BRADFORD WHITE®
WATER HEATERS

Installation and Operation Manual
Hybrid Electric Heat Pump Water Heater

Scan this QR code to view the manual in your desired language.

Numérisez ce code QR pour afficher le manuel dans la langue souhaitée.

Escanee este código QR para ver el manual en el idioma que desee.

⚠ WARNING

Read and understand the instruction manual and safety messages before installing, operating, or servicing this product. Failure to follow these instructions and safety messages could result in death or serious injury. This manual must remain with the water heater.

ECO 8535
Effective: May 2025

For your family's comfort, safety, and convenience we recommend this water heater be installed and serviced by a plumbing professional.

WARNING
CANCER AND REPRODUCTIVE HARM
WWW.P65WARNINGS.CA.GOV

As required by the state of California Proposition 65

238-55123-00A

CONGRATULATIONS!

You have purchased one of the finest water heaters on the market today!

This installation, operation and instruction manual will explain in detail the installation and maintenance of your new water heater. We strongly recommend that you contact a plumbing professional for the installation of this water heater.

We require that you carefully read this manual, as well as the enclosed warranty, and refer to it when questions arise. If you have any specific questions concerning your warranty, please consult the plumbing professional from whom your water heater was purchased. For your records we recommend that you write the model, serial number and installation date of your water heater in the maintenance section in the back of this manual.

This manual should be kept with the water heater.

Table of Contents

Safety Information

This manual contains information regarding the safe installation and use of your water heater. It is very important that the information below and throughout the manual is understood for the health and safety of both the installer and the user.

Read and obey all safety instructions detailed in this manual.

This is the safety alert symbol. It is used to bring attention to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER
Indicates an immediately hazardous situation which, if not avoided, WILL result in death or injury.
⚠ WARNING
Indicates a potentially hazardous situation which, if not avoided, COULD result in death or injury.
⚠ CAUTION
Indicates a potentially hazardous situation which, if not avoided, COULD result in moderate to minor injury.
IMPORTANT
Indicates a potentially hazardous situation which, if not avoided, COULD result in damage to property.

All safety messages in this manual will define the type of hazard, what can happen if the safety message is not followed, and how to avoid or mitigate the hazard and risk of injury.

	**⚠ DANGER** Do not store or use gasoline or other flammable, combustible, or corrosive vapors and liquids in the vicinity of this or any other appliance. Failure to do so can lead to an explosion or fire that may result in death or severe injury.
	**⚠ WARNING** Turn OFF the electrical supply to the unit before installation and before removing any access panels to service the heater. Failure to do so can result in death, severe injury, and/or property damage.
	**⚠ WARNING** High temperatures and pressures in the water heater tank can cause an explosion resulting in property damage, serious injury or death. This unit is supplied with a combination temperature and pressure relief valve. Verify that the combination temperature and pressure relief valve complies with local codes. If the combination temperature and pressure relief valve does not comply with local codes, replace it with one that does.
	**⚠ CAUTION** Increasing the thermostat setting above the preset temperature may cause severe burns and consume excessive energy. Hotter water increases the risk of scald injury. Scalding may occur within five (5) seconds at a temperature setting of 140°F *(60°C)*. It is advised to test the temperature of the water before exposing oneself to it.

General Information

READ ALL INSTRUCTIONS BEFORE USING THE APPLIANCE

For your safety, the information in this manual must be followed to minimize the risk of fire or explosion, electric shock, and/or to prevent property damage, personal injury, or loss of life.

The warranty on this water heater is in effect only when the water heater is installed and operated in accordance with local codes and these instructions. The manufacturer of this heater will not be liable for any damage resulting from failure to comply with these instructions. Read these instructions thoroughly before starting.

This water heater must be installed in accordance with local codes. In the absence of local codes, install this water heater in accordance with the latest edition of the National Electrical Code.

⚠WARNING

Incorrect operation of this appliance may create a hazard to life and property and will nullify the warranty.

Do NOT use this appliance if any part has been submerged in water. The plumbing professional responsible for the installation of this water heater should be contacted to inspect the appliance and to replace any part of the control system that has been submerged in water.

⚠WARNING

If the water heater has been subjected to flood, fire, or physical damage, turn off power and water to the water heater. Do NOT operate the water heater again until it has been thoroughly checked by qualified service personnel.
- **Turn OFF power to water heater if it has been subjected to overheating, fire, flood, or physical damage.**
- **Do NOT turn on water heater unless it is filled with water.**
- **Do NOT turn on water heater if cold water supply shut-off valve is closed.**

NOTE: Flammable vapors may be drawn by air currents from surrounding areas to the water heater.

Make sure that the rating plate on the water heater is referenced for certainty that the correct voltage is being supplied to the water heater.

⚠DANGER

DO NOT store or use gasoline or other flammable, combustible, or vapors and liquids in the vicinity of this water heater or any other appliance. Keep rags and other combustibles away.

A sacrificial anode(s) is used to extend tank life. Removal of any anode, except for inspection and/or replacement, will nullify the warranty. In areas where water is unusually active, an odor may occur at the hot water faucet due to a reaction between the sacrificial anode and impurities in the water. If this should happen, an alternative anode(s) may be purchased from the supplier that installed this water heater. This will minimize the odor while protecting the tank. Additionally, the water heater should be flushed with appropriate dissolvers to eliminate any bacteria.

IMPORTANT

Before proceeding, please inspect the water heater and its components for possible damage. DO NOT install any damaged components. If damage is evident, please contact the supplier where the water heater was purchased, or the manufacturer listed on the rating plate for replacement parts.

For Installations in the State of California

Per Section 507.2 Seismic Provisions of the 2021 Uniform Plumbing Code (UPC). Water heaters shall be anchored or strapped to resist horizontal displacement due to earthquake motion. Strapping shall be at points within the upper one-third and lower one-third of its vertical dimensions. At the lower point, a distance of no less than 4 inches shall be maintained from the controls with the strapping.

Please refer to the local authority having jurisdiction to see if there are any additional local requirements regarding seismic provisions.

IMPORTANT

This water heater has been designed and certified for the purpose of heating potable water. The installation and use of this water heater for any purpose other than the heating of potable water may cause damage to the water heater, create a hazardous condition, and nullify the warranty.

Water Heater Specifications

Water Heater Capacity and Increasing Temperature Setpoint:

The water heater temperature setting strongly impacts the amount of usable hot water available for showers and baths.

- Energy consumption/savings and efficiency testing of water heaters is performed according to the Department of Energy (DOE) requirements specified at the date of manufacture.
- When the installer sets the location of the water heater during startup, the heater will default to it's preset startup temperature. This temperature is 120°F (*49°C*) in the US, and 140°F (*60°C*) in Canada. Therefore, if your previous water heater was set to a hotter temperature than your new water heater at the factory setpoint, the new water heater may seem to provide lower capacity than your old water heater. This can be corrected by increasing the temperature setpoint.
- Certain appliances such as dishwashers and automatic clothes washers may require increased temperature water.
- The user can adjust the temperature setting to meet their needs. Always read and understand the safety instructions contained in the Installation and Operation Manual before adjusting the temperature setpoint.

ASSE Approved Mixing Valves

Mixing valves for reducing point-of-use water temperature by mixing hot and cold water in branch water lines are commercially available. Contact a licensed plumber or the local plumbing authority for further information.

Fig. 1

Specifications

Nominal Capacity	50/65/80 US Gal.
Tank Max. Working Pressure	150 PSI
Water Temperature Set Point Range	100˚F-140˚F
Electrical	240/208 VAC 60 Hz 1-PH
Circuit Breaker	25 Amp minimum recommended*
Upper Element Wattage	4000/3000
Lower Element Wattage	4000/3000

Refrigeration System

Compressor	365 W
Refrigerant Charge (R134a)	29.1/30.9/30.9 oz (50/65/80 gal)
Compressor LRA	11.5A
Compressor RLA	1.78A

Temperature Adjustment

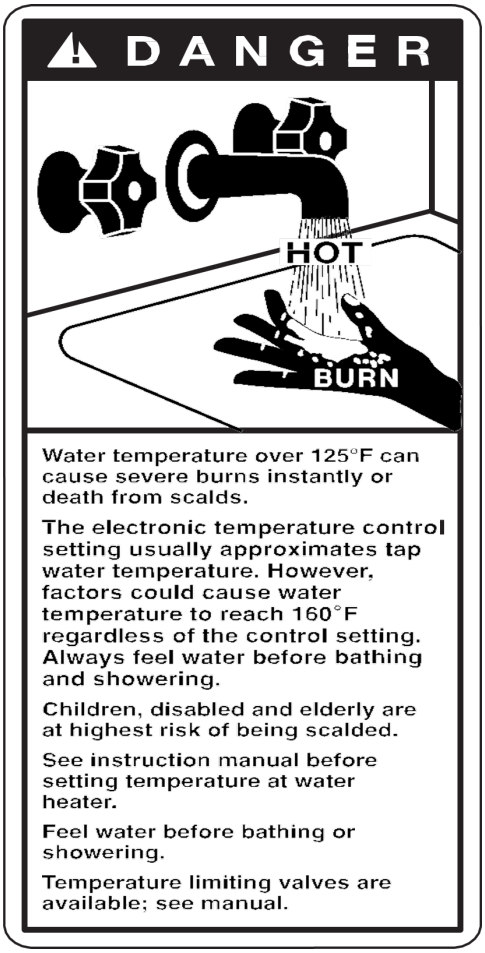
⚠ CAUTION

Increasing the temperature setting above the preset temperature may cause severe burns and consume excessive energy. Hotter water increases the risk of scald injury.

This water heater can deliver scalding temperature water at any faucet in the system. Be careful whenever using hot water to avoid scalding injury. Certain appliances, such as dishwashers and automatic clothes washers, may require increased temperature water. By setting the control on this water heater to obtain increased temperature water required by these appliances, you may create the potential for scald injury. To protect against injury, you should install an ASSE approved mixing valve in the water system. This valve will reduce the point of discharge temperature by mixing cold and hot water in branch supply lines. Such valves are available from the manufacturer of this water heater or a local plumbing supplier. Please consult with a plumbing professional.

Safety, energy conservation, and hot water capacity are factors to be considered when selecting the water temperature setting of the water heater. Water temperatures above 125°F can cause severe burns or death from scalding. Be sure to read and follow the warnings outlined on the label pictured below. This label is also located on the water heater near the top of the tank.

The control has been set at the factory to 120°F (*49°C*) for US applications, and 140°F (*60°C*) for Canadian applications. This setting can be adjusted to any temperature between 100°F and 140°F (*38°C and 66°C*).



To adjust the temperature, follow these steps:

1. Press the UP or DOWN arrow on the control panel keypad to the desired temperature.
2. Press ENTER to accept the new setting.

Note: To change between °F and °C, navigate to the main menu by pressing the menu button, select “SETTINGS”, then “DISPLAY”, and then “UNITS”.

APPROXIMATE TIME/TEMPERATURE RELATIONSHIPS IN SCALDS	
120°F (49°C)	More than 5 minutes
125°F (52°C)	1½ to 2 minutes
130°F (54°C)	About 30 seconds
135°F (57°C)	About 10 seconds
140°F (60°C)	Less than 5 seconds
145°F (63°C)	Less than 3 seconds
150°F (66°C)	About 1½ seconds
155°F (68°C)	About 1 second

Fig. 2

The chart shown above may be used as a guide in determining the proper water temperature for your home.

Water Heater Temperature Set-point

The water heater temperature setting strongly impacts the amount of usable hot water available for showers and baths.

- Energy consumption/savings and efficiency testing of water heaters is performed according to the Department of Energy (DOE) requirements specified at the date of manufacture.
- Safety regulations require a factory setting of 120°F to 125°F (49°C to 52°C) maximum for all new water heaters in the US (140°F (*60°C*) in Canada). Therefore, if the previous water heater was set at 130°F (54°C) or above and the new water heater is installed with a factory set set-point of 120°F (49°C), the new water heater may seem to provide lower capacity than the existing water heater.
- The user can adjust the temperature setting to meet their needs.
- Always read and understand the safety instructions contained in the Installation and Operation Manual before adjusting the temperature set-point.

Installation

Local Installation Regulations

This water heater must be installed in accordance with these instructions, local codes, and utility company requirements or, in the absence of local codes, the latest edition of the National Electrical Code. It is available from some local libraries or can be purchased from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02169 as booklet ANSI/NFPA 70.

Power Requirements

Check the markings on the rating plate of the water heater to be certain the power supply corresponds to the water heater requirements. Note: 208V installations may experience lower recovery performance.

Locating the Water Heater

⚠WARNING

Water heaters are heat producing appliances. To avoid damage or injury, there shall be no material stored against the water heater and proper care shall be taken to avoid unnecessary contact (especially by children) with the water heater.
UNDER NO CIRCUMSTANCES SHOULD FLAMMABLE MATERIALS, SUCH AS GASOLINE OR PAINT THINNER BE USED OR STORED IN THE VICINITY OF THIS WATER HEATER OR ANY LOCATION FROM WHICH FUMES COULD REACH THE WATER HEATER.

This water heater MUST be installed indoors out of the wind and weather.

This water heater must be located in an area where leakage of the tank, water line connections, or the combination temperature and pressure relief valve will not result in damage to the area adjacent to the water heater or to lower floors of the structure. When such locations cannot be avoided, a suitable drain pan must be installed under the water heater. The drain pan must have a minimum length and width of at least 4 in (10.2 cm) greater than the diameter of the water heater. The drain pan, as described above, can be purchased from your plumbing professional. The drain pan must be piped to an adequate drain. The piping must be at least 3/4 in (1.9 cm) in diameter and pitched for proper drainage.

The location of this water heater is to be installed is of utmost importance. Before installing this water heater, consult the installation section of these instructions. After reading these installation and operating instructions, select a location for the water heater where the floor is level and is easily accessible to a power supply and water connections. The water heater and water lines should be protected from freezing temperatures and highly corrosive atmospheres. The condensate drain pipe must NOT be routed through an area subject to below freezing temperatures. Locate the water heater in a clean, dry area. It is recommended that the water heater be located near the center of greatest hot water usage to prevent heat loss through pipes.

