BSERIES

OPERATION AND MAINTENANCE MANUAL

BioMass B250

HeatMaster™
Tough on Winter, Easy on You

By HeatMaster Furnaces Inc.
Version 2

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RETAIN THIS MANUAL FOR FUTURE REFERENCE

DO NOT THROW AWAY

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LIMITED WARRANTY

HeatMaster Furnaces Inc. warrants to the original owner of the Biomass furnace that it is free from defects in workmanship and material, which could cause a leak or malfunction of the firebox or water jacket, and against corrosion (if the instructions in the owners manual for water treatment and maintenance are followed) for the life of the furnace towards the purchase of a new HeatMaster[SS] furnace, in the following pro-rated schedule.

Warranty schedule

Coverage in the initial 5 years is 100%

- Year 6 - 7 is 50%
- Year 8 - 9 is 40%
- Year 10 - 15 is 30%
- Year 16 to life is 10%

In addition, all steel and drive components including housing, legs, Augers, Burners, etc. have a pro-rated warranty for a period of 10 years with coverage reducing by 10% per year. Any parts not manufactured by HeatMaster Furnaces Inc. that are used on the furnace – such as thermostats, limit switches, pumps, heat exchangers, burners, augers, and motors – carry their own manufacturer's warranty. HeatMaster Furnaces Inc. will not be liable for the cost of shipping, replacement or repair of these parts.

If warranty requires removal or replacement of the furnace or a part on the furnace, HeatMaster Furnaces Inc. is not responsible for the cost of plumbing, replacement of antifreeze or water treatment, shipping cost or any other cost other than the replacement component or furnace.

HeatMaster Furnaces Inc. always has the right to decide if a part or furnace will be repaired or replaced and will not be liable for any cost not authorized by a HeatMaster Furnaces Inc. representative.

HeatMaster Furnaces Inc. does not warranty any damage caused by negligence and deterioration due to lack of proper ongoing maintenance, physical damage caused by abuse or freeze up power surges or unauthorized work, or modifications to the furnace.

HeatMaster Furnaces Inc. is not liable for any damage or cost which may occur from or during the operation of the furnace or damage incurred due to any heating system failure. The purchaser assumes all responsibility for the care, maintenance and safe operation of the furnace including adding of approved furnace treatment or water. HeatMaster Furnaces Inc does not warrant door gaskets, exterior paint or finish.

To qualify for warranty all instructions must be followed in operator's manual, water must be tested and maintained at a minimum of once per year, and warranty registration must be on file at HeatMaster Furnaces Inc. within 30 days of purchase along with a copy of the original invoice. No warranty can be approved unless the warranty registration and water test verifications are on file at the HeatMaster Furnaces Inc. office.

The warranty can be violated by operating the furnace in a manner inconsistent with the owner's manual.

HeatMaster Furnaces Inc. reserves the right to change conditions of warranty at any time.

WATER TREATMENT AND TESTING

Water Treatment Policy

To qualify for warranty, water must be tested at a minimum of once per year and water treatment added when necessary.

To take a water sample:

- Locate your water sample bottle, mailing carton and mailing label provided to you by your dealer.
- Open the furnace drain located in the side pump cabinet of the furnace for 10-15 seconds or until the water runs clear. CAUTION: Water is hot! Use extreme care when pouring into a bucket, and let cool before collecting a sample.
- Fill one of the test bottles at least 1/2 to 2/3 full.
- Fill out the mailing label provided with the test bottle completely, including your email address, the model number and the serial number of your furnace. Make sure to note if the furnace water contains any antifreeze or additional chemicals.
- Attach top part of the label to sample bottle and bottom part to the outside of mailing tube. Place bottle in the tube.
- Mail to our testing lab. Results can take up to 4 weeks to receive and up to 8 weeks if no email address is on hand at HeatMaster^{SS}.
- You will receive a water test report outlining what must be done (if anything). If any action is necessary, take another sample and mail it to our test lab again to verify the recommended changes have been made.

Add the water treatment through the fill pipe located at the top of the furnace when initially filling the furnace with water or after testing, if needed. Ensure that all drains are closed. It is recommended that water treatment is added at a 1:200 ratio when initially firing the furnace and 1:300 after that. Additional treatment may have to be added for water with more severe properties or for systems with more chemically demanding requirements.

Recommended operating levels are as follows:

Conductivity: 100 - 4000 ppm

pH: 8.5 – 10. 5

Nitrates: no less than 730 ppm

Test Parameters and What They Mean

Conductivity

Conductivity is a measurement of minerals in your furnace water. While it is common to have minerals in water, in excess minerals can cause many problems in hydronic systems including scaling and corrosion.

pH

pH is a measurement of alkalinity (hard or soft water). For outdoor furnace water and the water treatment used in outdoor furnaces, it is better to have your water a little harder than softer (recommended pH range is 8.5-10) as the active ingredients in the water treatment neutralize harder water easier than softer water.

Nitrates

Nitrates tested for are a measurement of how much water treatment is in the water. Nitrates measured are active units of water treatment available to neutralize harmful elements in your furnace water. Nitrates also act to neutralize harmful bacteria that may build-up in the furnace water over time.

Glycol

Inhibited glycol provides anti-corrosion elements and freeze protection for outdoor furnaces and is compatible with Outdoor furnace Water Treatment. Because outdoor furnaces are open to the atmosphere systems and will have fresh water added occasionally, oxygen is always entering the system and will break down the glycol over time to create glycolic acid which will harm your furnace system. When this happens you will be required to drain and flush your furnace system.

It is always suggested to use 100% virgin glycol instead of recycled glycol as it will break down much sooner and create glycolic acid.

SAFETY PRECAUTIONS

Read and understand all precautions before operating the furnace.

This furnace needs a periodic inspection for proper operation. It is against federal regulations to operate this furnace in a manner inconsistent with operating instructions in this manual.

Save these instructions. Retain this manual as long as you own your furnace. Carefully read and follow these directions.

DANGER

Do not start the fire with or burn garbage, gasoline, naphtha, engine oil or other inappropriate materials. Only competent persons with a sound understanding of this heating method that are qualified and trained should operate this furnace. Improper firing could result in personal injury and/or damage to the unit and void warranty.

ATTENTION

- **USE APPROVED FUELS ONLY!**
- The person(s) operating this furnace must comply with all applicable local and state laws or other requirements.
- The person(s) operating this furnace is responsible to run it in such a way so that it does not cause a public or private nuisance. Consult with local authorities prior to installation to adhere to local laws and ordinances.
- **DO NOT OVER FIRE THIS HEATER.** Attempts to achieve heat output rates that exceed the heater design specifications can result in permanent damage to the heater.

WARNING

- All installations and operations of your furnace must follow state, provincial, and local laws pertaining to operations, wiring, plumbing and building codes.
- All models operate at atmospheric pressure. **DO NOT** obstruct, block or plug the overflow vent tube in any way, which is located on top of the furnace.
- When installing the furnace, the chimney should never be connected to a chimney flue serving another appliance.
- **DO NOT** operate furnace in event of power failure.
- Use caution when opening firebox and ash cleaning doors.
- **DO NOT** use chemicals or fluids to start the fire.

Risk of Fire:

- **DO NOT** operate with fuel loading or ash removal doors open.
- **DO NOT** store fuel or other combustible material within marked installation clearances.
- Inspect and clean flues and chimney regularly.
- This appliance should not be installed in a location where a corrosive atmosphere, flammable gas or vapour, combustible dust or combustible fibers may be present. If flammables are present in the building, ensure ducts, vents and doorways between the rooms are sealed so as to not allow vapours or fibers to travel to the appliance.

CAUTION

- **DO NOT** start or operate furnace without checking the heating fluid. The furnace must be filled.
- Check for buried cables and utility lines before digging the trench to your furnace.
- For safety and proper temperature control keep all doors closed during operation.
- **Hot Surfaces:** Keep children away. Do not touch during operation.

ATTENTION: DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

FURNACE INSTALLATION GUIDE

Installation should be performed by a qualified installer and must comply with all requirements of the agency having jurisdiction.

	B250	
Max BTU Output	250,000 BTU/hr	
Furnace Size (W x H x L)	61 x 84 x 112	
Furnace Weigh	3,000 lbs	
Firebox Dimensions	(W x H x L) 14.5 x 29 x 24	
Chimney Size	6″	
Water Capacity	140 gallons	
Inlet / Outlet	1 pair of 1″, 1 pair of 1 1/2″	
Power requirements	125/250V, 1Phase, 60Hz, 19 AMPS	

LOCATION

The location of the furnace will affect the heat lost to the surrounding area. Although the unit is well insulated, a furnace installed indoors will lose less heat than in an outdoor location.

- Ensure the minimum clearances to combustibles are maintained.
- Store the furnace fuel in a clean, dry location.
- Do not place or store furnace fuel within the installation clearances or within the space required for servicing the unit.
- Indoor installations will require adequate fresh air supply into the room housing the furnace. If other fans are drawing air from the same space ensure there is sufficient supply air to prevent a negative pressure.
- Contact all governing authorities in your area prior to installation.
- When choosing the location for your furnace; you should consider prevailing wind direction, as well as distance from buildings and fuel storage.
- Give consideration for any effect on your neighbors.

CLEARANCES TO COMBUSTIBLES

Whether installing your furnace inside a building or outside, the following clearances to combustibles must always be followed. Damage and personal injury may result.

DO NOT STORE COMBUSTIBLE FUELS IN THE SAME SPACE AS THE FURNACE IF INSTALLED INDOORS.

