



**INSTALLATION AND
OPERATING INSTRUCTIONS**

FOR

**THE HARDY
OUTSIDE WOOD
BURNING HEATER**

Model - H2 & H4

**HARDY MANUFACTURING
COMPANY, INC.**

12345 ROAD 505

PHILADELPHIA, MS 39350

PHONE: (601) 656-5866

FAX: (601) 656-4559

www.hardyheater.com



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INTRODUCTION

Thank you for purchasing the original all stainless steel Hardy Outside Woodburning 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 Woodburning 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) A tube of silicon (located in the firebox for shipping)
- (4) Smoke stack and condenser tank stack both with trim (located in the firebox for shipping)
- (5) H2 has two I-beams and three cast iron grates (located in the firebox)
H4 has one I-beam, two channels and six grates (located in the firebox)
- (6) Shovel (located in the firebox for shipping)
- (7) Stainless steel panel and insulation that will be located between the firebox door & ash door after installation of the heater
- (8) Stainless steel flame baffle (15" x 10"). Only for use on Hardy model H4 180,000 BTU heater

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 Heater.

Sincerely,

Frank L. Moore
President
Hardy Manufacturing Company, Inc.

(MODEL H2 & H4)

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.

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(MODEL H2 & H4)

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:

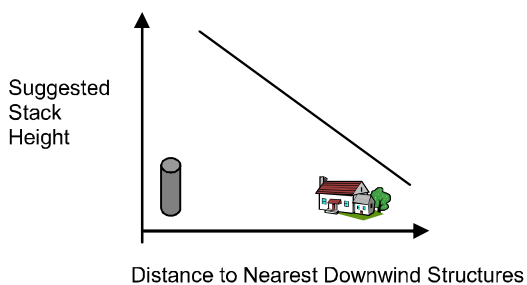
- Observe all safety stickers on the unit.
- This unit must be wired by a qualified electrician in accordance with the National Electrical Code.
- Never use any type of petroleum product, petroleum based product, charcoal starter, lighter fluid, or any other flammable accelerant to start your unit.
- Always open the ash door (bottom) before you open the firebox door (top).
- Never leave the doors open, always latch the doors 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 Manufacturing Company.

Failure to heed this warning or any additional warnings on the unit may result in a accident causing personal injury.

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OUTDOOR FURNACE BEST BURN PRACTICES

1. Read and follow all operating instructions supplied by the manufacturer.
2. **FUEL USED:** Only those listed fuels recommended by the manufacturer of your unit. 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.
3. **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.
4. **STARTERS:** Do not use lighter fluids, gasoline, or chemicals.
5. **LOCATION:** It is recommended that the unit be located with due consideration to the prevailing wind direction.
 - If located 50 feet or less to any 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 50 but no more than 100 feet to any residence, it is recommended that the stack be at least 75% of the height of the eave line of that residence, plus an additional 2 feet.
 - 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.



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



OUTDOOR FURNACE MANUFACTURERS CAUCUS

THE HARDY OUTSIDE WOODBURNING HEATER

How does an outside heater heat my home?

The Hardy Outside Woodburning 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 basically 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 180 degrees or less.

How does THE HARDY heat water for household use?

A cold water supply line goes to the outside heater. This water line also keeps the water tank on the heater full. The heater only takes on water as it evaporates. This water line is connected to a heat exchanger which lies inside the water reservoir of the outside heater. The pressure on the supply line forces water through the heat exchanger when you open a hot water faucet inside your home. As this water passes through the heat exchanger it picks up the heat from the hot water that surrounds it and then goes to the cold side of your water heater. This means your water heater will take on hot water. This water is not contaminated with the water that passes through your heater and coil to heat your house.

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 two thermostats are installed so that if the outside wood heater is not in operation, your existing unit will automatically take over to maintain your household temperature. The wall thermostat which regulates the heat from the outside heater performs two functions; when it senses your need for heat according to your temperature setting, it turns the water pump on to circulate the hot water through the coil and also 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 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 intake is automatically opened and remains open until such temperature is attained.

Where should an Outside Wood Burning Heater be located?

The outside unit should be located at least 10 feet from your home so that all fire danger is removed from your home. The unit may be installed as much as 100 feet away and still heat your house and hot water. If the unit is located more than 100 feet away, you may experience some heat loss on the water going to your hot water heater. Locate the outside wood heater where it will be convenient for refueling and wood storage. All water and power lines are installed underground between the house and the outside wood heater.

(MODEL H2 & H4)

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SECTION I

GENERAL INFORMATION

Section I 1-1 Specifications

Type of fuel – Wood

For outdoor use only

US Patent No. 4,360,003

Underwriters Laboratories Inc. Listed – 84E4

Electrical Rating 115 VAC/ 60 HZ / 1P
MFS-15 AMP, MCA-15 AMP

Clearance to Combustibles

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

Water Capacity

| |
|---|
| H2 – Holds Approximately 100 Gallons of Water |
| H4 – Holds Approximately 130 Gallons of Water |

HEATER DIMENSIONS

| Description | Width | Depth | Height | Weight |
|------------------|-------|-------|--------|----------|
| H2 – 120,000 BTU | 30" | 52 ½" | 59 ½" | 650 lbs. |
| H4 – 180,000 BTU | 40" | 52 ½" | 59 ½" | 850 lbs. |

FIREBOX SIZES

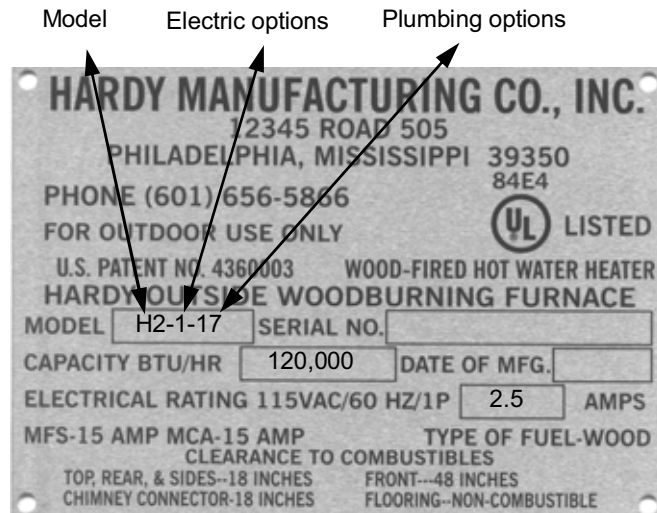
| Description | Width | Depth | Height |
|------------------|-------|-------|---------------------|
| H2 – 120,000 BTU | 24" | 32" | 36" + 8" for Grates |
| H4 – 180,000 BTU | 34" | 32" | 36" + 8" for Grates |

Section I 1-1 Specifications (continued)

On the front of your heater there is a nameplate. Along with other information you will find the model number of your heater. This model number tells you what your heater rating is and what electrical and plumbing options your heater has, use the following list to determine this. The first section determines the rating of your heater. The second section determines electrical options. The last section determines the plumbing options. For example heater model number **H2-1-17**. The **H2** designates that you have a 120,000 BTU heater. The **1** in the second section designates that you have a standard pump. The **1** in the last section designates that you have standard domestic hot water. The **7** in the last section designates that you have extra ports on your heater.

Heater Rating

H2 – 120,000 BTU
H4 – 180,000 BTU



Electrical Options

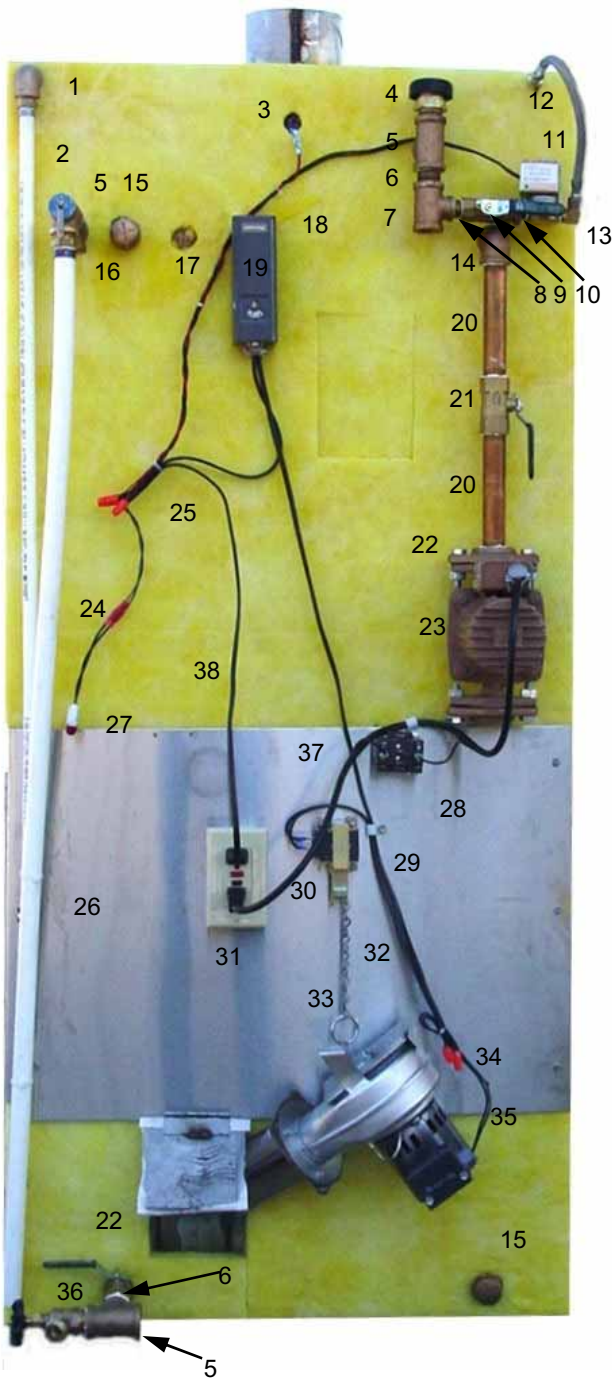
- 0 – Without a Pump
- 1 – Standard Pump
- 2 – 2nd Pump & Relay
- 3 – 3rd Pump & Relay
- 4 – Without a Pump for Heating System and with Circulating Domestic Hot Water
- 5 – With a Standard Pump for Heating System and with Circulating Domestic Hot Water
- 6 – With 2nd Pump and Relay and with Circulating Domestic Hot Water
- 7 – With 3rd Pump and Relay and with Circulating Domestic Hot Water

Plumbing Options

- 0 – Without Domestic Hot Water
- 1 – Standard Domestic Hot Water
- 2 – With 2nd Heat Exchanger (2nd Domestic Hot Water or Swimming Pool Heat Exchanger)
- 3 – With 3rd Heat Exchanger (2nd Domestic Hot Water and Swimming Pool Heat Exchanger)
- 4 – Extra 60' copper in Domestic Hot Water
- 5 – Extra 60' copper in Domestic Hot Water and Swimming Pool Heat Exchanger
- 6 – 1" Heat Exchanger – 2 – 60' Rolls 3/4" Copper Manifold to 1" Ports
- 7 – Extra Ports, 1/2", 3/4", 1", etc.

Section I 1-2

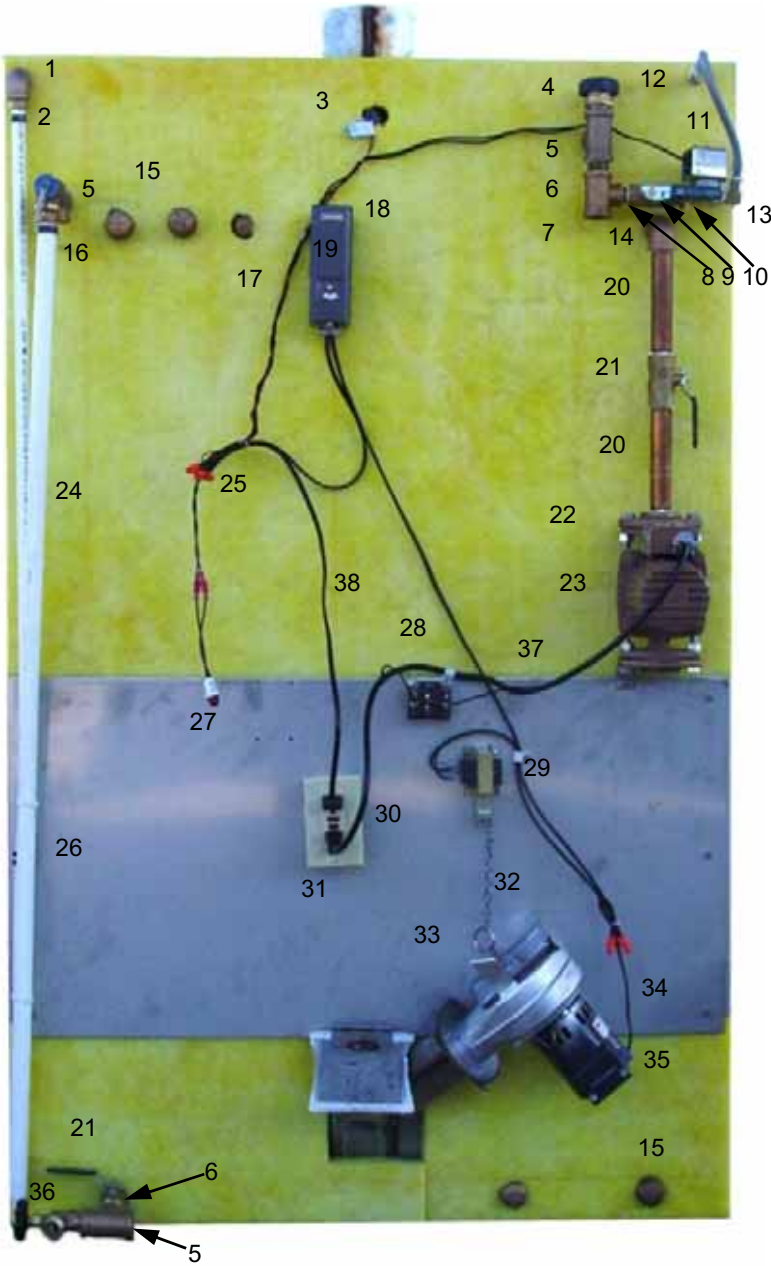
Heater Component Parts (Model H2)



