

The Hardy

INSTALLATION AND OPERATING INSTRUCTIONS

FOR

THE HARDY OUTSIDE WOOD BURNING HEATER

Model - KB125

**HARDY MANUFACTURING
COMPANY, INC.**

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PHILADELPHIA, MS 39350

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www.hardyheater.com



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INTRODUCTION

Thank you for purchasing the KB125 which is Certified to the EPA 2015 Emission Standards. The KB125 is an all stainless steel Hardy Outside Wood Fired Hydronic Heater. It represents the result of many years of Hardy experience and the input of Hardy customers in the production of a top quality heater. With the purchase of this Hardy Heater, you can now appreciate the high degree of craftsmanship and reliability that have made “The Hardy” the leader in the Outside Wood Fired Hydronic Heater field. This manual will provide you with a good basic understanding of the installation and operation of this heater.

THIS MANUAL INCLUDES IMPORTANT SAFETY INFORMATION.

Your new heater should have the following:

- (1) Owner’s manual complete with installation and hook-up instructions
- (2) Warranty & return warranty card
- (3) 2 double wall sections of smoke stack & ring
- (4) Ash shovel
- (5) 1.75” flue brush with handle
- (6) Fire poker
- (7) Ash removal pan

Should your heater not have any of these items or if you have any questions regarding the operation or maintenance of your heater, please consult you local Hardy dealer.

Again, thank you for purchasing a Hardy Hydronic Heater.

Sincerely,
Frank L. Moore
President
Hardy Manufacturing Co., Inc.

(MODEL KB125)

Please fill in the following information

Hardy Model _____

Serial Number _____

Date of Purchase _____

Date of Installation _____

Dealer Purchased from _____

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 unit. If you should ever have a problem or question please refer to this manual or have it available when you call your Hardy Dealer or Hardy Manufacturing Company, Inc.

HARDY MANUFACTURING COMPANY, INC.

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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 unit.

For units 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 unit.
- This unit must be wired by a qualified electrician in accordance with the National Electrical Code.
- Never use any type of petroleum based product, charcoal starter, lighter fluid, or any other flammable accelerant to start your unit.
- Fuel: Clean seasoned oak hardwood. Clean wood means wood that has no paint, stains, or other types of coatings, and wood that has not been treated with preservatives, including but not limited to, copper chromium arsenate, creosote, or pentachlorophenol.
- Never leave the door open, always latch the door securely.
- Always use proper care when installing, operating and maintaining the unit.
- Do not modify the unit.
- Do not substitute repairs which can be provided by your dealer, distributor, or Hardy Manufacturing Co. Inc.

Failure to heed this warning, any additional warnings on the unit, or instructions contained in this manual may result in an accident causing personal injury and/or loss of warranty.

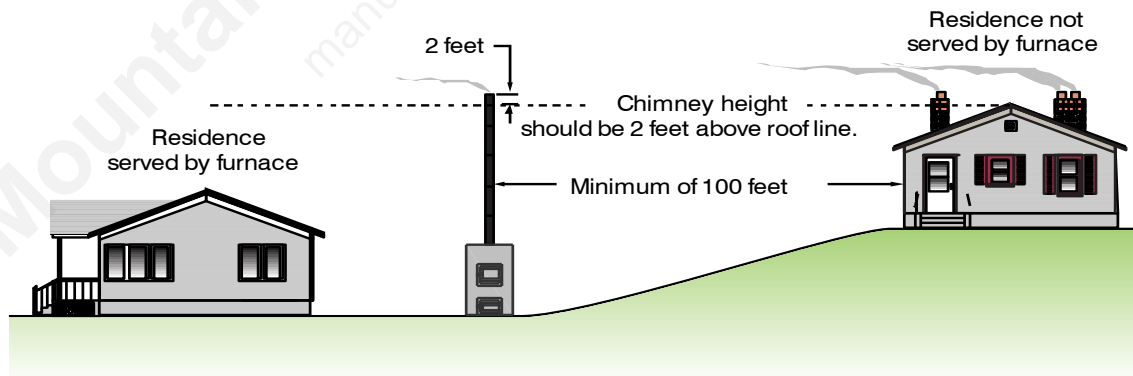
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OUTDOOR WOOD HEATER BEST BURN PRACTICES

1. Read and follow all operating instructions supplied by the manufacturer.
2. This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods.
3. **FUEL USED:** Only those listed fuels recommended by the manufacturer of your unit.
Never use the following: Garbage; Lawn clippings or yard waste; Materials containing rubber, including tires; Materials containing plastic; Waste petroleum products, paints or paint thinners, or asphalt products; Materials containing asbestos; Construction or demolition debris; Railroad ties or pressure-treated wood; Manure or animal remains; Salt water driftwood or other previously salt water saturated materials; Unseasoned wood; or Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater. Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke."
4. **LOADING FUEL:** For a more efficient burn, pay careful attention to loading times and amounts. Follow the manufacturer's written instructions for recommended loading times and amounts.
5. **STARTERS:** Do not use lighter fluids, gasoline, or chemicals.
6. **LOCATION:** It is recommended that the unit be located with due consideration to the prevailing wind direction.
 - Furnace should be located no less than 100 feet from any residence not served by the furnace.
 - If located within 100 feet to 300 feet to any residence not served by the furnace, it is recommended that the stack be at least 2 feet higher than the peak of that residence.

Chimney Height Installation Scenario



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



OUTDOOR FURNACE MANUFACTURERS CAUCUS

(MODEL KB125)

THE HARDY OUTSIDE WOOD FIRED HYDRONIC HEATER

How does an outside heater heat my home?

The Hardy outside wood fired hydronic heater is designed to save the most energy and provide the most comfortable heating available. It heats your home by heating a stainless steel tank filled with water, which surrounds the firebox of the outside heater. The heater is a non pressurized boiler with an atmospheric vent. This hot water is then circulated through underground hot water pipes to a water coil inside your existing central duct system. The Hardy Heater can be connected to any existing hydronic heating system that operates at 170 degrees Fahrenheit or less.

How does THE HARDY heat water for household use?

A plate heat exchanger (optional) is installed in the hot water circulator line. When you open a hot water faucet inside your home, the cold water passes through the other side of the heat exchanger and the water going to your water heater is preheated. The only additional energy required is maintaining the water temperature. The plate heat exchangers can be used for pools, dairies and other domestic hot water needs.

How do the Thermostat Controls work?

The only visible addition to the heating system inside your home is the thermostat which is located next to your existing thermostat. The two thermostats are installed so that if the outside wood burning heater is not in operation, your existing unit can be used to maintain your household temperature. The wall thermostat which regulates the heat from the outside heater turns the blower on inside your central unit to force air across the hot coil. This forces hot air into your central duct system. The outside heater has a Process Control Module which senses the water temperature of the unit. This module cycles the heater on and off in order to maintain a preset water temperature.

Where should the Hardy Heater be located?

The outside unit should be located at least 10 feet from your home, other structures or any other combustible materials so that all fire danger is removed. The unit may be installed as much as 100 feet away. Locate the outside wood burning heater where it will be convenient for refueling. All water and power lines are installed underground between the house and the outside wood heater. Additionally refer to the Best Burn Practices section in this manual.

Additional Installation and Operational Considerations

Installation

Person(s) operating a Hardy hydronic heater must comply with all applicable laws or other requirements, such as state laws or regulations and local ordinances. Person(s) is/are also responsible for operation in a manner that does not create a public or private nuisance condition. The distance and stack height Hardy Mfg. recommends and the requirements in any applicable laws or other requirements may not always be adequate to prevent nuisance conditions due to terrain or other factors. This wood heater has a manufacturer-set minimum low burn rate that must not be altered. This appliance needs periodic inspection and repair for proper operation. It is against federal regulations to alter this setting or otherwise operate this appliance in a manner inconsistent with operating instructions in this manual. Operation in a manner inconsistent with the owner's manual will void the warranty.

EPA's Burnwise Program

<http://www.epa.gov/burnwise>

How to Use a Moisture Meter Video

<http://www.youtube.com/watch?v=jM2WGgRcnm0>

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.

Split, Stack, Cover and Store Video

<http://www.youtube.com/watch?v=yo1--Zrh11s>

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.

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SECTION I

GENERAL INFORMATION

This manual describes the installation and operation of The Hardy, Model KB125 Wood Fired Hydronic Heater, certified to the EPA 2015 Emission Standards

This heater meets the 2015 U.S. Environmental Protection Agency's crib wood emission limits for wood heaters sold between May 15, 2015 and May 15, 2020.

Under specific test conditions this heater has been shown to deliver heat at rates ranging from 17,984 to 119,457 Btu/hr with efficiencies ranging from 53.2% to 83.7%.

This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual. Operation in a manner inconsistent with the owner's manual will void the warranty.

1 – 1 Specifications

KB125 Hardy Wood Fired Hydronic Heater

For Outdoor Use Only

Type of fuel – Clean seasoned oak hardwood

Never use the following: Garbage; Lawn clippings or yard waste; Materials containing rubber, including tires; Materials containing plastic; Waste petroleum products, paints or paint thinners, or asphalt products; Materials containing asbestos; Construction or demolition debris; Railroad ties or pressure-treated wood; Manure or animal remains; Salt water driftwood or other previously salt water saturated materials; Unseasoned wood; or Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater. Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.

Wood Dimension & Condition -
22" to 24" in Length, 15% - 30% Moisture, Cured between 6 to 9 months.
Any round wood over 7" in diameter must be split at least once.

Wood Load Capacity -
10 to 15 pounds / cubic ft.
Firebox is approximately 7 Cubic Feet
Wood weight is approximately 80 to 100 pounds.

1 – 1 Specifications (continued)

Clearance to Combustibles

Top, Rear, Sides	18"
Chimney Connector	18"
Front	48"
Flooring	Non Combustible

Electrical Rating 115 VAC/ 60 HZ / 1PH
MFS-20 AMP, MCA-20 AMP

Water Capacity

KB125 – Holds Approximately 80 Gallons of Water

Heater Outside Dimensions

Model	Width	Depth	Height	Weight
KB125 - 120,000 BTU	33"	65"	70"	1086 lbs.

