

# Peerless® Partner®

## *Indirect-Fired Water Heater*

PT-30 PT-40 PT-50 PT-60 PT-80 PT-120



## **Installation, Operation & Maintenance Manual**



# TABLE OF CONTENTS

<b>USING THIS MANUAL</b>	<b>1</b>	<b>4. INSTALLATION - WIRING</b>	<b>16</b>
A. INSTALLATION SEQUENCE .....	1	A. WIRING REQUIREMENTS .....	16
B. SPECIAL ATTENTION BOXES .....	1	B. CIRCULATORS .....	16
<b>PRODUCT &amp; SAFETY INFORMATION</b>	<b>2</b>	C. ZONE VALVES .....	16
<b>1. PREINSTALLATION</b>	<b>3</b>	D. SNAPSET CONNECTION .....	16
A. CODES COMPLIANCE .....	3	<b>5. INSTALLATION - WIRING DRAWINGS</b>	<b>17</b>
B. CODES RESTRICTIONS .....	3	<b>6. WATER HEATER START-UP</b>	<b>22</b>
C. OPERATING RESTRICTIONS .....	3	A. FILLING THE INNER (DOMESTIC WATER)	
D. LOCATING WATER HEATER .....	3	TANK .....	22
E. PRODUCT SELECTION .....	4	B. FILLING THE OUTER (BOILER WATER)	
F. RECOMMENDED CLEARANCES .....	5	TANK .....	22
<b>2. INSTALLATION - PIPING</b>	<b>6</b>	C. GENERAL NOTES .....	23
A. TEMPERATURE & PRESSURE (T&P)		D. ADJUSTING THE WATER HEATER	
RELIEF VALVE .....	6	THERMOSTAT .....	23
B. DRAIN VALVE .....	6	<b>7. WATER HEATER MAINTENANCE</b>	<b>24</b>
C. AUTOMATIC AIR VENT .....	7	A. MAINTENANCE SCHEDULE .....	24
D. THERMAL EXPANSION .....	7	B. FILLING WATER HEATER .....	24
E. WATER HAMMER .....	7	C. DRAINING WATER HEATER .....	24
F. VACUUM BREAKER .....	7	D. DRAINING INNER (DOMESTIC WATER)	
G. GENERAL PIPING .....	7	TANK .....	25
H. DOMESTIC PIPING .....	7	E. DRAINING OUTER (BOILER WATER)	
I. THERMOSTATIC MIXING VALVE .....	8	TANK .....	25
J. RECIRCULATION PIPING .....	8	<b>8. TROUBLESHOOTING</b>	<b>26</b>
K. MULTIPLE WATER HEATER SYSTEMS .....	8	<b>9. REPAIR PARTS</b>	<b>27</b>
L. BOILER PIPING .....	8	<b>10. WATER HEATER DIMENSIONS &amp;</b>	
<b>3. INSTALLATION - PIPING DRAWINGS</b>	<b>9</b>	<b>RATINGS</b>	<b>29</b>
		<b>11. PERFORMANCE RATINGS</b>	<b>30</b>

# USING THIS MANUAL

## A. INSTALLATION SEQUENCE

Follow the installation instructions provided in this manual in the order shown. The order of these instructions has been set in order to provide the installer with a logical sequence of steps that will minimize potential interferences and maximize safety during boiler installation.

## B. SPECIAL ATTENTION BOXES

Throughout this manual special attention boxes are provided to supplement the instructions and make special notice of potential hazards. The definition of each of these categories, in the judgement of PB Heat, LLC are as follows:

### DANGER

Indicates a condition or hazard which will cause severe personal injury, death or major property damage.

### WARNING

Indicates a condition or hazard which may cause severe personal injury, death or major property damage.

### CAUTION

Indicates a condition or hazard which will or can cause minor personal injury or property damage.

### NOTICE

Indicates special attention is needed, but not directly related to potential personal injury or property damage.

# PRODUCT SAFETY & INFORMATION

## **DANGER**

### **HOT WATER CAN SCALD!**

- Water temperatures over 125°F can cause severe burns instantly or death from scalding.
- Children, disabled and elderly are at highest risk of being scalded.
- Never leave them unattended in or near shower, bathtub or sink.
- Never allow small children to use a hot water faucet or draw their own bath.
- Never allow small children to use a hot water faucet or draw their own bath.
- If anyone using hot water in the building fits the above description or if local codes or state laws require specific water temperatures at hot water faucet, it is recommended:
  - to install a thermostatic mixing valve at this appliance or at each water faucet.
  - or
  - to set the thermostat knob for the lowest temperature which satisfies your hot water needs.
- Water drained from the system drain valves may be extremely hot. To avoid injury:
  - Make sure all connections are tight.
  - Direct water flow away from any person.

## **WARNING**

Protection must be taken against excessive temperature and pressure!

- Installation of a Temperature & Pressure (T&P) relief valve is required.

## **CAUTION**

To prevent damage to the inner tank, the installer must:

- Always fill inner tank prior to outer tank and always drain outer tank prior to inner tank.
- Relieve primary system pressure below 15 psig prior to draining inner tank.



# 1. PREINSTALLATION

## A. CODES COMPLIANCE

Water heater installation must conform with the instructions in this manual and where applicable:

- local, state, provincial, and national codes, laws, regulations and ordinances.
- in Canada - CAN / CGA B149.1 or B149.2 Installation Code.

Peerless® Partner® water heaters are exempt from ASME Section VIII, Division 1 Code construction per Interpretation VIII-86-136. Check with local codes for applicability.

### NOTICE

**Peerless® Partner® water heaters will absorb less than 200,000 BTU/hr when domestic water outlet temperature is 210°F and boiler water supply temperature is 240°F. Listed outputs are based on ASME Section VIII Interpretation VIII-1-86-136.**

Where recommendations in this manual differ from local, or national codes, the local or national codes take precedence.

## B. CODES RESTRICTIONS

1. Single wall heat exchanger in the Peerless® Partner® water heater complies with National Standard Plumbing Code, provided that:
  - a. boiler water (including additives) is practically non-toxic, having toxicity rating or class of 1, as listed in Clinical Toxicology of Commercial Products, and
  - b. boiler water pressure is limited to maximum 30 psig by approved relief valve.
2. Single wall heat exchangers are permitted under the Uniform Plumbing code - Paragraph L3.2. and L3.3 if they satisfy all of the following requirements.
  - a. The heat transfer medium is potable water or contains only substances which are recognized as safe by the U.S. Food and Drug Administration.
  - b. The pressure of the heat transfer medium is maintained less than the normal minimum operating pressure of the potable water system  
*Exception:* Steam complying with section #1 above.
  - c. The equipment is permanently labeled to indicate that only additives recognized as safe by the FDA shall be used in the heat transfer medium.

Other heat exchanger designs may be permitted where approved by the Administrative Authority.

## C. OPERATING RESTRICTIONS

1. Maximum domestic hot water temperature is 194°F for commercial applications and 140°F for residential applications.
2. Maximum boiler water temperature is 210°F.
3. Maximum working pressure for inner (domestic water) tank is 150 psig.
4. Maximum working pressure for outer (boiler water) tank is 45 psig.
5. pH and chloride limits for water heaters are:
  - a. chloride, less than 150 mg/l (ppm)
  - b. pH value min. 6 - max. 8

### NOTICE

**Any water conditioning system must be installed and maintained in accordance with manufacturer's specifications.**

### NOTICE

**Do not install the water heater on any application if the boiler piping contains non-oxygen barrier tubing or if the boiler piping is considered an "open system". Exposing the outer tank of the water heater to oxygen contamination will lead to premature tank failure and denial of the warranty.**

## D. LOCATING WATER HEATER

1. This water heater is not intended for outdoor installations.
2. Keep distance between boiler and water heater to a minimum to:
  - a. reduce piping heat loss
  - b. provide minimal friction loss
3. Locate water heater so that any leakage from the tank or water connections will not cause damage to the area adjoining the water heater or to lower floors in the structure.  
When such a location is unavoidable, a suitable drain pan with adequate drainage, should be placed under the water heater.
4. The Peerless® Partner® water heaters are designed for vertical installation only.

**E. PRODUCT SELECTION**

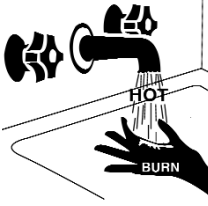
1. The following guidelines apply to residential systems only. For commercial or institutional installations contact your local PB Heat, LLC representative.
2. Determine the quantity of domestic hot water required. Factors to consider:
  - a. Estimate typical peak hour demand. Determine the general time of day (morning, noon, evening) when the most hot water is used. Use chart below to determine potential maximum usage.
  - b. **Estimate unusual peak draw demand.** Whirlpool baths, hot tubs, and multiple head showers require large quantities of hot water in a short period of time. Contact fixture manufacturer for quantity of water required. Generally speaking, these circumstances can only be met with larger storage volumes.
  - c. **Domestic Water Temperature.** Most residential usage will be satisfied with 119°F water, the temperature setting recommended by the Consumer Product Safety Commission. Some applications such as laundry and dishwashers may require a higher temperature.

Ratings can be improved by increasing Peerless® Partner® thermostat setting and using a mixing valve to temper the hot water to the proper temperature. When temperatures greater than 119°F are required, use a mixing valve at the outlet of the water heater or anti-scald fittings at point of use.

**NOTICE**

The Peerless® Partner® indirect-fired water heater is deemed to be used in a "commercial setting" if at any time the unit is operated at a temperature over 150°F. Refer to warranty for additional information.

**⚠ DANGER**



**Water temperatures over 125°F can cause severe burns instantly, or death from scalds.**

**Children, disabled, and elderly are at the highest risk of being scalded.**

**See instruction manual before setting temperature at water heater.**

**Feel water before bathing or showering.**

**Temperature limiting valves are available, see manual.**

- d. **Domestic water priority.** First hour ratings may be less than published when boiler output is shared with space heating. Generally a consumer will notice a drop in domestic water temperature before a drop in space heating temperature. Giving domestic water production priority by directing entire boiler output to Peerless® Partner® will maximize domestic water output. However, prioritization controls could result in an unacceptable drop in space heating temperature when large quantities of domestic hot water are used, and a prioritization control malfunction could result in loss of space heating.

3. **Multiple Water Heaters.** Peak domestic water usage (first hour rating) or unusual peak draw may not be met with a single water heater. Multiple units can be installed as either a bank of tanks acting as a single unit, or as multiple individual units sized and located for specific draw situations.

**Estimate of Peak Domestic Hot Water Usage**

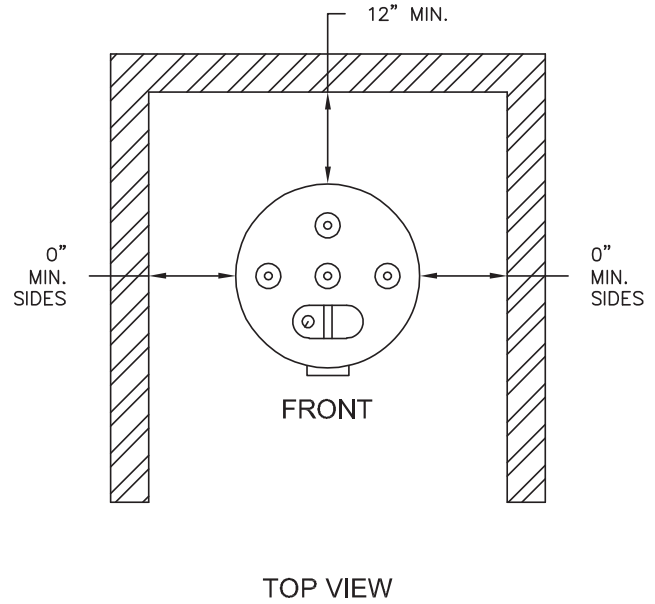
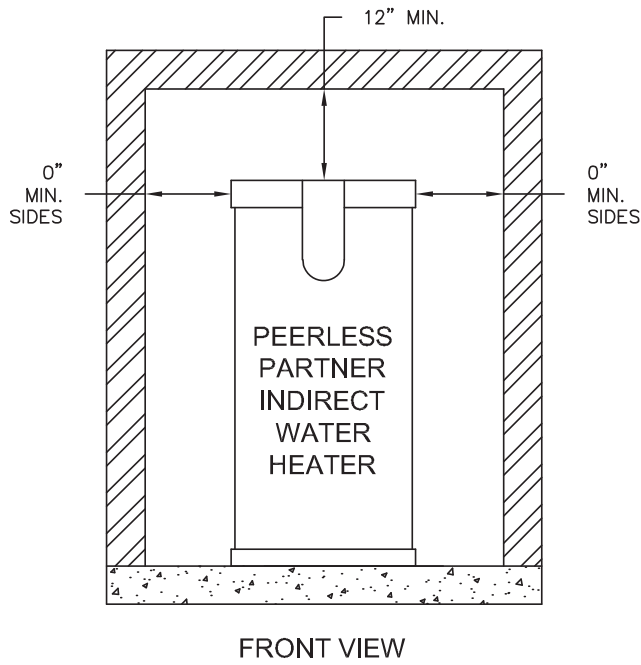
Use	Average Gallons of Hot Water per Usage	Times Used During One Hour	Gallons Used in One Hour
Shower	20	x _____	= _____
Bath	20	x _____	= _____
Shaving	2	x _____	= _____
Hands and Face Washing	4	x _____	= _____
Hair Shampoo	4	x _____	= _____
Hand Dish Washing	4	x _____	= _____
Automatic Dish Washing	14	x _____	= _____
Food Preparation	5	x _____	= _____
Wringer Clothes Washer	26	x _____	= _____
Automatic Clothes Washer	32	x _____	= _____

Total Peak Hour Demand = \_\_\_\_\_

**F. RECOMMENDED CLEARANCES**

1. Water heater should be installed to allow adequate clearance for servicing.
2. Zero clearance is permissible to any side of the Peerless® Partner® water heater, but information labels may be hidden.