| Legend | Part No. | Description |
|--------|----------|--------------------------------|
| 1 | 600.10 | 1/2" Brass Elbow |
| 2 | 810.00 | 1/2" Overflow Pipe |
| 3 | 1100.27 | Low Water Switch |
| 4 | 607.37 | Vacuum Relief Valve |
| 5 | 602.16 | 3/4" Brass Tee |
| 6 | 603.40 | 3/4" x Close Brass Nipple |
| 7 | 602.32 | 3/4"x3/4"x1/2" Brass Tee |
| 8 | 603.08 | 1/2" x Close Brass Nipple |
| 9 | 607.00 | 1/2" Brass Ball Valve |
| 10 | 605.00 | 1/2" x 1/4" Brass Bushing |
| 11 | 1100.00 | Electric Solenoid Valve Assy. |
| 12 | 400.73 | 3/8 OD X 10 IN. Pex Fill Line |
| 13 | 600.55 | 3/8 comp. X 1/4" mpt Elbow |
| 14 | 600.30 | 3/4" Brass Elbow |
| 15 | 604.32 | 3/4" Brass Cap |
| 16 | 607.30 | T&P Valve |
| 17 | 604.16 | 1/2" Brass Cap |
| 18 | 2000.48 | Well Fitting |
| 19 | 2000.08 | Honeywell Hi-temp Thermostat |
| 20 | 603.32 | 3/4" x 6" Brass Nipple |
| 21 | 607.12 | 3/4" Brass Ball Valve |
| 22 | 502.40 | 3/4" Bronze Flange |
| 23 | 502.08 | Taco 009 Brz Pump w/Power Cord |
| 24 | 810.10 | 3/4" T&P Relief Pipe |
| 25 | 2004.40 | Wire Connectors |
| 26 | 810.15 | 5/8" Clamp |
| 27 | 1100.30 | Low Water Light |
| 28 | 2000.52 | Relay |
| 29 | 2001.00 | Dormeyer Damper Solenoid |
| 30 | 2004.00 | GFCI Receptacle |
| 31 | 2004.16 | Receptacle Box 2 1/8" deep |
| 32 | 3200.12 | Jack Chain |
| 33 | 3200.16 | Key Ring |
| 34 | 2002.16 | 100 CFM Blower with Damper Lid |
| 35 | 2004.28 | Plastic Romex Connector |
| 36 | 607.42 | 3/4" Boiler Drain |
| 37 | 2004.04 | 3' 3 Wire Power cord |
| 38 | 2004.08 | 8' 2 Wire Power cord |

Section I 1-3

Heater Component Parts (Model H4)



| Legend | Part No. | Description |
|--------|----------|--------------------------------|
| 1 | 600.10 | 1/2" Brass Elbow |
| 2 | 810.00 | 1/2" Overflow Pipe |
| 3 | 1100.27 | Low Water Switch |
| 4 | 607.37 | Vacuum Relief Valve |
| 5 | 602.16 | 3/4" Brass Tee |
| 6 | 603.40 | 3/4" x Close Brass Nipple |
| 7 | 602.32 | 3/4"x3/4"x1/2" Brass Tee |
| 8 | 603.08 | 1/2" x Close Brass Nipple |
| 9 | 607.00 | 1/2" Brass Ball Valve |
| 10 | 605.00 | 1/2" x 1/4" Brass Bushing |
| 11 | 1100.00 | Electric Solenoid Valve Assy. |
| 12 | 400.73 | 3/8 OD X 10 IN. Pex Fill Line |
| 13 | 600.55 | 3/8 comp. X 1/4" mpt Elbow |
| 14 | 600.30 | 3/4" Brass Elbow |
| 15 | 604.32 | 3/4" Brass Cap |
| 16 | 607.30 | T&P Valve |
| 17 | 604.16 | 1/2" Brass Cap |
| 18 | 2000.48 | Well Fitting |
| 19 | 2000.08 | Honeywell Hi-temp Thermostat |
| 20 | 603.32 | 3/4" x 6" Brass Nipple |
| 21 | 607.12 | 3/4" Brass Ball Valve |
| 22 | 502.40 | 3/4" Bronze Flange |
| 23 | 502.08 | Taco 009 Brz Pump w/Power Cord |
| 24 | 810.10 | 3/4" T&P Relief Pipe |
| 25 | 2004.40 | Wire Connectors |
| 26 | 810.15 | 5/8" Clamp |
| 27 | 1100.30 | Low Water Light |
| 28 | 2000.52 | Relay |
| 29 | 2001.00 | Dormeyer Damper Solenoid |
| 30 | 2004.00 | GFCI Receptacle |
| 31 | 2004.16 | Receptacle Box 2 1/8" deep |
| 32 | 3200.12 | Jack Chain |
| 33 | 3200.16 | Key Ring |
| 34 | 2002.28 | 130 CFM Blower with Damper Lid |
| 35 | 2004.28 | Plastic Romex Connector |
| 36 | 607.42 | 3/4" Boiler Drain |
| 37 | 2004.04 | 3' 3 Wire Power cord |
| 38 | 2004.08 | 8' 2 Wire Power cord |

SECTION II

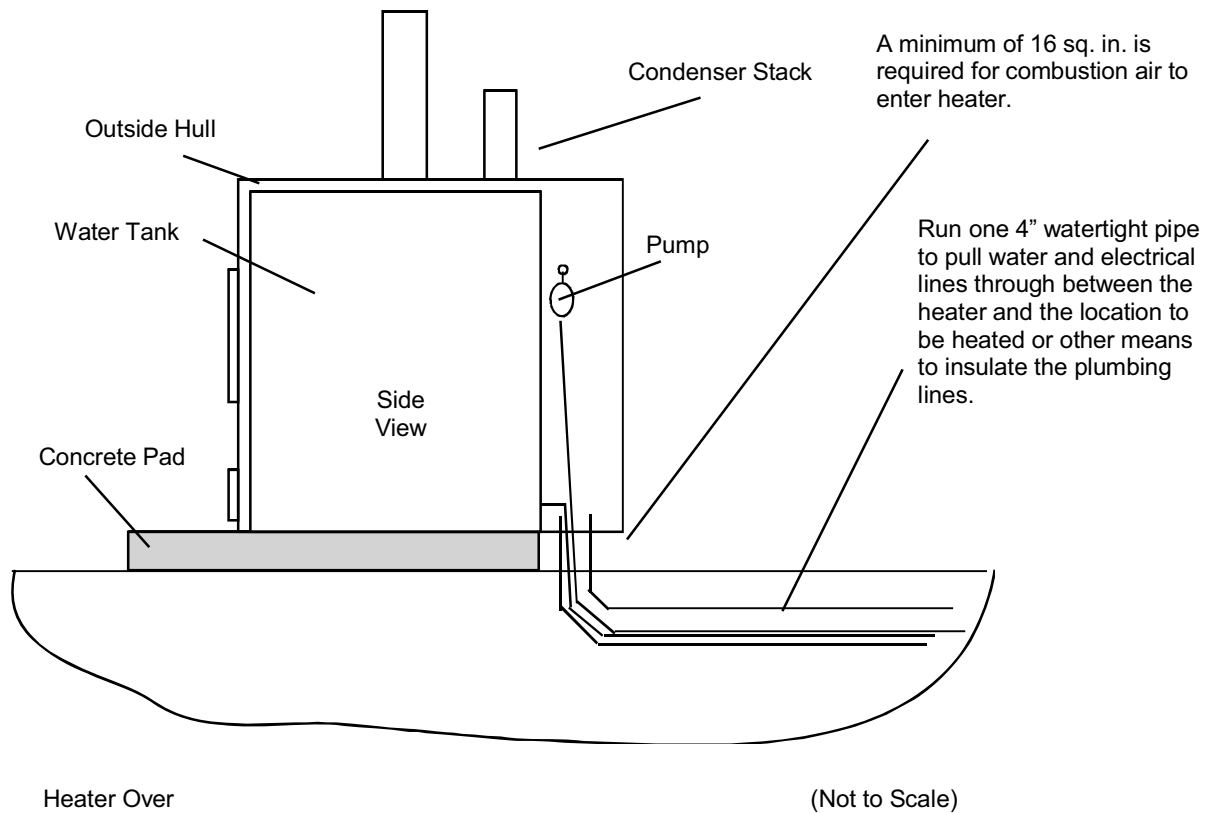
INSTALLATION OF HEATER

Section II 2-1 Location of Heater

The Hardy Heater is designed to set outside the building to be heated. The unit must be located a minimum of 10 feet from the building. The unit should be installed upon a concrete pad. There are two typical options that we recommend.

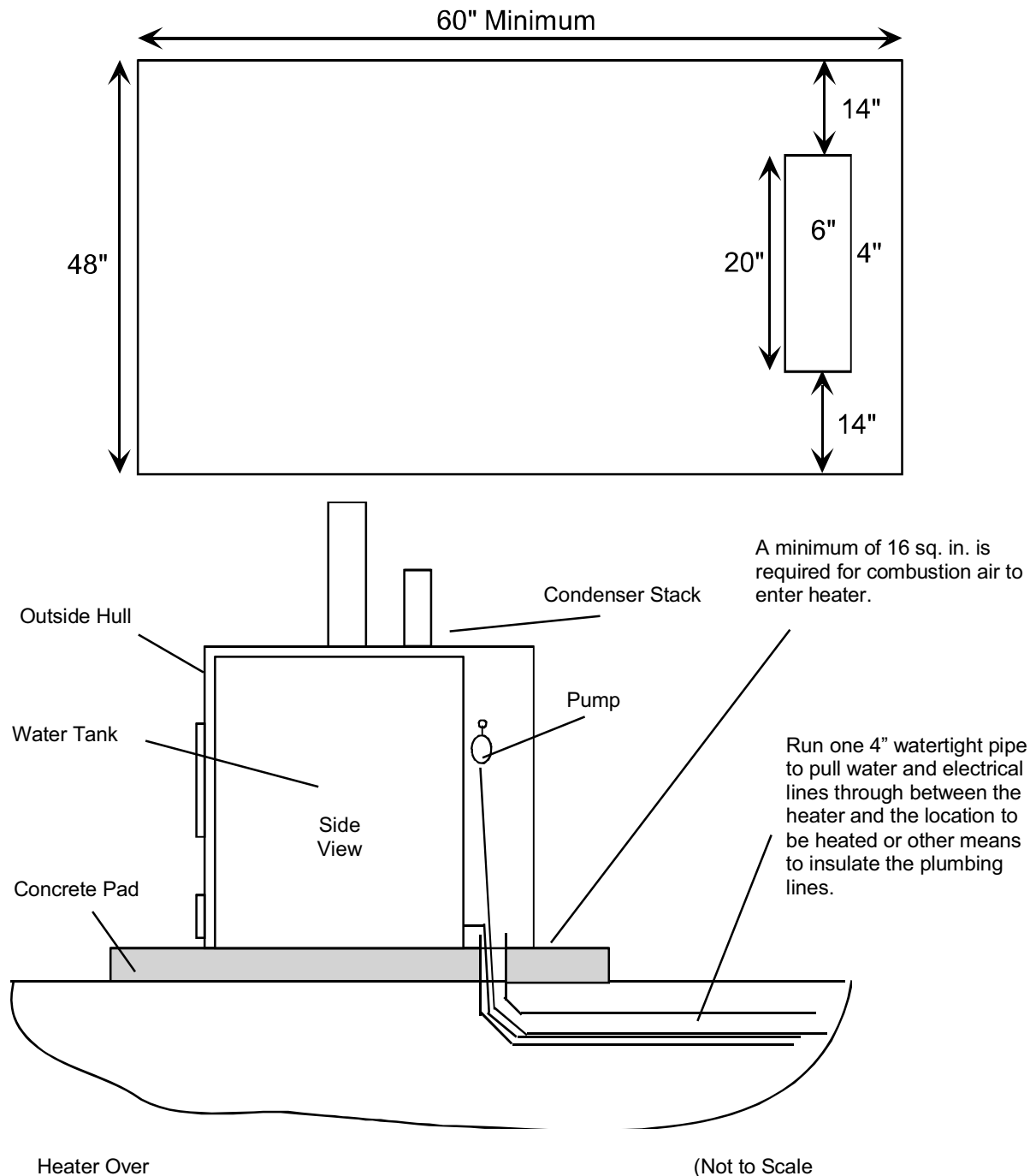
Option 1 has the unit installed on concrete pad with the rear of the water tank flush with end of the pad. We recommend the pad to be 48" wide and 53" long minimum. If you add extra length it will allow ample concrete in front of the heater for loading wood and removing ashes. The space between the rear of the unit and the outside cover will allow a 4" watertight pipe or other means to insulate the plumbing and electrical lines to run directly into the ground. The outside cover can be removed by lifting it off the water tank on all four corners. This will allow you easy access for the connection of the plumbing and electrical lines.

Please see the illustration below for details.



Section II 2-1 Location of Heater (continued)

Option 2 illustrates the unit installed on a concrete pad with cut out in the pad for plumbing and electrical connects to run through. We recommend this pad to 48" wide by 60" minimum long. If you add extra length it will allow ample concrete in front of the heater for loading wood and removing the ashes. The 4" watertight pipe or other means to insulate plumbing that runs underground exits through this cut out to allow connections to the unit. The unit sits on the pad with the rear of the water tank flush or even with the front side of the cutout. The outside cover of the heater can be removed by lifting it from the water tank on all four corners. This will allow you easy access for the plumbing and electrical connections.



Section II 2-2 Hull Removal

After placing your new Hardy Heater upon the concrete pad, you are ready to continue the installation process. There are two methods to gain access to the rear of the heater to make plumbing and electrical connections.