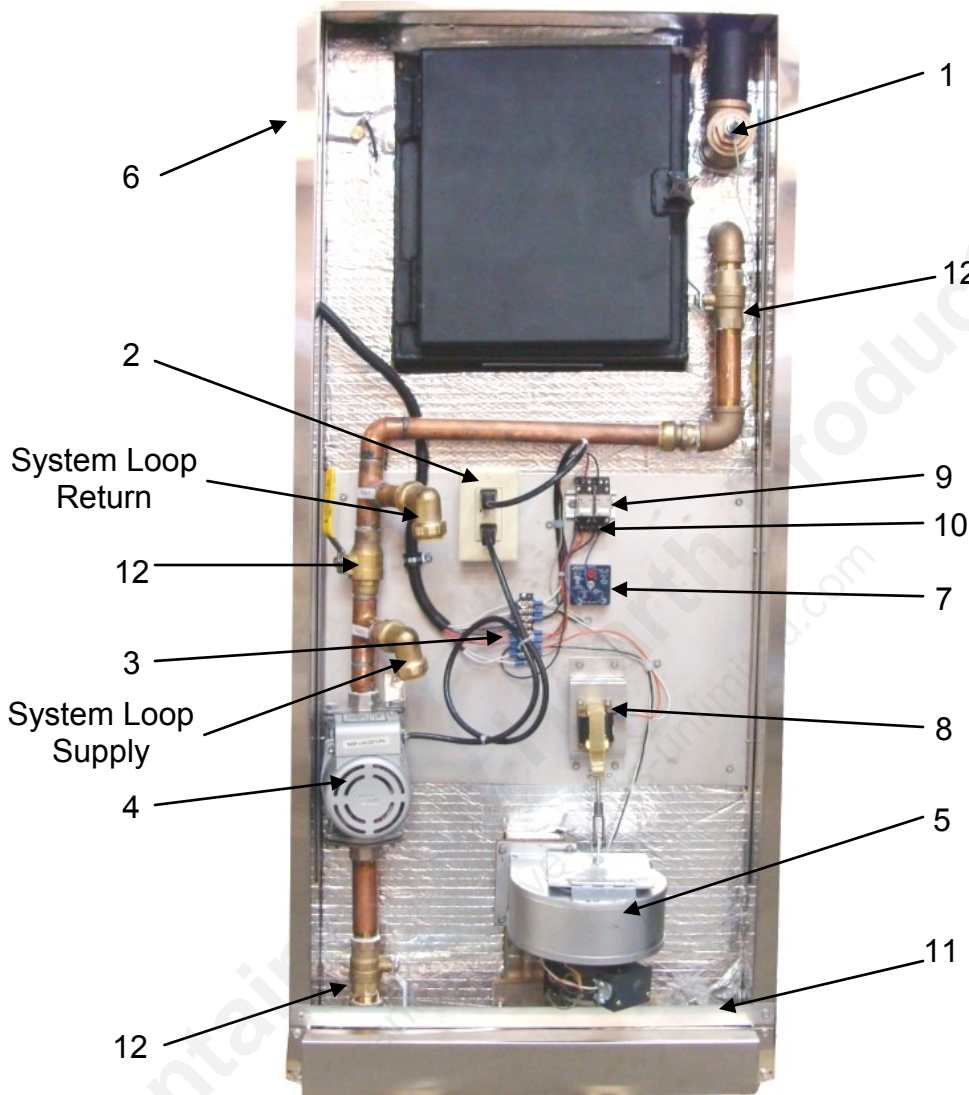
This model wood fired hydronic heater has a preset forced air draft fan that requires no draft adjustments.

Draft is the force of air drawn from outside the heater and pushed throughout the various chambers before finally exiting through the smoke/flue stack. Excess ash or creosote buildup can hinder this process causing the heater to under perform and produce excess emissions. Normal maintenance at scheduled intervals keeping all air passages clean will insure optimal performance.

DO NOT OVERFIRE THIS HEATER. Attempts to over fire this heater to achieve more than rated outputs will void your warranty.

**1-2 Heater Component Parts
Standard Components**

Model KB125



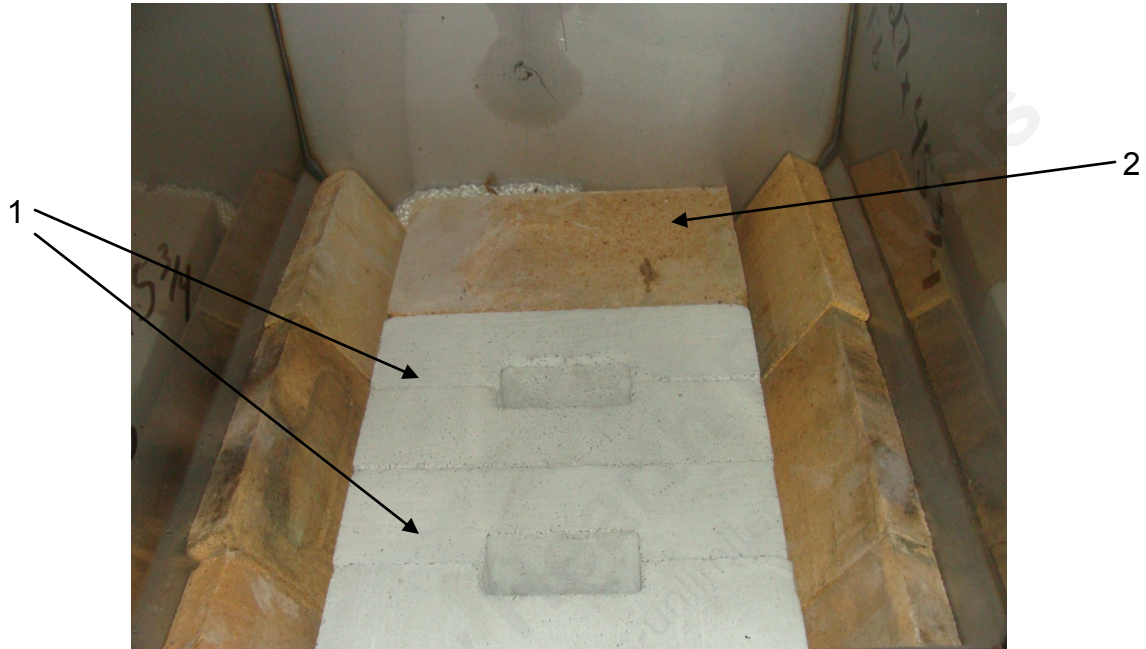
Legend	Part No.	Description
1	2000.74	Continuity Probe
2	2004.00	Ground Fault Interrupter Receptacle
3	2004.30	Terminal Block Assy.
4	506.30	SS Anti-Stratification Circulator <i>(Can Not Be Used To Supply System Loop)</i>
5	2002.95	Combustion Blower
6	2125.25	Temperature Logic Controller (Not Visible)
7	2000.65	Time Delay Relay
8	2001.05	Damper Solenoid
9	2000.53	(2) Low Water Lockout Relay
10	2000.55	(2) Socket For Low Water Lockout Relay
11	607.42	3/4" Boiler Fill/Drain <i>(Not Visible)</i>
12	607.45	(3) 1" Brass Ball Valve

1-2 Heater Component Parts Model KB125
Standard Components (continued)



Legend	Part No.	Description
1	2125.50	(15) Turbulators
2	7125.99	Bypass Flap

1-2 Heater Component Parts Model KB125
Standard Components (continued)



Legend	Part No.	Description
1	3105.25	(4) Refractory Grates
2	2165.31	(2) Front & Back Fire Bricks

SECTION II

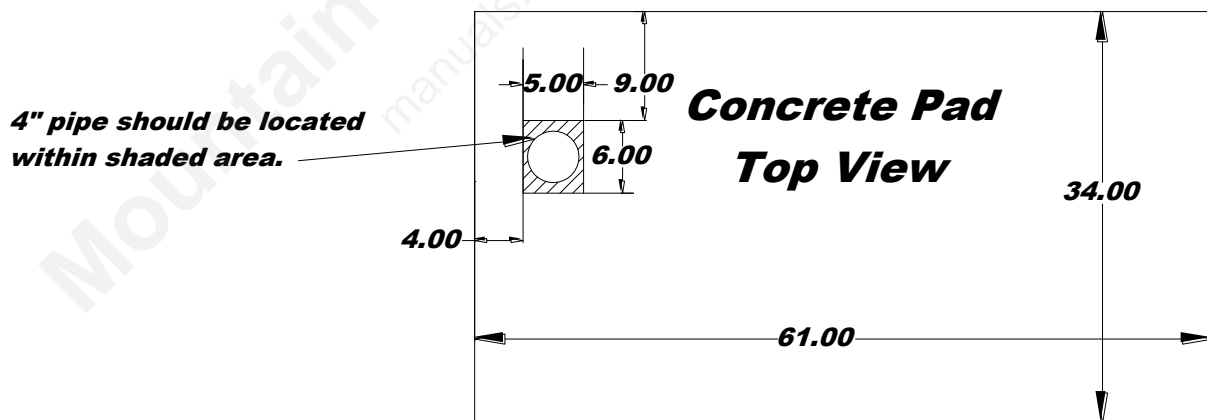
INSTALLATION OF HEATER

2-1 Location of Heater

The Hardy Heater is designed to operate outside the structure to be heated. The unit must be located a minimum of 10 feet from any structure.

The heating unit should be installed on a concrete pad with a recommended minimum dimension of 34"W x 61"L x 4"D. On the plumbing end of the heater you will need to bring up through the pad a 4" water tight chase pipe to route your water lines and electrical lines from the structure to be heated to the furnace.

Reference the illustration below for pad layout and ideal placement of 4" pipe.



2-2 Chimney Connection

Do not connect this unit to a chimney flue servicing another appliance

2-3 Location of Plumbing & Electrical Lines

To locate the connection points for plumbing and electrical lines you will need to open the back hull door. The plumbing and electrical lines for your unit must be installed underground in a water tight pipe or other suitable insulation means. The water lines must be buried below the frost line to prevent freezing. Verify the correct depth according to local building codes prior to installation.

The installation will require a trench wide enough to accommodate a 4" water tight pipe or other insulation means. All plumbing and electrical lines should be installed inside the 4" water tight pipe or other insulation means for a standard installation.

This pipe will run from the rear of the unit to the location to be heated. Contained inside the 4" watertight pipe is 2 water lines and electrical supply wire. The listing below describes each line and related function.

1. One 1" water supply line to heating system
2. One 1" water return line from heating system
(Note: The supply and return lines must be 1" pipe .)
3. One #12/2 w/gnd NM type UF underground wire

2-4 Connection of Power to Heater

This unit must be wired by a qualified electrician in accordance with the National Electrical Code.

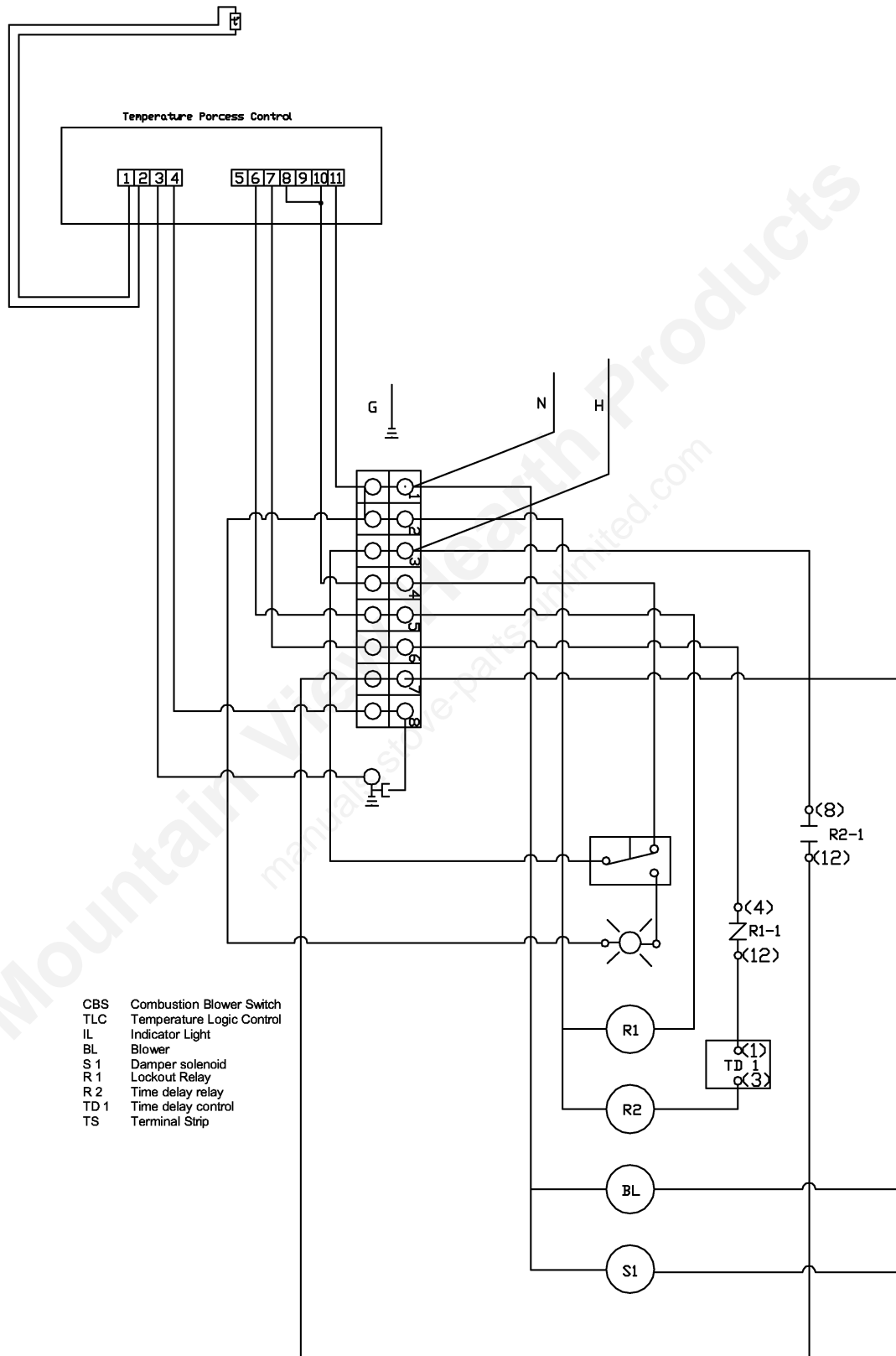
Verify that all electrical power is turned off. Install a 20 amp circuit with #12/2 W/Gnd NM Type UF wire from the power source through the 4" watertight pipe or other means to the heater. This wire will connect to the "LINE" Terminals on the GFCI Receptacle located on the rear of the Heater. The breaker installed at the power source should be a 20 amp GFCI.

