User & Installation Manual
Electric Residential Hybrid Water Heater

Water Heater Model

MCHW-50VN3A
MCHW-65VN3A
MCHW-65VN3A

Warning: **DO NOT** destroy or lose this manual. Please read the manual thoroughly. Store manual for easy retrieval as a future reference. As a result of product improvement, specifications and design of this water heater are subject to change without advanced notice. Consult your manufacturer or your dealer for details concerning your product. The diagram pictured on the front cover is a reference image; please take the appearance of the actual product as the standard.

Table of Contents

Thank You

Thank you for choosing Midea! Before using your new Midea product, please read this manual thoroughly to ensure that you know how to operate the features and functions that your new unit offers in a safe way.

For Your Records

Record the model and serial numbers here:

Model #: □ MCHW-50VN3A □ MCHW-65VN3A □ MCHW-80VN3A (check one)

Serial #: _____

Check the rating label on the front of your water heater for these numbers.

Keep track of the sales slip and proof of original purchase. The owner needs this evidence to obtain service under warranty.

Intended Use

This manual will provide the installer with recommendations and basic instructions for the proper installation and adjustment of the water heater. This manual will explain to the owner-operator the features, operations, safety precautions, maintenance, and troubleshooting steps of the water heater. This manual includes a replacement parts list.

The instructions must be read carefully by the owner-operator to ensure that they can adjust the water heater or operate the water heater proficiently. Please seek professional advice if you find that you do not understand the instructions.

For additional questions regarding service, warranty, and maintenance that are not covered by these instructions, please contact the seller from whom your product was purchased.

Read This Manual

Preventive care by the owner can maximize the life of the water heater. Please refer to the CARE & CLEANING section and TROUBLESHOOTING TIPS section. This may prevent you from making a service call for your unit.

Safety Instructions

Your safety and the safety of others are important. This manual and your water heater contain important safety messages. Obey all safety messages.

⚠ Located to the left is a symbol for a safety alert. That symbol indicates Important Safety Information regarding potential hazards that can cause harm or death to you and others.

Please see an explanation of symbols below for “DANGER”, “WARNING”, “CAUTION”, or “NOTICE”.

Explanation of Symbols

⚠ DANGER

This represents a serious hazard that must be taken seriously to avoid death or injury to yourself and others.

⚠ WARNING

This represents a potentially hazardous situation. Warnings should be noted so that users can avoid situations that could result in damage to property and/or death or serious injury.

⚠ CAUTION

This symbol indicates the owner/user should take care to avoid minor or moderate injury in a potentially harmful situation.

NOTE

This symbol is to indicate that attention should be directed towards a specified procedure or maintain a specific condition.

Important Safety Information - Read All Instructions Before Using

⚠ WARNING

State of California Proposition 65 Warning (US Only)

This product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

⚠ DANGER

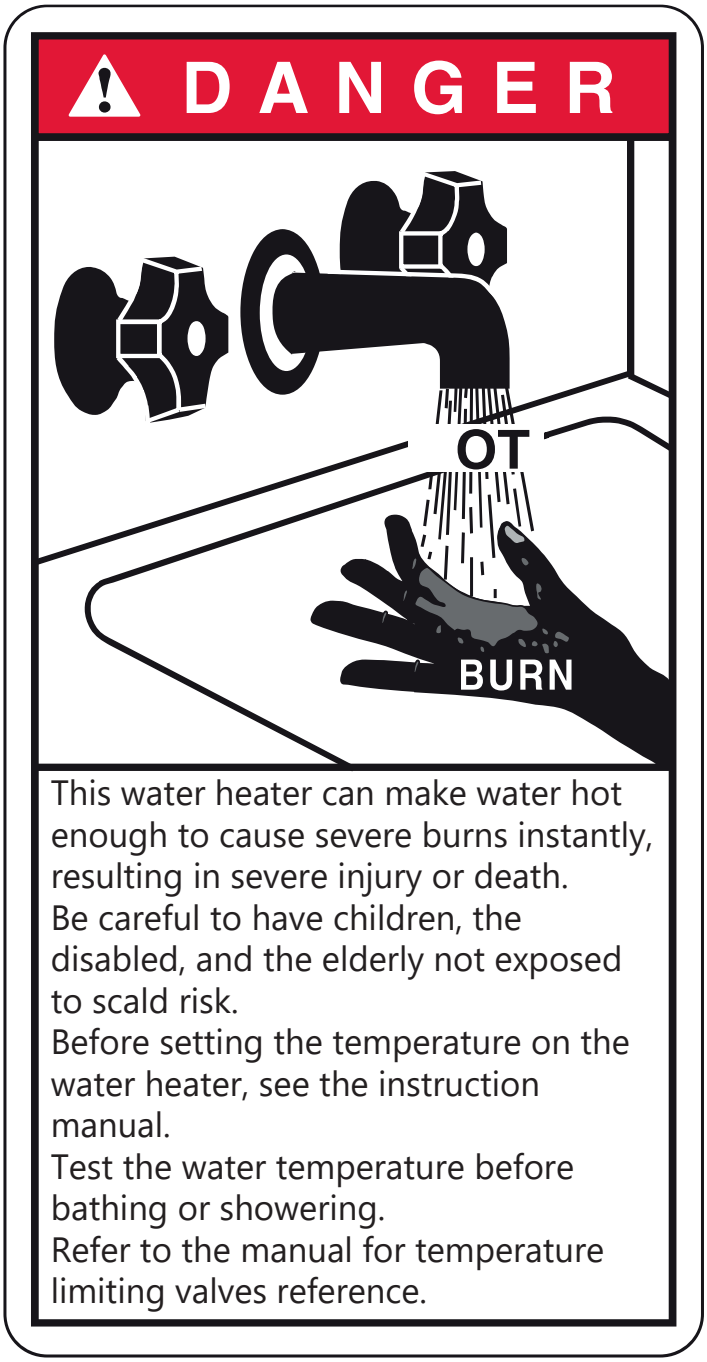
WATER TEMPERATURE SETTING

Please consider safety and energy conservation when selecting the water temperature setting of the water heater. Severe burns can occur from hot water

In extreme cases, death from scalding can occur. As an owner-operator, be sure to read and follow the warnings outlined on the label pictured right. This label is also located on the water heater.

NOTE

It is possible to reduce the point-of-use water temperature with a mixing valve. The way that mixing valves work is that they mix hot and cold water in branch water lines. Please note that this product does not include a mixing valve.



During installation and use, it is necessary to purchase and install a mixing valve separately. It is recommended that a mixing valve comply with the Standard for Temperature Actuated Mixing Valves for Hot Water Distribution Systems. ASSE 1017 before being installed. See page 32 for more details. For assistance, please contact a licensed plumber for further information.

To use demand response for your water heater, use a thermostatic mixing valve (that conforms to ASSE 1017) on the hot water supply line, following the instructions.

If the SUPPLY CORD is damaged, it must be replaced by the manufacturer, its service agent, or similarly qualified person in order to avoid a hazard.

Heat Pump Strictest operation environment: 37°F~109°F (3°C~43°C). Heating element: Strictest operation environment: -15°C~46°C. Strictest operation environment: 5°F~115°F (-15°C~46°C).

The temperature can be set range is 109°F~-85°F (43°C~65°C). The vent shall not be obstructed.

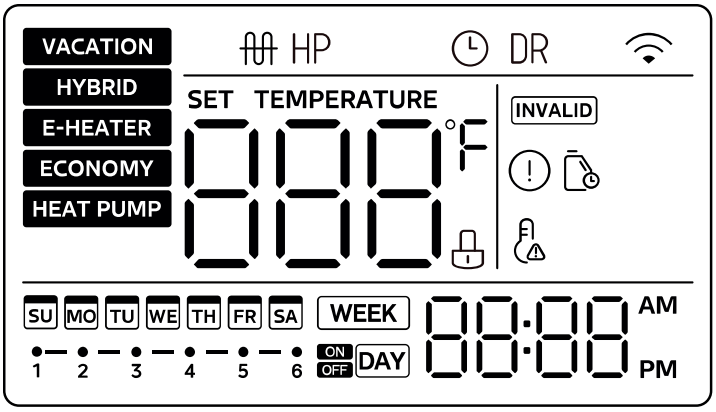
Time/Temperature Relationship in Scalds

Temperature	Time To Produce a Serious Burn
120°F (49°C)	More than 5 minutes
125°F (52°C)	1 1/2 to 2 minutes
130°F (54°C)	About 30 seconds
135°F (57°C)	About 10 seconds
140°F (60°C)	Less than 6 seconds
145°F (63°C)	Less than 3 seconds
150°F (65°C)	About 1 1/2 seconds
155°F (68°C)	About 1 seconds
Table courtesy of Shriners Burn Institute	

The guide above shows how fast it is possible to be scalded based on the output temperature of the water. Use this guide to determine the proper water temperature for your home.

⚠ DANGER

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or a lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance. Before the water heater is shipped from the factory, it is set to a temperature of 120°F (49°C) to reduce the risk of scald injury (For CAN – factory set to 140°F (60.0°C)). This is being done to comply with safety regulations. Referring to the illustration below shows the water temperature setting. Refer to the Operating instructions in this manual for detailed instructions on how to adjust the water temperature.



⚠ DANGER

It is important to note that higher temperatures of water increase scald risk.

Relief Valve Warnings

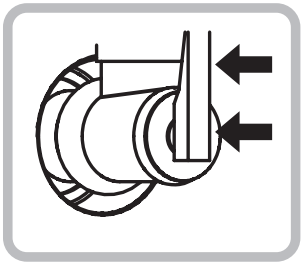
Safety Devices

Temperature sensors, overheat sensors and switches, and a Pressure & Temperature Relief (PTR) valve are supplied for the water heating system.

- DO NOT tamper with these devices.
- DO NOT remove these devices.
- DO NOT seal the PTR Valve or drainpipe.
- DO NOT operate the system unless each device is properly fitted.

Pressure & Temperature Relief (PTR) Valve

Please note that this valve is located near the top of the water heater and is essential for safe operation. It is normal for the valve to release a small quantity of water through the drain line during heating.



Lower lever carefully until water flows from the drain line.

BATTERY WARNING **WARNING**: Contains a coin battery.

⚠ WARNING **INGESTION HAZARD:** This product contains a button cell or coin battery.

- **BATTERY WARNING: KEEP OUT OF REACH OF CHILDREN;**
- If the battery compartment (if applicable) does not close securely, stop using the product and keep it away from children.
- If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.

⚠ WARNING

- **INGESTION HAZARD:** This product contains a button cell or coin battery.
- **DEATH** or serious injury can occur if ingested
- A swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours.**
- **KEEP** new and used batteries **OUT OF REACH of CHILDREN.**
- **Seek immediate medical attention if a battery** is suspected to be swallowed or inserted inside any part of the body.

⚠ BATTERY WARNING

KEEP OUT OF REACH OF CHILDREN.
Swallowing can lead to chemical burns, perforation of soft tissue, and death. Severe burns can occur within 2 hours of ingestion. Seek medical attention immediately.

⚠ WARNING

- Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children. Do not dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information. Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, heat above -4°F-158°F (-20-70°C), or incinerate. Doing so may

result in injury due to venting, leakage, or explosion, resulting in chemical burns.
- Ensure the batteries are installed correctly according to polarity (+ and -).
- Do not mix old and new batteries, different brands or types of batteries, such as alkaline, carbon-zinc, or rechargeable batteries.
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations.
- Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.
- Battery type: CR2032
- Battery nominal voltage: 3.0 V

⚠ WARNING

- DO NOT remove safety devices or tamper with them.
- ENSURE that all safety devices are fitted and in working order BEFORE operating the water heater.
- The PTR Valve and drainpipe MUST NOT be blocked or sealed in any way.
- The PTR valve or its drain must NEVER be blocked for any reason. Every 6 months, the easing gear MUST be operated in order to verify that they are not blocked and to remove lime deposits. Water heater may fail if these steps are not followed.
- Contact a local plumber without delay if the PTR valve does 1) not discharge water when the easing gear lever is opened, or (2) does not seal again when the easing gear is closed. The PTR valve is not serviceable and must be replaced if damaged.

Excessive Discharge From Safety Devices

Pressure & Temperature Relief (PTR) Valve (Required) and Expansion Control Valve (ECV)-(If Required)

- A small quantity of water will discharge from the PTR valve during normal operation during the heating cycle of the water heater. Continuous and ongoing leakage of water from the valve and its drain line may indicate a problem with the water heater.
- If the valve leaks continuously but not a large amount, then there may be foreign matter inside the valve. Locate a bucket to place under the valve and ease the valve gear for a few seconds to dislodge the debris.
- HOWEVER, if the valve discharges at high flow, this may be because the water pressure is exceeding the design pressure of the water heater. Ask your installer or local plumber to heater. fit a Pressure Limiting Valve (PLV).

⚠ WARNING

To minimize the risk of fire or explosion, electric shock, or to prevent property damage, personal injury, or loss of life, please follow the information in this manual. Before attempting to install or operate this water heater, be sure to read and understand the entire Use and Care Manual.

STOP if you have any issues understanding the instructions in this manual and get help from a local plumber, local plumbing authority, local electric utility, or qualified service technician.

⚠ CAUTION

- Know the location of the circuit breaker and how to shut it off if necessary. If you cannot find the circuit breaker, ask the installer to locate it for you. Should the water heater be subjected to overheating, fire, flood physical damage, or if the ECO (temperature limiting control) fails to shut off, turn off the circuit breaker IMMEDIATELY.
- Local codes and the provided installation instructions should be used to ensure your appliance is properly installed.
- Servicing should be referred to a qualified technician. DO NOT repair or replace any part of your water heater unless it is specifically recommended in this manual.
- DO NOT attempt to repair any part associated with the sealed refrigerant system.
- MAKE SURE the water heater is completely filled with water BEFORE turning on the electrical supply.

⚠ CAUTION

To avoid a hazard due to inadvertent resetting of the THERMAL CUT-OUT, this appliance must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.

⚠ WARNING

COMPRESSOR IS NOT SERVICEABLE; DO NOT ATTEMPT TO SERVICE COMPRESSOR.

The pressurized refrigerant and oil can escape if the compressor wiring terminals arc. This can cause the compressor to ignite and cause serious bodily injury, severe burns, or death.

⚠ WARNING

BEFORE starting maintenance, disconnect all power to the unit to avoid electrical shock resulting in severe personal injury or death.

