

**INSTALLATION AND
OPERATING INSTRUCTIONS
FOR**

**THE HYPROTHERM
Commercial
Top Loading Furnaces**

***Manufactured by*
Hyprotherm LLC.**

Hyprotherm

Table of Contents	Page #
General Information/Safety Precautions	2, 3
Best Burn Practices	4
Disposal of Ash	5
The Outdoor Hydronic Furnace	6
The Outdoor Forced Air Furnace	7
Location of Furnace	7, 8
Furnace Installation Overview	8
Description of Hydronic Furnace Components and Water Flow	9 -12
Description of Forced Air Furnace Components	13, 14
Startup Procedure for Hydronic Furnaces	15
Startup Procedure for Forced Air Furnaces	16, 17
Testing and Recording Water Flow	18
Maintenance	19
Warranty	20 - 22
Hyprotherm Water Treatment Program	23 - 24
Registration Card	25
Gallon per minute test	26, 27

HyProTherm

Commercial Top Loading Furnaces

GENERAL INFORMATION

Hyprotherm manufactures two types of Top Loading Furnaces and many sizes of each type. These instructions will briefly touch on each type.

SAFETY PRECAUTIONS

Make sure you read this manual and follow the recommendations contained in it to have the joy of operating your furnace for years to come. Improper use and/or installation may void warranties. Always follow local code requirements and seek the help of qualified craftsmen when installing the furnace or systems associated with your furnace.

Do not operate this equipment for other than its intended purpose nor other than in accordance with the instructions contained in this manual and all other instructions accompanying the furnace. Do not modify the furnace in any manner! Any modification without express written consent of manufacturer will void warranty.

For furnaces covered by this instruction book, it is important to observe safety precautions to protect yourself from possible injury.

This furnace must be wired by a qualified electrician in accordance with local and/or

National Electric Codes and must have a power ground.

Install a ground rod, several feet deep and attach a 12- or 14-gauge wire, with a clamp and attach it to the frame of the furnace.

Never use any type of petroleum product, petroleum-based product, charcoal starter, lighter fluid, lantern fuel, kerosene, or any other flammable accelerant to start your furnace.

KEEP ALL SUCH LIQUIDS WELL AWAY FROM FURNACE WHEN IN USE

Keep antifreeze, which is flammable, far away from the furnace.

The use of treated wood (painted, treated, etc.) and any other salvaged material that can emit toxic gases into the environment and may be corrosive toward the components of the appliance is **NOT ALLOWED** and eliminates the rights of the warranty.

DO NOT BURN GARBAGE, HOUSEHOLD WASTE OR YARD WASTE IN THE FURNACE. In most areas, this is illegal. The furnace is designed to burn seasoned cordwood. Burning non-approved materials can reduce the life of the furnace and will void your warranty.

DO NOT OPERATE THE FURNACE WITH THE DOOR OPEN. Always latch the doors securely. If the door is open for any extended period, it will cause over-firing of the fire. Always remember to keep your hinges oiled.

Always use proper care when installing, operating, and maintaining the furnace.

Always wear protective gloves and glasses and be aware that loose or hanging clothing can catch fire!

Be careful when loading wood into the furnace. Surface areas inside the furnace are hot.

Creosote buildup in the furnace can ignite suddenly or cause burns if dripped onto the skin.

Do not modify the furnace. Do not substitute repairs that can be provided by your dealer, distributor, or manufacturing company. Any such action will void your warranty.

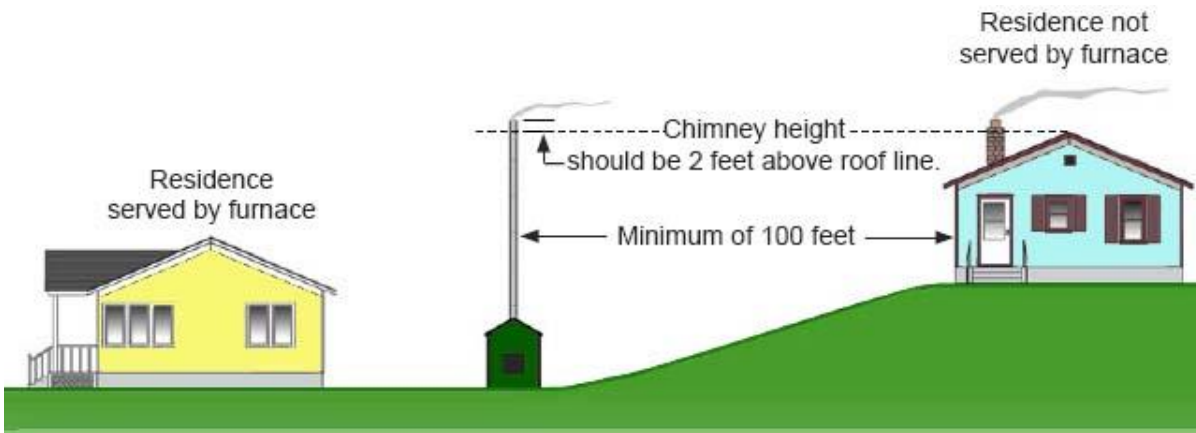
Failure to heed these warnings or any additional warnings on the furnace may result in an accident-causing personal injury and damage.

!! CALL LOCAL UTILITIES BEFORE YOU DIG THE TRENCH!!

OUTDOOR FURNACE BEST BURN PRACTICES

1. Read and follow all operating instructions supplied by the manufacturer.

2. **FUEL USED:** It is important to burn only good quality coal. Burning inferior coal may lead to issues that may not be covered under warranty. Be sure to read your warranty statement (separate document) for exclusions.
3. **LOADING FUEL:** For a more efficient burn, always add fuel before previous load has burned out. Commonly your furnace will have to be loaded in the morning and at night.
4. **STARTERS:** NEVER use lighter fluids, gasoline, or chemicals. Good kiln dried scrap lumber is better!
5. **LOCATION:** It is recommended that the furnace be located with due consideration to the prevailing wind direction. Chimney height can be easily extended with 6" Stovepipe.
 - We recommend a distance of at least 100 feet if prevailing winds blow towards any other residence not served by the furnace, it is recommended that the stack be at least 2 feet higher than the eave line of that residence.
 - If located more than 100 feet but no more than 150 feet to any residence, it is recommended that the stack be at least 50% of the eave line of that residence, plus an additional 2 feet.
 - If located more than 150 feet but no more than 200 feet to any residence, it is recommended that the stack be at least 25% of the height of the eave line of that residence, plus an additional 2 feet.