3. Recommended top or vertical clearance is 12" minimum.
4. Refer to boiler manual for boiler clearances.
5. See Figure 1.1 for recommended service clearances.



**Figure 1.1: Recommended Clearances**

## 2. INSTALLATION – PIPING

### A. TEMPERATURE & PRESSURE (T&P) RELIEF VALVE

#### CAUTION

To reduce risk of excessive pressures and temperatures in the water heater, install temperature and pressure protective equipment required by local codes, but no less than a combination temperature and pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22. This valve must be marked with a maximum working pressure of the water heater.

- 1 Every Peerless® Partner® water heater must be protected with a T&P relief valve.
- 2 Determine T&P relief valve size by the following specifications, unless they conflict with local codes:
  - a. Peerless® Partner® 30/40/50: 3/4" NPT with an AGA Rating of 100,000 BTU/hr and a maximum pressure rating of 150 psig. (Watts 100XL-8 or equivalent).
  - b. Peerless® Partner® 60/80/100/120: 3/4" NPT with an AGA Rating of 200,000 BTU/hr and a maximum pressure rating of 150 psig. (Watts 40XL-8 or equivalent).

#### NOTICE

For proper operation of the T&P and to prevent the T&P from activating due to boiler water temperature, use a T&P relief valve with extended element. Recommended, an 8" minimum length.

3. Standard Installation:  
Install T&P relief valve in the Auxiliary connection located behind the air vent on the top of the water heater (Figure 3.1).  
  
or  
  
Install the T&P relief valve in the run (straight through leg) of a tee located at the domestic hot water outlet when using the Auxiliary connection for a recirculation return (Figure 3.2).
4. Commonwealth of Massachusetts Installation:  
Follow this procedure for jurisdictions requiring a vacuum breaker to be installed on the domestic cold water inlet.
  - Install the T&P in the run (straight through leg) of tee located at the domestic hot water outlet. Use a long element T&P relief valve (Fig. 3.4).

5. T&P Relief Valve Discharge Piping:  
T&P relief valve discharge piping must be:
  - made of material serviceable for temperatures of 250°F or greater.
  - directed so that hot water flows away from all persons.
  - directed to a suitable place for disposal.
  - installed so as to allow complete draining of the T&P relief valve and discharge line.

T&P relief valve discharge piping must not be:

- excessively long. Using more than 2 elbows or 15 feet of piping can reduce discharge capacity.
- directly connected to a drain. Terminate the discharge piping within 6" from a drain and within 6" of the floor. Refer to local codes.
- plugged, reduced or restricted.
- subject to freezing.

#### WARNING

Do not install any valve between T&P relief valve and tank connection or on T&P relief valve discharge piping. Do not plug T&P relief valve or discharge piping. Improper placement and piping of T&P relief valve can cause severe personal injury, death or substantial property damage.

### B. DRAIN VALVE

Drain valve and fittings are supplied by others.

1. Standard Installation
  - a. Install a tee connection at the domestic cold water inlet (Fig. 3.1 and 3.2).
  - b. Pipe the drain piping with drain valve from the tee connection to:
    - i. a suitable place for disposal
    - or
    - ii. terminate within 12" of the floor
2. Commonwealth of Massachusetts Installation
  - a. Use the drain tube assembly supplied in the tank carton.
  - b. Thread a 3/4" close nipple onto the Auxiliary connection and insert an open-end dip tube into the Auxiliary connection on top of water heater. As shown in Fig. 3.3.
  - c. Install a 3/4" NPT elbow to the Auxiliary connection, see Fig. 3.4.
  - d. Pipe the drain piping with drain valve from the elbow connection to:



- i. a suitable place for disposal
- or
- ii. terminate within 12" of the floor

**C. AUTOMATIC AIR VENT**

1. Remove plastic shipping cap from 1/2" NPT pipe fitting on top center of water heater.
2. Install 1/2" x 1/8" reducer bushing provided with water heater, using suitable pipe dope or tape.
3. Install automatic air vent provided with water heater, using suitable pipe dope or tape.
4. Unscrew vent cap on air vent one full turn. Leave cap unscrewed one turn for normal venting.

**D. THERMAL EXPANSION**

If a backflow preventer, check valve or pressure reducing valve is piped on cold water supply piping of water heater, install an expansion tank on cold water supply line to prevent normal thermal expansion from repeatedly forcing open T&P relief valve.

**⚠ CAUTION**

**T&P relief valve is not intended for constant duty, such as relief of pressure due to repeated normal system expansion. Correct this condition by installing a properly sized expansion tank in domestic water system. Refer to expansion tank manufacturer's installation instructions for proper sizing.**

**E. WATER HAMMER**

Dishwashers, clothes washers and fast-closing positive shut-off valves incorporated in the system all contribute to creating water shock. Install a water hammer arrester to prevent damage to pipes and appliances. See device manufacturer's instructions for application and installation.

**⚠ NOTICE**

**Water hammering within the domestic piping system can cause premature failure of the inner tank of the water heater. This type of failure is NOT covered under warranty.**

**F. VACUUM BREAKER**

Installing a vacuum breaker Watts N36-M1 or equivalent on the domestic cold water inlet will prevent damage to the inner tank if a negative pressure is developed in the domestic supply line. See manufacturer's instructions for application and installation of the vacuum breaker.

**G. GENERAL PIPING**

1. For domestic water piping diagrams, see Figures 3.1 through 3.4.
2. See Figures 3.5 through 3.9 for boiler water piping
3. See Figures 3.10 and 3.11 for multiple water heater domestic piping.
4. See Figure 3.12 for multiple water heater boiler piping.
5. See Table 1.1 for domestic and boiler piping connection sizes.
6. All plumbing must meet or exceed all local, state and national plumbing codes.
7. Use pipe dope or tape suitable for potable water systems.
8. Use isolation valves to isolate system components.

**H. DOMESTIC PIPING**

1. Union on domestic hot water outlet should be piped at a higher elevation than domestic water drain valve. This will make draining the water heater easier.
2. Install unions for easy removal of water heater. Use dielectric unions or couplings to protect hot and cold water fittings from corrosion when connecting dissimilar materials such as copper and galvanized iron pipe.
3. If copper pipe is used for domestic water connections, first solder pipe to a threaded adapter and then screw adapter into cold water inlet on top of water heater. Inlet contains an internal plastic dip tube which can be damaged by heat from soldering.

**Table 1.1:**

Water Heater Model Number	Connections - NPT			Recirculation Dip Tube		Draining Dip Tube		Recommended Minimum Boiler Piping Diameter (inches)
	Domestic Water Inlet/Outlet	Boiler Water Supply/Return	Auxiliary Connection	Length (inches)	Diameter (inches)	Length (inches)	Diameter (inches)	
PT-30	3/4	1	3/4	34	3/4	34	3/4	1
PT-40	3/4	1	3/4	43	3/4	43	3/4	1
PT-50	3/4	1-1/4	3/4	25	3/4	52	3/4	1-1/4
PT-60	3/4	1-1/4	3/4	34	3/4	62	3/4	1-1/4
PT-80	1-1/2	1-1/2	1-1/2	25	1-1/2	48	1-1/2	1-1/2
PP-120	1-1/2	2	1-1/2	32	1-1/2	61	1-1/2	2

### NOTICE

**Do not apply heat to the cold water inlet when making sweat connections to water heater. Sweat tubing to adapter before fitting adapter to cold water inlet of heater. It is imperative that no heat be applied to the cold water inlet, as it contains a non metallic dip tube.**

4. When the water supply pressure is higher than 70 psig, it is recommended to install a pressure reducing valve on cold water supply line to prevent water loss through T&P relief valve.
5. If water heater will replace tankless coil in boiler, disconnect piping to coil. Allow water to drain from coil. Do not plug tankless coil.

### DANGER

**Plugging tankless coil inlet and outlet will result in severe personal injury, death, or substantial property damage.**

#### I. THERMOSTATIC MIXING VALVE

1. It is recommended to install an optional mixing valve on the domestic hot water outlet.
2. Mixing valve should comply with ASSE 1017.

#### J. RECIRCULATION PIPING

1. T&P relief valve must be installed in run (straight through leg) of tee located at domestic hot water outlet of water heater.
2. It is recommended that the recirculation dip tube be installed in auxiliary connection using a close nipple assembly as shown Fig. 3.3, page 9. See Table 1.1 page 6 for diameter and length of dip tube.
3. A stainless steel or bronze circulator is recommended.
4. Install automatic mixing valve either at the hot water outlet of water heater or each hot water faucet.

#### K. MULTIPLE WATER HEATER SYSTEMS

1. Parallel Pipe Recirculation Systems - Manifold recirculation return to all water heaters.
2. Series Piped Systems - Piped return to the leading (cold water inlet) water heater.
3. Install automatic mixing valve either at the hot water outlet of water heater or each hot water faucet.

### DANGER

**Failure to install automatic mixing valve where recommended will result in severe personal injury or death.**

#### L. BOILER PIPING

1. If plastic pipe is used for boiler water piping, it must have a maximum oxygen diffusion rate of 0.1 mg/liter-day for boiler and water heater protection.

### NOTICE

**The Peerless® Partner® IDWH must be installed on a closed type hydronic system. Failure to provide such a system will result in premature failure of the outer tank and annulment of warranty.**

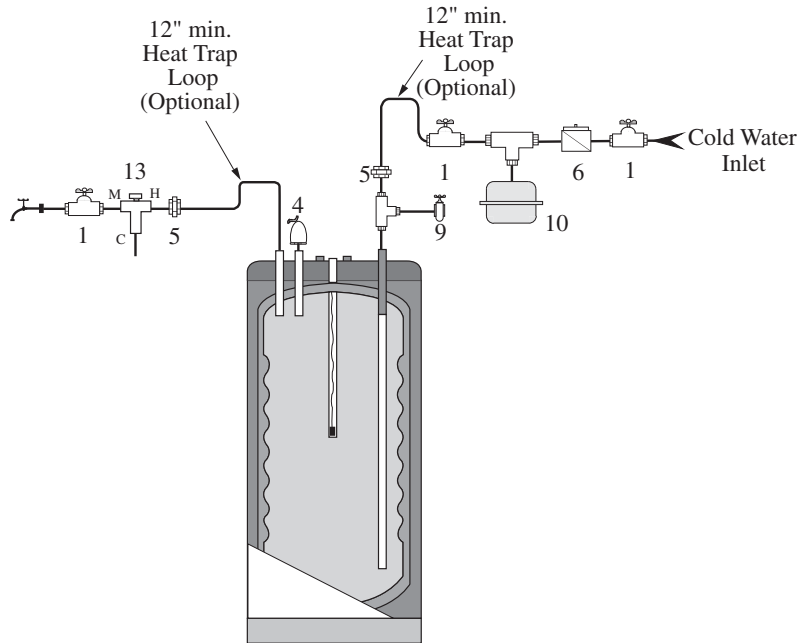
2. Boiler water (including additives) must be practically non-toxic, having toxicity rating or class of 1, as listed in Clinical Toxicology of Commercial Products.

If antifreeze is used in boiler system, local codes may require a backflow preventer on cold water supply line. Use antifreeze specifically intended for hydronic heating systems. Inhibited propylene glycol is recommended at a maximum 50/50 mixture.