The first and easiest method is to remove the screw holding the back door panel in place. The door is easily removed by lifting up on the handle and taking it out. With the back door removed, using a 5/16" wrench, remove the 8 metal screws that are located below the back door. There are four on each side that hold the panel in place. After the screws are removed, the panel should come out easily and allow access to the bottom of the unit to make plumbing and electrical connections.

The second method is the removal of the entire cover. With the back and the rectangular piece of stainless and insulation between the fire box and ash door removed, the outside cover can be lifted up and off as seen in the picture. To replace the cover simply repeat these steps in reverse order.



Rear View



Front View

Section II

2-3 Set-Up of Grates

First open the firebox door and remove everything from inside of the heater except the two I-beams and three grates. Lay the two I-beams up on the edge and over against the tabs as shown in the picture below. The grates can now be placed on the I-beams in line and side to side. The picture below shows the proper way for grates to be installed.

These grates are designed to be turned over if they warp.

On Hardy H4 models, there is a stainless steel flame baffle (15" x 10"). This flame baffle is inserted in the firebox across the 3/4" stainless steel pipes located directly below the smoke stack.

3 Grate Setup for H2



6 Grate Setup for H4



Section II

2-4 Location of Plumbing and Electrical Lines

The plumbing and electrical lines for your unit must be installed underground. The water lines must be buried below the frost line to prevent freezing. The depth of the trench varies to different regions of the country. Be completely sure about the correct depth before the plumbing lines are installed underground.

A trench must be dug wide enough to accommodate a 4" watertight pipe or other insulation means. All plumbing and electrical lines should be run inside the 4" watertight pipe or other insulation means for a standard installation. If more than 1 zone is to be heated or more than 1 location is to be heated then an additional pipe, or insulation must be installed underground.

This pipe will run from the rear of the unit to the location to be heated. Inside the 4" watertight pipe will be the 4 water lines, thermostat wire, and electrical supply wire. The listing below describes each line and their function.

1. One cold water supply line.
2. One hot water return line to water heater.
3. One water supply line to heating system.
4. One water return line from heating system
(All of these must be at least 3/4" pipe and may require 1" because of longer distances or some hydronic applications.)
5. One 3 conductor thermostat wire.
6. One #12/2 W/G UF underground Romex wire.

If more than one location is to be heated, a second 4" or single 6" watertight pipe or other insulation means will need to be installed underground for the water lines and thermostat wires of the second location.



Section II**2-5 Connection of Power to Heater**

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

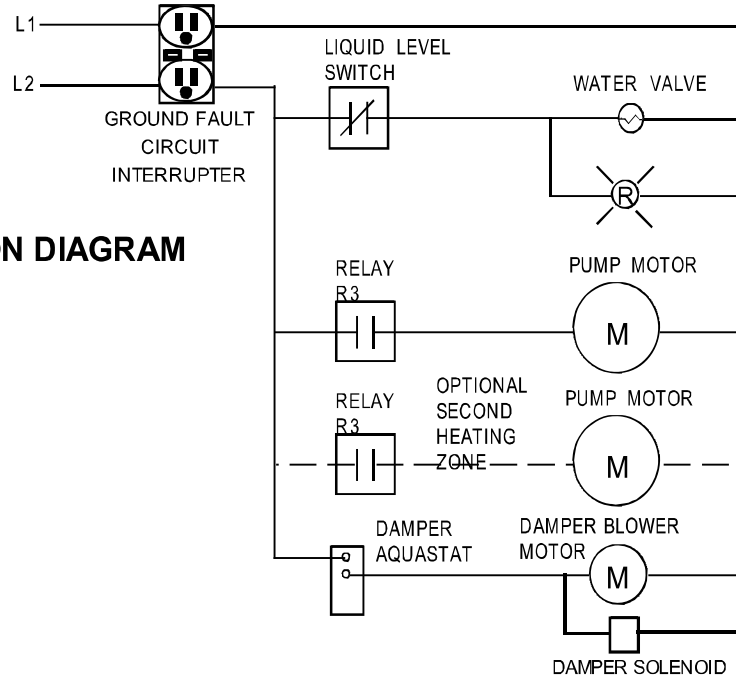
- 1 The #12/2 W/G UF wire is run from the electrical system in the house through the 4" watertight pipe or other insulation means to the heater.
- 2 This wire will connect to the Ground Fault Circuit Interrupter (GFCI) on the back of the heater.
- 3 Install a Romex Connector in the bottom of the electrical makeup box, and insert Romex wire through this connector.
- 4 Connect the black wire to the brass screw on the line side of the GFCI receptacle.
- 5 Connect the white wire to the silver screw on the line side of the GFCI receptacle
- 6 Connect the bare copper wire to the green screw on the GFCI receptacle.
- 7 After the wiring is complete, and power is applied, check the receptacle with a circuit tester to determine if the polarity is correct, and to make sure the ground is connected. Press the test button on the GFCI receptacle. The reset button should pop out indicating the interrupter is operating correctly. Push the reset button back to restore the GFCI receptacle to normal operation. This test should be done monthly to insure safe operation of the heater.
- 8 If moisture is allowed into the Ground Fault Circuit Interrupter box, it will have a tendency to trip unwarranted. Measures should be taken to keep the box dry.

Section II

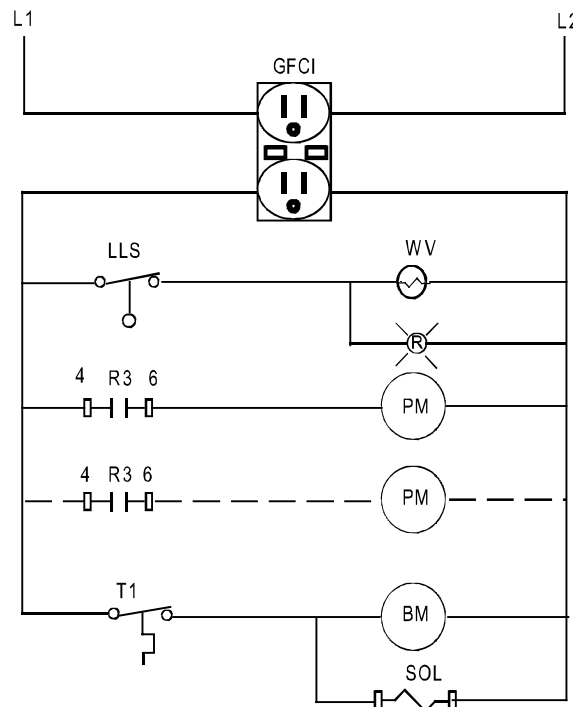
2-6 Wiring Diagrams (H2)

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

CONNECTION DIAGRAM



SCHEMATIC DIAGRAM



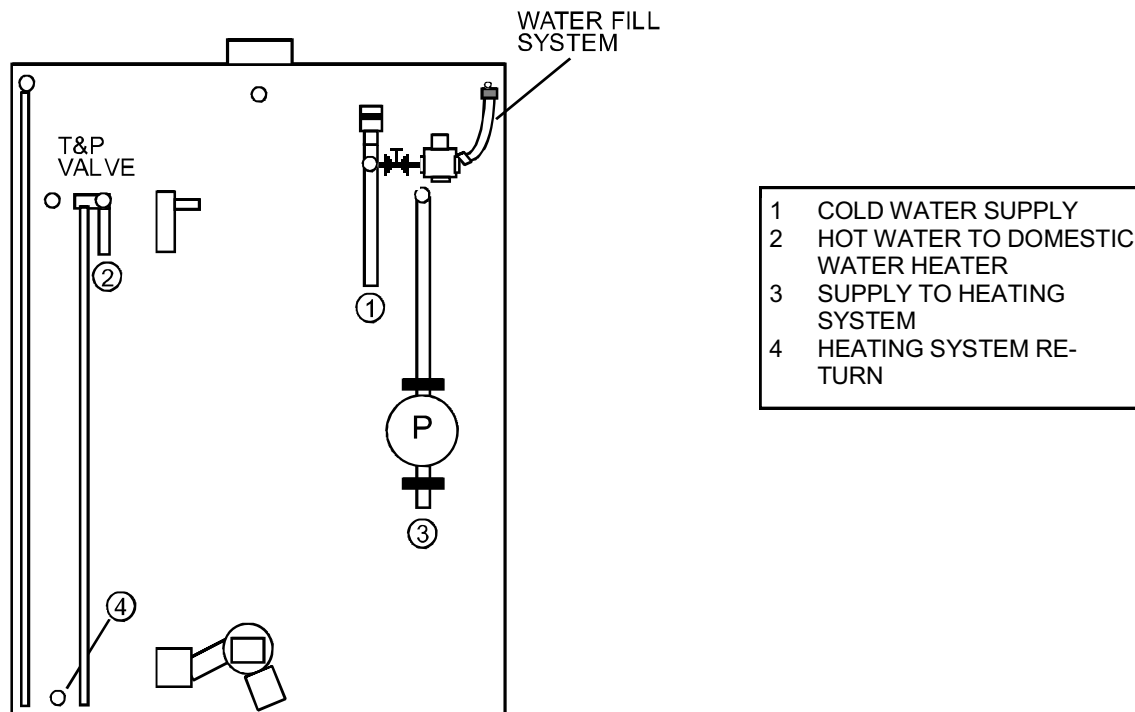
LEGEND

- GFCI GROUND FAULT CIRCUIT INTERRUPTER
- LLS LIQUID LEVEL SWITCH
- WV WATER SOLENOID VALVE
- R3 CIRCULATOR PUMP RELAY
- PM WATER CIRCULATOR PUMP
- T1 DAMPER AQUASTAT
- BM DAMPER BLOWER MOTOR
- SOL DAMPER SOLENOID
- R LOW WATER LIGHT

Connection to Heating System

1. The 3/4" pipe that will supply your heater with fresh water connects to the 3/4" brass tee on the upper right hand side of the heater (noted by # 1 diagram). We recommend installing a valve in your supply line for maintenance considerations.
2. The 3/4" pipe that will supply the domestic hot water is connected to 3/4" brass tee located in the upper left hand side of the heater. There is a drain line from the Temperature and Pressure relief valve (pop-off) down to bottom of the hull. This line must never be plugged or capped.
3. The pipe that will supply the heating system is connected to the under side of the pump. This pump is located on the right hand side of the heater (noted by # 3 in diagram.)
4. The pipe that will carry the return water from the heating system is connected to the 3/4" brass tee located at the bottom left hand corner of the heater (noted by # 4 in diagram).

Water pipes must be designed for hot water service (ex. Copper, cpvc, or Pex.) Pipes should be installed in a 4" watertight 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.



SECTION IV

CONNECTION TO HYDRONIC HEATING SYSTEMS (BASEBOARD)

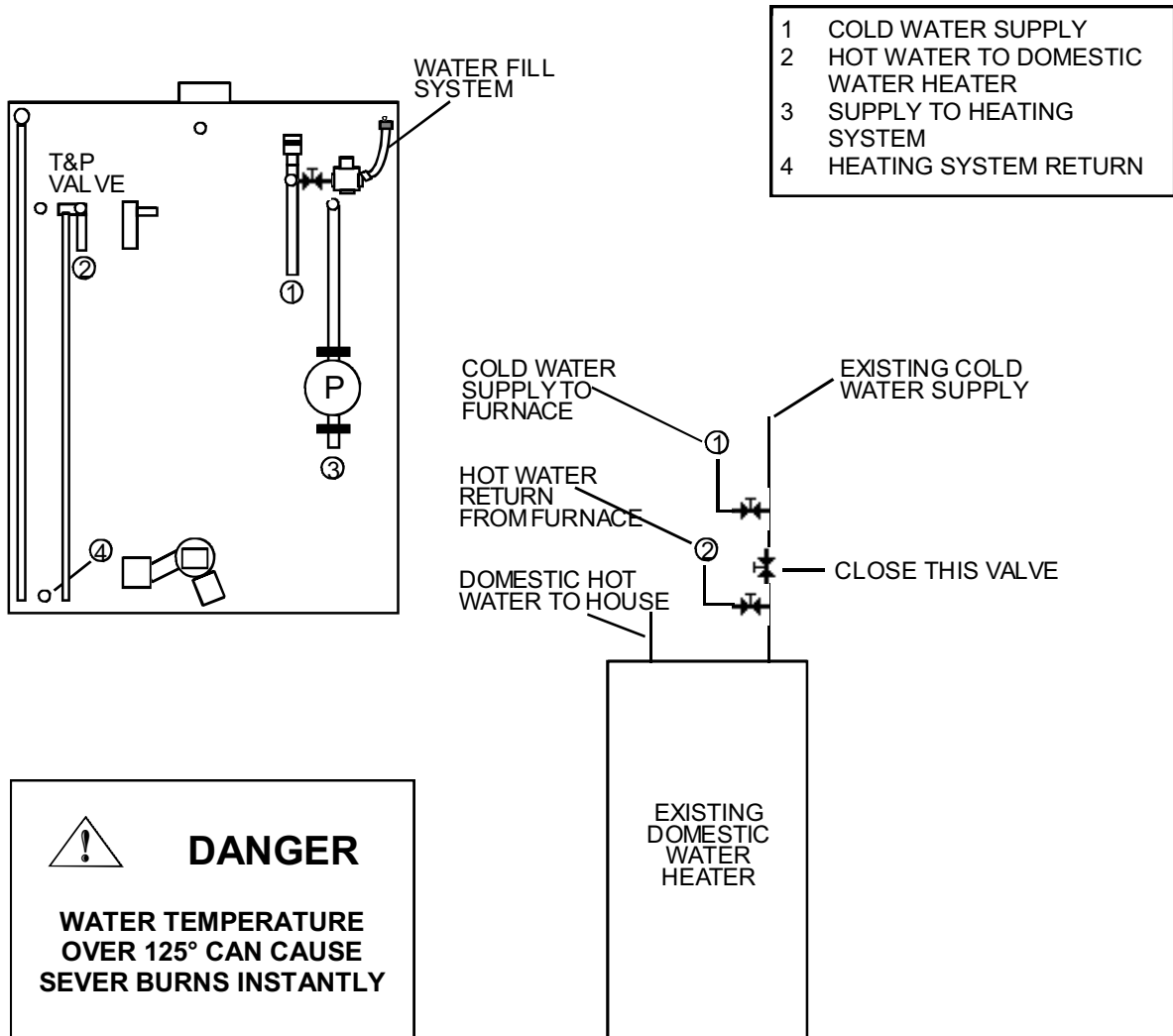
Section IV 4-1 Connection to Hydronic System with 24 Volt Transformer

**ONE PUMP ON THE WOOD HEATER
USING HONEYWELL RELAY R8222D.
This unit must be wired by a qualified electrician in
accordance with the National Electrical Code.**

- 1 Run two conductor thermostat wire from the wood heater to the existing heating system in the house. This wire must be rated for underground use or be run inside a pvc pipe. The colors normally used are red and white.
- 2 At the heater, connect the white wire to terminal 8 of the water pump. (R-3)
- 3 Connect the red wire to terminal 7 of the water pump relay. (R-3)
- 4 In the house, locate the existing pump relay. Connect the red wire of the two conductor thermostat wire to the coil of the pump relay that is fed by the existing thermostat.
- 5 Connect the white wire of the two conductor thermostat wire to the coil of the pump relay on the side that is fed from the common side of the transformer.

