

**INSTALLATION AND
OPERATING INSTRUCTIONS
FOR**

**THE HYPROTHERM
FRONT LOADING
FORCED AIR
FURNACE**

**Manufactured by
Hillbilly Manufacturing LLC
Salem, Arkansas 72576**

INTRODUCTION

Thank-You and congratulations on the purchase of your new Furnace.HyProTherm, Front Loading, Forced Air, (Coal or Wood) Outdoor Furnace. With the purchase of this HyProTherm Furnace, you can now appreciate the high degree of craftsmanship and reliability that are a result of every furnace being carefully hand-built.

Your choice shows the recognition you have for high quality products.

You are now a member of the large international family of HyProTherm customers, who have enjoyed the elegance, efficiency and reliability of our furnaces for many years.

The HyProTherm Furnace was the first and is the leader in the Outside Wood Burning Furnace field. We sell furnaces as far away as Canada, the UK, Ireland, the Ukraine and Spain!

We deem it important to provide you with this user's and maintenance manual: to allow you to use your equipment under the best possible conditions and in the most optimal manner, and furthermore to increase its operating life. **We strongly advise you to read it twice, carefully and keep it handy.**

Again, **Thank-You** for purchasing the original HyProTherm Outdoor Wood Burning Furnace

If you have any questions about this manual, please contact Wood Heating Solutions at (800) 780-4302

THIS MANUAL INCLUDES IMPORTANT SAFETY INFORMATION.

Hillbilly Manufacturing LLC
1148 Hwy 62 West
Salem, Arkansas 72576

We are always here to help!

“When in Doubt – Make it Stout”

Prior to connecting the duct work to the furnace it is important to start a fire and bring the furnace up to its operating temperature. Run the furnace for 3 – 4 hours at temperature to burn off any residue left over from the manufacturing process.

Specifications

Type of fuel – Wood only
For outdoor use only
Electrical Rating 115 VAC/ 60 HZ / 1PH
30 AMP Breaker for FLFA-4000
20 AMP Breaker for FLFA-1000 - 3000

Clearance to Combustibles

Top, Rear, Sides: 5 feet
Chimney Connector: 18"
Always use a double or triple-wall pipe when going through any kind of roof with at least 6" to 2 feet of clearance from any combustibles (depending on the type of flu pipe). Check with the manufacturer for their recommendations! We suggest using Metalbestos® stove pipe for the flue, which is insulated to prevent fires (available at ACE Hardware).
Front: 10 feet, with the door facing away from the structure.
Flooring: Non-Combustible

FURNACE DIMENSIONS

HyProTherm FLFA -1,000
Heats; up to 3,500 sq ft.
62"L x 46"W x 87"H
1,720 lb shipping weight

HyProTherm FLFA -2,000
Heats; up to 5,500 sq ft.
76"L x 46"W x 87"H
2,220 lb shipping weight

HyProTherm FLFA -3,000
Heats; up to 6,875 sq ft.
89"L x 46"W x 87"H
2,340 lb shipping weight

HyProTherm FLFA -4,000
Heats; up to 8,500 sq ft.
78"L x 85"W x 87"H
3,380 lb shipping weight

Specifications subject to change at any time.



SAFETY PRECAUTIONS WARNING



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.

For furnaces covered by this instruction book, it is important to observe safety precautions to protect yourself from possible injury. Among the many considerations, you are advised to:

- Observe all safety stickers on the furnace.
- **This furnace must be wired by a qualified electrician in accordance with local and/or National Electrical Codes.**
- 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 FIREPLACE WHEN IT IS IN USE.
- Keep antifreeze, which is flammable, well away from the furnace.
- The use of treated wood (painted, treated, etc.) driftwood and any other salvaged material that can emit noxious gases for the environment and is corrosive towards the components of the appliance is NOT ALLOWED and eliminates the rights of guarantee.
- DO NOT BURN GARBAGE, HOUSEHOLD WASTE, STRAW, HAY OR YARD WASTE. In most areas this is illegal. The furnace is designed to burn seasoned cordwood and coal. Burning other materials can reduce the life of the furnace and will void your warranty.
- **Open Loading door – pausing momentarily between the first latch and the safety latch to allow any combustion gases to burn off.**
- DO NOT OPERATE THE FURNACE WITH THE DOOR OR ASH RECEPTACLE DOOR OPEN. Always latch the doors securely. If the ash door open for any extended period of time, other than for cleaning - it will cause over-firing of the furnace.
- Always use proper care when installing, operating and maintaining the furnace.
- **Always wear protective gloves and glasses and be aware that hanging and loose clothing can catch fire!** The fire's heat can burn your eyes!
- Do not modify the furnace. Do not substitute repairs that can be provided by your dealer, distributor, or Manufacturing Company (Weld Rite, Inc).
- Failure to heed these warning or any additional warnings on the furnace may result in an accident causing personal injury and damage.



