

Series **WBV/WV**TM Plastic Jacket

Oil Boilers



Installation, Operation & Maintenance Manual



PeerlessBoilers.com

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USING THIS MANUAL

A. INSTALLATION CLEARANCE

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 you will see special attention boxes intended to supplement the instructions and make special notice of potential hazards. These categories mean, in the judgment of PB Heat, LLC:

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 cause minor personal injury or property damage.

NOTICE

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

NOTICE

In accordance with Section 325 (f) (3) of the Energy Policy and Conservation Act, this boiler is equipped with a feature that saves energy by reducing the boiler water temperature as the heating load decreases. This feature is equipped with an override which is provided primarily to permit the use of an external energy management system that serves the same function.

THIS OVERRIDE MUST NOT BE USED UNLESS AT LEAST ONE OF THE FOLLOWING CONDITIONS IS TRUE:

- An external energy management system is installed that reduces the boiler water temperature as the heating load decreases.
- This boiler is not used for any space heating.
- This boiler is part of a modular or multiple boiler system having a total input of 300,000 BTU/hr or greater.
- This boiler is equipped with a tankless coil.

1. PREINSTALLATION

Read carefully, study these instructions before beginning work. It will save time. Study the included drawings. Save these instructions for reference.

This boiler must be installed by a qualified contractor.

The boiler warranty can be voided if the boiler is not installed, maintained and serviced correctly.

⚠ NOTICE

The equipment shall be installed in accordance with those installation regulations in force in the local area where the installation is to be made, including the current edition of NFPA-31, Standard for the Installation of Oil-Burning Equipment, and in Canada, CSA B139, Installation Code for Oil Burner Equipment. These shall be carefully followed in all cases. Authorities having jurisdiction shall be consulted before installations are made.

⚠ CAUTION

Never burn garbage or paper in the unit, and never leave combustible material around it.

⚠ CAUTION

Do not tamper with boiler controls.

⚠ WARNING

Do not install this appliance where gasoline or other flammable liquids are stored or are in use. Do not store clothing or combustible materials on or against the venting system or jacket.

B. AIR FOR COMBUSTION AND VENTILATION

A. CLEARANCES

Unit may be installed on combustible flooring, provided the boiler is not set on carpet and a metal drip pan is placed under the appliance.

Unit may be installed in a closet with the below clearances. See also Section B, Air for Combustion and Ventilation.

⚠ DANGER

Do not install this appliance on carpeting.

1. Be certain adequate facilities are available to provide air for satisfactory combustion and ventilation.
2. Appliances Located in Unconfined Spaces.
 - a. For installation in unconfined spaces with conventional construction and larger areas such as basements, the supply of air for combustion and ventilation can usually be considered adequate.

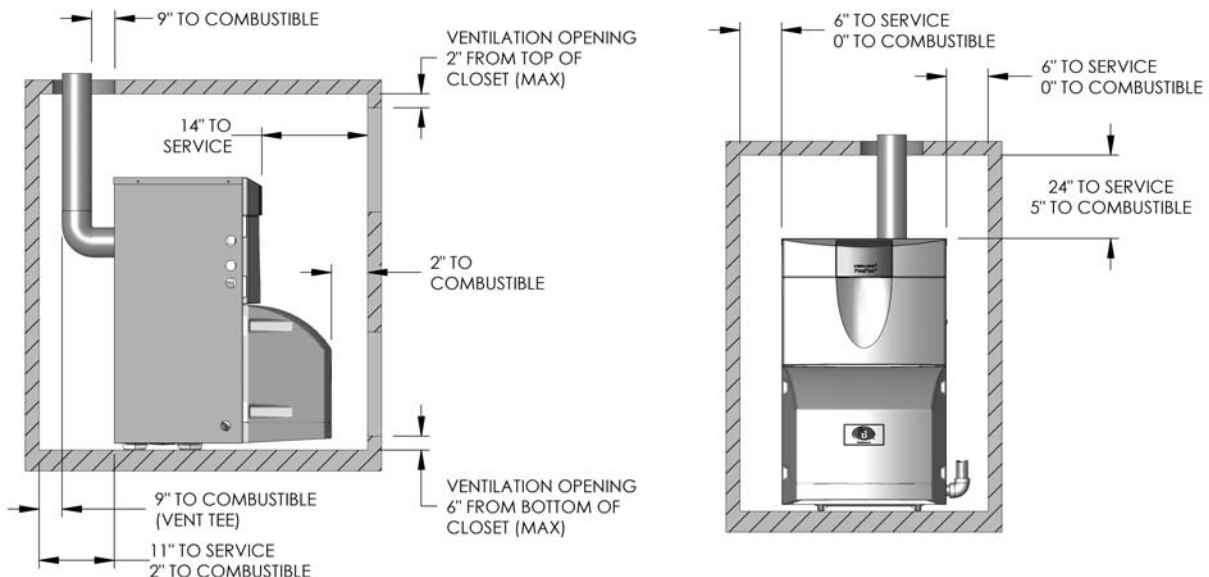


Figure 1.1: Appliance Installation Clearances

3. Appliances Located in Confined Spaces.
 - a. All air from inside the building: Provide two permanent openings communicating directly with an additional room. If all air for combustion and ventilation is to come from within the building: two openings, one near the ceiling and one near the floor of the boiler room shall be provided with the minimum free area of each opening equal to 140 sq. in. per gallon of oil burned.
 - b. If all air for combustion and ventilation is to come from outside the building: two openings, one near the ceiling and one near the floor of the boiler room shall be provided with the minimum free area of each opening equal to 35 sq. in. per gallon of oil burned.

If ducts are used to convey the air, areas of 35 sq. in. per gallon of oil burned for vertical ducts or 70 sq. in. per gallon of oil burned for horizontal ducts are to be provided. Ducts shall have the same area as the free area of the openings to which they are connected.

4. Special Conditions: If the boiler is located in areas with exhaust fans, direct-fired water heaters or fireplaces can create conditions for unsatisfactory combustion or venting, special provisions must be made.
5. Specially Engineered Installations: The size of the combustion air openings in this section may not apply to specially engineered systems. These systems are to be designed to ensure adequate supply of air for combustion and ventilation.

3. Inspect the existing chimney or vent system. Make sure it is in good condition. Inspect chimney liner and repair or replace if necessary.
4. The vent system and installation must be in accordance with the current edition of the American National Standard ANSI/NFPA 211, "Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances," or applicable provisions of the local building codes. Typical minimum chimney size is 8" x 8", 15 feet high, unless otherwise allowed by code. If the vent system is not sized properly, the burner may not operate properly. This can cause poor combustion, sooting and odors to occur.

5. Background Information Regarding Draft: Modern boilers operate with higher efficiencies than older boilers. Smaller flueways, as well as bars, pins and fins are designed into modern boilers to transfer as much heat as possible from the hot gases to the water or steam and prevent heat loss up the chimney. However, these design features result in higher pressure, or draft loss, in the boiler.

This draft loss must be taken into account when installing an oil boiler into a new or old chimney. New chimneys are less likely to have poor draft. However, they must have sufficient draft to support combustion. A -0.06" draft is desirable and preferred. Older chimneys may require a replacement liner to have them perform well enough to support combustion.

For Example:

	Old Installation	New Installation	Comments
Chimney Draft	-0.04"	-0.04"	No change, but older chimneys (especially unlined ones) have leaks which reduce draft.
Boiler Design Pressure Drop	+0.01"	+0.01"	Required for mandated efficiency increases.
Draft Over Fire	-0.03"	-0.00"	The old installation would have had a higher temperature in the chimney [as high as 800 degrees vs. 400 degrees F], which would increase the draft.

The above readings are "cold" readings (before the boiler and chimney are heated up).

Note also that the higher the firing rate on a unit which has multiple firing rates, the higher the draft required. For example, increasing the firing rate 1/4 gallon may increase the draft loss in a unit by approximately +0.01".

⚠ CAUTION

Do not install this appliance where corrosive materials, such as ammonia, chlorine, water softener salt, etc. are stored.

C. CHIMNEY / VENT AND DRAFT CONTROL

⚠ CAUTION

An oil-fired unit shall be connected to a flue having sufficient draft at all times, to assure safe proper operation of the unit.

1. Draft Requirement – Minimum draft required in the vent system is -0.03" to -0.03" W.C. depending on boiler model, see Table 7.1 (Section 7). This draft is necessary to provide the necessary draft over fire of -0.01" to -0.02" W.C. See discussion in paragraph 5 below regarding draft.
2. A barometric draft control is recommended for regulation of overfire draft. Follow manufacturer's instructions to locate and adjust the control.

D. INSTALLATION SURVEY

For new and existing installations, a Water Installation Survey or a Steam Installation Survey is available from P.B. Heat, LLC. The surveys will provide information on how the boiler works with your specific system and will provide an overview of boiler system operation in general.

You can also use this survey to locate system problems which will have to be corrected. To obtain copies of these Surveys, contact your PB Heat representative or download it from PeerlessBoilers.com.

