

RENOVATOR MANUAL

Retain this manual



www.woodmaster.com / 800-932-3629 / Manual PN: 7994-850

Northwest Manufacturing, Inc / 600 Polk Ave SW / Red Lake Falls, MN 56750

Rev: 1.6



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Thank you for purchasing a quality Renovator Pellet Burner from Northwest Manufacturing, Inc. This product was designed to deliver easy, trouble free operation for years to come. Check out other WoodMaster heating products at www.woodmaster.com, or our line of quality pellet grills at www.woodmasterpelletgrills.com.

Terms



Renovator AKA Burner or Pellet Gun - Combustion chamber that burns pellets

Air Compressor - Optional on board air cleaning agent. an optional adapter (pn: 0020-23) can be used to attach the air cleaner to a shop air compressor

PLC - Programmable Logic Control - Controls the burner

Start Dose - Amount of fuel need to initiate ignition (approx. 5.25 oz, 150 grams, and 8.5 oz in volume)

Photo Sensor - Read the photo resistance value to control the flame from ignition to combustion

Auger Spiral - Feed auger screw

Pellets - Wood sawdust compressed into small cylinders to be used as fuel

Fault - An error or malfunction during the ignition or combustion process

Flue AKA Chimney - any duct or passage for air, gas or exhaust

O₂ The oxygen that is in the flue gas

Flue Gas Analyzer - O₂ sensor that is used to properly calibrate the air to fuel ratio of the burner. (Testo 327-0632 320370)

End Stop - Replaceable plate at the end of the burn pot that prevents the pellets from falling off the burn pot

Flame Guard - A guard that prevents the flame from going up the intake chute

Igniter - A heating element that ignites the pellets

Tipping Chute - The fuel inlet pipe on the Renovator

Combustion Fan - The fan that controls the air flow for combustion

Temp Sensor - Temperature sensor that dectects the boiler water temperature.

Draft Inducer - Fan that assists the combustion process to ensure a proper burn under all conditions



Safety

- *Read and follow these directions carefully. Retain this manual for as long as you own your Renovator.*
- *All installation and operations must follow STATE and LOCAL CODES for wiring, and firing of this unit. These CODES may differ from this manual. Installation must be performed by a qualified installer.*
- *Follow the manual carefully. Follow the recommended cleaning and maintenance.*
- *Never open the ash doors during operation!*
- *Never operate any part of the system with covers, shields or panels removed.*
- *Anyone who is not familiar with and/or has not been trained to operate the burner may not operate the system. Only responsible adults should operate your burner. If the burner is not fired properly damage could result and the warranty may be voided.*
- *Never allow children to play near or tamper with the burner, fuels/fuel tank or any other part of the system.*
- *Always keep the area around, and in front of the system clean and free from combustible materials.*
- *Keep animals away from the system.*
- *The operation may not be continued or restarted in the event of visible damages (for example, thermal distortion, traces of smoke or fire, mechanical damages, etc.). Any damages must be repaired. In the event of any doubts, please contact your authorized dealer.*
- *The system must not be exposed to external mechanical stress (for example, as storage, climbing support, brace, or similar). This also applies for single parts (doors, covers, etc.).*
- *During operation only touch the P.L.C. Temperatures at other points (for example, chimney, ash door, ducting...) can be very high.*
- *The Renovator Pellet Burner must be operated exclusively according to the guidelines for planning, assembly, regulations, statutes and product related instructions. The manufacturer is not liable for damages and their results, if they occurred due to improper assembly, operation, application and also inadequate maintenance and cleaning.*
- *Do not connect this unit to a chimney flue serving another appliance. Follow all state/local codes.*
- *Ensure that the burner is inserted to the maximum depth of the furnace. Check this each time the burner is removed for cleaning or servicing.*
- *After installation the exhaust must be tested with an O2 sensor from dealer for flue gas analysis.*
- *Disconnect all electrical power to the furnace before performing any service.*
- *After installation, the exhaust must be tested with an O2 sensor by your dealer for flue gas analysis.*

Safety



- *The Renovator must be operated exclusively according to the guidelines for planning, assembly, regulations, statutes and product related instructions. The manufacturer is not liable for damages and their results, if they occurred due to improper assembly, operation, application and also inadequate maintenance and cleaning.*
- *Ensure that the burner is inserted to the maximum depth of the furnace. Check this each time the burner is removed for cleaning or servicing.*
- *Take the proper precautions to ensure that the modifications made to an existing heating system does not interfere with existing safety controls.*
- *Never use the following: trash, plastics, gasoline, rubber, or naphtha in your Renovator.*
- *Read and follow these directions carefully. Retain this manual for as long as you own your furnace.*

Sweeping

The chimney should be inspected and cleaned as needed, typically twice a year. This is to be done by qualified persons. Regular cleaning of heating surface of the furnace will help the furnace operate at the highest possible efficiency. Shut off furnace/boiler and Renovator, disconnect power and allow the system to cool before attempting to clean the system.

Warning!

Always disconnect the power to the furnace/boiler before any cleaning or maintenance.

Service agreements increases operation length and life of the unit. For more information contact your local Northwest Manufacturing, Inc. dealer.

Replacement parts should only be genuine Northwest Manufacturing, Inc. components. Your dealer can supply the genuine service parts and install them. They can then reevaluate the system and provide a flue gas analysis. Failure to perform a flue gas analysis may void your warranty.

Safety Standards

Guardian info: Solid Fuel Burner System. Listed by Guardian Fire Testing Laboratories Inc. Tested and listed to THE Applicable Sections of UL-391, ETLM 78-1, ASTM-E 1509 & CAN/CSA-B366.1 EPA EXEMPT PER 40CFR60.53A, METHOD 28A



Technical Features

Features & Highlights:

- Compact design that easily fits into tight areas.
- High Efficiency wood pellet burner with automatic ignition. Burns less fuel for greater savings.
- Air Cleaned Firepot to help keep maintenance to a minimum and retain high efficiency.
- Central electrical location for ease of wiring.
- High quality attractive outer shell.
- Easily connect to existing systems to minimize installation costs.
- Fully automatic P.L.C. for ease of operation.
- Burn back protection for safe operation.
- Safety tested by Guardian to meet or exceed their standards for product quality & safety.
- Two sizes to choose from; 12-20 kW and 20-30 kW to fit most needs.
- The 20 kW unit has approximately 68,000 BTU (max input) and can be fitted onto the Force 20.
- The 30 kW unit has approximately 102,000 BTU (max input) for larger applications.
- Low maintenance.



Fuels



All wood pellets must conform to certain quality standards to ensure trouble free operation of the burner. Use of unapproved fuels may result in faulty operation and a voided warranty. Never use the following: trash, plastics, gasoline, rubber, or naphtha. Please contact your Renovator dealer or Northwest Manufacturing, Inc. for any questions on fuel use.

Pellet Specifications

Only premium wood pellets certified by the Pellet Fuels Institute may be used and must follow these guidelines:

- Bulk density per cubic foot must be a minimum of 40 pounds
- The diameter is between 1/4 inch to 5/16 inch
- Maximum length is 1.5 inches
- Fines (dust) of not more than 0.5% by weight
- Sodium content shall be less than 300 parts per million
- Ash content of 1% or less
- Moisture content of 10% or less

**Note: Pellets should be stored in a dry area and should not be allowed to get wet.
Handle pellets with care.**

Note: Each time you change brand/quality of pellets you may also have to change the start dose and feed rate of the burner.



Installation

Current system requirements

The furnace/boiler that the burner is to be installed in must match the BTU capacity of the burner to ensure a proper burn. A furnace/boiler that is sized too large for the burner can lead to poor draft and condensation in the chimney. A furnace/boiler that is too small for the burner will lead to overheating and loss of excess heat out the stack.