Do NOT locate the water heater where water lines could be subjected to freezing temperatures. Locate the water heater so that access panels and drain valves are accessible.

Water heater corrosion and component failure can be caused by the heating and breakdown of airborne chemical vapors. Examples of some typical compounds that are potentially corrosive are: spray can propellants, cleaning solvents, refrigerator and air conditioning refrigerants, swimming pool chemicals, calcium or sodium chloride, waxes, and process chemicals. These materials are corrosive at very low concentration levels with little or no odor to reveal their presence.
Note: Damage to the water heater caused by exposure to corrosive vapors is not covered by the warranty. Do NOT operate the water heater if exposure has or will occur. Do NOT store any potentially corrosive compounds in the vicinity of the water heater.

This unit is designed for any common indoor installation in a space with at least 700 ft3 (19.8 m³) including: garage, utility room, attic, closet, etc. It can be installed in rooms smaller than 700 ft³ (19.8 m³) with the installation of a louvered door, or two louvered sections (one at the top and one at the bottom of the door or wall for airflow). Each louver should have 240 in² (0.15 m²) of open airflow area or greater. Servicing the water heater requires proper installation so that the air filter, covers, trim ring, and front panels can be removed to permit inspection and servicing. Reference "Recommended Clearances" below.

The heat pump operating range is 37°F to 120°F (*3°C to 49°C*). If the ambient temperature is outside of this range, the heat pump will turn off and the electric elements will be used until the ambient temperature returns to within the operating range.

Attic installations require access stairs and solid flooring with no exposed floor joists up to the installation location.
Note: Moving the water heater or other appliances to provide service to the water heater is not covered under warranty.

Note: For California installation this water heater must be braced, anchored, or strapped to avoid falling or moving during an earthquake. See instructions for correct installation procedures. Instructions may be obtained from DSA Headquarters Office, 1102 Q Street, Suite 5100, Sacramento, CA 95811.

Air Exchange Efficiency

Recommended minimum clearances listed in this Installation and Operations Manual are for the optimum performance, efficiency, and serviceability of the water heater.

Installing the water heater in a manner that does not provide sufficient air exchange will result in increased energy consumption. Ducting may be required in order to achieve optimum efficiency. Bradford White is not liable or responsible for any additional energy consumption or warranty implications.
Note: If the air temperature in the installed location drops more than 15˚F (*8˚C*) during heating, air circulation is insufficient for optimum operation.

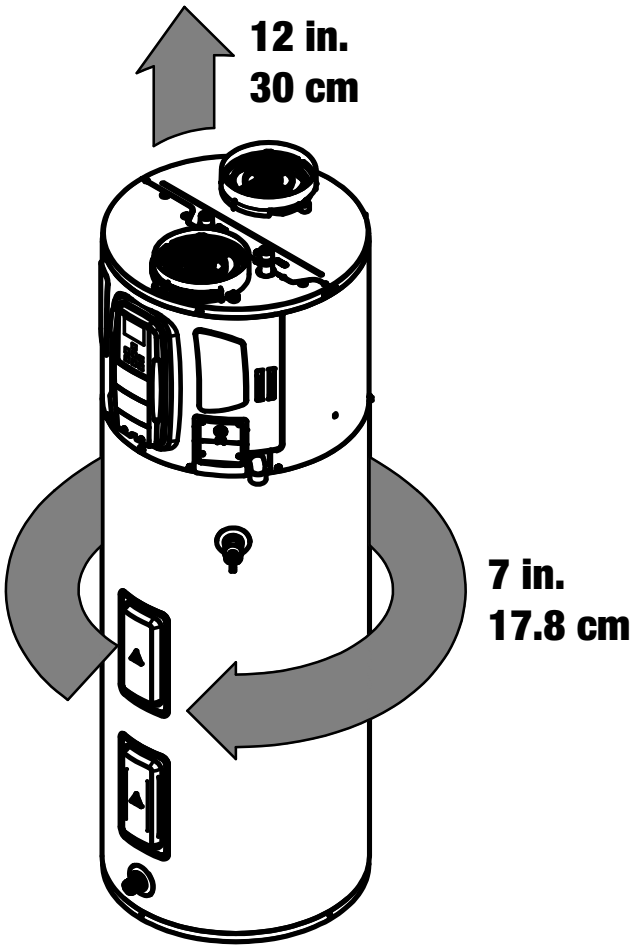
Recommended Clearances

NOTE: Installations in a confined space, or installations where the recommended service clearances are not met, will lead to higher power consumption (increased use of resistance heating elements and/or heat pump efficiency reduction).

It is recommended to have a 7" (17.5 cm) clearance between any object and the rear and right side of the water heater in the event service is needed. A minimum 12" (30 cm) clearance above the water heater for air discharge and for service access, and clear access to the front of the water heater, and 4" (10 cm.) around the T&P valve, is recommended. Installations that require less than 7" (17.5 cm) clearance on the right side or rear of the water heater for earthquake straps are also acceptable. In these cases, it is recommended to provide additional clearance on the opposite side of the unit to allow for service access. The hot and cold water plumbing and electrical connections must not interfere with the removal of the filter.

The clearances shown are recommended for optimal performance (best possible efficiency) as well as adequate service room. Reducing these clearances may impact the overall performance compared to what is displayed on the water heater.

Insufficient air exchange will result in increased energy consumption levels.



Note: Model appearance may vary

Fig. 3

Condensate Drain Connection

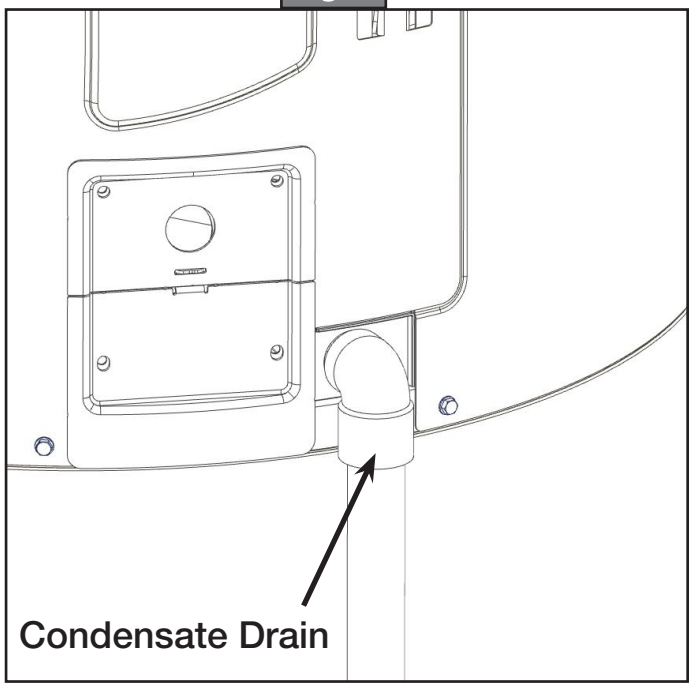
This unit has a condensate drain; therefore, a floor or other drain no higher than 36 in (91.4 cm) above the floor must be available. It must be in close proximity to the water heater to allow for the shortest possible drain line with minimal turns. The drain must meet state and local codes. It is important to install a ¾" MNPT fitting suitable for either rigid or flexible drain line to the primary drain port coming off the side of the unit. Diameter reductions from a ¾" drain line are discouraged.

Ensure that the rigid or flexible drain line maintains a downward slope to allow for proper gravity drainage of condensate to the drain and to allow for proper function of the condensate drain blockage sensor. If no drain is available, then a common condensate pump with a capacity no less than 1 gallon/day (3.8 L/day) must be purchased and installed. It is important to route the flexible or rigid drain line so that the discharge water cannot contact live electrical parts or cause water damage.

Drain Pan Installation

Auxiliary drain pan MUST conform to local codes. Drain pan kits are available from the distributor where the water heater was purchased or any water heater supplier. The drain pan should be at minimum 4 in (10.2 cm) larger than the water heater base diameter. To prevent corrosion and improve drain valve access it is recommended that the water heater be placed on risers inside the drain pan.

Fig. 4



Water Supply Connections

Note: BEFORE PROCEEDING WITH THE INSTALLATION, CLOSE THE MAIN WATER SUPPLY VALVE.

After shutting the main water supply valve, open a faucet to relieve the water line pressure to prevent any water from leaking out of pipes while making the water connections to the water heater. After the pressure has been relieved, close the faucet. Refer to the typical installation illustration below for suggested set-up. The HOT and COLD water connections are clearly marked and are ¾" NPT on all models. When connecting to the inlet/outlet ports, the use of ¾" female NPT tapered thread fittings with use of thread sealant is recommended. The installation of unions is recommended on the hot and cold water connections so that the water heater may be easily disconnected for servicing if necessary.

Note: Install a shut-off valve in the cold water line near the water heater. This will enable easier service or maintenance of the unit later.

⚠ CAUTION

Do NOT apply heat to the HOT or COLD water connections. If sweat connections are used, sweat tubing to adapter before fitting the adapter to the cold water connections on heater. Any heat applied to the hot or cold water connection will permanently damage the internal plastic lining in these ports.

IMPORTANT

Failure to install and maintain a new, listed 3/4" x 3/4" temperature-pressure relief valve will release the manufacturer from any claim which might result from excessive temperature and pressures.

⚠ DANGER

There is a hot water scald potential if the control water temperature is set too high. Households with small children, disabled, or elderly persons may require a 120°F (49°C) or lower temperature setting to prevent contact with "HOT" water.

⚠ CAUTION

The cause of the high temperature condition must be investigated by a qualified service technician and corrective action must be taken before placing the water heater in service again.

To Fill the Water Heater:

1. Close the water heater drain valve. This water heater utilizes a ball valve; when closing the valve, the stem will spin indefinitely. Confirm it is closed by ensuring the slot on the stem is perpendicular to the valve body.
2. Open the cold water supply shut-off valve.
3. Open several hot water faucets to allow air to escape from the system.
4. When a steady stream of water flows from the faucets, the water heater is filled. Close the faucets and check for water leaks at the water heater drain valve, combination temperature pressure relief valve, and the hot and cold water connections.

To Drain the Water Heater:

Should it become necessary to completely drain the water heater, make sure you follow the steps below.

1. Turn OFF the power to the unit. The electric heating elements will become damaged if operated without water.
2. Attach a hose to the drain valve located at the bottom of the unit and direct the hose to a drain.
3. Turn OFF the cold water supply.
4. Admit air to the tank by opening a hot water faucet or lifting the handle on the relief valve.
5. Open the drain valve with a flat screwdriver.

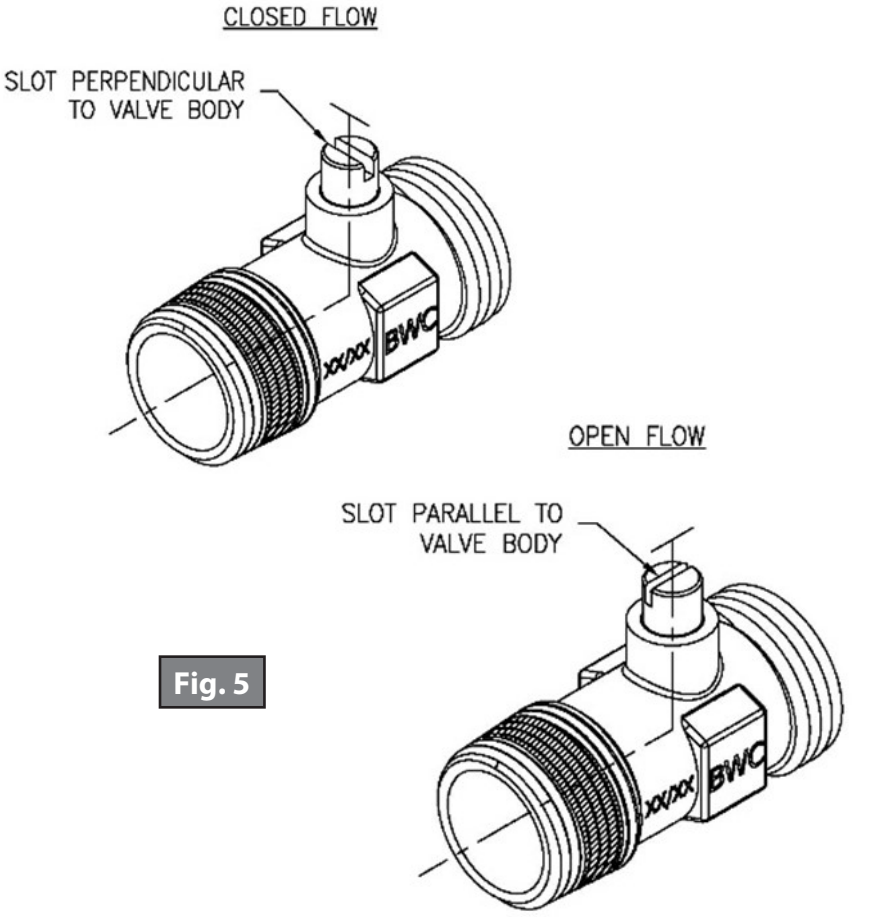


Fig. 5

⚠ CAUTION

Install a discharge line so that water discharged from the combination temperature and pressure relief valve will exit within 6 in (15.3 cm) above, or any distance below the structural floor and cannot contact any live electrical part. The discharge line is to be installed to allow for complete drainage of both the temperature and pressure relief valve and the discharge line. The discharge opening must not be subjected to blockage or freezing. Do NOT thread, plug, or cap the discharge line. It is recommended that a minimum of 4 in (10.2 cm) be provided on the side of the water heater for servicing and maintenance of the combination temperature and pressure relief valve.

Do NOT place a valve between the combination temperature and pressure relief valve and the tank.

Note: Some models may already be equipped or supplied with a combination temperature and pressure relief valve. Verify that the combination temperature and pressure relief valve is in compliance with the local codes. If the combination temperature and pressure relief valve does not comply with local codes, replace it with one that does. Follow the installation instructions above on this page.