Minimum Clearance to Combustibles

Furnace Roof to Ceiling (Indoor Installations)	24″
Side Walls & Rear	6″
Front (Loading door)	24″

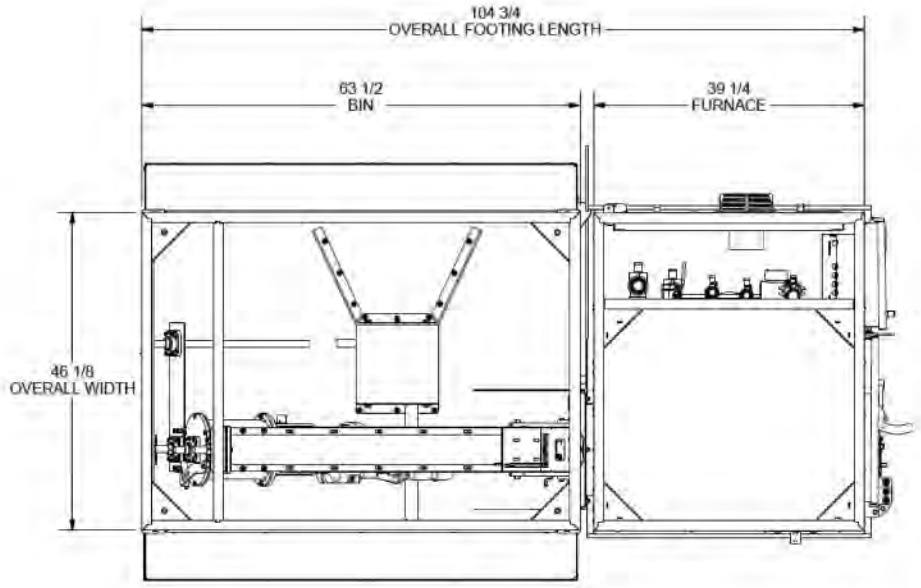
Service Clearances

Front (Firebox Door)	48″
Sides	48″
Roof	48″
Ash Auger (from the motor end)	30″

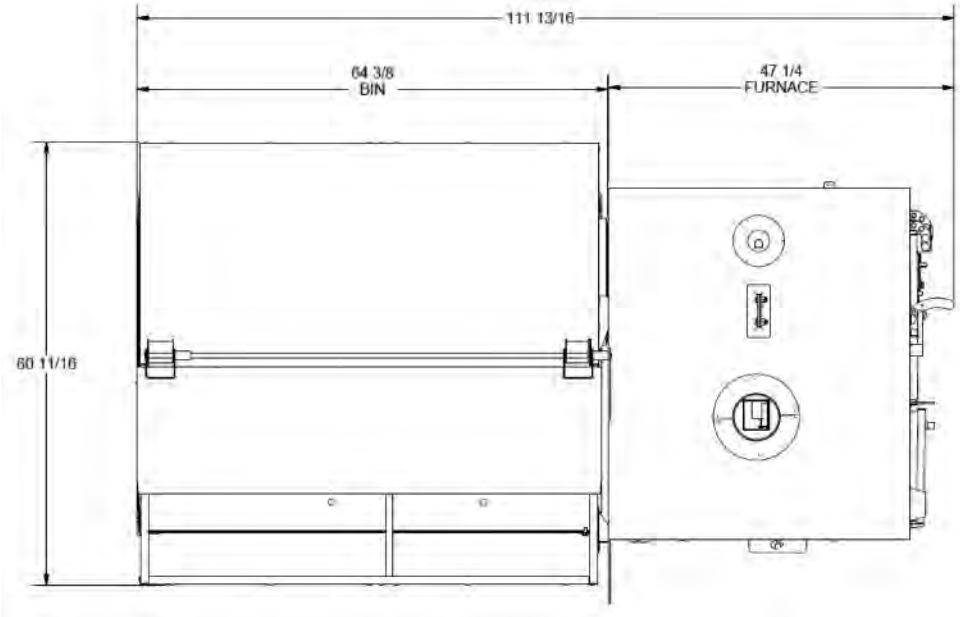
FURNACE FOUNDATION

- Footprint dimensions and load specifications are shown in the illustration at the bottom.
- Consult with local professionals to ensure the foundation design is adequate to support the given loads with your soil conditions.
- Extending the concrete to include the service areas around the furnace is recommended.
- A cement pad of 4-6" in thickness should be used.
- The furnace should never be installed on a combustible floor.
- Never allow combustible material to accumulate on the furnace foundation.
- A non combustible material such as cement or steel should be used under the boiler and at least 16 inches (400 mm) in front and 8 inches (200 mm) on either side of the fuel-loading and ash removal doors.

Bottom View



Top View



TRENCH

HeatMaster Furnaces Inc recommends the trench to be 24" to 36" deep and wide enough to install your water lines. If possible, have a gradual slope in your trench to allow drainage away from your lines and out of the trench bottom.

Some insulated underground pipes have room for electrical wire in it. If it does not, place the electrical supply in the bottom of the trench and cover with 6 inches of dirt before installing the heating lines.

NOTE: We recommend a deeper burial when installing piping below an area with regular vehicle traffic. This will help to reduce the compression force on the lines.

INDOOR INSTALLATION

IMPORTANT: A fire may be caused by the following:

- Improper installation. To reduce the risk of fire, follow all local codes and these installation instructions carefully.
- Storing flammables in the same room as the furnace or fuel.
- Improper ash handling.
- This appliance should not be installed in a location where a corrosive atmosphere, flammable gas or vapour, combustible dust or combustible fibers may be present. If flammables are present in the building, ensure ducts, vents and doorways between the rooms are sealed so as to not allow vapours or fibers to travel to the appliance.

ATTENTION: When installing the furnace in a building, always make sure that smoke and CO detectors are properly installed in the same area as the furnace.

- Outside combustion air requirements will apply. Refer to the "Combustion Air Requirements" section in this manual.

Outside combustion air may be necessary if:

- The solid-fuel fired appliance does not draw steadily, smell, experiences smoke roll-out, burns poorly, or back-drafts whether or not there is combustion present
- Any of the above symptoms are alleviated by opening a window slightly on a calm day.
- The building is equipped with a well-sealed vapor barrier and tight-fitting windows and/or has any powered devices that exhaust house air.
- There is excessive condensation on windows in the winter.
- A ventilation system is installed in the house.

Chimney

Note: Incorrect chimney installation will void the warranty.

The chimney on your B Series outdoor furnace is a stainless steel double wall insulated chimney. When installing the furnace, the chimney should never be connected to a chimney flue serving another appliance. Make sure chimney, flue pipe and draft inducer fan stay clean and in good condition at all times.

The top of the chimney must extend at least 3 feet above the highest point where it exits the roof and be at least 2 feet taller than any point of the roof within 10 feet. For a new chimney, use an insulated stainless steel system that conforms to type HT (High Temperature) requirements of UL 103 and ULC-S629 and complies with the requirements of Chapter 11 of NFPA 211, Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances in the USA or CSA B365 Installation Code for Solid Fuel Burning Appliances and Equipment in Canada.

This is a forced air furnace but it is important that the chimney has a good draft to further eliminate any smoke issues.

Note: Using a smaller chimney may cause smoke issues and using larger chimney may negatively affect furnace performance.

ATTENTION: Cleaning of the heat exchanger, flue pipe, chimney and draft inducer is especially important at the end of the heating season to minimize corrosion during the summer months caused by accumulated ash.

Chimney Installation

ATTENTION: Before installing, check with local building codes for information regarding chimney height and distances to adjacent buildings, etc. You may need to obtain a building permit for the installation of this appliance or the chimney.

Make sure to follow these simple rules to ensure proper performance and safety.

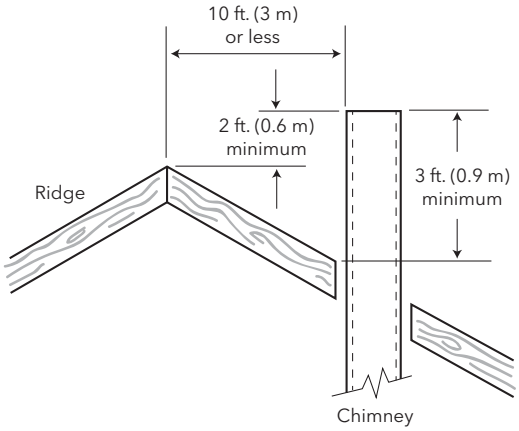
- We recommend that chimney installed on our products be installed by professionals who are certified in the USA by NFI (National Fireplace Institute) or in Canada by WETT (Wood Energy Technology Transfer).
- Draft problems may occur because of incorrect chimney installation.
- The chimney must be connected using a minimum double wall stainless steel chimney and connector.
- Use only components intended for the brand and model of chimney you are using. Never substitute parts from other chimney brands or fabricate your own components.
- To be safe and effective, the chimney must be installed exactly in accordance with the manufacturer's instructions.
- Use a direct exit whenever possible. A vertical exit with no elbows is always the safest and most trouble-free installation.
- Maximum chimney installation height is 15 ft.
- If installation requires a taller chimney height, contact the manufacturer.
- Maximum horizontal installation from the furnace to the exhaust exit is 3 ft.
- Maximum 8 ft. run from elbow to elbow but keep as short as possible.
- Never use an elbow with a greater than 30 degree bend. 45 degree elbows and tees cannot be used.
- Elbows should never be installed in floor joists or roof and attic entries.
- Shields should be used whenever going through floors, attics, and roofs to keep the wood and insulation from getting too hot and possibly catching fire.
- Make sure to follow local building codes.

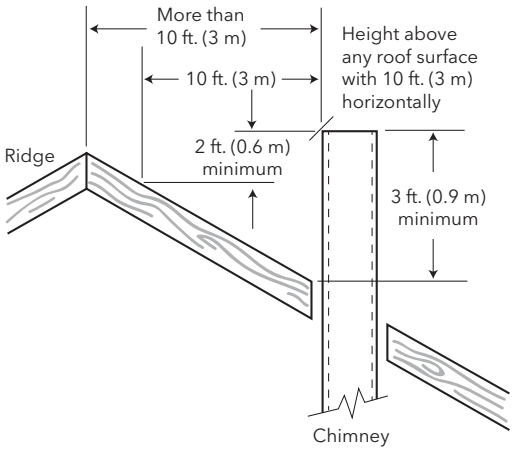
Roof Penetrations and Clearances

The basic rule is this: the top of the chimney must clear the roof penetration point (the upper edge) by at least 3 feet and must clear anything within a 10 foot radius by at least 2 feet. This includes the peak of the house, parapet, dormer, chimney, or spire. See diagram below.

If the chimney terminates beyond 10 feet from the ridge of the roof it must clear the upper penetration of the roof by 3 feet. Notice that the flue still terminates 2 feet above the roof at the 10 foot perimeter:

ATTENTION: Do not connect this unit to a chimney flue serving another appliance





Combustion Air

Furnaces, exhaust fans, and other appliances all draw air from the room in which they are located. Your Biomass furnace adds to that draw, making it important to ensure there is an adequate source of fresh air to offset these demands. If this is not provided a negative pressure may be created in the room and starve combustion in the furnace. The room housing the B250 must have an opening to the outside providing a minimum of 250 square inches of net free air into the room.