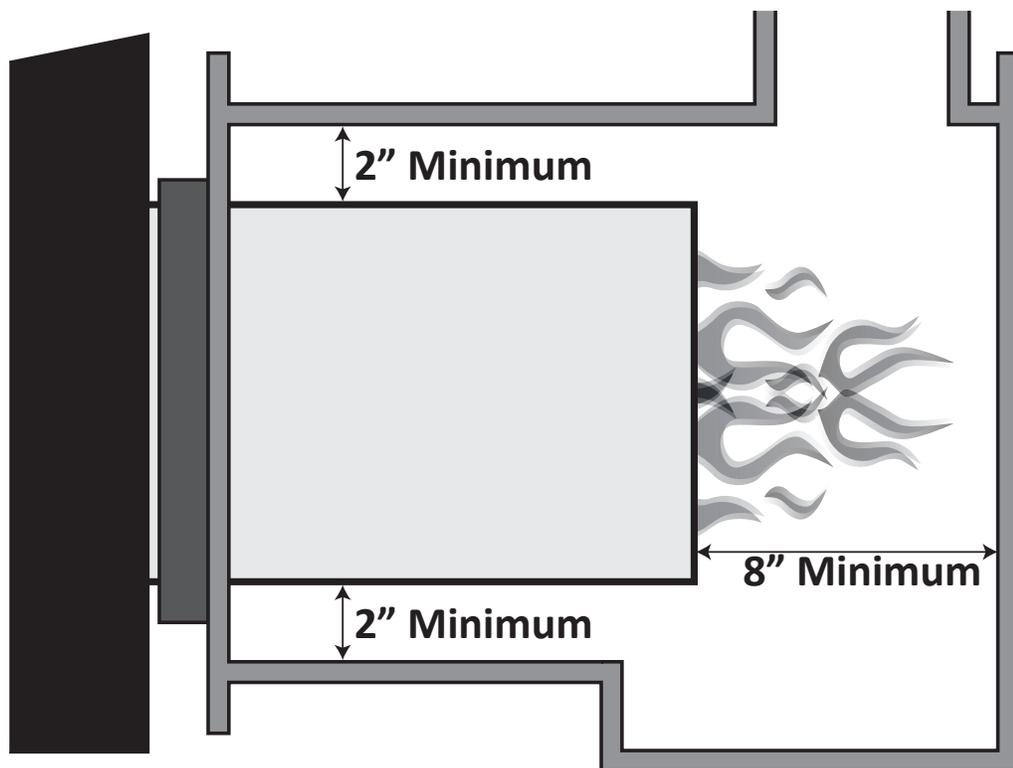
There should be at least 2 inches of clearance between the top of the burn pot housing and the top of the hearth of the furnace/boiler. There should also be at least 8 inches of clearance between the end stop of the burner and the back wall of the hearth.

The hearth should be large enough to hold the ash from 1000 pounds of pellets. This will vary depending on your application and is approx. 1.5 cubic feet of storage.

If the burner is mounted on the fuel door, the door should be switched so that the burner shuts down if the door is open. Do not open the fuel door when the burner is operational.

The door should have a layer of insulation with a fireproof plate on the inside of the firebox.

Completely remove the components of the old fuel system.



These are the minimum requirements of the firebox chamber. Not to scale.

Installation



General Information

The furnace/boiler that the Renovator Pellet Burner is installed in must meet certain requirements for proper operation of the burner. The furnace/boiler that the burner is to be installed in must match the BTU capacity of the burner to ensure a proper burn. There should be at least 2 inches of clearance between the top of the burn pot housing and the top of the hearth of the furnace/boiler. There should also be at least 8 inches of clearance between the end stop of the burner and the back wall of the hearth. The hearth should be large enough to hold the ash from 1000 pounds of pellets. This will vary depending on your application and is approx. 1.5 cubic feet of storage.

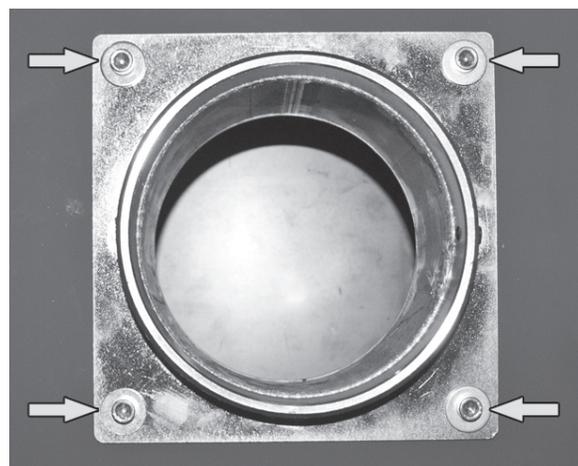
The Renovator Pellet Burner must be installed in a location that has enough space to allow for easy cleaning and maintenance. There must also be ample room for the pellet hopper and auger assembly.

The furnace/boiler room must also have a vent to allow ample fresh air for the combustion process. A vent size of at least 20 sq. in. is recommended. The main electrical wiring should be done by qualified persons. The Renovator should be mounted on the fuel gun door of the furnace/boiler if possible. Ensure that there is suitable space for ash to collect inside the furnace/boiler. The size of the area inside the furnace/boiler will determine how often you have to clean your furnace/boiler. If the door cannot be opened without removing the pellet burner, the burner can easily be removed and replaced with the mounting bracket.

Renovator Pellet Burner Installation

Mark out where the burner is going to be mounted determine if the door needs to be modified. If possible, we recommend that you mount a fireproof board on the inside of the door. This reduces radiant heat on the burner. Check that all door seals are air tight and that air cannot enter the boiler in any other way. If there is an air leak in the boiler the burn efficiency will be lowered.

Install the mounting bracket to the furnace/boiler with the supplied hardware. The holes on the frame are slotted to allow adjustments for proper alignment. Leave the bolts loose to allow for adjusting when installing the burner. There is a set screw on the ring of the bracket to lock the burner in position. Position the bracket so the set screw is easily accessible.



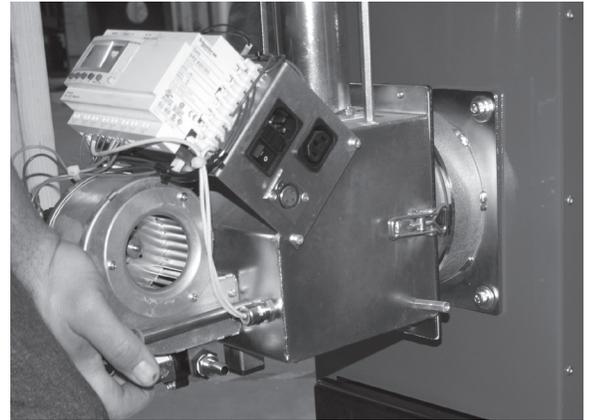
Attach the tipping chute to the burner in the desired position with the supplied screws. The tipping chute can be installed in multiple directions to allow for the pellet hopper to be placed on either side of the Renovator. Remove the four thumb screws that hold the cover on the burner and remove the cover.





Installation

Slide the burner assembly into the furnace/boiler 3/4 of the way to center the mounting bracket. Tighten the four bolts that secure the mounting plate. Now slide the burner all the way into the furnace. Ensure the burner is level and secure it in place with the set screw on the bracket.



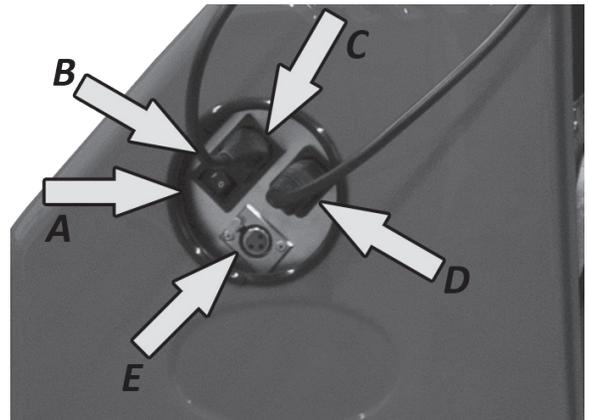
Place the cover over the burner and secure it in place using the four thumb screws provided.



Connect the wires to the burner. The Renovator Pellet Burners have very simple connections that allow for easier removal for cleaning and maintenance.

- A. Power Switch
- B. Fuse
- C. Power lead in
- D. To feed auger
- E. To Temperature Sensor

The protective cover on the burner cannot be removed without disconnecting these cables.



Replacement Fuse PN: 100-0038

Installation



Feed Auger Installation

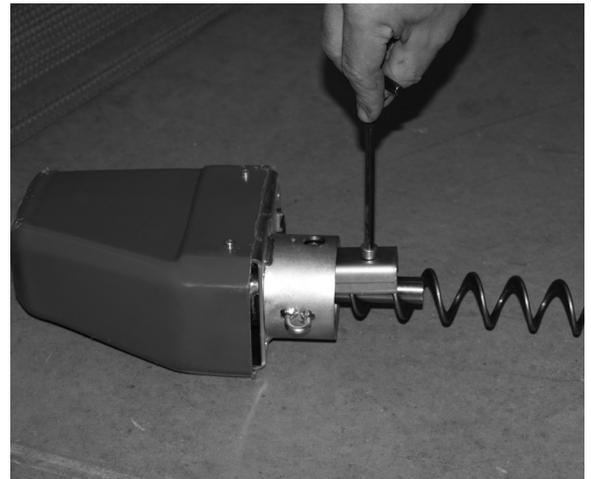
The angle of the auger should be between 43 and 45 degrees. The feed auger has to be fastened well. The auger can be hung from the ceiling or overhead support with a chain. The feed auger should be placed so that it does not sit right above the tipping chute on the burner. This helps reduce potential damage in the event of a burn back. Fill the feed auger with pellets before you connect the tube to the burner. Connect cable of the auger with the power cable for the burner and run it manually until pellets have been fed out from the auger for about 15 minutes. We recommend that you run the auger a couple of times manually for 70 second intervals and then weight each dose to see if the auger gives an even feeding. The margin of error should only be within 3-4 %. In 70 seconds the auger loads approx. 150 grams or 5.25 ounces, which is the recommended start dose. Insert the auger tube into the tipping chute when complete.