⚠ WARNING

Hydrogen gas can be produced in a hot water system served by this water heater when there has been little to no usage. HYDROGEN GAS IS EXTREMELY FLAMMABLE. To reduce the risk of injury under these conditions, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. If hydrogen is present, there will probably be an unusual sound, such as air escaping through the pipe, as the water begins to flow. There should be NO smoking or open flame near the faucet at the time it is open.

Safety Controls

The water heater is equipped with a high limit that is located above the heating element in contact with the tank surface. If for any reason the water temperature becomes excessively high, the high limit breaks the power circuit to the heating element. Once the control opens, it must be reset manually. Resetting of the high limit should be done by a qualified service technician.

To reset the high limit:

1. Turn OFF the power to the water heater.
2. Remove the jacket access panel(s) and insulation. The high limit protective cover should NOT be removed.
3. Press the red RESET button.
4. Replace the insulation and jacket access panel(s) before turning on the power to the water heater.

Typical Installation

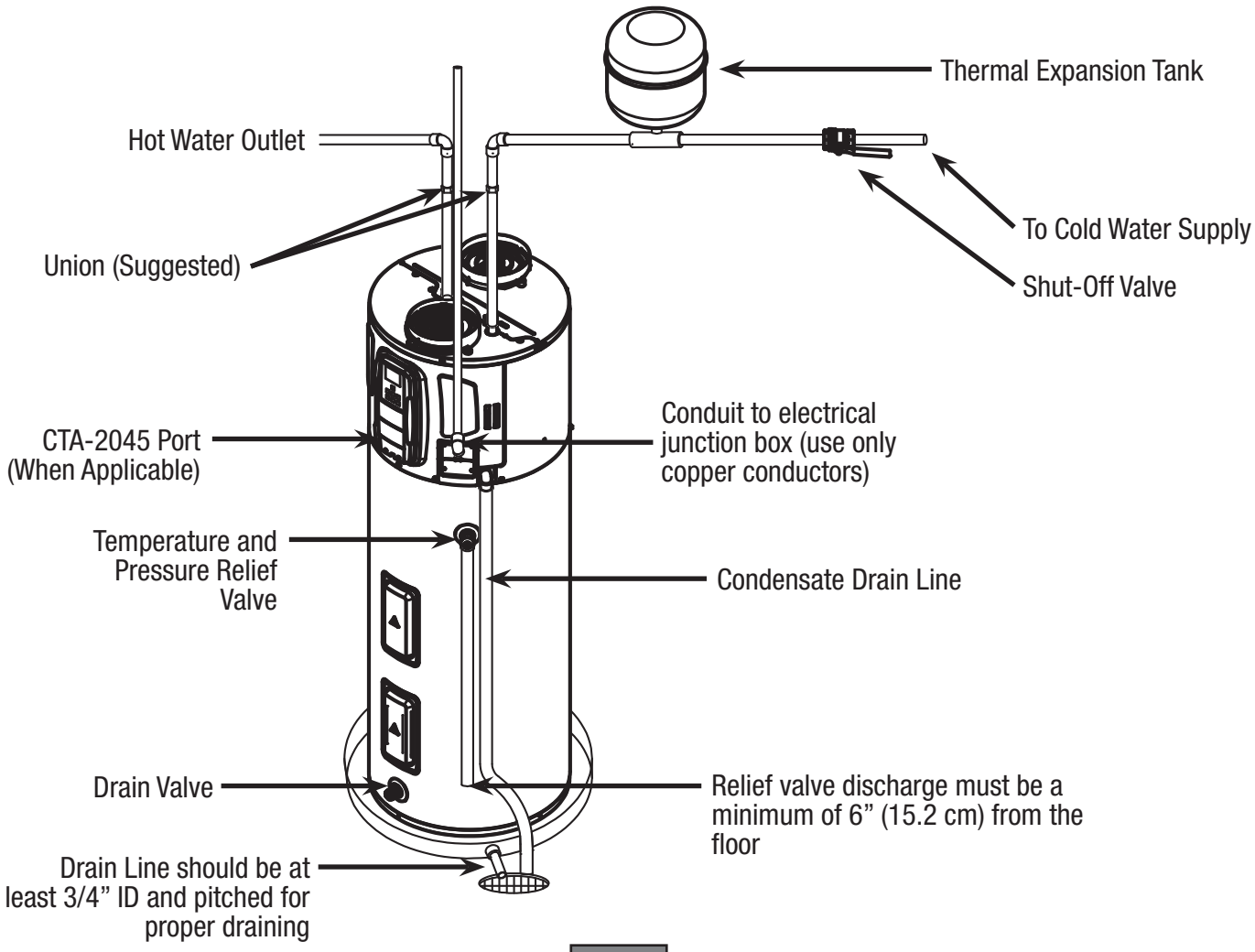


Fig. 6

Temperature and Pressure Relief Valve

⚠WARNING

The pressure rating of the relief valve must not exceed 150 PSI (1.03 kPa) or the maximum working pressure of the water heater as marked on the rating plate.

A new combination temperature and pressure relief valve, complying with the Standard for Relief Valves and Automatic Gas Shut-off Devices for Hot Water Supply Systems, ANSI Z21.22, is supplied and must remain installed in the opening provided and marked for this purpose on the water heater. NO valves of any type should be installed between the relief valve and the tank. Local codes shall govern the installation of relief valves. The BTUH rating of the relief valve must NOT be less than the input rating of the water heater as indicated on the rating label located on the front of the water heater (1 watt = 3.412 BTUH).

Connect the outlet of the relief valve to a suitable open drain so that the discharge water cannot contact live electrical parts or persons and to eliminate potential water damage.

Piping used should be of a type approved for hot water distribution. The discharge line must be no smaller than the outlet of the valve and must pitch downward from the valve to allow complete drainage (by gravity) of the relief valve and discharge line. The end of the discharge line should not be threaded or concealed and should be protected from freezing. No valve of any type, restriction, or reducer coupling should be installed in the discharge line.

⚠ CAUTION

For protection against excessive temperatures and pressure, install temperature and pressure protective equipment required by local codes, but not 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. The combination temperature and pressure relief valve shall be marked with a maximum set pressure, not to exceed the maximum working pressure of the water heater. The combination temperature and pressure relief valve shall also have an hourly rated temperature steam BTU discharge capacity not less than the hourly input rating of the water heater.

Install the valve into an opening provided and marked for this purpose in the water heater, and orient it or provide tubing so that any discharge from the valve exits only within 6 in (15.2 cm) above, or at any distance below the structural floor, and does NOT contact any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances.

Thermal Expansion

Determine if a check valve exists in the inlet water line. It may have been installed in the cold water line as a separate backflow preventer, or it may be part of a pressure reducing valve, water meter, or water softener. A check valve located in the cold water inlet line can cause what is referred to as a “closed” water system. A cold water inlet line with no check valve or backflow prevention device is referred to as an “open” water system. As water is heated, it expands in volume and creates an increase in the pressure within the water system. This action is referred to as thermal expansion.

In an “open” water system, expanding water which exceeds the capacity of the water heater flows back into the city main where the pressure is easily dissipated. A “closed” water system prevents the expanding water from flowing back into the main supply line, and the result of thermal expansion can create a rapid and dangerous pressure increase in the water heater and system piping. This rapid pressure increase can quickly reach the safety setting of the relief valve, causing it to operate during each heating cycle.

Thermal expansion, and the resulting rapid and repeated expansion and contraction of components in the water heater and piping system, can cause premature failure of the relief valve, and possibly the heater itself. Replacing the relief valve will NOT correct the problem.

The suggested method of controlling thermal expansion is to install an expansion tank in the cold water line between the water heater and the check valve. The expansion tank is designed with an air cushion built in that compresses as the system pressure increases, thereby relieving the over-pressure condition and eliminating the repeated operation of the relief valve. Other methods of controlling thermal expansion are also available. Refer to the manufacturer provided installation instructions when installing the thermal expansion tank.

IMPORTANT

If this water heater is installed in a closed water supply system, such as the one having a back-flow preventer, check valve, pressure reducing valve, or water meter with check valve in the cold-water supply, provisions shall be made to manage thermal expansion. DO NOT operate this water heater in a closed water supply system without proper provisions. A properly sized and properly installed thermal expansion tank and/or other device(s) must be installed. Work with your installation professional, your water supplier, or local plumbing inspector on how to properly manage this situation. Warranties do NOT cover damages from thermal expansion, such as pressure bulges and/or deformities.

Electrical Connections

A separate branch circuit with copper conductors, overcurrent protective device, and suitable disconnect must be provided by a qualified electrician. All wiring must conform to local codes or latest edition of National Electrical Code ANSI/NFPA 70.

The water heater is completely wired to the junction box at the top of the water heater. An opening of 7/8" electrical fitting is provided for field wiring connections. The voltage requirements and wattage load from the water heater are specified on the rating label on the front of the water heater.

The branch circuit wiring should include either:

1. Metallic conduit or metallic sheathed cable approved for use as a grounding conductor and installed with fittings approved for the purpose.
2. Nonmetallic sheathed cable, metallic conduit, or metallic sheathed cable not approved for use as a ground conductor shall include a separate conductor for grounding. It should be attached to the ground terminals of the water heater and the electrical distribution box.

To connect power to the water heater:

1. Turn the power OFF.
2. Remove the screw(s) holding the junction box top cover.
3. Install L1 to L1, L2 to L2, and ground to the green ground wire connected to the bottom of the junction box.

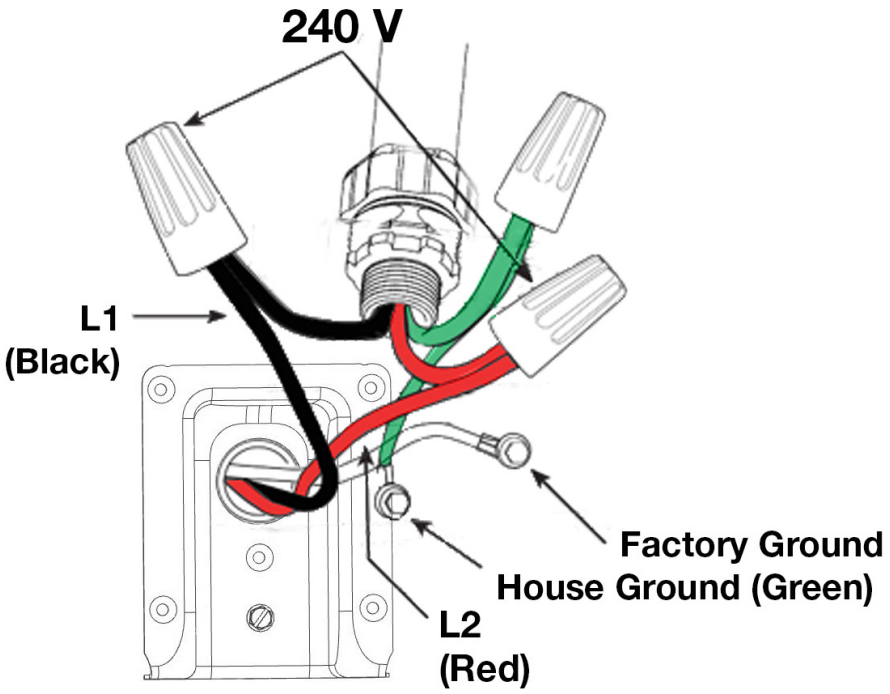


Fig. 7

⚠WARNING

Proper ground connection is essential. The presence of water in the piping and water heater does NOT provide sufficient conduction for a ground. Nonmetallic piping, dielectric unions, flexible connectors, etc., can cause the water heater to be electrically isolated. Do NOT disconnect factory ground.

Note: 208V installations may experience lower recovery performance.

Note: Install electric connections according to local codes or latest edition of National Electrical Code ANSI/NFPA 70.

The manufacturer's warranty does NOT cover any damage or defect caused by installation, attachment or use of any type of energy-saving or other unapproved devices into, onto, or in conjunction with the water heater. The use of unauthorized energy-saving devices may shorten the life of the water heater and may endanger life and property. The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized devices.

If local codes require external application of insulation blanket kits, the manufacturer's instructions included with the kit must be carefully followed.

Application of any external insulation, blankets or water pipe insulation to this water heater will require careful attention to the following:

- **Do NOT** cover the temperature and pressure relief valve.
- **Do NOT** cover access panels to the heating elements.
- **Do NOT** cover the electrical junction box of the water heater.
- **Do NOT** cover the operating or warning labels attached to the water heater or attempt to relocate them on the exterior of the insulation blanket.
- **Do NOT** block the air inlet/outlets in the top covers or rear of the unit.

Note: This guide recommends minimum branch circuit sizing based on the National Electric Code. Refer to wiring diagrams in this manual for field wiring connections.

Branch Circuit Sizing Guide for 208V and 240V Heaters

Total Water Heater Wattage	Recommended Over-Current Protection (fuse or circuit breaker amperage rating)	
	208V	240V
3,000	20	20
4,000	25	25
4,500	30	25
5,000	30	30
5,500	35	30
6,000	40	35
8,000	50	45
9,000	-	50
10,000	-	-
11,000	-	-
12,000	-	-

Total Water Heater Wattage	Copper Wire Size AWG Based on N.E.C. Table 310-16 (167ºF/75ºC.)	
	208V	240V
3,000	12	12
4,000	10	10
4,500	10	10
5,000	10	10
5,500	8	10
6,000	8	8
8,000	8	8
9,000	-	8
10,000	-	-
11,000	-	-
12,000	-	-

Fig. 8

What to Expect for "Normal Startup" in Hybrid Mode

Electrical Notices:
Do NOT incorrectly wire electrical connections. 240 VAC or 208 VAC must be applied across L1 and L2 wires. Failure to do so will void the warranty and can result in 120 VAC applied to water heater, which may damage the compressor or other electrical components.
NOTE: Regarding Utility Power-Management Devices (sometimes called Peak Load Reduction Switches) – Some power-management switching devices or even some basic timer switches exist that reduce voltage from 240 VAC to 120 VAC during high-electricity-demand periods. These devices must be removed from the circuit providing power to the water heater because of the potential water heater damage noted above. Switching devices, which cut power from 240 VAC to 0 VAC on a periodic basis, are acceptable.