E. PLANNING THE LAYOUT

Prepare sketches and notes of the layout of the installation. Include boiler location, venting system, existing piping and wiring. Show existing equipment that may interfere with installation of new equipment.

2. BOILER PLACEMENT AND ASSEMBLY

A. SETTING THE BOILER

1. Provide a level foundation, located as close as possible to the center of the heating system.
2. Refer to Figure 8.1 for exploded view of boiler while checking and/or assembling parts of the boiler.
3. On packaged boilers, open burner mounting plate (item 5) at this time to make certain the target wall (item 2) is seated in the back of the combustion chamber. (WBV-04™/WV-05™) Ceramic fiber blanket base liner (item 3) should be lying flat on bottom of combustion chamber between target wall and burner mounting plate. Close burner mounting plate.
4. See clearance information in Section 1, "Preinstallation."

B. CONNECTING THE FLUE OUTLET

The WBV-03™ and WBV-04™ boiler models may be installed as a rear flue outlet unit or a top flue outlet unit. Packaged WBV-03™ and WBV-04™ boiler models are shipped as rear flue outlet and may be converted. The WV-05™ boiler model is only available as a top flue outlet unit. On Knockdown boilers, the flue outlet components are located in the water trim or steam trim carton.

1. If converting to a top flue application on a packaged boiler, remove top jacket panel and remove the large knockout in the jacket top panel. A stub vent will be required to extend the vent above the jacket top panel (not provided).
2. Remove the rear outlet cover plate (Item 13 Figure 8.1) and mount the flue collar to the flue collector plate (Item 11 Figure 8.1) with the 4 #12 screws.
3. Attach the rear outlet cover plate (item 13) to the rear outlet opening using four (4) 5/16" bolts and washers provided.

3. WATER PIPING

A. GENERAL

1. Follow these instructions closely in order to be sure that the boiler operates as it is intended. Water piping is extremely important to the system operation.
2. Size water supply and return piping in accordance with system requirements.
3. If the WBV/WV™ boiler is replacing an existing boiler, make sure that the system piping is thoroughly cleaned and free from debris before installing this boiler.
4. Install this boiler so that the oil burner and limit controls are protected from water (dripping, spraying, etc.) during operation and service.
5. The WBV/WV™ boiler is designed to operate in a closed loop hydronic system under forced circulation. However, there is no minimum water flow rate for this boiler.

B. SYSTEM COMPONENTS

Figure 3.1 shows the symbol key for the piping diagrams in this section. The following are brief descriptions of system components.

1. *Pressure/Temperature Gauge:* A combination pressure/temperature gauge is provided with each WBV/WV™ boiler to be mounted in the supply (outlet) piping as shown in figure 3.2. Most local codes require this gauge.
2. *Air Elimination:* Closed loop hydronic systems require air elimination devices. As the system water is heated, dissolved oxygen and other gases will separate from the liquid. An air elimination device (such as a TACO Vortech Air Separator) is required to remove the dissolved gases preventing corrosion in the piping system and eliminating noise.

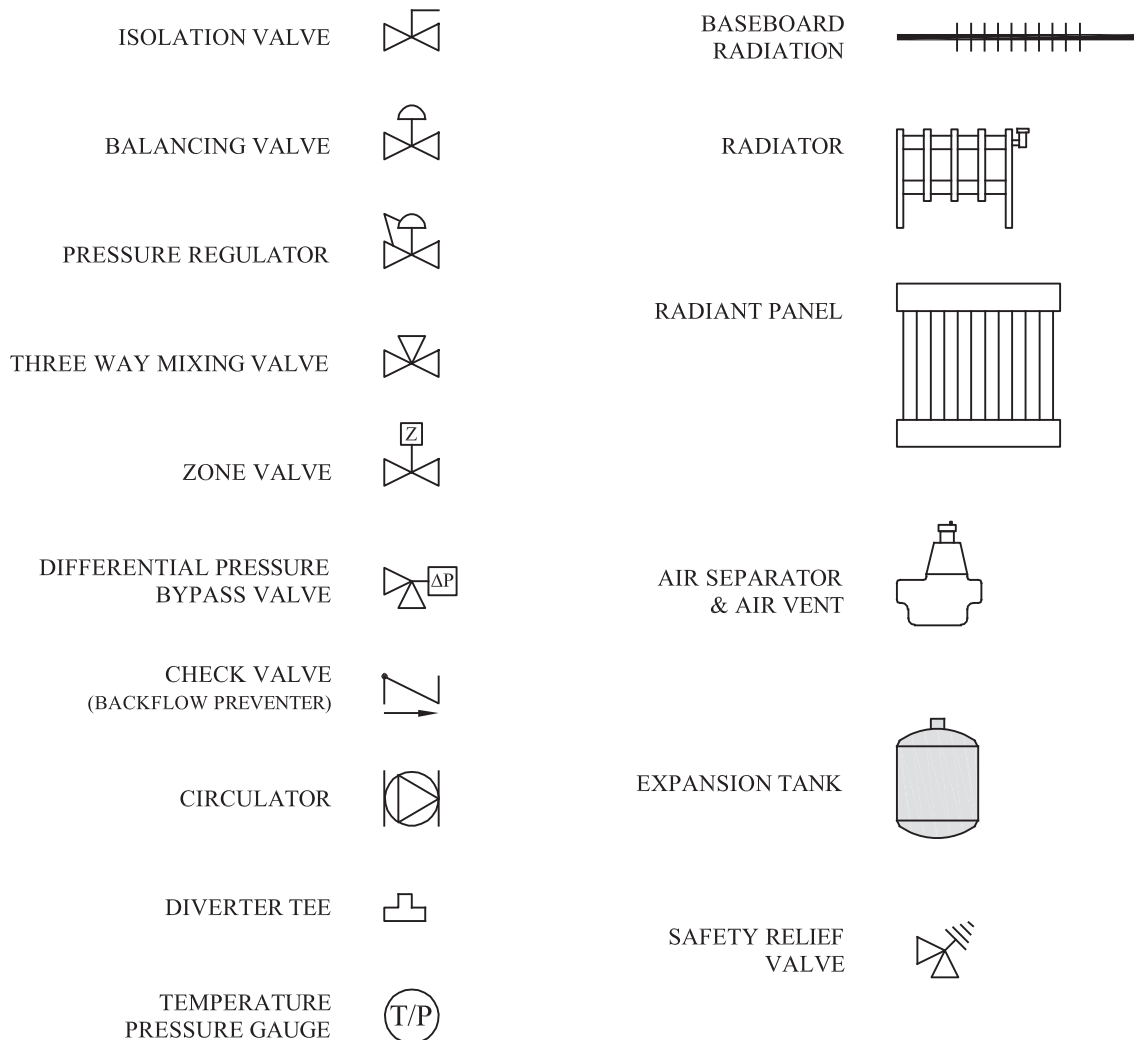


Figure 3.1: Symbol Key

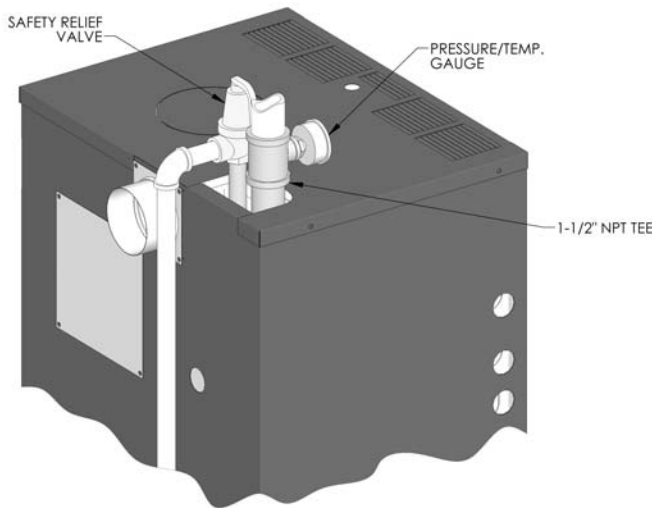


Figure 3.2: Pressure/Temperature Gauge & Relief Valve Piping

3. *Expansion Tank:* An expansion tank (such as a Bell & Gossett Series HFT) is required to provide room for expansion of the heating medium (water or glycol solution). Consult the expansion tank manufacturer’s instruction for specific sizing information. The expansion tank is to be sized for the required system volume and capacity. In addition, care must be taken to size the expansion tank based on the proper heating medium. Glycol solutions may expand more than water for a similar temperature rise. Table 3.1 shows the approximate water volume of the boiler for sizing the expansion tank and determining glycol solution concentration.

Table 3.1: Boiler Water Volume

Boiler Model	Water Volume, Gal (Liter)
WBV-03	11.75 (44.5)
WBV-04	14.75 (55.8)
WV-05	17.75 (67.1)

4. *Flow Control Valve (Check Valve):* Flow control valves or check valves are used to prevent gravity circulation by incorporating a weighted disc into the check valve. These valves also prevent problems with reverse circulation through parallel heating loops which cause erratic behavior of the heating system and prevent heat from reaching its intended load.
5. *Pressure Reducing Valve:* A pressure reducing valve, such as the Bell & Gossett B-38 or a TACO #29, is used in a hydronic system to automatically feed water to the system whenever the pressure drops below the set pressure. These valves should not be used on glycol systems unless close supervision of the glycol solution is practiced.

