CLASSIC® OUTDOOR WOOD FURNACE OWNER'S MANUAL

Save This Manual For Future Reference

Tested & Listed By O-T-L Beaverton Oregon USA
OMNI-Test Laboratories, Inc.

c UL us

The Classic®

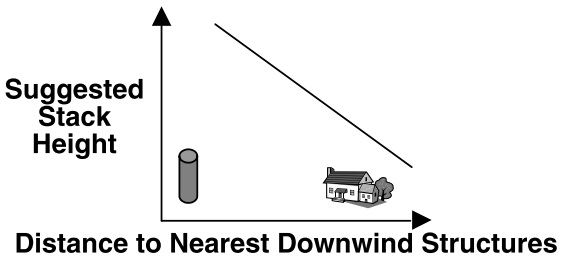
by

Central Boiler, Inc.
20502 160th Street
Greenbush, MN 56726
www.centralboiler.com

The Central Boiler Classic Models CL 4436, SCL 5636, CL 5648, and SCL 5648 are either UL or OMNI tested and listed.

OUTDOOR FURNACE BEST BURN PRACTICES

1. Read and follow all operating instructions supplied by the manufacturer.
2. **FUEL USED:** Only those listed fuels recommended by the manufacturer of your unit. Never use the following: trash, plastics, gasoline, rubber, naphtha, household garbage, material treated with petroleum products (particle board, railroad ties, and pressure treated wood), leaves, paper products, and cardboard.
3. **LOADING FUEL:** For a more efficient burn, pay careful attention to loading times and amounts.
4. **STARTERS:** Do not use lighter fluids, gasoline, or chemicals.
5. **LOCATION:** It is recommended that the unit be located with due consideration to the prevailing wind direction.
   - If located 50 feet or less to any residence not served by the furnace, it is recommended that the stack be at least 2 feet higher than the eave line of that residence.
   - If located more than 50 but no more than 100 feet to any residence, it is recommended that the stack be at least 75% of the height of the eave line of that residence, plus an additional 2 feet.
   - If located more than 100 but no more than 150 feet to any residence, it is recommended that the stack be at least 50% of the height of the eave line of that residence, plus an additional 2 feet.
   - If located more than 150 but no more than 200 feet to any residence, it is recommended that the stack be at least 25% of the height of the eave line of that residence, plus an additional 2 feet.



6. Always remember to comply with all applicable state and local codes.

HPBA
Hearth, Patio & Barbecue Association

Outdoor Furnace Manufacturers Caucus

INSTALLATIONS IN MASSACHUSETTS

1. All installation components must be products approved in the Commonwealth of Massachusetts by the Gas and Plumbing Board.
2. Maximum run of tubing from water heater to fan coil is 50 linear feet.

INTRODUCTION

Labeling and Terminology

The wood furnace and this manual use the following terms and symbols to bring attention to the presence of hazards of various risk levels and important information concerning the use and maintenance of the wood furnace.

WARNING: Indicates presence of a hazard which can 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.

NOTE: Indicates supplementary information worthy of particular attention relating to installation, operation, or maintenance of the wood furnace but is not related to a hazardous condition.

Be sure to follow all instructions and related precautions as they are meant for your safety and protection. Store this manual in a readily accessible location for future reference.

Foreword

This manual is to be used as a guideline for installation, operation, and maintenance of the Classic outdoor wood furnace. This manual is organized into six sections for your easy reference.

Section 1 relates to Operation;
Section 2 relates to Maintenance;
Section 3 relates to Installation;
Section 4 relates to Troubleshooting;
Section 5 relates to Owner Serviceable Items;
Section 6 includes General Information.

Anyone owning or operating this furnace must read, fully understand, and follow all of the information in this manual.

With proper maintenance, the Classic outdoor wood furnace will give many years of service; however, if replacement of any component is desired, be sure the furnace has cooled prior to starting the replacement procedure. Also, all live coals should be removed from the firebox before performing any maintenance that requires the draining of water.

WARNING

Be careful when performing maintenance on the furnace prior to it being thoroughly cooled down. Disconnect the electrical power to the furnace and remove all live coals from the firebox before performing maintenance that requires the draining of water or replacement of an electrical component.

Wood Quality and Storage

It is always best to burn seasoned wood. Seasoned wood burns more efficiently and minimizes the amount of creosote formation. Wood should be stacked so that both ends are exposed. Covering the wood to keep it out of the elements will keep it from absorbing moisture.

CAUTION

Do not store wood within the installation clearances listed with this manual.

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1 YEAR LIMITED WARRANTY ..... BACK COVER

SECTION 1 - OPERATING INSTRUCTIONS

OPERATING CLEARANCES AND PRECAUTIONS

Please read and observe the following information carefully before operating the Classic outdoor wood furnace.

WARNING

Never fire the furnace if the water level is below the FULL mark.

1. **The Classic** is to be fueled with untreated **wood only**. Do not burn garbage, gasoline, rubber, engine oil, naphtha, plastics, treated wood, or combustibles other than wood.
2. Do not use chemicals or fluids to start the fire. Use only paper and kindling to start an initial fire. Existing coals left in the firebox will restart the fire after reloading the furnace.
3. Do not store wood or other combustibles within the installation clearances listed in Section 3. Be sure to leave a safe amount of room to load the firebox and clean out ashes without causing a fire hazard. **Keep the area around the furnace clear of combustible materials. For fire safety, we recommend maintaining a 6 foot clearance to all combustible materials especially around door and draft areas. Debris of wood chips and other combustibles in the loading area may very easily be ignited if a hot coal is spilled out of the firebox and left unnoticed.**
4. This furnace is not to be used with an automatic stoker.
5. The furnace must not be allowed to pressurize. The vent cap is to be inspected periodically for any obstructions or restrictions. The vent cap must fit loosely over the vent. Do not extend or connect anything to the vent pipe.

Fig. 1

6. All cover plates, enclosures, and guards must be secured at all times except during maintenance, inspection, and servicing.
7. When replacing a light bulb, use a 40 watt appliance bulb. Do not install a bulb in excess of 60 watts.
8. In case of a power outage, either a small generator or 12V battery and a power inverter can maintain enough electricity to operate the system.
9. If any questions should arise that cannot be answered by the information in this manual, be sure to contact either your dealer or heating contractor.

FIRING THE FURNACE

The furnace comes equipped with a digital temperature controller which controls the water temperature at which the furnace damper shuts down. The controller allows the furnace to operate with a water temperature within a range of 150-195° F.

CAUTION

CHECK WATER LEVEL! Be sure water is at the FULL mark before firing.

CAUTION

If the furnace boils hard, be sure to check the water level and restore to the correct level if needed. Add Corrosion Inhibitor as needed.

The first time you fire the furnace, place dry kindling wood near the middle of the firebox. Use a **small** amount of paper to light the fire. Add larger pieces of wood to the fire but do not fill the firebox completely. When the water temperature reaches the controller setting (185° F) and the damper closes, let the furnace cycle a few times to be sure it is operating properly; then the furnace may be filled with more wood. After a few days of operation you will begin to know how much wood is needed each day. If you only fill the amount needed, it is easier to stir the ashes along the sides of the firebox and pull them forward (see Firebox Maintenance).

NOTE: Be sure to clean and inspect the firebox as outlined in Section 2, Firebox Maintenance.

CAUTION

Failure to clean the firebox as indicated will result in accelerated corrosion.

Periodically during the normal operation of the furnace, look at the water temperature display on the furnace. It should read the same temperature as the controller setting (185° F). If the reading is 212° F or above, this indicates either a low-water condition or a malfunctioning temperature controller or snap disc (unless the door and/or damper are open or not sealing properly). If the condition persists and the water level is correct, call your dealer for service.

Filling the Firebox

Prior to filling the firebox with wood, **always** pull the hot coals forward to the draft area (front and center of the firebox). When hot coals are pulled to the draft area before filling wood each time, the added wood ignites faster as the combustion air is forced through the hot coals and into the newly added wood. If the coals are pushed to the back, a less efficient burn will result. If needed to extend the burn time, the furnace may be completely filled.

When filling the firebox with wood, use the following procedure.

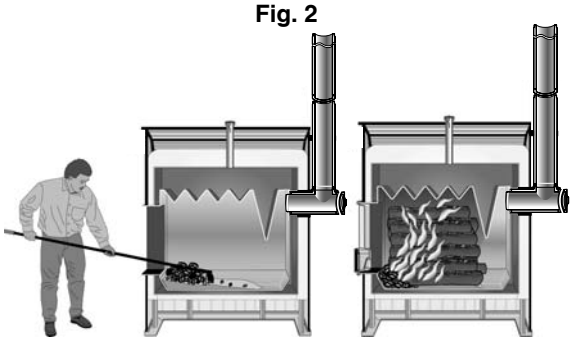
1. Unlatch the door; then as the door is opened, step back from the furnace. From a distance, observe the fuel load. Stay as far away from the furnace as possible especially if large amounts of wood and coals are present.

CAUTION

Stay as far away as possible from the door area when opening the door.

2. If necessary, clean the firebox of excess ashes and/or crusty deposits.
3. Pull the hot coals to the draft area of the firebox.

Fig. 2



4. Load the firebox with wood being careful not to be pinched between the wood and any part of the furnace.

NOTE: Use extreme care if adding wood when a large amount of wood and coals are already present in the furnace as very hot gasses will be coming out of the firebox door.

WARNING

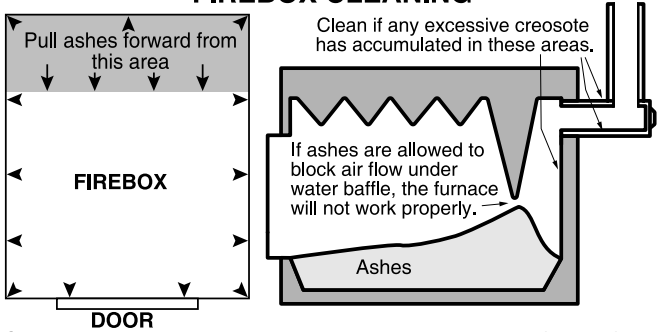
When filling wood into the firebox, be careful not to get pinched between the wood and the door frame or any part of the furnace. Use extreme care as large pieces of wood are difficult to handle.

5. Close and secure the door. **Do not use the door to ram wood into the furnace. Do not operate the furnace with the door open.** If the door is left open, an uncontrolled burn will result. To return to a controlled burn, close and secure the door.

NOTE: Creosote is an accumulation of combustion by-products on the surfaces of wood burning appliances. Twice a month during the heating season, inspect for excessive creosote buildup on the walls, flue, and chimney; if present, it should be removed for proper operation and fire safety. Creosote if ignited in the chimney, results in an excessively hot chimney fire. In case of a chimney fire, close the door.

Fig. 3

FIREBOX CLEANING



Clean corners as indicated by arrows in illustration. Pull ashes forward from the back of the firebox in shaded area. The walls of the firebox should be scraped from the ash line and below. Clean excessive creosote as necessary.

Adjusting Water Temperature

The furnace high water temperature setting can be adjusted anywhere within a temperature range from 150 - 195˚F. At 10˚F less than the temperature setting (10º F being the thermostatic differential), the controller will start the draft cycle by opening the damper (and activating the optional draft inducer if equipped). The controller has been preset at the factory at 185˚F. When OUT is indicated on the display, the controller is calling for heat. If it is desired to change the setting (because of a higher than normal heat load or cooler weather) use the following procedure.

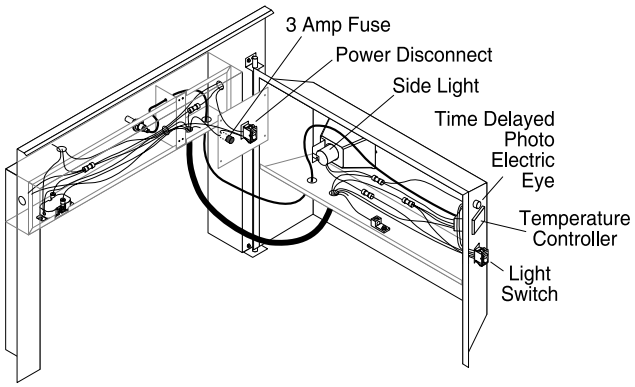
NOTE: It is not recommended to set the controller below 165˚F.

1. Press the SET button on the controller. "SP" will appear on the display.
2. Press SET again. The set temperature will now be displayed. The factory preset temperature is 185˚F.
3. Press either the UP or DOWN button until the desired operating temperature is reached.
4. Press SET to save the setting. "SP" will appear.
5. To exit the programming mode, either press the SET and DOWN buttons at the same time or wait one minute and the controller will automatically exit the programming mode.

NOTE: The controller will only allow values between 150 and 195˚F.

CONTROL LOCATIONS

Fig. 4



SECTION 2 - MAINTENANCE INSTRUCTIONS

FIREBOX MAINTENANCE

NOTE: Proper firebox maintenance will have direct effect on the life of the furnace.

CAUTION

Do not burn plastic, garbage, or treated wood.

NOTE: Chloride or sulfurous gasses generated if plastic or rubber is burned will mix with the moisture from the wood and form sulfuric or hydrochloric acids in the firebox creating excessive corrosion.

It is important to stir the ashes in the firebox and pull them forward once every three or four days to prevent the ashes from sealing moisture on the bottom and along the edges. It is especially important to scrape the walls and the four corners at the ash line and below. If this maintenance operation is not performed as directed, deterioration can result from moisture trapped between the ashes and the steel.

Once each day, apply Ashtrol Conditioner to the firebox. Use a spoon as directed to broadcast powder in firebox, alternating placement daily. One day broadcast on fire or hot coals, the next day broadcast against the walls and baffle. Ashtrol is a pH modifier that helps to neutralize acids that may form in the firebox.

Any heavy or solidified ashes should be removed. When the ashes build up either to the door frame in the front or to the top of the beveled ash pan of the firebox, they should be removed. A hoe, ash rake, and shovel to be used for this procedure may be purchased from your Central Boiler dealer. Leave enough ashes and coals to relight the fire. For your protection, wear a dust mask and protective clothing when cleaning ashes from the firebox.

CAUTION

Always wear a dust mask and protective clothing when cleaning ashes from the firebox.

When the ashes are cleaned out, be sure to put them in a noncombustible container with a tight cover. It can take many days before they are completely cooled down. Other waste should not be placed in this container. Each time the ashes are cleaned out, inspect the door rope to make sure it is sealing properly.

WARNING

When cleaning the furnace, be careful not to spill any coals outside of the noncombustible container.

Once a month the bottom 12 inches of the firebox should be scraped clean. This can be accomplished by letting the fire get very low; then moving the coals to one side and, using a hoe, cleaning half of the firebox. Next, move the coals to the other side and finish cleaning the firebox leaving some ashes with the live coals. Finally, pull the coals and ashes to the draft area (front and center of the firebox). When the furnace is filled, the coals left in the firebox will light the fire.

The top and walls of the firebox above the ash line should be scraped clean if large, thick, or dry crusty deposits are present on the walls or behind the baffle. A thin, tar-like layer of creosote does not cause any problems in the operation of the furnace. If the flue passageway behind the baffle becomes plugged, it must be cleaned. Inspect the chimney; clean if an excessive buildup of creosote is present. The ash line and below needs to be cleaned to reduce the possibility of corrosion.

Inspect the firebox for signs of corrosion every 3 months the first year and every 6 months thereafter. Clean firebox walls, front and back corners; then inspect the firebox. If excessive corrosion is visible, review your maintenance procedures and monitor quarterly (see Maintenance Schedule).

Periodically, lubricate door handle with a light petroleum distillate (WD-40 or equivalent).

MAINTENANCE SCHEDULE	
Daily –	**Broadcast Ashtrol in firebox. Alternating each day, apply once per day on the fire then against walls and baffle. Stir, scrape, and pull ashes in firebox forward, especially in the back corners. Check water level. Be sure to close the sight-gauge valve after checking water level.**
Monthly –	**Check door rope; check chimney; check vent cap; remove ashes and clean firebox.**
Biannually –	**Complete ash removal and firebox inspection; then scrape the firebox. This biannual inspection should be performed on new furnaces after the first month and after the third month of operation. Use a wire brush and small scraper to clean firebox, side wall, back wall and ash pan; then using a light, inspect for corrosion. Lubricate solenoid plunger with a light petroleum distillate (WD-40 or equivalent).**

WATER QUALITY AND MAINTENANCE

An important part of furnace maintenance is controlling the quality of the water in the furnace. Central Boiler supplies a pH tape and a nitrite test kit with each new outdoor wood furnace.

Before filling the furnace with water, a sample of the supply water that will be used to fill the furnace (softened water is best if possible) should be tested with the pH tape. This is a simple test in which a small sample of the water is collected in a clean container; then dip the pH indicator tape in the water and compare the color to the chart provided with the test paper. If the pH test results indicate a pH level between 6.5 and 8 and there are no other known water quality problems, then the furnace may be filled with this water. If the water to be used to fill the furnace has a pH level of less than 6.5 or greater than 8, a sample of this water should be sent to a water quality test lab for recommended treatment, the water should be conditioned, or water should be supplied from a different source.

Central Boiler Corrosion Inhibitor (p/n 165) gives optimum protection with an initial treatment of 2000 ppm and a maintenance level between 1500 and 2000 ppm. Corrosion Inhibitor should be added through the vent pipe at the top of the furnace at the recommended rate for each furnace. The recommended initial treatment rate for each furnace is specified by units. One unit of the Corrosion Inhibitor is a 3-quart container. The normal rates for the initial treatment of the furnaces are as follows: CL 4436— 1 unit, SCL 5636 — 1 ½ units, CL 5648 and SCL 5648 — 2 units.

Immediately after adding Corrosion Inhibitor, fill the furnace to the FULL mark on the sight gauge; then start the pump(s). Circulate water for 24 hours and test inhibitor and pH levels using the appropriate test kit. Use Test Kit, p/n 405 when **no** antifreeze is present in the water. Use Test Kit, p/n 597, when antifreeze **has been** added to the water. If the nitrite level is not at least 2000 ppm, add ½ unit of p/n 165; then circulate water for 24 hours and repeat procedure until the 2000 ppm level is achieved. Do not exceed 3000 ppm. After the proper nitrite level has been obtained, check pH to make sure it registers between 8 and 9.5.

NOTE: If the system has a larger than normal water capacity, more inhibitor should be added at a recommended rate of one unit per 180 gallons of water.

Before collecting the sample, drain about a quart of water from the sight-gauge tube and then carefully fill the sample container without contaminating the sample. It will be necessary to remove the tube from the sight-gauge mounting clip and bend the tube away from the furnace to collect the sample. Be sure to properly install the sight-gauge tube and **close the valve when finished**. The sight-gauge valve and tube will drain when the valve is closed.

The water, once treated, should remain stable as long as water is not added to the furnace. If water is added to the system, the system water should be tested and Corrosion Inhibitor should be added (if necessary) to maintain the same level of protection.

NOTE: Water should not be added to the furnace frequently as it may increase the amount of solids in the system that can cause problems in the water jacket. If there is a leak in the system or if the furnace is boiling frequently causing an abnormal water loss, the problem should be identified and repaired immediately. Under normal operation, only a small amount of water should need to be added once each year or two.

After the initial three months of operation and every six months thereafter, the water should be tested for the pH and nitrite levels. These levels should be maintained as indicated in the following chart.

Water Treatment Guidelines		
Nitrite Level	**pH Level**	**Change Necessary**
1500-2000 ppm	8.0-9.5	No treatment necessary.
0-500 ppm	Below 9.0	Add p/n 165: 1 unit for CL 4436, SCL 5636, SCL 5648 and CL 5648 models. Circulate 24 hours; add more if needed to bring up to 1500 ppm.
500-1500 ppm	Below 9.0	Add p/n 165: ½ unit for CL 4436, SCL 5636, SCL 5648 and CL 5648 models.
Above 3000 ppm	8.0-9.5	Dilute by adding water to the system; then retest after water circulates for one day.
1000-1500 ppm	Above 10	Dilute by adding water to the system; then retest after water circulates for one day. If necessary, add p/n 165 to bring the nitrite level back to a minimum of 1500.

