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MODEL 800 CSS STAINLESS STEEL OUTDOOR FURNACE



INSTALLATION SHOULD BE PERFORMED BY A QUALIFIED INSTALLER AND WILL COMPLY WITH ALL THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION OVER THE INSTALLATION.



READ THROUGH THE ENTIRE OPERATORS AND MAINTENANCE MANUAL AND THIS SUPPLEMENT BEFORE OPERATING YOUR HEATMOR™ STAINLESS STEEL OUTDOOR FURNACE MODEL 800 CSS.



NOTE: NEVER START A FIRE INSIDE THE FIREBOX UNTIL THE WATER JACKET IS FULL OF WATER AND SAND HAS BEEN ADDED TO THE BASE TO THE CORRECT LEVEL.

Units are Safety Listed by Omni Test Laboratories

Report # 275-O-12-4

Listed to UL2523-2009 and CSA B366.1-11





MODEL 800 CSS FURNACE SPECIFICATIONS

Specifications	Model 800 CSS
Overall Width (inches)	87
Base Width (inches) (footprint)	83
Overall Height (inches) (With chimney stub)	126
Overall Length (inches)	105
Base Length (inches)(footprint)	95
Total weight (lbs.) (Without Water)	4930
Water Capacity (US. Gal.)	487
Forced Draft (C.F.M.)	350 secondary 150 primary
Chimney Size (inches)	16
Max. Wood Length (inches)	54
Insulated Heating Area (sq.ft.)* 1 Loading per day 2 Loading per day	Approx. 12,000 Approx. 25,000
Firebox Width (inches)	60
Firebox length (inches)	54
Firebox height (inches)	71
Volume of firebox (cu.ft.)	135
Fire Door Size (inches)	56 x 50
Flue transfer area (sq.ft.)	32
BTU'S (maximum)**	900,000
Water Jacket Steel Gauge	Stainless 7
Firebox Steel Gauge	Stainless 7
Base Steel Gauge	Stainless 7
Base of Unit to Bottom of Loading Door (inches)	18
Sand required during initial setup.	3/4 yd.
Warranty – Workmanship (Includes total unit)	Limited LIFETIME Warranty

*This is an estimate only. Actual loadings per day may vary depending on structures heated and type of wood used.

**This value should only be used as an indication of the furnace's heat recovery ability. Sustained outputs at this rate will increase the loadings per day. Some types of wood may prevent the furnace from reaching this maximum output.

Updated: 07/11/12



MODEL 800 CSS FURNACE SPECIFICATIONS (CONTINUED)

Warranty –Corrosion (Includes total unit)	Limited LIFETIME Warranty
Approvals Test Standards	UL 2523 - 2009 CSA-B366.1-11
Hookup Location	Back
Total Heat Extraction area sq.ft	168.50
Type of Fuel	WOOD ONLY
Electrical Supply 1 Phase	115 Volts, 60HZ

Bladder

Principle of the Bladder

The Bladder of the Model 800 CSS works on the same principles outlined in “Bladder Assembly” section of the Operators and Maintenance Manual.

Operation of the Bladder

The bladder of the model 800 CSS furnace has a capacity of approximately 30 gallons. It operates slightly different than the other furnaces. The bladder has a float internally in the bladder cavity that moves vertically when the water is cooling or heating. Normally, the bladder cavity should be approximately 1/2 full when the water temperature is at the high water temperature set point. Slits are cut at the bottom of the rubber bladder to prevent rainwater or condensation from building up above the relief vent plate.



Filling the Bladder with Water

- 1) The relief vent pipe on a model 800 CSS is located as a vent plate located on the bladder float in the bladder cavity. To fill the furnace you must prop open the plate to allow air to escape from the water jacket as the furnace is being filled with water.
- 2) When the entire system is bled of air, and the water jacket is full of water, the bladder float will begin to rise vertically. Leave the water from the water source (well) flowing to the HEATMOR™ until the bladder float is approximately four to six inches up the bladder cavity. Turn off the water supply.
- 3) Place the weighted vent plate back onto the bladder float. This will make the water jacket a semi-closed system.
- 4) Place the bladder cavity lid back, over the water level indicator rod, onto the bladder cavity stub. Ensure that the water level rod can move freely through the lid.

