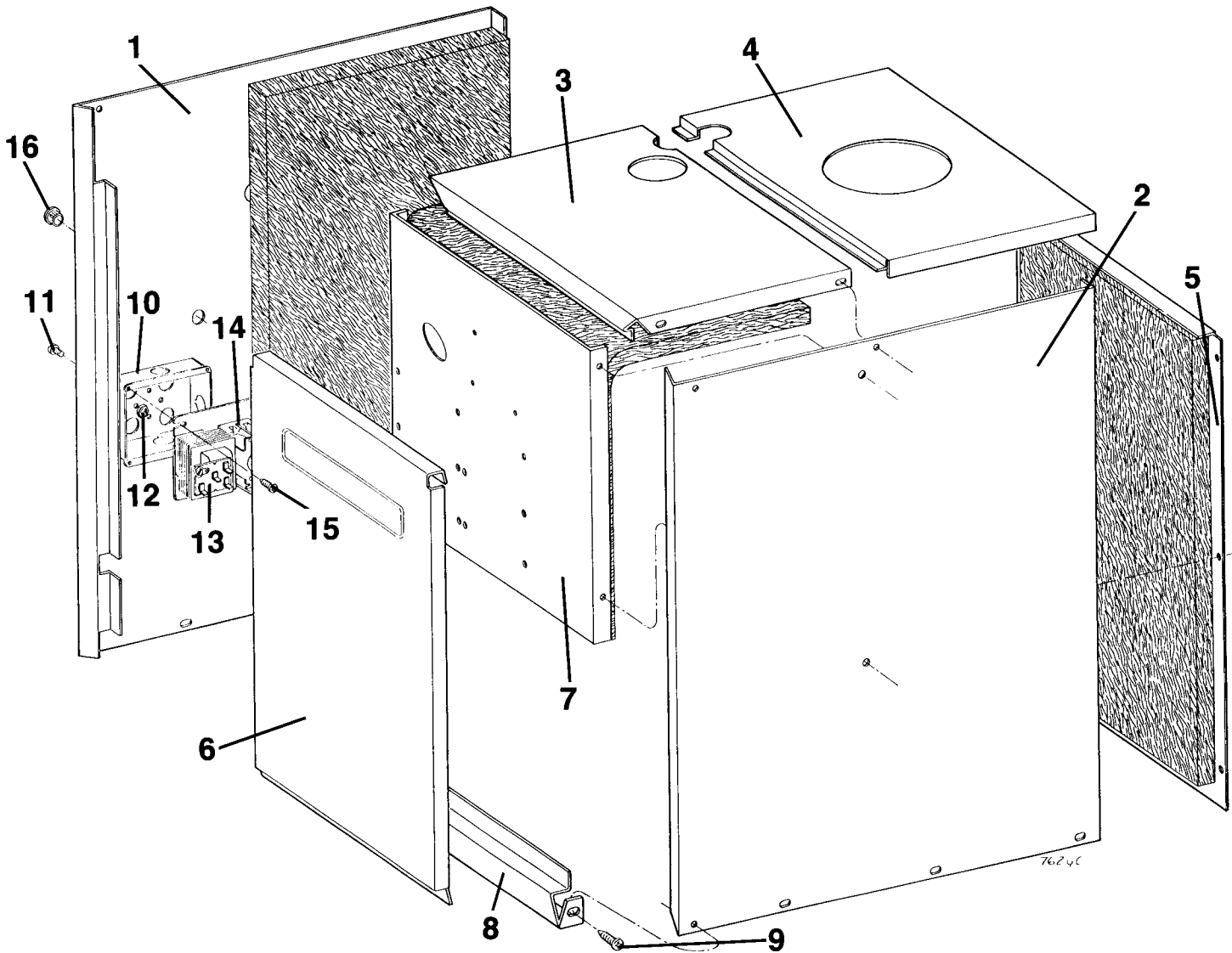
# Base Assembly CGM and P-CG Series 9



| FIG. NO. | DESCRIPTION   | VENDOR/PART NUMBER                            | W-M PART NUMBER   |
|----------|---|---|---|
| 1        | Base Side Panel   | W-M   | 460-003-710   |
| 2        | Base Front Cross Tie—<br>CG-25/CG-3<br>CG-4<br>CG-5<br>CG-6<br>CG-7<br>CG-8 | W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M | 460-003-777<br>460-003-778<br>460-003-779<br>460-003-780<br>460-003-781<br>460-003-782                |
| 3        | Base Back Cross Tie—<br>CG-25/CG-3<br>CG-4<br>CG-5<br>CG-6<br>CG-7<br>CG-8  | W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M | 460-003-701<br>460-003-702<br>460-003-703<br>460-003-704<br>460-003-705<br>460-003-706                |
| 4        | Base Access Panel—<br>CG-25/CG-3<br>CG-4<br>CG-5<br>CG-6<br>CG-7<br>CG-8    | W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M | 460-003-741<br>460-003-742<br>460-003-743<br>460-003-744<br>460-003-745<br>460-003-746                |
| 5        | Base Pan Angle—L.H.   | W-M   | 450-030-475   |
| 6        | Base Pan Angle—R.H.   | W-M   | 450-030-474   |
| 7        | Base Pan—CG-25/CG-3<br>CG-4<br>CG-5<br>CG-6<br>CG-7<br>CG-8                 | W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M        | 450-003-730<br>450-003-731<br>450-003-732<br>450-003-733<br>450-003-734<br>450-003-735                |