2-5 Wiring Diagram

This equipment must be installed in accordance with the National Electrical Code.

(See wiring diagram next page)

2-5 Wiring Diagram (continued)



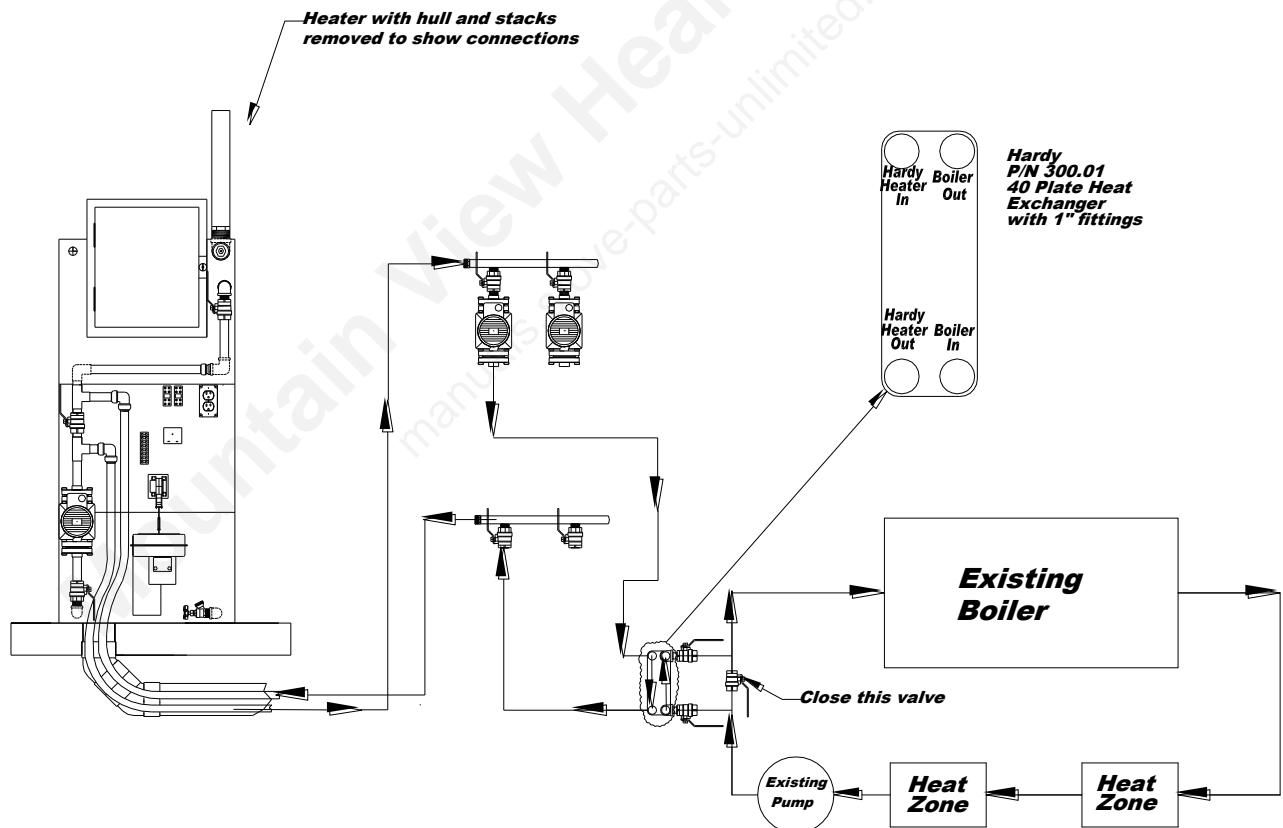
- CBS Combustion Blower Switch
- TLC Temperature Logic Control
- IL Indicator Light
- BL Blower
- S 1 Damper solenoid
- R 1 Lockout Relay
- R 2 Time delay relay
- TD 1 Time delay control
- TS Terminal Strip

2-6 Plumbing Connections

Connection to Heating System

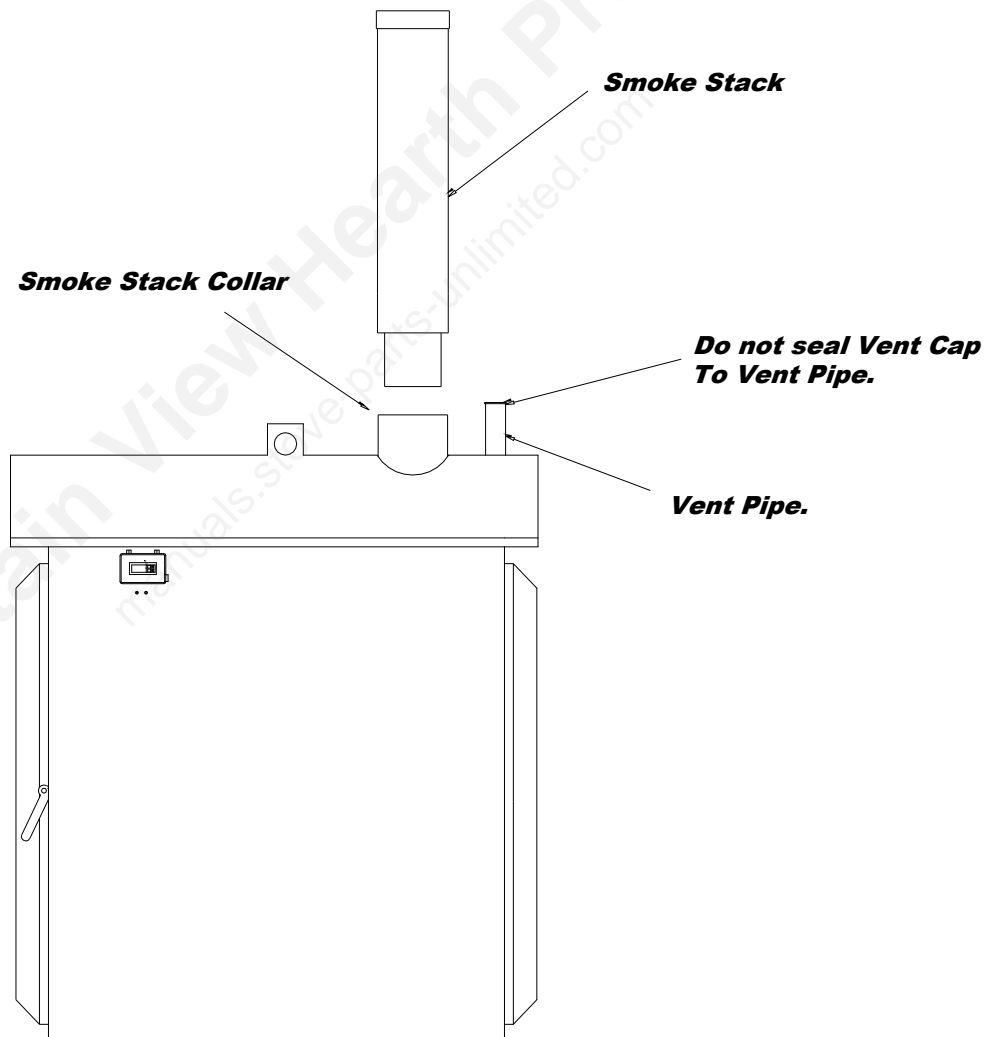
1. The pipe that will supply the heating system is connected to the first tee connection above the pump.
2. The pipe that will carry the return water from the heating system is connected to the second tee fitting after the pump.

Water pipes must be designed for hot water service (ex. copper, cpvc, or Pex A). Pipes should be installed in a 4" water tight pipe or some other type of insulating means to prevent heat loss from heater to heating system. Use only copper, brass, or stainless steel fittings. Do not use galvanized or black iron.



2-7 Installation of Smoke Stacks

The KB125 comes with two three foot sections of smoke stack and a stack ring. Push the two smoke stacks into one another. Then place the stack ring onto the top section. Last install the combined stacks into the units flu gas exit hole on the roof. Pay close attention while working above the unit top when installing the stacks. Don't apply too much pressure or drop any tools as the stainless steel roof can be scratched and bent.



2-8 Filling the Heater with Water

The Hardy Hydronic Heater Must Be Filled with Water Before Operation

There is a low water sensor located in a fitting at the top of the tank. This low water sensor signals a low water condition in the process control module. The heater will not operate while a low water condition exists. Water will have to be added to correct the low water condition.

There are certain parts of the country that have high enough levels of chloride in the water to be harmful to stainless steel tanks. Even though the USDA allows up to 250 parts per million of chloride (salt) in the water as acceptable for drinking, experience has shown that chloride levels as low as 45 parts per million will eventually cause stress corrosion cracking in stainless steel tanks when water is heated. It is therefore required to use rain water or bottled water with chloride content of less than 15 parts per million or test the water supply for chloride to assure that the water supply does not exceed 45 parts per million. Call your Hardy dealer to obtain a chloride test on your water supply. If the chloride content of your local water supply exceeds the specifications mentioned above this necessitates the use of bottled or rain water, please do so to maintain the warranty of your heater.

