



RENEWABLE ENERGY FURNACES

Owner's Manual

GX Series Models with Afterburner™ Technology

High Efficiency Wood Hydronic Heaters



MADE IN THE USA

LIMITED WARRANTY

Hawken Energy, Inc. ("Hawken Energy") warrants to the first retail purchaser that the parts manufactured by Hawken Energy and included as part of the furnace GX Series, GX Series Afterburner™, or simply Afterburner™ (GX-15 or GX-30 models) shall be free from defects in workmanship. This warranty is effective for a period of twenty (20) years from the date of purchase; provided that the first retail purchaser complied in a timely manner with the warranty registration requirements described below. Upon notice of a warranty claim, Hawken Energy shall have the option of repairing or replacing the defective part or refunding the purchase price of the furnace.

Hawken Energy further warrants to the first retail purchaser that the firebox assembly of the GX Series Afterburner™ shall be free from corrosion. More specifically, Hawken Energy will provide warranty coverage due to corrosion for the cost of the parts only, based on the following pro-rated scale: for years one through five at 100% of Factory Retail Prices; for years six through ten at 75% of Factory Retail Prices; for years eleven through fifteen at 40% of Factory Retail Prices; and in the years sixteen through twenty at 25% of Factory Retail Prices. Upon notice of such a warranty claim, Hawken Energy shall have the right to replace or repair the parts at its option.

Hawken Energy further warrants to the first retail purchaser that the electrical components in the GX Series Afterburner™ shall be free from defects during normal usage for a period of one year from the purchase date; provided that the first retail purchaser complied in a timely manner with the warranty registration requirements described below. Upon notice of such a warranty claim, Hawken Energy shall have the option to replace or repair the defective components.

Hawken Energy reserves the right to modify the design of any furnace at any time and for any reason.

The liability of Hawken Energy shall not exceed the repair or replacement value of the defective parts and does not include any costs for labor to remove and reinstall the alleged defective part, transportation to and from the factory, the costs of plumbing, the costs of replacement water or water additives, and any other materials required to make the repair.

The warranties described above do not cover defects, corrosion or malfunctions resulting from: (i) failure to properly install, operate or maintain the furnace in accordance with Hawken Energy's published Owner's Manual; (ii) the workmanship of any installer or repairman of the furnace; (iii) abuse, misuse, alteration, accident, fire, flood, negligence or acts of God; (iv) freezing or overheating; (v) any unauthorized work or alterations to the furnace; (vi) improper water treatment or ash removal procedures, or (vii) normal wear items including without limitation door gaskets, paint, chimney components, firebrick, cleaning tools, catalyst, and air deflector.

These are the only warranties given by Hawken Energy as regarding GX Series Afterburner™. No one is authorized to make any other warranties on Hawken Energy's behalf.

THESE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. HAWKEN ENERGY EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT OR PUNITIVE DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY.

Defects in components incorporated into the furnace (including, the aquastats, pumps and fans) but not manufactured by Hawken Energy, shall be governed by the terms and conditions of the relevant component manufacturer's warranties, if any.

Other furnace models, including GX-10, HE-750, HE-1000, HE-1100, HE-2000, HE-2100, HE-3000, HE-4000, and HE-5000 are covered under a separate warranty.

In order for the warranties described above to be effective, the first retail purchaser must deliver a signed warranty registration in the form below to Hawken Energy within fifteen (15) days of purchasing the furnace along with a copy of the original invoice from the dealer or representative conducting the sale.

EXTENDED LIMITED WARRANTY

Additional extended warranties may be purchased for the GX Series Afterburner™ at the point of purchase. Extended warranties may be included in a trim package (such as Greenhawk, Silverhawk, Goldenhawk, etc.) and/or sold separately.

Hawken Energy further warrants to the first retail purchaser that the firebox assembly of the GX Series Afterburner™ shall be free from operational failures due to corrosion. This warranty is effective for a period of five (5) years or ten (10) years from the end of the twentieth year after the original date of purchase depending on the trim package or the extended warranty that was purchased; provided that the first retail purchaser complied in a timely manner with the warranty registration requirements described above. More specifically, Hawken Energy will extend the final pro-rated period of warranty coverage on the standard limited warranty and will provide warranty coverage for operational failure due to corrosion for the cost of the parts only at 25% of Factory Retail Prices. Upon notice of such a warranty claim, Hawken Energy shall have the right to replace or repair the parts at its option.

All other terms of the standard limited warranty apply and remain the same for extended warranties.

CONGRATULATIONS

You now own a Hawken GX Series Afterburner™ - an outdoor wood hydronic heater (WHH) designed with your needs in mind. Use this manual for safety, installation and maintenance of your new Hawken. You must read, understand and follow the entire manual before installing or operating your furnace. **SAVE THESE INSTRUCTIONS.**

Locate your Serial Number and Model Number inside the control box on the front or side of your Hawken (see Nameplate Illustration).

Record your serial number and model number here:

Serial Number _____

Model Number _____

Please have this information available when contacting your local dealer or Hawken Energy for warranty, service, etc.

Hawken Energy Inc.


1064 Industrial Park Dr. Suite A

Shelby, MI 49455

231-861-8200

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custserv@hawkenenergy.com



HAWKEN ENERGY

1064 Industrial Park Dr. Suite A, Shelby, MI 49455

Model: GX15 GX30 Serial Number: _____ Manufactured: _____


MODEL	GX15	GX30
HEAT OUTPUT (BTU/HR)	193,000	248,000
EMISSION RATE (LB/MMBTU)	0.18	0.17
VOLTS	120	
FREQUENCY (HZ)	60	
PHASE	1	
MAX OVERCURRENT DEVICE	15A	
MIN CIRCUIT AMPACITY (MCA)	15A	

REFER TO OWNERS MANUAL
 - FOR BASIC OPERATING INSTRUCTIONS AND MAINTENANCE INSTRUCTIONS
 - SWITCH IN UP POSITION FOR BOILER ON, SWITCH IN DOWN POSITION FOR BOILER OFF
 - FOR WOOD BURNING ONLY

USE A CHIMNEY CAP SUITABLE FOR WOOD COMBUSTION.
 CLEARANCE TO COMBUSTIBLES: 16" SIDES AND REAR. 96" TOP.
 FOR INSTALLATION ON NONCOMBUSTIBLE FLOORING ONLY.
 LOAD FUEL CAREFULLY OR DAMAGE MAY RESULT.
 NOT TO BE CONNECTED TO AN EXISTING BOILER SYSTEM. CONNECTION TO PLATE EXCHANGERS IS ACCEPTABLE.