Chimney height relative to nearest downwind neighbor

The chimney can easily be extended with a flue adapter and standard double wall stove pipe, to any height necessary, with zero adverse effect on performance. In fact, it may even draft better. Always use a double wall pipe when going through any kind of roof or extending the flue pipe.

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

Disposal of ashes:

OPEN THE DOOR FOR THE DISPOSAL OF ASHES. ASHES SHOULD BE PLACED IN A METAL CONTAINER WITH A TIGHT-FITTING LID. THE CLOSED CONTAINER OF ASHES SHOULD BE PLACED ON A NON-COMPUSTIBLE FLOOR OR ON THE

GROUND. ALL COMBUSTIBLE MATERIALS SHOULD BE DISPOSED OF BY BURIAL IN SOIL OR OTHERWISE DISPERSED. ASHES SHOULD BE RETAINED IN THE CLOSED CONTAINER UNTIL ALL CINDERS HAVE THOROUGHLY COOLED.

Installation, to include wiring and plumbing, and operation must follow Federal, Provincial, State and Local Codes, electrical, plumbing, fire and building codes.

Install a ground rod, several feet deep and attach a 12- or 14-gauge wire, with a clamp and attach it to the frame of the furnace.

The manufacturer is not liable for damages or property in the case of misuse, improper installation of equipment or for knowing local installation codes. Product owner assumes all responsibility for this. This document is a general manual to aid in installation. We cannot know all applicable codes in your area!

Remember to give the furnace a “Once Over” regularly.
“Once” a week clean the ashes out (or often if needed)
“Once” a month clean the chimney.

BE SAFE:

Never leave the door open or unattended.
Keep children away – the door will be hot.
Never endanger your dwelling or buildings by putting the furnace too close or where the flu-chimney could endanger.
Know your local codes before purchasing.
Follow all local, state, building, fire, and electrical codes.

THE OUTDOOR HYDRONIC FURNACE

How does an outside hydronic furnace heat my home?

The HyProTherm outside furnace is designed to save the most energy and provide the most comfortable heating available. It heats your home by heating a firebox surrounded by a steel tank filled with water. The water furnace (boiler) is a non-pressurized boiler with an atmospheric vent. This hot water is then circulated through underground hot water pipes (Pex Pipe) to a water coil (heat exchanger) installed inside your existing central duct system. You may also need to use a plate exchanger with a boiler or radiant heat.

A typical water-to-air heat exchanger - much like a small radiator or heater core in a car, is installed in your ductwork. When air blows through it, heat is extracted, and hot air blows out of your vents.



The HyProTherm furnace can also be connected to any existing Hydronic heating system that operates at 180 degrees or less. *Not for steam systems.*

The HyProTherm can also heat water for household use if the optional internal water to water coil exchanger is ordered.

Water is circulated directly between the outdoor furnace and your water heater, via the built-in **water to water coil exchanger** in our furnace. The water going to your water heater is reheated. The only energy required is maintaining the hot water temperature in the outdoor furnace and a small pump mounted on the hot water heater vs a typical 4500 Watts for a water heater.

When you shut down the wood burner for the season, simply unplug the pump or turn off the circuit breaker to it. Your existing water heater will take over. Please remember to adjust your thermostat, if you had it turned down during the winter.

Heating a **POOL**

A stainless-steel shell and tube heat exchanger should be used for heating pools and spas. The chlorine will ruin a brazed plate heat exchanger in short order.

How do the Thermostat Controls work?

The only visible addition to the heating system inside your home is the thermostat which is located near the existing thermostat. The 2nd thermostat is installed so that it turns the blower on inside your existing furnace to force air across the hot water coil (heat exchanger). This forces hot air into your central duct system. The wall thermostat which regulates the heat from the outside furnace performs a second function as well; when the furnace fan powers up it sends power to the circulating pump in the outdoor furnace to circulate the hot water through the heat exchanger (running only on demand, not 24/7 like most others).

The outside furnace has a hot water thermostat which senses the water temperature of the unit. If the water is not as hot as the thermostat setting, then the combustion air blower is automatically turned on (building a hotter fire) and remains on until such temperature is attained.

THE OUTDOOR FORCED AIR FURNACE

How does an outdoor forced air furnace heat my home?

The HyProTherm outdoor wood furnace is designed to save the most energy and provide the most comfortable heating available. It heats your home by heating a firebox surrounded by a steel air chamber. When this air chamber reaches a preset temperature a fan controller turns on the main circulation blower. This blower forces the air into your existing central duct system.

How do the Thermostat Controls work?

The only visible addition to the heating system inside your home is a 2nd thermostat, which is located near the existing thermostat, if possible. This thermostat actuates the combustion blower of your outdoor furnace. It does not control the big blower that blows the air into the area being heated. This blower is controlled by a Honeywell Fan Limit Controller located on the side of the forced air furnace. When the air inside the air chamber reaches the temperature of the **ON** setting of the Fan Controller turns on the main circulation blower. This blower forces the air into your existing central duct system. It will continue to run until the internal furnace temperature drops to the **OFF** setting. By setting the thermostat of your original heat system (if applicable) lower than that of your wood furnace it will act as a backup. The original wall thermostat turns on your original furnace if the outside wood furnace is not in operation. Your existing furnace will automatically take over to maintain your household temperature.

Location of Furnace

The HyProTherm furnace is designed to be set outside the building to be heated. The furnace must be located a minimum of 5 feet from and facing away from the building. Further is recommended and distances up to 40 feet are within the capabilities of the included pump. For distances greater than 40 feet an upgrade pump will be required. The furnace should be installed upon a 4" thick concrete pad (see pad information beginning on page 12). Remember, your furnace will weigh about 3000 lb. or more, when filled with water.

- A) It is recommended that the appliance be located with due consideration to any neighboring residences. Do not locate an Outdoor Wood Burning Appliance within 100 ft of a residence not served by the appliance. Be considerate of neighboring residences, properties, parks, etc.
- B) Review the recommended stack heights on page 8.
- C) Do not locate near any combustible materials, gasoline or other flammable liquids or gases.
- D) Locate away from *dry* grassy areas.
- E) Place far enough away from any building to minimize fire danger.
- F) Check with your insurance company and local codes or ordinances.
- G) Do not install in an area where nearby structures or trees might cause down drafts.
- H) Typically, Outdoor Wood Burning Appliances are located 40 to 100 ft downwind from the served structure.
- I) Transfer lines more than 40 ft long will require a larger size pump than the one provided with the appliance.
- J) Locate to allow easy access to wood supply.
- K) To aid in smoke dispersal, extra chimney lengths may be required depending on the distance to surrounding structures. See page 8 for guidance.
- L) It is recommended that the appliance be located with due consideration to the prevailing wind direction.
- M) The furnace requires 115 V 10 Amp electrical service to operate.

