

WOODMASTER ULTRA SERIES

Retain this manual

WOOD
MASTER®
Ultra Series

PELLET
FURNACE



POWERED BY THE
RENOVATOR PELLET BURNER

www.woodmaster.com / 800-932-3629 / Manual PN: 7994-875

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

Obadiah's • 406-300-1776



TABLE OF CONTENTS

Terms	3
Safety	4-5
Technical Features	6
Fuels	7
Installation	8-19
Operation	20-23
Maintenance	24-26
Troubleshooting	27
Wiring Diagram	28-29
Specifications	30
Warranty	31-34
Temperature Conversion	35



Thank you for purchasing a quality Ultra Series Pellet Furnace from WoodMaster. 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 - On board air cleaning agent

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 automatically 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 detects the boiler water temperature

Hopper - Storage container used to hold pellets

Blow Down - The process of removing sediment deposits from the furnace by draining water
from the bottom of the unit(s) until the water runs clean

Firebox - Chamber where the flame is present

Water Jacket - Steel casing that surrounds the firebox and holds the water/antifreeze

Turbulator - Cleaning device located in heat exchangers that also increase efficiency

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

- Read and follow these directions carefully. Retain this manual for as long as you own your furnace.
- 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.
- All WoodMaster Hydronic Furnace models operate at atmospheric pressure. **DO NOT** obstruct, block, or plug in any way the overflow vent pipe which is located directly in front of the chimney on top of the furnace.
- Freeze protection must be guaranteed in all water-bearing parts in the event of extensive idle periods of the system. Note: Your WoodMaster Ultra is not intended to be your only heat source.
- Boiler water treatment must be used to ensure proper water quality.
- The chimney height may need to be adjusted depending on the installation and local codes. Do not connect this unit to a chimney flue serving another appliance. Follow all state/local codes.
- 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 furnace may not operate the system. Only responsible adults should operate your furnace. If the furnace 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 WoodMaster 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.).
- Only touch the handles during the operation. Temperatures at other points (for example, chimney, ash door, water lines...) can be very high.
- The WoodMaster Ultra 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.
- After installation, the exhaust must be tested with an O2 sensor by your dealer for flue gas analysis.
- Disconnect all electrical power to the furnace before performing any service, except when servicing the burner. There is a circuit breaker on the electrical box of the furnace that will shut off power to the burner, but will leave power to your pump, light and outlet.

SAFETY



- *The water pump must run continuously whenever the WoodMaster Furnace is being used.*
- *The water pump must be installed on the supply line on the furnace.*
- *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 WoodMaster Furnace.*
- *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. Shut off the 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/burner before any cleaning or maintenance.

Service agreements increases operation length and life of the unit. For more information contact your local WoodMaster 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, UL2523 & CAN/CSA-B366.1 EPA EXEMPT PER 40CFR60.53A, METHOD 28A

SOLID FUEL BURNER SYSTEM	
Listed By: GUARDIAN FIRE TESTING LABORATORIES, INC.	
Make/Model: Ultra 30	Serial No.: UL3xxxx
Production Date Code:	
Manufacturer: Northwest Mfg., Inc. WoodMaster	
Test Date: 10/02/2009	Electrical Rating: 6A, 120V, 60HZ
Fuel: WOOD PELLETS, 10% MAXIMUM MOISTURE CONTENT. LESS THAN 1% ASH CONTENT	
	
Tested and Listed to the Applicable Sections of UL-391, ETLM 78-1, ASTM-E-1509, UL2523 & CAN/CSA-B366.1, EPA EXEMPT PER 40CFR60.53A, METHOD 28A	

SOLID FUEL BURNER SYSTEM	
Listed By: GUARDIAN FIRE TESTING LABORATORIES, INC.	
Make/Model: Ultra 20	Serial No.: UL2xxxx
Production Date Code:	
Manufacturer: Northwest Mfg., Inc. WoodMaster	
Test Date: 10/02/2009	Electrical Rating: 6A, 120V, 60HZ
Fuel: WOOD PELLETS, 10% MAXIMUM MOISTURE CONTENT. LESS THAN 1% ASH CONTENT	
	
Tested and Listed to the Applicable Sections of UL-391, ETLM 78-1, ASTM-E-1509, UL2523 & CAN/CSA-B366.1, EPA EXEMPT PER 40CFR60.53A, METHOD 28A	

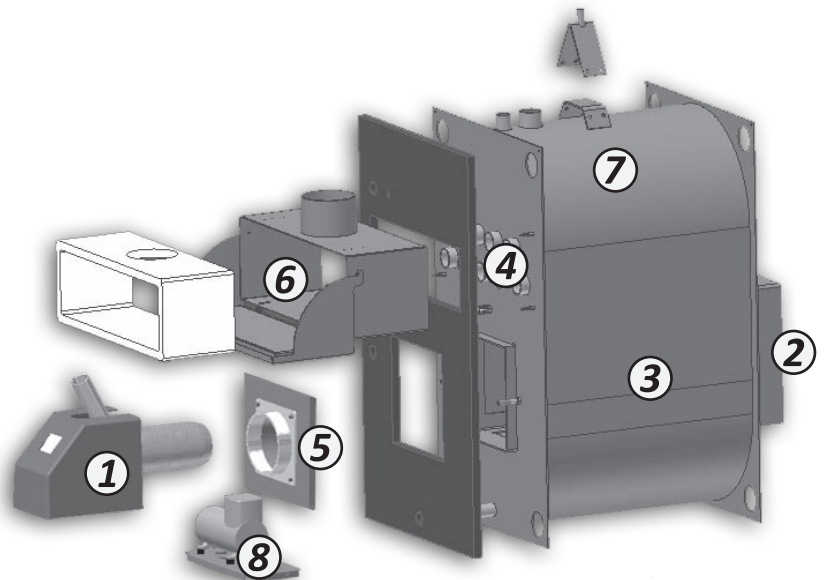
RENOVATOR PELLET BURNER

- Efficient heat from wood pellets that supports local economy.
- The 20 kW unit has Approximately 68,000 BTU.
- The 30 kW unit has Approximately 102,000 BTU.
- Automatic ignition for heat on demand.
- Air cleaned firepot to help keep maintenance to a minimum and retain high efficiency.
- Fully automatic PLC (Programmable Logic Control) for user friendly operation.
- Low maintenance.
- Built in burn back protection.
- Central electrical location for ease of wiring.
- Safety tested by Guardian to meet or exceed their standards for product quality & safety.



BENEFITS OF THE ULTRA SERIES

1. High efficiency Renovator burner with automatic ignition.
2. Easy access ash door in front for quick and easy ash maintenance.
3. Large ash box for longer intervals between cleaning.
4. Efficient heat transfer tubes.
5. Rear access door that the burner mounts to.
6. Easy access flue tube clean out door for simpler maintenance.
7. Water jacket with 60 gallon capacity.
8. Air supply to auto clean the Renovator & minimize 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 WoodMaster 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

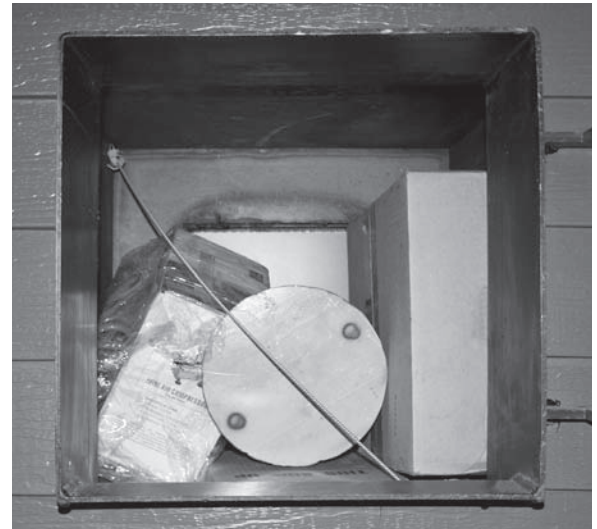
Note: Pellets should be stored in a dry area and should not be allowed to get wet.
Handle pellets with care.

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

Unpacking

Before you start installing your Ultra Furnace, remove the ash shovel and auger pipe from the furnace. These are located inside the back access door along the left hand side.