A water heater equipped with an adjustable tempera- ture-regulating control shall be provided with instruc- tions that: Inform the user that the thermostat, as applicable, has been set at the factory to 120°F (49°C) or lower, to reduce the risk of scald injury (For CAN -factory set to 140°F (60.0°C).

⚠ WARNING

DO NOT EVER replace the PTR valve with one that has a higher pressure rating than is specified for your water heater; This can result in damage to the water heater and create unsafe conditions.

Read And Follow This Safety Information Carefully

NOTE

SAVE THESE INSTRUCTIONS.

⚠ WARNING

When using electrical appliances, basic safety precautions to reduce the risk of fire, electric shock, or injury to persons should be followed, including: **READ ALL INSTRUCTIONS BEFORE USING THIS WATER HEATER.** This water heater must be grounded. Connect only to a properly grounded outlet. See "GROUNDING INSTRUCTIONS".

Install or locate this water heater only following the installation instructions provided. Use this water heater only for its intended use as described in this manual.

As with any appliance, close supervision is necessary when used by children.

This water heater should be serviced only by qualified service personnel. Contact the nearest authorized service facility for examination, repair, or adjustment.

Do not use multi-outlet adaptors (i.e., power strips) with this water heater.

Refrigerant

This Hybrid Water Heater is factory charged R134a; do not attempt to service the refrigerant.

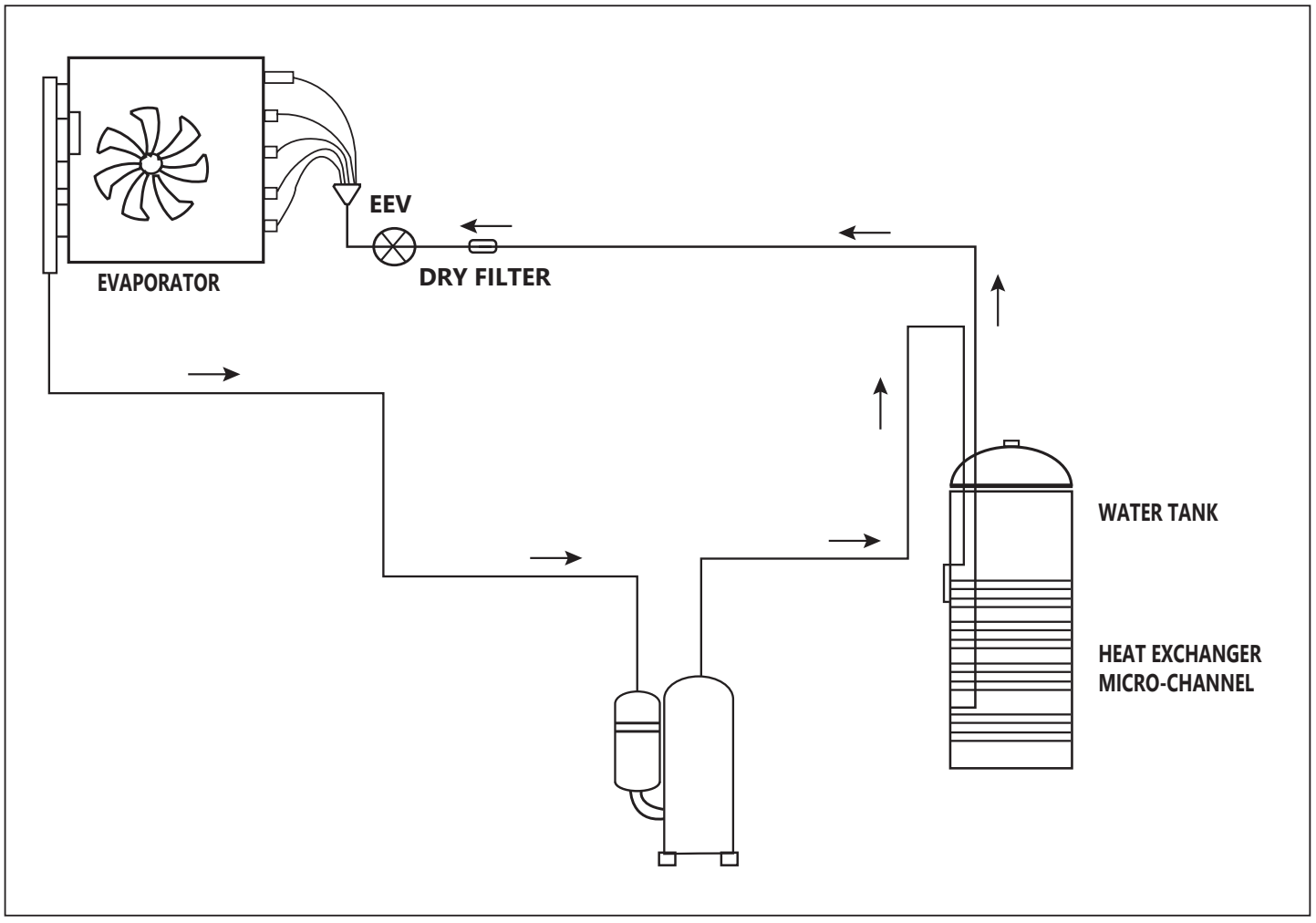
Operating Principle

The electric heat pump operation is the reverse of a refrigerator's operation. The heat pump transfers heat from the ambient outside air into the water. Electricity is only used to operate the system.

The heat pump system will be more efficient at heating water during warmer ambient conditions. There is a micro-channel heat exchanger wrapped around the inner cylinder; this is to allow for thermal conductivity between the refrigerant in the tank. A suitable tank temperature is achieved by using a temperature sensor in the tank.

In the event that ambient weather conditions are not suitable for the heat pump to operate, the electric element will provide heating to ensure operator-owner will have a supply of hot water.

System Schematic



* This figure only for reference, may differ from the actual system.

Specification Sheet

Description	Model Number		MCHW-50VN3A	MCHW-65VN3A	MCHW-80VN3A
	Normal Gallon Capacity		50	65	80
	Rated Gallon Capacity		45	61	74
	Voltage		208V/240V, 60Hz, 1Ph		
	Water Outlet Temperature Range		109°F~149°F (43°C~65°C)		
Energy Info	Uniform Energy Factor (UEF)		3.75	3.90	4.00
	First Hour Rating (FHR)		69	80	91
	Element Wattage	Upper	4500 W (240 V)		
		Lower	4500 W (240 V)		
	Compressor capacity		1500 W		
	Total Unit Wattage (input)		5500 W		
	Cold Climate Efficiency(CCE)		3		
	Recovery In G.P.H. 90°F Rise		27.5		
	Heat pump ambient operating range		37°F~109°F (3°C~43°C)		
	Heating element ambient operating range		5°F~115°F (-15°C~46°C)		
Features	LED Screen		√		
	WiFi-Ready		x		
	Built-in CTA-2045 Port		√		
	Leak Detection		Optional		
	8 in. inlet & outlet air duct connection		Optional		
	Operation Modes		5		
	TP Valve installed		√		
	Min. Circuit Amps		23.6 A (208 V)/26.8 A(240 V)		
	Electric Breaker Size		25 A (208 V)/30 A (240 V)		
	Replaceable Filter		√		
	Installation Clearance (Back)		0''		
	Installation Clearance (side)		6''		
	Installation Clearance (top)		20''		
	Dry Fire Protection		√		
Dimensions	Body Height		66-4/5 in.	65-6/7 in.	74-3/5 in.
	Body Diameter		21-9/10 in.	25-7/10 in.	25-7/10 in.
	Body Weight		218.26 lb.	271.39 lb.	293.22 lb.
	Ship Length		28-7/10 in. × 27-3/5 in.	30-1/10 in.× 28-9/10 in.	30-3/10 in. × 29-1/10 in.
	Ship Height		75-1/5 in.	75-3/5 in.	83-2/5 in.
	Ship Weight		264.56 lb.	334-2/9 lb.	357.15 lb.
	Water Connection Size	Inlet Outlet	3/4 in. 3/4 in.		
	Drainage Hose		3/4 in.		
Certifications	UL 60335-1 & UL 60335-2-40		√		
	UL 174		√		
	AHRI		√		
	NEEA		Tier 4		
	NSF/ANSI 372		√		
	Energy Star		√		
Sound	NEEA test protocol		49.5 dB(A)		

Product Installation

The location chosen for the water heater must take into consideration the following:

Local Installation Regulations

Follow the instructions in this manual, local codes, utility codes, utility company requirements, or, in the absence of local codes, the latest edition of the National Electrical Code while installing this water heater. These materials are available from some local libraries. These materials can also be purchased from the National Fire Protection Association. Batterymarch Park, Quincy, MA 02269, as booklet ANSI/ NFPA 70. For Canadian owners, please refer to Canadian Standards Association, 5050 Spectrum Way, Mississauga, ONT L4W 5N6 to purchase standard CSA22.1.

Installation should be avoided in an environment where flammable and explosive gases are leaking or where there are strong corrosive gases.

Location

Locate a clean, dry area for your water heater and position it as near as practical to the area of
greatest heated water demand. Please understand that long, uninsulated hot water lines can waste energy and water.

Ensure that the thermistor and element access panels can be removed when choosing a location for the water heater. This is to permit inspection and service, such as removal of elements or checking controls.

Protect the water heater and water lines from freezing temperatures, AVOID installing the water heater in outdoor, unprotected areas.

The floor underneath the water heater MUST be strong enough to support the weight of the water heater after being completely filled with water.

Where applicable, installing a floor isolation kit is recommended to minimize vibrations.

⚠ CAUTION

The Water Heater should not be located in an area where leakage of the tank or connections will result in damage to the area adjacent to it or to lower floors of the structure. Where such areas cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the water heater.

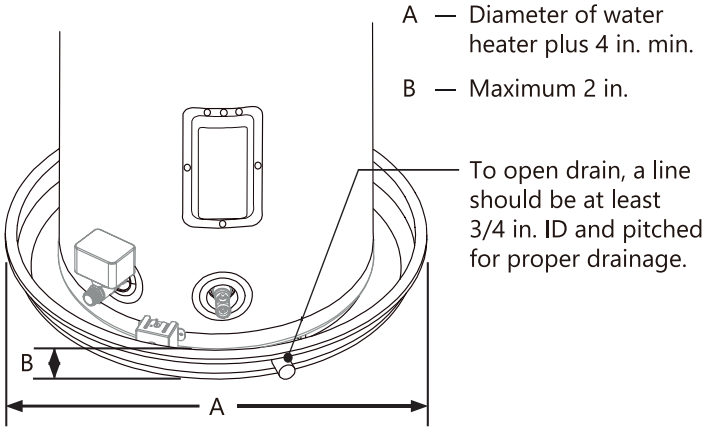
NOTE

If adequate ventilation is not provided for installs inside confined spaces, the unit will have higher power consumption.

DO NOT install the hybrid water where ambient temperatures EXCEED 114°F (46°C).

Clearances

Rear	Sides	Top
0 in.	6 in.	20 in.



NOTE

ENSURE that the auxiliary drain pan conforms to local codes. Purchase drain pan kits from the store where the water heater was purchased, or any water heater distributor. ENSURE that the drain pan **DOES NOT** obstruct cold inlet or drain valve.

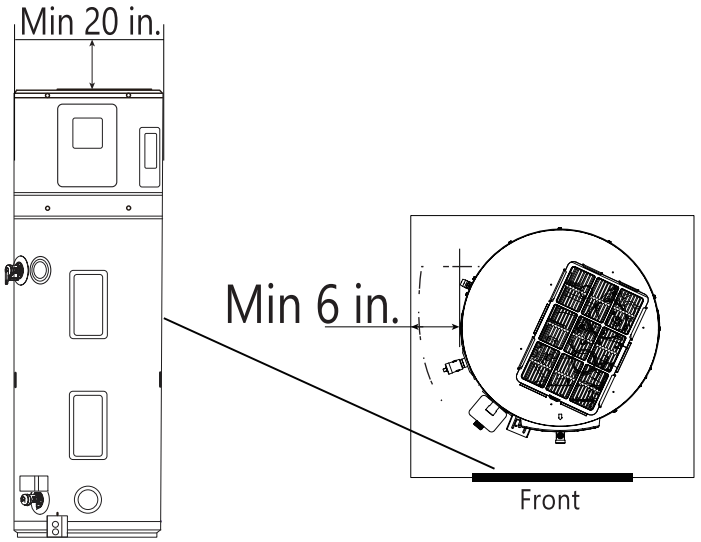
Inspect Shipment

Check the water heater for possible shipping damage after receiving the unit. Be certain that the power supply corresponds to the water heater requirements by checking the marking on the rating plate. Rating plate is located on front of water heater.

The clearance requirements of this water heater are as follows:

Minimum Required Clearances

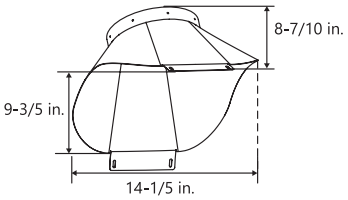
Back	Left Side	Right Side	Top
0 in.	0 in.	6 in.	20 in.