Failure to keep the HyProTherm Furnace area clear and free of combustible materials, gasoline and other flammable liquids and vapors can result in severe personal injury, death, or substantial property damage.

Furnace Installation Overview

The furnace must be placed on a concrete pad with the plumbing lines and electric wires entering the service area as described in the example below.

Standard top loading furnaces have a row of removable steel grates running down the center of the fire box. The grates rest on vertical plates running the width of the fire box. The vertical plates have four rectangular forklift fork holes (two on each side) in them. These holes must be closed after



the furnace is set on the pad. There will be four plates and the bolts to mount them sent with the furnace. Usually, the delivery driver will have these plates along with any other loose items that come with the furnace. Prior to firing your furnace put sand in the open areas on both sides of the furnace grates and install the fork port covers.

Description of Components And Water Flow of Hydronic Furnaces

The furnace comes with one continuous run pump which is used to maintain even temperature throughout the furnace.

A brass dry well is installed in this area.

This dry well is used for the Ranco thermostat included with your furnace. The Ranco thermostat is used to control the combustion blower installed on

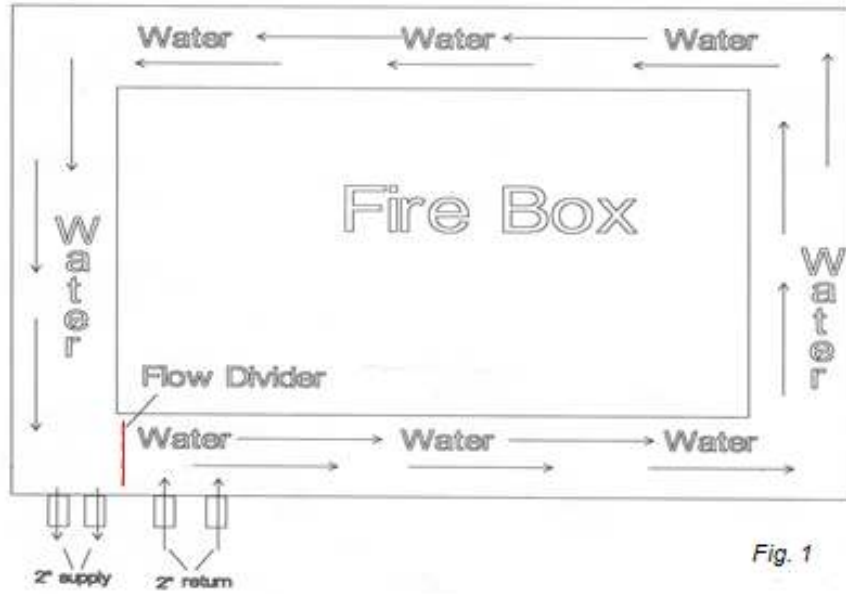
your new furnace. The photo below is an example of a WT (waterless top)

There can be many variations in proper installation. It is important that you have the furnace installed by a qualified installer. Hyprotherm will not be held responsible for complications due to improper installation and in some cases the warranty may be voided due to improper installation or start up.

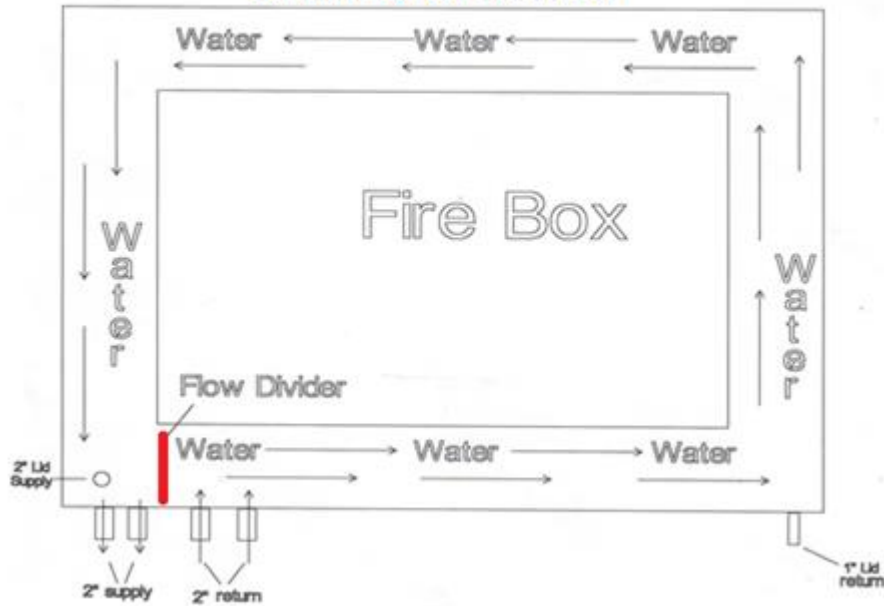
Your furnace comes with Two 2" supply ports and two 2" return ports. Each 2" port may be split into two 1" ports, giving you a total of four 1" supply and four 1" return ports that may be used in any combination.

Each heat loop has a supply out of the furnace, and each has a return in to the furnace. On the inside of the water jacket is a vertical divider plate (Fig. 1). The returns are located on the right-hand side of this flow divider and the supply ports are on the left. With the divider to the left the returning water has no choice but to flow in a counterclockwise direction around the water chamber of the furnace. After making a complete circle around the entire fire box the heated water exits the furnace through one of the 2" supply ports. Examples of the plumbing and water flow are shown in the pictures below.