DANGER - RISK OF FIRE OR EXPLOSION
 DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.
 DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.
 DO NOT BURN GARBAGE, GASOLINE, NAPHTHA, ENGINE OIL, OR OTHER INAPPROPRIATE MATERIALS

WARNING - RISK OF FIRE
 THE HEAT EXCHANGERS, FLUE PIPE, AND CHIMNEY MUST BE CLEANED REGULARLY TO REMOVE ACCUMULATED CREOSOTE AND ASH. ENSURE THAT THE HEAT EXCHANGER, FLUE PIPE, AND CHIMNEY ARE CLEANED AT THE END OF THE HEATING SEASON TO MINIMIZE CORROSION DURING THE SUMMER MONTHS. THE APPLIANCE, FLUE PIPE, AND CHIMNEY MUST BE IN GOOD CONDITION. THESE INSTRUCTIONS ALSO APPLY TO A DRAFT INDUCER.
UNIT WILL NOT OPERATE WITHOUT ELECTRICAL POWER.
 DO NOT STORE SOLID FUELS WITHIN THE COMBUSTION CLEARANCES.
 DO NOT OPERATE BOILER WITH DOOR OPEN.
 DO NOT LEAVE BOILER UNATTENDED WITH DOOR OPEN.
 GX15-ART-003_REVA



0487WB0055
 Tested to ANSI/UL 2523-2013

Nameplate Illustration

SAFETY

This manual provides important information to familiarize you with safe operating and maintenance procedures. Even though you may be familiar with similar equipment, you **MUST** read and understand this manual before operating the Hawken GX Series Afterburner™ and follow its instructions when operating.

Safety is everyone's business and is our top concern. Knowing the guidelines covered in this section will help ensure your safety, the safety of those around you and a Afterburner's™ proper operation.

LOOK FOR THESE SYMBOLS WHICH POINT OUT ITEMS OF EXTREME IMPORTANCE TO THE SAFETY OF YOU AND OTHERS. READ AND UNDERSTAND THOROUGHLY. HEED THE WARNING AND FOLLOW THE INSTRUCTIONS.

Keep safety labels in good condition. If safety labels become missing or damaged, replacement safety labels are available from Hawken Energy.

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates a situation which can cause damage to the equipment, personal property and/or the environment, or cause the GX Series furnace to operate improperly.

NOTE: Indicates a procedure, practice, or condition that should be followed in order for the furnace or component to function in the manner intended.

 **DANGER** The following have **DANGER!** level safety hazards.

- Do not burn garbage, gasoline, drain oil or other flammable liquids. Burn only well-seasoned, untreated wood.

 **WARNING** The following have **WARNING!** level safety hazards.

- Do not use chemicals to start furnace firing.
- Do not operate with fuel-loading or ash-removal doors open. Do not leave furnace unattended with door open. For safety keep fire and ash pit doors tightly closed and maintain all seals in good condition.
- Do not store fuel or other combustible materials within marked installation clearances.

NOTE: Clearance to combustibles: 16" sides and rear. 96" top.

- Inspect and clean flues and chimney regularly.

NOTE: When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire.

- In the event of a runaway fire turn off power to the unit.
- Never operate furnace without a grounding rod properly installed at furnace.

⚠ CAUTION The following have **CAUTION!** level safety hazards.



Burn Hazard! Hot surfaces can cause personal injury. Do not touch during operation or when unit is hot. Keep face and exposed skin away from door area. Wear protective clothing as necessary.

- Load fuel carefully or damage to furnace may result. Always take care to not allow hot coals or sparks to spill out.
- Keep children away.
- Do not pressurize this furnace. Not to be connected to an existing boiler system. Connection to plate exchangers is acceptable.

NOTE: The GX Series Afterburner™ are considered “open systems”, meaning they are open to the atmosphere and are therefore unpressurized.

- For installation on noncombustible flooring only.
- Installation clearances must be adhered to. Not doing so may result in a fire hazard.
- Store firewood fuel in a dry location. Stack fuel carefully, not higher than 5'. Do not store fuel within the installation clearances of the unit. Do not store fuel in a way that it will interfere with loading or maintenance operations of the unit.
- Do not connect this unit to a chimney flue serving another appliance.
- Never operate furnace when water level is not completely full of properly treated water.

NOTE: This furnace has a safety feature installed to prevent overheating. If hot supply water temp reaches 190°F, this safety feature will disable blower fan and light. If no power to fan and light, press red reset button on snap-disk in rear of furnace once furnace temperature has reached normal operating range (less than 182°F).

NOTICE The following have **NOTICE** level safety hazards.

- Any person operating a wood hydronic heater must comply with all applicable laws or other requirements, such as federal or state laws or regulations, codes and ordinances.
- Keep fire and coals at least six inches back from door chute. Keep ashes from piling against firebox rear or side plates. Do not allow burning wood or coals to touch door, door frame or door chute. Place wood into firebox carefully to avoid damage to the firebrick. Stack all wood in the same orientation, front to back, to prevent bridging over the firebrick vents. Use a variety of log sizes to maximize wood volume in firebox. Always use dry, seasoned hardwood. Green wood will create excessive creosote and hamper the full function of your Hawken GX Series Afterburner™. Do not burn pine or soft woods.
- Do not overfill firebox. A small intense fire is preferable to a large smoldering one to reduce the amount of creosote deposition. A Hawken GX Series Afterburner™ system requires circulation of water to dissipate heat. Too much stored heat may cause damage to your Afterburner™.
- Unit will not operate without electrical power. Do not open doors without power. Do not bypass controls during a power failure. In case of a power outage: Auxiliary power generator may be used in the event of a power failure to prevent freezing by unplugging the pump from the receptacle in the rear of the unit and plugging it into the generator. To operate the furnace for heating purposes if there is a prolonged power failure it will be necessary to connect a generator to the main power connection in the rear of the unit. It is acceptable to wire the unit with a standard electrical plug to make a generator connection easier.
- Do not block blower inlet fan area. Allow proper airflow around furnace. Keep insulation away from fan inlet.
- Disposal of Ashes: Ashes should be placed in non-combustible container with a tight-fitting lid. The container of ashes should be moved outdoors immediately and placed on a non-combustible floor or on the ground, well away from combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Other waste shall not be placed in this container.
- Do not allow ash level to build up above bottom door frame. Take care to pull ashes away from rear steel of firebox.
- All cover plates, enclosures, and guards must be maintained in place at all times, except during maintenance and servicing.
- For outdoor installation.
- Never operate furnace without a grounding rod properly installed at furnace.

DO NOT VOID YOUR WARRANTY

We at Hawken want you to enjoy your new Hawken GX Series Afterburner™ for years and years - that's why we design and build them to last! The following information is not only critical to understand and do to keep your warranty valid, but also to keep a Afterburner™ working properly. To keep your warranty valid, you must do the following:

1. Read, understand and follow this Owner's Manual. The warranty can be voided by operating your Afterburner™ in a manner inconsistent with the Owner's Manual.

NOTE: Check www.HawkenEnergy.com for periodic product updates and service bulletins. Visit www.HawkenEnergy.com/servicebulletins/ at least semiannually and follow any and all instructions listed.

2. Submit Warranty Registration Form to Hawken Energy within 15 days of purchase. See www.HawkenEnergy.com or the back of this manual for the Registration Form.

OPERATION

3. Do not burn unspecified fuels including trash, plastic, gasoline, rubber, naphtha, household garbage, material treated with petroleum products (including particle board, railroad ties and pressure treated lumber), leaves, paper products and cardboard. Burning such fuels causes damage to a Afterburner™ and will void your warranty. Small amounts of newspaper can be used in the initial start-up of your furnace.