6. *Back Flow Preventer:* A back flow preventer (check valve) is required by some jurisdictions to prevent water in the hydronic system from backing up into the city water supply if the supply pressure drops below that of the heating system. This is especially important on systems in which glycol solution is used as a heating medium.
7. *Pressure Relief Valve:* The boiler pressure relief valve is shipped separately for field installation. On the WBV/WV™ boiler, this can be piped into the connection provided next to the boiler supply (outlet) connection or, alternatively, on the connection at the rear of the boiler below the supply. The value is to be installed as shown in Figure 3.2.

⚠ WARNING

Do not operate this appliance without installing the pressure relief valve supplied with the boiler or one with sufficient relieving capacity in accordance with the ASME Rating Plate on the boiler.

Pipe the discharge of the safety relief valve to within 12" of the floor and close to an open drain. The discharge piping must be the same size or larger than the relief valve outlet. **DO NOT INSTALL A CAP OR VALVE AT THE RELIEF VALVE OUTLET.**

⚠ CAUTION

Pipe the discharge of the relief valve as close as possible to the floor and away from high traffic areas. Pipe the discharge close to a floor drain. Failure to do so may result in personal injury and/or property damage.

⚠ CAUTION

The relief valve must be mounted in a vertical upright position. No other valve or restriction is to be installed in this line.

8. *Circulator:* Circulators for central heating distribution should be sized and installed in accordance with system requirements and pump manufacturers recommendations.
9. *Indirect Water Heater:* An indirect water heater should be piped to a dedicated zone as shown in Figure 3.3.
10. *Boiler Drain Valve:* Fittings are provided for mounting the boiler drain valve in the return tapping at the bottom rear of the boiler. See Figure 3.4. It is recommended that the boiler return be piped to the rear of the block, however for a front return locations see Figure 3.5.

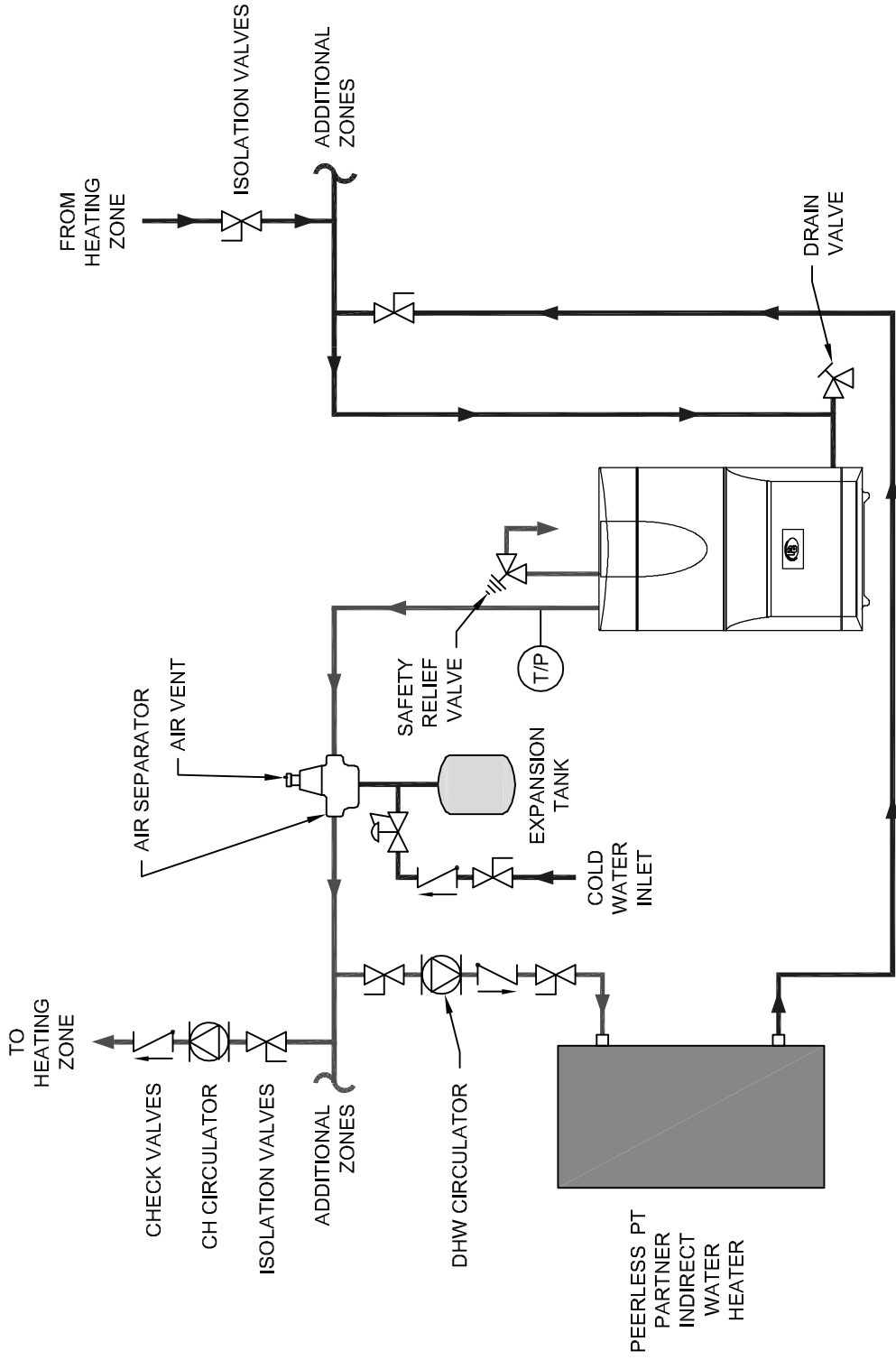


Figure 3.3: Recommended Water Piping

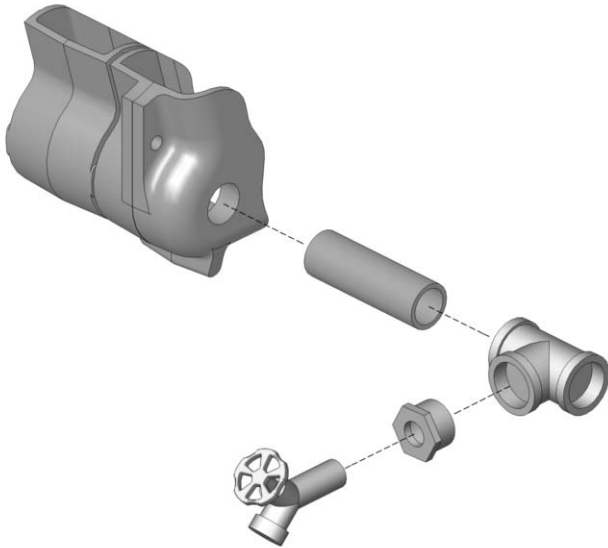


Figure 3.4: Recommended Near Boiler Piping for Rear Return

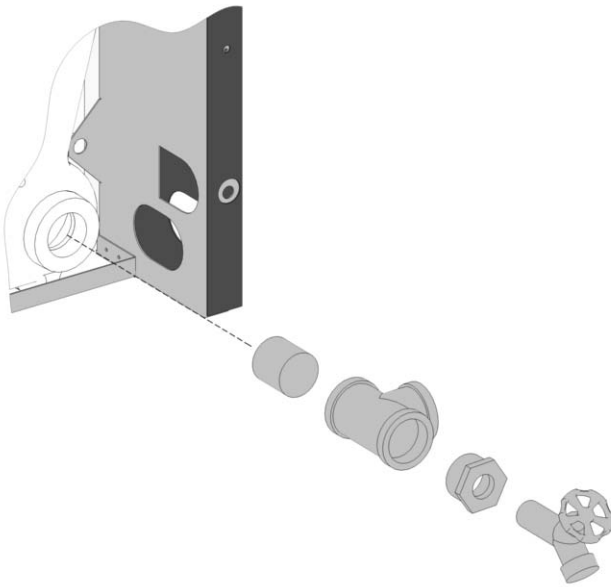


Figure 3.5: Optional Near Boiler Piping for Front Return

C. SYSTEM PIPING

1. The WBV/WV Plastic Jacket boiler is recommended to be piped with the return line in the rear. The return can be moved to the front of the boiler by moving the plug from the front return port to the rear. The necessary components for a front return are included with the boiler.
2. Figure 3.3 shows the recommended piping for the WBV/WV™ boiler.
3. The DHW zone is piped from the primary loop in parallel with the central heating (CH) zones. It should be piped as close to the boiler as possible since it should be the hottest zone.

D. FREEZE PROTECTION

Glycol for hydronic applications is specially formulated for heating systems. It includes inhibitors which prevent the glycol from attacking metallic system components. Make sure that the system fluid is checked for correct glycol concentration and inhibitor level.

