

Owner's Manual Model AHB 100 Boiler - 100,000 Btu Model AHB 170 Boiler - 170,000 Btu



LMF MANUFACTURING

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TABLE OF CONTENTS

INTRODUCTION	
RULES FOR SAFE OPERATION AND INSTALLATION	2
BOILER AND STORAGE BIN UNPACKING AND SET UP	3
INSTALLATION	4
QUICK START MODEL B1 BOILER CONTROL	5- 5A
ELECTRICAL WIRING	6 - 6A
BURNER LIGHTING	7
BOILER OPERATION	8 – 8A
MAINTENANCE	9
REPAIR PARTS LIST	10
(INSTRUCTIONAL PICTURES VARIOUS CONTROLS)	11 – 11A
AUGER PARTS	12 – 12A
EXISTING BOILER CONNECTIONS	
FIELDS CONTROL DRAFT CONTROL	14 – 14A
WARRANTY INFORMATION	15 – 15A

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AMERICAS HEAT BOILER

Congratulations on your purchase of the AMERICAS HEAT® bio -mass fueled boiler. We are proud you selected the AMERICAS HEAT® boiler. The AMERICAS HEAT® boiler is UL and CUL, (Canada) approved by Underwriters Laboratories.

Burning shelled corn as a fuel can be a feasible way of dealing with the high prices of more conventional fuels such as fuel oil, propane, natural gas, coal, and firewood. It makes so much sense to use a heat source that utilizes a resource that is readily available and cost effective.

LMF Manufacturing believes that there is no substitute for safety and quality. You can have confidence that your AMERICAS HEAT® boiler will serve your heating needs now, and for years to come. We ask that you follow our policy of "safety first" when installing and using your AMERICAS HEAT® boiler. We strongly advise you to read the owners manual before installing and operating your AMERICAS HEAT® boiler.

Your AMERICAS HEAT® boiler is a practical alternative heat source specifically designed for residential application. Proper care of this appliance should result in many years of service and comfort. An annual checkup by a competent service person is recommended.

AMERICAS HEAT® boiler comes with a Low Water Cut-off for safety reasons. (Now required by Underwriters Laboratories) U.L. Listing and CUL, (Canada).

AMERICAS HEAT® boiler is universal in its design. Our 100,000 Btu & 170,000 Btu models come ready to install a Domestic Hot Water coil. They also can be converted from 100,000 Btu to 170,000 Btu and back, with a conversion kit. See your dealer or call LMF Manufacturing for information.

If you have any problems, questions or concerns, please contact your AMERICAS HEAT® dealer from whom you purchased your unit, or contact LMF Manufacturing at 570-769-7775

PLEASE READ ALL INFORMATION ON THIS PAGE BEFORE INSTALLATION

This appliance must be installed in accordance with local codes. Installation is to be performed by a qualified installer, according to state and local codes.

Maintain adequate minimum clearances to combustible materials. (See page 4).

Install in an area with adequate air for combustion and ventilation – 60 cubic feet per minute minimum.

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

Disconnect all power to the unit before performing routine maintenance or service. Before servicing, allow the unit to cool.

Establish a regular service and maintenance schedule for efficiency and safe operation. Have a qualified service person perform tasks you are not familiar with.

CAUTION: Children and adults should be alerted to the potential high surface temperatures of the burner door. Keep children away!

DANGER: Risk of fire or explosion. Do not burn gasoline, oil garbage, or other flammables.

Do not place clothing or other flammable material on or near this appliance.

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground, well away from all combustible materials pending final disposal. If the ashes are disposed of by burial in soil or otherwise dispersed, they should be retained in the closed container unit until all clinkers have thoroughly cooled.

CAUTION: Make sure all fittings and controls are tight before introducing water to the boiler.

All units require a dump zone to distribute a low fire B.T.U.

UNPACKING AND SET UP

After removal of shipping container, position storage bin, on storage bin base, at desired angle for installation.