Connection to Existing Water Heater

1. The cold water supply to your heater can be picked up from the cold water line supplying your existing water heater. This can be accomplished by inserting a tee into the existing cold water line. Directly below this tee you will need to insert a valve to stop cold water from entering the water heater. Another cold water supply may be used that is closer or more accessible to the heater.
2. The hot water supply line from the heater is connected into the existing water heater by teeing it into the cold water supply line below the valve that was installed in step 1. If you picked up your cold water supply elsewhere, then a valve will need to be inserted above the tee for the hot water supply.



When you are ready to replace the cover, the hull can slide down over the heater. Make sure that the condenser tank and smoke stack opening come through the outside cover.

The space between the smoke stack opening and outside cover will need a bead of silicon applied to fill any openings. The condenser tank stack will also need to be sealed in this manner. The application of silicon to these openings is illustrated by the picture and diagrams on the next page.

Inside the firebox and should be a rectangular piece of insulation and stainless steel. The insulation fits between the firebox and ash doors. The stainless steel slides between the two doors to protect the insulation.

After these steps, you can install the smoke stack which is a three foot section of pipe. The trim should be slid down the smoke stack until it sits on the outside cover.

The condenser stack must also be installed in the condenser stack opening. The trim must also sit snugly upon the outside cover.

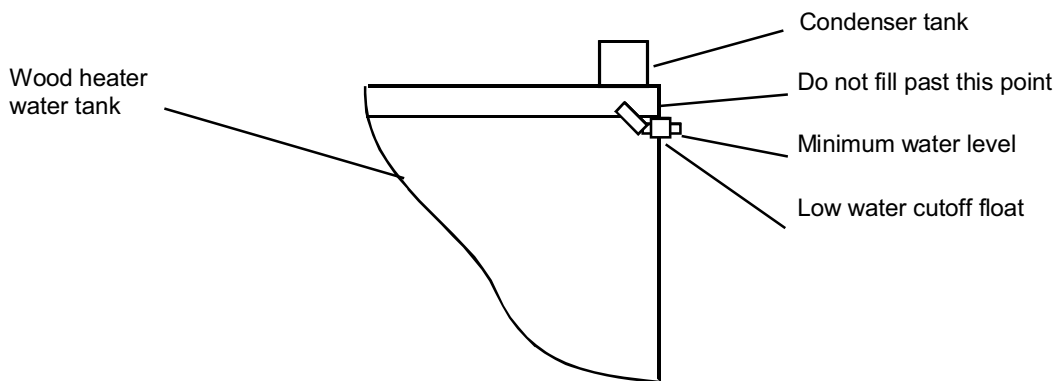
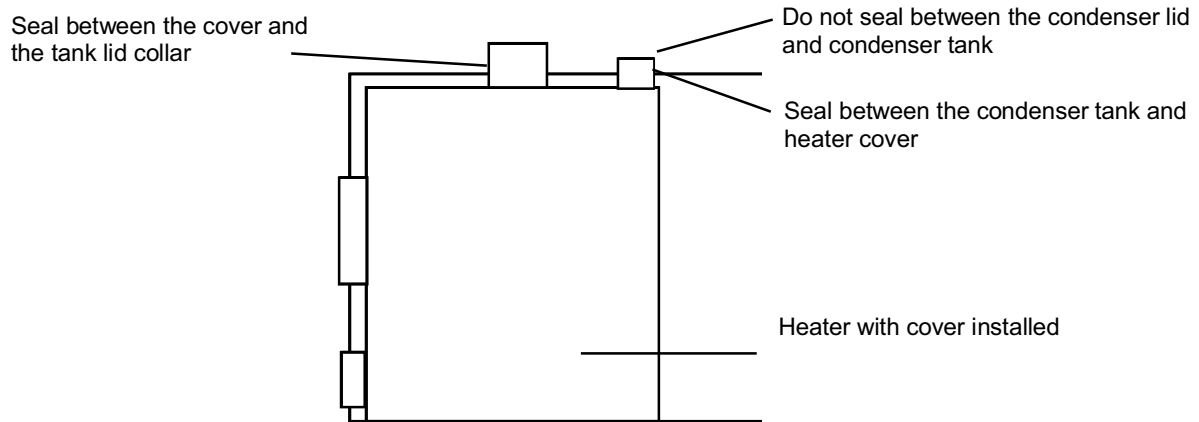
DO NOT SEAL THE CONDENSER TANK TO THE CONDENSER TANK LID. THIS IS THE WATER TANK VENT AND MUST NOT BE SEALED.

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 get a chloride test on your water supply.

Fill your heater with water through the condenser stack opening. If the chloride content of your local water supply exceeds the specifications mentioned above and necessitates the use of bottled or rain water, please do so to maintain the warranty of your heater.

THE FURNACE MUST BE FILLED WITH WATER BEFORE STARTING A FIRE.

There is a low water switch located in the back of the furnace. This low water switch extends into the water tank directly into the condenser tank area. This switch will activate a low warning light mounted into the side of the outer hull. The water level in the furnace needs to be high enough to operate low water switch and turn off the low water warning light.



SECTION III

CONNECTION TO CENTRAL HEATING/AC SYSTEM

Section III 3-1 Connection to Central Unit with Existing Blower Relay

CONNECTED TO ONE CENTRAL HEATING/AC SYSTEM THAT HAS AN EXISTING BLOWER RELAY AND ONE PUMP USING HONEYWELL RELAY R8222D FOR THE PUMP RELAY AND THE NEW BLOWER RELAY.

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

1. Run a three conductor thermostat wire from the wood heater to central unit in the house. This wire must be rated for underground use or be run inside a watertight pipe. The colors normally are red, white, and green.
2. At the heater, connect the white wire to terminal 8 of the water pump relay (R-3).
3. Connect the red wire to one side of the low temperature sensor (the round disc with two terminals under the insulation near the center of the heater approximate 12" from the top). This is an option that prevents the pumping of water less than 100°F but is not required. If you elect not to use this option, then only a two wire conductor is required, bypassing the low temperature sensor.
4. Connect a jumper wire from the other side of the low temperature sensor to terminal 7 of the water pump relay (R-3) and also connect the green wire to terminal 7 of R-3. If two wires are used then one is connected to terminal 7 and the other to terminal 8.
5. Inside the house:
 - A. Install the new wood heating thermostat near the existing thermostat.
 1. Remove the cover on the new home heat thermostat to mount it on the wall. There is a round dial visible with an adjustable pointer. This is the heat anticipator. The dial also has a series of numbers. The pointer must be set to the highest number on the dial. On the Honeywell model #t 822-1016), the pointer is turned counter clockwise as far as it can go.
6. Run a two conductor thermostat wire from the new thermostat to central unit:
 - A. The colors normally used are red and 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 overheat and burn out.

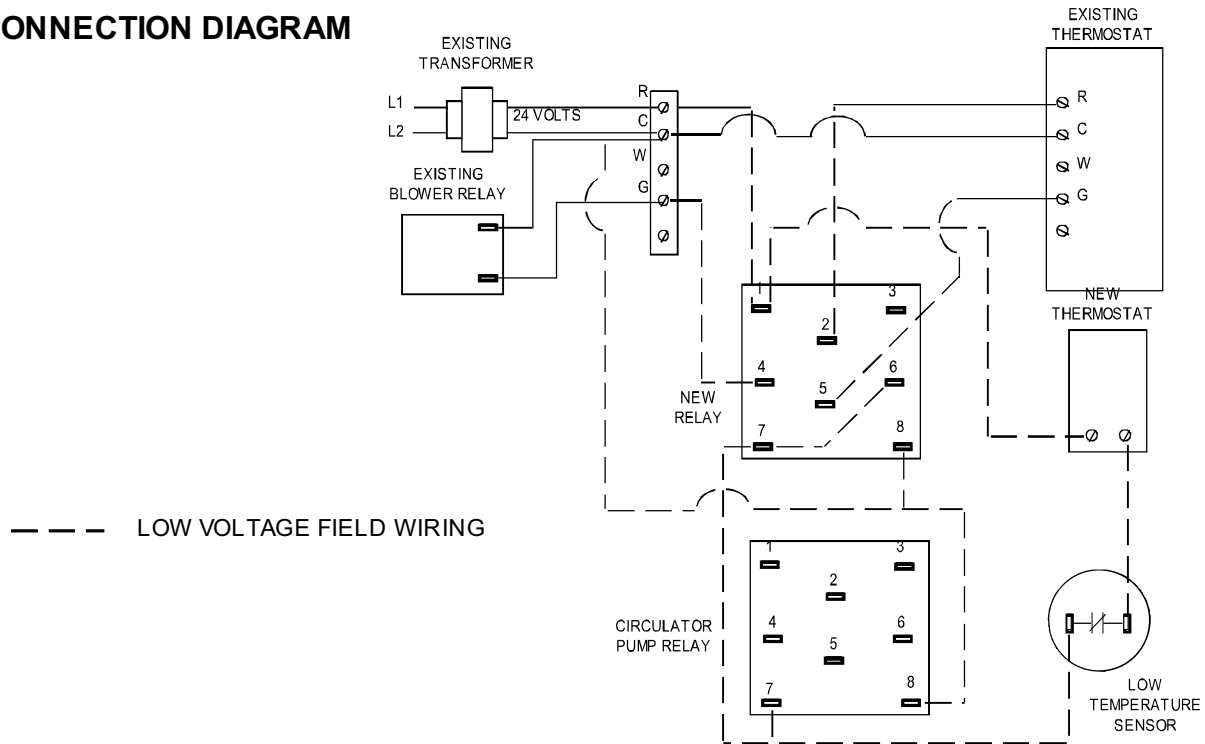
Section III
Relay

3-1

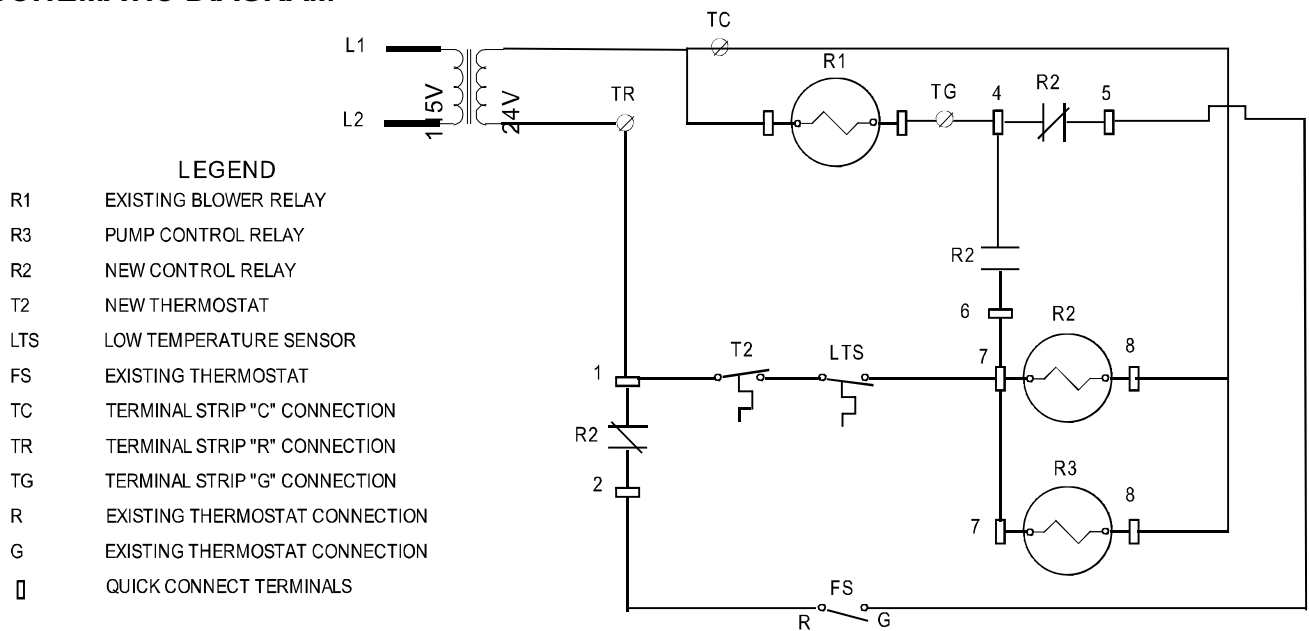
Connection to Central Unit with Existing Blower Relay

7. Locate the existing 24 volt transformer:
 - A. One 24 volt line (hot) should run from the transformer to the existing thermostat;
 1. Cut this wire and connect the wire going to the existing thermostat to terminal 2 of R-2 (new blower relay).
 2. Connect the wire running from the 24 volt transformer to terminal 1 of R-2 and also connect the red wire of the two conductor thermostat wire to terminal 1 of R-2.
 3. Connect the white wire of the two conductor thermostat wire from the new thermostat to the red wire of the three conductor wire coming from the outside heater.
8. Locate the other 24 volt line (common) coming from the transformer:
 - A. Splice a white jumper wire to this wire.
 - B. Connect the other end of the white jumper wire to terminal 8 of R-2.
 - C. Also connect the white wire of the three conductor thermostat to terminal 8 of R-2.
 - D. Connect the green wire of the three conductor thermostat wire to terminal 7 of R-2.
 - E. Also connect a jumper wire from terminal 7 of R-2 to terminal 6 of R-2.
9. Locate the existing central unit blower relay (R-1):
 - A. Locate the wire running from the existing thermostat to the blower relay coil. Disconnect this wire from the existing blower relay coil and connect it to terminal 5 of the new blower relay R-2.
 - B. Connect a jumper wire from the existing blower relay coil (the point that you just disconnected) to terminal 4 of relay R-2.
10. If all connections are made properly and the water in the wood heater is hot, the unit should be ready for operation. NOTE: This is a general diagram. You may have to make various changes according to how your unit is wired.
 - A. Insure that the compressor on a heat pump or A/C unit does not run when the wood system is running.
 - B. Insure that the gas burner, oil burner, or electric elements do not come on when the wood system is running.
 - C. Insure that only one speed of the blower motor can be energized at one time. If more than one speed is energized at the same time, the blower motor will burn out.
 - D. Insure that the volt amp rating of the existing 24 volt transformer is not exceeded when the relays in the wood heating system are energized.