POST HEATING SEASON MAINTENANCE

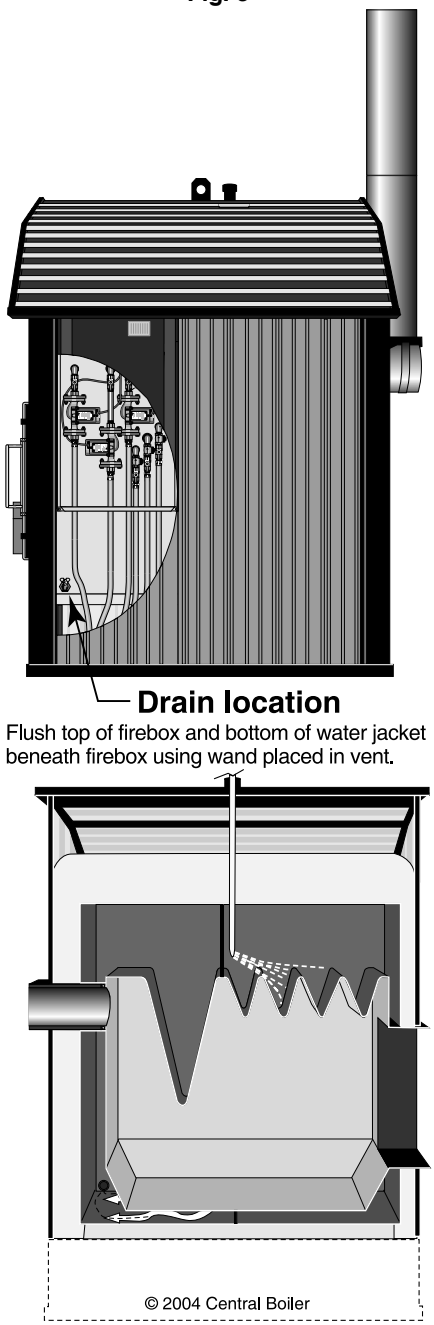
The water should be left in the furnace during the non-heating season. Check pH and nitrite as described in the Water Quality and Maintenance section; add Corrosion Inhibitor (p/n 165) as needed. If Corrosion Inhibitor is added, run the circulation pump for two days to thoroughly mix in the new corrosion inhibitor. If water is added, bring the water up to operating temperature as soon as possible.

At the end of the season, clean all the ashes out of the furnace. Scrape the walls and floor of the firebox taking special care to clean at the ash line and below, especially in the corners. Check behind the baffle and in the chimney flue. Clean out any excessive buildup. Any large or dry crusty deposits on the walls, baffle, or heat exchanger area should be removed. A thin, tar-like coating of creosote above the ash line does not need to be scraped clean as it works like a protective coating on the metal. When cleaning the firebox, be sure to wear eye protection and a dust mask.

When the furnace is clean, carefully inspect the firebox for any excessive corrosion or deterioration. If any corrosion or deterioration is found, call your dealer. It is always better to do furnace maintenance during the non-heating season. After the inspection is completed, apply a thin coat of motor oil to the firebox being sure to work oil into all corners. Place a cover over the chimney to keep rain from entering the furnace. Clean and oil the chimney flue to the firebox.

Once every three years, the water should be flushed from the system and the water jacket should be rinsed (see Fig. 5). Remove the inspection panel and insulation covering the drain to gain access to the drain. Open the drain; then drain and flush the furnace. Close the drain securely after flushing the furnace. Check the drain for leaks after filling the furnace with water being certain to treat with the correct amount of Corrosion Inhibitor. Operate the pump to thoroughly mix the inhibitor. After confirming the seal of the drain, insulate the area with either canned urethane foam insulation or a mat of fiberglass insulation. Install the inspection panel and secure with the self-tapping screws.

Fig. 5



If water is added more frequently than once during the heating season, a complete inspection of the furnace and plumbing should be performed.

SECTION 3 - FURNACE INSTALLATION

Careful planning and proper installation of the outdoor wood furnace and the entire heating system are essential for the ultimate in customer satisfaction and heating comfort and efficiency. Be sure to read and observe all of the following information in this section when installing the furnace.

CAUTION

This wood furnace is not intended to be the only source of heat. Should the system be left unattended, run out of wood, or be in need of service, a backup system should be in place to prevent damage caused by freezing.

INSTALLATION CLEARANCES AND PRECAUTIONS

- **The Classic** is not intended or certified to be installed inside a building.
- If this outdoor wood furnace is used to heat potable water that has any association with commercial food preparation or heating milk-house hot water, it is recommended that a double wall heat exchanger be installed. Also, a check valve (backflow preventer) must be installed in the line used to fill water into the system.

NOTE: All installations and operations must be in accordance with local and state codes which may differ from the information in this manual.

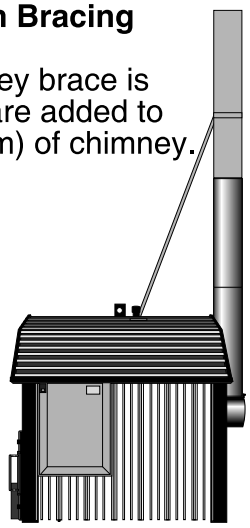
1. Installation requirements for clearances to combustibles are as follows:
   - 18 inches from the back of the furnace.
   - 6 inches from the sides of the furnace.
   - 48 inches from the front of the furnace.
   - 18 inches from the chimney connector.
   - The foundation must be noncombustible.
2. **In higher populated areas, it is necessary to extend the chimney to a height above the roofs of surrounding buildings.** All chimney extensions should be insulated to prevent condensation from entering the furnace firebox. When extending the chimney, each section must be secured at each connection joint with 4 screws to stabilize the extension. The outer shell of each extension (that covers the insulation) should also be fastened with 4 screws to increase stability. If extensions are added to the standard 8 feet of chimney, a stabilizing brace or other suitable support should be installed to ensure the stability of the extended chimney.

NOTE: If a chimney extension or chimney replacement is desired, only use genuine Central Boiler chimney components listed in the parts section of this manual.

Fig. 6

Chimney Extension Bracing

Installation of a chimney brace is required if extensions are added to the standard 8 feet (2.4 m) of chimney.



3. A nontoxic boiler-type antifreeze may be added to prevent freezing if the furnace is to not be fired for extended time periods in cold weather. If antifreeze is used, be sure to adhere to all warnings and precautions on the label of the product being used.

NOTE: Do not use automotive or RV types of antifreeze. Water may be kept from freezing by running the circulating pump(s) and drawing the heat off the building being heated by the backup heating system.

WARNING

Vent cap must fit loosely on the vent opening. Do not force the cap down or try to seal it tightly onto the vent pipe. Do not extend or restrict the vent pipe or opening. DO NOT ALLOW THE FURNACE TO PRESSURIZE.

4. An approved chimney spark arrestor is recommended for all installations and is required if the furnace is used in areas with high fire risk.
5. Installation of the furnace is to be performed by a qualified installer.
6. The qualified installer must determine how to install this supplementary furnace to be compatible with the existing heating source.
7. Add Central Boiler Corrosion Inhibitor (p/n 165); then if possible, fill the furnace with softened water.
8. If any installation questions arise that cannot be answered by the information in this manual, be sure to contact either your dealer or Central Boiler.

PLANNING THE INSTALLATION

Several items must be taken into consideration when selecting a suitable location for the Classic outdoor wood furnace. Highlighted below are many of the key items that must be considered when choosing a location for the furnace.

Check all pertinent state, provincial, and local codes.

Check with your insurance company to see if they have any location requirements.

Consider the direction that the smoke will travel with the prevailing winds.

The shorter the distance between the furnace and building(s) being heated, the lower the cost will be for the installation of the supply and return water lines and insulation. Be sure to maintain the required clearances to combustibles.

The water lines from the furnace to the building(s) should not be buried in low lying areas with standing water or very high water tables.

The water lines should not (if at all possible) run across an area of heavy vehicle traffic. Water lines that run under heavy vehicle traffic areas should be protected from excessive compression.

If the ground where the furnace is to be placed is either unstable or subject to frost heaving, a concrete foundation with two 3 foot cement pilings positioned near the front corners should be installed.

GENERAL INSTALLATION INFORMATION

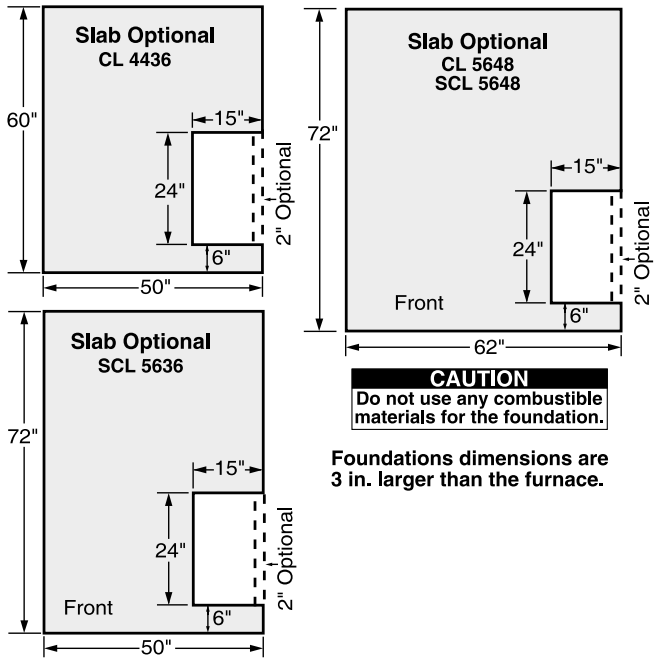
The furnace may be installed directly on stable ground without the necessity of pouring a slab. If the ground is unstable you may want to either use a perimeter of patio blocks under the base or pour a concrete foundation.

It is recommended however, that the furnace be installed on a concrete foundation. Figure 7 identifies the foundation dimensions and hollowed out area necessary for each model. A 4 to 6 inch thick concrete slab works well, but a thicker slab may be used to obtain the desired door opening height. If the area where the furnace is to be positioned is unstable and/or affected by frost heaving, before pouring the concrete, dig two 8 inch holes 3 feet deep at the rear corners of the slab to provide additional support to keep the slab from tipping.

WARNING

Do not allow combustible materials (straw, hay, or wood) near the base. Keep the perimeter of the furnace clear and clean.

Fig. 7
Foundation Dimensions



CAUTION
Do not use any combustible materials for the foundation.

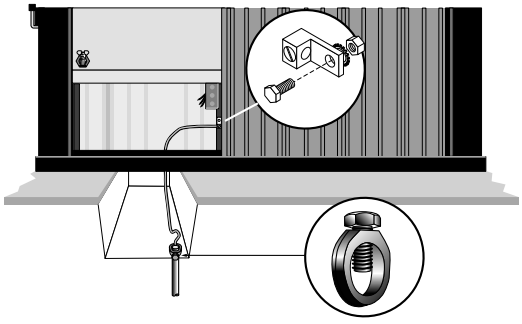
Foundations dimensions are 3 in. larger than the furnace.

Furnace must be installed on a non-combustible surface or foundation that incorporates an enclosure that will prevent supply and return lines from any possible exposure to sunlight, fire, or physical damage that may be caused by an occurrence outside the furnace enclosure.
Foundation may consist of concrete, crushed rock, or patio blocks.

Shut-off valves must be installed on each line so the water lines can be shut off individually for purging air from the lines if necessary. Be sure all fittings are metal. **Do not use plastic fittings or valves.**

Using the following instructions, install and connect a ground rod (kit p/n 6593) to the furnace. In the water supply trench near the furnace, drive the ground rod into the ground until the top of the ground rod is below the ground surface. Route the ground wire from the ground rod, under the furnace base, and over to either a vertical brace or the frame on the furnace. Drill a 1/4 in. hole in the brace and secure the ground terminal with a cap screw (1/4x20x3/4 in.), star washer and nut; then secure the ground wire to the terminal. Secure the ground wire to the ground rod with the clamp. Tighten all hardware securely.

Fig. 8



NOTE: Prior to drilling the 1/4 in. hole in the brace, check to see if there is already a 1/4 in. hole in the base for the ground. Some models have a hole predrilled in the base for the ground terminal.

Access to the hot and cold outlets is gained by opening the control panel on the right-hand side of the furnace. The upper outlets are the hot (supply) outlets and the lower outlets are the cold (return) outlets. This allows for the mounting of the circulation pumps on the furnace. If desired, the circulation pumps may also be installed in the building being heated. Figures 9 & 10 illustrate proper water line and pump installations.

Fig. 9

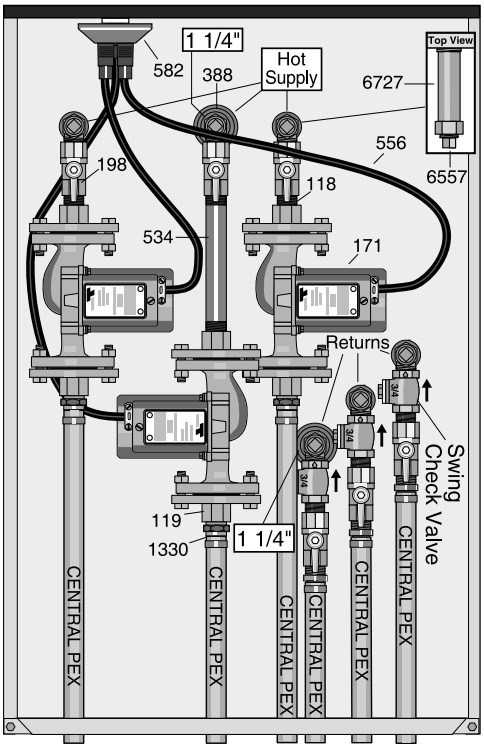
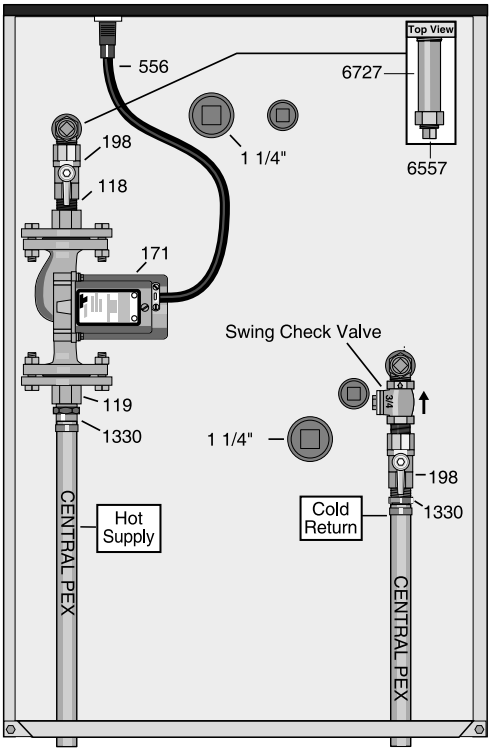
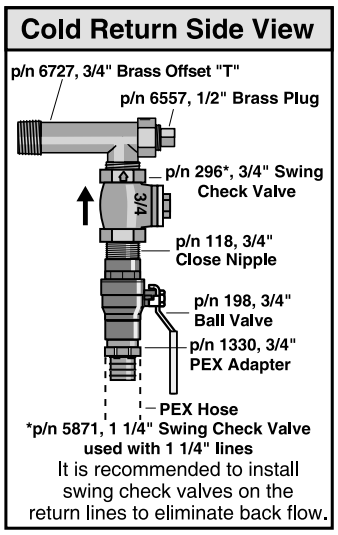


Fig. 10





Power Disconnect Shuts Off All Power Including Pumps.

1 - Pump Parts List*

Qty	p/n	Description
2	6727	3/4" Brass Offset "T"
2	118	3/4" Close Nipple
1	171	007 Pump
1	119	3/4" Flange Kit
2	198	3/4" Ball Valve
2	1330	3/4"x 1" MPT to PEX
2	6557	1/2" Brass Plug
1	556	3' Pump Cord
1	296	3/4"Swing Check Valve

3 - Pump Parts List*

Qty	p/n	Description
6	6727	3/4" Brass Offset "T"
5	118	3/4" Close Nipple
3	171	007 Pump
3	119	3/4" Flange Kits
1	534	3/4"x 7" Nipple
6	198	3/4" Ball Valve
6	1330	3/4"x 1" MPT to PEX
6	6557	1/2" Brass Plug
3	556	3' Pump Cord
1	582	6 Outlet Converter
2	388	1 1/4 x 3/4" Bushing

*Parts & accessories sold separately.

Section 3

WATER SUPPLY LINES AND INSULATION

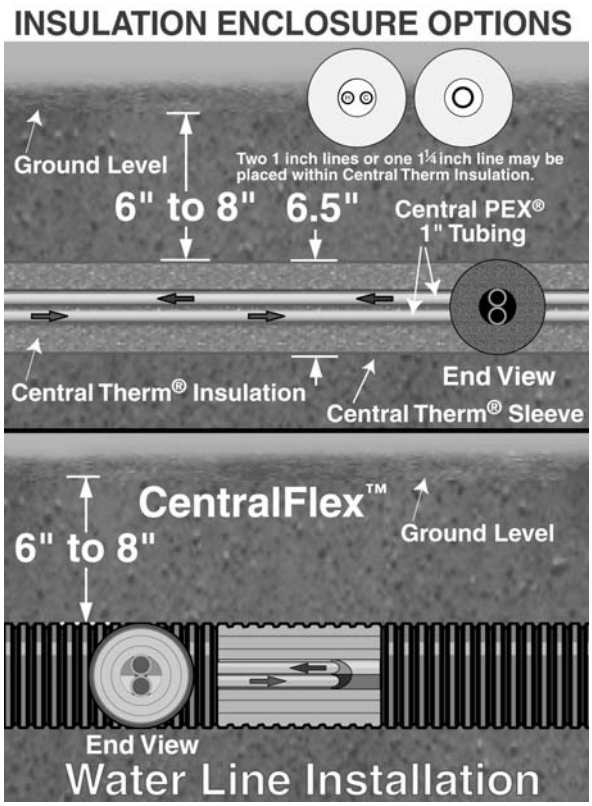
General Information

The water lines to be used are 1-inch (1 ¼ -inch on large heat loads) **Central PEX** crosslink polyethylene lines (rated for 100 PSI at 180° F). **Central Therm** foam pipe insulation (p/n 241 or 242) should be used to insulate the lines (see Fig. 11) and they should be covered with **Central Therm Sleeve**. Installation of the water lines and insulation into a continuous length of Central Therm Sleeve will greatly reduce heat loss caused by ground water contact. Also, use of Central Therm Sleeve for temporary above ground applications (4-6 months) will reduce the effects of ultraviolet rays on the water lines and insulation.

Central Boiler now offers a convenient alternative to ordering and assembling Central PEX tubing, Central Therm insulation, and Central Therm Sleeve. **CentralFlex™** is a preassembled set of two 1 in. PEX tubes surounded by insulation and encased in a waterproof corrugated jacket. It is available in 100 and 500 foot lengths.

The water lines should be buried in a trench approximately 12 inches deep. The water lines should **not** be buried in low lying areas with standing water. Historically, lines buried deep (3 to 4 feet) have been known to have a greater number of problems especially when ground water contacts the water lines causing an excessive heat loss and greatly increasing the amount of wood consumption. An exception to the previously stated depth of the lines is necessary if the lines run across an area of heavy vehicle traffic. In above ground applications where the lines will not be buried in a trench, the lines and insulation should be covered as exposure to ultraviolet rays will cause deterioration of the water lines and insulation.

Fig. 11



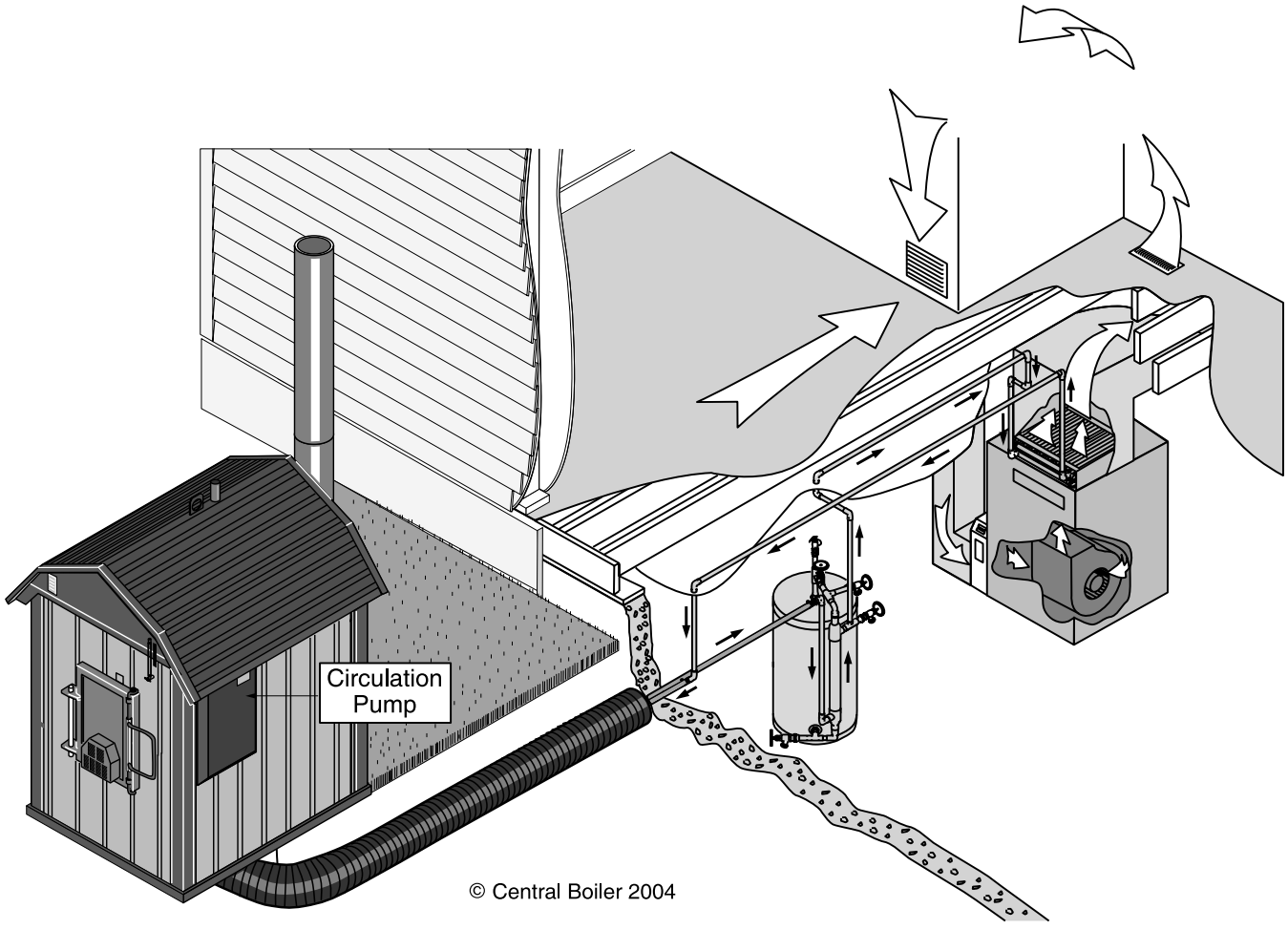
Do not use a drain tile pipe, bubble wrap, or PVC pipe for water lines unless these pipes can be installed in a manner that allows the drainage of any water that could possibly enter. If the water supply and return lines are not insulated properly, there can be excessive heat loss. This heat loss can greatly increase the wood consumption.