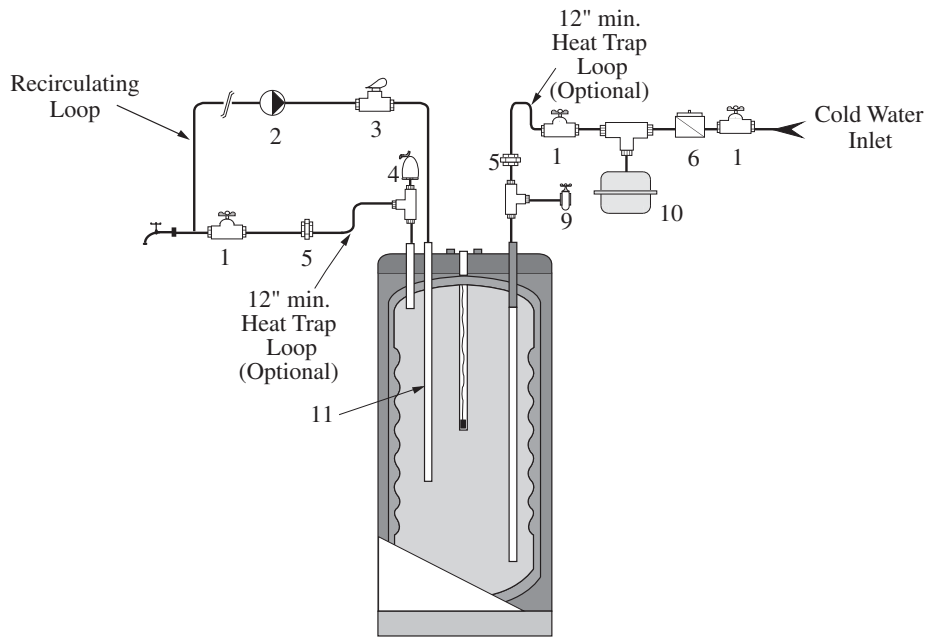
### WARNING

**Do not use automotive, ethylene glycol or petroleum-based antifreeze. Do not use any undiluted antifreeze. This can cause severe personal injury, death or substantial property damage.**

### 3. INSTALLATION – PIPING DRAWINGS



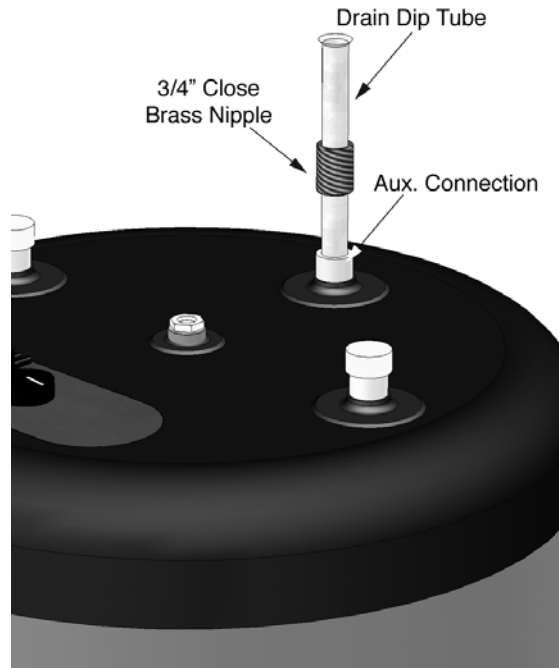
**Figure 3.1: Peerless® Partner® Recommended Installation: Domestic Water Piping**



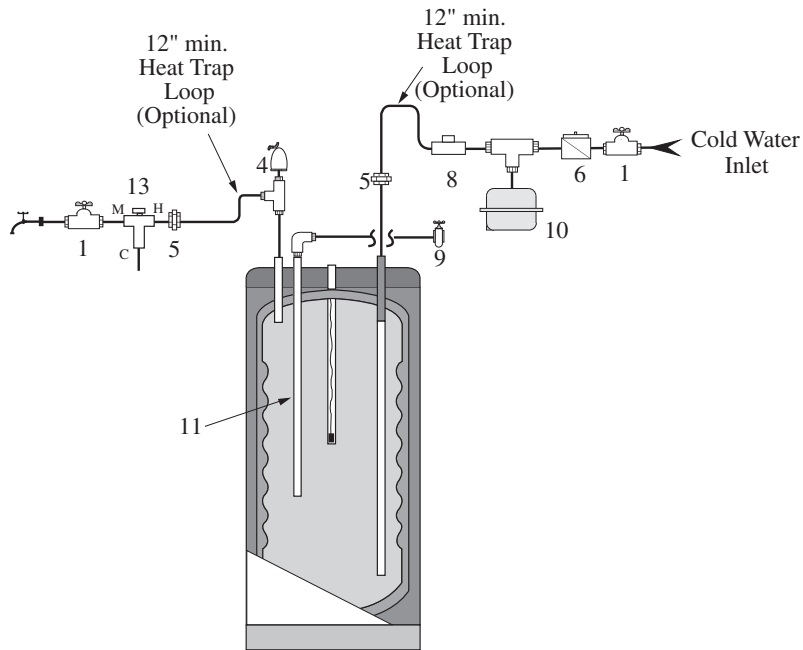
**Figure 3.2: Peerless® Partner® Recommended Installation: Domestic Water Piping with Recirculation**

- 1. Shut-off valve
- 2. Recirculation Circulator
- 3. Flow Check Valve
- 4. T&P relief valve
- 5. Unions
- 6. Backflow preventer or pressure reducing valve(\*)

- 9. Drain valve
  - 10. Thermal expansion tank (potable)
  - 11. Recirculation dip tube
  - 13. Thermostatic mixing valve (\*)
- (\*) Optional devices may be required by local codes.



**Figure 3.3: Domestic Water Drain Tube Assembly: Commonwealth of Massachusetts Requirements**



**Figure 3.4: Peerless® Partner® Domestic Water Piping: Commonwealth of Massachusetts Requirements**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1. Shut-off valves</li> <li>4. T&amp;P relief valve</li> <li>5. Unions</li> <li>6. Backflow preventer or pressure reducing valve (*)</li> <li>8. Vacuum breaker</li> <li>9. Drain valve</li> </ul> | <ul style="list-style-type: none"> <li>10. Thermal expansion tank (potable)</li> <li>11. Dip tube - Draining per Table 1.1</li> <li>13. Mixing valve (*)</li> </ul> <p>(*) Optional devices may be required by local codes.</p> |
|---|---|

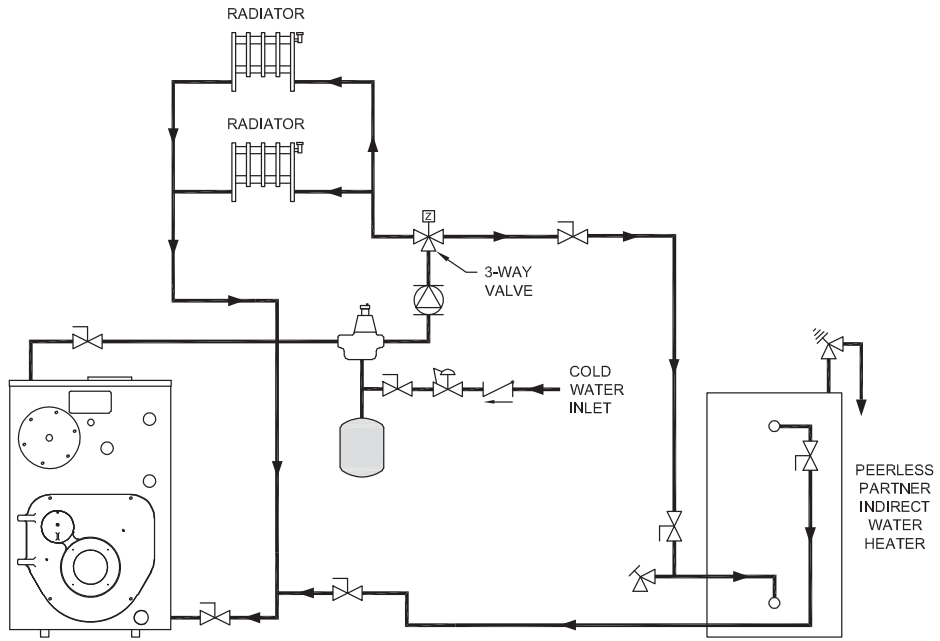

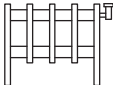












Figure 3.5: Peerless® Partner® Boiler Piping with 3-Way Valve (Domestic Priority)

PIPING LEGEND

ISOLATION VALVE		RADIATOR	
PRESSURE REGULATOR		AIR SEPARATOR & AIR VENT	
THREE WAY ZONE VALVE		EXPANSION TANK	
ZONE VALVE		SAFETY RELIEF VALVE	
DRAIN VALVE			
CHECK VALVE (BACKFLOW PREVENTER)			
CIRCULATOR			
TEMPERATURE PRESSURE GAUGE			