E. SPECIAL APPLICATIONS

1. If the WBV/WV™ boiler is used in conjunction with a chilled medium system, pipe the chiller in a separate secondary loop as shown in Figure 3.6.
2. If using the WBV/WV™ with a hot water coil in a forced air system, be sure the hot water coil is downstream of the cooling coil in the airstream.

F. TANKLESS HEATER OR COVERPLATE

1. If a tankless coil is used (item 9), install as pictured. On water boilers, install in opening in front section.

⚠ DANGER

Install anti-scald device in hot water supply piping. Water temperature above 125°F can cause severe burns instantly or death from scalds.

⚠ NOTICE

X1019R and X1020R coils installed in WBV™ boilers have internal flow controls installed. Do not use external flow controls with these coils.

2. If not using a tankless coil, cover the heater opening with cover plate (item 7 or 16).

⚠ NOTICE

Be sure rubber gasket is in place between cover plate or water heater plate and boiler section.

G. CONTROLS

⚠ CAUTION

Pipe the discharge of the safety valve or relief valve to prevent injury in the event of pressure relief. Pipe the discharge to a drain. Provide piping that is the same size as the relief valve.

1. Water Boiler Controls:
 - a. For installations subject to UL726, a second operating control that senses water temperature is also required (not provided). Use an L4080B or equivalent. Install in the supply piping near the boiler.
2. For complete information on servicing and adjustment of controls, refer to the attached control specification sheets.

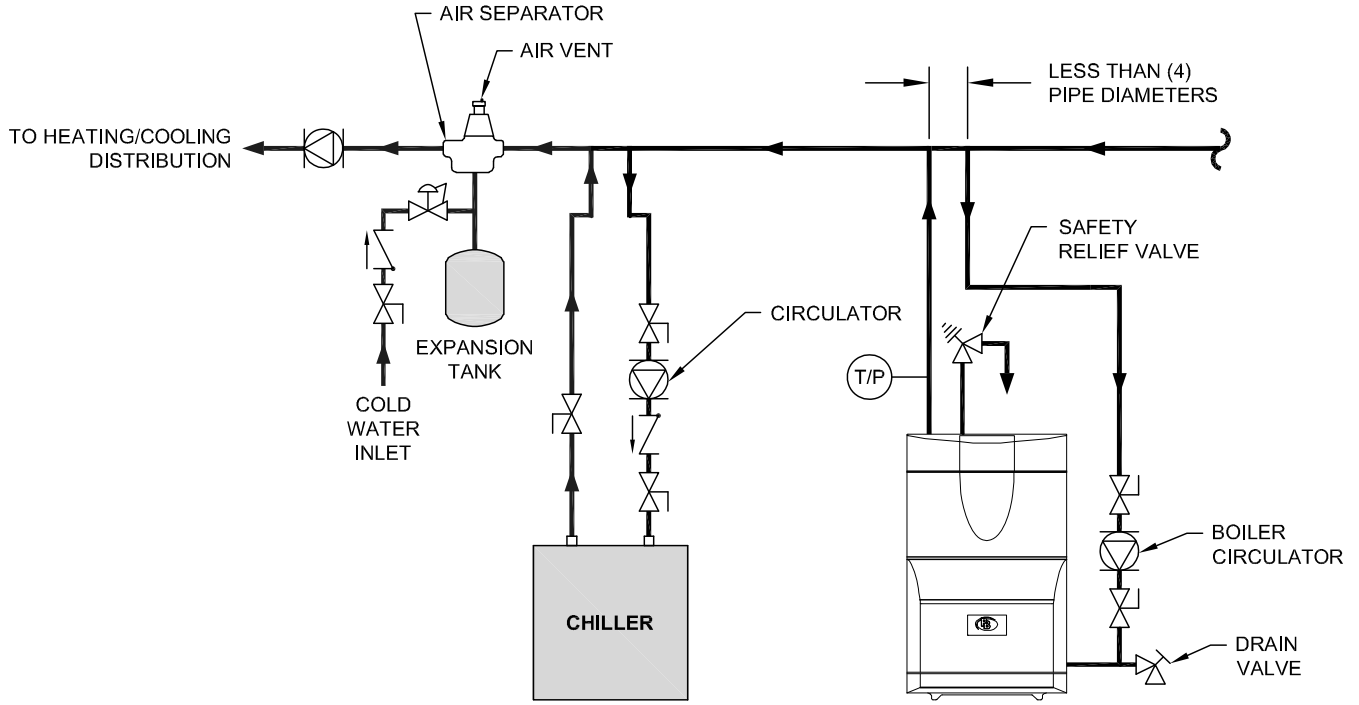


Figure 3.6: WBV/WV™ Piped with a Chiller

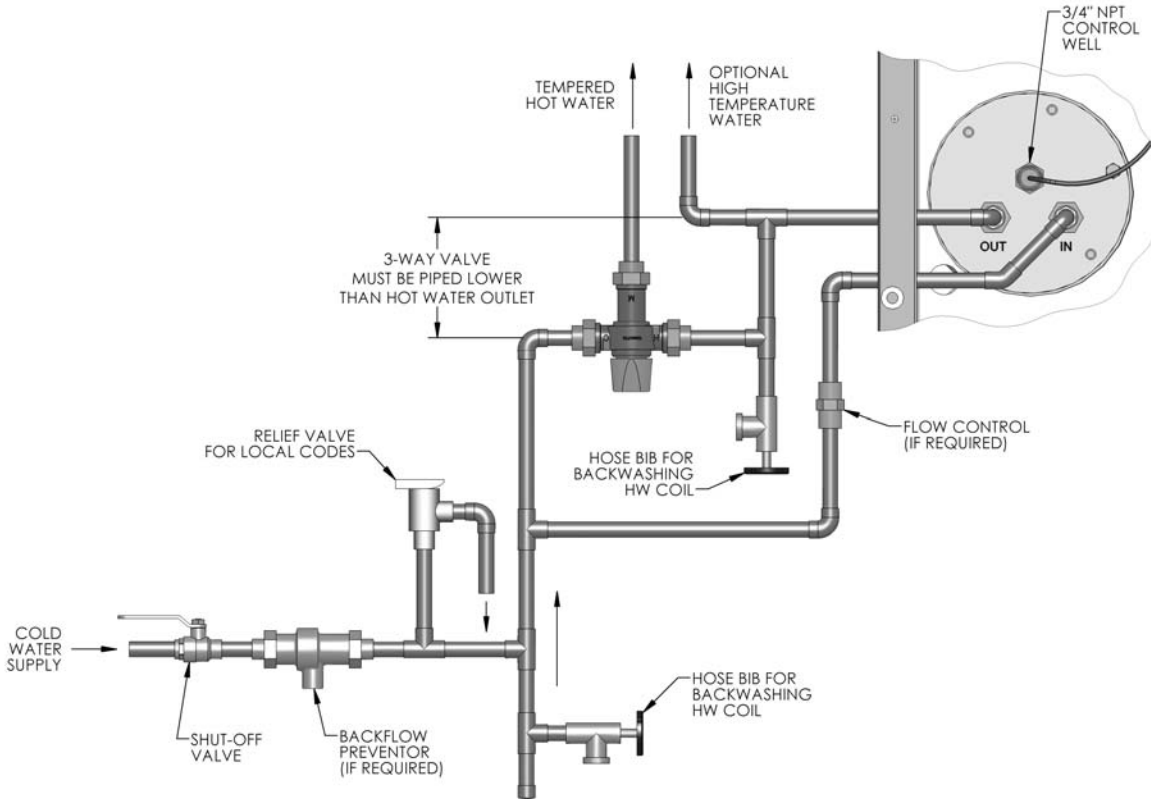


Figure 3.7: Tankless Coil Piping, Water Boiler

4. BURNER SETUP & BOILER OPERATION

CAUTION

This appliance is designed to burn only standard No. 1 or No. 2 Fuel Oil (ASTM D396). Do not use gasoline or waste oil.

CAUTION

Do not use compression fitting for oil supply lines. Do not use copper sweat fittings with oil piping. Oil leaks may occur causing a fire hazard.

NOTICE

Oil piping must be air tight. Air leaking into the oil supply system may cause erratic burner operation and/or burner lockout.

A. BURNER INSTALLATION

1. The oil burner is supplied with a mounting flange fixed in position.

NOTICE

Be sure high temperature gasket is between the burner mounting flange and the burner mounting plate.

2. Mount the burner to the burner mounting plate (Item 5 Figure 8.1) with four (4) 5/16" studs and nuts provided.
3. Pipe the oil lines through the holes in the left side of the jacket. Care must be taken when routing the oil lines so not to interfere with the opening and closing of the burner mounting plate. Flexible oil lines or flared copper disconnects with valves (when copper lines are used) may be installed to assure full opening of the burner mounting plate when servicing.

NOTICE

Two-pipe oil supply for Riello burner requires a separate kit. Order part #C7001026 from Riello dealer.

4. Oil burner specifications:
For information pertinent to the oil burner such as nozzle sizing, fuel supply piping, adjusting or servicing, refer to the charts in this section and the burner installation manual.