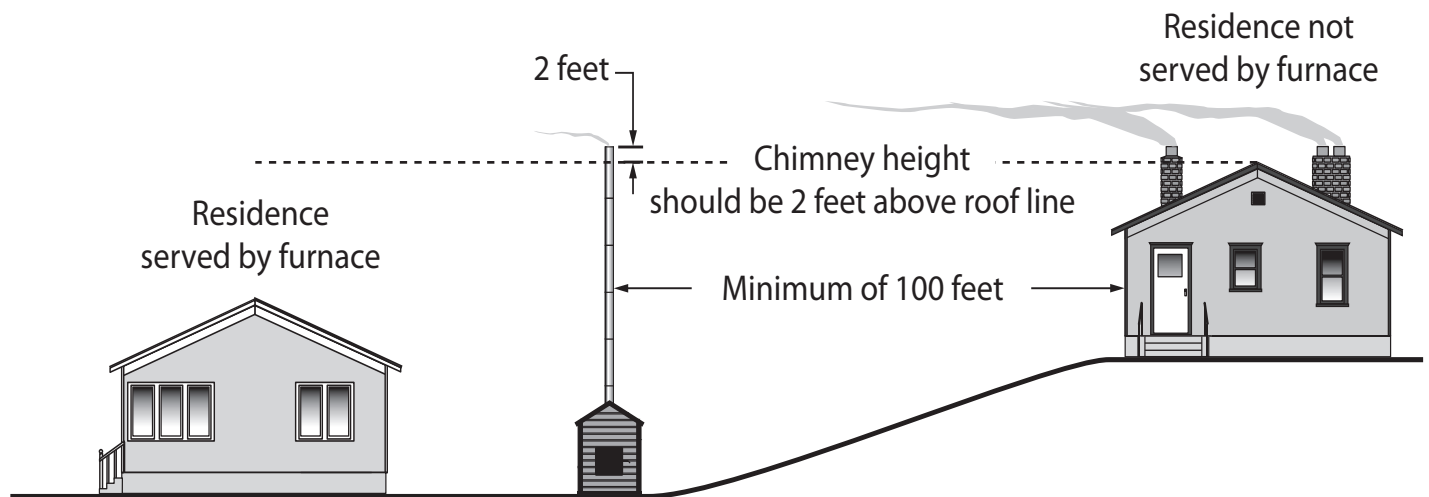
The fire box contains the remainder of the system components; the auger spiral, air compressor and hose kit, tube brush, wringing, a box containing the auger motor and fittings, the flame deflector and a box containing boiler treatment and a steam saver cap. make sure all components are removed before beginning installation.



LOCATION: It is recommended that the unit be located with due consideration to the prevailing wind direction.

- When using more than 4 feet of chimney extension external support is needed.
- Should be located greater than 100 feet from any residence not served.
- If located between 100 and 300 feet to any residence not served, it is recommended that the stack be at least 100% of the height of the peak of the residence, plus an additional 2 feet.

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



Choosing Location

When installing your WoodMaster, keep in mind the direction of the winds during heating months. Try to place the furnace in an area where exhaust will not be a problem for yourself or any surrounding neighbors.

Chimney Specifications

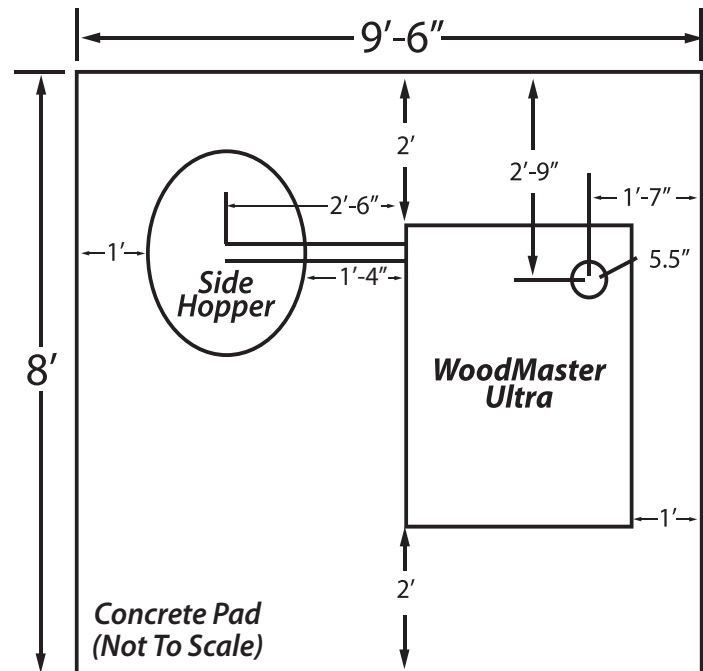
To insure proper insulation, use only a Class A Insulated Chimney and Chimney Adapter from your local WoodMaster Dealer or Northwest Manufacturing, Inc. A draft inducer may be used to ensure proper draft under all conditions. The Chimney should draw between $-.15$ and $-.10$ mbars. *Note: Remove the chimney cap prior to lighting the furnace.*

INSTALLATION



Pad Supports

The pad support for the furnace and hopper should be a concrete slab at least 9'-6" x 8' x 4". Two feet of clearance from the front and rear of the furnace and at least one foot clearance on the sides is recommended. Failure to install the WoodMaster Ultra on a cement slab will result in a voided warranty.



Trench

The trench must be 24 inches deep and 6 to 12 inches wide. It can be dug with a shovel or a backhoe. Place all the dirt to one side of the trench to allow room for working on the other side.

Wiring

Place electrical supply in bottom of trench and cover with 6 inches of dirt. Electrical wire rated for underground use (12-2 +ground) can be buried in the same trench as the water lines but must maintain a minimum 24 inch depth. Always follow state and local codes.

Water Lines

The remaining 18 inches of open trench is where the water lines are placed. Use only water line approved by Northwest Manufacturing through your Woodmaster Dealer.

NOTE: If lines travel under a driveway or where heavy equipment travels, the line should be buried two to three feet deep. If lines travel through a low or wet area, they should be insulated and installed in a water tight piping, (PVC).

Note: The water temp gauge on the front of the furnace is for reference only.

Note: Leave a minimum of three feet of water line exposed above ground at the furnace to insure adequate length for connection.

Note: Before insulating and burying the water lines, label the hot water supply line at both ends. Once the lines are covered you will be able to easily determine which line is connected to the pump.

Note: Use only approved water line insulation sold through your WoodMaster Dealer. Poor insulation will cause your Wood Master furnace to burn large amounts of fuel, and hurt the efficiency of the system. For best results use high quality insulation.

Mounting the Pump

Note: The pump must be located on the furnace.

The pump flange valve comes pre installed on the supply line.

Locate one of the black rubber gaskets, and place it between the pump and the mounted flange valve, bolt the pump to the flange. Make sure the arrow on the pump indicating direction of water flow points down.

Bolt a 1" cast iron pump flange and gasket to the bottom of the Pump.

Note: Make sure that the pump is attached to the supply line, not the return.

Note: A pump that has a minimum flow rate of 6 GPM is recommended

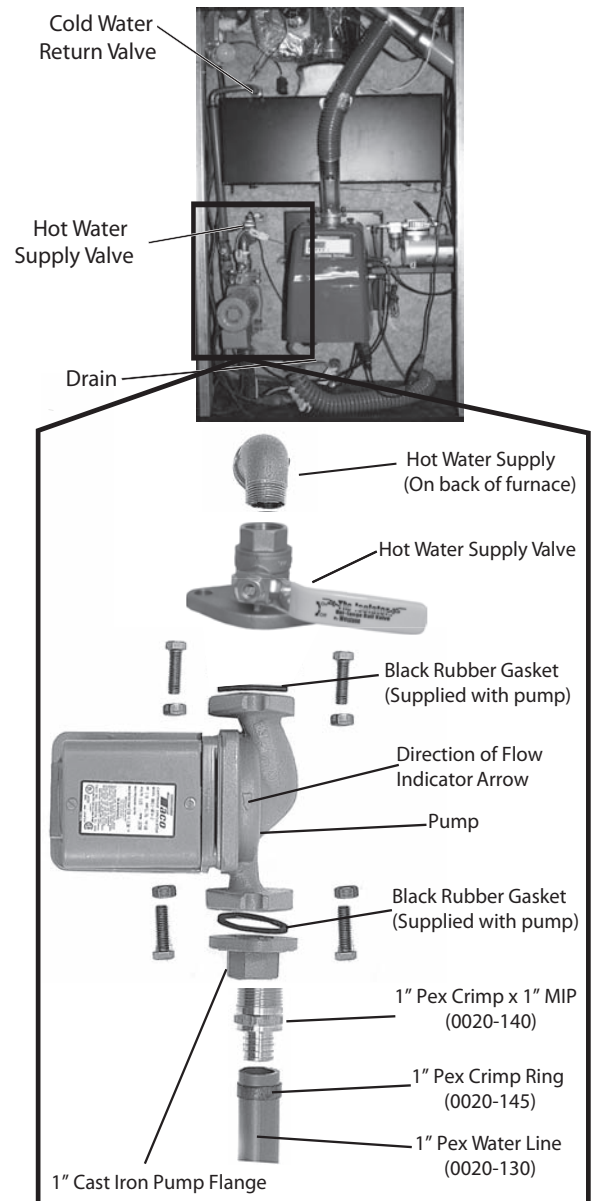
Hooking Up Water Lines

Water Supply

Attach the 1" Pex x 1" MIP fitting (0020-140) to the flange on bottom of the pump. Then attach the hot water supply 1" Pex Water Line (0020-130) to the fitting using 1" Pex Crimp Ring (0020-145).