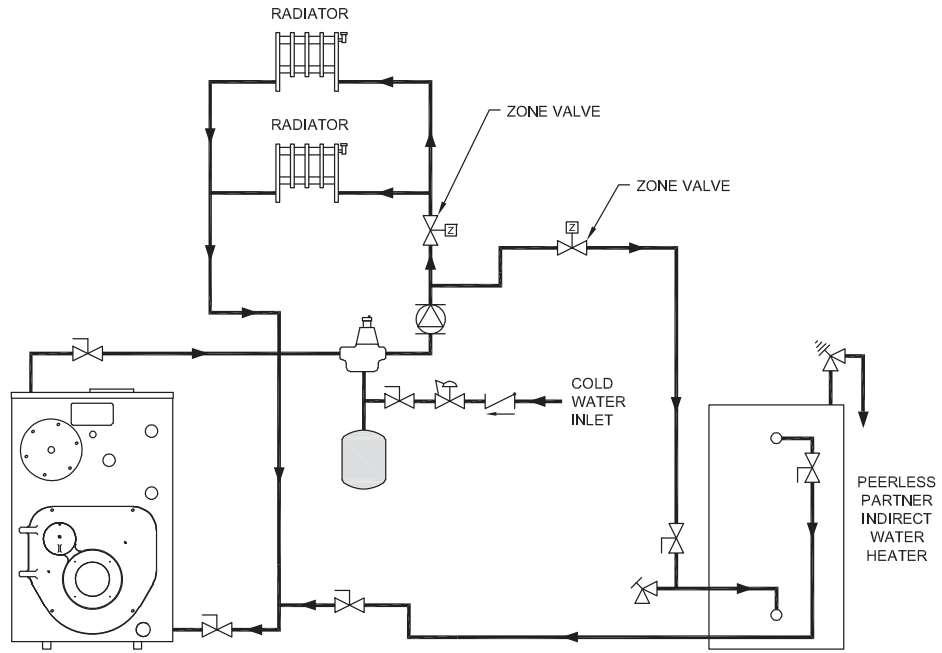


Figure 3.6: Peerless® Partner® Boiler Piping with Zone Valves

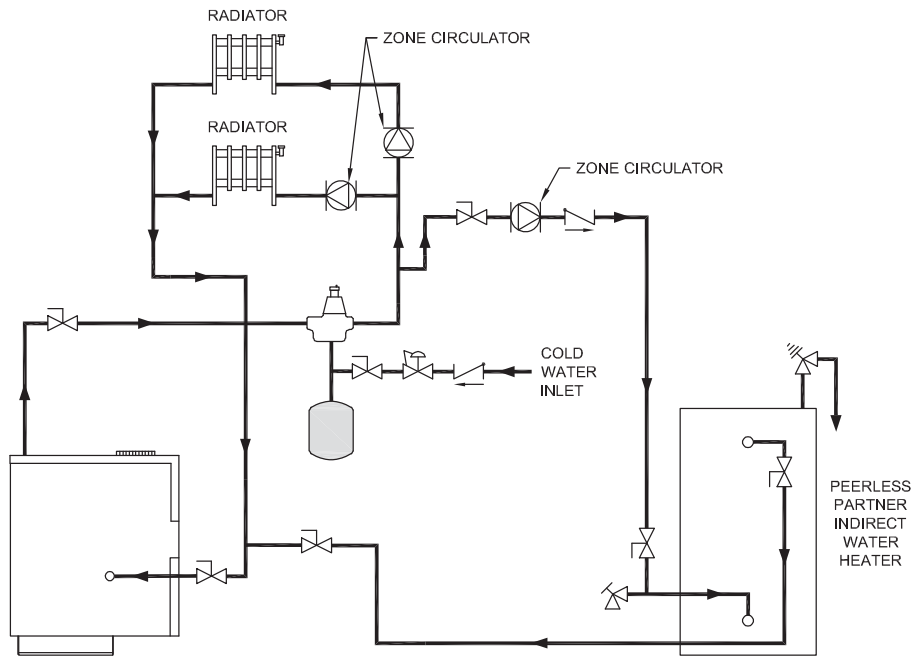
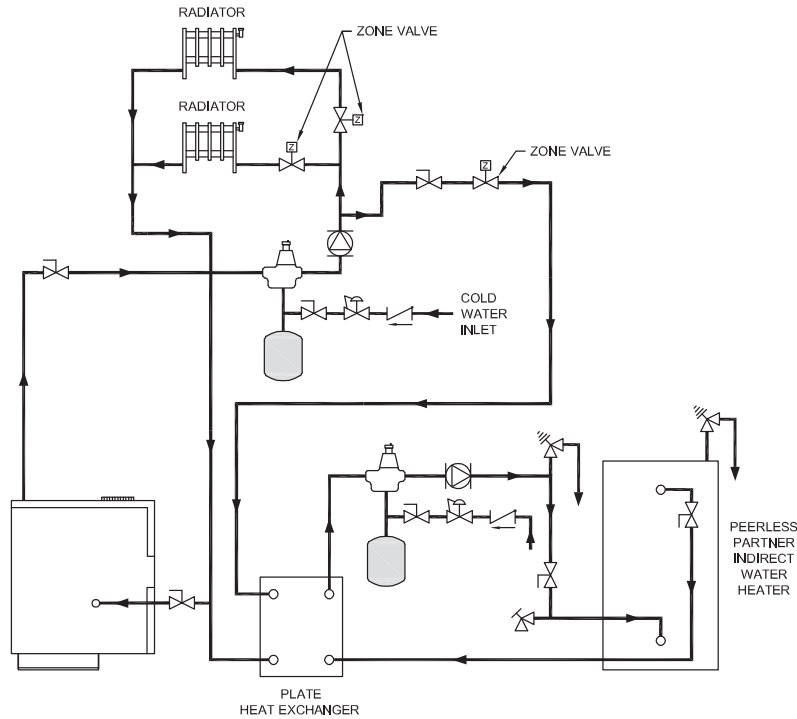
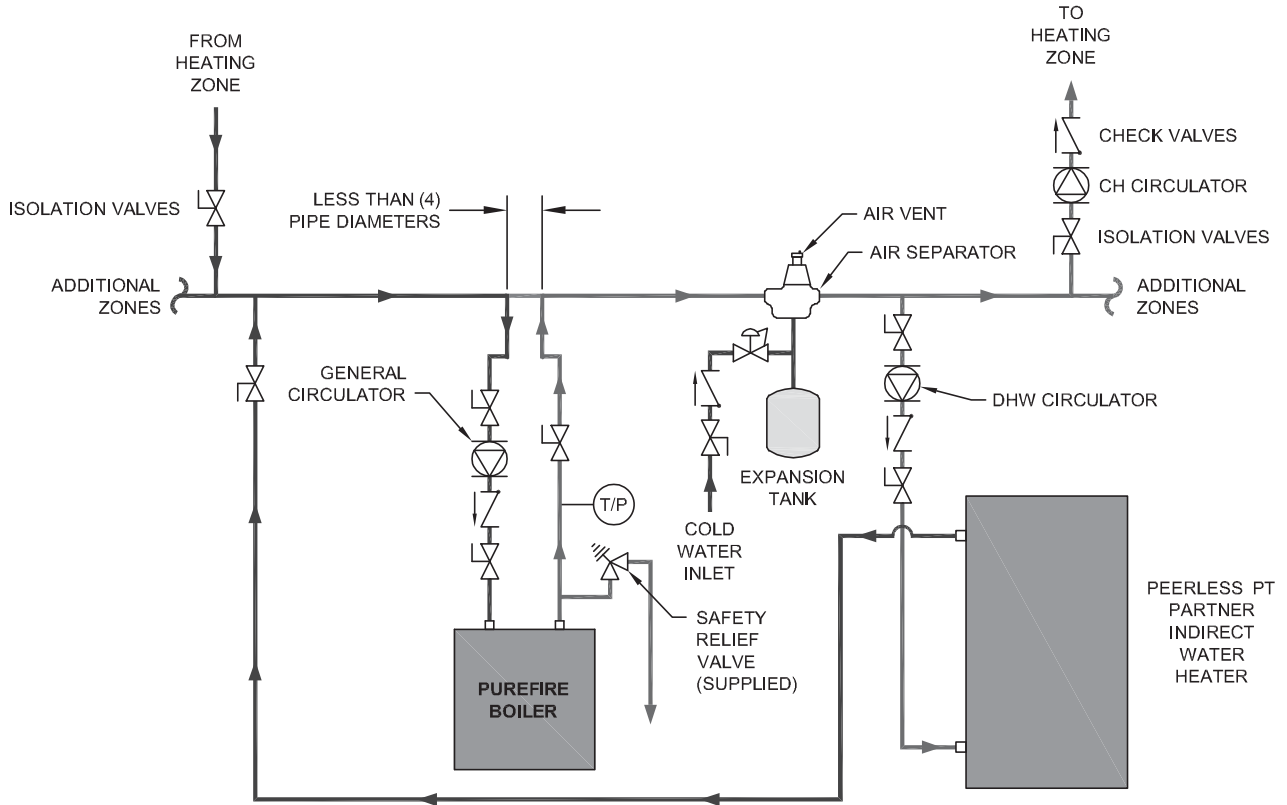


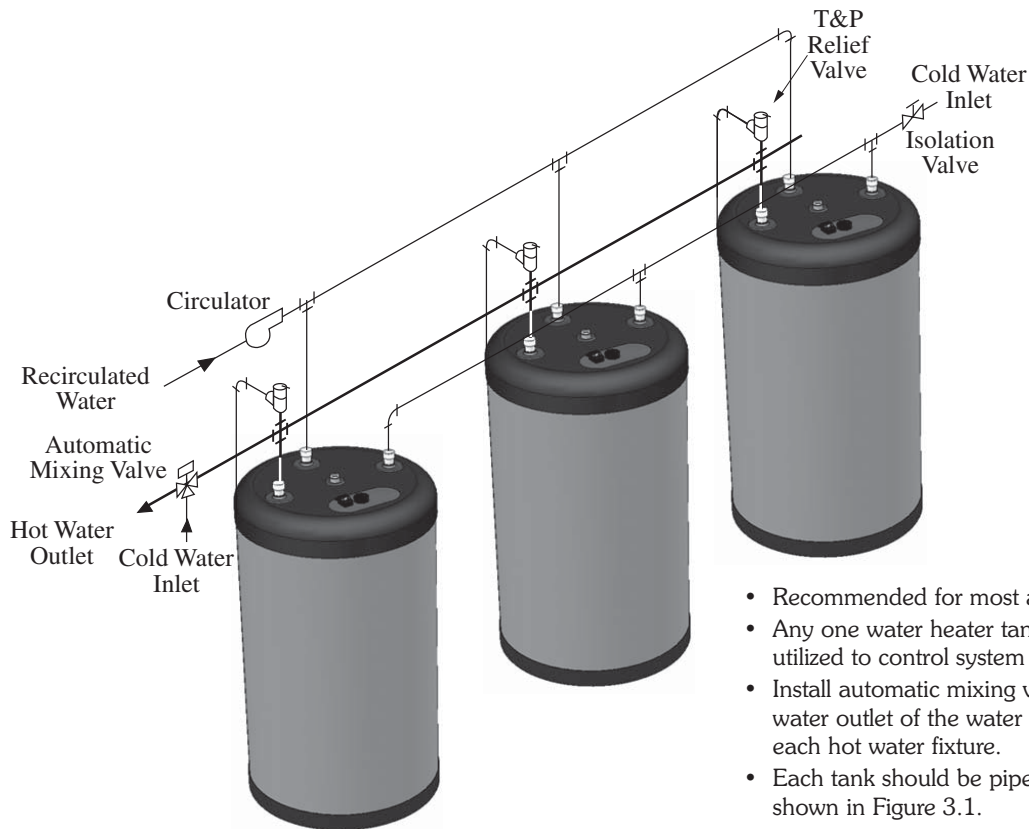
Figure 3.7: Peerless® Partner® Boiler Piping with Zone Circulators



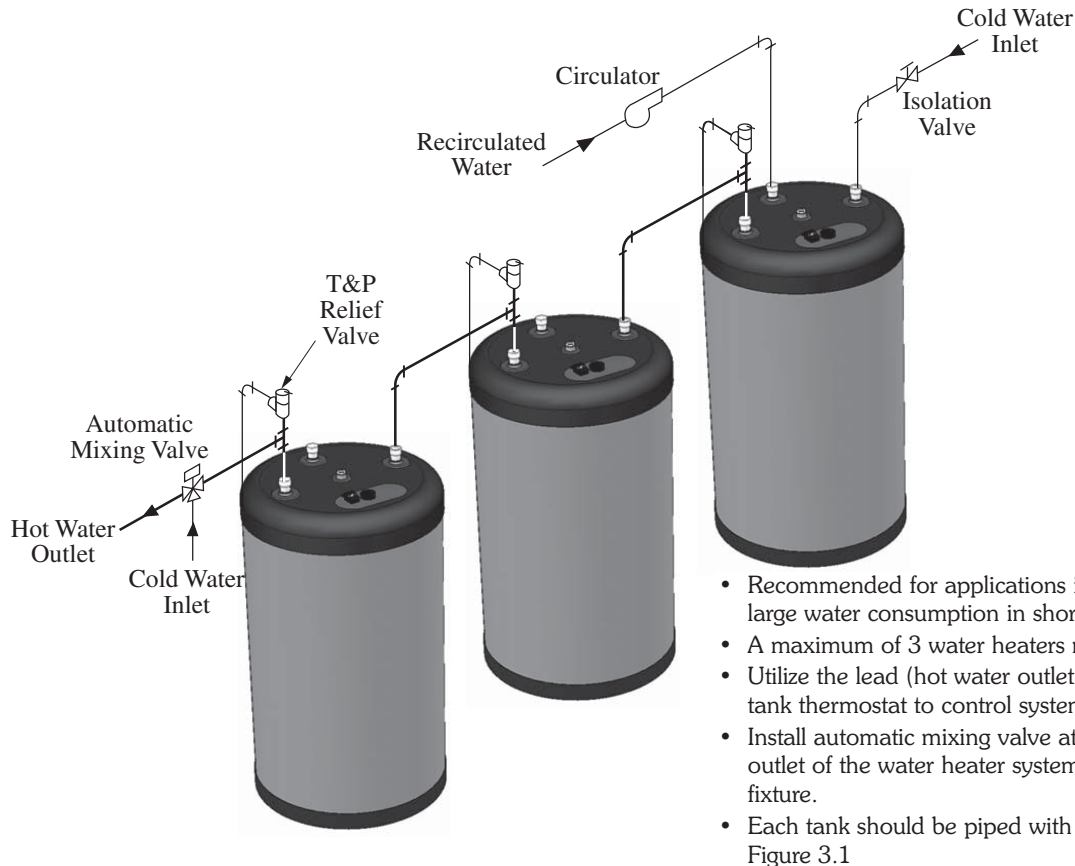
**Figure 3.8: Peerless® Partner® Boiler Piping with Plate Heat Exchanger for "Double Wall" Applications**  
 (Refer to the PureFire® Installation, Maintenance, and Operations Manual for alternate piping configurations).



**Figure 3.9: Peerless® Partner® Boiler Piping for Peerless® PUREFIRE® Condensing Boilers**  
 Note: Contact PB Heat for optional heat exchanger kit for "Double Wall" applications.