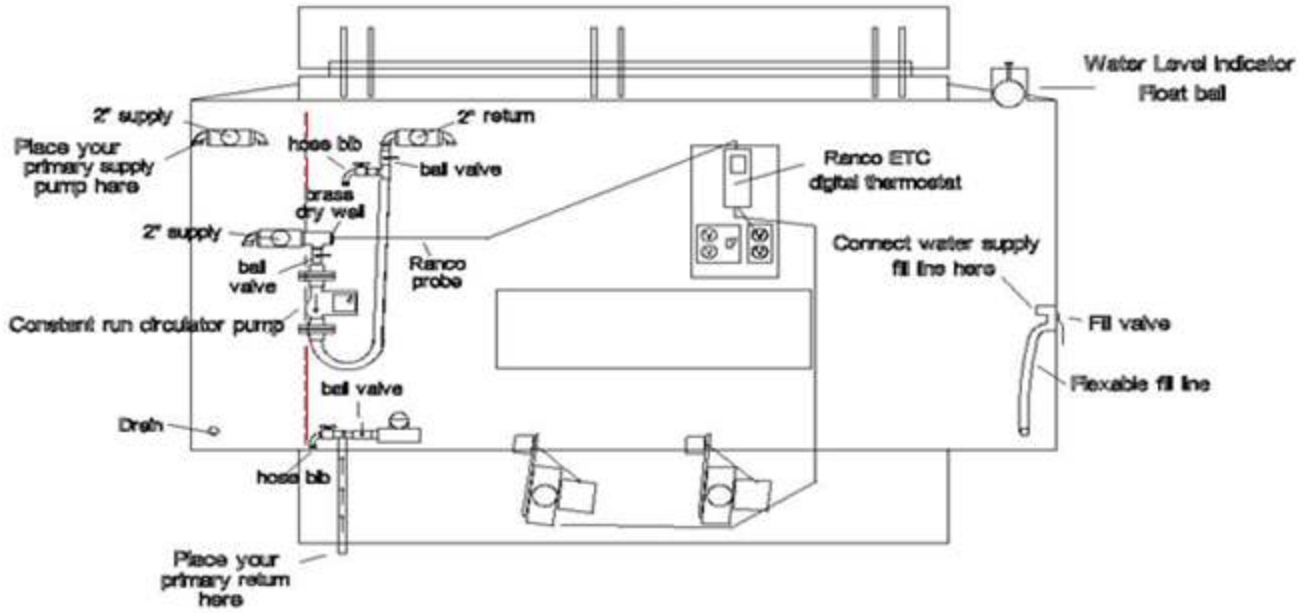
TL - WT furnace down view of the lower section



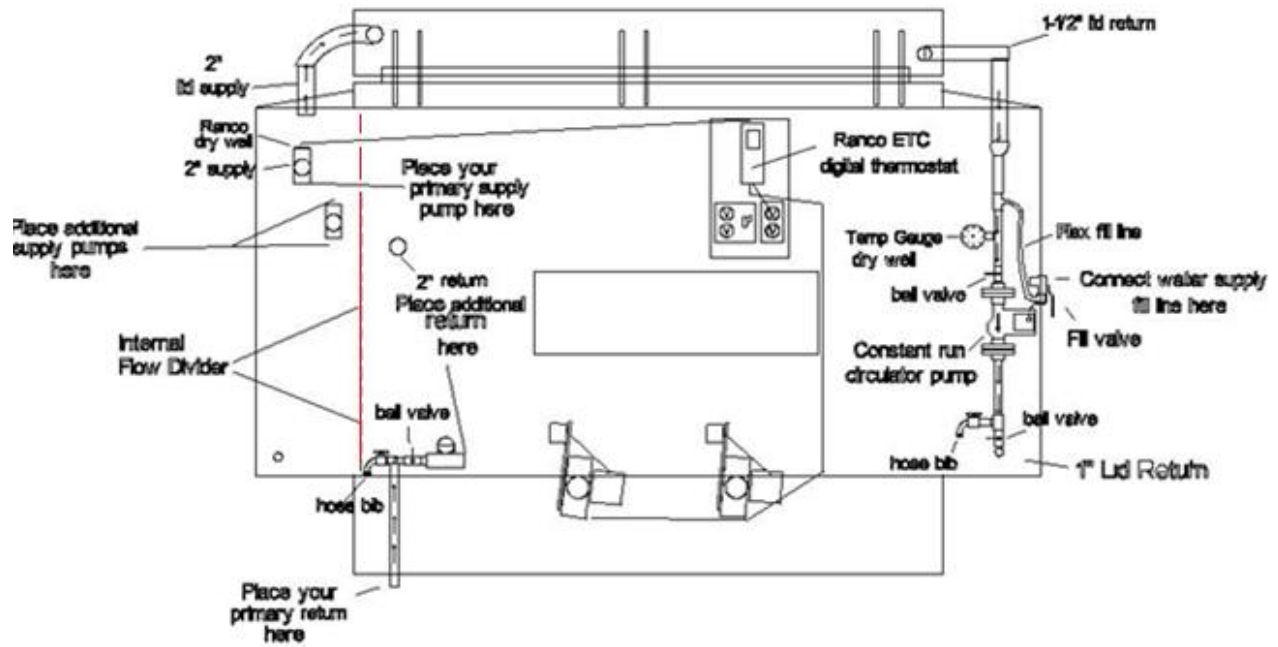
TL - WTC furnace down view of the lower section