IMPORTANT: The furnace room must never be in a negative pressure condition. Negative pressure could result in smoke in the room.

WIRING AND HYDRONIC LINES

- All wiring must conform to local codes.
- Use an electrical wire rated and approved for underground installations. This wiring can be placed in the same trench below the water lines. A qualified technician must perform the electrical portion of the installation.

Underground Hydronic Lines

Hydronic lines (hot water heating lines) whenever buried or encased in cement should not be spliced. Take the necessary steps to ensure they stay dry. This ensures that minimal heat loss occurs. Supply and return lines should always be sized according to the flow rates required by the building heat load.

A minimum of R8 insulation value is recommended. Using pre-insulated piping with a waterproof jacket is strongly encouraged. Any insulated piping must be encased in a waterproof jacket to prevent damage to the insulation and saturation from ground water.

Hint: Mark your feed and return lines prior to covering and allow enough pipe above ground at both ends for a relaxed connection.

Furnace Connection

- Connections to the furnace are clearly marked.
- Return (from the building) are the top ports.
- Supply (to the building) are the bottom ports.
- The installation of isolation valves at both ends of the pump is recommended as well as a valve at the return line. This will allow you to shut off water supply if repairs or additional heating components are added to the system.
- Your main power is connected to the junction box on the side of the control panel and should be connected by a qualified technician.

Building Connections

A hole large enough to accommodate the water lines and proper insulation through the wall is important. Be sure to properly seal this penetration from both sides of the wall to avoid damage from water and condensation.

System Flow Rates

Your B250 Biomass furnace is factory equipped with a circulating pump to maintain proper flow through the furnace at all times. This pump is factory wired. Never operate circulating pumps when the furnace is low on water. This pump is not designed to provide any flow to the supply/return piping to the buildings. Circulating pump(s) need to be properly sized and installed on the outlets provided in the pump cabinet on the furnace. The size of the pump(s) will depend on the heat load requirements and the pressure drop through the system piping and components. These selections should be made by a hydronic professional.

Interior Connections

You may require either a water-to-water (tube and shell or plate) or a water-to-air exchanger (rad) to transfer heat energy from the hot water your furnace has produced. Your plumber or dealer can design and install a system to best fit your needs. The following are examples of basic interior connections. Your dealer carries the necessary parts for installation.

It is important to note that when installing a piping system in your building that you should avoid installation methods that cause too great a restriction in the piping system. Examples of this are reducing pipe size, an excessive amount of joints and elbows, etc.

Whenever possible we recommend installing the pumps supplying the buildings in the cabinet on the Biomass furnace. This will aid in priming the pumps and minimize the potential for cavitation. Strategically placed air bleeders in the system can simplify air removal on initial startup. This can also allow a point for feeding water into the system for the initial fill and topping up when necessary. Air locks restrict system flow which leads to poor performance of any type of heat exchanger.

DISCLAIMER: The following information in the interior connections are examples and suggestions only. Your Biomass heating system should always be designed and installed by a hydronic heating professional.

Water-To-Water Heat Exchangers For Pressurized Furnace Systems

A water-to-water heat exchanger may be used to maintain pressure in an existing boiler system. The water-to-water exchanger is installed in-line on the return side of the existing pressurized boiler system. This allows the non-pressurized outdoor boiler to heat the pressurized indoor boiler.

The pressurized boiler system can be used as a backup heat source in case of emergency or need for additional heat.

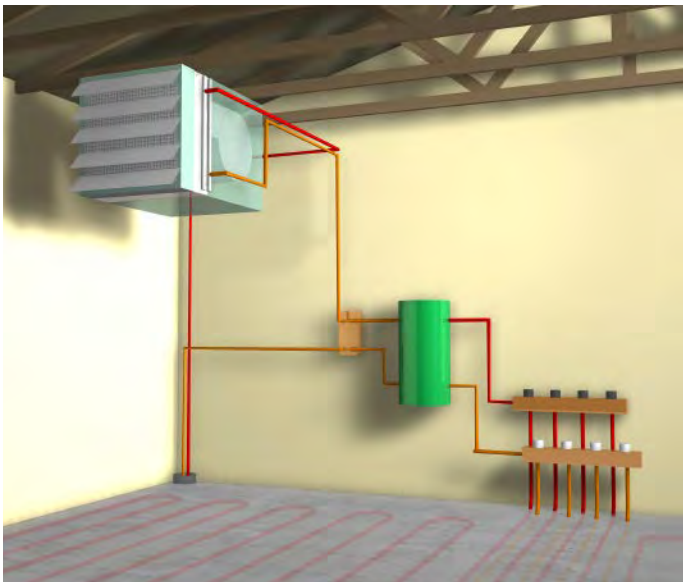
When connecting the Boiler to an existing pressurized boiler system:

- The heat exchanger must not be installed so that it interferes with normal heat delivery of the existing boiler system.
- The heat exchanger must be installed without affecting the operation of the electrical and mechanical safety controls of the original boiler.
- The heat exchanger must provide for a changeover from one fuel to the other without requiring manual adjustment of any controls or components other than the thermostats.
- The heat exchanger must have provisions for preventing, or adequate water capacity within the boiler to prevent damage from loss of circulation due to electrical power failure.
- The heat exchanger must be installed without changing the function of the controls or rewiring of the original boiler. A wiring interconnection is permitted. The electrical system of both boilers shall be powered from a single branch circuit without exception.

Furnace Safety

- Operate the boiler periodically to ensure that it will operate satisfactory when needed.
- Do not relocate or bypass any of the safety controls in the original boiler installation.
- The operation of the boiler must be verified for acceptable operation before and after installation of the add-on appliance by a gas fitter who is recognized by the regulatory authority.
- Do not connect to any chimney or vent serving a gas appliance.

Installation should comply with requirements of CAN/CSA-B365, and changes to the installation should comply with CSA B139 (for oil-fired boilers), C22.1 (for electric boilers), or CAN/CSA B149.2 (for gas-fired boilers).



Example of overhead heater hookup through boiler

Domestic Hot Water

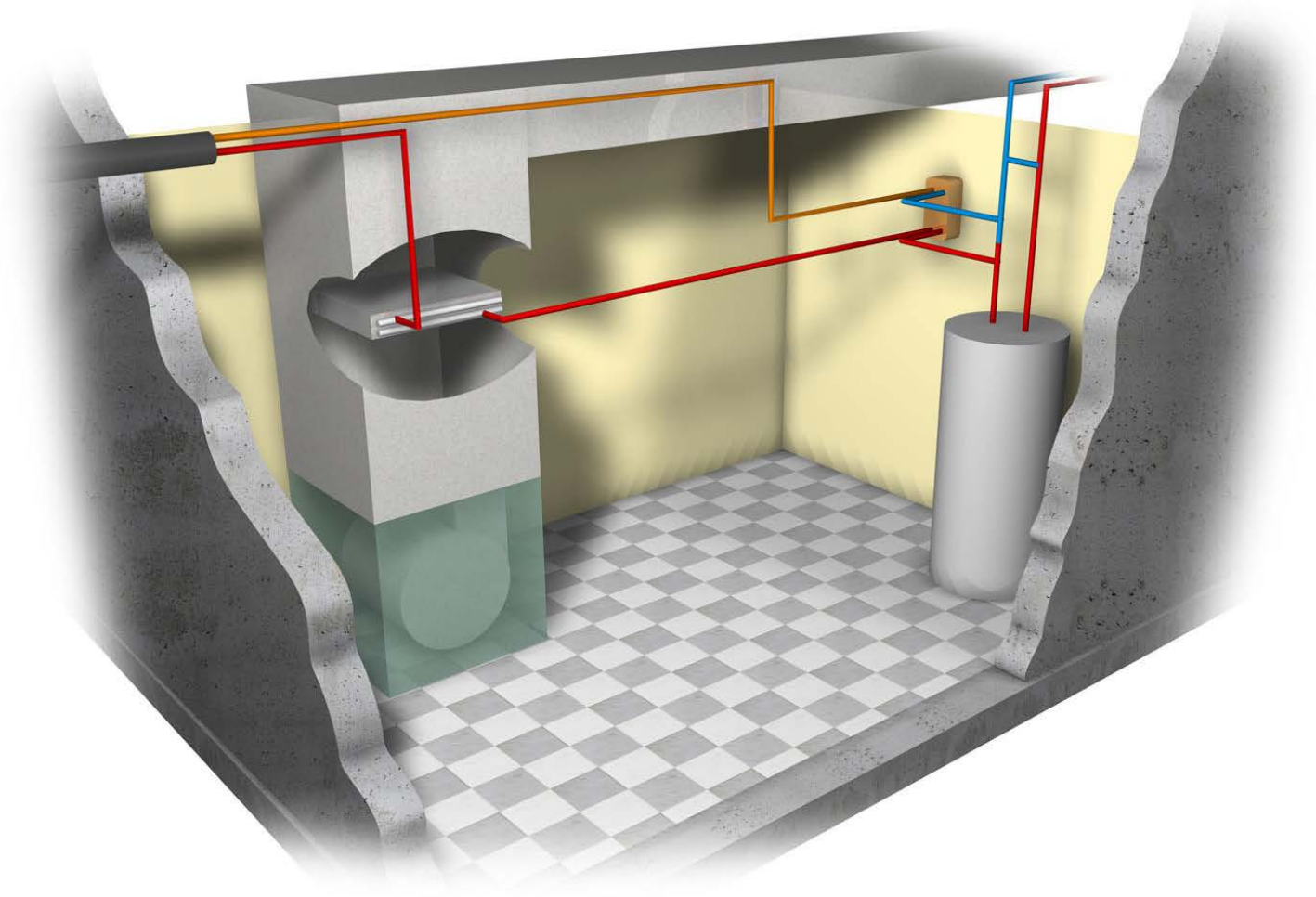
Flat plate heat exchangers can be used very effectively to pre-heat domestic water. This heat exchanger is typically installed in the cold water line feeding the conventional water heater. The water heater settings remain unchanged. Depending on the furnace operating temperatures, an anti-scald valve may need to be installed after the water heater. In situations with very hard water, you may find a tube & shell style heat exchanger to have lower maintenance requirements than a flat plate style.

