
CENTRAL BOILER E-CLASSIC® 1450 IR

OUTDOOR WOOD GASIFICATION FURNACE OWNER'S MANUAL



WARNING: If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
 - Do not try to light any appliance.
 - Do not touch any electrical switch.
 - Immediately call your gas supplier. Follow the supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Tested &
Listed By  Portland
Oregon USA

OMNI-Test Laboratories, Inc.
117-O-30-2



**SAVE THESE
INSTRUCTIONS**

(p/n 9000347 - REV. A) - 26-AUG-15

CENTRAL BOILER E-CLASSIC®

Central Boiler, Inc.

20502 160th Street • Greenbush, MN 56726

www.CentralBoiler.com

The E-Classic 1450 outdoor hydronic heater by Central Boiler is listed by OMNI-Test Laboratories to the applicable portions of the following standards: UL 2523-2009 Solid Fuel-Fired Hydronic Heating Appliances, Water Heaters and Boilers, CAN/CSA-B366.1-M91 (R2007) Solid-Fuel-Fired Central Heating Appliance. Dual Fuel models tested to applicable portions of ANSI Z21.20a-2008 Automatic Gas Ignition Systems and Components and certified to add to an existing heating system.

The E-Classic includes two 4-foot stainless steel insulated chimney sections (6" in diameter, p/n 6500004). Use only stainless steel solid fuel chimneys specified by Central Boiler. Maximum draft is marked on nameplate.

French Owner's Manual and decal set available upon request from your dealer.

(Manuel d'installation en français et décalcomanies disponible sur demande auprès de votre revendeur)

Manuel d'installation en français : p/n 9000202 Décalcomanies : p/n 7000041

Thermal Output Rating*: Manufacturer's Rated Heat Output Capacity: 200,000 Btu/hr

Annual Efficiency Rating*: 84% (lower heating value), 77% (higher heating value)

*Performance is a product of the combustion rate, combustion efficiency and heat exchange efficiency with a single fuel load without refueling. Results vary based on wood species, wood quality, wood quantity and moisture content. Efficiencies are determined under the same test conditions using higher heating value, lower heating value and annual fuel utilization efficiency (AFUE).

- This heater meets the 2015 U.S. Environmental Protection Agency's crib wood emission limits for wood heaters sold after May 15, 2015. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 0 to 214,271 Btu/hr.
- This wood heater has a manufacturer-set minimum low burn rate that must not be altered. This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.
- DO NOT OVERFIRE THIS HEATER. Attempts to achieve heat output rates that exceed heater design specifications can result in permanent damage to the heater.
- Any person(s) operating a hydronic heater must comply with all applicable laws, including but not limited to local ordinances.
- Improper use or failure to maintain the hydronic heater may cause nuisance conditions. The person(s) operating a hydronic heater is/are responsible for operation in a manner that does not create a nuisance condition. Meeting the setback distance and stack height recommendations from the manufacturer and requirements in applicable State and local regulations may not always be adequate to prevent nuisance conditions in some areas due to terrain or other factors.
- Operating an outdoor furnace may not be suitable to some individuals' abilities or lifestyles. Be sure to review the Owner's Manual for the appliance with your dealer.



Videos to supplement the Owner's Manual are available at

www.youtube.com/centralboilerinc

Watch tips on initial startup, testing system water and more.

**- Register at time of purchase for FREE 25 Year Limited Warranty -
Verify your warranty at CentralBoiler.com/w25**

For parts and accessories, service or repairs, call your authorized Central Boiler dealer or heating contractor. Record the information below for future reference.

Model	Serial Number	Installation Date
Dealership Name		Phone Number
Owner Name		

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1-YEAR LIMITED WARRANTY	Back Cover

CENTRAL BOILER ONLINE RESOURCES

Enter the web address in your browser or scan the code using any QR code reader app on your smartphone to access Central Boiler's library of information to help with installation, operation and maintenance of your Central Boiler outdoor furnace.

Detailed Furnace Installation Variations -

<http://www.CentralBoiler.com/explore/furnace-installation/>

View and/or download PDFs to assist in installation of your outdoor furnace. Information and examples regarding pumps, foundations, chimneys and support structures, ThermoPEX piping, and example configurations for a variety of heating configurations.



Videos - <http://www.CentralBoiler.com/explore/videos/>



Push-fit Fittings

Central Boiler's push-fit fittings make configuring and connecting your heating system easy and quick.



Performing a Water Test

Testing and maintaining the water in your system is critical for the operation and longevity of your heating system.



E-Classic Initial Startup Procedure

How to fire your E-Classic from a cold start (meaning the furnace water temperature is below 100°F and/or there is no charcoal base left in the firebox).



E-Classic Refueling Tips

Following a few easy tips when you're refilling your E-Classic with wood will help to ensure smooth, reliable operation day after day.

EPA RESOURCES

EPA's Burnwise Program - <http://www.epa.gov/burnwise>

How to Use a Moisture Meter Video - <http://www.youtube.com/watch?v=jM2WGgRcnm0>

EPA offers tips on how to properly use a moisture meter to test firewood before using in a wood-burning stove or fireplace. Wet wood can create excessive smoke which is wasted fuel.

Split, Stack, Cover and Store Video - <http://www.youtube.com/watch?v=yo1--Zrh11s>

EPA offers four simple steps to properly dry firewood before using in a wood-burning stove or fireplace. Wet wood can create excessive smoke which is wasted fuel. Burning dry, seasoned firewood with a moisture content of 20% or less can save money and help reduce harmful air pollution.

Wet Wood is a Waste brochure - <http://www.epa.gov/burnwise/pdfs/wetwoodwastebrochure.pdf>

This tri-fold brochure provides colorful illustrations of the four easy steps to dry firewood.

NOTE: The warranty can be voided by operating a residential hydronic heater in a manner inconsistent with the owner's manual.

INTRODUCTION

Labeling and Terminology

The outdoor furnace and this owner's 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 outdoor furnace.

DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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 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 outdoor 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 E-Classic Outdoor Wood Furnace.

This manual is organized into six sections for easy reference.

- Section 1 – Outdoor Furnace Installation;
- Section 2 – Operating Instructions;
- Section 3 – Maintenance;
- Section 4 – Owner Serviceable Items;
- Section 5 – Troubleshooting;
- Section 6 – General Information.

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

NOTE: In higher populated areas, extend the chimney to a height above the roofs of surrounding buildings (see E-Classic Outdoor Furnace Installation Scenario illustration in Planning the Location section).

NOTE: The outdoor furnace may be connected to an existing boiler system or hot water heating system by a qualified installer only. However, the outdoor furnace must not be pressurized.

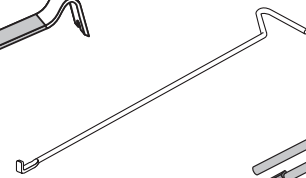
Tools

Included with each new furnace are tools that are invaluable for maintenance and cleaning. Use the hoe to clean the firebox and Reaction Chamber. The Wonder Bar® is used for scraping the firebox and the door frame. The cleaning rod can be used to break up heavy or solidified ash in the firebox. The heat exchanger scraper is used to remove fly ash and deposits from the heat exchangers.

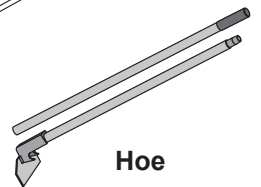
Heat Exchanger Scraper



Wonder Bar

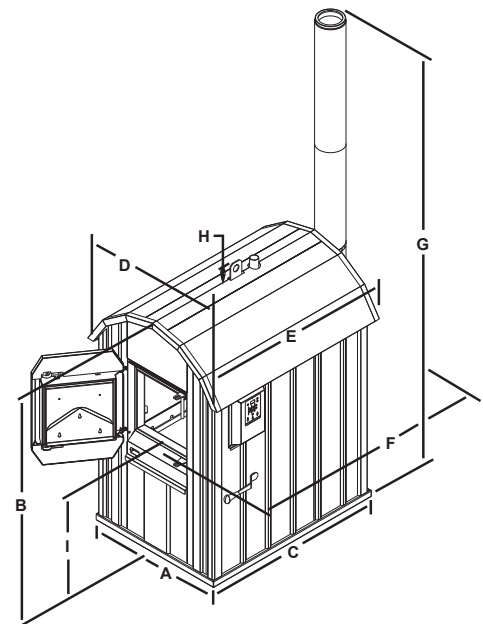


Cleaning Rod



Hoe

Measurements



E-Classic 1450 Measurements

	A	B	C	D	E	F	G	H	I
in.	42	73	57	47	59	71	150	5	34
cm	107	185	145	119	150	180	381	13	86

- Measurement (F) is from firebox door to chimney inspection cover.
 - Measurement (G) includes two 4 ft (1.2 m) chimney sections.

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IMPORTANT PRECAUTIONARY INFORMATION

The information contained on pages 4-5 appears throughout this manual. Be sure to read carefully and understand these precautions before, during and after the installation, operation and maintenance of the furnace.

CAUTION

This outdoor furnace is not intended to be the only source of heat. In the event of a prolonged power failure, a generator may be used to prevent lines from freezing. Should the outdoor furnace be left unattended, run out of fuel or require service, an alternate heating source in the building being heated should be in place to prevent damage caused by freezing.

WARNING

The outdoor furnace vent cap must fit loosely on the vent opening (Fig. 1). 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 OUTDOOR FURNACE TO BE PRESSURIZED.**

Fig. 1



WARNING

Be sure the outdoor furnace is filled with water before firing. Never fire the outdoor furnace when the water level is more than 1" (2.5 cm) below the FULL mark on the sight gauge. Corrosion Inhibitor Plus™ must be added before the initial fill (see Water Quality and Maintenance).

WARNING

Do not install this outdoor furnace inside a building. It is not intended or certified to be installed inside a building.

WARNING

This outdoor wood furnace and/or chimney must not be installed inside or under any configuration or construction that contains combustible materials as part of the structure or configuration. The chimney is not intended or safety tested to be used or installed other than on the furnace located outside of any structure or enclosure.

WARNING

Disconnect the electrical power to the outdoor furnace before replacing an electrical component.

WARNING

Should overheating occur or the gas supply fail to shut off, do not turn off or disconnect the electrical supply to the outdoor furnace. Instead, shut off the gas supply at a location external to the appliance.

WARNING

Do not use this appliance if any part of the gas train system has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

WARNING

Allow the outdoor furnace to thoroughly cool and completely clean out the firebox before draining water from the outdoor furnace. If the water in the outdoor furnace ever boils, be sure to check the water level and restore to full. If water is added, the proper level of Corrosion Inhibitor Plus™ (p/n 1650) must be maintained.

WARNING

When cleaning the outdoor furnace, be careful not to spill any coals.

WARNING

ALWAYS store ash in a covered non-combustible container.

WARNING

When installing a heat exchanger on an existing hot water boiler or in a forced air system, be sure none of the existing system safety controls are disabled.

NOTE: Any changes to an existing boiler system should be done by a qualified installer in accordance with applicable codes.

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 qualified installer in accordance with applicable codes.

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

WARNING

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

IMPORTANT PRECAUTIONARY INFORMATION

The information contained on pages 4-5 appears throughout this manual. Be sure to read carefully and understand these precautions before, during and after the installation, operation and maintenance of the furnace.

WARNING

Maintain the following clearances from combustibles for the furnace installation:

- 44" (112 cm) from the back
- 12" (30.5 cm) from the sides
- 48" (122 cm) from the front
- 18" (46 cm) from chimney inspection cover
- The foundation must be noncombustible
- Refer to Fig. 3 for required maintenance clearances

WARNING

For fire safety, keep all combustible materials at least six feet (two meters) away from the outdoor furnace, especially around the door area. Debris of wood chips and other combustibles in the area may be easily ignited if a hot coal is spilled out of the firebox and left unnoticed.

WARNING

The firebox door must be closed and latched at all times except when filling the firebox with wood. Leaving the firebox door open may lead to a runaway fire. In the event of a runaway fire, close the firebox door. In the event of a chimney or soot fire, close the firebox door and make sure power is off to the outdoor furnace.

CAUTION

Open the bypass door 15 seconds before opening the firebox door and close the bypass door 15 seconds after closing the firebox door. Do not leave the bypass door open during operation. Leaving the bypass door open during operation may cause damage to components of the outdoor furnace and may cause creosote buildup that can prevent the bypass door from sealing properly.

WARNING

All covers must be maintained at all times except during maintenance, inspection and service.

WARNING

When opening the firebox door, the door switch will shut off the primary air solenoid and prevent the gas-fired wood ignition burner (if installed) from operating while the firebox door is open. Do NOT disable the door switch.

CAUTION

This outdoor furnace is not to be connected to a chimney flue serving another appliance.

WARNING

Use only untreated wood in the firebox. Do not burn trash, plastics, gasoline, rubber, naphtha, household garbage, material treated with petroleum products (particle board, railroad ties and pressure treated wood), leaves, paper products or cardboard.

WARNING

This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods. **DO NOT BURN:** any wood that is not clean wood, unseasoned wood, garbage, tires, lawn clippings, leaves, brush trimmings or general yard waste, materials containing asbestos, materials containing lead, mercury or other heavy toxic metals, materials containing plastic, materials containing rubber, waste petroleum products, paints and paint thinners, asphalt products, chemicals, coal, glossy or colored paper, construction and demolition debris, plywood, particleboard, salt water driftwood and other previously salt water saturated materials, manure, animal carcasses and asphalt products. Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.

NOTE: The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater.

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

NOTE: Do not use chemicals or fluids to start the fire. Use kindling or gas-fired wood ignition option to start an initial fire.

NOTE: This outdoor furnace is not to be used with an automatic stoker.

WARNING

When adding wood to the firebox, be careful not to get pinched between the wood and the door frame, or any part of the outdoor furnace. Use extreme care with large pieces of wood that may be difficult to handle.

NOTE: The sight gauge valve should always be closed, except when checking water level. Water will automatically drain from the sight gauge tube when the valve is closed. Remember that this type of valve requires only 1/4 turn to open or close.

WARNING

Sulfuric acid in the test kit is a corrosive acid. Handle carefully. Carefully read and follow precautions on test chemical labels. Keep test chemicals away from children. Safely dispose of tested samples.

SECTION 1 – OUTDOOR FURNACE INSTALLATION

To ensure the E-Classic Outdoor Wood Gasification Furnace functions as designed, careful planning and proper installation are imperative. This section outlines much of the information needed to install the outdoor furnace, select water lines, install circulation pumps and connect to your existing heat emitter(s).

Be sure to read carefully and observe all of the information, not only in this section, but in the entire owner's manual.

If any installation questions arise that cannot be answered by the information in this manual, be sure to contact your dealer.

PLANNING THE LOCATION

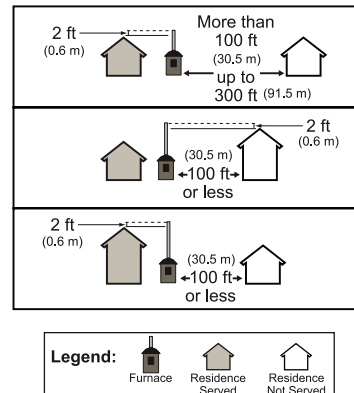
When selecting a suitable location, carefully consider each of the following:

- Must be installed in accordance to all applicable codes and regulations.
- Check with your insurance company to see if they have any location requirements.
- Consider prevailing winds and the direction smoke will travel.
- The shorter the distance between the outdoor furnace and building(s) being heated, the lower the cost will be for the installation of the hot supply and return water lines and insulation.
- Be sure to maintain the required clearances to combustibles and recommended maintenance clearances.
- ThermoPEX pre-insulated piping is recommended for all installations. Other types of piping should not be buried in low-lying areas with standing water or with a very high water table, or under an area of heavy vehicle traffic unless protected from excessive compression.
- If the ground at the location is unstable or subject to frost heaving, consider installing 2" (5 cm) closed-cell insulation under the front portion of the concrete slab the outdoor furnace will be installed on, and under the area around the slab used for walking (see Fig. 3).

OUTDOOR WOOD 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. Follow the manufacturer's written instructions for recommended 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 within 300 feet (91.5 m) to any residence not served by the furnace, it is recommended that the chimney be at least 2 feet (0.6 m) higher than the peak of the residence served.
 - If located within 100 feet (30.5 m) to any residence not served by the furnace, the chimney must be 2 feet (0.6 m) higher than the peak of the residence served or not served, whichever is higher.

Chimney Height Installation Scenario



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

Be considerate of neighbors when operating your furnace. If you use your furnace in the summer months, be certain your chimney exhaust is not adversely affecting neighbors with open windows.

NOTE: You may need to increase the chimney height if conditions occur that force exhaust to low levels.

INSTALLATIONS IN MASSACHUSETTS:

1. All installation components must be products approved in the Commonwealth of Massachusetts by the Gas and Plumbing Board.
2. The maximum run of tubing from the water heater to a fan coil is 50 linear feet.
3. Persons operating this hydronic heater are responsible for operation of the hydronic heater so as not to cause a condition of air pollution as defined in 310 CMR 7.01(1).

INSTALLATION PRECAUTIONS

A qualified installer must perform the installation of this supplementary outdoor furnace and must determine how to install it to be compatible with the existing heating source.

Chimney Recommendations

In higher populated areas, extend the chimney to a height above the roofs of surrounding buildings. Use Central Boiler Chimney Extensions when extending the chimney. When only the standard eight feet (2.4 m) of chimney are used, the sections must be secured at the connection joint with four (4) screws to stabilize the extension.

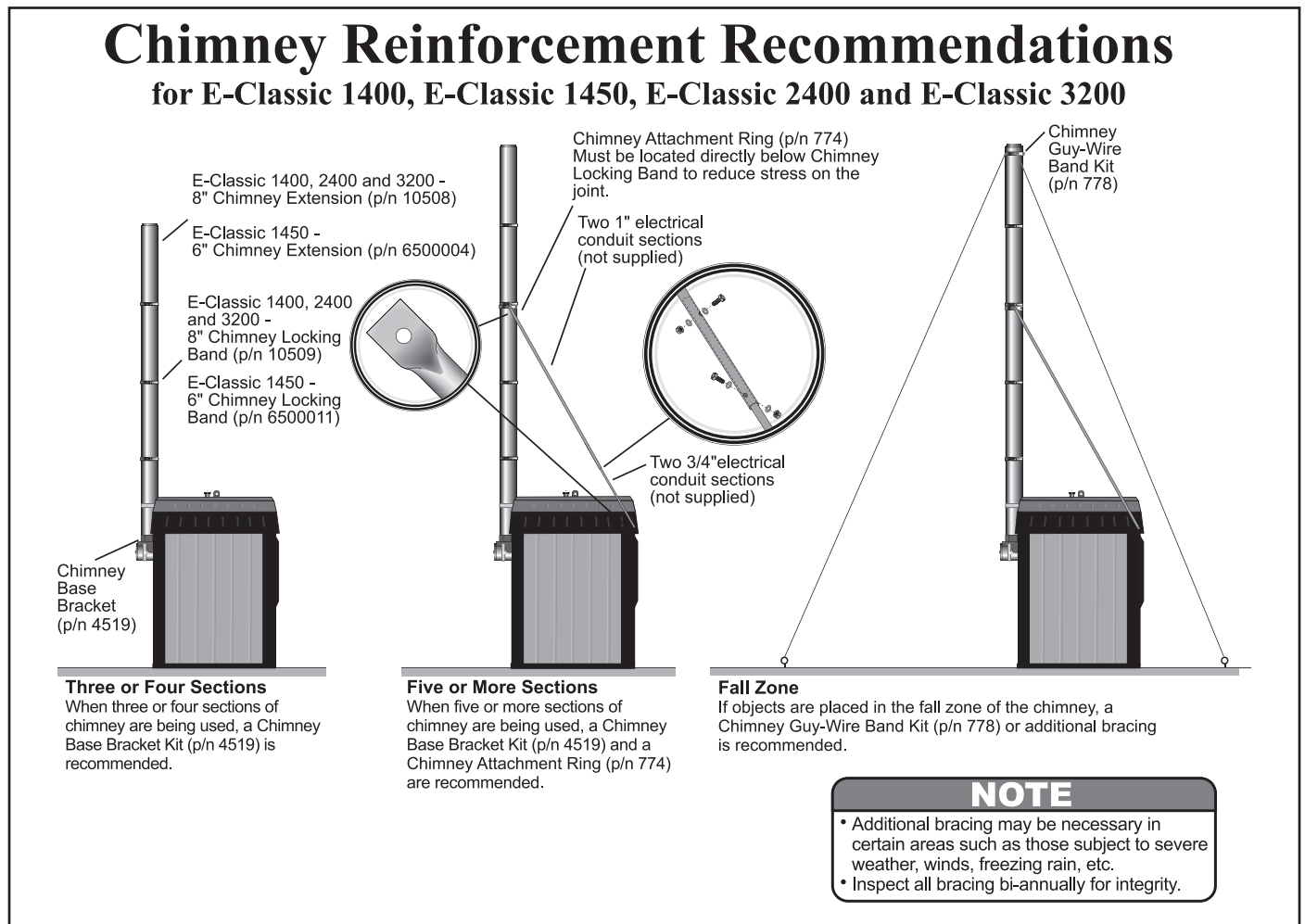
If extensions are added to the standard eight feet (2.4 m) of chimney, the chimney should be reinforced appropriately. Fig. 2 shows chimney support recommendations when three or more sections are used. When adding sections of chimney, make sure that there is nothing within the fall zone of the chimney that could be damaged. If something is located within the fall zone and cannot be removed, guy wires or braces may need to be installed to prevent a falling chimney from causing damage (see Fig. 2).

NOTE: If more than three 4-foot (1.2-m) sections of chimney are used, a support (e.g., a pole, pipe or other structural support) may be installed from the ground that can withstand wind. Other reinforcement recommendations are shown in Fig. 2.

NOTE: For chimney extensions or chimney replacement, use only genuine Central Boiler chimney components. Parts are available from an authorized Central Boiler dealer.

The installation of a spark arrester is recommended, particularly where there are dry conditions or where there is combustible material near the unit, unless the installation of a spark arrester is prohibited by local requirements. Use common sense to avoid potential fires, including exercising caution when disposing of ashes, cleaning and refueling. Keep all highly combustible materials (e.g., gasoline, propane, leaves, pine needles, etc.) away from an operating unit at all times. Take special precautions in windy conditions.

Fig. 2



GENERAL INSTALLATION INFORMATION

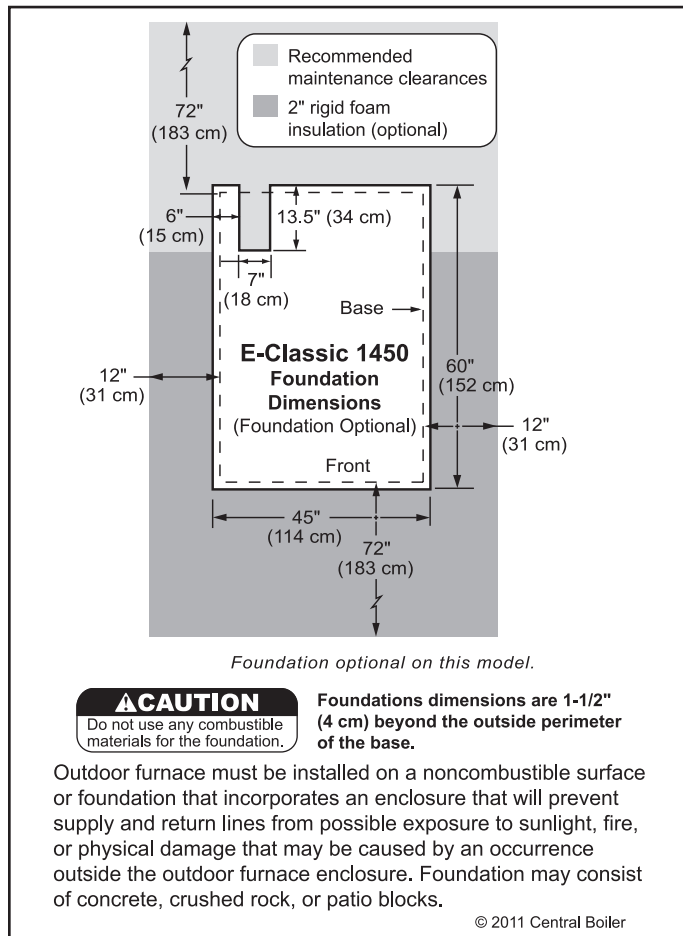
Foundation

The outdoor furnace may be installed directly on **stable, level ground** without the necessity of a foundation.

If the ground is unstable, one option is to use patio blocks under the perimeter of the base. Another option is to pour a concrete foundation.

To install the outdoor furnace on a concrete foundation, refer to Fig. 3 for dimensions and for the location of the hollowed-out area for each model. A 4" to 6" (10 to 15 cm) thick concrete slab works well; however, a thicker slab may be used to obtain the desired door opening height.

Fig. 3



If the area for the concrete slab is unstable and/or affected by frost heaving, consider installing 2" closed-cell insulation beneath the front portion of the slab and under the area of the ground used for walking (see Fig. 3).

NOTE: The installation surface or foundation must be noncombustible. The hot supply and return lines must also be protected from possible exposure to sunlight, fire or physical damage. Foundations may consist of concrete, crushed rock or patio blocks.

Potable Water

If the outdoor furnace is to heat potable water associated with commercial food preparation or for heating milk-house hot water, it is recommended to install a double-wall heat exchanger. Also, when filling the system with water, a backflow preventer must be installed in the line used for filling.

Antifreeze

Most outdoor furnaces are installed without antifreeze when an existing heating system is in place and there is no anticipation of leaving the outdoor furnace unattended for extended periods of time. If the building being heated has an alternate heat source, system water may be kept from freezing by running the circulating pump(s) and drawing heat from the existing heat emitter(s).

To prevent freezing if the outdoor furnace is not fired for extended time periods or if lengthy power outages are anticipated during cold weather, a nontoxic propylene glycol boiler-type may be used in the system. Some types of antifreeze that contain various inhibitors have been known to create problems like coagulation and jelling. To prevent potential problems, **do not use** propylene glycol that is premixed with unknown inhibitors. Central Boiler Corrosion Inhibitor Plus (p/n 1650) is compatible with straight propylene glycol. It is important to use Corrosion Inhibitor Plus with straight propylene glycol for corrosion protection. If adding antifreeze to the system, it is imperative that the entire system contain at least 30% antifreeze concentration mixed with softened water to prevent bacterial growth and minimize minerals in the system. Bacterial growth is likely to occur with low antifreeze concentrations and can cause corrosion in the furnace water jacket and/or clogging of heat exchangers. To confirm the antifreeze solution is adequate, allow the pumps to circulate for at least 24 hours and then obtain a sample of the system water. Using an antifreeze tester, the solution must be protected to 0°F (-18°C) or below.

NOTE: Be sure to adhere to all warnings and precautions on the antifreeze label.

NOTE: Do not use automotive or RV types of antifreeze.

NOTE: If using antifreeze, use Test Kit (p/n 597) when testing the treated water in the outdoor furnace (see Water Quality and Maintenance).

Corrosion Inhibitor Plus™

To aid in protecting the system from corrosion, it is imperative to add Central Boiler Corrosion Inhibitor Plus™ (p/n 1650). When initially filling the system (see Finalizing the Installation), add the Corrosion Inhibitor Plus™ **before adding water** to the system. Any time water is added to the system, Corrosion Inhibitor Plus™ must be added if a tested water sample indicates it is necessary (see Water Quality and Maintenance).

Corrosion Inhibitor Plus™ is composed of common materials and is biodegradable. However, in keeping with good safety and environmental practices, the supplier recommends the following if draining treated system water becomes necessary:

- You may drain the outdoor furnace to a home septic system. Central Boiler Corrosion Inhibitor Plus™ is biodegradable and can be properly treated in a residential septic system. If doing so, however, be careful not to overflow the septic system.
- Do not drain the outdoor furnace in such a manner that the drain water could in any way contact surface water, stream, river, estuary (where a river meets a sea), lake, pond, ocean or other types of waters.
- Do not drain to any location within 50 feet (15 meters) of any water well.

Shut-Off Valves

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

Ground Rod Kit

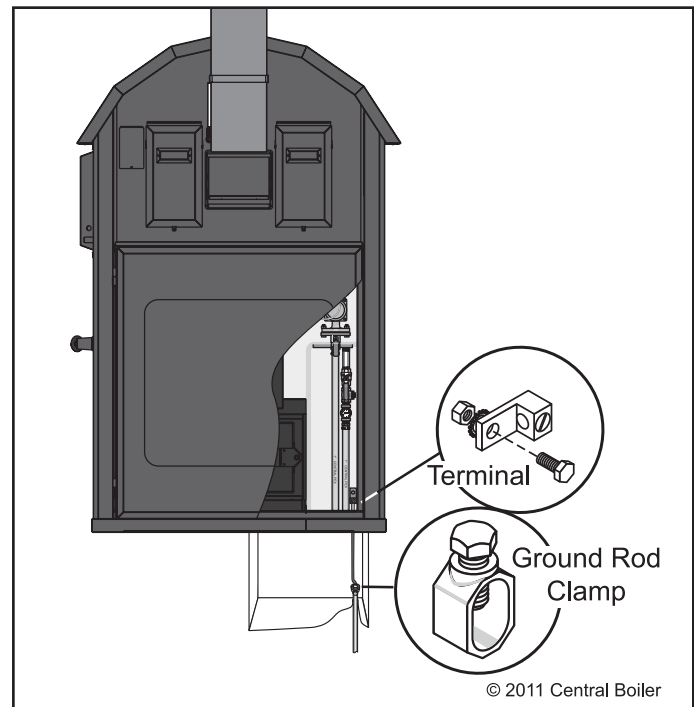
The outdoor furnace must be electrically bonded to ground in accordance with the requirements of the authority having jurisdiction or, in absence of such requirements, with the National Electrical Code, ANSI/NFPA 70 and/or the Canadian Electrical Code Part 1, CSA C22.1 Electrical Code.

Install a Ground Rod Kit (p/n 6593) and connect it to the outdoor furnace.

1. In the water line trench near the outdoor furnace, drive the ground rod into the ground until the top of the ground rod is below the ground surface.
2. Route the ground wire from the ground rod under the outdoor furnace base and over to the frame of the outdoor furnace.
3. Secure the ground terminal with a cap screw (1/4" x 3/4"), star washer and nut. Secure the ground wire to the terminal; then secure the ground wire to the ground rod with the clamp. Tighten all hardware securely.

NOTE: A hole for the ground terminal has been pre-punched in the outdoor furnace base near the pumps.

Fig. 4



SUPPLY AND RETURN LINES

Determine the configuration of the supply and return lines from the outdoor furnace to where the supply and return lines will connect to the existing heating system. Central Boiler recommends using the ThermoPEX® piping system.

ThermoPEX is a fully assembled, pre-insulated piping system consisting of two 1" Central PEX lines or two 1-1/4" PEX lines. The two lines (one a supply and one a return line) are insulated with high-density urethane insulation and a thick, durable, waterproof, polyethylene outer jacket. One of the lines is marked with a black stripe for identification.

NOTE: To prevent ground water from entering the house, do not use drain tile, PVC pipe with bubble wrap, or any other inferior material for insulating the water lines.

NOTE: If the outdoor furnace supply and return lines are not insulated properly, or if other brands of insulated piping are used, there can be excessive heat loss. This heat loss can greatly increase the fuel consumption.

NOTE: If it is unavoidable that the trench will run through an area of ponding water, use ThermoPEX instead of other materials. ThermoPEX should also be used for above-ground or winter installations, and if the area is likely to be affected by compaction.

Temporary Above Ground or Winter Installations

For temporary above ground or winter installations in which the supply and return lines can not immediately be buried underground, Central Boiler recommends using ThermoPEX. Be sure that both the insulation and the supply and return lines will not be exposed to ultraviolet rays. The ThermoPEX black exterior jacket has UV protection but the insulation and water lines inside do not. Use a ThermoPEX termination cap at each end of the installation to protect and seal the insulation from water.

NOTE: Bury the ThermoPEX as soon as conditions permit (e.g., once the ground has thawed).

NOTE: If ThermoPEX is installed temporarily above ground, provisions should be made to prevent possible risk of fire coming into contact with the ThermoPEX. ThermoPEX is constructed of materials that can burn and transfer a fire.

CAUTION

If ThermoPEX is installed temporarily above ground, do not cover with combustible materials (e.g., straw, hay, leaves, etc.).

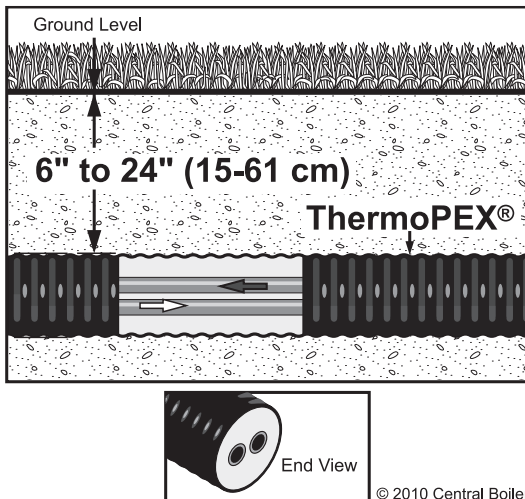
Digging the Trench

WARNING

Before digging, be sure to call for utility locator service.

The trench depth for ThermoPEX should be between 10" and 28" (25 and 71 cm).

Fig. 5



Underground Electric Wire

A 14-2 (two wires plus ground) underground rated wire should supply the outdoor furnace with electricity. A heavier gauge wire may be needed if the run is over 200 feet (61 meters). Check local codes and requirements. It is recommended that the incoming fuse or circuit breaker not exceed 15 amps.

Connecting to Existing Heating System

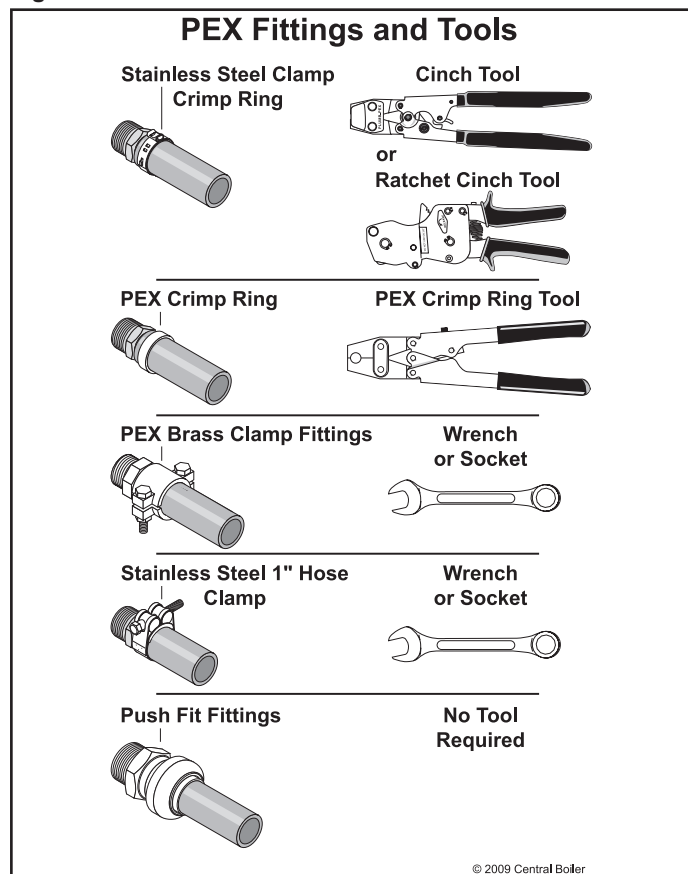
1. Make an entrance into the building(s) where the supply and return lines are to enter.
2. Lay the ThermoPEX assembly in the trench and feed one end into the building. Apply sealant around the supply and return lines where they enter the building.
3. Purge the supply and return lines before connecting any fittings to ensure there is no debris or foreign matter present.

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

4. Close all valves on the outdoor furnace.
5. Install fittings to allow pressure-testing of both supply and return lines. Pressurize with 50 psi (3.5 kg/cm²) of air; then check after 30 minutes to see if pressure has dropped. A drop in pressure indicates a leak; repair as necessary.
6. Connect the supply and return lines to the outdoor furnace and the existing heat emitter(s). Fig. 6 shows some of the PEX fittings and tools used in making connections.

NOTE: The base on the back of the outdoor furnace is removable if necessary for connecting the supply and return lines to the outdoor furnace.

Fig. 6



CAUTION

Allow for expansion and contraction of the supply and return lines at each end. Without an allowance for expansion and contraction, the lines may kink or the fittings may be pulled apart, causing an immediate water loss from the outdoor furnace. Central PEX water lines can have an expansion and contraction rate up to .095" per each 100 ft and each 10°F (2.4 mm/30 m/5.5°C).

7. Make sure there are no leaks in the supply and return lines; then backfill the trench.

NOTE: Do not backfill the trench until the supply and return lines have been tested to ensure there are no leaks.

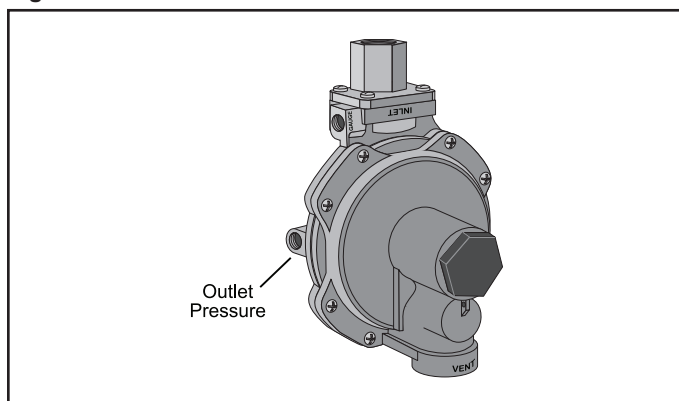
INSTALLING LP TANK & GAS PIPING

If installing an LP tank for the optional gas-fired wood ignition burner, it must be installed by a qualified installer familiar with all regulations and must conform to the authorities having jurisdiction, or in the absence of such requirements, with the NFPA 54, the National Fuel Gas Code ANSI Z223.1 or CAN/CGA B149.

All gas piping must conform to the authorities having jurisdiction, or in the absence of such requirements, with the National Fuel Gas Code ANSI Z223.1 or CAN/CGA B149. The line to the outdoor furnace should be buried underground and supported to the gas valve appropriately. The piping should be installed and tested for leaks by a qualified installer familiar with all regulations. A sediment trap should be provided upstream of the gas controls.