Water Return

Attach the 1" Pex x 1" MIP (0020-140) fitting to the Water Return Valve. Then attach the cold water return 1" Pex Water Line (0020-130) to the fitting using 1" Pex Crimp Ring (0020-145).



This is an example of an installation using a Taco pump. Your layout may vary, but the pump must be on the supply line.

Wiring The Pump

Remove the cover on the pump. Then using an approved wire, connect the ground wire to the green ground screw on the pump. Connect the black wire to the yellow wire on the pump. Finally, connect the remaining two white wires together and replace the pump cover.

Locate the junction box in the back of furnace and remove the cover. Connect the running end of the approved wire coming from the Pump to the Junction.

Note: The wires from the pump will have to connect with the main power wires in the junction box.

Note: The pump must run continuously whenever the WoodMaster Furnace is in use. DO NOT run the pump dry.

Note: All wiring must follow state and local codes and should be done by a qualified electrician. Disconnect power before servicing any electrical components.

INSTALLATION



Entering the building with water lines can be done underground or over the sill plate. Once inside the building the typical hookup would run first to the Domestic Hot Water Supply and next to an existing heating system such as a forced air furnace or a hot water heating system. Finally, before leaving the building, a fill valve must be installed near a water supply for filling and flushing the boiler in the WoodMaster Furnace.

Domestic Hot Water

The Domestic Hot Water/Flatplate Kit consists of a Water to Water Heat Transfer unit and the fittings needed to hook it up. The unit mounts on the wall **VERTICALLY** in your utility room and is connected as shown.

Existing Forced Air

A water to air heat exchanger is inserted in the existing plenum. In most cases the heat exchanger is placed in a horizontal position, keeping all four sides level. The air must be forced through the finned area of the heat exchanger evenly. The hot water line coming from the hot-water tube enters the bottom fitting of the heat exchanger and exits the top fitting, which returns to the furnace. If the plenum is too large or too small, it must be altered to fit the heat exchanger properly.

Note: The water to air heat exchanger must be installed below any existing off-peak electric coils already in the plenum.

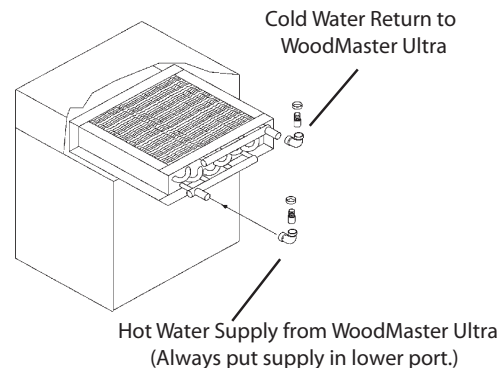
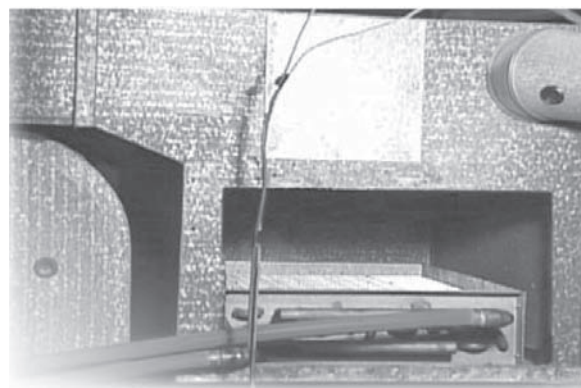
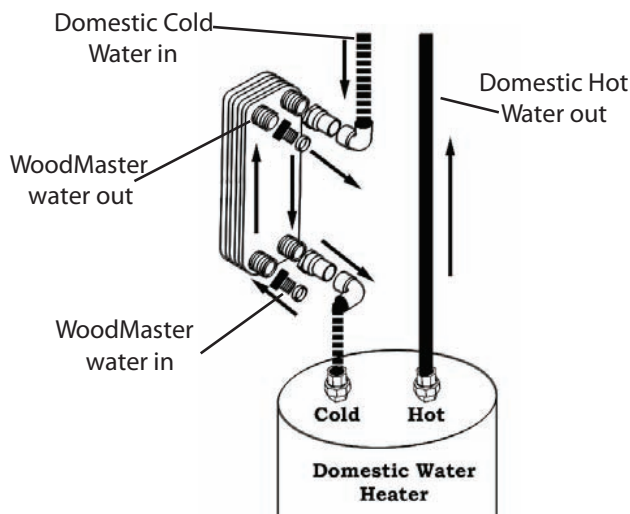
After the installation of the WoodMaster add-on water to air exchanger, the air flow may need to be increased to fuel furnaces, electric furnaces, and electric/gas furnaces. Methods of doing this are:

Belt Drive System

Blower pulleys and motor pulleys may be changed but the electric current flowing through the motor shall not exceed the nameplate rating. (A blower motor of larger power may be used.)

Direct Drive System

The motor shall not be changed, however the speed of the motor may be increased.

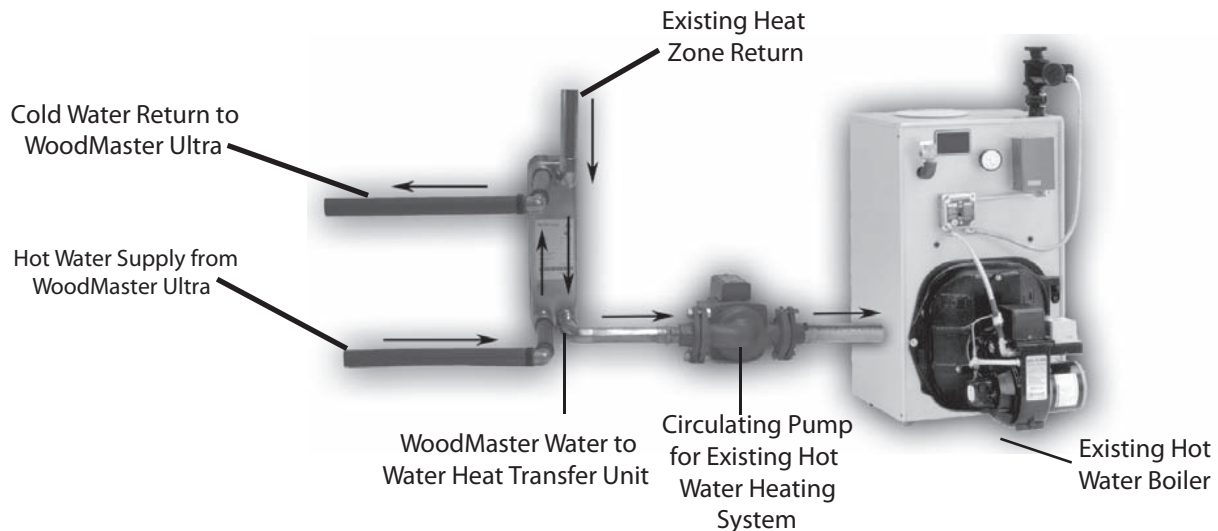


The heat exchanger works on the same principal as your car heater. Air blows through the heat exchanger, taking the heat from the water and blowing it into your existing duct work.

Existing Hot Water Heat

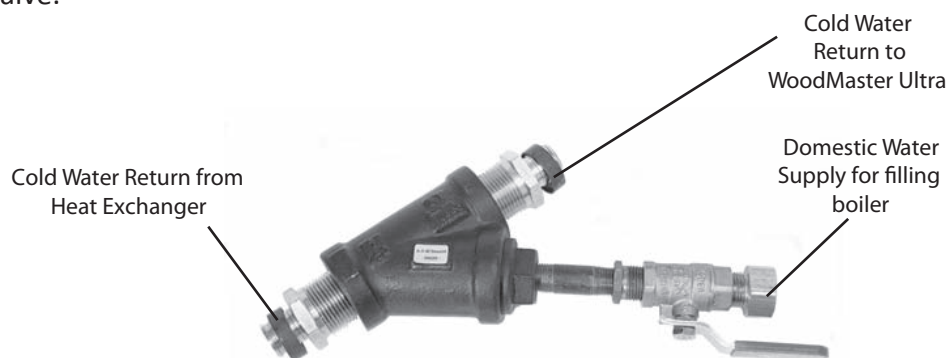
A Water to Water Heat Transfer Unit (0020-052) is used to connect to an existing hot water boiler system.

Note: Any changes that are made to an existing boiler should be done by a qualified plumber and follow all state and local codes.