Install auger assembly by sliding auger boot (with clamp) over bin outlet; align elbow on bin auger tube directly over boiler fuel inlet. Tighten auger boot clamp securely. Install fuel delivery coupler between bin auger tube and boiler fuel inlet. (See Figure 1)

Fasten flex conduit extending from storage bin auger assembly to boiler auger motor housing using conduit lock nut. (See Figure 1)

Connect one black Feed auger motor lead to the orange and white wire with wire nut connector. Connect the other black Feed auger motor lead to the one white wire on the feed auger and one white wire in the hopper auger using wire nut connector. Then, Connect the orange feed auger wire to the orange hopper auger wire using a wire nut connector (See Figure 1)



OXYGEN DIFFUSION BARRIER

This barrier provides added protection against corrosion for the various ferrous components of a heating system.

Oxygen molecules will penetrate through the tubing wall and into the circulating water of a "closed" system. The amount of oxygen passing through the tubing wall and into the system is well known for all materials and increases with temperature. For a typical system with plastic tubing working at 100° F continuously, this oxygen diffusion leads to the generation of about 1 oz. corrosion products (MagnetiteFe304) per 100 ft. of pipe each year (10 times more for epdm rubber hoses). That is, if ferrous materials are present in the systems, such as steel pipes, steel pumps or steel boilers. If the quality of the water is good, general corrosion occurs. The resultant sludge consists of a fine grain metal oxide that normally is easily transported with the water. It mainly settles where the water flow rate is low. However, the amount of sludge builds up over the years and will lead to circulation disturbances and other corrosion-related problems. With more corrosive water qualities, problems due to pitting corrosion are likely to occur early.

An Oxygen barrier is a layer within the pipe construction which prevents oxygen from entering the system. By preventing oxygen from entering the system, corrosion of the pipe, radiators, boilers and associated fittings is massively reduced, thus prolonging the life of the system.

Other problems that will increase the corrosion of the system: Faulty expansion tank, Leak in pipes or expansion tank and new water introduced

WARNING: FAILURE TO INSTALL THE AMERICAS HEAT ® BOILER According TO INSTRUCTIONS MAY VOID THE WARRANTY.

Install the AMERICAS HEAT [®] boiler in a room with adequate air for combustion and ventilation. – 60 cubic feet per minute, minimum. Minimum clearances to combustibles for the AMERICAS HEAT[®] boiler is 18" from the flue connector, 30" from the front, 6" on either side and 6" from the back. The AMERICAS HEAT[®] boiler can be installed on a combustible floor if a non-combustible mat is placed directly under the ash removal drawer.

Connect the AMERICAS HEAT® boiler to an all fuel or Class "A" fuel chimney only, with 6" (minimum) metal flue pipe using sheet metal screws. Do not connect the AMERICAS HEAT® boiler to any chimney flue servicing any other heating appliance, as recommended by the National Fire Prevention Association. All chimney connections must meet the approval of the local building inspector and fire marshal and conform to all local, state and national codes.

The AMERICAS HEAT® boiler requires .04 inches water column draft (chimney draft), on low fire, to assure proper operation. Low fire mode is when the thermostat is satisfied and fuel is not being augured into the burner. When the chimney draft is too high, burner fire may go out. If the chimney draft is too low, smoke may back up in the boiler storage bin, causing a possible hazard.

Chimney draft can be tested by inserting a draft gauge, in the glue pipe, as close to boiler as possible. Check draft after boiler has been burning for a minimum of thirty minutes. The supplied automatic barometric damper should be installed, in the flue, to properly regulate .04 water column draft. (Install as close to boiler as possible.)

Quick Start – Model B1 Boiler Control - LMF Manufacturing

Scope:

This guide provides a summary guide to the features and use of the Model B1 Boiler Control as applied to LMF Multi-fuel Pellet/Corn furnaces running Version 2-018 firmware. It is assumed that installation is complete and the boiler equipment and at least one zone is ready for operation.

Control Introduction:



Model B1 Bolier Control

ON/OFF SWITCH: When ON switch lights up red.

MENU Pushbutton: Used to select modes of operation and to navigate menus. UP and DOWN Pushbuttons: Used to increase or decrease settings, or to initiate mode changes STATUS Light: Indicates fuel feed and alarm status.

Power-up Display:

Upon first power-up, the display indicates the firmware version number, "Boiler LMF", and then enters the Round-Robin display.