| 8        | Burner Rest—CG-25<br>—CG-3<br>—CG-4<br>—CG-5<br>—CG-6<br>—CG-7<br>—CG-8     | W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M | 450-030-742<br>450-030-736<br>450-030-737<br>450-030-738<br>450-030-739<br>450-030-740<br>450-030-741 |

| FIG. NO. | DESCRIPTION  | VENDOR/PART NUMBER                            | W-M PART NUMBER   |
|----------|--|---|---|
| 9        | Base Insulation Set—<br>CG-25/CG3<br>CG-4<br>CG-5<br>CG-6<br>CG-7<br>CG-8<br>Staple, 13/4" for base insulation | W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M | 591-222-040<br>591-222-041<br>591-222-042<br>591-222-043<br>591-222-044<br>591-222-045<br>■           |
| 10       | Leg, Screw-on Assembly*  | W-M   | 590-424-252   |
| 10a      | Leg  | —   | —   |
| 10b      | Washer, 3/8" Hole  | —   | —   |
| 10c      | Nut, 5/16-18 Jam   | —   | —   |
| 10d      | Nut, 5/16-18 Whiz-Lock   | —   | —   |
| 10e      | Screw, 5/16-18 x 2 1/4 Mach. Fl. Hd. Phil.   | —   | —   |
| 11       | Manifold—CG-25<br>CG-3<br>CG-4<br>CG-5<br>CG-6<br>CG-7<br>CG-8   | W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M<br>W-M | 591-126-549<br>591-126-550<br>591-126-551<br>591-126-552<br>591-126-553<br>591-126-554<br>591-126-555 |
| 12       | Orifice, Main Burner—<br>Natural, #46 Drill<br>Propane, #56 Drill  | W-M<br>W-M                                    | 560-528-997<br>560-528-998  |
| 13       | Burner, Steel  | W-M   | 512-200-060   |
| 14       | Burner, Steel w/Pilot Brkt.  | W-M   | 512-200-065   |
| 15       | Screw, 10-32 x 3/8 STP Type D Hex Wash. Hd. Slot ZP  | —   | ■   |