Note: The heat pump operating range is 37ºF to 120ºF *(3ºC to 49ºC)*. Outside of this range, StartGuard® will use the upper element and be complete in less than one minute

After the unit has been installed, with all electrical and water connections secure and checked, then the unit should be filled with water (vent tank by opening a hot water faucet somewhere in home to allow tank to fully fill with water). Once the tank is full and power is energized, it will go into StartGuard®. StartGuard® is a proprietary software that ensures all conditions are met before the water heater starts so it can operate without issue. During startup, you may experience the following:

Elapsed Time	Water Heater Actions	Comments
Startup	Display will provide a series of user prompts.	These prompts set up language, country, time zone, date and time. The last prompt will ask if the tank is filled. **Be certain the tank is filled before proceeding.**
0-8 Minutes	Compressor and fan turn on.	StartGuard® algorithm attempts to detect an empty or partially filled tank during this 8-minute period
8 Minutes and beyond	After the final step in StartGuard®, normal operation begins.	The water heater is operating in Hybrid mode, quickly providing an initial amount of hot water before switching to the efficient heat pump for the majority of heating.

Fig. 9

Fault Code 10 During Installation:
If the unit is powered on without a full tank, Fault Code 10 will appear. Turn the power OFF, finish filling the tank with water, then turn the power back ON.

NOTE: The StartGuard® Technology, dry fire protection, on the tank is for the aid of the installer and should NOT be used as the primary control to prevent operation with an empty or partially filled tank. Power should NEVER be applied to the water heater until the installer has verified that the tank is filled, and all air has been purged from the system.

Fault Code 6 During Installation:
If a "Fault Code 6" is shown on the display, the water heater is not receiving the correct voltage as a result of incorrect wiring. To correct this fault, turn the power OFF to the water heater, correct the wiring issue, then turn the power back ON.

Installation Checklist

- ☐ **1. Tank location**:
  - Does room size require louvered door, ducting, or similar ventilation? 10' x 10' x 7' (700 cu. ft.) or 240 square inches (0.15 m^2) open air-flow area needed.
  - Sides have recommended 7 inches (17.5 cm) of clearance. (Reduced clearance for earthquake strap installations).
  - Front of unit is free and clear.
  - Is the water heater level? If no, add shims under the base of the unit to ensure proper function of the sensors.
- ☐ **2. Verify Air Filter** is installed.
- ☐ **3. Plumbing connections** have no leaks. After filling the tank with water, check for leaks when water is flowing and when idle.
- ☐ **4. Condensate lines are in place**:
  - Use a ¾" NPT 90 degree elbow turned downward to the drain/drain pan to prevent condensation back-up.
  - Flexible or rigid drain line installed and directed to a drain or condensate pump. Reducer fittings are not recommended.
- ☐ **5. Temperature and pressure relief valve** is working and drain line completed per local code.
- ☐ **6. Electrical**: Verify 208/240 VAC to L1 and L2 at tank.
- ☐ **7. Electrical** connection does not prevent air filter removal.
- ☐ **8. Verify** proper start up and commissioning. Assist user in how to adjust temperature and modes (see "Temperature Adjustment" section of the Installation and Operation Manual).

Venting (Optional)

⚠ CAUTION

Failure to follow these warnings can result in personal injury or property damage. Check with your local building inspector for building and HVAC codes. You must follow all governing codes and guidelines as you install supply or return ducting to the water heater.

IMPORTANT

To reduce the risk of property damage, do not attach rigid ducting directly to the water heater. A section of flexible ducting should be added to the heater first before it is attached to the water heater. This will reduce vibration noise and chatter when the heater is in operation. It is recommended to use insulated flexible ducting with the appropriate insulation R value for your application per the installation instructions. Consult an HVAC professional for questions concerning the installation.

BEFORE YOU START

Consider the following when installing heat pump water heater ducting:

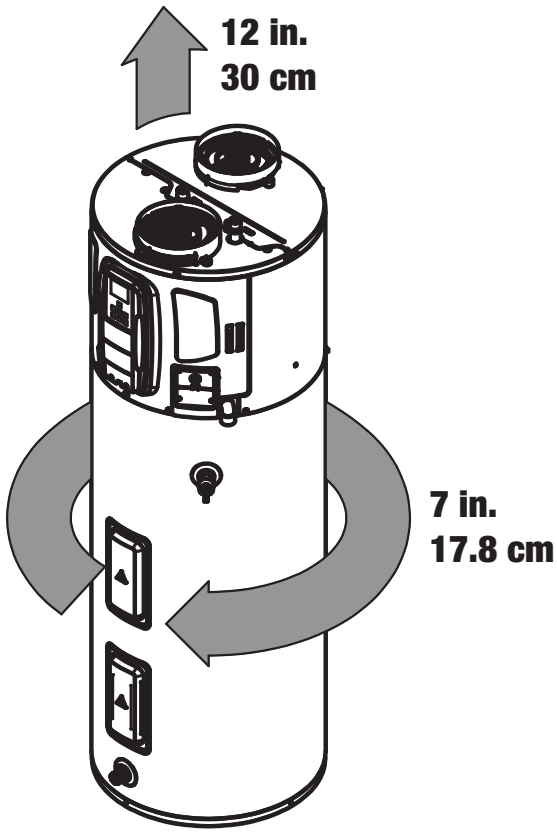
- Typical application requires 12” of clearance above water heater although room height restrictions may affect this. If a 90 degree turn is required directly from the water heater, ensure that flexible ducting has not collapsed internally restricting airflow.
- The heat pump water heater requires additional space above for attaching ducting to the duct adapters. Heat pump water heaters may have to be reinstalled to meet the minimum clearance requirements.
- Total equivalent (straight) duct work length of the INLET and OUTLET ducting COMBINED must be:
  - Less than 125 ft. for flexible ducting.
  - Less than 300 ft. for rigid ducting.
- On new heat pump water heater installations select a location for the water heater that will allow for easy duct installation, meet clearance requirements, and minimize the length and number of elbows of the INLET and OUTLET duct work. Use the table in the DUCT LENGTH section to calculate the total equivalent straight length of duct work. Consult an HVAC professional for questions concerning the installation.
- Install any duct termination in accordance with local building codes with appropriate inlet/outlet wall cap/vent hoods.
- Acquire additional materials to complete proper installation of ducting.

CLEARANCES

The clearances referenced in “Recommended Clearances” apply to all vented heaters. It is recommended to have a 7” (17.5 cm) clearance between any object and the rear and right side of the water heater in the event service is needed. A minimum 12” (30 cm) clearance above the water heater if either the INLET or OUTLET is not ducted. In the event that both INLET and OUTLET airflow is ducted with 90° elbows directly off the heater, it is acceptable to have less than 12” of clearance, but ONLY if both INLET and OUTLET air is ducted. Clear access to the front of the water heater and the T&P valve is recommended.

Installations that require less than 7” (17.5 cm) clearance on the right side or rear of the water heater for earthquake straps are also acceptable. In these cases, it is recommended to provide additional clearance on the opposite side of the unit to allow for service access. The hot and cold water plumbing and electrical connections must not interfere with the removal of the filter.

Additional considerations may need to be taken for venting installation.



Note: Model appearance may vary

Fig. 10

DUCTING LENGTH

Using ducting longer than specified length will:

- Increase the water heater recovery times and the energy cost.
- Reduce the water heater fan life.
- Induce dirty filter faults due to lack of proper airflow. Refer to Operation section bullet 2 for more details.

The correct ducting installation is YOUR RESPONSIBILITY.

IMPORTANT

Problems due to incorrect installation are not covered by the water heater warranty.

The MAXIMUM ALLOWABLE length of the ducting system depends upon the type of duct, number of turns, the type of ducting hoods (wall cap) and all conditions noted on the chart below. All ducting used with the system should be 8" in diameter, unless a separate booster fan has been installed.

Consider the following when installing Heat Pump Water Heater ducting:

- Any elbow/bend greater than 45° should be treated as a 90° elbow/bend.
- Two 45° elbows/bends will be treated like one 90° elbow/bend.
- For every 90° elbow/bend, reduce the allowable vent system length by 13 feet.
- When calculating the total vent system length, you must add all the straight portions and elbows of the system for both inlet and outlet ducts. Equivalent straight duct length should not exceed 125 feet.

Inlet Venting + Outlet Venting MUST be less than 125 ft. (flexible ducting) or 300 ft. (rigid ducting) of equivalent straight duct length, taking elbows into account.

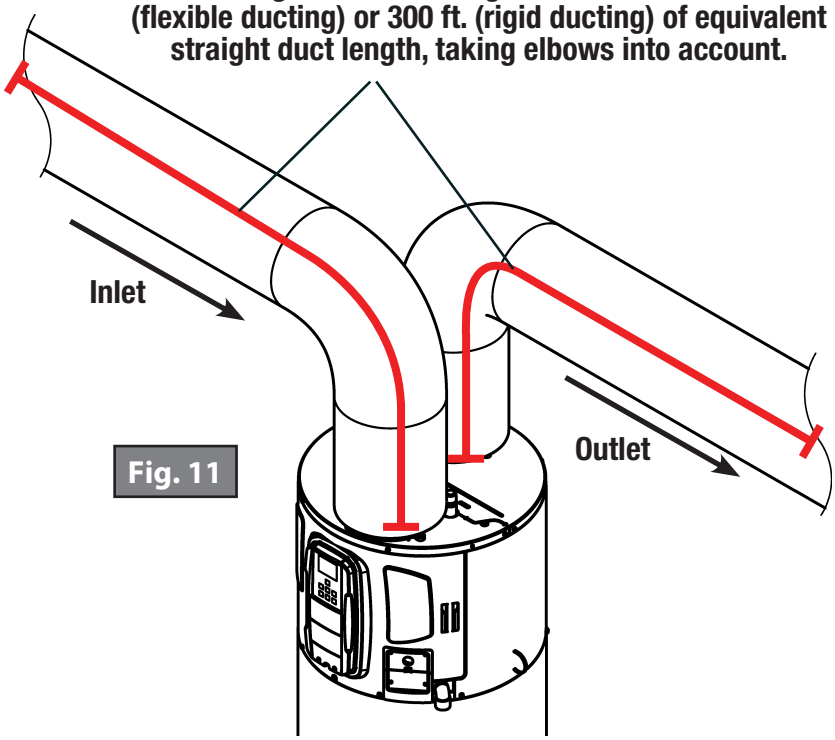


Fig. 11

	8" Venting						6" Venting	
	No Wall Cap		8" Wall Cap		6" Wall Cap		No Wall Cap	
90° Elbows	Rigid	Flexible	Rigid	Flexible	Rigid	Flexible	Rigid	Flexible
0	300	125	270	95	225	50	60	25
1	287	112	257	82	212	37	35	-
2	274	99	244	69	199	24	10	-
3	261	86	231	56	186	-	-	-
4	248	73	218	43	173	-	-	-

Fig. 12

WATER HEATER AND AREA PREPARATION

NOTE: Read the “Before You Start” section and determine the most ideal location for the water heater.

1. Remove power from the water heater at the fuse, breaker panel, or outlet before proceeding with installation. The unit does not have a power button, so this precaution must be taken before proceeding. During this installation, the unit will not be producing hot water. Because of this, it is recommended to plan hot water usage around the installation of this ducting kit.
2. Determine duct length design based on “Ducting Length” section and acquire the necessary ducting supplies. If bends are needed in the ducting, ensure the inner radius of any flexible ducting is not smaller than its diameter.
3. The filter in the INLET adapter must remain in place.

DUCT INSTALLATION

1. The INLET adapter is directly compatible with 8” flexible ducting. There are features included on the Inlet duct adapter that will ensure the air filter removal is not hindered. Ensure ducting is fully seated on top of these features in the following steps.
2. The flange on the INLET adapter is extended to fit inside of the 8” insulated flexible ducting. Cut back the insulation from the insulated ducting to expose the inner flexible duct and slide the inner flexible duct over the INLET adapter.
3. Secure the inner flexible ducting with a cable tie or band clamp. Apply insulation tape over the cable tie or band clamp ensuring that contact is made with the INLET adapter to prevent any bypass air. Two full revolutions is recommended.
4. Slide the insulation back over the exposed inner flexible duct. Apply a cable tie or band clamp as well as insulation tape to ensure the insulation stays in place.
5. The outlet adapter is also compatible with 8” flexible ducting and has the same features as the INLET adapter. Repeat steps 1-4 on the OUTLET adapter.
6. Ensure ducting is supported by the surrounding structure and not the heat pump water heater. Use hangers, hooks, or other means to support the ducting as required by local codes.

Be sure to add appropriate means to prevent the following:

- Accumulation of debris.
- Entrance of insects, rodents and other small animals.
- Rainwater accumulation.

Install any duct termination in accordance with local building codes with appropriate inlet/outlet wall cap/vent hoods.