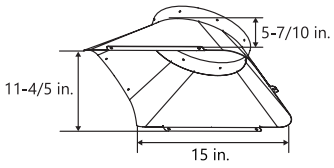
Duct Adapter Kit Installation

HPWHA-08A(UL)

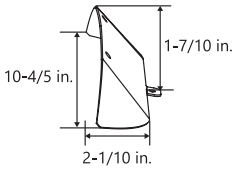
1. Duct Adapter A
   (US3-RSJ-15/190RDVN3-L3.3-2)
2. Duct Adapter B
   (US3-RSJ-15/190RDVN3-L3.3-3)
3. Sealplate
   (US3-RSJ-15/190RDVN3-L3.3-4)



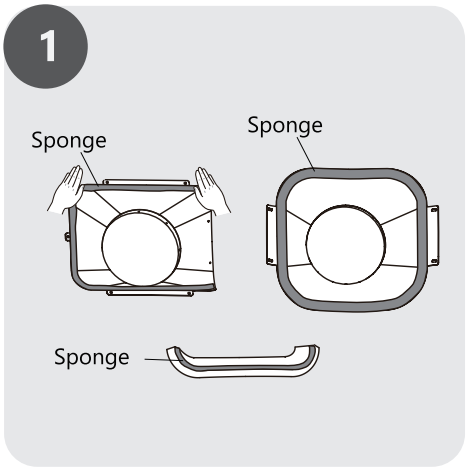
1. Duct Adapter A



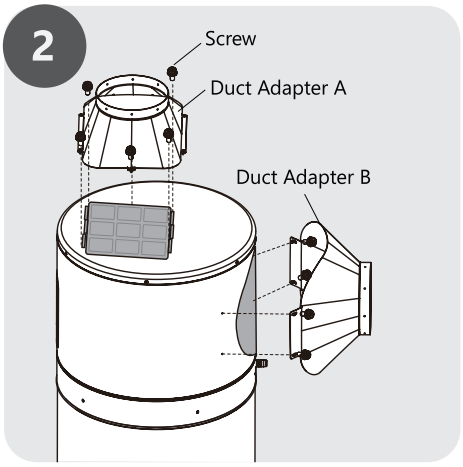
2. Duct Adapter B



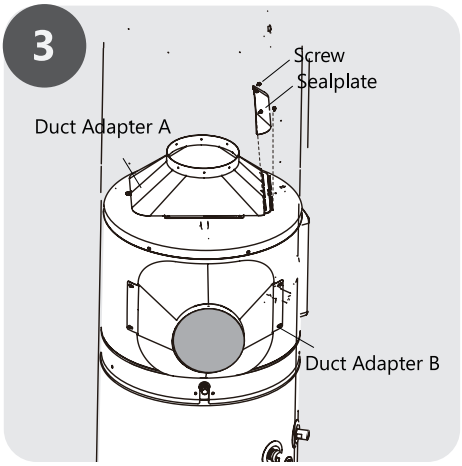
3. Sealplate



1. Glue the sponge along the plate.



2. Secure the duct adapter Cover to the tank, then attach the screws.

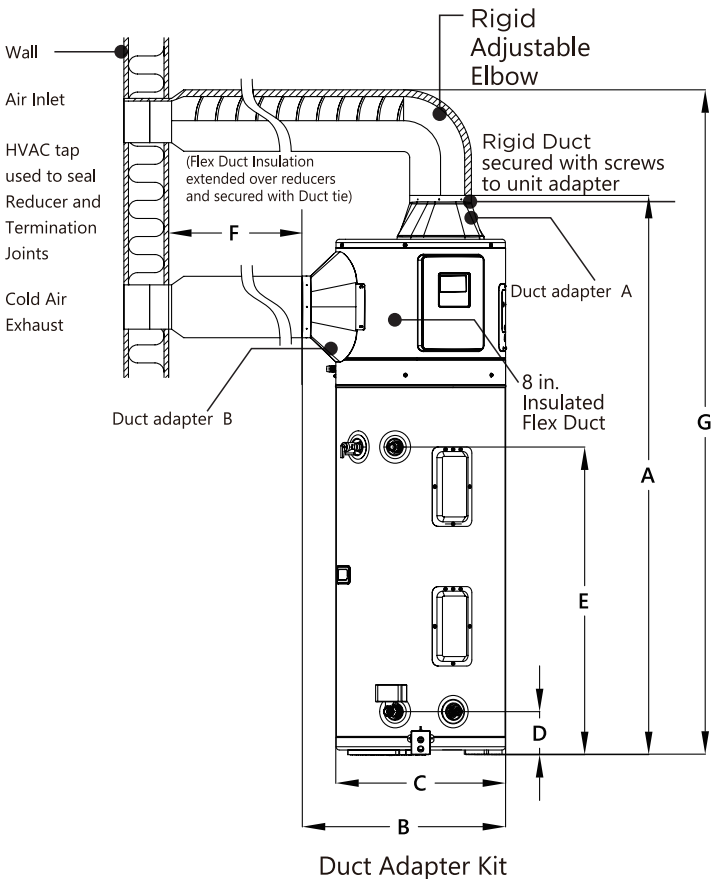


3. Secure the seal plate Cover to the edge of the duct adapter.

NOMINAL GALLON CAPACITY	50	65	80
DIMENSIONS(SHOWN IN INCHES)			
A	71-7/8	70-5/8	79-6/8
B	26-7/8	30-6/8	30-6/8
C	21-6/8	25-6/8	25-5/8
D	5-4/8	5-4/8	5-4/8
E	39-4/8	37-6/8	46-4/8
F	≥59-1/8	≥59-1/8	≥59-1/8
G	89-5/8	88-3/8	97-4/8

NOTE

Must be installed by professionals. It is recommended that engineering channel 40 be adjusted (For detailed operation, please look at the part of "OPERATING INSTRUCTIONS → Setting Menu" in the USE & CARE MANUAL) after installing the air duct to achieve better performance. When installing the ducting, obstacles need to be kept at a certain distance from the duct adapter, as shown in "F" (Fig. 1); the headroom required for installation is shown in "G" (Fig. 1). Objects around the duct need to be more than 1 in. away from the duct.



Duct Adapter Kit

Fig. 1

Ducting Requirements

Before designing the duct system, always check with local building and HVAC codes. Read these instructions carefully for ducting the unit outdoors or to other spaces. Ducting configurations that do not comply with these instructions are not supported.

This water heater MUST be ducted separately from other appliances. Only use ducting approved for HVAC applications. ENSURE ducting is adequately supported and that terminations are used.

HVAC-approved indoor registers are required. To minimize transmission of vibration or noise, rigid ducting must be isolated from floor joists or other structural members. Utilize a short section

(12 in. or larger) of flexible duct between the water heater and rigid ducting as an isolation method.

Every foot of flexible ducting counts as three feet of rigid ducting. Ducting must be insulated per HVAC codes (to prevent condensation).

Cold air MUST exhaust sufficiently away from structures to prevent condensation on surfaces. Lowering resistance to airflow and regular filter maintenance will maximize heater performance. Providing the unit with warm, moist air is also beneficial to the performance of the water heater.

Considerations when planning the duct system:

- Use the direct route for running the ducting. For best airflow, reduce elbows/bends used in the layout as much as possible.
- Utilize the largest duct size for the project that is allowable for installation.
- Utilize the largest termination possible for ductwork. The length of the duct is the length of the inlet plus the length of the outlet. You may use any combination of duct lengths to reach max. duct length in Table 1.

Table 1 - Maximum Duct Length

Duct Type / Diameter	8 in.	7 in.	6 in.	5 in.
Rigid	357 ft.	168 ft.	68 ft.	18 ft.
Flexible	131 ft.	68 ft.	26 ft.	--

NOTE

All ducting accessories and installations need to follow local electrical installation and building codes. When the installation is completed, the equivalent pressure load needs to be less than 45 Pa, or the airflow at the outlet of the water heater needs to be no less than 150 m^3/h. If the static pressure is higher than 45 Pa or the airflow at the outlet is less than 150 m^3/h, the efficiency will reduce by more than 20%.

When the unit is running in a high-humidity environment, it is recommended to add sponge wrapping at the air outlet duct to reduce the generation of condensation water.

Duct System Configuration

Use 8 in. diameter ducting for inlet and outlet ducting connections on the water heater.

Note that 7-in., 6-in., and 5-in. diameter ducting are supported. The total feet of ducting allowed are in Table 1.

Accessory Installation Requirements (not included)

Elbows/Bends

An elbow is defined as a rigid duct with a flex bend greater than 45°.

If a bend is needed that has a tighter radius than its diameter, then a rigid elbow must be used.

Terminations/Registers

Smaller diameter terminations and registers with more than a 2 ft. connection should not be used. The angle of the duct adapter needs to be maintained at an inclined angle to avoid rainfall backflow.

Damper

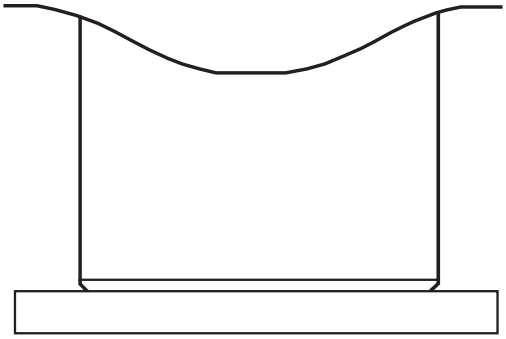
An approved damper should be installed no further than 10 ft. of rigid ducting total (two elbows equivalent) from the unit if ducting to the outside while using an exhaust duct only (no intake duct). This action will prevent outside air from entering the living space.

NOTE

These accessories will increase the load static pressure throughout the piping system and will reduce airflow.

Transport & Handling

Positioning The Heat Pump



Install a plinth under the heat pump where it is subjected to wet conditions

- Perform a Work Method Statement (WMS) or Job Site Analysis (JSA) on site to ensure safety. Be careful to unload all materials in a safe manner.
- For ease of unloading, position the vehicle with all materials and the unit in a position near the work area.
- Installers MUST consider the impact on living areas caused by the noise of the water heater. Avoid positioning the unit against a wall shared with neighbors' bedrooms. The water heater is expected to run at night, and noise caused by the unit (while low) can be considered intrusive to the inhabitants of the home.
- MAINTAIN access to the relief valve and anodes.
- OBSERVE all plumbing and building regulations while installing the unit. ENSURE the unit is installed on a flat and level surface.
- To prevent property damage from water spillage, you MUST use a properly drained overflow tray (See AS/NZS 3500.4.2 for further details.)
- DO NOT drain into gardens or outdoor areas containing greenery.

- DO NOT start the job of installing the water heater when risks cannot be controlled.
- ENSURE 200 m^2 of free space to provide clear ambient airflow around the water heater; this helps the water heater's performance. This free space must be clear of debris, stored items, tree branches, and obstructive elements.

NOTE

- DO NOT drain onto grass or garden beds.
- Allow 200 m^2 of free space surrounding the unit. This provides clear ambient air flow assisting the product's performance. Ensure the clearance requirements specified in the section "Location" are complied with. The area MUST also be clear of debris such as leaves and tree branches.

Thermal Expansion

An open water system occurs if a cold-water inlet line does not have a check valve or backflow prevention device. This can cause a problem when thermal expansion occurs. Thermal expansion is the increase in pressure and volume that water undergoes when it is heated. In an open water system, this thermal expansion of the water exceeds the capacity of the water heater and then flows back into the city main, where the pressure is easily dissipated.

In contrast, a closed water system prevents the expanding water from flowing back into the main supply line. This can create a rapid and dangerous pressure increase in the water heater and system piping, which will activate the safety setting of the relief valve. When the relief valve is constantly activated, it will cause premature failure. Please note that replacing the relief valve WILL NOT resolve the problem.

To control thermal expansion, please install an expansion tank in the cold-water line between the water heater and the check valve. The expansion tank relieves the over-pressure condition and prevents the relief valve from being activated regularly. The expansion tank is built to have an air cushion built in that compresses as the system pressure increases.

If you require more information on this subject, please contact your installation contractor, water supplier, or plumbing inspector. It is important to extend your water heater's longevity by using an expansion tank

Water Supply Connections

Refer to the illustration "Water Heater Junction Box" for water supply connections.

The HOT and COLD water connections use 3/4" NPT on all models. Please install a shut-off valve in the cold water line near the water heater. These appliances are intended to be permanently connected to the water mains and shall not be connected by hose-sets. See "To Fill The Water Heater" for further instructions.

Water inlet or outlet pipes: The spec of the water inlet or outlet thread is 3/4 in. NPT (external thread). Pipes must be heat-resistant and durable. The outlet of the drain pan should be connected to the drainage system by DETACHABLE HOSE -HOSE SETS. The new hose sets supplied with the appliance are to be used, and the old hose sets should not be reused.

Installation of the pipe for the PTR valve: The valve connecting thread is 3/4 in. NPT (internal thread). After installation, it must be confirmed that the drainpipe outlet is exposed in the air. All piping is properly installed and free of leaks. The unit was completely filled with water. Tempering valve installed per manufacturer's instructions

The water in this appliance does not need to be potable. If a potable water source is used for the equipment's water supply, the source water supply shall be protected against back siphonage by the equipment. Besides, the water inlet or outlet of the equipment is unpotable. A one-way valve must be installed on the water inlet side, as well as an isolation valve. It is normal for some water to be released from the PTR valve during operation. But if there is a large volume of water, call your service agent for instructions. After long-term use, check the unit base and fittings.

If damaged, the unit may sink, resulting in injury. Arrange the drainpipe to ensure smooth draining. Improper drainage work may cause flooding of the building, furniture, etc. Do not touch the inner parts of the controller or remove the front panel. Some parts inside are dangerous to touch, and damage may be caused.

NOTE

DO NOT apply heat or a heating process to the HOT or COLD water connections during installation; doing so will damage the heat traps. Connect the hose to the adapter before installing the adapter to the water connection on the heater.

Condensate Drains

Consult local codes or ordinances for specific requirements.

IMPORTANT: When making drain fitting connections to the drain tubing, use clamps to secure.

IMPORTANT: When making drain fitting connections to the drain tubing, DO NOT overtighten. Overtightening fittings can split pipe connections on the drain pan.

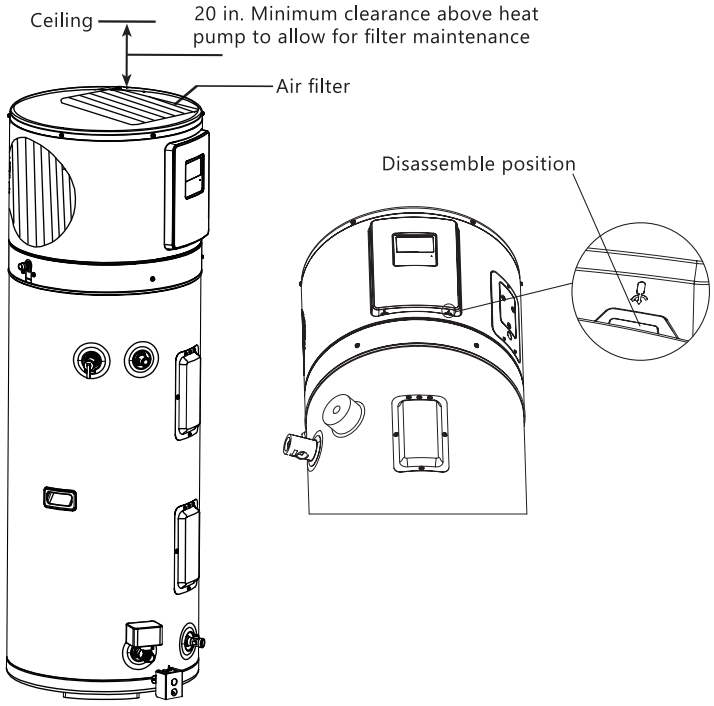
- For more requirements, please consult local codes or ordinances.
- IMPORTANT: USE SECURE CLAMPS when making drain fitting connections to the drain tubing.
- IMPORTANT: DO NOT over-tighten when making drain fitting connections to the drain tubing. Overtightening fittings can split pipe connections on the drain pan.
- DO NOT reduce the drain line size to less than the connection size provided for the condensate drain.
- To ensure proper drainage, pitched drain lines downward away from the unit a minimum of 1/8 in. per foot of line, include a P-trap in the drain line if it is connected to a sewer pipe.
- DO NOT allow the water heater drain pan to be used as a condensate drain.
- INSULATE the drain line to prevent sweating and damage due to condensate forming on the outside surface of the line.