Removal and Replacement of the Bladder

- 1) Remove the entire bladder assembly from the bladder enclosure by removing the outer clamp and lifting the assembly out.
- 2) Loosen and remove the inner clamp. This will allow the rubber bladder to be separated from the bladder float.
- 3) Stretch the inner section of the rubber bladder over the float and fasten it using the inner clamp.
- 4) Take the outer clamp and stretch the outer rim of the rubber bladder over it, as it would look when the bladder would be mounted into the bladder enclosure.
- 5) Lower the bladder assembly into the bladder enclosure and tighten the outer clamp to lock the bladder assembly into place.
- 6) Re-cut the slits at the appropriate locations. Slits are approximately two inches long and are located such that any water trapped above will run through when the bladder is at its lowest level possible.
- 7) Re-install lid, check water level is appropriate and begin to use the furnace once again.

DO NOT PERFORM THIS PROCEDURE WHEN THE WATER TEMPERATURE IS ABOVE 100°F.

Bladder (Continued)

Relief Vent Plate

The relief vent plate is the equivalent of the weighted pop off ball on the residential models. The relief vent plate is attached to the bladder float on top of the Model 800 CSS.



The weighted relief vent plate should always be in the down position on the bladder float during normal operation of the HEATMOR™ furnace. DO NOT permanently obstruct the relief vent plate. This could cause water jacket or firebox damage, due to a build up of pressure.

Filling the HEATMOR™ Outdoor Furnace Model 800 CSS Initially with Water

When filling the Model 800 CSS with water refer to the “**Filling the Bladder with Water**” (preceding), Follow the steps outlined to allow air to escape from the water jacket and to set the bladder to the appropriate level of water. Once the system has reached operating temperatures, the bladder cavity should be approximately 1/2 full.

Low Water Gauge

The water in the Model 800 CSS furnace must be kept to the appropriate level. There are two parts to the gauge. The low water indicator is attached to the bladder cover, next to the water level indicator rod. This gauge has a step in it. **The water level indicator rod must stick up, above the step, when the unit is up to its normal operating temperature range.** If the rod does not stick up above the step, water must be added to the system to bring the gauge to the appropriate level. If there are any questions as to the operation of this gauge, please contact your local dealer.



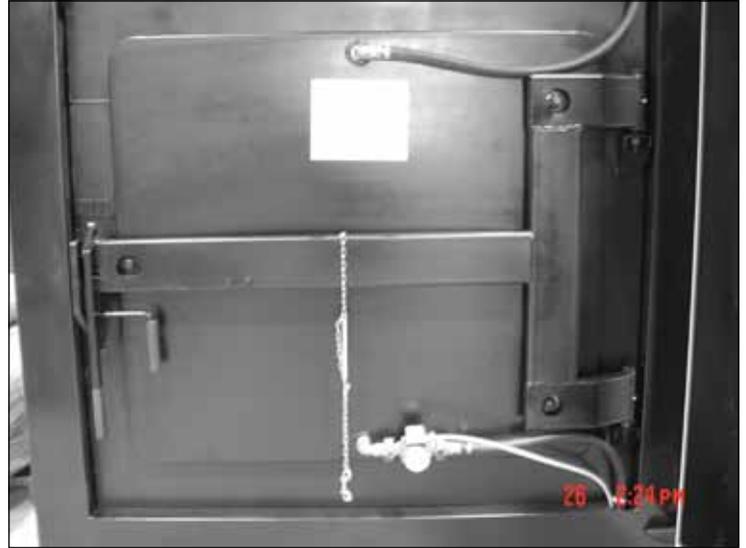
Fire Door

Principles of the Fire door

The model 800 CSS fire door is water cooled to prevent warping of the door. Because it is water cooled, the outer surface will never be hotter than the water in the furnace. The model 800 CSS requires a pump to move the water through the door in a loop between the fire door and the main water jacket. The fire door pump is a Taco model 007.

Removal and Replacement

If your fire door needs to be removed or replaced on your Model 800 CSS, please contact your local dealer for assistance.