For a single building water to air heat exchanger system, the direction of water flow is to be as follows: from hot outlet on the outdoor furnace to the bottom of the domestic water heater exchanger, to the lower fitting of the heat exchanger on the existing furnace, and returned to the cold return of the outdoor furnace.

NOTE: The direction of water flow is very important for the proper operation of the furnace.

The circulation pump(s) **must be installed in the hot supply line(s)** with the arrow on each pump pointed away from the furnace. In order to avoid circulation problems, do not install the pump(s) in the return line(s).

Fig. 12

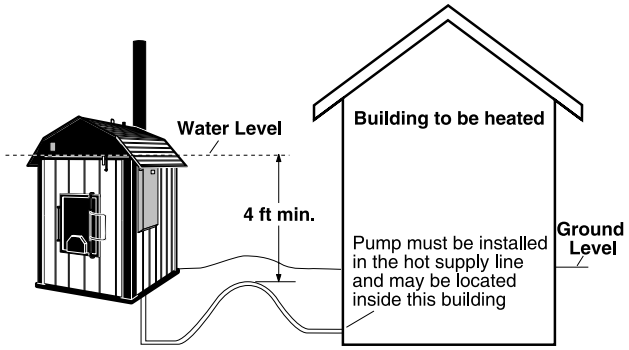


If not mounted on the furnace, the circulation pump(s) need to be mounted 4 to 5 feet lower than the top water level in the furnace (see Fig. 13 & 14). It is recommended to mount the pump(s) at the furnace especially if the building being heated is higher than the furnace or if there is a large rise in the water lines between the furnace and the building (see Fig. 15 & 16). Hot water boils at a lower temperature when pulled uphill (because it is at a lower pressure); therefore, hot water must be **pushed** uphill to ensure proper circulation. Shut-off valves should be installed on both sides of each pump so if it becomes necessary to repair or replace the pump, the water can be shut off on both sides of the pump. A screen or filter with a sediment chamber may be installed in the line to remove foreign particles which might be present in the water. The following guidelines must be adhered to when installing the circulation pump(s).

A. The pump motor must be installed in a horizontal position.
B. The junction box must be located above the pump motor.
C. Do not run the circulation pump until the system has been tested for leaks and filled with water.

NOTE: Be sure to follow the pump installation instructions that are supplied with the pump if they differ from the information contained in this manual.

Fig. 13



When the pump is located inside the building to be heated, a minimum of 4 feet between the water level in the outdoor furnace and the highest point of the water line between the furnace and the building must be maintained.

NOTE: The circulation pump(s) must be installed in the hot supply line(s).

Fig. 14

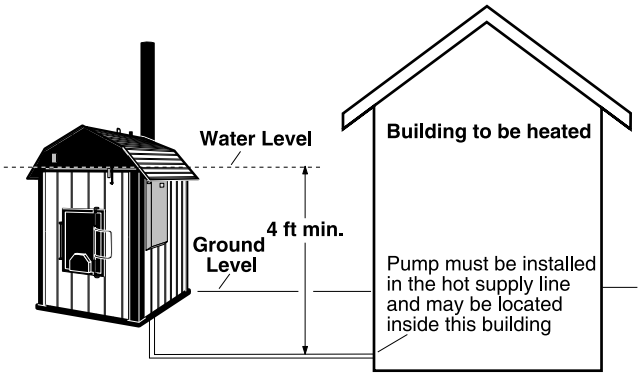


Fig. 15

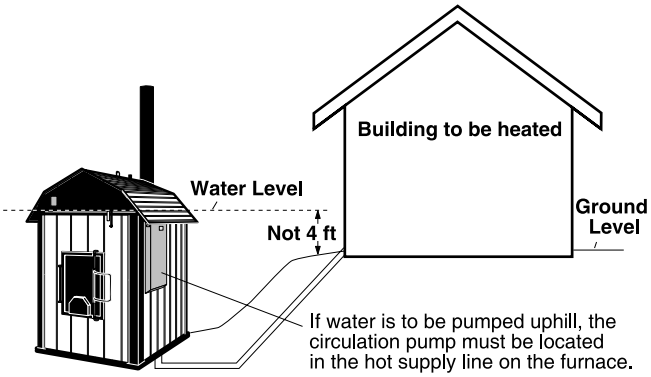
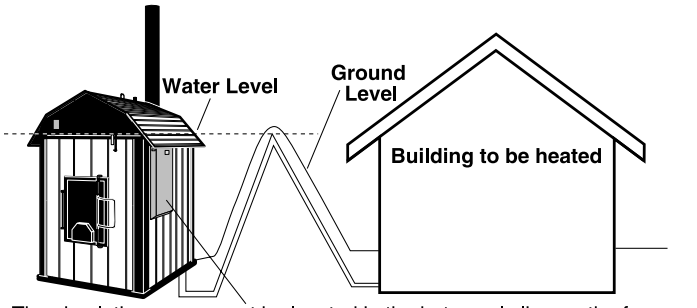
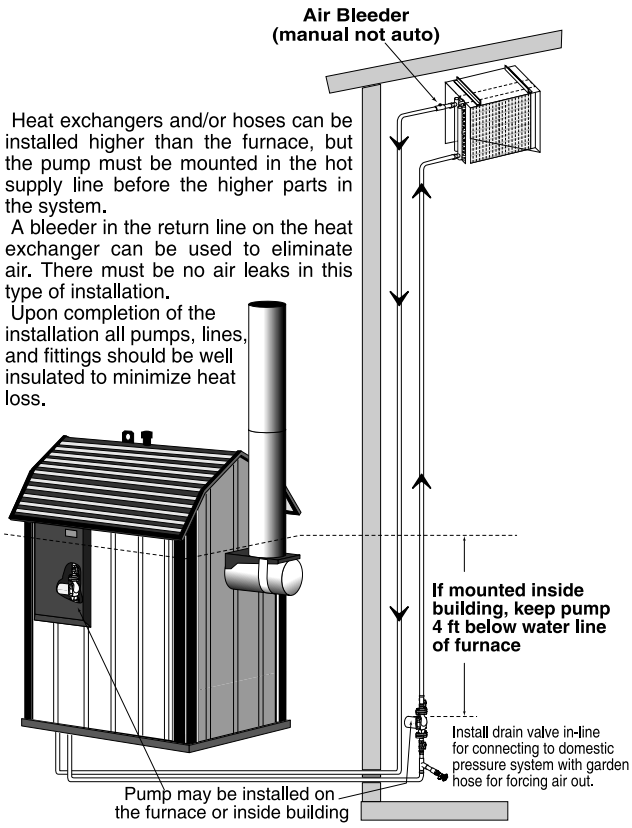


Fig. 16



Manual air bleeders may be installed in the high points of the water lines where air may get trapped and cause circulation problems. Water can be pumped to levels higher than the furnace as long as the pump is pushing the water to the higher level and providing there are **no air leaks** in the system (see Fig. 17).

Fig. 17



Section 3

Installing

NOTE: If installing CentralFlex™, the tubing, insulation, and sleeve assembly instructions in this section may be ignored.

Prior to installing the water lines in the insulation, mark both ends of the hot line so that the hot water line can be identified for correct installation. The hot fitting on the furnace takes the water from near the top of the water jacket and the return is lower on the water jacket. It is very important to keep the water lines properly identified.

When installing the water lines, an installation allowance for expansion and contraction of the lines must be made. If the water lines are mounted solid to the furnace or inside the building, the lines may kink or the fittings may be pulled apart causing an immediate water loss from the furnace. Central PEX water lines can have an expansion/contraction rate up to 0.95 in./100ft/10°F.

A 14-2 underground rated wire (2 wires plus ground) may be buried in the same trench to supply the furnace with electricity. A larger wire diameter may be needed if the run is over 200 feet. When installing the electrical supply for the furnace, it is recommended that the incoming fuse or circuit breaker not exceed 15 amps. The furnace must be electrically bonded to ground in accordance with the requirements of the authority having jurisdiction or, in absence of such requirements, with the National Electrical Code, ANSI/NFPA 70 and/or the Canadian Electrical Code Part 1, CSA C22.1 Electrical Code.

NOTE: If unavoidable that the trench is to be run through an area of ponding water, the installer must make certain that water will not enter the installation enclosure. One option is to encase the water lines, insulation, and sleeve in corrugated flexible tubing and digging the trench with a slight slope to one direction or the other (preferably away from the building) to allow drainage of any water that may enter the tube.

1. Remove the siding panel and base trim below the control panel. Dig a trench 12 inches deep between the furnace and building(s) to be heated; then make an entrance for the lines into the building(s).

WARNING

Before trenching, be sure to call for locator service.

2. Mark both ends of the hot water line; then install both water lines in the Central Therm foam pipe insulation using the following procedure:

   A. Using a large mitre box and a fine tooth saw, trim both ends of each insulation section.

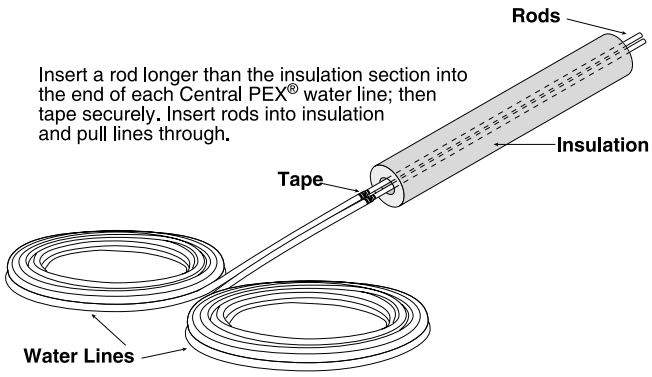
NOTE: The insulation sections must be trimmed square so they can be glued together during the installation process.

   B. To make inserting the water lines easier in the insulation, insert a rod into the end of each water line; then securely tape the rods to the water lines.

NOTE: The rods should be long enough to be inserted into the insulation section and grabbed from the other end.

   C. For each insulation section, slide the rods into the insulation section; then pull the water line through the insulation. Continue until the water lines have been threaded into all insulation sections.

Fig. 18



   D. Using contact cement, glue the ends of the insulation sections together; then using tile tape, tape the perimeter of each seam.

   E. Measure the length of Central Therm Sleeve necessary to run the entire length of the installation, add two additional feet (minimum), and cut. Slide the sleeve over the insulation; then wrap each end and secure with duct tape. Waterproof each end with silicone or other waterproofing agent.

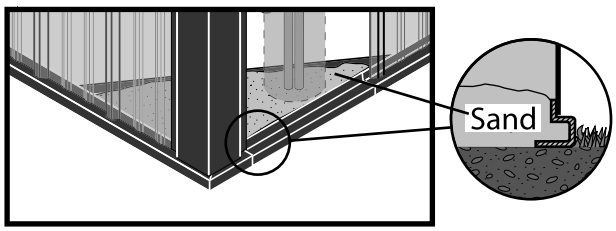
3. Lay the supply lines into the trench and feed one end into the building. Apply sealant around the lines where they enter the building. Do not backfill the trench until the water lines have been tested to ensure there are no leaks.

NOTE: All holes made in basement or building walls are to be completely sealed to prevent water from entering the building.

4. Connect the water lines to the furnace and building allowing for expansion and contraction of the lines at each end.

5. Install the base trim; then using sand or fine dirt, back fill the perimeter of the water line enclosure to the top, inner edge of the base. Install the siding panel.

Fig. 18a



Wiring The Circulation Pumps

Upon completion of the water lines and circulation pump(s) installation, the circulation pump(s) must be properly wired using the following procedure. Perform the procedure on each pump and power cord assembly. Power cords must be UL listed and rated for 221° F.

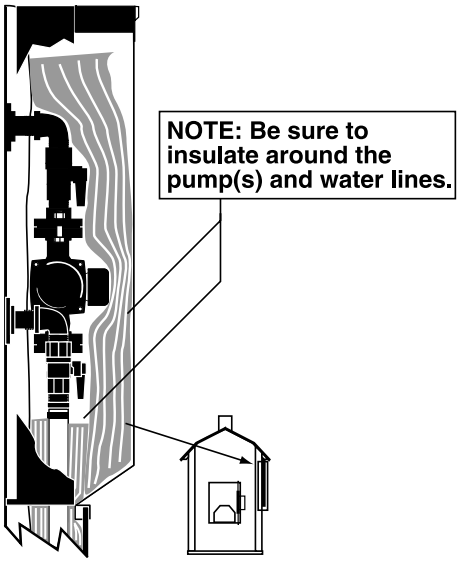
WARNING

Do not attempt service inside the electrical control panel without first disconnecting the electrical power at the main power source.

NOTE: Any electrical installation should be done by a certified electrician in accordance with all applicable codes.

1. Remove the screw securing the capacitor box cover; then remove the cover.
2. Slide the metal strain relief onto the end of the cord assembly; then insert the end of the cord assembly into the capacitor box. Secure the strain relief to the box and cord assembly. Tighten securely.
3. Slide the green wire beneath the green screw; tighten securely. Join the white wires and secure with a wire nut. Join the yellow and black wires and secure with a wire nut.
4. Carefully position all wires within the capacitor box and install the cover. Secure with the screw.
5. Plug the cord into the receptacle. Route or tie the cord so it does not contact any hot areas of the furnace or water lines.
6. Insulate the areas around the water lines and pump(s); then install and secure the cover.

Fig. 19



NOTE: If installing three pumps, use a UL approved splitter on the receptacle outlet.

CAUTION

Maximum load of the outlet is 10A, 120VAC, and 60Hz.

WATER HEATER INSTALLATION

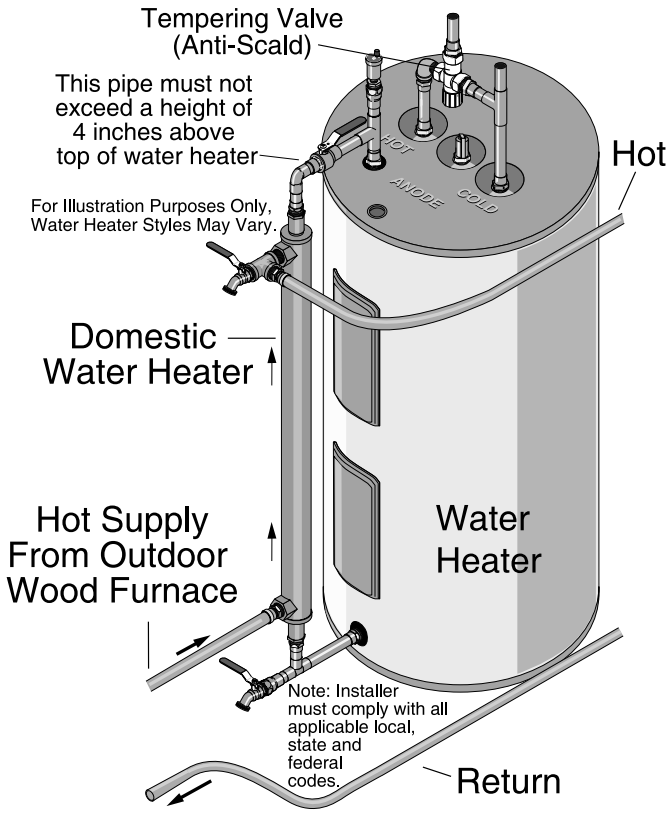
Installing a domestic hot water heat exchanger in the building that is being heated is an inexpensive way to capture additional savings from installing the outdoor wood furnace. The hot water line from the furnace should be plumbed first to the water heater heat exchanger and then to the balance of the heating system.

When necessary in certain applications, a 3-way zone valve should be installed so that during the non-heating season, the water heater may be operated without operating the entire heating system. A tempering valve (or anti-scald valve) is to be installed in the hot water outlet from the water heater. Install a tee in a fitting on the top of the water heater (see Fig. 20) for the hot water heat exchanger.

NOTE: If the water heater has been in service and contains an anode rod, flush the water heater prior to installing the hot water heat exchanger as existing anode rod residue may tend to plug the heat exchanger.

Fig. 20

NOTE: When heating water with a high mineral content, it may be necessary to periodically remove and clean the heat exchanger using non-diluted Anti-Sludge Conditioner.



WARNING

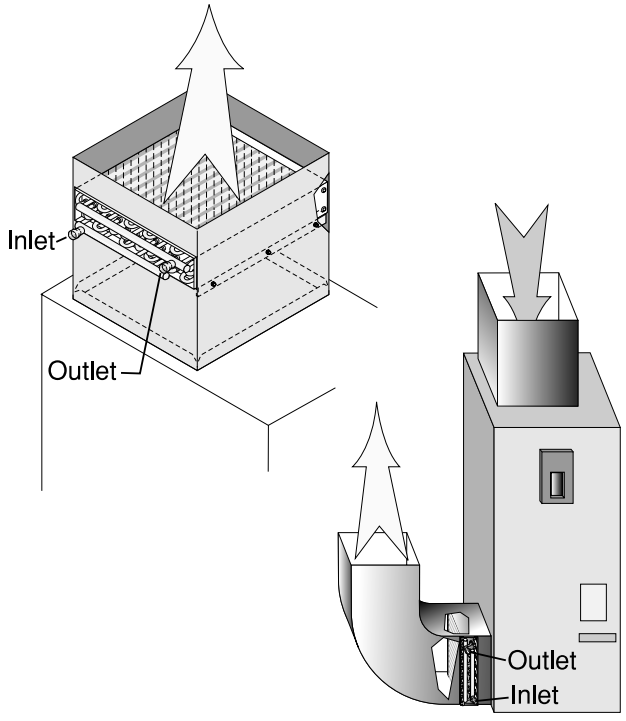
DO NOT disable or remove any safety reliefs or controls. Turn off the power to the water heater before starting the installation process.

EXISTING FORCED AIR INSTALLATION

When the Classic furnace is installed in conjunction with an existing forced air system, a water-to-air heat exchanger is to be mounted in the plenum or duct work of the existing furnace. Heated water from the outdoor wood furnace continuously flows through the water to air heat exchanger. When the thermostat senses the need for heat, the fan on the existing heating system forces air through this heat exchanger transferring heat throughout the existing ductwork.

If an air conditioning coil is located in the plenum, the heat exchanger should be mounted between the fan and the air conditioning coil so the heat exchanger will not freeze up when the air conditioner is being used. The heat exchanger should **not** be installed in the cold-air return of the existing forced air furnace because the possibility exists that components of the existing furnace could overheat and cause the existing furnace to operate other than intended. The heat exchanger may be mounted either horizontally or vertically with the outlets on the side (see Fig. 21). In all applications, the heat exchanger must be mounted level from front to back, with the outlets on the side. If the outlets are positioned upward or if the exchanger is not level, an air lock can restrict the water circulation and reduce the amount of heat transfer. The **lower fitting is the inlet** from the outdoor wood furnace and the **top fitting is the outlet** for return to the outdoor wood furnace. If the plenum is larger than the heat exchanger, it should be mounted in the center **without** gaps on the sides that would allow air to flow around the heat exchanger. All air must be directed through the face of the exchanger. Be sure to consider the airflow through the ductwork so heat isn't blocked off to parts of the building.

Fig. 21
PROPER HEAT EXCHANGER MOUNTING IN FORCED AIR FURNACE



Adding a heat exchanger coil in the hot air plenum or ductwork of the existing furnace may decrease the air flow in the system. The existing heating (gas or electric) system should be operated before adding the heat exchanger. The air temperature rise should be measured with the system running for an adequate amount of time to get a stabilized temperature reading. The heat exchanger can then be installed in the system. The existing heating system should be operated again and the air flow should be adjusted to maintain the same temperature reading. The air flow may have to be increased to accomplish this. On a belt-drive system, the blower pulley and/or motor pulley may be changed but the electrical current flowing through the motor shall not be changed to exceed the nameplate rating. A blower motor of larger power may be used. In most cases on a direct-drive system, the blower motor will not need to be replaced; however, the speed of the blower motor may have to be increased.