B. BURNER START-UP AND ADJUSTMENT

1. Burner should start automatically when thermostat is turned up and main boiler service switch is turned on. If burner does not start, check to be sure there is oil in the tank and push reset button on burner control:

Beckett: Square red button.

Carlin: Round red button.

Riello: Round red button inside clear flexible cover on back of burner cover.

If burner still does not start, contact serviceman.

CAUTION

Do not attempt to start the burner when excess oil has accumulated, when the unit is full of vapor, or when the combustion chamber is very hot.

2. Adjust burner and barometric draft control for highest CO₂ (Maximum 13%) while maintaining a 0 Smoke and -.01 to -.02" W.C. draft overfire.

All adjustments must be made using suitable instruments such as found in a Bacharach Combustion Test Kit.

WARNING

Do not attempt to set up the burner without using test instruments. Visual and auditory inspection can not be trusted to assure proper operation. Failure to check and adjust combustion using combustion test instruments may result in severe personal injury, death or major property damage.

3. Burner and boiler can be shut down by turning down the thermostat and moving the main boiler service switch to the "off" position.
4. See burner manufacturer's manual for further information regarding the burner.

C. CHECK BOILER CONTROLS

1. Limit and Operating Controls:
 - a. Lower the set point of each control until the burner shuts down. Note that the system pressure (or temperature) corresponds to the desired set point.
 - b. Return the controls to the desired set point.
2. Low Water Cut-off (Built in to limit control.) - consult the manufacturer's instructions for the low water cut-off operational check procedure.
3. Refer to Limit Control Man. Instrucitons for further information.

D. PURGE AIR FROM THE SYSTEM (WATER BOILERS ONLY)

1. Purge the system using purge valves, isolating zones in the process or use system vents. Do not operate the pump(s) while purging. Pumps will hold air in the eye of the impeller.
2. Allow the system to reach 180°F and use manual vents, if installed, to remove any remaining air. Watch the pressure gauge as the system approaches 180°F. If the pressure exceeds the design operating pressure, check:
 - a. Fill valve pressure.
 - b. Expansion or compression tank operation and sizing.

Table 5.1: Beckett Burner Specifications

BECKETT BURNER SPECIFICATIONS								
Boiler Model No.	Burner Model No.	Burner Head	Static Plate	Nozzle Size	Pump Pressure	Start-up Settings		Head Setting
						Air Shutter	Air Band	
WBV-03-085	AFG-F3 ¹	F3	3-3/8"	0.75 80° B HAGO ³	140 PSI	6.0	1	N/A
WBV-03-105	AFG-F4	F4	3-3/8"	0.90 80° B HAGO	140 PSI	6.0	0	N/A
WBV-04-095	AFG-F4	F4	3-3/8"	0.85 80° B DEL ⁴	140 PSI	6.0	0	N/A
WBV-04-125	AFG-F4	F4	3-3/8"	1.10 80° B HAGO ³	140 PSI	5.0	2	N/A
WBV-04-150	AFG-F6	F6	2-3/4"	1.25 80° B HAGO	140 PSI	8.0	1	N/A
WV-05-175	AFG-MV1	V-1	-	1.50 60° B HAGO ³	140 PSI	10.0	3	3
WV-05-195	AFG-MV1	V-1	-	1.65 60° B HAGO	140 PSI	10.0	9	3

BECKETT NX BURNER SPECIFICATIONS				
Boiler Model No.	Burner Model	Nozzle Size	Pump Pressure	Start Up Head/Air
WBV-03-085	NX70LB	0.65 x 60° W DEL ³	170	1.5
WBV-03-105	NX70LB	0.85 x 60° B HAGO	170	2.5
WBV-04-095	NX70LB	0.75 x 60° W DEL ⁴	170	2.0
WBV-04-125	NX70LD	1.10 x 60° W DEL ³	140	1.0
WBV-04-150	NX70LD	1.25 x 60° W DEL	140	2.0

Note: Burner used to fire the WBV-03-085 and 1.05 rate is also required to fire the WBV-04-095 rate with nozzle indicated in above chart.

Table 5.2: Carlin Burner Specifications (with 98022 PSC motor)

CARLIN BURNER SPECIFICATIONS (WITH 98022 PSC MOTOR)						
Boiler Model No.	Burner Model No.	Head Bar	Nozzle Size	Pump Pressure	Start-up Settings	
					Air Shutter	Air Band
WBV-03-085	EZ-1HP	0.60 - 0.65	0.65 70° A DEL ³	150 PSI	Blank	0.60
WBV-03-105	EZ-1HP	0.85 - 1.00	0.85 70° A DEL	150 PSI	Blank	0.65
WBV-04-095	EZ-1HP	0.75	0.75 70° A DEL ⁴	150 PSI	Blank	0.60
WBV-04-125	EZ-1HP	0.85 - 1.00	1.00 70° A DEL ³	150 PSI	Blank	0.85
WBV-04-150	EZ-1HP	1.10 - 1.25	1.25 60° B DEL	150 PSI	Blank	1.00
WV-05-175	99FRD	N/A	1.50 60° B HAGO ³	150 PSI	Open	10% open
WV-05-195	99FRD	N/A	1.65 60° B HAGO	150 PSI	Open	45% open

Table 5.3: Riello Burner Specifications

RIELLO BURNER SPECIFICATIONS						
Boiler Model No.	Burner Model No.	Burner Series	Nozzle Size ²	Pump Pressure	Start-Up Settings	
					Turbulator	Air Damper
WBV-03-060	F3	Series 40	0.50 90° B	145 PSI	0.0	2.9
WBV-03-085	F5	Series 40	0.65 60° W ³	170 PSI	1.0	2.45
WBV-03-105	F5	Series 40	0.85 60° W	165 PSI	2.5	2.8
WBV-04-095	F5	Series 40	0.75 80° B ⁴	160 PSI	0.5	2.25
WBV-04-125	F5	Series 40	1.00 60° W ³	155 PSI	2.5	3.4
WBV-04-140	F5	Series 40	1.10 60° W	160 PSI	4.0	4.2
WV-05-175	F10	Series 40	1.35 60° B ³	165 PSI	2.0	2.5
WV-05-195	F10	Series 40	1.50 60° B	170 PSI	2.5	2.8

Factory Installed Nozzles (Packaged Boilers or Burner Cartons) are indicated in **Boldface**.

1 Requires Low Firing Rate Baffle

2 Delavan Recommended

3 Shipped Loose with Packaged Boiler or Burner Carton

4 Not included with Packaged Boiler or Burner Carton

5. ELECTRICAL

A. GENERAL

All electrical wiring shall be done in accordance with the National Electrical Code and Local Requirements. Single pole switches including those of safety controls or protective devices shall not be wired in a grounded line.

B. WIRING

1. See Section 4 for mounting burner.
2. For complete information on servicing and adjustment of controls, refer to the attached control specification sheets.
3. See the following Wiring Diagrams:
 - Figure 5.1 - Water Boilers, Beckett 7600A
Limit Control
 - Figure 5.2 - Water Boilers, Hydrolevel 3250
Limit Control