CONNECTION DIAGRAM



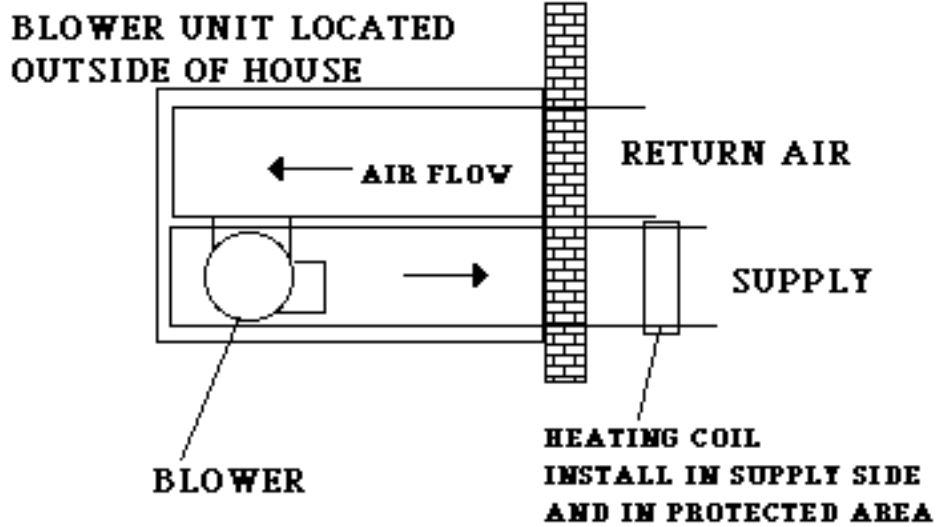
SCHEMATIC DIAGRAM



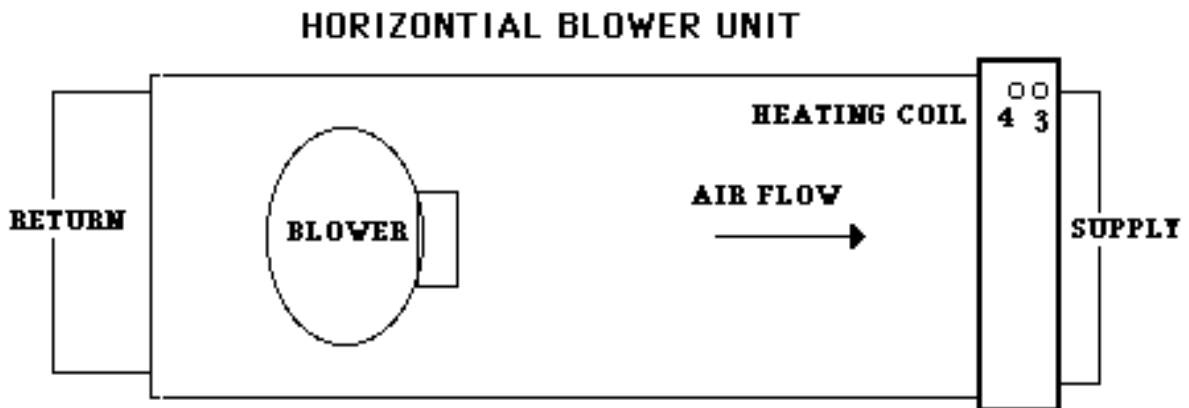
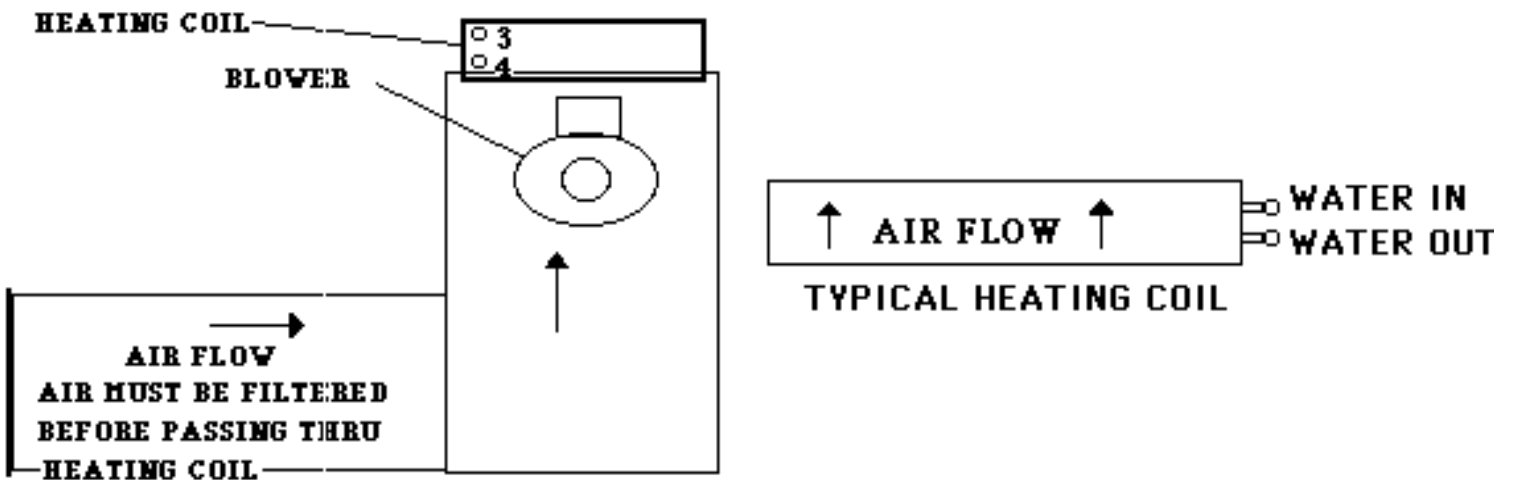
Section III

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 forced air system.

