Document 1.

# CENTRAL BOILER E-CLASSIC® 3200 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.





SAVE THESE INSTRUCTIONS

(p/n 9000349 - REV. A) - 26-AUG-15

### 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.
- If not using the optional gas-fired wood ignition, 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.
- 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.

### Operating the E-Classic for Maximum Efficiency and Performance

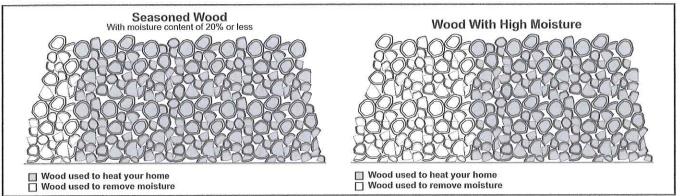
Because of its highly efficient and clean-burning design, the E-Classic operates differently than other types of wood-burning devices. Understanding a few basic principles will help you operate the E-Classic as it was designed, maximizing its performance, heat transfer and longevity.

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

Fig. 37



combustion air outlets as shown in Fig. 38).

Combustion
Air Outlets

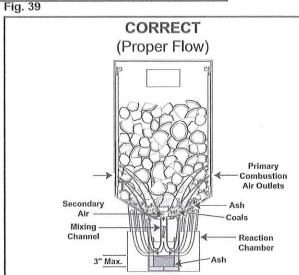
NOTE: Combustion air outlets are also located in front corners.

Gas Ignition Burner Shield

Secondary Air Charge Tube

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

- 2. Gasified fuel exits the bottom of the firebox along 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.
- 3. Heat is transferred to the water from the hot gases as they move through the firebox, the Reaction Chamber and the Xtract<sup>TM</sup> heat exchanger.



NOTE: Fig. 39 shows the E-Classic 3200 operating correctly with proper combustion air flow and with the wood properly loaded.

NOTE: A key point to remember about E-Classic 3200 operation 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. 39.

NOTE: Refer to 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. 40, 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 (2-7 cm) of loose, glowing coals along 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 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

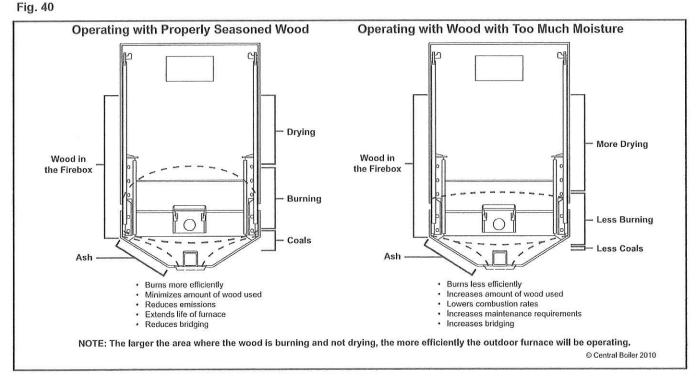
#### Ash Removal Frequency

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 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.

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.



#### **COLD START FIRING**

wood is loaded at more frequent intervals.

If pieces of wood that are too large and/or wood with too high a 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 along 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.

2. Turn the controller on by pressing the **Power** 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 without Power Ignition**

- 1. Disconnect the heat load draw by turning off the pump(s). 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

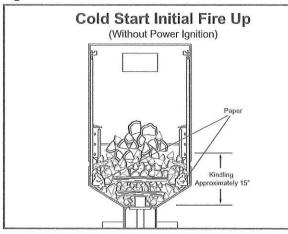
When opening the firebox door, the door switch will shut off the primary air supply solenoid and prevent the gas-fired wood ignition burner from operating while the firebox door is open. Do NOT disable the door switch.

- 4. 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.
- 5. 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. 41



- 6. 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.
- 8. After the water temperature is above 150°F (66°C), proceed to Adding Heat Load.

#### Cold Start Firing with Power Ignition

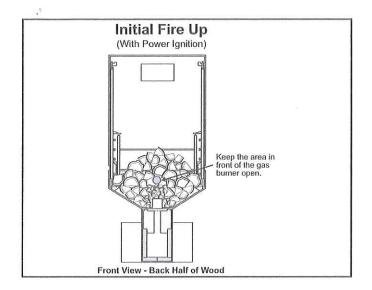
- 1. Disconnect the heat load draw by turning off the pump(s).
- Turn the controller on by pressing the Power
   button,
- 3. Lift and push the bypass door handle toward the back of the outdoor furnace to open the bypass door. Wait for 15 seconds; then unlatch and open the firebox door.

#### 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.

4. 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. 42).

Fig. 42



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.

- 6. 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, about 5 to 8 minutes may be adequate.

NOTE: The maximum amount of time the gas ignition burner will run is 30 minutes, no matter how much the Wood Ignition timer is increased.

- 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.
- 11. After the water temperature is above 150°F (66°C), proceed to Adding Heat Load.

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

NOTE: Review the DVD included with the furnace or watch the video on centralboiler.com/brochure. html for refueling tips.

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 ignite the new wood load. 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. 47 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.

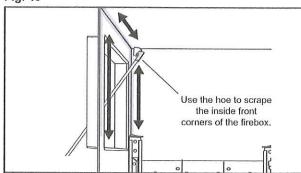
NOTE: Neglecting to push the cleaning rod through the ash and coals as described in Step 3 each time before wood is loaded can cause the ash bed to deepen and become compacted. This can result in poor heat output and combustion because restricted airflow. Compacted ash will not fall into the Reaction 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. 43



Section 2 - Operating Instructions

- 7. 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.
- 8. 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.
- 9. 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.

#### **SECTION 6 - GENERAL INFORMATION**

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