CAUTION

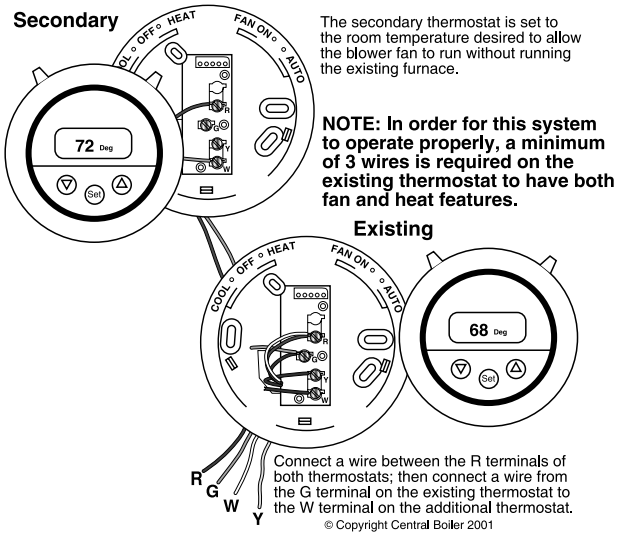
When installing the heat exchanger, be sure none of the existing system safety controls are disabled.

NOTE: Any electrical installation should be done by a certified electrician in accordance with all applicable codes.

A snap disc temperature control should be installed on the heat exchanger manifold to provide an interlock for the air conditioner. This prevents the air conditioner from operating when the water temperature is higher than 140° F.

There are several methods to install thermostatic controls for this type of installation. If the existing heating system is controlled by a 4 wire, 24 volt thermostat, the simplest method is to add a second 24 volt thermostat. The secondary thermostat will control the room temperature at which the fan on the existing heating system will activate with heat being drawn from the Classic furnace and should be set to the desired room temperature. The existing heating system thermostat should be set to a temperature 4-5° lower than the secondary thermostat and controls the temperature at which the existing heating system will activate as a backup to the outdoor wood furnace. Connect the thermostats according to the following wiring diagram (see Fig. 22).

Fig. 22
Thermostatic Wiring Diagram for Forced Air System



An alternative method is to install a line voltage thermostat to control the blower on the existing furnace. In this installation, a 120-volt line is run from the thermostat to the furnace where one wire is connected to the hot (line feed) and the other wire to the furnace blower wire. A low water temperature switch may be installed to shut off the blower if the temperature of the water is too low. This switch is connected in series to the wire coming from the thermostat previously mentioned. This switch must be installed so that it does not affect the existing system thermostat.

NOTE: If a low water temperature switch is not installed, the fan will run continuously even when the outdoor wood furnace is out of wood. Not installing the switch is acceptable if it is desired to keep the water in the furnace the same temperature as the air temperature in the house to prevent the water in the furnace from freezing.

Fig. 23

WATER TO AIR HEAT EXCHANGER SYSTEM

NOTE: A certified electrician must do the electrical installation.

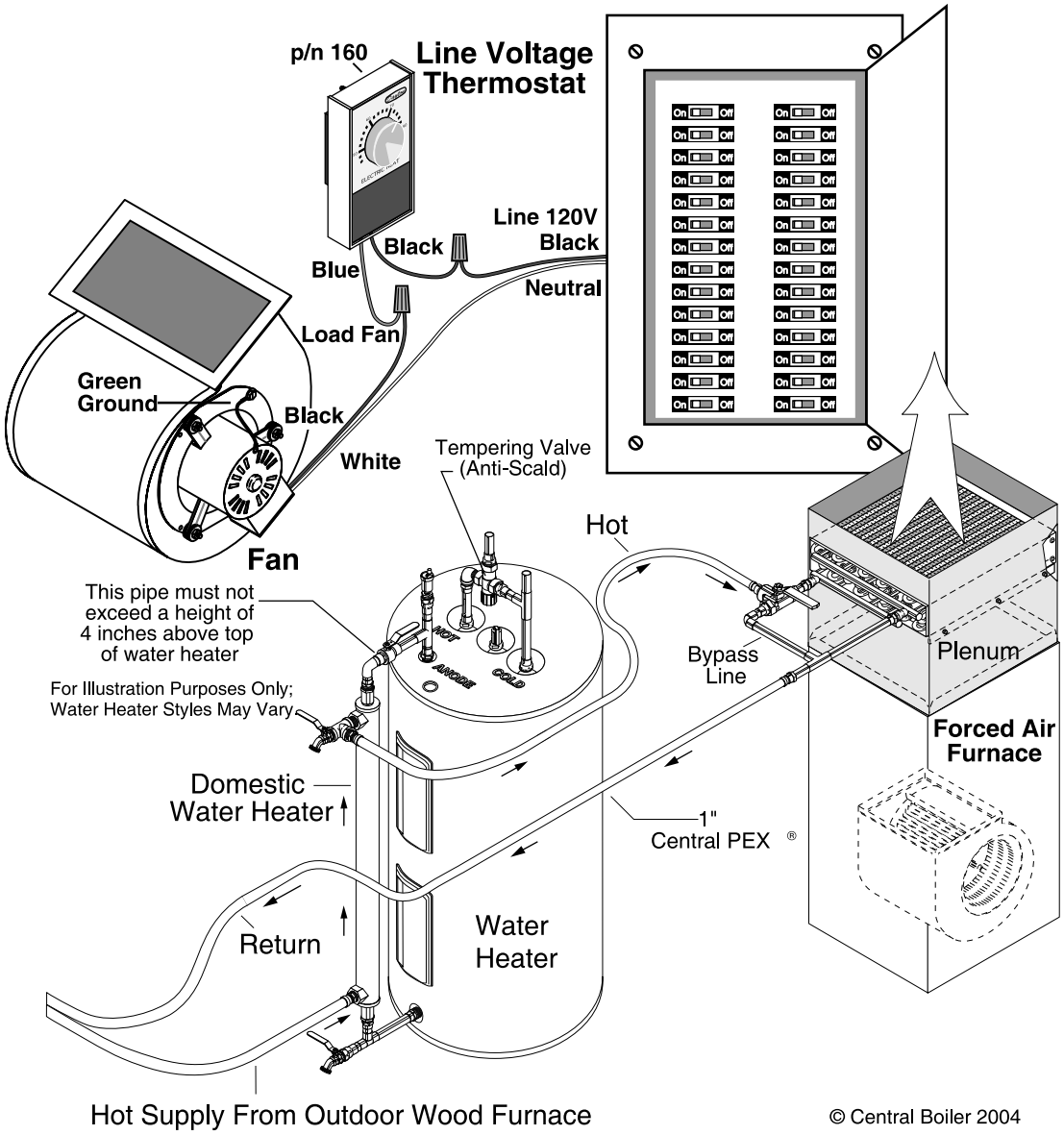
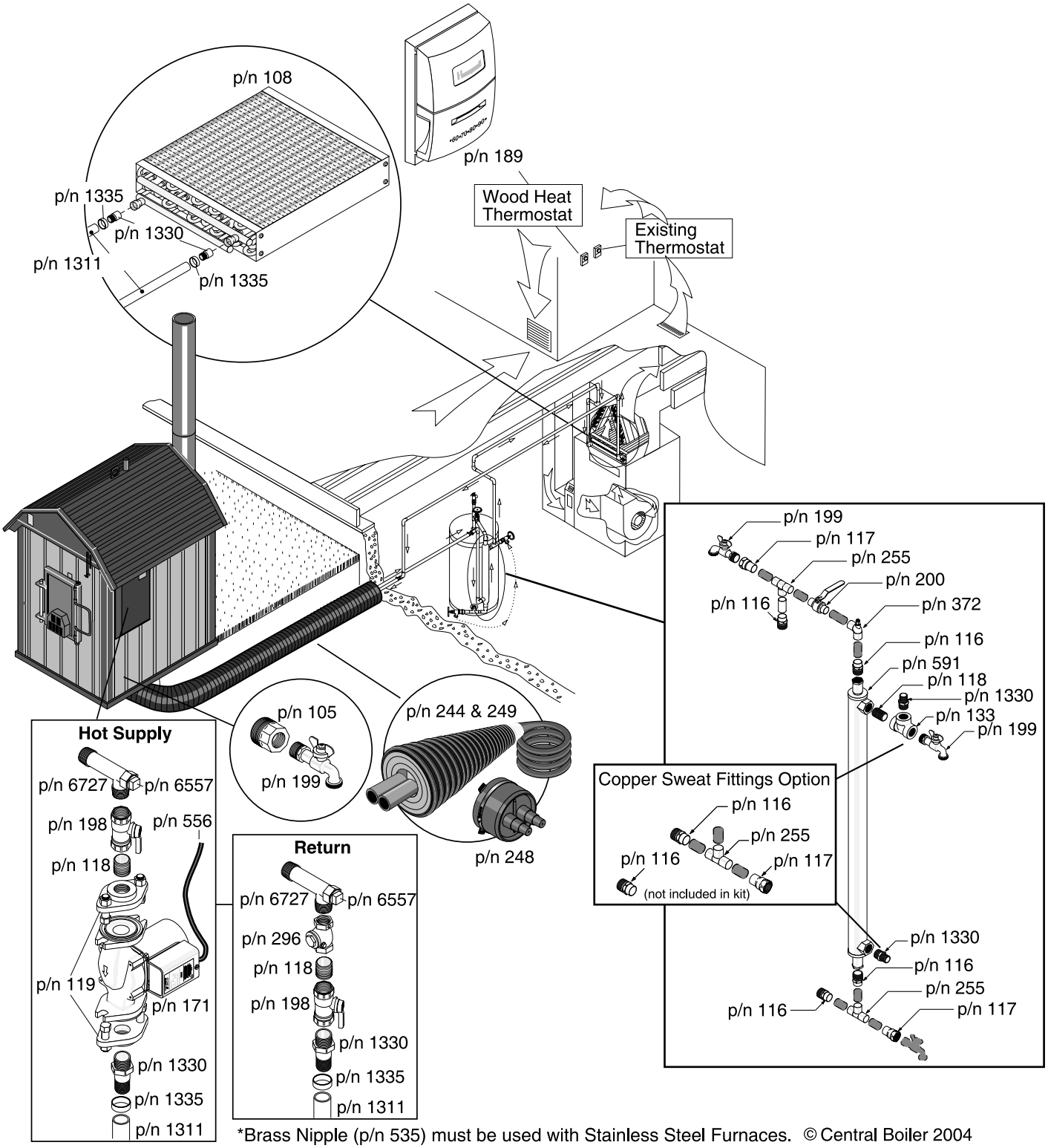


Fig. 24

Forced Air Heating System

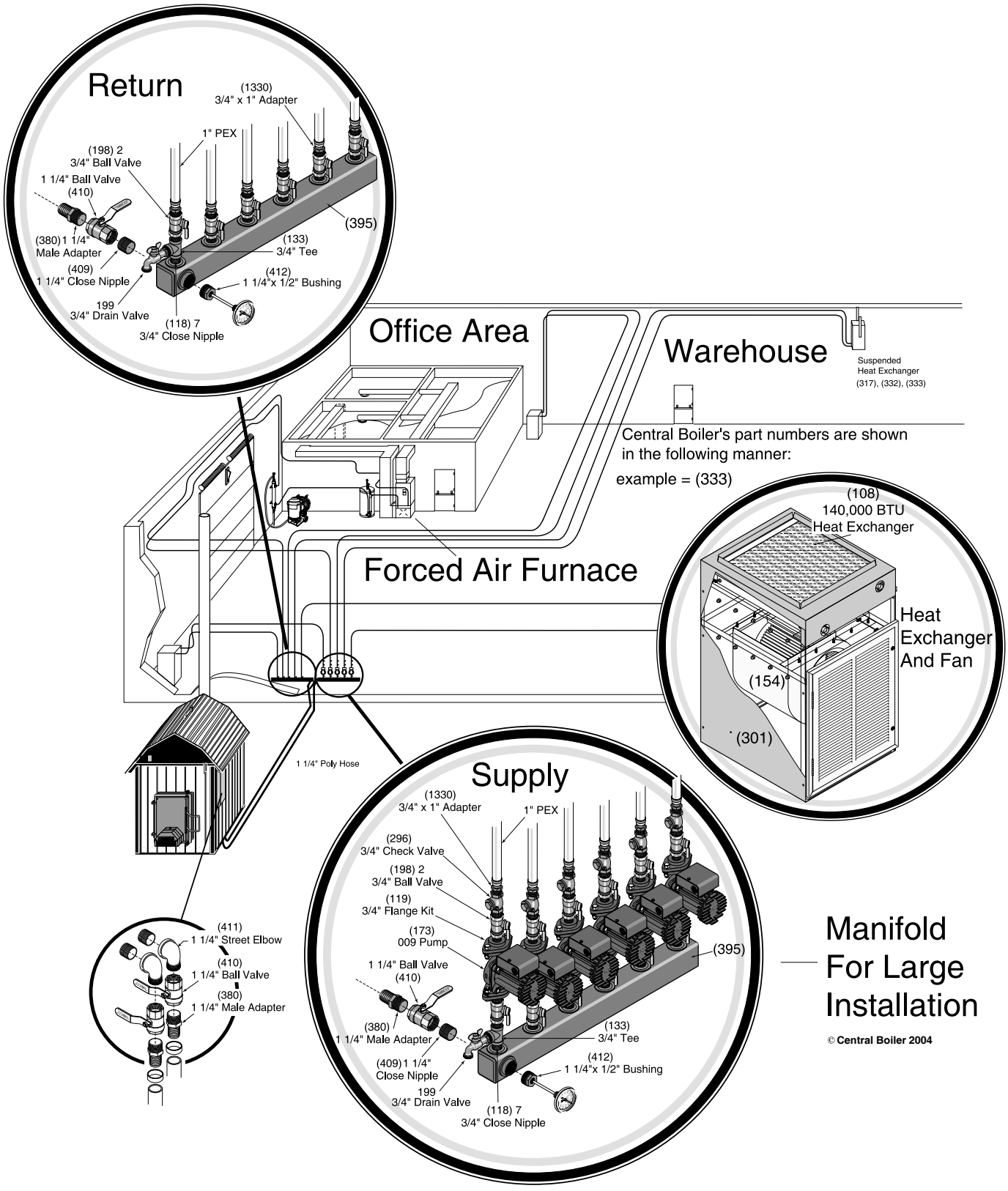


*Brass Nipple (p/n 535) must be used with Stainless Steel Furnaces.

HEATING MULTIPLE ZONES OR BUILDINGS

A single pump and manifold may be used to heat more than one zone or building as long as the return water can be maintained above 150°F. If the return water temperature can not be maintained above this level, then a separate pump should be used for each building and a one way swing check valve should be installed on the outlet side of each pump. Side panel models offer three sets of outlets (for up to three zones or buildings without the need for manifolds) for the mounting of up to three pumps on the furnace.

Fig. 25



HYDRONIC INSTALLATIONS

If a water-to-water heat exchanger is to be used with an existing heating system, the existing heating system must be able to adequately heat the building with a water temperature of approximately 165° F. Some existing fin tube baseboard hot water heating systems are designed to operate with water temperatures up to 220° F or higher. If the existing hot water heating system has had trouble maintaining the temperatures in the home at any time during cold weather before installing the outdoor wood furnace, then the system is not adequate to work properly. Evaluate the existing hot water system before starting the installation. If the existing heating system is marginal or designed to operate with water temperatures above 165° F, there are alternative installation procedures that will make the system work very well with the Classic outdoor wood furnace. These include:

1. More fin tube water baseboard heaters can be added.
2. A water to air heat exchanger with a thermostatic controlled fan can be installed in the lower part of the building being heated. This can increase the amount of heat added to the building to maintain a constant temperature. This heat exchanger can be added in the return line of the outdoor system after the water-to-water heat exchanger.
3. An additional radiant heating circuit can be added to heat areas that require additional heat.

Vented System Installation

NOTE: Any changes in the existing boiler should be done by a certified plumber in accordance with applicable codes.

When installing the outdoor wood furnace in conjunction with an existing hot water system, it can be connected directly into the existing system changing it to an atmospheric vented system. The hot supply line from the furnace can be connected into the top of the existing boiler and returned to the outdoor wood furnace from the bottom of the boiler (see Fig. 26). Use one pump to continuously circulate the water from the outdoor wood furnace through the existing boiler and back to the outdoor wood furnace.

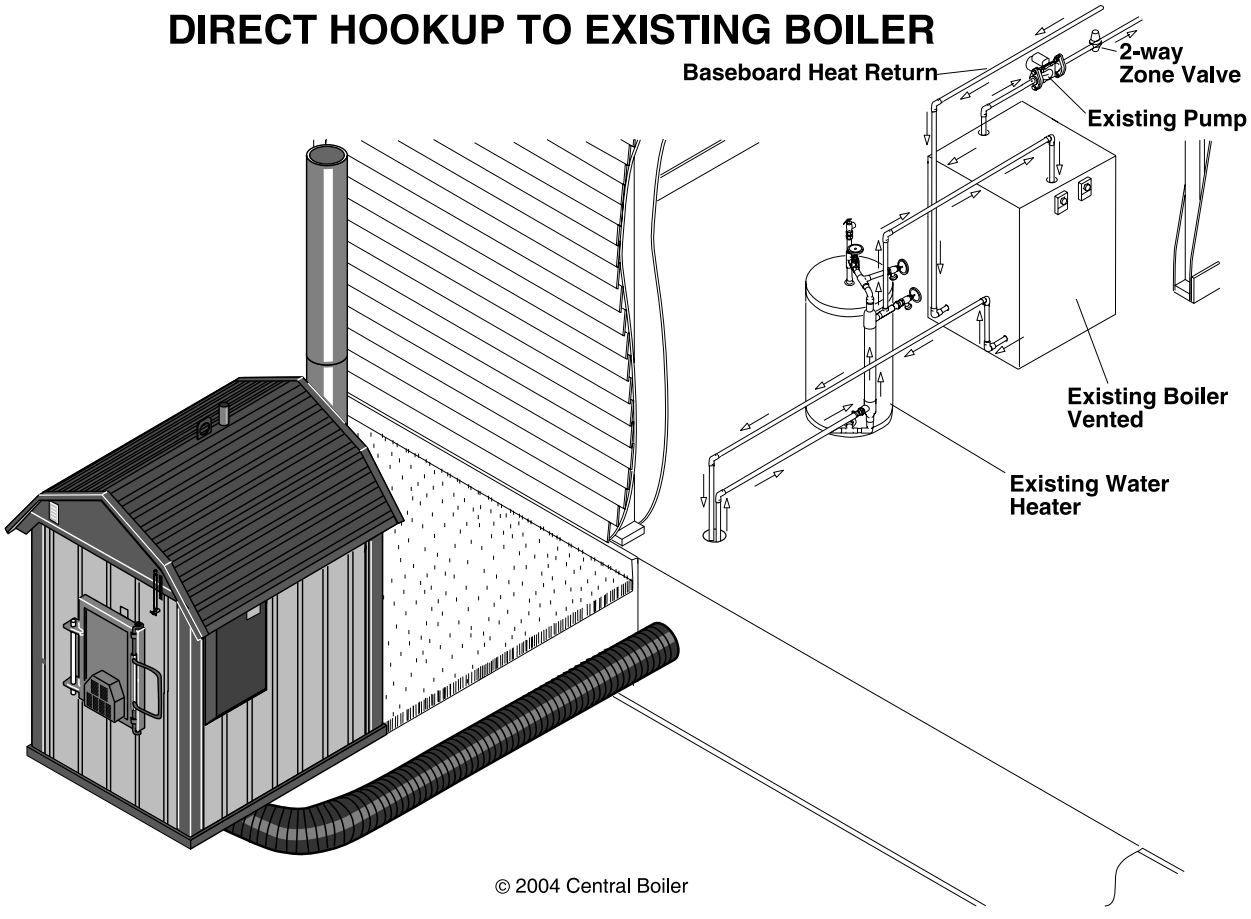
CAUTION

The outdoor wood furnace must NEVER be pressurized. The vent cap must always be loose. Do not extend the vent pipe. The furnace will be damaged if it is pressurized.

When the existing system is connected to the outdoor system as illustrated in Fig. 26, the circulating pump(s) in the existing system must be located in the hot supply line(s), **not** in the return line(s).

Fig. 26

DIRECT HOOKUP TO EXISTING BOILER



It is very important to purge all air and eliminate all air and water leaks (valve packings, bleeders, etc.) from the existing system. **After filling the outdoor furnace** (as described in the Initial Start-Up Procedures section) and existing system with water, purge the air from the indoor system **by closing the valves on the outdoor furnace** then pressurize the indoor system with water from the domestic water line.

Bleed air from the pressurized indoor system then operate the circulating pump(s) on the indoor system. Perform this procedure twice. If any auto float vents are used in the existing system, they must be capped off tight after the air bleeding is completed. This eliminates the possibility of allowing air to enter after the system is depressurized. When air bleeding is finished, close the valve on the water line used to pressurize the indoor system. If any air is allowed in the system, the system will not operate properly. Open valves on the outdoor furnace, turn on the pump and proceed to fire the furnace.