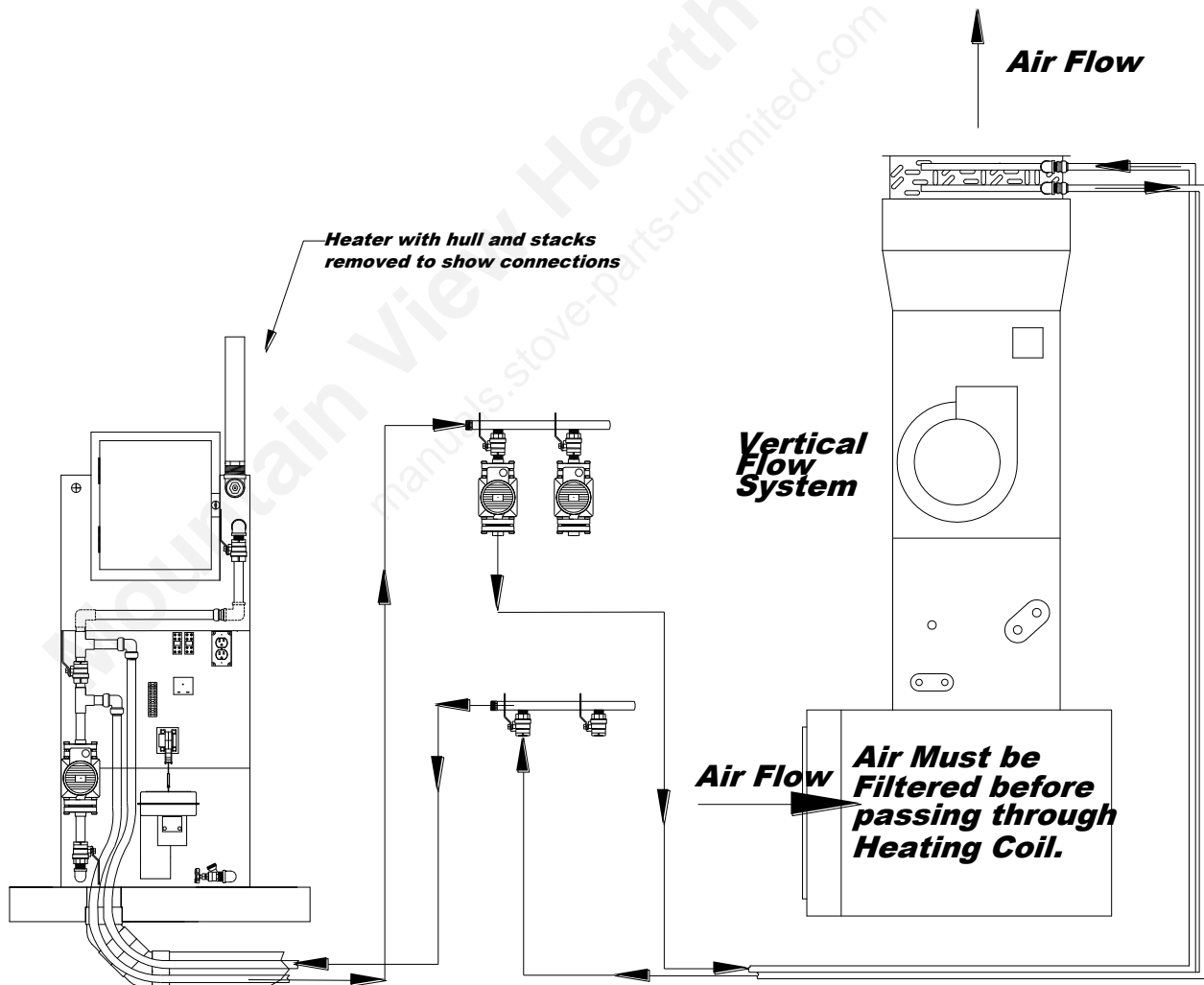
Fill your heater with water through the boiler drain at the bottom of the heater.

2-9 Priming the Pumps

Once the furnace has been filled with water, the system pump and anti-stratification circulator comes pre-installed and must run continuously.

This circulator should not be modified and must not be used in conjunction with any other application.

You will need to open the supply valves and the return valves on the pump. Plug the power cord for the circulator pump into the GFCI receptacle, and listen for the air bubbling back into the water tank. Once you no longer hear air bubbling, slowly close the supply valve above the pump until you hear a change in the sound the water makes as it flows through the pump. Once you are satisfied that the pump is moving water open the supply valve back up.



SECTION III

CONNECTION TO CENTRAL HEATING/AC SYSTEM

3-1 Connection to Central Unit with Existing Blower Relay

This unit must be wired by a qualified electrician in accordance with the National Electrical Code.

Turn off all power going to your central air handler system.

You will need to add a double pole / double throw relay to your central air handler. You will also need a heat only thermostat added to the wall, preferably next to the existing thermostat. Run a two (2) conductor thermostat wire from the air handler to the new heat only thermostat that was added to the wall. The normal colors for this wire are red & white.

NOTE: If you are not familiar with the control circuit of your central unit, do not continue beyond this point. Call a heating and air conditioning serviceman to complete the wiring. Improper wiring can cause excessive electrical usage or cause your blower motor to over heat and burn out.

At the wall heat only thermostat connect the red wire to the screw terminal marked R and the white wire to the screw terminal marked W.

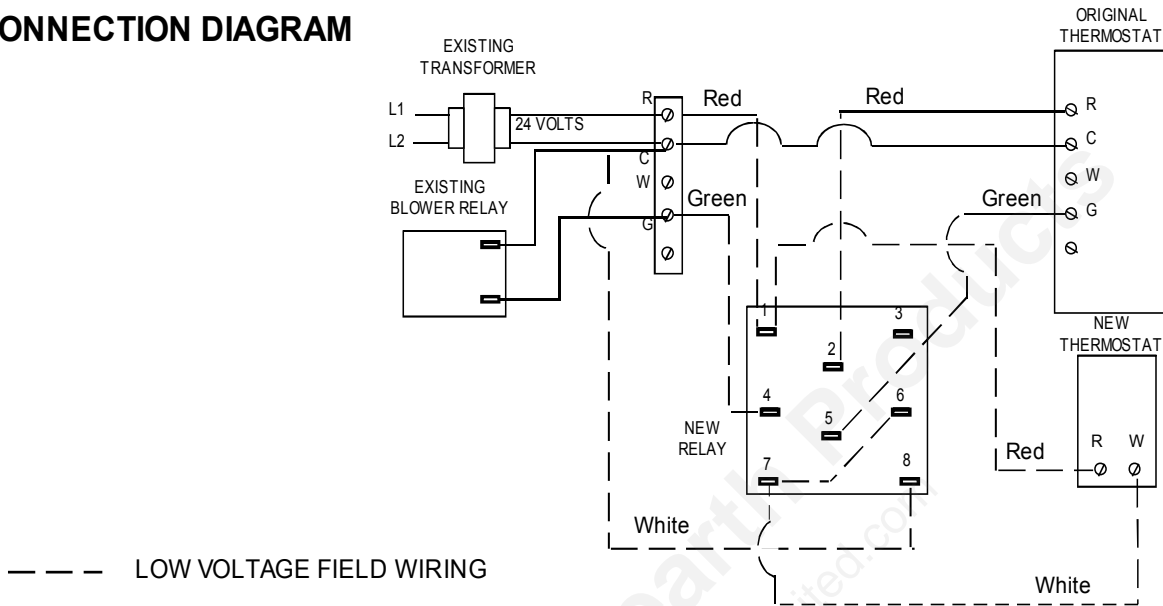
At the central air handler where you added the relay, connect the white wire that is going to the new heat only wall thermostat to terminal #7 of the new relay along with a short jumper wire that will connect to terminal #6 of the new relay. Next find the red wire going from the air handler control wiring to the original wall thermostat. Cut this wire and connect the end that is going to the wall thermostat to terminal # 2 on the new relay. The end of the red wire that is still connected to the control wiring of the air handler will need to be connected to terminal # 1 along with the new red wire that is going to the new heat only wall thermostat.

Locate the green wire going from the central air handler control wiring to the original wall thermostat. Cut this wire. Connect the end of the green wire that is going to the original wall thermostat to terminal #5 of the new relay. Connect the end of the green wire that is still connected to the central air handler control wiring to terminal #4.

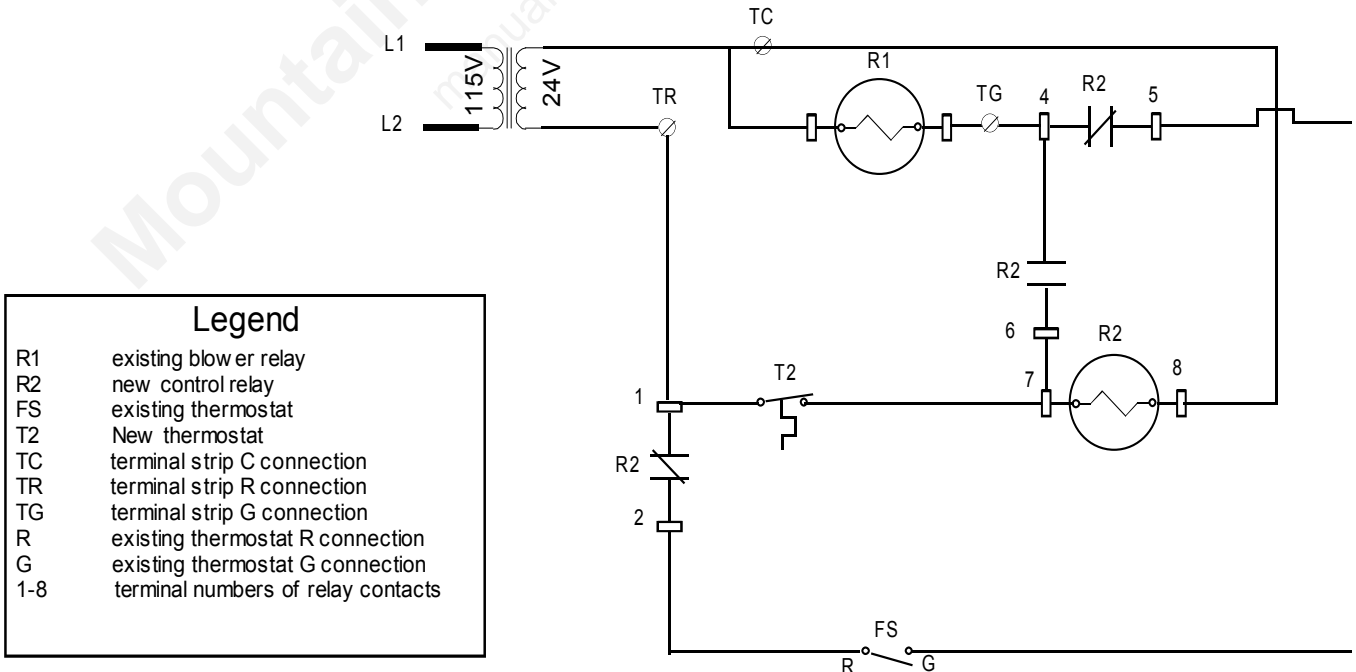
Locate the low voltage transformer that is providing you with 24 volt power. Find the common lead of this transformer and connect a wire to this lead and to terminal #8 of the new relay.