CALL BEFORE YOU DIG THAT TRENCH!



Disposal of ashes

OPEN THE ASH 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-COMBUSTIBLE FLOOR OR ON THE GROUND. ALL COMBUSTIBLE MATERIALS SHOULD BE DISPOSED OF BY BURIAL IN SOIL OR OTHERWISE DISPERSED, THEY SHOULD BE RETAINED IN THE CLOSED CONTAINER UNTIL ALL CINDERS HAVE THOROUGHLY COOLED.

All installation and operation must follow Federal, Provincial, State and Local Codes

Lifetime Limited Warranty

5 Year 100% On-Site Warranty!

plus a Lifetime and 30 Year Warranty on roof and siding!

We have a 5-YEAR ON-SITE warranty against leaks on the furnace - NOT prorated.

Plus we have a 15-YEAR ON-SITE warranty against leaks on the furnace - Parts AND Labor.

Electrical components such as the fan, thermostat and pump and the door and grates have a one-year manufacturer's warranty (labor is not covered).

We don't have you ship the furnace back to us, like some other companies demand.

We send a local professional repairman out to your furnace, and it's repaired on the spot, if it ever leaks!

Years 6-20 are prorated as follows. We pay the following percentage or credit*:

Year 6 - 90%
Year 7 - 80%
Year 8 - 70%
Year 9 - 60%
Year 10 - 50%
Year 11 - 40%
Year 12 - 14 - 30%
Year 15 - 20 - 20%
Year 21 to forever - 10%

* We will give you the percentage discount on the repair or off a replacement boiler. Furnace will be repaired or replaced, whichever is less expensive.

Shipping not included.

No cash or surrender value.

The cost of the service call is not covered after 5 years.

The life of your furnace depends upon proper maintenance. With proper maintenance your furnace can give you 25 - 30 plus years of dependable service. We have many that are 25 years old and they're being built even better now!

WARRANTY CONTINUED

We have Hillbilly Furnaces in service that are over 30 years old, with wood siding (we used to make them that way) and they're still going strong!

Exclusions

1. Disasters, breakdown or faulty operation linked to:

- inadequate relation between the nominal power of the equipment and the heat requirements of the premises;
- a faulty installation or faulty connections;
- damage to the thermostat through overheating due to intensive use:
 - the ash box door is left open;
 - When the ventilation convection fan is left off with high fires.
- **Failure to clean out ash!! Moisture combined with ash will eat through a furnace in short order and is NOT covered under warranty**
- an insufficient or excessive draft;
- incorrect use;
- burning non-compatible fuels, destructive and/or damp fuels (treated wood, hay, straw etc...);
 - burning other than non-treated, non-painted wood or coal; **Damage caused from burning unprocessed coal or overloading it, is not covered under the warranty.**
- consumption exceeding the use limits;
- a lack of maintenance.
- any modification, transformation inside the appliance;
- transport and installation.

2. Transport and packaging cost.

3. All costs not previously accepted by Hillbilly Manufacturing LLC

4. Costs and deterioration due to the non-use of the equipment.

5. The cost of any incidentals or consequential damage.

6. Warped Grates or door. Grates and doors always warp over time due to high heat.

7. The guarantee starts on the date of delivery. The invoice showing the delivery date is the only document valid for the guarantee.

All warnings in this manual on Page 5 and Pages 8-10 and elsewhere and all maintenance items on Page 42, constitute part of this warranty.