NOTE: See [HawkenEnergy.com](http://www.HawkenEnergy.com) for additional information on safe and efficient wood burning practices, and in particular this document: <http://www2.epa.gov/sites/production/files/2015-02/documents/20150204-residential-wood-heaters-nsps.pdf>

4. Do not operate your furnace at temperatures below 140°F except at startup and shutdown.

NOTE: When the furnace is operated at temperatures cooler than 140°F there is an increased likelihood of creosote forming and excessive water condensing in the system, both can cause the furnace to operate less optimally.

NOTE: If your heating load pulls more heat than the rated output your operating temperatures will drop below the recommended temperature range of 172 to 182°F. Your furnace is equipped with an LED indicator that alerts the operator if the temperatures drops below 140°F. Do not alter the operating parameters of your controller. Doing so may void your warranty.

NOTE: A thermostatic bypass valve may be installed in the system to prevent the water in the furnace from getting too cool.

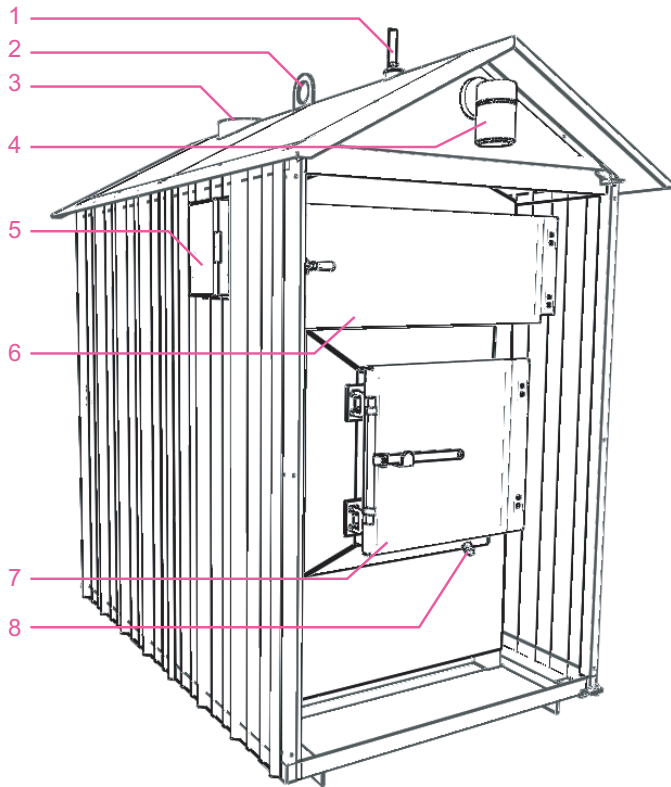
5. Follow proper water treatment and testing procedures.
6. Only operate furnace when water level is completely full of properly treated water. Pump must run continuously whenever furnace is being used.

INSTALLATION

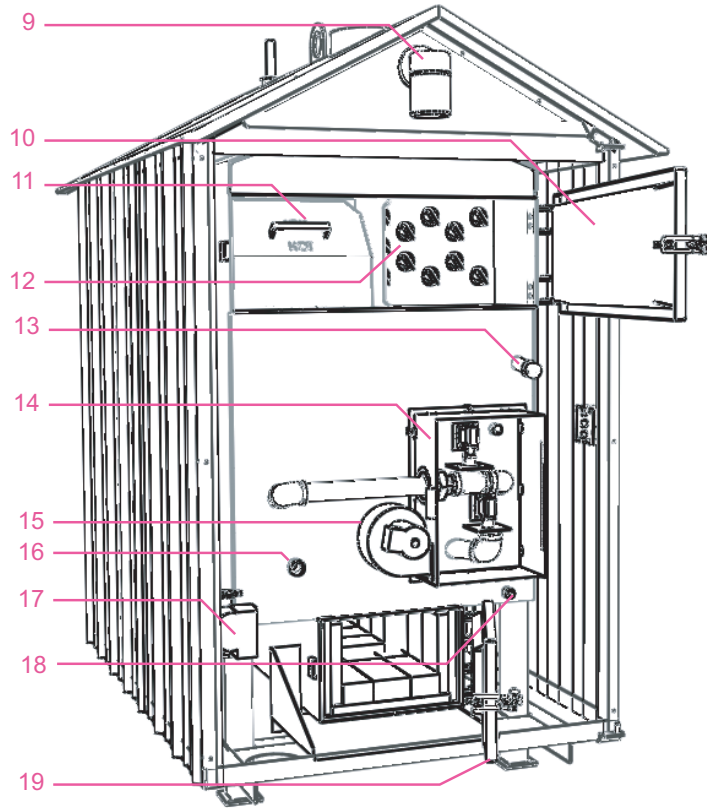
7. Installation to be performed by a qualified installer and will comply with all the requirements of the authority having jurisdiction over the installation. Install furnace according to Hawken Installation Guide and use only Authorized Hawken parts and accessories.
8. Install Hawken water filter kit on water loop (indoors) and clean regularly.
9. Properly install a grounding rod at the furnace.
10. Ensure furnace is installed level.
11. Always install furnace with a Hawken authorized 6" chimney cap (sold separately). Never operate or store furnace without an approved chimney cap. Chimney extensions and chimney caps should be locked to mating pieces. Support chimneys higher than 8' with wires or bracing. The Hawken GX Series Afterburner™ utilizes 6" stainless steel insulated chimney pieces. Any extensions, accessories or cap must be of the same make and material and should meet UL-103HT or equivalent standard. For best fit, contact your Hawken rep or Hawken Energy for authorized Hawken parts.

COMPONENTS		
COMPONENT	IDENTITY	MODEL
Blower Motor	Fasco	B24220
Blower Control	Love/Dwyer	TSWB-101
Snap Disk	Thermo-Disk	60T11-610013
Burner ON/OFF Switch	Leviton	145-2IS
Firebrick	Standard Firebrick	Contact Hawken
Relay	White Rodgers	90-341
Light	Hampton Bay	WB0317 (252-550)
Insulated Chimney	Selkirk	SPR6L24

COMPONENT LOCATIONS



1. Water Level Indicator
2. Lift Eye
3. Chimney Stack
4. Front Light
5. Control Panel
 - a. Light/Blower Switch
 - b. Digital Temperature Control (Love Controller)
 - c. Nameplate Label
6. Front Cleanout Door
 - a. Horizontal Heat Exchange Tubes
7. Firebox Door - Primary Burn Chamber (closed)
 - a. Air Channels (center, left/right)
8. Firebox Door Chute Water Jacket Drain



9. Back Light
10. Back Cleanout Door (open)
11. Catalyst Deflector
12. Horizontal Heat Exchange Tubes
13. Cold Return Line
14. Blower Box (door removed for illustration purposes)
 - a. Solenoids (inside)
 - b. Thermowell Temperature Probe
 - c. Air Supply Lines
15. Fan/Blower
16. Hot Supply Line
17. Pump/Circulator
18. Drain Valve (Water Sample Location)
19. Afterburner Combuster™ (open)

FINDING THE BEST LOCATION FOR YOUR AFTERBURNER™

When identifying the ideal location for your Hawken, please consider the following:

- Review the EPA Burn Wise Best Burn Practices: <http://www.epa.gov/burnwise/bestburn.html>
- Install on non-combustible flooring with adequate support. Hawken furnaces do not require a cement slab. Furnace feet may be set on 4-inch thick header blocks that are level, centered, and properly supported.