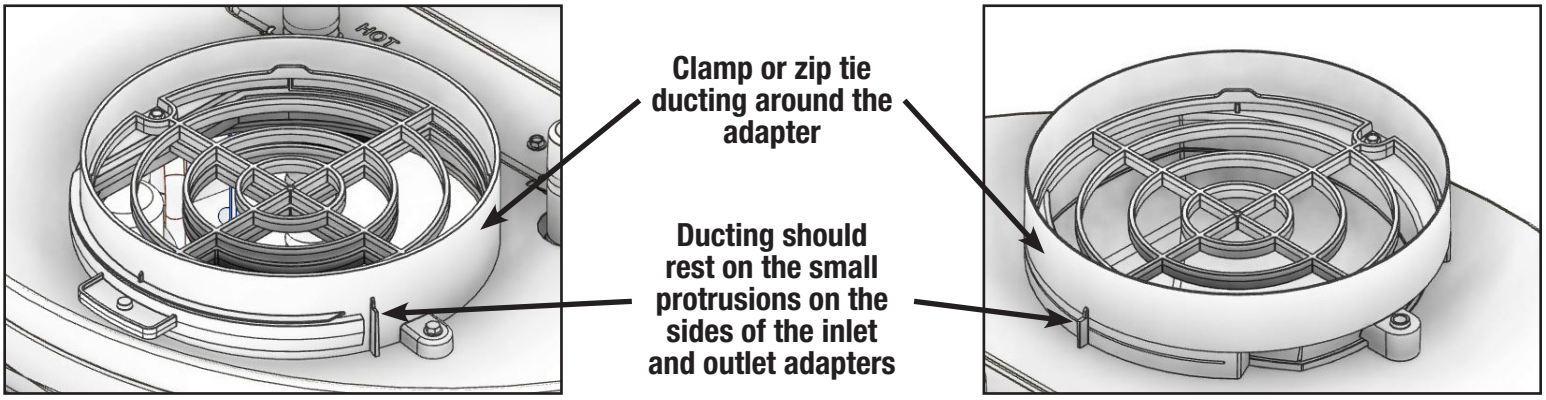


Fig. 13

OPERATION AND TROUBLESHOOTING

- The Heat Pump Water Heater, when operated in HYBRID Mode with inlet temperatures below 37°F (*3°C*), will automatically switch to electric elements temporarily. It is recommended to change the inlet air source to a warmer source during this condition to increase energy efficiency.
- If the unit continually indicates that the filter needs to be serviced, it is recommended that the calculated run length of the ducting be checked using the method described in the Ducting Length section. If this is within specified limits, check for obstructions. If there are no obstructions, a separate in-line booster fan may be installed to assist with air flow. If this does not correct the situation, contact customer service.
- In the event that outdoor temperatures reach levels above those within the household, but not more than 15° F above household temperatures, it may be beneficial to duct outlet air from the water heater into the conditioned space to assist with cooling.

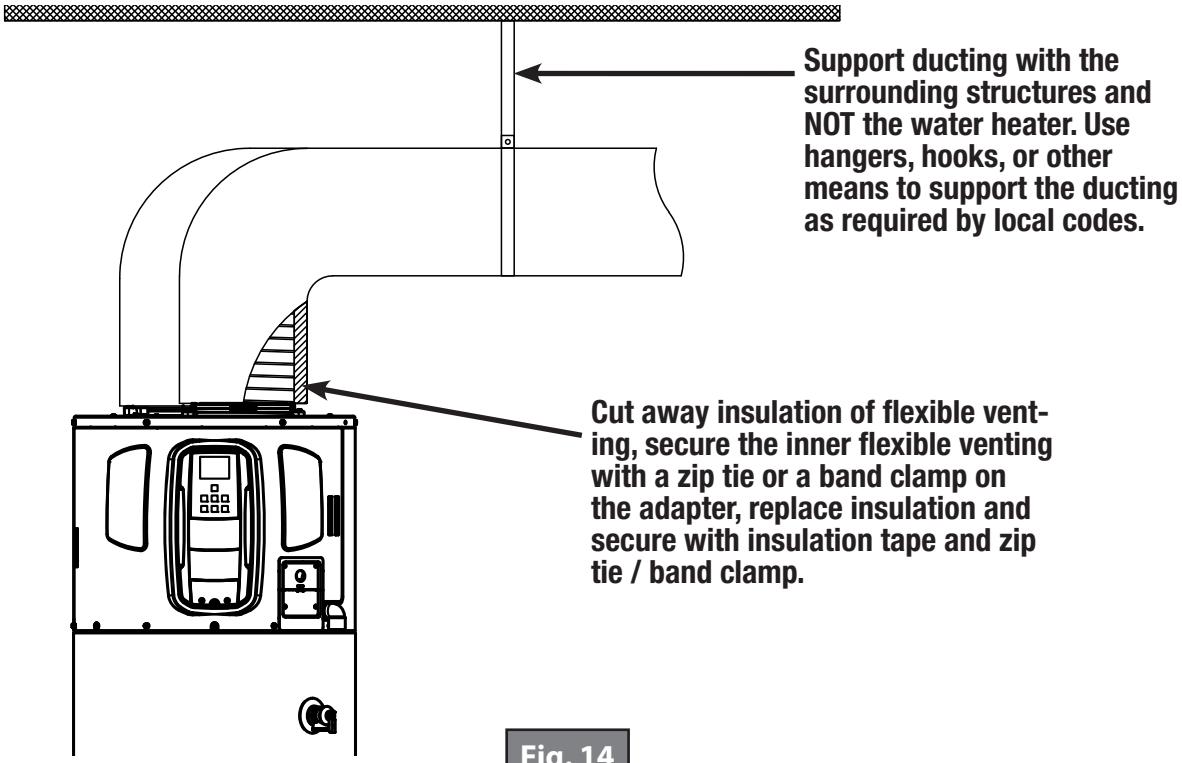


Fig. 14

TEMPERATURE AND HUMIDITY CONSIDERATIONS

Heat pump water heaters produce cool air that can cool down the surfaces it comes in contact with. In some cases, the water heater may be installed where the exhaust air is below surface dew point.

- Exhaust air. In absence of using ductwork, consider directing the exhaust air away from nearby surfaces like walls or the ceiling if the installation may create condensation.
- Ductwork. Consider using vapor tight and insulated ductwork. The insulation R value may vary based on climate. Using vapor tight and insulated ductwork may prevent surface condensation on the ductwork.

DUCTING LOCATION CONSIDERATIONS

Never duct the water heater from an unconditioned space to a conditioned space.

- For example, never duct the exhaust air from a water heater located in a garage into the living space of the home. This may bring unwanted contaminants like automobile exhaust into the home.

Never duct the water heater from a conditioned space to an unconditioned space.

- For example, never duct the exhaust air from a heat pump water heater located in an interior closet into the attic of the home. This may create negative air pressure on the home and affect combustion appliances, or pull in air from unwanted sources like crawlspaces.

When ducting outside of a conditioned space:

- Ensure outdoor temperatures are within operating range of the heat pump, 37-120°F (*3 - 49°C*).
- Ensure both intake and exhaust duct terminate in the same air space.
- Ensure duct outlet locations are free of dust and contaminants that could clog the air filter or otherwise damage the heat pump.
- Ensure the intake air and exhaust air do not mix (duct exhaust air away from the intake air)

When ducting inside of a conditioned space:

- Ensure indoor temperatures are within operating range of the heat pump, 37-120°F (*3 - 49°C*).
- Ensure both intake and exhaust duct terminate in the same air space.
- Ensure duct outlet locations are free of dust and contaminants that could clog the air filter or otherwise damage the heat pump.
- Ensure the intake air and exhaust air do not mix (ie. duct exhaust air away from the intake air).
- If ducting to a conditioned space from an unconditioned space, check with your local jurisdiction regarding appropriate materials to use for firewall barriers.

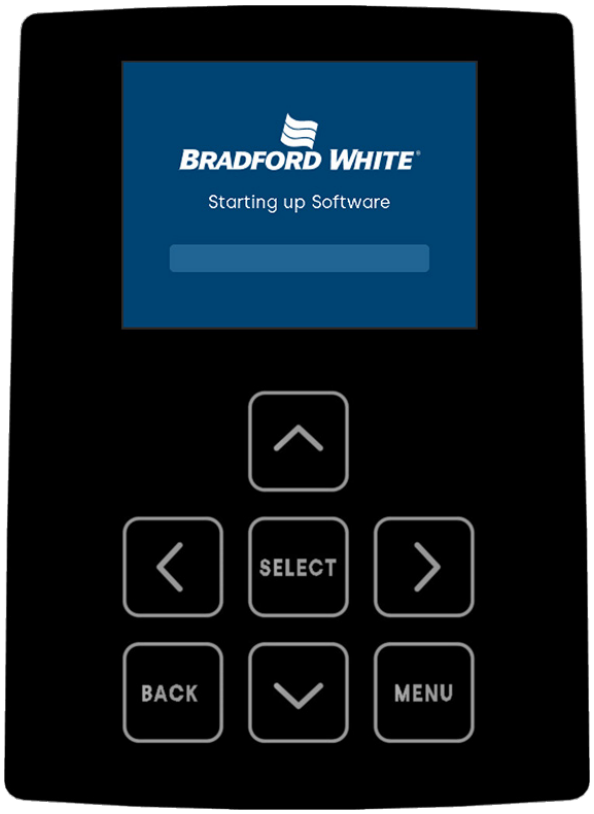
The Control Panel

Displaying Temperature Setpoint

Upon first installation, the control will run through it's startup procedure. The installer will be prompted to input the following information into the heater:

- Preferred language of the user: English, French, Or Spanish
- Country of installation
- Time zone
- Daylight Savings Time if observed
- Date and Time

The control will prompt the installer to confirm the water heater is filled, then it will initiate the StartGuard® protection program. StartGuard® is a proprietary software that ensures all conditions are met before the water heater starts so it can operate without issue. The water heater MUST be filled with water before proceeding with the StartGuard® protection test. See the "Water Supply Connections" section of this manual for information on filling the heater with water.

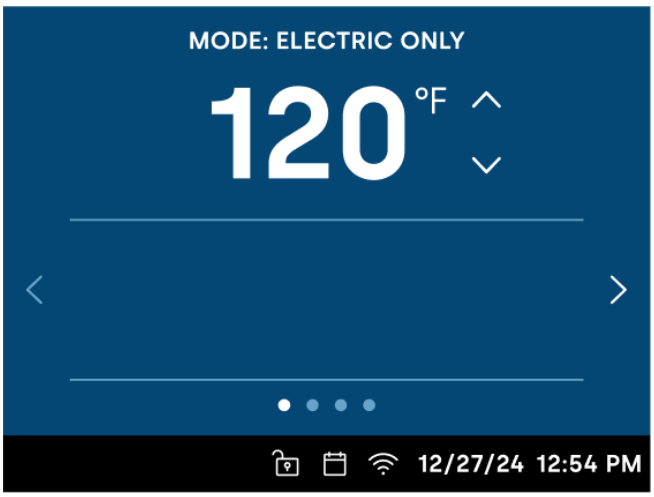


Buttons		Function
		PRESS (Tap)
SELECT		Select, make an on-screen selection
BACK		Previous (Cancel)
MENU		Tap to display the menu
ARROW KEY		Left, Up, Down, Right

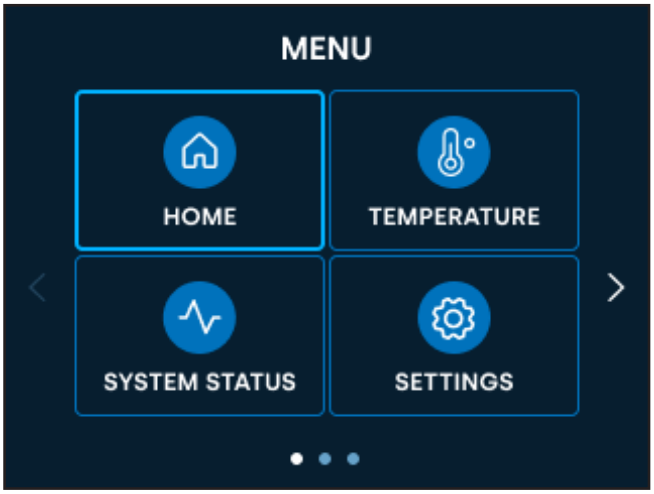
Fig. 15

Navigation

Fig. 16



Dashboard



Menu

The control has two main interfaces the user can interact with: the Dashboard and Menu.

The dashboard gives the user an overview of the water heater and basic actions to adjust main settings.

The Main Menu serves as the central navigation point for the electronic control system of the water heater. From this menu, users can access and adjust all settings and operational features of the unit.

In the dashboard view, the user can view the Status Bar which provides at-a-glance information on the state of the heater and its connectivity.

Fig. 17

Status Bar

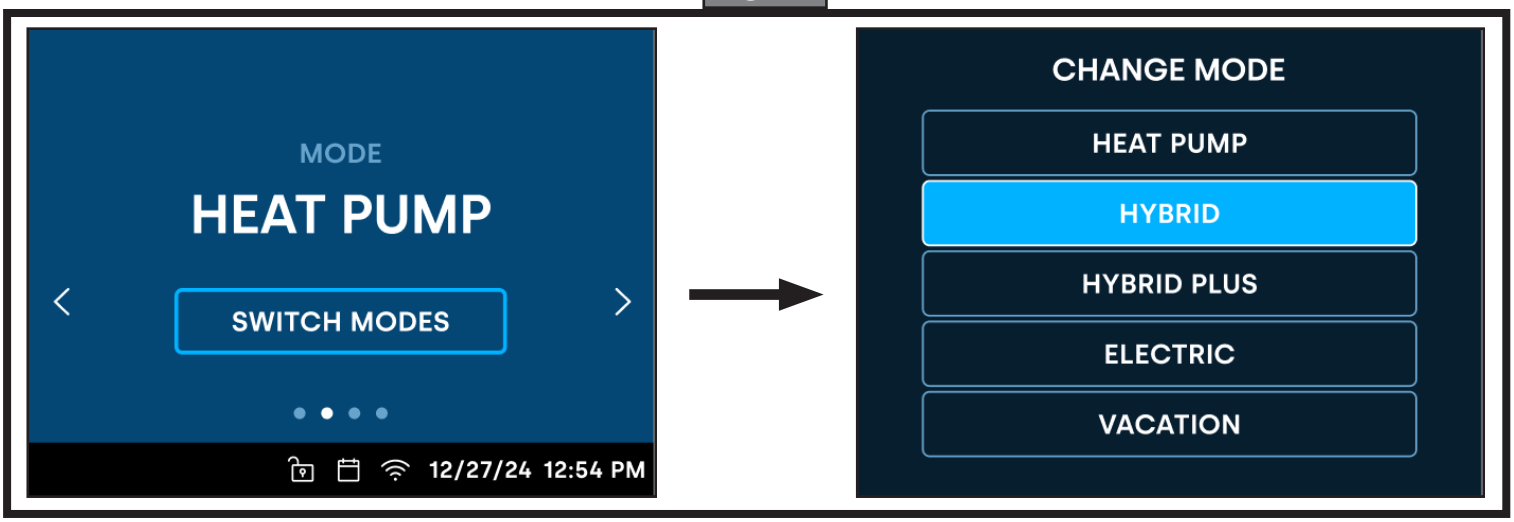
Menu Bar	
1	When a Pro is logged in, the Menu bar contains the word “Pro.” After the pro logs out, the word disappears.
2	When the heater has been set up with Universal Communications Module (UCM) cartridge from the utility company, used for a utility company’s grid enabled or demand response load management program, this icon will appear. Contact local utility provider for more information.
3	Keypad is unlocked or locked by user.
4	Bluetooth connectivity is shown. To connect to Buetooth, download the Bradford White Wave™ App.
5	Schedule is running or not running . For more details see “Scheduling” section of this manual.
6	Wifi connectivity is shown. See “Wifi Connectivity” section of this manual.
7	Date
8	Time

Operational Modes

This water heater defaults to the Hybrid operating mode.