Feed Auger Assembly

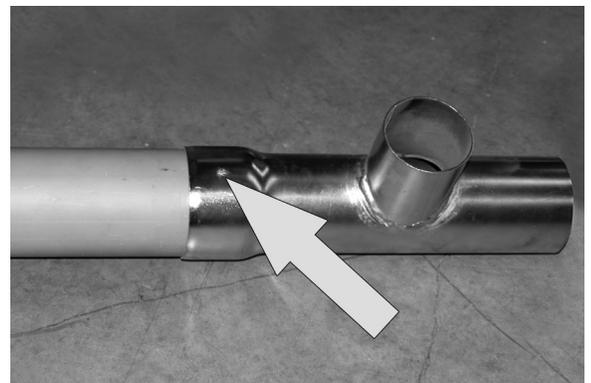
The following instructions describe how to assemble the feed auger out of the supplied parts. The auger pipe is 51" in length and the spiral is 65.75". No modifications to the length of the components can be made.

Manufacturing and mounting example:

1. Attach the auger spiral to the motors output shaft. Push the spiral as far as it can go onto the shaft, then pull it back approx. 3/8" to prevent binding. Clamp the spiral in place by tightening the two bolts that hold the clamp in place.



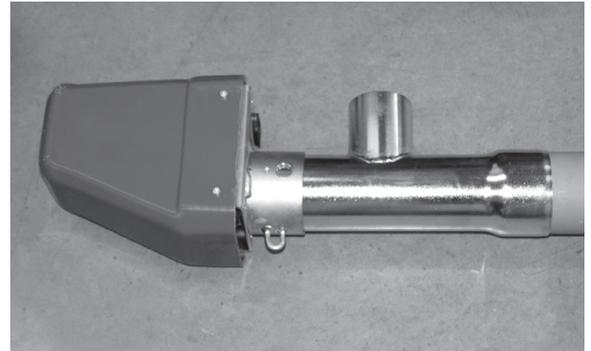
2. Slide the T-pipe onto the auger tube and fasten them together using the screw indicated by the arrow.



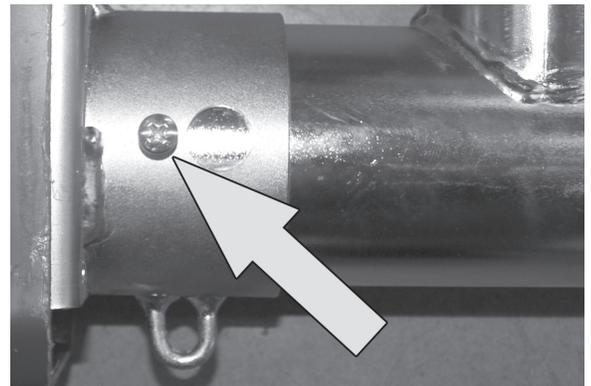


Installation

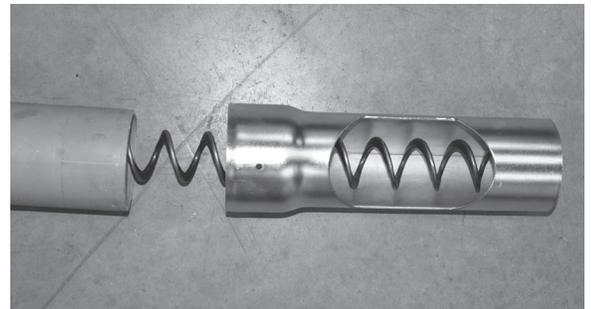
3. Push the auger pipe over the spiral. Make sure the outlet of the T pipe is pointed in the direction shown.



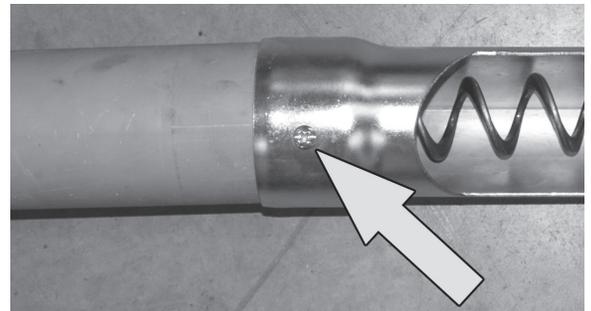
4. Fasten the screw shown to lock the auger pipe in place.



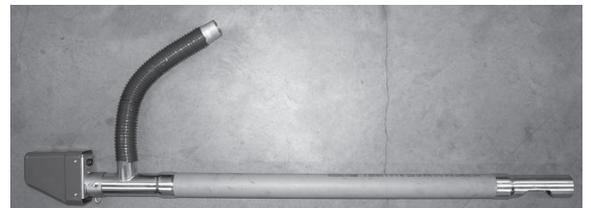
5. Slide the inlet pipe over the auger tube. The hole in the inlet pipe should be 180 degrees towards the outlet on the T-pipe.



6. Fasten the screw shown to lock the inlet pipe in place.



7. Slide the blue tube to the outlet of the T-pipe, and the cap on the end of the inlet pipe. The auger is now ready to be installed.



Installation



Pellet Hopper Assembly

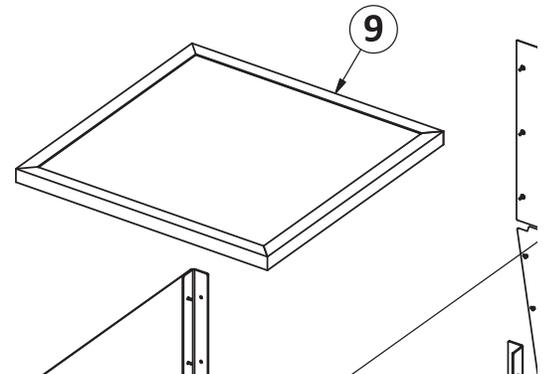
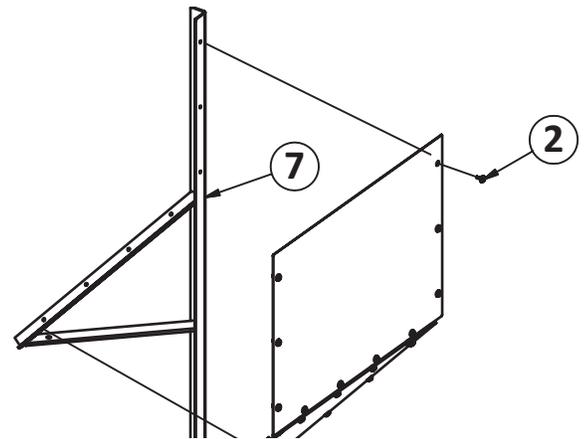
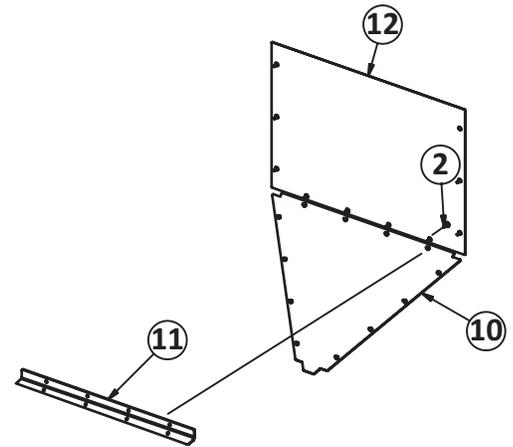
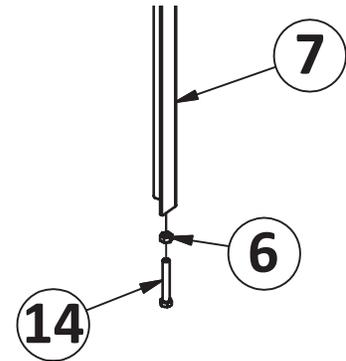
The optional pellet hopper holds approximately 280 pounds of pellets. Northwest Manufacturing, Inc. recommends using our pellet hopper to ensure proper fuel flow. Each part is numbered on the chart on the next page for reference.

1. Install the adjustable feet into each of the four legs of the hopper.

Assemble the four side walls out of side skins 12 and 10. Use the hopper side seam 11 to join the skins together using the provided screws.