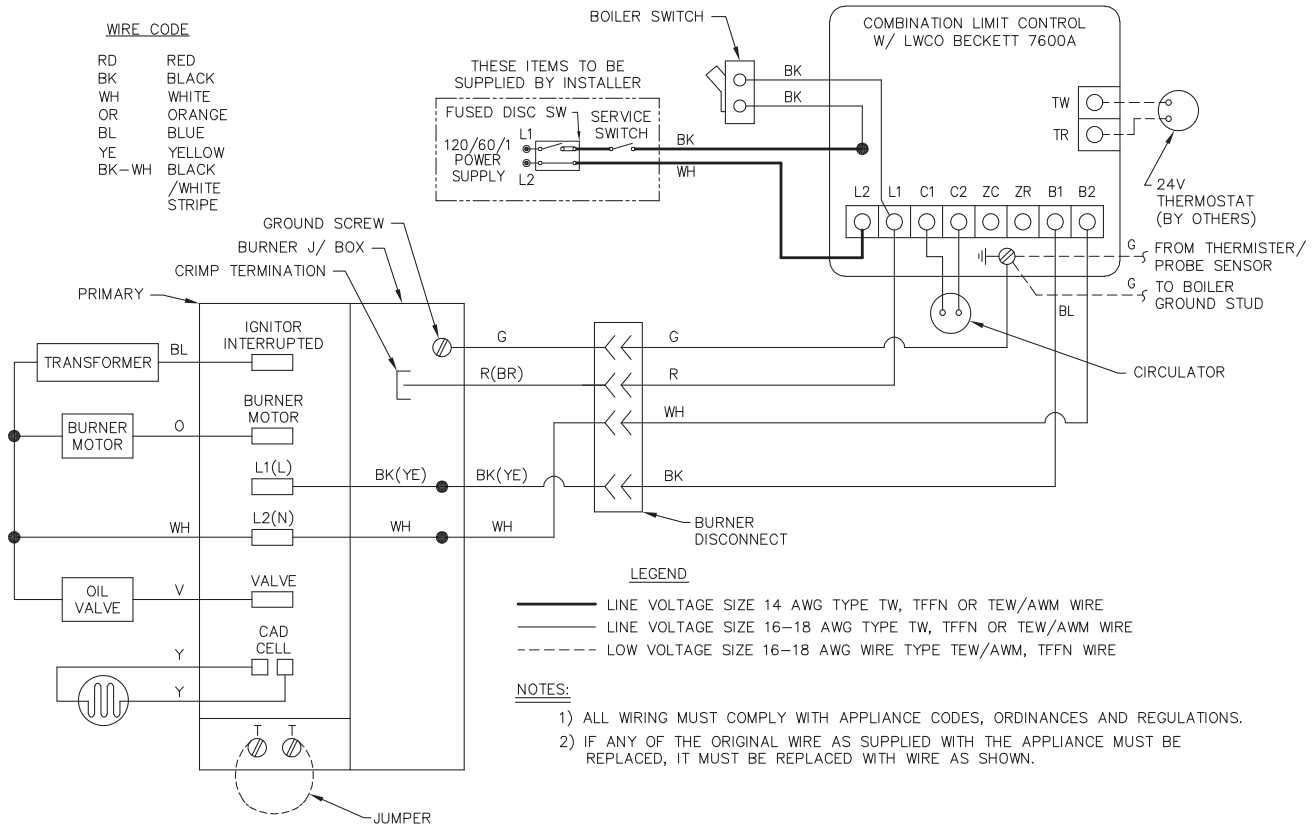


Figure 4.1: Water Boilers, Beckett 7600A Limit Control

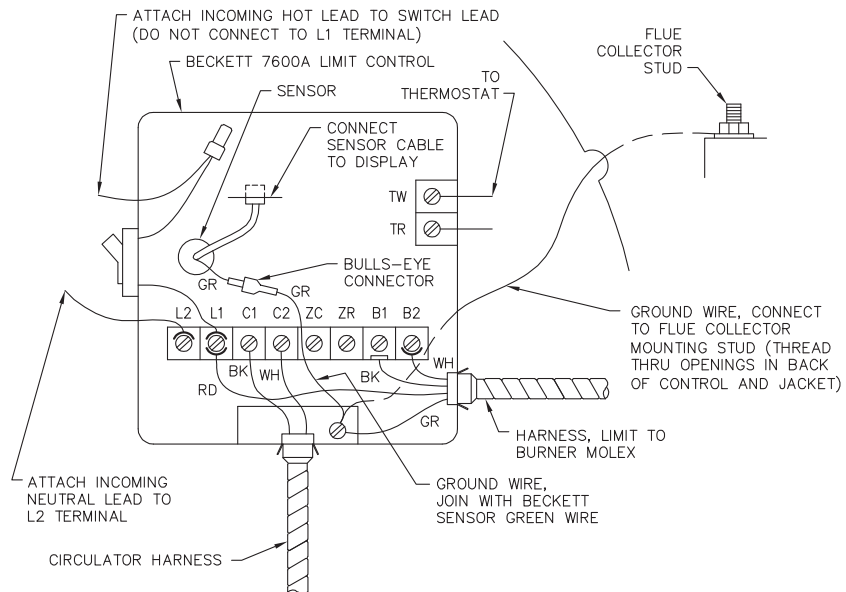


Figure 4.1a: Beckett AquaSmart 7600A Limit Control Wiring Details

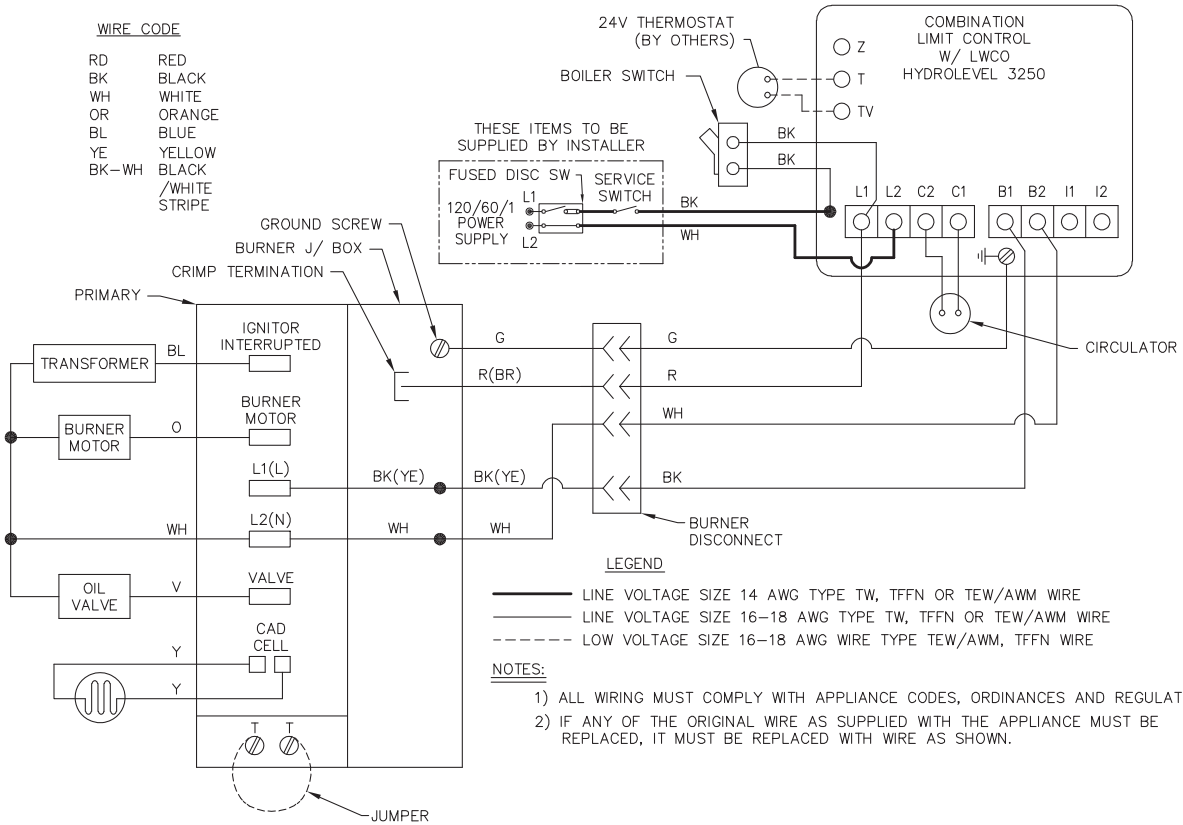


Figure 4.2: Water Boilers, Hydrolevel 3250 Limit Control

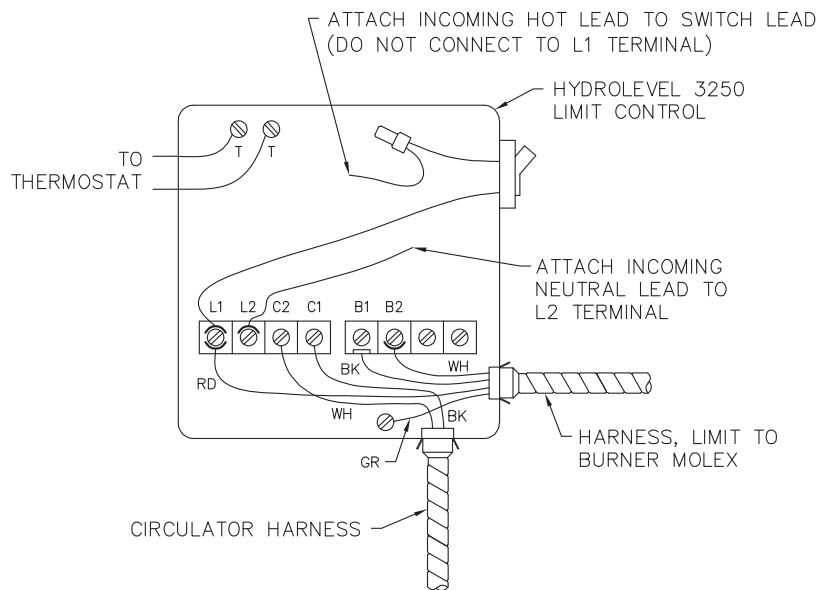


Figure 4.2a: Hydrolevel HydroStat 3250 Limit Control Wiring Details

6. MAINTENANCE

WARNING

Product Safety Information Refractory Ceramic Fiber Product

This appliance contains materials made from refractory ceramic fibers (RCF). Airborne RCF, when inhaled, have been classified by the International Agency for Research on Cancer (IARC), as a possible carcinogen to humans. After the RCF materials have been exposed to temperatures above 1800°F, they can change into crystalline silica, which has been classified by the IARC as carcinogenic to humans. If particles become airborne during service or repair, inhalation of these particles may be hazardous to your health.

Avoid Breathing Fiber Particulates and Dust

Suppliers of RCF recommend the following precautions be taken when handling these materials:

Precautionary Measures:

Provide adequate ventilation.

Wear a NIOSH/MSHA approved respirator.