Pressurized Water System Installations

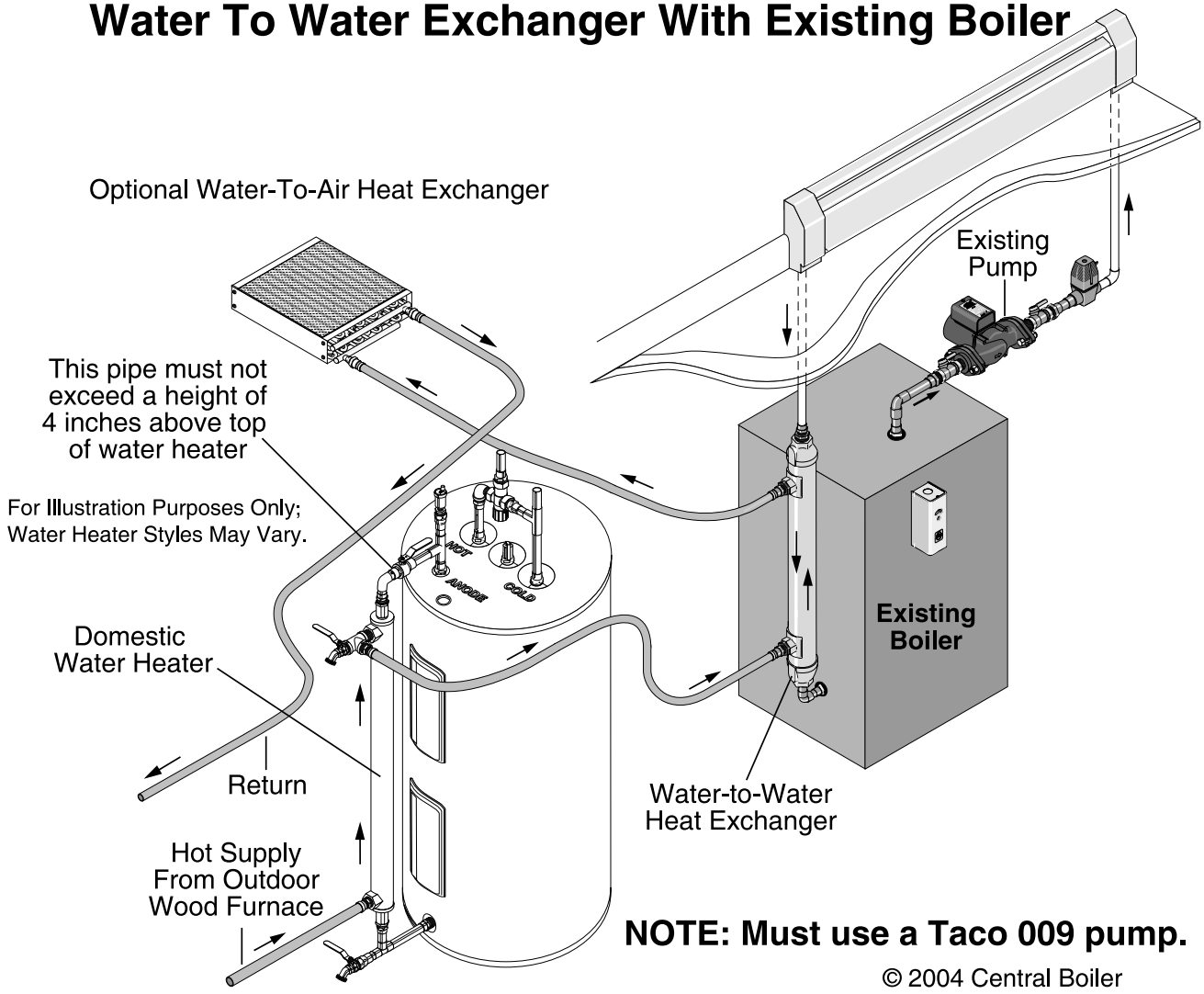
WATER TO WATER HEAT TRANSFER SYSTEM

If it is preferred to keep the existing system pressurized, a water-to-water heat exchanger may be used (see Fig. 27). This is to be installed in the return line of the existing system. The water from the existing system passes through the heat exchanger when the thermostat calls for heat. The water from the outdoor furnace circulates through the other part of the heat exchanger continuously. The water temperature at which the existing burner starts up may need to be lowered to a setting (approximately 120° F) that prevents the existing boiler burner from cycling on when the outdoor wood furnace is heating the home.

Water to water heat exchangers will produce transfer temperatures approximately 20º F less than the outdoor wood furnace water temperature; therefore if the controller is set at 185° F, it will produce approximately 165° F of water temperature transfer. Each system will vary in water temperature transfer depending upon the heat loss of the existing heating system. The controller may be adjusted to allow the outdoor wood furnace to reach water temperatures up to 195º F.

Fig. 27

Water To Water Exchanger With Existing Boiler



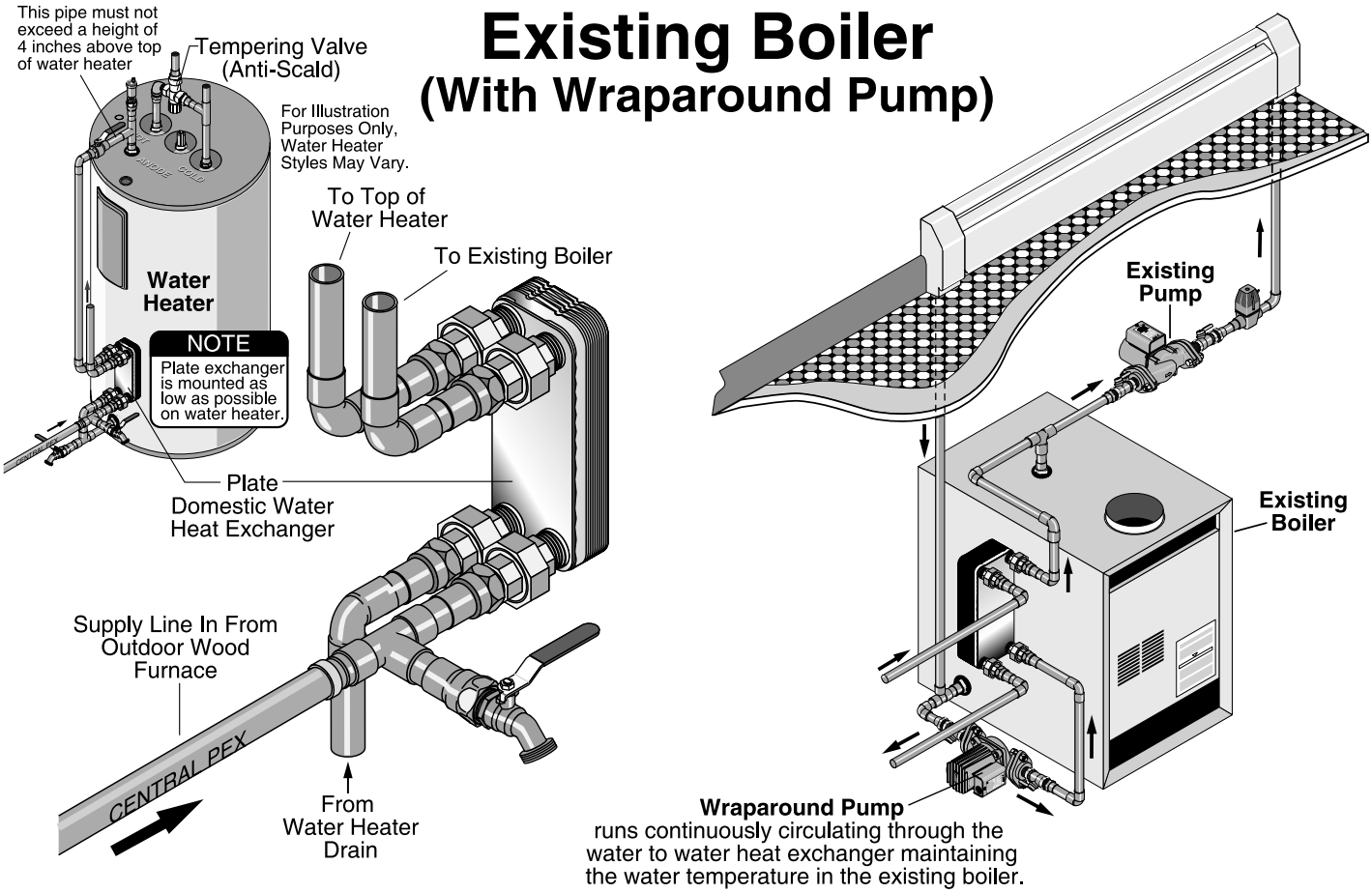
WATER TO WATER HEAT TRANSFER SYSTEM USING A WRAPAROUND HEAT EXCHANGER

Another option for installing the water-to-water heat exchanger for increased heat transfer is illustrated in Fig. 26. This wraparound installation allows circulation continuously through the heat exchanger, maintaining the maximum exchanger temperature in the existing boiler. Note the water flows in opposite directions.

With this type of installation, the exchange temperature may be more than 165° F and may eliminate the need for additional baseboard heaters or other added heat exchanger as illustrated.

When installing water-to-water heat exchangers, be sure to flush any rust particles or sediments out of existing boiler. A 009 Taco pump must be used for the outdoor system and Anti-Sludge Conditioner (p/n 166) also must be added in the outdoor wood furnace.

Fig. 28



Direct Circulation Baseboard Installation

Baseboard heaters, as either the main source of heat or as supplements to forced air or boiler applications are easily plumbed into the water lines from the outdoor wood furnace. The following illustrations detail the proper plumbing methods.

Fig. 29

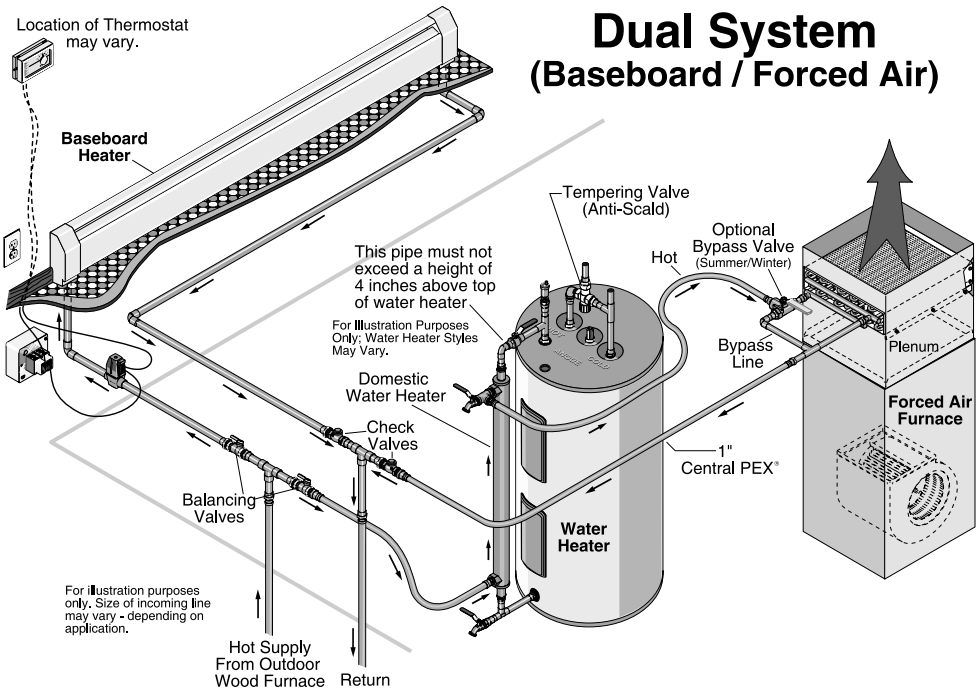
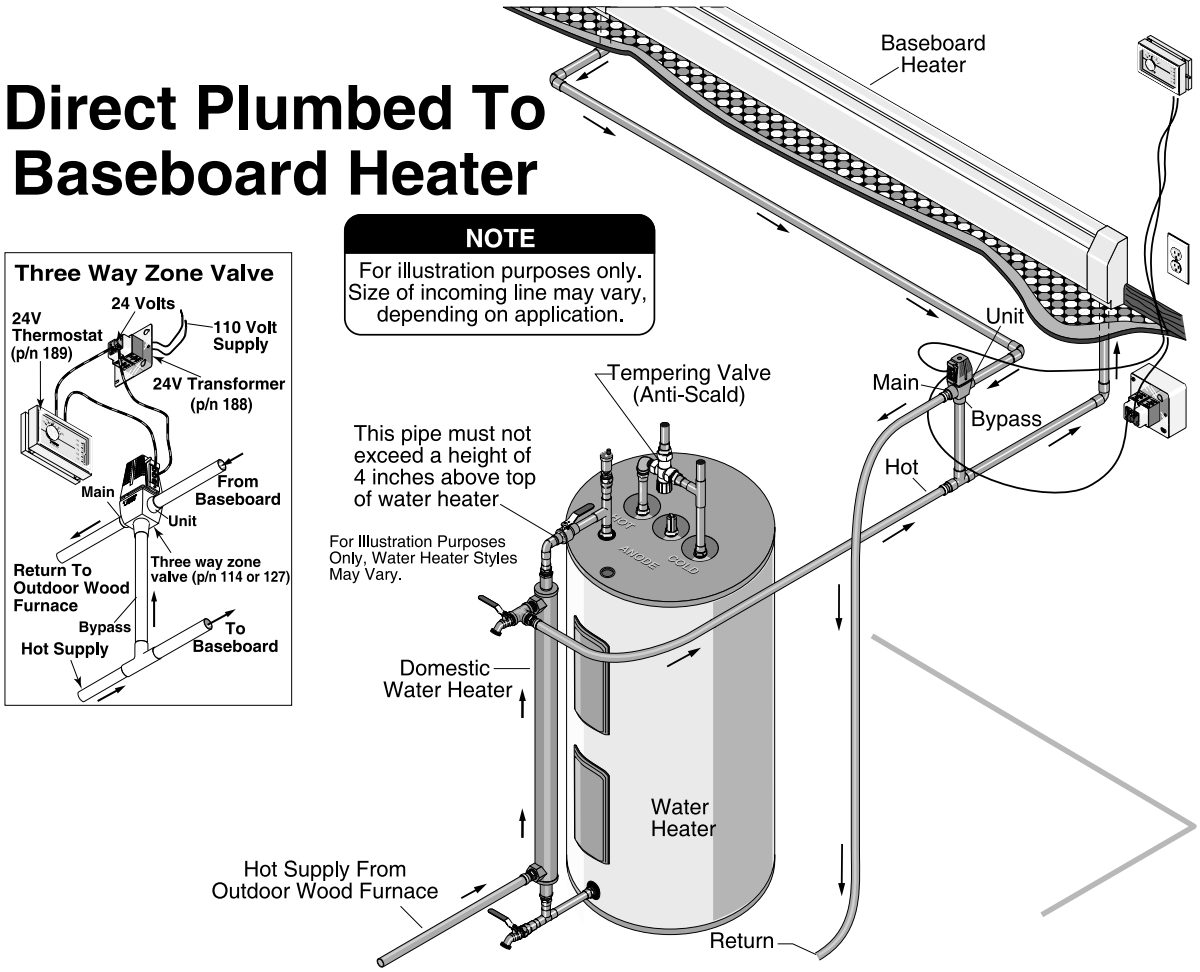


Fig. 30



Radiant Floor System Installations

Installing radiant floor (ceiling) heating is a very viable heating option when either remodeling or building new. Radiant floor heat can also be adding to an existing home easily if the floor joists are exposed (as in an unfinished basement). The tubing may be installed in a wide variety of configurations and locations including but not limited to the following: in or under a concrete slab, within the subfloor system (gypcrete), within the floor and ceiling joist system, or within the walls.

When installing tubing between floor joists (16 in. on center) run two ½ in. tubes between each joist. Insulate below tubing to prevent excessive heat in the lower level.

Proper insulation is key to effective radiant heating and controlling large heat demands. Heat from this type of system radiates nearly equally in all directions; therefore as an example, if tubing is installed below a slab, the ground below the slab must be dry and well insulated. If not properly insulated, nearly 50% of the heat will be wasted warming up the ground below the slab.

Areas with high water tables need to be prepared properly to avoid contact between the ground water and tubing.

The following illustrations are examples of radiant heating systems using ½ in. tubing in the loops. The spacing of each circuit should be 12 in. between tubes. The water circulates in opposite directions to provide an even distribution of heat. The mixing valve regulates the temperature of the water circulating through the loops by mixing return water with the supply water (140º F or less is preferred). In areas where high heat loss is expected, loop spacing may be reduced to 10 in. or less. If additional information is desired, contact either your dealer or Central Boiler.

Fig. 31

Radiant Floor Heat

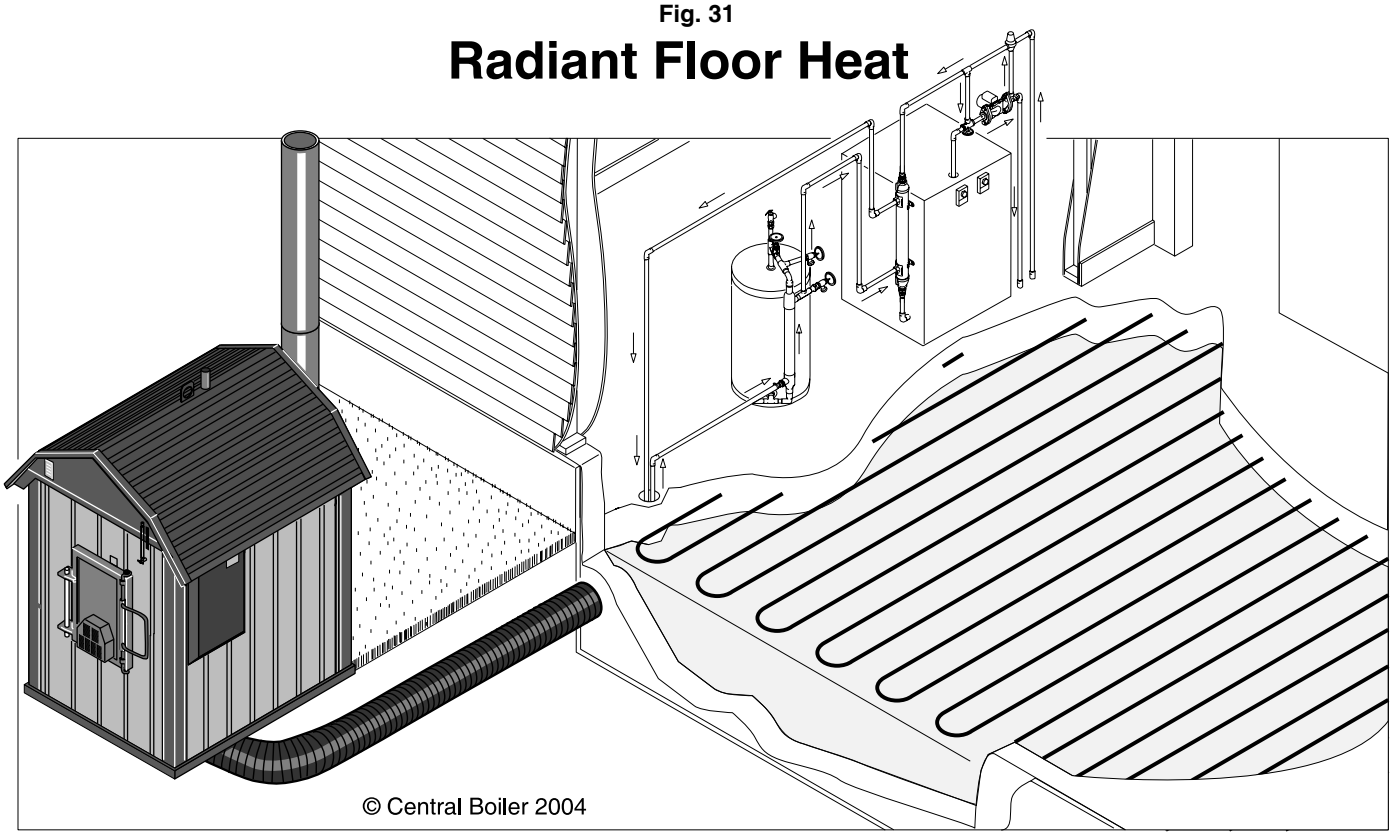


Fig. 32

Multi Zone In-Floor

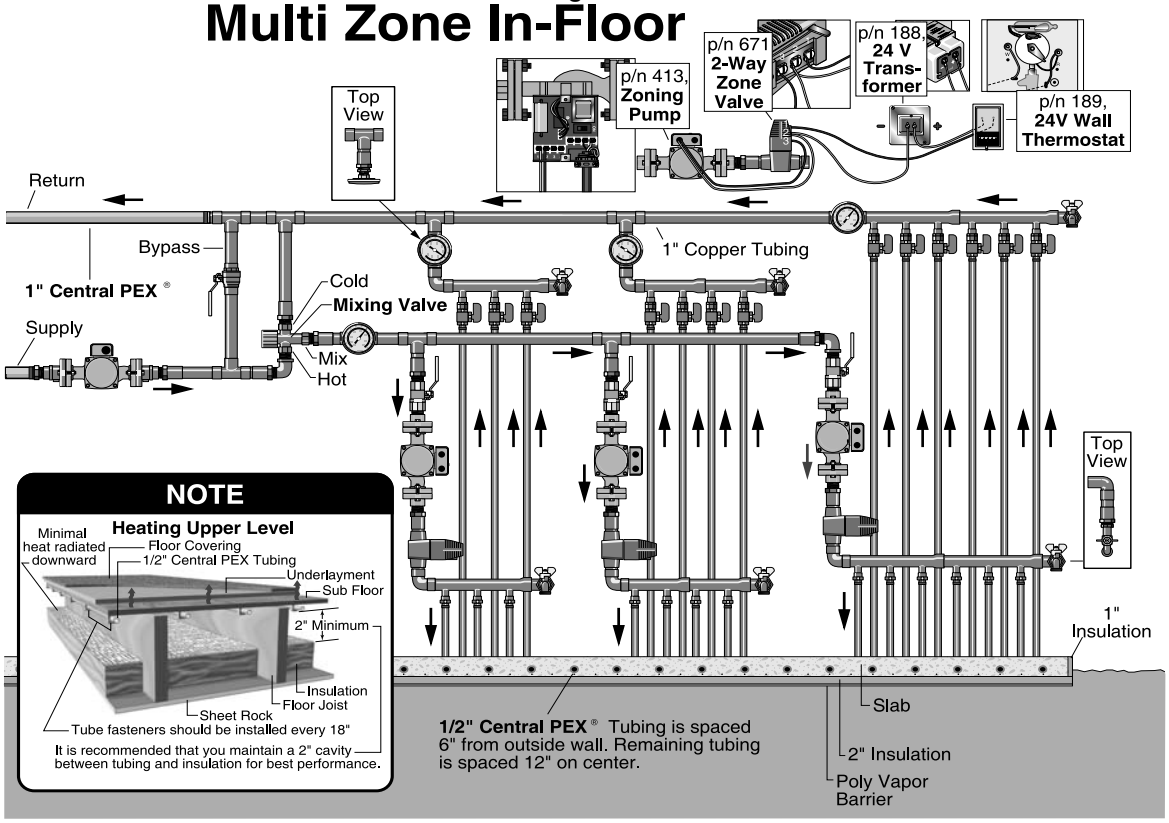


Fig. 33

Dual System
(In Floor Radiant / Forced Air)