Opening the Fire Door

It is important to always stand behind the fire door when opening it. Open the door just slightly to allow air to the firebox. This clears the firebox of smoke that may be lingering in the firebox. Once the smoke is evacuated from the firebox, it is safe to open the door fully, always standing behind the door for safety. Refer to the “Safe Furnace Operation Guidelines” section of the Operators and Maintenance Manual for further instruction on safe opening of the fire door.



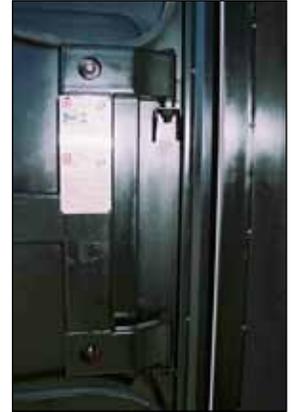
Refer to Safe Operating Guidelines for further instructions on how to safely open and close the fire door or contact your local dealer. Ask for a demonstration.

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Adjustment of the Model 800 CSS Fire Door

The fire door hinges of the Model 800 CSS are stronger, more permanent, hinges than the residential models. Unlike the residential models, the hinges are not utilized for adjustment.

There are two major parts that make up the fire door of the Model 800 CSS, the door water jacket and the door-mounting frame. The water jacket is mounted to the door frame with three one inch threaded studs and held in place with two jamb nuts and two washers on each stud. When making adjustments, it is important not to loosen more than two studs at a time. The holes in the doorframe are larger than the studs to allow for movement required to align the door with the doorframe. Please follow the recommended instructions for proper adjustment of the fire door or contact your local dealer for further details.



If there is smoke leakage around the fire door at any point, and the gasket has been found to not be the problem, the door should be adjusted. Prolonged exposure to smoke and heat can cause permanent damage to the fire door gasket, magnify leakage problems, and create safety concerns. If the door seems to be aligned properly with the fire door frame, adjusting the fire door towards the fire door frame will likely solve the leakage problem. Using a socket, loosen the outer and inner nuts located on the horizontal door support arm. This will move the door towards the firebox creating a tighter seal between the door seal gasket and doorframe. Once the door has been adjusted to the correct depth, the inner and outer nuts should, once again, be tightened against each other to hold the door in that position.

Alignment

- 1) The fire door should be positioned over the fire door frame so that there is an equal distance between the fire door and the fire door frame on all four sides. Generally, this can be achieved by returning the three adjustment studs to the center of their respective holes. The model 800 CSS fire door is heavy; safe adjustment can be done with the assistance of a hydraulic or manual jack and a small pry bar. Loosen the doorframe jamb nuts just enough to allow the door to move. Center the door vertically in the frame. Move the door horizontally right to left with the use of a small pry bar between the door mounting frame and a jamb nut. When the water jacket is centered on the doorframe, the jamb nuts should all be tightened.
- 2) The next procedure is to seat the door water jacket evenly around the fire door frame. It is best to start with the water jacket away from the fire door frame approximately a ¼”.
- 3) If the right side of the door is not seated against the fire door frame, loosen the top right adjustment, first the outer jam nut, then the inner jam nut may be turned until the water jacket is seated about 1/8” into the silicone seal.
- 4) Follow the same procedure on the bottom adjustment until the right edge is seated evenly. Now tighten the bottom adjustment.
- 5) To ensure the left side of the door is sealed, follow the same procedure as the right side with left side adjustment only.



Remember: When adjusting the seating of the fire door, loosen only one adjustment at a time. After completion, make sure all adjustments are tight.

Fire Door Latch & Deadbolt

Principles of the Fire Door Latch

The purpose of the fire door latch is to secure the fire door during operation. The fire door latch is not adjustable on the Model 800 CSS.

Principles of the Fire Door Deadbolt

The purpose of the fire door deadbolt is to provide additional safety for the operator. Pulling parallel to the doorframe on the deadbolt handle opens the deadbolt.



Fire Door Chain

The fire door chain prevents the outer door of the Model 800 CSS from swinging open uncontrollably. It is recommended to install a post to the side of the furnace, to secure the outer door from opening or closing during loading procedures (see Site Preparation Specifications).



Fill Line

The purpose of the Fill Line is to avoid a situation where the furnace is overfilled with wood. An over filled furnace will smoke more than one that has been properly filled with wood. A properly filled furnace will have fewer problems with debris in the secondary airbox.