Round-Robin Display:

The Round-Robin display describes the cycling of the display between showing the boiler Temperature, the firing rate [FR] (what percent of fuel is being fed), and the current operation mode, described more fully below. After most setting changes the display will return to the Round-Robin Display.

Operation Modes:

The control uses Modes to assist in sequencing the boiler from stopped to startup, running, and shutdown. These modes are navigated by momentarily pressing the MENU button once. When this is done, the display will indicate the Current Mode, and if the UP or DOWN button is then momentarily pressed, the Mode will advance forward to the next mode or backward to the previous mode, depending if the UP (forward) or DOWN (backward) button was pressed.

Page 1 of 2

Quick Start – Model B1 Boiler Control - LMF Manufacturing

Operation Mode Change Examples:

On initial power-up, the Round-Robin Display indicates that the Current Mode is "STOP". To change the mode to "START", press the MENU button once. The display changes to "STPPED". Press the UP button once. The display will blink the word "START". If you do nothing, after about 12 blinks, the control will proceed to the START mode.

As a second example, say you are in START mode and want to return back to STOP mode. From the Round-Robin Display, press the MENU button once, the display will show "FEEDNG". Press the DOWN button once, the display will blink "STOP", when the blinking stops, the mode is now STOP.

Changing the Boiler Operationg Temperature:

From the Round-Robin Display, press the UP or DOWN button. The display shows "S 175F" or the currently setpoint temperature. Press the UP or DOWN button a number of times to increment the temperature either up or down. Press and hold the UP or DOWN button to rapidly increase or decrease the setting.

Selecting Fuel Type:

The default fuel selection is corn. To change to pellet, from the Round-Robin Display, press and hold the MENU button for 3 seconds. The display shows "MENU" and the "MIN xx". Press the MENU button multiple times until "FUEL C" is displayed. Press the UP or DOWN button to toggle between "C" for corn and "P" for pellet. To exit to the Round-Robin Display, press the MENU button a number of times until "EXIT" is displayed. Press the UP button.

Starting a Boiler Fire:

- 1) Turn Boiler Control ON. The red light will turn on.
- To prime fuel from the bin, change the Operating Mode to "Auto Feed" by pressing MENU button once, and pressing UP button once.
- 3) Start fire. Start the Combustion Blower by changing the Operating Mode to "Starting" by pressing MENU button once, and then pressing the UP button once.

The boiler is now started and will automatically change Operating Mode to "Running" once the temperature increases to the Low Temperature switch (105F) and the Boiler Temperature Setpoint.

Stopping a Boiler Fire:

1) Switch the Operating Mode to "Stopping". Press the MENU button once. Press the DOWN button once. The display will show "STOPNG". During this time, fuel feed is stopped and the combustion fan continues until the remaining fuel is consumed.

Page 2 of 2





6-A

BURNER LIGHTING

Add dry, (12%-15% moisture) clean (USDA #3 or better) corn to holding bin. (See "Important" below) CAUTION: corn or pellets with stalks, excess cob. Fines, dirt, etc. may cause the augers to plug resulting in excessive wear and possible auger motor failure. Burning treated seed corn is not suggested because of excessive clinkers build up and problems with fire extinguishing, caused by the treatment used on the corn.

IMPORTANT On the initial lighting of the boiler, add only approx. 2-3 cups of corn to the hopper. Continue with steps 2 thru 7. As the corn feeds into the hopper auger, add only small amounts of corn until the fire is established and the feeding system is working properly. This procedure should be followed at the beginning of each heating season. This procedure should also be followed if the hopper is allowed to empty and the resulting sticky smoke film coats the hopper feed auger.

Turn on the electrical power to the boiler. Turn the thermostat to highest setting.

Fill burner with corn or wood pellets to the lower set of air holes located on the inside of the burner.

Liberally fill burner to the top with kindling wood and paper, light paper and close the door. NOTE: Gelled fire starter may be used as a substitute.

Set wall thermostat to temperature desired.

It may be necessary to add kindling wood a couple of times before the corn is completely ignited.