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:

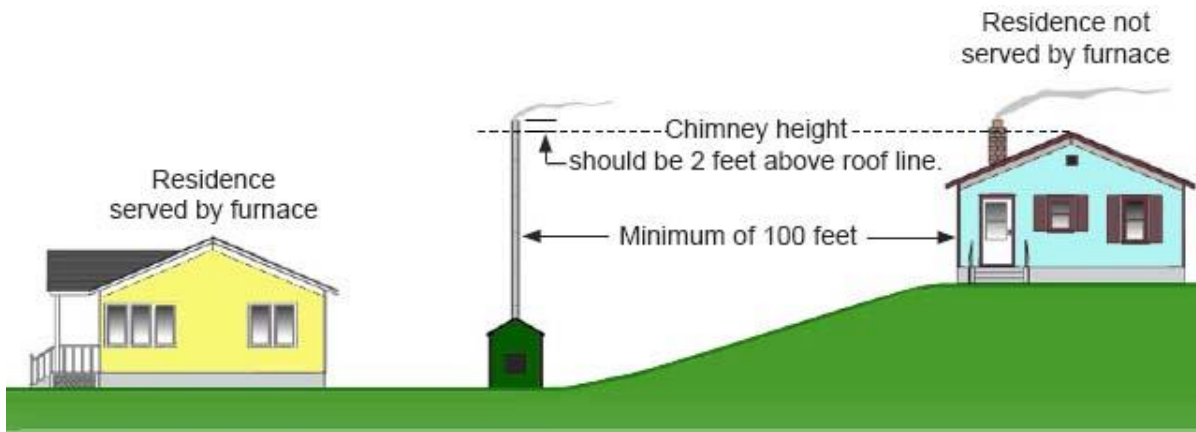
Dealer Phone Number: _____

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

A duplicate for mailing is at the end of this manual. Retain this completed copy for your records.

OUTDOOR FURNACE BEST BURN PRACTICES

1. Read and follow all operating instructions supplied by the manufacturer.
 2. FUEL USED: You may burn any hardwood (or softwood), as well as pallets that have been split up and coal but NEVER burn driftwood, painted, stained or pressure or/and chemically treated wood. Never use the following: trash, plastics, gasoline, rubber, naphtha, household garbage, material treated with petroleum products (particle board, railroad ties and pressure treated wood), leaves, paper products, and cardboard. If you burn softwood, the wood will burn faster and you will have to clean the creosote and chimney more often.
 3. LOADING FUEL: For a more efficient burn, always add wood before the wood has burned out. Most often it can be loaded in the morning and at night.. See next page.
 4. STARTERS: Do not use lighter fluids, naphtha, gasoline, or chemicals.
 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 5.5" Stovepipe. You can get downdrafts if the furnace is too close to a building. See Page 13 for additional information.
- 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 our chimney adaptor (optional) or 5.5" stove pipe, to any height necessary, with zero adverse affect on performance. In fact, it may even draft better. Always use at least a double-wall pipe when going through any kind of roof! The chimney should extend at least 2 feet higher than any portion of a building within a horizontal distance of 10 feet. You can get downdrafts if the furnace is too close to a building.

6. Always remember to comply with all applicable federal, state and local codes and laws.

Wood Recommendations

Burn only cordwood that has been seasoned for 12-18 months. Burning unseasoned wood is wasteful and inefficient, using much of the combustion energy to boil off the excess moisture. It also puts a lot of moisture into the ash “pan” which makes it corrosive. The wood *can* be split to aid in seasoning if it’s real wet and should be approx. 25% moisture content by weight. **However, whole rounds burn longer and are cheaper but will have to be dried longer.**

The following are general guidelines for wood selection:

- Hardwoods burn better than softwoods (mix them if you need to burn softwood).
- Larger pieces (whole rounds) are best and burn better and longer than small pieces.
- 25% moisture content is optimum. Drier is ALWAYS better!

Higher moisture content wastes energy boiling off water. Wood with a lot of moisture can cause more smoke than the chimney can dispose of. It also puts a lot of moisture into the ash “pan”, which makes an extremely corrosive mixture. **Ash corrosion is NOT covered by the warranty.**

Lower moisture content (very dry, old wood) burns rapidly and inefficiently.

THE HYPROTHERM OUTDOOR WOODBURNING FURNACE

How does an outdoor 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, and 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 back up. 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 **SOME STATES HAVE THEIR OWN LAWS!**

The outdoor furnace should be located at least 10 feet from your home (according to most insurance companies), with the door facing away from the house, so that all fire danger is removed from your home. We recommend 30 feet or more. The furnace may be installed as much as 30 feet away from your indoor furnace. The chimney should extend at least 2 feet higher than any portion of a building within a horizontal distance of 100 feet but MAY need to extend to your roof ridge line.

The furnace should be installed on a 4" thick concrete pad or you can use solid concrete pavers.