NOTE: Hawken GX Series Afterburner™ utilize a frame design to allow lifting from the front or sides using a fork lift or other similar machine. The unit is very heavy; please use caution. A lift loop is also mounted to the top of the furnace for crane type lifting. A concrete pad is not required for placement, but if pouring concrete, don't forget to leave a space for the underground feed and return pipe(s).

- When possible, have the furnace door open towards prevailing winds. This helps disperse the smoke while loading the furnace.
- Locate furnace so that prevailing winds will not cause a nuisance for neighbors.

NOTE: Hawken GX Series Afterburner™ are designed for low emissions. Some smoke may be present, especially at startup and filling. The primary firebox may disperse smoke when door is opened - this is normal since the smoke has not had a chance to go through the secondary burn chamber and be burned.

- When possible, locate furnace downwind from nearby buildings.

NOTE: Although outdoor prevailing wind and smoke considerations should be given first priority, your outdoor furnace location selection may also minimize the amount of purchased pipe required. Authorized Hawken underground pipe loses very little heat, so longer distances will not cause significant heat loss, but reducing distance will reduce cost of purchased pipe. Finally, keep in mind that the underground pipe must enter the home or building to be heated, and plan for this accordingly.

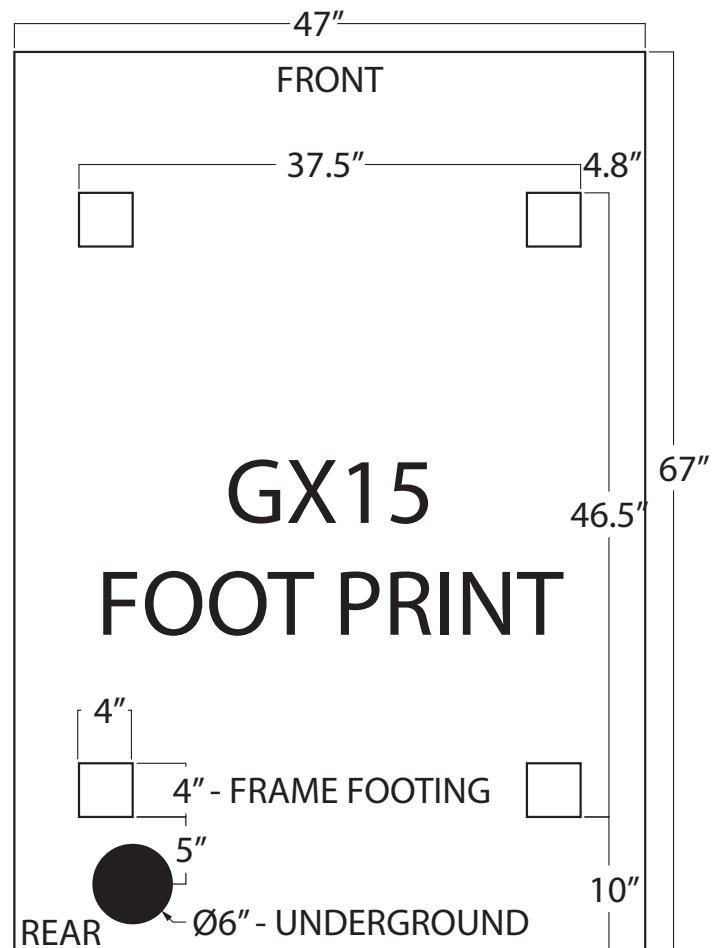
- Always install a Afterburner™ with a Hawken authorized chimney cap to reduce heat loss, keep rain out, and to serve as a spark arrestor.
- When possible locate furnace 30 to 50 feet from any structure. Consult with your insurance company for minimum distances.

PREPARING THE LOCATION FOR YOUR AFTERBURNER™

When preparing the location for your Afterburner™, please consider the following:

When possible, install underground pipe before delivery and placement of furnace. This simplifies the placement process. If installing a Afterburner™ on a cement pad, it is recommended to install underground pipe before pouring cement pad. Make sure to leave a hole in cement pad (minimum 12" square) at rear of Afterburner™ (see footprint illustration below). Installation should be performed by a qualified installer.

For customers who require chimney extensions, insulated pipe is required. Contact Hawken to ensure that the insulated chimney extensions you purchase mate with the factory installed chimney on your unit.



FIRST TIME FILL - WATER TESTING

Your warranty requires the use of Hawken authorized water treatment. You **MUST** take the steps listed below to ensure the proper operation of your Hawken. Further, your Hawken and its components will receive better protection against corrosion, your filter will require less frequent cleaning and your system will last longer.

See our video at https://www.youtube.com/watch?v=FfB_G8QrHXA to help explain the steps outlined below.

1. Before you fill your furnace the first time, purchase from your Hawken Rep the appropriate amount of Hawken authorized water treatment. Follow the directions on the bottle for how much to add to your system. Your dealer will also provide you with sample test bottles and labels so that you can submit a water sample annually for laboratory testing (follow instructions included with test bottles.)
2. Once your installation is complete, fill your new furnace so that it is approximately half full of water. Make sure all valves are closed. Do not fill furnace with water until your installation is complete, and the drain valve is properly installed.
3. Add the appropriate amount of Hawken authorized water treatment.
4. Fill your furnace until it is completely full of water. You will know it is full when water spills out of the vent tube onto the roof of the furnace. Once full of water, do not start a fire in your furnace yet.
5. Open all necessary valves, wait 5 minutes, then turn on your pump. Allow the pump to circulate the water for at least 2 to 4 hours.
6. After the pump circulates the water for at least 2 to 4 hours drain a small sample of water from the drain valve located at the bottom of the furnace. Follow the enclosed directions to send this water sample for testing. You may now startup your furnace.
7. Once your water sample is received by the laboratory and tested, you will receive a lab report containing the results from your water sample test. Please be sure to legibly print your information on the label provided and provide an e-mail address where you would like your report to be sent. If your water is found to contain anything harmful to your Hawken, further action on your part will be specified in this lab report. If any further action is required on your part, you must comply with the instructions provided in the lab report. Once you do so, you will then be required to submit another water sample to the lab for testing. Please take this sample according to instructions below under "Periodic Water Testing".

NOTE: A "satisfactory" water sample report must be on file at Hawken to maintain your warranty and this must be renewed annually. Please save reports for your own records.

8. Follow instructions below for Periodic Testing. Your Hawken authorized water treatment will indicate how often such testing is necessary (currently once per year). Any changes to this testing procedure will also be specified in service bulletins posted at www.HawkenEnergy.com/servicebulletins/ which you should check at least semiannually.

PERIODIC WATER TESTING

Periodic water testing must be completed upon installation and at least once every 12 months thereafter. This is a free test, but in order to maintain your warranty you must comply with the following instructions. See our video at https://www.youtube.com/watch?v=FfB_G8QrHXA to help explain the steps outlined below.