Firebox Door Hoses and Elbows

Principle of the Door Hoses

The door hoses allow water to circulate between the firebox door and the water jacket. On the Model 800 CSS, a circulating pump that is mounted on the lower door hose, speeds up this circulation.

Maintenance/Result

Proper maintenance of the door hoses and elbows will ensure that water is able to flow through the firebox door. Build-up (calcium) in the elbows is possible over time, which slowly reduces the water flow through the door. If water does not flow freely through the door hoses to the firebox door, you may hear popping sounds in the door. Once the hoses are around five years old, or if they begin to show signs of wear, they should be replaced. Replacement of the hoses should only be done with the furnace shut down and the water temperature less than 100 degrees Fahrenheit. To clean the elbows, remove the hoses and use a pipe cleaning brush to clear out the build-up.

Removal and Replacement

To remove and replace the door hoses, use the following steps:

- 1) Turn off the power to the combustion blowers by turning off the combustion blower switch.
- 2) Ensure the fire in the firebox is extinguished, and allow the water to cool.
- 3) Once the water has cooled, turn off the main power source for the furnace.
- 4) Clamp each of the hoses in the middle of the hose to stop water flow.
- 5) Clamp each of the new hoses in the middle of the hose as well.
- 6) Loosen the hose clamps on each end of the door hose.
- 7) Remove the first end of the door hose needing replacement.
- 8) Push on the end of the new door hose and repeat the steps for the other end.
- 9) Tighten the hose clamps, securely fastening the door hose ends.
- 10) Remove the clamps in the middle of the new hoses. This will allow water to flow through the door once again.
- 11) Check for leaks.
- 12) Repeat the above steps if additional hoses must be changed.
- 13) Turn on the main power source for the furnace.
- 14) Turn on the combustion blower switch to resume normal furnace operation.

Firebox Door Circulating Pump

Principle of the Circulating Pump

Increases water circulation through the firebox door to eliminate any boiling within the firebox door. Natural thermal siphoning is not adequate flow through such a large door.

Removal and Replacement

To remove the firebox door circulating pump, use the following steps:

- 1) Turn off the power to the combustion blowers by turning off the combustion blower switch.
- 2) Ensure the fire in the firebox is extinguished, and allow the water to cool.
- 3) Once the water has cooled, **turn off the main power source for the furnace.**
- 4) Clamp each of the hoses in the middle of the hose to stop water flow.
- 5) Using wrenches, loosen and remove the pump flange bolts to remove the circulating pump. If the top hose is pinched properly, there should be minimal water loss when the lower hose and flange is separated from the pump.

- 6) With the pump removed, disconnect the wiring from the pump and attach to the new pump to be installed. If you are not comfortable or experienced in doing electrical repairs, have the electrical work done by a certified professional.
- 7) Mount the pump in place and tighten the flange bolts. Ensure the pump is circulating in the correct direction (pushing water into the firebox door)
- 8) Remove the clamps in the middle of the new hoses. This will allow water to flow through the door once again.
- 9) Check for leaks. Re-tighten as necessary.
- 10) Turn on the main power source for the furnace.
- 11) Turn on the combustion blower switch to resume normal furnace operation.

Chimney

The Model 800 CSS chimney is a two-piece chimney. The upper portion, also known as the chimney stub, is not installed when the furnace is shipped. This is done because of height restrictions during shipping. The chimney stub is designed to fit inside of the lower portion of the chimney, located on the top of the furnace. We recommended using proper, safe, equipment when mounting the chimney stub in place. Refer to the “Installation of the HEATMOR™ Furnace” section of the Operators and Maintenance Manual for suggestions on required equipment.

Air Supply

Combustion Blower Power Switch

Principle of the Combustion Blower Power Switch

The Combustion Blower Power Switch is located at the front of the unit, making it easy to switch the blowers on or off during loading or maintenance.

Removal and Replacement

To remove the Combustion Blower Power Switch, use the following steps:

- 1) Turn off the main electrical power supply to the HEATMOR™.
- 2) Remove the switch cover plate.
- 3) Make a sketch of the location of the wires on the switch.
- 4) Remove the wires and replace the switch.
- 5) Replace the wires to the original locations.
- 6) Secure the cover plate.
- 7) Turn the main electrical power supply back on to the HEATMOR™.