- A) It is recommended that the furnace be located with due consideration to any neighboring residences and to the prevailing wind direction.
- B) Do not locate an Outdoor Wood Burning Appliance within 100 ft of a residence not served by the furnace. **Follow local and state laws concerning setbacks.** Please be considerate of neighboring residences, properties, parks, etc.
- C) Review the recommended stack heights on page 9.
- D) Do not locate near any combustible materials, gasoline or other flammable liquids or gases.
- E) Locate away from dry grassy areas, dry leaves, brush and trees.
- F) Place far enough away from any building to minimize fire danger.
- G) Check with your insurance company and local codes or ordinances.

- H) Do not install in an area where nearby structures or trees might cause downdrafts or fires.
- I) Typically, Outdoor Wood Burning Force Air Furnaces are located 5 - 20 ft down wind from the served structure.
- J) Locate the furnace 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.
- L) The furnace requires 115 V, 30 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.

CONCRETE PAD: The concrete pad should have a $\frac{3}{4}$ " PVC pipe placed through the concrete to run the power supply and thermostat wire (see below image). The furnace should be installed on the concrete pad with the rear of the furnace 2-3 inches from end of the pad, so that the pipe comes up in the space provided under the back access door.

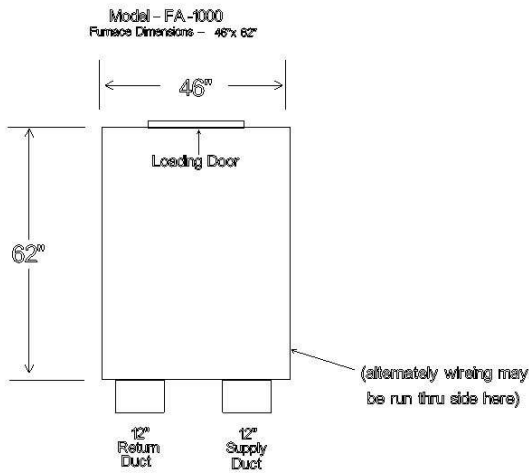
We recommend the pad to be an add extra 48" in length to allow ample concrete in front of the furnace to stand, for loading wood and removing ashes.

HyProTherm FLFA -1000 - 46" x 62" Suggested pad size 58" x 68"
Alternate Extra Loading Deck (58" x 86")

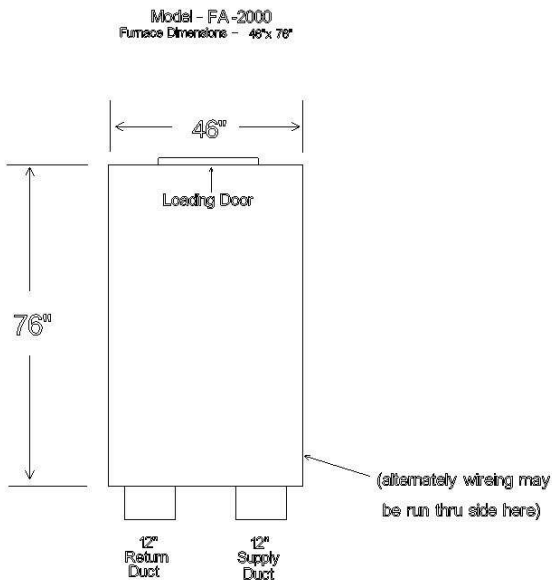
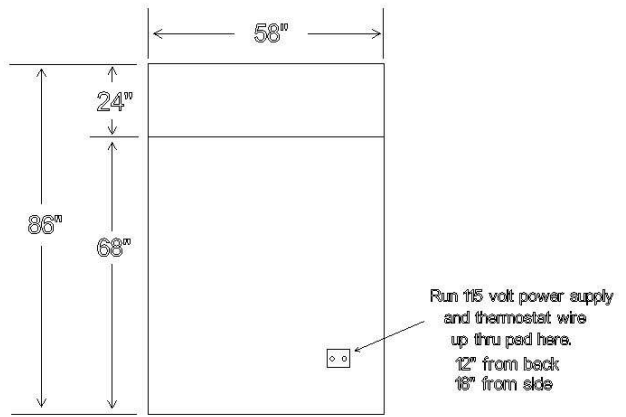
HyProTherm FLFA - 2000 - 46" x 76" Suggested pad size 58" x 82"
Alternate Extra Loading Deck (58" x 86")

HyProTherm FLFA - 3000 - 46" x 89" Suggested pad size 58" x 96"
Alternate Extra Loading Deck (58" x 113")