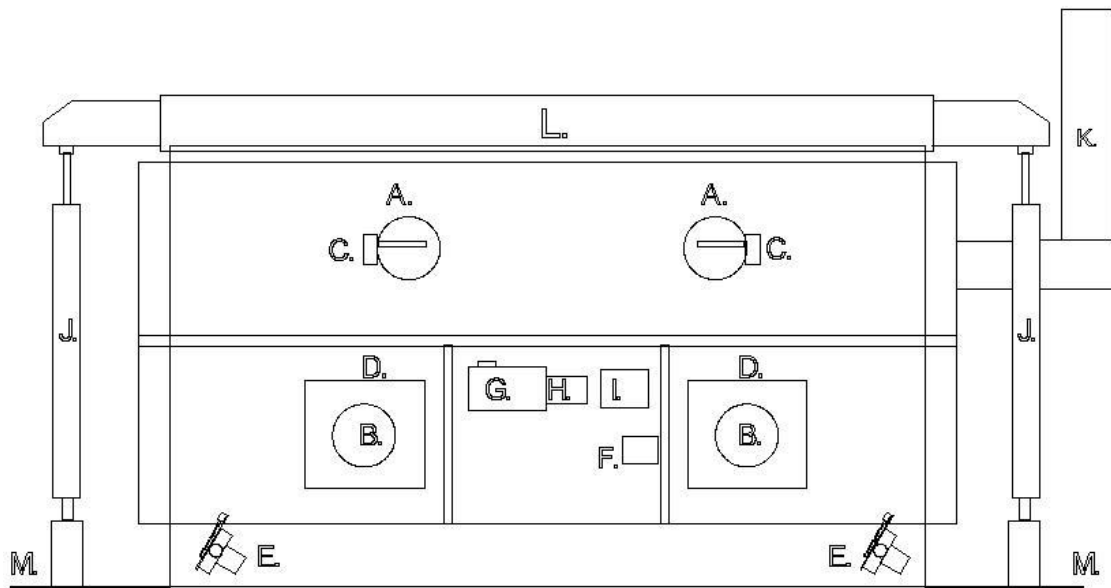
TL WT Back View



TL WTC Back View



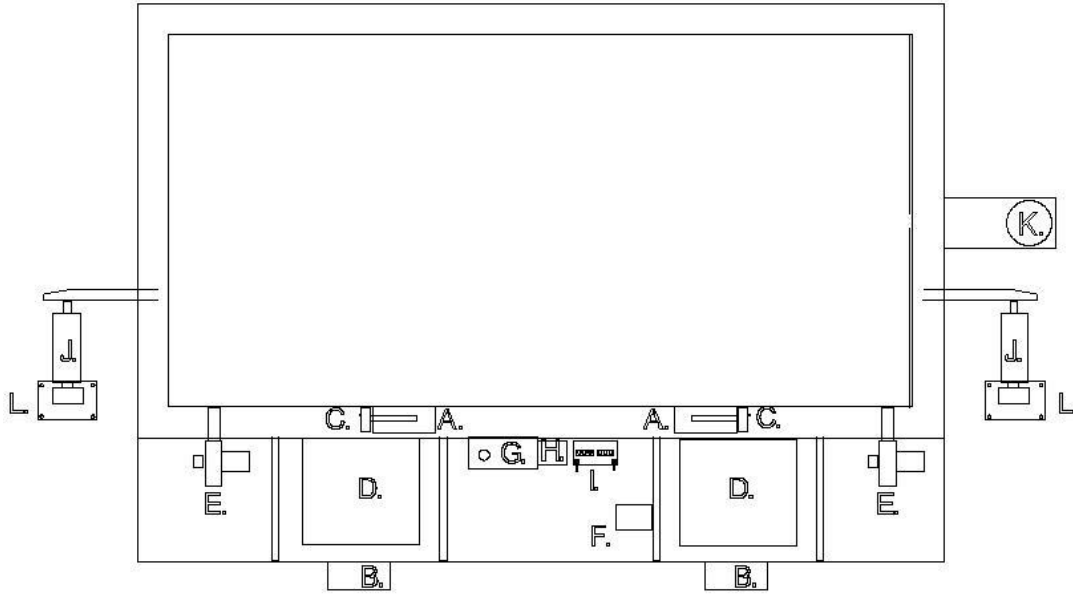
**Description of Components
of Forced Air Furnaces**



TLFA Component List

Rear View

- A. 12" Supply Ducts
- B. 12" Return Ducts
- C. Honeywell Fan and Limit Control L4064B2210 Grainger #2E820
- D. Dayton #7HL64 Transfer Blowers
- E. Dayton #5NRC5 Combustion Blower
- F. White Rogers #2E852 Fan Control Center
- G. Hydraulic Fluid Reservoir
- H. 12-volt (KTI) Power Unit DC 45046 RA
- I. 12-volt Battery
- J. Hydraulic Rams
- K. 10" Exhaust Flue
- L. Top Lid
- M. Concrete Mounting Plates



TLFA Component List

Top View

- A. 12" Supply Ducts
- B. 12" Return Ducts
- C. Honeywell Fan and Limit Control L4064B2210 Grainger #2E820
- D. Dayton #7HL64 Transfer Blowers
- E. Dayton #5NRC5 Combustion Blower
- F. White Rogers #2E852 Fan Control Center
- G. Hydraulic Fluid Reservoir
- H. 12-volt (KTI) Power Unit DC 45046 RA
- I. 12-volt Battery
- J. Hydraulic Rams
- K. 10" Exhaust Flue
- L. Concrete Mounting Plates

Startup Procedure

Hydronic Furnaces

Fill your furnace up with water.

#1 Top Loader Furnace put in your temperature gauges per diagram.

#2 Put a shut off valve in line before each pump so if the pump goes out you can replace it without losing your chemicals.

#3 Put a shut off valve and a hose bib at the furnace for all pump returns.

#4 Make sure water circulates in furnace at approximately 45 minutes minimum.

#5 Get a water sample and send it into the chemical company to start your water treatment program for your warranty.

#6 Make sure pumps supplied to water to air heat exchangers have the right required gallon per minute per factory specs at the return at the furnace. If radiant floor systems ,make sure gallon per minute is correct at the return at the furnace.

#7 Make sure all pumps and Ranco thermostat is installed properly per local electrical codes and furnace ground rod.

#8 After everything hooked up double check GPM so furnace circulation at furnace circulates at approximately 45 minutes.

#9 Put Biomass in Start fire

Startup Procedure

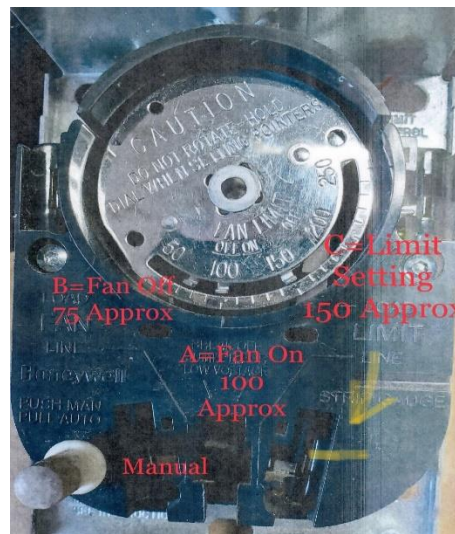
Forced Air Furnaces

Prior to connecting the supply and return ductwork or starting a fire in the furnace follow the steps below.

Setting the Fan and Limit Controller

This controller is a thermostat turning the big blower on and off based on your settings and the furnace interior temperature. These settings are represented as “Fan On” and “Fan Off” on the dial of the controller. It also acts as a temperature Limit switch. In this capacity it will cut power to the combustion blower of the furnace to prevent overheating as well as over consumption of wood. The setting for this is represented as “Limit” on the dial of the controller.

In normal operation a thermostat placed in the area to be heated turns the combustion blower of the furnace on when the house needs heat. This builds the temperature in the furnace up, and when it reaches the “Fan On” setting of the Fan Limit Controller the big blower will come on moving hot air to the house. When either the house reaches its desired temperature or the furnace reaches the temperature of the Limit setting on the controller, the combustion blower will shut off. The big blower will continue to run until the “Fan Off” temperature of the fan limit controller is reached. The 3 settings on the Fan Limit Controller need to be adjusted per install to maximize heat transfer and minimize wood consumption. A good beginning setting for the Fan Limit Controller is to set the Fan On to 100, the Fan Off to 75, and the Limit to 150 see below.



Once the fan and limit controller has been set it is time to start a fire to burn off any residue left over from manufacturing. This needs to be done before the duct work is connected so the fumes do not enter any enclosed space.