■ LISTED PART OR EQUIVALENT CAN BE PURCHASED AT LOCAL SUPPLY HOUSE.  
\* SOLD AS ASSEMBLY ONLY

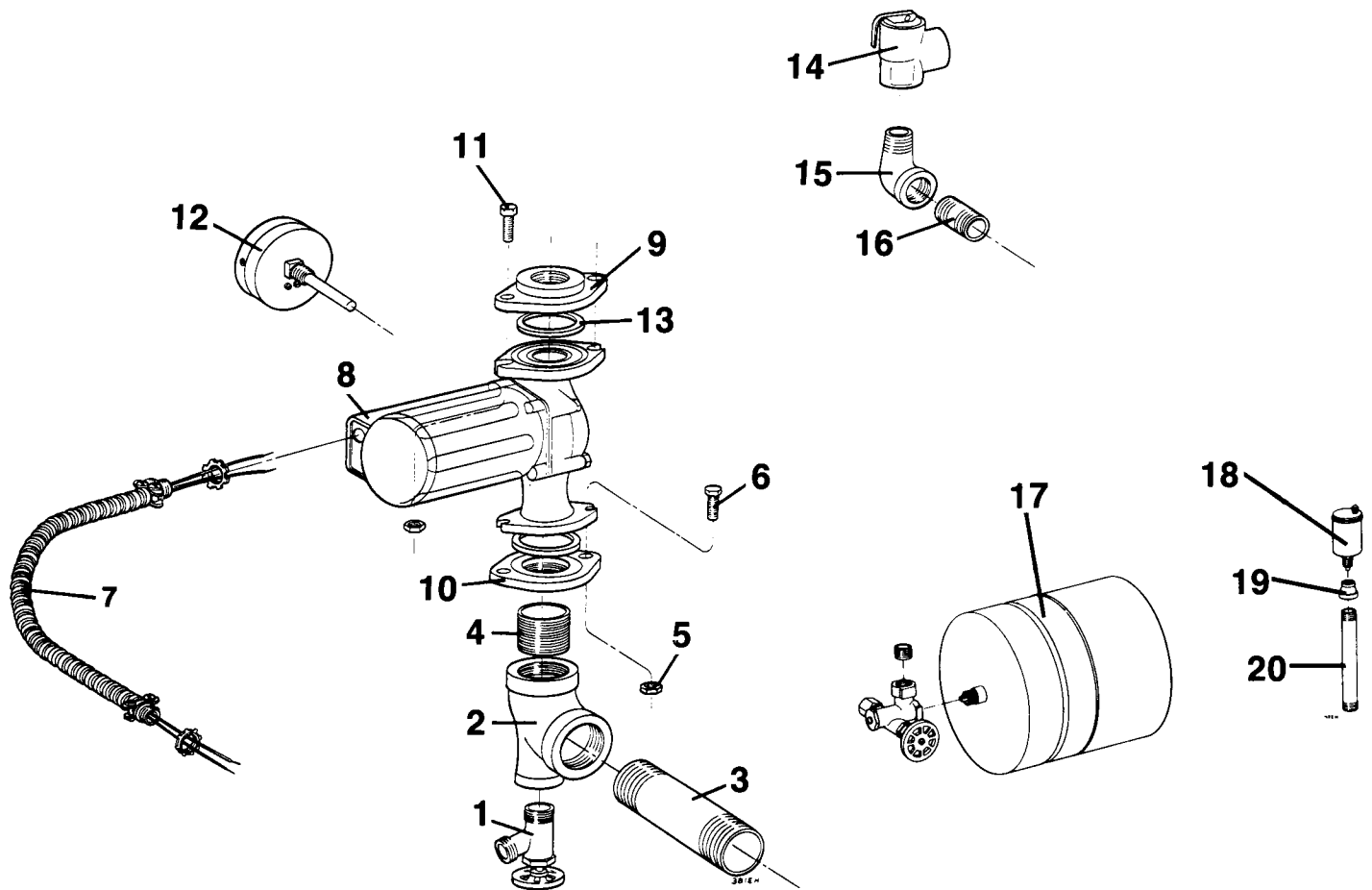


| FIG. NO. | DESCRIPTION           | VENDOR/PART NUMBER | W-M PART NUMBER |
|----------|-----------------------|--------------------|-----------------|
| 1        | Side Panel, L.H.      | W-M                | 421-208-159     |
| 2        | Side Panel, R.H.      | W-M                | 421-208-160     |
| 3        | Top Panel, Removable— |                    |                 |
|          | CG-25                 | W-M                | 431-203-112     |
|          | CG-3                  | W-M                | 431-203-127     |
|          | CG-4                  | W-M                | 431-203-128     |
|          | CG-5                  | W-M                | 431-203-129     |
|          | CG-6                  | W-M                | 431-203-130     |
|          | CG-7                  | W-M                | 431-203-131     |
|          | CG-8                  | W-M                | 431-203-132     |
| 4        | Top Panel—CG-25/CG-3  | W-M                | 421-203-120     |
|          | CG-4                  | W-M                | 421-203-121     |
|          | CG-5                  | W-M                | 421-203-122     |
|          | CG-6                  | W-M                | 421-203-123     |
|          | CG-7                  | W-M                | 421-203-124     |
|          | CG-8                  | W-M                | 421-203-125     |
| 5        | Rear Panel—CG-25/CG-3 | W-M                | 431-202-139     |
|          | CG-4                  | W-M                | 431-202-140     |
|          | CG-5                  | W-M                | 431-202-141     |
|          | CG-6                  | W-M                | 431-202-142     |
|          | CG-7                  | W-M                | 431-202-143     |
|          | CG-8                  | W-M                | 431-202-144     |
| 6        | Door—CG-25/CG-3       | W-M                | 421-208-150     |
|          | CG-4                  | W-M                | 421-208-151     |
|          | CG-5                  | W-M                | 421-208-152     |