First, a sample of water must be taken from the furnace. To do so, observe the following steps:

- a. The furnace must be turned off and cooled in order to take the water sample. If the furnace is going to sit idle during the summer months, it is best that testing and proper amounts of water treatment chemical are added to the furnace prior to the idle summer months.
- b. **NEVER DRAIN YOUR FURNACE AND LEAVE IT EMPTY OF PROPERLY TREATED WATER.** Always have your furnace full of properly treated water.
- c. Let the fire burn out. Allow the furnace to cool until the water temperature is below 80°F.
- d. Remove the ash. Lightly scrape the inside of the firebox to remove the ash.
- e. Shut off the power to the furnace to stop the pump(s).
- f. Make sure the ball valves to the pumps are in the open position to avoid any air lock upon restart. Never attempt to operate the pump(s) with the ball valves (to pumps) in the closed position.
- g. If you have a forced air furnace with a second Hawken thermostat, turn the thermostat off.
- h. Attach a hose to the water jacket drain at the bottom of the furnace.
- i. Open the water jacket drain at back of furnace until the water runs clear. Close the drain. This is an important annual maintenance item that flushes any sediment buildup from the furnace.

NOTE: Sediment that accumulates at the bottom of the water tank can prevent properly treated water from protecting the furnace steel. The lower drain valve can be opened as often as necessary to get rid of this unwanted sediment. Ensure that the furnace water level does not get too low. Refill with properly treated water as necessary.

- j. Repeat steps h and i from second drain at front of unit, as necessary.
- k. Add chemical as needed. If a significant volume of water was required to be drained from the furnace to get the water to run clear, refill the furnace using your in-house fill valve.
- l. Turn on the power to the pump and circulate the furnace water for 2 to 4 hours. Turn pump and power off again.
- m. With a water sample bottle ready to fill, open the water jacket drain again and fill the water sample bottle.
- n. Turn power and pump back on, and return furnace to service when ready.

1. Send water sample to laboratory for lab testing. Please be sure to legibly print your information on the label provided.
2. Follow mailing instructions included with the water sample test bottles.
3. A water sample report will be returned to you via e-mail (be sure to include your e-mail on the label).
4. If the water sample lab report indicates that the "Treatment level is satisfactory", then no further action is required. If the report indicates that the "Treatment level is low", then the lab report will specify what you need to do.
5. Carefully follow the instructions specified in the water sample lab report (if any), and then send another water sample to the lab for another test (see Step 1 above).

NOTE: A "satisfactory" water sample report must be on file at Hawken every 12 months that you own your furnace to maintain your warranty, and this must be renewed annually. Please save reports for your own records.

OPERATION

A Hawken GX Series Afterburner™ is a high efficiency, low emissions wood hydronic heater. As a result of the wood burning process using patented Afterburner™ technology, combustion temperatures reach 2,000°F, yet stack temperatures just before entering the flue are typically between 200-300°F. This indicates that a GX Series Afterburner™ is incredibly good at extracting and storing all that heat energy, saving you time and money over the years by burning less wood for the same amount of usable heat.

A Hawken GX Series Afterburner™ requires a hot, dry fire with properly mixed air to achieve optimal combustion in the primary firebox chamber (where you load wood) and Afterburner™ chamber (below the primary chamber).

If wood is not completely seasoned (less than 25% moisture) then it may not burn properly in a GX Series Afterburner™ and the excess moisture in the wood may contribute to excessive creosote that can restrict airflow and lead to less optimal operation and require more maintenance and cleaning.

Use a wood moisture meter to ensure that you are only burning completely seasoned wood in a GX Series Afterburner™.

NOTE: Some people don't care about efficiency – but did you know that as much as two-thirds of your wood may need to be consumed to burn off the water in a batch of green wood? We hate to think that people are burning far too much wood just because they did not allow their wood enough time to dry out. To learn more about this, check out our blog post on the topic: <http://blog.hawkenenergy.com/2013/12/moisture-meter.html>

Visit our youtube channel for additional videos and tips:

www.youtube.com/hawkenenergy

WATER TEMPERATURE

NOTICE You must NEVER operate a Afterburner™ at temperatures below 140°F – the only exception to this is during "Start-up", but that is only allowed ONCE PER YEAR in the autumn.

Wood contains moisture – lots of moisture! When the Afterburner™ water temperature is below 140°F, the moisture in the wood condenses on the inside walls and tubes of the Afterburner™ and that turns into large volumes of creosote. That creosote plugs up the heat exchange tubes and this PREVENTS proper air flow. When that happens, you will not get enough heat out of the Afterburner™, and then no matter how good your wood quality is, you cannot get a good hot burn because air cannot flow through the heat exchange tubes and catalyst system.

NOTE: During the fall "start-up" some water may leak out the back of the furnace upper rear door and/or front upper door. Those water drips will stop once the furnace reaches 140°F and the remaining moisture that had condensed will dry up harmlessly during this once per year "start up".

NOTE: The best way to start up a cold Hawken GX Series Afterburner™ is with charcoal coals from previously burned wood. Such coals have already had the water burned out of them so the amount of potential creosote is greatly reduced. Then once the Afterburner™ water temp is above 140°F, add well seasoned wood.

NOTE: When the Afterburner™ water temp is at its normal operating temperature range of 172 to 182°F, all the moisture from the wood that is burned off will EXIT THE Afterburner™ HARMLESSLY AS STEAM.

If you are operating your Afterburner™ at temperatures below the designated temp range, here are some potential causes:

- Your wood is not properly seasoned so the Afterburner™ never has a chance from the start.
- The Afterburner™ must be cleaned every two weeks. Regardless of how dry and seasoned your wood is. For tips on how to clean your Afterburner™, see "ROUTINE CLEANING" below. If your Afterburner™ is not cleaned regularly, or if ANY cleaning step is missed, the tubes will get clogged and you will also not get proper combustion. This will lead to the Afterburner™ operating below 140°F.
- If your Afterburner™ is too small for your heating requirements, then it is likely that the Afterburner™ will require wood more often than you care to fill it. This can lead to running out of fuel, the furnace temperature therefore drops below 140°F.
- If your Afterburner™ ever runs out of wood, you must schedule more frequent loading times.
- Your fan could be defective. This can be evaluated by simply observing the fan and feeling airflow. Also, the solenoid that lifts the damper plate can fail (sometimes if there is an electrical short in your home somewhere, this will manifest). Test this by turning on the blower fan switch (located inside the control box) and you should hear a click. Turn it off and hear a similar sound. If not, open the blower box to inspect.