NOTE

Condensate is not required to be neutralized from this unit because it is not acidic.

Typical Installation

A temperature and pressure relief valve (that complies with the Standard for Relief Valves for Hot Water Supply Systems, ANSI Z21.22) is factory-installed and must remain installed.
DO NOT install a valve of any type between the relief valve and the tank.



Relief Valve (T&P Valve)

Look at the rating label of the water heater, the btu/h rating of the relief valve must not be less than the input rating listed (1 watt = 3.412 btu/h).
DO NOT allow discharged water to contact live electrical parts. Make sure that the relief valve is connected to a suitable open drain.
ONLY use piping that is approved for hot water distribution.
The outlet of the valve must pitch downward from the valve. This allows complete drainage (by gravity) of the relief valve and discharge line. The discharge line should be protected from freezing.
DO NOT install a valve of any type, restriction, or reducer coupling in the discharge line.

⚠ CAUTION

To reduce the risk of excessive pressures and temperatures in this water heater, install temperature and pressure protective equipment required by local codes and no less than a combination temperature and pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22. This valve must be marked with a maximum set pressure not to exceed the marked maximum working pressure 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 inches 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.

⚠ WARNING

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

⚠ WARNING

T&P plumbing MUST go directly to a suitable open drain.
T&P MUST NOT connect to the condensate plumbing.

To Fill the Water Heater

Ensure the closure of the drain valve before starting this process. For the cold-water supply line, open completely.
Allow the air to vent from the water heater and piping by opening each hot water faucet slowly to allow. A steady flow of water from the hot water faucet(s) indicates a full water heater.
Built-in leak detection and an automatic water shut-off valve protect the water heater. The App is notified if there is a trigger for leak detection, and the unit will shut down.

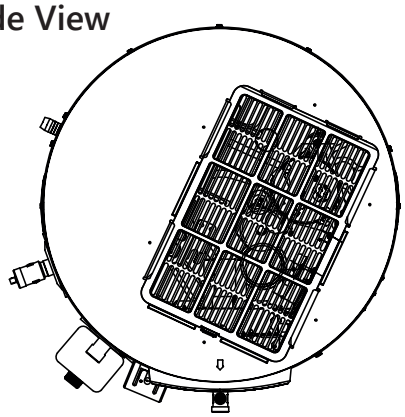
⚠ WARNING

The manufacturer's warranty will be void if the installer or owner fails to follow the instructions provided in this manual. Failure to follow directions in the manual may permanently damage the unit.

⚠ WARNING

ENSURE the water heater is completely filled with water before turning on the electrical supply.
If the water heater is operated with an empty or partially empty tank, the warranty does not cover the resulting damage or failure.

Right Side View



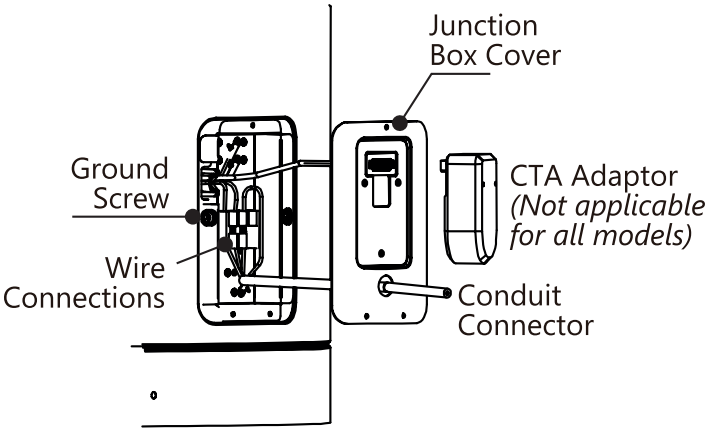
Electrical Connections

⚠ WARNING

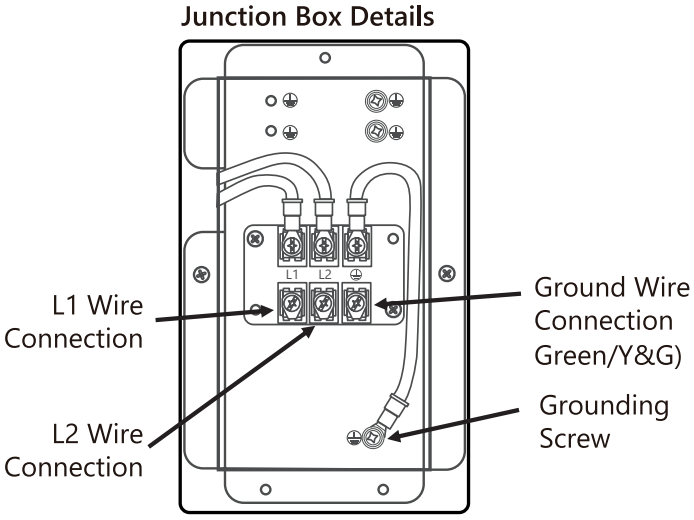
Before making any electrical connections, turn off the electric power at the fuse box or service panel.
ENSURE the ground connection is completed before making line voltage connections. Failure to do so can result in death, injury, or electrical shock. Also, before any maintenance, disconnect all power to the unit before starting maintenance. DO NOT operate the water heater if the water heater has been subjected to fire, flood or physical damage, until it has been checked by a qualified service technician.

A qualified electrician will be commissioned to provide a separate branch circuit with copper conductors, over overcurrent protective device, and a suitable disconnecting means. The Latest edition of the National Electrical Code, ANSI/NFPA 70, and all local codes must be conformed to for wiring.

Water Heater Junction Box



Junction Box Details

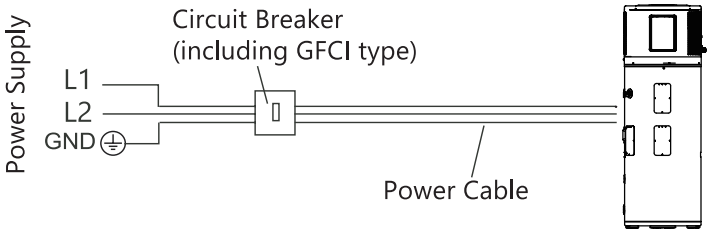


NOTE

If this water heater or any part of this water heater has been under water and/or flooded, DO NOT attempt to repair the unit! It must be replaced.

Grounding Instruction

1. Metallic conduit or metallic sheathed cable (approved for use as a grounding conductor). These must be installed with fittings approved for the purpose.
2. A separate conductor for grounding shall be included for non-metallic sheathed cable, metallic conduit or metallic sheathed cable not approved for use as a ground conductor.
3. The unit must be installed with a circuit breaker (including GFCI type) near the power supply and must be effectively earthed.
4. All wire connections refer to the "Wiring Diagram".



NOTE

Refer to the National Electrical Code. Refer to "Wiring Diagram" in this manual for field wiring connections.

Branch Circuit Sizing & Wire Size Guide - Single Phase Wiring

Maximum Wattage	Recommended Over Current Protection (Fuse or Circuit Breaker Amperage Rating)		Copper Wire Size AWG Based on NE.C Table 310-16 167°F (75°C)
	208 V	240 V	240V
5,500	25	30	10

NOTE

When sizing the breaker and wire for over current protection, include an additional 500W to the upper element wattage rating for the maximum amperage draw of the compressor and fan motor.

⚠ WARNING

MAKE SURE the unit is full of water before turning on the electrical supply or operating this water heater.

⚠ CAUTION

Note that the presence of water in the piping and water heater does not provide acceptable conduction for a ground. The water heater can become electrically isolated if non-metallic piping, dielectric unions, flexible connectors, etc., are used.

⚠ WARNING

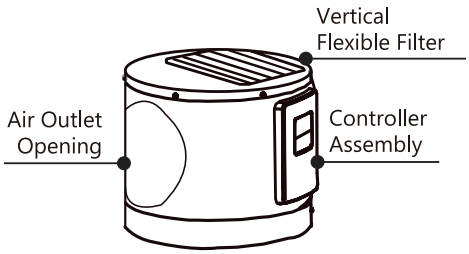
Follow the manufacturer's instructions on the insulation blanket kits included with the kit carefully if local codes require external application of the insulation blanket. An insulation blanket can reduce standby heat loss.

This manufacturer's warranty does not claim responsibility for any damage or defects caused by installation, attachment, or use of any type of energy-saving or other unapproved devices (other than those authorized by the manufacturer) into, onto, or in conjunction with the water heater.

⚠ CAUTION

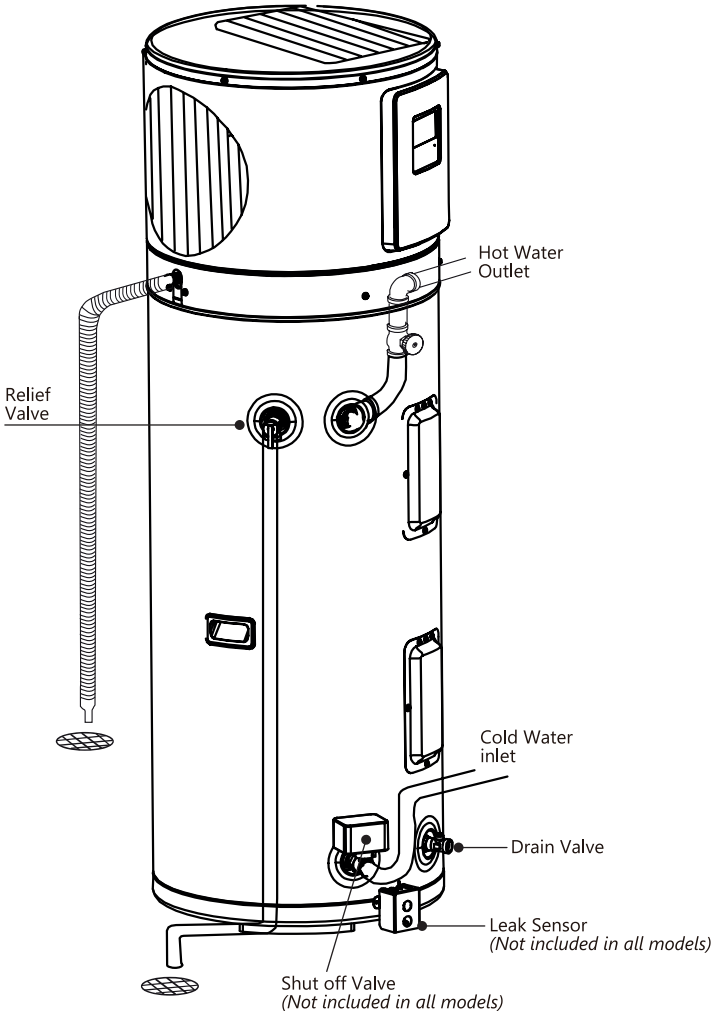
If local codes require the application of an external insulation blanket to this water heater, pay careful attention to the following so as not to restrict the proper function and operation of the water heater:

- Operating or warning labels attached to the water heater **MUST STAY** visible.
- Air openings on both sides of the water heater **MUST STAY OPEN**.
- Controller Assembly, temperature and pressure relief valve, or drain valve, **SHOULD NOT** be covered.
- Frequently inspect the insulation blanket.



Hot and Cold Pipe Insulation Installation

Install the insulation on the cold water supply inlet and the hot water outlet as shown in the illustration.



Operating Instructions

Operating The Water Heater

⚠ CAUTION

Hydrogen gas (EXTREMELY FLAMMABLE) can be produced in a hot water system served by this water heater that has not been used for a period of two weeks or more. 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.
You will hear a strange sound of air escaping if hydrogen is present. Do not have an open flame or smoke near any facet if this is the case.

Safety Precautions

1. If the water heater has been subjected to overheating, fire, flood, or physical damage, disconnect the power.
2. Fill the water heater before turning the water heater on.
3. If the cold-water supply shut-off valve is closed, DO NOT turn on the water heater.
4. It is recommended that a qualified person or serviceman perform the work.

⚠ WARNING

If the water heater has been subjected to fire, flood, or physical damage, disconnect all power to the water heater. DO NOT operate the water heater again until it has been checked by a qualified service technician.

NOTE

DO NOT use this appliance if any part has been under water. Immediately call a qualified installer or service agency to replace a flooded water heater.
DO NOT attempt to repair the unit! It must be replaced.

Safety Controls

The water heater is equipped with a temperature limiting control (ECO) that is located above the upper heating element in contact with the tank surface. If, for any reason, the water temperature becomes excessively high, the temperature limiting control (ECO) breaks the power circuit to the heating element. Once the control opens, it must be reset manually.

Resetting ECO

⚠ 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 reset the temperature limiting control (Refer to illustration in Cavity Insert section):

1. Disconnect all power to the unit before starting maintenance.
2. Remove the upper cavity cover and insulation.
3. Press the red RESET button.
4. Replace the insulation, jacket access panel, and plastic housing before turning on the power to the water heater.

⚠ WARNING

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

Water Temperature Setting

The temperature of the water in the water heater can be regulated by selecting the desired temperature on the control display. Safety and energy conservation are factors to be considered when selecting the water temperature setting of the water heater. The lower the temperature setting, the greater the savings in energy and operating costs.
To comply with safety regulations, the temperature is factory set at 120°F (49°C) (For CAN -factory set to 140°F(60.0°C) or less where local codes require. This is the recommended starting point. Severe burns can occur from hot water.
Be sure to read and follow the warnings outlined in this manual and on the label on the water heater. This label is located on the front of the water heater.
Mixing valves are recommended for reducing the point-of-use water temperature by mixing hot and cold water into branch water lines. It is recommended that a mixing valve comply with the Standard for Temperature
Actuated Mixing Valves for Hot Water Distribution Systems, ASSE 1017 be installed. See "Time/Temperature Relationship in Scalds" for more details, and contact a licensed plumber or the local plumbing authority for further information.
When used in demand response applications, a thermostatic mixing valve conforming to ASSE 1017 shall be installed on the hot water supply line following all manufacturer installation instructions. See "Replacement Parts" for additional installation information.
The chart "Time/Temperature Relationship in Scalds" may be used as a guide in determining the proper water temperature for your home.