|          | CG-6                  | W-M                | 421-208-153     |
|          | CG-7                  | W-M                | 421-208-154     |
|          | CG-8                  | W-M                | 421-208-155     |

| FIG. NO. | DESCRIPTION   | VENDOR/PART NUMBER | W-M PART NUMBER |
|----------|---|--------------------|-----------------|
| 7        | Interior Panel—   |                    |                 |
|          | CG-25/CG-3  | W-M                | 431-223-130     |
|          | CG-4  | W-M                | 431-223-131     |
|          | CG-5  | W-M                | 431-223-132     |
|          | CG-6  | W-M                | 431-223-133     |
|          | CG-7  | W-M                | 431-223-134     |
|          | CG-8  | W-M                | 431-223-135     |
| 8        | Front Bottom Cross Tie  |                    |                 |
|          | CG-25/CG-3  | W-M                | 431-214-124     |
|          | CG-4  | W-M                | 431-214-125     |
|          | CG-5  | W-M                | 431-214-126     |
|          | CG-6  | W-M                | 431-214-127     |
|          | CG-7  | W-M                | 431-214-128     |
|          | CG-8  | W-M                | 431-214-129     |
| 9        | Screw, #10×1/2 Sht. Mtl. Type A Pan Hd. Phil.                           |                    | ■               |
| 10       | Junction Box, 4×4×1/2   |                    | ■               |
| 11       | Screw, 10-32×1/2 Mach. Pan Hd. Phil.                                    |                    | ■               |
| 12       | Nut, 10-32 Hex Green-plated   |                    | ■               |
| 13       | Transformer w/Plug-in Recp. and Bale Wire, 24V<br>Transformer Relay, MV |                    | ■               |
| 14       | Relay, 24V  |                    | ■               |
| 15       | Screw, #8×1/2 Sht. Mtl. Pan Hd. Phil.                                   |                    | ■               |
| 16       | Bushing, Thermostat Wire  |                    | ■               |

■ LISTED PART OR EQUIVALENT CAN BE PURCHASED AT LOCAL SUPPLY HOUSE.