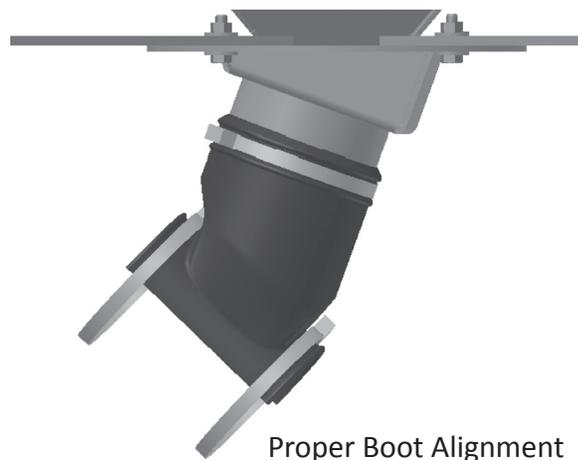
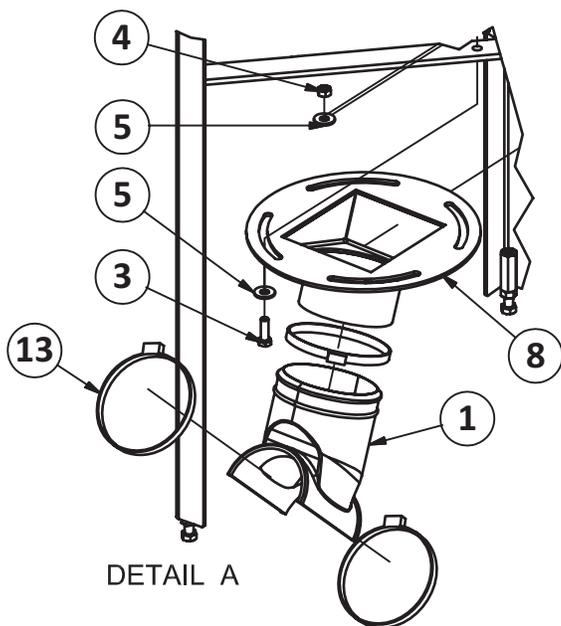
Join the assembled side walls to the legs using the supplied screws. The legs will be on the inside of the hopper, with the skins screwed to the outside.

Place the lid of the hopper on the hopper when assembly is complete. **DO NOT** remove the cover during operation.

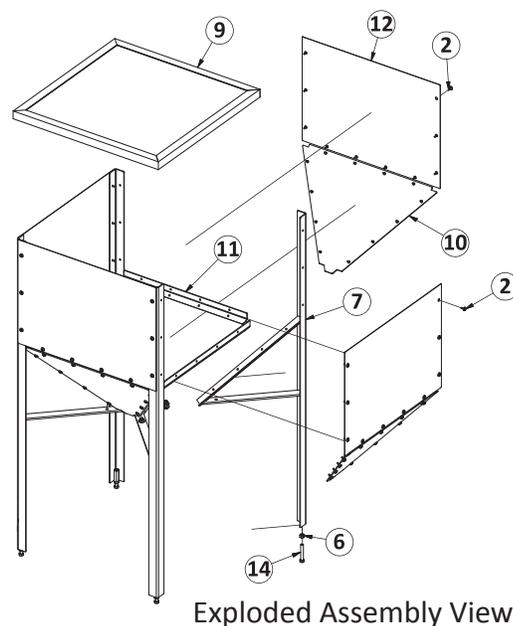




Installation



Once the hopper is assembled put it in place next to the furnace. The bottom is adjustable to allow for easy installation of the auger tube. Assemble the bottom by securing the hopper boot to the adjustable bottom with a hose clamp. Using the provided bolts and washers secure the bottom to the braces on the legs, do not tighten the bolts until the auger is in place to allow for adjustments.



ITEM	PART NUMBER	QTY	DESCRIPTION
1	0409-212	1	AFS9 HOPPER BOOT
2	0219-948	88	SCREW: 1/4-20 x 1/2" PPH THREAD ROLLING, Z
3	0219-265	4	SCREW: 5/16-18 x 1, HHCS, Gr5, Z
4	0219-001	4	NUT: 5/16-18, HEX, Z
5	0219-041	8	WASHER: 5/16" USS FLAT, Z
6	0219-002	4	NUT: 3/8-16, HEX, Z
7	980-0081	4	PTD: 4' HOPPER LEG WMT
8	980-0082	1	PTD: HOPPER ADJUSTABLE BOTTOM WMT
9	980-0083	1	PTD: HOPPER LID WMT
10	910-0285	4	PTD: HOPPER FUNNEL SIDE SKIN
11	910-0286	4	PTD: HOPPER SIDE SEAM
12	910-0287	4	PTD: HOPPER SIDE SKIN
13	0209-250	3	HOSE CLAMP, Ideal # 6872
14	210-0010	4	BOLT: 3/8-16X2.5; HH, FULL THREAD

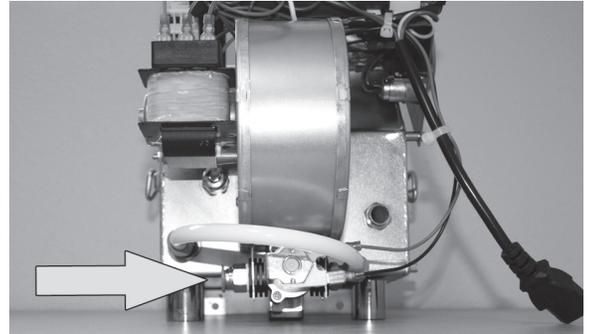
Installation



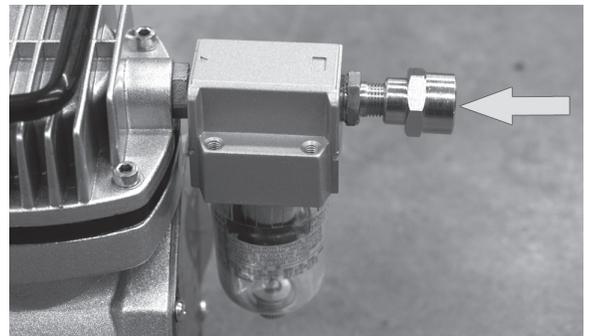
Optional On Board Air Cleaner Installation

The Renovator Pellet Burner has the capability to clean the fire pot with compressed air supplied by an on board air compressor. This allows for easier ignition as well as lower maintenance. Below is a brief explanation of the installation process. Make sure to place the air compressor in a safe place on level away from any heat source. **NOTE: Disconnect all power during installation.**

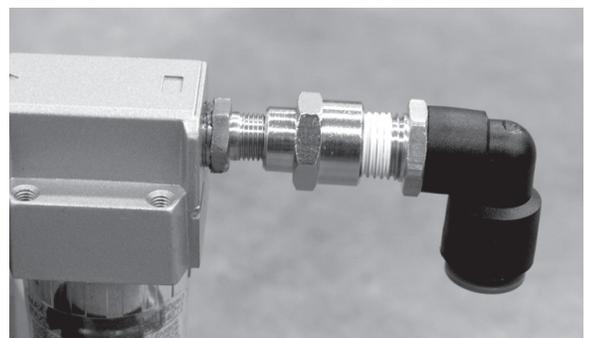
1. Disconnect the wiring and remove the plastic cover of the burner. **Note: The burner does not need to be removed from the furnace/boiler to perform this installation, the burner is shown off the furnace for reference only.** The location of the air line connector is below the combustion fan on the left side. Connect the supplied air hose to the air line connector on the burner.



2. Unpack the air compressor. Connect the adaptor fitting to the outlet of the air compressor. **NOTE: Thread sealant must be used in this connection.**



3. Connect the quick connect elbow to the adaptor fitting that you just installed on the air compressor. **NOTE: The threads on the quick connect elbow will already have thread sealant applied.**



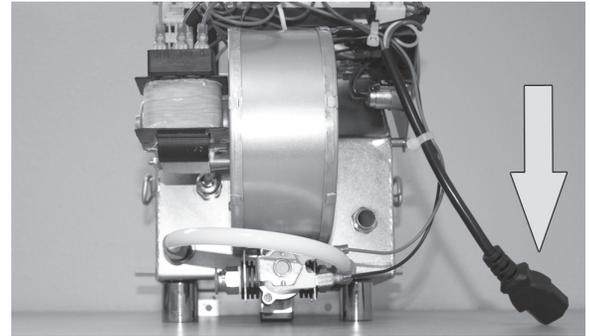
4. Connect the air hose to the air compressor via the quick connect. Make sure the air compressors power switch is left in the “on” position. **NOTE: Do not modify the length of the air hose.**





Installation

5. Plug the supplied air compressor power cord adaptor into the burner. Plug the air compressor power cord into the adaptor. Replace the burner cover.



If you do not obtain the optional on board air cleaner, you still need to supply compressed air to the burner for cleaning. Northwest Manufacturing, Inc. offers an adapter (Part Number: 0020-213) that will allow you to connect the air hose to a full size air compressor. Whenever the furnace is operational there needs to be a constant supply of compressed air over 90 psi available to the burner.

Chimney

The flue pipe to be installed is a rising chimney.

Elbows can be used, but T's are recommended to allow for the cleaning of the flue pipe.

For every one foot of horizontal pipe three feet of vertical pipe is required.

A draft controller should be used to allow proper flow. The draft controller must be installed as close to the furnace as possible.

A draft inducer may be used to ensure proper draft.

The chimney draw must be between $-.15$ and $-.10$ mbars ($-.06$ and $-.04$ inches of water).

The chimney must follow all state and local codes.

The Chimney should be installed by a qualified professional.

Flue Gas Analysis

Once the furnace is installed, it must be adjusted to proper burn settings. The sensor should be placed as close to the furnace/boiler as possible, and before any draft controller that may be installed. These setting will vary slightly depending on variables in each installation. A flue gas instrument must be used to properly adjust the burner. **NOTE: Make sure the flue gas instrument used supports biomass fuels, otherwise damage to the instrument may occur.** The target value for oxygen that you are trying to reach is: O2: 6.5-8.5%

the O2 value is the average over a one hour continuous burn. The value will fluctuate slightly during the duration of the burn. It is recommended to wait 3-5 minutes between adjustments to give the burner time to react to the adjustments. Shorter on/off time intervals will result in a more even and efficient burn. When adjusting to the oxygen level, if the O2 level is below the target values, then less fuel needs to be added, if it is above the target values, then more fuel is needed.