3-1 Connection to Central Unit with existing Blower Relay (continued)

CONNECTION DIAGRAM

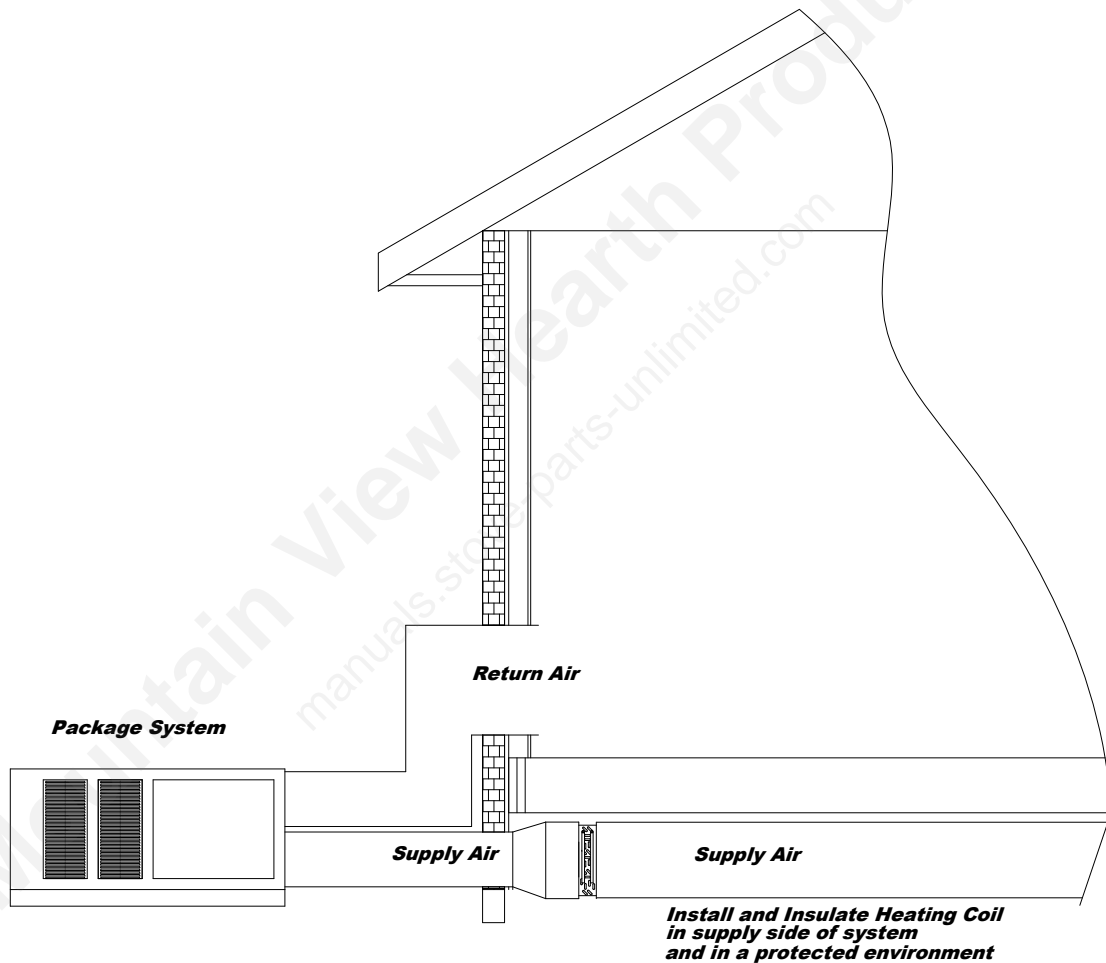


SCHEMATIC DIAGRAM

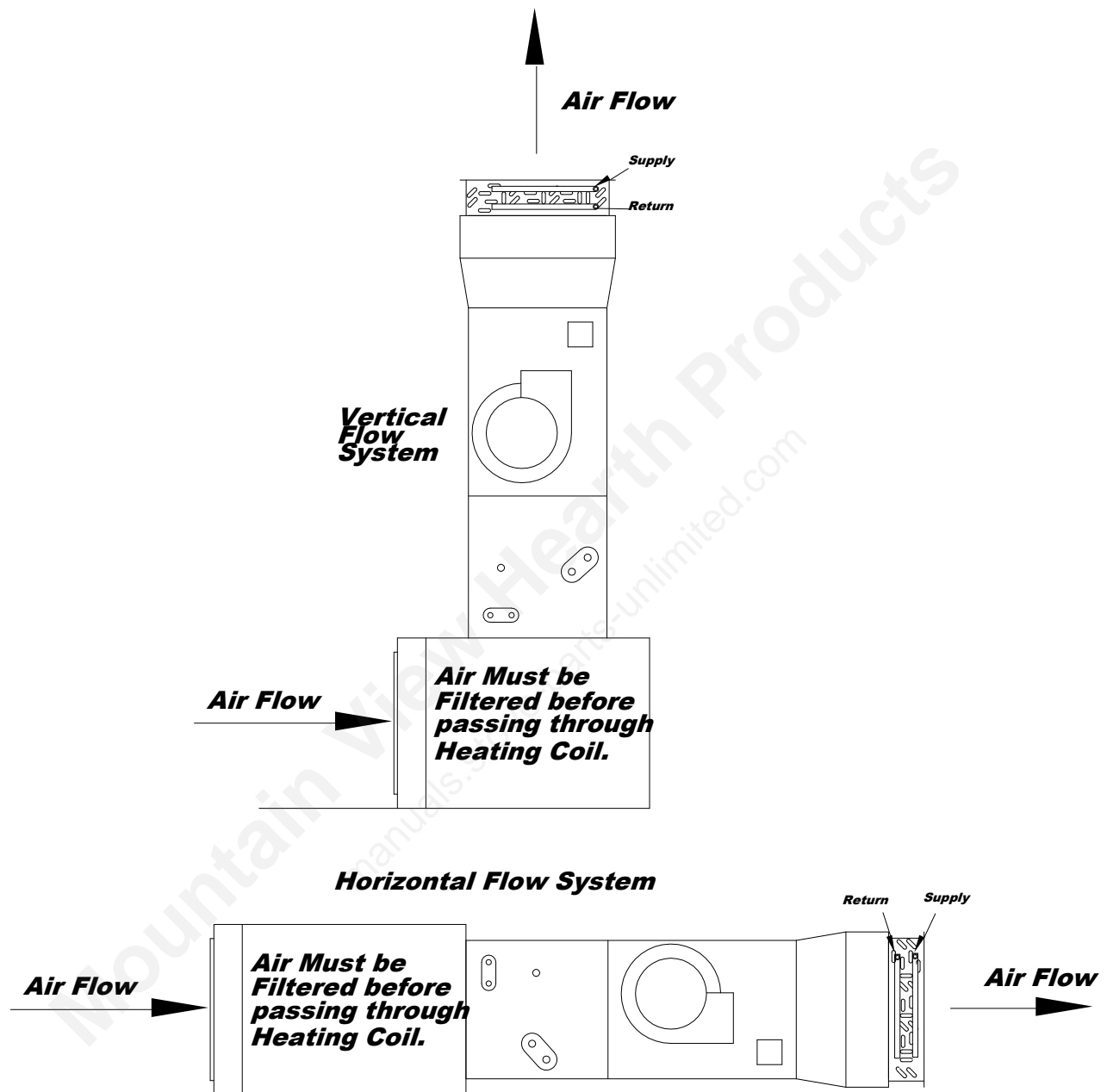


3-2 Location of Heating Coil

The following diagrams and pictures on this page and the following page show various methods of installing the heating coil in a forced air system.



3-2 Location of Heating Coil (continued)



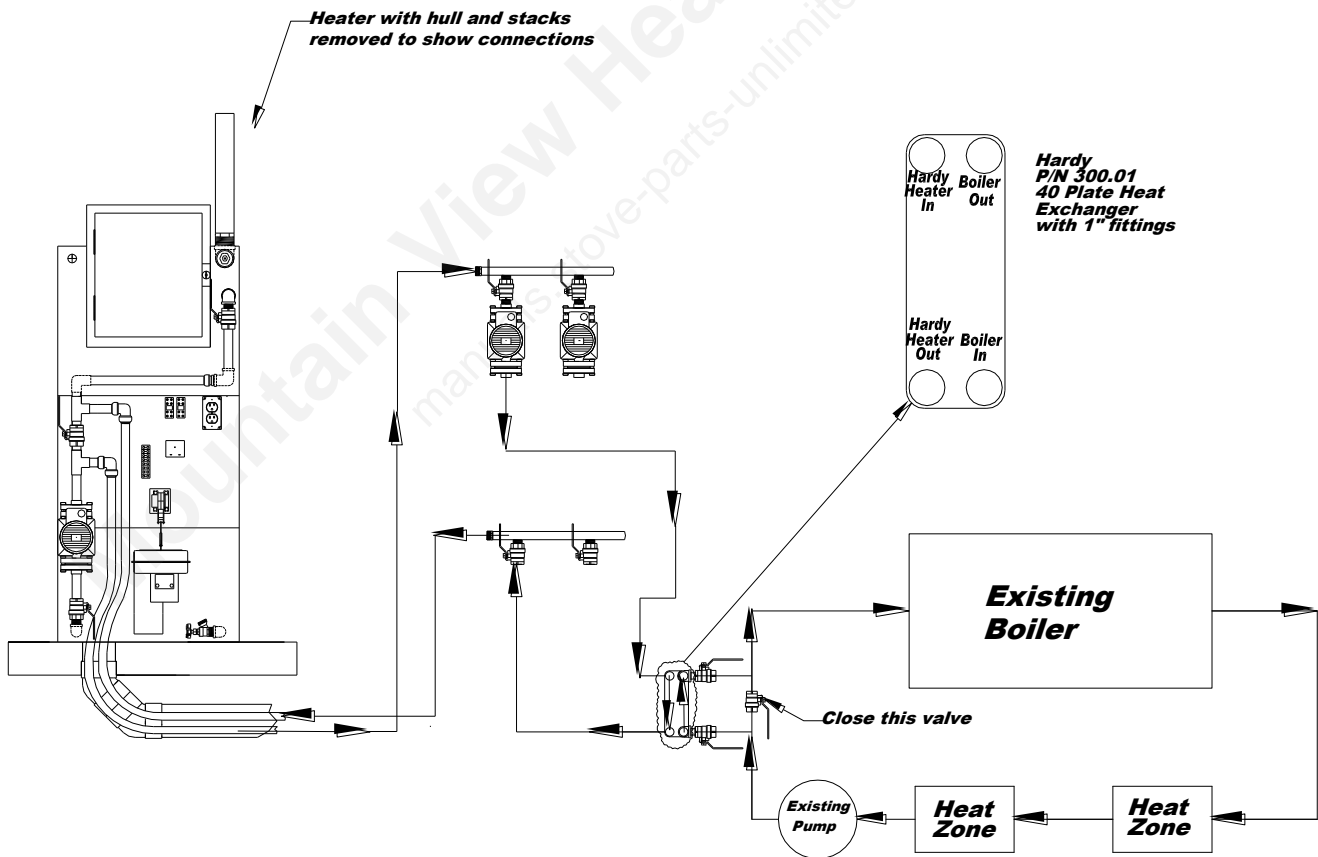
SECTION IV

CONNECTION TO HYDRONIC HEATING SYSTEMS (BASEBOARD)

4-1 Connection to Hydronic System

This unit must be wired by a qualified electrician in accordance with the National Electrical Code.

The preferred method for connecting the Hardy KB125 Hydronic Heater to an existing hydronic system is by installing a p/n 300.01 (40 plate heat exchanger w/ 1" fittings) into the return line of the existing boiler system. Run 2 -1" potable hot water lines from the wood heater to the existing hydronic system. Add a properly sized circulator to the supply line and connect to the plate heat exchanger so that the water flow of the wood heater is opposite of that from the existing hydronic system. Connect the return line to the opposite port on the plate heat exchanger.