In Line Filter and Fill Valve Assembly

The In Line Filter and Fill Valve Assembly (0020-275) must be installed in the cold water return line before the line exits the building. It should be placed so that a garden hose can be connected between a domestic water supply and the fill valve.



Filling With Water

Connect a garden hose between a domestic water supply and the furnace fill valve (0020-275), which was installed in the cold water return line at a point just prior to its exiting the building. Make sure that valves not being used on the furnace are closed and the valves that are being used are open. Begin filling and inspect for leaks on all fittings. Repair any leaks that are found. The furnace may also be filled through the vent pipe in front of the chimney.

Routinely pay attention to the water level light. If the light is not lit, this indicates that the water level is low and the furnace may need to have water added. Add water until it flows out of the vent pipe.

Note: Place the steam saver on the furnace vent once the furnace is full.

INSTALLATION



Bleeding The System

While filling the boiler, close the cold water return valve on the furnace for two or three minutes, and then open the valve. This will force trapped air out of the hot water supply line. Repeat this process with the hot water supply valve on the furnace to force air out of the cold water return line. Once both lines have been “bled” continue filling the furnace until the system is full and water comes out of the vent pipe.

Note: Air in the water lines can cause damage to the pump.

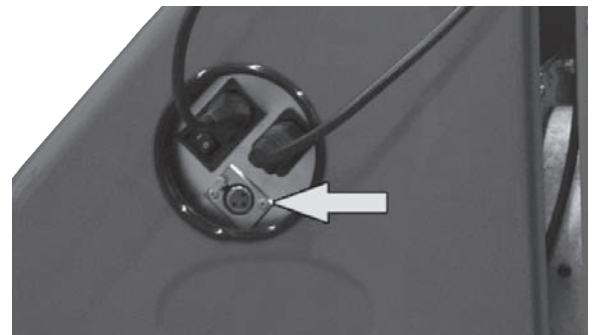
Renovator Pellet Burner Installation

The burner come pre installed in its mounting location on the furnace. Before using the furnace, remove the protective film from the burner cover.

The water temp probe must be installed in the well on the supply line of the furnace.



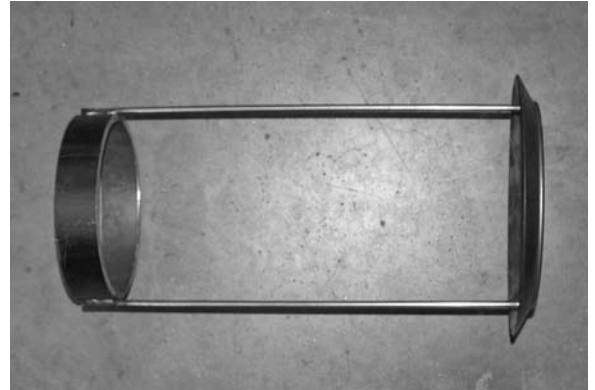
Plug the probe connector into the side of the burner.



Install the probe in the well on the supply line. Make sure the probe set screw contacts the metal of the probe. DO NOT clamp the probe by the wire, this will damage the probe.



Locate the flame deflector that fits over the burner to prevent excess heat from contacting the door.



Slide the ring of the flame deflector over the burner until it contacts the rear door of the firebox.



Feed Auger Installation

The angle of the auger should be between 43 and 45 degrees. The auger is to be hung from the roof of the boiler housing on the motor mount stud. The feed auger location is positioned 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.

Feed Auger Assembly

The following instructions describe how to assemble the feed auger out of the supplied parts. The auger pipe and spiral come precut to their proper lengths. No modifications to the length of the components can be made.

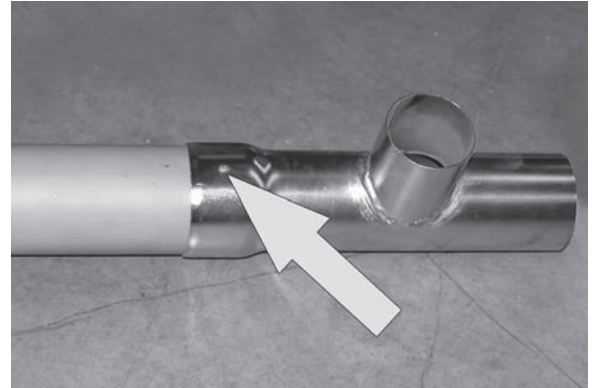
1. Attach the auger spiral to the motor's output shaft. Push the spiral as far as it can go onto the shaft, then pull it back approx. 3/8" to prevent binding. Clamp the spiral in place by tightening the two bolts that hold the clamp in place.



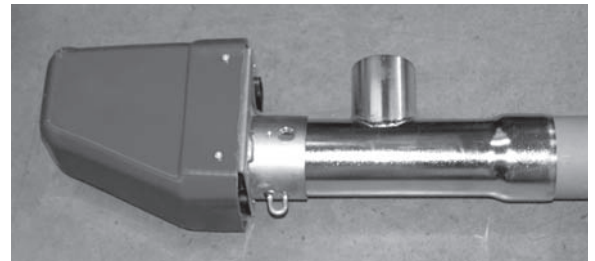
INSTALLATION

WOODMASTER®
Ultra Series

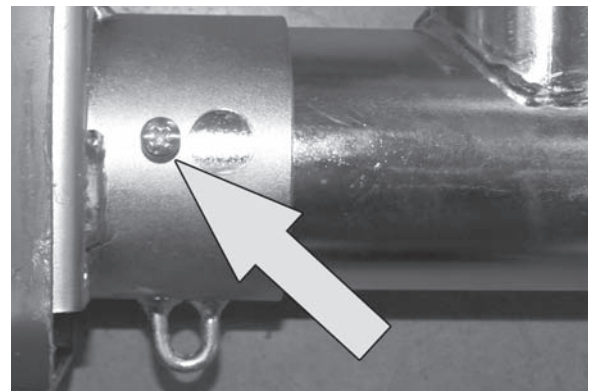
2. Slide the large end of the T-pipe over one end of the gray tube and secure it using the set screw in the indicated location.



3. Route the auger spiral through the T-pipe and slide the auger motor over the other end of the T-pipe.



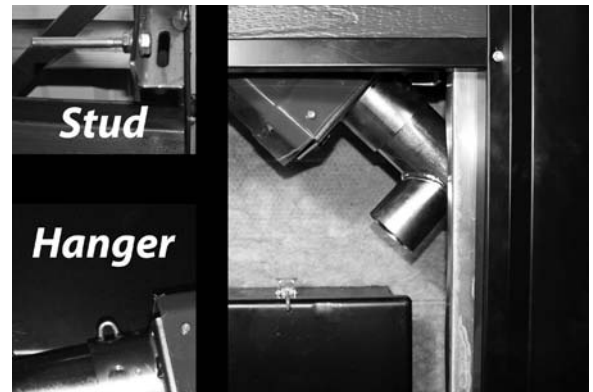
4. Fasten the motor to the T-pipe. Make sure that the T-pipe and the wire connection on the motor point in the same direction.



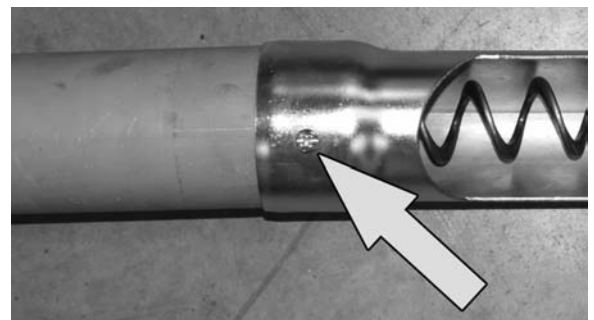
5. Slide the assembly through the hole in the side of the furnace until the T-pipe contacts the siding.



6. Hang the motor on the hook that is located under the roof of the furnace using the hanger on the motor that is by the T-pipe set screw.



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



8. Slide the blue tube to the outlet of the T-pipe, and connect the tipping chute fitting to the other end of the blue tube. The auger is now ready to be connected to the hopper.



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 and to protect the pellets from the elements.

1. Lay the hopper's main body on its side and attach the legs by inserting the bolts and securing them on the inside of the hopper body with the supplied hardware.



INSTALLATION

WOODMASTER®
Ultra Series

2. Stand the side hopper upright. Attach the leg supports ensuring that the longer of the three supports is on the side of the hopper that faces the furnace.

Note: Install the supports on the inside of the legs, securing the supports to the legs with the "U" bolts. DO NOT TIGHTEN THE "U" BOLTS AT THIS TIME!



3. Attach the boot to the bottom of the side hopper. Do not tighten the clamp on the boot at this time.



4. Put the top on the hopper by securing the hopper top to the side hopper with the screws (6) provided. Place the hopper in its location next to your Ultra Series furnace.