To select available modes listed below, from the dashboard, press the right arrow button to the “Mode” screen on the main dashboard, and “Select” to switch modes. Use the up and down arrow buttons to select the preferred mode and press “Select” to confirm the setting.

Fig. 18



Heat Pump Mode—Recommended For Maximum Energy Savings

Heat Pump is the most energy-efficient mode for this water heater. It takes heat from the surrounding air to heat the water. It takes more time to heat the water in this mode, so it may not be sufficient if you have a high-demand situation, such as a large household or visitors. Operating in Heat Pump Mode may provide greater savings in energy and operating costs than the claimed savings.

Hybrid Mode

Hybrid Standard Mode is the factory setting and combines the energy efficiency of Heat Pump Mode with the recovery speed and power of the Electric (Only) Mode. When needed using the upper element only, Hybrid Mode will allow the unit to perform like a standard electric water heater while providing significant energy savings.

NOTE: Energy Guide unit performance, energy consumption, and savings are based on non-ducted installations in Hybrid Mode at required Department of Energy (DOE) test conditions.

Hybrid Plus Mode

This mode may be necessary if the household has a higher-than-average water usage. In this mode, the water heater can use the heat pump and either the upper or lower heating elements when the water demand rate is high. When using the heating elements, the water temperature will recover at a faster rate but it will use more energy to heat it. Unlike Electric (Only) mode, it will use the heating elements only when needed, and use the heat pump when water demand is lower. The maximum the heater can remain in Hybrid Plus Mode is 3 days, per NEEA Tier 4 regulatory guidelines.

Electric (Only) Mode

Electric (Only) Mode uses only the upper or lower heating elements to heat the water, stopping the cool air discharge during heat pump operation. It takes less time to heat the water in this mode, but it is the LEAST energy-efficient mode. The maximum length of time the heater can be in Electric Mode is three (3) days per NEEA Tier 4 regulatory guidelines.

Vacation Mode

This feature is recommended when you will be away from the home for an extended period of time and hot water is not needed. In this mode, the unit will reduce the water temperature setting to 50°F (10°C) and will use the most efficient heating mode to conserve energy while the heater is sitting idle. The unit will automatically resume heating one day before your return, so that hot water will be available. For example, if you will be gone 14 days, set Vacation Mode for 14 days using the steps above. The temperature setting will automatically reduce to 50°F (10°C) for 13 days. At the end of the 13th day, the previous operating mode and temperature setting will reset to ensure hot water is available upon your return.

Extended Shutdown Periods

If the water heater is to remain idle for an extended period of time, the power and water to the appliance should be turned OFF and the water heater drained to conserve energy and prevent a buildup of dangerous hydrogen gas.

This unit has no power button. The power can only be shut off at the circuit breaker or a field installed disconnect switch.

After a long shutdown period, the water heater's operation and controls should be checked by qualified service personnel. Make certain the water heater is completely filled again before placing it in operation.

⚠ WARNING

Hydrogen gas can be produced in a hot water system served by this water heater when there has been little to no usage. HYDROGEN GAS IS EXTREMELY FLAMMABLE. To reduce the risk of injury under these conditions, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. If hydrogen is present, there will probably be an unusual sound, such as air escaping through the pipe, as the water begins to flow. There should be NO smoking or open flame near the faucet at the time it is open.

General Operation

IMPORTANT

Before energizing the appliance, allowing electric current to flow to the water heater, make certain that the water heater is full of water and that the cold water inlet valve is open. Complete failure of the heating element(s) will result if they are not totally immersed in water at all times. Failure of the element(s) due to dry-firing is NOT covered by warranty.

When the heater has power, the operation of this water heater is automatic. The control is preset to provide a water temperature of approximately 120ºF (49ºC) for US applications, 140°F (*60°C*) for Canadian applications.

Care must be taken whenever using hot water to avoid scalding injury. Certain appliances require high temperature hot water (such as dishwashers and automatic clothes washers).

⚠WARNING

Turn OFF the electrical supply to the unit before removing any access panels to service the heater. Failure to do so can result in death, severe injury, and/or property damage.

⚠WARNING

If a Universal Communications Module (UCM) is removed from the CTA-2045 (AC) port, reinstall the plastic cover over the port to prevent accidental contact with the electrodes. Failure to do so can result in death, severe injury, and/or property damage.

Electric Grid Connectivity (Optional)

To participate in a utility energy management program, an ASSE approved mixing valve must be installed in the water system. This valve will reduce point of discharge temperature by mixing cold and hot water in branch supply lines. Please consult with a plumbing professional for an appropriately specified ASSE thermostatic mixing valve.

This heat pump water heater is equipped with a CTA-2045 (AC) port, used for energy management by the electric grid. Insert a compatible AC Universal Communications Module (UCM), supplied by your electric utility provider, into the CTA-2045 port. Follow the UCM instructions provided by the utility company to connect the UCM to the utility grid. Further management of utility programs, including activating or deactivating, can be done on the control display or in the Bradford White Wave™ App.
For more details about participation or eligibility, contact your electric utility provider.

Time of Use (Optional)

To participate in a time of use (TOU) program, an ASSE approved mixing valve must be installed in the water system. This valve will reduce point of discharge temperature by mixing cold and hot water in branch supply lines. Please consult with a plumbing professional for an appropriately specified ASSE thermostatic mixing valve. To download a TOU schedule onto the water heater, you must first download the Bradford White Wave app. Go to Get Connected in the menu and follow the on-screen instructions. Bluetooth must be activated on your mobile device.

Temperature Adjustment

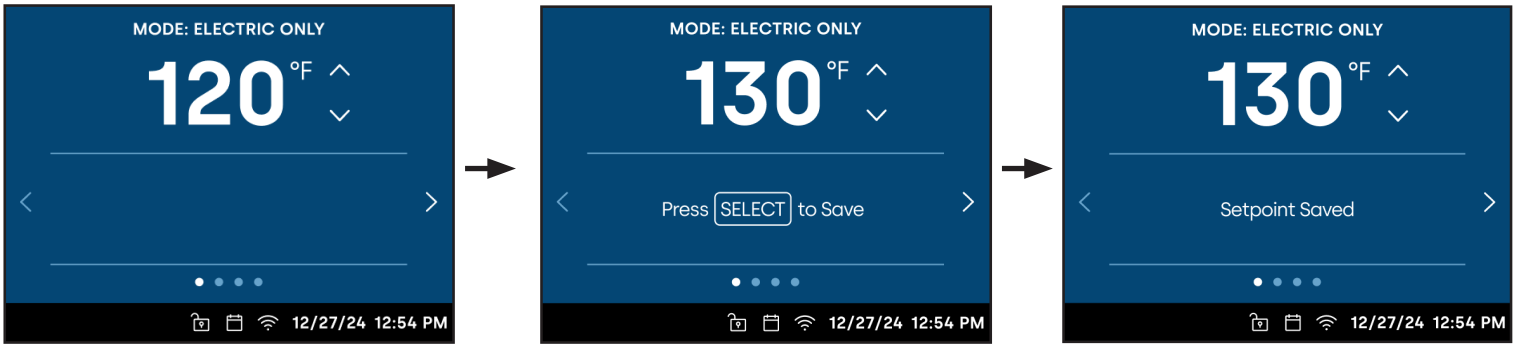
⚠ CAUTION

Scalding may occur within 5 seconds at a temperature setting of 140°F (60°C).

The temperature of the water can be adjusted either from the main dashboard or from the menu.

To adjust the temperature from the dashboard:

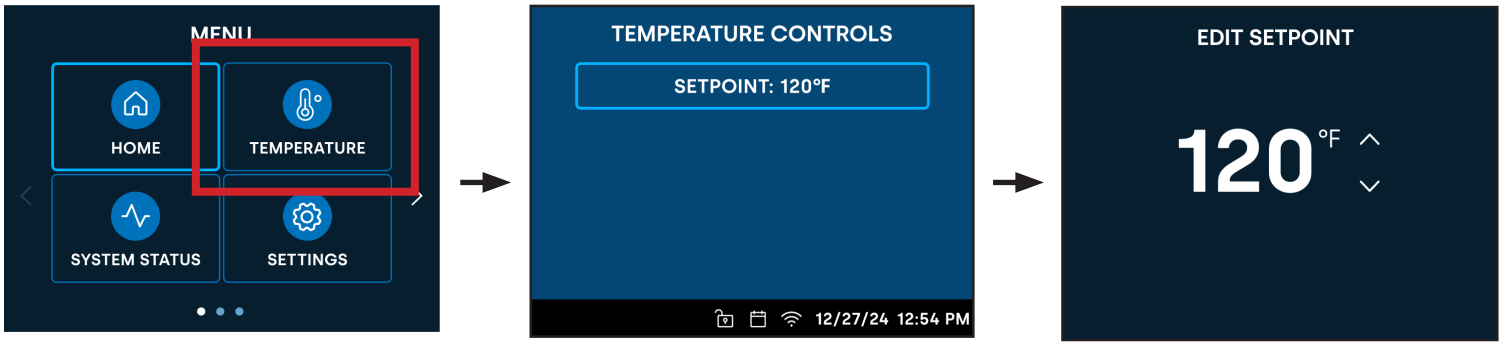
Fig. 19



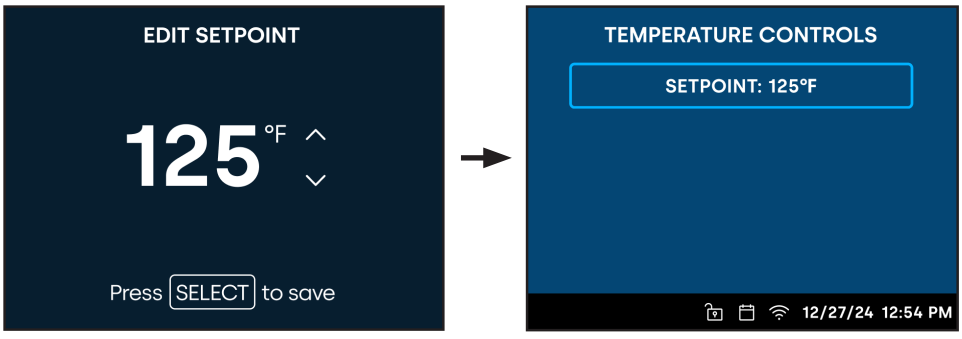
1. Press either the “Up” arrow or the “Down” arrow on the control.
2. Continue until the desired temperature is reached.
3. When the desired temperature is reached, press the “Select” button.

To adjust the temperature from the menu:

Fig. 20



1. Navigate to the “Temperature” section of the menu and press “Select”.
2. With the “Setpoint” field highlighted, press “Select”.
3. Press either the up “^” arrow or the down “v” arrow on the control to adjust the setpoint.



4. When the desired temperature is reached, press the “Select” button.
5. The setpoint is saved. Press “Back” or “Menu” to exit the temperature controls

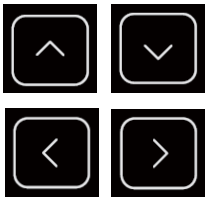
Buttons	
SELECT	
BACK	
MENU	
UP, DOWN, LEFT, RIGHT KEY	

Fig. 21

WiFi Connectivity

Begin the process from either the main dashboard or the menu options. Both routes will lead to a prompt to download the Bradford White Wave™ App.