Note: The furnace should be readjusted each time a new brand of pellets is used.

Operation



The burner is not adjusted from the factory. The burner has to be adjusted with a flue gas instrument the first time the burner is fired and after a change in fuel brand/quality.

1. Fill the feed auger with pellets before you connect the tube to the burner. Connect cable of the auger with the power cable for the burner and run it manually until pellets have been fed out from the auger for about 15 minutes. Insert the auger tube into the tipping chute when complete.
2. Setting of start dose (the amount of pellets at ignition). A good start dose is approx. 150 grams (5.25 ounces) We recommend manually measuring the start dose. The start dose is approx. equal to the volume of an 8.5 oz cup.
3. To adjust amount of fuel for operation, a flue gas instrument must be used. The proper adjustment is needed to obtain the cleanest and most efficient burn. This should be made by your authorized WoodMaster Dealer.

Programming and information about the PLC control

To make changes to the settings of the PLC, use button 1 to scroll between menus. Once you have found the menu with the setting you wish to change, press the white button on the right with button 4.

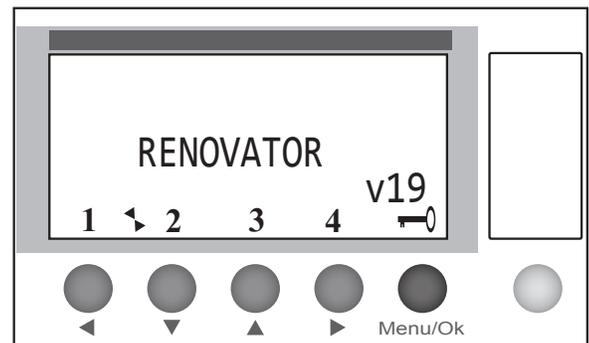
Once the white button and button 4 have been pressed one of the values that can be changed is now blinking.

To change the desired value, adjust with buttons 2 (down) and 3 (up).

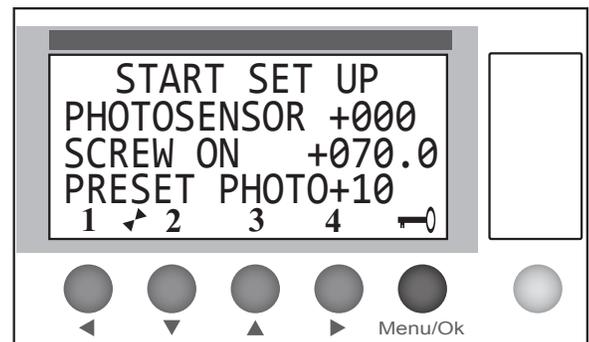
Buttons 1 and 4 let you scroll between the different settings on each menu.

Press the menu/ok to save any changes made. The value should stop blinking.

1. This is the default home screen. No changes can be made in this menu. Pressing the White button and the Menu/Ok button will briefly change the display to show the date/time screen. This will change back on its own.



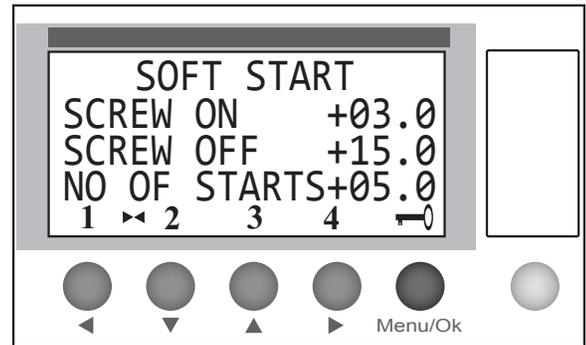
2. In this menu you can set the start dose. Here you choose how many seconds the auger takes to feed the optimal start dose (approx. 150 grams or 5.25 oz) of fuel pellets. Factory default is 70 seconds. This menu also handles the desired value of the photo sensor that controls the flame at combustion. When the sensor feels the flame has reached input value the burner switches to the soft start in the combustion. The photo sensor value can also be read in real time.



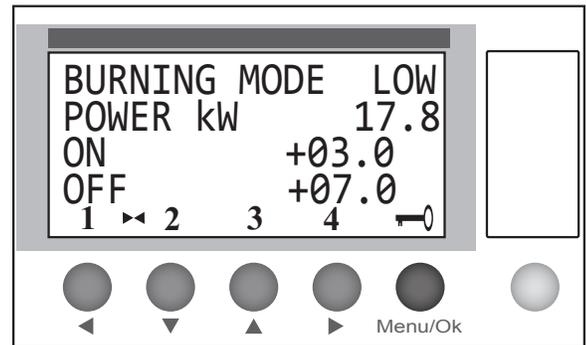


Operation

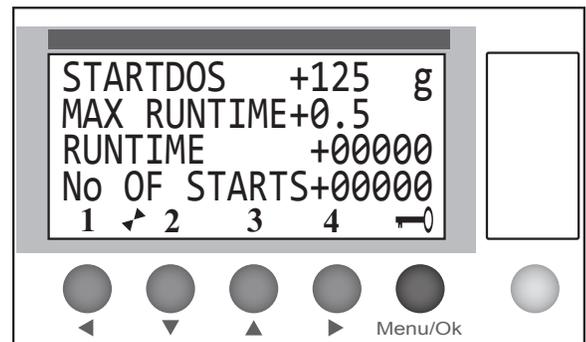
3. In phase two, the soft start level, the auger feeds the burner 5 times with three second operation intervals on the auger before it goes over completely to full burn mode. The three values in this menu can be changed.



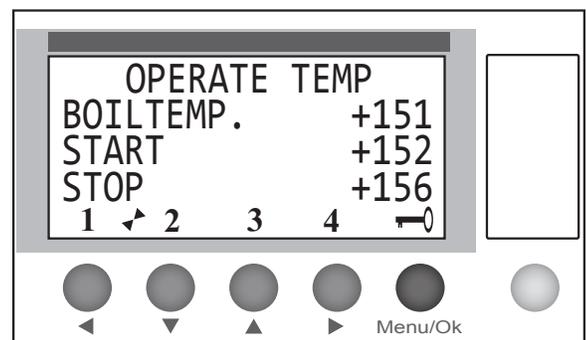
4. The next menu shows the burn mode the burner. The power displayed is the approximate input power. This is where the settings for the burner are changed when adjusting the furnace with a flue gas analyzer. This is made by adjusting the time for the feeding of the auger and time between the feeds. You can also select the mode in this menu. The choices are LOW and HIGH, where the user determines the feed rate, and AUTO mode, where the P.L.C. determines the feed rate. See step 5 for adjusting AUTO mode. Press buttons 2 and 3 together to change this value. You do not have to press button 4 and the white button prior to changing this setting.



5. The Startdos value in this menu (this is a different setting than the startdos previously described) is adjustable between 100 and 400 grams and is the adjustment used when the burner is in Auto burning mode. The MAX RUNTIME value is how long the burner will run before shutting down to self clean. The default value shown is 1/2 an hour. If heat is still called for, the burner will restart after the cleaning is completed. You can also read the operation time of the burner and how many times it has started.



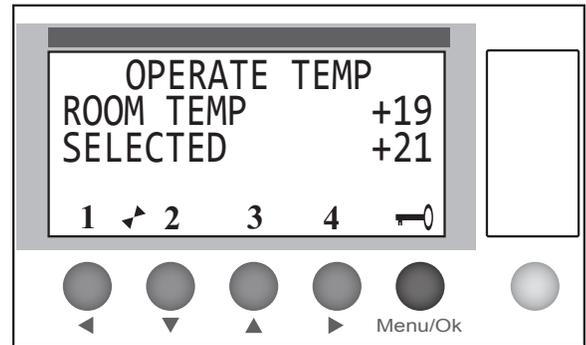
6A. This menu displays the current temperature of the boiler under the BOILTEMP value. The START and STOP values are user controlled to set the desired hysteresis for the burner. This menu will only appear on units programmed for a boiler installation.



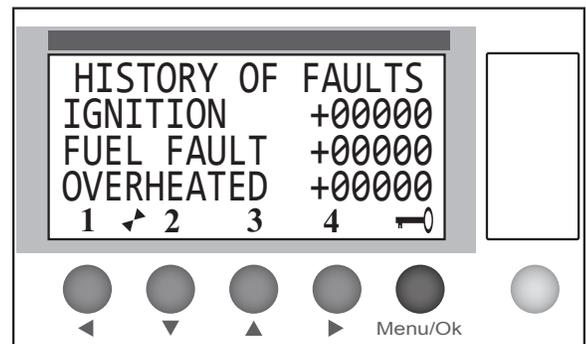
Operation



6B. This menu displays the current room temperature and allows you to set the desired temperature. The selected temperature can be changed. The room temp is the temperature that the supplied temp sensor is detecting. The burner comes with a temperature sensor that starts and stops the burner. A wall mounted thermostat can be wired directly to the P.L.C. on the burner. If a wall mounted thermostat is used, disconnect the temperature sensor. If a wall mounted thermostat is used, the selected value can no longer be changed in this menu, and is instead controlled by the thermostat. This menu will only appear on units programmed for a forced air installation.