Local Startup

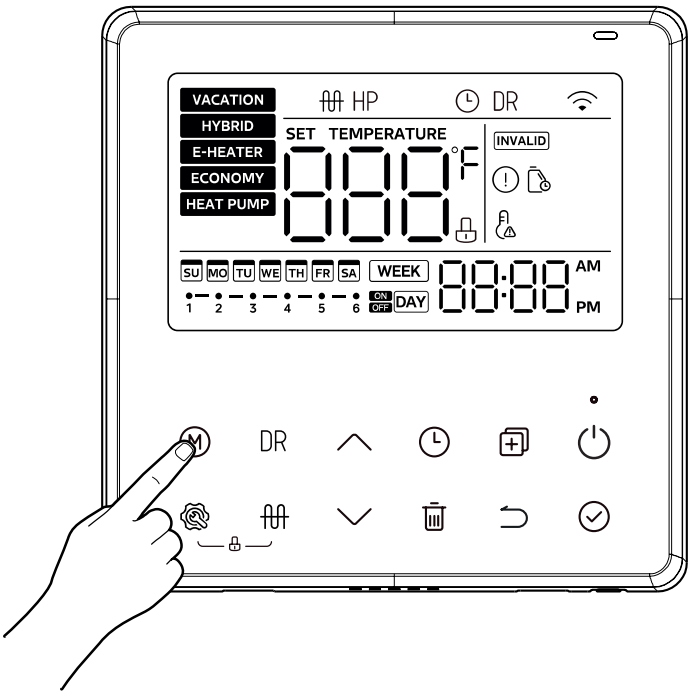
Change Mode of Operation

Press the "MODE" button to select operating mode.

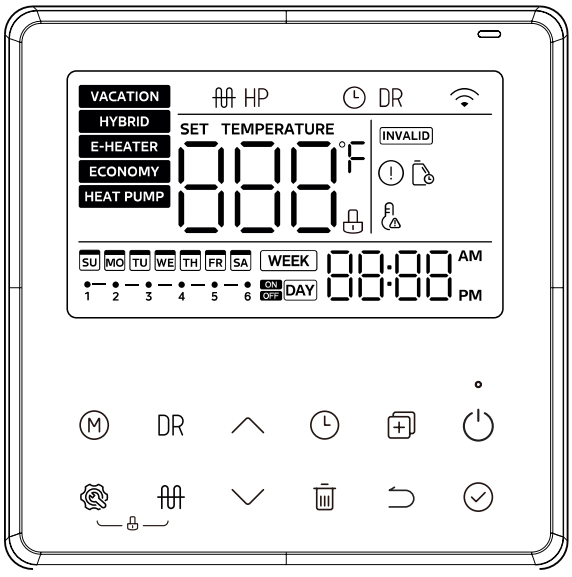
Operation Modes

- Vacation
- Hybrid
- E-Heater
- Economy
- Heat-Pump

Mode	Efficiency	Recovery
Vacation	N/A	N/A
Hybrid	Low	Very High
E-Heater	Very Low	High
Economy	High	Low
Heat-Pump	Very High	Very Low



Setting Menu



Enter the engineering channel mode:

Long-press and hold the check button for 3 seconds on the main interface.

Select the engineering channel, press the confirm button to enter, and switch between valid values using the up/down keys.

Engineering channel

Engineering channel 1	Temperature unit switching	0: Centigrade 1: Fahrenheit degree
Engineering channel 2	Maintenance reminder on	0: Off 1: On
Engineering channel 3	Maintenance time setting	Default value: 365 days
Engineering channel 4	Zero maintenance time	0: Do not clear; 1: Clean up
Engineering channel 19	E-Heater mode automatically switches to Economy mode	0: No 1: Yes
Engineering channel 20	The hybrid mode automatically switches to Economy mode	0: No 1: Yes
Engineering channel 30	Backlight	0: Off (Backlight always on) 1: On (Normal mode)
Engineering channel 34	Turn off the sound	0: Off (Normal mode) 1: On (No buzzer sounds)
Engineering channel 35	Automatic child lock	0: Off (Normal mode) 1: On
Engineering channel 38	Ball Valve	0: Null 1: With
Engineering channel 39	Forced sterilization	0: Off 1: On (Valid once)
Engineering channel 40	Air duct	0: Null 1: With 2: Not recommended to set

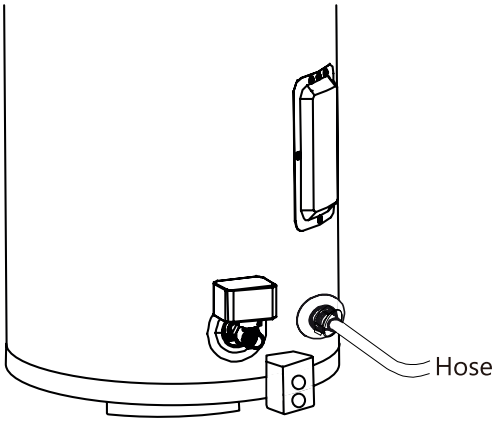
Care & Cleaning

⚠ CAUTION

Be sure to shut off the power to the water heater before attempting to drain the water heater.

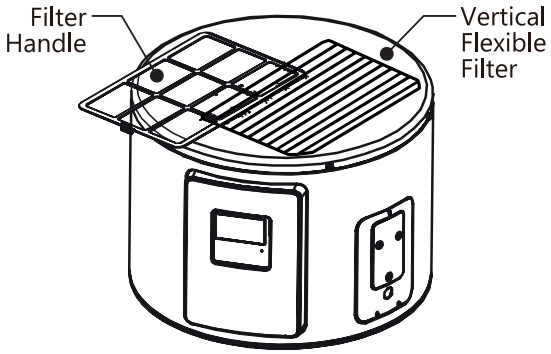
⚠ WARNING

Before manually operating the relief valve, make certain no one will be exposed to the hot water released by the valve to avoid any scald risk, injury, or damage.
Do not use volatile oils, alcohol, thinners, lacquers, etc. to clean the machine; otherwise, the product may be damaged.
Turn off the cold water supply before draining the water heater.
Attach a garden hose to the drain valve on the water heater, open the T&P valve, and direct the stream of water to a drain. Open the valve.



Routine Preventative Maintenance
Your water heater will provide years of dependable trouble trouble-free service if you maintain your water heater properly. However, contact a qualified installer or plumbing contractor to inspect the unit if you see or hear any strange behavior.
Annually, you must:

1. Lift and release the lever handle on the temperature-pressure relief valve and allow water to discharge from the system.
2. Clean the air filter (or more often as needed). A clean filter is important for keeping the air flow to the heat pump from being obstructed.
3. Pour bleach down the condensate drain.



4. Check that the condensate can flow freely.
5. Drain the water heater to clear debris accumulated in the tank from hard water deposits.

Vacation and Extended Shutdown

NOTE

Refer to the Hydrogen Gas Caution in the Operating Instructions.
The power and water to the appliance should be turned off to conserve energy and prevent a build-up of dangerous hydrogen gas for periods of inactivity longer than 2 weeks.
If there is a risk that the water heater and piping will be subject to freezing while the system is inactive, the water heater and piping should be drained.
The water heater's operation and controls should be checked by a qualified service person after a long shut-down period.
Make sure to completely refill the water heater before placing it in operation.

Anode Rod

NOTE

The life of the glass-lined tank can be prolonged by the anode rod, as it prevents corrosion of the tank. Do not remove the anode rod.
The gas-lined tank of this water heater is protected by an anode rod. The purpose of this rod is to attract corrosive elements inside of hard water so that the anode rod is sacrificed to corrosion instead of the insides of the water heater. For cases where the water contains high mineral content or high sulfates, this process
of the anode rod reacting to the water can cause an odor, this odor is like rotten eggs. This can happen especially during long periods of inactivity. In this case, the owner can use the chlorine bleach removal method by adding an automatic chlorination to the water system. The chlorine will eliminate the rotten egg smell because it chemically reacts with hydrogen sulfide and disinfects the water.

Troubleshooting Tips

⚠ CAUTION

Before You Call For Service...
Save time and money! Review this section first, and you may not need to call for service.
Troubleshooting

1. Non-error tips
   Q: Why won't the compressor start immediately after turning on the unit?
   A: The pressure of the system needs to be balanced. This is a self-protection logic of the unit that should take 3-4 minutes.

   Q: Sometimes the temperature shown on the display panel decreases while the unit is running. Why is this?
   A: The upper tank temp and bottom tank temp will mix when there is a temperature
   difference, thus lowering the reading. This is not an abnormal operation.

Q: The display shows a decreased temperature unit, but the unit is closed?
A: To avoid cutting on and off repeatedly, the machine will turn on only when the T5U temperature is lower than the setting temperature for at least 41°F (5°C) (50 Gal)/ 39°F (4°C) (80 Gal).

Q: Why does the temperature shown on the display decrease sometimes, but I still have hot water?
A: The upper water sensor is positioned on the upper 1/4 of the water heater, and therefore, there is still about 1/4 of the tank of hot water available to the user.

Q: Why is it that sometimes the buttons are unavailable?
A: Maybe the panel is locked, press the "⚙" and "⋔" for 2 seconds, the unit will lock the panel, shows "🔒", to unlock the panel, please press the "⚙" and "⋔" for 2 seconds again.

Q: Sometimes some water flowed from the drainage pipe of the PT valve. why does this occur?
A: Because the tank is a pressure-bearing one, when water is heated inside the tank, water will expand, so the pressure inside of tank will increase. If pressure goes up more than 1.0MPa, the PT valve will activate to relieve the pressure, and hot water drops will be discharged correspondingly. If a water drop is continually discharged from the PT valve drainage pipe, it is abnormal, please contact qualified staff to check.

2. Self-protection of the unit
   A. When the self-protection happens, the system will be stopped and start self-check, and restart when the protection is resolved.
   B. When the self-protection happens, the buzzer will buzz in all the time, the "ⓘ" light will turn on, and the error code will be shown on the water temperature indicator. The "ⓘ" and error code do not disappear until protection is resolved.
   C. In the following circumstances, self-protection may happen;
      - The air inlet or outlet is blocked;
      - The evaporator is covered with too much dust;
      - Incorrect power supply (exceeding the range of 187- 265V).
3. Recognizing an Error
   A. If some normal errors happen, please contact qualified staff to repair.
   B. If a severe error happens, the unit will not start. Please contact qualified staff to repair.
   C. If a fault occurs, the "ⓘ" icon will light up, the buzzer will beep, and the main interface will display a fault code.

4. Error phenomenon shooting

Error Phenomenon	Possible Reason	Solution
Cold water tapped out, and the display screen extinguished	1. Bad connection between the power supply plug and the socket. 2. Setting water temperature too low; 3. Temp. sensor broken; PCB of the indicator broken.	1. Plug in. 2. Setting water temp. higher; 3. Contact the service center.
No hot water tapped out	1. Public water supply ceased; 2. Cold water inlet pressure is too low (<0.15 MPa); 3. Cold water inlet valve closed.	1. Waiting for the public water supply to recover. 2. Waiting for the inlet water pressure to increase. 3. Open the water inlet valve.
Water leakage	Hydraulic pipeline joints are not sealed well.	Check and reseal all joints.

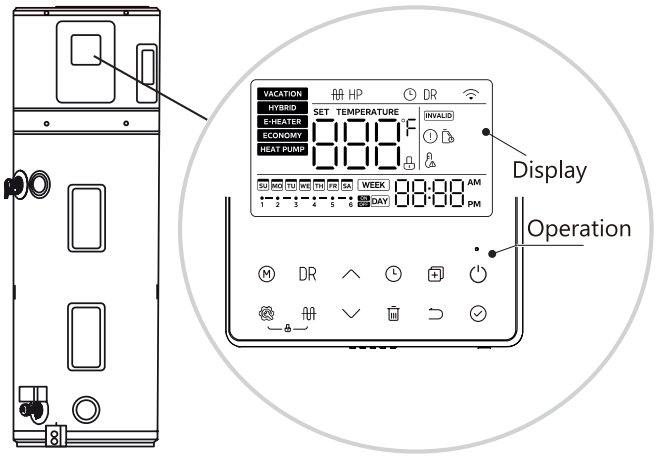
1. Basic function
   A. Vacation function
      Press "Ⓜ" the button to select VACATION. The unit will automatically heat water to 59°F (15°C) to save energy during vacation days.
   B. How is the unit running
      If unit is OFF -> press "⏻" -> unit will be waken -> press "∧∨" to set target water temperature (109°F/43°C~149°F/65°C) -> press "✓" -> unit will automatically select the heat source and heat the water to the target temperature.
   C. Remote shutdown function
      Users can connect a switch. If the switch is closed, the unit will be stopped forcibly. If the switch breaks, the unit can run normally according to the settings.
2. Query function
   Press the "⚙" button, then the system running parameters will be shown one by one in the following sequence by each pushing of "∧" or "∨" button.

No.	Hour Low Bit	Min. High Bit	Min. Low Bit	Unt	Explanation
1	T	5	U	Temp.	T5U
2	T	5	L	Temp.	T5L
3	T	5	I	Temp.	-.-.
4		T	5	Temp.	Heat pump stop temp.
5		T	3	Temp.	T3
6		T	4	Temp.	T4
7		T	P	Temp.	TP
8		T	H	Temp.	Th
9		o	n		-.-.
10	T	F	r		-.-.