# Boiler Trim Assembly CGM and P-CG Series 9

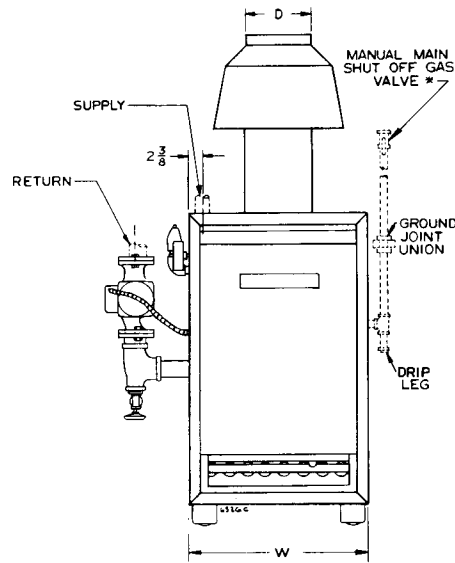


| FIG. NO. | DESCRIPTION  | VENDOR/<br>PART NUMBER                                   | W-M<br>PART NUMBER |
|----------|--|--|--------------------|
| 1        | Drain Valve, 3/4"  |  | ■                  |
| 2        | Tee, Reducer Black 1 1/4 x 3/4 x 1 1/4   |  | ■                  |
| 3        | Nipple, Black—<br>Taco 007 1-11/4 x 5 1/2<br>B&G LR20 1-1/4 x 6<br>B&G100/Taco 110 1-1/4 x 5     |  | ■<br>■<br>■        |
| 4        | Nipple, Close 1 1/4  |  | ■                  |
| 5        | Nut, Hex 7/16-14   |  | ■                  |
| 6, 11    | Screw, Cap Hex Hd. 7/16-14 x 1 1/4—SMALL PUMPS<br>Screw, Cap Hex Hd. 7/16-14 x 1 1/2—LARGE PUMPS |  | ■<br>■             |
| 7        | Wiring Harness, Box to Pump  |  | ■                  |
| 8        | Circulator, SMALL<br>Circulator, LARGE   | Taco 007 or<br>B&G LR20<br>Taco 110 or<br>B&G 100        | ■<br>■             |
| 9        | Pump Flange—<br>CG-25—3/4 NPT<br>CG-3-5—1 NPT<br>CG-6-7—1 1/4 NPT<br>CG-8—1 1/2 NPT              | B&G or Taco<br>B&G or Taco<br>B&G or Taco<br>B&G or Taco | ■<br>■<br>■<br>■   |

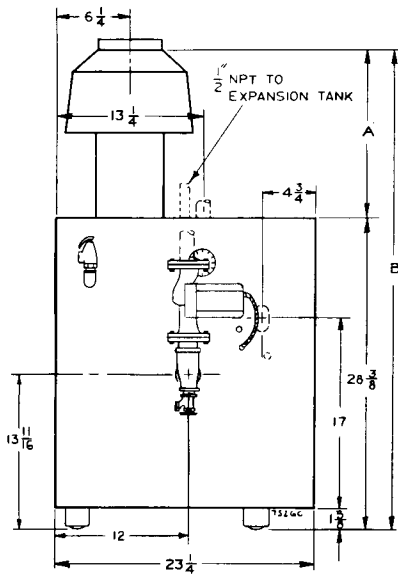
| FIG. NO. | DESCRIPTION  | VENDOR/<br>PART NUMBER                               | W-M<br>PART NUMBER |
|----------|--|--|--------------------|
| 10       | Pump Flange—<br>CG-25—3/4 NPT<br>CG-3-8—1 1/4 NPT        | B&G or Taco<br>B&G or Taco                           | ■<br>■             |
| 12       | Pressure-Temperature Gauge                               | Ametek Spec<br>#135392<br>Short Shank                | ■                  |
| 13       | Gasket   | Taco—SMALL<br>& LARGE PUMPS<br>B&G LR 20<br>B&G 100  | ■<br>■<br>■        |
| 14       | Relief Valve, 30# Male or Female                         |  | ■                  |
| 15       | Street Elb, 3/4 Black for Female Elb, 3/4 Black for Male |  | ■                  |
| 16       | Nipple, 3/4 x 2 Black                                    |  | ■                  |
| 17       | Expansion Tank—<br>(P-CG-25-5)<br>(P-CG-6)               | Fill-Trol System<br>#109<br>Fill-Trol System<br>#110 | ■<br>■             |
| 18       | Auto Air Vent (P-CG only)                                | Maid O'Mist #68                                      | ■                  |
| 19       | Reducer 1/2 NPT x 1/4 NPT (P-CG only)                    |  | ■                  |
| 20       | Nipple 1/2 x 6 (P-CG only)                               |  | ■                  |
| ***      | Silicone Sealant—400°F                                   | Dow 732 RTV  | ■                  |
| ***      | Retort Cement  |  | ■                  |