5. Secure the boot to the intake auger tube with the clamps provided. Apply the bottom boot to the end of the intake auger tube and secure it with the clamp. Tighten the clamp on the boot to secure it to the side hopper.



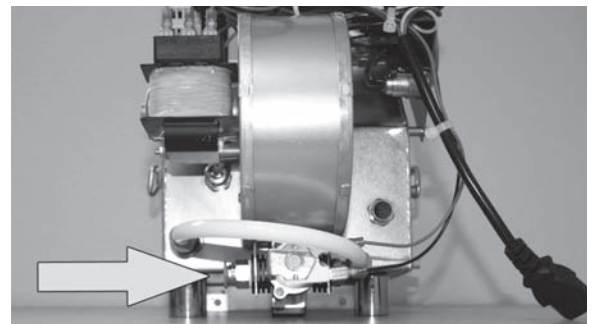
6. Raise the leg supports to a point just below the intake auger tube. Tighten the “u” bolts on the leg supports to secure the legs to the leg supports. Fill the side hopper with wood pellets and prime the auger following the directions on page 20.



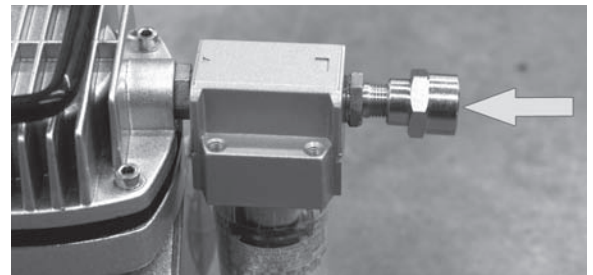
On Board Air Cleaner Installation

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. **NOTE: Disconnect all power during installation.**

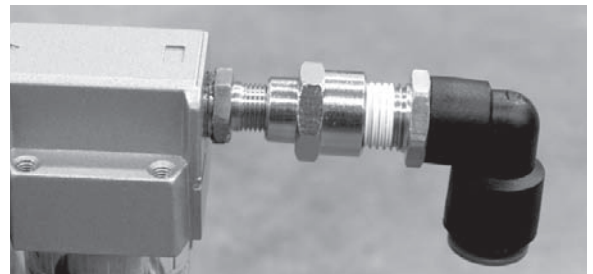
1. Disconnect the wiring and remove the plastic cover of the burner. **Note: The burner does not need to be removed from the furnace/boiler to perform this installation, the burner is shown off the furnace for reference only.** The location of the air line connector is below the combustion fan on the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



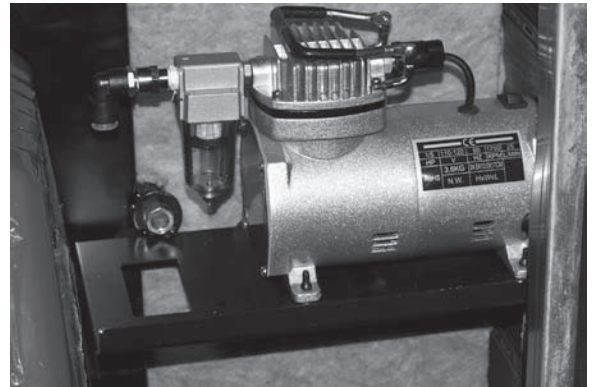
3. Connect the quick connect elbow to the adaptor fitting that you just installed on the air compressor. **NOTE: The threads on the quick connect elbow will already have thread sealant applied.**



INSTALLATION



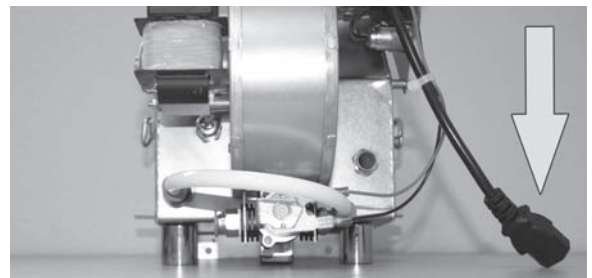
4. Place the air compressor on the shelf that is next to the burner



5. 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.**



6. 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 wish to use the 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.

Flue Gas Analysis

Once the furnace is installed, it must be adjusted to proper burn settings. The sensor should be placed in the sensor access port on the boiler chimney, directly above the tube access box and below the draft inducer. These setting will vary slightly depending on variables in fuel quality. A flue gas instrument analyzer (Testo 327-0632 320370) 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%

NOTE: THE FURNACE AND CHIMNEY WILL BE HOT DURING THIS TEST!

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.

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. Remove the blue hose from the burner prior to priming the feed auger. 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 using a bucket or pail to catch the pellets. Insert the tube adaptor into the tipping chute when complete.
2. Setting of screw on (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.

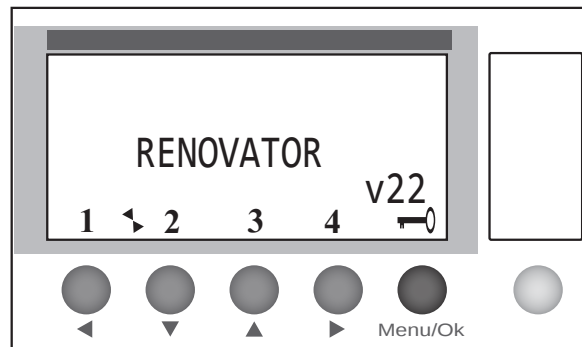
Once the white button and button 4 have been pressed one of the values that can be changed is now blinking.

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

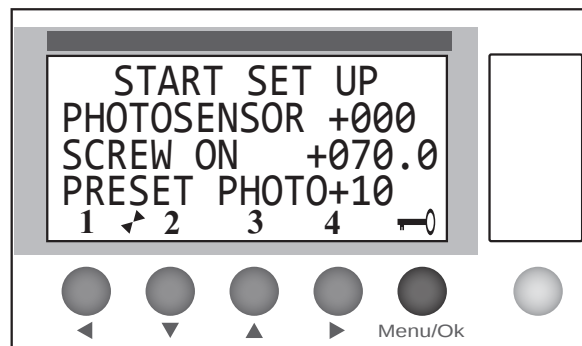
Buttons 1 and 4 let you scroll between the different settings on each menu.

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.



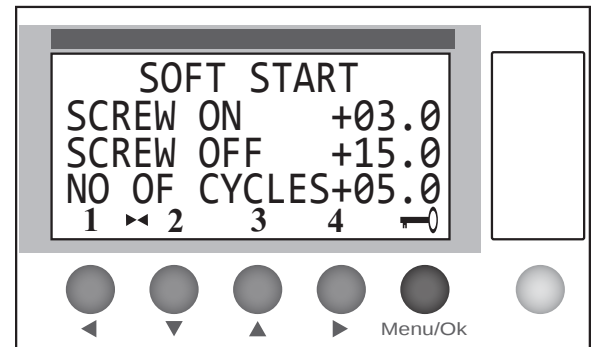
2. In this menu you can set the screw on time. Here you choose how many seconds the auger takes to feed the optimal start dose (approx. 150 grams or 5.25 oz) of fuel pellets. This menu also handles the desired value of the photo sensor that controls the flame at combustion. When the sensor sees the flame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



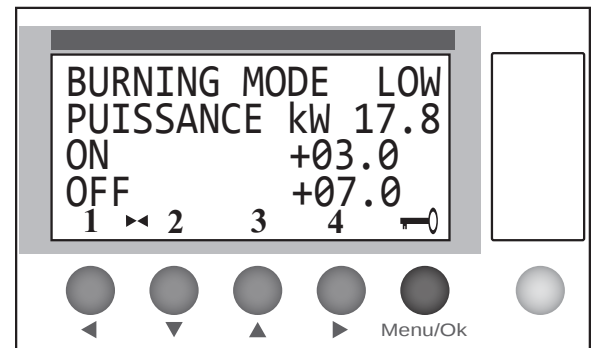
OPERATION



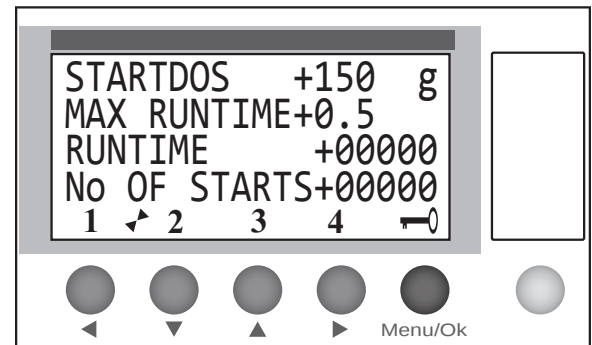
3. In phase two, the soft start level, the auger feeds the burner 5 times with three second operation intervals on the auger before it goes over completely to full burn mode. The three values in this menu can be changed.