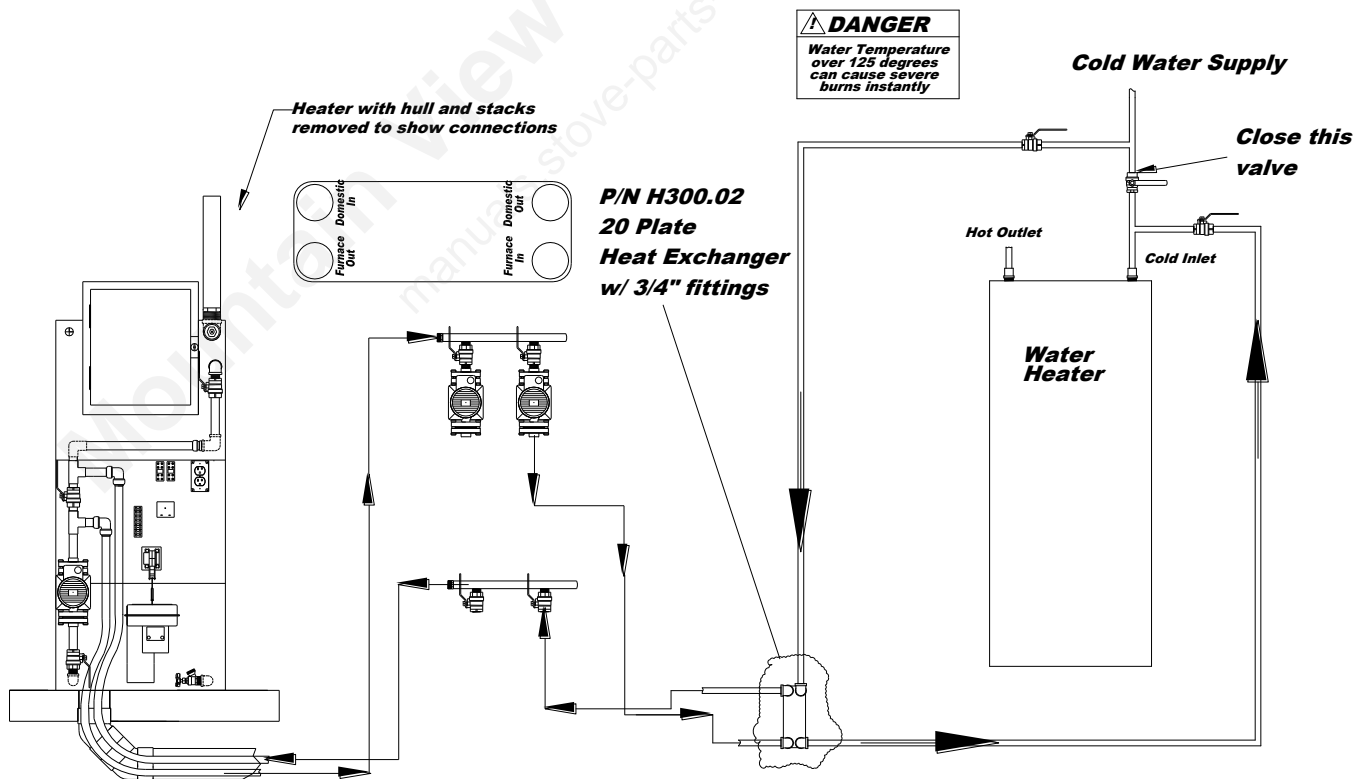


SECTION V

PLUMBING OPTIONS FOR DOMESTIC WATER

5-1 Plate Heat Exchanger for Domestic Hot Water

To add domestic hot water to the KB125 hydronic heater, a plate heat exchanger and pump can be added. This plate heat exchanger will provide preheated water to the domestic hot water. The preferred method is to mount a plate heat exchanger at the water heater and connect it as shown in the following drawing. The pump will circulate heater water through the plate continuously. The cold water supply will need to be connected to the opposite side of the plate heat exchanger and flowing in the opposite direction for maximum efficiency.



SECTION VI

HEATER OPERATION

6-1 Firing the KB125

Hardy Manufacturing recommends burning clean seasoned oak hardwood in this heater: Clean Wood means wood that has no paint, stains, or other types of coatings, and wood that has not been treated with preservatives, including but not limited to, copper chromium arsenate, creosote, or pentachlorophenol.

- 22" to 24" in length
- 15% to 30% moisture wood
- Cured between 6 to 9 months

The following steps should be completed to light and operate the heater unit:

1. Place the heater at the location where it's to be installed.
2. Install system lines.
3. Fill the heater with water through the boiler drain at the bottom of the heater.
4. Once heater is full of water, prime pump following procedure outlined in section 2-9.
5. Open bypass damper located on front left side of the heater and open the firebox door.
6. Verify the blower switch is in the off position. Put paper in the firebox over the grates.
7. Add approximately 10 lbs of small kindling on top of the paper.
8. Light the paper and close the firebox door.
9. Flip the blower switch on. Let it burn between 15 to 20 minutes.
10. Open the firebox door and add 4 to 6 sticks of 2" to 4" split wood.
11. Close the firebox door.
12. Close the bypass damper. Let the heater run between 30 to 40 minutes.
13. Open the bypass damper, then open the firebox door and stir the fire.
14. Flip blower switch off (located on the right side of the heater, light will turn on).
15. Once coal bed is established, load the heater firebox half full of wood.
16. Close the firebox door, and then close the bypass damper.
17. Flip on the blower switch. (Temperature will begin rising).
18. After one hour, open the bypass damper and then the firebox door.
19. Fill the heater firebox with wood.
Wood should be loaded from front to back and stacked as uniform in the firebox as possible. DO NOT attempt to load wood across the width (crossways) of the firebox.
20. Close the firebox door and then the bypass damper.

6-2 Loading the KB125

The following steps should be completed to load the KB125 Hardy Heater:

1. Open the bypass damper (located on the left side of the firebox door).
2. Open the firebox door.
3. Flip the blower switch off (located on the left side of the heater), light will turn on. This will begin the off delay timer that is set for 5 minutes.
4. Open the ash door.
5. Remove the ashes with the provided shovel.
Ashes should be placed in a metal container with a tight fitting lid.
The closed container of ashes should be placed on the ground away from any combustible materials, pending final disposal. The ashes should be retained in the closed container until all cinders have thoroughly cooled.
6. Close the ash door.
7. Rake the coals around in the firebox.
8. Confirm that the two holes in the fire grates are open.
9. Load the heater firebox with the amount of wood needed for your application.
(For Example: Using an average load of approximately 60,000 BTU/HR, the heater firebox should be loaded with approximately 105 pounds of wood with an average moisture content of 20% for an 8 hour burn.)
Wood should be loaded from front to back and stacked as uniform in the firebox as possible. DO NOT attempt to load wood across the width (crossways) of the firebox.
10. Close the firebox door.
11. Close the bypass damper.
12. Flip the blower switch on, light will turn off. Keep in mind that the off delay timer could still be timing.

SECTION VII

SERVICE INFORMATION

7-1 Temperature Logic Controller



The heater water temperature is maintained by the Temperature Logic Controller. The normal operating temperature of 175° F to 180° F is preset at the factory and should not be adjusted. The Temperature Logic Controller opens the air intake damper and brings on the combustion air blower when the water temperature drops below the preset temperature. This Logic Controller also monitors water level. If the temperature Logic Controller malfunctions, it will require replacement by a certified Hardy Dealer.

7-2 Low Water Sensor

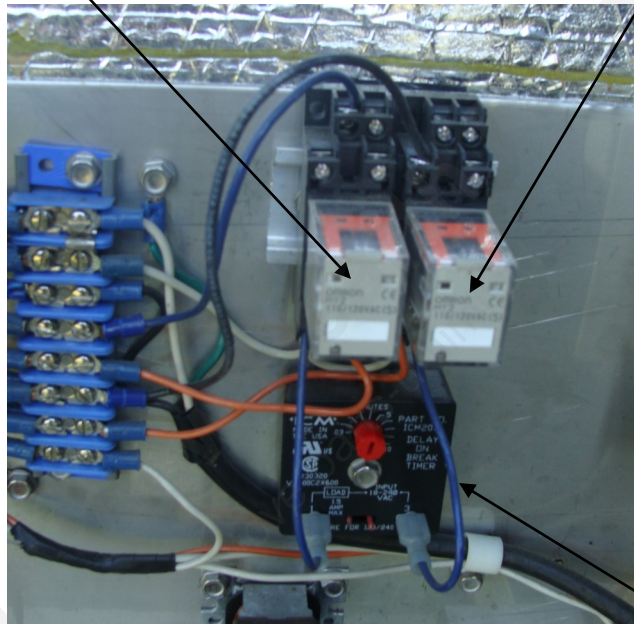
The low water sensor signals a low water condition in the Temperature Logic Controller. The heater will not operate if a low water condition exists.

7-3 Low Water Lockout Relay and Time Delay Relay

The low water relay is energized when the water level sensor detects a low water condition. In a low water situation the blower and damper systems will not operate and the low water indicator on the temperature logic controller will light up. The time delay relay will keep the blower from coming on for 5 minutes when de-activated by the low water relay or the blower switch mounted on the right side of the heater. This is used during all maintenance and fueling times.

Low water lockout relay

Time delay relay



Timer (delay on break)

7-4 Combustion Air Blower and Damper Solenoid

The combustion air blower is a high static blower. It's purpose is to provide air to the primary and secondary burn chambers. It also pressurizes the firebox to force unburned fuel (smoke) through the coal bed and into the secondary burn chamber. The air intake is preset at the factory for optimum burn and does not require any adjustments.

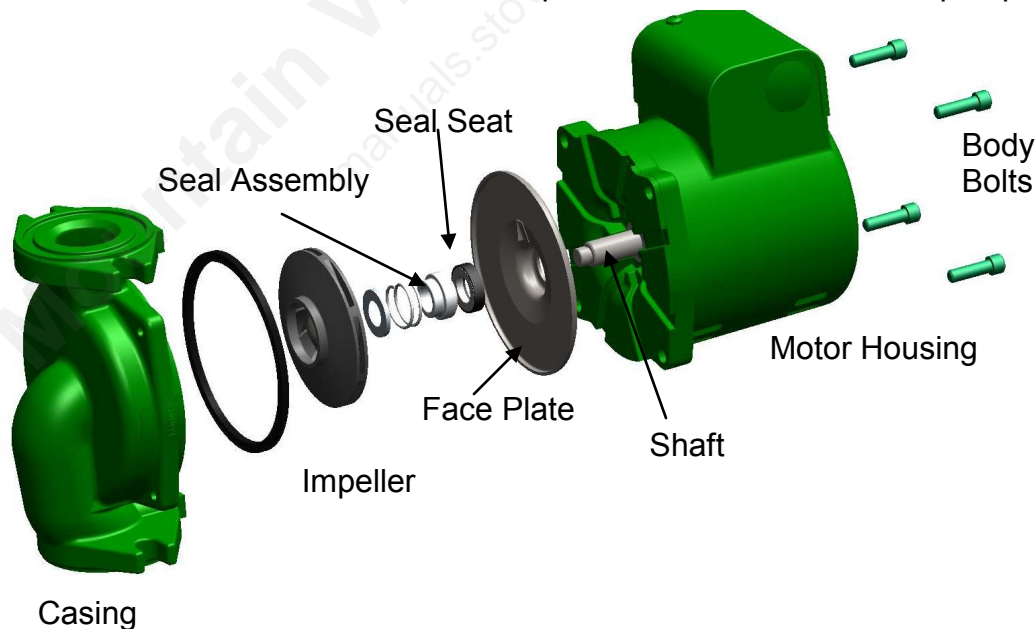
Attempts to over fire this heater to achieve more than rated outputs will void your warranty.



7-5 Destratification pump

The destratification pump circulates the heater water continuously to maintain a more consistent water temperature throughout the heater. For service of the destratification pump follow the steps below.

1. Disconnect power from pump by unplugging the pumps power cord.
2. Loosen the four body bolts that attach the motor housing to the casing. While supporting the motor, remove the four bolts and carefully remove the motor and impeller assembly from the casing.
3. To remove the impeller, insert a screwdriver into the motor ventilation slots to make contact with one of the rotor cooling fins. While holding the rotor in place with the screwdriver, turn the impeller clockwise to loosen and remove from shaft.
4. Remove Seal assembly from the shaft.
5. Remove the face plate from the motor housing. To remove the face plate gently pry it away from the housing.
6. Remove the old seal seat and cup. Lubricate the new cup with soapy water and install new parts in the face plate recess. Replace the face plate to its original position. Carefully tap the face plate into the recess in the motor housing.
7. Clean the Impeller shaft before installing the new seal.
8. Lubricate the impeller shaft with soapy water. Do not install new seal on a dry impeller shaft or damage to seal may result.
9. Slide the new carbon seal and spring assembly onto the shaft until it contacts the silicon-carbide seal seat.
10. While holding the rotor in place as in step 3, thread the impeller onto the shaft in a counter-clockwise direction until it stops. Check to make sure the pump will rotate.