■ LISTED PART OR EQUIVALENT CAN BE PURCHASED AT LOCAL SUPPLY HOUSE.  
\*\*\* NOT SHOWN

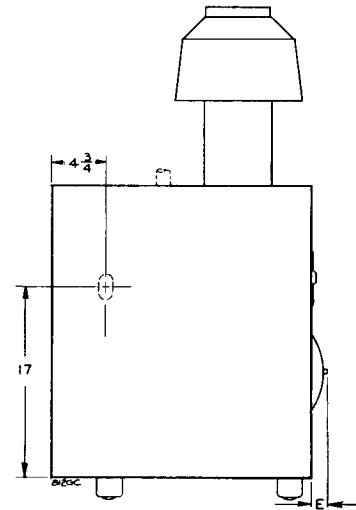
## DIMENSIONS



**FRONT**



**LEFT SIDE**



**RIGHT SIDE**

| Boiler Number | Supply Outlet |           | Return Inlet |           | Gas Connection Pipe Size |             |      | Gas Manifold Pipe Size All Gases | Dimensions |         |    |        |     |  |
|---------------|---------------|-----------|--------------|-----------|--------------------------|-------------|------|----------------------------------|------------|---------|----|--------|-----|--|
|               | No.           | Pipe Size | No.          | Pipe Size | Natural Gas              | Propane Gas | A    |                                  | B††        | C       | D  | E      | W   |  |
| †CGM-25       | 1             | 3/4"      | 1            | 3/4"      | 1/2"                     | 1/2"        | 1/2" | 11"                              | 39 3/8"    | 18 1/4" | 4" | 1 1/2" | 10" |  |
| †CGM-3        | 1             | 1 1/4"    | 1            | 1"        | 1/2"                     | 1/2"        | 1/2" | 18 1/2"                          | 46 7/8"    | 18 1/4" | 4" | 1 1/2" | 10" |  |
| †CGM-4        | 1             | 1 1/4"    | 1            | 1"        | 1/2"                     | 1/2"        | 1/2" | 20"                              | 48 3/8"    | 21 1/4" | 5" | 1 1/2" | 13" |  |
| †CGM-5        | 1             | 1 1/4"    | 1            | 1"        | 1/2"                     | 1/2"        | 1/2" | 23"                              | 51 3/8"    | 24 1/4" | 6" | 1 1/2" | 16" |  |
| †CGM-6        | 1             | 1 1/4"    | 1            | 1 1/4"    | 1/2"                     | 1/2"        | 1/2" | 26"                              | 54 3/8"    | 30 7/8" | 6" | 4"     | 19" |  |
| †CGM-7        | 1             | 1 1/4"    | 1            | 1 1/4"    | 3/4"                     | 3/4"        | 3/4" | 24 3/4"                          | 53 1/8"    | 33 7/8" | 7" | 4"     | 22" |  |
| †CGM-8        | 1             | 1 1/2"    | 1            | 1 1/2"    | 3/4"                     | 3/4"        | 3/4" | 27 1/2"                          | 55 7/8"    | 36 7/8" | 7" | 4"     | 25" |  |

†† Add 4 1/2" when automatic vent damper is used.