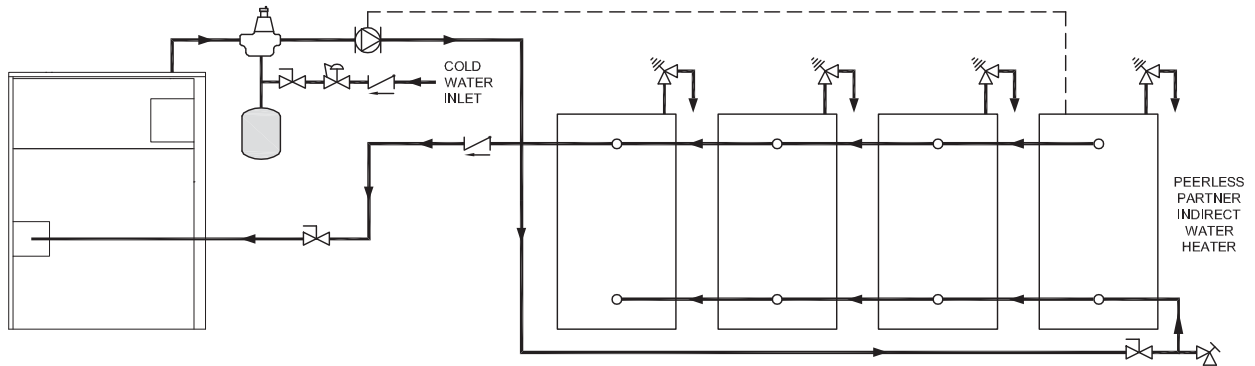


**Figure 3.10: Multiple Peerless® Partner® Water Heater System Domestic Piping - Parallel**



**Figure 3.11: Multiple Peerless® Partner® Water Heater System Domestic Piping - Series**





**Figure 3.12: Recommended Multiple Peerless® Partner® Boiler Piping (Reverse Return)**

## 4. INSTALLATION – WIRING

### **WARNING**

**Electrical shock hazard can cause severe personal injury, death or substantial property damage. Disconnect power before installing and/or servicing.**

#### **A. WIRING REQUIREMENTS**

1. All wiring must be a minimum of 18 gauge and installed in accordance with:
  - a. U.S.A. - National Electrical Code and any other national, state or local code requirements having jurisdiction.
  - b. Canada - C.S.A. C22.1 Canadian Electrical Code Part 1 and any other national, provincial and local code requirements having jurisdiction.
2. If original wire supplied with appliance must be replaced, Type 90°C or its equivalent must be used.
3. Refer to control component instructions packed with boiler for application information.
4. An optional service switch may be installed in water heater electrical circuit. This switch would only shut off the water heater, not the home heating system. Do not shut off water heater if there is a chance of freezing.
5. All electrical contacts shown do not have power applied - off the shelf condition. See Figures 5.1 through 5.9.

#### **B. CIRCULATORS**

Priority relay must be sized for total amp draw of all circulators.

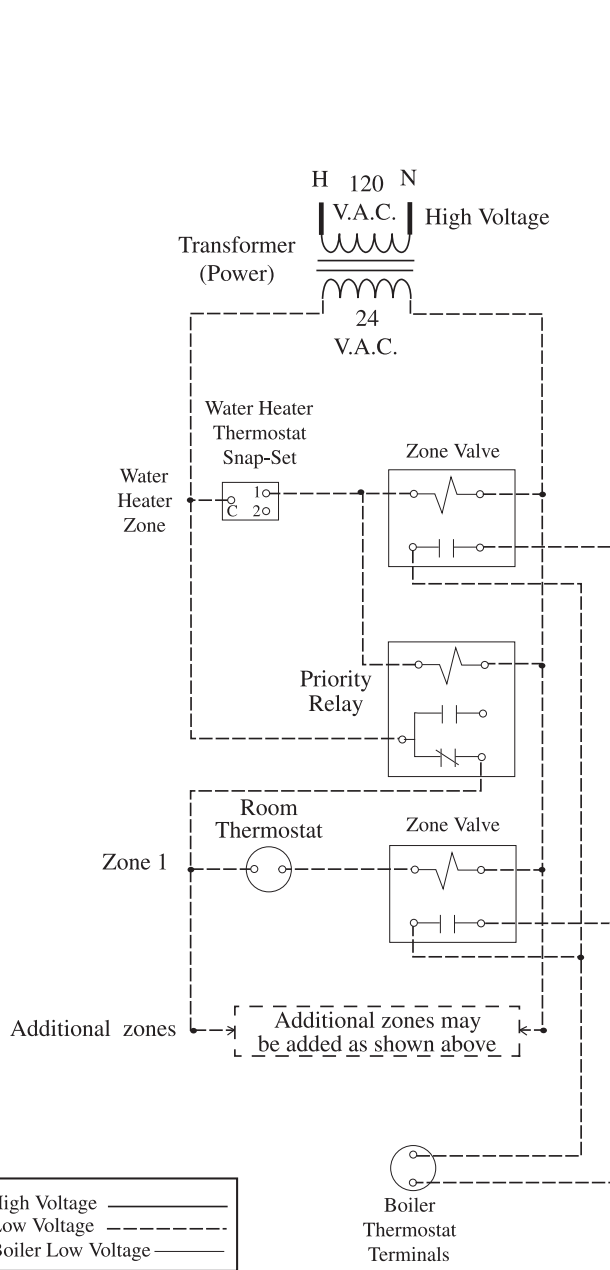
#### **C. ZONE VALVES**

Transformer must be sized for maximum load of all zone valves.

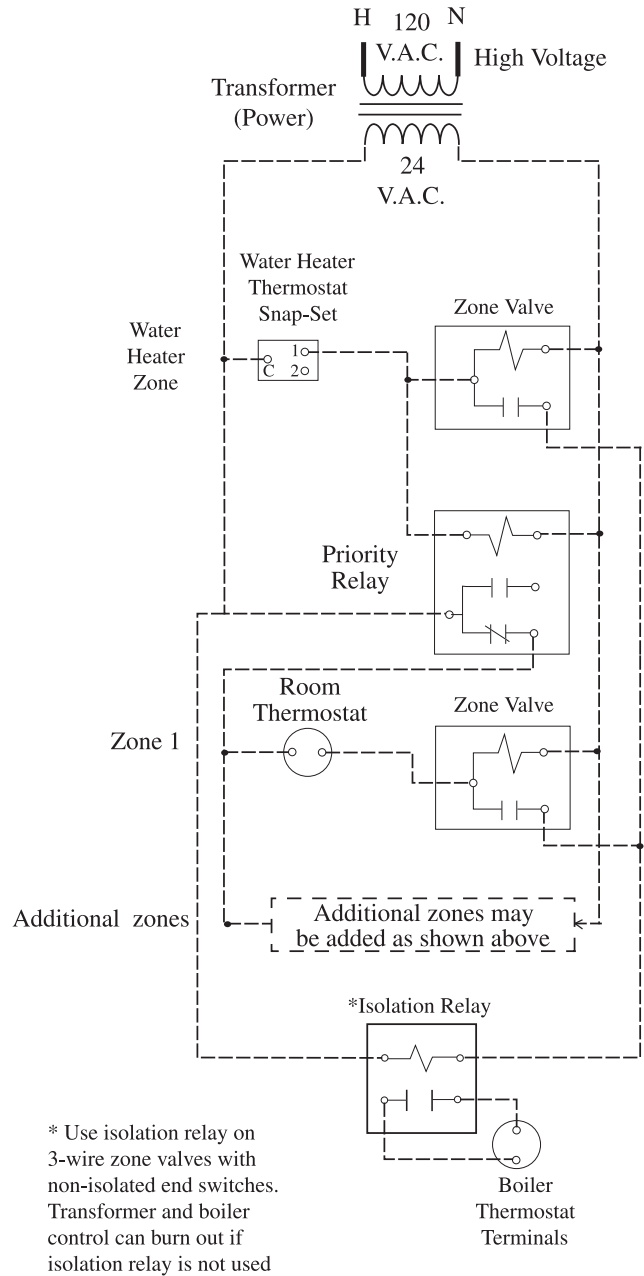
#### **D. SNAP SET CONNECTION**

1. For easy wiring between water heater thermostat and boiler controls see Installation Wiring section Figures 5.1 through 5.9.
2. Make sure snap set is firmly snapped together after wiring.

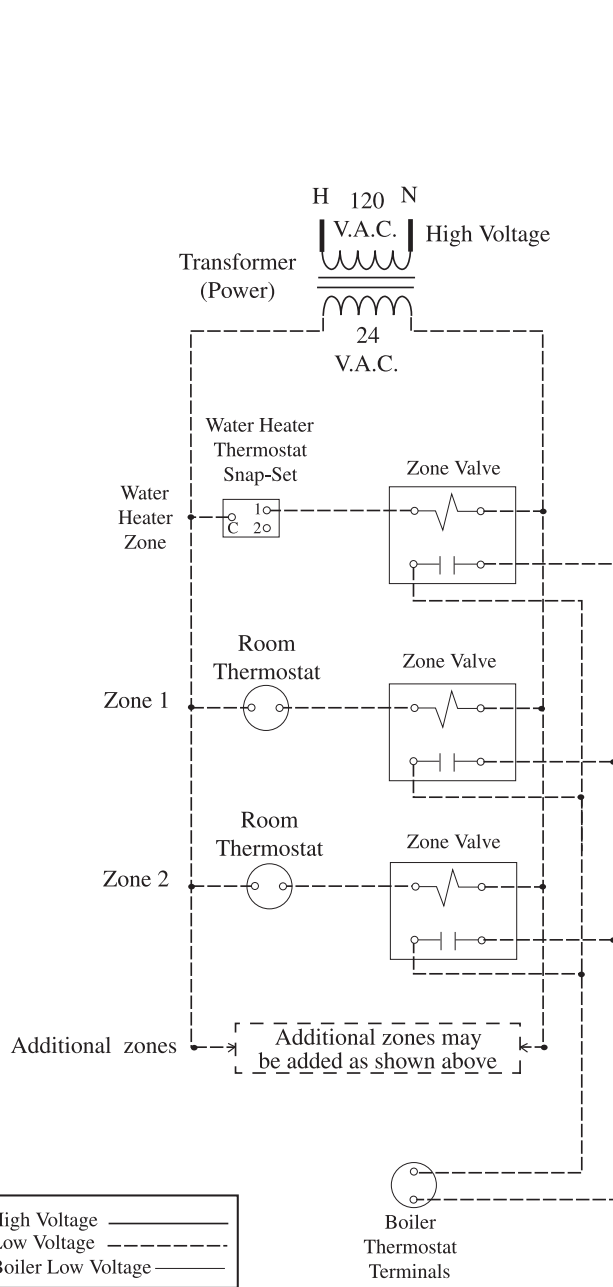
# 5. INSTALLATION – WIRING DRAWINGS



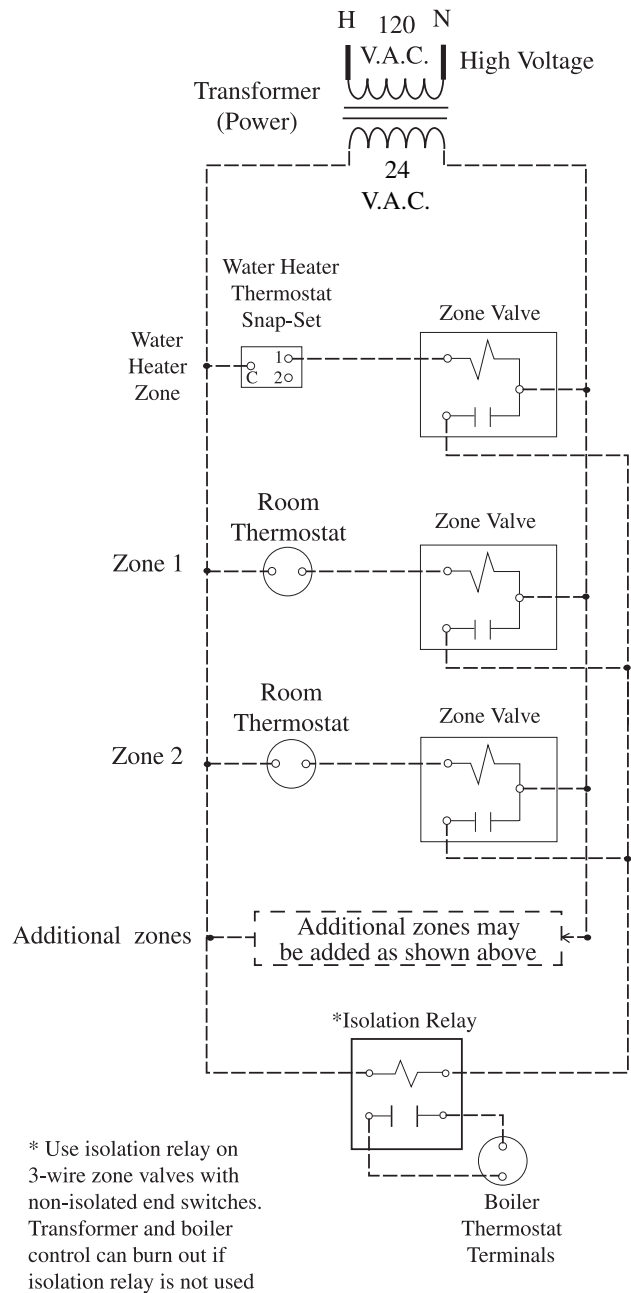
**Figure 5.1: Typical 4-Wire Zone Valve Zoning, With Domestic Priority**