Once on the App, follow the instructions in the App to continue setup. Bluetooth must be activated on your mobile device

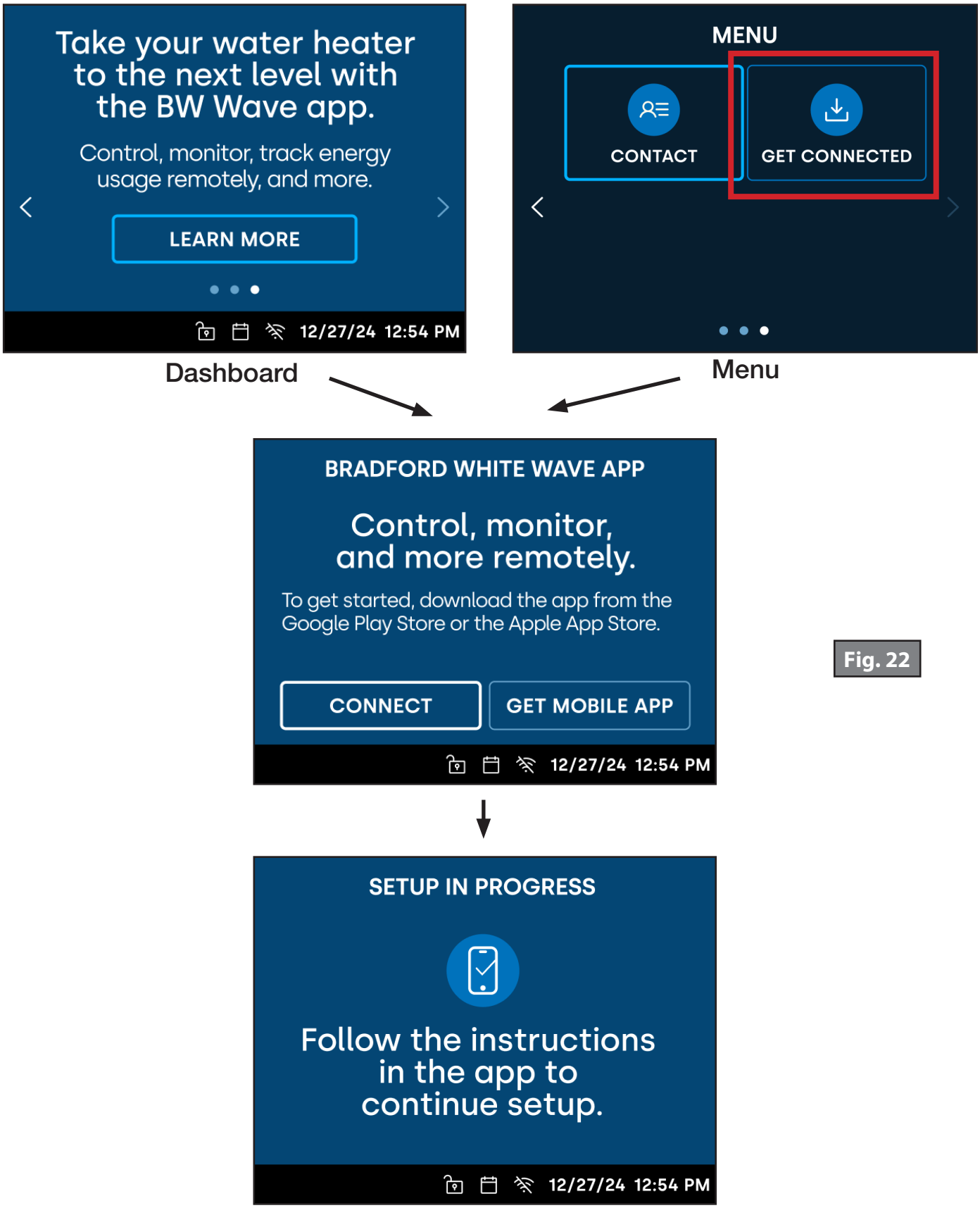


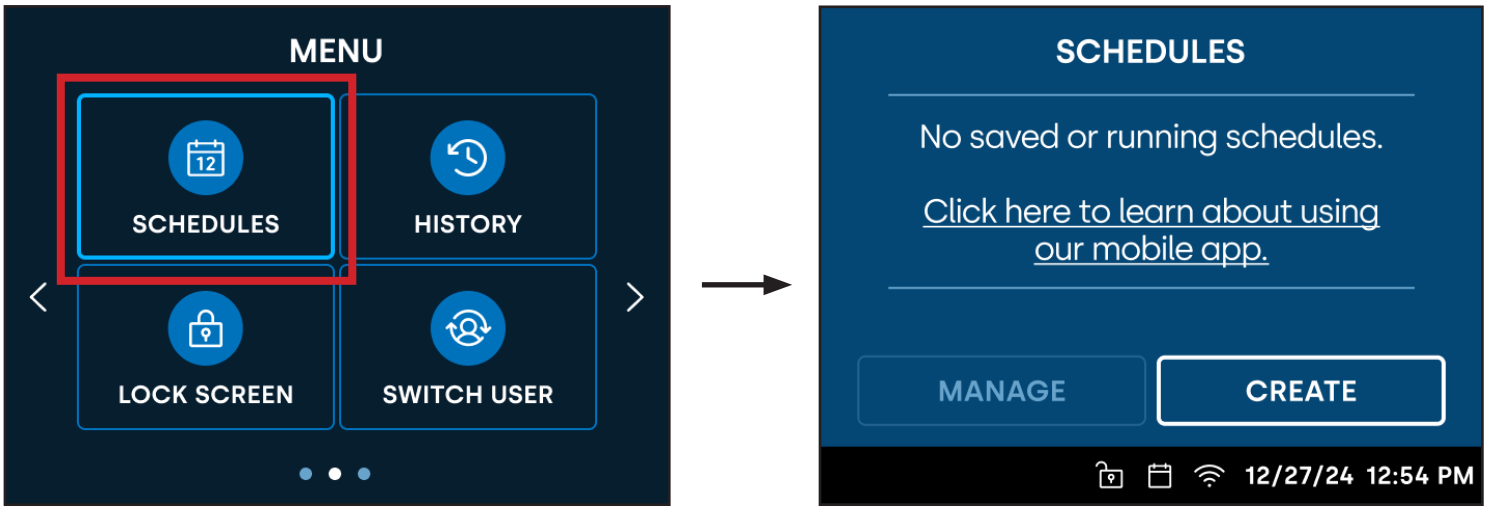
Fig. 22

Scheduling

The water heater includes a built-in scheduling feature that allows the user to program when the unit turns on and off. This helps reduce energy consumption by heating water only when needed.

The user can set specific times for the water heater to operate at different temperature and on different modes throughout the day. By doing this, the user can best optimize their use of energy.

Fig. 23



Making a Schedule

1. In the main menu, select the “Schedules” Icon.
2. The user will be given the option to “Manage” existing schedules or “Create” new schedule. To make the first schedule, select “Create”.
3. Select the appropriate days of the week the schedule will be running on.
4. Set the start time.
5. Set the starting temperature and/or the starting mode.
6. Set the stop time.
7. Set the stop temperature and/or the mode your heater will be ending in.
8. Review the schedule and hit save.

Recirculation System

Over time, a heat pump water heater installed with a continuous recirculation system may reduce the overall efficiency and increase energy consumption. If a recirculation system is still desired, it should be designed to recirculate on-demand or based on a timer.

IMPORTANT

Recirculation systems may reduce the life expectancy of the product. Recirculation systems apply an extra hot water demand that may result in a lack of hot water when needed during large draw instances (showers, baths, etc). Recirculation pipes must be properly insulated to reduce the amount of heat loss to the surrounding area of the return hot water.

Maintenance

IMPORTANT

The water heater should be inspected annually at minimum by a qualified service technician for damaged components. Do NOT operate this water heater if any part is found damaged.

Shut off the electric power whenever the water supply to the water heater is off. Shut off the electric power and water supply, drain the water heater completely to prevent freezing whenever the building is left unoccupied during the cold winter months. In order to ensure efficient operation and long tank life, drain the water heater at least once a year through the drain valve until the water runs clear. Failure to do this may result in noisy operation and lime and sediment buildup in the bottom of the tank. Check the temperature pressure relief valve to ensure that the valve has not become encrusted with lime. Lift the lever at the top of the valve several times until the valve seats properly without leaking and operates freely.

⚠WARNING

When lifting the temperature pressure relief valve lever, hot water will be released under pressure. Be certain that any released water does not result in bodily injury or property damage. The magnesium anode rod should be inspected periodically and replaced when necessary to prolong tank life.

Properly maintained, your water heater will provide years of dependable trouble-free service. It is suggested that the following yearly preventive maintenance program be established.

1. Inspect Temperature & Pressure Relief Valve
   - Once a year, it is recommended to lift and release the lever handle on the temperature and pressure relief valve, located on the front-right side of the water heater, to make certain the valve operates freely. Allow several gallons to flush through the discharge line to an open drain.
2. Inspect heating elements, high limit, and wiring to each.
   - Once a year, it is recommended to inspect the heating elements, high limit, and wiring to each. Inspection should be completed by service personnel qualified in electrical appliance repair.
   - Most electrical appliances, even when new, make some sound when in operation. If the hissing or singing sound level increases excessively, the electric heating element may require cleaning. Contact a qualified installer or plumber for inspection.
3. Drain and flush the water heater tank.
4. Clean the air filter.
5. Clear the condensate drain pan and the drain lines.
6. Remove and inspect the anode rod(s) on a regular basis.

⚠CAUTION

For your safety, do NOT attempt to repair the water heater or any of its parts. Refer any repairs to a qualified service technician.

Draining and Flushing the Water Heater

⚠ DANGER

Shut OFF power to the water heater before draining water to avoid electrocution.

⚠ WARNING

Before manually operating the relief valve, make certain no one will be exposed to the danger of coming in contact with the hot water released by the valve. The water may be hot enough to scald person(s) nearby. The water should be released into a suitable drain to prevent injury or damage.

A water heater's tank can act as a settling basin for solids suspended in the water. It is therefore not uncommon for hard water deposits to accumulate in the bottom of the tank. To clean the tank of these deposits, it is recommended to drain and flush the water heater tank once a year.

Draining the Water Heater

1. Turn OFF the power to the unit. The electric heating elements will become damaged if operated without water.
2. Attach a hose to the drain valve located at the bottom of the unit and direct the hose to a drain.
3. Turn OFF the cold water supply.
4. Admit air to the tank by opening a hot water faucet or lifting the handle on the relief valve.
5. Open the drain valve with a flat screwdriver.

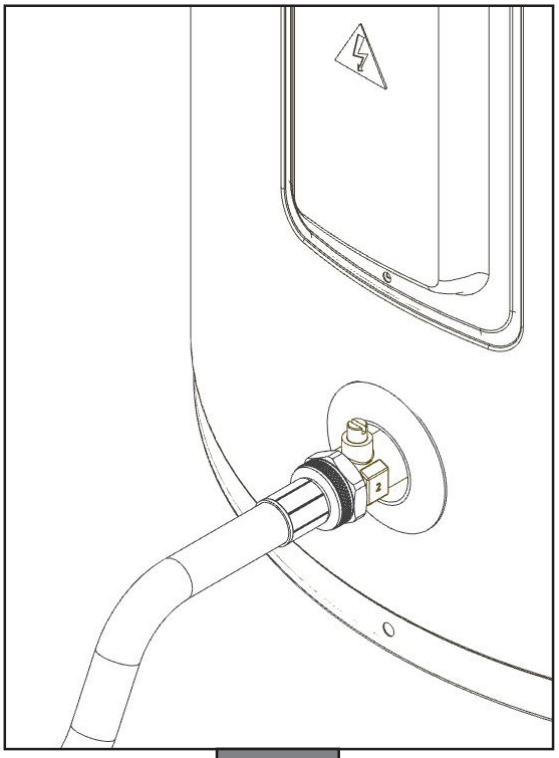


Fig. 24

Flushing the Tank

Flushing should be done with an empty tank to promote additional removal of sediment.

1. Follow the steps above to drain the water heater.
2. Once the water heater is empty, with the drain valve open and hose attached to the drain valve, turn on the cold water supply.
3. Allow several gallons to flush through the drain valve and hose to an open drain.
4. Turn OFF the water supply and allow any water remaining in the tank to drain.
5. Repeat steps 3 and 4 until the water runs clear.
6. Close the drain valve and fill the tank BEFORE returning power to the unit. The tank is full when water runs out of a nearby open hot water faucet.

Cleaning the Filter

In the Hybrid, Hybrid Plus, and Heat Pump modes, the water heater pulls air through the filter and out the top of the unit. The filter is in place to protect the evaporator from dirt and dust.

A clean air filter is important to get the highest efficiency. Occasionally this filter will need to be cleaned. When the filter requires cleaning, a fault code will display, notifying the user that the air filter needs to be cleaned.

Note: If the filter gets too dirty, the unit will automatically switch to Electric (Only) Mode and energy savings will be lost.

IMPORTANT

Filter must be cleaned when the alarm is displayed. A dirty filter will make the system work harder and result in a reduction of efficiency and cause possible damage to the system. In order to get the best energy efficiency available, make sure the filter is clean.

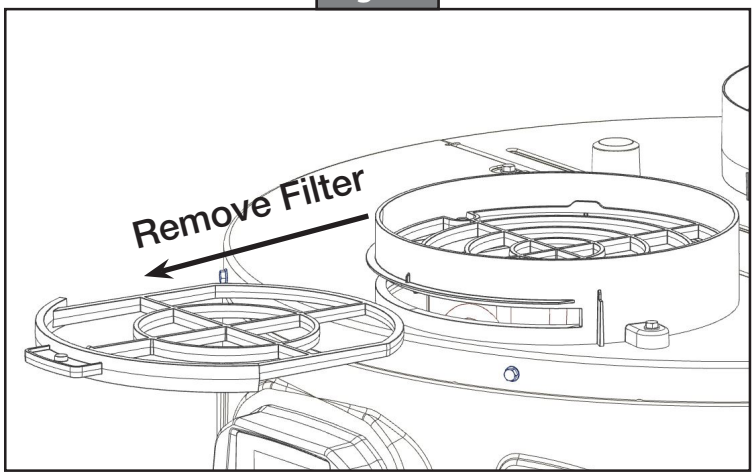
To clean the filter:

1. Leave the power ON.
2. Pull the filter out of the slot on the air intake. Once it has been removed, the filter can be vacuumed or wiped clean with a damp cloth or rinsed with warm water.
3. Once the filter has been cleaned and dried, it can be replaced by aligning it into the slot on the top of the unit and pushing it into place.

The unit will automatically revert to the previously selected operating mode. If a heating cycle is active when the filter alarm is reset, it will continue in Electric (Only) mode to finish the cycle, then automatically revert to the previously selected mode.

Note: If the dirty filter alarm returns within a few days after cleaning and resetting, it may be an indication of other complicating factors. Further diagnosis by a service technician is necessary.

Fig. 25



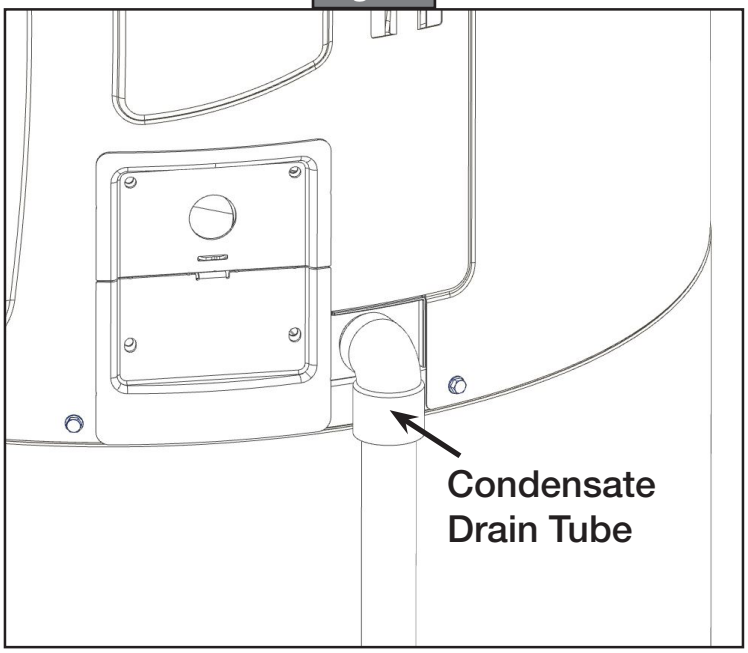
Clearing the Condensation Drain Tube

The main drain is intended to remove all condensate. If it is clogged, the heat pump will stop operating, the display will show Error Code 16, and an alarm will sound. Press any button to silence the alarm, then clear the condensate drain by removing any drain lines and connections and clearing debris. Reattach drain lines and connections, then allow the water heater to run.