**RATINGS**


DOE



| Boiler Number | Input BTU/Hr. | D.O.E. Heating Capacity‡ | NET I-B-R Ratings BTU/Hr.* | Boiler Water Content Gallons | Maximum Allowable System Water Content in Gallons with Standard Fill-Trol▶ | D.O.E. Seasonal Efficiency (A.F.U.E.)‡ |      |              | Chimney and Breeching Size** |
|---------------|---------------|--------------------------|----------------------------|------------------------------|--|--|------|--------------|------------------------------|
|               |               |                          |                            |                              |  | Standing Pilot                         | PI   | PI w/ damper |                              |
| †CGM-25       | 52,000        | 44,000                   | 38,000                     | 1.54                         | 18   | 69.5                                   | 74.3 | 82.7         | 4" I.D. x 20'                |
| †CGM-3        | 70,000        | 58,000                   | 50,000                     | 1.54                         | 18   | 70.3                                   | 73.7 | 81.8         | 4" I.D. x 20'                |
| †CGM-4        | 105,000       | 86,000                   | 75,000                     | 2.11                         | 18   | 70.3                                   | 73.7 | 81.7         | 5" I.D. x 20'                |
| †CGM-5        | 140,000       | 115,000                  | 100,000                    | 2.69                         | 18   | 70.3                                   | 72.9 | 81.5         | 6" I.D. x 20'                |
| †CGM-6        | 175,000       | 143,000                  | 124,000                    | 3.26                         | 44   | 70.4                                   | 72.5 | 81.4         | 6" I.D. x 20'                |
| †CGM-7        | 210,000       | 172,000                  | 150,000                    | 3.84                         | 44   | 70.4                                   | 72.0 | 81.2         | 7" I.D. x 20'                |
| †CGM-8        | 245,000       | 200,000                  | 174,000                    | 4.42                         | 44   | 70.4                                   | 71.6 | 81.1         | 7" I.D. x 20'                |

NOTES: Fill Trol Expansion tank not furnished with CGM boilers.

- † Add "P" to designator for package unit without Fill-Trol (example P-CG-3). Add "PI" to designator for intermittent electronic ignition system; add "PI w/damper" to designator for intermittent electronic ignition system with automatic vent damper (example: CGM-3-PI w/damper).
- ▶ Includes boiler water volume. For piping systems which have a higher water content, additional compression tank capacity must be provided (see table, Page 6).
- \*\* In special cases where surrounding conditions permit, chimney height may be 10 ft.
- \* Net I-B-R 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 for factor of 1.15. For unusual piping and pick-up loads, consult your Weil-McLain representative.
- ‡ Based upon standard test procedures prescribed by the United States Department of Energy.

## STANDARD EQUIPMENT

**ASSEMBLED ON THE BOILER** • Insulated Extended Jacket • Vertical Draft Hood (packed in carton) • Aluminized Steel Burners • Stainless Steel Radiation Plates • Combination Gas Valve (with redundant seats) for 24 Volt • 100% Shutoff • Thermocouple • Built-in Air Eliminator • Non-Linting Pilot Burner • ASME Safety Relief Valve • Automatic Air Vent (not mounted—P-CG only) • Combination Pressure-Temperature Gauge • Combination Relay Receptacle and 40VA Transformer • Plug-in Circulator Relay • High-Limit Control • Electrical Junction Box • Wiring Harness and Safety Control Wire • Circulator— $\frac{3}{4}$ " CGM and P-CG-25; 1" CGM and P-CG-3 thru 5;  $1\frac{1}{4}$ " CGM and P-CG-6 and CGM-7;  $1\frac{1}{2}$ " CGM-8 • Fill-Trol (compression tank—not mounted—with fill and check valve, P-CG only) • Boiler Drain Cock

**OPTIONAL EQUIPMENT** • Fill-Trol Package for CGM (No. 109 or 110 compression tank, fill and check valve, automatic air vent and fittings) • Self-Generating Controls with 100% Shutoff (dual limit control furnished in place of gas valve with redundant seats) • Intermittent Electronic Ignition System (mounted and wired) • Intermittent Electronic Ignition System with Automatic Vent Damper

In the interest of continual improvement in products and performance, Weil-McLain reserves the right to change specifications without notice.

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