A two-regulator system using a first-stage and a second-stage regulator, or a combination two-stage regulator (p/n 1930) such as the one shown in Fig. 7 should be used. A small single-stage regulator may not flow enough in cold weather.

Fig. 7



CAUTION

Make sure all covers for the gas ignition system on the appliance are in place during operation and service.

WARNING

Once the gas supply is connected, the appliance and gas connection must be tested for leaks before placing the appliance in operation.

HIGH ALTITUDE INSTALLATIONS

High altitude derating instructions are included with the Gas-fired Wood Ignition Burner Kit.

CIRCULATION PUMPS

NOTE: The direction of water flow is very important for the proper operation of the outdoor furnace. Installing a swing check valve in the return line can prevent possible reverse flow.

Water Flow

For a single building water-to-air heat exchanger system with a domestic water heater, the direction of water flow must go from the hot outlet on the outdoor furnace to the lower side fitting of the domestic water heater exchanger, to the lower fitting of the heat exchanger in the plenum of the existing furnace, and then to the return port of the outdoor furnace.

NOTE: Some systems may have different flow patterns.

Access to Ports on Outdoor Furnace

NOTE: Spare ports are sealed with pipe plugs and covered with vinyl caps. To access a spare port, remove the vinyl cap and trim the foam as necessary.

The upper ports are the hot supply outlets and the lower ports are the return inlets. This configuration allows for mounting the circulation pumps on the outdoor furnace. Refer to Fig. 8 and 9 for proper supply and return line and pump installations.

Pump Selection

The Taco 009 is a medium flow, high head pressure pump that requires an adequate amount of pressure on the outlet side to prevent the motor from overloading.

The Taco 014 is a high flow, high head pressure pump that requires an adequate amount of head pressure on the inlet side to prevent cavitation. Therefore, a Taco 014 may need to be mounted lower near the base of the furnace.

The Taco 007 is a medium to high flow, low head pressure pump. In a very low-resistance system (e.g., short length of supply and return lines, only a flat plate heat exchanger, etc.), the 007 pump may need to be mounted lower near the base of the furnace to prevent cavitation at high water temperatures.

NOTE: See the Hydronic Component Selection Guide (p/n 2482) for more detailed information.

Fig. 8

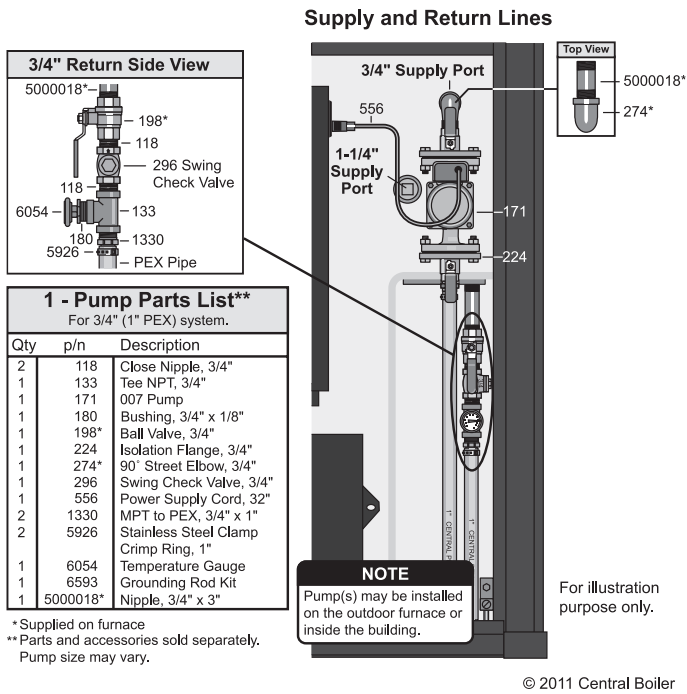
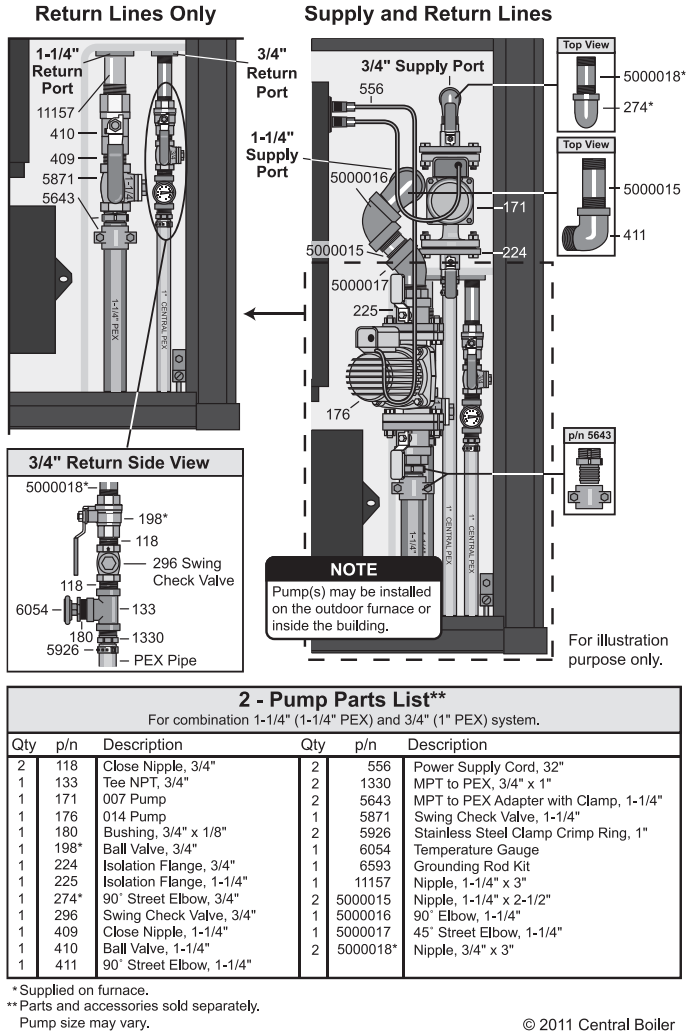


Fig. 9



Installing Circulation Pumps

The following guidelines must be adhered to when installing the circulation pump(s).

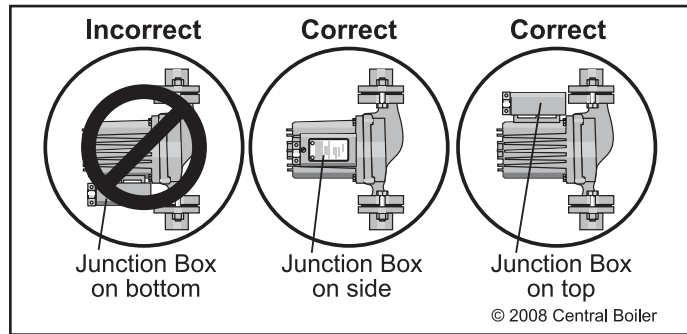
NOTE: See the **Hydronic Component Selection Guide (p/n 2482)** for more detailed information.

WARNING

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

- The pump motor must be installed in a horizontal position.
- The junction box must not be located below the pump motor (see Fig. 10). If necessary, remove the four screws and rotate the pump body.

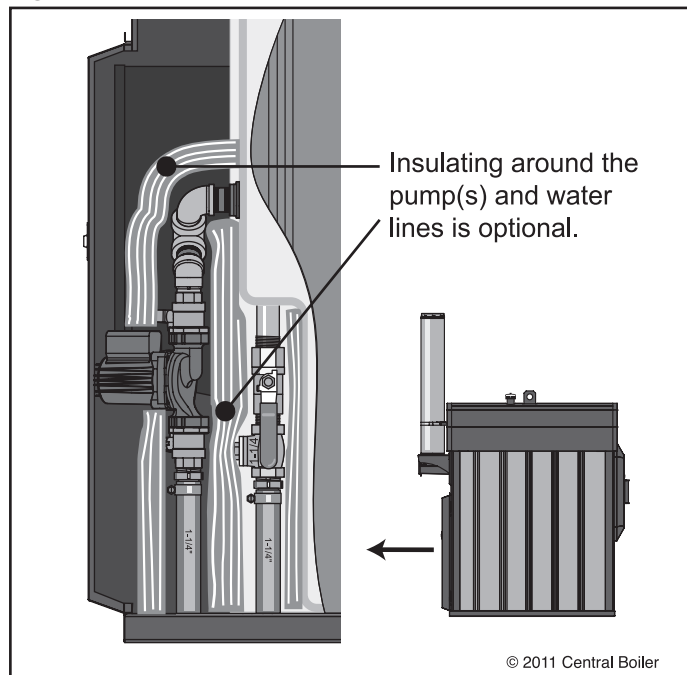
Fig. 10



C. Do not operate the circulation pump until the entire system has been filled with water and checked for leaks or the pump may be damaged.

D. Insulate the areas around the supply and return lines, pumps and drain valve (Fig. 11); then install and secure the back panel.

Fig. 11



NOTE: At least one circulation pump must run continuously to ensure proper operation of the outdoor furnace.

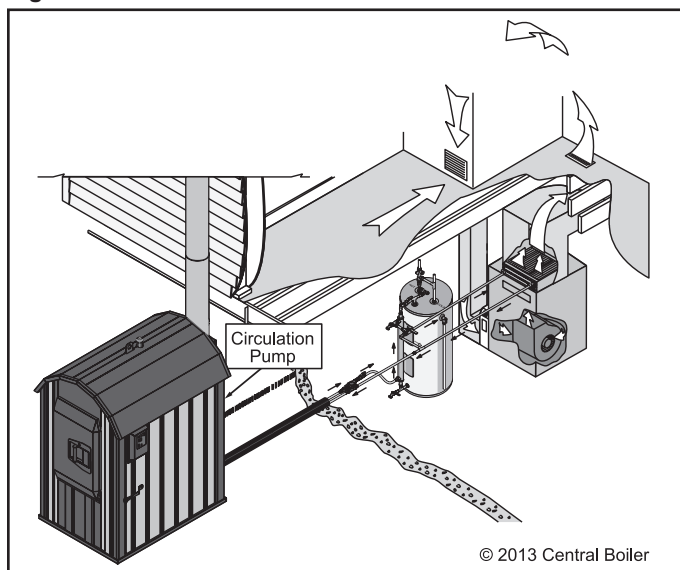
- E. The circulation pump(s) **must be installed in the supply line(s)** with the arrow on each pump pointed away from the outdoor furnace. In order to avoid circulation problems, do not install the pump(s) in the return line(s).
- F. The pump(s) must be located near the base of the outdoor furnace if the system has a high-flow pump or very low resistance on the outlet side of the pump. For example, if the outdoor furnace is 20 feet (6 meters) from the building and pumping water through one-inch pipes, a 50-plate heat exchanger or water-to-air exchanger, and back to the outdoor furnace, the pump needs to be mounted with four feet of water above the pump.

The pump(s) must also be located near the base of the outdoor furnace if operating with water temperatures of 195°F. Water at 195°F will boil on the inlet side of the pump if there is not an adequate amount of water above the pump. This causes cavitation, indicated by a noisy, rattling pump and results in premature failure of the pump.

Three or four feet of water above the pump should be adequate for systems with higher resistance (e.g., longer loops with other fittings, elbows, heat exchangers). For systems with low resistance (e.g., short loops, larger diameter pipes and low resistance heat exchangers like a water-to-air exchanger), it may be necessary to mount the pumps with four to eight feet of water above the pump. **See the Hydronic Component Selection Guide (p/n 2482) for more information.**

NOTE: See the Hydronic Component Selection Guide (p/n 2482) for more detailed information.

Fig. 12



Installing the circulation pump(s) at the outdoor furnace is recommended, but required if the building being heated is higher than the outdoor furnace or if there is a large rise in the water lines between the outdoor furnace and building (see Fig. 13 and 14). 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.

Fig. 13

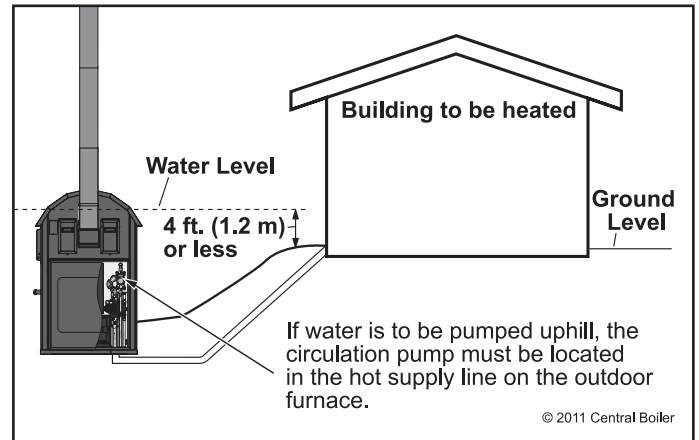
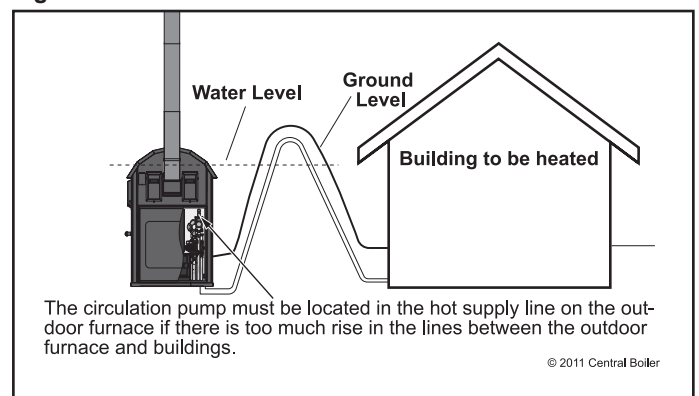
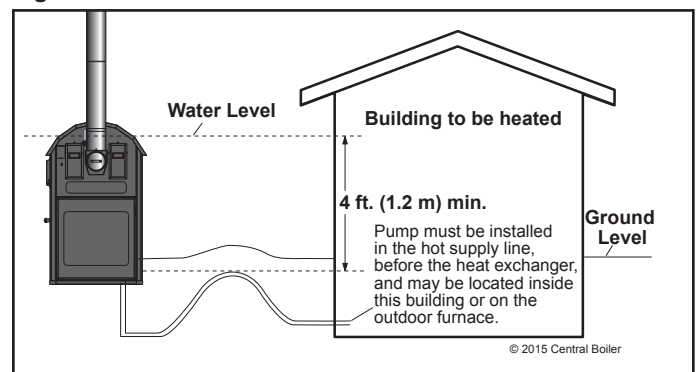


Fig. 14



If not mounted on the outdoor furnace, the circulation pump(s) must be mounted 4 to 5 feet (1.2 to 1.5 meters) lower than the top water level in the outdoor furnace (see Fig. 15).

Fig. 15



Shut-Off Valves

Shut-off valves should be installed on both sides of each pump so if it becomes necessary to repair or replace the pump, the pump can be isolated (see Fig. 9).

Filters

A Y-strainer or filter may be installed at the outlet side of the pump to remove foreign particles which may be present in the water. Always install Y-strainers with the cleanout in the lowest position.

Thermostatic Valves

NOTE: A 3/4" thermostatic valve with installation instructions is included with each new E-Classic 1450 and must be installed on each set of supply and return lines or warranty can be voided.

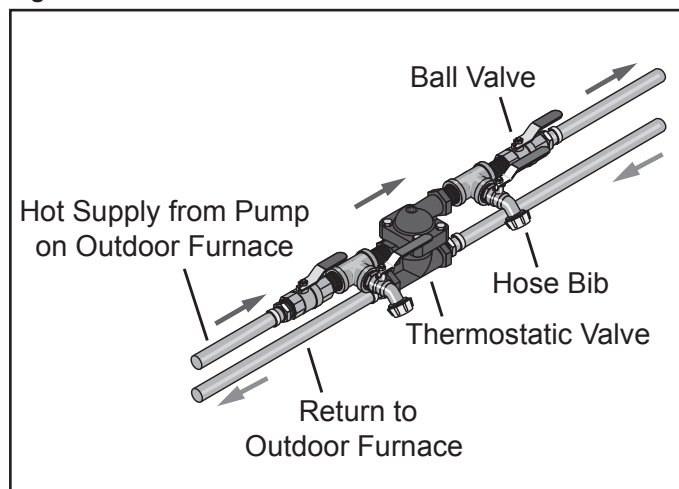
NOTE: For additional thermostatic valves, or for 1-1/4" thermostatic valves, contact your authorized Central Boiler dealer.

NOTE: The thermostatic valves illustrated throughout the manual may vary from your installation. See the installation instructions provided with the thermostatic valve.

A thermostatic valve must be installed on each set of supply and return lines in the system to maintain the outdoor furnace water temperature above 150°F (65°C). Operating the outdoor furnace with the water temperature less than 150°F (65°C) may result in more condensation in the firebox that can lead to corrosion.

It is recommended that the water temperature setpoint of the furnace be set to 185°F (85°C) to decrease the likelihood of the water temperature falling to 150°F (65°C). As a result, the outdoor furnace will operate with a greater efficiency and require less maintenance. Failure to follow proper operating instructions may result in furnace damage.

Fig. 16



Thermostatic Valve Exemption

If the system includes more than one building and one of the buildings is heated with an oil, gas or electric boiler that also serves as a backup for the other building(s) by keeping the system water temperature above 150°F (65°C) when the outdoor wood furnace is not fired, the thermostatic valve is not required.

Thermostatic Valve - How It Works

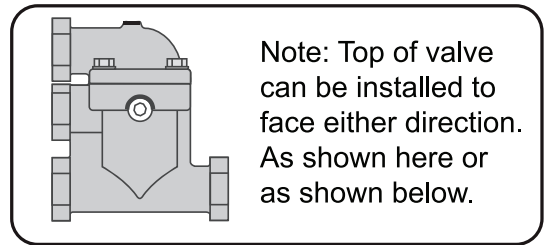
(arrow indicates water flow)

NOTE

Install a Thermostatic Valve on each set of supply and return lines in the system. Each Thermostatic Valve must be installed inside the building to be heated.

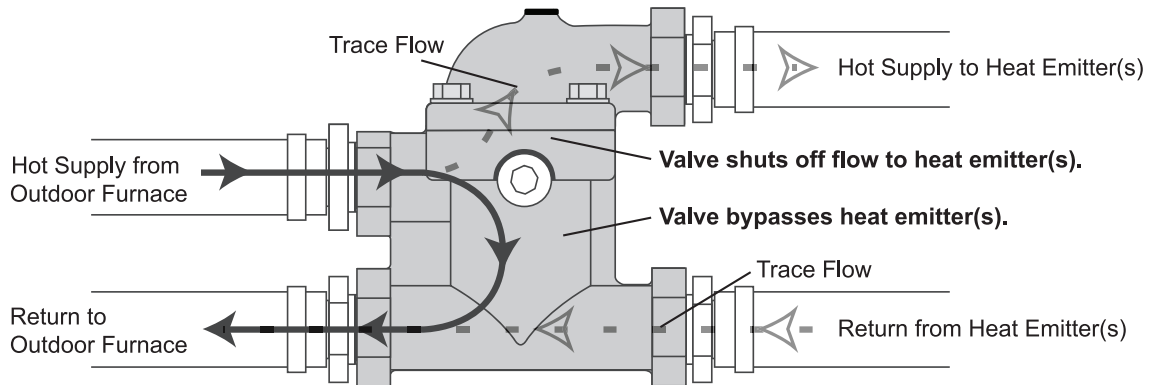
NOTE

The proper level of Corrosion Inhibitor Plus™ (p/n 1650) must be maintained (see Owner's Manual for more information).



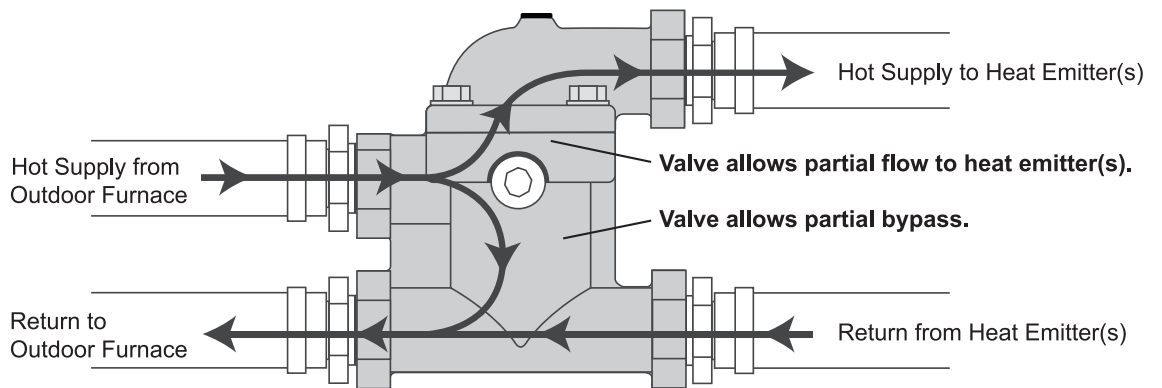
Water Below 150°F at Thermostatic Valve

(water returns to furnace to be reheated)



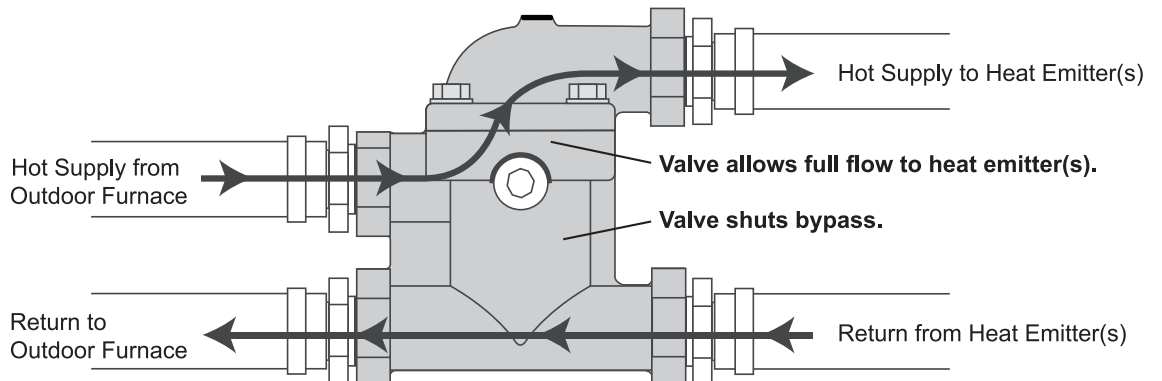
Water at 150°F up to 170°F at Thermostatic Valve

(water is partially released to heat emitter(s) and partially bypassed)



Water Above 170°F at Thermostatic Valve

(water is released to heat emitter(s))



Optional Gas-fired Wood Ignition Burner

An optional Gas-fired Wood Ignition Burner Kit (p/n 2500000) may be installed to light and automatically relight the wood. Installation instructions are provided with the kit.

Purging Air from the System - Manual Air Bleeders

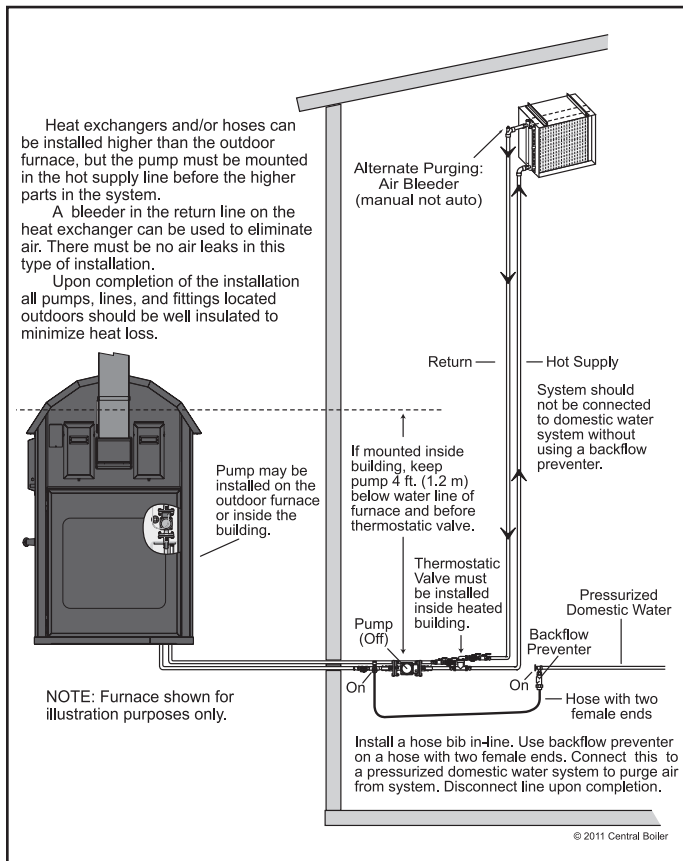
Manual air bleeders may be installed in the high points of the water lines where air may get trapped and cause circulation problems. Water can be pumped to levels higher than the outdoor furnace as long as the pump is **pushing** the water to the higher level and there are no air leaks in the system. Additionally, air should be purged from the system using pressurized domestic water and a hose with two female ends (see Fig. 17 and 35).

WARNING

The outdoor furnace 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 OUTDOOR FURNACE TO BE PRESSURIZED.**

If any auto float vents are present in the system, they must be capped off tightly to prevent air from entering the system.

Fig. 17



NOTE: See the Hydronic Component Selection Guide (p/n 2482) for more detailed information.

WATER HEATER INSTALLATION

WARNING

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

When installing a domestic hot water heat exchanger, the hot supply line from the outdoor furnace should be plumbed first to the water heater heat exchanger and then to the balance of the heating system.

A manual 3-way valve may be installed so that during the non-heating season, the water heater may be operated without operating the entire heating system (see Fig. 20). A tempering valve (or thermostatic mixing 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. 18) for the hot water heat exchanger.

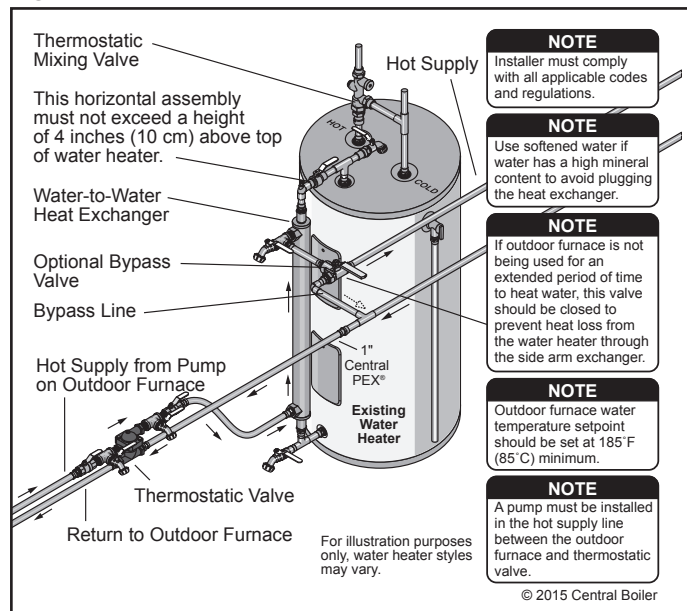
NOTE: If the water heater has been in service, flush the water heater prior to installing the hot water heat exchanger. Anode rod residue or other sediments in the water heater may plug the heat exchanger.

NOTE: Some gas water heaters are equipped with a high water temperature probe that is connected to the gas valve. When the water temperature exceeds the high limit, the gas valve enters a non-resettable lock out condition. This requires replacement of the entire valve. The installer must determine if this type of valve is present before installation of a water-to-water heat exchanger.

CAUTION

Costly maintenance may be incurred if steps are not taken during installation to reduce or eliminate the possibility of the water temperature in the water heater exceeding the high limit.

Fig. 18



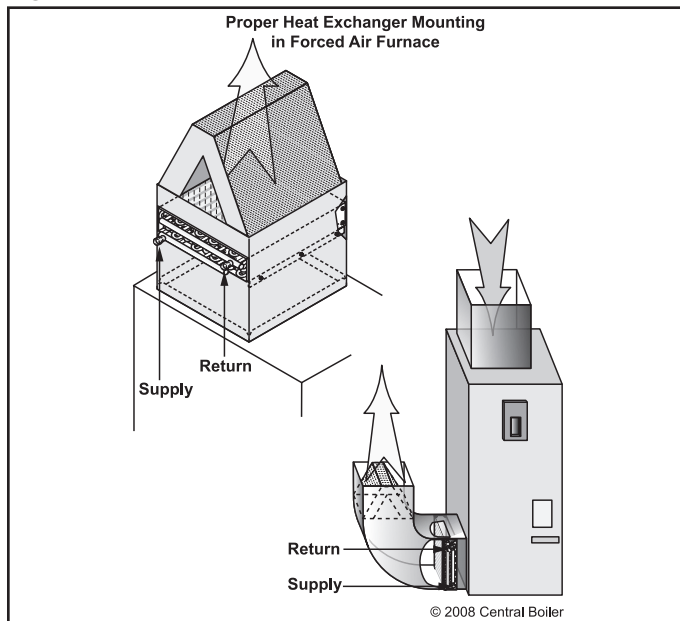
EXISTING FORCED AIR INSTALLATION

When the E-Classic Outdoor Wood Gasification Furnace is installed in conjunction with an existing forced air system, a water-to-air heat exchanger is mounted in the plenum or duct work of the existing furnace. Heated water from the outdoor furnace either continuously flows through the water-to-air heat exchanger or is diverted through a 3-way zone valve. When the thermostat senses the need for heat, the fan on the existing furnace forces air through the heat exchanger, transferring heat throughout the existing ductwork.

Following are several important items for this type of installation.

- Plenums installed to the furnace must be constructed of metal in accordance with NFPA 90B, 2-1.3.
- 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 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 components of the existing furnace could overheat.
- The heat exchanger may be mounted either horizontally or vertically with the outlets on the side (see Fig. 19).

Fig. 19



- 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/hot supply** from the outdoor furnace and the **top fitting is the outlet/return** back to the outdoor furnace.
- It is best to install a heat exchanger that fits the plenum.
- 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. Air flow deflectors need to be installed in the plenum on the outlet side of the heat exchanger if air flow is funneled into the heat exchanger.
- Be sure to consider the airflow through the ductwork so air circulation is not blocked off to parts of the building.
- 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 heat emitter(s) (gas or electric) should be operated before adding the heat exchanger.
- The air temperature rise should be measured with the heat emitter(s) 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 heat emitter(s) 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; however, the electrical current flowing through the motor must not be changed to exceed the nameplate rating. A larger blower motor may be used. On a direct-drive system, in most cases 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.

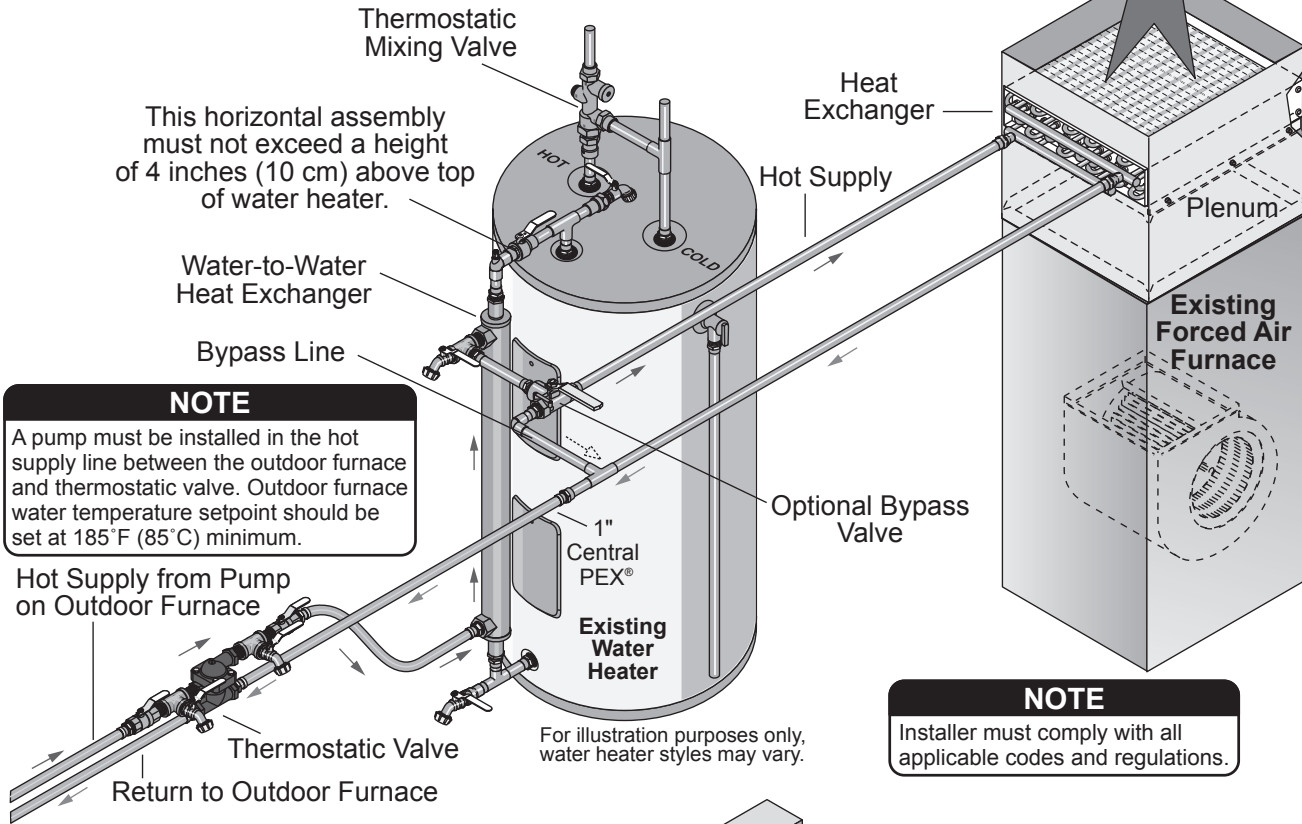
NOTE: Any electrical installation should be done by a certified electrician in accordance with all applicable codes.

- Due to the internal circuitry of some thermostats, a snap disc temperature control may have to 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 (60°C).

Fig. 20

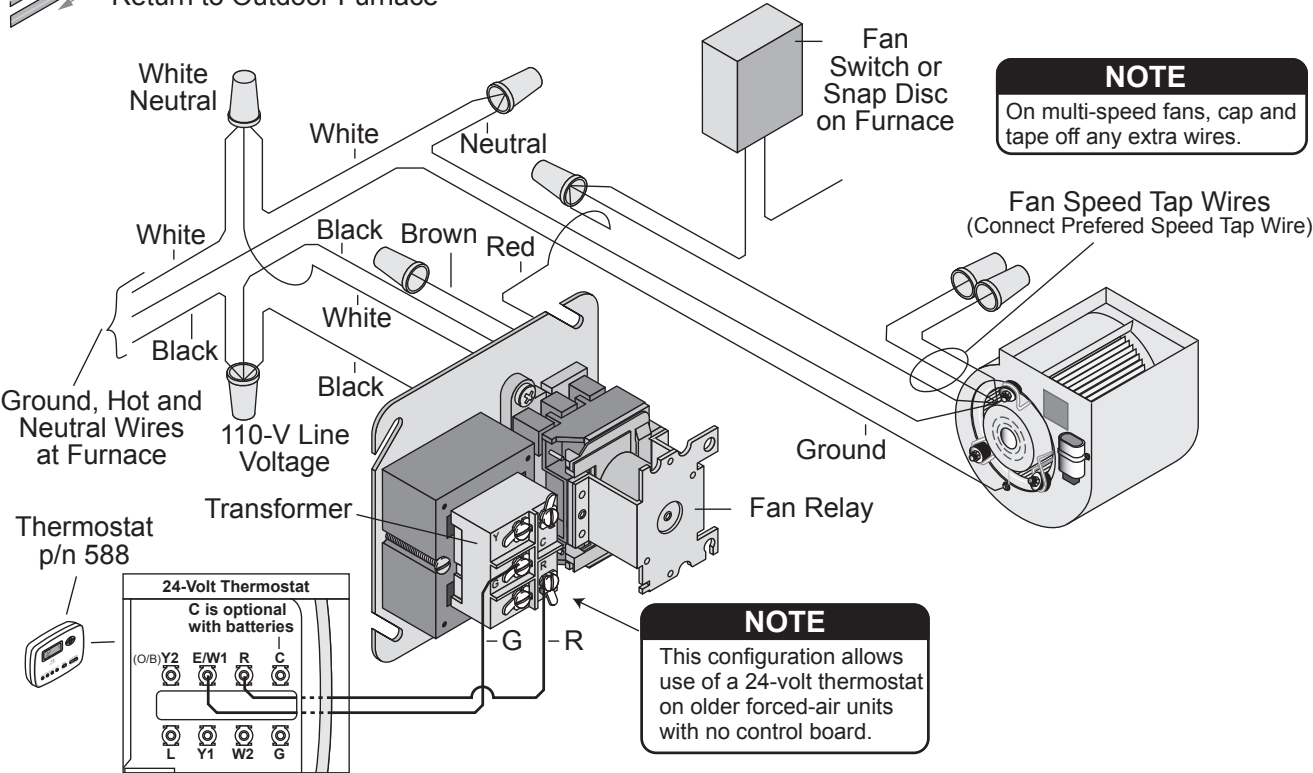
WATER-TO-AIR HEAT EXCHANGER AND WATER HEATER SYSTEM

NOTE: A certified electrician must perform the electrical installation.



NOTE
A pump must be installed in the hot supply line between the outdoor furnace and thermostatic valve. Outdoor furnace water temperature setpoint should be set at 185°F (85°C) minimum.

NOTE
Installer must comply with all applicable codes and regulations.