ATTENTION!!!

ATTENTION!!! Forced Air Furnace Owners Never shut off or cut power to the large blower (FLFA-1000, FLFA-2000, FLFA-3000) or blowers (FLFA-4000) while there is a fire in the furnace. These blowers must remain thermostatically controlled to protect themselves and other components from overheating. If the area supplied by the blower has reached its desired temperature the air must be directed to some other location. The large blowers not only move the heat from the furnace to the area being heated, but they are also temperature regulators for the furnace air chamber. As such they pull excess heat away from the furnace, protecting it and extending its service life. For example, our friend John Bob has purchased a FLFA – 4000 forced air furnaces from Hyprotherm to provide the heat for two wood kilns. John has attached his main kiln to one of the two sets of 12” ductwork supplied with his furnace, and he connected a smaller kiln to the remaining set of 12” supply and return. Setting the fan and limit controllers to the manufacturer’s suggested settings John lit a fire in his furnace. The furnace soon reaches the desired temperatures, and the fan and limit controllers turn on the large blowers moving the hot air from the air jacket of the furnace to the kilns. Some time later the smaller of the two kilns indicates the wood in it has been properly dried. The large kiln still has an hour or two before it will be done so the furnace will continue operating. The Hyprotherm FLFA-4000 is capable of operating or providing heat to two separate areas at the same time however, it is still one furnace with one fire box, one air chamber, one combustion blower. Although the smaller kiln no longer needs heat the furnace is still hot. If the blower attached to the small kiln was shut down and not allowed to move out the heat the furnace would overheat. This would likely melt or burn up all of the electronics at least on the side which had been shut off. Rather than shutting down the blower attached to the small kiln, a bypass has been added to the install ductwork. This allows the heat from the ducts of the small kiln to be redirected and added to the volume of the large kiln blower. If this is not wanted a bypass venting the heat from the small kilns duct straight into the air is the only other option.

Testing and recording water flow.

This test should be done when the furnace and heat exchanger are first installed so that you will know that the water flow is like in *your* system, for future reference.

IMPORTANT! Perform these Steps on a new furnace:

1. After the furnace is filled and each heat loop has been purged of air, close the ball valve, at the return. One such ball valve comes plumbed into the return from the lid on top loaders with water in the lid. Each heat loop should have this ball valve/hose bib combination added by the installer(as shown in the drawings above).

Connect a garden hose or washing machine hose to the hose bib at the return and put it in a 5-gallon bucket. Open the faucet style hose bib. Turn on the pump for that loop. If it runs on demand, you may have to turn on the furnace (raising the thermostat if necessary).

2. **Record the amount of time it takes to fill the 5-gallon bucket.** Ideal is 20 - 30 seconds or less. Write that figure down on the inside of the furnace with a permanent magic marker, near the valve for future reference. Turn off the valve.
3. Next, disconnect the Pex line at the pump output. Install a short piece of Pex Pipe or washing machine hose about 4-6 feet long and insert the pipe/hose into a bucket. Turn on the pump by turning on the furnace (raising the thermostat if necessary).
4. Record the amount of time it takes to fill the 5-gallon bucket. If it is 10 seconds, for example, write that figure down on the inside of the furnace, next to the pump for future reference. Turn the pump off.

The results can be used to check for proper pump sizing AND for futures diagnostics (comparing current figures with future figures), if things should change (heat output diminishes) down the road.

It is imperative that the water flow (gpm) is across each loop matches that required by the heat exchanger of that loop. This cannot be determined by simple feeling the pipe and knowing there is flow or by any other (simple) means except the above flow test. If the gallons per minute of a loop is less than that required by the heat exchanger in that loop the only alternative will be to raise the temperature of the water flowing through it. This will at the very least will cause a furnace to burn more wood than necessary and could easily turn into an overheat situation if the furnace is being asked to produce hotter and hotter water to compensate for poor water flow. Another example of this test is located on pages 24 and 25 at the end of this manual.

Maintenance

Clean out ash!! Moisture combined with ash will eat through a furnace in short order and is NOT covered under warranty. With our grate and ash pan, you can remove the ashes while the fire is still burning.

- **Creosote** – Formation and Need for Removal:

- When you burn pine and other soft woods, or when wood is burned slowly, it produces tar and other organic vapors. These vapors combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool flue (exposed to the outside air). As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire.

- Inspect the flue at least twice a year during the heating season to
- determine when a creosote buildup has occurred. Sometimes, you need to check it weekly!

- If creosote has accumulated, it needs to be removed to reduce the risk of a chimney fire. **Your fire may not even burn if the flue pipe becomes clogged up!** 5" chimney brushes are available on Amazon, or eBay.

- **Door Seals**

- Periodically, during the heating season, check the sealing of the silicone seal. The silicone seal withstands high heat and molds itself to the shape of the door, providing an excellent seal that won't deteriorate like a rope seal.

END OF SEASON:

- Power: Turn off power supply at the appropriate circuit breaker
- Chimney: Clean and inspect chimney! 5" chimney brushes are available on Amazon or search Google.com. Use the chimney cap to keep rainwater out.
- Firebox & Ash trough: **Remove ashes**, soot, and hardened deposits from the fire chamber by using putty knife or wire brush. Coat inside of firebox with a light coat of motor oil to protect steel during the off-season.
- Doors: Oil door hinges and latch.
- Plumbing: Ensure fittings on both ends of tubing are tight AND at all locations.

DO NOT DRAIN WATER FROM FURNACE!

Moisture from rain or condensation must not be allowed to accumulate in the firebox or ash pan during the off-season. Failure to perform preventive maintenance may result in corrosion damaging the boiler resulting in possible severe property damage. This damage is NOT covered under warranty!

Hyprotherm Home & Commercial Wood and Coal Furnace Warranty

20 Year Limited Warranty

Hyprotherm, LLC of Salem Arkansas, 72576, herein known as Hyprotherm, warrants material and labor on any defects in workmanship on the fire box for a period of 20 years from the purchase date to the original owner only (see proration below) and on the water jacket for a period of 10 years from the purchase date to the original owner only (see proration below). If there is a leak in your properly delivered, installed and maintained commercial boiler, we will cover repair costs for the first 5 years and prorated after that (see below). Repair under warranty may be denied if the unit's water jacket has exceeded 220 degrees. The thermostat must be set so the water jacket temperature never falls below 150F otherwise condensation may form on the inside of the firebox and will cause corrosion that is not covered under warranty.