Forced Air Furnace (Water-To-Air Exchanger)

The water-to-air heat exchanger is typically mounted in the supply air plenum directly off the forced air furnace cabinet. The entire airflow should be routed through the heat exchanger and it should be mounted below the A/C coil if possible. The heat exchanger should be sized to fit existing ductwork and exceed the heat loss requirements of the building. An over-sized heat exchanger can result in very short on cycles providing uneven heat.

If undersized, it will not produce the necessary BTU's to maintain the building temperature in the coldest weather. Although not ideal, the heat exchanger can also be placed in the cold/return air portion of the ductwork. Some furnaces may have issues with hot return air exceeding the maximum design temperatures of the furnace. This should be investigated prior to installation.

It is important that the warm-air supply-duct system is constructed of metal in accordance with NFPA 90B- 1993, 2-1.1. If the outlet-air temperature of a central furnace exceeds 250° F (121° C) when it is tested in accordance with the requirements for Simultaneous Firing in 56.4.1 and 56.4.2 of the standard. It is also important that the plenum's installed to the furnaces be constructed of metal in accordance with NFPA 90B- 1993, 2-1.3.



Example of hookup for a forced air furnace and hot water.

Heatmaster SS
B250-2019 Electrical Schematic
Revision 7-V1.6

FUEL

This heater is designed to burn coal, wood pellets and natural wood chips only. Using high quality fuel is essential for optimal operation

WOOD CHIPS

Choosing a high quality wood chip from a quality supplier will give you higher efficiencies, less ash and less maintenance.

A lower quality wood chip will include with it unwanted debris such as gravel, nails, etc and higher amounts of bark which will result in lower efficiencies and higher amounts of ash and maintenance.

Wood chips should be sized to 1" or smaller. Chips larger than 1" may jam the feed auger and/or air lock.

Higher efficiencies and lower emissions generally result when burning wood fuel with less than 25% moisture content. Burning wood chips with a moisture content over 25% will cause the unit to fail and are not approved.

Storing Wood Chips

Store chips on a flat surface such as a cement floor to avoid picking up unwanted debris that may cause an issue in the appliance operation.

Protecting the fuel from rain and direct contact with the ground will prevent the fuel quality from deteriorating over time. Store your wood chips under an open-ended shelter to avoid rain and snow build-up on the pile. Keeping 3 sides open will allow the sun and wind to season the wood. Storing wood chips in a woodshed or under a tarp in the summer will hinder airflow and allow moisture to wick up from the ground into the fuel.

KEEP ALL FUELS IN A DRY AIR-AIDED STORAGE

WARNING: Risk of fire:

- Do not operate with firebox or ash removal doors open.
- Do not store fuel or other combustible material within marked installation clearances.
- Inspect and clean flues and chimney regularly.
- Remove ashes regularly.
- Do not use chemicals or fluids to start the fire.

CAUTION: Hot Surfaces: Keep children away. Do not touch during operation.

DO NOT BURN:

- Garbage
- Lawn clippings or yard waste
- Materials containing rubber, including tires
- Materials containing plastic
- Waste petroleum products, paints or paint thinners, or asphalt products
- Materials containing asbestos
- Construction or demolition debris
- Railroad ties or pressure-treated wood
- Manure or animal remains
- Saltwater driftwood or other previously salt water saturated materials
- Unseasoned wood
- Paper products, cardboard, plywood, or particleboard

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

Burning these materials may result in the release of toxic fumes or render the heater ineffective and cause smoke.

BURNING COAL

Both bituminous and anthracite coal can be burned in this appliance. However, the characteristics of coal can vary significantly depending on the type, location and quality of coal and thus, will burn differently with varied BTU's, ash content, clinkers, etc. Settings will need to be adjusted to account for the different characteristics. This appliance is designed to burn 1 1/4" and down stoker coal. If other sizes are used, adjustment to the feed and burn settings need to be made to prevent over feeding, jamming and ensure a proper burn.

Anthracite Coal burns hot and clean but will not re-light very easily once it goes out. It is best to run for long burn times using large differentials or by heating a storage tank.

WOOD PELLETS

Wood pellet fuel belongs to the category of biomass fuels. It is produced automatically by compressing wet sawdust and green wood chips and forming them into pellets. When compared to other fuels, wood pellets are easier to move, burn, need less storage space, produce less ash and deliver more energy content by weight (almost 7,750 Btu per pound). Traditionally wood pellets are classified according to the amount of the ash produced. There are three grades in this classification;

- **Premium** (ash content of wood pellets less than one percent)
- **Standard** (ash content between one and two percent)
- **Industrial** (ash content three percent or more)

WARNING: Be careful to choose a high quality wood pellet for best results. Lower quality wood pellets will contain more debris such as glue, cardboard, bark and other biomass materials that may burn less efficiently and cause more creosote, ash and maintenance

Look for the following when choosing a high quality pellet:

- High Heat Output/BTU Rating
- Low Moisture Content
- Low Ash Content
- No additives or bark

CONTROLS

Review the furnace controls, components, and safety devices prior to start up.

CONTROLS AND SAFETY DEVICES

Furnace Control Your HeatMaster^{SS} B Series furnace uses a factory-programmed control to maintain the set water temperature. The control is located to the left of the firebox door and offers several user programming options to accommodate a wide variety of installation variables.

Cold Start Mode

If the unit has been started in a low water temperature situation and the water is still below normal operating temperature.

Alarm

If there is an Alarm condition (see the Alarm screen descriptions).

Water Temperature

This displays the current temperature of the water in the furnace. In normal operation, this should be within +/-5 F. of the set temperature range.

Software Version

This is displayed for several seconds once the control is turned on.

WATER TEMPERATURE SCREEN

Water Temperature Set-point

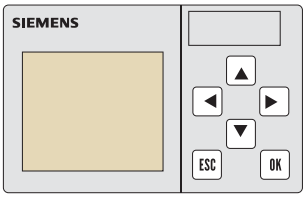
The temperature the furnace should shut down. The differential is the number of degrees in Fahrenheit the furnace should cool from set-point before the furnace should start up.

Low Temperature Shut Down

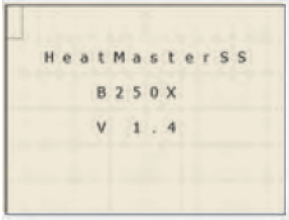
The temperature at which the furnace should shut down to preserve heat in the event of a loss of operation.

USING YOUR CONTROL

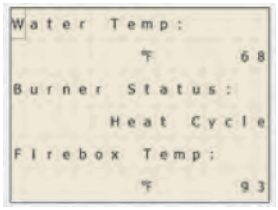
Screen/Keypad



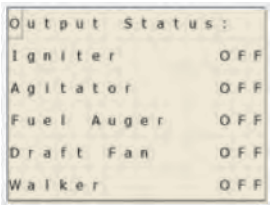
The LOGO control is equipped with a display which communicates the furnace status as well as any alarms. The keypad allows the user to navigate through the various screens and make adjustments to the settings.



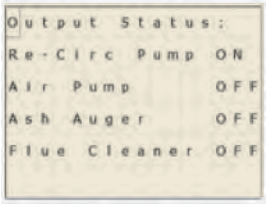
When the unit is powered on the Model/Software version screen will be displayed temporarily



Dashboard - Heating Cycle
This screen is the default in normal operation. This will display the current Water Temperature, Burner Status (Heating or Off), and Firebox Temperature

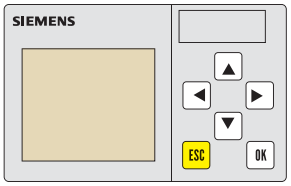


Output Status 1
Displays the current status of the unit's components.

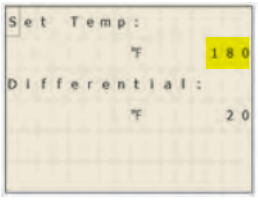


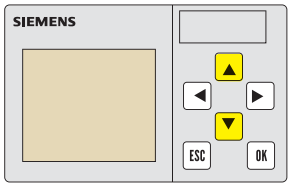
Output Status 2 – Displays the current status of the unit's components.

CHANGING CONTROL SETTINGS

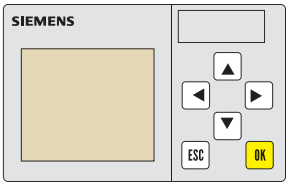


To change a setting press the UP/DOWN arrows to navigate to a SETTINGS screen. To enter the Adjust Mode, press and hold the ESC key until a black box appears around a parameter on the screen.

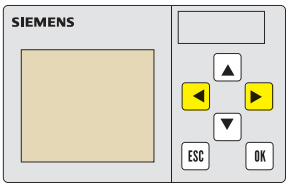




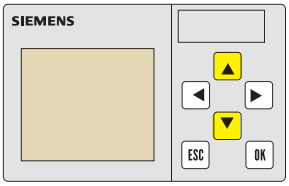
Use the UP/DOWN arrow keys to move the black box to the parameter you desire to change.



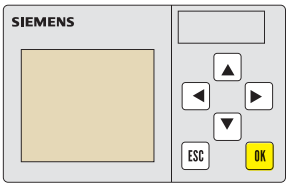
Press the OK key to open the parameter for editing.



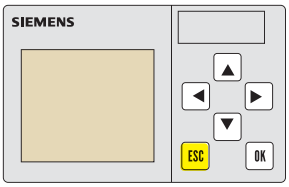
Use the LEFT/RIGHT keys to navigate to the character you wish to change.



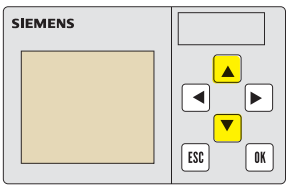
Use the UP/DOWN keys to change the character. Be careful not to change the +/- character at the left side of the value as this will cause operational issues.



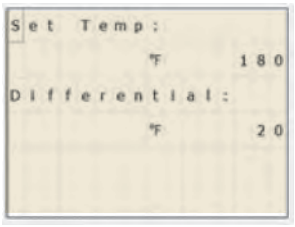
Press the OK key to save your changes.



Press the ESC key to exit the Adjust Mode.

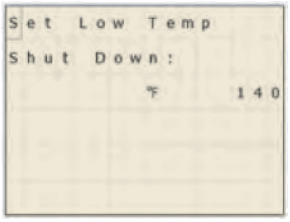


Use the UP/Down keys to navigate to the desired screen. Repeatedly pressing the UP key will bring you to the current dashboard screen.