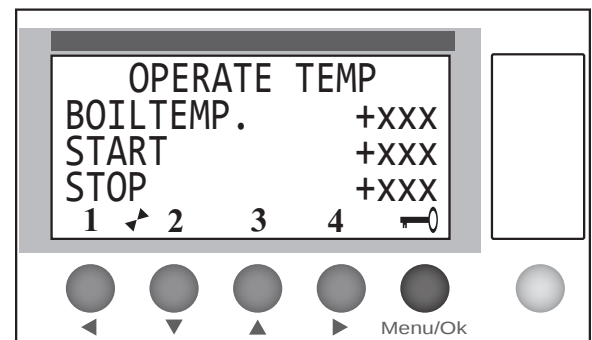
4. The next menu shows the burn mode the burner. The power displayed is the approximate input power. This is where the settings for the burner are changed when adjusting the furnace with a flue gas analyzer. This is made by adjusting the time for the feeding of the auger and time between the feeds. You 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 PLC 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.



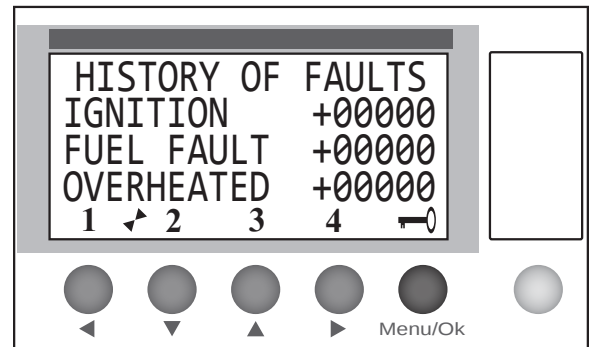
5. The Startdos value in this menu (this is a different setting than the start dose previously described) is adjustable between 100 and 400 grams and is the adjustment used when the burner is in Auto burning mode. The MAX RUN-TIME value is how long the burner will run before shutting down to self clean. 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.



6. 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.

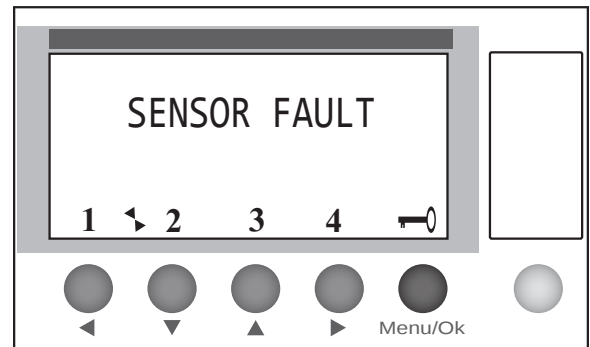


7. The PLC also keeps track of some faults that could be useful to in the event of a problem occurring. This history shows how many ignition errors, fuel errors and if the burner has overheated via the temperature sensor that is placed on the tipping chute. There are no values that can be changed in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

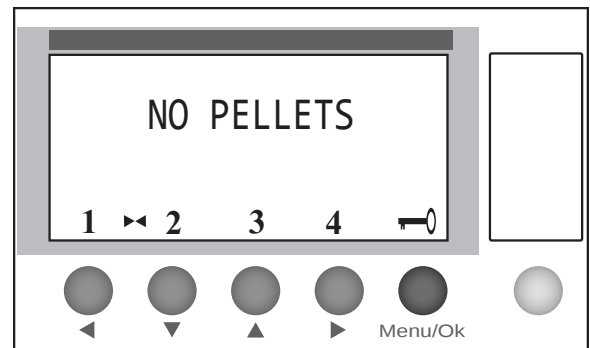


Alarm (The display shows a message and the burner has turned off.)

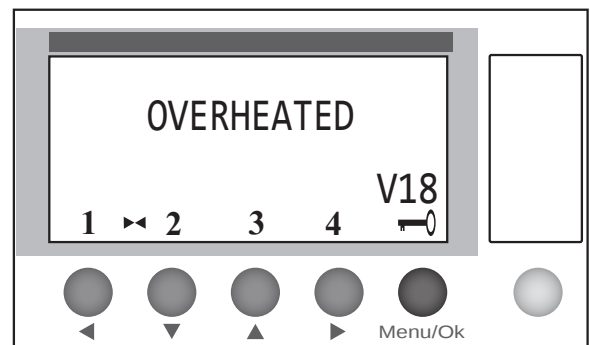
8. This alarm example indicates an error has occurred to the sensor that controls the furnace temperature. ***Do not attempt to start the burner.*** Turn off the burner and check the connections for the sensor. Restart the burner. If the problem persists, contact your dealer or Northwest Manufacturing,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



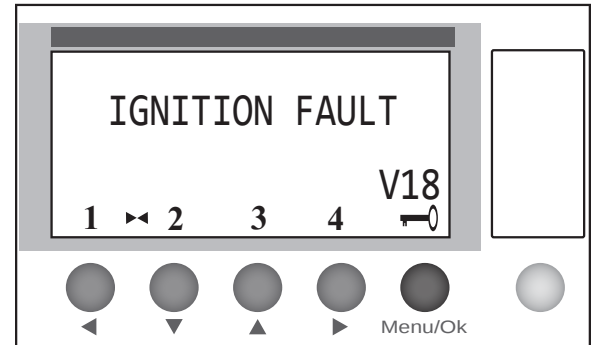
10. When this alarm appears on the burner turn the power off to the burner once the combustion fan has stopped. Allow the furnace to cool and clean the furnace. Check the heat exchanger tubes and clean if they are dirty. Turn the burner back on and reset it. To reset the burner hold down button 4 until the PLC 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.



OPERATION

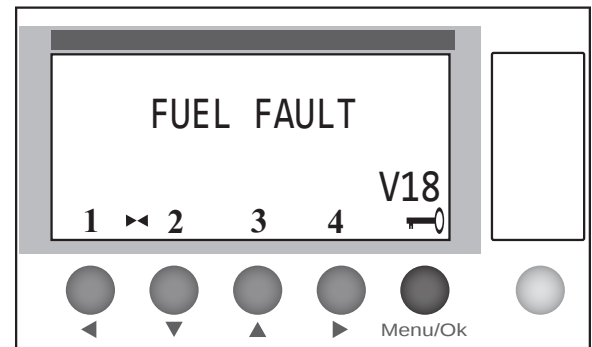


11. Error on the ignition element. This may be caused by an incorrect start dose, a dirty burner or a failed igniter. Turn off the burner and restart. Check to make sure you have the correct start dose settings, or check the connection for the feed auger. If the burner starts, no further action is needed. 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 cavitating. If this is occurring, clean the pellet hopper.

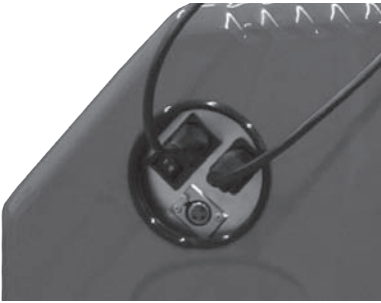


If the problem persists, contact your dealer or Northwest Manufacturing, Inc. See the trouble shooting section for further assistance.

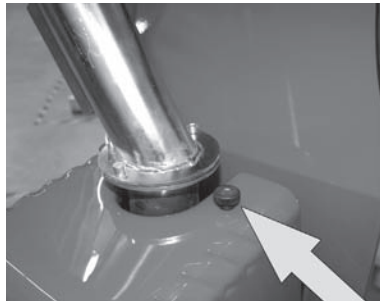
WARNING: Before performing any of the following tasks, ensure that the power is disconnected from the burner by switching the circuit breaker to the off position, and that all components of the system have had ample time to cool.

Cleaning the Burner

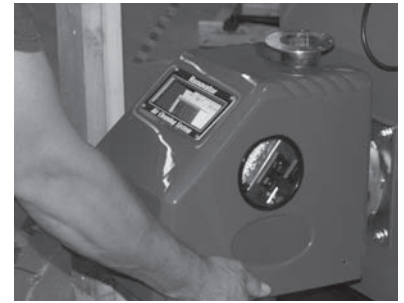
Manual cleaning is a simple process. Removal of the firepot takes only a few minutes. Below is a step by step process for burner removal. The burner and chimney should be cleaned twice a year.



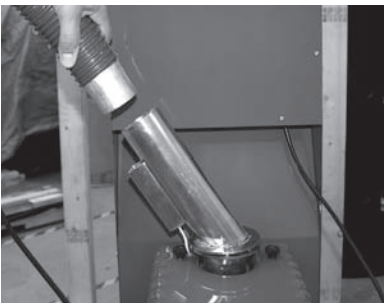
1. Disconnect the cables on the side of the burner.