Wear long sleeved, loose fitting clothing and gloves to prevent skin contact.

Wear eye goggles.

Minimize airborne dust prior to handling and removal by water misting the material and avoiding unnecessary disturbance of materials.

Wash work clothes separately from others. Rinse washer thoroughly after use.

Discard RCF materials by sealing in an airtight plastic bag.

First Aid Procedures:

Inhalation: If breathing difficulty or irritation occurs, move to a location with fresh clean air. Seek immediate medical attention if symptoms persist.

Skin Contact: Wash affected area gently with a mild soap and warm water. Seek immediate medical attention if irritation persists.

Eye Contact: Flush eyes with water for 15 minutes while holding eyelids apart. Do not rub eyes. Seek immediate medical attention if irritation persists.

Ingestion: Drink 1 to 2 glasses of water. Do not induce vomiting. Seek immediate medical attention.

A. GENERAL

1. Check pipes adjacent to cold walls or in unheated spaces. Insulate and tape them if necessary to be sure they can't freeze up. Keeping the water moving at all times will reduce the likelihood of freezing.
2. If there is considerable foreign matter in the boiler water, the boiler should be shut down and allowed to cool, then drained and thoroughly flushed out. Drain the boiler at the drain cock. Pipe the drain cock to a suitable drain or containment device (if antifreeze is used). Flush the system to remove remaining matter. If there is evidence that hard scale has formed on the internal surfaces, the boiler should be cleaned by chemical means as prescribed by a qualified water treatment specialist.
3. There must be no signs of continuous wetness at the chimney. If signs of continuous wetness are observed, a qualified service agency must be consulted to modify the vent configuration to prevent the formation of condensate, which may damage the vent pipe.

WARNING

Do not use this appliance if any part has been under water. Improper or dangerous operation may result. Immediately call a qualified service technician to inspect the boiler and to replace any part of the control system and any control which has been under water.

B. DAILY MAINTENANCE (WITH BOILER OPERATING)

Daily boiler observation can be performed by the owner. If any potential problems are found, a qualified installer or service technician/agency must be notified.

1. Remove any combustible materials, gasoline and other flammable liquids and substances that generate flammable vapors from the area where the boiler is contained. Make certain that the boiler area has ample air for combustion and ventilation and that there are no obstructions to the free flow of air to and from the boiler.
2. Observe general boiler conditions (unusual noises, vibrations, etc.)
3. Observe operating temperature and/or pressure gauge on the boiler. Boiler pressure should never be higher than 5 psi below the rating shown on the safety relief valve. The valve rating can be found on the top of the safety relief valve. Boiler temperature should never be higher than 250°F.
4. Check for water leaks in boiler and system piping.

C. WEEKLY MAINTENANCE (WITH BOILER OPERATING)

1. Flush float-type low-water cut-off (if used) to remove sediment from the float bowl as stated in the manufacturer's instructions.

D. MAINTENANCE OF SAFETY RELIEF VALVE

1. Check function and maintain safety relief valve as specified by manufacturer, typically every other month or every month, per the instructions on the tag on the safety relief valve.

E. MONTHLY MAINTENANCE (WITH BOILER OPERATING)

1. Check boiler room floor drains for proper functioning.
2. Test probe type low-water cut-off (if used) by using the Push-to-Test Button.
3. Test limit by lowering the limit set point until the burner shuts down. When proper operation is confirmed, return the set point to original setting.
4. Follow additional instructions in the Burner Manual for proving the burner component operation.

F. MAINTENANCE – ANNUAL

NOTICE

Entire heating system, including boiler, burner and venting system, must be inspected at least once a year by a qualified heating professional. Boiler is to be cleaned at least once a year.

WARNING

Disconnect all power to the burner before accessing combustion chamber.

TO CLEAN:

1. Remove top jacket panel and flue collector cover plate, Item 11 (Figure 2.1).
2. To thoroughly clean the boiler it must be brushed down from the top. The target wall is made of a soft ceramic fiber. Care must be taken not to damage this material during cleaning.
3. Remove any scale or soot from the combustion chamber area by vacuum cleaning or any other available means.

NOTICE

Burner mounting plate must be opened gain access to combustion chamber for the removal of dirt and debris.

4. Inspect the insulation and rope seal on the burner mounting plate. Replace if damaged.
5. Replace oil burner and flue collector cover plate making sure all gaskets are in place.
6. Replace jacket top panel.

 **NOTICE**

All cover plates, enclosures, and guards must be maintained in place at all times, except during maintenance and servicing.

7. Check the ventilation system for signs of external corrosion.
8. Disassemble exhaust vent and air inlet (if applicable) connections to check for blockage and/or corrosion.
9. Assure that barometric damper swings freely.

G. WATERSIDE INSPECTION

1. Connect a suitable drain hose to the boiler drain valve. Have a 5 gallon bucket available to catch boiler water.
2. Be sure that the system temperature is below 125° F before draining water from the system.

 **WARNING**

Water in excess of 125° F can cause severe burns instantly. DO NOT drain water in excess of 125° F from the boiler. Failure to comply may cause severe injury or death.

3. Drain water from the boiler into the bucket. If there is evidence of excessive sediment/sludge in the system, contact a qualified water treatment company for appropriate compounds such as Sentinel X-400 or Rhomar Hydro-Solve 9100.

 **CAUTION**

The Peerless Warranty does not cover sediment or corrosion related damage. Excessive sediment may cause a failure of the boilers cast iron heat exchanger.

H. INSPECT HEAT DISTRIBUTION SYSTEM

1. Check all visible water piping for signs of water leaks (corrosion scale or scale staining).
2. Check the boiler system pressure to be sure it is at the required pressure. Open the city water inlet valve to assure required system pressure (usually about 12 psi). Close the inlet valve (if it is necessary to open the inlet water valve frequently, a substantial leak may be the cause).
3. Repair any leaks to the system to prevent corrosion and scale in the boiler.

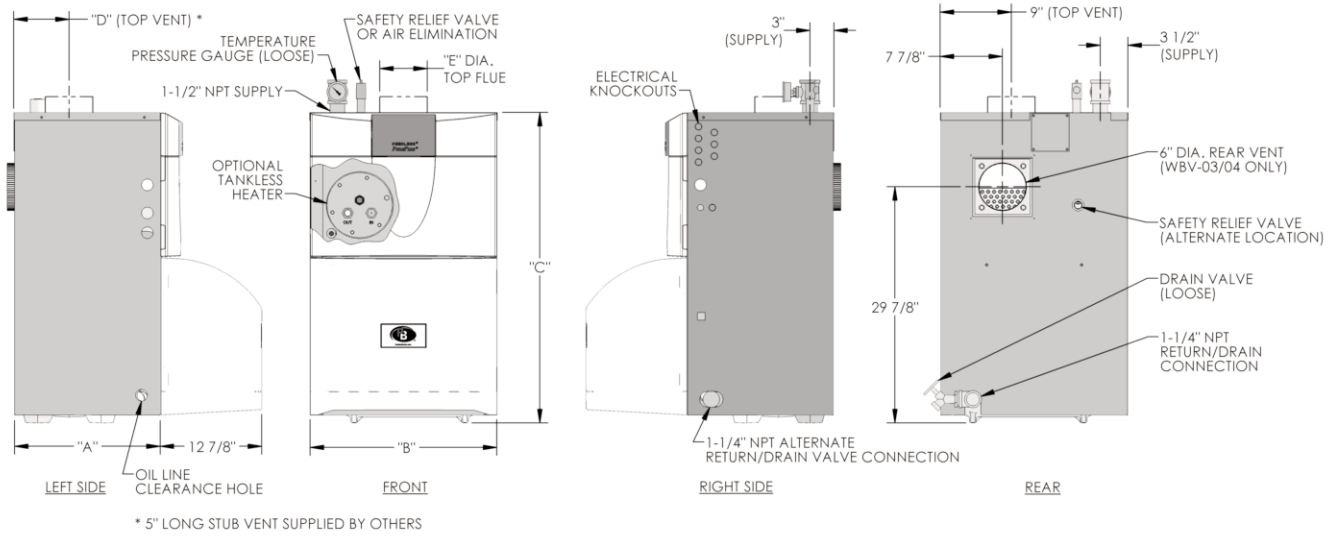
I. IF A LONG SHUTDOWN IS REQUIRED

1. To take boiler out of service if the boiler and system are not to be used when temperatures are below freezing:
 - a. Drain the boiler and system completely and shut off make-up water supply.
 - b. Open main line power disconnect switch to boiler. Remove the fuses or secure the switch so that the power cannot be turned on accidentally.
2. Be certain that the boiler and system are refilled before returning to service.

 **CAUTION**

Always keep the manual fuel supply valve shut off if the burner is shut down for an extended period of time.