AFTERBURNER™ STARTUP/SHUT DOWN

Afterburner™ STARTUP PROCEDURES

Observe the following steps when starting the Afterburner™:

1. Observe all safety precautions.
2. Ensure that the installation has been completed properly.
3. Make sure the Afterburner™ is full of water. Verify this with the water level indicator AND by filling the Afterburner™ until water flows out of the vent tube on the roof peak.
4. Make sure the Afterburner™ water has been properly treated with Hawken authorized water treatment.
5. Open all valves. Allow 5 minutes for water to fill pump and system.
6. Turn on power and make sure pump is running. Never operate a Afterburner™ without the pump circulating water.
7. Make sure fan switch is operational. Fan switch is located on the side of the Afterburner™ inside the control box. Turn the fan switch to the ON position (up).
8. The Afterburner™ water temperature is controlled by an electronic temperature controller. The temperature controller comes set from the factory to 182°F high and 172°F low. The temperature controller will automatically control the blower to maintain the water temperature between this range under normal operation conditions.
9. Build a small fire in the primary firebox chamber, and allow Afterburner™ temperature to rise SLOWLY. If possible, use only charcoal coals from previously burned wood.
10. When the temperature reaches 170°F, the Afterburner™ is ready to be filled to capacity for full operation.

NOTE: Full combustion efficiency may take up to 4 to 6 hours to be achieved. Smoke may be visible during this time.

Afterburner™ SHUT DOWN PROCEDURES

Observe the following steps when shutting down the furnace:

1. Observe all safety precautions.
2. Allow time for the fire and coals to completely burn out.
3. Empty all the ashes and lightly scrape out the firebox and Afterburner chamber to remove all ashes. Also clean the heat exchangers in the rear of unit. See Afterburner™ Maintenance for more details.
4. Fill the system with water until it is completely full.
5. Flush and clean the in-line water filter.
6. Make sure the proper water treatment procedure is followed (see "Periodic Water Testing").
7. Make sure the chimney cap is in place to prevent rainwater from entering firebox.
8. If you have a forced air furnace with a second thermostat controlling your indoor furnace blower fan, be sure to turn off the power to this thermostat.
9. Ensure that the heat exchanger, flue pipe, and chimney are cleaned at the end of the heating season to minimize corrosion during the summer months.

AFTERBURNER™ MAINTENANCE

ROUTINE CLEANING

The GX Series Afterburner™ must be cleaned regularly – at least twice per month during the heating season and/or year-round use. Once every two weeks, the heat exchange tubes must be cleaned. This process should take no more than 15-20 minutes as part of regular maintenance. Here is a link to a video that overviews cleaning steps: <https://www.youtube.com/watch?v=WluU26tySAY>

NOTE: Check daily for creosote buildup until experience shows how often cleaning is necessary. The hotter the fire the less creosote is deposited. Cleaning may be required more often when the weather is milder and less often when the weather is colder.

NOTE: If the water jacket temp has ever been allowed to drop below 140°F, then this process may take longer. Watch this video for how to accomplish this – and note the process of using a cable and a pipe nipple with a cordless drill to clean the tubes. ALSO NOTE THIS IMPORTANT COMPONENT that is not stressed in the video – For pipes that are significantly clogged, the cable/drill cleaning method should be used with a vacuum hose that is inserted periodically to suck out pieces of ash and creosote that are dislodged from the inside of the pipes.

Pay very close attention to these three important cleaning tips:

- Vacuum Horizontal Tubes – We have found that the easiest first step in cleaning the horizontal heat exchange tubes is to insert into each tube a shop vac hose extension that fits just inside the tube. As you push this into the tube, you will hear the sound of ash and creosote being sucked into your shop vac. It is a very effective first step in cleaning those tubes. Vacuum the tubes on the left side first as they accumulate more ash. Then proceed with the “Heavy Duty Wire Cleaning Tool” instructions described below.
- Heavy Duty Wire Cleaning Tool – Sometimes cleaning the tubes of the GX Series Afterburner™ will require more strength than the 1.5” tube brush can deliver. In cases like this use a length of steel wire rope about 4’ 6” (54”) long to fit into your drill’s chuck, preferably 3/8”. One end goes into the drill and the other end goes into the tubes of the GX Series Afterburner™ to clean. Spin the drill backwards to avoid unwinding the wire. It is essential to feed the wire rope through a 30” piece of steel pipe (for example, a 3/4” x 30” black pipe nipple fits a 3/8” wire rope nicely). This will help stabilize the wire rope as it spins and give you something to hold on to. You’ll still need to run the 1.5” tube brush through the pipes to pull all the dust through but this tool will make the job much easier. Watch how this is done in this video link – (video advanced to time of 3:09 for specific instructions on this step): <http://youtu.be/WluU26tySAY?t=3m9s>

- TSP or Tri Sodium Phosphate – TSP, or Tri Sodium Phosphate, is a cleaning product that is regularly available at hardware stores. Many times a chimney sweep will visit a home two days before he is about to sweep a chimney and put a tablespoon of TSP on the burning wood in the fireplace or stove. TSP does NOT eliminate creosote, it only makes it brittle and easier to remove. Therefore, if TSP is used in your Afterburner™, make sure to clean the tubes within 24 hours until all creosote is removed. While TSP will make creosote easier to remove, it may also cause it to swell and may possibly cause airflow restriction.

NOTICE Do not use TSP in a GX Series Afterburner™ when catalyst is in place. TSP may damage the catalyst and may void any catalyst warranty. Without catalyst in place, a Afterburner™ may run less efficiently and produce more fine particulate emissions than allowable for EPA Phase II qualified furnaces.

1. Heat Exchanger Cleaning. Observe all safety precautions. Wear gloves and eye protection. Turn off blower before performing maintenance. Every 14 days open the rear top door to clean the heat exchange tubes (It is recommended that you perform the first cleaning 6 to 7 days after the initial firing). Remove the steel tray that holds the catalyst. Use the provided brush, to clean the heat exchange tubes. To clean the vertical tubes in the left-hand chamber feed the brush into the tubes, bristles first. Then, clip the brush to the extension cable. Open the lower rear door. Feed the cable into the vertical tubes and pull brush through each tube to clean and remove ash buildup. To clean horizontal tubes, push shop vac hose into tubes from rear. Leave front access door closed. Then push brush into tubes, (bristle end first) - then open front access door and vacuum out ash. Use a duster or vacuum to remove ash from exhaust areas and drip tray under rear door. Clean your furnace regularly to maintain the highest efficiency. Close doors after cleaning. To see a video explaining these steps further, contact Hawken Energy.
 2. Inspect Catalyst. While cleaning the heat exchange area check the catalytic disk. Make sure the catalyst is well seated and clean. If deeper cleaning of the catalyst is required visit www.HawkenEnergy.com for instructions. Though not required for proper operation it is recommended that the catalyst be kept in place during normal operation. Replace the catalyst every five years for maximum catalytic efficiency.
 3. Rake Ash Level/Remove As Needed. Before each loading of the furnace with wood, rake coals level in the firebox. Do not allow level of coals to rise above the bottom level of the door frame. Remove ash/coals with a shovel as needed to keep below this level.
- NOTE: The GX Series Afterburner™ tends to operate better when there is a full bed of coals (just below the door chute bottom level).**
4. Clean Lower Ash Chamber. Use caution. Only open the lower back door when furnace is switched to off position. Using the provided cleaning/scraping tool, remove ash from lower chamber as necessary, at least every week. Always remove ash into a covered, non-combustible container.