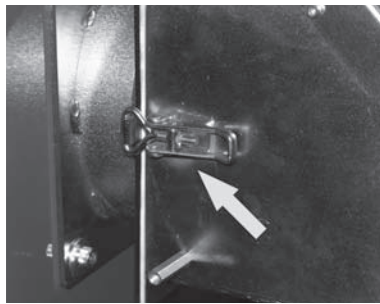
2. Unscrew the cover. There are 4 thumb screws that hold the cover on.



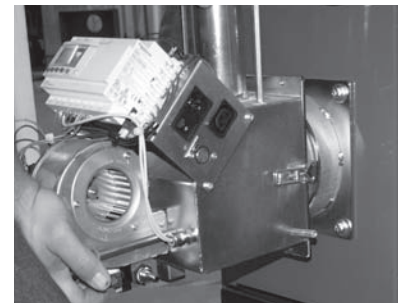
3. Lift the cover off the burner.



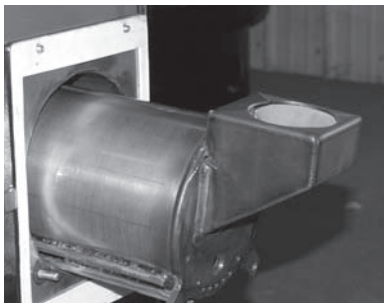
4. Lift the blue hose out of the tipping chute.



5. Release the quick latches.



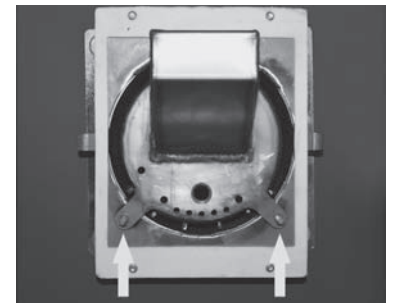
6. Lift the rear section of the burner off the burn pot.



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

WOODMASTER[®]
Ultra Series

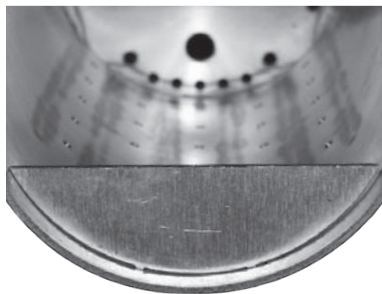
WARNING: Before performing any of the following tasks, ensure that the power is disconnected from the burner by switching the circuit breaker to the off position, and that all components of the system have had ample time to cool.

Replacing the Endstop

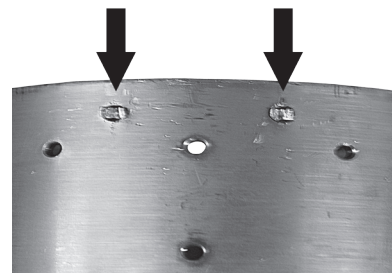
To replace the endstop first you need to remove the burner from the furnace by following the removal process described on the prior page.



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.

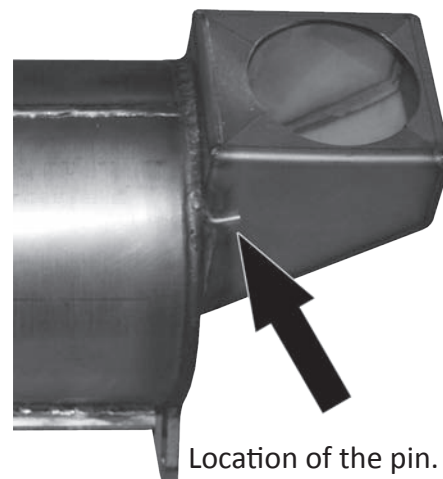
Replacing the Igniter

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.



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.





MAINTENANCE

Note: You should clean the furnace on an “as needed” basis, typically once a week. Not all wood pellets burn the same, some may require you to clean the furnace more frequently. Your warranty does not cover ash corrosion. The furnace must be completely cleaned of ash and creosote at least twice a year, including at the end of the heating season. Neglecting to clean your furnace or cover the chimney when not in use, will void the warranty.

Cleaning the Firebox (Weekly)

- Check that the power is disconnected to the burner and the furnace is cool.
- Open the ash chamber door.
- Use the ash shovel to remove the ash.
- Discard of the ash in a metal container away from combustibles.
- Clean the area around the door seal to ensure the door closes properly.
- Close the ash door, making sure the door is closed tight.

Cleaning the Heat Exchanger (Weekly)

- Remove blue hose and tipping chute from the burner. Do not damage the wires attached to the chute.
- Open the tube access box door.
- Remove the swirlies and clean.
- Clean each tube with the supplied brush.
- Clean out all ash that is left in the tube access box.
- Replace the swirlies and close the door.
- Replace the tipping chute and blue hose on the burner.

Annual Furnace Water Jacket Blow Down

If antifreeze is being used, water should be drained from the bottom of the furnace to remove any sediment buildup. The water should drain until it runs clean, approximately 2 gallons. You can also completely drain and flush your furnace if needed. Remember to recycle your used antifreeze. If antifreeze is not in use, drain, flush and refill your furnace.

Note: Leaving your furnace empty exposes the water jacket to oxygen which will shorten the life of your furnace. Boiler treatment must be used.

Annual Water Testing

After the blow down procedure is preformed on the furnace, a sample of water is to be taken from the bottom of the furnace. A water testing kit and mailing instructions is available at your dealer.

Annual Maintenance:

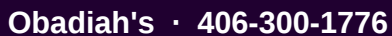
Annual maintenance should be performed in the spring when you shut down the furnace for the season.

- Clean all of the ash from the tube access box.
- Clean the heat transfer tubes.
- Clean out the Renovator pellet burner as previously described.
- Shovel out the fire box.
- Blow any visible dust off of the motors, pumps, fans, etc.
- Make sure to cover the chimney to prevent water from getting into your furnace when not in use.