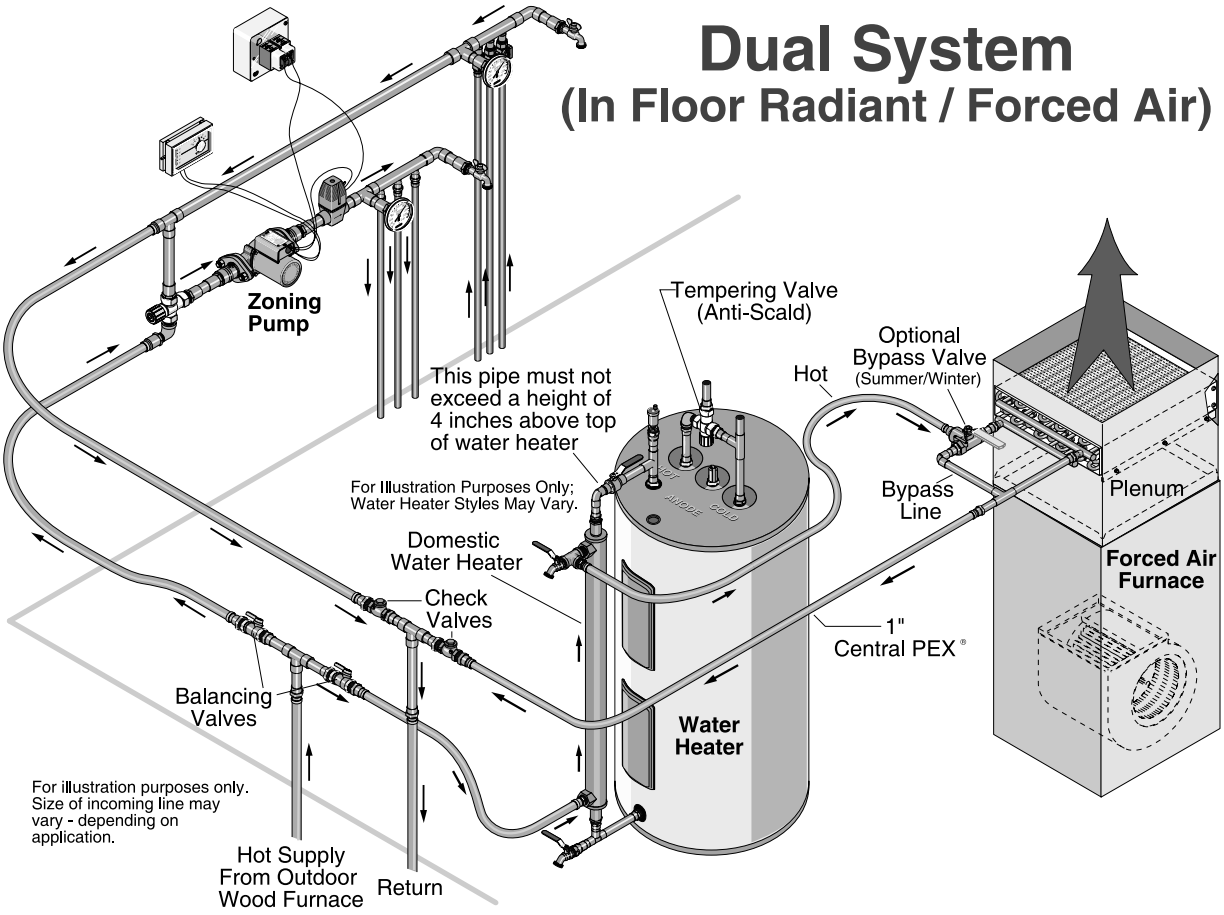
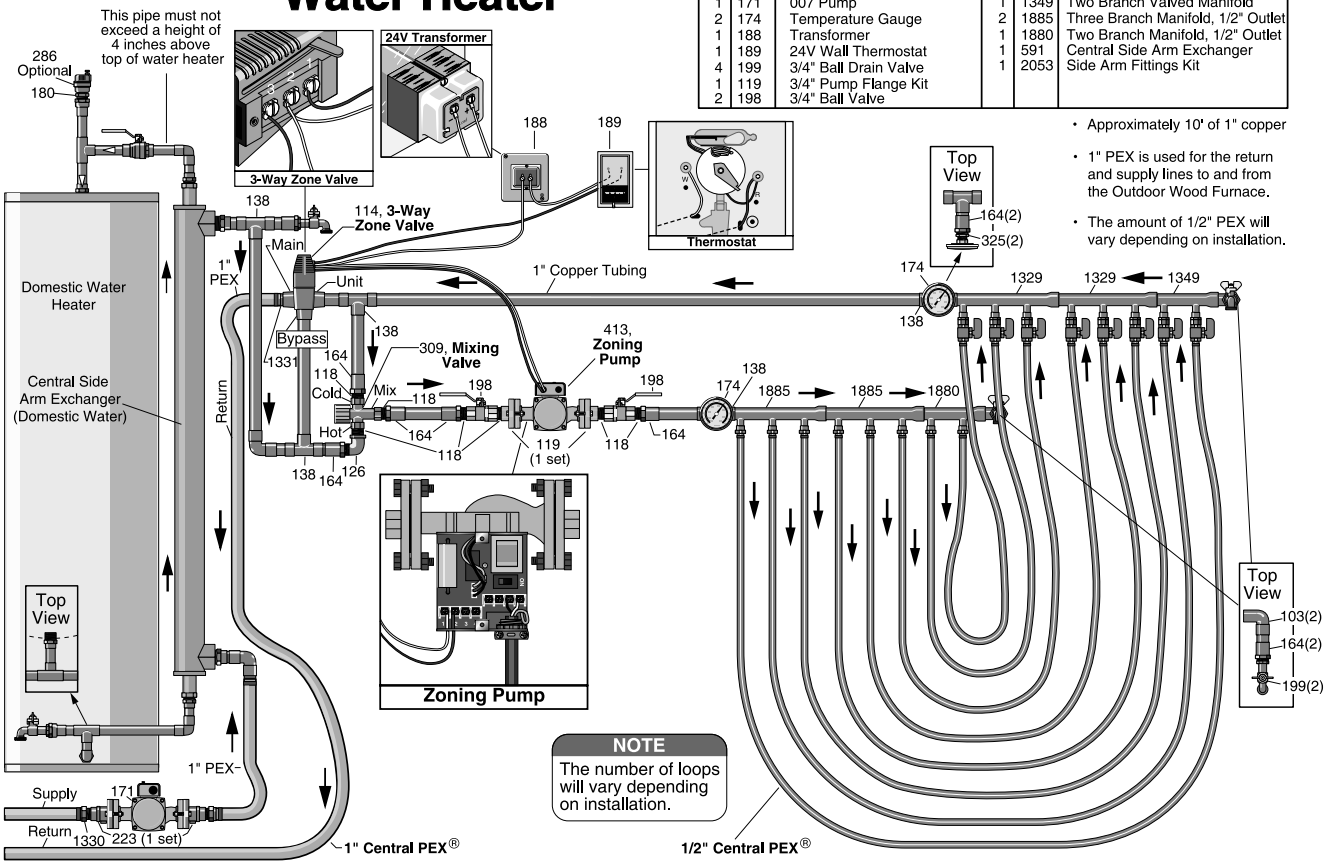


Fig. 34

Radiant Heat
Single Zone 8-Loop with Water Heater

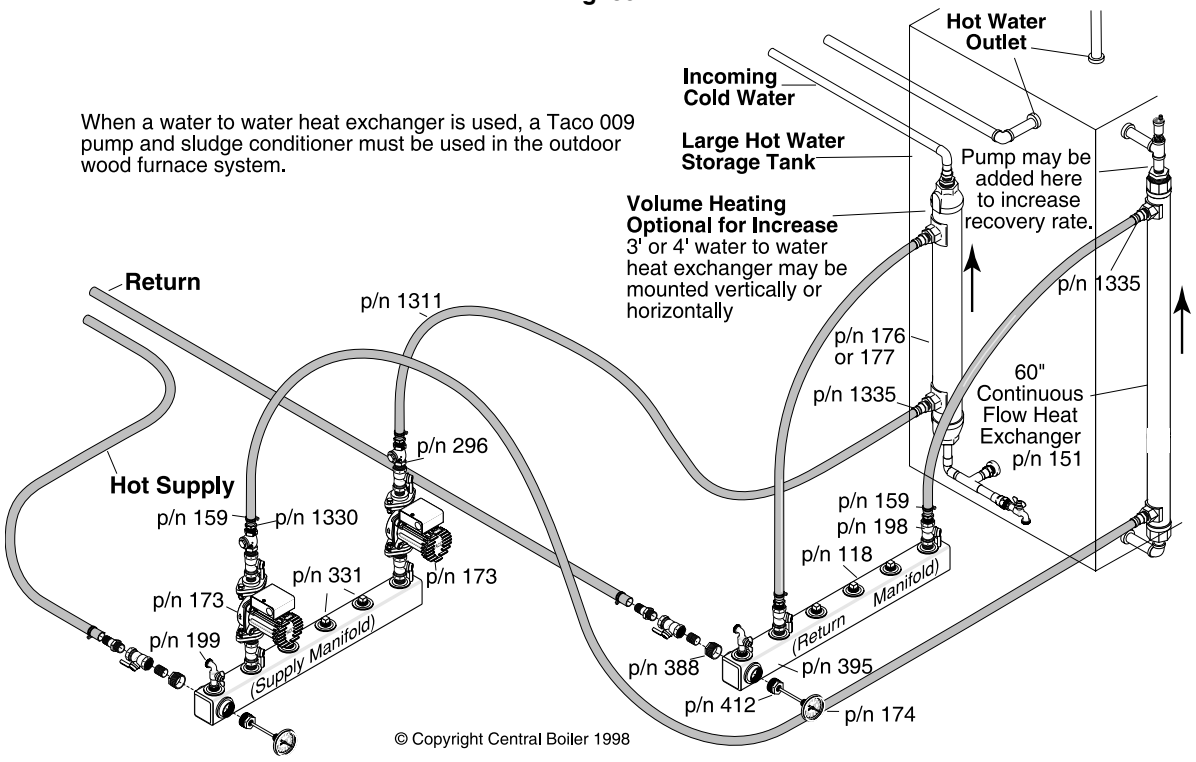
Qty	p/n	Description	Qty	p/n	Description
3	103	90° 1" Street Elbow	1	223	3/4" Pump Isolation Flange Kit
1	114	3-way Zone Valve	1	309	3/4" Mixing Valve
5	118	3/4" Close Nipple	2	325	1/2" x 3/4" Bushing
1	126	90° Brass, 3/4" Street Elbow	1	413	007 Zoning Pump
5	138	1" Sweat Tee	2	1329	Three Branch Valved Manifold
9	164	3/4" FIP to 1" Sweat Adapter	4	1331	1" x 1", Sweat to PEX Adapter
1	171	007 Pump	1	1349	Two Branch Valved Manifold
2	174	Temperature Gauge	2	1885	Three Branch Manifold, 1/2" Outlet
1	188	Transformer	1	1880	Two Branch Manifold, 1/2" Outlet
1	189	24V Wall Thermostat	1	591	Central Side Arm Exchanger
4	199	3/4" Ball Drain Valve	1	2053	Side Arm Fittings Kit
1	119	3/4" Pump Flange Kit			
2	198	3/4" Ball Valve			



High Volume Water Heating

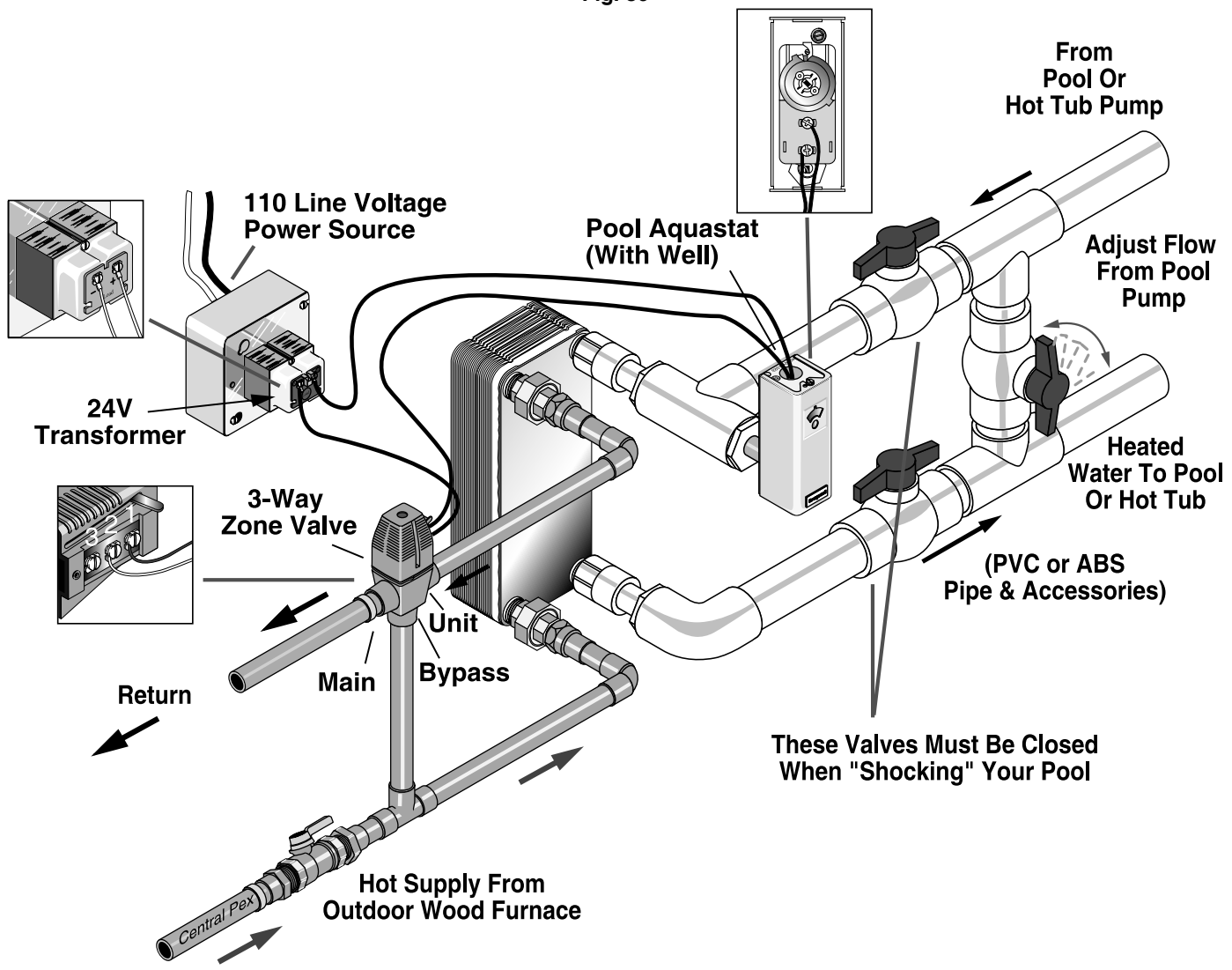
Fig. 35

When a water to water heat exchanger is used, a Taco 009 pump and sludge conditioner must be used in the outdoor wood furnace system.



Pool And/Or Hot Tub Heating

Fig. 36



Valves should be installed so the heat exchanger can be isolated when shock treating or adding chemicals. High chemical concentrations from improper feeding of chemicals can cause rapid corrosion to the heat exchanger. Bypassing the heat exchanger is recommended prior to the stabilization of pH between 7.2 and 7.8.

CAUTION

Do not install a swimming pool heat exchanger inside a home or building below the level of the pool as a damaged heat exchanger may result in extensive flooding and draining of the pool.

WARNING

Do not use automotive or ethylene glycol antifreeze in the outdoor wood furnace connected to a swimming pool heat exchanger as a damaged heat exchanger may cause severe personal injury, death, or substantial property damage.

FINALIZING THE INSTALLATION

Before firing the furnace for the first time, perform the following important items:

A. Check for leaks. Pressure test the entire plumbing system. Apply 30 lb of pressure for thirty minutes and closely monitor for any pressure loss. Inspect all fittings and hose ends for any signs of leakage; repair as necessary. A very slow leak at a hose clamp may possibly be stopped by tightening the clamp after the system has warmed up as the poly becomes more pliable when it is warm. It also may be necessary to install a second hose clamp with the screw positioned on the opposite side of the hose. Release the pressure upon completion of the test.

NOTE: PEX lines should never be pressurized when the heating system is being operated.

B. Cover Water Lines. Backfill the trench dug for the installation of the water lines. If the water lines are to be run on top of the ground, cover the lines as they will deteriorate with exposure to UV rays.

C. Remove the strapping securing the vent cap. The vent cap must fit loosely over the furnace vent.

D. Fill with water, purge air from the system, and verify flow direction of the water. All air must be purged from the water lines when filling the system. The water must circulate in the hot supply line from the furnace to the building being heated. Also, the circulation pump(s) **must** be installed in the hot supply line(s). See Initial Start-up Procedures section for details.

E. Add Corrosion Inhibitor. Add Corrosion Inhibitor immediately after filling with water. Be sure to add Corrosion Inhibitor as soon as possible so it will immediately begin to protect the steel. Bring the water temperature to the operating temperature as soon as possible after adding the Corrosion Inhibitor. **It should not be necessary to add water to the furnace frequently.** If water needs to be added more frequently than once every six months, either there is a leak in the system or the furnace is boiling because of improper operation or maintenance (see Troubleshooting Section B). Be sure to locate and repair the problem immediately. The need to frequently add water will cause deterioration in the water jacket. Corrosion Inhibitor must be added if water is added to the furnace. Deterioration due to improper operation and/or maintenance is not covered by warranty.