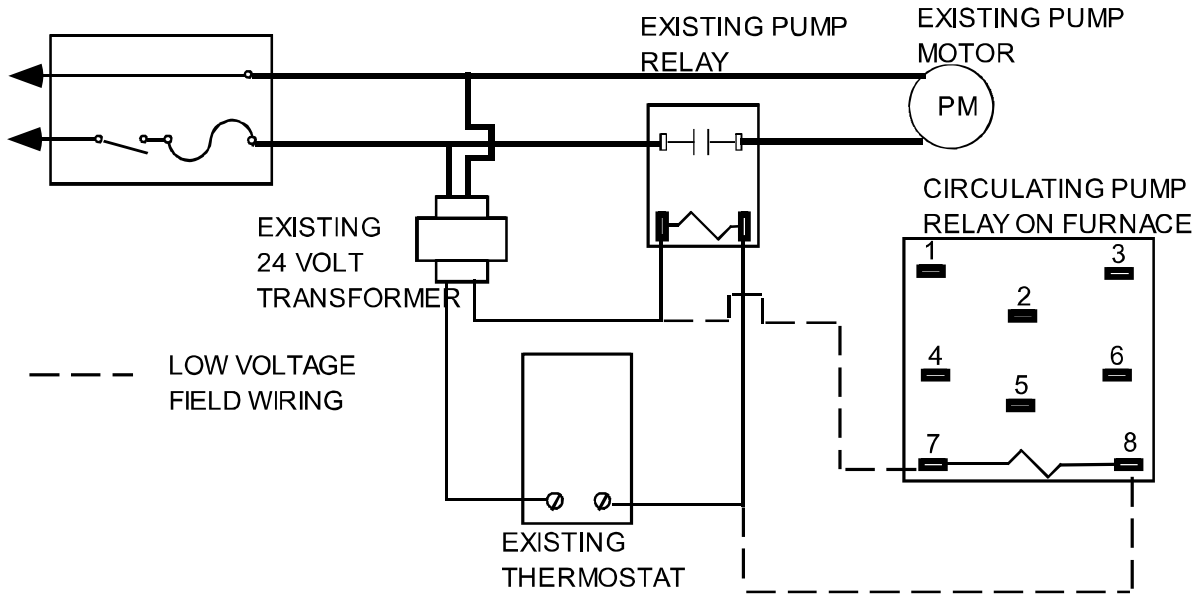


- 3) SUPPLY TO HEATING SYSTEM
- 4) HEATING SYSTEM RETURN

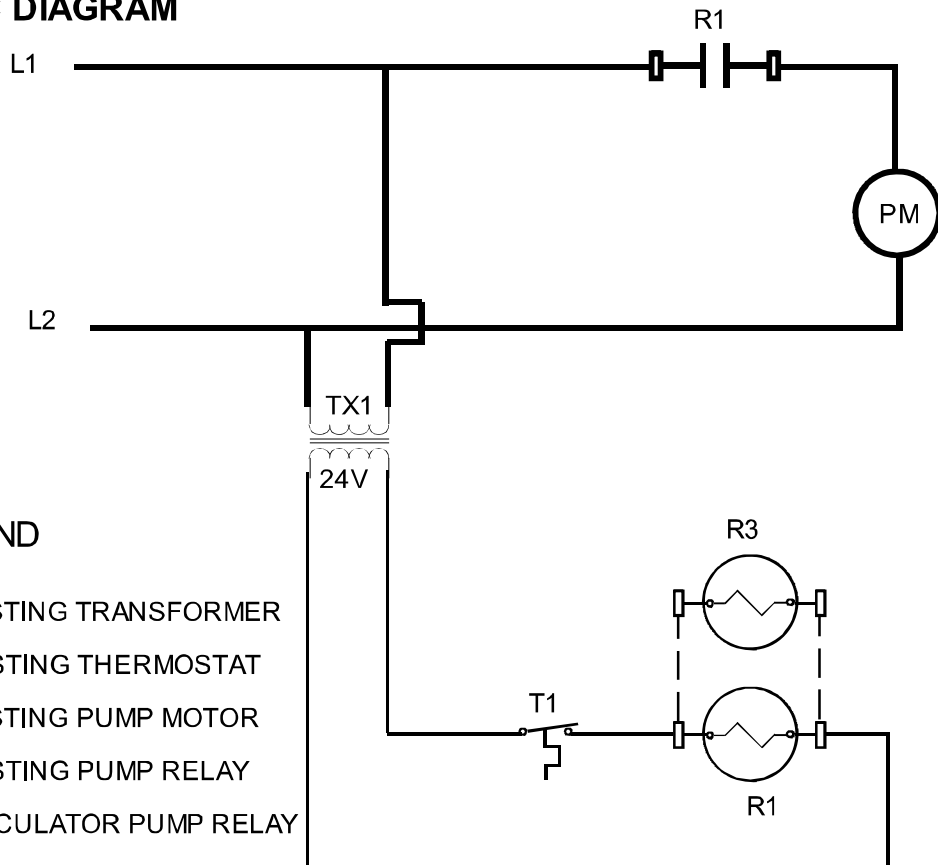


Section IV 4-1 Connection to Hydronic System with 24 Volt Transformer

CONNECTION DIAGRAM



SCHEMATIC DIAGRAM

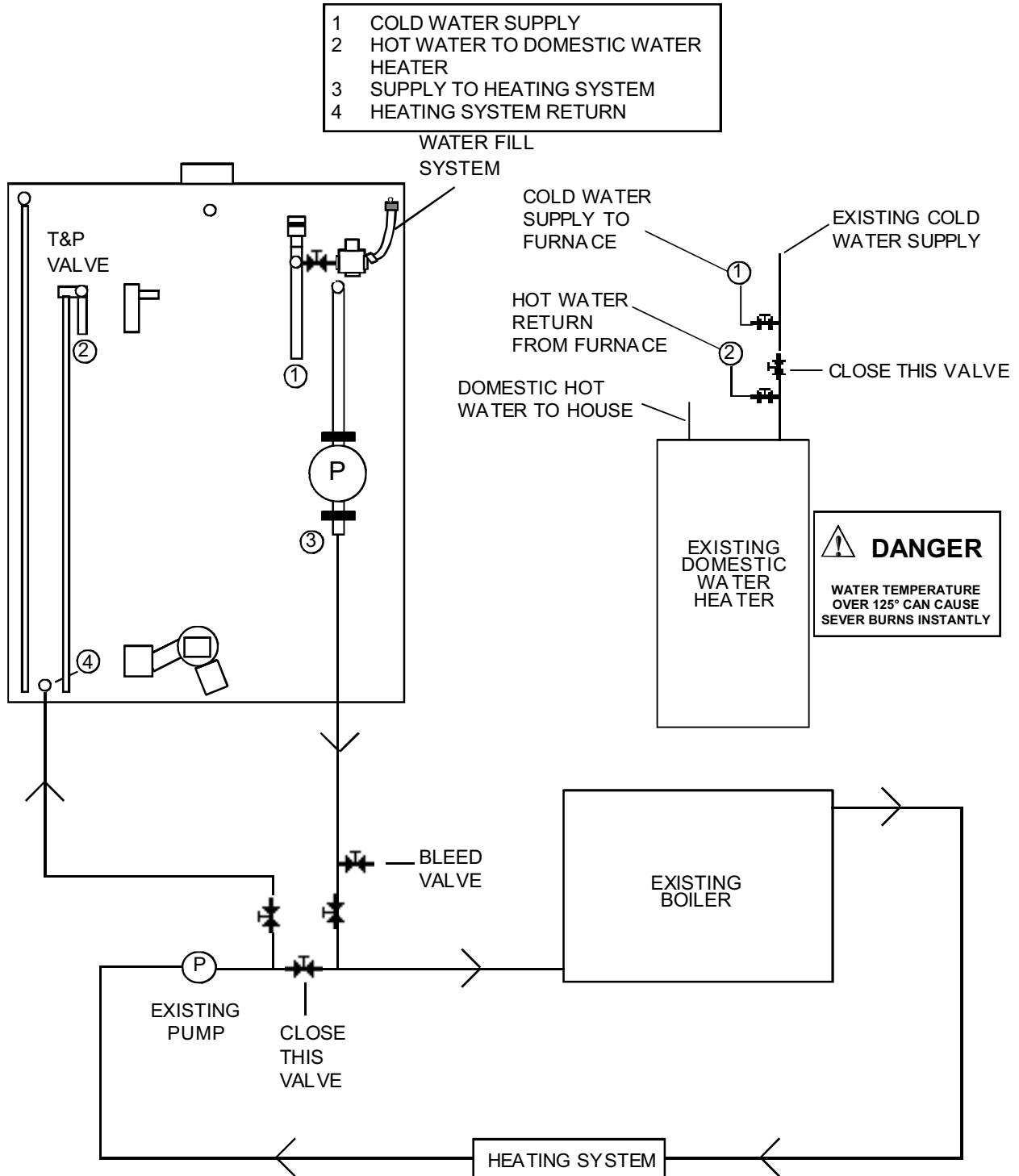


LEGEND

- TX1 EXISTING TRANSFORMER
- T1 EXISTING THERMOSTAT
- PM EXISTING PUMP MOTOR
- R1 EXISTING PUMP RELAY
- R3 CIRCULATOR PUMP RELAY

Section IV 4-2 Typical Diagram for Plumbing Hydronic System

Water Pipes must be designed for hot water service (ex. copper, cpvc, or cross-linked polyethelene.) Pipes should be installed in a 4" watertight 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. Turn off the makeup water for the existing system. Manual filling of the wood heater or the electric fill option will supply makeup water for the wood heater and the existing hydronic. Close all automatic air vents on the existing system.



SECTION V

CIRCULATING DOMESTIC HOT WATER

Section V 5-1 Description of Circulating Domestic Hot Water

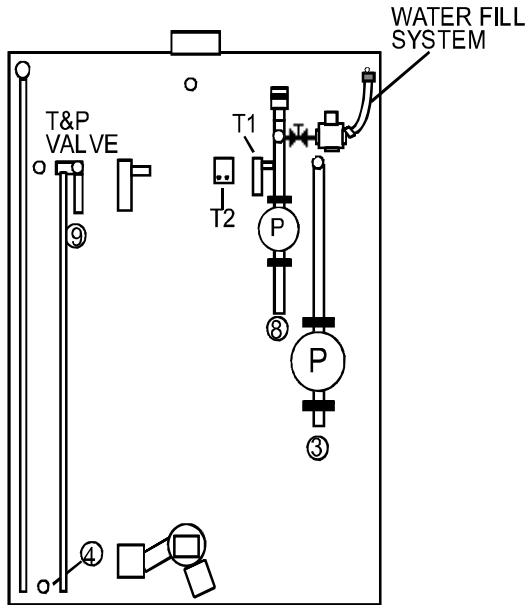
Circulating domestic hot water is available as an option on Hardy Heater. This option allows your domestic hot water to be circulated between the Hardy and your current water heater. This type of circulation keeps the water at a preset temperature.

A thermostat mounted in the water line constantly measures the water temperature. When the water temperature decreases the pump cuts on to circulate the domestic hot water through a heat exchanger to maintain the preset temperature.

Section V 5-2 Plumbing Instructions for a 2 Line Circulating Domestic Hot Water System

Water Pipes must be designed for hot water service (ex. Copper, cpvc, or crosslinked polyethylene.) Pipes should be installed in a 4" watertight 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.

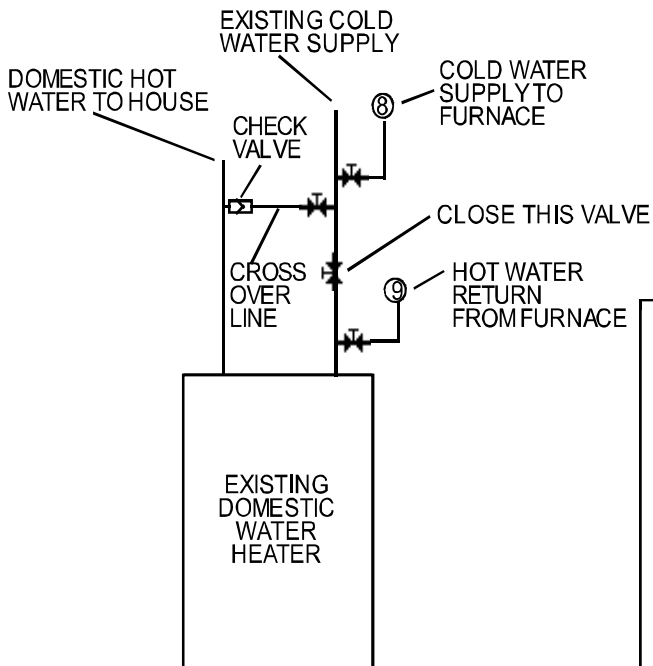
Do not use galvanized or black iron.




- 3) SUPPLY TO HEATING SYSTEM
- 4) HEATING SYSTEM RETURN
- 8) COLD WATER SUPPLY
- 9) HOT WATER RETURN

T-1 THERMOSTAT FOR DOMESTIC HOT WATER SET ON APPX. 140 DEGREES F.
 T-2 LIMIT THERMOSTAT - WILL NOT ALLOW CIRCULATING PUMP FOR DOMESTIC HOT WATER TO RUN IF WATER IN WOOD HEATER IS BELOW SET POINT. SET ON APPX. 160 DEGREES F.

CHECK VALVE IS SHIPPED ON HOT WATER SUPPLY PIPE ON HEATER. REMOVE CHECK VALVE FROM HEATER AND INSTALL AT HOT WATER HEATER.



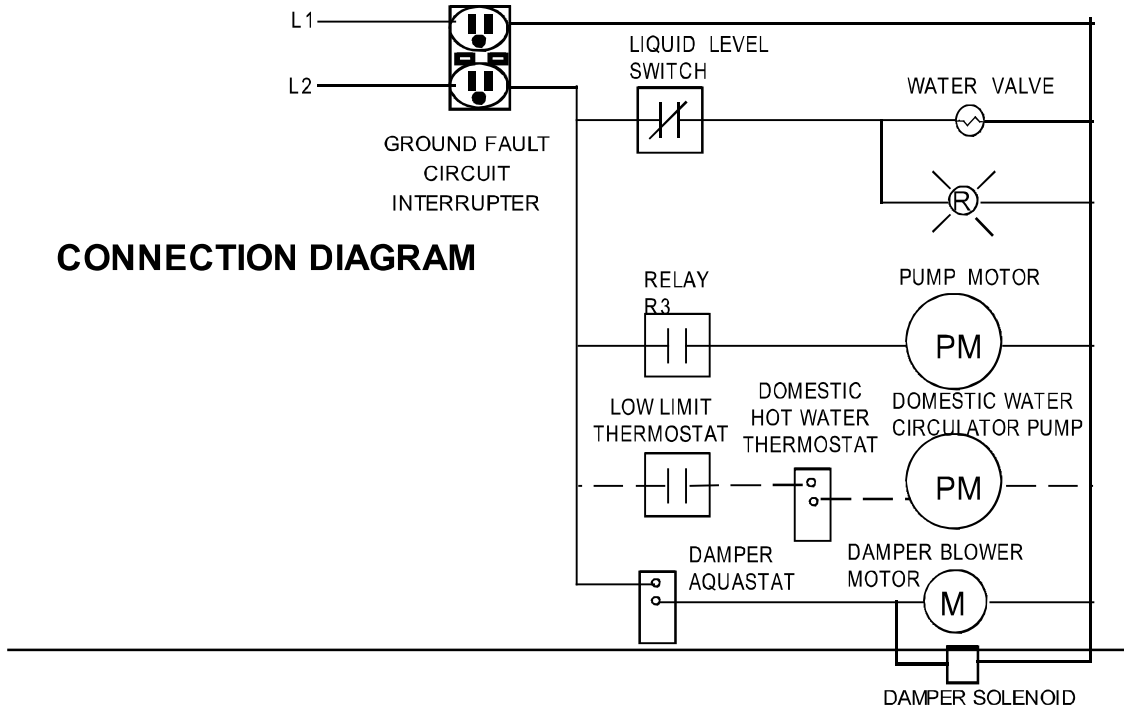


DANGER

WATER TEMPERATURE OVER 125° CAN CAUSE SEVER BURNS INSTANTLY

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

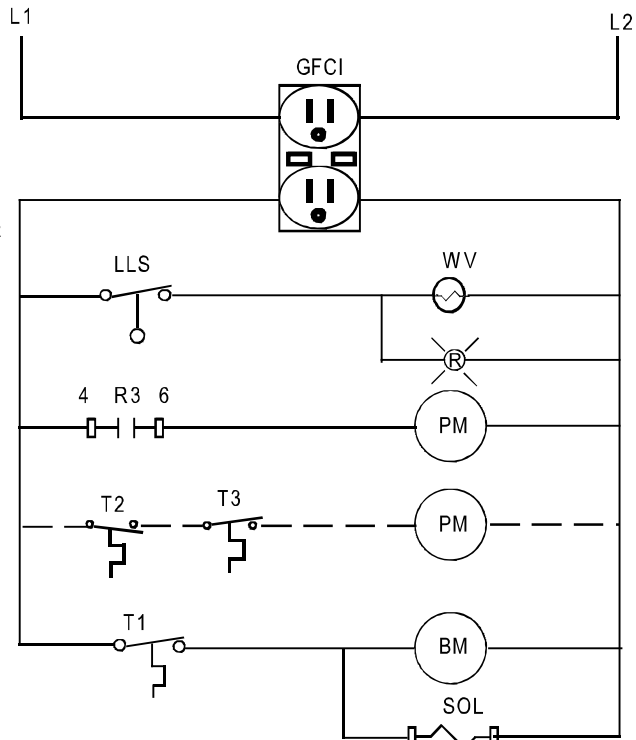
CONNECTION DIAGRAM



SCHEMATIC DIAGRAM

LEGEND

- GFCI GROUND FAULT CIRCUIT INTERRUPTER
- LLS LIQUID LEVEL SWITCH
- WV WATER SOLENOID VALVE
- R3 CIRCULATOR PUMP RELAY
- PM WATER CIRCULATOR PUMP
- T1 DAMPER AQUASTAT
- T2 LOW LIMIT THERMOSTAT
- T3 DOMESTIC WATER THERMOSTAT
- BM DAMPER BLOWER MOTOR
- SOL DAMPER SOLENOID
- R LOW WATER LIGHT



SECTION VI HEATER OPERATION

Section VI 6-1 Firing the Heater

Start the fire as you would in any other wood heater. Do not use petroleum products to start a fire. After you get an initial fire started, always stack the wood in the fire box straight. Do not cross the wood because this can cause the fire to go out. Any time you add wood, fill the fire box completely. The heater will burn only as much wood as is needed to keep the water hot.

CAUTION: ALWAYS OPEN THE BOTTOM DOOR BEFORE YOU OPEN THE TOP DOOR.

Section VI 6-2 Water Temperature

In the back of the heater is a Honeywell hot water aquastat. The normal operating temperature is 170°-180°F. Do not set the thermostat lower than 140°F because the fire might go out. Never set the thermostat above 180°F because the heater could overheat and boil the water away.

Section VI 6-3 Wood Usage

Never leave the doors open unattended because it will cause excessive wood consumption and could possibly damage the heater. If the heater is burning more wood than usual, check the seal around the front doors. If the seal is bad it will need replacing. Call your local Hardy dealer and order rope and silicone for the firebox or ash door.

The fire in the heater must be out to seal the door. With door still mounted on the heater, scrape the old silicone out of the groove. Run a small bead of silicone in the groove of the door. Start installing the rope at the top edge in the wide groove (next to the hinges) running down the hinge side and continue around the door.

Section VI 6-4 Moisture in the Firebox

On a new heater or the first time you start a fire each year, you will probably think you have a leak in the firebox. The firebox walls will sweat and water will run down the side. This can also happen if the water temperature drops below 100°F in the winter. This drop in temperature can be caused by improper burning due to stopped up grates.