Note: It is recommended to contact a licensed electrician to perform the above operation.

Combustion Air Blowers

The Model 800 CSS has two blowers, one 350 CFM and one 150 CFM blowers. The blower on the left, also called the primary air, delivers air to the fire from below the grates. The blower on the right, also known as the secondary air, delivers air into the firebox by means of an airbox on the inside, rear, wall of the firebox. The airflow of each blower is adjustable by means of a damper installed on each. This adjustable air flow is key to getting the most efficiency from your model 800 CSS Outdoor Wood Furnace.

Principle

Refer to the “Wood” section of the Operators and Maintenance Manual to gain a better understanding of how wood burns and the stages of combustion.

The air delivery of the model 800 CSS is different than the residential models because it supplies air to two areas of the fire. The primary air is supplied under the fire and is responsible for creating smoke and getting the temperature above 500 degrees fahrenheit. The secondary air is introduced into this smoke above the wood stack allowing the smoke to combust, creating



Air Supply Continued...

higher fire temperatures and less smoke.

Depending on the type of wood fuel used, different amounts of primary and secondary air are required for optimal efficiency. For example, small pieces of wood (high surface area) with low moisture content requires a small amount of primary air and a large amount of secondary air. If the opposite is done, with this type of fuel, an over-fueling situation will likely exist and the furnace will lose efficiency and smoke more. Cordwood with high moisture (30-40%) will likely require a lot of primary air and medium to large amounts of secondary air. A properly fired furnace will operate at the optimum efficiency with the least amount of visible exhaust. Once the operator is familiar with their type of fuel, they will not need to adjust the dampers on the fans.

Operation

The blowers are controlled by the “Water Temperature Range Control” aquastat. When the water temperature reaches the low set point of the aquastat, the aquastat will supply power to the fans until the water temperature reaches the high set point of the aquastat. When the high set point is reached, the aquastat terminates the power supply to the fans.

The dampers on the blowers give control over the airflow while the aquastat is supplying power to the blowers.

Maintenance

Refer to the “Air Supply” section of the Operators and Maintenance Manual for further information on maintaining the air combustion blowers.

Flipper Assemblies

There are two styles of flipper assemblies on the Model 800 CSS Furnace. Refer to the “Air Supply” section of the Operators and Maintenance Manual for information on the primary blower flipper assembly.

The secondary blower has a different style flipper assembly, making service and maintenance easier. Instead of having the blower/flipper assembly unbolt and pull out to service, it is mounted on a hinged plate. This allows the operator to loosen one thumbnut and open the door to access the flipper assembly. For proper maintenance of the flipper assembly refer to the “Air Supply” section of the Operators and Maintenance Manual.

Secondary Air Box

Operation

The Secondary Airbox is located along the rear, interior, firebox wall. It is a means to direct air from the secondary combustion air blower to the upper area of the firebox. This is how smoke from the fire can be ignited. The secondary air box is designed as a two-piece part. The upper section can be unbolted and removed for maintenance or replacement. Do not stack anything over the opening of the secondary airbox as poor combustion could occur.



Anti-Rollout Device (A.R.D.) and Auger Tube



THE A.R.D. MUST OPERATE PERFECTLY OR PROBLEMS QUICKLY ARISE.

Anti-Rollout Device

Principle

The Anti-Rollout Device (A.R.D.) is a safety feature that allows air into the firebox before the main fire door is opened. Along with normal, recommended, safe fire door opening practices, the risk of a flash back is greatly reduced.

Operation

The A.R.D. opens and closes automatically with the operation of the outer door.

Maintenance / Result

Ensure ash, shavings or small wood pieces do not become lodged in the A.R.D. Make sure that the spring on the auger tube cover is working properly. This ensures a compression fit of the cover to the auger tube. If the A.R.D. is not closing 100%, a constant air leak will allow air to continually fuel the fire. This will cause a smoldering fire resulting in creosote, boiling, and premature warping of the ash pan grates.