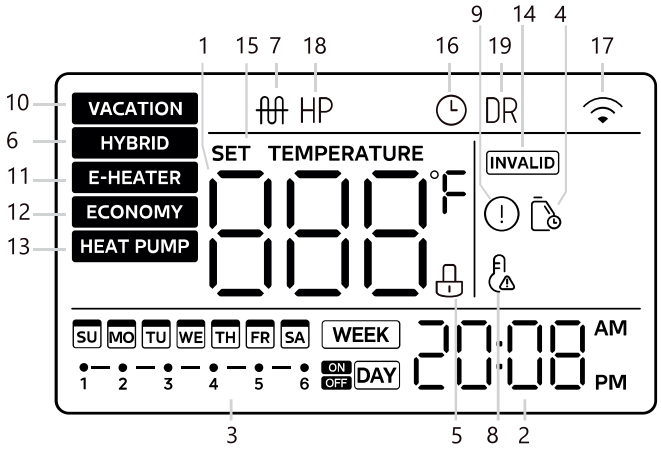
No.	Hour Low Bit	Min. High Bit	Min. Low Bit	Unt	Explanation
11		T	T	Temp.	Disinfect temp.
12		C	o	Current	Compressor and electric heating current
13		F	o	Fan	Ac Fan Dc Fan 0:OFF Real speed10 1:LOW 2:MID 3:HIGH
14		E	o	Machine parameters	0~255
15	E	E	r		Electronic expansion valve opening
16	E	E			Compression mechanism hot water demand
17	P	U	P		-.-.
18		P	S		-.-.
19		F	T		0: Ac Fan 1: Dc Fan
20		H	T		1 (Eheater control type)
21		H	P		0 (Compressor control type)
22	F	S	I		-.-.
23	S	I	o		Tank capacity
24	P	4	P		Four-way valve status
25		U	U		0
26		U	I	Version	Host software version
27		U	2	Version	LCD panel software version
28		U	3	Version	000
29		U	4		0:One electric heater 1:Two electric heaters
30		U	T		2
31	I	E	r		Last error code
32	2	E	r		Previous 1st error or protection code
33	3	E	r		Previous 2nd error or protection code
34	H	H	H		Maintenance time
35	T	L	F		Target Temp
36	E	n	d		End sign

1. Operation

1.1 Control Panel Explanation



1.2 Display Explanation



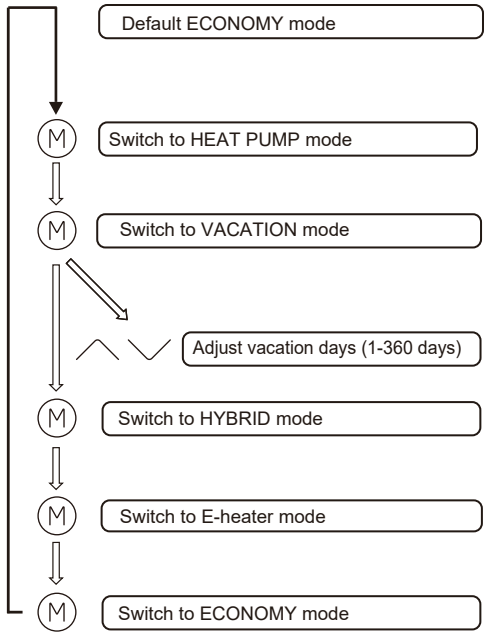
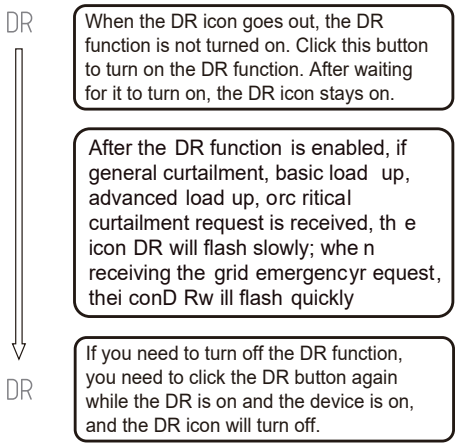
Callout No.	Icon	Description
1	888°F	888 will be lighter if the screen is unlocked. It shows water temperature on normal. It shows remaining vacation days on vacation; It shows the setting temperature on the setting. It shows unit setting/running parameters, error/protection code on querying.
2	20:08	**Time and clock setting** 20:08 shows the clock. Whenever there is any setting for the clock, SET TIME will be lit.
3	WEEK ON OFF DAY	There are daily or weekly TIMER icons. If any of them has been set, this icon will light the corresponding one when the screen is unlocked If there is none of the timers have been set, it will keep extinguished. If a timer is being set, this icon will flash the corresponding one with a 2Hz frequency, as well as lighten the timer that has been set.

Callout No.	Icon	Description
4		It flashes to remind the user to maintain the water tank and clean the air filter. If you do not need maintenance reminders, you can enter engineering mode channel 2 to disable this function, or engi-neering mode channel 4 to reset the maintenance reminder time, the default maintenance reminder time is 365 days.
5		**Lock:** If the button is locked, the icon will be lit, otherwise, it will be extinguished.
6	HYBRID	**HYBRID MODE:** The heat pump and the electric heater are running at the same time.
7		**E-heat:** It will be lit when E-heat is running, otherwise, it will be extinguished. NOTE: When the operating conditions are not met to turn on this function, the corresponding icon on the wire controller lights up briefly and then goes out.
8		**High temp. Alarm** If the water temp is higher than 122°F (50°C), it will be lit, otherwise, it will be extinguished.
9		**Error:** It will be lit up when the unit is under protection/error.
10	VACATION	**VACATION MODE:** For the outgoing vacation mode, the water tank is set at 59°F (15°C). Maintains low tank water temperature, preheats hot water and anti-freeze lines, while reducing on/off operation of the tank.
11	E-HEATER	**E-HEATER MODE:** This icon will be lit when the appliance is running in E-HEATER MODE. IN this mode, only the heating element will work (won't work at the same time).
12	ECONOMY	**ECONOMY MODE:** This icon will be lit when the appliance is running in ECONOMY MODE. In this mode, while the ambient temperature is within the heat pump's ambient operating range, a heat pump will work if T5U/T5L is lower than a special parameter. And upper heating element will work when T5U is lower than 97°F (36°C). If the ambient temperature is out of the heat pump's ambient operating range, only the heating element will work (won't work at the same time).

Callout No.	Icon	Description
13	HEAT PUMP	**HEAT PUMP MODE:** This icon will be lit when the appliance is running in HEAT PUMP MODE. In this mode, while the ambient temperature is within the heat pump's ambient operating range, the heat pump will work if T5U/T5L is lower than a special parameter. If the ambient temperature is out of the heat pump's ambient operating range, only the heating element will work (won't work at the same time).
14	INVALID	When any key is invalid, this icon will flash for 3 seconds.
14	SET TEMP	The icon lights up when the water temperature is being set.
16		The icon lights up when the clock is being set.
17		**Wireless:** (some units) will be lit when Wireless is connected. will be extinguished when Wireless is not connected; will flash with a 2Hz frequency when setting Wireless.
18	HP	**HEAT PUMP ICON:** When the heat pump is operating and producing hot water, the icon lights up.
19	DR	**DR ICON:** After the DR function is enabled, if a general curtailment, basic load up, advanced load up, or critical curtailment request is received, the icon DR will flash slowly; when receiving the grid emergency request, the icon DR will flash quickly

1.3 Operation Explanation

Any pressing of the button is effective only when under button and display unlocked state.

Callout No.	Icon	Description
1	Ⓜ	Use this key to switch mode  If no user changes the device mode within 72 hours (except for VACATION mode and HEATPUMP mode), it will automatically switch to ECONOMY mode (72 hours is the power on time).
2	DR	The DR button is valid once. 
3	⌃ ⌄	**INCREASE AND DECREASE** If the screen is unlocked, the corresponding value will increase by pressing the button. •When setting temperature, press more than 1s. The temperature value will be increased continuously; •When setting clock/timer, press more than 1s. the clock/timer value will be increased continuously. •When setting vacation days, press more than 1s. The day value will be increased continuously. On querying, the check items will page up by pressing it.

Callout No.	Icon	Description
4	⚙	**Query function** 1) In the main interface, press the search button to enter the spot check function, and use the up and down keys to switch the spot check channel, and the attribute value of the channel will be displayed when switching to the channel, and the specific channel can be found in the function book. 2) After 30 seconds from the last operation of the up and down keys, or by pressing the return key or the on/off key, you can directly exit the engineering mode. 3) Query mode can be entered in both the power-on and power-off states. **Engineering Mode** 1) In the main interface, press and hold the key for 3 seconds to enter the engineering mode; use the up and down keys to switch the in-spection channel, and the attribute value of the channel will be displayed when switching to the channel. By the up and down keys, you can modify a parameter setting. after setting and adjusting, press the confirm key to return to the main interface to make the setting effective (channels 2, 3, 4, 34, and 35 will be effective immediately). Press the Return button to return to the previous interface (channel selection interface). After 30 seconds from the last operation of the up and down buttons, or by pressing the return button or the on/off button, you can directly exit the engineering mode. 2) Engineering mode can be accessed in both power-on and power-off states. It is strictly prohibited for the customer to change the parameter settings of other channels in the engineering mode without authorization to avoid affecting the normal operation of the unit or causing damage to the prototype.
5	⏻	**Power on/off button** Press the button to turn the device on or off.

Callout No.	Icon	Description
6		**TIMER (Daily setting)** 1) Press the TIMER button to the day timer icon ON OFF DAY, and press the confirmation button to enter the day timer setting interface. The day timer has a total of 6 time periods, each time period can be set to open the time, close the time, mode, set the temperature of the water; when set the first time period set the temperature of the water, press the confirmation button to enter the next time period of the set; when set the sixth time period set the temperature of the water, press the confirmation button to return to the main interface; during this period, you can press the return button to return to the previous setting or main interface. 2) When setting the on time and off time, press the delete button , and the time can be restored to the default value, and it will display (-. --). 3) If there is a conflict between the set time periods, the time set at the back will be the valid time, and the time in front will be the invalid time; the invalid time period restores the default setting. 4) You can enter the daily timer setting in both power-on and power-off state.
7		**TIMER (Weekly setting)** 1) Press the TIMER button to the weekly timer icon WEEK, press the confirmation button to enter the weekly timer setting interface, weekly timer for a total of 7 days. There are 6 time slots can be set each day, each time slot can be set to open the time, close the time, the mode, set the water temperature; when the first time slot set the water temperature, press the confirmation button to enter the next time slot settings; when the sixth time slot set the temperature, press the confirmation button to return to weekly After setting the water temperature for the 6th period, press the confirmation key to return to the selection of week; during this period, you can press the return key to return to the previous level of setting or the main interface. 2) When setting the on time and off time, press the delete button to restore the time, mode, and set water temperature to the default value, and display (-. --). 3) If you adjust the timing again after the setting is completed, then all the settings after the adjustment time period will be canceled. For example, if you adjust the timer on for time period 2, the timer off for time period 2, and the settings for time periods 3, 4, 5, and 6 will all be canceled to (-. --) after adjustment. Mode and setting water temperature becomes the default values (Energy saving mode, 140 °F (60°C). 4) In the weekly timer setting, in the weekly selection, use the copy button , you can locate the setting of a certain day to the base day, select other days, press the copy button to change the status of the day, and the fast flashing is selected, the slow flashing is unselected, and af-ter pressing the confirmation button, you can copy the set-ting of the base day to the selected day. 5) You can enter the weekly timer setting in both the power-on and power-off states.

Callout No.	Icon	Description
8		**CONFIRM/UNLOCK** If the screen and buttons are unlocked, press it to upload the setting parameters after setting any parameter.

1.4 Button Combination

Function	Icons	Description
Setting the date and clock	+ +	1) In the main interface, press and hold the timer button for 3 seconds to enter the date setting, press the up/down button to select the date, press the confirmation button to enter the clock setting, press the up/down button to modify the time, and press and hold to accelerate the increase/ decrease of the time. After setting the clock, press the confirm button to return to the main interface to complete the setting of date and time. (2) After 30 seconds from the last operation of the up/down button or pressing the return button, or the power on/off button, you can directly exit the date and time setting. 3) Setting can be done in both power-on and power-off states.
Connecting the wireless function	Press for 3 seconds	1) In the main interface, long-press the on/off key for 3 seconds to enter the AP wireless network mode; there will be a wireless icon in the upper right corner of the line controller. At this time, enter the APP, select the category of air water heater, choose the correct model, and then network according to the APP prompts, and after the connection is completed, the wireless icon will always be on. (2) Wireless matching can last up to 8 minutes, after 8 minutes, if the matching is not successful, the wireless icon will go out. 3) Long-press the delete button for 8 seconds in the main interface to reset the wireless function. 4) It can be set in both power-on and power-off states.
Child lock function		1) In the main interface, long-press the key combination for 2 seconds to enter the child lock state. (2) In the state of child lock, long-press the key combination again for 2 seconds to release the child lock state. 3) In the locked state, there will be an icon next to the water temperature display

Error Codes

Display	Malfunction Description	Corrective Action
EH0b	Tank and LCD panel communication error.	The connection between LCD panei and PCB has released or PCB has been broken.
EH00	Machine working parameters are abnormal.	**Contact a qualified person to service the unit.**
EH03	DC fan fault.	The connection between fan and PCB has released or fan has been broken. **Contact a qualified person to service the unit.**
PH15	Electric leakage error. If the PCB current_induction_circuit checks the current difference between L, N > 14mA, the system considers it as "electric leakage error".	Some wires have been broken or a bad wire connection. **Contact a qualified person to service the unit.**
EC54	Compressor discharge temperature sensor TP error.	If the connection between sensor and PCB has released or sensor has been broken. **Contact a qualified person to service the unit.**
EH5H	Compressor suction temperature sensor TH error.	
EC53	Ambient temperature sensor T4 error.	
EC52	Evaporator temperature sensor T3 error.	
EH5L	Error of sensor T5L (lower water temperature sensor).	
EH5U	Error of sensor T5U (upper water temperature sensor).	
EHLA	When the ambient temperature T4 is out of the compressor operating range, the compressor stops, and EHLA is displayed until T4 returns to the normal range. Only works on units without electric heaters. Devices with electric heaters will never display "EHLA".	This is normal and not necessary to repair.
EH5d	Electric heater open-circuit error.	The electric heater has been broken or a bad wire connection after repair.
EHHP	Heat pump system fault. When PH20, PH21, PC30, or PC06 any protection appears 3 times or the protection lasts 1 hour.	The compressor works abnormally. **Contact a qualified person to service the unit.**
PHdH	Dry burning protection.	Ensure that there is water in the water tank before heating.
PH20	Compressor abnormally stopped protection. The discharge temperature is not so higher than evaporator temperature after compressor running a term.	The compressor is broken or bad connection between the PCB and the compressor. **Contact a qualified person to service the unit.**
PH21	The working current of the compressor is too large.	The compressor is broken, system blocked, air or water or more refrigerant in system (after repair), water temperature sensor malfunction, etc. **Contact a qualified person to service the unit.**
PH24	Frost protection. T5L < 39.2°F (4°C) and T4 < 44.6°F (7°C).	The cold water temperature is too low, which will affect the water tank. The electric heater will work.
PC30	System high pressure protection ≥ 3.0 MPa active; ≤ 2.4 MPa inactive	If the system is blocked, air or water or more refrigerant in the system (after repair), water temperature sensor malfunction, etc. **Contact a qualified person to service the unit.**
PC06	High TP protection. Tp > 221°F (105°C). Protection active; Tp < 194°F (90°C) Protection inactive.	If the system blocked, air or water or less refrigerant (leakage) in system (after repair), water temperature sensor malfunction, etc. **Contact a qualified person to service the unit.**
PH9b	Overtemperature protection. The current water temperature exceeds the target temperature by more than 41°F (5°C).	The water temperature sensor is faulty or the current water temperature is too high. In case of burns, **contact a qualified person to check.**
PH91	Low T3 protection.	If the fault persists. **Contact a qualified person to service the unit.**
PH22	Chassis leakage protection.	Check if the chassis is leaking water. If there is any leakage, please clean and check the leakage port or **contact after-sales personnel.**
PHL1	Leakage protection of the water tray.	Check if the drain tray is leaking. If there is any leakage, please clean and check the leakage port or **contact the after-sales personnel.**
FC06	Electric ball valve malfunction.	Check if the electric ball valve is working properly. If it does not work properly. Replace it or **contact after-sales personnel.**

Customer Service

CTA Module Wiring

Water Heater Junction Box

⚠ WARNING

A qualified technician must install a separate branch circuit with copper conductors and an overcurrent protective device. He must also provide a suitable disconnecting means.