TROUBLESHOOTING

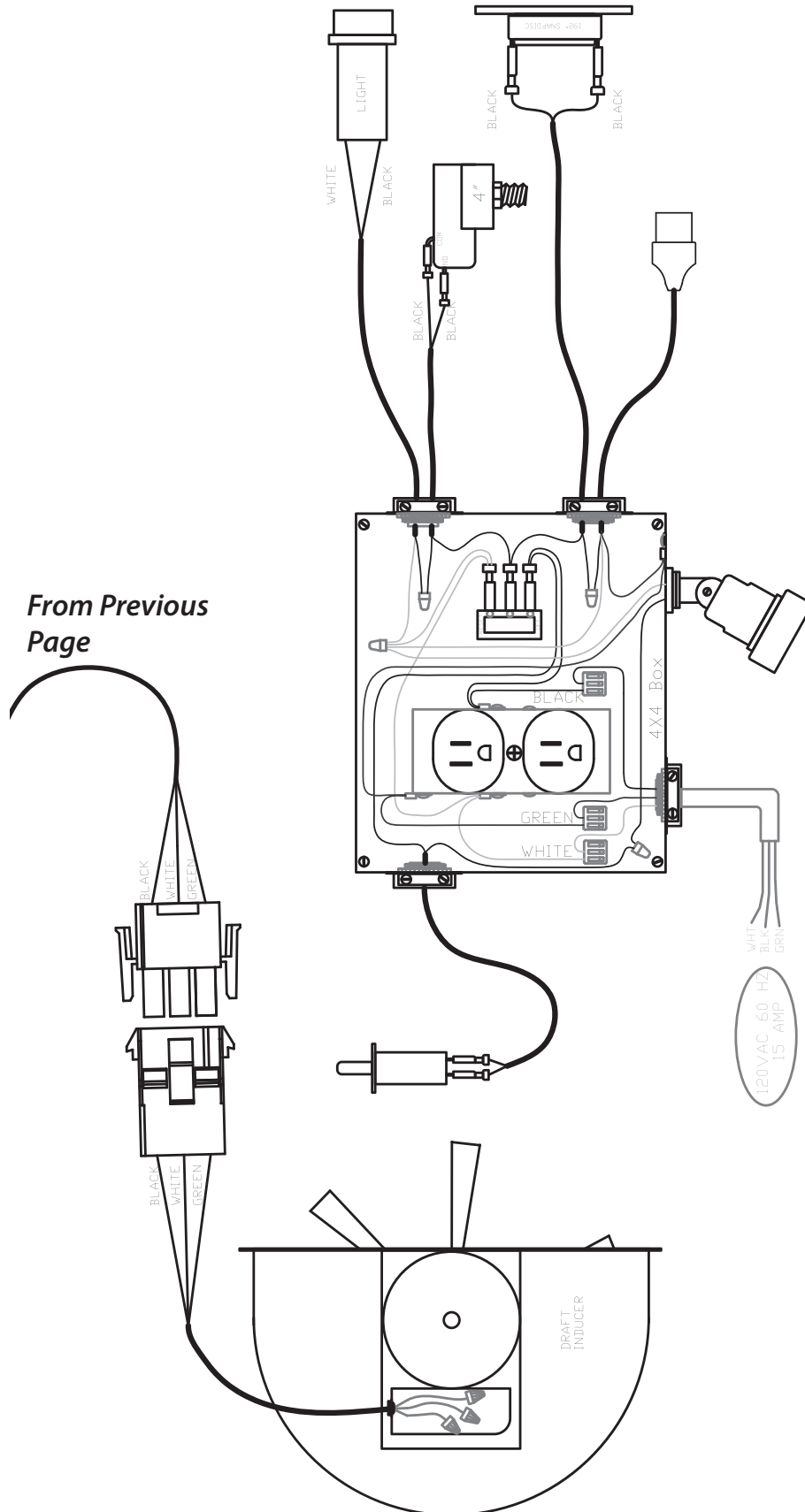


Error	Cause	Solution
The burner has stopped. "Fuel fault" is on the display.	1. The pellet hopper is empty. 2. An air pocket has developed in the inlet of the feed auger. The fuel is cavatating in the pellet hopper. 3. The auger has been blocked by waste. 4. The tipping chute is plugged.	1. Fill the 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.	1. Too heavy of feeding during the soft start or combustion phase. 2. Flame guard is dirty or broken.	1. Adjust the fuel feed rate. 2. Clean or replace the flame guard.
The burner does not ignite. "Ignition fault" is on the display.	1. Incorrect start dose. 2. Broken ignition element. 3. Stop in tipping chute.	1. Change the start dose. 2. Replace the ignition element. 3. Clean the tipping chute.
The burner stops without visible reason.	1. Incorrectly adjusted burner. 2. Too much back pressure in the chimney. 3. Error in the fuel feeding.	1. Adjust the burner. 2. Install a draft limiter. 3. Test with O2 Sensor 4. Clean the feed auger.
"Overheated" on display.	1. Too low of draft in the furnace. 2. Safety temp limiter has tripped 3. There is no power to the burner	1. Turn off the burner and clean the furnace and burner. 2. Check to ensure proper airflow in the System. 3. Check to ensure the chimney is not restricted. 4. Check the power to the furnace and the burner. Check the breaker.



WIRING

WOODMASTER®
Ultra Series





SPECIFICATIONS

Power Connection	120v
Maximum Current Draw	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 Power - Input (20 kW unit)	68,000 BTU
Maximum Power - Input (30 kW unit)	102,000 BTU
Weight	1000 Pounds (approx.)
Furnace Height	74"
Furnace Width	46"
Furnace Depth	48"
Hopper Height	56"
Hopper Width.....	28"
Hopper Depth.....	40"
System Height.....	74"
System Width	90"
System Depth	60"
Hopper Capacity.....	280 Pounds
Water Jacket Capacity	60 Gallons
Door Size.....	16"x16"

WARRANTY



WoodMaster Ultra Warranty
NORTHWEST MANUFACTURING, INC.
600 Polk Ave. SW – Red Lake Falls, MN 56750
Toll free (800) 932-3629 or (218) 253-4328

Five (5) Year Warranty on Firebox and Water Jacket

Northwest Manufacturing, Inc. of Red Lake Falls, MN 56750 warrants material and labor on any defects in workmanship on the firebox and water jacket for a period of Five (5) years from the purchase date to the original owner only. If there is a leak in your properly delivered and installed WoodMaster Ultra furnace in the first year, WoodMaster will replace the furnace at no cost to the original owner. (A leak means; a leak in the firebox or water jacket.) Northwest Manufacturing, Inc. will not be responsible for environmental conditions we cannot control. Therefore, Northwest Manufacturing, Inc. will only pay costs of warranty work for years two (2) through five (5) – 100% of warranty work. After the end of the fifth year, Northwest Manufacturing, Inc. provides no other warranty.

A blow down of the furnace and must be performed yearly after each heating season and every six months if the furnace is used year round. After the furnace has had a blow down performed, an annual water test must be taken and immediately treat and refill the furnace. Failure to send in a water sample annually will void the warranty.

This warranty is limited to defective parts – repair and/or replacement only, and excludes any incidental and consequential damages connected therewith. Northwest Manufacturing, Inc. is not responsible for replacement of water, water treatment, antifreeze, costs of transportation, or shipping charges. WoodMaster will not cover any construction or modification costs due to the furnace being in a non-accessible area. Any construction or modification costs are the customer's responsibility.

WARNING: Northwest Manufacturing, Inc. will not warranty the inside of firebox due to ash corrosion. Ashes must be taken care of as displayed on the maintenance list located in your owner's manual. The firebox must be completely cleaned of all ashes and creosote a minimum of two (2) times per year, preferably half way through the heating season and immediately after the heating season. If the furnace is being used year round, more maintenance is required thus the firebox must be completely cleaned of all ashes and creosote a minimum of four (4) times per year. Installation of an approved Class "A" insulated chimney and chimney cap must be used.

One (1) Year Warranty on Additional Components – Parts and Labor

Northwest Manufacturing, Inc. warrants to the original owner only, any additional components, including, but not limited to the outer shell, paint, insulation, doors and latches during normal usage for a period of one (1) years from the date of purchase.

One (1) Year Warranty on Electrical Components – Parts and Labor

Northwest Manufacturing, Inc. warrants to the original owner only, any electrical components in the furnace that is defective during normal usage for a period of one (1) year from the date of purchase.



WARRANTY

Additional Components & Warranty Guidelines

Northwest Manufacturing, Inc. will warranty for a period of one (1) year, any factory defects in materials or workmanship to the wood pellet auger attachment for the WoodMaster Ultra.

Components that come in direct contact with the flame, including, but not limited to; the flame guard, flame deflector, end stop and tube access box insulation are considered consumable parts and are not covered under this warranty.

Parts will be replaced on an even exchange basis.

These warranties apply only if the device is installed and operated as defined in the Owner's Manual.

WoodMaster Furnaces are not intended to be the only source of heat; therefore a backup system should be in place to prevent any damage caused by lack of heat. Your dealer may charge you for a service call to do warranty work.

Damage caused by abuse, accidents, improper installation, overheating, corrosion, freezing, negligence, or excess creosote buildup will not be covered under warranty. Damage caused by burning flammable materials (such as petroleum products), or unapproved fuels will not be covered under warranty.

Only nontoxic antifreeze is acceptable. Antifreeze will break down over a period of time and therefore should be tested annually. Always dispose of antifreeze by state and local codes. Loss of antifreeze under any condition will not be covered.

How to file a claim – ANY CLAIM UNDER THIS WARRANTY MUST BE MADE TO YOUR DEALER.



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

WoodMaster Ultra 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 (Burner and Firebox)

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

Measured start dose in grams: _____ Dosage time in seconds: _____

Setting of operation time, On _____ Off _____ Max run time: _____

Flue gas temperature measured from the access port in degrees F: _____

Oxygen value measured from access port in percents: _____

I have read the owners manual and understand the proper usage of my Ultra Series Furnace.

Signature _____ Printed Name _____

Thank you for purchasing a WoodMaster Ultra Series Pellet Furnace.



TEMPERATURE CONVERSION



Degree C	Degree F
0	32
1	33.8
2	35.6
3	37.4
4	39.2
5	41
6	42.8
7	44.6
8	46.4
9	48.2
10	50
11	51.8
12	53.6
13	55.4
14	57.2
15	59
16	60.8
17	62.6
18	64.4
19	66.2
20	68
21	69.8
22	71.6
23	73.4
24	75.2
25	77
26	78.8
27	80.6
28	82.4
29	84.2
30	86
31	87.8
32	89.6
33	91.4
34	93.2
35	95

Degree C	Degree F
36	96.8
37	98.6
38	100.4
39	102.2
40	104
41	105.8
42	107.6
43	109.4
44	111.2
45	113
46	114.8
47	116.6
48	118.4
49	120.2
50	122
51	132.8
52	125.6
53	127.4
54	129.2
55	131
56	132.8
57	134.6
58	136.4
59	138.2
60	140
61	141.8
62	143.6
63	145.4
64	147.2
65	149
66	150.8
67	152.6
68	154.4
69	156.2
70	158
71	159.8

Degree C	Degree F
72	161.6
73	163.4
74	165.2
75	167
76	168.8
77	170.6
78	172.4
79	174.2
80	176
81	177.8
82	179.6
83	181.4
84	183.2
85	185
86	186.8
87	188.6
88	190.4
89	192.2
90	194
91	195.8
92	197.6
93	199.4
94	201.2
95	203
96	204.8
97	206.6
98	208.4
99	210.2
100	212
101	213.8
102	215.6
103	217.4
104	219.2
105	221
106	222.8
107	224.6



www.woodmaster.com / 800-932-3629 / Manual PN: 7994-875

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

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