NOTE: If the burner has been used, all leftover ash and clinkers must be thoroughly removed from the burner before lighting instructions above.

OPERATION

After the burner has been lit and operating temperature has been reached, see burner lighting pg. 6...you need only to set the thermostat to the desired temperature. The thermostat will turn the boiler circulating pump on and off to sustain the desired temperature.

A typical boiler cycle would be:

Thermostat activates aquastat relay to turn circulating pump on. Aquastat also activates fuel feed system, feeding the burner with corn or pellets to maintain water temperature.

When the thermostat setting is satisfied, the thermostat will shut off the aquastat relay.

On low fire, the boiler timer will activate, auguring a specified amount of corn or pellets to sustain burner fire.

CLINKER BUILDUP

The AMERICAS HEAT® boiler feeds the corn or pellets into the bottom of the burner, therefore creating the most efficient fuel consumption. The residual ash (clinkers) are then spilled over the top of the burner ring, falling into the ash pan below. This process, essentially, self cleans the burner chamber. Bio-mass pellets leave from .5% to 4% ash residue.

CAUTION: If the boiler is installed in an unsuitable application, causing the boiler to run on high fire for extended amounts of time or if certain varieties of corn or pellets (i.e. seed corn or low grade pellets) are burned, large clinkers can form resulting in boiler inefficiency and possible fire outage.

The large clinkers must be loosened with a clinker tool and removed manually or the clinkers could render the boiler inoperable.

SUMMARY OF SETTINGS & OPERATIONS

HIGH FIRE

Adjustment of the opening on the combustion blower inlet controls fuel air mixture on high fire only. This opening should be adjusted during the high fire mode of operation to obtain an intense flame that consumes the fuel at the same rate it is augured in.

LOW FIRE

Adjustment of the chimney draft controls the rate of burn on the low fire mode of operation. Chimney draft must remain below .04 inches W.C. and constant. The use of a second automatic barometric damper may be necessary on some installations to insure the precise draft control. A setting of .02 - .03 is ideal. In most installations, the counter weight on the automatic barometric dampers should be set on the minimum setting.

MAINTENANCE

DAILY

Inspect burner. Clinkers will be pushed out of the top of the burner as fuel is augured into the burner. Clinkers that appear to be stuck to the side of the burner should be broken loose. Large clinkers, that may appear, must be manually pushed over the top of the burner with a clinker tool.

Check fuel level in holding bin for adequate supply.

WEEKLY

Check contents of ash drawer and empty as needed. Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground well away from the combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally disbursed, they should be retained in the closed container until all clinkers have thoroughly cooled.

MONTHLY

Check flue tubes for ash build-up. Clean as required.

ANNUALLY

Remove and inspect all chimney pipe connections; clean out ash build-up. Clean ash build-up from flue tubes.

Clean, oil, and inspect all blower and auger motors.

Repair parts

Key #	Part number	Part description
1	L6006A-1269	High & low Limit Aquastat
2	10-407-05	Pressure Relief Valve
3	1580	Thermostat Relay
4	2160	Fuel Delivery Tube
5	1860	Combustion Blower
6	1900	Furnace Auger Motor (see page 12)
7	1880	2 RPM Hopper Auger Motor 100,000 btu Boiler (see page
		13)
8	1901	3 RPM Hopper Auger Motor 170,000 BTU Boiler (See
		Page 13)
9	750P-MT-120	Low Water Cutoff
10		Temperature Probe & Clip













REPAIR PARTS

Furnace Auger



KEY#	PART NUMBER	PART DESCRIPTION
1	1900	FURNACE AUGER MOTOR
2	3180	LOCK COLLAR
3	1980	1/4 x 1/2 SELF TAPPING BOLT
4 .	3200	BURNER AUGER
5	2070	SHEET METAL SCREW, #10 x 1 3/4
6	3000	AUGER SUPPORT
7	1410	6 x 6 BOX

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HOPPER AUGER



KEY#	PART NUMBER	PART DESCRIPTION
1	A-3220	HOPPER AUGER
2	3180	LOCK COLLAR
3	1880	HOPPER AUGER MOTOR
4	1410	6 x 6 BOX
5	A-3070	AUGER SUPPORT
6	2070	SHEET METAL SCREW, #10 x 1 3/4
7	7530	RUBBER TEE
8	A-7540	HOPPER AUGER TUBE
9	1480	CONDUIT FITTING
10	A-1550	FLEX CONDUIT



BAROMETRIC DRAFT CONTROLS

Model: 4"-7" RC

ATTACH CONTROL

BUT 18" BEYOND

STACK SWITCH

CLOSE TO FURNACE

FURNACE

OR BOILER

WARNING: Read the installation instructions carefully and completely before proceeding with the installation.