This warranty is limited to defective parts and excludes any incidental and consequential damages connected therewith. Hyprotherm does not warranty damage or malfunction to any interior portion of the boiler caused by ash corrosion or allowing the unit to overheat. All interior portions (especially corners) must have the ash stirred daily to prevent caking and be completely cleaned out of all ashes and creosote a minimum of 2 times per year, halfway through the heating season and at the end of heating season. The chimney must be covered or have a rain cap must be installed when the boiler is not in use. Caulk around chimney and potable lid must be inspected frequently and re-sealed if necessary. Caulk sealant and rope gaskets are not covered under this warranty. Damage caused by abuse, neglect, accidents, improper installation, customer or dealer modification, overheating and/or freezing will not be covered under warranty. Damage caused by burning flammable materials (i.e., petroleum products), wet (green) wood or anything other than dry coal or dry, seasoned cordwood will not be covered under warranty. Hyprotherm does not warranty boilers against environmental conditions out of its control. Hyprotherm does not warranty or guarantee against your area's governing laws or changes in your area's governing laws that will affect the use or non-use of the unit.

Hyprotherm is not responsible for replacement of water, water treatment, antifreeze and glycol, costs of transportation or shipping charges. On sight non-warranty parts and labor will be provided at the discretion of your dealer. Please contact your dealer for their current non-warranty rates. Labor is not covered for repairing or replacing electrical or other components not a part of the welded assembly that is under warranty.

Hyprotherm home and commercial coal and wood furnaces are not meant to be your sole source of heat. It is the responsibility of the owner to have a backup system in place. If you do not have a backup source of heat you are at risk of damage due to lack of heat. Hyprotherm will not warranty or be responsible for any damage caused by lack of heat at your premises or for any cost incurred from using a backup heat system in the event of a boiler failure.

There is no written or implied performance warranty on the boiler as Hyprotherm has no control over the installation, structure insulation, maintenance, daily operation and heating demand on a unit or what is burned in the boiler. Hyprotherm will not be held responsible for the cost of wood or coal burned in excess of what is expected or considered normal as installation, fuel being used, structure size and insulation conditions are out of its control.

Treatment & Testing

Your furnace must have an approved by Hyprotherm “water treatment” added during initial filling with water, antifreeze or glycol and a water sample must be submitted for nitrite testing when first filled and then annually at the end of a heating season to ensure proper nitrite concentration (1,000-1,500ppm) for your warranty to remain valid. The water jacket must remain full of properly treated water at all times, except when draining, flushing and re-treating. Minimum recommended initial mix ratios are dependent upon the size commercial boiler and the different properties of the water to be used in filling it. An official approved nitrite test must still be performed after treating by sending in a sample. Water in all areas is different and initial treatment may not be sufficient. **Contact image supply, inc. to obtain water treatment kit. You must have your water tested for nitrite levels, conductivity and pH acidity by image supply, inc.** Always request results to be sent to you and you must keep them on file to show proof of treatment and testing if warranty work is ever needed. **Testing done by anyone other than image supply, inc. will not be accepted for warranty claims.** Monitoring treatment levels by **image supply, inc. has proven to increase the life of the furnace/boiler if their treatment program is followed. Water levels must be monitored to get the maximum life out of a Hyprotherm home and commercial coal and wood furnace particularly if water is being added throughout a heating season (this is a result of improper operation or installation).** Treatment and nitrite test kits are available from **image supply, inc.** Drain, flush, re-fill and re-treat if water is ever not crystal clear.

image supply, inc. Is the only recognized and approved Water Testing Facility and distributor of Water Treatment Chemicals for Hyprotherm Hydronic Furnaces. Please contact them for directions on how to proceed with your water tests. Their contact info is below:
(910) 738-1166 Office (800) 672-8251

**5081 Dawn Dr, Lumberton
28360**

North Carolina

Hyprotherm Warranty Pro-ration:

Hyprotherm will pay costs of warranty work based on the following pro-ration:

Fire Box: Years 1 – 5: 100%, Year 6 – 90%, Year 7 – 80%, Year 8 – 70%, Year 9 – 60%, Year 10 – 50%, Year 11 – 40%, Year's 12 – 14: 30%, Years 15-20: 20%

Water Jacket: Years 1 – 5: 100% Year 6 – 80%, Year 7- 60%, Year 8 – 40%, Year 9 – 20%, Year 10 – 10%

1 Year Warranty on Other Components

Hyprotherm warranties, to the original owner only, any component or part of the boiler that is defective during normal usage for a period of 1 year from customer's date of delivery. Shipping for returning defective parts is not included. Replacement/repaired parts are obtained from the dealer purchase was made through. Labor is not covered for repairing or replacing components that is under warranty. After one year, your dealer may charge you for any parts provided. **No warranty parts will be provided without first returning the defective part.** Replacement/repaired parts carry a 90-day warranty or the fulfillment of the 1-year warranty period, whichever comes later. Pump failure due to water quality issues or not bleeding the air out from the bearings before startup are not covered under warranty. Proof of treatment and testing is required for pump warranty.

Warranty Procedure

All claims under this warranty must be made through Hyprotherm regardless of where it was purchased. If by inspection or photo observations Hyprotherm indicates that a warranty claim is justified and that all conditions of this warranty have been met, Hyprotherm will repair or replace the problem part according to the above proration. Proof of purchase, treatment and testing records and return of the defective part (if applicable) must be provided by the owner of the boiler before any warranty is given. All costs of removal, shipment to and from the dealer or Hyprotherm and losses during shipment and reinstallation and any other losses due to the stove being removed shall be covered by the owner of the boiler. Please contact Hyprotherm via email to proceed:

office@hillbillytrailers.com

Hyprotherm Water Treatment Program New Furnace Purchase **MANDATORY INSTRUCTION SHEET**

Contents: Instruction Sheet
2-, 4-, 8- or 12-Gallons Control Water Treatment depending on kit and Furnace size
5 Shipping Boxes
5 Sample Bottles with lids
Shipping Labels

Program by image supply, inc. for Hyprotherm Mfg, LLC.

Getting Started

You are the Caretaker of your Furnace. It is YOUR responsibility to keep Chemicals at an acceptable range maintaining a Nitrite level of at least 1000ppm and a maximum of 4000ppm, a PH no less than 8 and Conductivity of less than 10 micromhos AT ALL TIMES to prevent loss of your Warranty coverage.

Instructions

1. Flush your system with fresh water to remove any debris from shipping or storage. Adding a degreaser to aid the process is highly recommended. Debris that remains following a flush (ex. weld slag, etc.) will be a corrosion hotspot and must be removed. All interior water jacket surfaces must be uniformly smooth and free of all “gunk” which will block the necessary interaction of the chemical with the direct metal surface. A dirty or irregular interior water jacket surface will promote failures.
2. Following complete flush and rinse of system in step #1 fill the system with clean water. Filtering of the water is highly recommended. As you are filling your furnaces with water add **Control Water Treatment** per instructions. When it becomes possible turn your circulator pump on.
3. Add Control per chart below immediately after filling the system.