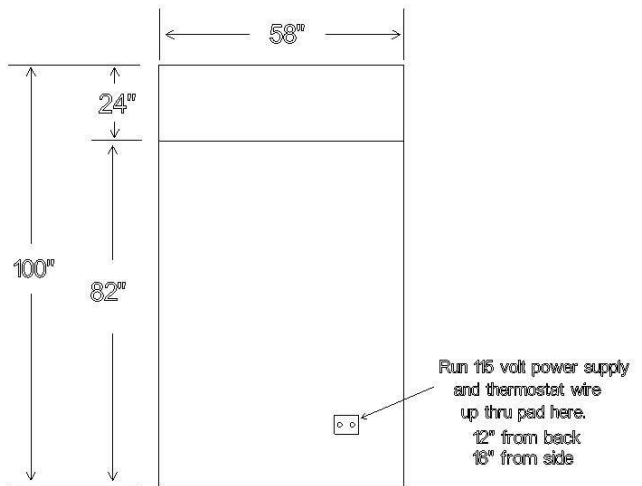
HyProTherm FLFA - 4000 - 85" x 78" Suggested pad size 97" x 84"
Alternate Extra Loading Decks (132" x 84")



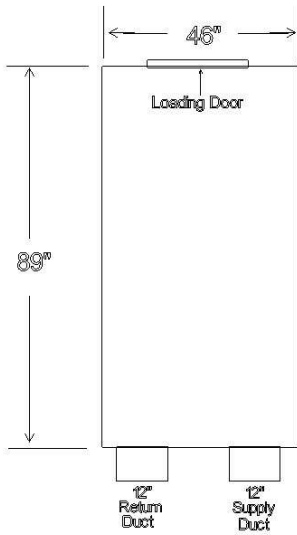
Model - FA-1000
Pad Dimensions - 58" x 86" Concrete Pad has 6" shoulder on both sides and front
Alternate Pad Dimensions - 58" x 88" Alternate Pad size has 24" shoulder by Loading Door



Model - FA-2000
Pad Dimensions - 58" x 100" Concrete Pad has 6" shoulder on both sides and front
Alternate Pad Dimensions - 58" x 107" Alternate Pad size has 24" shoulder by Loading Door



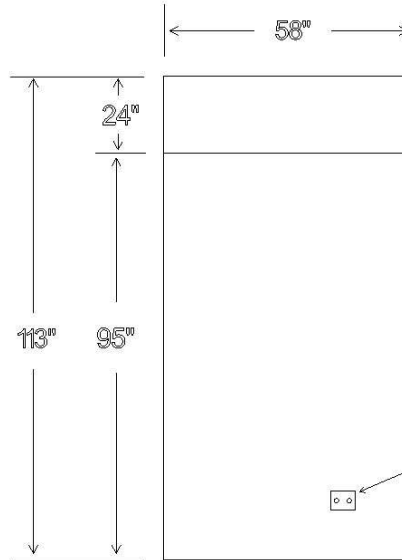
Model - FA -3000
Furnace Dimensions - 46" x 89"



(alternately wiring may be run thru side here)

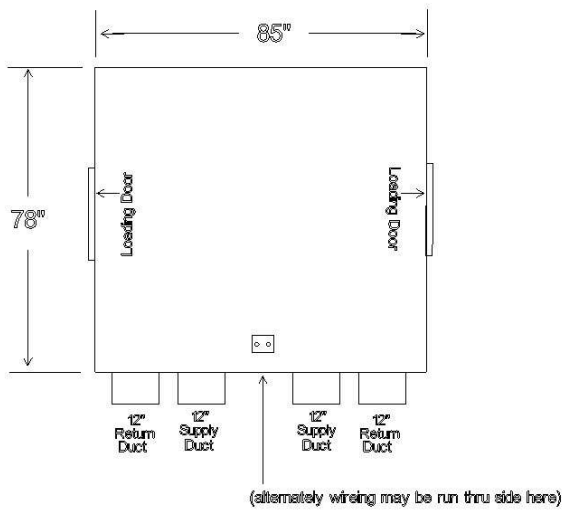
Model - FA -3000

Pad Dimensions - 58" x 95" Concrete Pad has 6" shoulder on both sides and front
Alternate Pad Dimensions - 58" x 113" Alternate Pad size has 24" shoulder by Loading Door