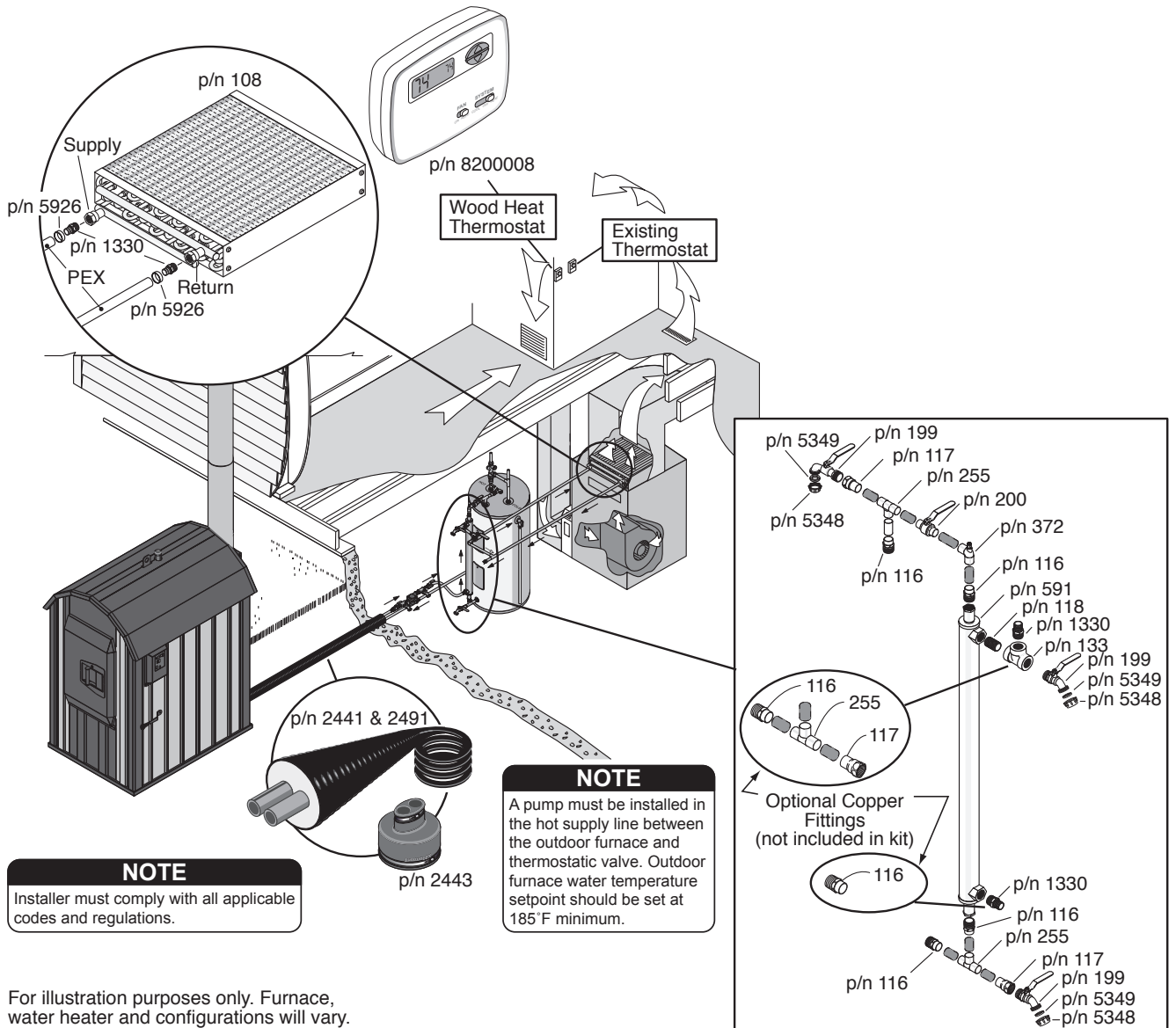
NOTE
On multi-speed fans, cap and tape off any extra wires.

NOTE
This configuration allows use of a 24-volt thermostat on older forced-air units with no control board.

For illustration purposes only.

Fig. 21

Forced Air System and Water Heater Heat Exchanger Components



Thermostatic Controls

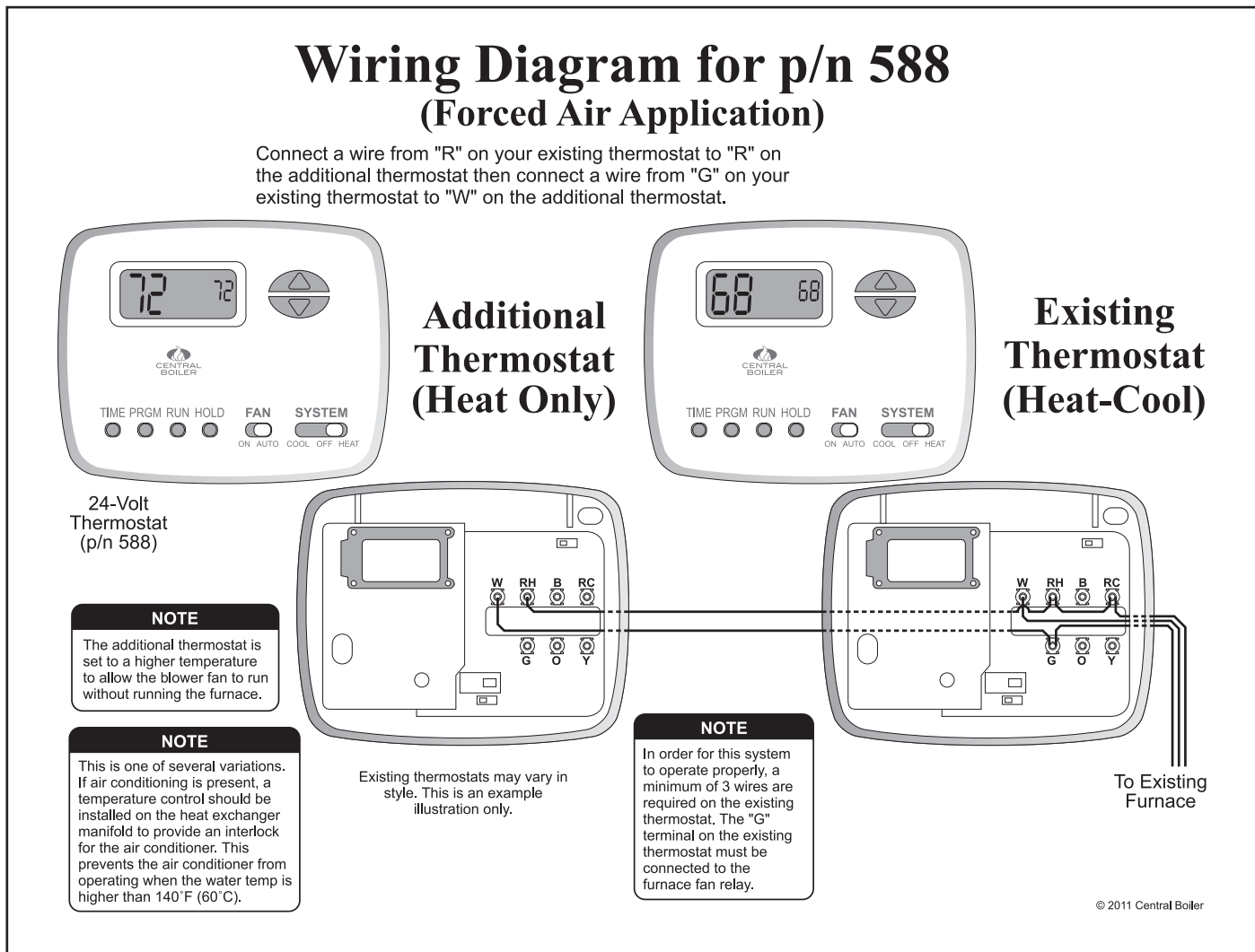
There are several methods for installing thermostatic controls for this type of installation.

1. If the forced air furnace has connections for control of the blower from a thermostat or switch, the simplest method is to add a second 24-volt thermostat. Wire the thermostat to the forced air furnace so that upon a call for heat, the thermostat closes the connection between power (usually 'R' or red) and the fan terminal (usually 'G' or green). By setting the new thermostat to the desired room temperature, it will control when the blower operates, drawing heat from the outdoor furnace. The existing thermostat should be set a few degrees below the new thermostat. This setting will be the temperature at which the existing forced air heating system will operate if the outdoor furnace is out of fuel. Refer to Fig. 22 for one possible arrangement.

2. An alternative method is to install a line voltage thermostat to control the blower on the forced air furnace. In this installation, a 120-volt line is run from the thermostat to the forced air furnace. One wire is connected to the hot (line feed) and the other wire is connected to the forced air 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. The switch is connected in series to the wire coming from the line voltage thermostat and must be installed so that it does not affect the forced air system thermostat.

NOTE: If the low water temperature switch is not installed, the fan will run continuously even when the outdoor furnace is out of fuel. This will keep the water in the outdoor furnace approximately the same temperature as the air in the house (to prevent the water in the outdoor furnace from freezing).

Fig. 22



HEATING MULTIPLE ZONES

A single pump and manifold may be used to heat more than one zone as long as the return water can be maintained above 150°F (66°C). If the return water temperature can not be maintained above 150°F (66°C), then a separate pump should be used for each zone. A thermostatic valve (see Fig. 16) must be installed to ensure that the water temperature in the outdoor furnace is maintained above 150°F (66°C).

The E-Classic offers two sets of supply and return ports (for up to two zones or buildings, without the need for manifolds) for mounting of up to two pumps on the outdoor furnace.

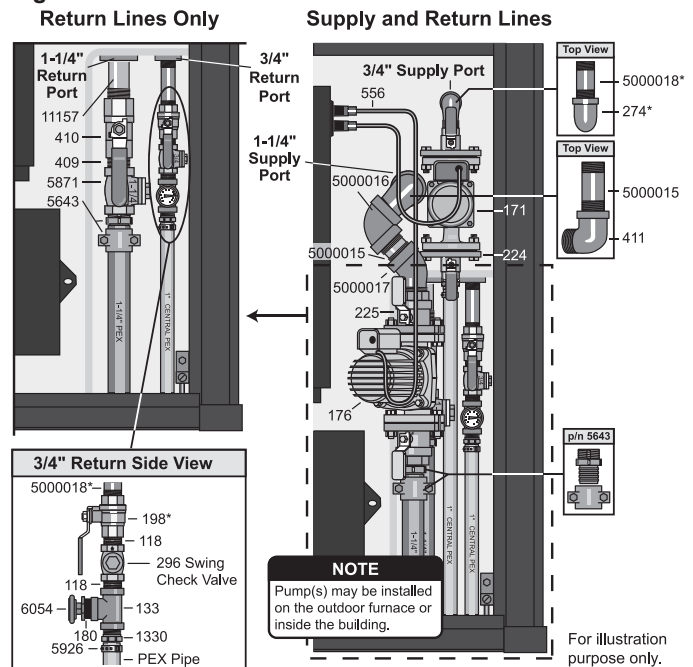
NOTE: Pump(s) may be installed on the outdoor furnace or inside the building.

NOTE: If a Taco 014 pump is used, the pump should be mounted at the base of the outdoor furnace and a 1-1/4" supply line to the pump should be used to ensure adequate supply feed to the pump. See the Hydronic Component Selection Guide (p/n 2482) for more detailed information.

NOTE: If the outdoor furnace is unable to maintain a water temperature of 150°F (66°C) or higher, inspect the thermostatic valve and replace if necessary.

NOTE: A properly-sized backup furnace or boiler should be configured to provide heat if the outdoor furnace is out of wood or the heat load exceeds the capacity of the outdoor furnace.

Fig. 23



2 - Pump Parts List**					
For combination 1-1/4" (1-1/4" PEX) and 3/4" (1" PEX) system.					
Qty	p/n	Description	Qty	p/n	Description
2	118	Close Nipple, 3/4"	2	556	Power Supply Cord, 32"
1	133	Tee NPT, 3/4"	2	1330	MPT to PEX, 3/4" x 1"
1	171	007 Pump	2	5643	MPT to PEX Adapter with Clamp, 1-1/4"
1	176	014 Pump	1	5871	Swing Check Valve, 1-1/4"
1	180	Bushing, 3/4" x 1/8"	2	5926	Stainless Steel Clamp Crimp Ring, 1"
1	198*	Ball Valve, 3/4"	1	6054	Temperature Gauge
1	224	Isolation Flange, 3/4"	1	6593	Grounding Rod Kit
1	225	Isolation Flange, 1-1/4"	1	11157	Nipple, 1-1/4" x 3"
1	274*	90° Street Elbow, 3/4"	2	5000015	Nipple, 1-1/4" x 2-1/2"
1	296	Swing Check Valve, 3/4"	1	5000016	90° Elbow, 1-1/4"
1	409	Close Nipple, 1-1/4"	1	5000017	45° Street Elbow, 1-1/4"
1	410	Ball Valve, 1-1/4"	2	5000018*	Nipple, 3/4" x 3"
1	411	90° Street Elbow, 1-1/4"			

* Supplied on furnace.
 ** Parts and accessories sold separately.
 Pump size may vary.

HYDRONIC INSTALLATIONS

NOTE: It is recommended that the circulation pump in all hydronic systems be located in the hot supply line, not in the return line (see Fig. 24 and 25).

Evaluate the existing hot water heating system before starting the installation. If the existing hot water heating system has been unable to maintain the temperatures in the home at any time during cold weather before installing the outdoor furnace, then the hot water heating system is not adequate. More baseboard or other type of heat exchanger must be added.

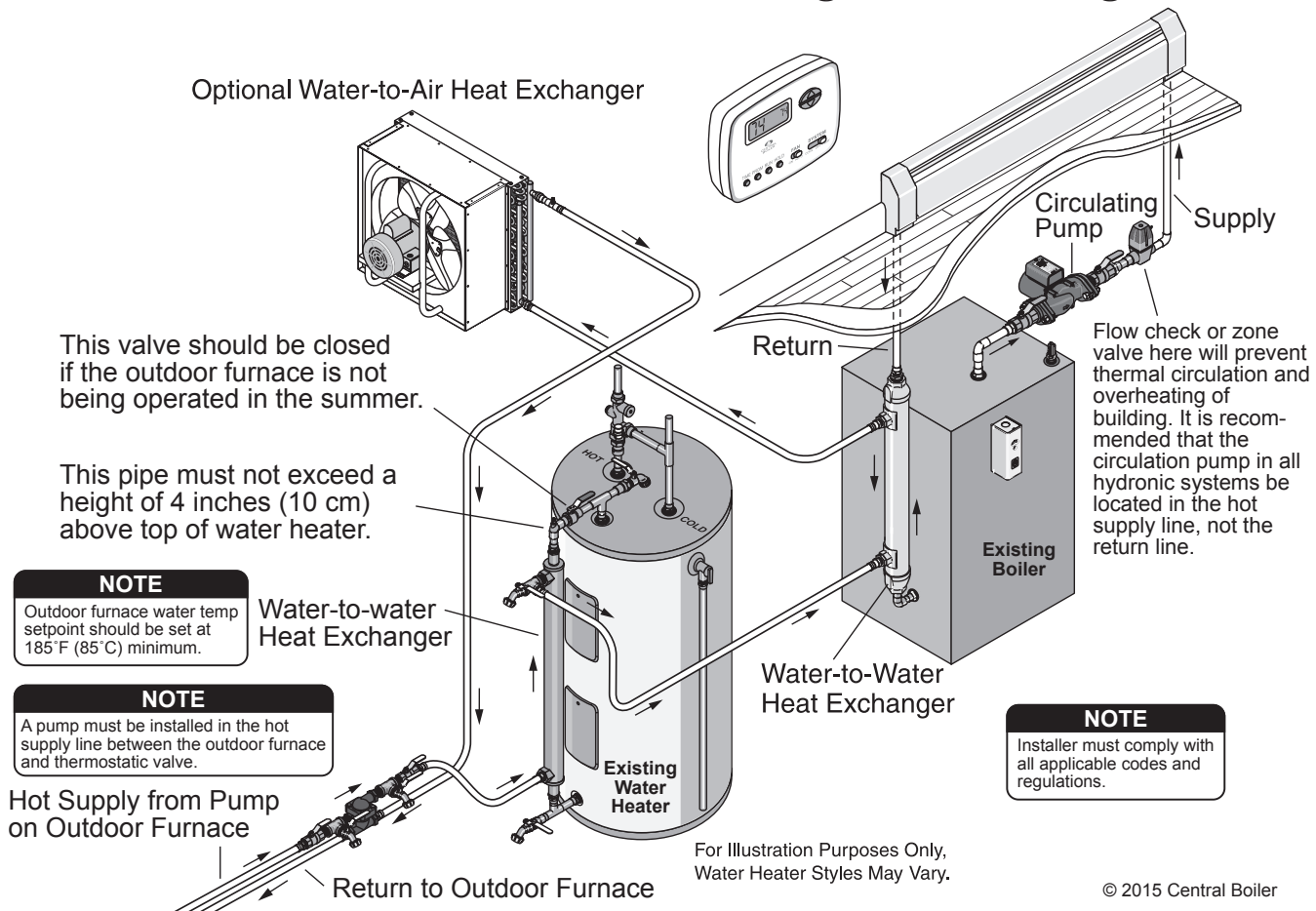
If a water-to-water heat exchanger is to be used with an existing heating system, the existing heating system must be able to adequately heat the building with a water temperature of approximately 165°F (74°C). Some existing finned tube baseboard hot water heating systems are designed to operate with water temperatures up to 220°F (104°C) or higher.

If the existing heating system is marginal or designed to operate with water temperatures above 165°F (74°C), there are alternative installation procedures that will make the existing system work very well with the outdoor furnace. These include:

1. Add more finned tube water baseboard heaters or panel radiators.
2. A water-to-air heat exchanger with a thermostatically controlled fan can be installed in the lower part of the building being heated (Fig. 24). This can increase the amount of heat added to the building, helping to maintain a constant temperature. This heat exchanger can be added in the return line of the system after the water-to-water heat exchanger.
3. An additional radiant heating circuit can be added to heat areas that require additional heat.

Fig. 24

Water-to-Water Shell & Tube Exchanger with Existing Boiler



Pressurized Boiler System Installations Water-to-Water Heat Transfer System

To keep the existing system pressurized, a plate exchanger or tube & shell water-to-water heat exchanger installed in the return line of the existing system may be used (see Fig. 25 and 26). 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 side of the heat exchanger continuously.

It may be necessary to lower the water temperature at which the burner in the existing boiler starts to a setting that prevents the burner in the existing boiler from cycling on when the outdoor furnace is heating the home. Another option is to install a thermostatically controlled interlock switch that prevents the burner in the existing boiler from operating when the water temperature in the outdoor furnace is above 150°F (66°C).

Water-to-water heat exchangers will produce transfer temperatures approximately 20°F (11°C) less than the outdoor furnace water temperature; therefore if the outdoor furnace water temperature is 185°F (85°C), it will produce approximately 165°F (74°C) of water temperature transfer. The temperature controller on the outdoor furnace may be adjusted to allow the outdoor furnace to reach water temperatures up to 195°F (91°C). Each system will vary in water temperature transfer depending upon the heat load of the existing heating system.

The addition of a wraparound pump with a water-to-water heat exchanger (see Fig. 25) may increase heat transfer by allowing circulation continuously through the existing boiler and heat exchanger. This will maintain the maximum temperature in the heat exchanger for heat transfer to the existing boiler. Note the water flows in opposite directions through the heat exchanger.

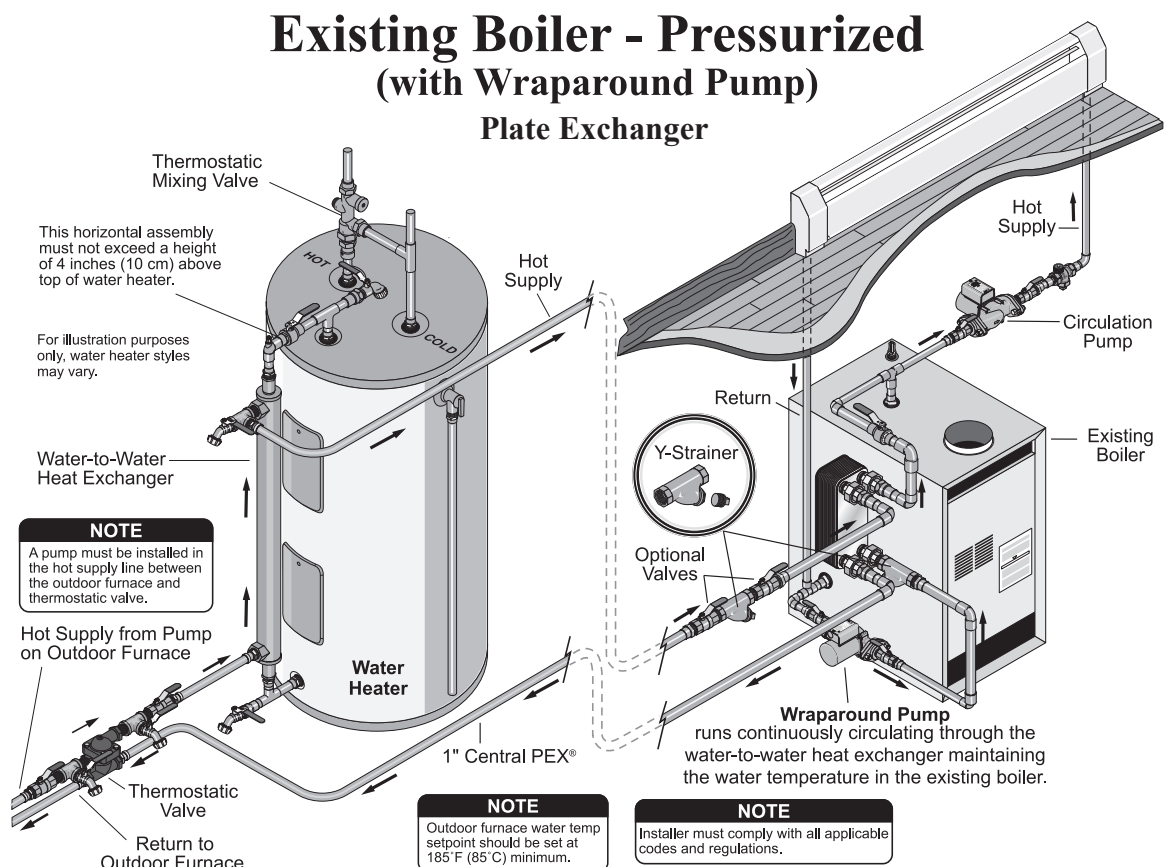
With this type of installation, the exchange temperature may be more than 165°F (74°C) and may eliminate the need for additional baseboard heaters, panel radiators or heat exchangers.

When installing water-to-water heat exchangers, be sure to flush any rust particles or sediments out of the existing boiler and install a Y-strainer as illustrated in Fig. 25. Also be sure to add Corrosion Inhibitor Plus™ (p/n 1650).

A Taco 007 pump can be used as a wraparound pump when a plate exchanger is installed. A Taco 009 pump should be used when a shell and tube heat exchanger (i.e., p/n 148, 151 or 177) is installed.

NOTE: See the Hydronic Component Selection Guide (p/n 2482) for more detailed information.

Fig. 25



Vented System Installation

The E-Classic Outdoor Wood Gasification Furnace may be connected directly into an existing hot water system, changing it to an atmospheric vented system.

NOTE: Any changes in the existing boiler and/or system should be done by a certified installer in accordance with applicable codes. Be sure the system water is properly maintained with Corrosion Inhibitor Plus™ (see Water Quality and Maintenance section).

The hot supply line from the outdoor furnace can be connected into the top of the existing boiler and returned to the outdoor furnace from the bottom of the boiler (see Fig. 26). Use one pump to continuously circulate the water from the outdoor furnace through the existing boiler and back to the outdoor furnace.

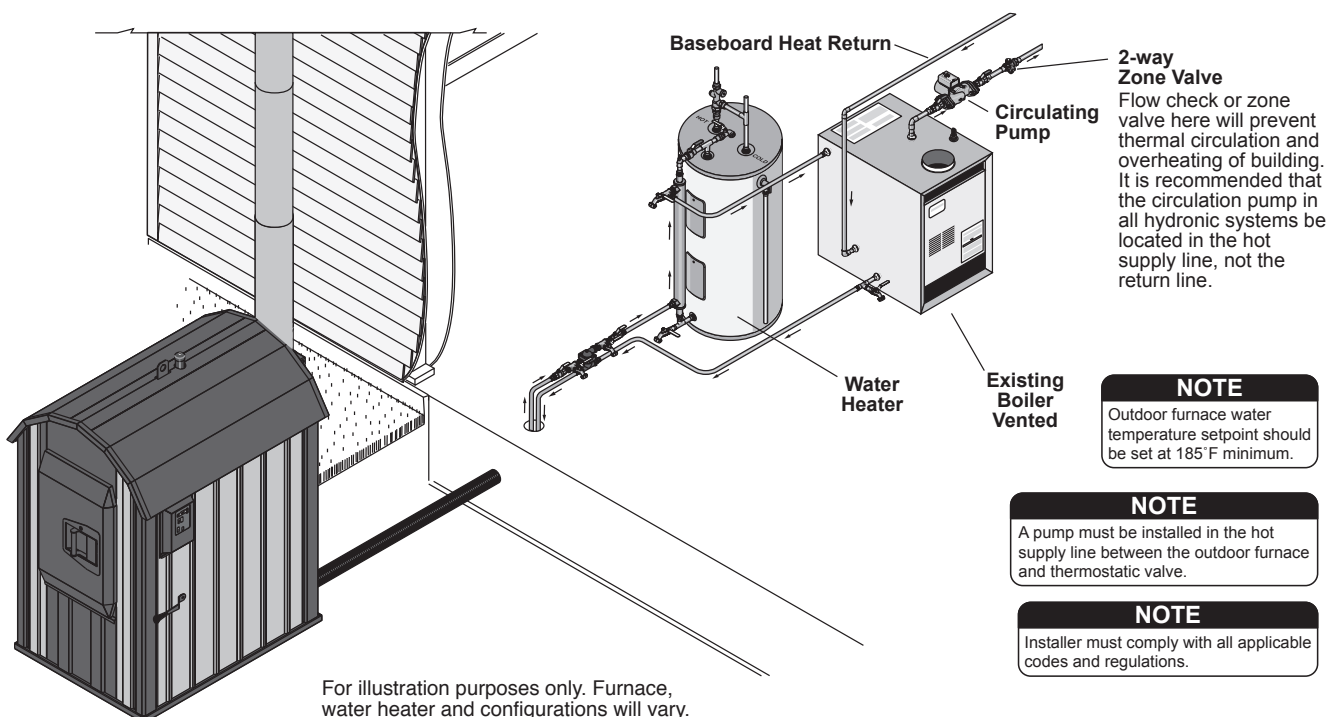
CAUTION

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

When the existing system is connected to the outdoor furnace 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). A flow check or zone valve will prevent thermal circulation and overheating of the building.

Fig. 26

Direct Circulation to Existing Boiler



For illustration purposes only. Furnace, water heater and configurations will vary.

It is very important to eliminate all air and water leaks (valve packings, bleeders, etc.) and purge all air from the existing system.

1. **After filling the outdoor furnace** (see 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.

CAUTION

Do not apply more pressure to the indoor system than the pressure relief valve on the existing boiler is rated for.

2. 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 tightly after the air bleeding is completed. This eliminates the possibility of allowing air to enter after the system is depressurized.
3. When the indoor system is completely purged of air, close the valve on the water line used to pressurize the indoor system. If any air is trapped in the system, it can reduce water flow. This will prevent the system from heating properly.
4. Open valves on the outdoor furnace, turn on the pump and proceed to start the fire in the outdoor furnace.

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 furnace.

Fig. 27 and 28 illustrate direct circulation baseboard installation examples.

Fig. 27

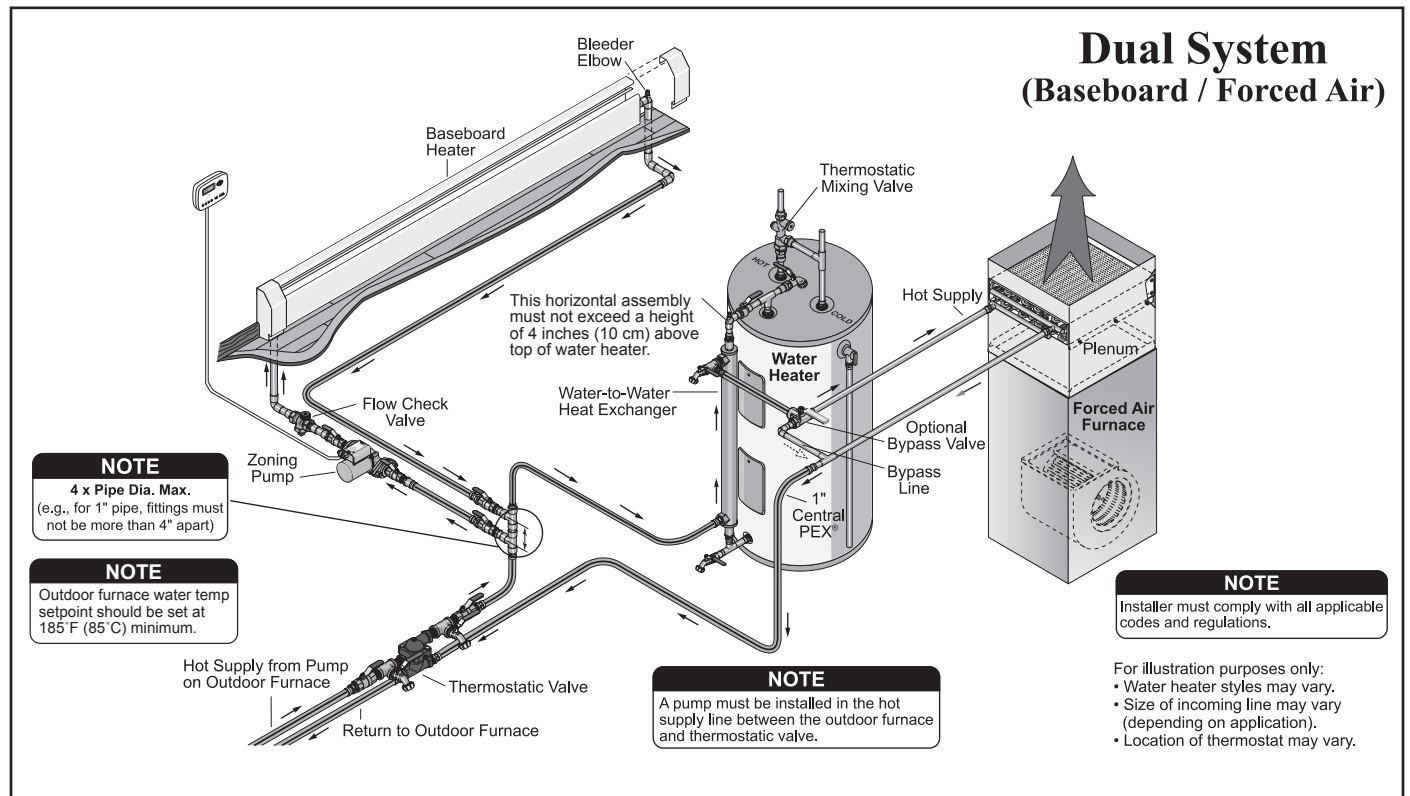
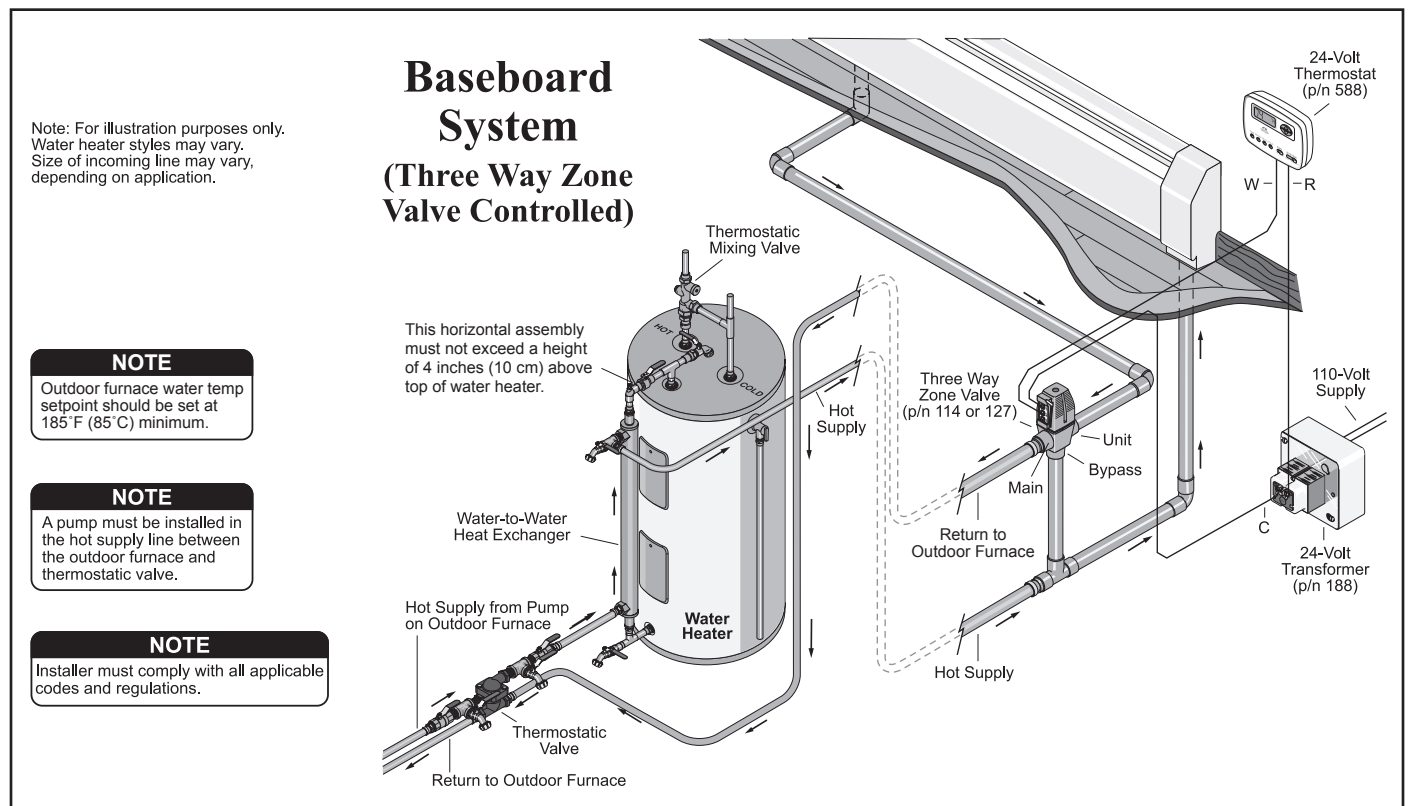


Fig. 28



Radiant Floor System Installations

Installing radiant floor heating is a very viable heating option when either remodeling or building new. Radiant floor heat can also be added to an existing home easily if the floor joists are exposed (as in an unfinished basement). Piping may be installed in a wide variety of configurations and locations including, but not limited to, the following:

- In a concrete slab
- Within the subfloor system (e.g., Gyp-Crete®)
- Within the floor joist system
- Within the walls or ceilings

When installing piping between floor joists (16" or 41 cm on center) run two 1/2" pipes between each joist. Insulate below the piping to prevent excessive heat in the lower level.

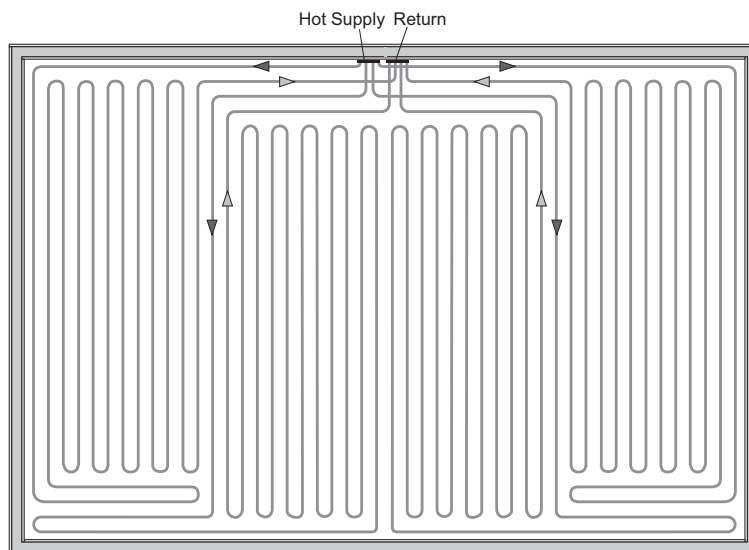
Proper insulation is key to effective radiant heating and controlling large heat demands. Heat from this type of system radiates equally in all directions. As an example, if piping is installed in a slab, the ground below the slab must be dry and well-insulated. If not properly insulated, nearly 50% of the heat will be wasted warming the ground below the slab. Two inches (5 cm) of blueboard insulation is recommended. Two 1" (2.5 cm) layers of blueboard can be used. This allows lapping of the joints in the 4' x 8' (122 x 244 cm) sheets.

NOTE: Do not use beadboard (expanded polystyrene), bubble foil or roll-out foam insulation.

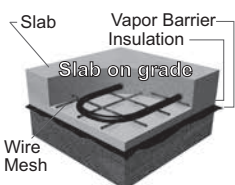
NOTE: A minimum of one inch (2.5 cm) of insulation should be used. Two inches (5 cm) of insulation and vapor barrier below the insulation is recommended.

Fig. 29

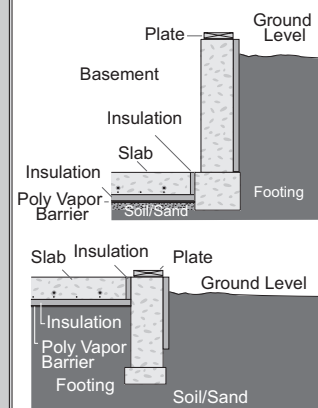
Radiant Floor Heat (For Slab on Grade or Basement)



NOTE: If the temperature of the concrete slab is below freezing (32°F), there must be adequate antifreeze in the system, or the slab must be pre-heated, before water is circulated through the radiant slab system.



2" Blueboard Styrofoam® is recommended (minimum of 1" Blueboard Styrofoam®).



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

For examples of radiant heating systems using 1/2" piping in the loops, refer to Fig. 29 through Fig. 32.

The spacing of each circuit is 12" (30.5 cm) between pipes. 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 hot supply water. In applications where high heat loss is expected, loop spacing may be reduced to 10" (25 cm) or less. If additional information is desired, contact your dealer.

NOTE: The longer the loop length, the lower the flow rate and the lower the heating capacity. Loop lengths greater than 350 feet (107 m) are not recommended.

NOTE: The temperature of the water used in radiant heating should be determined by the installer in accordance with the application.

NOTE: It is not uncommon that it can be very difficult to get a concrete slab up to temperature in late fall or early winter in a new building that is not completely sealed and not well insulated. Once the building is completely sealed and well insulated, bringing the slab up to temperature can still take a considerable amount of time and wood; however, once warm, wood consumption will be reduced if the concrete slab and building are insulated properly .

NOTE: For zone installations, refer to Fig. 30 (multi-zone) or Fig. 32 (single zone).