7-6 Gaskets and Seals

All door seals used on the Hardy KB125 Heater are replaceable. The firebox door and the ash door both use a 1" silicone impregnated fiberglass weave rope. The recovery chamber door uses a 3/4" fiberglass weave rope and the bypass damper uses a 1" fiberglass flat weave gasket. Replacement gaskets and silicone can be purchased through your local Hardy dealer, should you need to locate a dealer call Hardy Mfg. Co., Inc at 601-656-5866. Allow fuel to burn completely out and let the heater cool down before any gasket replacement or maintenance is done.

To replace the door gaskets (See images 7-6-1, 7-6-2 & 7-6-3 on the following page):

1. Remove door from heater.
2. Strip old gasket out of door.
3. Clean gasket area with a wire brush.
4. Lay a bead of silicone into the gasket area.
5. Starting at one corner, work the appropriate size rope gasket material into the door going all the way around until the gasket touches the beginning end.
6. Trim any excess gasket.
7. Fill any gaps around the gasket with silicone and wipe off any silicone that sticks out past the gasket.
8. Allow the silicone to cure before remounting the door.

To replace the gasket for the bypass damper (See image 7-6-4 on the following page):

1. Remove the screws attaching the bypass handle trim pieces located above the firebox door.
2. Open the flue box door, located in the back of the heater.
3. Pull the bypass handle until it has reached the stopping bracket. Slowly lift upward on the bypass handle to clear the stopping bracket and continue to pull until bypass damper is completely open.
4. Strip off the old gasket.
5. Clean gasket area with a wire brush. The replacement gasket should be installed on the water jacket tank not on the bypass damper.
6. Lay a bead of silicone around the rectangle opening through the firebox where the gasket will be installed.
7. In a circular motion gently lay the flat gasket onto the bead of silicone, do not overlap the gasket. Trim any excess gasket.
8. While inside the flue box chamber push downward on the bypass damper until it touches the stopping bracket.
9. At the front of the unit raise the bypass handle to clear the stopping bracket. Slowly close the bypass damper which will compress the silicone and make the newly installed gasket seat properly to the bypass damper.
10. Re-install the bypass handle trim and close the flue box door.
11. Allow the silicone to cure before using heater.

7-6 Gaskets and Seals (continued)

The Draft blower has a cork gasket under the air intake lid. This is custom built gasket that allows a specific air intake, should you need a replacement gasket contact your local Hardy dealer.

To replace the draft blower gasket: (final gasket installation image 7-6-5)

1. Disconnect the linkage on top of the blower air intake lid by removing the clevis pin that has linkage attached to lid.
2. Raise the intake lid and scrape off the old gasket with a gasket scraper.
3. Along the outer edge of the blower intake opening put a bead of silicone.
4. Place a new gasket on top of the silicone and close the intake lid back down on top of the gasket. Make sure the gasket is touching the intake lid all the way around.
5. Reconnect the linkage to the intake lid.



7-6-1 Completed
Firebox Door Gasket Installation



7-6-3 Completed
Flue Box Door Gasket Installation



7-6-2 Completed
Ash Door Gasket Installation



7-6-4 Completed
Bypass Damper Gasket Installation



7-6-5 Completed
Blower Gasket Installation

7-7 Moisture content of wood

Seasoned wood is wood that has air dried until it's moisture content is between 15% and 30% moisture level. Seasoning hard wood can take six months to one year, depending on the climate you live in and the moisture content of the wood when it was cut. Winter cut wood usually has a moisture content around 50% while wood cut during the growing season will be much higher.

The best way to tell if your firewood is ready to use would be to use a moisture meter. To test a piece of firewood for it's moisture content, first split a seasoned log. Using the supplied moisture meter take sample readings across several locations of the split side and average the readings. If moisture level is between the recommended 15% to 30% levels your firewood is ready for use.

Steps to take moisture readings:

1. Remove "protective cap" from top of meter and attach to the bottom side.
2. Press and hold power switch to turn meter on.
3. If your meter has different modes set the mode switch to wood.
4. Insert the "measuring pins" as deep into the split side of the firewood as possible.
5. Read the values on the readout.
6. Take several different readings and average them.

7-8 Fuel Usage

Hardy Manufacturing recommends the use of clean seasoned oak hardwood. Any fuels other than this will result in poor and erratic heater performance. This heater is designed to use a minimum amount of fuel but as with any heater of this type fuel usage is based upon the required load and temperature requirements. Using seasoned hardwood instead of wood with high moisture content or softwood, will allow the unit to operate more efficiently at high burn rates, as well as low burn rates that are generally less efficient due to BTU consumption and heater cycles. The 8 hour output with higher heating value is rated at 69%. While using an annual efficiency rating a 61% was determined during testing. These ratings are the results of four different operational tests (weighted, not averaged) that determine heater characteristics during simulated real world use. Using a correctly rated heater for your application and seasoned hardwood will ensure you achieve a "sweet spot" of efficiency.

You may use fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire. Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.

It is recommended that any building serviced by this heater or adjacent to this heater be equipped with smoke detectors and carbon monoxide monitors as tests have indicated this heater produces a weighted average of 30.51 lbs/mmbtu CO that could potentially seep through improperly sealed building or other construction materials.

7-9 Ash Removal

Ashes must be removed from inside the heater on a routine basis. Excessive ash buildup inside the Firebox and recovery chambers will reduce heating efficiency. Remove ashes with the provided shovel. Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on the ground away from any combustible materials, pending final disposal. The ashes should be retained in the closed container until all cinders have thoroughly cooled.

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SECTION VIII

HEATER MAINTENANCE

The Hardy heater is designed for ease of operation and ease of service. There is a minimal amount of maintenance that has to be done for proper operation of your new unit to minimize visible emissions, and to achieve proper draft.

8-1 Weekly Maintenance

The following steps should be completed weekly to clean the KB125 Hardy Heater:

1. Burn down wood in the firebox to a coal bed.
2. Open the bypass damper (located on the left front side of the firebox door).
3. Open the firebox door.
4. Flip the blower switch off (located on the right side of the heater), light will turn on. This will begin the off delay timer that is set for 5 minutes.
5. Open the ash door and shovel the ashes out with the provided shovel. Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on the ground away from any combustible materials, pending final disposal. The ashes should be retained in the closed container until all cinders have thoroughly cooled.
6. Close the ash door.
7. Stir the coal bed in the firebox with the provided fire poker.
8. Poke out the holes in the grates, verifying the loose powder ash has been raked down through the grates with the provided fire poker.
9. Load the heater firebox with the amount of wood needed for your application.
(For Example: Using an average load of approximately 60,000 BTU/HR, the heater firebox should be loaded with approximately 105 pounds of wood with an average moisture content of 20% for an 8 hour burn.)
Wood should be loaded from front to back and stacked as uniform in the firebox as possible. DO NOT attempt to load wood across the width (crossways) of the firebox.
10. Close the firebox door.
11. Close the bypass damper.
12. In rear of heater place ash scoop into slot below flue box door.
13. Open flue box door on rear of heater.
14. Raise each turbulator approximately 6 to 8 inches and shake to remove ash.
15. Drop turbulators back into operating position.
16. Close flue door and remove ash scoop.
17. Flip the blower switch on, light will turn off. Keep in mind that the off delay timer could still be timing.

8-2 Monthly Maintenance

The following steps should be completed monthly to clean the KB125 Hardy Heater:

1. Burn down wood in the firebox to a coal bed.
2. Open the bypass damper (located on the front left side of the heater).
3. Open the firebox door.
4. Flip the blower switch off (located on the right side of the heater), light will turn on. This will begin the off delay timer that is set for 5 minutes.
5. Rake the coals around, pushing any coal or burning wood to the right hand side of the firebox with the provided fire poker.
6. Remove the powder ashes from the left side of the firebox with the provided shovel.
7. Move coal and burning wood to the left side of the firebox with the provided shovel.
8. Remove the powder ashes on the right side of the firebox with the provided shovel.
9. Open the ash door and remove the ashes with the provided shovel.
Ashes should be placed in a metal container with a tight fitting lid.
The closed container of ashes should be placed on the ground away from any combustible materials, pending final disposal. The ashes should be retained in the closed container until all cinders have thoroughly cooled.
10. Close the ash door.
11. In rear of heater place ash scoop into slot below flue box door.
12. Open flue box door on rear of heater.
13. Close the bypass damper.
14. Remove the tubulators out of each 2" tube.
15. Push the provided 1.75" flue brush down each hole.
16. Put the tubulators back in each 2" tube.
17. Close flue door.
18. Remove ash scoop.
19. Open the bypass damper.
20. Load the heater firebox with the amount of wood needed for your application.
(For Example: Using an average load of approximately 60,000 BTU/HR, the heater firebox should be loaded with approximately 105 pounds of wood with an average moisture content of 20% for an 8 hour burn.)
Wood should be loaded from front to back and stacked as uniform in the firebox as possible. DO NOT attempt to load wood across the width (crossways) of the firebox.
21. Close the firebox door.
22. Make sure all other doors are closed.
23. Close the bypass damper.
24. Flip the blower switch on, light will turn off. Keep in mind that the off delay timer could still be timing.

8-3 Extended Period Shut Down and Start Up

Extended Period Shut Down Procedure

1. Preplan when you want to shut your system down.
2. Allow the heater to operate until all fuel in firebox burn chamber is consumed and has cooled down.
3. Turn off power to the heater. Turn off system control switch; also turn off supply breaker from power source.
4. Perform normal monthly maintenance schedule (see monthly maintenance schedule section 8-2).

Start Up of Heater After Extended Shut Down.

1. Verify no creosote, ash or other debris is obstructing air flow into or out of the combustion air blower; air distribution tubes, secondary heat recovery tubulators, or smoke stacks.
2. Confirm all door gasket seals are clean and secured to form an air tight seal onto the door frame.
3. Refer to Section 6-1 & 6-2 instructions

Section IX APPENDIX

9-1 GENERAL TROUBLE SHOOTING GUIDE

WARNING:

**When working with electrical circuits, use caution to avoid electrical shock
Service on this heater should only be performed
by a qualified service technician.**

Complaint	Area of Trouble	Possible Cause	Corrective Action
Ground Fault Interrupter Receptacle Tripping	Ground Fault Interrupter Receptacle	<ol style="list-style-type: none"> 1. Moisture in receptacle 2. Receptacle not grounded properly. 	<ol style="list-style-type: none"> 1. Remove cover and check for moisture inside box. If moisture is present, use blow dryer to dissipate. 2. Remove cover and check the bare copper wire connected to the green screw for secure attachment. Test receptacle for proper operation.
	Forced air draft blower and damper solenoid.	Moisture or corrosion in electrical connections or windings	Check electrical connections and windings for moisture or corrosion. Clean or dry and then test for proper operation.
	Pump motor	Corrosion in motor electrical connections or windings	Check electrical connections, capacitor and motor winding for bad connections or corrosion. Clean, dry and then test for proper operation.