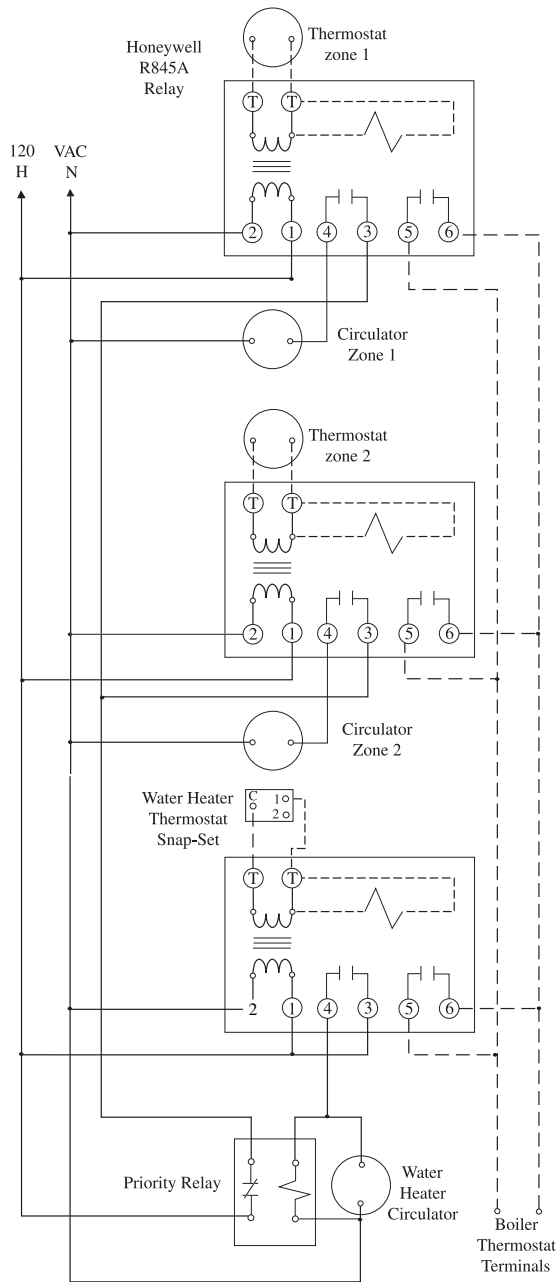
**Figure 5.2: Typical 3-Wire Zone Valve Zoning, With Domestic Priority**



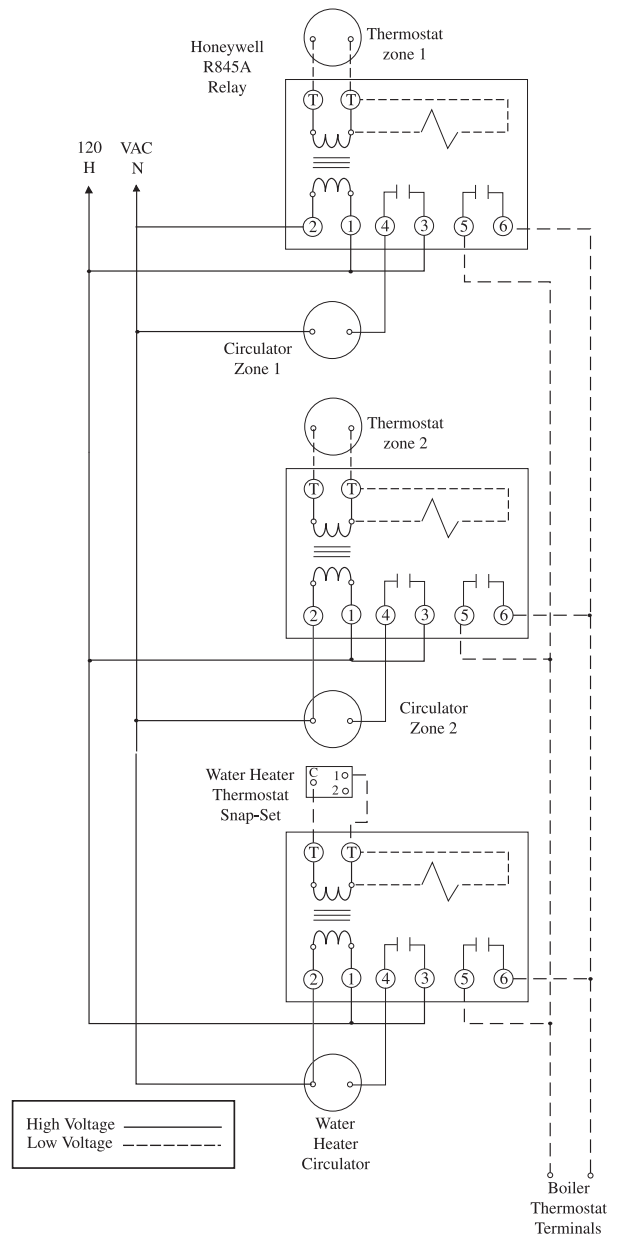
**Figure 5.3: Typical 4-Wire Zone Valve Zoning, Without Domestic Priority**