ITEMS INCLUDED:

Barometric Draft Control

WHEN SHIPPED WITH A COLLAR ADDITIONAL ITEMS:

Mounting straps, Collar, Mounting Hardware

GENERAL INFORMATION

BAROMETRIC DRAFT CONTROLS WITH OR WITHOUT COLLAR

The Field RC is furnished as standard equipment on many leading brands of oil fired heating equipment. It is calibrated to allow for easy adjustment to the furnace or boiler manufactures specifications. Designed for draft settings from .02" to .08" inches of W.C.

CONTROL LOCATIONS

The control should be located as close as possible to a furnace or boiler and positioned as shown in Figure 1. It should be 18" from a stack switch and at least 18" from a combustible ceiling or wall. Do not locate in a room separated from the appliance. **NOTE:** When a sheet metal tee is used instead of the collar, the "B" dimension must not be less than indicated for proper operation. (See Figure 2 and Table 1)

COLLAR INSTALLATION

WHEN SHIPPED WITH A COLLAR

To attach the collar to the flue, see Figure 2 and follow the instructions as follows:

- 1. Bend the two ears at the front corners of the collar outward. Bend 90°, ¼" behind the single hole on the straps.
- 2. Insert clamping screw in ears on collar and bolt the remainder of the collar together.
- Hold the collar against the side of the flue in the exact position it is to be installed (shown by dotted lines) and mark the outline of the collar on the flue.
- 4. Cut a hole in the flue about 1/2" inside of the outline.
- 5. Make a series of cuts about 1/2" apart from the edge of this hole to the outline marks.
- 6. Strap the collar to the flue pipe.
- 7. Bend the tabs formed by the series of cuts outward against the inside of the collar to make a tight joint.
- 8. Insert the draft control. (See Installation & Adjustment)

If flue pipe is made of material too heavy to bend out into collar, make the diameter of the opening within $\frac{1}{2}$ " of the inside diameter of the collar. Seal with high temperature RTV silicone or high temperature foil tape UL listed for the temperature of the application.

For proper settings and operation of the burner and the draft combustion testing instrumentation and draft gauges must be used.







NOT AT THIS

THIS LEVEL

POINT OR BELOW



MINIMUM DISTANCE

CEILING

NOTHERE

FROM COMBUSTIBLE

NOTHERE

DRAFT

CONTROL

OK

FLUE



NOTE: See sections on control locations and collar installation.

Insert the draft control into the collar. The front face of the control must be plumb. The pivot points must be level whether the control is on a horizontal, vertical, or sloping flue pipe. Use a spirit level, plumb and level accurately. Secure the control in the collar by tightening the clamping screws. If the collar is not supplied by Field, the control may be held in place by small bolts or sheet metal screws so located as not to interfere with the movement of the gate. When a sheet metal TEE is used instead of the collar, the B dimension must not be less than indicated for proper operation. The "B" dimension prevents the damper gate from obstructing the flue passage way.

VERTICAL FLUES

See Figure 2 and Table 1.

The control is shipped for installation in a vertical flue. The adjustment weight should be in the right hand slot when you face the control. (See Figure 3)

HORIZONTAL FLUES

For horizontal flues, remove the weight from the right hand slot and attach it to the left hand slot as shown in Figure 3.

ADJUSTING THE CONTROL

The burner must be running when the adjustment of the control is made. The use of a draft gauge is required to accurately set the over fire draft. Set the over fire draft according to the appliance manufactures installation instructions.