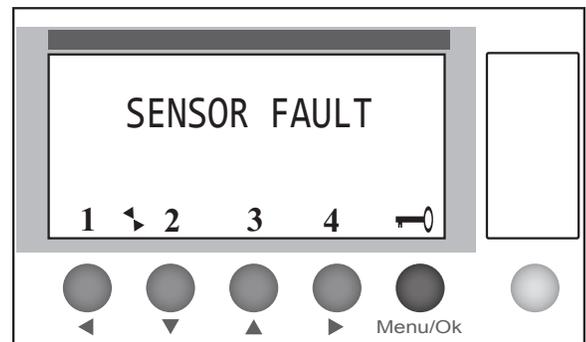


7. The P.L.C. also keeps track of some faults that could be useful to in the event of a problem occurring. This history shows how many ignition errors, fuel errors and if the burner has overheated via the temperature sensor that is placed on the tipping chute. There are no values that can be changed in this menu.

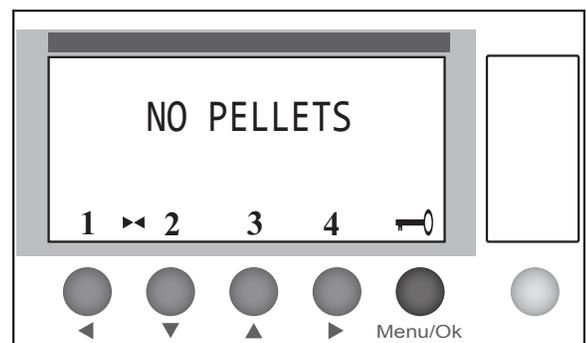


Alarm (The display shows a message and the burner has turned off.)

8. This alarm example indicates an error has occurred to the sensor that controls the furnace temperature. **Do not attempt to start the burner.** Turn off the burner and check the connections for the sensor. restart the burner. If the problem persists, contact your dealer or Northwest Manufacturing, Inc.



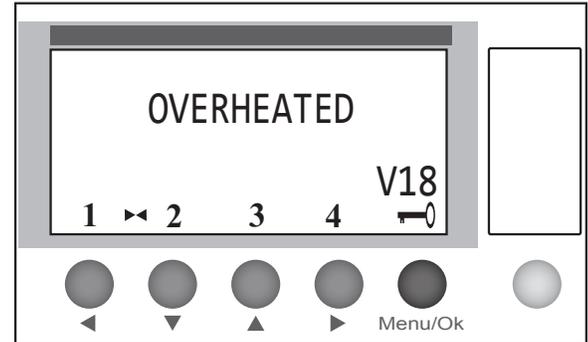
9. When this alarm appears the pellet hopper is empty. Please refill the pellet hopper with pellets. This will only appear if you have set up a level sensor in the pellet hopper. If you do not have a level sensor in the pellet hopper, then a FUEL FAULT will occur. See the troubleshooting section for further assistance.



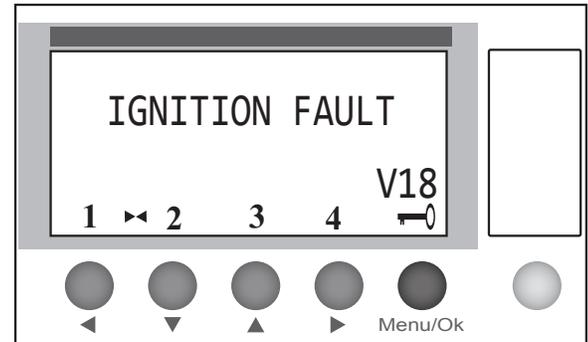


Operation

10. When this alarm appears on the burner turn the power off to the burner once the combustion fan has stopped. Allow the furnace to cool and clean the furnace. Check the blower air box filter and replace if the filter is dirty. Turn the burner back on and reset it. To reset the burner hold down button 4 until the P.L.C. is reset. If the problem persists, there could be a lack of proper draft. Contact your dealer or Northwest Manufacturing, Inc. or see the troubleshooting section for further assistance.

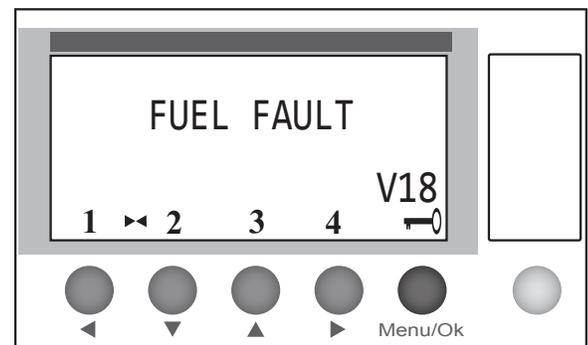


11. Error on the ignition element. This may be caused by an incorrect start dose, a dirty burner or a failed igniter. Turn off the burner and restart. Check to make sure you have the correct start dose settings, or check the connection for the feed auger. If the burner starts, no further action is needed. If not see the troubleshooting section for further assistance. If the problem persists or if the igniter is bad, contact your dealer or Northwest Manufacturing, Inc.



12. The error "FUEL FAULT" can be displayed for multiple issues:

1. Make sure there are pellets in the pellet hopper.
2. Make sure that the auger drive motor is working by connecting the power cord of the burner and the power cord of the auger.
3. If the pellet hopper is empty it is best to fill and run the auger until pellets come again manually. Let the auger run for approx. 10 -15 min to get an even dosage.
4. Make sure the pellets in the pellet hopper are not cavatating. If this is occurring, clean the pellet hopper.



If the problem persists, contact your dealer or Northwest Manufacturing, Inc. See the trouble shooting section for further assistance.

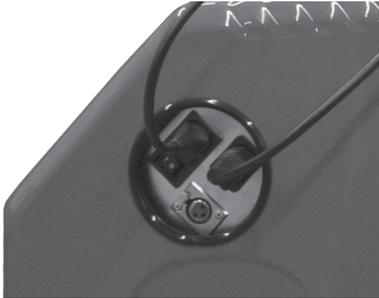
Maintenance



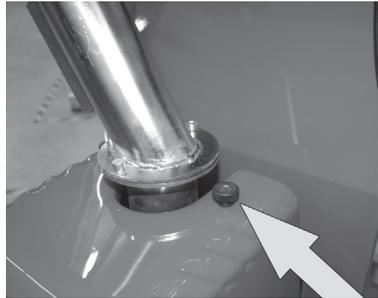
WARNING: Before performing any of the following tasks, ensure that the power is disconnected from the furnace and the burner, and that all components of the system have had ample time to cool.

Cleaning the Burner

Manual cleaning is a simple process. Removal of the firepot takes only a few minutes. Below is a step by step process for burner removal. The burner and chimney should be cleaned twice a year.



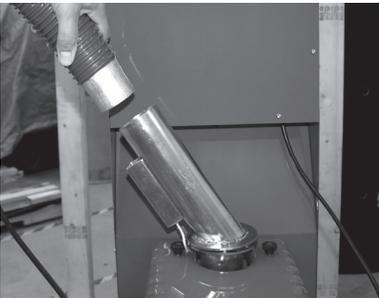
1. Disconnect the cables on the side of the burner.



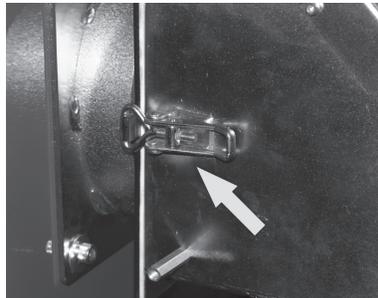
2. Unscrew the cover. There are 4 thumb screws that hold the cover on.



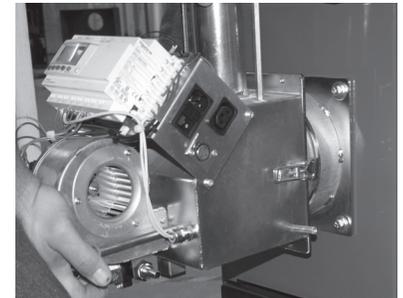
3. Lift the cover off the burner.



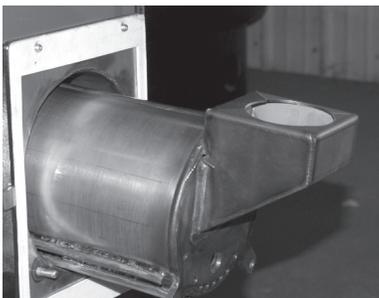
4. Lift the pellet feed hose out of the tipping chute.