One gallon: FLRH – 85, FLRH – 100, FLRH – 185, TL-633-WT6/6, TL-633-WTC6/6
TL-734-WT6/6

Two gallons: FLRH – 265, FLRH – 300 FLRH – 350, FLRH – 400, TL-433 WT12/12, TL-446-WT6/6,
TL-454-WT6/6, TL-454-WTC6/6, TL-534-WT6/6, TL-534-WTC6/6, TL-553-WT6/6,
TL-634-WTC6/6, TL-634-WT6/6 TL-744-WT6/6, TL-844-WT 6/6, TL-854-WT6/6 TL-1044-WT6/6,
TL-1054-WT6/6

Three gallons: TL-454-WT12/12, TL-534-WT12/12, TL-553-WTC6/6, TL-553-WT 12/12, TL-553-WTC 12/12,
TL-555-WT6/6, TL-555-WTC6/6, TL-556-WT6/6, TL-556-WTC6/6, TL-633-WT12/12
TL-633-WTC12/12, TL-634-WT12/12, TL-644-WT6/6, TL-644-WTC6/6, TL-1350WT6/6,
TL-844-WTC 6/6, TL-854-WTC6/6, TL-934-WT6/6, TL-934-WTC6/6, TL-944-WT6/6,
TL-944-WTC6/6, TL-955-WT6/6, TL-1044-WTC6/6, TL-1056-WT6/6,
TL-433-WTC12/12, TL-446-WT10/10, TL-446-WTC6/6

Four gallons: TL-446-WTC10/10, TL-454-WTC12/12, TL-534-WTC12/12,
TL-634-WTC12/12, TL-644-WT12/12, TL-644-WTC12/12, TL-1350-WTC6/6,
TL-844-WT12/12, TL-854-WT12/12, TL-934-WT12/12 TL-1046-WTC6/6, TL-1054-WTC6/6
TL-1055-WTC6/6, TL-1256-WT6/6, TL-1456-WT6/6,

Five gallons: TL-555-WT12/12, TL-555-WTC12/12, TL-556-WT12/12, TL-1350-WT12/6
TL-844-WTC12/12, TL-854-WTC12/12, TL-934-WTC12/12, TL-944-WT12/12,
TL-944-WTC12/12, TL-955-WTC6/6, TL-1044-WT12/12, TL-1054-WT12/12,
TL-1056-WTC6/6, TL-1065-WTC6/6, TL-1256-WTC6/6

Six gallons: TL-556-WTC12/12, TL-1350-WTC12/6
TL-955-WT12/12, TL-1044-WTC12/12, TL-1054-WTC12/12, TL-1055-WT12/12,
TL-1456-WTC6/6

Seven gallons: TL-955-WTC12/12, TL-1046-WTC12/12, TL-1055-WTC12/12,
TL-1056-WT12/12

Eight gallons: TL-955-WTC14/12, TL-955-WT14/12, TL-1056-WTC12/12, TL-1256-WT12/12,

Nine gallons: TL-1456-WT12/12

Ten gallons: TL-1256-WTC12/12, TL-1456-WTC12/12

4. Take a **sample bottle** and fill it with treated water from your furnaces. Take the **sample bottle and shipping label** out and cut along the dotted line. Fill out the furnace information label completely and attach to the **sample bottle**.
- 5 Make a shipping box from the **flat cardboard shipping box** and insert the **sample bottle**. Attach the **Self Addressed shipping label** over the fold to seal the box.
- 6 Mail by your favorite source UPS, USPS or FedEx.

NOTE: THE AMOUNT OF TREATMENT NEEDED WILL BE DEPENDENT ON HOW MUCH WATER YOU NEED TO ADD TO YOUR SYSTEM DURING THE COURSE OF OPERATION.

*****FREQUENT AND EXCESSIVE WATER ADDITIONS require FREQUENT CHEMICAL ADDITIONS!!**

THE LEAST EVAPORATION THE BETTER, THIS CANNOT BE STRESSED ENOUGH!!!

Keep system filled with treated water per above specifications always even in seasons when your stove is shut down and not being used for heating.

Retention of all records and copies of analysis reports is the sole responsibility of the stove owner alone.

For testing help or to reorder chemicals call your parts dealer or image supply, inc. at 800-672-8251

Please fill in the following information and mail this copy by mail to:

Hillbilly Manufacturing LLC, POB 156, Salem, AR 72576

Your name and address:

Phone number(s): _____

HyProTherm Model:

Date of Purchase:

 /

 /

Serial Number: (Only applicable only if financed)

Date of Installation and who installed (Proper self-installation, following the instructions. will not void the warranty):

Dealer Purchased from (if purchased from the factory, put Hillbilly Manufacturing LLC):

Dealer Address:

Dealer Phone Number: _____

Please keep this manual with all other important papers. The information in this manual is necessary for the installation, operation, and proper use of this furnace. If you should ever have a problem or question, please refer to this manual or have it available when you call your HyProTherm dealer or Hillbilly Manufacturing LLC Phone: **800-780-4302**

Gallon Per Minute Test



Plumb a garden hose bib (spigot), and a gate valve into the return line of each heat loop. To check the gpm flowing thru each loop.

1. shut off the supply pump of loop being tested.
2. close gate valve at furnace
3. connect short hose to hose bib at furnace and place other in five-gallon bucket.
4. Turn on pump and record amount of time it takes to fill bucket and compare time to figures below. This will give you the approximate gallons per minute that is flowing thru the loop being tested. Record this number.

10 sec to fill bucket = 30 gpm

12 sec to fill bucket = 25 gpm

14 sec to fill bucket = 21.42 gpm

16 sec to fill bucket = 18.75 gpm

18 sec to fill bucket = 16.67 gpm

20 sec to fill bucket = 15 gpm

22 sec to fill bucket = 13.63 gpm

24 sec to fill bucket = 12.49 gpm

26 sec to fill bucket = 11.53 gpm

28 sec to fill bucket = 10.71 gpm

30 sec to fill bucket = 9.99 gpm

35 sec to fill bucket = 8.57 gpm

40 sec to fill bucket = 7.5 gpm

5. Check the documentation of the heat exchanger being supplied for its gallon per minute requirement.
6. Compare the required gpm of step #5 to the actual gpm flow found in step #4