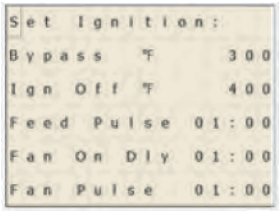
Set Water Temperature

In this screen the user may view and adjust the Water Temperature Setpoint and the Differential. When the water temperature reaches the Set Temperature the unit will turn OFF. When the unit cools to the Set Temperature minus the Differential the unit will start up.



Set Low Temperature Shut Down

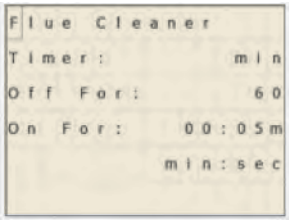
In this screen the user may view and adjust the Low Temperature Shut Down. If the water temperature cools to this point the unit will turn off and display a Low Temperature Alarm. The Cold Start Button will need to be pressed to resume operation.



Ignition Settings

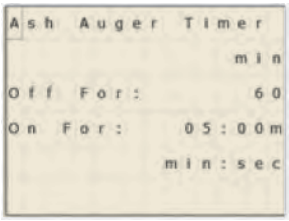
Here the user may view and adjust the Ignition Settings. The ignition sequence operates as follows:

- When the unit starts a heating cycle it needs to determine if the igniter is necessary to light the fresh fuel.
- If the firebox temperature is warmer than the Bypass set point the unit will begin the heating cycle without running the igniter.
- The Bypass set point must be set high enough to ensure the fresh fuel will ignite when it drops to the grate.
- If the firebox temperature is cooler than the Bypass set point the unit will run the ignition sequence. The igniter will start and the unit will deliver fuel to the grate for Feed Pulse length of time.
- Once the Feed Pulse time has expired the Fan On Delay time will begin. This allows enough time for the igniter to establish a small fire before the draft fan turns on.
- Once the Fan On Delay time has expired the draft fan will turn on for the length of the Fan Pulse time. If during this time the firebox temperature reaches the Ignition Off setpoint the unit will resume feeding fuel and shut down the igniter. If the firebox does not reach the Ignition Off setpoint during the Fan Pulse the unit will repeat the ignition cycle to bring in another fuel Feed Pulse and allow time for ignition. This cycle will repeat until the firebox reaches the Ignition Off setpoint when it will turn off the igniter, turn on the draft fan, and resume feeding fuel.



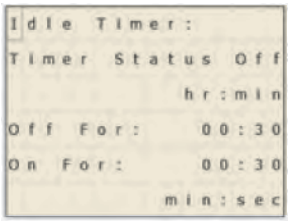
Flue Cleaner Settings

The user can view and adjust the flue cleaner run time. The unit will accumulate burn time unit it reaches the Off For set time in minutes. It will then turn the flue cleaner On For the set time in minutes:seconds.



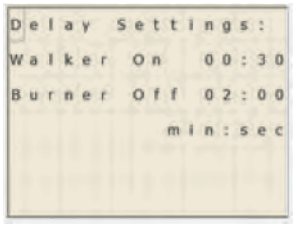
Ash Auger Timer Settings

The user can view and adjust the ash auger run time. The unit will accumulate burn time unit it reaches the Off For set time in minutes. It will then turn the ash auger On For the set time in minutes:seconds.



Idle Timer

An optional timer that will cycle burner after being in an off cycle for a set amount of time. To enable this feature turn the Timer Status to ON. Set the OFF For time in hours:minutes and the On For time in minutes:seconds. This allows the fire to be kept alight between heating cycles. Generally, this feature is not used with an automatic ignition system.

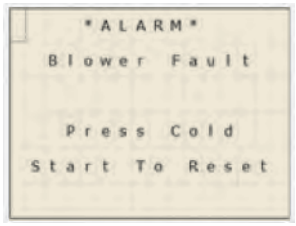


Delay Settings

Walker On – This delay the start up of the walking grate at the start of a heating cycle. This allows time for the fire to become established before moving the fuel along the grate.

Burner Off – This will allow the draft fan to continue to run at the end of a heating cycle after the fuel feed has been shut down. This can be set longer to burn off the fuel remaining on the grate or shorter to leave some fuel on the grate at the end of the heating cycle.

CONTROL ALARMS

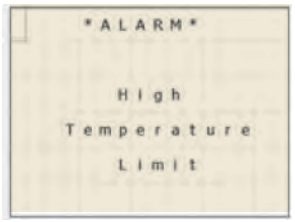


Alarm – Blower Fault

The draft fan operation is confirmed by a pressure switch. The control has turned on the draft fan but the pressure switch was not activated. Check the draft fan for blockage. If it is clear press the Cold Start button to clear the fault. If the fan runs but continues to fault check the pressure switch. The tubing may be blocked or the switch may need adjustment.

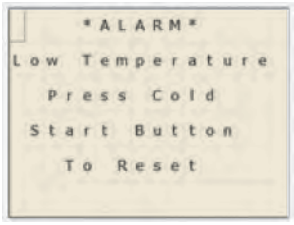
Alarm – Emergency Stop

The Emergency Stop button on the furnace has been pressed. Once it is safe to do so, rotate the Emergency Stop button to allow it to pop up and the fault will reset.



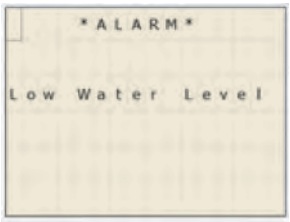
Alarm – High Temperature Limit

The High Limit switch on the unit has been activated. This indicates a high water temperature situation has occurred. The switch will automatically reset at approximately 150 F.



Alarm – Low Temperature

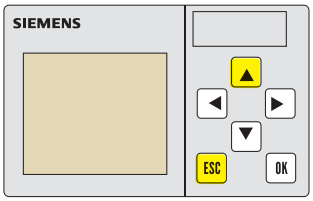
The water temperature in the unit has gone below the Low Temperature Shut-Down setpoint. Press the Cold Start button to resume operation. The unit will remain in Cold Start Mode until the water temperature has reached the Water Temperature setpoint minus the differential.



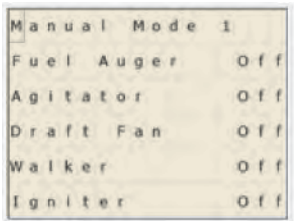
Alarm – Low Water Level

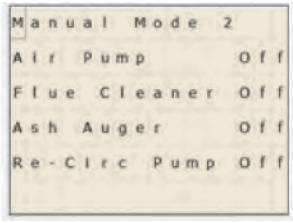
The water level sensor has detected a low water situation. Check for leaks and repair if necessary. Add fluid until the alarm clears. Once the unit is back up to operating temperature top off the fluid so the float indicator shows full.

To Enter Manual Mode

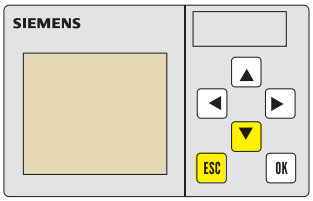


Press and hold the ESC and UP keys until the screen changes to Manual Mode.





Once in Manual Mode you can press and hold the ESC key to enter the adjust mode and turn ON or OFF individual components for testing. This is for testing and service only and the furnace should never be used to operate in this mode.



Be sure all Manual parameters are set OFF before exiting Manual Mode. To exit Manual Mode press and hold the ESC and Down keys until the screen changes to the dashboard.

Variable Frequency Drive

The Variable Frequency Drive controls the speed of the main drive motor on the B250. This single motor controls:

- The agitator in the integrated fuel bin
- The fuel auger
- The air lock.

The UP/DOWN arrows are used to speed up or slow down the fuel feed to the grate in the furnace. The speed can only be adjusted while the drive is in operation. The adjustment range is from 4 Hz to 80 Hz.

When the drive is in standby mode the set speed will be flashing on the screen and the LED should be a **solid green.** When in operation the drive speed should be displayed steady on the screen and the LED a solid green. The drive is equipped to diagnose certain motor issues and will display a **RED LED** when a fault is present.

B250 SAFETY COMPONENTS

High Limit Switch

The high limit cut off switch is used to ensure the furnace does not cause damage via runaway fire. It is a safety switch to cut the power to the furnace combustion components if the water temperature rises above 190° F.

Low Water Cut Off Switch

This switch is mounted in the upper part of the water tank and floats when submerged in water.

Emergency Stop Button

Emergency stop of all motor-controlled equipment. Power will remain on for controls, lighting, and accessory outlets. To reset, twist the button counter-clockwise.

HOW THE B-SERIES BIOMASS FURNACE WORKS

HeatMaster[SS] is proud of its reputation for producing innovative heating methods. Our efficient and clean burning B Series furnaces are continuing that trend.

How It Works

The B250 consists of 4 main components:

- The Fuel Storage Bin
- The Fuel Delivery System
- The Firebox
- The Water Jacket

Fuel Storage Bin

Fuel is stored in the bin. When the furnace calls for heat, the bin sweep and augers are activated to move the fuel from the bin in to the firebox.

Fuel Delivery System

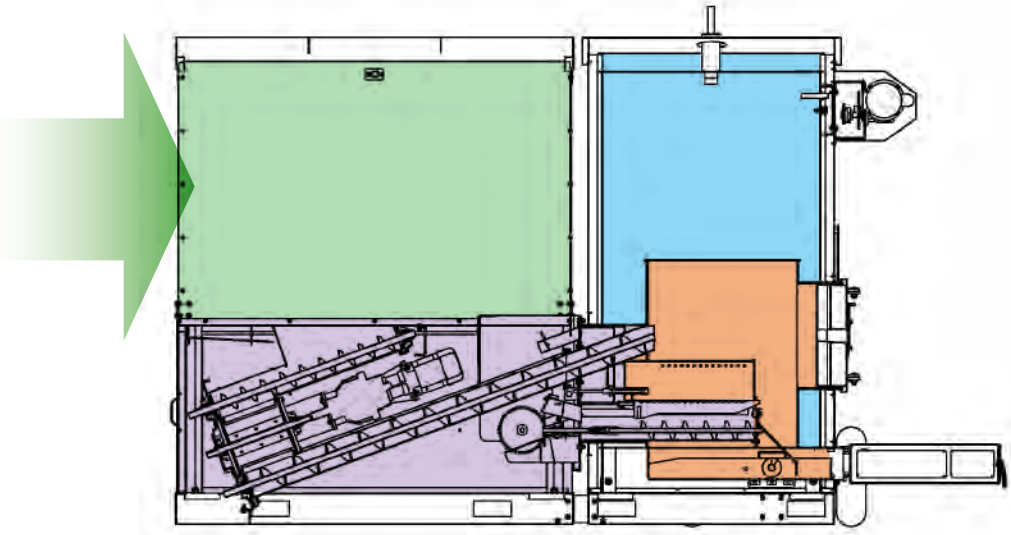
The stage 1 auger moves fuel from the bin to the *Guardian* Air Lock. The Guardian Air Lock rotates and lets the fuel fall through while at the same time ensuring that there is no burn back from the unit as it does not let the air flow through the auger.