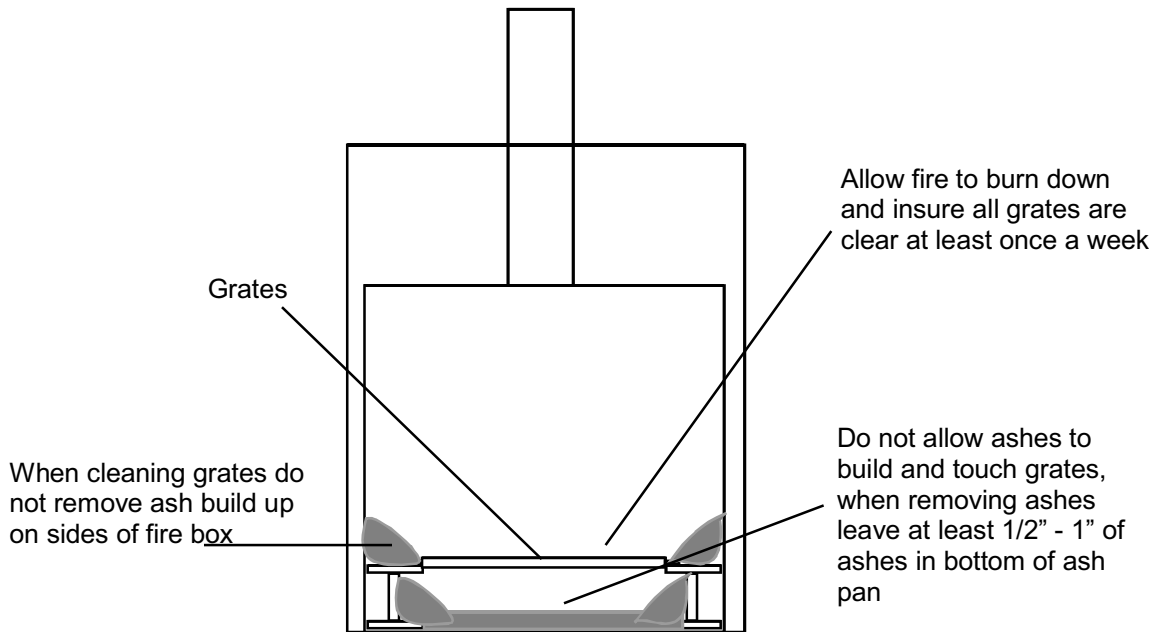
If you see moisture in the firebox, wait three days before you get alarmed. If it continues, check to see if you are burning green wood. Green wood will create a lot of moisture in the firebox, even to the extent that water can get as high as an inch or two in the ash pan. If you still think you have a leak in your heater, remove all wood and ashes from the heater. Let it set a couple of days with doors closed. Then open the ash door. If you have a leak, water will run out of the firebox.

Section VI 6-5 Improper Burning

If the fire is not burning properly, remove all of the ashes and wood from the heater. Check to see if the grates are stopped up. Check the air intake at the back of the heater to insure it is clear of ashes. Lift the damper lid to check for ashes. Check to see if the forced air blower is running. If you have made these checks and the fire will not burn properly, remove the smoke stack and check for creosote build up. Look down the smoke stack into the firebox to check for creosote build up. On the 180,00 BTU heater there is a removable baffle in the firebox just below the smoke stack. Remove this baffle through the firebox door. Clean off the creosote and reinstall the baffle. These steps should correct the problem. If the fire goes out when the damper is closed and will not start (after the damper has been open for at least 15 minutes), remove one of the screws in the damper lid. If the problem continues, remove the other screw. (Remove the screws only if you are absolutely sure the fire is going out !!!)

Section VI 6-6 Ash Removal

Ashes must be removed before they build up to the level of the grates. Failure to keep the ash bin cleaned out will result in warped grates. The build up of ashes in the firebox should be checked at least once a week. Allow the fire to burn down until the grates can be seen. This insures that all of the grates are clear. Failure to do this will cause your heating system to stop working and the grates to warp. If the grates warp slightly, they can be turned over and allowed to straighten out. The drawing shown below shows how the grates should look when you allow the fire to burn down.



SECTION VII SERVICE INFORMATION

Section VII 7-1 Electric Make-Up Water System

LOW WATER SWITCH, P/N H1100.27 – (WARNING: When working with electrical circuits, use caution to avoid electrical shock) – The low water switch is a horizontally mounted reed switch that has a magnet in the floating portion of the switch. When the water level is high enough to raise the magnet up off of the reed switch this allows the switch to break contact, and discontinue power to the water solenoid. When the water level drops the floating portion of the low water switch that has the magnet will once again come into close proximity of the reed switch and close the contacts allowing power to be applied to the water solenoid. If this switch is working in an opposite order to this it will need to be tightened another 180 degrees to allow the switch to operate correctly. Never add any additional load to this switch since it is only rated for 30 watts.

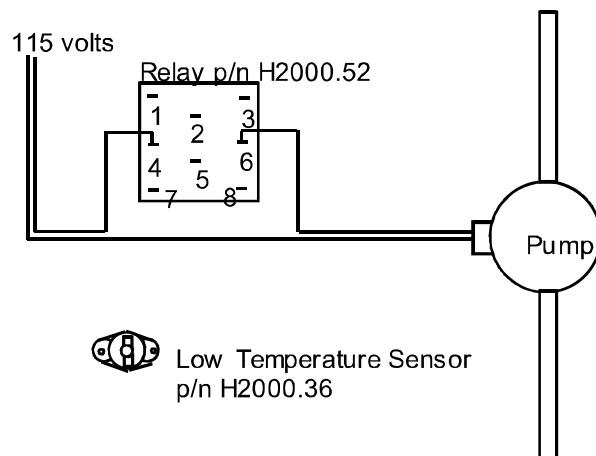
LOW WATER LIGHT, P/N H1100.30 - (WARNING: When working with electrical circuits, use caution to avoid electrical shock) – 115 VAC indicator light controlled by the float switch. The light comes on when the water level in the heater is low.

ELECTRIC WATER SOLENOID, P/N H1100.00 - (WARNING: When working with electrical circuits, use caution to avoid electrical shock) – 115 VAC electric solenoid controlled by the float switch. This solenoid keeps the heater full of water by allowing water to fill the heater when the float switch closes.

WATER FILTER, P/N H1100.55 – (WARNING: When working with electrical circuits, use caution to avoid electrical shock) - 100 MESH FILTER WASHER is located in the 1/2" x 1/4" brass hex bushing at the solenoid. It is inserted with the cone of the screen pointed out. Filter washers are always placed where the cone points toward the water flow. It can be removed for cleaning.

Section VII

7-2 Water Circulation System

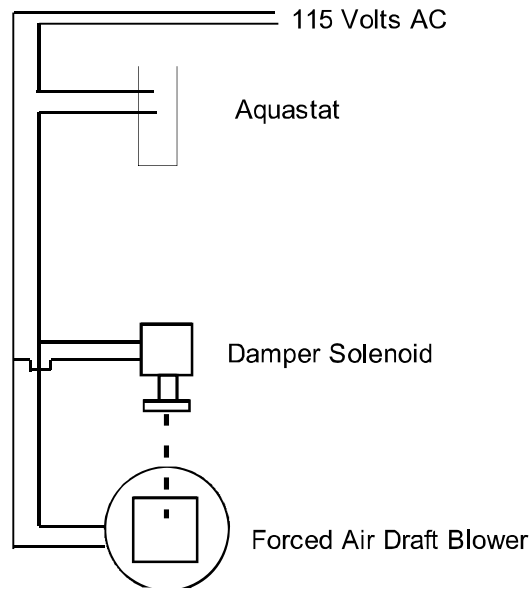


LOW TEMPERATURE SENSOR, P/N H200.36 – (WARNING: When working with electrical circuits, use caution to avoid electrical shock) - This sensor can be wired in the home heat thermostat circuit to prevent the pump on the heater from running when the water in the wood heater is not hot. The sensor has a set of contacts that close when the water rises to 110°F and open when the water drops to 90°F.

WATER PUMP RELAY, P/N H2000.52 – (WARNING: When working with electrical circuits, use caution to avoid electrical shock) - This is a Honeywell DPDT relay with a 24 volt coil. Terminal 4 and 6 (normally open contacts) are used to turn on the water pump. Control voltage (24 volts) connected at terminals 7 and 8 routed through a home thermostat energizes the relay.

WATER PUMP FOR HEATING SYSTEM, Taco 009 pump P/N H502.00 – (WARNING: When working with electrical circuits, use caution to avoid electrical shock) - with bronze body. If the pump will not run, first unplug the power cord then check the water pump relay. The relay can be bypassed by disconnecting the wire terminal 6 and the connecting to terminal 5 (terminals 4 to 5 is normally closed) and remove the thermostat wire from terminal 8, now plug the power cord back in. This should supply 115 vac directly to the pump. If the pump will still not run, unplug the power cord. Remove the four bolts holding the pump to the pump housing. Remove the cartridge from the pump. Spin the impeller if it will not spin, replace the cartridge. If the impeller will spin, it may have been temporarily stuck (reassemble and try again) or the problem is the electrical winding or capacitor. Use an ohm meter to check the winding and capacitor. If the capacitor is defective, replace it. If the electrical winding is defective, replace the complete pump.

Section VII 7-3 Temperature Control System



DAMPER AQUASTAT, P/N H2000.08 - (WARNING: When working with electrical circuits, use caution to avoid electrical shock) – This thermostat has a probe that is in a well in the water tank of the wood heater. It has one set of contacts that open on a temperature rise and close on a temperature fall. This thermostat is normally set at 170°F to 180°F. It controls the damper solenoid and the forced air draft. If the damper solenoid and forced air draft will not operate, place a jumper wire across the thermostat terminals. If they operate when the thermostat is jumpered out, and the temperature of the water in the heater is below the set point on the thermostat, the thermostat is defective. Do not leave the jumper on the thermostat because the heater will overheat.

DAMPER SOLENOID, P/N H 2001.00 - (WARNING: When working with electrical circuits, use caution to avoid electrical shock) – This solenoid lifts the cover off the intake to the forced air draft blower. The solenoid is controlled by the damper thermostat. It should lift the cover when the forced air blower comes on and drop the cover after the blower goes off. If the solenoid does not drop the cover when the blower goes off, the solenoid should be replaced. The forced air draft intake cover must be in place when the blower is not running or the heater will overheat and cause excessive wood usage.

FORCED AIR DRAFT BLOWER, P/N H2002.16(28) - (WARNING: When working with electrical circuits, use caution to avoid electrical shock) – This blower supplies air to the fire box when the damper thermostat calls for heat. If the blower wheel or the intake to the blower is clogged, the blower will not deliver the proper amount of air to the fire. The blower can be disassembled and cleaned. Be sure to seal the blower motor back to the blower housing if the blower is disassembled. The motor should be oiled at the beginning of each heating season. When the heater is not in use, the power cord for the blower should be unplugged.

Section VII 7-4 Preseason Heater Maintenance

**Each year before the heating season begins,
you should check your heater to insure
that everything is ready for the heating season.**

1. **ELECTRIC MAKE UP WATER** – Turn on the cold water supply to the heater. Plug in the power cord. Check the float switch operation by lifting up and pushing down on the float. When you push the float down it should activate the electric water solenoid and allow water to enter the heater water tank. When you lift up on the float it should deactivate the water solenoid, stopping the water. Also make sure the float will float up on its own when the water level is high enough. After checking the float and solenoid operation, you should be able to determine if either of these components will require replacement. Next, turn off the cold water supply and remove the screen filter. Clean this filter or replace it. Reinstall the screen filter, making sure the cone point of the screen is pointing towards the incoming water. Turn the cold water supply back on.

2. **WATER QUALITY** – The Hardy Heater is designed not to lose heater water through evaporation. At times during the year, accidental overheating can occur, and the water will evaporate. The evaporation causes a concentration of chlorides (salts) and other minerals. To protect your heater from this build up of chlorides (salts) and other minerals, we recommend to drain your heater each year at time of startup for the heating season and refill with rain water or bottled water with a chloride concentration of less than 15 parts per million. This will add to the life of your stainless steel tank.

3. **DAMPER AND DRAFT SYSTEM** – When you plugged in the power cord, the damper solenoid should have opened the draft lid on the draft blower. The forced air draft blower should also have come on. If both of these components are working correctly, unplug the power cord. Open the clean out lid beside the draft blower and check for any build up of ash, tar, or any other material that could restrict the amount of combustion air entering the heater. Check the seal on the clean out lid to assure a good air tight seal is still established. Lift the damper lid on the draft blower and inspect the blower wheel for any build up of lint, dust, creosote, or any other substance that could affect the performance of the draft blower. Spray the damper lid hinge, and the damper solenoid plunger with WD-40, or its equivalent. Oil the draft blower motor with electric motor oil, or 10 weight no detergent motor oil. Do not use WD-40, or machine oil. Check the grates inside the heater to see if there is any ash build up or if the grates are warped. If a grate does warp, lift that grate up and turn it over. Also at this time check the smoke stack for blockage.

4. **WATER PUMP** – Unplug the power cord going to the water pump. Close the valve above the water pump and the return water valve at the bottom of the heater. Remove the pump motor from the pump housing by removing the four bolts in the pump housing. Remove the impeller cartridge assembly from the pump housing. Check the impeller to determine if it is free by spinning the impeller in the cartridge. Check the pump housing for rust or any other build up that could impede the flow of water. Reassemble the water pump, making sure the “O” ring in the cartridge is seated right. Once the pump is reinstalled, open the water valve above the pump and the return valve.

WARNING
HAZARDOUS VOLTAGE WILL CAUSE DEATH, SEVERE PERSONAL INJURY OR SUBSTANTIAL PROPERTY DAMAGE. ALWAYS FOLLOW THE SAFETY PRECAUTION WARNINGS POSTED IN THIS INSTRUCTION BOOKLET.

PREVENTATIVE MAINTENANCE

Preventative Maintenance can provide measurable improvements in system performance as well as a marked reduction in comfort complaints. The customer should always remain aware of preventative maintenance actions that could help them avoid unnecessary shutdown time and save them repair expense.