Ash Auger Tube

Principles

The Anti-Rollout Device also serves as the ash auger tube. Opening the outer door will expose the auger tube. The auger tube cover is located under the front outer door of the furnace. **The cover must have a good seal against the auger tube.**

Ash Removal

- 1) When removing ashes, always turn off the combustion air blowers.
- 2) Open the outer door, which releases the auger tube cover plate.
- 3) Insert the ash auger and remove the ashes.

Supply Line and Return Line Threaded Connectors

There are two 2.5" Supply line and two 2.5" Return line threaded connectors (female NPT) located at the back of the Model 800 CSS. A brass nipple should be used to connect any fittings to the threaded spuds. Refer to the "Supply Line and Return Line Threaded Connectors" section in the Operators and Maintenance Manual.

Low Water Cutoff

Principles

The low water cutoff (located above the flue) shuts down power to the fans when the water in the furnace is low.

The only way to restore power to the fans is to fill the furnace with water. Do not fill a warm furnace with cold water.



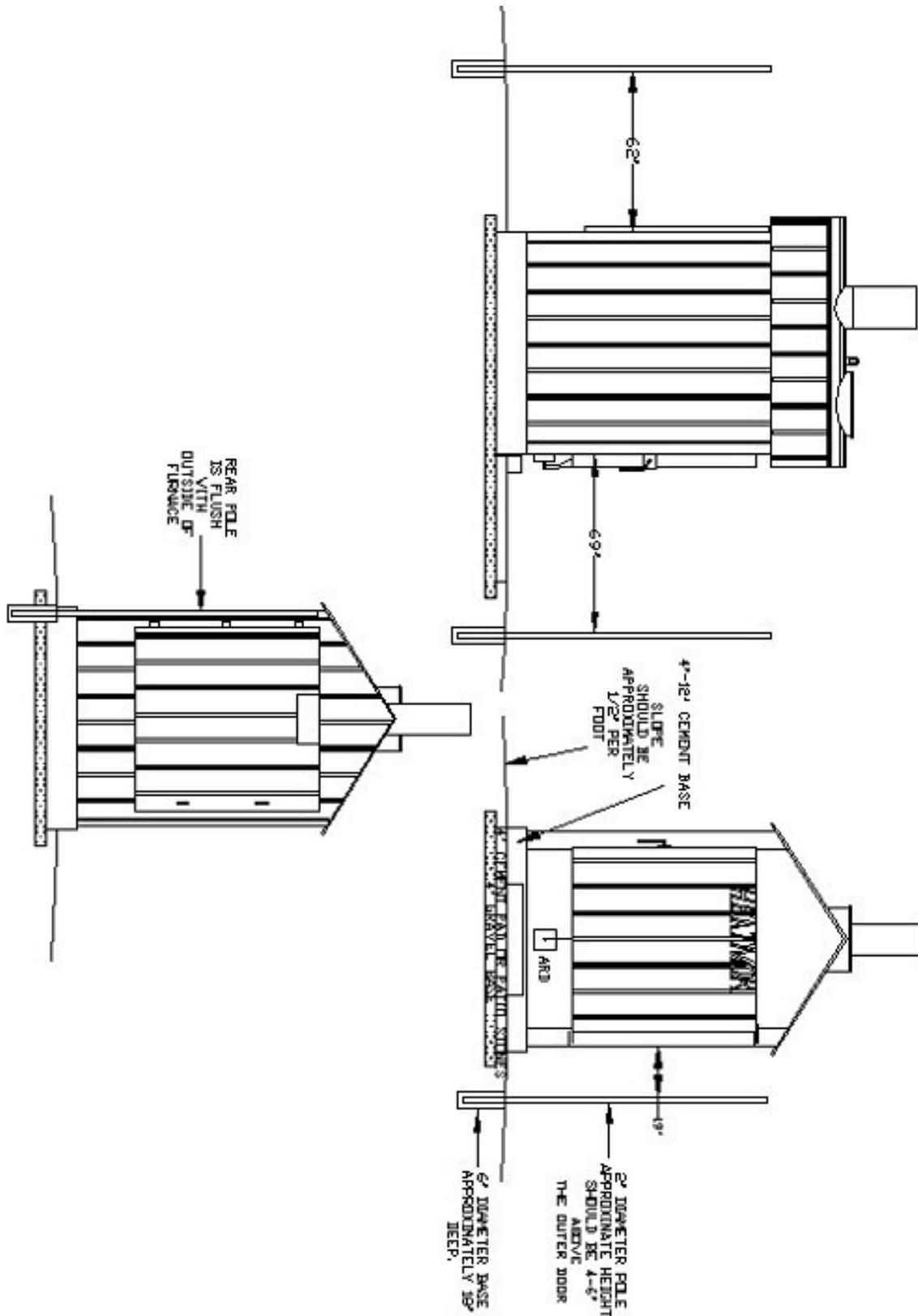
Outer Door

Operation

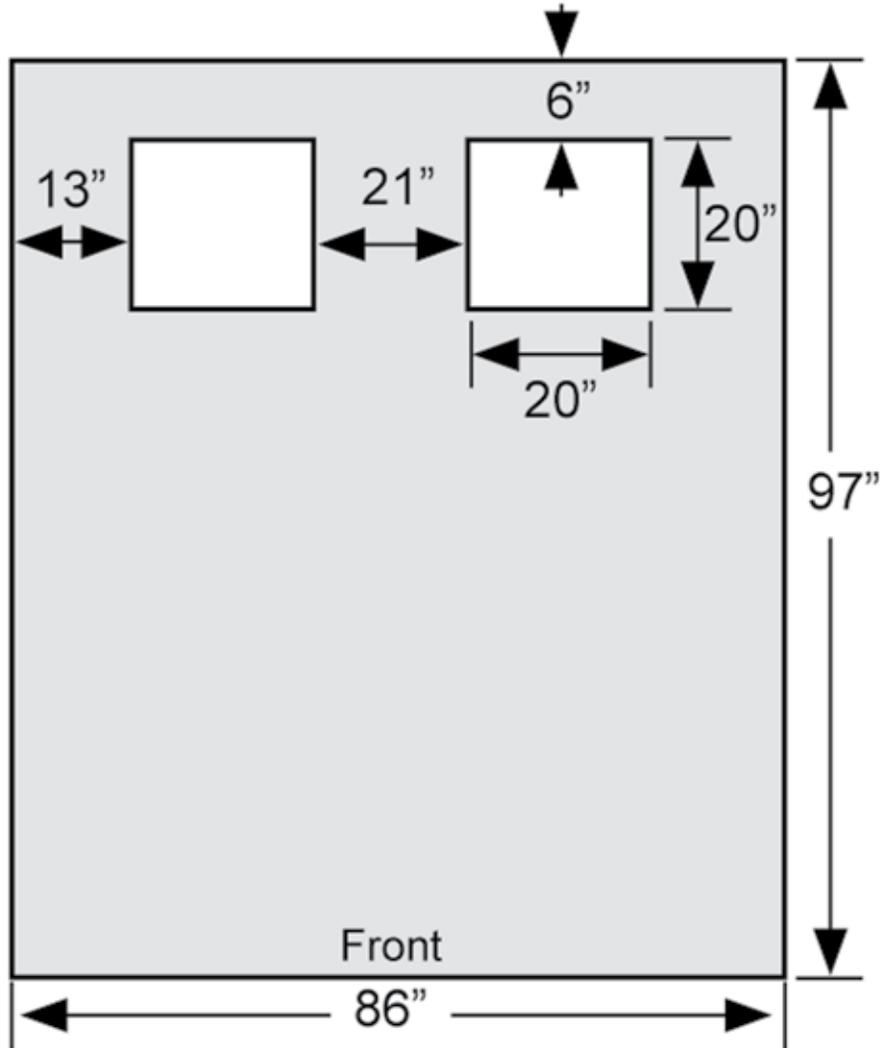
The outer door on the firebox is hinged and latched separately from the internal fire door. The door is hinged and opens to the right of the furnace. As the door opens it releases the A.R.D. auger tube cover plate, which allows air to enter the firebox before the fire door is opened, reducing the risk of a flashback. It is strongly recommended that a post is installed to the outside corner of the opened door to fasten the back and front external doors secure while in the open position. This reduces the risk of injury caused by the sudden movement of either large door (see drawing supplied).