Firebox

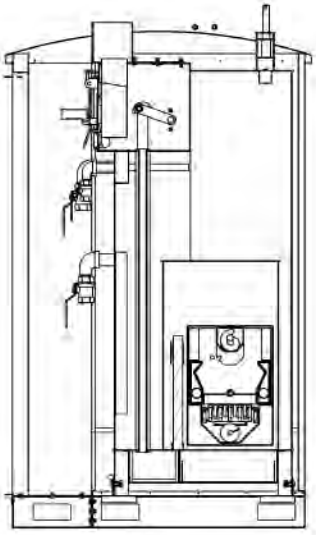
The fuel then falls in to the Stage 2 auger which delivers the fuel in to the firebox and drops it on to the burner head.

Air is drawn through the floor of the grated burner and through the sides of the burner at select volumes to ensure a high efficiency, low emission combustion is achieved, burning at very hot temperatures. The hot exhaust is then drawn up and around the divider and back down before traveling through the flues. The turbulators in the flues create friction and velocity to maximize heat transfer to the surrounding water jacket which surrounds the sides and top of the firebox and heat exchange tubes, before exiting the chimney.

Side View



Front View



Fuel Storage Bin Fuel Delivery System Water Jacket Firebox

OPERATING THE FURNACE

FILLING THE FURNACE WITH WATER

The most effective way to fill the furnace with water is to do so from a valve installed in the heating lines within the building. Be sure the water is of good quality and check with local codes to confirm proper installation to prevent back-flow. Using this method water can be pushed out to the furnace through the underground piping alternating between the supply and return lines. This will push much of the air in the lines out the vent on the roof of the furnace and simplify air elimination on startup.

- With all the circulating pumps in the "OFF" position, power up the furnace. A low water alarm should display on the control screen.
- Fill the furnace with water until the "Low Water" alarm is cleared. Do not fill the unit to the full mark on the rooftop float indicator as this will cause spillage when the water expands as it is heated.
- Start up the system pumps and purge any remaining air from the system piping. Check for, and repair any leaks at this time.
- After the initial fire and the furnace has reached its set temperature, top up the water until the float indicator on the roof shows full.
- Check the water level weekly and add water as necessary. There is evaporation from an open system and adding 6-10 gallons per year is not unusual.

CAUTION: Do not fire the furnace or power on the circulating pumps until the unit is filled with water. Check system water levels and fittings for leaks after startup, and again after 2 days of operation. Take your initial water sample at this time and be sure that it is sent in for testing.

IMPORTANT: To properly maintain your furnace, test your water every year. Water treatment may need to be added or your furnace may need to be drained and flushed and water treatment added. For information on acquiring this product refer to your local dealer.

Hint: A bleeder valve installed at a high point in the building piping can be very helpful in removing air from the system on initial startup. If any part of the system is higher than the furnace; a bleeder valve should be used to make sure all air is removed.

ATTENTION: Your water level will rise as the temperature of the water rises and fall as the water temperature falls. If your water level falls to a low level, first check your water temperature before filling with water again.

ATTENTION: On the initial startup, the water jacket will reach what is called the dew point. This creates condensation inside the fire box which may pool on the floor. This moisture will normally evaporate within a couple of days and is no cause for concern.

FIRING THE FURNACE

These furnaces have been specifically designed to burn wood chips, wood pellets and coal and as such, are not intended for burning any other fuels such as rubber, material treated with petroleum products, leaves, paper products, cardboard, plastic or garbage. Burning these fuels in your furnace will result in the warranty on the furnace being voided.

BURN WOOD CHIPS, WOOD PELLETS AND COAL ONLY! (Load carefully or damage may result.)

Assembly Steps

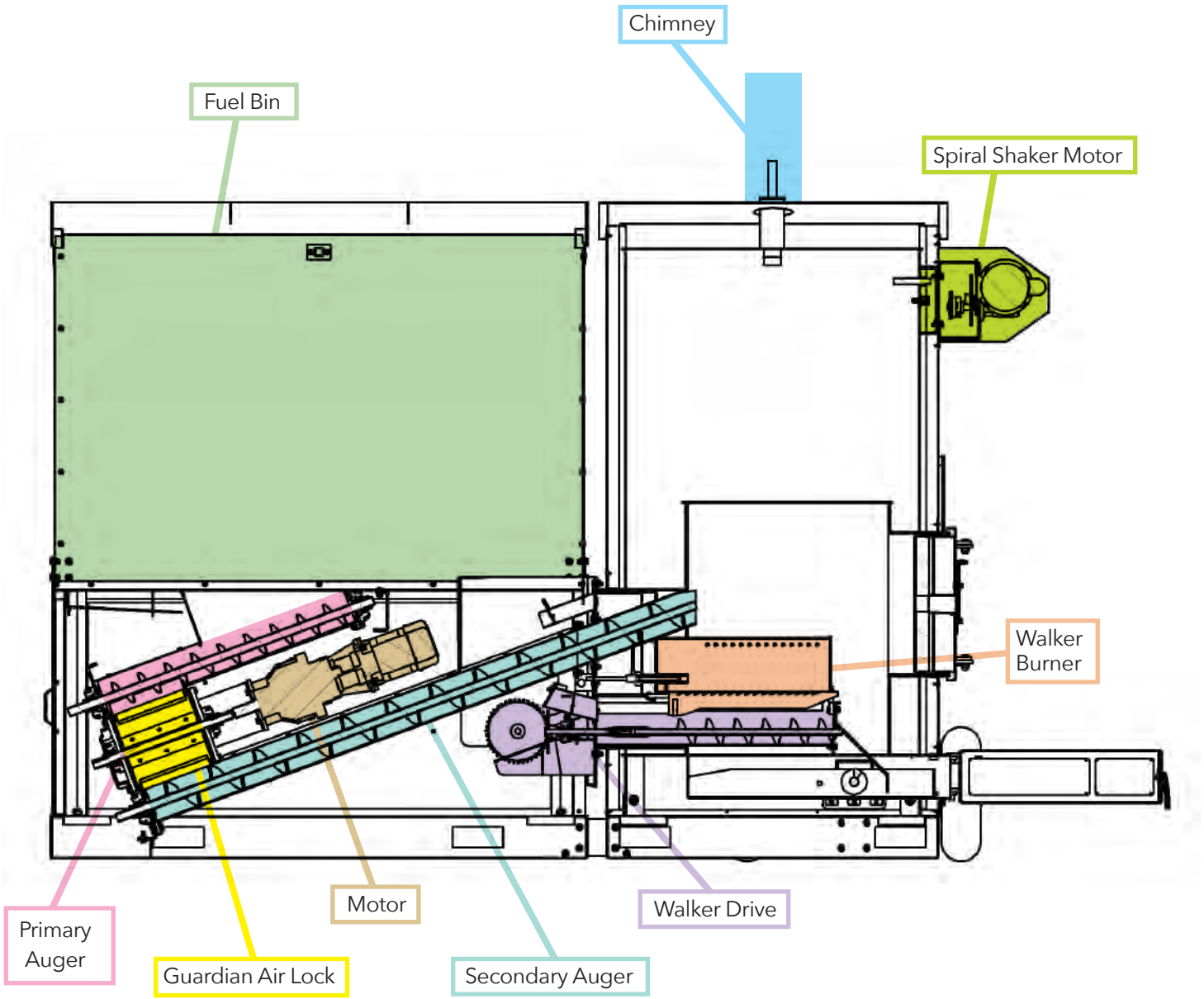
- Prepare the foundation and place the furnace in the desired position.
- Install the factory supplied chimney and any additional sections of chimney pipe, supports and guards needed.
- Connect the power supply at the control cabinet junction box.
- Install and pressure test the supply and return piping to the building(s).

Commissioning Steps

- Turn on the Main Power switch on the right-hand side of the control cabinet. The Alarm screen should display "Low Water".
- Fill the furnace with water until the Low Water alarm is cleared. Do not fill the furnace completely full. Top it off once the water is up to the set operating temperature.
- Power up the pumps supplying the building loop(s) and purge the air.
- Press the Cold Start button to over-ride the Low Temperature Shut-Down alarm
- The furnace should automatically ignite and proceed to burn until it reaches the Water Temperature Set-point.
- To optimize the combustion, adjust the fuel feed rate to match the combustion air flow. If the feed rate is too high the exhaust will be smoky and the fuel may not be completely burnt when falling off the Walking Grate. If the feed rate is too low the flame will be small and thin and the heat output will be low.
- Adjust the Walking Grate speed to move the fuel along the grate to the point where the flame is spread out over roughly 2/3 of the grate area. If the speed is too low the flame will all be in the back of the grate and the fuel will pile up quite deep. If the speed is too high the fuel will fall off the grate into the ash area unburned. Try to target a relatively even fuel spread in the back ½ of the grate area diminishing toward the front edge. The fuel should be reduced to complete ash before it reaches the front edge of the grate.
- Monitor the ash levels in the area below the walking grate. In normal operation, the auger should always be full of ash but the ash should never build up to touch the walking grate. Adjust the Ash Auger Timer settings accordingly.
- The Fuel Feed Rate, Walker Speed and Ignition Settings will need to be adjusted when burning fuel of different size and moisture content.

For detailed instructions on the control settings, see the "Controls and Safety Devices" section of this manual.