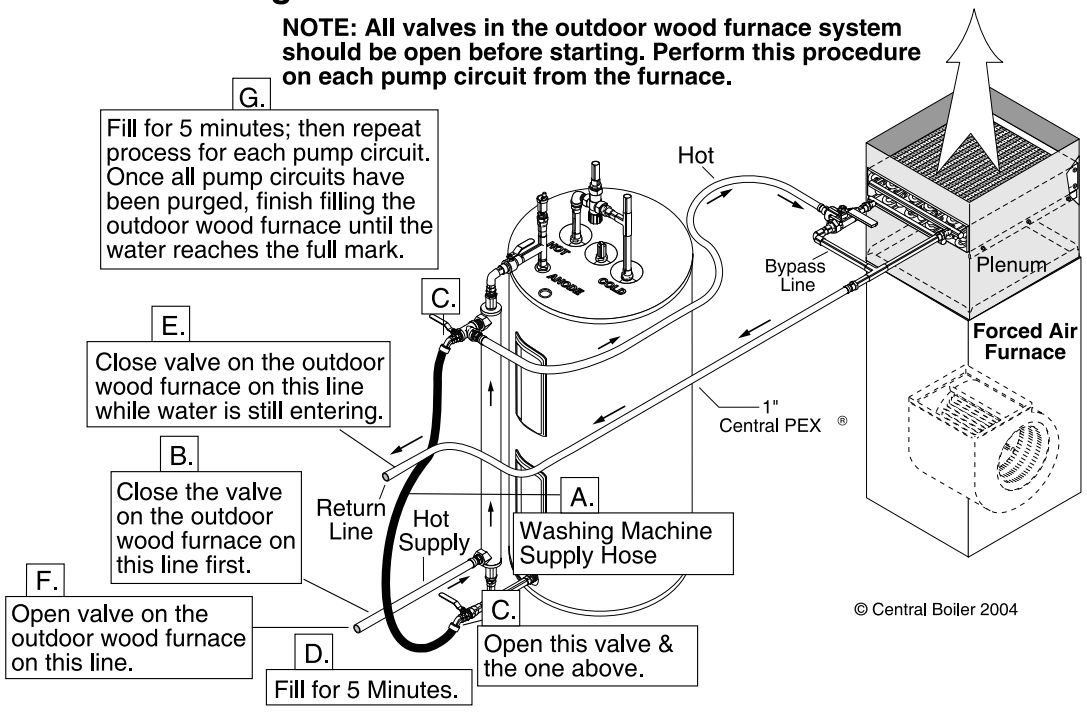
INITIAL START-UP PROCEDURES

NOTE: Be sure to fill the furnace with water of good quality. See Water Quality and Maintenance section of this manual.

Use the following procedure to fill the outdoor furnace with water and purge the air from the system. Be sure to purge the air from each pump circuit from the outdoor furnace. If the furnace is being filled with water when the outdoor temperature is very cold, be sure the water is circulated immediately after filling to prevent freezing of the water lines beneath the furnace. If the water heater has been in use, flush the water heater to remove all sediment prior to filling the outdoor wood furnace with water.

Fig. 37

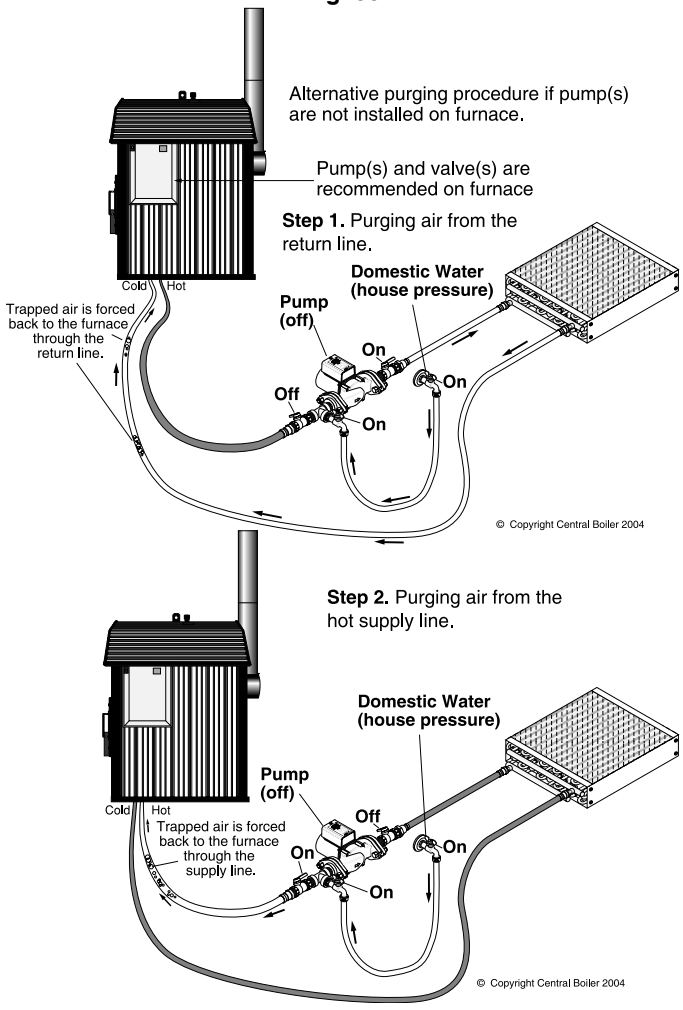
Filling Outdoor Wood Furnace With Water



All valves in the outdoor wood furnace system should be opened before starting this procedure.

1. Connect a washing machine supply hose (a garden hose with two female ends) to the pressurized domestic water line. Run water into pail or other container until clear; then connect to the outdoor system.
2. Close the valve on the hot (supply) line of the outdoor wood furnace.
3. Open the two valves that allow the pressurized domestic water to fill into the system (water will start entering the furnace through the return line). Confirm that the water lines are connected correctly by feeling the water lines as indicated by the arrows. They should immediately feel cold to the touch. If they don't immediately feel cold but the other ones do, stop filling the furnace as the water lines are reversed. Continue filling the furnace after switching the return and supply water lines.
4. Let the outdoor wood furnace fill for about five minutes.
5. Close the valve on the return line of the outdoor wood furnace (both valves are now closed) while the water is still entering the outdoor wood furnace.
6. Open the valve on the hot (supply) line of the outdoor wood furnace.

Fig. 38



7. Fill for 5 minutes; then if more than one pump circuit is present, close the valves and repeat the process for each pump circuit. Once all pump circuits have been backfilled with water, finish filling the outdoor wood furnace until the water level reaches the FULL mark.
8. Close the two filling valves.
9. Open all valves on the outdoor wood furnace. This will allow the water to circulate throughout the system when the pump(s) are operating.

NOTE: The outdoor wood furnace can also be filled through the vent in the top of the furnace and the air can be bled out with bleeders.

CAUTION

Be sure the outdoor wood furnace is filled with water before firing. Never fire the furnace with the water level below the FULL mark.

Never drain water from the furnace with live coals or fire in the furnace. If the furnace ever boils hard, be sure to check the water level and restore to full if necessary.

If water is added, the proper level of Corrosion Inhibitor (p/n 165) must be maintained.

WARNING

Never leave the door open or ajar when unattended. The fire cannot be controlled by the draft opening when the door is open.

10. Turn on the circulation pump(s); then fire up the outdoor wood furnace. When the water reaches the operating temperature, finish filling the furnace to the full level on the sight gauge; then close the sight-gauge valve and disconnect the filling hose.

NOTE: When filling is completed, the sight-gauge valve should be closed. The water will automatically drain from the sight-gauge tube. Remember, this type of valve requires only ¼ turn open and close.

CAUTION

Do not force the water level check valve in the open position, as it may damage the valve and cause the valve to leak. This type of valve requires only ¼ turn to open and close.

SECTION 4 - TROUBLESHOOTING

A. FURNACE DOES NOT HEAT (BUILDING IS LOSING TEMPERATURE)

1. **Circulation valve(s) closed -** Be sure all valves in the system are open.
2. **Out of wood -** Check firebox to see if fire is out. Add wood as necessary. Use good quality wood as poor quality wood will have very short burn times.
3. **Solenoid not operating properly -** Disconnect power to the furnace: then check fuse in control panel. If fuse is blown, check damper door for obstructions and free movement. Be sure damper door works freely; then replace the fuse. Check the solenoid plunger free length. With the damper door fully closed, the correct length is between 15/16 and 1 in. (see Fig. 40). Adjust if necessary, but do not exceed 1 in. Be sure that the damper door (when activated by the solenoid) does not contact the louvered cover. Lubricate or adjust as necessary.
4. **Circuit breaker off -** Check the circuit breaker that supplies power to the furnace.
5. **Furnace exhaust obstructed -** Check furnace exhaust for obstructions by observing the amount of smoke coming out of chimney with the firebox door slightly ajar. If smoke seems very restricted, remove the firewood and hot coals and check chimney (top and bottom) and behind the baffle for obstructions.
6. **Circulation pump not operating/installed backwards -** Check to see if circulation pump is operating and pump flow direction is correct. If not, shut off power to pump. If the flow is not the correct direction, disconnect pump from water line and reverse pump mounting to correct flow direction. Also if not mounted on the furnace, check for proper pump mounting location (see Fig. 13-16). Be sure the power is disconnected before working on the pump. Close valves at the pump. Take the pump apart and try to turn pump shaft. If shaft is stuck, replace pump cartridge (or pump if necessary). Replace only the cartridge whenever possible. Follow instructions supplied with the pump.
7. **Air in system -** Check for air in the water lines or heat exchanger. If you hear a gurgling sound in the heat exchanger, air is present in the system. Either shut off the pump and wait 15 seconds and try again or force air from lines as described earlier in filling the furnace with water (pages 28-29).
8. **Water lines installed incorrectly -** Make sure the hot supply water line is connected to the correct fitting on the furnace and heat exchanger (see Fig. 9 & 10).
9. **Water lines insulated poorly -** Heat loss in underground lines (evidenced by an unusually high amount of snow melting above lines when the ground temperature is 20º F or colder) due to improper installation (see Water Supply Lines And Insulation section).
10. **Water lines uninsulated -** Losing heat from uninsulated water lines in areas that are not intended to be heated (unheated crawl spaces, under mobile homes, etc.). Correct the situation by insulating the lines.
11. **Excessive building heat loss -** Poorly insulated or uninsulated building and/or buildings with uninsulated or poorly insulated ceilings can cause excessive wood consumption and or heating problems.

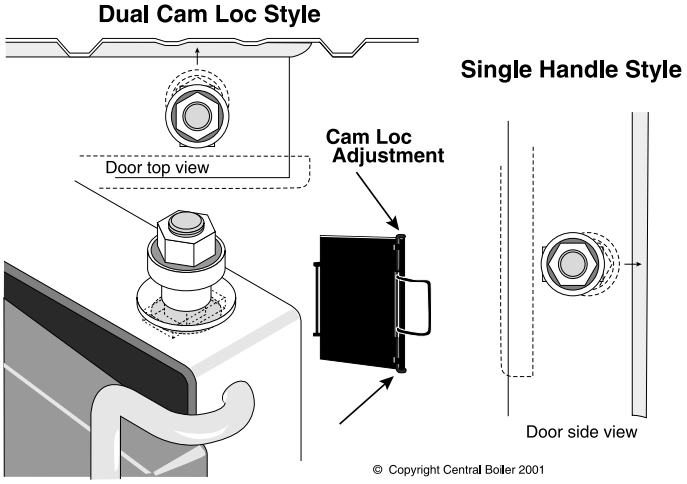
B. FURNACE IS OVERHEATING OR BOILING.

NOTE: If furnace boils do not be alarmed, but identify the cause and correct immediately; the furnace will not be damaged by boiling unless repeated boiling reduces the water level below the safe level. If water boils, restore water level to full and add Corrosion Inhibitor. If water is added frequently it will cause deterioration in the water jacket which will reduce the life of the furnace.

1. **Air entering through the door -** Make sure the door is properly latched. Check the condition of the door rope. If it is not sealing properly (as indicated by a uniform indentation in the rope), replace the rope. If door does not close tightly, adjust using the appropriate procedure.

Loosen the adjustment nut (two nuts on the dual Cam Loc® style door) and slide the lock assembly in slightly toward the furnace; then tighten securely (see Fig. 39). On the dual Cam Loc doors, make sure to adjust both the top and bottom for equal pressure when latched.

Fig. 39



2. **Air entering through the damper -** Check to be sure the damper is operating correctly as explained in section A.3. Be sure the damper closes all the way and that no obstructions are present. If the solenoid is sticking, lubricate with silicone spray or a light petroleum distillate (WD-40 or equivalent). Check linkage for binding.

3. **Temperature controller set incorrectly -** The temperature controller should not be set above 195°F.
4. **Circulation pump not running -** The pump should run continuously to keep water temperature uniform in furnace while in use.

NOTE: If there is an overheating problem in extremely warm weather, the furnace can be filled with a smaller load of wood.

C. SOLENOID DOES NOT OPERATE.

1. **Fuse blown -** Check the fuse. Check damper and solenoid area for obstructions or damage. Be sure the damper door operates properly; then replace the fuse.
2. **Solenoid not operating properly -** Solenoid may be damaged. If so, be sure to check the linkage for free movement and for creosote buildup between damper door and draft opening. Replace the solenoid if burned out or stuck in the open position. The solenoid is an owner serviceable item (see instructions for replacement in Maintenance section of this manual).

D. FREQUENT PUMP TROUBLE OR POOR WATER CIRCULATION.

1. **Pump mounted incorrectly -** Check to be sure the pump is mounted either on the furnace or a minimum of 4 feet lower than the top water level in the furnace or the highest point of the supply lines between the furnace and the pump (see Fig. 13-16).
2. **Water will not circulate -** If the system has been drained and there is a problem getting the water to circulate, force water through all lines with water pressure from pressurized domestic water system, closing one valve at a time on the furnace to force water through each line. See Initial Start Up Procedures section.

E. ERRATIC TEMPERATURE READING ON GAUGE.

1. **Return water too cold -** Water circulation may be too slow. The return water should be no more than 20°-25° F less than hot supply water. Returning water that is too cold to the furnace may cause erratic temperature readings. Check for partial air lock or install larger pump.

F. BURNING AN EXCESSIVE AMOUNT OF WOOD.

1. **Excessive heat loss -** See 9-11 of Furnace Does Not Heat section.
2. **Air entering through door -** See 1 of Furnace Is Overheating Or Boiling section.
3. **Excessive draft -** If a very tall extension is added to the chimney, the increased draw through the draft may cause excessive wood consumption. Decreasing the draft opening may increase efficiency and reduce wood consumption.
4. **Water line heat loss -** If water lines are buried in wet, low-lying areas, there may be a large heat loss which would greatly increase the wood consumption.
5. **High volume water heating -** High volume water heating (e.g., car wash, swimming pool, etc.) will require high wood consumption.
6. **High heat demand -** Radiant floor heating a concrete slab that is either poorly insulated or is exposed to water or cold outside temperatures will require increased wood consumption. Bringing a concrete slab up to temperature the first time will take a considerable amount of time and wood, but once it is warm, the wood consumption will be reduced if the concrete and the building are insulated properly.

SECTION 5 - OWNER SERVICEABLE ITEMS

NOTE: If any of these items are under warranty, remember that the warranty covers only the cost of the replacement part. Labor is not covered.

CIRCULATION PUMP

Taco® circulation pumps can be easily replaced or repaired. The pumps have a replaceable cartridge that can be installed easily.

1. Shut off (or disconnect) the electrical supply to pump.
2. Shut off valves on both sides of pump.
3. Remove the four screws securing the motor and impeller assembly to the cast body of the pump; then remove the motor from the pump.
4. Pull the replaceable cartridge from the assembly and install new cartridge.
5. Place motor assembly into position on the cast body taking care to properly position the gasket. Secure with four new screws. Tighten securely.
6. Open both valves and check for leaks; then turn on electrical supply.

NOTE: Instructions are provided with replacement cartridge. Be sure to follow manufacturer's recommendations if they differ from these instructions.

SOLENOID

Prior to replacing the solenoid, check the following items.

1. Check to be sure there is incoming power to the furnace.
2. Check inside the control panel to see if the fuse has blown. If the fuse is blown, check the draft opening to be sure the linkage operates freely and that there are no obstructions to the door; then replace the fuse
3. If solenoid still does not operate, turn the **Power Disconnect Switch** to the **off** position.

WARNING

Do not attempt service on the solenoid without first disconnecting electrical power to the solenoid.

4. Remove the screws securing the draft enclosure cover; then remove the cover.

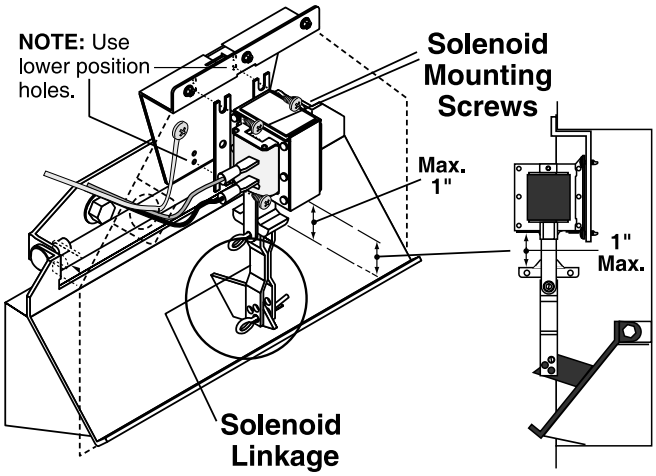
CAUTION

Solenoid may be hot.

5. Carefully disconnect the two wire leads connected to the left side of the solenoid by gently pulling and moving them from side to side.
6. Remove top cotter key of the linkage.
7. While supporting the solenoid with your hand, remove the top two solenoid mounting screws and loosen the bottom two.
8. Lift up on the solenoid until it clears the screw heads and remove.
9. Place the new solenoid into position and lightly secure with the screws. Adjust the solenoid up or down until the solenoid plunger free length is between 15/16 and 1 in.; then tighten the screws securely. Connect the solenoid to the linkage with the cotter pin. Slightly spread the legs of the cotter pin.
10. Carefully attach wire leads onto the solenoid terminals (white wire connected to the upper terminal).
11. Install the cover and secure with the screws.
12. Turn the Power Disconnect Switch to the ON position.

NOTE: If the solenoid rattles during operation, the alignment between the solenoid and the lift tab is incorrect. To align the solenoid and lift tab, loosen the four solenoid mounting screws and move the solenoid until the solenoid plunger aligns with the lift tab. Secure the solenoid; then make sure it operates smoothly.

Fig. 40



TEMPERATURE CONTROLLER

1. Remove all wood and live coals from the firebox.

CAUTION

Remove all wood and live coals from the furnace. Do not perform this procedure with any live coals in the furnace.

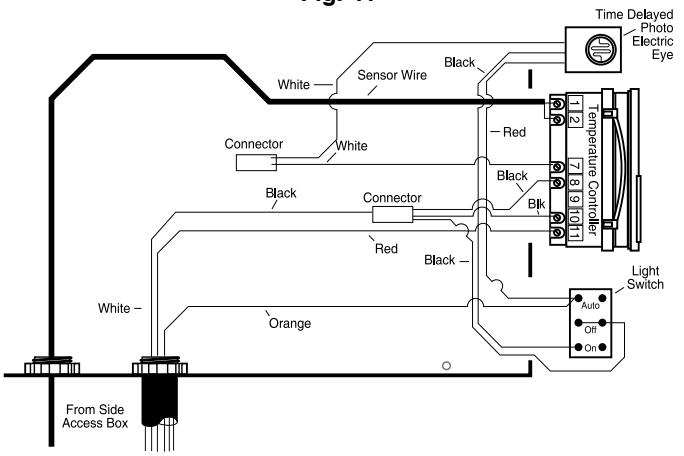
2. Disconnect the electrical power at the main power source to the wood furnace; then open the control panel door. Remove the screws securing the inner door panel; then remove the panel.

WARNING

Do not attempt service inside the electrical control panel without first disconnecting the electrical power at the main power source.

3. Carefully label each of the wires connected to the temperature controller according to the numbered connections identified on the top of the controller.
4. Using a small screwdriver, loosen the screws securing each of the wires; then pull the wires out of the controller.

Fig. 41



5. Depress the tabs on the side of the controller mounting strap; then slide the strap off the controller. Remove the controller from the control panel.
6. Place the new gasket onto the controller. Slide the new controller into position (making sure it is positioned upward) in the control panel; then secure with the mounting strap.
7. Slide each of the labeled wires into their proper positions on the controller; then tighten each of the screws securely.
8. Place the inner door panel into position on the door and secure with the screws.
9. Close and secure the door. Connect power to the furnace.

WATER TEMPERATURE SENSOR

1. Remove all wood and live coals from the firebox.

CAUTION

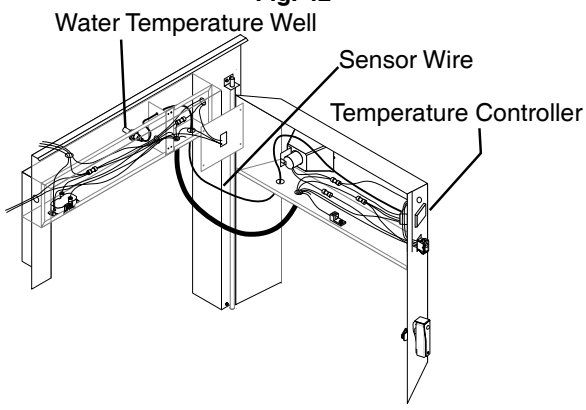
Remove all wood and live coals from the outdoor wood furnace. Do not perform this procedure with any live coals in the furnace.

2. Disconnect the electrical power at the main power source to the outdoor wood furnace; then open the control panel door. Remove the screws securing the access box panel; then remove the panel.

WARNING

Do not attempt service inside the electrical control panel without first disconnecting the electrical power at the main power source.

Fig. 42



3. Remove (by pulling) the sensor wire from the well.
4. Firmly press the sensor wire into the well.
5. Place the access box panel into position and secure with the screws.
6. Close and secure the door. Connect power to the furnace.

SECTION 6 - GENERAL INFORMATION

Fig. 43

Make note of these precautionary statements also found on the outdoor wood furnace.