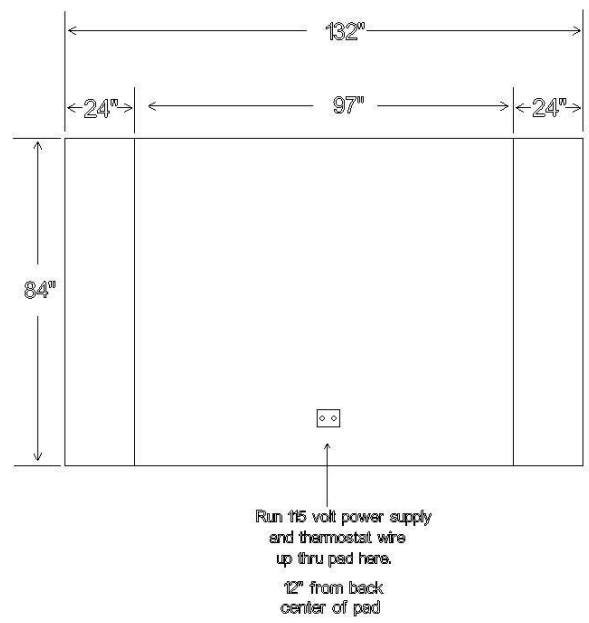
Run 115 volt power supply and thermostat wire up thru pad here. 12" from back 18" from side

Model - FA-4000
 Furnace Dimensions - 85" x 78"



Model - FA-4000

Pad Dimensions - 97" x 84" Concrete Pad has 6" shoulder on both sides and front
 Alternate Pad Dimensions - 132" x 84" Alternate Pad size has 24" shoulder by Loading Door



**This furnace must be wired by a qualified electrician
In accordance with the National or/and County/State Electrical Code.**

Connecting power to your furnace

The furnace requires 115 VAC, and connection will be made under the back access door of your HyProTherm Furnace, as will the thermostat wires.



Black (A) goes to 115 VAC 20 Amp circuit breaker (or 30 amp for 4000 models), and connects to the black wire on your outdoor furnace.

White (B) goes to circuit breaker box - common connections, and connects to the white wire on your outdoor furnace.

Ground wire (C) is grounded in circuit breaker box, and connects to bare copper ground wire on your outdoor furnace.

Wiring up your house thermostat

Purchase a simple, 2-wire thermostat (a simple ON/OFF switch) use those 2 wires to connect to the 2 thermostat wires of your outdoor furnace. (D)

Connecting the Air Ducts

Prior to connecting the duct work to the furnace it is important to start a fire and bring the furnace up to its operating temperature. Run the furnace for 3 – 4 hours at normal temperature to burn off any residue left over from the manufacturing process.

The furnace may be connected to an existing HVAC duct system or may be operated as a stand alone heat system. The furnace has a 12” round male connector on both the supply and return side at the furnace. Use only metal pipe to connect the supply side of the furnace to the area being heated, however Flex or other material may be used to connect the return line to the furnace.

Starting a Fire

Use small pieces of split kindling together with crumbled newspaper or cardboard, and add larger pieces. Kiln dried lumber (as shown) works great!!
Remember: The smaller the better, the dryer the better.



If you have poor draft, heat up the chimney by twisting some newspaper into a torch and hold it up into the stove until the draft is reversed.

If it is difficult to start the fire the reasons could be:

Not enough air: Make sure that fan is on or open the ash door (approx. 1 cm gap).

Bad/wet kindling: Use small pieces of split kindling together with crumbled newspaper or cardboard, and add larger pieces. Remember: The smaller and drier the better.

Down draft/cold chimney: Heat up the chimney by twisting some newspaper into a torch and hold it up into the stove until the draft is reversed.

The fire should be blazing when the fan is on. It should be just smoldering if the fan is off.

Quickly crack open the firebox door to see what the fire is doing. (Leaving the door open any length of time will give you a blazing fire that could cause an over temp condition.)

Maintenance

 **Clean out ash!! Moisture combined with ash will eat through a furnace in short order and ash or/and coal corrosion IS NOT COVERED under warranty.**

Green wood can also cause a lot of water to get into the ash area as well, so keep a sharp eye on that.

With our grate and ash door, you can remove the ashes while the fire is still burning.

Creosote – Formation and Need for Removal:

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.

The chimney should be inspected at least once a month during the heating season to determine when a creosote buildup has occurred. When creosote has accumulated, it needs to be removed to reduce the risk of a chimney fire.

All creosote and ash must be cleaned from firebox twice a year, preferably halfway through the heating season and immediately after the heating season.

END OF SEASON:

- Power: Turn off power supply at the appropriate circuit breaker
- Chimney: Clean and inspect chimney. **Cap the chimney to keep rain water 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 the steel during the off-season.
- Doors: Oil door hinges and latches.