5. Release the quick latches.



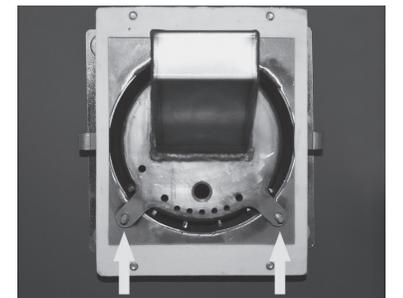
6. Lift the rear section of the burner off the burn pot.



7. Pull out the burn pot and sweep out the burn pot mounting bracket



8. Clean out all the air holes.



9. When reinstalling the burn pot make sure the alignment pins line up properly.

Repeat the same process in reverse to reinstall the burner.

Cleaning the Auger

The auger should be removed from the storage at least once per year and cleaned. Then re-mount the auger and connect cable of the auger with the burner power cable and run it manually until pellets have been fed out from the auger for about 15 minutes. This avoids air pockets that could cause uneven feeding. Ensure the angle of the auger is between 43 and 45 degrees each time it is removed for cleaning.



Maintenance

WARNING: Before performing any of the following tasks, ensure that the power is disconnected from the furnace and the burner, and that all components of the system have had ample time to cool.

Replacing the Endstop

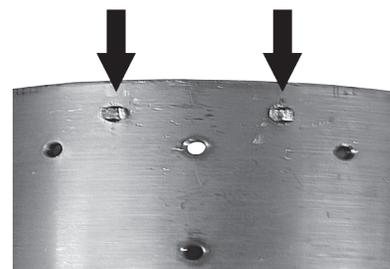
To replace the endstop first you need to remove the burner from the furnace by following the removal process described on the prior page.



1. Locate and remove the endstop from the burn pot.



2. Use a pliers or similar tool to press the endstop into the burn pot.



3. Use a screwdriver to lock the endstop into place.

Replacing the Igniter

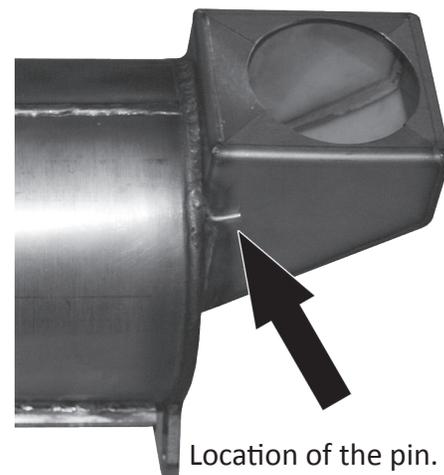
The igniter is located inside the air box of the burner. Remove the burner as shown on the prior page. It is recommended to clean the firepot while the burner is removed. Disconnect the two power wires for the igniter. The connection for the wires are located outside of the air box. Then loosen the screw that holds the igniter in the mount. Carefully remove the old igniter and place the new one in the mount. Secure the screw and plug the igniter in. Properly secure all wires. Remount the burner.

Location of the screw.



Replacing the Flame Guard

The flame guard is located inside the burn pot of the burner. Remove the burner as shown on the prior page. The flame guard is in the chute of the burn pot. To remove the flame guard, first locate the metal pin that holds the guard in place. Bend one end of the pin straight. Carefully pull the pin out the other end. Carefully put the new guard in place and slide the pin in, ensuring that the pin properly goes through the guard. Once in place, bend the straight end of the pin to lock it in place. Ensure the flame guard moves freely before reinstalling the burn pot in the furnace.



Location of the pin.

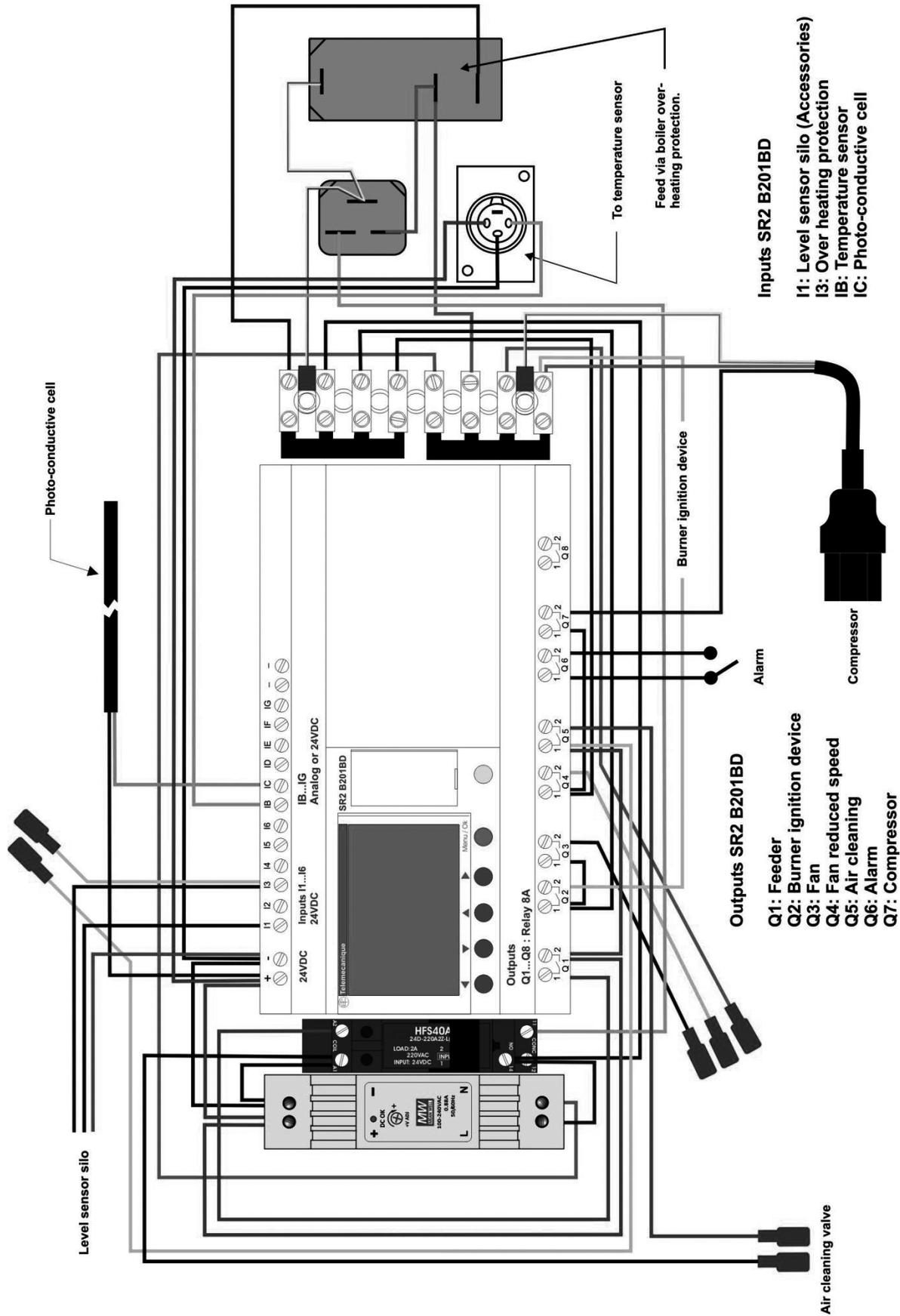
Troubleshooting



Error	Cause	Solution
The burner has stopped. "Fuel fault" is on the display.	<ol style="list-style-type: none"> 1. The pellet hopper is empty. 2. An air pocket has developed in the inlet of the feed auger. The fuel is cavatating in the pellet hopper. 3. The auger has been blocked by waste. 4. The tipping chute is plugged. 	<ol style="list-style-type: none"> 1. Fill the pellet hopper with pellets. Restart the furnace. 2. Agitate the fuel in the pellet hopper Note: Ensure power to the auger is disconnected before agitating fuel. 3. Clean the feed auger. 4. Decrease the start dose.
The burner stops even though it ignites.	<ol style="list-style-type: none"> 1. Too heavy of feeding during the soft start or combustion phase. 2. Flame guard is dirty or broken. 	<ol style="list-style-type: none"> 1. Adjust the fuel feed rate. 2. Clean or replace the flame guard.
The burner does not ignite. "Ignition fault" is on the display.	<ol style="list-style-type: none"> 1. Incorrect start dose. 2. Broken ignition element. 3. Stop in tipping chute. 	<ol style="list-style-type: none"> 1. Change the start dose. 2. Replace the ignition element. 3. Clean the tipping chute.
The burner stops without visible reason.	<ol style="list-style-type: none"> 1. Incorrectly adjusted burner. 2. Too much back pressure in the chimney. 3. Error in the fuel feeding. 	<ol style="list-style-type: none"> 1. Adjust the burner. 2. Install a draft limiter. 3. Test with O2 Sensor 4. Clean the feed auger.
"Overheated" on display.	<ol style="list-style-type: none"> 1. Too low of draft in the furnace. 2. Dirty filter in the filter box 3. Safety temp limiter has tripped 4. There is no power to the burner 	<ol style="list-style-type: none"> 1. Turn off the burner and clean the furnace, burner and air filter. 2. Check to ensure proper airflow in the System. Clean the filter 3. Check to ensure the chimney is not restricted. 4. Check the power to the furnace and the burner. Check the breaker.