Please consult the National Electrical Code, ANSI/NFPA 70, for wiring best practices. Please consult local codes.
Install the Adaptor on the top right side of the water heater (as shown in Fig. 2). To gain access to the port, remove 3 screws holding the junction box cover and connect the Adaptor to the port.

NOTE

Look at the manufacturer's instructions for the CTA2045 (that is ACTA2045 compliant).

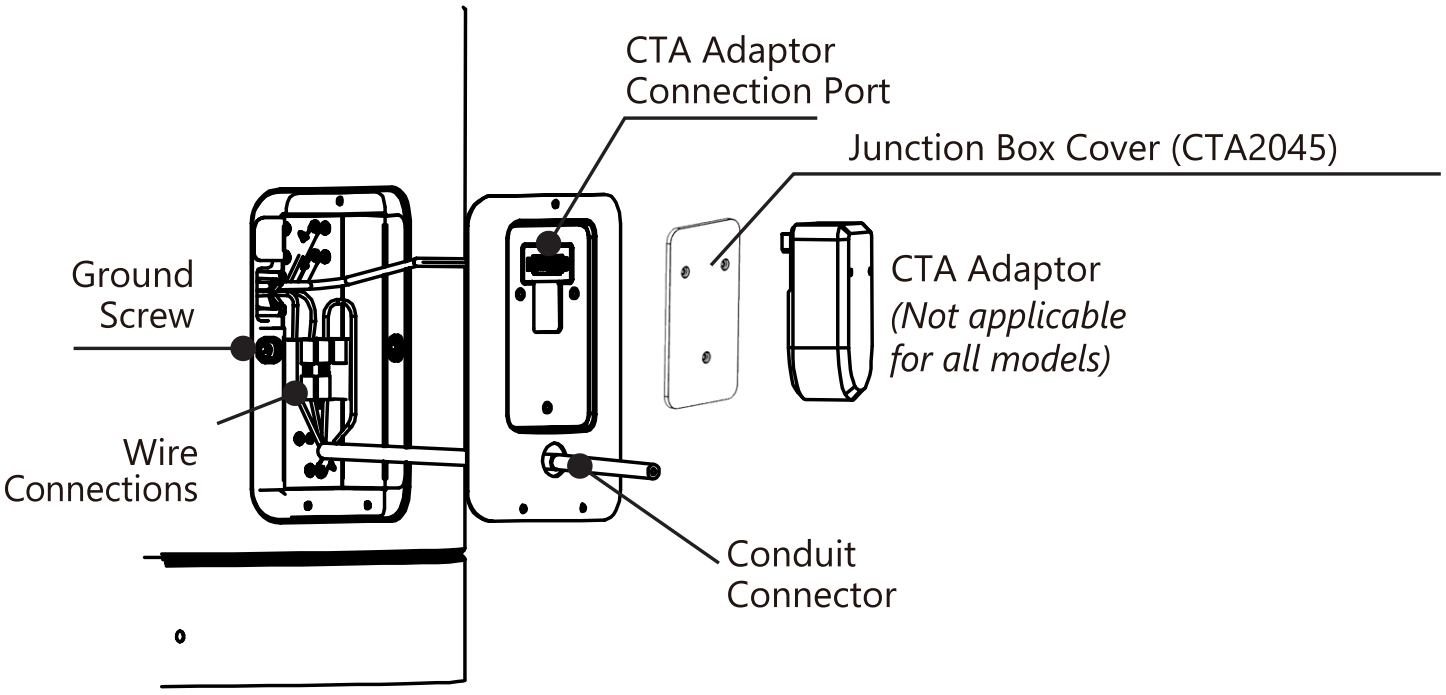
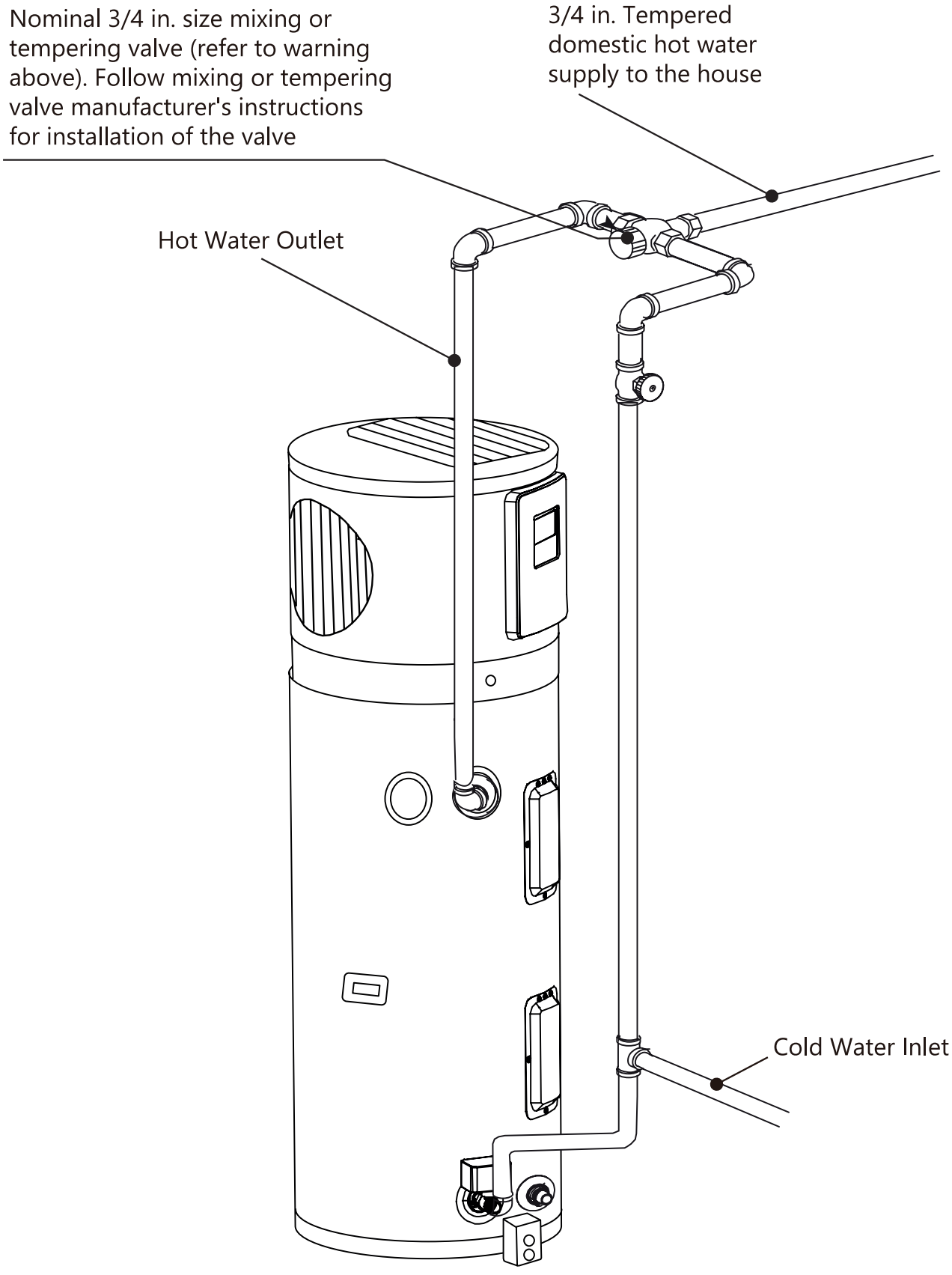


Fig. 2

Demand Response (CTA-2045) Installations

A thermostatic mixing valve conforming to ASSE 1017 shall be installed on the hot water supply line following all manufacturer installation instructions.
Maximum and minimum inlet water operating temperatures 48.2°F~109.4°F (9°C~43°C);
Maximum and minimum inlet water operating pressures 0.3 MPa-1.03 MPa and flow rate 0.2-0.7 (m^3/h);



Replacement Parts

Instructions For Placing a Parts Order

Address parts orders to the distributor or store where the heater was purchased.

All parts orders should include:

1. The model and serial number of the water heater are from the rating plate located on the tank jacket.
2. Specify voltage and wattage as marked on the rating plate.
3. Part description (as noted below) and number of parts desired.

NOTE

Check the water heater's rating label on the front of the unit for the acceptable element wattage.

⚠ CAUTION

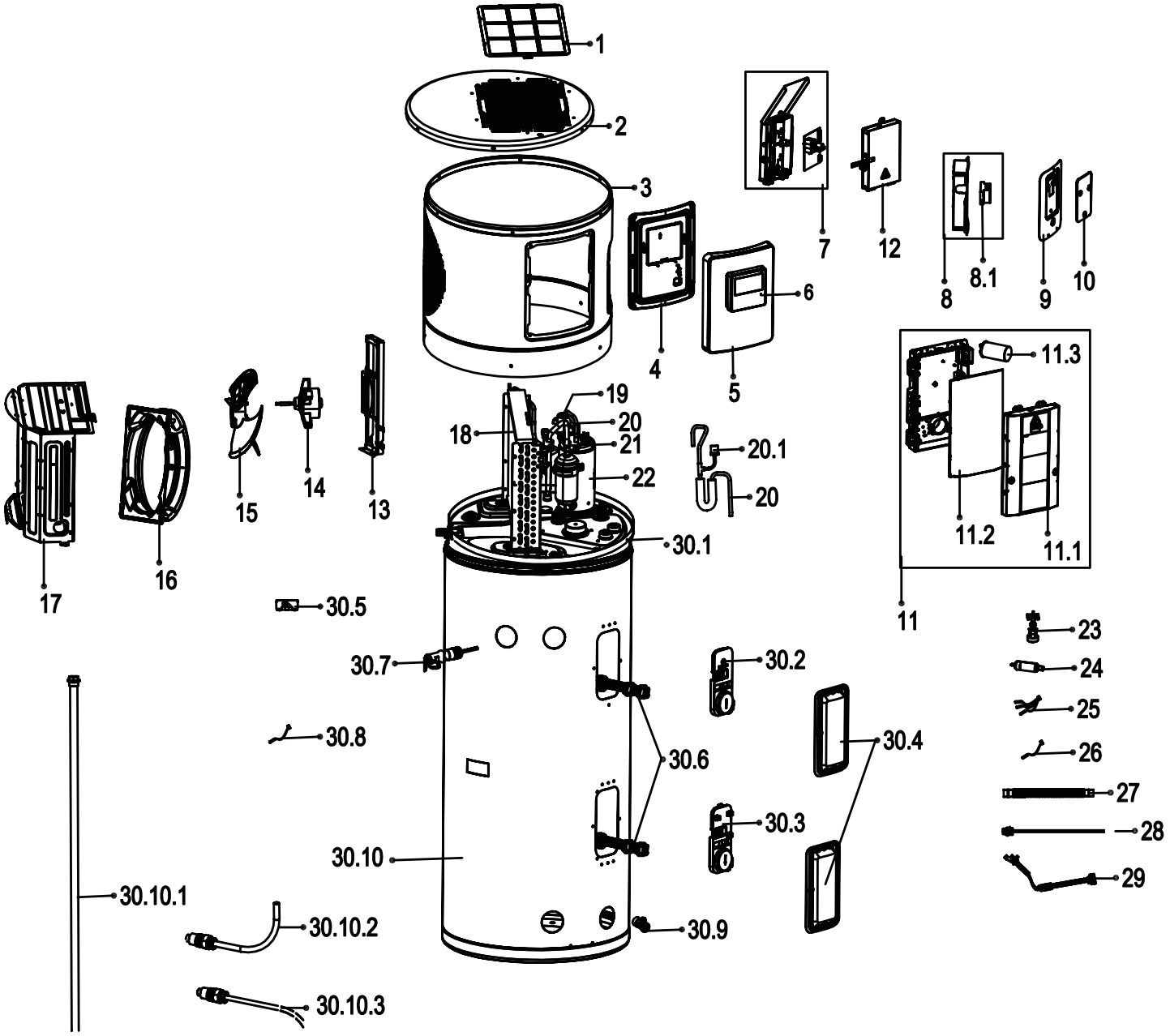
For your safety DO NOT attempt repair of electrical wiring, heating elements, heat pump or electronic controls. Refer repairs to qualified service personnel.

⚠ WARNING

FLAMMABLE CONTENTS UNDER PRESSURE.

The compressor is not a serviceable part. The compressor wiring terminals may be allowing pressurized refrigerant and oil to escape, ignite, and cause serious bodily injury, severe burns, or death.