Preventative Maintenance Checklist:

- 1 **Ground Fault Interrupter Receptacle** > Should be tested monthly to insure proper and safe operation. (a) check with a circuit tester to determine if the polarity is correct. (b) Press the test button, the reset button should pop out indicating the interrupter has tripped. Press the reset button to restore to normal operation.
- 2 **Heater Piping** > Check all piping occasionally on back of heater for any possible water leaks. Water leaks on heater components can cause electrical shorts, damage to component parts and insulation.
- 3 **Low Water Light** > Check the low water warning light each week for proper operation to avoid low water or over filling in heater with electric make-up water systems, See service information section in owners manual for proper checking procedures.
- 4 **Ash Bin** > Keep ash bin from ash buildup. Remove ashes before they build up to the level of the grates. This will restrict proper air flow and cause the grates to warp. Leave at least 1/2" to 1" of ashes in bottom of ash pan to protect the bottom from burnout.
- 5 **Damper/Draft System and Smoke stack** > Check at least every two weeks for build up of ash, tar, or any other material that could restrict the amount of air flow required. Oil the blower motor bearings prior to each heating season with 10 to 20 drops of electric motor oil.
- 6 **Door Seals** > Check firebox door and ash door seals occasionally for damage or obstructions that would affect an airtight seal.
- 7 **Preseason Maintenance** > Review preseason heater maintenance section in owners manual prior to each heating season.

| COMPLAINT | AREA OF TROUBLE | POSSIBLE CAUSES | CORRECTIVE ACTION |
|---|--|---|--|
| Ground Fault Interrupter Receptacle Tripping | Ground Fault Interrupter Receptacle | 1 Moisture in receptacle 2 Receptacle not grounded properly. | 1 Remove cover and check for moisture inside box. If moisture is present, use blow dryer to dissipate. If moisture inside box continues to be a problem, wrap the box with cellophane to protect from moisture. 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. |
| | Liquid Level Switch, Low water light, and Water solenoid valve | Bad connections possibly to ground. | Check electrical connections for bad connections or corrosion. Clean, dry and then retest for proper operation. |

Section VII 7 – 5

Trouble Shooting Guide H2 & H4

| COMPLAINT | AREA OF TROUBLE | POSSIBLE CAUSES | CORRECTIVE ACTION |
|--|--------------------------|---|---|
| <p>NO HEAT</p> <p>Main power supply and ground fault interrupter receptacle "OK"</p> <p>Water temperature is "HOT"</p> | <p>Pump Performance</p> | <p>Unplug pump and bypass relay by tying relay wires #4 and #6 together. Plug pump back in.</p> | |
| | <p>Pump does not run</p> | <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 Ohmmeter. 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 ohmmeter. The insulator of the windings should show no breakage. If it does, replace pump |
| | <p>Pump does run</p> | <ol style="list-style-type: none"> 1 Defective 24 volt transformer 2 Defective wall thermostat (heater) 3 Defective low temperature sensor 4 Defective pump relay | <ol style="list-style-type: none"> 1 Located at existing central unit. If 115/120 volts is being supplied to primary side check for 24 volts on secondary. If 24 volts not present, replace transformer. Located inside home. 2 Remove cover. Check for 24 volts. Level the mounting base. Blow dust from sensing bimetal. Adjust heat anticipator. See owners manual connection instructions. 3 Remove wires on sensor and connect to each other to bypass. If pump runs replace low temperature sensor. 4 Check relay terminals #7 & #8 for 24 volts. If 24 volts is present, use ohmmeter to check contacts. Connect ohmmeter to terminals #4 & #6. If no reading replace relay. |

Section VII 7 – 5

Trouble Shooting Guide H2 & H4

| COMPLAINT | AREA OF TROUBLE | POSSIBLE CAUSES | CORRECTIVE ACTION |
|--|-------------------------------|--|---|
| <p>NO HEAT</p> <p>Main power supply and ground fault interrupter receptacle "OK"</p> <p>Water temperature is "COLD"</p> | Aquastat | 1 Defective Aquastat | 1 Place a jumper wire across terminal #4 & #5 on the terminal strip. If blower and Damper solenoid operates, replace aquastat. |
| | Damper solenoid | 1 Defective damper solenoid | 1 When bypassing aquastat if solenoid does not lift the lid off the intake to the forced air draft blower, replace the solenoid. |
| | Forced Air Draft Blower Motor | <p>Defective blower motor</p> <p>1 Defective electrical wiring</p> <p>2 Air passage stoppage</p> <p>3 Blower wheel clogged</p> | <p>1 Make sure all connections are secure.</p> <p>2 Clear air passages in cleanout and damper blower outlets</p> <p>3 Clear blower wheel of any lint, ashes or creosote buildup.</p> |
| | Ash Bin | 1 Ash buildup in ash bin | 1 Clean out ash bin. Ash bin should be cleaned out each week. Ash buildup on grates can cause grates to warp. If grates warp they can be turned over and allowed to straighten. When removing ashes, leave at least 1/2" to 1" of ashes in bottom of ash pan. |
| | Heater Stack | 1 Ash and Creosote Buildup | 1 Clean heater stack of any ash and creosote buildup. On H4 models make sure the baffle plate is clear of ash and creosote buildup. Make sure baffle is in place, otherwise heat will be lost up the stack. |
| <p>No Heat</p> <p>Water Level is "LOW"</p> <p>Water temperature is "HOT"</p> <p>Main power supply and Ground Fault Interrupter Receptacle "OK"</p> | Water supply | Defective Liquid Level Switch. | Liquid level switch controls the water level indicator light and water solenoid valve. Check switch with hand by raising or lowering float inside the condenser area. If water solenoid does not click and light does not go on and off, replace the liquid level switch. |
| | Water solenoid valve | <p>1 Defective solenoid valve</p> <p>2 Water filter</p> | <p>1 If water solenoid valve does not click when checking the liquid level switch, but level indicator light does come on – replace solenoid valve.</p> <p>2 Remove filter screen from 1/2" bushing in end of 1/2" ball valve, clean or replace.</p> |

Section VII 7 – 5

Trouble Shooting Guide H2 & H4

| COMPLAINT | AREA OF TROUBLE | POSSIBLE CAUSES | CORRECTIVE ACTION |
|---|---|---|---|
| <p>NO HEAT</p> <p>Blowing cold air in house</p> <p>Water temperature is "HOT"</p> <p>Power "OK"</p> | <p>Water not circulating through the heat loop</p> | <p>1 Pump not operating</p> <p>2 Inline valves closed/ bad</p> <p>3 Air trapped in plumbing</p> <p>4 Scale deposits in hot water coil reducing water flow and restricting heat transfer.</p> <p>5 Air lock in hot water coil.</p> | <p>1 See area of trouble: "Pump Operation"</p> <p>2 Open or replace valves</p> <p>3 Bleed lines if air is trapped non pressured lines require pump to be running.</p> <p>4 Disconnect the inlet and outlet of the hot water coil and pump clean with descale cleaning kit.</p> <p>5 Bleed air from hot water coil</p> |
| <p>Excessive wood usage</p> <p>Or</p> <p>Overheating (boiling)</p> | <p>Heater water boils</p> <p>(Symptom –Popoff valve is relieving)</p> | <p>1 Doors open</p> <p>2 Defective door seals</p> <p>3 Damper blower lid stuck open</p> <p>4 Damper aquastat defective</p> <p>5 Water lines / connections leaking</p> | <p>1 Close all doors and make sure they are securely fastened.</p> <p>2 If the seal is bad it will need replacing. Call your local Hardy Dealer for parts. See Owners Manual for replacing door seals.</p> <p>3 Unplug blower motor. Check lid and blower for creosote buildup. Remove blower, disassemble, clean, and oil.</p> <p>4 Check temperature setting on aquastat. Should be 170°F. If aquastat is allowing blower to run until water boils, replace aquastat.</p> <p>5 Repair or replace all lines or connections that are leaking.</p> |

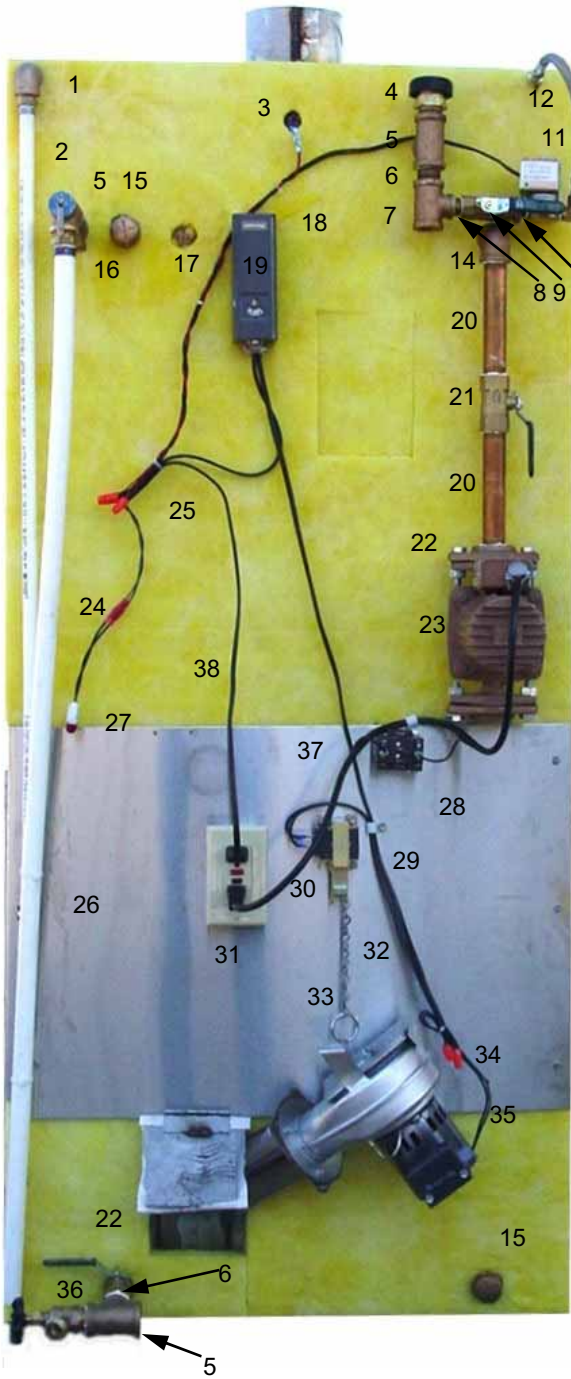
Section VII 7 – 5

Trouble Shooting Guide H2 & H4

| COMPLAINT | AREA OF TROUBLE | POSSIBLE CAUSES | CORRECTIVE ACTION |
|---|--|--|---|
| Excessive wood usage Or Overheating (boiling) | Excessive wood usage Symptom; Pop off valve is relieving Heater water overflowing | 1 Pop-off valve 2 Defective Liquid Level Switch. 3 Solenoid valve stuck or corroded 4 Domestic hot water heat exchanger coil leaking. | 1 If Pop – off valve is relieving for no reason, replace pop – off valve. 2 Check liquid level switch float for upright position, float magnets should be on top. Check switch by moving float up and down to see if solenoid clicks and light goes on and off, if not replace switch. 3 If solenoid does click and the heater still overflows, it could be stuck in open position, - remove and clean or replace. 4 Disconnect line to the electric water solenoid and turn off valve to system fill to assure no water enters tank from the fill system. If heater tank still overfills then remove heater hull and lid to check domestic water coil for leaks, repair or replace. |
| Improper Burning | Grates | Grates stopped up | Clear grate of ash buildup. If grates are warped, turn over. |
| | Air intake | Damper blower clogged | Clean damper blower assembly. |
| | Air tube inspection lid | Air tube clogged | Lift inspection lid and cleanout all obstructions. |
| | Smoke Stack | Smoke stack stopped up | Remove smoke stack, check flue out of top of heater, clean both flue pipe and smoke stack. |
| | Baffle | (Model H4 Only) Baffle stopped up | Remove baffle through the fire box door, clean baffle and flue area. |
| | Fire | Fire going out | If fire goes completely out remove one screw in blower lid. |
| | Forced air blower running but no draft | 1 Solenoid not lifting lid 2 Creosote buildup | 1 Replace solenoid. 2 See excessive wood usage. |
| Moisture In Fire box | Fire box | 1 Initial or yearly start up 2 Green Wood | 1 Fire box 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. |

Section VIII 8-1

Heater Repair Parts (Model H2)



| Legend | Part No. | Description |
|--------|----------|--------------------------------|
| 1 | 600.10 | 1/2" Brass Elbow |
| 2 | 810.00 | 1/2" Overflow Pipe |
| 3 | 1100.27 | Low Water Switch |
| 4 | 607.37 | Vacuum Relief Valve |
| 5 | 602.16 | 3/4" Brass Tee |
| 6 | 603.40 | 3/4" x Close Brass Nipple |
| 7 | 602.32 | 3/4"x3/4"x1/2" Brass Tee |
| 8 | 603.08 | 1/2" x Close Brass Nipple |
| 9 | 607.00 | 1/2" Brass Ball Valve |
| 10 | 605.00 | 1/2" x 1/4" Brass Bushing |
| 11 | 1100.00 | Electric Solenoid Valve Assy. |
| 12 | 400.73 | 3/8 OD X 10 IN. Pex Fill Line |
| 13 | 600.55 | 3/8 comp. X 1/4" mpt Elbow |
| 14 | 600.30 | 3/4" Brass Elbow |
| 15 | 604.32 | 3/4" Brass Cap |
| 16 | 607.30 | T&P Valve |
| 17 | 604.16 | 1/2" Brass Cap |
| 18 | 2000.48 | Well Fitting |
| 19 | 2000.08 | Honeywell Hi-temp Thermostat |
| 20 | 603.32 | 3/4" x 6" Brass Nipple |
| 21 | 607.12 | 3/4" Brass Ball Valve |
| 22 | 502.40 | 3/4" Bronze Flange |
| 23 | 502.08 | Taco 009 Brz Pump w/Power Cord |
| 24 | 810.10 | 3/4" T&P Relief Pipe |
| 25 | 2004.40 | Wire Connectors |
| 26 | 810.15 | 5/8" Clamp |
| 27 | 1100.30 | Low Water Light |
| 28 | 2000.52 | Relay |
| 29 | 2001.00 | Dormeyer Damper Solenoid |
| 30 | 2004.00 | GFCI Receptacle |
| 31 | 2004.16 | Receptacle Box 2 1/8" deep |
| 32 | 3200.12 | Jack Chain |
| 33 | 3200.16 | Key Ring |
| 34 | 2002.16 | 100 CFM Blower with Damper Lid |
| 35 | 2004.28 | Plastic Romex Connector |
| 36 | 607.42 | 3/4" Boiler Drain |
| 37 | 2004.04 | 3' 3 Wire Power cord |
| 38 | 2004.08 | 8' 2 Wire Power cord |