5. Remove ash and coals every week and scrape firebox clean. Never operate the furnace with a fire in it with the door open, except for brief periods while loading wood or removing ash. Always remove ash into a covered, non-combustible container. Clean ash from all firebox surfaces, especially the rear plate and side plates. **DO NOT ALLOW ASH TO BUILD UP ON THE STEEL SURFACES.**
6. Inspect/Clean Filter (inside house/building) – Inspect filter for any sediment. When necessary, flush filter by opening the Filter By-Pass valve and close the valves on both sides of the visible flow filter. This allows the system to continue to circulate while you discharge the filter of all collected materials. Open the ball valve on the clean water side of the filter. Then, while holding a bucket under the filter, open the valve at the bottom of the filter to flush out the stainless steel filter, close that valve again once clear. This method generally cleans the filter without disassembly. Open both filter valves and close the by-pass valve. This should be done once a month. Occasionally, the stainless steel filter will appear dirty even after the above flush. In such cases, open the Filter By-Pass valve and close the valves on both sides of the visible flow filter. Filter and housing can be very hot. Allow to cool before handling. The filter can then be removed and cleaned by hand.

ROUTINE MAINTENANCE - ONCE PER HEATING SEASON

7. Clean Air Feed Chamber – Smoke and creosote can build up in the air feed tubes between the blower box and the firebox. To clean, remove the solenoids from their mounts in the blower box. Unscrew the horizontal pipe fitting at the union joint, then unscrew 90° Elbow on left hand. Unscrew pipe fitting from 90° Elbow on right hand. Unscrew lower elbow. Push brush through exposed pipe going into and through the water jacket. Cleanout ash from firebox side. Replace blower pipe fittings, elbows and solenoids to their proper location.
 - a. To clean the air channels inside the firebox first, shut down your furnace and allow time for the interior to cool, generally 24 hours is recommended. Leave the pump running during this time. Clean the firebox thoroughly. Remove any coals and ashes. Use a shop vac if desired. The more you clean the firebox, the cleaner this job will be.
 - b. Remove the air channel on the left and right by unscrewing the bolts from each side. Take a brush or scraping tool to clean out any accumulated creosote and ash from behind the air channel. Take care not to knock the bolt mounts. Use a shop vac to ensure you have cleaned the air channel pipe coming from the blower box thoroughly before replacing side channels. Ensure bolts are tightened and there is no gap between the top of the air channels and the side of the firebox.
 - c. Remove center channel from firebox by lifting straight up and then out. Use a brush or other scraping tool to clean center air channel from the back and allow ash and creosote debris to fall out. Ensure that all air holes are free from obstructions before replacing. Replace center air channel and ensure that it seals tightly to the rear wall of the firebox.

ROUTINE INSPECTION

The following inspection items must be followed to ensure proper and safe operation of your GX Series Afterburner™:

Remember to observe all safety precautions.

1. Check Water Level/Fill – Always keep the Afterburner™ full of water. On a daily basis, check the water level indicator located in the vent tube at the peak of the roof towards the front of the furnace. If not full, open in-house fill valve until full. Normally, this step should be taken once a month by opening the in-house fill valve for a few seconds until water spills out on the roof of the furnace. Add water to furnace slowly.
2. Door Rope/Seal – Inspect door seal fire rope monthly or as needed. Make sure door seals properly to prevent air from entering furnace; this will cause the furnace to overheat and can cause serious damage to the furnace. If necessary, replace fire rope. If necessary, adjust door for proper fit. Never operate the furnace with a fire in it with the door open, except for brief periods while loading wood or removing ash. When replacing fire rope or adjusting door for proper seal, be sure to remove any fuel from furnace to prevent overheating, since door may be open for more than a few minutes.
3. Chimney/Flue Inspection – Inspect chimney and flue monthly and clean as needed. Clean chimney and flue annually. Perform cleaning and maintenance only when no fire is present in the firebox and ashes are cooled completely.
4. Water Treatment – Ensure proper water treatment - (see “Periodic Water Testing”).
5. Firebrick – Check for normal wear and tear. Ensure all air flow holes in brick are not altered. Visually inspect the lower burn chamber to make sure all the brick are standing vertically, not tilted or out of place. Replace any firebrick as necessary. Insulation and firebrick are not covered by the warranty. New brick may be obtained by contacting Hawken Energy.

NOTE: The Hawken Energy GX series Afterburner™ utilize firebrick refractory to contain the high temperature burn of the combustion process.

NOTICE Do not drop heavy pieces of wood onto the brick. Use caution when raking or shoveling ashes and coals. Do not operate furnace if pieces of brick are missing. Wear and signs of stress on brick are normal. Do not alter or change your unit, including firebrick and insulation orientation.

6. Digital Temperature Controller – ensure proper operation. There is no routine maintenance required for the temperature switch. Do not alter the settings on your Digital Temperature Controller.

NOTE: The Hawken GX Series Afterburner™ use a digital temperature switch to regulate the unit's temperatures. The 3 digit display indicates the unit's water temperature from a probe at the rear of the furnace. The Digital Temperature Switch has a high and a low set point for controlling the water temperature. This control also has a conductivity probe input to check for low water condition. A water level sensor is connected to the digital input. When

the control detects an open signal, the unit is low on water. In this case the water LED on the face of the control lights and power to the air input for the unit is shut off. When this happens it will be necessary to add properly treated water to refill the unit.

NOTE: The controller has the following functionality/ indicators: Fuel LED indicates the stove is out of wood or operating at a temperature below 140°F. Water LED indicates the unit is low on water. In normal operation, the probe temperature will be shown on the display. In case of alarm or error, the following messages can be shown:

- Erl = Memory Error
- ooo = Open Probe Error
- --- = Short Circuit Probe Error

CERTIFICATION

The GX Series Afterburner™, (GX15 and GX30) are U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2015 particulate emission standards. Not approved for sale after May 15, 2020.

Furnace Model GX Series

Tested to ANSI/UL 2523-2013

For wood fuel only. Patent Pending.



ADDITIONAL INFO

For more information visit these helpful websites:

EPA's Burn Wise Program: www.epa.gov/burnwise

How to use a moisture meter video: <http://blog.hawkenenergy.com/2013/12/moisture-meter.html>

EPA offers tips on how to properly use a moisture meter to test firewood before using in a wood-burning stove or fireplace. Wet wood can create excessive smoke which is wasted fuel.

The importance of dry wood: <http://blog.hawkenenergy.com/2013/12/dry-firewood.html>

EPA offers four simple steps to properly dry firewood before using in a wood-burning stove or fireplace. Wet wood can create excessive smoke which is wasted fuel. Burning dry, seasoned firewood with a moisture content of 20% or less can save money and help reduce harmful air pollution.

Wet Wood is a Waste brochure: <http://www.epa.gov/burnwise/pdfs/wetwoodwastebrochure.pdf>

This tri-fold brochure provides colorful illustrations of the four easy steps to dry firewood.