**Figure 5.4: Typical 3-Wire Zone Valve Zoning, Without Domestic Priority**

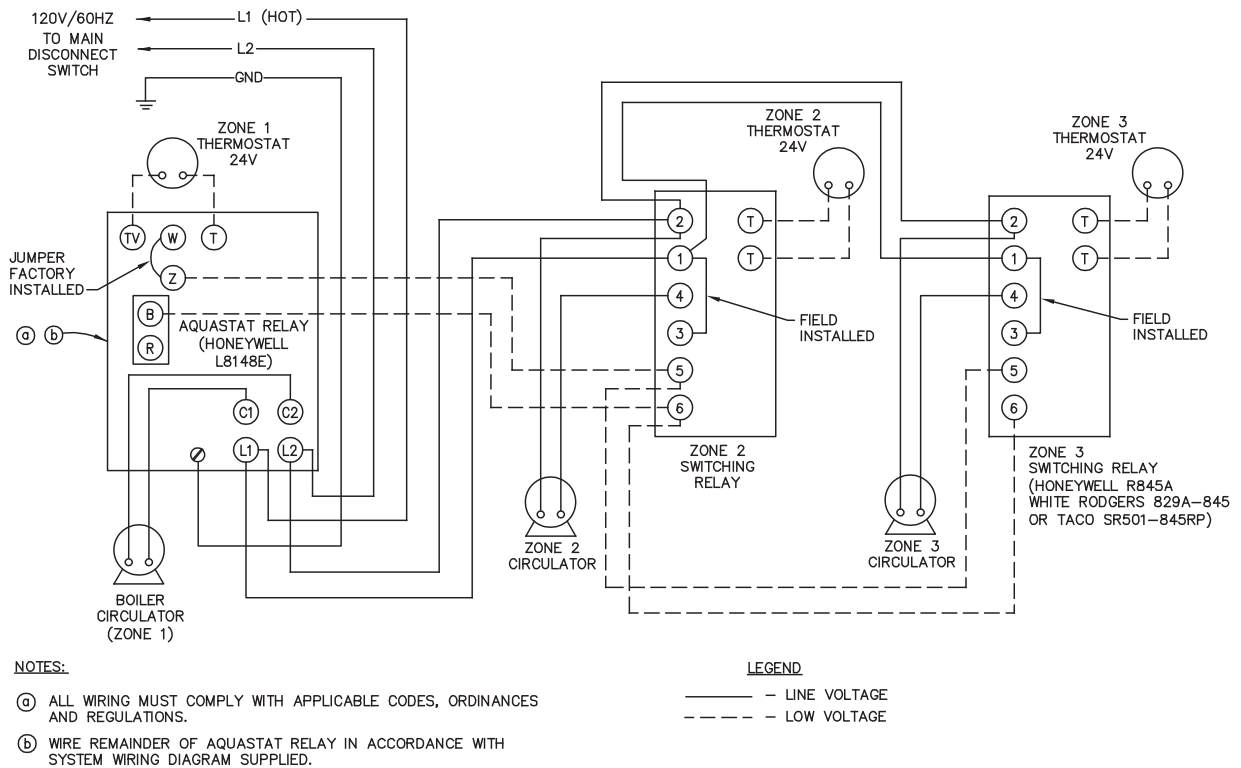


**Figure 5.5: Typical Circulator Zoning With Domestic Priority**

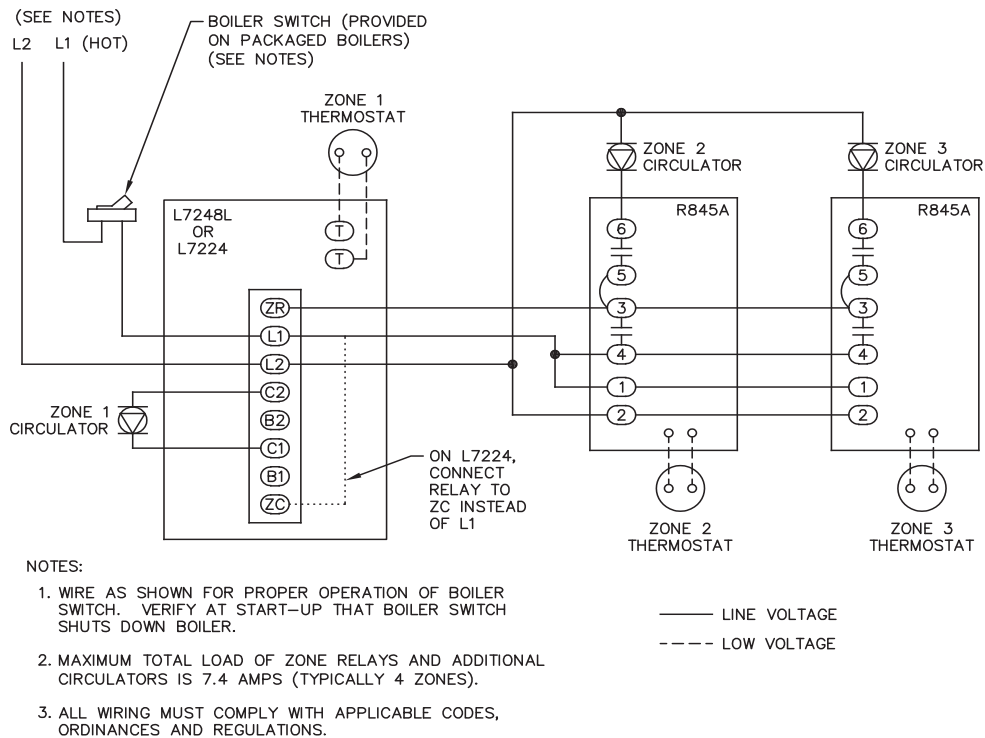


**Figure 5.6: Typical Circulator Zoning Without Domestic Priority**

# INSTALLATION - WIRING DRAWINGS



**Figure 5.7: Circulator Zoning Without Domestic Priority, Series MI**



**Figure 5.8: Circulator Zoning Without Domestic Priority, Series WBV/WV, WV-DV, EC, SC**

**Note:** Maximum of 4 total circulator zone when wiring 1 zone for priority.

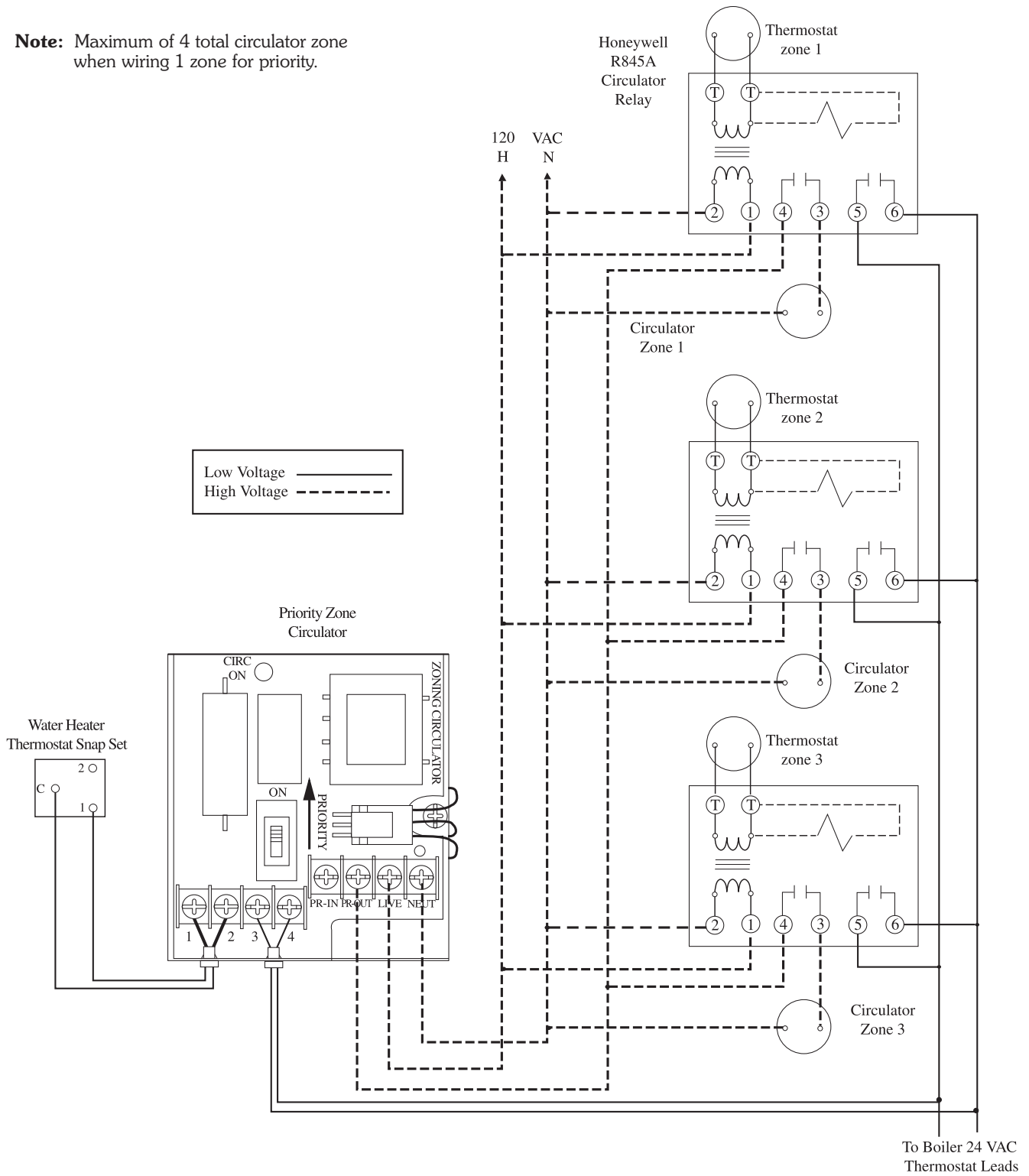


Figure 5.9: Priority Zoning Circulator Wiring

## 6. WATER HEATER START-UP

### A. FILLING THE INNER (DOMESTIC WATER) TANK

#### ⚠ CAUTION

Never use water heater unless inner and outer tanks are completely filled with water. Inner tank must be completely filled and pressurized before pressurizing outer tank.

1. Close domestic water drain valve.
2. Open domestic water isolation valves for water heater.
3. Vent air from inner (domestic water) tank by opening nearest hot water faucet. Fill domestic water tank completely by allowing water to run until there is a constant flow of water.
4. Close hot water faucet.

### B. FILLING THE OUTER (BOILER WATER) TANK

#### ⚠ CAUTION

Never use water heater unless inner and outer tanks are completely filled with water. Inner tank must be completely filled and pressurized before pressurizing outer tank.

1. Close boiler water drain valve at boiler water outlet of water heater.
2. Open water heater's boiler water isolation valves.
3. Allow air to escape from outer (boiler water) tank by opening vent cap A on automatic air vent, located on top of water heater. See Figure 6.1.
4. Follow instructions furnished with boiler to fill with water.
5. When tank is full, air will stop escaping, and the automatic air vent will close. If air vent does not seat properly (water leaks out), remove cap A. Briefly push in valve B and release it to clean valve seat. Screw cap A on completely, then unscrew one turn. See Figure 6.1.

#### ⚠ NOTICE

For proper operation of the water heater, be sure the top cap is tightened at all times.

6. If antifreeze is used in boiler water, check concentration. Boiler water (including additives) must be practically non-toxic, having toxicity rating or class of 1, as listed in *Clinical Toxicology of Commercial Products*.
  - Install an automatic mixing valve at water

#### ⚠ WARNING

Do not use automotive, ethylene glycol or petroleum-based antifreeze. Do not use any undiluted antifreeze. This can cause severe personal injury, death or substantial property damage.

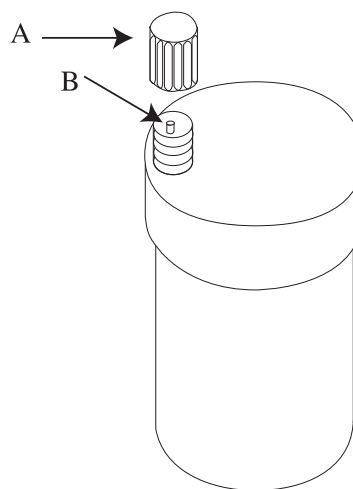


Figure 6.1: Automatic Air Vent

#### ⚠ DANGER

##### HOT WATER CAN SCALD!

- Water temperatures over 125°F can cause severe burns instantly, or death from scalds.
- Feel water before bathing or showering.
- Consumer Product Safety Commission and some states recommend temperature settings of 130°F or less. Setting thermostat higher than 130°F will increase risk of scald injury and cause severe personal injury or death.
- Water heated to a temperature suitable for clothes washing, dish washing and other sanitizing needs will scald and cause permanent injury.
- Children and elderly, infirm, or physically handicapped persons are more likely to be injured by hot water. Never leave them unattended in or near a bathtub. If anyone using hot water in the building fits this description, or if state laws or local codes require certain water temperatures at hot water faucets, take special precautions.



**⚠ DANGER**

**HOT WATER CAN SCALD!**

- Install an automatic mixing valve at water heater or at each hot water faucet, bath and shower outlet. Selection and installation must comply with valve manufacturer’s recommendation and instructions.
- Use the lowest practical temperature setting.
- Measure water temperature at hot water faucet after any adjustment. You must follow “Adjusting the Water Heater Thermostat” procedures.

**C. GENERAL NOTES**

- Household water usage patterns will affect water temperature at any faucet or shower. Occasionally check temperature at each point of use, then adjust thermostat accordingly. Always recheck temperature after adjusting thermostat.
- When hot water is used in repeated small quantities, a “stacking” effect can develop in the water heater. The upper layer of water in tank can be hotter than lower layer.
- Lowering the thermostat setting or installing automatic mixing valves as indicated in these instructions will reduce water temperature levels. Consult your installer or service technician.

**⚠ WARNING**

At no time should boiler limit control be set above 210°F. This can cause severe personal injury, death or substantial property damage if ignored.



**D. ADJUSTING THE WATER HEATER THERMOSTAT**

Water heater thermostat is factory set to its lowest temperature. This may or may not be suitable for your needs.

Turn thermostat knob clockwise ↻ to increase water temperature.

Turn thermostat knob counter-clockwise ↺ to decrease water temperature.

**⚠ WARNING**

Studies have indicated that dangerous bacteria, including legionella, pneumophila, can form in the potable water distribution system if certain minimum water temperatures are not maintained. Contact your local health department for more information.

- Measure water temperature at a hot water faucet immediately after first heating cycle. Further temperature adjustment may be necessary as water heating system is used. Recheck water temperature at faucet after adjustment.
- When adjusting thermostat, be sure boiler limit control is set a minimum of 20°F higher.

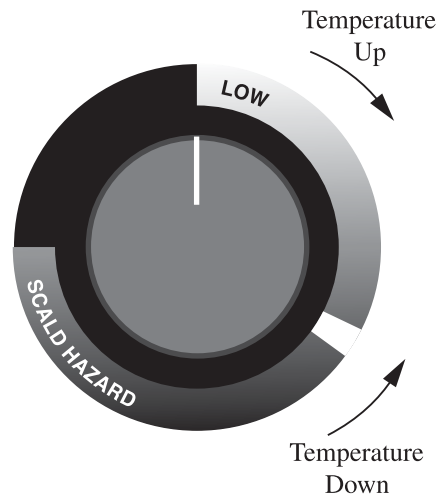


Figure 6.2: Peerless® Partner® Knob

# 7. WATER HEATER MAINTENANCE

## A. MAINTENANCE SCHEDULE

Annual service by qualified service technician should include the following:

1. Any procedure required by local codes.
2. Check air vent operation.
3. Verify system pressure. Air venting procedure may require adding water to bring system up to pressure, typically 12 psig.
4. Manually operate T&P relief valve at least once a year. This will release some hot water.

### **WARNING**

**Before operating T&P relief valve, make sure no one is in front of or around T&P relief valve discharge piping. Hot discharge water can cause severe personal injury or substantial property damage.**

5. Move operating lever to open position for a few seconds and then move it back, allowing it to snap closed. After T&P relief valve is operated, if it continues to release water, close cold water inlet to water heater immediately. Follow draining instructions, and replace T&P relief valve. If T&P relief valve weeps periodically, it may be due to thermal expansion see Thermal Expansion, page 5. Do not plug T&P relief valve or discharge piping.

### **DANGER**

**Plugging T&P relief valve or discharge piping can cause excessive pressure in water heater, resulting in severe personal injury, death, or substantial property damage.**

6. Follow instructions on circulator to oil it, if required.
7. Check mixing valve, valves, pipes and fittings for leaks.
8. Check function of field-installed controls and valves. See component manufacturer's instructions.
9. Review homeowner's maintenance responsibilities and their frequencies, including any not listed in the following section.

Homeowner monthly maintenance to include:

- Check air vent operation.  
Automatic air vent - remove cap. Briefly push in valve and release it to clean valve seat. Screw cap on completely, then unscrew one full turn. If air vent does not operate, call qualified service technician.
- Visually check valves, pipes and fittings for leaks. Call qualified service technician to repair leaks.

## B. FILLING WATER HEATER

See "Filling the Inner (Domestic Water) Tank and "Filling the Outer (Boiler Water) Tank" on in Section 6.A and 6.B.

## C. DRAINING WATER HEATER

Drain water heater if it will be shut off and exposed to freezing temperatures. Freezing water will expand and damage water heater.

- If boiler water contains sufficient antifreeze, then only the domestic water needs to be drained.

### **WARNING**

**Close boiler water isolation valves and relieve system pressure to below 15 psig in outer tank before draining inner tank to prevent damage to inner tank.**

- If boiler water does not contain sufficient antifreeze, then the boiler water and domestic water must be drained.

If antifreeze is used in boiler water, check concentration. Boiler water (including additives) must be practically non-toxic, having toxicity rating or class of 1, as listed in *Clinical Toxicology of Commercial Products*. A maximum 50/50 mixture of inhibited propylene glycol is recommended. Follow antifreeze manufacturer's instruction.

### **WARNING**

**Do not use automotive, ethylene glycol or petroleum-based antifreeze. Do not use any undiluted antifreeze. This can cause severe personal injury, death or substantial property damage.**

### **WARNING**

**Water from opened drain valves, unions and other connections may be extremely hot. To avoid severe personal injury, death or substantial property damage:**

- Tighten all drain hose connections.
- Direct hot water away from all persons.

**D. DRAINING INNER (DOMESTIC WATER) TANK**

(See Domestic Piping Fig. 3.1)

1. Disconnect snap set wiring connection at water heater.
  - a. If outer (boiler water) tank pressure is greater than 15 psig, relieve boiler pressure and close isolation valves before proceeding.
2. Close system supply isolation valve.
3. Connect a hose to domestic water drain valve at cold water inlet. Hose should extend to drain at floor level to allow siphoning of domestic water tank.
4. Open hot water faucet at highest point above heater.
5. Open domestic water drain valve to start siphoning.
6. When draining is complete, close hot water faucet and domestic water drain valve.

**E. DRAINING OUTER (BOILER WATER) TANK**

1. Disconnect snap set wiring connection at water.
2. Close boiler water isolation valves between boiler and water heater.
3. Connect hose to boiler water drain valve at water heater. Open and drain water to a safe place.
4. To speed draining procedure, loosen air vent on top of tank.
5. When draining is complete, close drain valve and retighten air vent.