The water heater will continue to produce hot water using the backup resistance heating elements until the condensate drain has been cleared and is able to drain properly. Once the drain has been cleared, the unit will then be able to operate the heat pump again.

Periodically inspect the drain lines and clear any debris that may have collected in the lines.

Fig. 26



Anode Rod

Anode rods are designed and installed to protect and extend the life of residential water storage tanks. The anode rod should be inspected periodically (every 2 years) and replaced when necessary to prolong tank life. Water conditions in your area will influence the time interval for inspection and replacement of the anode rod. Contact the plumbing professional who installed the water heater or the manufacturer listed on the rating plate for anode replacement information. The use of a water softener may increase the speed of anode consumption. More frequent inspection of the anode is needed when using softened (or phosphate treated) water.

Failure to replace the anode rod when consumed risks voiding the warranty for the tank. Warranty coverage for all other components remains intact and is unaffected by this maintenance requirement. The replacement anode rod, and the inspection for consumption are not covered by warranty.
Due to shock hazard and to prevent accidental water leaks, this inspection should be done by a qualified servicer or plumber and requires that the electric power and cold water supply be turned OFF before servicing the anode rod.

Do NOT remove the anode rod from the water heater's tank except for inspection and/or replacement, as operation with the anode rod removed will shorten the life of the glass-lined tank and will void warranty coverage.

Anode Rod Maintenance and Service

⚠ CAUTION

This information is intended to use by individuals possessing adequate background of electrical, electronic and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

To Service the Anode Rod:

1. Turn OFF power to the heater.
2. Shut OFF the water supply, and drain one or two gallons from the water heater through the lower drain valve.
3. Remove the top panel from the heater (the panel with the air filter). This is done by removing the screws attaching it to the main body of the shroud.
4. Using a 1 1/16" socket and extension, unscrew the anode rod, then lift out to inspect as shown in the illustration below. Use caution when handling as the anode will be the temperature of the water when removed.
5. To install the anode rod, seal the threads with soft set sealant, thread into the port using the torque wrench tighten to 50± 5ft-lbs of torque.
6. Turn water supply ON, open a tap to remove any air in the plumbing system, inspect for leaks, then re-install the top cover.
7. Turn the power to the heater ON.

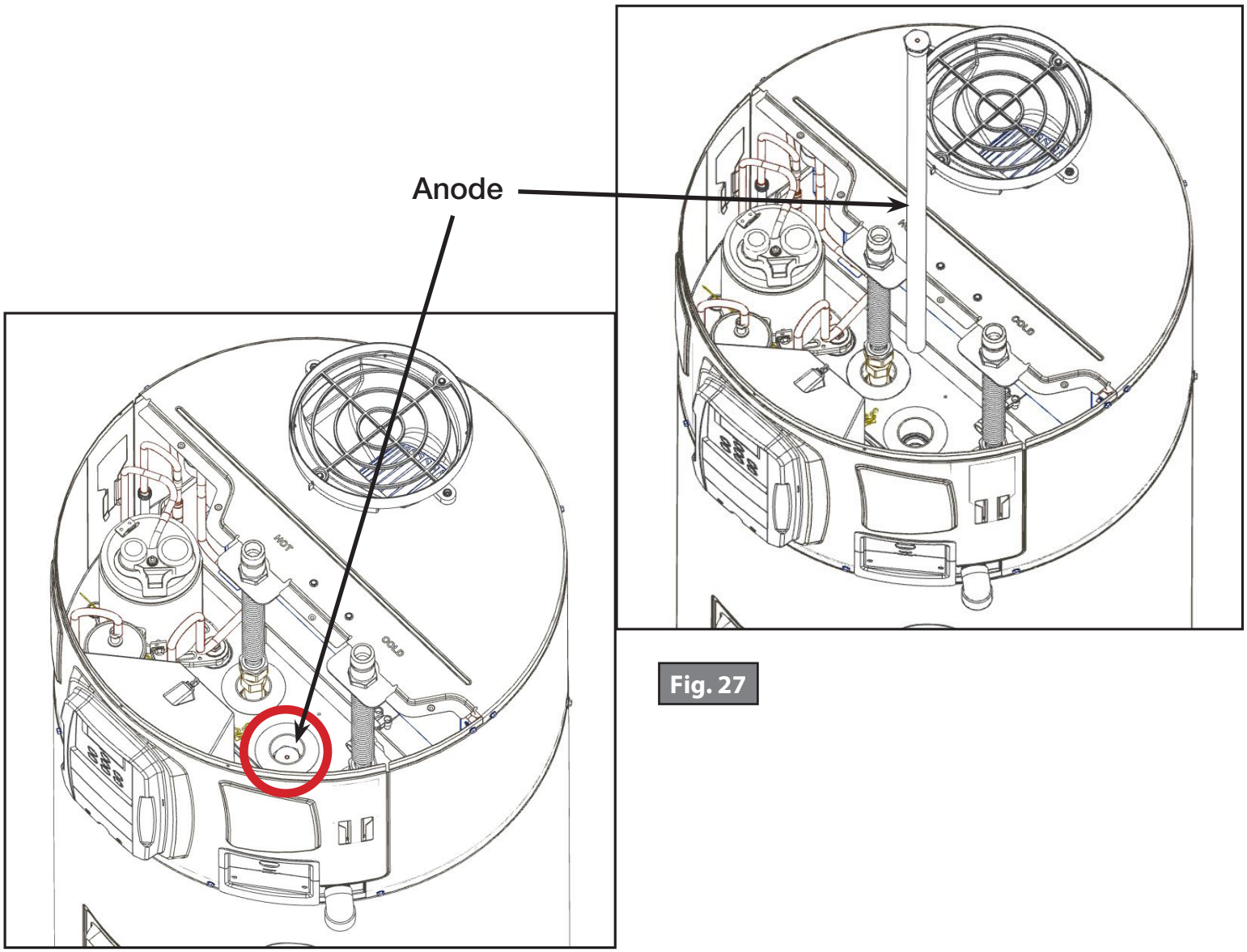


Fig. 27

Contact your local plumbing supplier or plumbing professional for replacement parts or contact the company at the address displayed on the rating plater of the water heater.

For faster and better service, please provide the part name, model, and serial number(s) of the water heater(s) when ordering parts.

READ THE WARRANTY FOR A FULL EXPLANATION OF THE LENGTH OF TIME THAT PARTS AND THE WATER HEATER ARE WARRANTED.

This product is covered under one or more of the following patents and or patent pending applications:
CA2,430,807 CA2,844,271 EP1369647 GB1369647 NL1369647 TWI276761 US7,559,293 US7,900,589 US7,007,748 CA2,476,685 US7,063,132 CA2,409,271 US6,684,821 US7,337,517 US7,665,211 US7,665,210 US7,699,026 CA2,504,824 US6,935,280 AU2007201423 CA2,583,609 EP1840484 GB1840484 NL0840484 US7,634,976 US7,270,087 US7/621,238 US7,334,419 US7,866,168 CA2,491,181 US7,063,133 CA2,677,549 US8,082,888 AU2007201424 CA2,583,108 EP1840481 GB1840481 NL1840481 CA2,659,534 US7,971,560 US7,992,526 US8,146,772 US8,707,558 CA2,548,958 MX243220 US6,422,178 TWI649522 US9,429,337 CA3,001,716 GB2558134 GB2013252.8 US10,866,010 US17/109,618 US10,503,183 US20/42096 CA2,949,830 DE112015002523.5 GB2540513 US9,574,792 US15/436,425 CA3,059,965 EP18784108.5 MX/a/2019/012268 US15/486,816 US17/038,087 US7,007,316 US7,243,381 CA2,784,312 US8,787,742 DE112014002713.8 GB2533862 US9,964,241 US6,644,393 US8,851,022 USD636,857 US8,931,438 CA2,899,271 US10,495,343 CA2,918,211 US10,094,619 US15/621,063 US16/474,833 US16/281,599

Refer to the parts list on www.bradfordwhite.com for a complete parts listing and expanded views of the models covered in this manual.

Complete the following information and retain for future reference:

Model No: _____

Serial No: _____

Service Phone: _____

Days: _____ Nights:_____

Address: _____

Supplier: _____

Supplier Phone No: _____

Frequently Asked Questions

Filter:

Q: Why is there a filter?
A: In Hybrid and Heat Pump modes the unit moves air through the system. The filter protects the unit from dirt and debris. A clean air filter improves efficiency.

Q: How do I clean the filter?
A: Leave the power ON and remove filter from top of unit. The filter can be vacuumed clean or rinsed with warm water. Once cleaned, reset the alarm. A dirty filter will reduce water heater efficiency.

Modes:

Q: What is “Heat Pump”?
A: Heat Pump is the most efficient mode. It takes heat from the air to heat water, cooling the surrounding air. It has slower recovery but is the most efficient mode. Although in Heat Pump mode, heating elements may kick on if needed to protect the water heater.

Q: What is “Hybrid”?
A: Hybrid Mode combines benefits of Heat Pump with the speed and power of Standard Electric. This provides great performance with less energy.

Q: What is Hybrid Plus?
A: The high demand version of Hybrid mode. Best option if the household has a higher-than-average water usage or the water heater is undersized for the household water demands.

Q: What is “Vacation” Mode?
A: If you are gone for an extended period, this mode lowers the water temperature set point to reduce energy used. Unit will switch to the previous mode one day before you get back.

Q: What is “Electric (Only)”?
A: Electric (Only) mode uses only the resistance heaters to heat the water. This gives faster hot water recovery than Hybrid mode but uses more energy. This mode operates without the fan, stopping the cool air normally discharged during heat pump operation.

Operation:

Q: Why can I hear the unit run?
A: In the most energy-efficient modes, Heat Pump and Hybrid, the method used to heat the water uses a fan and compressor that can be heard while running.

Q: The heat pump is not running its normal length of time. What causes this?
A: Under some conditions, the water heater will operate using the electric elements instead of the heat pump to protect your unit and ensure hot water is available to you. These conditions include extreme cold ambient temperature (below 37°F), extreme hot ambient temperatures (above 120°F), or very low voltage conditions. The unit will return to normal operation when conditions permit.

Q: Why isn’t the temperature setting always displayed on the temperature setpoint at startup or following a power loss?
A: The control will only display the temperature setting when a heat source is called for by the system and will turn off when the heating elements and heat pump are not running. Pressing any button will wake the control and display the temperature setpoint. The display screen will go blank after a period of inactivity in order to conserve energy.

Fault Codes

Fault Code	Fault Code Description	Condition
1	Lower Temp Sensor - T1 fault	T1 tank temperature sensor failure. Just before compressor starts, control checks T1 sensor is within 30°F - 170°F temperature range.
3	Lower Element Fault	Lower heating element failure. Control energizes lower element, but current sensor detects no current flow.
4	Upper Element Fault	Upper heating element failure. Control energizes upper element, but current sensor detects no current flow.
5	Control Fault	The control has detected a microcontroller or relay failure in the main control board.
6	Supply Voltage Fault	The voltage is too low at power-up. The control monitors the input line voltage one minute after power-up, and if the voltage is below 155 VAC, the fault code will be displayed.
7	Tank Over Temp Fault	The tank has overheated.
8	Fan Fault	The fan is not functioning properly, or could have a locked rotor.
9	Compressor Fault	Compressor failure. Control energizes compressor, but current sensor detects no current flow.
10	Superheat Fault	The control has detected an issue in the superheat stage of the refrigeration cycle, and the system may be too low in refrigerant.
11	Airflow Restriction	Filter is too dirty to enable proper function of water heater. The evaporator is operating at a colder temperature than the ambient temperature as measured by T5.
12	Evap Outlet Sensor - T3B Fault	T3b sensor (evaporator outlet temperature) failure. The control detects the thermistor output is at or nearly shorted or open circuit.
13	Evap Inlet Sensor - T3A Fault	T3a sensor (evaporator inlet temperature) failure. The control detects the thermistor output is at or nearly shorted or open circuit.
14	Compressor Outlet Sensor - T4 Fault	T4 sensor (compressor outlet) failure. The control detects the thermistor output is at or nearly shorted or open circuit.
15	Ambient Sensor - T5 Fault	T5 sensor (ambient temperature) failure. The control detects the thermistor output is at or nearly shorted or open circuit.

Fault Code	Fault Code Description	Condition
16	Ambient Temp Hi/ Lo	The ambient temperature is either too high or too cold to run the compressor.
17	Compressor Hi Temp Fault	The temperature of the compressor is too high.
18	Water Leak Detected	The control has detected a water leak.
92	Heating Relay Fault	The control has detected a fault in the heating relay.
93	Element Hard Fault	A heating element has failed and operation cannot continue.
94	Condensate Fault	Condensate drain port blocked. Water heater will only operate in standard/electric mode until the drain port is cleared and the sensor is no longer in contact with water.
95	EEV Hard Fault	The EEV has failed and operation cannot continue.
96	Superheat Hard Fault	An issue in the superheat stage of the refrigeration cycle has been detected and operation cannot continue.
97	Compressor Hard Fault	The compressor has failed and operation cannot continue.
98	Fan Hard Fault	The fan is not functioning and operation cannot continue.
99	Upper Temp Sensor - T2 fault	T2 tank temperature sensor failure. Just before compressor starts, control checks T2 sensor is within 30°F - 170°F temperature range.

NOTES