Site Preparation Specifications – Model 800 CSS



Model 800 CSS



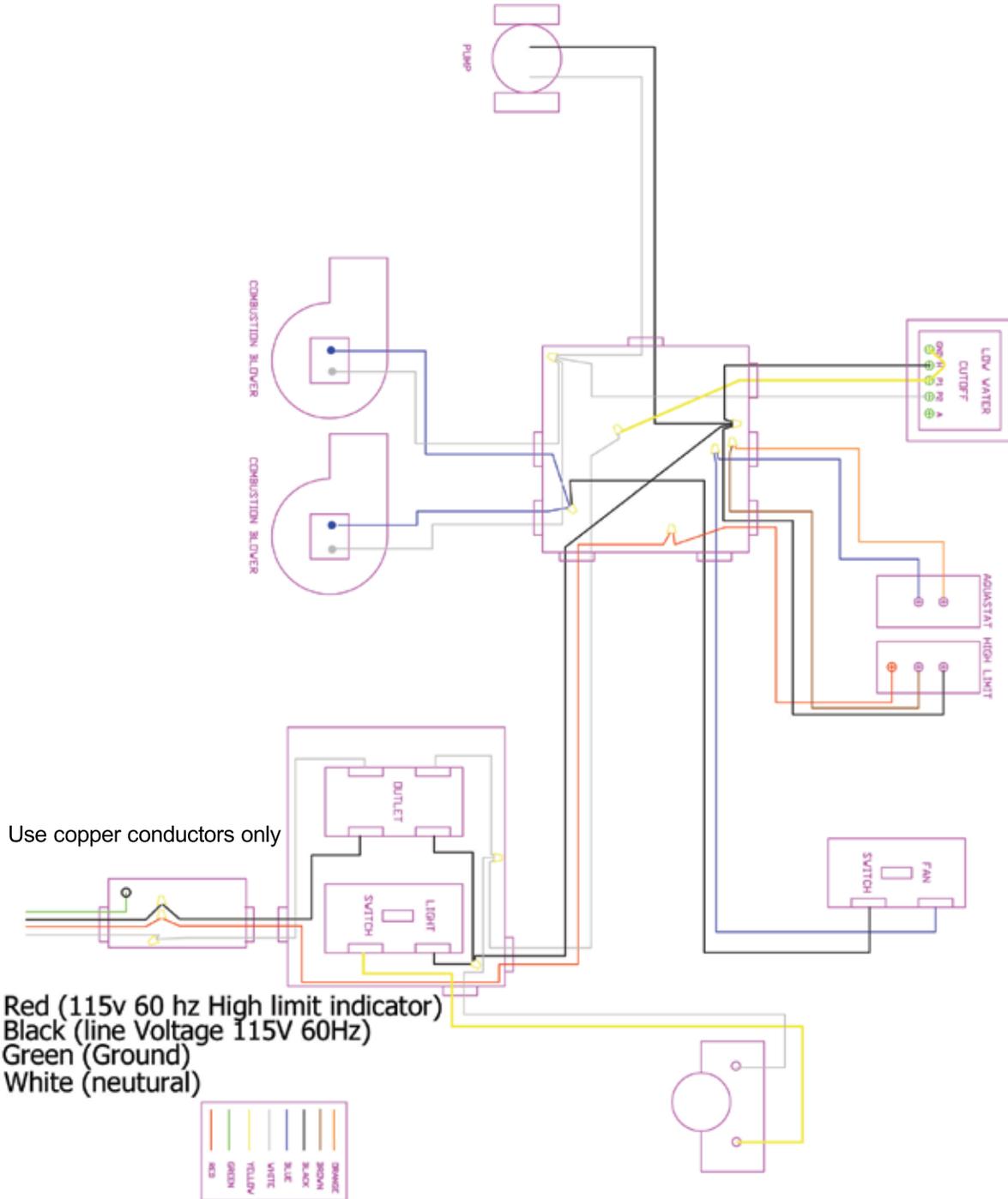
Notes:

1. Pad sizes are shed base dimensions plus 3 inches in width and 2 inches in length.
2. Pad thickness must be at least 4 inches but not more than 12 inches.
3. All measurements are in inches.

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Wiring Diagram – Model 800 CSS

For supply connections use 14 AWG or larger wires acceptable for at least 90C



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