Wiring



Renovator 20 Wiring Diagram

11: Warranty



ONE YEAR LIMITED WARRANTY

This Warranty is provided by Northwest Manufacturing, Inc. only for the benefit of the initial purchaser (Original Owner) of the Northwest Manufacturing, Inc. Renovator Pellet Burner (the "Burner") on the original site of installation (the "Site of Original Installation"). This Warranty provides specific legal rights. You may have other rights depending on where you live.

The rights in this warranty depend on the proper assembly, installation and commissioning of the Burner by a dealer or installer who is certified by Northwest Manufacturing, Inc. (the "Certified Contractor"); and proper operation and maintenance. Proper maintenance in accordance with the Maintenance Intervals (as defined herein) must be preformed. Installation by an uncertified or unqualified contractor or installer and/or improper maintenance, operation, misuse or abuse of the Burner shall void this Warranty in whole or in part.

LIMITED ONE (1) YEAR WARRANTY ON THE BURNER AND ELECTRICAL COMPONENTS

Northwest Manufacturing, Inc. warrants to the Original Owner, That the Burner is free from manufacturing defects for the period of one (1) year from the date of installation. Northwest Manufacturing, Inc. will not warranty the Flame Guard and endstop on the burner, these items are consumable items and in the case of normal wear is the responsibility of the owner to replace as necessary. Northwest Manufacturing, Inc. warrants any electrical components are free from defects for the period of one (1) year from the date of installation. Northwest Manufacturing, Inc. will determine whether to repair or replace the defective parts.

START OF WARRANTY PERIODS

The Warranty Period shall begin on the date the Burner installation has been completed (the "Original Date of Installation"). In the event of dispute as to the Date of Original Installation, the shipping date of your Burner, as recorded by Northwest Manufacturing, Inc., shall be deemed to be the Date of Original Installation.

WARRANTY LIMITATIONS

I. Damages for unsatisfactory performance caused by improper installation or any damages caused by or as a result of improper use of the Burner, incorrect start-up, incorrect or careless handling, improper control adjustment, incorrect burner adjustment, disregard of the operating instructions and proper maintenance or disregard of any other instructions supplied with the Burner, improper operation of the Burner or improper alteration and repairs/service by a third party not affiliated with Northwest Manufacturing, Inc. will not be covered under this warranty. All repairs must be performed by a Certified Contractor.

II. The warranty will not cover damage to parts caused by improper installation, improper care or maintenance. The Burner and any installed accessories must be serviced, inspected and cleaned at regular intervals. Northwest Manufacturing, Inc. will NOT warranty damage to the Burner due to ash corrosion.

III. The workmanship, repairs or replacement of parts of the Certified Contractor will not be covered under this warranty.

IV. Components of the heating system not furnished by Northwest Manufacturing, Inc. as part of the Burner and components of the Burner are not covered under this Warranty. Damages caused by components of the heating system not supplied by Northwest Manufacturing, Inc. will not be covered under this Warranty.

V. Fuels used in the Burner must meet the specifications set out by Northwest Manufacturing, Inc.. Suitable fuels are listed in the user manuals for proper fuel requirements. Damage caused by the use of any unapproved fuel, or any fuel that does not meet the guidelines set forth by Northwest Manufacturing, Inc. will not be covered by this warranty.

VI. Any costs for labor for the examination, removal or reinstallation of allegedly defective parts, transportation of the parts to and from Northwest Manufacturing, Inc. facilities will not be covered and will be the responsibility of the Original Owner. This includes any other labor and costs for any material necessary for the said examination, removal or re-installation.



Warranty

VII. The warranty will not cover damage to the Burner or any of its original parts, replacement parts or other accessories or standard equipment caused by excessive temperatures or pressures, vandalism, fuel or gas explosion, electrical, chemical or electrochemical reaction, electrical failures, insurrection, riots, war, acts of God, combustion air contaminated externally, air impurities, sulfur or sulfuric action or reaction, dust particles, corrosive vapors, oxygen corrosion, and situating the Burner in an unsuitable location or continuing use of the Burner after onset of a malfunction or discovery of a defect.

VII. Consumable parts, and parts in direct contact with the flame, will not be covered under this warranty.

WARRANTY TERMS

The Warranty shall also be subject to the following terms and conditions:

I. The Burner must have been installed by a Certified Contractor.

II. The Burner must have been properly maintained, cleaned and serviced during the Warranty Periods in accordance to the manual.

III. This Warranty is non transferable and only covers the Original Owner, at the original site of installation.

IV. Northwest Manufacturing, Inc. shall have the time needed and unobstructed access to the Burner for the purpose of conducting tests of the Burner and for the making of repairs or installation of replacement parts.

V. Repairs, replacement or the repair of replacement parts shall be subject to the terms and conditions of this Warranty as if they had been installed at the time of original installation.

VI. This Warranty is limited to the provisions previously described and does not extend to any Burner, related parts or products that are (a) not sold in Canada or the United States; (b) not installed in Canada or the United States; or (c) not purchased from an Authorized Distributor.

VII. Northwest Manufacturing, Inc. shall not be responsible for any consequential damages, direct or indirect caused by the products described in this Warranty.

APPLICABLE LAW

All disputes or claims on the Warranty shall be determined in accordance with the laws of Red Lake County, Minnesota.

WARRANTY CLAIM/SERVICE

Notify the Certified Contractor who installed your Burner. The Contractor will then notify Northwest Manufacturing, Inc. who will make all warranty decisions. No warranty work can be carried out without approval from Northwest Manufacturing, Inc.. If the Certified Contractor fails to make a warranty claim, contact Northwest Manufacturing, Inc. directly. Allegedly defective parts **MUST** be returned to Northwest Manufacturing, Inc. for the purpose of inspection to determine cause of failure.

Northwest Manufacturing, Inc. / 600 Polk Ave. SW / Red Lake Falls, MN 56750-5002

(800) 932-3629 • Fax: (218) 253-4409 / www.woodmaster.com



Cut here and mail registration card

Northwest Manufacturing Inc.
600 Polk Ave. SW
Red Lake Falls, MN 56750

PLACE
POSTAGE
HERE

Northwest Manufacturing Inc.
600 Polk Ave. SW
Red Lake Falls, MN 56750

Renovator Warranty Registration Card

Please fill out the warranty registration card below and mail it back to us.

Failure to register may delay warranty claims.



Serial Number

Owners Name _____

Address _____

City _____ State _____ Zip _____

Daytime Phone _____ Home Phone _____

Email _____ Date of Purchase _____

Dealers Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

How did you learn about our product?

Radio Newspaper Internet TV Print Other _____

Would you like information on other products from Northwest Manufacturing, Inc.? Yes No

I have read the owners manual and understand the proper usage of my Renovator Pellet Burner.

Signature _____ Printed Name _____

Thank you for purchasing a Renovator by Northwest Manufacturing, Inc.

Cut here and mail registration card



Specifications



Connection Hole	6" Diameter
Power Connection	120v
Maximum Current Draw	4.17 Amps @ 120 v, 60 Hz
Igniter (Max Draw)	3.33 Amps @ 120 v, 60 Hz
Burner (Max Draw)	0.833 Amps @ 120 v, 60 Hz
Maximum Output (20 kW unit)	68,000 BTU
Maximum Output (30 kW unit)	102,000 BTU
Hopper Height	52"
Hopper Width	24"
Hopper Depth	42"



Temp Conversion

Degree C	Degree F	Degree C	Degree F	Degree C	Degree F
0	32	36	96.8	72	161.6
1	33.8	37	98.6	73	163.4
2	35.6	38	100.4	74	165.2
3	37.4	39	102.2	75	167
4	39.2	40	104	76	168.8
5	41	41	105.8	77	170.6
6	42.8	42	107.6	78	172.4
7	44.6	43	109.4	79	174.2
8	46.4	44	111.2	80	176
9	48.2	45	113	81	177.8
10	50	46	114.8	82	179.6
11	51.8	47	116.6	83	181.4
12	53.6	48	118.4	84	183.2
13	55.4	49	120.2	85	185
14	57.2	50	122	86	186.8
15	59	51	132.8	87	188.6
16	60.8	52	125.6	88	190.4
17	62.6	53	127.4	89	192.2
18	64.4	54	129.2	90	194
19	66.2	55	131	91	195.8
20	68	56	132.8	92	197.6
21	69.8	57	134.6	93	199.4
22	71.6	58	136.4	94	201.2
23	73.4	59	138.2	95	203
24	75.2	60	140	96	204.8
25	77	61	141.8	97	206.6
26	78.8	62	143.6	98	208.4
27	80.6	63	145.4	99	210.2
28	82.4	64	147.2	100	212
29	84.2	65	149	101	213.8
30	86	66	150.8	102	215.6
31	87.8	67	152.6	103	217.4
32	89.6	68	154.4	104	219.2
33	91.4	69	156.2	105	221
34	93.2	70	158	106	222.8
35	95	71	159.8	107	224.6

Northwest Manufacturing, Inc



Renovator Pellet Burners