## 8. TROUBLESHOOTING

**Table 8.1: Troubleshooting**

Problem	Cause	Solution
No hot water at faucet.	Boiler does not operate	Refer to boiler installation instructions
		Check main service switch
		Check fused disconnect
	Circulator does not operate	Check power supply
		Check circulator switching relay
	Improper tank thermostats setting or calibration	Turn tank thermostat to higher setting
	Zone valve does not open (if used)	Check power supply
Electrical problem (relay, wiring, fuse, etc.)	Check fuse and replace	
	Check circuit breaker and reset (if applicable)	
	Check power supply	
Air trapped in boiler supply to tank	Purge piping	
Insufficient hot water.	Tank thermostat	Adjust thermostat to higher setting
	Undersized boiler with no priority to domestic hot water	Rewire for priority
	Peak use of hot water is greater than tank storage capacity	Determine peak usage and compare to tank volume
	Undersized circulator	Check recommended circulator size in Table 11.1 and 11.2
	Faulty tank thermostat	Replace thermostat
Water at faucet too hot.	Tank thermostat set too high	Lower thermostat setting
	Improper system plumbing	Compare plumbing to Section 3
	Improper system wiring	Compare wiring to Section 4
	Tank thermostat faulty	Replace thermostat
Excessive boiler cycling per day during summer.	Large demand	Reduce demand or consider larger tank
	Faulty tank thermostat	Replace thermostat
	Boiler high limit set too low	Increase boiler high limit setting

# 9. REPAIR PARTS

**Table 9.1: Repair Parts**

	Description	Models	Stock Code
1	Air Vent, Automatic	All	51329
2	Thermostat - 160°F Residential	All	51330
	Thermostat - 194°F Commercial	All	51331
3	Bottom Cap	PT-30, 40, 50, 60	51332
		PT-80	51333
		PT-120	51334
4	Top	PT-30, 40, 50, 60	51335
		PT-80	51336
		PT-120	51337
5	Thermostat Drywell	PT-30	51338
		PT-40	51339
		PT-50	51340
		PT-60, PT-80	51341
		PT-120	51342
6	Dip Tube	PT-30	51343
		PT-40	51344
		PT-50	51345
		PT-60	51346
		PT-80	51347
		PT-120	51348



Figure 9.1: Peerless® Partner® Tank Components

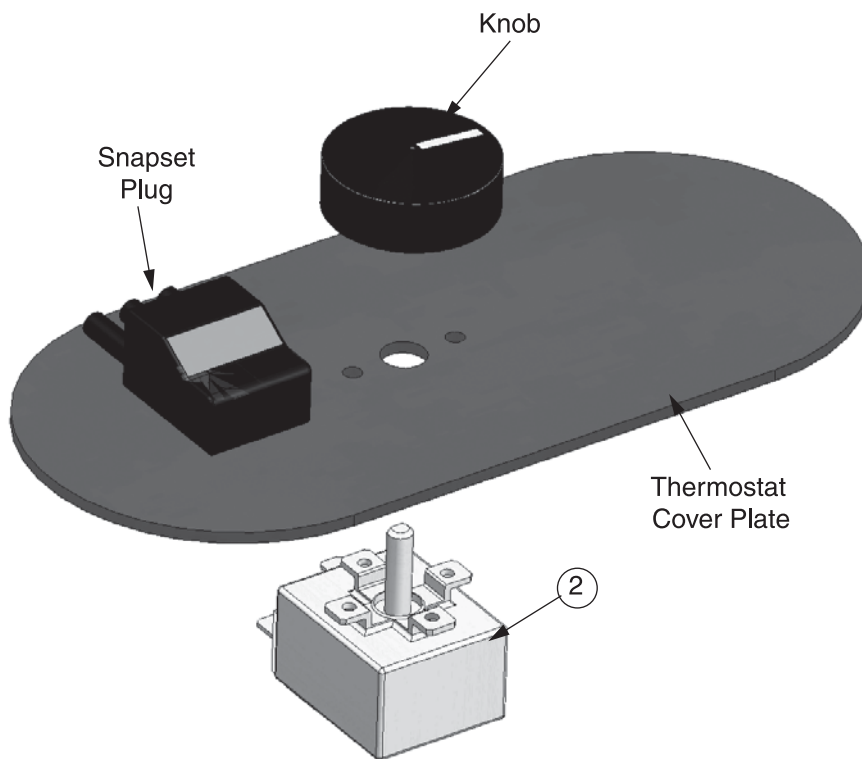


Figure 9.2: Thermostat Cover Plate Assembly

# 10. WATER HEATER DIMENSIONS & RATINGS

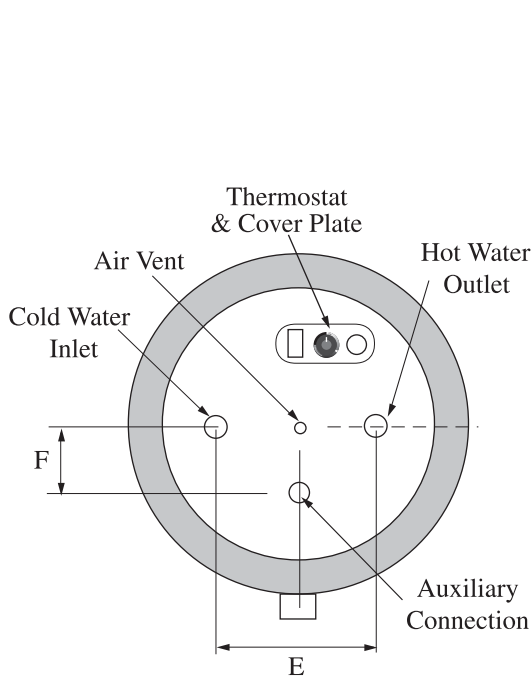


Figure 10.1: Top View

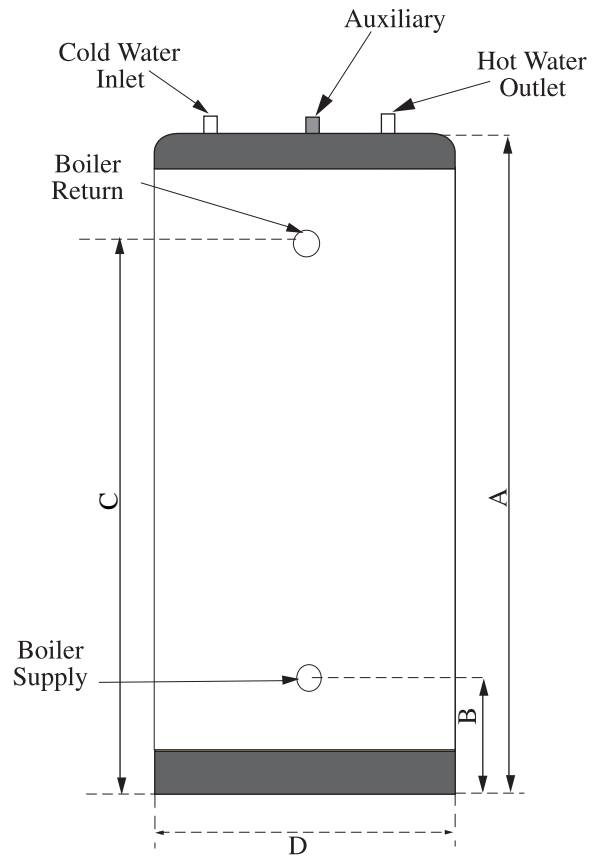


Figure 10.2: Rear View

Table 10.1

PEERLESS® PARTNER® DIMENSIONS & RATINGS															
Water Heater Model Number	Capacity (gallons)		Heating Surface (sq. ft.)	Boiler Head Loss at Min. Flow (Ft. of Water)	Piping Connections (NPT)			Dimensions (inches)						Thermostat Drywell Length (inches)	Empty Weight (lbs.)
	Domes-tic	Boiler			Domes-tic	Boiler	Aux.	A	B	C	D	E	F		
PT-30	28	5	13	.75	¾	1	¾	38	9	30	22	14	6	25	115
PT-40	39	6	16	1.0	¾	1	¾	46	9	38	22	14	6	29	135
PT-50	46	8	20	1.25	¾	1¼	¾	57	9	49	22	14	6	37	165
PT-60	56	8	24	1.50	¾	1¼	¾	66	9	58	22	14	6	47	190
PT-80	70	14	29	2.0	1½	1½	1½	61	10	50½	26	10½	10½	47	271
PT-120	119	43	42	2.50	1½	2	1½	72	10	64	32	10½	5	51	479

# 11. PERFORMANCE RATINGS

**Table 11.1**

Water Heater Model Number	Boiler Heating Capacity MBH	Peak Flow Gallon/10 Minute	1st Hour Flow Gallon/Hour	Continuous Flow Gallon/Hour	Circulator Minimum GPM
PT-30	87	42	138	116	9
PT-40	112	54	178	149	11
PT-50	140	68	224	187	14
PT-60	270	105	405	360	27
PT-80	300	123	456	400	30
PT-120	420	189	655	560	42

Conditions: 50°F Domestic Cold Water Inlet Temperature  
140°F Domestic Hot Water Outlet Temperature  
200°F Boiler Water Supply Temperature

**Table 11.2**

Water Heater Model Number	Boiler Heating Capacity MBH	Peak Flow Gallon/10 Minute	1st Hour Flow Gallon/Hour	Continuous Flow Gallon/Hour	Circulator Minimum GPM
PT-30	102	54	210	188	10
PT-40	131	69	271	242	13
PT-50	164	87	339	302	16
PT-60	316	142	628	583	32
PT-80	351	164	704	648	35
PT-120	492	246	1003	907	49

Conditions: 50°F Domestic Cold Water Inlet Temperature  
115°F Domestic Hot Water Outlet Temperature  
200°F Boiler Water Supply Temperature

**Table 11.3**

Water Heater Model Number	Boiler Heating Capacity MBH	Peak Flow Gallon/10 Minute	1st Hour Flow Gallon/Hour	Continuous Flow Gallon/Hour	Circulator Minimum GPM
PT-30	67	37	111	89	7
PT-40	86	48	143	114	9
PT-50	107	61	180	143	11
PT-60	206	91	320	275	21
PT-80	229	107	362	306	23
PT-120	321	167	523	428	32

Conditions: 50°F Domestic Cold Water Inlet Temperature  
140°F Domestic Hot Water Outlet Temperature  
180°F Boiler Water Supply Temperature

**Table 11.4**

Water Heater Model Number	Boiler Heating Capacity MBH	Peak Flow Gallon/10 Minute	1st Hour Flow Gallon/Hour	Continuous Flow Gallon/Hour	Circulator Minimum GPM
PT-30	82	48	174	152	8
PT-40	106	61	224	195	11
PT-50	132	78	281	244	13
PT-60	255	123	516	471	26
PT-80	284	143	579	523	28
PT-120	397	217	828	733	40

Conditions: 50°F Domestic Cold Water Inlet Temperature  
115°F Domestic Hot Water Outlet Temperature  
180°F Boiler Water Supply Temperature



**Table 11.5 First Hour Ratings for Reduced Boiler Output (Gallons)**

Boiler Output (MBH)	PT-30		PT-40		PT-50		PT-60		PT-80		PT-120	
	140°F	115°F	140°F	115°F	140°F	115°F	140°F	115°F	140°F	115°F	140°F	115°F
40	76	96	82	103	90	111	98	119	109	130	149	169
50	89	115	95	121	103	129	111	137	123	148	162	188
60	102	133	109	140	117	148	125	156	136	167	175	206
70	116	152	122	158	130	166	138	174	149	185	189	224
80	129	170	135	176	143	184	151	192	163	204	202	243
90	---	189	149	195	157	203	165	211	176	222	215	261
100	---	207	162	213	170	221	178	229	189	241	229	280
120	---	---	---	250	197	258	205	266	216	278	255	317
140	---	---	---	---	223	295	231	303	243	314	282	354
160	---	---	---	---	---	332	258	340	269	351	309	391
180	---	---	---	---	---	---	285	377	296	388	335	428
200	---	---	---	---	---	---	311	414	323	425	362	464
220	---	---	---	---	---	---	338	451	349	462	389	501
240	---	---	---	---	---	---	365	488	376	499	415	538
260	---	---	---	---	---	---	391	525	403	536	442	575
280	---	---	---	---	---	---	---	562	429	573	469	612
300	---	---	---	---	---	---	---	599	456	610	495	649
340	---	---	---	---	---	---	---	---	---	684	549	723
380	---	---	---	---	---	---	---	---	---	---	602	797
420	---	---	---	---	---	---	---	---	---	---	655	871
460	---	---	---	---	---	---	---	---	---	---	---	944

Note: shaded values are recommended only for PureFire® and Pinnacle® boilers due to potential for condensation.



# Peerless® Partner®

## ***Indirect-Fired Water Heater***

***PT-30 PT-40 PT-50  
PT-60 PT-80 PT-120***

## **Installation, Operation & Maintenance Manual**

**TO THE INSTALLER:**

*This manual is the property of the owner and must be affixed near the water heater for future reference.*

**TO THE OWNER:**

*This water heater should be inspected annually by a Qualified Service Agency.*



**PB HEAT, LLC**

131 S. CHURCH STREET • BALLY, PA 19503