Set the control to maintain as low a draft as will give good combustion and meet the requirements for heat. Turn the adjustment weight counter-clockwise

to loosen, then slide in slot to the proper position and tighten. The bracket is marked 2,4,6 and 8, which indicates draft settings of .02",.04", etc. (These are drafts in flue adjacent to control, NOT over-fire drafts)

OIL BURNER COMBUSTION AIR AND OVERFIRE DRAFT SETTING (INCHES OF W.C.)

After the burner has operated for at least 5 to 10 minutes, take draft readings over the fire. For a domestic oil burner, the over-fire draft should be approximately .02" to .03", although there are some makes of burners which require higher drafts. Follow the burner manufacturer installation instructions for proper settings. There must always be enough draft so that the burner does not puff back into the room at the moment it starts, and there should be no objectionable smoke. CO₂ and smoke readings must be taken to determine the proper adjustments.

ADDITIONAL APPLICATIONS (FOR RC SERIES DRAFT CONTROLS)

STOKERS

Adjustments must be made while the stoker is running, with a normal fuel bed depth and its fan adjusted to approximately the correct setting.

A draft gauge must be used to accurately set the overfire draft. Follow the manufacture installation instructions for proper settings. If no instructions are available.

For a domestic stoker, the draft should be set at -.04" OVER THE FIRE, with the STOKER ON. Have just enough draft so that at the moment the stoker starts, it does not gas or puff back into the room through cracks around the fire door (with the fire door closed). If there is objectionable smoke, increase draft slightly.

HAND FIRED PLANTS

Adjust the draft control when a good fire is burning. Close any check damper and open wide any internal damper.

Usually a draft of -.06" will be sufficient for cold weather, with reasonably quick pickup after a banked period. But if plant overheats, change to a lower draft setting. Raise the setting if there is not enough heat.

In mild weather when less heat is needed, or the fire is to be banked, close ash pit draft door partly or entirely. If desired, a check damper also can be used when banking the fire.

PN 02702600 Rev A 10/00



B-DIMENSION

RC SIZE

0



Figure 3



LMF Manufacturing 900 Park Ave, Woolrich Lock Haven, PA 17745 (570) 769-7775



Warranty Limitations and Disclaimers of Liability

LMF Manufacturing warrants the America's Heat Boiler against defects in workmanship and material for a period of one (1) year after the date of purchase. LMF Manufacturing will repair or replace as necessary any defective parts within the warranty period.

LMF Manufacturing warrants the burner for a period of five (5) years after the date of purchase. LMF Manufacturing will replace any defective burner free of charge within the five (5) year warranty period provided that labor shall be at the expense of the owner.

The Vessel (Water Tank) is warranted for a period of twenty years from the date of purchase. LMF Manufacturing will replace or repair any defective vessel free of charge within the twenty (20) year warranty period provided that labor shall be at the expense of the owner.

Warranty claims shall be reported to your America's Heat dealer.

Disclaimer of Liability

THE FOREGOING WARRANTY CONSTITUTES THE ONLY WARRANTY MADE BY LMF MANUFACTURING REGARDING THE AMERICA'S HEAT FURNACE. LMF MANUFACTURING MAKES NO WARRANTY TO MERCHANTABILITY OR AS TO FITNESS FOR A PARTICULAR PURPOSE. LMF MANUFACTURING DISCLAIMS ANY AND ALL LIABILITY FOR DAMAGES, CONSEQUENTIAL OR OTHERWISE, COST OR EXPENSE OF ANY SORT OR NATURE ARISING OUT OF THE USE OF THE AMERICASHEAT FURNACE OR OF ANY ALLEGED DEFECT IN DESIGN, MANUFACTURE, ASSEMBLY, INSTRUCTIONS, OR LABELING THEREOF.



Warranty Information & & Buyer Registration

****America's Heat Corn Fired Boiler****

Please enter the requested information in order to have your warranty application processed and to qualify for customer and technical support.

Full Name of Buyer:
Address:
City:
State or Province:
Zip Code:
Country:
Phone #:
E-Mail Address:
Place of Purchase:
Date of Purchase:
Date of Installation:
Unit Serial Number:
Dealer's Name, if applicable:

Please Return To:

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