⚠ WARNING

- NEVER install or operate furnace before first reading and understanding the owner's manual.
- NEVER allow others to install or operate furnace without first reading and understanding the owner's manual.
- NEVER use lighter fluids, gasoline or chemicals to start the fire.
- NEVER leave furnace unattended with this door or the firebox door unlatched.
- ALWAYS keep children away from furnace.

⚠ CAUTION

Keep face away from door area.

- NEVER burn treated wood, plastics, rubber or garbage in the furnace.
- ALWAYS comply with all applicable state or local codes and regulations.
- ALWAYS take care when adding wood to the furnace to prevent hot coals from spilling out.
- ALWAYS store ashes in a covered non-combustible container.

FURNACE LOCATION:
- When installing consider the direction that smoke will travel with prevailing winds and chimney height.

p/n 6632

⚠ WARNING
Vent cap must fit loosely over pipe.
p/n 626

NOTICE
Chimney pipe and all extensions must be insulated.

⚠ WARNING
MAY BE HOT
p/n 628

DO NOT BURN GARBAGE

Burning garbage causes damage to components of wood burning appliances.
p/n: 6050

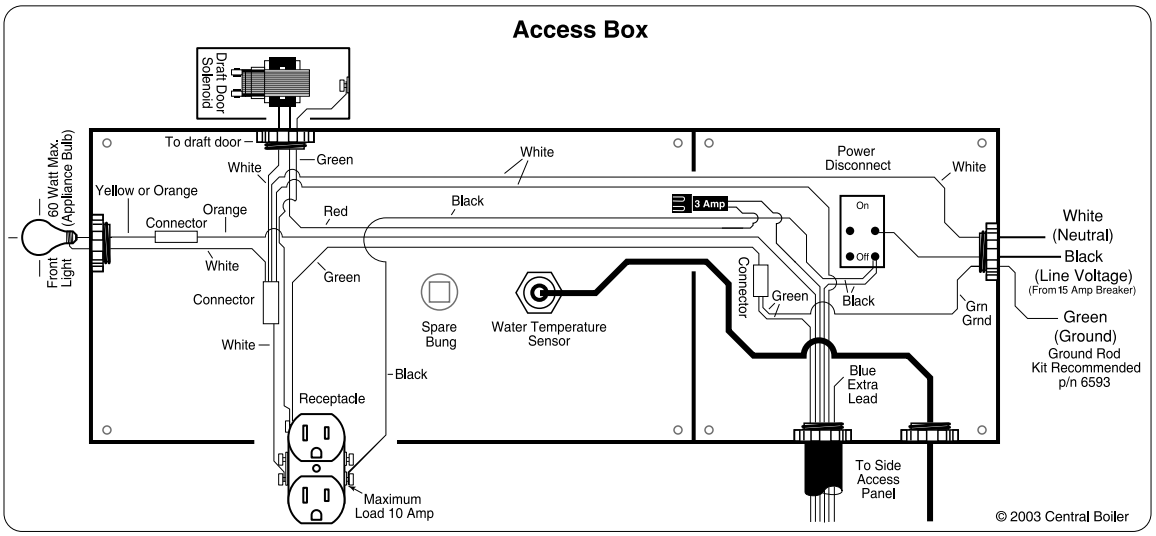
⚠CAUTION
Do not start fire until water level is full.
Keep face away from door area.
p/n 630

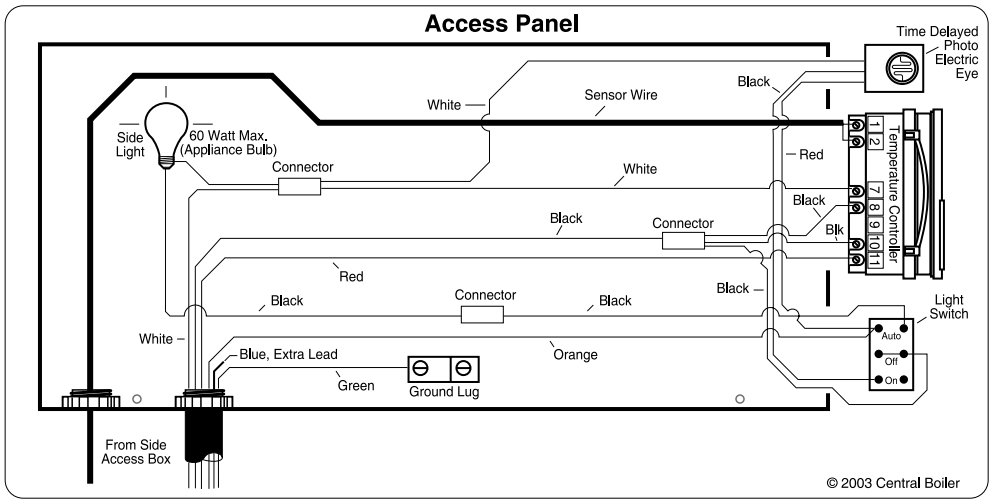
⚠ WARNING
Remove strapping over vent cap before filling or operating furnace.

⚠ WARNING
Disconnect power before removing this panel.
p/n 6626

WIRING DIAGRAMS

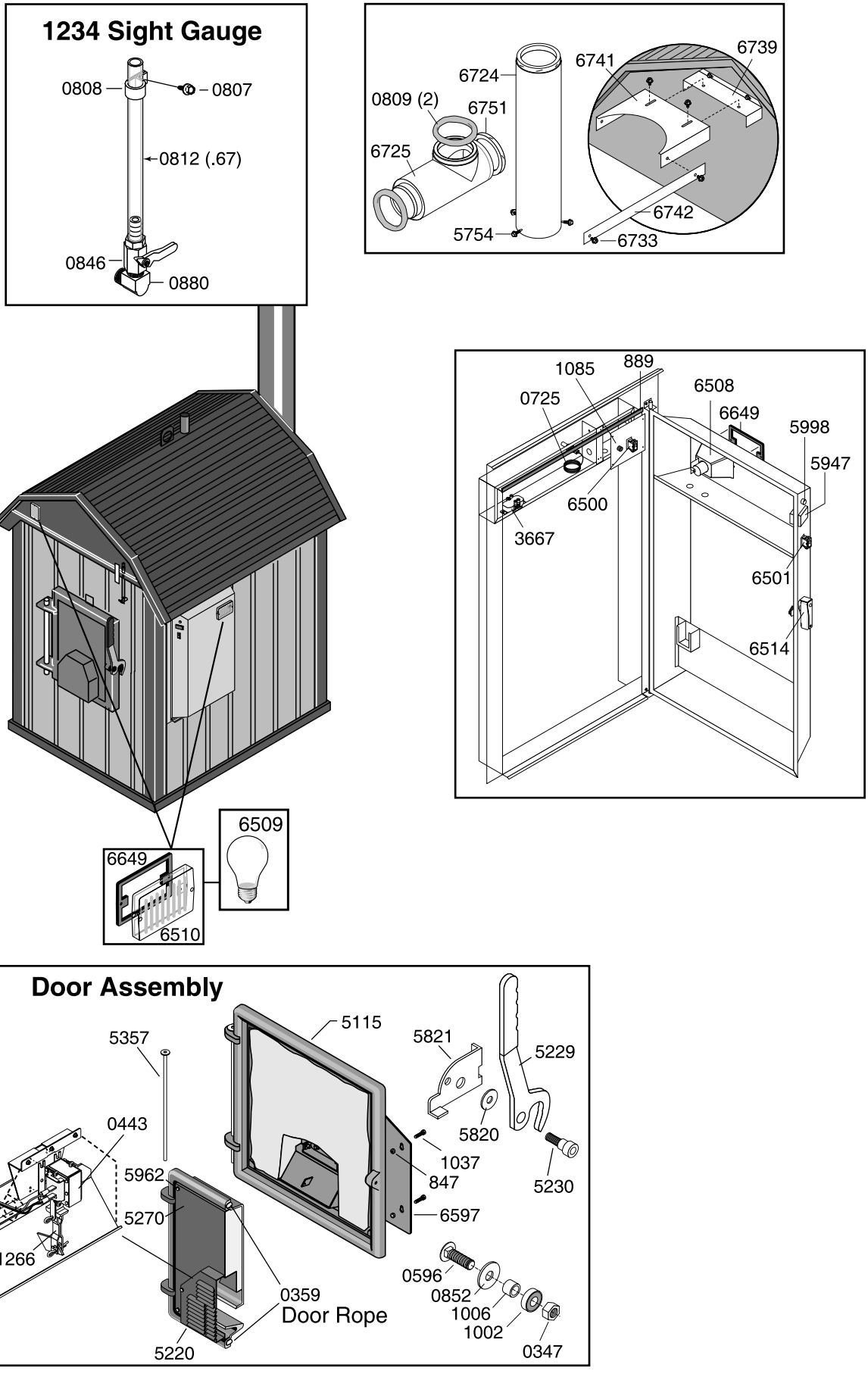
Fig. 44





PARTS LISTING, CL 4436

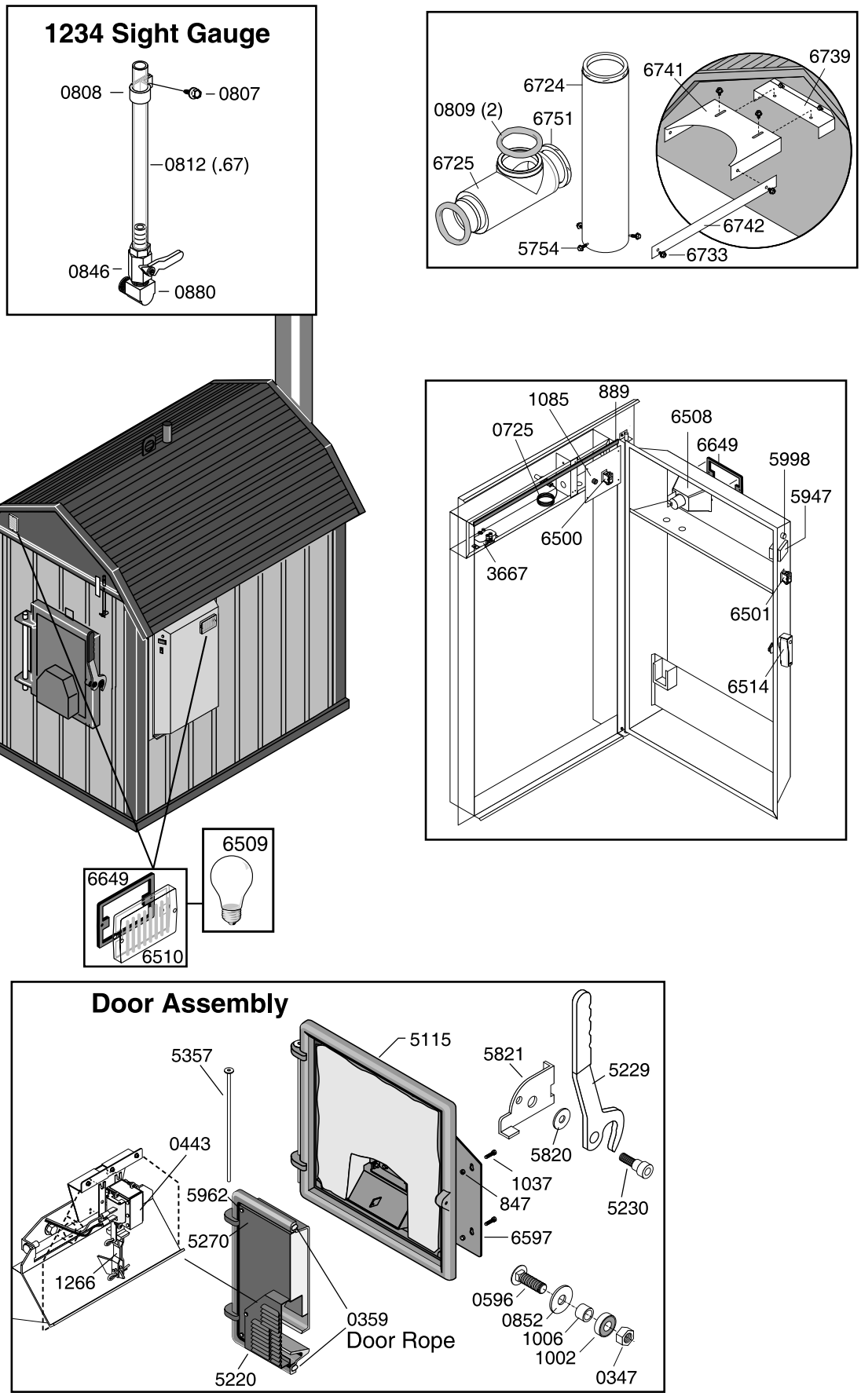
Fig. 45



Section 6

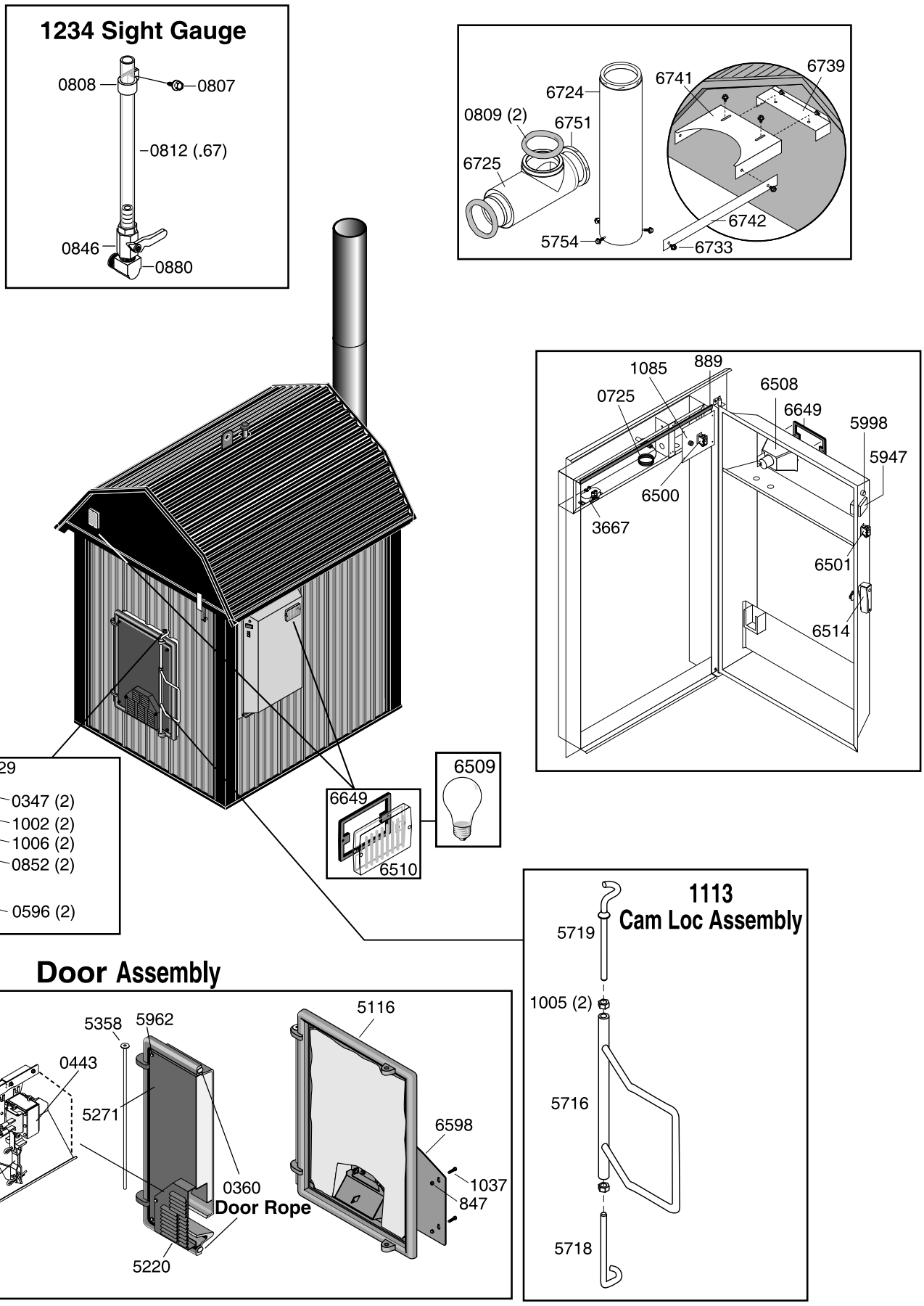
PARTS LISTING, CL 5636

Fig. 46



PARTS LISTING, CL 5648 & SCL 5648

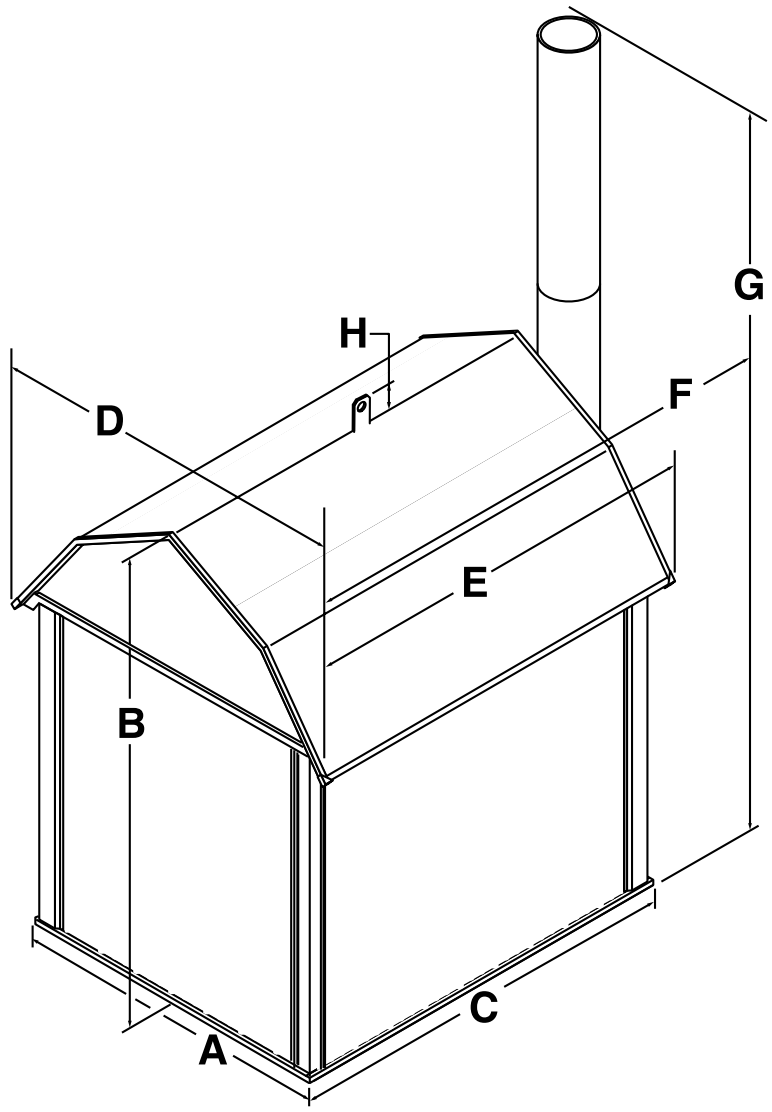
Fig. 47



Section 6

FURNACE MEASUREMENTS

Fig. 48



Furnace Measurements								
	A	B	C	D	E	F	G	H
CL 4436	47"	80"	57"	54"	58"	69"	*149"	5"
CL 5648 & SCL 5648	59"	95"	69"	69"	70"	81"	*161"	5"
SCL 5636	47"	80"	69"	54"	70"	81"	*149"	5"

*** Measurement (G) includes a standard 96" Chimney.**

INSPECTION RECORD

Date	Inspection Performed	Date	Inspection Performed

1 YEAR LIMITED WARRANTY

Central Boiler, Inc. (hereinafter referred to as Central Boiler) warrants the original owner of a Central Boiler model CL 4436, CL 5648, SCL 5636, or SCL 5648 outdoor wood furnace to be free from defects in the workmanship of all parts of the outdoor wood furnace manufactured by Central Boiler for a period of 1 year from date of manufacture. Central Boiler reserves the right to repair or replace any defective part(s), to replace the outdoor wood furnace with a comparable model, or to refund the purchase price. This warranty covers the cost of parts and labor to replace such parts for the repair of the workmanship defect.

A 25 year Warranty is available if a completed Warranty/Registration is submitted to Central Boiler within five days of purchase.

If the outdoor wood furnace need be removed from it's location for repair, the warranty excludes the cost of shipping, labor for removal and installation, plumbing labor and/or parts, and replacement of water or water additives. Physical damage caused by misuse or abuse, unauthorized work, alterations to the furnace, and normal wear items (such as door gasket, exterior paint, and replaceable chimney parts) are not considered warrantable items. Components such as aquastats, pumps, actuators, etc., that are used on the outdoor wood furnace or in the heating system, carry their own warranty provided by their manufacturer.

Central Boiler is not liable for any incidents or accidents, which can be prevented by the owner or that may occur from the operation of the outdoor wood furnace, or damage incurred due to heating system failure. The owner assumes all responsibility for the care, maintenance, and safe operation of the furnace.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow the exclusions or limitation of incidental or consequential damages, so certain limitations or exclusions under the warranty may not apply to you.