Moisture from rain or condensation must not be allowed to accumulate in the firebox or ash pan at any time, including the off-season. Failure to perform preventive maintenance may result in corrosion damaging the boiler resulting in possible severe property damage. This IS NOT COVERED under warranty.

Disclaimer



All installation, wiring and operation must follow Federal, Provincial, State and local codes, ordinances and laws.

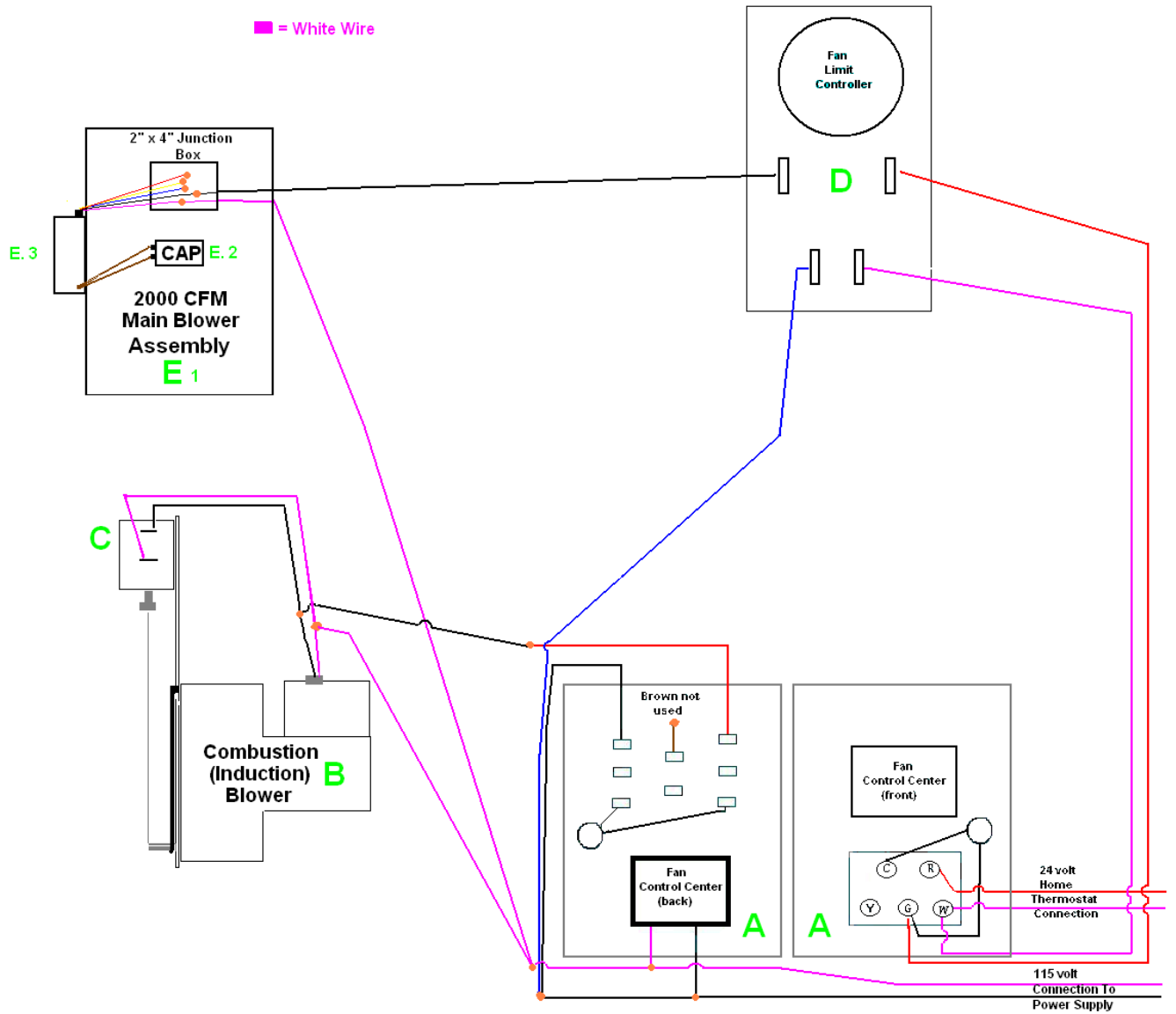
Do Not consider outdoor wood furnaces for built up urban areas.

The HyProTherm furnace is not intended to be the only source of heat. Therefore a backup system should always be in place and be ready for use.