7. BOILER DIMENSIONS & RATINGS



Boiler Model Number	Jacket Depth "A"	Jacket Width "B"	Jacket Height "C"	Rear of Jacket to c/l of Vent "D"	Vent Size Diameter "E"
WBV-03-060/085/105	18-3/8"	23-5/8"	39-1/4"	7"	6"
WBV-04-095/125/150	22-3/8"	23-5/8"	39-1/4"	11"	6"
WBV-05-175/195	26-3/8"	23-5/8"	39-1/4"	15"	7"

Figure 7.1: Boiler Dimensions, Water Boiler

Table 7.1: Boiler Ratings

SERIES WBV/WV™ BOILER RATINGS - WATER							
Series WBV/WV™ - water						Water Content, gal	Minimum Stack Draft Required, in. W.C.
Boiler Model Number	Input		Heating Capacity ¹ , MBH	Net Ratings ³	AFUE, %		
	GPH ¹	MBH	Water	Water, MBH ²	Water		
WBV-03-060-W	0.60*⊕	84	75	65	87.5*	11.75	-0.03
WBV-03-085-W	0.85	119	104	90	86.2	11.75	-0.04
WBV-03-105-W	1.05	147	126	110	85.0	11.75	-0.05
WBV-04-095-W	0.95*	133	117	102	87.0*	14.75	-0.03
WBV-04-125-W	1.25	175	151	131	85.4	14.75	-0.04
WBV-04-150-W	1.50	210	180	157	85.1	14.75	-0.05
WBV-05-175-W†	1.75	245	212	184	85.5	17.75	-0.05
WBV-05-195-W†	1.95	273	235	204	85.0	17.75	-0.06

* As an ENERGY STAR® Partner, PB Heat, LLC has determined that these firing rates meet the ENERGY STAR guidelines for energy efficiency.

† Top venting only.

• Nozzles for these firing rates not provided as standard equipment. Consult factory for price and availability.

⊕ This firing rate can only be achieved with a Riello F-3 burner. See Table 5.3.

1 Burner input based on No. 2 fuel oil with a heating value of 140,000 Btu per gallon.

2 Net water ratings based on an allowance of 1.15.

3 Consult factory before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc.

4 Heating Capacity and Annual Fuel Utilization Efficiency (AFUE) ratings are based on U.S. Government tests.

Chimney Size: 8" x 8" x 15 ft.

8. REPAIR PARTS

Repair parts are available from your local PB Heat, LLC distributor or from Parts To Your Door at 1 (610) 916-5380 (www.partstoyourdoor.com).

Note: Remember to include the boiler model number and serial number when ordering parts.

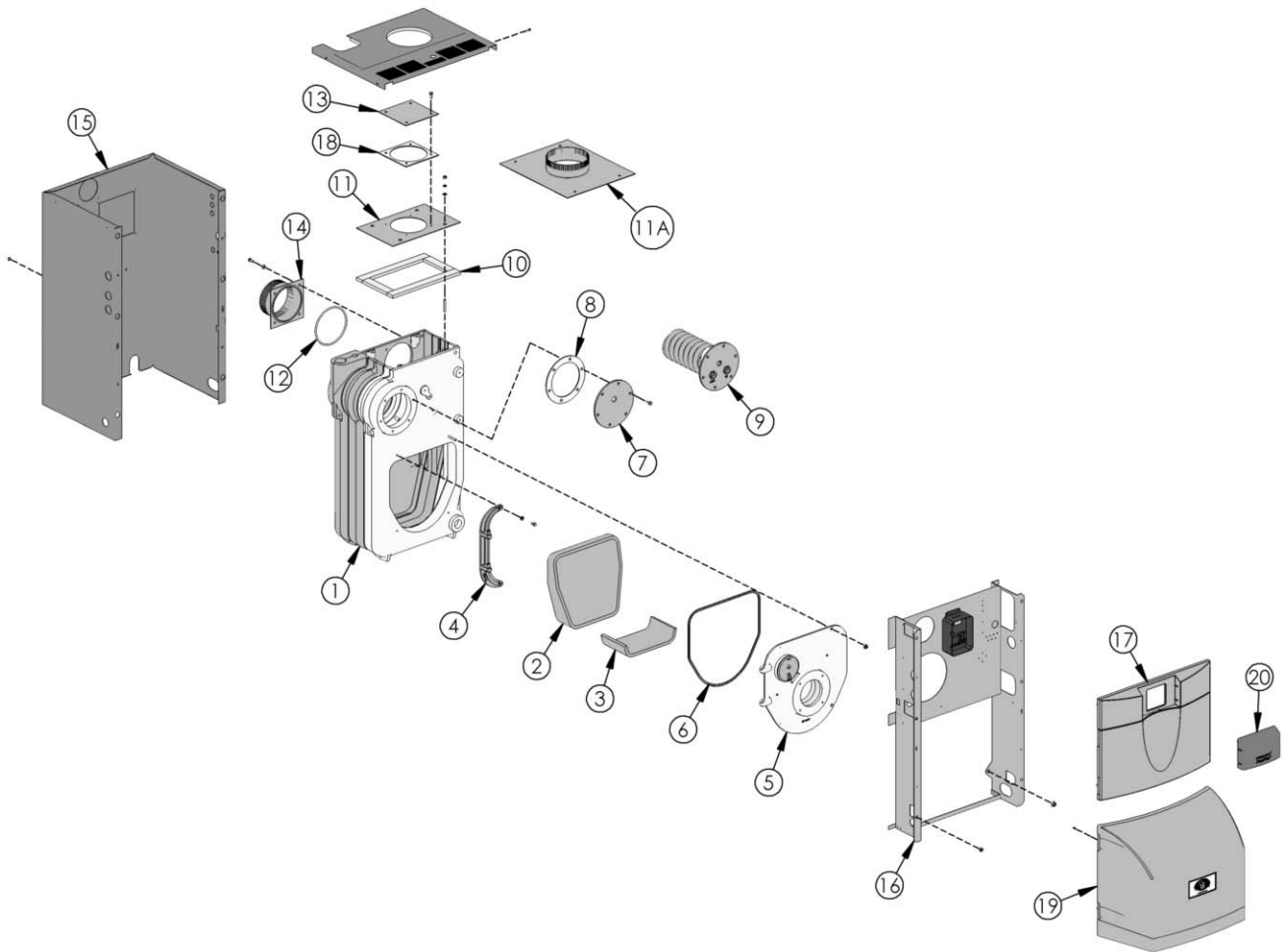


Figure 8.1: Water boiler

Table 8.1

Item No.*	Description	Additional Information	Stock Code
1	Block Assembly – Water – WBV-03(Open)	-	90815
	Block Assembly – Water – WBV-04 (Open)	-	90824
	Block Assembly – Water – WV-05 (Open)	-	91085
	Block Assembly – Water – WBV-03 (Closed)	-	90806
	Block Assembly – Water – WBV-04 (Closed)	-	90813
	Block Assembly – Water – WV-05 (Closed)	-	91088
2	Target Wall	-	50795
4	Swing Door Hinge	-	90538
5	Burner Mounting Plate Assembly	-	91278
-	Burner Mounting Plate Insulation	-	50796
6	Burner Mounting Plate Rope Seal	-	51211
7	Steel Cover Plate (Front) – Water	-	99812
8	Rubber Gasket (Front) – Water	-	51800
9	Tankless Coil – WBV-03 – Water	-	90637
	Tankless Coil – WBV-04 – Water	-	90534
	Tankless Coil – WV-05 – Water	-	90534
10	Flue Collector Plate Blanket Seal	-	90999
11	Flue Collector Cover Plate – WBV-03	-	90565
-	Flue Collector Cover Plate – WBV-04	-	90566
11A	Top Outlet Flue Collector Plate – WV-05	-	90562
12	Rope Seal	-	51209
13	Rear Outlet Cover Plate	-	90563
14	Flue Collar Adapter – WBV-03 & 04 – Water	-	90568
15	Plastic Jacket Assembly – Water – WBV-03	-	54525
	Plastic Jacket Assembly – Water – WBV-04	-	54526
	Plastic Jacket Assembly – Water – WV-05	-	54652
16	Jacket Support Frame	-	54524
17	Upper Plastic Cover	-	54479
18	Flue Outlet Gasket	-	PP5011
19	Lower Plastic Cover	-	54480
20	Plastic Lens	-	54508
-	Drain Valve	-	50764
-	Relief Valve – Water	-	50501
-	Bracket/Sensor Assembly HydroStat	-	50835
-	Insulation Hardware PJKT	-	91217
-	Limit Control, Beckett AquaSmart 7600A	-	50338
-	Immersion Well, Beckett 7600T	-	50341
-	Sensor, Beckett 7600P 07B Long	-	50340
-	Limit Control with 24" Sensor, Hydrolevel HydroStat 3250	-	50353
-	Immersion Well, Hydrolevel	-	50723

Part numbers may be subject to change without notice.

*See Figure 8.1 boiler exploded view.

Series WBV/WV™

Plastic Jacket

Oil Boilers

Installation, Operation & Maintenance Manual

TO THE INSTALLER:

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

TO THE OWNER:

This boiler should be inspected annually by a Qualified Service Agency.



PeerlessBoilers.com

PB HEAT, LLC

131 S. CHURCH ST • BALLY, PA 19503

Service Information

Name: _____

Address: _____

Phone: _____