Fig. 30

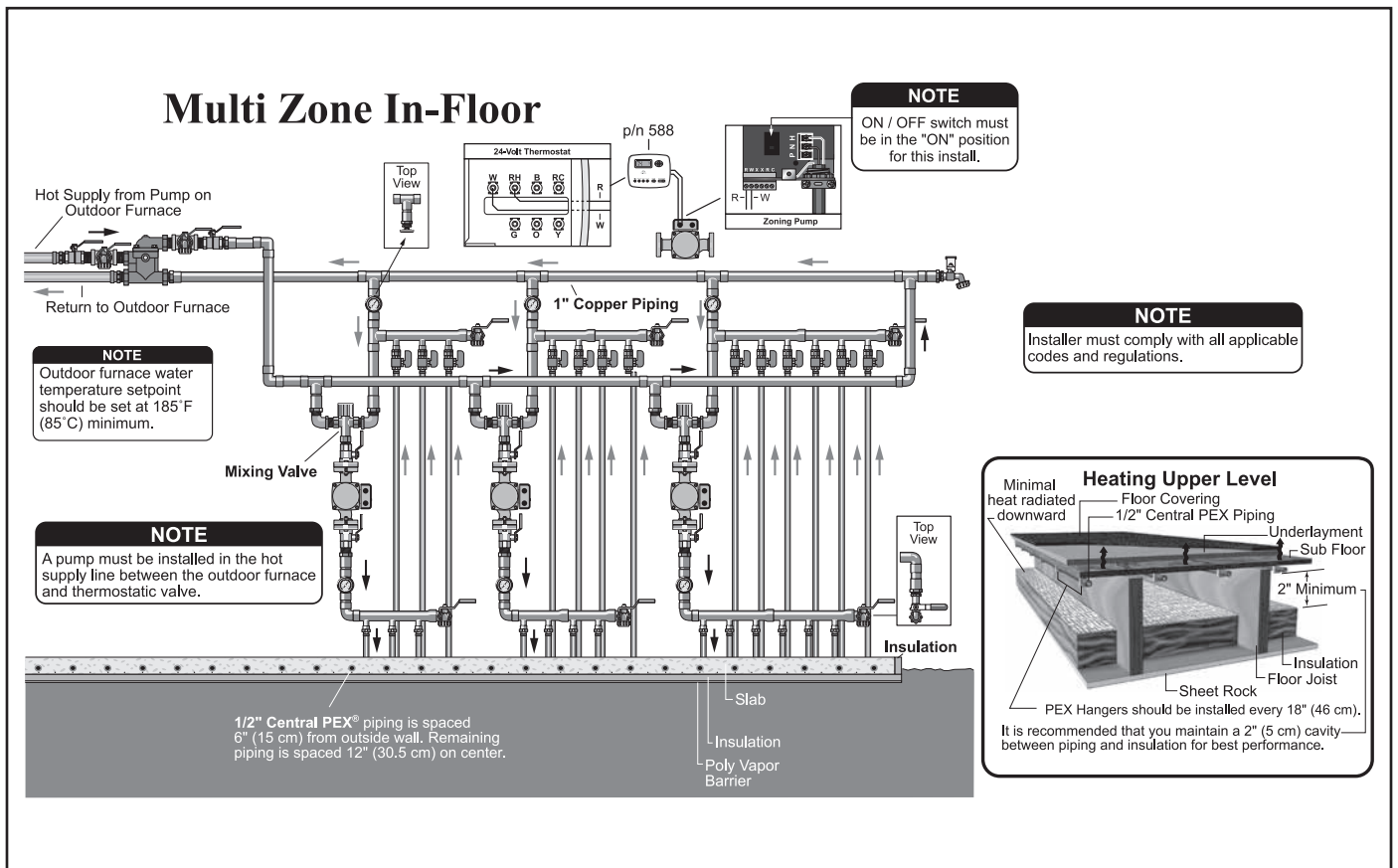


Fig. 31

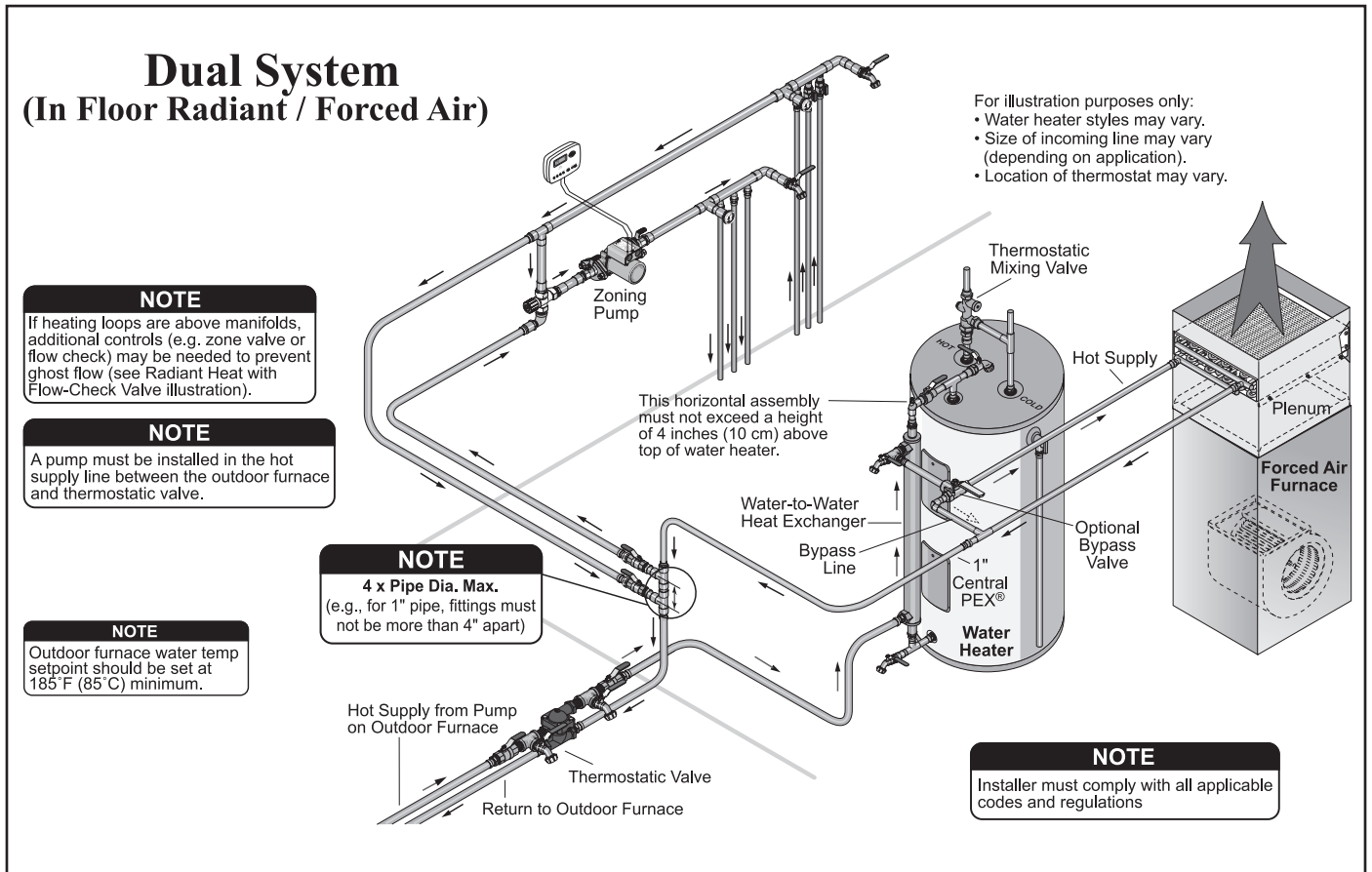


Fig. 32

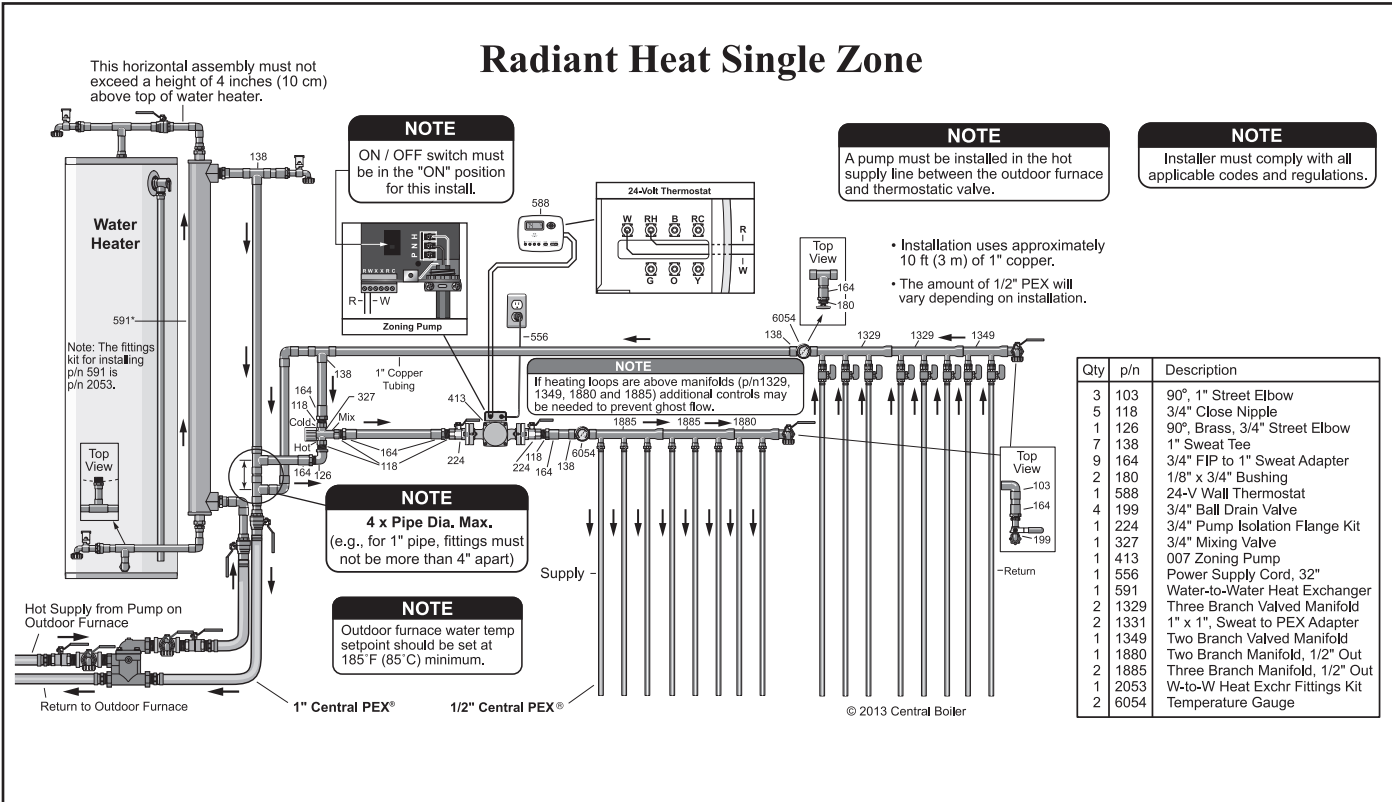
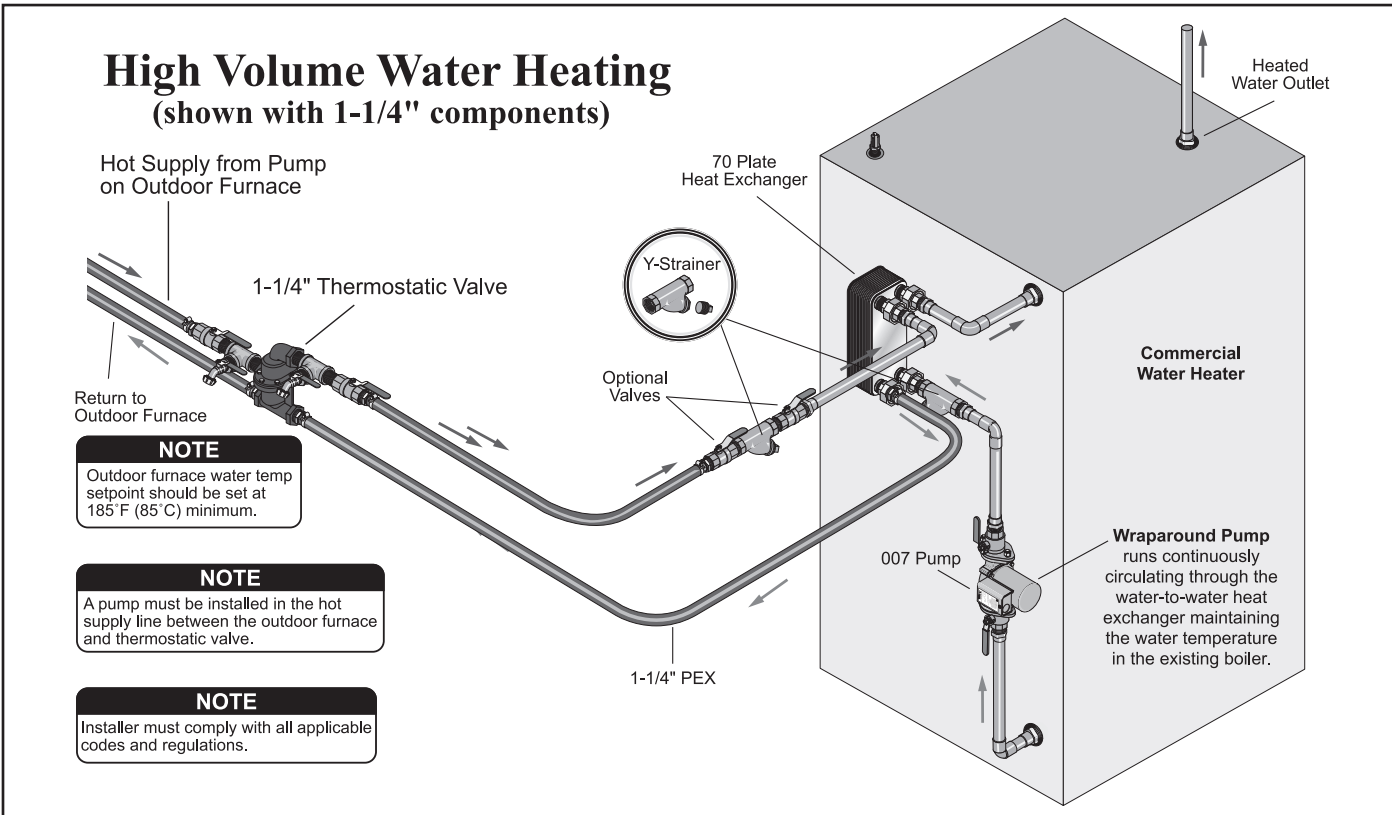


Fig. 33



Pool and/or Hot Tub Heating

Valves should be installed so the heat exchanger can be isolated and bypassed when shock-treating or adding chemicals to a pool or hot tub (Fig. 34). Incorrect chemical concentrations can cause rapid corrosion to the heat exchanger. Bypassing the heat exchanger is recommended until the pH has stabilized between 7.2 and 7.8.

If the swimming pool or hot tub is salt water treated, the heat exchanger should be a shell and tube type (p/n 148, 151 or 177). See the Hydronic Component Selection Guide (p/n 2482) for more detailed information.

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.

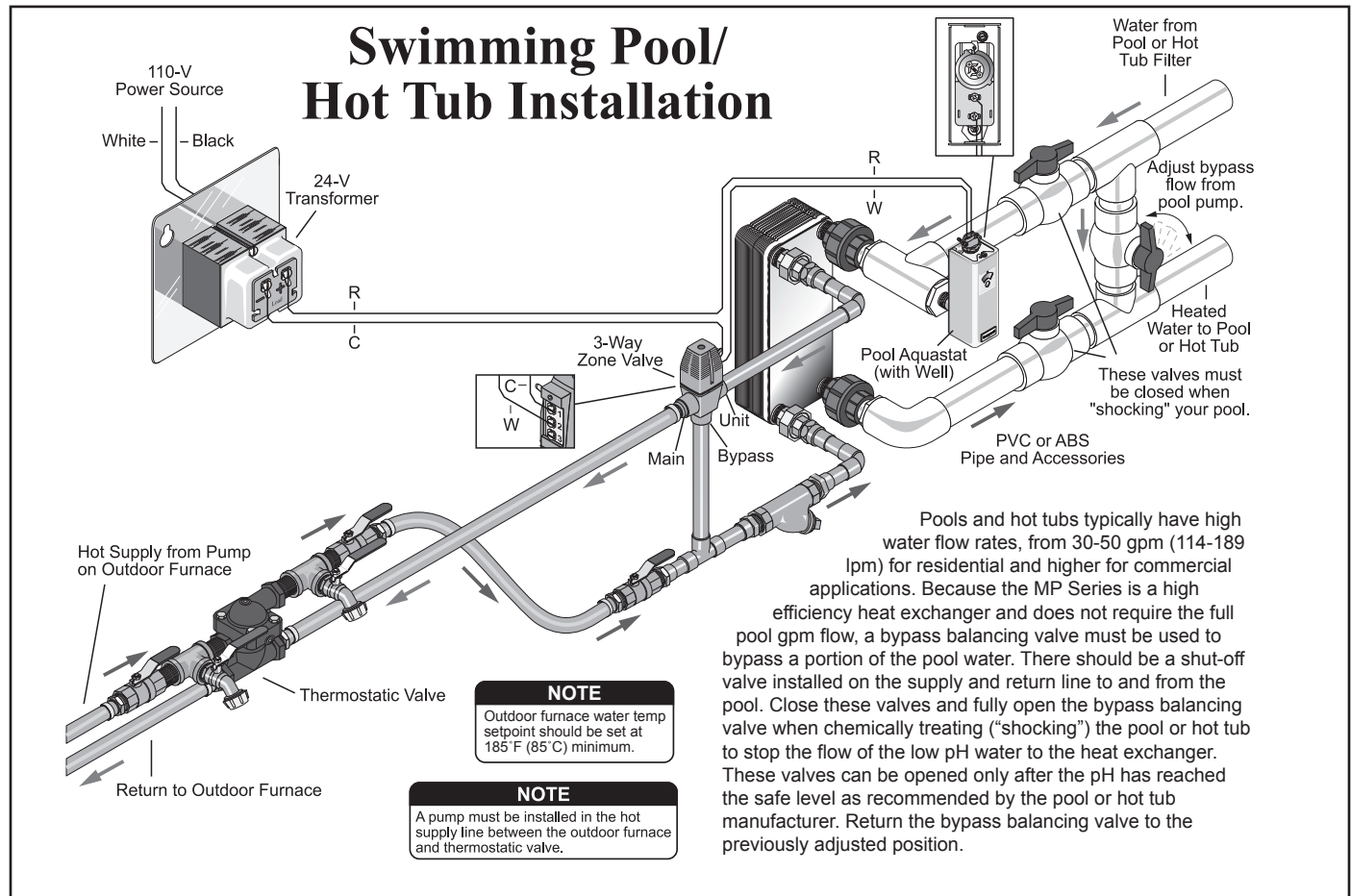
WARNING

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

CAUTION

Do not operate the outdoor furnace frequently or for extended periods of time with the water temperature below 150°F (65°C) as this will result in more condensation in the firebox that can lead to corrosion.

Fig. 34



FILLING OUTDOOR FURNACE WITH WATER AND PURGING AIR

NOTE: The items referred to in this procedure correspond to the items in Fig. 35. Refer to Fig. 35 when performing these steps.

All air must be purged from the water lines when filling the system. Also, the circulation pump(s) must be installed in the hot supply line(s).

NOTE: If using the valve on the water heater to fill the outdoor furnace, flush the water heater to remove all sediment before filling the outdoor furnace.

NOTE: If the outdoor furnace is being filled with water when the temperature is below freezing, circulate the water immediately after filling to prevent freezing the water lines.

NOTE: Be sure to fill the outdoor furnace with water of good quality (softened water, if possible). See Water Quality and Maintenance section.

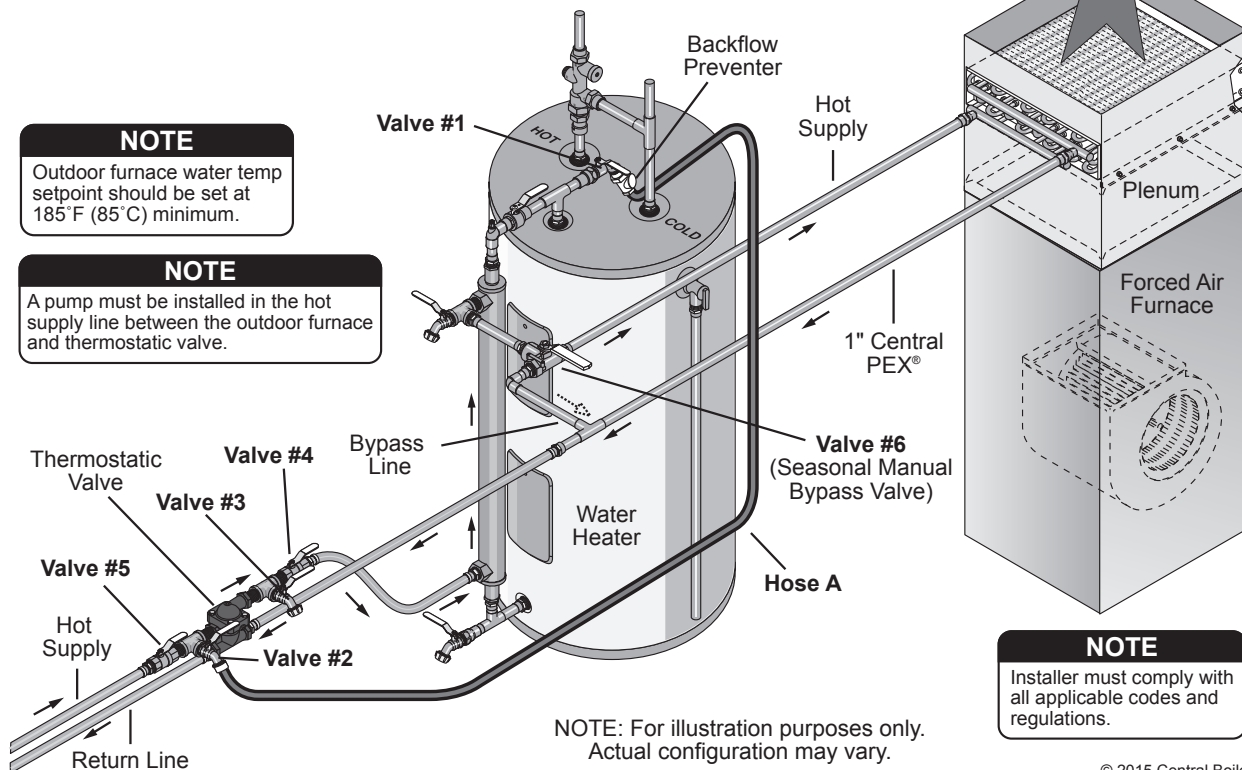
Use the procedure in this section to fill the outdoor furnace with water and purge the air from the system. All valves in the outdoor furnace system that allow circulation through each circuit should be open before starting. Perform this procedure on each pump circuit from the outdoor furnace.

NOTE: Add Corrosion Inhibitor Plus™ (p/n 1650) through the 2-inch vent pipe on the outdoor furnace before filling with water to immediately begin to protect the steel.

1. Connect the male end of garden hose A to valve #1 using the backflow preventer and two 3/4" female hose x 3/4" male pipe adapters (p/n 4928). Connect the female end of the garden hose to valve #2.
2. Close the valves on the hot supply and return lines of the outdoor furnace.
3. Close valve #4 and valve #5.
4. Open valve #1 and valve #2. This step begins filling the system with domestic water and purging the hot supply line and thermostatic valve.
5. Remove cap from valve #3 and open valve #3 slightly to purge air from valve body. Close valve #3 when air is purged.
6. Open valve #5.
7. Open the valve on the hot supply line of the outdoor furnace for 5 minutes; then close the valve. Water will purge air from the hot supply line. The valve and attached fittings on the outdoor furnace will become cold as water starts filling into outdoor furnace.

Fig. 35

Filling Outdoor Furnace and Purging Air Using Pressurized Domestic Water



8. Close valve #5, #1 and #2.
9. Move hose A from valve #2 to valve #3.
10. Open valves #1, #3 and #4.

NOTE: Skip to Step 12 if your system does not have a seasonal manual bypass valve (valve #6 shown in Fig. 35).

11. Valve #6 (seasonal manual bypass valve) should be positioned to direct water through the heat exchanger first.
12. Open the valve on the return line of the outdoor furnace.

NOTE: Skip to Step 14 if your system does not have a seasonal manual bypass valve (valve #6 shown in Fig. 35).

13. As soon as the valve on the return line of the outdoor furnace is opened, turn valve #6 to the bypass direction for 30 seconds; then turn valve #6 back to previous position.

NOTE: The heat exchanger manifold (lower manifold first) and fittings will become cold as water flows through the heat exchanger to the outdoor furnace.

14. Allow outdoor furnace to fill until the water reaches the full mark.
15. Close valves #1 and #3. Disconnect hose A and replace caps on valves #1, #2 and #3.
16. Open the valve on the hot supply line of the outdoor furnace and valve #5.

NOTE: The valves on the hot supply and return lines of the outdoor furnace, and valves #4 and #5 should all be open, allowing the pump to circulate heated water in the system. Start pump.

NOTE: If there are multiple circuits connected to the outdoor furnace, repeat the process for each circuit.

17. Refer to Firing the Outdoor Furnace to fire up the outdoor furnace.

CAUTION

Be sure the outdoor furnace is filled with water before firing. Never fire the outdoor furnace when the water level is more than 1" (2.5 cm) below the FULL mark on the sight gauge.

NOTE: The sight gauge valve should always be closed except when checking water level. Water will automatically drain from the sight gauge tube. Remember that this type of valve requires only 1/4 turn to open or close.

18. Check the system for leaks again. Inspect all fittings and hose ends for any signs of leakage; repair as necessary. It may be possible to stop a very slow leak at a hose clamp by tightening the clamp after the system has warmed up and the poly becomes more pliable. It might also be necessary to install a second hose clamp with the screw positioned on the opposite side. Release the pressure upon completion of the test.

NOTE: It should not be necessary to add water to the outdoor furnace more frequently than once every twelve months. If it is more frequent, either there is a leak in the system or the outdoor furnace is boiling because of improper operation or maintenance (see Troubleshooting Section). Be sure to locate and repair the problem immediately. Frequently adding water can cause deterioration in the water jacket. Each time water is added, refer to Water Quality and Maintenance for water testing procedures. If indicated by test results, add Corrosion Inhibitor Plus™ as required. Deterioration due to improper operation and/or maintenance is not covered by warranty.

SECTION 2 – OPERATING INSTRUCTIONS

Wood Selection and Preparation

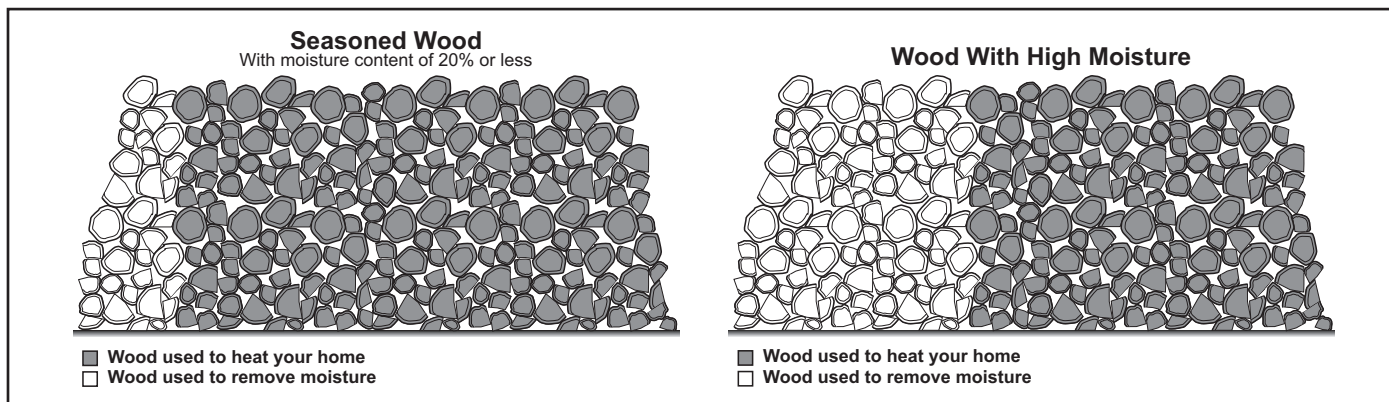
For the best results, it is best to burn seasoned split wood. However, it may be possible to burn some unsplit wood with the split wood depending on quality, size, moisture content and wood type. Properly seasoned wood has a moisture content of 20% or less. It is darker, has cracks in the end grain, and sounds hollow when smacked against another piece of wood. Most wood needs to be split to dry down to 20% within a year. Wood between 4" and 8" (10 and 20 cm) in diameter works well in most cases. Pieces of wood that are too large can reduce output capacity because they burn slower.

- Seasoned wood burns more efficiently, minimizes the amount of creosote formation, reduces emissions and extends the life of the outdoor furnace.
- Maintain a quantity of smaller, drier pieces of wood for relighting the fire and for other situations when larger pieces of wood don't work as well.
- The larger the heat load on the outdoor furnace, the drier the wood needs to be in order to maintain an adequate glowing coal bed.

Following are some reasons that green, unseasoned wood should not be used:

- Green wood contains about 50% moisture by weight. Energy is required to heat the wood and evaporate the moisture - energy which could have been used to provide heat for the home. The illustration below shows that burning drier, seasoned wood provides more energy for heating your home compared with burning green, unseasoned wood that uses more energy to evaporate the moisture and provides less energy for heating your home.
- Unseasoned wood provides less heat, resulting in more condensates (moisture) in the firebox and increased wood consumption.
- Increased moisture in the firebox can result in corrosion.

Fig. 36



- Unseasoned wood causes reduced performance, lower combustion rates and lower heat output.
- The full heating potential is unlikely to be achieved with unseasoned wood.
- Burning wood with an excessively high moisture content increases maintenance requirements and can lower the service life of the outdoor furnace.
- The higher the moisture content of the wood being burned, the harder it is to maintain a glowing coal bed because it burns more slowly.

NOTE: Do not store wood within the outdoor furnace installation clearances or within the spaces required for fueling, ash removal and other routine maintenance operations.

FIRESTAR CONTROLLER

Refer to the FireStar II Operator's Manual for information about the controller.

Operating the E-Classic for Maximum Efficiency and Performance

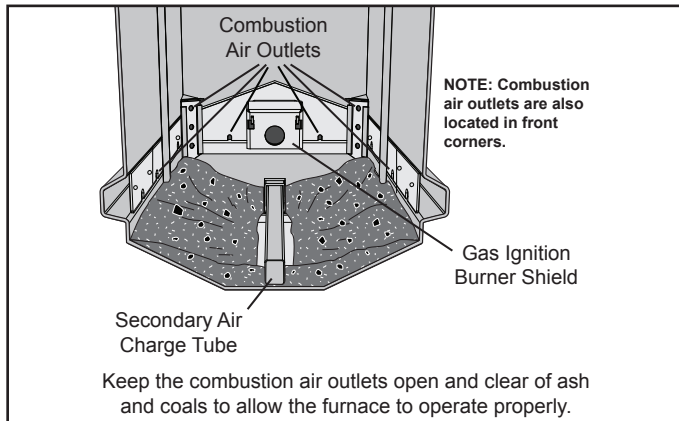
Because of its highly efficient and clean-burning design, the E-Classic operates differently than other types of wood-burning devices. Understanding a few basic principles will help you operate the E-Classic as it was designed, maximizing its performance, heat transfer and longevity.

NOTE: For proper operation, the fuel must match the heat load, the furnace must be maintained to ensure proper air flow, and the water temperature must be kept above 150°F (66°C).

1. The combustion air fan pressurizes the airbox located at the back of the outdoor furnace. Primary air flow, regulated by a solenoid, flows into the firebox through combustion air outlets located on the front, sides and the back, near the bottom. Secondary air is regulated by solenoids that allow air flow to the secondary air charge tube. Combustion starts in the firebox near the bottom of the wood load.

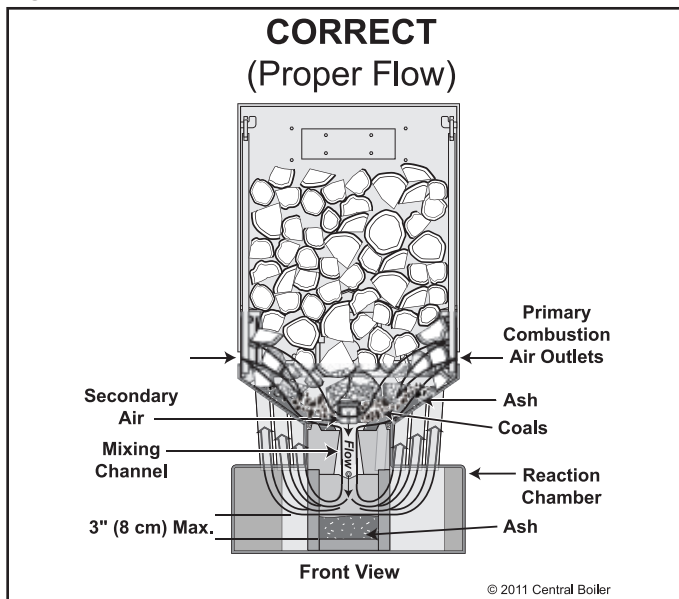
NOTE: The combustion air outlets must be visible (i.e., ash must be kept below the combustion air outlets as shown in Fig. 39).

Fig. 37



- Gasified fuel exits the bottom of the firebox alongside and under the secondary air charge tube, through the mixing channel and down to the Reaction Chamber™. Final combustion occurs in the Reaction Chamber where extremely high temperatures aid in complete combustion. The chimney creates a draft (negative pressure) which helps to draw exhaust gases from the furnace.
- Heat is transferred to the water from the hot gases as they move through the firebox, the Reaction Chamber and the Xtract™ heat exchanger.

Fig. 38



NOTE: Fig. 38 shows the E-Classic 1450 operating correctly with proper combustion air flow and with the wood properly loaded.

NOTE: A key point to remember about the operation of the E-Classic 1450 is that as wood burns, the combustion gases flow down through the bottom of the firebox so the proper flow must be maintained as shown in Fig. 38.

NOTE: Refer to the General Troubleshooting Information for more information on outdoor furnace operation and for conditions to avoid.

Importance of Properly Seasoned Wood

Burning properly seasoned wood (less than 20% moisture content) will minimize wood usage and maximize the efficiency and performance of the E-Classic (see Wood Selection and Preparation in the Introduction).

In order for wood to burn, the moisture in the wood must first be evaporated (boiled off). The more moisture there is in the wood, the more energy it will consume to dry it and the less energy will be available for heating the water.

As shown in Fig. 39, the higher the moisture in the wood, the larger the area in the firebox that is used for drying and the smaller the area used for burning. This results in lower efficiency and lower heat output.

The lower the moisture in the wood, the smaller the area in the firebox that is used for drying and the larger the area used for burning. This results in higher efficiency and higher heat output.

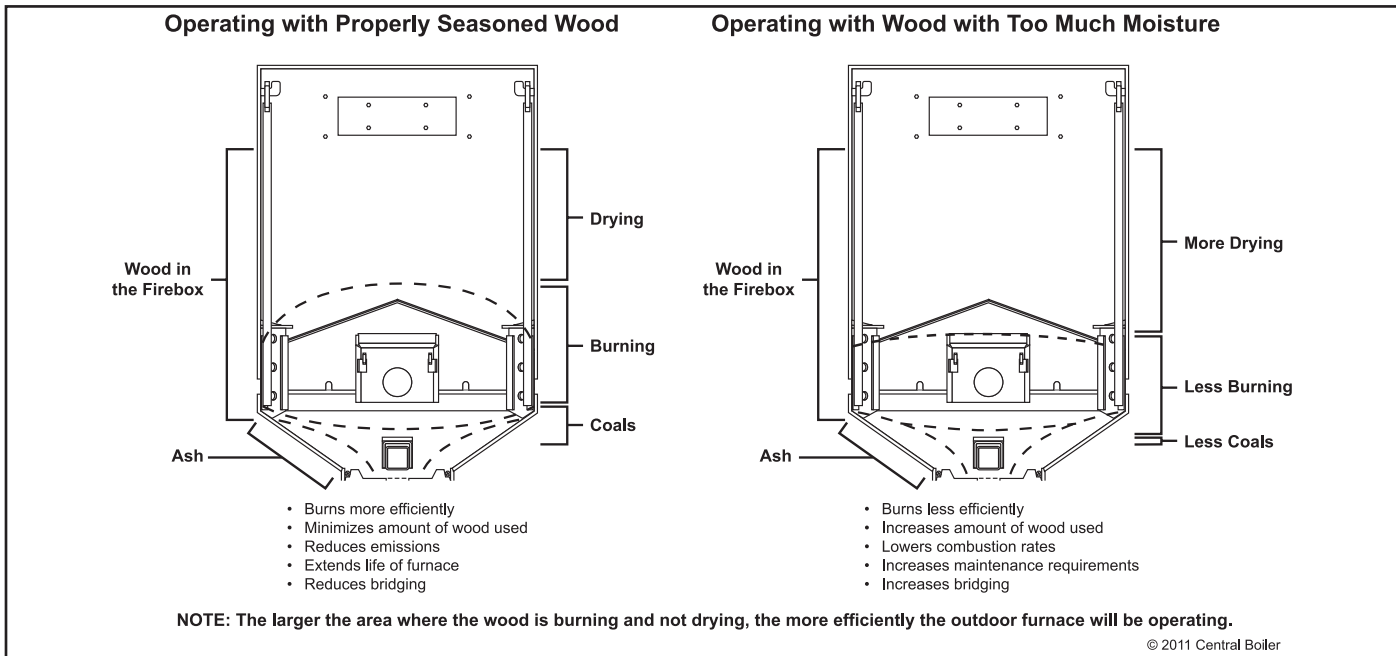
Air Flow and Maintaining the Coal Bed

Each time the firebox is loaded with wood, make sure that air flow through the combustion system is not blocked or restricted. Maintain 1-3 inches (2.5 cm to 7.5 cm) of loose, glowing coals alongside the charge tube to optimize the operation of the outdoor furnace. If the coal bed is too deep, it will restrict air flow and limit the amount of heat output. If there is no coal bed, or if the coal bed is too shallow, it will reduce the potential heat output, and can reduce efficiency.