B250 FURNACE COMPONENTS



B250 FURNACE COMPONENTS

1. Chimney
2. Draft Inducer Fan
3. Return Lines
4. Supply Lines
5. Power Junction Box
6. Recirculation Pump
7. Emergency Stop Button
8. Firebox Door
9. Ash Drawer
10. Ash Auger and Bin

CARE AND MAINTENANCE

To maintain high levels of performance from your furnace, certain maintenance procedures are required periodically.

CAUTION: Always turn off the furnace before removing or servicing any components on this furnace. Serious injury or death may result.

On a daily basis:

- Ensure that all doors are closed and sealing properly. Adjust if necessary.
- Make sure all covers and guards are securely in place.
- Check for ash build-up in the firebox. Adjust the ash auger timer settings if necessary.
- Check water level.
- Clean heat exchange tubes by aggressively pushing and pulling the lever back and forth at least 5 times.
- Check the control screen to confirm the temperatures are within normal operating limits.
- Check the level of the ash bin. Empty when necessary.
- Take a moment to stop and listen to the operation of the unit. An unusual noise can be a simple indicator of a problem with a mechanical component.
- Check daily for creosote build up until experience shows how often cleaning is necessary.

On a weekly basis:

- Check the lower flue area and remove the fly ash as necessary.
- Inspect chain drives for proper lubrication and tension.
- Inspect gearboxes for any signs of leaks.
- Inspect piping connections for signs of leaks.

On a monthly basis:

- Inspect air inlet damper and solenoid for proper operation.
- Lubricate all chains and bearings.
- Check oil levels in all gearboxes.
- Check the fan motor and wheel for soot build-up.

On a seasonal basis when the furnace is not in use, you will have to:

- Remove all ashes and excess creosote from the firebox, upper and lower flue areas, heat exchanger tubes and chimney.
- Check all gasket seals to make sure they are sealing. To replace, remove the old seal and residues from the door, scuff the surface where the seal is placed with sandpaper and re-apply high temp silicone. Lay fiberglass rope over silicone and let it bond for at least 24 hours before using the furnace again.
- Cover the chimney and crack open the bottom door enough to allow air movement and reduction of condensation within the firebox.
- Make sure your water tank is full and have your water tested and adjusted to manufacturer's specifications. See page 5 for exact specifications.
- Check and adjust the furnace doors if necessary to maintain a good seal. This may be done by adjusting the hinges on each side of the door.

All covers and guards must be in place at all times, except for maintenance or service.

Care for the exterior of your furnace is minimal. The user must wash and remove ash and creosote regularly.

Disposal of Ashes:

Ashes should be placed in a metal container with a tight-fitting lid. The closed container should be placed on a non-combustible floor or on the ground well away from all combustible materials before 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.

Creosote – Formation, and Need for Removal.

The formation of creosote in a Biomass furnace is a sign of poor combustion caused by an improper air/fuel mixture. If you notice creosote in your firebox or flues, check your air and fuel flow rates and balance them to achieve a hot, clean burn. 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 and chimney connector should be inspected at least twice a month during the heating season to determine if a creosote build-up has occurred. If creosote has accumulated it should be removed to reduce the risk of a chimney fire.

CAUTION: Make certain that all electrical power to the furnace and components is shut off. It can be washed using water and a mild nonabrasive cleaner suitable for painted surfaces.

ATTENTION: Avoid direct water pressure to electrical components and connections.

TROUBLESHOOTING

Troubleshooting Poor Combustion and Low Heat Output:

Symptoms:

- Cannot achieve the set temperature.
- Excessive smoke for extended periods of time.
- No exhaust coming from the chimney.
- Poor general functionality.

Follow the steps below to inspect and test the components that may influence these factors.

CAUTION: Always shut the furnace down and allow it to cool sufficiently before inspecting or servicing.

Draft Fan

- Place the furnace in Manual Mode. Turn on the Draft Fan.
- Confirm the fan motor is turning by checking the fan motor. The motor cooling fan is visible with the side cabinet door open and it should be rotating when the Draft Fan is turned on.
- If the motor is not turning check the breaker for the fan motor. If this breaker has tripped check the Draft Fan for blockage and build-up, and clean if necessary. Reset the breaker and check for motor rotation. If the motor will not turn it may need to be replaced.

Solenoid

- Inspect the damper and solenoid. The solenoid should by fully opening the damper when the Draft Fan is on and closing the damper when it is turned off.
- If the solenoid is not opening check the breaker. Reset if it has tripped and check again for proper operation. If the damper remains closed the solenoid may need to be replaced.
- Test for airflow by covering the damper opening with a piece of paper while the draft fan is on. If the paper is drawn against the opening this confirms the fan is drawing air.

Chimney & Fan Wheel:

- With the furnace off, check the chimney for blockage and the fan for soot build-up. They should both be clean for optimum airflow.

Lower Flue Area:

- With the furnace off, check the lower flue area for ash build-up that may be restricting airflow. Clean as necessary.

Walking Grate:

- With the furnace off, check the walking grate for blockage. Clean the grate and make sure the gaps between the walking fingers are clear to allow good airflow.
- Remove one of the walker fingers by lifting the front and rear of the finger evenly. Inspect the chamber below to ensure that it is free from blockage. The drag auger in the chamber should be keeping that area clear. Reinstall the finger.
- Test the walking grate by placing the furnace in Manual Mode and turning on the Walker. The fingers should be sliding freely while rising and falling slightly above and below the fixed grate as they move forward and backwards.

- If the walking grate is not moving, check the motor, gearbox, and chain drive for the walker in the service area of the furnace. If there does not appear to be a problem there check the Walker Control for power. The indicator light should be on when the furnace is calling for heat, or the furnace is in Manual Mode and the Walker is turned on.

If these inspections do not lead to a solution please contact your dealer for assistance.

Upper Flue Area:

- Inspect the upper flue area of the furnace and heat exchange tubes for blockage.
- Is there wet creosote build-up?
- Do the spirals in the heat exchange tubes have full movement up and down?
- Clean the area as necessary.

Air Lock/Secondary Auger:

CAUTION: The Air Lock, Augers, Chains & Sprockets are dangerous and can cause serious personal injury or death. ALWAYS turn off the main furnace power before servicing.

- Check the V20 drive screen status. If the drive set speed is flashing and the light is green it is ready and waiting for a call to run from the control. If the set speed is steady on the screen and the green light is steady the drive is running. If there is a fault code displayed or a red light consult your dealer for assistance.
- With the power off, check the air lock and remove any blockage that may be present. In Manual mode you may jog the air lock to check for rotation.
- If the Air Lock is clear and turns, or tries to turn, visually inspect the secondary auger. To do so, open the firebox door and check the auger coming through the back wall above the walking grate. When the Fuel Auger is on, this auger should be turning. If the Air Lock turns, but the secondary auger does not check the chain drive at the bottom end of the auger for damage and repair if necessary.
  If the chain is okay you may need to remove the top cover of the secondary auger and check for damage or blockage to the auger.

Fuel Feed Auger:

- Examine the chain and sprockets driving the fuel auger. If damaged make the necessary repairs. If not, the fuel auger may be plugged or jammed. The fuel auger can be inspected from the fuel bin above but the bin may need to be emptied to make a proper inspection.

Agitator:

- With the furnace on and calling for heat, the agitator should be turning within the bin and delivering fuel to the Fuel Feed Auger.
- If fuel is not being fed to the auger, visually inspect the agitator if possible by looking into the bin. If this is not possible, visually inspect the agitator motor and gearbox to see if it is turning.

More than likely, if there is a problem with the furnace burn or airflow, you will find it by checking these things.

Symptom:

The furnace water temperature has reached its target, but the water temperature in the distribution supply lines is cool.

1. Check the operation of the furnace recirculation pump. Confirm that the pump has power and that all the valves are open to allow it to flow. Correct any issues and replace the recirculation pump if it is faulty.
2. Check the distribution pumps for flow.
   - Check to ensure all pumps in the system are running and none are pumping the wrong way.
   - Check filter cartridge for flow blockage (if installed).
   - Check for air in the distribution system and bleed it off where necessary.
   - Check for closed valves blocking water flow.
   - Check for closed/faulty zone valves.
3. If no obvious flow issues arise from the above system checks, turn off pumps on each line, and close ball valves on the return lines. Remove a return line from a distribution circuit and turn the pump on again. Run the return water into a 5 gallon bucket and time how long it takes to fill it up. Use this information to calculate the flow rate. Do this for each distribution circuit being fed from the furnace to confirm adequate flow. If the problem persists have your dealer inspect the system for possible flow issues or air locks.

If the furnace water and the building supply lines are hot but buildings do not have heat:

1. Check to ensure all pumps in the system are running.
2. Check filter cartridge for flow blockage (if installed).
3. Check for air in the system and bleed if necessary.
4. Check for closed valves to ensure water flow.
5. Check the temperature of the water exiting the furnace, entering the building being heated and before and after each heat exchanger. Large temperature drops signal large consumption of the BTU's produced by the furnace.

If the furnace overheats:

1. Close all air inlets and doors on the furnace.
2. Draw as much heat as possible from the system by turning thermostats up and opening windows until furnace cools down.
3. Check that all doors are closing properly and that the door gasket is completely sealing.
4. Check that the damper plate is opening and closing properly. It should be completely closed when the furnace temperature is over 180° F
5. Check water level.
6. Check to ensure all pumps in the system are running.

If there is a runaway or chimney fire:

1. Make sure the firebox and ash pan doors are tightly closed.
2. Close all combustion air inlets on the furnace.

If the furnace has shut down:

1. Check to ensure that the unit has power.
2. Check to ensure the furnace On/Off switch is in the On position.
3. Check the water temperature (furnace has a high temperature cut off of 190° F and turns on again at 140° F).
4. Check control for errors that may have shut the furnace down.
5. If all checks have not corrected the problem, have a technician check the control panel.

If there is a power failure:

1. This furnace will not operate without power. Open all flow-check and zone valves in the system. Depending on the system design, this may allow convective circulation.
   NOTE: This does not apply to gravity systems, as they have no flow-check valves and will continue to operate normally without electricity.
2. It is important to remember that the heating systems cannot dispose of a great deal of heat without the circulator(s) running.

   DO NOT LOAD SOLID FUEL INTO THE FURNACE!
3. When the power has returned, reset all flow-check and zone valves and resume normal operation of the system.