A backup generator is HIGHLY recommended so that you can have heat during power outages!

All electrical and plumbing should be done by qualified personnel and conform to national and local state/county building, electrical, plumbing, fire and building codes.

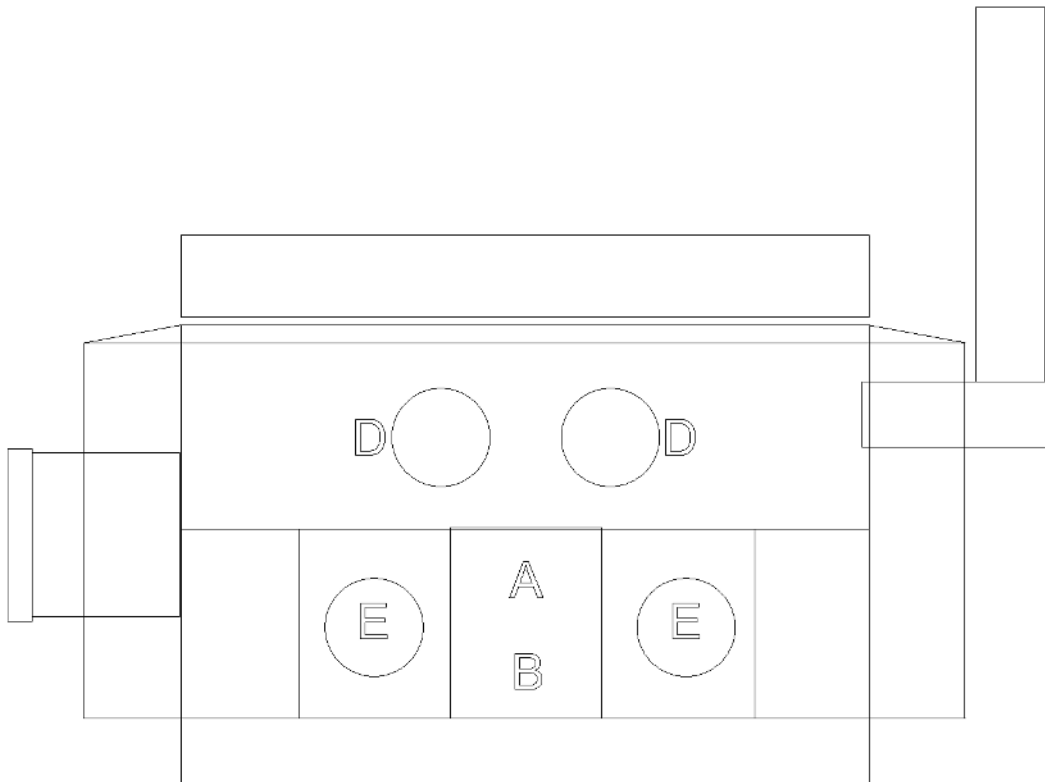
Manufacturer is not liable for damages to personnel or property for misuse, improper installation of equipment or for knowing local installation codes. Owner assumes all responsibility for this. This is just a general manual to aid in installation. We cannot know all applicable codes in your area!



Electrical Component List

1. White Rodgers #90-113 Fan Control Center
2. Dayton #1TDP3 75 CFM Blower or (#1TDP7 150 CFM or #1TDR3 273 CFM)
3. Dormeyer #4X240 Solenoid
4. Honeywell #L4064B2210 Combination Fan and Limit Control

- E1. Dayton #7HL64 Blower Assembly
- E2. Dayton Capacitor, # 2MDV9, 15MFD Oval, 370VAC
- E3. [DAYTON #3LU87 3/4 HP Direct Drive Blower Motor, Permanent Split Capacitor, 1075 Nameplate RPM, 115 Voltage](#)
 - 4 speeds
 - White = Common
 - Black = High - 2000 CFM
 - Blue = Med High - 1650 CFM
 - Yellow = Med Low - 1135 CFM
 - Red = Low – 975 CFM



On larger units having two separate blowers (E) each one is controlled by its own Fan Limit Controller (D). Both controllers get power at (A). The second function of the controllers (D) is to act as a limit switch for the combustion blower (B). If the air chamber reaches the temperature set as the limit, the controller will cut power to the combustion blower to prevent an over temperature situation. The limit will auto reset returning power to blower when the air chamber temperature drops below the limit setting. Only one controller (D) will be used as fan controller and a limit switch. The second controller will act as a fan controller only.

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: _____

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