Generally, the coal bed depth will increase if smaller dry wood is loaded at more frequent intervals. If too large pieces of wood and/or wood with too high moisture content are used, the coal bed is likely to be depleted, resulting in reduced heat output and efficiency.

Some ash in the bottom of the firebox (but not alongside the charge tube) is necessary for the proper operation of the outdoor furnace. Ash acts as an insulator, keeping the glowing coals in the bottom of the firebox hot enough to restart the fire when needed after being in idle mode.

Fig. 39



Ash Removal Frequency

During the first week of operation, check the level of ash in the Reaction Chamber every two days. Ash needs to be removed from the Reaction Chamber before it obstructs the combustion air flow for efficient operation. Clean the Reaction Chamber before it becomes 1/3 full of ash (approximately 3" or 7.5 cm deep in any area of the Reaction Chamber).

If there are significant changes in the heat load because of colder weather and more wood is burned each day, ash will need to be removed from the Reaction Chamber more often. Using different types of wood can also affect the frequency with which ash will need to be removed.

COLD START FIRING

NOTE: These procedures apply to initial firing or refueling the outdoor furnace from a cold start (water temperature below 100°F or 38°C) and/or no charcoal base left in the firebox).

It's been said that lighting a fire can be more of an art than a science. You may need to vary techniques to achieve best results. Many factors can have a significant effect such as size of wood, moisture content, wood storage, etc.

Over time, you will become familiar with your particular conditions. This will allow you to identify cause and effect in a variety of circumstances and what works best for your conditions.

CAUTION


Do not burn plastic, garbage, treated wood or fuels not listed for this outdoor furnace.

CAUTION

If the water in the outdoor furnace boils, be sure to check the water level and restore to full. Add Corrosion Inhibitor Plus™ (p/n 1650) as needed (see Water Quality and Maintenance).

NOTE: Before firing the outdoor furnace for the first time, make sure the proper amount of Corrosion Inhibitor Plus™ has been added and the water level is 1" below the full mark on the sight gauge.

Cold Start Firing

1. Disconnect the heat load draw by turning off the pump(s).
2. Turn the controller on by pressing the **Power**  button.
3. Lift and push the bypass door handle toward the back of the outdoor furnace to open the bypass door. Wait for 15 seconds; then unlatch and open the firebox door.

NOTE: The alarm is a reminder that the bypass door is open. During a cold start, it will continue to sound.

WARNING

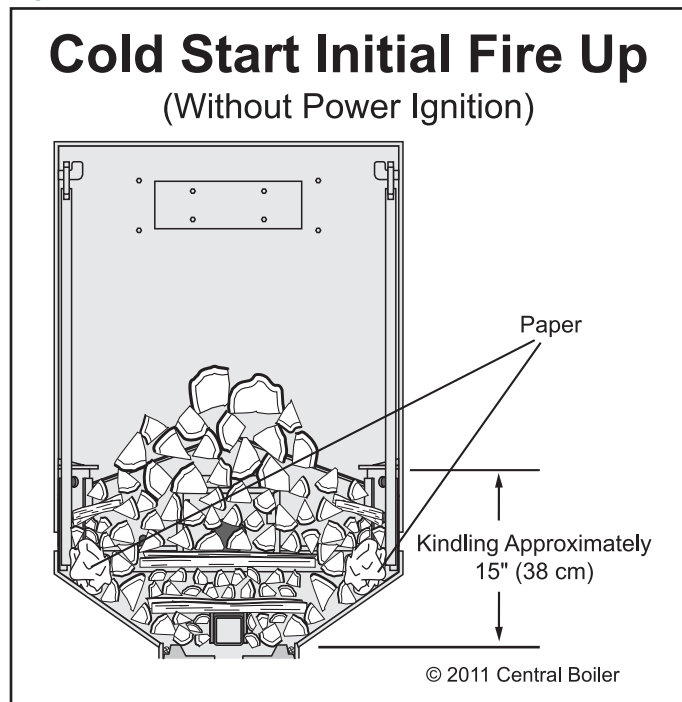
When opening the firebox door, the door switch will shut off the primary air supply solenoid and prevent the gas-fired wood ignition burner from operating while the firebox door is open. Do NOT disable the door switch.

- The first time you fire the outdoor furnace, add very dry kindling to fill the firebox to a level approximately 15 inches (38 cm) from the bottom of the firebox. Smaller kindling is preferred. It should be staggered and able to ignite and burn quickly for the initial fire.
- To get the cleanest start-up, the kindling must first start to burn at the bottom and as close to center as possible. Place paper around the firebox with very small pieces of kindling on top (see Fig. 41). Light the paper and kindling. Once the paper and kindling are lit, close and latch the firebox door. Do not close the bypass door.

CAUTION

Do not leave the firebox door open while the fire is burning. Damage to the door seal and paint on the front of the outdoor furnace will result and it could cause a dangerous build-up of gas in the firebox.

Fig. 40



- Allow the wood load to burn with the bypass door open until the kindling turns to coals; then add enough kindling again to fill the firebox about 1/4 full. On top of the kindling, add 8-10 inches (20-25 cm) of dry, seasoned split wood. Close and latch the firebox door.
- Wait for 15 seconds; then slowly pull the bypass door handle toward the front of the outdoor furnace and push down to close the bypass door.
- After the water temperature is above 150°F (66°C), proceed to Adding Heat Load.

Cold Start Firing with Power Ignition

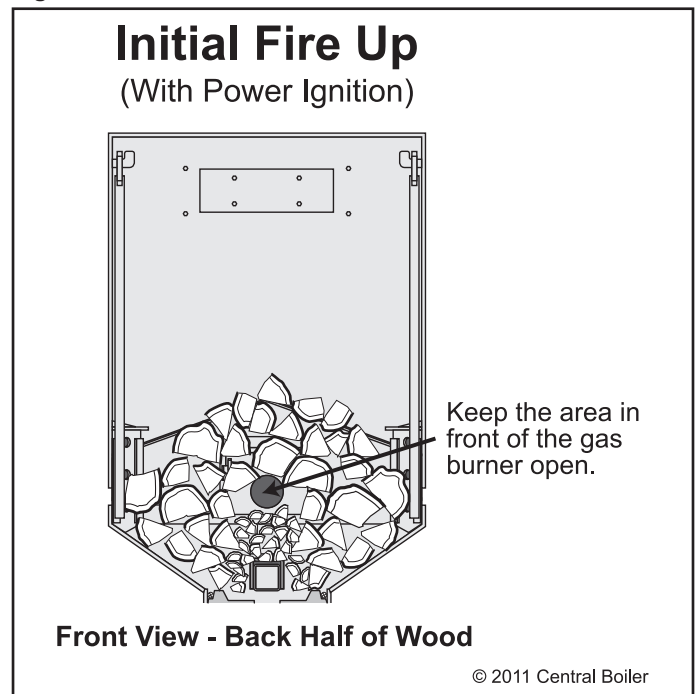
- Disconnect the heat load draw by turning off the pump(s).
- Turn the controller on by pressing the **Power** button.
- Lift and push the bypass door handle toward the back of the outdoor furnace to open the bypass door. Wait for 15 seconds; then unlatch and open the firebox door.

WARNING

When opening the firebox door, the door switch will shut off the primary air supply solenoid and prevent the gas-fired wood ignition burner from operating while the firebox door is open. The fan will continue to run. Do NOT disable the door switch.

- The kindling in the initial load should be arranged to provide an air space through the wood pile where the flame will occur once the gas-fired wood ignition is activated (see Fig. 41).

Fig. 41



- Close and latch the firebox door. Do not close the bypass door.

NOTE: The alarm is a reminder that the bypass door is open. During a cold start, it will continue to sound.

- Press the **Wood Ignition** button to initiate gas assisted wood ignition (for more information, see section How the Wood Ignition Works). The Wood Ignition light bar will indicate the amount of time remaining for the gas ignition burner to operate.

7. If desired, press the Wood Ignition ▲ and ▼ button to increase or decrease the amount of time the gas ignition burner operates. For split wood that has been seasoned 6 months or more, 5 to 8 minutes may be adequate.
8. After the wood ignition timer reaches zero, the controller will cycle between Low Burn, High Burn and idle to maintain the system water temperature.
9. Allow the wood load to burn with the bypass door open until the kindling turns to coals; then add enough kindling again to fill the firebox about 1/4 full. On top of the kindling, add 8-10 inches (20-25 cm) of dry, seasoned split wood. Close and latch the firebox door.
10. Wait for 15 seconds; then slowly pull the bypass door handle toward the front of the outdoor furnace and push down to close the bypass door.

NOTE: If using Wood Ignition doesn't light the wood (e.g., if the moisture content of the wood is too high), it may be necessary to press the Wood Ignition ● button again after the wood ignition timer reaches zero.

ADDING HEAT LOAD

CAUTION

Open the bypass door 15 seconds before opening the firebox door and close the bypass door 15 seconds after closing the firebox door. Do not leave the bypass door open during operation. Leaving the bypass door open during operation may cause damage to components of the outdoor furnace and may cause creosote buildup that can prevent the bypass door from sealing properly.

NOTE: During initial start-up, a considerable amount of moisture from condensation will collect inside the firebox and heat exchanger and may drip out of the Reaction Chamber door. This is normal and the moisture will evaporate after the first couple of fuel loads.

1. With no heat load draw in the system, monitor the operation of the outdoor furnace until the water temperature reaches the water temperature setpoint.
2. Turn on the pump(s); then start a heat load draw in the system by turning up the thermostat in the house. Monitor the outdoor furnace for one hour or until another cycle occurs (i.e., outdoor furnace goes from combustion to idle mode). If the water temperature drops and does not recover to the water temperature setpoint within one hour of starting the heat load draw, the heat load draw should be shut off, allowing the furnace to cycle to the idle mode again.

NOTE: The outdoor furnace will not operate satisfactorily if the heat load is higher than the output capacity of the outdoor furnace.

3. At this point, there should be glowing coals established in the bottom of the firebox. The firebox can be filled with dry, seasoned split wood.

LOAD WOOD TO REDUCE CONDENSATION

For the best results, it is best to burn seasoned split wood with a moisture content of 20% or less. Burning wood with a high moisture content increases maintenance requirements and can lower the service life of the outdoor furnace.

To reduce condensation and creosote formation and to increase efficiency, the recommendation is to load the outdoor furnace with only enough wood to maintain the fire for your heat load requirements for 12 hours. There should be enough wood left at the end of 12 hours to re-ignite the fire.

Adding more wood than is needed between fills causes increased condensation in the firebox. Condensation reduces efficiency and increases the amount of combustion by-products like creosote. Air flow can also be restricted because too much wood in the firebox will create excessive coals or too deep of a coal bed.

CAUTION

Do not burn wood with an excessively high moisture content and/or operate the outdoor furnace frequently or for extended periods of time with the water temperature below 150°F as this will result in more condensation in the firebox that can lead to excessive corrosion.

NOTE: Operating at temperatures of 170°F or more will decrease condensation in the firebox. As a result, the outdoor furnace will operate with a greater efficiency and require less maintenance. Failure to follow proper operating instructions may result in furnace damage.

NOTE: To reduce flare-ups when opening the firebox door to reload with wood, it is best to wait 15 minutes or more after a burn cycle has completed.

CAUTION

To reduce condensation, DO NOT overload the firebox with wood.

1. Slowly lift and push the bypass door handle toward the back of the outdoor furnace to open the bypass door; then wait for about 15 seconds.

NOTE: The alarm is a reminder that the bypass door is open.

WARNING

Keep your face away and stay as far away as possible from the firebox door area when opening the door.

2. Unlatch the firebox door; then stay as far away as possible as the firebox door is opened because smoke and hot gases escaping through the firebox door opening could ignite. From a safe distance, observe the fuel load.

WARNING

Use extreme care when adding wood when wood or coals are already present. Very hot gases may be coming out of the firebox door opening.

3. Using Fig. 42 as a reference, push the cleaning rod back and forth through the ash, coals and remaining wood in the bottom of the firebox to loosen it up, including a pass on each side of the air charge tube.

NOTE: Neglecting to push the cleaning rod through the ash and coals as described in Step 3 each time before wood is loaded can cause the ash bed to deepen and become compacted. This can result in poor heat output and combustion because of restricted airflow. Compacted ash will not fall into the Reaction Chamber; it will need to be removed with a shovel.

4. Some ash in the bottom and the angled sides of the bottom of the firebox (but not alongside the charge tube) is necessary for the proper operation of the outdoor furnace. Ash acts as an insulator, keeping the glowing coals in the bottom of the firebox hot enough to restart the fire. When using the cleaning rod, some of the ash will fall into the Reaction Chamber and some ash with coals will remain. The coals remaining around the mixing channel (the area alongside the secondary air charge tube) will create a clean, efficient burn.
5. The combustion air outlets must be kept open and clear of ash and coals to allow the furnace to operate properly. If needed, remove enough ash to keep the combustion air outlets free of obstruction.

WARNING

When adding wood to the firebox, be careful not to get pinched between the wood and the door frame or any part of the outdoor furnace. Use extreme care with large pieces of wood that may be difficult to handle.

6. Each time wood is loaded, visually check the condition of the coal bed and ash content and, if needed, use the cleaning rod to make sure the system is not plugged. Inspect the firebox for crusty deposits on the walls and in the corners and use a Wonder Bar or similar type of tool to scrape and remove.
7. Use the hoe to scrape the inside front corners of the firebox, down each side and across the top, as shown in Fig. 43.

Fig. 42

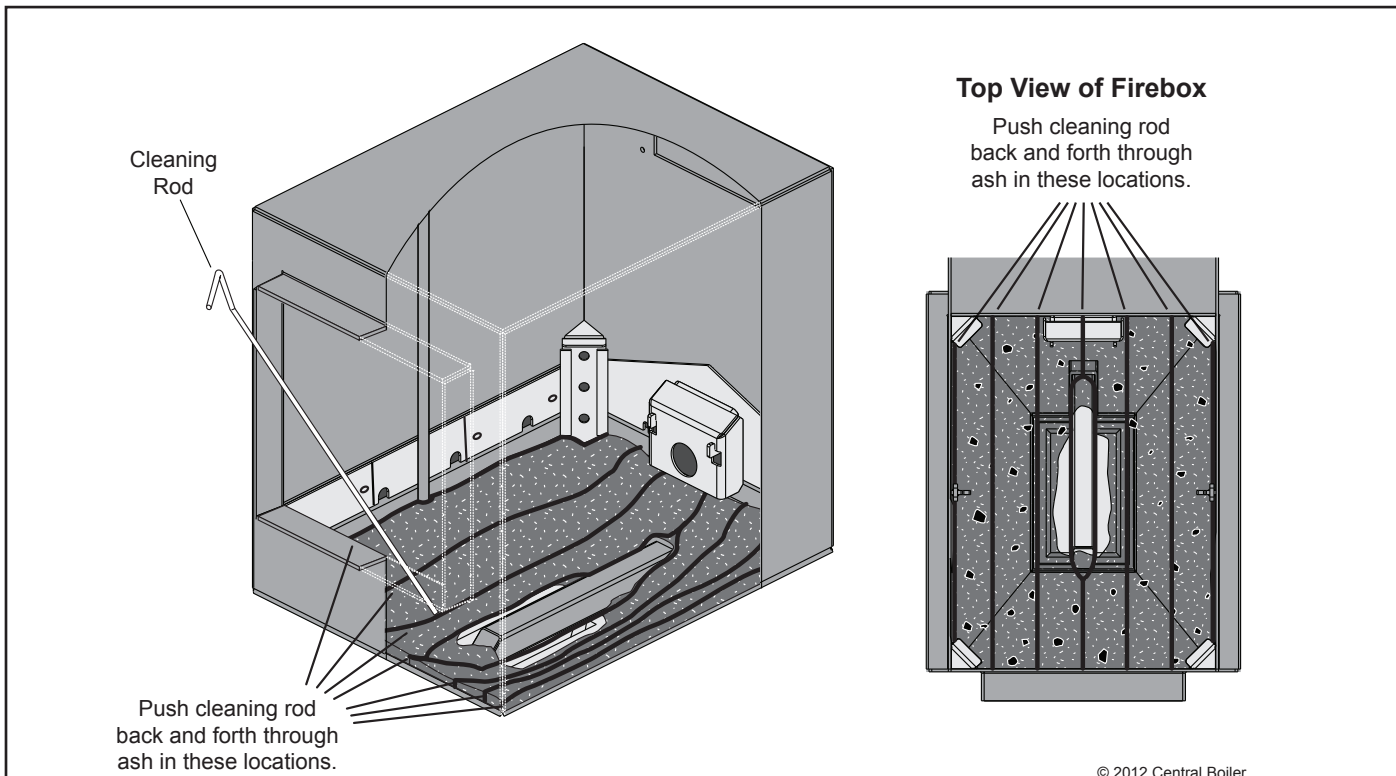
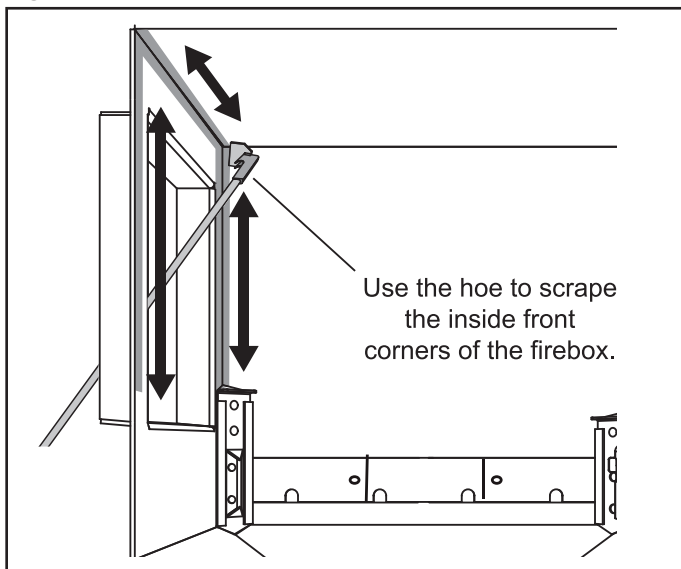


Fig. 43



8. When loading, do not tightly pack wood into the firebox. Load the wood so that the combustion air outlets on the side of the firebox do not become blocked or restricted.
9. Close and latch the firebox door. **Do not use the firebox door to ram wood into the outdoor furnace. Do not operate the outdoor furnace with the firebox door open.** Combustion in the firebox cannot be controlled if the firebox door is left open or unlatched. If the firebox door is left open, an uncontrolled burn will result. To return to a controlled burn, close and latch the firebox door.

10. Wait for 15 seconds; then slowly pull the bypass door handle toward the front of the outdoor furnace and push down to close the bypass door.

NOTE: When the firebox door is open, uncontrolled amounts of air entering the firebox can accelerate combustion. It is very important to leave the bypass door open for 15 seconds after closing and latching the firebox door to purge the firebox and to allow the fire to return to a controlled condition.

CAUTION

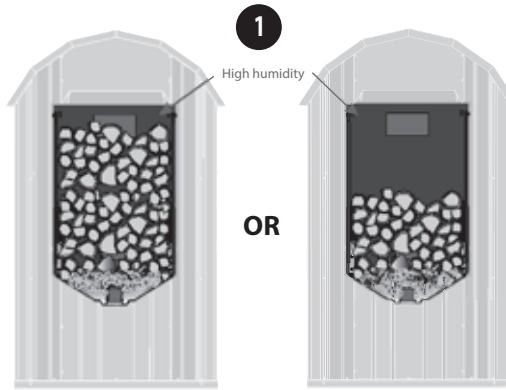
Excessive combustible gases could accumulate, ignite and create a loud boom in the firebox if the bypass door is not left open for 15 seconds after closing and latching the firebox door.

WARNING

The firebox door must be closed and latched at all times except when filling the firebox with wood. Leaving the firebox door open may lead to a runaway fire. In the event of a runaway fire, close the firebox door.

Operating for a 12-Hour Burn

It is best to burn the wood load down to a glowing coal bed as often as possible to dry the firebox, air channels and ashes.



Load enough wood to maintain the fire until next reloading, preferably about 12 hours



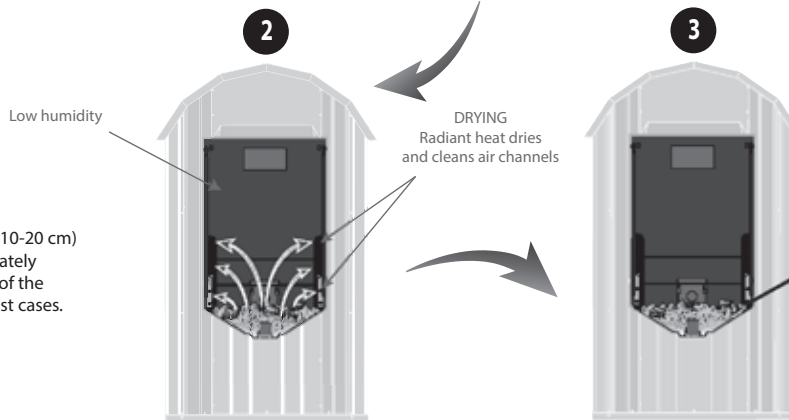
OPERATING TIP

Run the rod through the coal bed in a number of places once every 8-12 hours to avoid bridging and to help optimize combustion.



OPERATING TIP

Wood between 4" and 8" (10-20 cm) across and approximately 60-70% of the length of the firebox works well in most cases.



Low humidity

DRYING
Radiant heat dries and cleans air channels

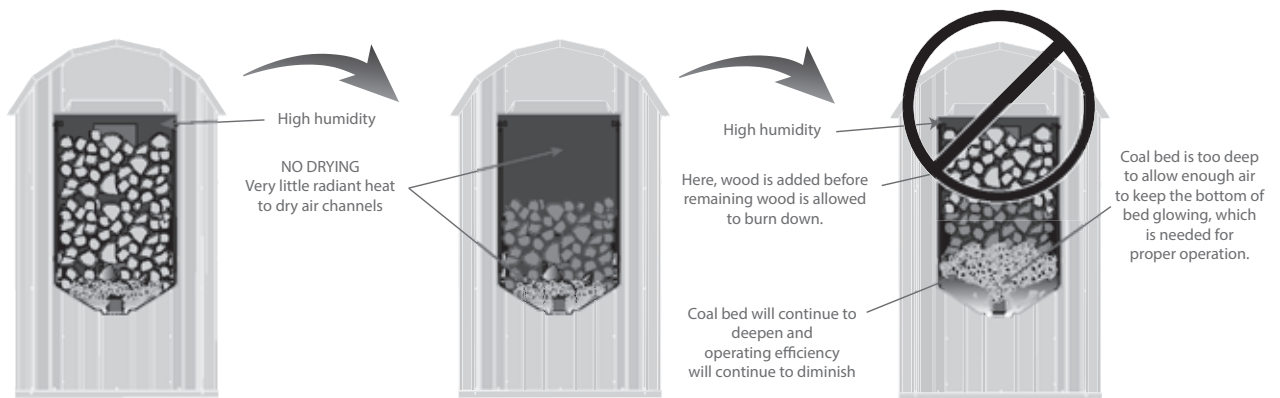
A dry firebox lasts longer, requires less maintenance and operates with more efficiency than a wet firebox.

Radiant heat from glowing ember bed dries and cleans air channels, and also will ignite new wood load

Before reloading, use the cleaning rod to loosen the ash and coals as directed in the Owner's Manual

Adding more wood than is needed between loads increases condensation and reduces efficiency.

A firebox with high humidity requires more maintenance, operates with less efficiency and will shorten the life of the furnace.



Loading more wood than is needed between fills increases condensation – the firebox and air channels will not dry

Reloading at this level can restrict airflow and create excessive coals or too deep of a coal bed, while making it impossible to run the cleaning rod through to loosen the ash and coals

Repeating this type of reloading pattern, along with not following other procedures described in the Owner's Manual and instructional videos, will diminish the efficiency, performance and life of the furnace

These illustrations provide a summary of how to properly load and reload your downdraft outdoor furnace. Be sure to read the Owner's Manual for other important safety and operational information. Over time, you will become familiar with your particular conditions, and you will learn how best to load the wood so it burns down to a glowing coal bed as often as possible before reloading. ©2015 Central Boiler • 1-MAY-2015

SECTION 3 – MAINTENANCE

PREVENTIVE MAINTENANCE SCHEDULE

Regular maintenance and inspections can help extend the life of your outdoor furnace and prevent high-cost repairs. This table is meant to serve as a general guideline until you become acquainted with how the outdoor furnace operates with your specific application.

OPERATION	SERVICE INTERVAL							See Section Number
	Before first operation of season	Daily	Weekly	Monthly	Semi-Annually	Post Season	Other	
Broadcast Ashtrol in firebox.		●						3-3
Check water level.	●	●						3-1
Remove ash.				C			●	3-4
Scrape firebox door frame; use cleaning rod in ash.			A				●	3-4
Inspect firebox door seal.			A				●	3-5
Inspect and lubricate door latch bushings.							●	G 3-5
Inspect chimney.	●		●				●	3-6
Check vent cap.	●							3-2
Inspect heat exchanger.	●			●			●	F 3-7
Inspect Reaction Chamber.	●			C			●	3-8
Inspect secondary air charge tube and refractory.							●	3-12
Inspect firebox and firebox ash area.	●		A				●	3-9
Inspect and clean combustion air outlets.	●			C			●	B 3-10
Inspect and clean the combustion fan and inlet screen.						D		3-11
Oil the combustion fan.							●	3-11
Check pH and nitrite levels of water.	●					D	●	E
Inspect and service gas burner.							●	3-13
Inspect primary combustion air elbow.							G	3-14
Grease bypass door handle.							●	G 3-15
Perform a complete firebox cleaning.					F		●	3-16

NOTE: Check daily for build-up of creosote in the lower corners and around the air outlets until experience shows how often cleaning is necessary.

- A Daily, or as needed.
- B Twice a week.
- C Weekly until interval for your application can be determined.
- D When new, after three months, then every six months thereafter.
- E Refer to **Testing Treated Water in the Outdoor Furnace**.
- F Frequency will vary depending on heat load requirements, type of wood used and the moisture content of the wood.
- G Or as needed.

CONTROL LOCATIONS

Fig. 44

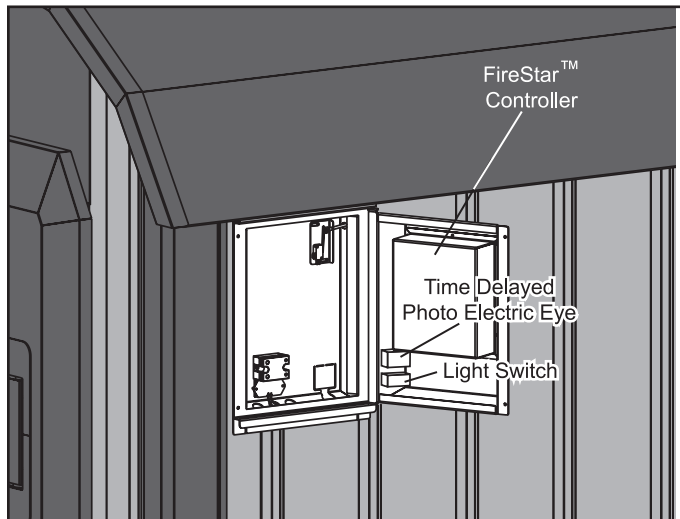
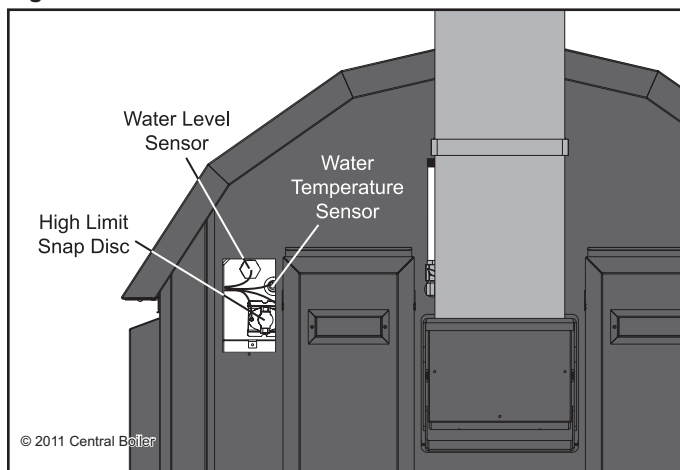


Fig. 45



ROUTINE MAINTENANCE

CAUTION

Use only genuine Central Boiler Parts and Accessories if it ever becomes necessary to replace any component of the outdoor furnace.

Routine inspections and maintenance are essential to the proper operation and longevity of the outdoor furnace. The items indicated in the preventive maintenance schedule are intended to serve as a guideline. Actual intervals between inspections and maintenance may vary depending on a number of factors, including your heat load requirements, type of wood used, and outdoor temperatures.

NOTE: Proper maintenance of the firebox, Reaction Chamber, heat exchanger, chimney transition box and chimney tee are essential for the outdoor furnace to function properly and for longevity.

CAUTION

Do not burn plastic, garbage, treated wood or fuels not listed for this outdoor furnace.

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

Creosote - Formation and Need for Removal. When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire.

The chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if a creosote buildup has occurred, and to check for corrosion or condensation. If creosote has accumulated it should be removed to reduce the risk of a chimney fire.

WARNING

The chimney and chimney connector must be clean and in good condition.

NOTE: A small intense fire is preferable to a large smoldering one to reduce the amount of creosote deposition. The wood load should be matched to the heat load.

3-1. Water Level

Open the sight gauge valve. The sight gauge tube will fill to indicate the level of water in the outdoor furnace. Be sure to close the sight gauge valve after checking water level. The sight gauge valve and tube will drain when the valve is closed.

3-2. Vent Cap

Check that the vent cap fits loosely on the vent opening.

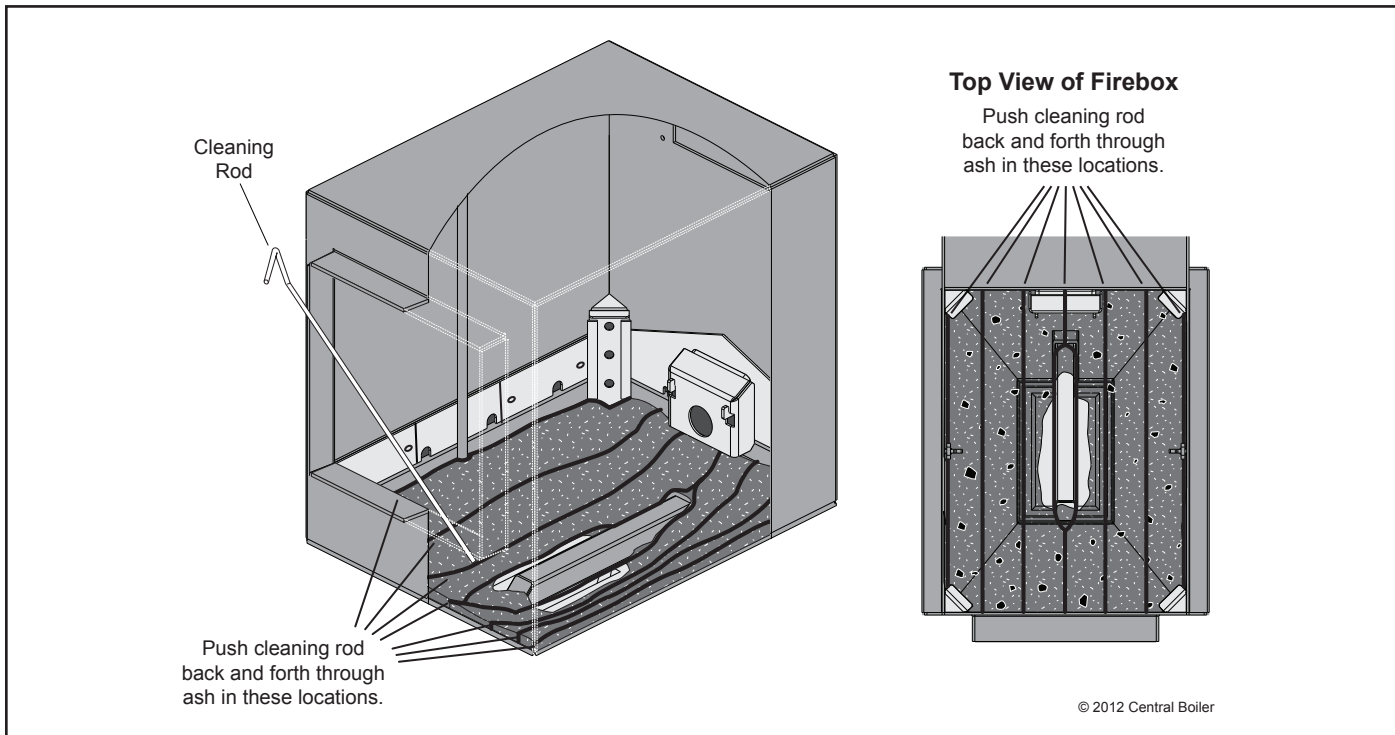
WARNING

The outdoor furnace vent cap must fit loosely on the vent opening (Fig. 1). 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 OUTDOOR FURNACE TO BE PRESSURIZED.

3-3. Ashtrol

Add Ashtrol to the firebox. Use a spoon as directed to broadcast the powder in the firebox, alternating the location. For example, broadcast on the fire or hot coals one day and then on the walls the next day. Ashtrol is a pH modifier that helps to neutralize acids that may form in the firebox.

Fig. 46

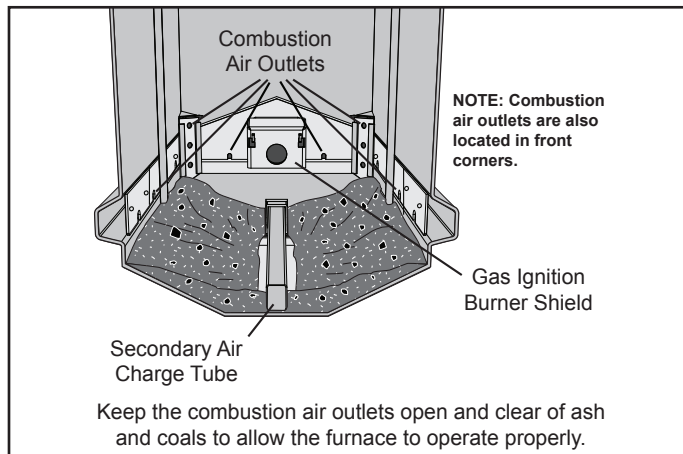


3-4. Ash

Some ash, but not more than three inches, on the sides and bottom of the firebox is necessary for the proper operation of the outdoor furnace (as shown in Fig. 47). No ash should cover the mixing channel (the area alongside the secondary air charge tube). Ash acts as an insulator, keeping the glowing coals in the bottom of the firebox hot enough to restart the fire. **For best performance and for a clean, efficient burn, a shallow bed (3 inches or less) of loose coals (without ash) should be raked back over the mixing channel if possible.**

1. Remove enough ash to keep the combustion air outlets free of obstruction (see Fig. 47).

Fig. 47



2. Make sure the area directly in front of and under the gas ignition burner shield is free of ash.

3. Remove any heavy or solidified ash.

CAUTION

Always wear the appropriate personal protective gear when cleaning ash from the firebox and the Reaction Chamber.

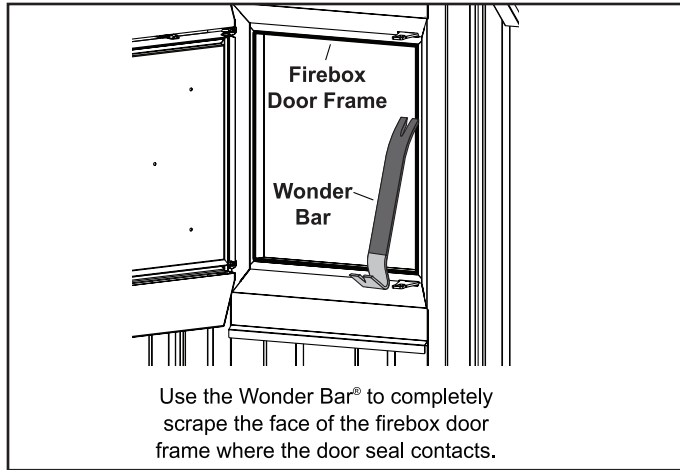
4. **Disposal of ashes** - Ashes should be placed in a steel container with a tight-fitting lid. The container of ashes should be placed on a noncombustible floor or on the ground, well away from combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Other waste shall not be placed in this container.

WARNING

When removing ash, be careful not to spill any coals or ash outside of the noncombustible container.

5. Each time ash is cleaned out, inspect the firebox door seal and/or covers to make sure they are sealing properly.
6. Every other day (or as needed), use the Wonder Bar to completely scrape the face of the firebox door frame where the door seal contacts.

Fig. 48



- Using Fig. 46 as a reference, push the cleaning rod back and forth through the ash in the bottom of the firebox in the locations indicated by the lines.

3-5. Firebox Door Seal and Bushings

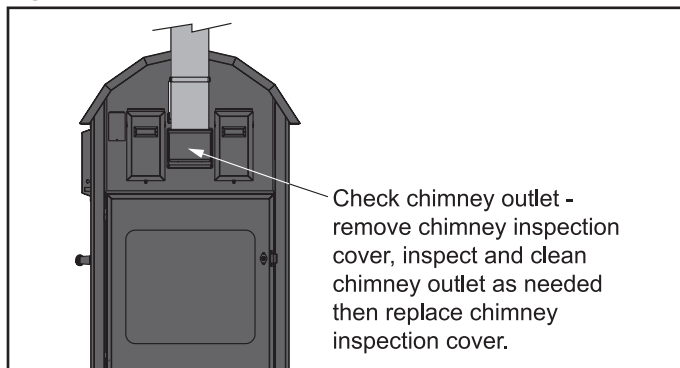
Make sure the firebox door is properly latched and check the condition of the firebox door seal. If it is not sealing properly (indicated by a uniform indentation, as shown in Fig. 64), replace the seal. If the firebox door does not close tightly, it may be necessary to adjust the firebox door latch bearings. See Owner Serviceable Items for both procedures. Whenever needed, lubricate the door latch bearings with motor oil.

3-6. Chimney

Remove the chimney inspection cover. Inspect the chimney outlet and chimney for excessive creosote, ash or deposits and clean as necessary.

NOTE: The chimney inspection cover must fit tightly. Check and clean if necessary the groove for the cover to prevent air from leaking out. Leaking air caused by an improperly fitting cover can cause corrosion.

Fig. 49



3-7. Heat Exchangers

- Press the **Power**  button on the FireStar controller to turn it off.