If there is smoke leaking out of the door

1. Check to ensure the door is sealing properly. If the seal is worn out it will have to be replaced.
2. The door may need to be adjusted. To do this, loosen the door latch bearings and nuts on the door hinge and set the door so it seals tightly against the door jamb. Re-tighten once the door is in place.

You are having to fill the furnace with water more than once a week or more than a few gallons of water per week and there is no obvious explanation.

1. Check the temperature settings and adjust if necessary. If water temperature reaches levels over 200 degrees Fahrenheit the water will steam and water loss will occur.
2. Check the perimeter of the furnace for water puddles collecting or dripping from the furnace.
3. Check all plumbing in the system to ensure there are no leaks.
4. If these checks have not provided an answer call your dealer.

ELECTRICAL TROUBLESHOOTING

Electrical troubleshooting should always be done by a qualified technician. Consult your dealer for assistance.

WARNING LABELS

HEATMASTER FURNACES INC.

SOLID-FUEL FIRED FURNACE FOR USE WITH WOOD CHIPS WOOD PELLETS AND COAL FUEL ONLY

Install and use only in accordance with the manufacturer's installation/operating instructions and local codes. If there are no applicable local codes, follow ANSI/NFPA 211 and NFPA 908. Special precautions are required for passing the chimney through a combustible wall or ceiling. Refer to authorities having jurisdiction for proper installation. THE HEAT EXCHANGER, FLUE PIPE, AND CHIMNEY MUST BE CLEANED REGULARLY TO REMOVE ACCUMULATED CREOSOTE AND ASH. ENSURE THAT THE HEAT EXCHANGER, FLUE PIPE, AND CHIMNEY ARE CLEANED AT THE END OF THE HEATING SEASON TO MINIMIZE CORROSION DURING THE SUMMER MONTHS. THE APPLIANCE, FLUE PIPE, AND CHIMNEY MUST BE IN GOOD CONDITION.
THESE INSTRUCTIONS ALSO APPLY TO A DRAFT INDUCER IF USED.

LOAD FUEL CAREFULLY OR DAMAGE MAY RESULT.

This furnace is equipped with an automatic stoker. The functions of this furnace are all completely automated and, as such, there are no steps needed for operation besides loading fuel in the bin and turning the furnace on.

Chimney must be a listed UL-103 HT or ULC-S629 residential all-fuel type or tile-lined masonry. Flue connector pipe must be made of a minimum 24 MSG black steel. Install on a non-combustible floor. For indoor or outdoor installation.

WARNING: EXPLOSIVE GASES.
Gases formed during solid-fuel combustion may cause a small explosion when a firebox door is opened. Always use your left hand to open the firebox door. Open the door SLOWLY and keep your face and body well away from the door until it is completely open.

CARE AND MAINTENANCE

On a daily basis:
- Ensure that all doors are closed and sealing properly. Adjust if necessary.
- Make sure all covers and guards are securely in place.
- Check for ash build-up in the firebox. Adjust the ash auger timer settings if necessary.
- Check water level.
- Clean heat exchange tubes by aggressively pushing and pulling lever back and forth at least 5 times.
- Check the level of the ash bin. Empty when necessary.
- Take a moment to stop and listen to the operation of the unit. An unusual noise can be a simple indicator of a problem with a mechanical component.
- Check daily for creosote build up until experience shows how often cleaning is necessary.

On a weekly basis:
- Check the lower flue area and remove the fly ash as necessary.
- Inspect chain drives for proper lubrication and tension.
- Inspect gear boxes for any signs of leaks.
- Inspect piping connections for signs of leaks.

On a monthly basis:
- Inspect air inlet damper and solenoid for proper operation.
- Lubricate all chains and bearings.
- Check oil levels in all gearboxes.
- Check the fan motor and wheel for soot build-up.

MAXIMUM OPERATING TEMPERATURE 190° F. THIS FURNACE MUST NEVER BE PRESSURIZED. DO NOT PLUG OR MODIFY THE RESERVOIR VENT. MAXIMUM WORKING PRESSURE O psi FOR SAFETY KEEP FIRING AND ASH PIT DOORS TIGHLY CLOSED.

DANGER! Risk of Fire or Explosion-Do not burn garbage, gasoline, drain oil, or other flammable liquids

WARNING! Risk of Fire or Explosion
-DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.
-DO NOT BURN GARBAGE, GASOLINE, NAPHTHA, ENGINE OILS, OR INAPPROPRIATE MATERIALS.
-Do not operate with firebox or ash removal doors open.
-Do not store fuel or other combustible material within marked installation clearances.
-Inspect and clean flues and chimney regularly.
-Do not alter this equipment in any way.
-BURN WOOD CHIPS WOOD PELLETS OR COAL FUEL ONLY

CAUTION! Hot Surfaces
-Keep children, clothing, furniture and other combustible material out of the installation clearance area.
-DO NOT allow ashes or coals to build up in the ash pit so that the air inlet becomes blocked.
-DO NOT connect this unit to a chimney flue that serves another appliance.
-Please follow all manufacturer instructions when connecting to an existing boiler system.
-UNSAFE TO ADJUST FLUE DRAFT HIGHER THAN .07"WC.
-Keep children away.
-Do not touch during operation.
-This furnace requires fresh air for ventilation and must be installed so there are provisions for adequate combustion and ventilation air
-Maximum draft marked on nameplate.

REFER TO THE OWNERS MANUAL FOR DETAILED OPERERATING INSTRUCITONS

WHEN OPENING THE FIREBOX DOOR, carefully follow the below procedure to avoid spillage of smoke and products of combustion:
1. SLOWLY open the firebox door so as to build up the draft.
2. This procedure will minimize smoke from escaping when the firebox door is opened.

IN THE EVENT OF LOSS OF ELECTRICAL POWER:
1. Open all flow-check and zone valves in the system. Depending on system design, this may allow convective circulation. NOTE: This does not apply to gravity systems, as they have no flow-check valves and will continue to operate normally without electricity.
2. It is important to remember that the heating systems cannot dispose of a great deal of heat without the circulator(s) running. Avoid over-firing! DO NOT LOAD SOLID FUEL INTO THE FURNACE!
3. The furnace will restart automatically after power is restored. Low Temperature Reset May Be Required.
4. When the power has returned, reset all flow-check and zone valves and resume normal operation of the system

IN THE EVENT OF RUNAWAYFIRE:
1. Make sure the firebox door is tightly closed.
2. Close all the combustion air inlets on the furnace.

TO COOL AN OVERHEATED (OVER 220°) FURNACE:
1. Turn all thermostats in your house to their highest temperature setting.
2. Open all hot water faucets.
3. Open all windows.
4. When furnace temperature has dropped below 180°, reverse the above steps.

For unit specifications, see the plaque located directly on the furnace.

***MAY BE ADDED TO AN EXISTING BOILER SYSTEM**
- Operate the (oil, gas, electric) boiler periodically to ensure it will operate satisfactorily when needed.
- Do not relocate or bypass any of the safety controls in the original boiler installation.
- Caution: this equipment may only be installed by qualified personnel.
- Disconnect electric power to both boilers before servicing.
- Caution: maintain combustion air supply to both boilers. Air starvation is dangerous. Provide two permanent combustion air openings into the room with a combined total of at least 520 in2. Minimum opening size of 12" x 12". .

REFER TO OWNERS MANUAL

HeatMaster

⚠ WARNING

DOOR MAY BE HOT

⚠ MISE EN GARDE

LA PORTE PEUT ÊTRE CHAUDE

5084D0133

C US Intertek

Manufactured By: HeatMaster Furnaces Inc.
Winkler, Manitoba

Test Standards: CAN/CSA B366.1-M91, UL 2523-2009

Test Dates: 10/17/2018 to 10/31/2018
Certified as an add on model: October, 2018

Serial#: _____

HeatMaster Furnaces Inc.

SOLID-FUEL FIRED FURNACE FOR US WITH WOOD CHIPS, WOOD PELLETS AND COAL FUEL ONLY

FOURNAISE CUITE AU FUEL SOLIDE POUR NOUS AVEC COPEAUX DE BOIS, GRANULÉS DE BOIS ET COMBUSTIBLE DE CHARBON SEULEMENT

INPUT POWER: 125/250V, Single Phase, 60Hz

This unit has a maximum 33 amp draw and must be connected to a circuit capable of supplying a minimum of 40 amps
USE COPPER CONDUCTOR ONLY

Cette unité a un tirage maximal de 31 ampères et mus être connecté à un circuit capable de fournir un conducteur minimum de 40 ampères
UTILISER UN CONDUCTEUR EN CUIVRE SEULEMENT

Model	Fuel Combustible	Heating Capacity Capacité de chauffage
B250	Biomass / Biomasse	250,000 BTU
B500	Biomass / Biomasse	500,000 BTU
B1000	Biomass / Biomasse	1,000,000 BTU

Do not install within 6ft (1.8m) of another furnace device
Ne pas installer à moins 6pi (1.8m) d'un autre dispositif de four

Minimum Clearances to Combustible / Dégagements aux matériaux combustibles	
Furnace Roof to Ceiling (Indoor Installation) / *Toit Furnace à plafond (installation intérieure)*	24" (609.6mm)
Side Walls & Rear / *Côté Murs & arrière*	6" (152.4mm)
Front (Loading door) / Avant (Porte de chargement)	24" (609.6mm)
Furnace Roof to Ceiling (outdoor installation) / *Toit Furnace à plafond (installation extérieure)*	6" (152.4mm)

2018	2019	2020	Jan / *Jan*	Feb / *Fév*	Mar / *Mar*	Apr / *Avr*	May / *Mai*	Jun / *Jun*	Jul / *Jul*	Aug / *Août*	Sep / *Sep*	Oct / *Oct*	Nov / *Nov*	Dec / *Déc*
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Proudly Serviced & Installed By: HeatMaster

Name:
Address:
Phone:
Installation Date:

This unit should be inspected annually by a qualified technician

This appliance needs periodic inspection and operation. Consult owner's manual for further information. It is against federal regulations to operate this appliance in a manner inconsistent with operating instructions in the owner's manual.

5084D0120

HeatMaster[SS] carries a full line of high-quality parts for your furnace including pumps, fittings and heat exchangers. For more information on our parts or to arrange product installation please contact your local HeatMaster[SS] dealer.

HeatMaster[SS]

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HeatMaster™

Tough on Winter, Easy on You