Callout No.	Part Name on Manual List
1	Air filter
2	Top cover
3	Front cover
4	Display box rear cover
5	Display box front cover
6	Display box assembly
7	Relay board E-box assembly
7.1	Relay board
8	Junction box subassembly
8.1	Wiring terminal
9	Junction box cover
10	Junction box cover (CTA-2045)
11	Main Control E-box assembly
11.1	Main Control E-box Lid Assembly
11.2	Main control board
11.3	Compressor capacitor
12	Cover of Relay board E-box
13	Motor holder assembly
14	Fan motor
15	Axial Flow Fan
16	Ventilation ring
17	Fan box assembly
18	Evaporator assembly
19	Expansion valve subassembly
20	Air discharge pipe assembly
20.1	Pressure switch
21	Suction pipe assembly
22	Compressor
23	Water Level Switch
24	Dry filter
25	HP Temperature sensors (T3, T4, TP)
26	Suction line temperature sensor (TH)
27	Drainage pipe
28	Ground wire
29	Compressor harness
30	Tank foaming assembly
30.1	Drainage tray
30.2	Insulating Cover (Upper)
30.3	Insulating Cover (Lower)
30.4	Cover (TCO)/Cover (Electric heater)
30.5	TCO
30.6	Element heater
30.7	T&P valve
30.8	Water temperature sensor
30.9	Drain valve
30.10	Tank enamel assembly
30.10.1	Anode rod
30.10.2	Water outlet J-tube
30.10.3	Water inlet pipe assembly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30.10.1
30.10.2
30.10.3

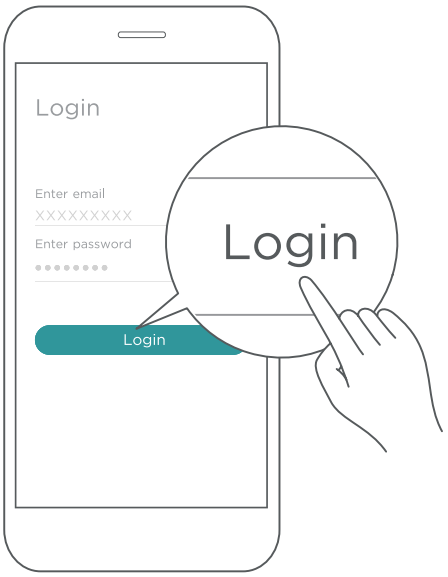
Using The SmartHome App

⚠ CAUTION

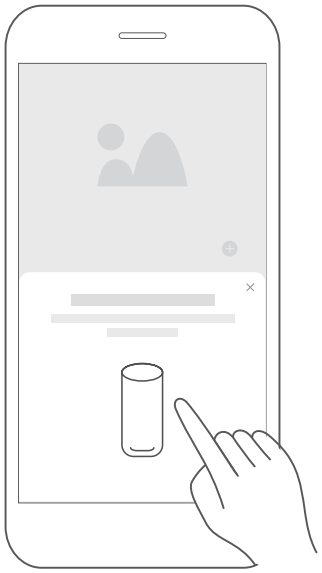
Ensure that your mobile phone is connected to the wireless network. Bluetooth must be turned on.

1. Download the SmartHome App
   Scan the QR code below to download the SmartHome app from the App Store or search for it directly on the Google Play Store or Apple's App Store.

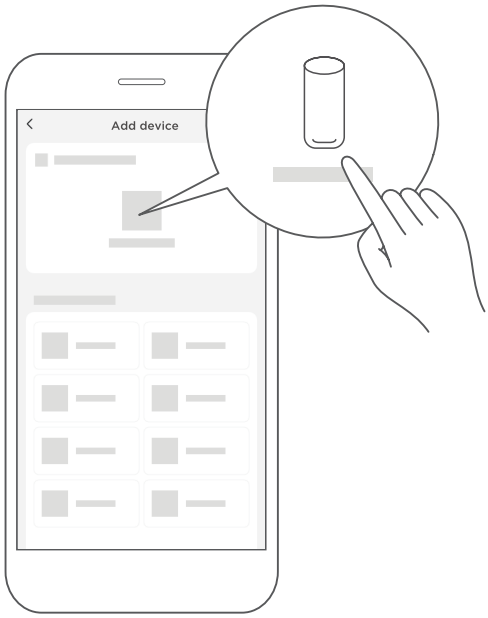
2. Log in
   Open the SmartHome app. Log in directly if you have an existing SmartHome account or create a new account. Alternatively, you can also use a 3rd party login platform.



3. Connecting the Device
   A. When you log in, you may see the message "Smart devices discovered nearby".
   Tap to add your device.



   B. If no such message appears, proceed as follows: Tap on "+" and select your device in the list of nearby available devices.
   If your device is not listed, please add your device manually, RST selecting the device category e.g., Water Heater.



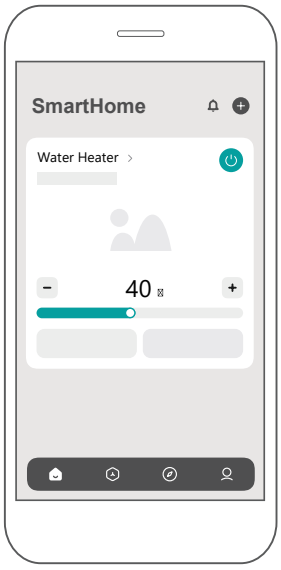
C. Follow the steps in the app to connect your device to the wireless network. If your device fails to connect, follow the additional instructions in the app.

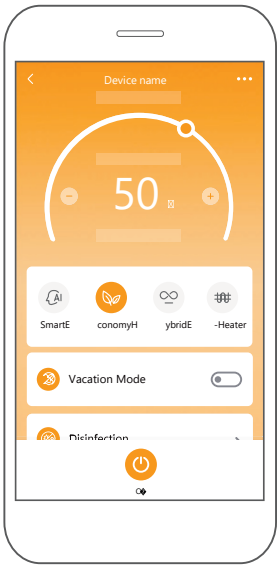
D. Controlling the Device

After pairing successfully, a card will be created for the device in the SmartHome app.

Shortcuts for basic functions will appear on the card, such as changing the temperature or switching the device on or off.

Tapping on the card, will reveal additional features and settings. The actual UI design may look different from examples due to app updates.



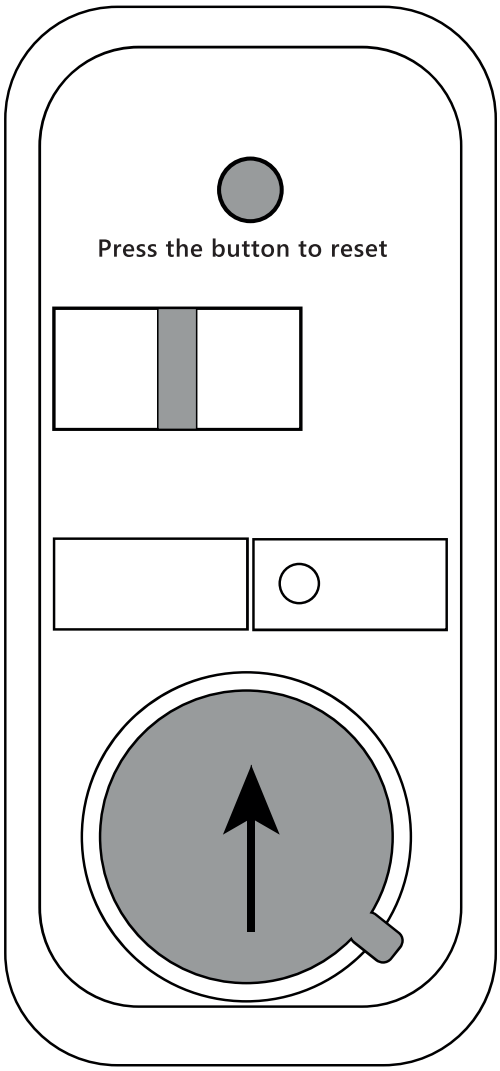


Cavity Insert Instructions

⚠ CAUTIONS

The following instructions are intended for qualified service personnel **ONLY**, and should only be done when necessary. To replace the ECO, thermistor, or heating element, remove the cavity insert crossbar by following the instructions below:

1. Disconnect all power to the unit before starting maintenance.
2. Remove the cap.
3. Replace the ECO, thermistor, and/or element as necessary.
4. Recover the cap before turning on the power to the water heater.

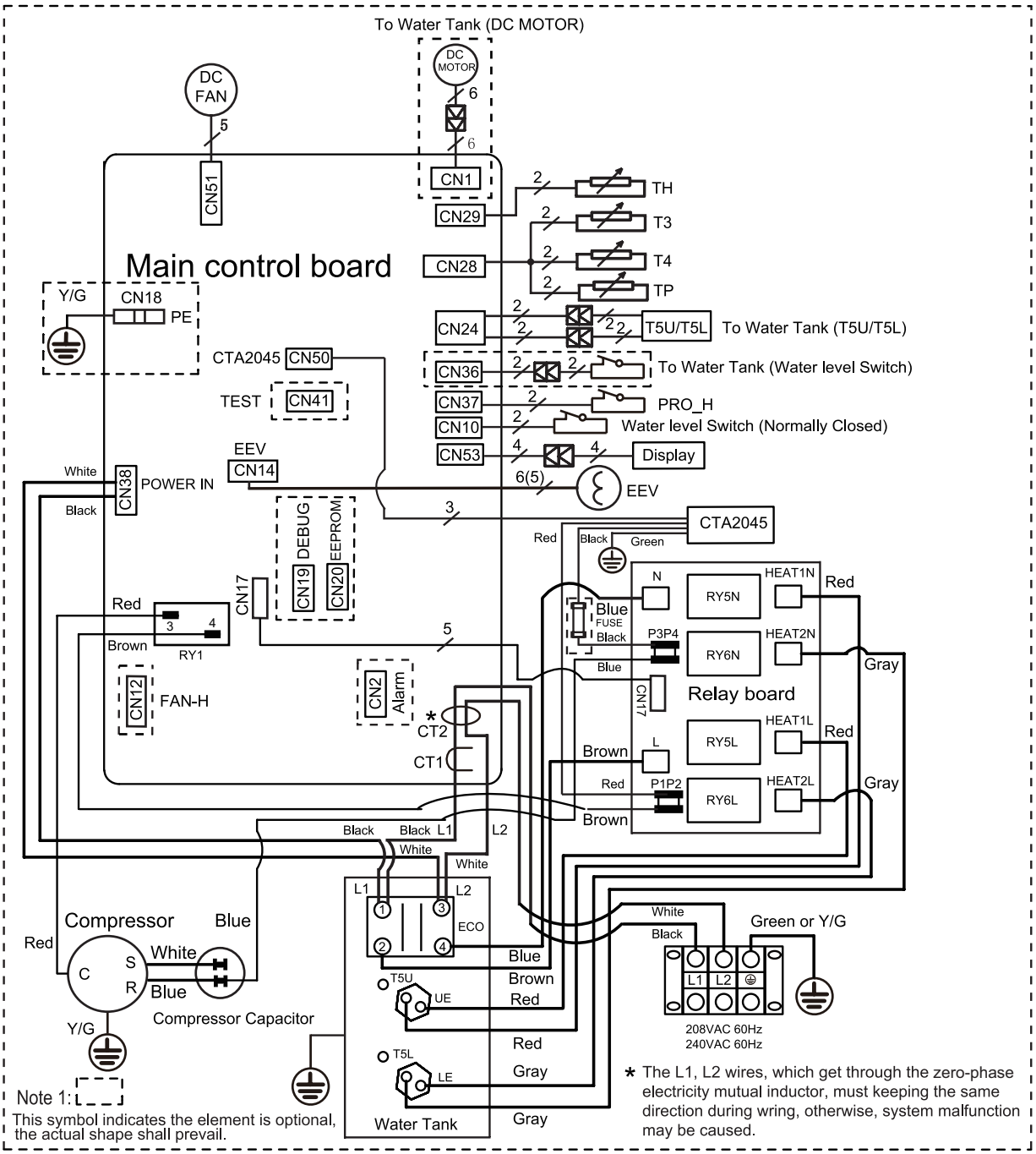


NOTE

The cavity insert crossbar is necessary for the manufacturing process only.

The removal of the crossbar will not interfere with the operation of the water heater.

Wiring Diagram



Terminal	Description
CT1	AC mutual inductor
CT2	Zero-phase electric mutual inductor
T3	Evaporator temperature sensor
T4	Ambient temperature sensor
T5U	Tank temperature sensor (Upper)
T5L	Tank temperature sensor (Lower)
TP	Discharge temperature sensor
TH	Suction temperature sensor
EEV	Electric expansive value
ECO	Emergency cut off

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All the functions and instructions described were up to date at the time of printing this manual. However, the actual product may vary due to improved functions and designs.

Disposal and Recycling

This symbol indicates that this product shall not be disposed of with other household waste at the end of its service life. Used devices must be returned to an official collection point for recycling of electrical electronic devices. To find these collection systems please contact your local authorities or retailer where the product was purchased. Each household performs an important role in recovering and recycling old appliances. Appropriate disposal of used appliances helps prevent potential negative consequences for the environment and human health.

Data Protection Notice

For the provision of the services agreed with the customer,
we agree to comply without restriction with all stipulations of applicable data protection law, in line with agreed countries within which services to the customer will be delivered, as well as, where applicable.

Generally, our data processing is to fulfill our obligation under contract with you and for product safety reasons, to safeguard your rights in connection with warranty and product registration questions. In some cases, but only if appropriate data protection is ensured, personal data might be transferred to recipients located outside of the European Economic Area.

Further information is provided upon request. You can contact our Data Protection **MideaDPO@midea.com**. To exercise your rights such as the right to object to your personal data being processed for direct marketing purposes, please contact us via **MideaDPO@midea.com**. To find further information, please follow the QR Code.

make yourself at home

The design and specifications may change without prior notice in order to enhance the product. For detailed information, please consult your sales agency or the manufacturer. Any updates to the manual will be posted on the service website, so be sure to check for the latest version.

Important!
Product Warranty Information

The Warranty Registration below is a requirement to print a warranty certificate. You're not mandated to register your products to enjoy the Midea Standard Warranty; however, registration is highly recommended. Registering your warranty within 60 days ensures easy access to support and service when needed.

United States

https://www.mideacomfort.us/registration.html

Canada

https://www.mideacomfortna.ca/registration.html

Electric Residential Hybrid Water Heater UM Rev. 1 04242025