CAUTION

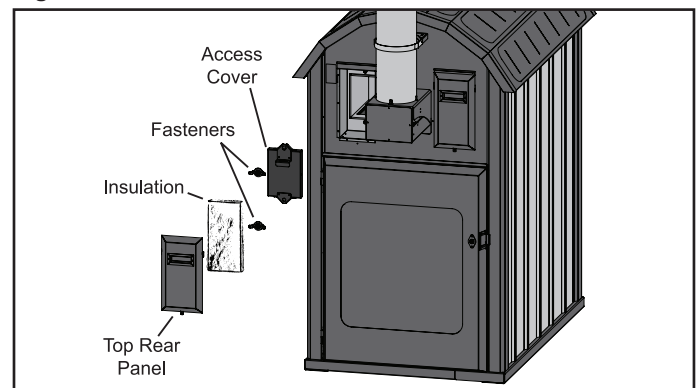
Be sure to turn off the FireStar controller before doing this procedure.

- Remove the top rear panels, insulation and the access covers to the heat exchangers.
- Open the rear access door; then open the Reaction Chamber door (see Fig. 51).

NOTE: Cleaning the heat exchangers when the water temperature is about 150°F (65.5°C) will help in removing deposits.

- Insert one chain attached to the heat exchanger scraper into the heat exchanger chamber; then insert the heat exchanger scraper and drop it down the chamber while holding on to the second chain.
- Once the heat exchanger scraper drops to the bottom of the heat exchanger, drop the second chain down the heat exchanger. Repeat this procedure for all eight heat exchanger chambers.

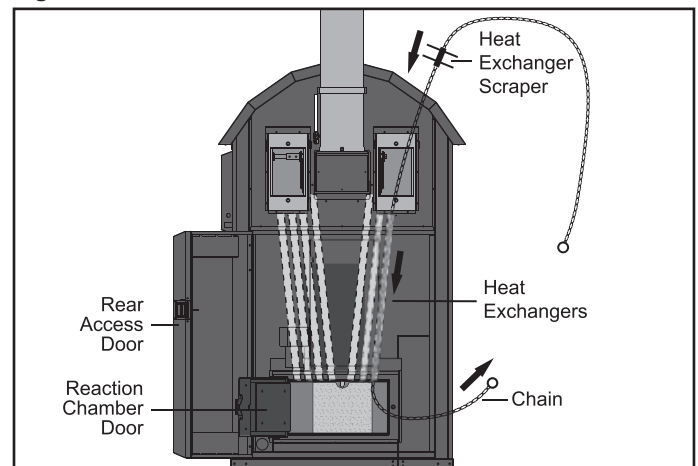
Fig. 50




- Inspect all heat exchanger chambers to make sure that the fly ash or any deposits were removed. Repeat step 4 if necessary.

NOTE: Using a light and mirror will aid with the inspection of the chambers.

Fig. 51



6. Close the Reaction Chamber door; then close the rear access door.
7. Replace the access covers, insulation and top rear panels.
8. Press the **Power**  button on the FireStar controller to turn it on.

3-8. Reaction Chamber

1. Press the **Power**  button on the FireStar controller to turn it off.

CAUTION

Be sure to turn off the FireStar controller before doing this procedure.

2. Lift and push the bypass door handle toward the back of the outdoor furnace to open the bypass door.
3. Open the rear access door; then remove the wing nut and open the Reaction Chamber door.
4. To remove ashes from the Reaction Chamber, tip the refractory end cap back as shown before lifting it out. Use a hoe to pull the ash to the rear of the furnace; then use a small shovel to remove all of the ash and deposits from the Reaction Chamber. Take care not to damage or move the firebrick, or to damage or move the temperature sensor.

NOTE: It is extremely important to clean all the way to the back of the Reaction Chamber. To make sure ash is being completely removed, mark the hoe handle when the hoe is positioned all the way to the back of the Reaction Chamber. Use the mark as a reference when removing ash.

CAUTION

Take care not to damage or move the temperature sensor when removing ash.

Fig. 52

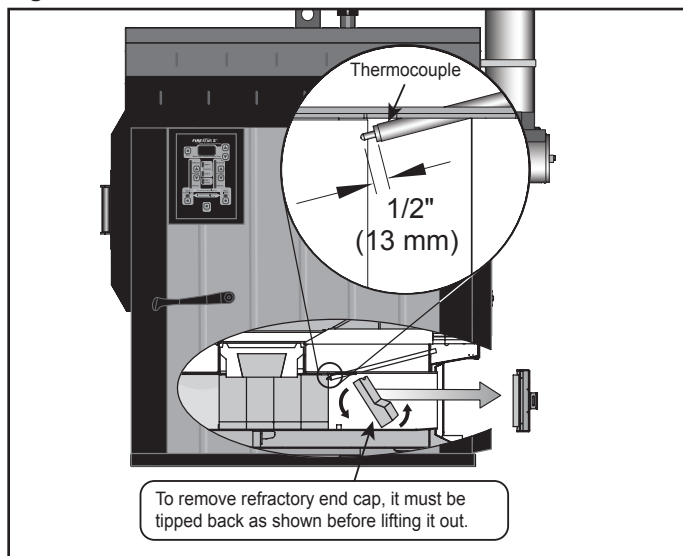
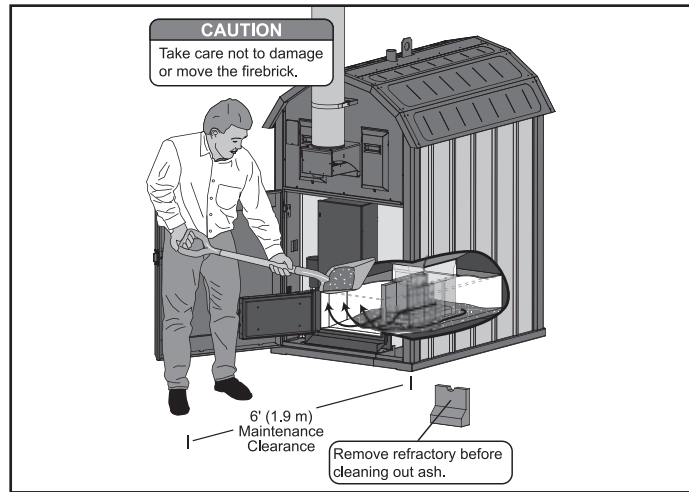


Fig. 53



5. Install the refractory end cap by tipping it forward before setting it in place. Close the Reaction Chamber door and install the wing nut; then close the rear access door.

CAUTION

Take care not to damage or move the temperature sensor when installing the refractory end cap.

6. Press the **Power**  button on the FireStar controller to turn it on.

3-9. Firebox

WARNING

Remove all wood, coals and ash from the firebox.

1. Scrape the top and sides of the firebox and around the door frame area to remove any deposits; then inspect the surfaces of the firebox for any signs of corrosion, paying particular attention to the ash level and below.

NOTE: When scraping to clean inside the firebox, be sure to pay particular attention to the corners and to the seams.

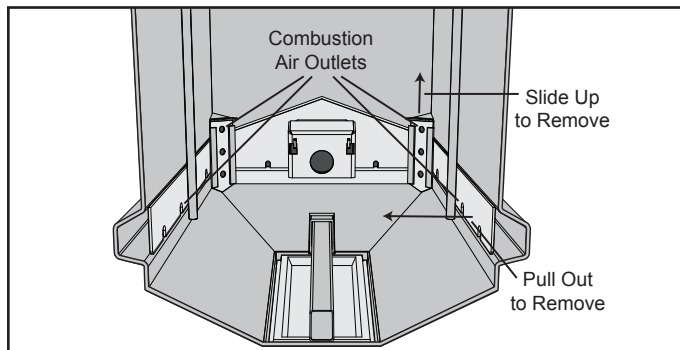
2. If signs of corrosion are present, determine the cause and correct it as soon as possible. Refer to Corrosion is Present in the Troubleshooting section.
3. A thin, tar-like creosote layer may form on the firebox walls and migrate toward the bottom of the firebox where it could collect into a thicker layer. Normally this layer will burn up as it collects on the bottom. If it migrates to the bottom of the firebox and does not burn up, it must be removed. Do not allow it to cover or restrict air flow through the combustion air outlets or bottom of the firebox. If larger, thick, dry deposits form on the walls in the firebox, they should be removed with a Wonder Bar or scraper.

NOTE: Be aware that the hotter the fire, the less creosote is deposited, so weekly cleaning may be necessary in mild weather, even though monthly cleaning may be enough in coldest months.

3-10. Combustion Air Outlets

Primary combustion air enters the firebox through the combustion air outlets located on the sides and in the front and back corners (Fig. 54). It is essential to the operation of the outdoor furnace that these outlets remain unobstructed. Clean the combustion air outlets before they become plugged. The corner sections can be removed for cleaning by sliding them up. The side air channels can be removed for cleaning by removing the acorn nuts. Make sure to thoroughly remove all ash and deposits from behind the corner and side air channels.

Fig. 54



3-11. Combustion Air Fan

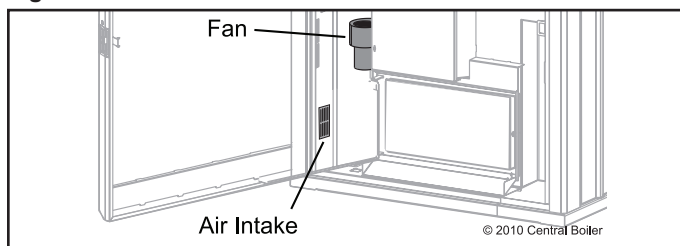
1. Disconnect power to the outdoor furnace.

WARNING

Do not proceed without testing that power is disconnected.

2. Open the rear access door; then inspect the combustion air fan inlet screen and fan wheel and clean if necessary. Make sure the air intake is clean and not obstructed.

Fig. 55



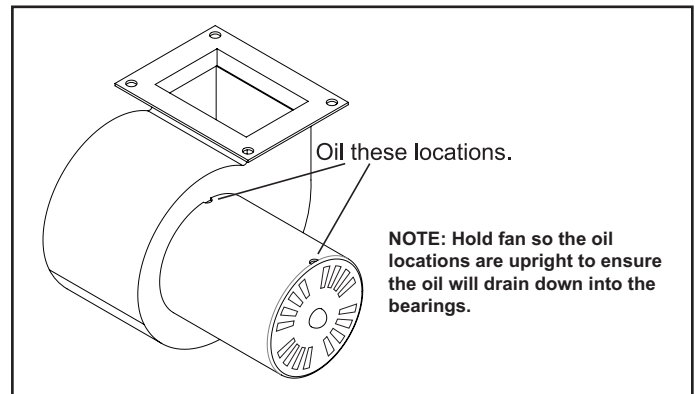
3. Connect power to the furnace.

NOTE: At the end of each heating season, oil the combustion fan bearings using the following procedure.

1. Remove the bolts securing the combustion fan and remove the combustion fan.

2. Hold fan so the oil locations are upright; then apply 10 drops of SAE 20 non-detergent oil (e.g., 3-IN-ONE® Oil) in each location, as shown in Fig. 56.

Fig. 56



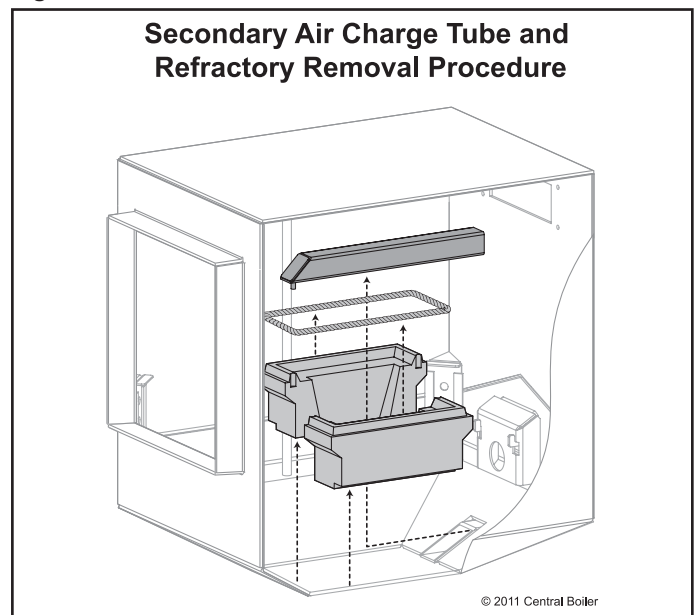
3. Install the combustion fan and secure with bolts.

3-12. Secondary Air Charge Tube and Refractory

Removing and inspecting the secondary air charge tube and inspecting the refractory is best done after the outdoor furnace has been shut down and the firebox has been cleaned according to the Complete Firebox Cleaning Procedures.

NOTE: The secondary air charge tube and refractory are wear items.

Fig. 57



1. Remove the secondary air charge tube by lifting and then sliding it toward the front of the outdoor furnace. Inspect the mixing channel to see the area is not plugged.

2. Inspect each refractory module for damage. Small cracks and chips in the refractory are normal. If large pieces of the refractory modules are missing, contact your Central Boiler dealer.
3. Install the secondary air charge tube making sure the alignment pin is seated in the alignment hole in the refractory modules.

3-13. Optional Gas-fired Wood Ignition Burner Maintenance

For annual inspection, cleaning and maintenance of the optional gas-fired wood ignition burner, contact your Central Boiler dealer or qualified service technician.

3-14. Primary Air Elbow

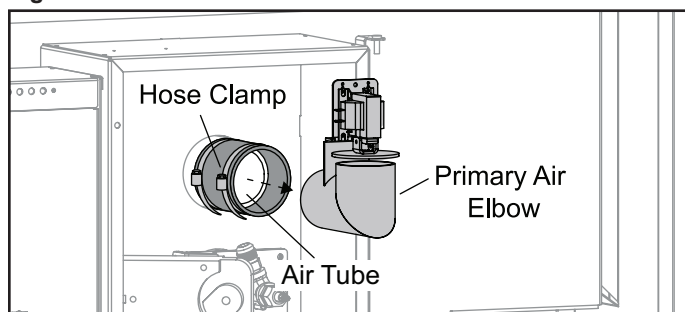
1. Disconnect the electrical power to the outdoor furnace at the main power source; then turn off the gas supply at the appliance service valve.

WARNING

Do not proceed without testing that power is disconnected. Make sure the power cannot be reconnected while servicing the solenoids (i.e., use lock out, tag out).

2. Open the rear access door; then open the airbox cover.
3. Disconnect the power leads from the solenoid.
4. Loosen the hose clamp securing the primary air elbow to the coupler; then remove the primary air elbow.

Fig. 58



5. Inspect the elbow and clean out any build-up or blockage.

NOTE: A small amount of material in the elbow is normal and is not an indication of improper operation.

6. Inspect the air tube for blockage or obstructions. To remove blockage or obstructions in the air tube, a screwdriver and a shop vac may be useful.
7. Install the primary air elbow in the coupler; then tighten the hose clamp.
8. Connect the power leads to the solenoid.

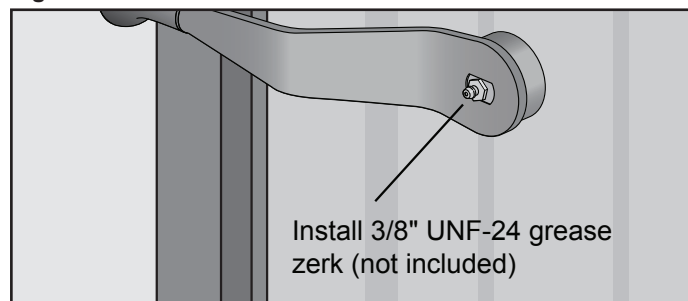
9. Close the airbox cover; then close the rear access door.
10. Connect the electrical power to the outdoor furnace at the main power source; then turn on the gas supply at the appliance service valve.

3-15. Bypass Handle

NOTE: This procedure only applies to furnaces with bypass handles that have a 3/8" NF-24 bolt (serial number E102458 and later). These bolts have a 9/16" hex head.

1. Remove the 3/8" NF-24 bolt and washer securing the bypass handle to the side of the furnace.
2. Install a 3/8" UNF-24 grease zerk (not included) in the opening and add grease.

Fig. 59



3. Remove the grease zerk; then install the washer and 3/8" NF-24 bolt. Tighten securely.
4. Lift and lower the bypass handle several times to distribute the grease.

3-16. Complete Firebox Cleaning Procedures

The procedures outlined here explain how to thoroughly clean the firebox, Reaction Chamber, heat exchanger, chimney transition box and chimney tee. The frequency for performing this type of cleaning will vary depending on a number of factors, including your heat load requirements, type of wood used, and the moisture of the wood.

NOTE: Proper maintenance of the firebox, Reaction Chamber, heat exchanger, chimney transition box and chimney tee are essential for the outdoor furnace to function properly and for longevity.

NOTE: It may be best to allow the wood and coals to burn out completely before this type of cleaning.

CAUTION

Always wear the appropriate personal protective gear (e.g., protective gloves, clothes, dust mask, etc.) when cleaning ash from the firebox and the Reaction Chamber, etc.

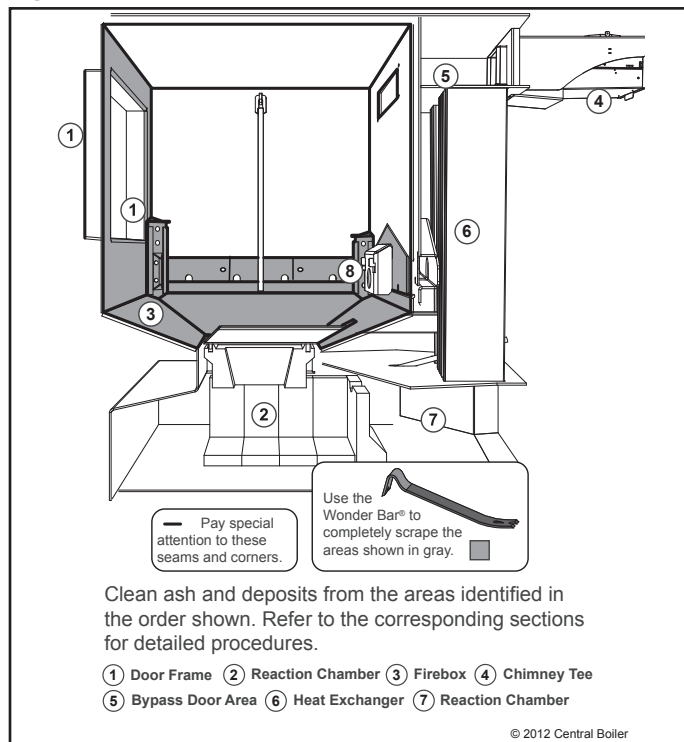
CAUTION

Clear the entire area surrounding the outdoor furnace of any combustible materials before performing these cleaning procedures.


WARNING

Be careful not to spill any coals or ash. Place coals and ash in a metal container with a tight-fitting metal lid.

Fig. 60



NOTE: Refer to Fig. 60 and clean the areas identified in the order shown. For each area in the illustration, refer to the corresponding section.

1. Press the **Power**  button to turn the FireStar controller off.
2. Lift and push the bypass door handle toward the back of the outdoor furnace to open the bypass door.

1. Door Frame

1. Open the firebox door; then scrape the face and surface area of the door frame to remove any deposits.

2. Reaction Chamber

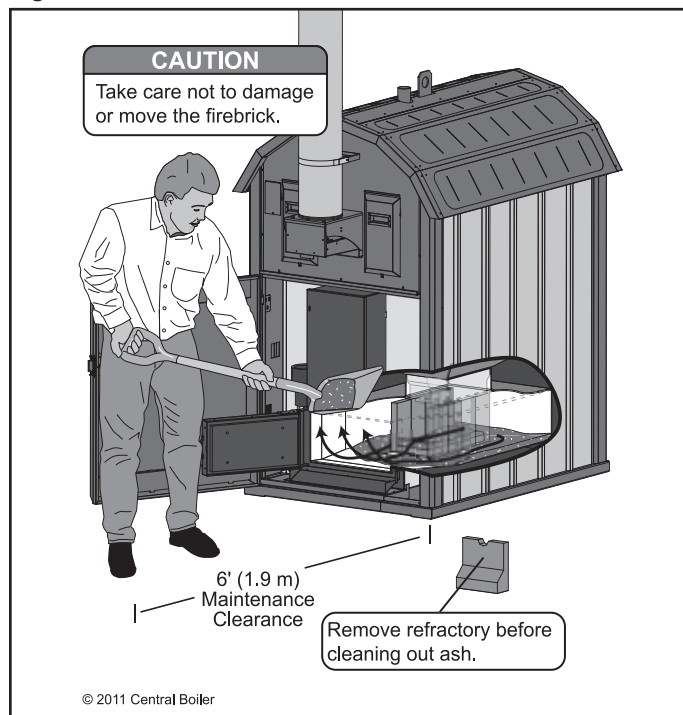
1. Carefully remove the refractory as shown in Fig. 61. Use a hoe to pull the ash to the rear of the furnace; then use a small shovel to remove all of the ash and deposits from the Reaction Chamber. Take care not to damage or move the firebrick, or to damage the temperature sensor.

NOTE: It is extremely important to clean all the way to the back of the Reaction Chamber. To make sure ash is being completely removed, mark the hoe handle when the hoe is positioned all the way to the back of the Reaction Chamber. Use the mark as a reference when removing ash.

CAUTION

Take care not to damage the temperature sensor when removing ash.

Fig. 61



3. Firebox

1. Using a shovel, remove as much ash as possible.
2. Turn the shovel around and push ash from the front of the furnace below the door frame to the back of the furnace. Remove as much ash as possible.

NOTE: It can take many days before ash is completely cooled. Other waste should not be placed in the same container.

WARNING

When removing ash, be careful not to spill any coals or ash outside of the noncombustible container.

3. Using a Wonder Bar or similar type of tool, completely scrape the area from one inch above the combustion air outlets down to the center refractory on the bottom of the firebox. Pay special attention to scraping the front corners. Scrape any crusty deposits off the firebox walls. Remove all of this material by shoveling it out.

4. Inspect the surfaces of the firebox for any signs of corrosion. Use a wire brush to clean if needed.

4. Chimney Tee

1. Remove the chimney inspection cover. Clean the chimney outlet and chimney of excessive ash or deposits.

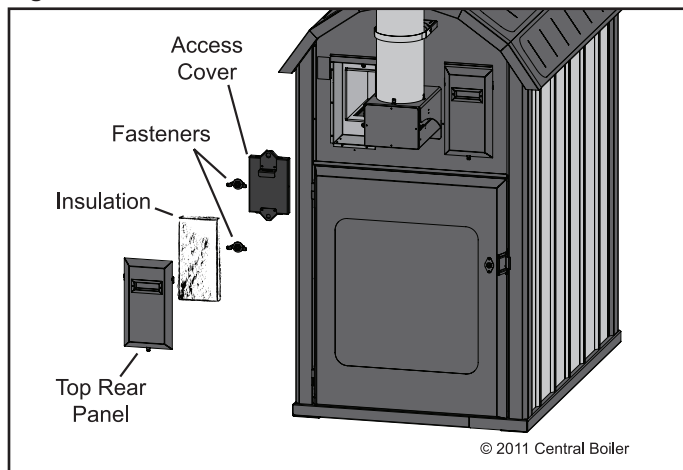
NOTE: The chimney inspection cover must fit tightly. Check and clean if necessary the groove for the cover to prevent air from leaking out. Leaking air caused by an improperly fitting cover can cause corrosion.

2. Use a small mirror to check that the chimney is clear.
3. Install the chimney inspection cover on the chimney tee.

5. Chimney Transition Box

1. Remove the top rear panel and the access cover to the heat exchanger. If there is any ash in the area behind the access cover, remove it.

Fig. 62

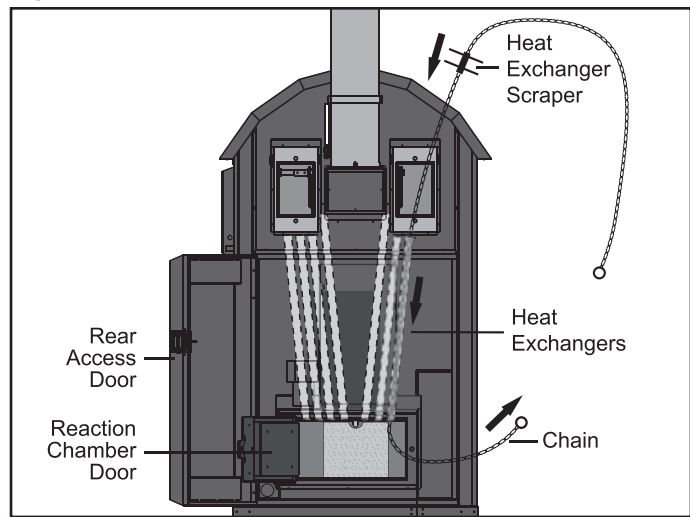


6. Heat Exchangers

NOTE: Cleaning the heat exchangers when the water temperature is about 150°F (65.5°C) will help in removing deposits.

1. Insert one chain attached to the heat exchanger scraper into the heat exchanger chamber; then insert the heat exchanger scraper and drop it down the chamber while holding on to the second chain. Once the heat exchanger scraper drops to the bottom of the heat exchanger, drop the second chain down the heat exchanger. Repeat this procedure for all eight heat exchanger chambers.

Fig. 63



2. Inspect all heat exchanger chambers to make sure that the fly ash or any deposits were removed. Repeat step 1 if necessary.

NOTE: Using a light and mirror will aid with the inspection of the chambers.

3. Replace the access covers, insulation and top rear panels.

7. Reaction Chamber


1. Lift and slide the charge tube toward the front of the outdoor furnace to remove; then inspect the mixing channel to see the area is not plugged.
2. Install the charge tube.
3. Using a hoe and small shovel, remove all of the ash and deposits from the Reaction Chamber being careful not to damage the temperature sensor (see Fig. 61).

CAUTION

Take care not to damage the temperature sensor when removing ash.

4. Install the refractory removed earlier. Close the Reaction Chamber door and install the wing nut; then close the rear access door.

8. Combustion Air Outlets/Air Channel Plates

1. Slide each of the four corner sections up and remove any ash or deposits from behind them. With access from the rear corners of the firebox, remove any ash or debris from the permanent air channel in the rear of the firebox.
2. Mark the location of each air channel plate; then remove the acorn nuts securing the RH and LH side air channel plates and remove the plates. Remove any ash or deposits from behind the air channel plates in the wall of the firebox.
3. Using a screwdriver or similar tool, clean out each combustion air outlet in the air channel plates and the corner sections. Make sure any debris or buildup on the back side of the plates and corner sections is removed.
4. Replace the corner sections by sliding them down in each corner of the firebox. Replace the side air channel plates, starting with the center section, then the front section and lastly the rear section. Replace the acorn nuts and tighten securely.
5. Press the **Power**  button to turn the FireStar controller on.
6. With the firebox door open, temporarily hold the door switch in. Air should blow into the firebox from each of the combustion air outlets. Feel with your hand to ensure air is coming out of each outlet. If air is not blowing through an outlet, determine and correct the cause.
7. Refer to the Firing the Outdoor Furnace section for initial start-up procedures.

WATER QUALITY AND MAINTENANCE

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

Water Test Kits and Test Results

It is very important to keep record of water test results (include the date, pH and nitrite level). If subsequent water tests indicate a pH that is too low and/or a nitrite level that is too high, the results should be verified using a new test kit.

The pH test strips and Permanganate Reagent each have a varying shelf life that can affect their accuracy. Test kits should be stored in a dry area at room temperature to obtain maximum accuracy over a longer period of time.

The pH of the water in the outdoor furnace will not decrease unless fresh water is added to the furnace. The nitrite level of the water in the outdoor furnace will not increase unless Corrosion Inhibitor Plus™ is added. For example, if a water test in the fall of the year indicates a pH of 8.5 and a nitrite level of 20 drops by nitrite test (2000 ppm) and no water or Corrosion Inhibitor Plus™ is added, a water test the following spring must indicate a pH of at least 8.5 and a nitrite level of no more than 20 drops by nitrite test (or slightly less, due to evaporation).

If the test indicates a significantly lower pH level or higher nitrite level, perform another test with a new test kit to verify the results. If the results are +10% different using a new test kit, either water or Corrosion Inhibitor Plus™ has been added to the system.

If a test is conducted and verified that indicates a high pH (above 9.5) and/or nitrite level (above 30 drops), **DO NOT ADD MORE CORROSION INHIBITOR PLUS™**. Adding Corrosion Inhibitor Plus™ **increases** nitrite and pH levels.

The outdoor furnace should be drained until the water in the sight gauge reaches the bottom of the sight gauge; then add fresh water until it is 1 inch (2,5 cm) below the FULL mark on the sight gauge. Circulate the water for 24 hours and test the water again.

Testing Supply Water

Before filling the outdoor furnace with water, test a sample of the supply water that will be used to fill the outdoor furnace (softened water is recommended).

1. Collect a small sample of the water to be used to fill the outdoor furnace in a clean container.
2. Dip the pH test strip from the test kit in the water sample. Shake excess water off the test strip. Compare the color of the test strip to the chart provided to determine pH level.

- If the pH level is between 6.5 and 8.0 and there are no other known water quality problems, then the outdoor furnace may be filled with this water.
- If the water to be used to fill the outdoor furnace has a pH level of less than 6.5 or greater than 8, a sample of the 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.

Corrosion Inhibitor Plus™ and Initial Treatment

Central Boiler Corrosion Inhibitor Plus™ (p/n 1650) gives optimum protection when it is used to initially treat the water and is then maintained at proper levels. The initial nitrite level target is 20 drops by nitrite test, but 20 to 30 drops is acceptable. Do not exceed treatment of higher than 30 drops by nitrite test.

The recommended initial treatment rate for the outdoor furnace is specified by units. One unit of the Corrosion Inhibitor Plus™ is a 1-gallon (3.78-liter) container. The normal rate for the initial treatment is 2 units.

NOTE: If the system has a larger than normal water capacity, more Corrosion Inhibitor Plus™ should be added at a recommended rate of one unit per 180 gallons (681 liters) of water.

- Add the recommended amount of Corrosion Inhibitor Plus™ through the vent pipe at the top of the outdoor furnace.
- Immediately fill the outdoor furnace to 1 inch (2.5 cm) below the FULL level mark on the sight gauge.
- Start the pump(s) and circulate water for 24 hours.

Testing Treated Water in the Outdoor Furnace

- To obtain a system water sample, it will be necessary to bend the sight gauge tube away from the outdoor furnace. Before collecting the sample, open the valve and drain about a quart of water from the sight gauge tube; then carefully fill the sample container without contaminating the sample. **Be sure to properly install the sight gauge tube and close the valve when finished.** The water in the sight gauge valve and tube will drain when the valve is closed.

CAUTION

The water in the sight gauge may be hot. Use caution when obtaining a sample.

- If no antifreeze is present in the water, use Test Kit (p/n 405). If antifreeze has been added to the water, use Test Kit (p/n 597).

- Dip the pH test strip from the test kit in the water sample. Shake excess water off the test strip. Compare the color of the test strip to the chart provided to determine pH level. The pH of the water should now be between 8.0 and 9.5.
- Rinse and fill the sample tube to the 25 mL mark with treated water from the outdoor furnace.
- Add 25 drops of Sulfuric Acid (p/n 404) to the water sample and swirl to mix.

WARNING

Sulfuric Acid is a corrosive acid. Handle carefully. Carefully read and follow precautions on test chemical labels. Keep test chemicals away from children. Safely dispose of tested samples.

- Using the dropper, add Permanganate Reagent (p/n 403) one drop at a time, swirling the water and counting each drop, until the color changes from colorless to a faint pink that persists for at least one minute.

NOTE: Always hold the dropper in a vertical position to ensure proper droplet size.

- If the nitrite level is not at least 20 drops by nitrite test, add 1/4 unit of Corrosion Inhibitor Plus™ (p/n 1650); then circulate water for 24 hours and repeat procedure, as needed, to achieve a nitrite level of at least 20 drops by nitrite test.
- Do not exceed treatment of higher than 30 drops by the nitrite test. If the test requires more than 30 drops, dilute the water by draining water from the system until the water level just reaches the bottom of the sight gauge. Then perform steps 2-3 from Corrosion Inhibitor Plus™ and Initial Treatment and steps 1-9 from Testing Treated Water in the Outdoor Furnace.

CAUTION

Completely clean out the firebox before draining water from the outdoor furnace.

- After the proper nitrite level has been obtained, check pH to make sure it is between 8 and 9.5.

After initial treatment, the maintenance nitrite level target is 15 drops by nitrite test, but 15 to 30 drops is acceptable. One drop of permanganate reagent equals approximately 100 ppm.

System Maintenance

The pH and nitrite levels of the water, once treated, should remain stable as long as water is not added to the outdoor furnace. If water is added to the outdoor furnace and/or system, the system water should be tested and Corrosion Inhibitor Plus™ should be added (if necessary) to maintain the recommended level of protection.

NOTE: If there is a leak in the system or if the outdoor furnace loses water from boiling frequently, the problem should be identified and repaired immediately. Under normal operation, little or no water needs to be added. Adding water to the furnace may cause corrosion if not immediately treated with Corrosion Inhibitor Plus™ to the proper pH and nitrite levels. In addition, the amount of dissolved solids in the system (due to adding additional water) can cause problems.

After the initial three months of operation and every six months thereafter, the pH and nitrite levels of the system water should be tested. These levels should be maintained as previously stated.

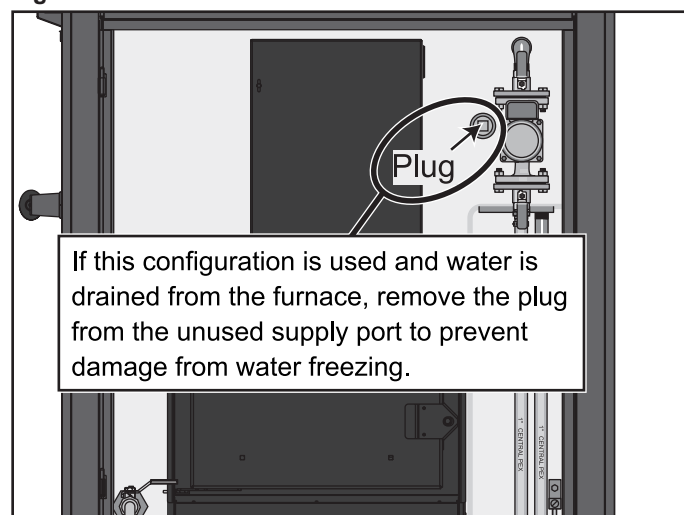
POST HEATING SEASON MAINTENANCE

The water should be left in the outdoor furnace if the outdoor furnace is not being used for an extended period of time. Check pH and nitrite levels as described in the Water Quality and Maintenance section.

1. Refer to the Preventive Maintenance Schedule for a list of operations to perform.
2. Shut off the power supply to the outdoor furnace.
3. Place a cover over the chimney to keep rain from entering the outdoor furnace. Clean and oil the chimney flue to the firebox.
4. To prevent condensation in the firebox, one option is to keep a 60W light bulb on in the firebox during the non-heating season.

If water is drained from the furnace, remove the plug from the unused supply port to prevent damage from water freezing in the supply port pipe.

Fig. 64



Flushing the System

If the system water is brown or orange, it is an indication the Corrosion Inhibitor Plus level has not been maintained and corrosion is present in the water jacket. The water jacket should be thoroughly flushed and the system refilled with the proper amount of Corrosion Inhibitor Plus added. Be sure to test the system water to verify the proper amount of Corrosion Inhibitor Plus.

1. De-energize the pumps and close the supply and return valves on the outdoor furnace. Remove the inspection panel and insulation covering the drain to gain access to the drain valve. Remove the cap and connect a hose to the drain.

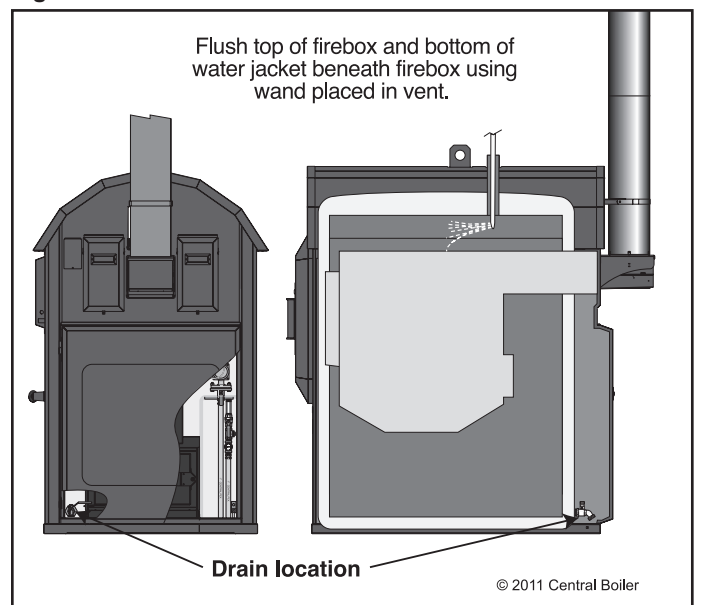
NOTE: Refer to General Installation Information for information on draining treated system water.

2. Open the drain valve to drain the outdoor furnace; then flush the top of the firebox and bottom of the water jacket beneath the firebox using a wand placed in the vent (Fig. 65). Rotate the wand in a circle to flush thoroughly.

CAUTION

Completely clean out the firebox before draining water from the outdoor furnace.

Fig. 65



3. Close the drain valve securely and replace the cap on drain after flushing the outdoor furnace.
4. Add Corrosion Inhibitor Plus™.
5. Fill the outdoor furnace following the procedure in Water Quality and Maintenance making sure to operate the pump(s) to thoroughly mix the Corrosion Inhibitor Plus.
6. Replace insulation around drain valve.
7. Replace the inspection panel.

SECTION 4 – SERVICEABLE ITEMS

NOTE: These procedures should be performed by a qualified individual and in accordance with any and all federal, state/provincial and local codes and regulations. When performing work on an appliance observe all precautions in the literature, tags and labels attached to the appliance and other safety precautions that may apply. When working with electricity and electrical components, failure to follow precautions could result in property damage, personal injury or death.

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.

NOTE: Use only genuine Central Boiler parts and accessories if it ever becomes necessary to replace any component on the outdoor furnace.