9-1 GENERAL TROUBLE SHOOTING GUIDE (continued)

Complaint	Area of Trouble	Possible Cause	Corrective Action
No Heat Main power supply and ground fault interrupter receptacle "OK" Water temperature is "COLD"	Blower switch.	Blower switch in off position	Flip blower switch to on position
	No Coal bed	Insufficient coal bed to maintain gasification	See Heater Operation section in manual
	Temperature Logic Controller	Temperature logic controller not working	Replace Temperature Logic Controller
	Damper & blower not operating	Low water indicated on Logic Controller has heater in lockout mode	Add water
	Damper solenoid	Defective damper solenoid	When voltage is applied to solenoid but it does not lift the lid off the intake to the forced air draft blower, replace the solenoid.
	Forced air draft blower motor	1. Defective electrical 2. Blower wheel clogged	1. Make sure all connections are secure, check capacitor 2. Clear blower wheel of any lint, ashes or creosote buildup.
	Ash bin	Ash buildup in ash bin	Clean out ash bin. Ash bin should be cleaned out as needed.
	Turbulators and recovery tubes	Ash and creosote buildup	Remove turbulators and brush out recovery tubes using supplied tube brush. Replace turbulators
	Bypass Damper	Bypass Damper in open position or leaking seal	Close Bypass Damper Replace seal

9-1 GENERAL TROUBLE SHOOTING GUIDE (continued)

Complaint	Area of Trouble	Possible Cause	Corrective Action
<p>No Heat</p> <p>Main power supply and ground fault interrupter receptacle "OK"</p> <p>Water temperature is "COLD"</p>	<p>Temperature Logic Controller</p>	<p>1. Power loss</p>	<p>1. Check for 120 vac on terminals 1 & 4</p> <p>2. Reset incoming power</p>
		<p>2. Bad water sensor</p>	<p>1. Check for low water light indicator on temperature logic controller, if so add water.</p> <p>2. Check to see if heater is full of water, if no add water.</p> <p>3. Change the water sensor if the heater is full of water but still detects a low water condition.</p>
		<p>3. Bad lockout relay</p> <p>4. Bad timer</p>	<p>1. Check for 120 vac coil power on terminals 1 & 7</p> <p>2. If power is present and relay is not energized replace relay</p> <p>1. Check for 120 vac coil power between time delay relay and terminal 1</p> <p>2. If power no is present after delayed time replace time delay relay</p>

9-1 GENERAL TROUBLE SHOOTING GUIDE (continued)

Complaint	Area of Trouble	Possible Cause	Corrective Action
<p>No Heat</p> <p>Blowing cold air in house</p> <p>Water temperature is "HOT"</p> <p>Anti stratification circulator is running</p> <p>Power "OK"</p>	Heat Zone Circulator	<ol style="list-style-type: none"> 1. Pump not operating 2. Inline valves closed/bad 3. Air trapped in plumbing 4. Scale deposits in hot water coil reducing water flow and restricting heat transfer 5. Air lock in hot water coil 	<ol style="list-style-type: none"> 1. See area of trouble: "Pump Operation" 2. Open or replace valves 3. Bleed lines if air is trapped (non pressured lines require pump to be running). 4. Disconnect the inlet and outlet of the hot water coil and clean with a scale remover solution. 5. Bleed air from hot water coil
<p>No Heat</p> <p>Main power supply and ground fault interrupter receptacle "OK"</p> <p>Anti stratification circulator is running</p> <p>Water temperature is "HOT"</p>	Pump Operation	Unplug pump and bypass relay by tying relay wires #4 and #6 together. Plug pump back in.	
	Circulator runs	<ol style="list-style-type: none"> 1. Defective 24 volt transformer 2. Defective wall thermostat 3. Defective pump relay 	<ol style="list-style-type: none"> 1. Usually located at existing central unit. If 120/230 volts is being supplied to primary side check for 24 volts on secondary. If 24 volts not present, replace transformer. 2. Check for 24 volts. Level the mounting base. Blow dust from sensing bimetal. Adjust heat anticipator. See owners manual connection instructions. 3. Check relay terminals #7 & #8 for 24 volts. If 24 volts is present, use ohm meter to check contacts. Connect ohm meter to terminals #4 & #6. If no reading replace relay.

9-1 GENERAL TROUBLE SHOOTING GUIDE (continued)

Complaint	Area of Trouble	Possible Causes	Corrective Action
No Heat	Pump Operation	Unplug pump and bypass relay by tying relay wires #4 and #6 together. Plug pump back in.	
<p>Main power supply and ground fault interrupter receptacle "OK"</p> <p>Water temperature is "HOT"</p>	Circulator does not run	<ol style="list-style-type: none"> 1. Defective pump cartridge 2. Defective pump capacitor 3. Defective pump motor winding 	<ol style="list-style-type: none"> 1. Unplug pump. Remove pump. Pull cartridge from pump and spin impeller by hand. If impeller will not spin, replace cartridge. 2. Use ohm meter. When the meter is connected to the capacitor, the needle should jump towards "0" ohms and slowly drift back to infinity. Replace if defective. 3. Disconnect the wires connected to the motor terminals to test the motor independent of electrical connections. Check for ground and continuity with ohm meter. The insulator of the windings should show no breakage. If it does, replace pump

9-1 GENERAL TROUBLE SHOOTING GUIDE (continued)

Complaint	Area of Trouble	Possible Causes	Corrective Action
Excessive Visual Emissions Improper Burning	Grates	Grates stopped up	Clear grate of ash buildup.
	Air intake	Damper blower clogged	Clean damper blower assembly.
	Turbulators	Turbulators clogged up	Remove turbulators and brush the recovery tubes with wire brush provided.
	Firebox	Lose of coal bed, ash build up, green or wet wood	Perform monthly maintenance in section 8-2.
	Forced air blower running but no draft	<ol style="list-style-type: none"> 1. Solenoid not lifting lid 2. Creosote buildup 	<ol style="list-style-type: none"> 1. Replace solenoid. 2. Clean combustion blower wheel 3. See excessive wood usage in section 9-1.
	Improper draft	<ol style="list-style-type: none"> 1. Creosote buildup 	<ol style="list-style-type: none"> 1. Make sure the air holes in the primary air tube are open. 2. Perform monthly maintenance in section 8-2.
	Air leakage	<ol style="list-style-type: none"> 1. Creosote buildup 2. Bypass damper leaking 3. Bypass damper not closing 	<ol style="list-style-type: none"> 1. Check and replace any bad gaskets. 2. Replace bypass damper gasket. 3. Clean creosote buildup off damper lid & gasket. 4. Replace closure sprint between outer hull and firebox as needed.

9-1 GENERAL TROUBLE SHOOTING GUIDE (continued)

Complaint	Area of Trouble	Possible Causes	Corrective Action
<p>Excessive wood usage</p> <p>or</p> <p>Overheating (boiling)</p>	<p>Heater water boils</p>	<ol style="list-style-type: none"> 1. Doors open 2. Defective door seals 3. Damper blower lid stuck open 4. Temperature Logic Controller defective 5. Water lines / connections leaking 	<ol style="list-style-type: none"> 1. Close all doors and make sure they are securely fastened. 2. If the seal is bad it will need replacing. Call your local Hardy Dealer for parts. See Owners Manual for replacing door seals. 3. Unplug blower motor. Check lid and blower for creosote buildup. Remove blower, disassemble, clean, and oil. 4. Replace Temperature Logic Controller. 5. Repair or replace all lines or connections that are leaking.
<p>Moisture In Firebox</p>	<p>Firebox</p>	<ol style="list-style-type: none"> 1. Initial or yearly start up 2. Green wood 3. To much wood in firebox 	<ol style="list-style-type: none"> 1. Firebox walls will sweat and water will run down sides, this should clear up in about a week. 2. Green wood will create moisture at any time. Green wood will also cause maintenance problems and excessive emissions. Only use seasoned hard wood. 3. Load only the amount wood need for your application.

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25 YEAR LIMITED WARRANTY

Hardy Manufacturing Co., Inc. (HARDY), hereby warrants that HARDY products shall be free from defect in material and workmanship under normal use according to the provisions and limitations herein set forth. HARDY warrants the Fire Box/Water Tank for five (5) years from the date of purchase by the original purchaser and pro rata thereafter according to the following schedule:

- * If the defect occurs to the tank during the sixth year, customer pays 20% of repair or replacement.
- * If the defect occurs to the tank during the seventh year, customer pays 35% of repair or replacement.
- * If the defect occurs to the tank during the eighth year, customer pays 50% of repair or replacement.
- * If the defect occurs to the tank during ninth year, customer pays 65% of repair or replacement.
- * If the defect occurs to the tank during the tenth year, customer pays 80% of repair or replacement.
- * If the defect occurs to the tank during the eleventh through twenty-fifth year, customer pays 85% of repair or replacement.

HARDY warrants catalytic combusters, if standard with furnace, for a period of three (3) years from the date of purchase by the purchaser.

HARDY warrants electrical and plumbing components for a period of one (1) year from date of purchase by the purchaser.

HARDY warrants all other Hardy Manufacturing products for a period of one (1) year from the date of purchase by the purchaser.

Limitations:

The obligation of HARDY for a breach of warranty shall be limited to products manufactured by HARDY 1) that are installed, operated and maintained according to HARDY's instructions, including Best Burn Practices, furnished and/or available to the purchaser upon request; 2) that are installed according to all other applicable Federal, State and local codes or regulations; and 3) that the purchaser substantiates products were defective in material and workmanship notwithstanding that they were properly installed and correctly maintained as set forth above and were not abused or misused.

The obligation of HARDY shall be limited to repairing or replacing the defective product, at the option of HARDY. HARDY shall not be responsible for any labor or cost removal or reinstallation of its products and shall not be liable for transportation costs to and from its plant in Philadelphia, Mississippi.

Use of parts for modification or repair of the product or any component part thereof not authorized or manufactured by HARDY specifically for such product shall void this warranty. Use of water in water tank that exceeds 45 ppm chloride content shall void warranty. Operation not in accordance with the provided "Installation and Operating Instructions" shall void the warranty.

This warranty shall not apply to any damage to or defect in any of HARDY's products that is directly or indirectly caused by 1) force majeure, Act of God or other accident not related to an inherent product defect, or 2) abuse, misuse or neglect of such product, including any damage caused by improper assembly, installation, adjustment, service, maintenance, or faulty instruction of the purchaser.

Other than as expressly set forth herein above, HARDY makes no other warranty, express or implied, with respect to any of HARDY's products including but not limited to any warranty of merchantability or fitness for a particular purpose.

And in no event shall HARDY be responsible for any incidental or consequential damages of any nature suffered by purchaser or any other person of entity caused in whole or in part by any defect in any HARDY's products. Any person or entity to whom this warranty extends and who claims breach of warranty against HARDY must bring suit thereon within one year from the date of occurrence of such breach of warranty or by forever barred from any and all legal or other remedies for such breach of warranty.

HARDY is not responsible for and hereby disclaims any undertaking, representation or warranty made by any dealer, distributor or other person that is inconsistent with or in any way, more expansive than the provisions of this limited warranty. The return of warranty registration, with chloride test strip, to manufacturer is required to secure warranty validation.

This warranty grants specific legal rights and shall be read in conformity with applicable state laws. In some jurisdictions, the applicable law mandates warranty provisions that provide greater legal rights than those provided for herein. In such case, this limited warranty shall be read to include such mandated provisions and any provision herein that is prohibited or unenforceable in any such jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceable without invalidating the remaining provisions and without affecting the validity or enforceability of such provision in any other jurisdiction(s).

Effective Date: 1-1-2008 • Revision Date: 2/26/2015

All warranty claims are handled through local Hardy Dealers.

Contact Hardy Mfg. Co., Inc. at 601-656-5866 to obtain contact information on local Hardy Dealers.

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