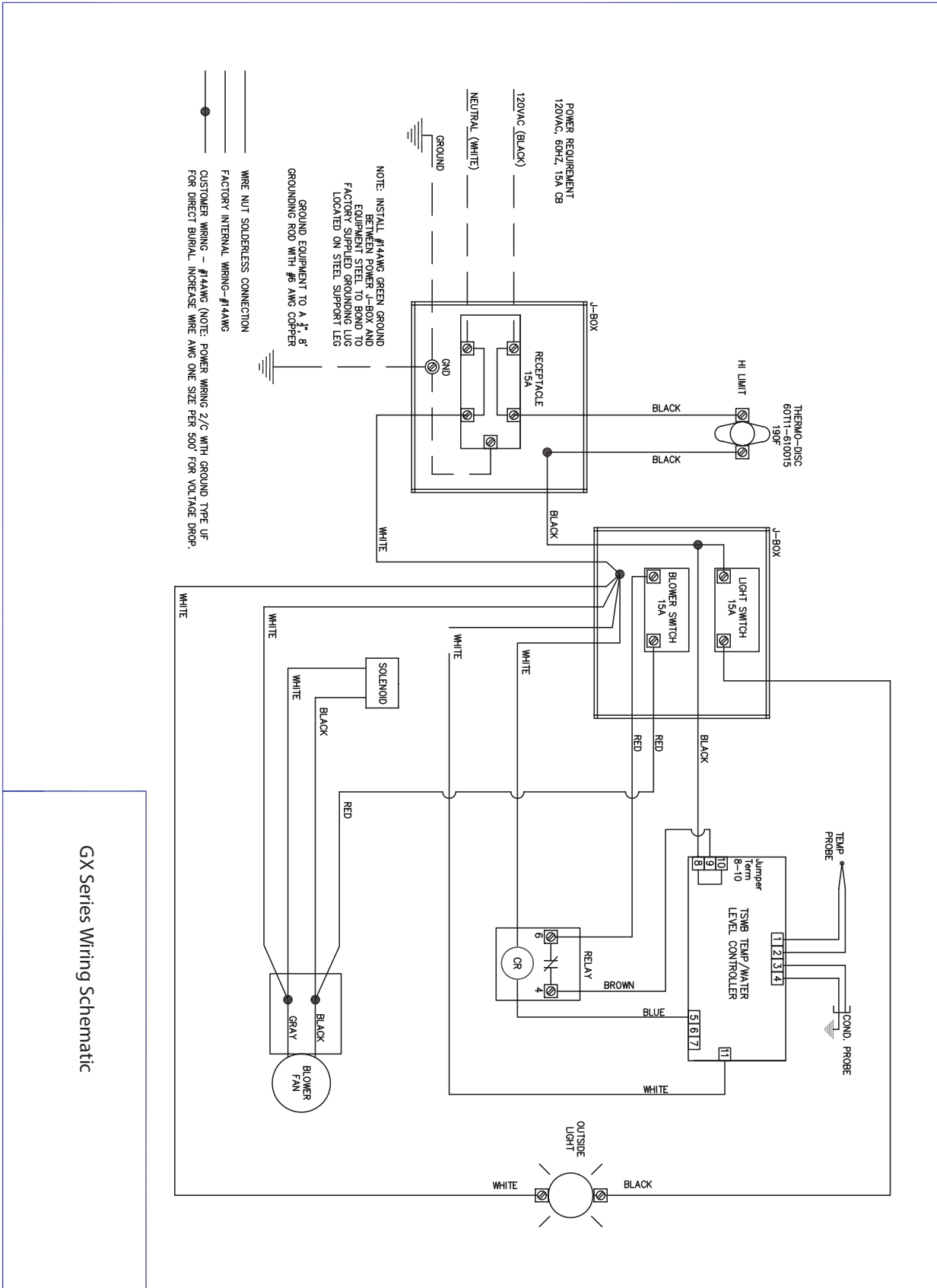
Why your furnace must never operate at temps below 140°F: <http://youtu.be/FdcAGG9k94U>

Three reasons why you should keep your furnace temperature above 140°F.

Proper water treatment video: http://youtu.be/FfB_G8QrHXA

Proper procedures and helpful hints for getting your water sample and sending to Hawken.

WIRING SCHEMATIC



GX Series Wiring Schematic

Fill out this Product Registration free online! Visit www.HawkenEnergy.com/registration

RETURN THIS PAGE TO HAWKEN ENERGY, INC.*

- I have received and read or will read the Owners Manual completely before I install and/or fire my Hawken Energy outdoor wood furnace, and I will comply with all instructions in the Owner's Manual.
- I agree to monitor and test the water in the system according to instructions in the Owners Manual.
- I agree to burn wood only.
- I agree to use properly installed grounding rod at the outdoor wood furnace, and to use only Hawken authorized parts in my outdoor furnace installation.
- I agree to follow all the operations and maintenance procedures listed in the Owners Manual.
- I acknowledge that my failure to abide by the above shall operate to void these warranties.

WARRANTY REGISTRATION*

Serial No. _____ Model _____ Date of Purchase _____

Name _____

Last First Middle Initial

Street _____

City _____ State/Prov. _____ Zip/Postal Code _____

Email _____

Phone _____

How did you first hear of Hawken Furnaces? _____

Rep Name _____ City _____ State _____

Owners Signature _____

* All information is required, PLEASE INCLUDE CHECK FOR \$10 FOR PAPER PROCESSING, or fill out online for free!

Acknowledgement of your warranty registration will be sent to you upon receipt by Hawken Energy Inc. If you do not receive such acknowledgment within two months, please contact your dealer/rep or Hawken Energy. Hawken Energy does not disclose this information to outside sources.

Mail to Hawken Energy Inc., 1064 Industrial Park Dr. Suite A, Shelby, MI 49455

Owner's Manual

DEAR NEW HAWKEN OWNER,

Thank you for purchasing a Hawken Energy outdoor furnace and registering your furnace warranty. Below you will find a brief survey about your furnace purchasing experience. Please complete this with your warranty registration. Other Hawken customers have helped us in the same way and we always appreciate the opportunity to consider your input.

1. Did you get other estimates before deciding on Hawken Energy? Yes No
2. What other brands did you consider? _____
3. Why did you decide on a Hawken Energy outdoor furnace? (check all that apply)
 Reputation Warranty Product Features Factory Rep
 Recommendation Lowest Price Other _____
4. How did you hear about our company? (check all that apply)
 Word of mouth Internet Newspaper
 Magazine _____ Show _____
 Other _____ Highway Display Furnace
5. Was your installation done in a real and professional manner? Yes No Self Install
6. Please describe your overall satisfaction with the Hawken Furnace.
 Very Satisfied Somewhat Satisfied Somewhat Unsatisfied Very Unsatisfied
7. Please describe your overall satisfaction with the Hawken Factory Rep.
 Very Satisfied Somewhat Satisfied Somewhat Unsatisfied Very Unsatisfied
7. Would you recommend Hawken Energy to your friends and neighbors? Yes No

Comments: _____

Thank you for completing this survey. We would also appreciate photos of you and your Hawken Furnace to accompany this survey. Look us up on Facebook for updates, news and contests. www.facebook.com/HawkenEnergy.

Warm Wishes,

The Hawken Energy Team



RENEWABLE ENERGY FURNACES

HAWKEN ENERGY INC.
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SHELBY, MI 49455