FIREBOX DOOR SEAL

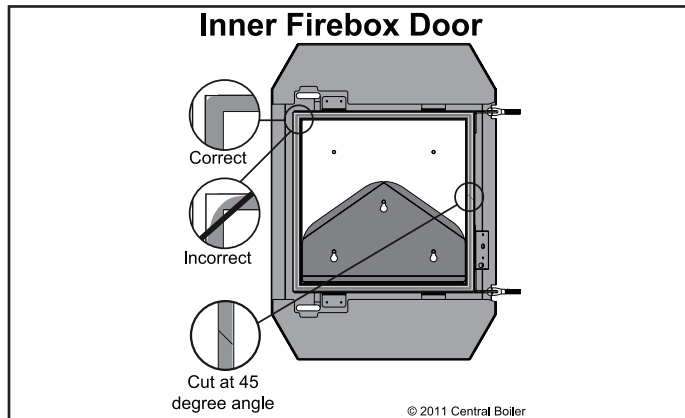
The firebox door seal must be in good condition to ensure an airtight seal. If the outdoor furnace is operated with the door open or ajar, the firebox door seal may become damaged or brittle due to excessive temperatures. If replacement is necessary, use the following procedure:

WARNING

Remove all wood, coals and ash from the firebox.

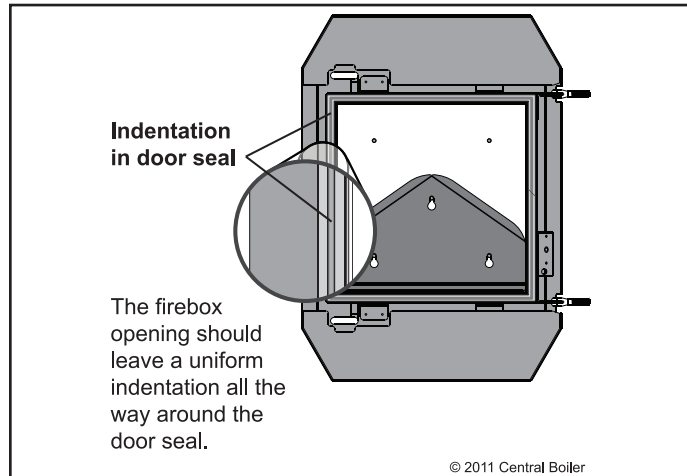
1. Using a scraper, remove the firebox door seal on the inner side of the firebox door and clean any remaining silicone adhesive from the groove. Any residue left in the groove will interfere with the new silicone seal.
2. Cut the end of the new seal at a 45-degree angle as shown in Fig. 66. Test fit the seal around the groove to find the correct length. When fitting the seal, do not stretch the seal in the corners. Press enough of the seal into the corners to completely fill them. When the start of the seal is reached, cut the end of the seal about an inch longer than required, at an angle that matches the starting end; then remove the seal from the groove.

Fig. 66



3. Apply a liberal amount of silicone sealant into the entire firebox door seal groove.
4. Starting at the center of the hinge side of the firebox door, insert the new silicone seal into the groove, pressing it firmly into the bead of silicone sealant. Make sure the seal is not stretched as it is pressed into the corners. Force the seal out to fill in the corners as shown in Fig. 66.
5. When the seal has been pressed into the groove all the way around the firebox door, apply a dab of silicone to the matching angles and press them together.
6. Scrape the face and surface area of the door frame to remove any deposits.
7. Close the firebox door. Make sure that pressure is felt as the latch is closed to ensure the seal is tight with the door frame.
8. Open the firebox door and check that there is an impression in the seal from the door frame. This mark must extend, with no gaps, around the entire perimeter of the firebox door seal (see Fig. 67). If it does not, the Cam Loc® bearing assembly may need to be adjusted to tighten the firebox door (see Firebox Door Latch Bearing Adjustment section).

Fig. 67



CAUTION

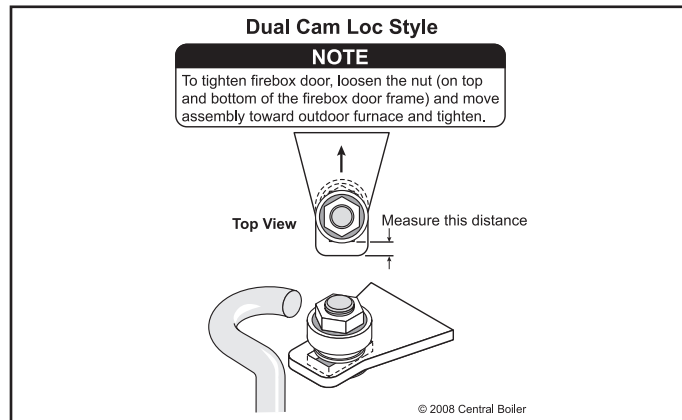
The firebox door seal will be damaged or destroyed if it is not installed properly.

FIREBOX DOOR LATCH BEARING ADJUSTMENT

If the firebox door seal has been replaced and it is not sealing properly, the firebox door may need to be adjusted to close more tightly. When adjusting the firebox door, make sure it is not adjusted too tightly as damage to the firebox door, frame or door seal may result.

1. Measure the distance from the edge of the bearing assembly mounting brackets to the bearing assemblies to serve as a reference point for subsequent adjustments.
2. Loosen the adjustment nut on the top bearing assembly and slide the bearing assembly in slightly (no more than 3 mm at a time) toward the outdoor furnace; then tighten securely (see Fig. 68). Using the same procedure, adjust the lower bearing assembly to ensure there is equal pressure on the top and bottom latches.
5. Starting at the center of the hinge side of the Reaction Chamber door, insert the new 3/4" door seal rope into the groove, pressing it firmly into the bead of silicone sealant. Make sure the Reaction Chamber door seal rope is not stretched as it is pressed into the corners. Force the Reaction Chamber door seal rope out to fill in the corners as shown in Fig. 69.

Fig. 68



2. Open the firebox door and check that there is an impression in the seal from the door frame. This mark must extend, with no gaps, around the entire perimeter of the door seal.

REACTION CHAMBER DOOR SEAL

The Reaction Chamber door seal must be in good condition to ensure an airtight seal. If replacement is necessary due to the Reaction Chamber door seal becoming damaged or brittle, use the following procedure:

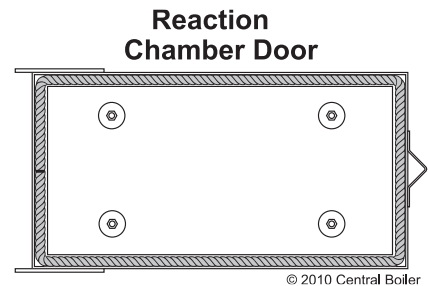
1. Disconnect power to the furnace. Open the firebox door.

WARNING

Remove all wood, coals and ash from the firebox and all ash from the Reaction Chamber.

2. Open the rear access door; then remove the wing nut and open the Reaction Chamber door.
3. Using a scraper, remove the Reaction Chamber door seal rope and clean any remaining silicone adhesive from the groove. Any residue left in the groove will interfere with the new seal.
4. Apply a liberal amount of silicone sealant into the entire Reaction Chamber door seal groove.

Fig. 69



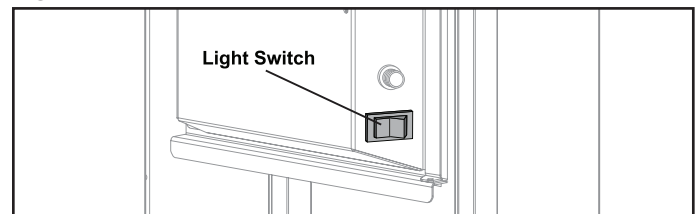
6. When the seal has been pressed into the groove all the way around the Reaction Chamber door, cut the end of the rope about one inch longer than required and press it tightly against the beginning end of the rope.

7. Close the Reaction Chamber door and install the wing nut. Snug the wing nut, but do not over-tighten. Close the rear access door.

EXTERIOR LED LIGHTS

The three exterior LED lights are controlled by the light switch on the panel and can be set to ON - OFF - Auto. The bulbs are 24 V and can be replaced if necessary.

Fig. 70



CIRCUIT BREAKER

The circuit breaker is located on the airbox and also serves as the furnace disconnect. If the circuit breaker trips (turns off), reset it by turning it on.

If the circuit breaker continues to trip, a component may be faulty. It is possible to isolate a faulty component using the following procedure.

1. Disconnect power to the outdoor furnace.

WARNING

Do not proceed without testing that power is disconnected. Make sure the power cannot be reconnected while testing components (i.e., use lock out, tag out).

- Open the airbox cover located at the rear of the outdoor furnace.
- Disconnect the wires from each of the solenoids, disconnect the fan harness and disconnect the push-wire connector from the transformer.
- To test for a faulty component, connect one component at a time (e.g., start with one of the solenoids); then connect power to the outdoor furnace. If the circuit breaker trips, the component is likely faulty. If not, disconnect power to the outdoor furnace and repeat the procedure until all components have been tested.

CAUTION

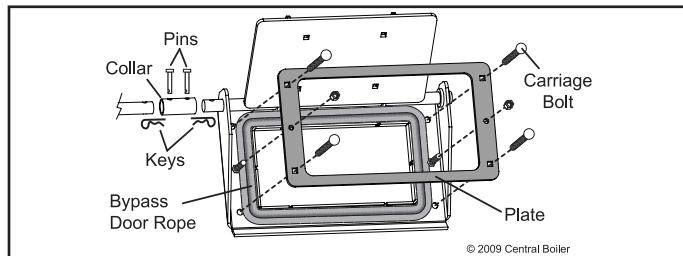
Disconnect power to the outdoor furnace before disconnecting a component and before connecting a component.

BYPASS DOOR ROPE

WARNING

Remove all wood, coals and ash from the firebox.

Fig. 71



- Working inside the firebox, remove the four nuts securing the bypass door assembly and discard.

NOTE: If necessary, break the carriage bolts off to remove. New bolts and nuts are provided in the kit.

- Remove the top rear panel and the access cover to the heat exchangers; then remove the four carriage bolts.
- Remove the keys from the pins on the collar; then remove the pins. Slide the bypass door assembly and collar off the shaft and remove.
- Remove the bolts securing the plate to the bypass door; then remove the plate.
- Remove the bypass door rope. Place the new bypass door rope into position and secure with the plate and bolts.
- Slide the collar and bypass door onto the bypass door shaft; then align the collar with the holes, install the pins and install the keys.
- Install the four new carriage bolts; then install the access cover and top rear panel.

- Working inside the firebox, install the four new nuts.

SOLENOID

- Disconnect power to the outdoor furnace.

WARNING

Do not proceed without testing that power is disconnected. Make sure the power cannot be reconnected while servicing the solenoids (i.e., use lock out, tag out).

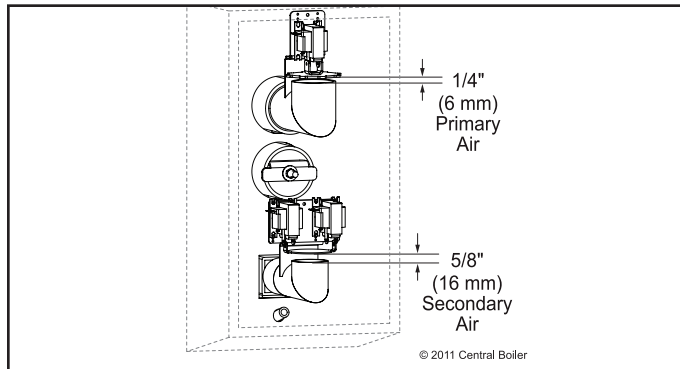
- Open the airbox cover located at the rear of the outdoor furnace.

NOTE: Smoke or creosote in the airbox is an indication that the bypass door was closed before waiting 15 seconds and/or the exhaust flow through the bottom of the firebox is plugged. After closing the firebox door, always wait for 15 seconds; then *slowly* pull the bypass door handle toward the front of the outdoor furnace and push down to close the bypass door.

- Disconnect the wires from the solenoid that is to be replaced.
- On the solenoid to be replaced, straighten the cotter pin that secures the air regulating disc to the solenoid and remove the pin.
- Mark the location of the solenoid to be replaced on its mounting bracket so the replacement solenoid can be installed in the same position.
- Remove the four screws securing the solenoid to be replaced to the bracket and remove the solenoid.
- Install the replacement solenoid on the bracket. Loosely install the four screws removed in step 6.
- Align the replacement solenoid with the mark made on the mounting bracket and tighten the four screws.
- Inspect the cotter pin hole in the air regulating disc for damage. If the hole is damaged, a new disc must be installed.
- Install the disc onto the air tube making sure the disc fits evenly. Install the cotter pin through the solenoid and disc; then bend the ends of the pin to prevent it from falling out.
- Connect the wires disconnected in step 3.
- Manually lift the solenoid and let it fall several times to ensure nothing can obstruct its operation. Perform the same check on all other solenoids in this compartment.
- Close the airbox cover; then connect power to the furnace and test solenoid operation.

NOTE: The factory settings for air regulating discs are illustrated in Fig. 72.

Fig. 72

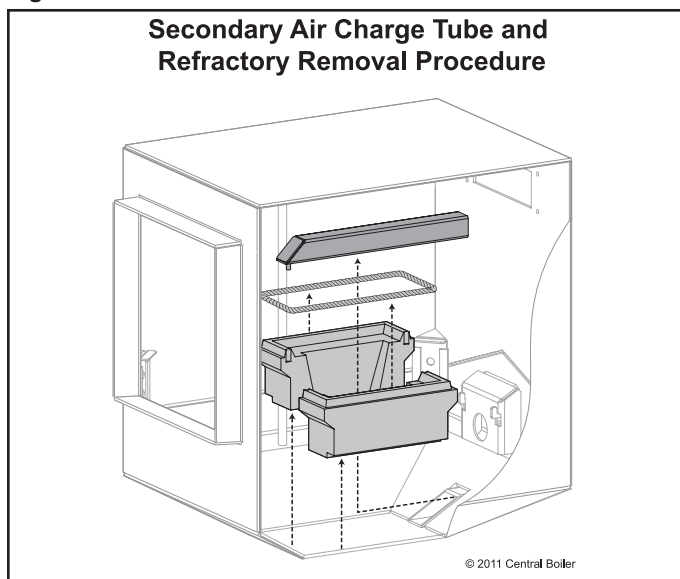


SECONDARY AIR CHARGE TUBE AND REFRACTORY MODULES

WARNING

Remove all wood, coals and ash from the firebox and allow the firebox to cool thoroughly before replacing the secondary air charge tube and/or refractory.

Fig. 73



1. Remove the secondary air charge tube by lifting it up and sliding it toward the front of the outdoor furnace.
2. Remove the rope gasket; then remove the existing refractory modules.
3. Install the new refractory modules making sure the bottom lip rests securely on the firebrick in the Reaction Chamber; then install a new rope gasket on top of the refractory modules.
4. Install the new secondary air charge tube by placing it in the opening at the back of the outdoor furnace as shown; then push it toward the back of the outdoor furnace to secure it in place making sure the alignment pin fits into the alignment hole in the refractory modules.

THERMOCOUPLE

1. Disconnect power to the outdoor furnace.

WARNING

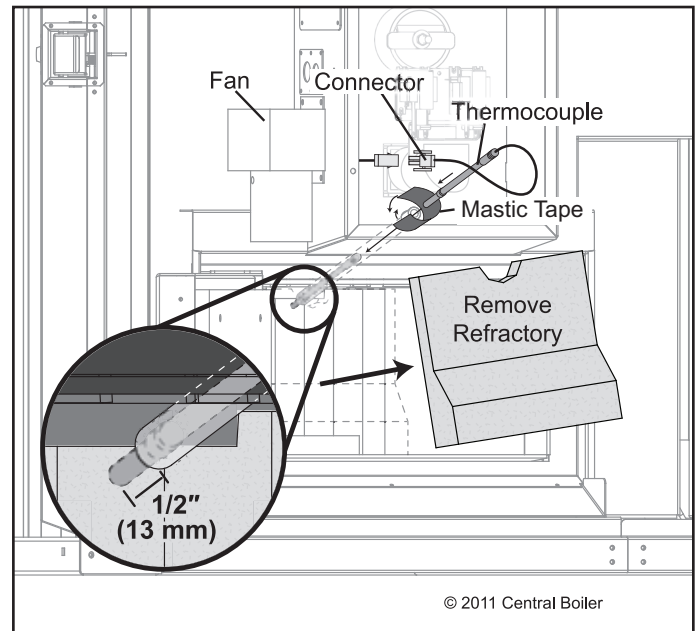
Do not proceed without testing that power is disconnected. Make sure the power cannot be reconnected while replacing the thermocouple

2. Open the airbox cover located at the rear of the outdoor furnace.

NOTE: Smoke or creosote in the airbox is an indication that the bypass door was closed before waiting 15 seconds and/or the exhaust flow through the bottom of the firebox is plugged. After closing the firebox door, always wait for 15 seconds; then *slowly* pull the bypass door handle toward the front of the outdoor furnace and push down to close the bypass door.

3. Disconnect the thermocouple connector; then remove the mastic tape from the thermocouple.
4. Remove the thermocouple.
5. Install the new thermocouple until 13 mm (1/2") of the temperature sensor extends into the Reaction Chamber.

Fig. 74



6. Secure the thermocouple with the mastic tape; then connect the thermocouple connector.
7. Close the airbox cover; then connect power to the furnace.

SECTION 5 – TROUBLESHOOTING

GENERAL TROUBLESHOOTING INFORMATION

The E-Classic operates differently than other types of wood-burning appliances. Understanding how the E-Classic operates will help you to quickly identify and solve many commonly asked questions. Be sure to read thoroughly and understand Section 2 – Operating Instructions.

If the outdoor furnace is not operating the way it should, start by asking yourself the following questions before continuing with more extensive troubleshooting.

Are the pieces of wood properly seasoned?

For the best results, it is best to burn seasoned wood for the following reasons:

- The higher the moisture content of the wood being burned, the less efficient the outdoor furnace is, because it uses extra wood to evaporate the moisture.
- The higher the moisture content of the wood being burned, the harder it is to maintain the proper coal bed because energy is required to heat the wood and more slowly evaporate (boil off) the water.
- The larger the heat load on the outdoor furnace, the drier the wood needs to be in order to maintain an adequate coal bed.

By loading the smallest, driest pieces of wood in the firebox first, it will help to dry out the wood loaded on top of those pieces.

Is the coal bed the correct depth?

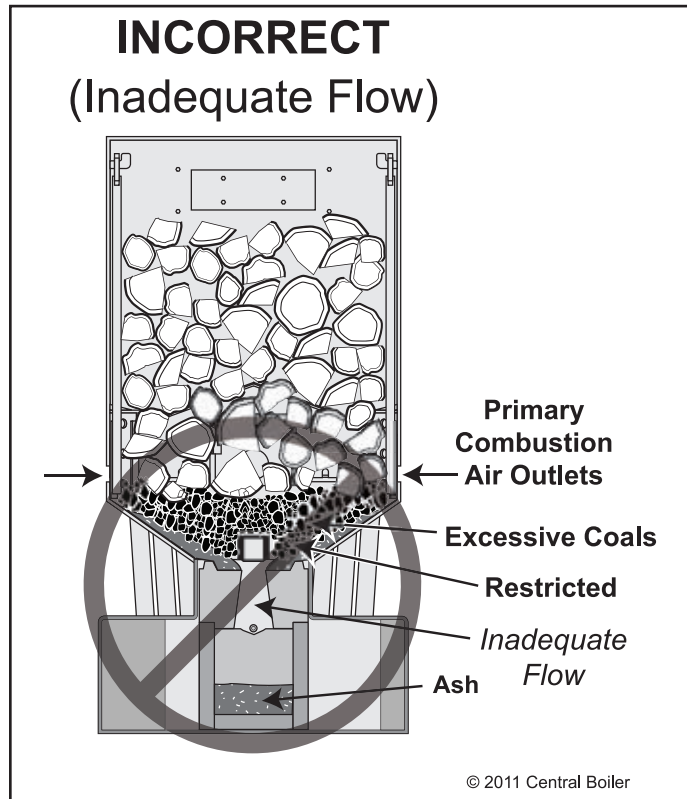
One to three inches (2.5 to 7.5 cm) of glowing coals are needed to optimize the operation of the outdoor furnace. If there is no coal bed, or if the coal bed is too shallow, it may affect emissions. If the FireStar controller never changes from Low Burn to High Burn (see FireStar Controller section), it could be an indication that the coal bed is inadequate.

If the coal bed is too deep, it could restrict air flow, the coals will stop glowing, and Btu output will be lowered (as shown in Fig. 75).

WARNING

Combustion air outlets must not be blocked or covered by coals.

Fig. 75

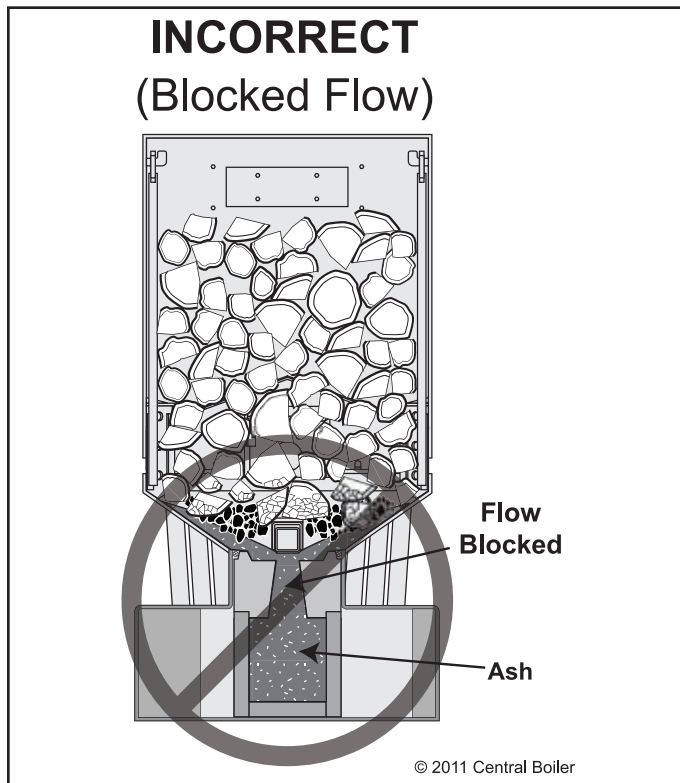


Is the Reaction Chamber full of ash?

The Reaction Chamber is where final combustion occurs. It is important that the Reaction Chamber remain unobstructed to allow final combustion to occur. It is not designed to be an ash collection area, although over time ash may gradually accumulate in the Reaction Chamber.

If ash builds up in the Reaction Chamber to a level that obstructs flow (as shown in Fig. 76), the performance of the outdoor furnace will be affected, so the ash must be removed. A good rule is to clean the Reaction Chamber before it becomes 1/3 full (approximately 3" or 7.5 cm deep in any area of the Reaction Chamber).

Fig. 76



Are the air outlets plugged?

Primary combustion air is provided through the combustion air outlets in the firebox. The air outlets must not be plugged or obstructed for the outdoor furnace to operate correctly. If it appears the combustion air outlets are plugged or restricted, refer to the Complete Firebox Cleaning Procedures section. If after cleaning each combustion air outlet, air flow is still blocked, inspect the primary combustion air elbow. Refer to section 3-14 Primary Combustion Air Elbow for the procedure.

Is there creosote and/or ash inside the airbox?

Creosote, ash, or even coals in the airbox is an indication that the outdoor furnace has not been maintained and/or operated properly. Especially important to the operation and efficiency of the outdoor furnace is unimpeded air flow throughout the entire system. Refer to Operating the E-Classic for Maximum Efficiency and Performance for a detailed explanation of how the E-Classic is designed to operate.

Following are possible causes for creosote and/or ash in the airbox:

1. **One or more combustion air outlets are covered** - If the level of coals and ash in the firebox is allowed to accumulate over the combustion air outlets, normal air flow can be blocked and could force coals and ash back into the airbox. Remove enough ash so the combustion air outlets are not covered. Review the Operating Instructions section for more information.

2. **Bypass door not operated correctly** - The function of the bypass door is to prevent the buildup of gases in the firebox in certain situations by venting them out through the chimney.

An example is when adding wood to the outdoor furnace with a very hot bed of coals or a raging fire in the firebox. If after closing the firebox door, the bypass door is closed too quickly, the fire can actually be put out. Gases will continue to accumulate in the firebox until they re-ignite, forcing smoke (and ash and coal, if above the air outlets) back into the airbox. This is an example of why it is important to *always wait 15 seconds* after closing the firebox door before *slowly* closing the bypass door.

CAUTION

Always wait 15 seconds after closing the firebox door to close the bypass door and always close the bypass door slowly. Never slam the bypass door shut.

TROUBLESHOOTING OTHER SITUATIONS

A. OUTDOOR FURNACE IS NOT OPERATING CORRECTLY

1. **Out of wood** - Add wood as necessary. Use correctly sized, seasoned wood.
2. **Mixing channel (area directly below the charge tube) obstructed** - Inspect and clean as required.
3. **Combustion air outlets obstructed** - Clean as required to prevent the combustion air outlets from being obstructed.
4. **Combustion air fan obstructed or not running** - Check the screen over the fan inlet and the inside of the fan for any obstructions.
5. **Airbox leaking** - The airbox cover must be properly secured. Determine the cause and correct.
6. **Primary air solenoid closed** - If the primary air solenoid is not operating properly, determine the cause and correct.
7. **Reaction Chamber, heat exchanger or the chimney plugged** - If the Reaction Chamber, heat exchanger or chimney are plugged, determine the cause and correct.
8. **Door open** - If the display on the controller indicates DO, close the firebox door. Make sure the firebox door is properly latched and check the condition of the firebox door seal (Fig. 67). If it is not sealing properly (indicated by a uniform indentation), replace the seal. If firebox door does not close tightly, adjust using the appropriate procedure (see Owner Serviceable Items).

9. **Low water** - If the display on the controller indicates **LL**, the system senses a low water condition. Check the water level at the sight gauge and, if necessary, add water according to the Water Quality and Maintenance section. If adding water does not correct the problem, contact your Central Boiler dealer.

10. **Low water temperature for too long a period of time** - The display on the controller will indicate **FD** and the controller will shut down the furnace if the water temperature has been too low for too long. Determine the cause of the water temperature being too low.

11. **Alarm condition** - Refer to FireStar Controller for E-Classic Operating Instructions.

12. **Chimney not drafting properly** - Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Draft occurs when the temperature in the chimney is high enough to cause a negative pressure that "pulls" the exhaust up and out the chimney.

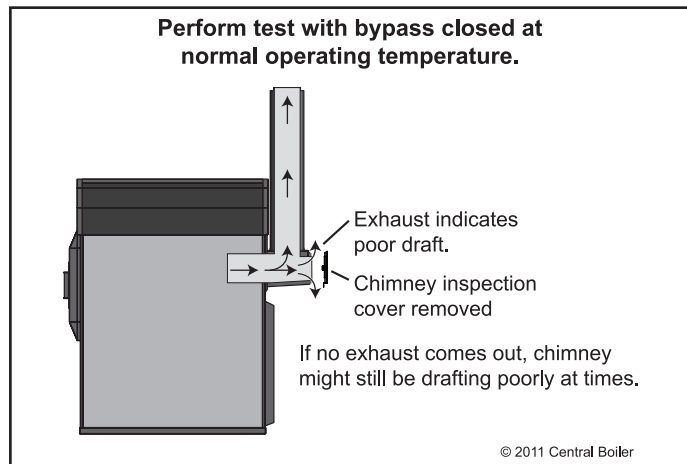
Proper draft is necessary for the E-Classic to operate optimally. Too much draft may cause excessive temperatures in the appliance. Inadequate draft may cause backpuffing and plugging of the chimney.

If poor draft is suspected, perform the following test: with the outdoor furnace and chimney at normal operating temperature, and with the bypass door closed, loosen the chimney inspection cover and pull it back about an inch (Fig. 77). If exhaust comes out from around the cover, pressure in the chimney may be incorrect and adding more chimney sections may be required. However, due to many variables, even if exhaust does not come out from around the cover, the chimney might still not be drafting properly at all times. Due to a number of variables, poor draft can be an intermittent problem.

NOTE: A qualified installer may perform the following test to check for proper draft. Before performing the test, the outdoor furnace should be completely cleaned to ensure nothing obstructs exhaust flow through the system. Fire the furnace and allow it to reach normal operating temperature before performing the test.

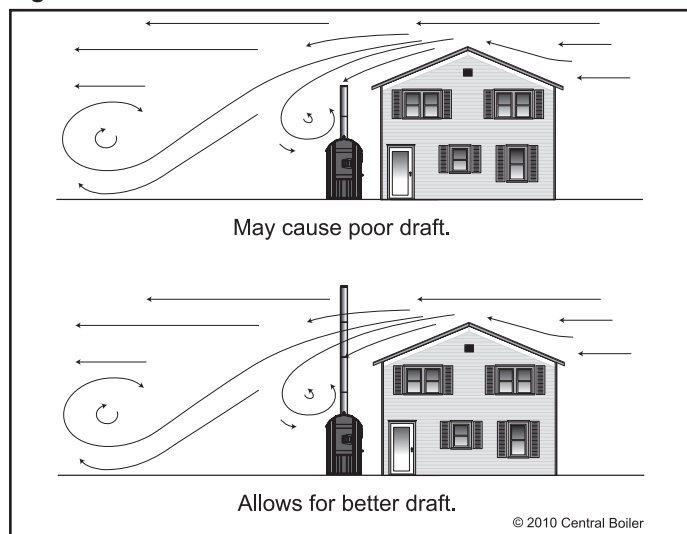
- Drill a hole in the chimney inspection cover; then with the outdoor furnace and chimney at normal operating temperature, and with the bypass door closed, use a manometer to check draft. If flue draft exceeds -0.05 in. WC (-12.45 Pa) add more chimney sections.
- After the test, fill the hole in the chimney inspection cover with high-temp silicone.

Fig. 77



- If a spark arrestor is being used, make sure it is clean and unobstructed.
- Objects like buildings and trees in close proximity or nearby terrain (e.g., hills, valleys, etc.) can adversely affect air flow in the chimney (see Fig. 78). Adding chimney sections may overcome these factors.

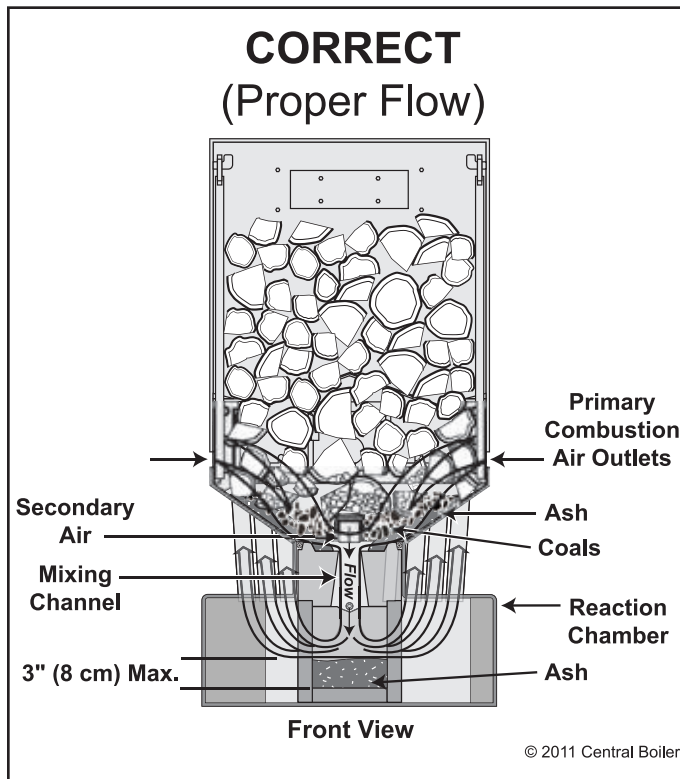
Fig. 78



B. FIRE GOES OUT OR KEEPS GOING OUT

1. **Wood moisture content is too high** - Use properly seasoned wood with a moisture content of 20% or less.
2. **Diameter of wood too large** - Wood between 4" and 8" (10 and 20 cm) in diameter works well in most cases. Larger diameter wood may need to be split.
3. **Wood too tightly packed** - Load the wood so that the combustion air outlets on the sides of the firebox do not become blocked or restricted.

Fig. 79



4. **Load of wood too large in relation to coal bed** - Adequate coals are needed to restart the fire after adding wood. If adding too much wood causes the fire to go out, either add drier, smaller pieces of wood first or partially fill with wood to allow time for the coals to restart the fire.
5. **Water temperature setpoint too low** - Set the water temperature setpoint higher (see Adjusting Water Temperature Setpoint).
6. **Water temperature differential too large** - Set the water temperature differential to a smaller value (see Changing Control Variables).
7. **Too much time between idle pulses of air** - Reduce the time between idle pulses of air (see Changing Control Variables).
8. **Length of pulse of air too short** - Increase the amount of time the pulse of air is provided (see Changing Control Variables).
9. **Not enough ash in the firebox** - Some ash, but not more than three inches, on the sides and bottom of the firebox is necessary for the proper operation of the outdoor furnace (as shown in Fig. 46). No ash should cover the mixing channel (the area alongside the secondary air charge tube). Ash acts as an insulator, keeping the glowing coals in the bottom of the firebox hot enough to restart the fire when needed after being in idle mode.

10. **Optional gas-fired wood ignition not operating** - Check that the supply valve is turned on, the propane tank is not empty and that Wood Auto Relight is enabled. Refer to the gas-fired wood ignition manual for more information.

C. BUILDING IS LOSING TEMPERATURE

1. **Circulation valve(s) closed** - Be sure the proper valves in the system are open to allow circulation.
2. **Circuit breaker off** - If there is a circuit breaker that supplies power to the outdoor furnace, check that it is on.
3. **Circuit breaker on airbox off** - Check that the circuit breaker switch on the airbox is on. If the circuit breaker has tripped, determine the cause before resetting it.
4. **Circulation pump(s) not operating** - Check that circulation pumps are operating. If not, disconnect power to the pump. Close valves at the pump. Disassemble the pump and try to turn the pump shaft. If the shaft is stuck, replace the pump cartridge. Replace only the cartridge whenever possible. If necessary, replace the pump. Follow instructions supplied with the pump.
5. **Air in system** - Check for air in the water lines or heat exchangers. If you hear a gurgling sound in a heat exchanger, air is present in the system. Shut off the pump, wait 15 seconds and start the pump. If it is necessary to force air from lines, refer to Initial Start-up Procedures.
6. **Building(s) poorly insulated or uninsulated** - Poorly insulated or uninsulated buildings, buildings with uninsulated or poorly insulated ceilings, or a lack of proper insulation under radiant flooring can cause excessive fuel consumption and or heating problems.
7. **Supply and return lines installed incorrectly** - Make sure the hot supply line is connected to the correct fitting on the outdoor furnace and heat exchanger.
8. **Circulation pump(s) installed backwards** - Check that pump flow direction is correct. If not, shut off power to pump. If the flow is not in the correct direction, disconnect pump from water line and reverse pump mounting to correct flow direction. If the pump is not mounted on the outdoor furnace, check for proper pump mounting location (see Fig. 15).
9. **Underground supply and return lines insulated poorly** - Heat loss from poorly insulated underground supply and return lines is often indicated by an unusually high amount of snow melting above the lines when the ground temperature is 10° F (-12°C) or colder.

10. **Supply and return lines uninsulated** - Uninsulated supply and return lines in areas that are not intended to be heated (unheated crawl spaces, under mobile homes, etc.) may cause excessive heat loss. Insulate the supply and return lines.

12. **Poor water quality** - Water with high amounts of solids, sand or dirt can create deposits inside the wall of heat exchanger components, reducing the amount of heat output. If this condition is suspected, contact your Central Boiler dealer.

13. **New construction with radiant in-floor heat** - Bringing a cold concrete slab up to temperature the first time will take a considerable amount of time and wood; once warm, wood consumption will be reduced if the concrete slab and building are insulated properly.

14. **Heat load too large** - Re-evaluate the system and match heat load to the outdoor furnace.

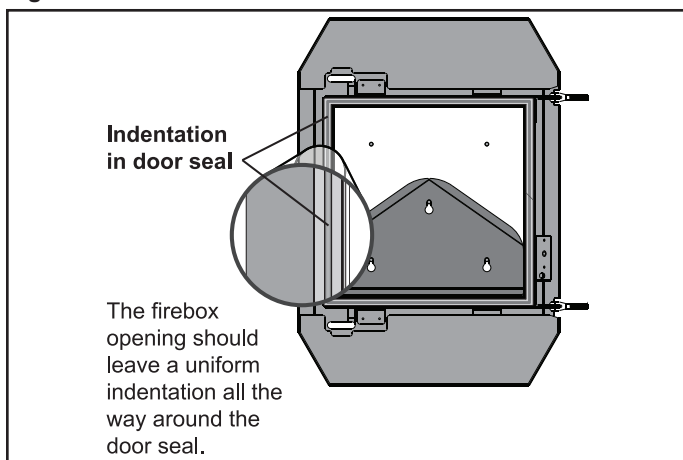
D. SMOKE COMING FROM BETWEEN FIREBOX DOOR AND FRONT OF THE DOOR FRAME

1. **Door seal faulty or door frame obstructed** - If there is smoke coming from between the firebox door and the front of the door frame for more than a short time after reloading, scrape the face and surface area of the door frame to remove any deposits. Check the condition of the firebox door seal and replace if necessary.

E. OUTDOOR FURNACE IS OVERHEATING

1. **Air entering through the firebox door or smoke coming out of the firebox door when the door is closed** - Make sure the firebox door is properly latched and check the condition of the firebox door seal (Fig. 80). If it is not sealing properly (indicated by a uniform indentation), replace the seal. If firebox door does not close tightly, adjust using the appropriate procedure (see Owner Serviceable Items).

Fig. 80



NOTE: If the outdoor furnace is operated with the door open, the firebox door seal will melt.

2. **Solenoid and/or air regulating disc stuck open or obstructed** - Remove any obstructions. Lubricate with WD-40 or similar type of lubricant. If replacement is necessary, refer to Fig. 72 for the factory settings for the air regulating discs.

NOTE: If the outdoor furnace loses water from boiling, the problem should be identified and repaired immediately. Under normal operation, little or no water needs to be added. Adding water to the furnace may cause corrosion if not immediately treated with Corrosion Inhibitor Plus™ to the proper pH and nitrite levels. In addition, the amount of dissolved solids in the system (due to adding additional water) can cause problems.

3. **Water is not circulating** - Check to make sure the pump is operating and water is circulating continuously through the supply and return lines to keep water temperature uniform in the outdoor furnace.

4. **Circulation valve(s) closed** - Be sure the proper valves in the system are open to allow circulation.

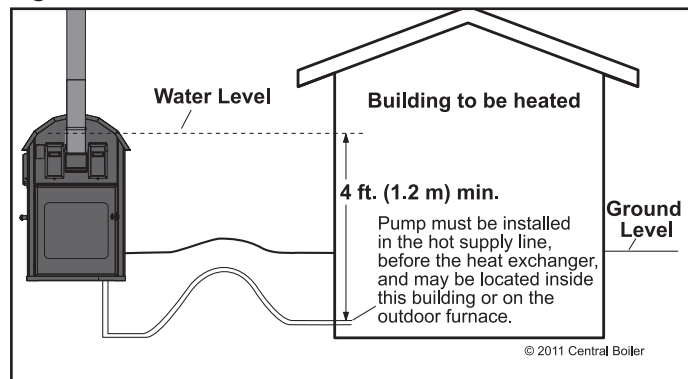
5. **Pulse set to run too long and/or too often in a low heat draw situation** - Increase the time between idle pulses of air and/or decrease the amount of time the pulse is provided (see FireStar operating instructions).

5. **FireStar controller set incorrectly** - Refer to FireStar operating instructions.

F. FREQUENT PUMP TROUBLE OR POOR WATER CIRCULATION

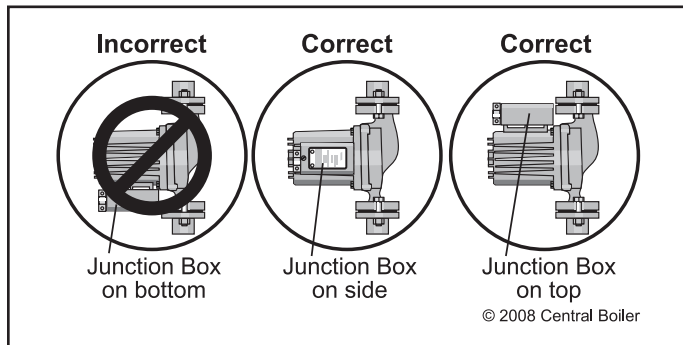
1. **Pump mounted incorrectly** - If the pump is not mounted on the outdoor furnace, it must be mounted at a minimum of four feet lower than the top water level in the outdoor furnace (see Fig. 81).

Fig. 81



Make sure the pump motor is installed in a horizontal position. The junction box must not be located below the pump motor (see Fig. 82). If necessary, remove the four screws and rotate the pump body.

Fig. 82



2. **Water will not circulate** - If the system has been drained and refilled, or if the system has been opened for any reason (e.g., replacement of pump, adding heat exchangers, repairing a leak), the system must be purged (see Initial Start-up Procedures).
3. **Poor water quality** - Water with high amounts of solids, sand or dirt can cause frequent pump failure. Use softened and/or filtered water.
4. **Deposits in water lines/heat exchanger walls** - If water high in silica or other mineral content has been used, material deposits may build up on the insides of the supply and return lines and on the heat exchanger walls. If this occurs, the system will need to be drained and then cleaned using Sludge Conditioner (p/n 166). The system must then be refilled with the proper amount of Corrosion Inhibitor Plus (p/n 1650) and fresh water.

G. BURNING AN EXCESSIVE AMOUNT OF WOOD

1. **High volume water heating** - High volume water heating (e.g., car wash, swimming pool, etc.) will require high wood consumption.
2. **Excessive heat loss** - See items 6-10 of Building is Losing Temperature.
3. **Supply and return line heat loss** - If not using ThermoPEX, supply and return lines buried in a wet, low-lying area may cause a large heat loss that will greatly increase wood consumption.

4. **High heat demand** - Concrete slabs (with radiant heat) that are poorly insulated or are exposed to water or cold outside temperatures will require increased wood consumption (see Hydronic Installations section). Bringing a cold concrete slab up to temperature the first time will take a considerable amount of time and wood; once warm, wood consumption will be reduced if the concrete slab and building are insulated properly. The following will also have a high heat demand: poorly insulated buildings, buildings with large amounts of glass windows/doors, buildings with overhead doors, greenhouses, uninsulated crawl spaces, outdoor air infiltration and air leaking through foundation.

5. **Bypass door open or not sealing properly** - Pull the bypass handle toward the front of the furnace and push down to close the bypass door or check for obstructions.

H. VISIBLE EXHAUST COMING FROM CHIMNEY

There are conditions related to outside temperatures, humidity, fuel moisture, burn rate and other factors that can cause steam to be visible in the exhaust plume of combustion equipment, whether it is wood, gas or oil.

Seeing a white exhaust plume with moisture present is normal under many conditions and is not suggestive of poor combustion or high emissions.

Opacity is the amount of light which is blocked in an exhaust plume. It is a measurement that is usually stated as a percentage. For example, an opacity of 0% means that all light passes through while an opacity of 100% means that no light can pass through. Opacity measurements give an indication of the concentration of particles in an exhaust plume.

To read opacity correctly, observations should be made only when:

- The sun is shining and behind you,
- You are at least three times the distance of the chimney height away from the furnace, and
- The plume is traveling perpendicular to your position.

The observation should be conducted looking at the point of the plume where condensed water vapor (steam) is not present. Do not observe the plume itself but rather look through it at a contrasting background (such as green leaves or trees). There are many other important factors as well.

The amount of visible emissions can be reduced by burning seasoned wood, by making sure that your chimney meets the recommendations in this owner's manual and by loading the firebox to match your heat load. Once the water content of the wood has evaporated, the emissions become very transparent.

1. **Bypass door open** - Pull the bypass handle toward the front of the furnace and push down to close the bypass door.
2. **Bypass door not sealing properly** - Make sure nothing is obstructing the bypass door, preventing it from closing completely. When the bypass door handle is pulled toward the front of the outdoor furnace and pushed down, the bypass door must form a seal over the bypass opening.

If the bypass door is obstructed, it may be necessary to shut down the outdoor furnace, allow it to cool thoroughly, and then inspect and clean the bypass door and chimney transition box.

Inspect and clean both from inside the firebox and in the chimney transition box (accessible by removing the top rear panel and access cover to the heat exchanger). It might also be necessary to remove the chimney and chimney tee to gain better access to the area.

If the outdoor furnace is being operated properly, the entire chimney transition box should always be completely dry. Any creosote or other moisture-related buildup is an indication that temperatures in the Reaction Chamber are not high enough. This can be caused by not loading the wood correctly, the wood having too high a moisture content, the outdoor furnace being operated with the firebox door open, or the lack of a sufficient coal bed.

3. **Solenoid air regulating disc not adjusted properly** - Refer to Fig. 72 for the factory settings for the air regulating discs.
4. **Solenoid not operating properly** - Refer to Solenoid in Owner Serviceable Items section if replacement is necessary.
5. **Too much ash in firebox** - Refer to Routine Maintenance for ash removal.
6. **No glowing coal bed** - One to three inches of glowing coals are needed to optimize the operation of the outdoor furnace.
7. **Wood contains too much moisture** - Use correctly sized, seasoned wood.

I. CORROSION IS PRESENT

Corrosion in the firebox can occur when the outdoor furnace is being operated improperly. To maximize the life of your investment, it is important to identify signs of corrosion early (you can do this by performing the items in the Preventive Maintenance Schedule) and take measures to correct it as soon as possible. Some, but not all, causes of corrosion are listed below with possible solutions. If you are unsure how to proceed, contact your Central Boiler dealer.

1. **Water temperature is too low** - If the heat load in the system is too large, the water in the system will not reach high enough temperatures to dry the firebox and corrosion can occur. Re-evaluate the system and match heat load to the outdoor furnace.

NOTE: To reduce condensation in the firebox, it is not recommended to set the temperature below 185°F (85°C).

2. **Heat load is low** - If the heat load is low (during warm outdoor temperatures, for example), filling the firebox full with wood can lead to condensation in the firebox. When the demand for heat is low, add only enough wood to the firebox to last for about 12 hours.
3. **Thermostatic valve is not installed** - A thermostatic valve must be installed on each set of supply and return lines in the system to maintain the outdoor furnace water temperature above 150°F (65°C).
4. **Acids forming in the firebox** - Use more Ashtrol in the firebox.
5. **Quality of wood poor** - Use wood with a lower moisture content or if the wood is properly seasoned, it may help to try a different species of wood.
6. **Burning garbage or plastic** - Do not burn garbage or plastic. It is likely unlawful and may damage the firebox in a very short period of time.

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

7. **Firebox wasn't cleaned out at the end of the heating season** - Be sure to follow the post-heating season maintenance schedule which includes scraping out firebox and removing all ash.

SECTION 6 – GENERAL INFORMATION

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

⚠ WARNING
Turn off Furnace Power Disconnect before opening this panel.

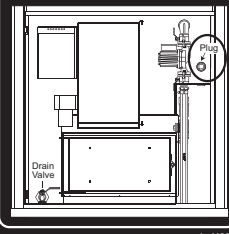
⚠ AVERTISSEMENT
Avant d'ouvrir ce panneau, arrêtez le commutateur de coupure électrique de la chaudière.

NOTICE
Furnace Power Disconnect located on side. →

REMARQUE
Ce commutateur se trouve sur le côté de la chaudière. →

p/n 7090246

CAUTION
If this configuration is used and water is drained from the furnace, remove the plug from the unused supply port to prevent damage from water freezing.



p/n 11288

NOTICE
Remove this fastener to remove panel. Install this fastener after replacing panel.

p/n 10307

CAUTION
Failure to perform proper care and maintenance will reduce the life and performance of your furnace. For best results, always follow these guidelines:

1. Add water treatment before filling with water.
2. Burn properly seasoned wood.
3. Do not burn anything other than the recommended fuels.
4. Clean and inspect the furnace regularly.
5. Do not operate with the water temperature below 150 F (66 C).
6. Maintain the recommended water treatment levels at all times.
7. Clean the firebox thoroughly and keep it dry when not in use.
8. See Owner's Manual for more information about regularly scheduled maintenance.

DO NOT BURN GARBAGE



Burning garbage causes damage to components of wood burning appliances.

Refer to your Owner's Manual.

BURN RESPONSIBLY

Preserve Your Right to Burn Wood

- Before installing, ALWAYS consider the direction that the chimney exhaust will travel with prevailing winds.
- BEFORE operating, the furnace must be installed with adequate chimney height. If there is a residence not served by the furnace within 300 feet (91.5 meters), the chimney must be 2 feet (0.6 meters) higher than the peak of the residence it serves. If there is a residence not served by the furnace within 100 feet (30.5 meters), the chimney must be 2 feet (0.6 meters) higher than the peak of the residence served or not served, whichever is higher. Proper chimney height will aid in dispersing the chimney exhaust. Chimney height may need to be greater than the above minimum requirements. The outdoor wood furnace must be installed in accordance with the manufacturer's recommendations and/or in accordance to all applicable codes and regulations, whichever is more stringent. Refer to your Owner's Manual.
- ONLY burn the proper fuels specified.
- DO NOT create a nuisance. Be certain your chimney exhaust is not adversely affecting neighbors. Creating a nuisance may affect your right to burn wood. If any issue with chimney exhaust arises, take immediate action to solve the issue.
- Properly dispose of ashes into a metal container with a cover.
- Wood burning can be more of an art than a science. The operator may need to vary technique to achieve satisfying results as installations, heat loads and fuel vary. Over time, you will become familiar with your particular installation and you will be able to identify cause and effect in a variety of circumstances.
- Protect your right to heat with wood. Careless operation may result in a loss of your rights.

p/n 7090061

⚠ DANGER
• Risk of fire or explosion.

⚠ DANGER
• Risque d'incendie ou d'explosion.

⚠ WARNING
• Risk of fire.
• DO NOT operate with flue draft exceeding -0.053 in. water column (-12.450 Pa).
• DO NOT use chemicals to start unit firing.
• DO NOT burn garbage, gasoline, fuel oils, or other flammable liquids or materials.
• DO NOT operate with fuel/hooding or ash-removal doors open.
• DO NOT store fuel or other combustible materials within marked installation clearances.
• Inspect and clean flues and chimney regularly.
• For safety, open bypass door 15 seconds before opening the firebox door and do not operate the furnace with the firebox door unlatched.
• Operating the furnace with the firebox door unlatched may lead to a runaway fire. In the event of a runaway fire or immediately after tending to the fire, latch the firebox door and wait 15 seconds before closing the bypass door to purge the firebox.
• DO NOT leave furnace unattended with the firebox door unlatched.
• DO NOT install or operate furnace before first reading and understanding the Owner's Manual.
• DO NOT allow others to install or operate furnace without first reading and understanding the Owner's Manual.

⚠ CAUTION

- DO NOT start fire until water level is full.
- Keep face away from door area.
- Hot surfaces.
- Keep children away.
- DO NOT touch during operation.
- DO NOT burn treated wood, plastics or rubber in the furnace.
- Maximum draft marked on the nameplate.
- ALWAYS comply with all applicable 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.

⚠ ATTENTION


- NE démarrez PAS le feu avant de faire le plein d'eau.
- Éloignez votre visage de la porte.
- Surfaces brûlantes.
- Éloignez les enfants.
- NE touchez PAS pendant l'utilisation.
- NE brûlez PAS de bois traité, de plastique ou de caoutchouc dans la chaudière.
- Le tirage maximal est indiqué sur la plaque signalétique.
- Respectez TOUJOURS l'ensemble des législations et réglementations applicables.
- Procédez TOUJOURS avec précaution lorsque vous ajoutez du bois dans la chaudière pour éviter de faire tomber des braises à l'extérieur.
- Stockez TOUJOURS les cendres dans un récipient non combustible et couvert.

p/n 7090233

⚠ WARNING
Risk of fire. Do not open the Reaction Chamber door when appliance is in operation. Do not leave Reaction Chamber door open when unattended.

NOTICE
During a cold start, a considerable amount of moisture from condensation will collect inside the firebox and Reaction Chamber. This is normal and the moisture will evaporate when the outdoor furnace reaches operating temperature.

CAUTION



Take care not to damage or move the firebrick.

6" (1.5 m) Maintenance Clearance

Remove refractory before cleaning out ash.

Take care not to damage the temperature sensor when removing ash.

p/n 11435

ATTENTION!
The Owner's Manual is located behind the furnace rear access panel. Remove and read it before operating furnace. If you have any questions, contact your dealer.

MAINTENANCE SCHEDULE

DAILY
Check water level. Remove ashes as needed.

MONTHLY
Check door seal, chimney and vent cap. Remove ashes and clean the firebox. Inspect and clean the heat exchanger and Reaction Chamber.

SEMIANNUALLY
Completely remove ashes from the firebox. Inspect and scrape the firebox. Inspect and clean the heat exchanger and Reaction Chamber. This inspection should also be performed after the first and third months of operation. Use a wire brush and small scraper to clean firebox, side walls, back wall and ash pan.

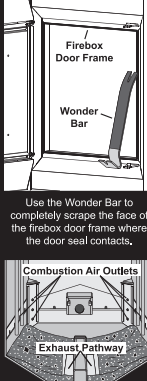
READ OWNER'S MANUAL FOR COMPLETE INSTRUCTIONS.

p/n 7090062

⚠ AVERTISSEMENT

- Risque d'incendie.
- N'UTILISEZ PAS l'appareil si le tirage dépasse de -0,050 pouce la colonne d'eau (-12,450 Pa).
- N'utilisez PAS de produits chimiques pour allumer la machine.
- Ne brûlez PAS de déchets, d'essence, d'huile de vidange ni d'autres liquides ou matériaux inflammables.
- NE faites PAS fonctionner la chaudière avec la porte de chargement du combustible ou celle d'enlèvement des cendres ouverte.
- NE stockez PAS de carburant ou autres matériaux combustibles à l'intérieur du périmètre de sécurité indiqué.
- Inspectez et nettoyez périodiquement les carneaux et la cheminée.
- Pour des raisons de sécurité, ouvrez la porte de dérivation quinze secondes avant d'ouvrir la porte du foyer. Ne faites pas fonctionner la chaudière avec la porte du foyer déverrouillée.
- Si la chaudière fonctionne avec la porte du foyer déverrouillée, un feu de cheminée risque de se déclarer. Si un feu de cheminée survient ou immédiatement après avoir éteint le feu, verrouillez la porte du foyer et attendez quinze secondes avant de fermer la porte de dérivation pour purger le foyer.
- Ne laissez PAS la chaudière sans surveillance lorsque la porte du foyer est déverrouillée.
- N'installez PAS et N'utilisez PAS la chaudière avant de lire et de comprendre le manuel du propriétaire.
- N'autorisez PAS d'autres personnes à installer et utiliser la chaudière avant de lire et de comprendre le manuel du propriétaire.

NOTICE



Use the Wonder Bar to completely scrape the face of the firebox door frame where the door seal contacts.

Combustion Air Outlets

Exhaust Pathway

Keep the combustion air outlets and exhaust pathway open and clear of ash to allow the furnace to operate properly.

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NOTICE
Chimney pipe and all extensions must be insulated.

CAUTION
HOT Surfaces
Do NOT Touch During Operation

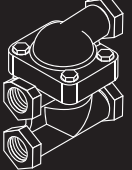
REMARQUE
Coupez l'alimentation électrique avant d'enlever ce panneau.

ATTENTION
Surfaces BRÛLANTES
NE touchez PAS pendant le fonctionnement

p/n 7090240

ATTENTION!
One Thermostatic Valve per set of supply and return lines must be installed in the system for the furnace's corrosion warranty to be valid.

READ OWNER'S MANUAL FOR COMPLETE INSTRUCTIONS.



p/n 10296

⚠ WARNING
Risk of fire. Do not store fuel or other combustible materials within marked clearances to combustibles. Do not cover supply and return lines with combustible materials.

⚠ AVERTISSEMENT
Risque d'incendie. Ne stockez pas de carburant ou autres matériaux combustibles à l'intérieur du périmètre de sécurité indiqué. Ne recouvrez pas les conduites d'alimentation et de retour avec des matériaux combustibles.

p/n 7090243

NOTICE
For use with aluminum or copper conductors.

p/n 7090039

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

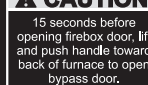
CAUTION
DO NOT disable the door switch, as it serves as a safety and reset function.

p/n 10306

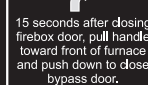
CAUTION
Watch your head.

p/n 8956

CAUTION
15 seconds before opening firebox door, lift and push handle toward back of furnace to open bypass door.



15 seconds after closing firebox door, pull handle toward front of furnace and push down to close bypass door.



p/n 11202

⚠ WARNING
Vent cap must fit loosely over pipe.

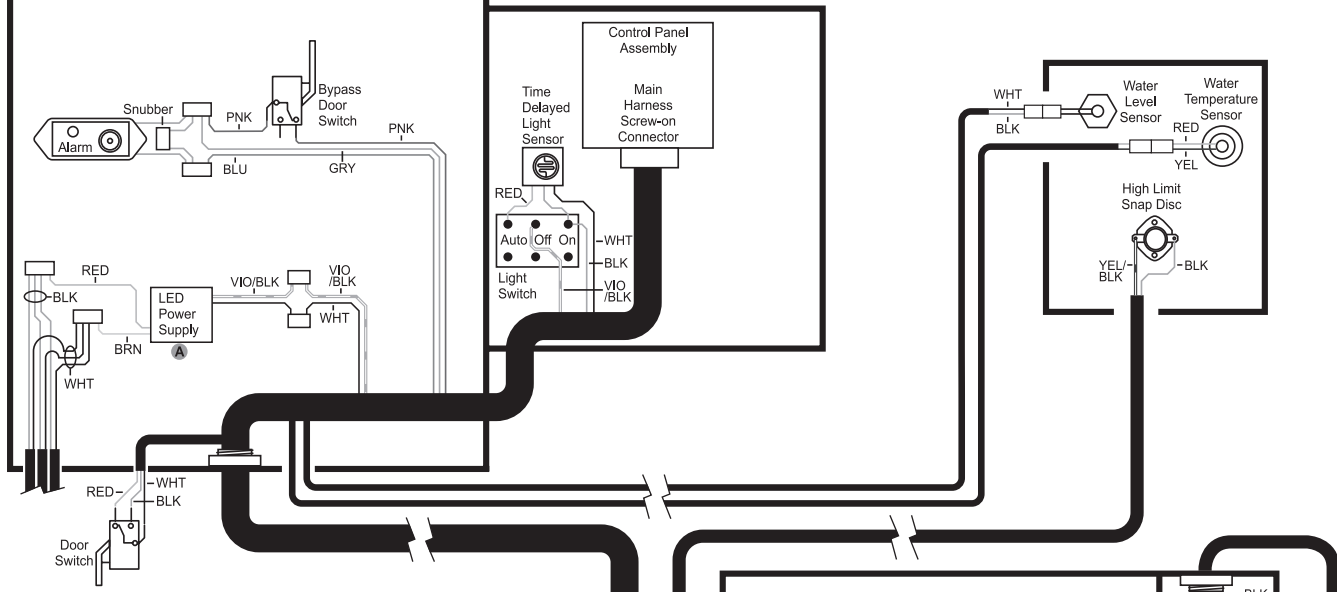
⚠ WARNING
Disconnect power before removing this panel.

⚠ AVERTISSEMENT
Coupez l'alimentation électrique avant d'enlever ce panneau.

p/n 7090245

E-CLASSIC 1450 WIRING DIAGRAM

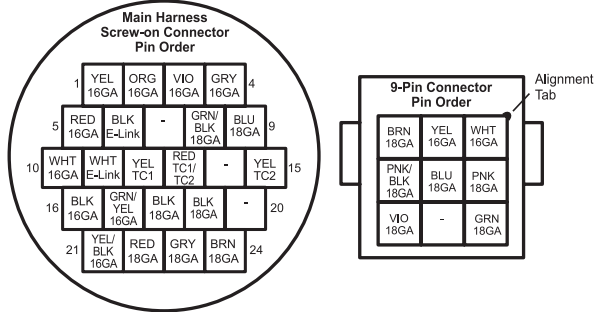
E-Classic 1450 Ignition Ready Wiring Diagram



NOTICE

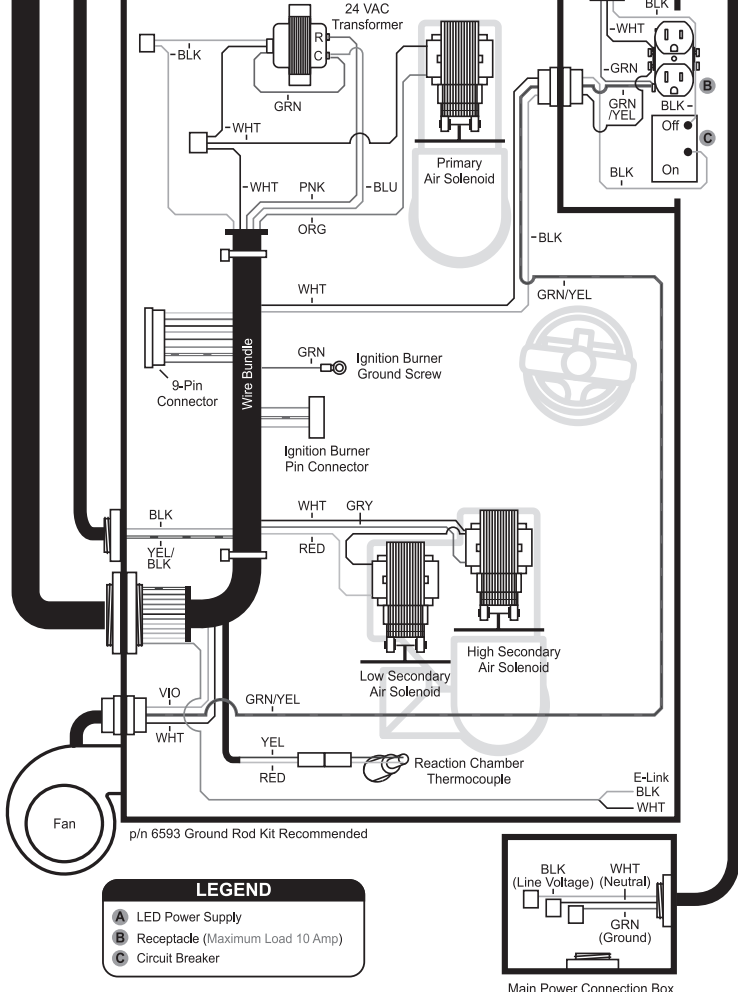
ATTENTION! IMMEDIATE ACTION REQUIRED

Corrosion Inhibitor Plus™ (p/n 1650) should be added to the furnace **BEFORE** it is filled with water. The normal rate for the initial treatment is: **E-Classic 1450 - 1 unit**
 Read Owner's Manual and test water to be certain that proper Corrosion Inhibitor and pH levels are achieved.



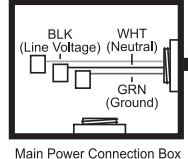
MAIN HARNESS SCREW-ON CONNECTOR WIRING REFERENCE GUIDE

TERMINAL	WIRE	DESTINATION
1	YEL 16GA	Gas Ignition 120 VAC Relay
2	ORG 16GA	Primary Air Solenoid
3	VIO 16GA	Fan
4	GRY 16GA	High Secondary Air Solenoid
5	RED 16GA	Low Secondary Air Solenoid
6	BLK 16GA	E-Link A
8	GRN/BLK 18GA	5 VDC - Door Switch and Water Level Sensor white wires.
9	BLU 18GA	24 V Common
10	WHT 16GA	Neutral - All white wires are connected except the Door Switch and Water Level Sensor white wires.
11	WHT 16GA	E-Link B
12	YEL TC1	Water Temperature Sensor
13	RED TC1/TC2	Reaction Chamber TC2 and Water Temperature Sensor TC1
15	YEL TC2	Reaction Chamber TC2
16	BLK 16GA	Line Voltage - All black wires are connected except the Door Switch and Water Level Sensor black wires.
17	GRN/YEL 16GA	Ground
18	BLK 18GA	Door Switch
19	BLK 18GA	Water Level Sensor
21	YEL/BLK 16GA	High Limit Snap Disc
22	RED 18GA	Door Switch
23	GRY 18GA	Bypass Open
24	BRN 18GA	Gas Ignition On



LEGEND

- A** LED Power Supply
- B** Receptacle (Maximum Load 10 Amp)
- C** Circuit Breaker



E-CLASSIC 1450 WIRING DIAGRAM - OPTIONAL POWER IGNITION

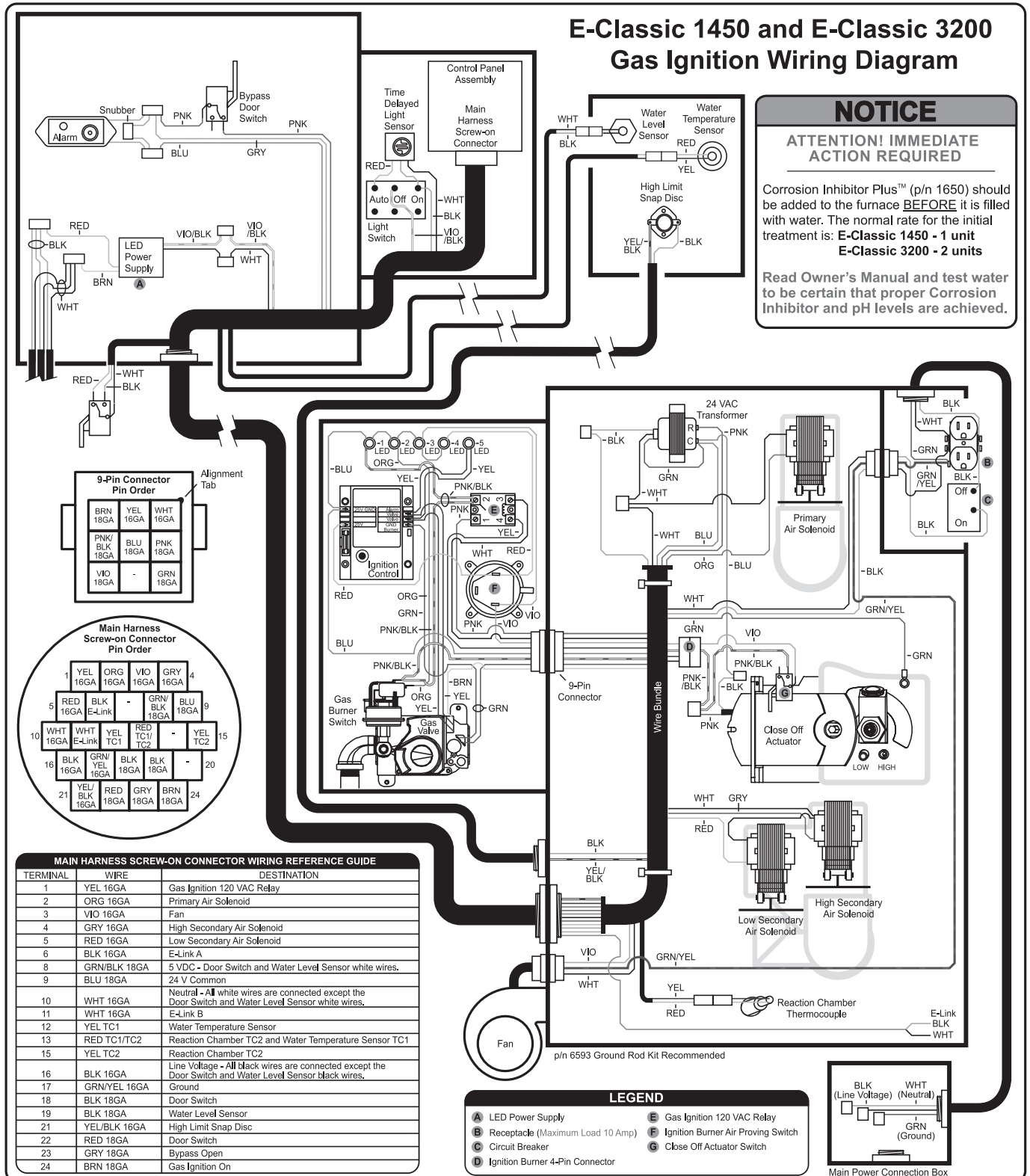
E-Classic 1450 and E-Classic 3200 Gas Ignition Wiring Diagram

NOTICE

ATTENTION! IMMEDIATE ACTION REQUIRED

Corrosion Inhibitor Plus™ (p/n 1650) should be added to the furnace **BEFORE** it is filled with water. The normal rate for the initial treatment is: **E-Classic 1450 - 1 unit**
E-Classic 3200 - 2 units

Read Owner's Manual and test water to be certain that proper Corrosion Inhibitor and pH levels are achieved.



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p/n 7000101

GLOSSARY

3-WAY VALVE

A valve that can supply one of two outlets, depending on the position of the valve handle.

AIR BLEEDER

A device that, when opened, allows air to flow out of the hydronic system.

AUTO FLOAT VENT

A device that will allow air out but not water. An air bleeder will close when it is completely full of water. Auto floats can allow air back into the system if they are above the water level in the furnace and are not manually closed after purging air from the system.

BYPASS DOOR / BYPASS DOOR HANDLE

Located at the back of the firebox near the top, the bypass door provides a way to redirect exhaust before opening the firebox door to add wood. During normal operation of the outdoor furnace, the bypass door remains closed. The bypass door handle on the side of the outdoor furnace is used to open or close the bypass door.

CHIMNEY FALL ZONE

A chimney fall zone is a circular area centered at the back of the outdoor furnace with a diameter approximately twice as high as the chimney. This represents the area that if the chimney were to fall, it could land anywhere within this zone. If objects are placed within this area, a chimney guy-wire band kit or additional bracing on the chimney is recommended.

CIRCULATION PUMP

The device that causes water to circulate within the heating system.

COMBUSTION AIR OUTLETS

The holes in the air channels inside the firebox that allow primary air into the firebox.

FIRE BARRIER

A device that blocks the spread of fire from one area to another by blocking flame, heat conduction, or heat radiation.

GROUND ROD

A copper or copper-coated steel rod driven into the earth near the outdoor furnace. This device conducts stray voltage into the ground, helping to prevent shock hazards, control board problems, ignition problems, and galvanic corrosion of the furnace.

HEAT EMITTER

The portion of the heating system that removes heat from the hot water and emits it into the space to be heated. This may be a baseboard register, a coil in a forced air furnace, tubing in a radiant floor. If the supply and return lines are not properly insulated, they will become heat emitters moving heat into the ground.

HYDRONICS

The name for the use of water as the heat transfer medium in heating systems.

MANIFOLD

A section of system piping that groups several branches of piping into one area.

MIXING CHANNEL

The channel below the secondary air charge tube, formed by the refractory.

PLENUM

The large duct area immediately before or after the forced-air furnace.

PRIMARY COMBUSTION AIR

The air injected into the firebox (upper) area of the outdoor wood furnace. This air helps produce the combustible gases during the gasification process.

SEASONED WOOD

Wood that has been dried to 20% or less moisture content, and kept out of the weather to maintain that moisture content.

SECONDARY AIR CHARGE TUBE

Tube located on the bottom of the firebox that provides secondary combustion air.

SECONDARY COMBUSTION AIR

The air that is injected into the Reaction Chamber to mix with the combustible gases traveling down from the firebox.

SHUT-OFF VALVE

A valve that can be closed to stop flow or opened to allow flow.

SIGHT GAUGE / SIGHT GAUGE VALVE

Located at the back of the furnace, the sight gauge consists of a sight gauge valve and a piece of clear tubing. The sight gauge can be used as a visual indicator of the water level in the furnace. To check the water level, the sight gauge valve is opened a ¼ turn so water enters the tubing. The level in the furnace corresponds to the level in the tubing and the decal next to the sight gauge. The sight gauge valve should always be closed when finished checking water level. Water will automatically drain from the tubing and valve when the valve is closed.

SNAP DISC

A component that acts as a switch to turn voltage on and off based on temperature. The temperature is sensed by the face of the snap disc making contact with the area to be monitored.

SPARK ARRESTOR

A spark arrestor is a device installed on top of the chimney that reduces the potential of sparks or large flaming debris from escaping into areas where they might start fires. It will not prevent all combustible material from escaping.

SUPPLY AND RETURN LINES

The water lines that carry heat from your outdoor wood furnace into the building to be heated. The water in the supply line flows from the furnace into the building and the water in the return line flows from the building back to the furnace.

SWING CHECK VALVE

A device installed in the water lines that will only allow the water to flow in one direction.

THERMOSTAT

The device that controls the temperature in the space to be heated by sensing that temperature and turning the heat emitters on or off.

THERMOSTATIC MIXING VALVE

A three way valve that mixes hot and cold water based on the temperature of the water flowing from the outlet.

THERMOSTATIC VALVE

A valve that opens and closes based on the temperature of the fluid inside the valve.

WATER-TO-AIR HEAT EXCHANGER

A coil with water flowing inside copper tubes that are covered with metal fins. Heat is removed from the water inside the tubes when air moves across the metal fins.

WATER-TO-WATER HEAT EXCHANGER

A device that transfers heat from one water system to another without mixing the water in the two systems. Central Boiler supplies plate-type and shell and tube type water to water heat exchangers.

WOOD GASIFICATION

The conversion of solid wood into combustible gases.

ZONE VALVE

A valve that is opened and closed electrically to send hot water to a specific zone in the building to be heated.

NOTES

NOTES

NOTES

1-YEAR LIMITED WARRANTY

Central Boiler, Inc. ("Central Boiler") warrants to the original owner, except (a) parts manufactured by others and excluded from warranty coverage below; and (b) parts or items specified below, Central Boiler Classic and E-Classic furnaces against defects in workmanship for a period of ONE (1) YEAR from the date of original retail purchase.

An optional 25-Year Warranty is available if a Limited Warranty Registration Form is completed and sent to Central Boiler within five (5) days of the original owner taking possession of the furnace AND provided that one thermostatic valve per set of supply and return lines is installed in the system.

If a defect exists, at its option Central Boiler will (1) repair the defective part at no charge, using new or refurbished replacement parts, (2) exchange the furnace with a comparable model furnace that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original furnace, or (3) refund the purchase price. A replacement furnace/part assumes the remaining warranty of the original furnace/part or ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you. If a furnace or part is qualified for replacement under the provisions of this limited warranty, at Central Boiler's discretion, the furnace or part may be required to be returned to Central Boiler for inspection and recycling or disposal.

This Limited Warranty applies only to Central Boiler Classic and E-Classic outdoor furnaces. This limited warranty covers only those defects that arise as a result of normal use of the outdoor furnace and does not cover any other defects or problems, including those that arise as a result of: (a) improper maintenance (b) operation outside the furnace's specifications, accident, abuse, misuse, misapplication, or parts that are not factory-installed; (c) service performed by anyone other than Central Boiler unless authorized by Central Boiler in writing; (d) modifications undertaken without the written permission of Central Boiler; or (e) if any Central Boiler serial number has been removed or defaced. This warranty excludes the cost of shipping, labor to remove or reinstall the furnace, plumbing labor and/or parts and the cost of alternative heat if the furnace is out of service for repairs. Warranty excludes replacement of water, inhibitors or other additives, and parts used in the system whether or not mounted on the furnace, such as pumps, valves, and piping.

The following parts are covered by this limited warranty for workmanship defects for one (1) year: gaskets, seals, heat shields, paint, charge tube, grates, combustors, aquastats, actuators, heat refractory, and firebrick.

Parts that are factory-installed by Central Boiler, but are manufactured by others, may be covered by their own manufacturer's warranty and are not covered by this limited warranty.

Central Boiler is not liable for damage or repairs required as a consequence of faulty installations or applications by others or any event of force majeure. Central Boiler is not liable for incidents or accidents which can be prevented by the owner or that occur from the operation of the outdoor furnace. A backup heating system should be in place to prevent damage in case of failure to refuel the outdoor furnace or mechanical failure of the outdoor furnace or system occurs. Heat replacement representations found in Central Boiler promotional information should be used only as a guideline. Heat loss for all applications with all weather extremes and other heat variables must be considered when sizing an outdoor furnace for different applications.

THIS WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. CENTRAL BOILER SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF CENTRAL BOILER CANNOT LAWFULLY DISCLAIM IMPLIED WARRANTIES UNDER THIS LIMITED WARRANTY, ALL SUCH WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY. No Central Boiler dealer or employee is authorized to make any modification, extension, or addition to this warranty. CENTRAL BOILER IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages or exclusions or limitations on the duration of implied warranties or conditions, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary by state or province.

To obtain warranty service, contact the Central Boiler dealer from whom you purchased your furnace or contact Central Boiler by telephone (800-248-4681) or mail (20502 160th Street, Greenbush, MN 56726). Please provide the dealer's name, original date of sale, model number and serial number in all communications. Central Boiler reserves the right to require the warranty service to be performed at Central Boiler facility when deemed necessary by Central Boiler.