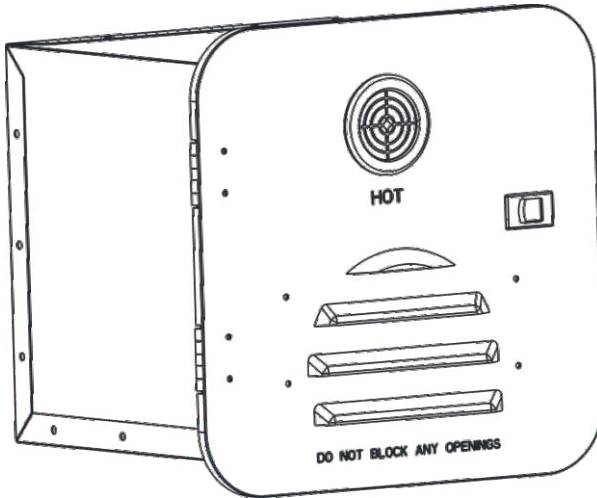


Caravan/RV On demand Hotwater Unit
SCH-RV2

Installation and Operating Instructions



This water heater is **ONLY** for installation
in Recreation Vehicles (RV's)
for showering or washing etc.



GASMARK SCHEDULE



Certificate Holder
Shillito Pty Ltd

42 Gregory Street, West Lake Gardens, Warendourie, Vic 3355 Australia

Manufacturer
Shillito Pty Ltd

Standard

AS/NZS 5263.1.2:2020

Gas fired water heaters for hot water supply and/or central heating

Certificate No. GMK10804

Certification Date: 23 Aug 2023

Expiry Date: 22 Aug 2028

First Certified: 23 Aug 2023

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Water heaters for recreational vehicle installation only

WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

—Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

—WHAT TO DO IF YOU SMELL GAS

- Evacuate all persons from the vehicle.
- Shut off the gas supply at the gas container or source.
- Do not touch an electrical switch, or use any phone or radio in the vehicle.
- Do not start the vehicle's engine or electric generator.
- Contact the nearest gas supplier or qualified service technician for repairs.
- If you cannot reach a gas supplier or qualified service technician, contact the nearest fire department.
- Do not turn on the gas supply until the gas leak(s) has been repaired.

—Installation and service must be performed by a qualified installer, service agency or the gas supplier.

▲ WARNING

Should overheating occur or the gas supply fails to shut off, turn off the manual gas control valve to the appliance.

Never operate the appliance if you smell gas. Do not assume that The smell of gas in your rv is normal. Any time you detect the odor Of gas, it is to be considered life threatening and corrected Immediately. Extinguish any open flames including cigarettes and Evacuate all persons from the vehicle. Shut of gas supply at lp gas Bottle. An odorant should be added to the gas used by this water heater.

Periodically inspect the vent for obstructions or presence of soot. Soot is formed whenever combustion is incomplete. This is your visual warning that the water heater is operating in an unsafe manner. If soot is present, immediately shut the water heater down and contact your dealer or authorized service person.

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

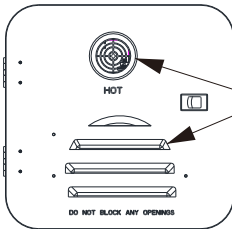
Do not alter the operation of your water heater ,nor change the Design/construction of your water heater. This appliance is not intended for use by young children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.

The thermostat on your water heater is adjustable. It is a temperature sensing limit designed to maintain a water temperature from 95°F (35°C) to 123°F (50°C). Water temperatures over 125°F (52°C) can cause severe burns instantly or death from scalds; therefore, be careful when using hot water. Children, disabled and elderly are at highest risk of being scalded. Always feel water before bathing or showering.

▲ WARNING

CARBON MONOXIDE RISK

WARNING: This water heater may produce unsafe levels of carbon monoxide if improperly operation. Ventilation and enough fresh air is a must. Carbon monoxide poisoning can cause death, and exposure for a short amount of time can lead to serious injuries. Carbon monoxide has no smell and is unlikely to be detected. It is also highly flammable and can explode on contact with a spark or flame. Never block the blower! Never block the fresh air inlet! For RV manufacturers: You might do testing this water. please keep ventilate while testing it.



DO NOT BLOCK

FIRE OR EXPLOSION RISK

WARNING: And a fire or explosion may result causing property damage, personal injury or loss of life. Do not store or use gasoline or other flammable vapors and liquids in the adjacent of this water heater or any other appliance. Failure to comply with all installation, and operating instructions will void the warranty.

OTHERS

- This water heater is recommended to be used at normal altitudes at 0-2000 feet and at high altitudes at 2001-4500ft, but NOT allowed to be used higher than the the above said altitudes.
- Use LPG only. Nature gas or other gas sources are not allowed.
- Use 12V DC only. 220V or 120V is not allowed.
- Blowing air might be hot to hurt skin.
- Shut off all gas appliances when refueling.
- Turn gas OFF when vehicle is in motion.
- LP tanks must be filled by a qualified gas supplier only.

Dear Customer,

Thank you for choosing this water heater from us. We hope that this product brings you years of reliable comfort and enjoyment during your travels. In order to fully understand all the heater's features, you must read these operating instructions. If you do not understand any information in the manuals or if you misplace any of them, please contact your authorized dealer immediately.

Please take the time to read this manual carefully. This enables you to use all features and makes you feel comfortable and safe. To ensure safe use of this water heater, ALWAYS read and follow all instructions in this manual. It is very important that an authorized dealer carries out any repair or maintenance not described in this manual.

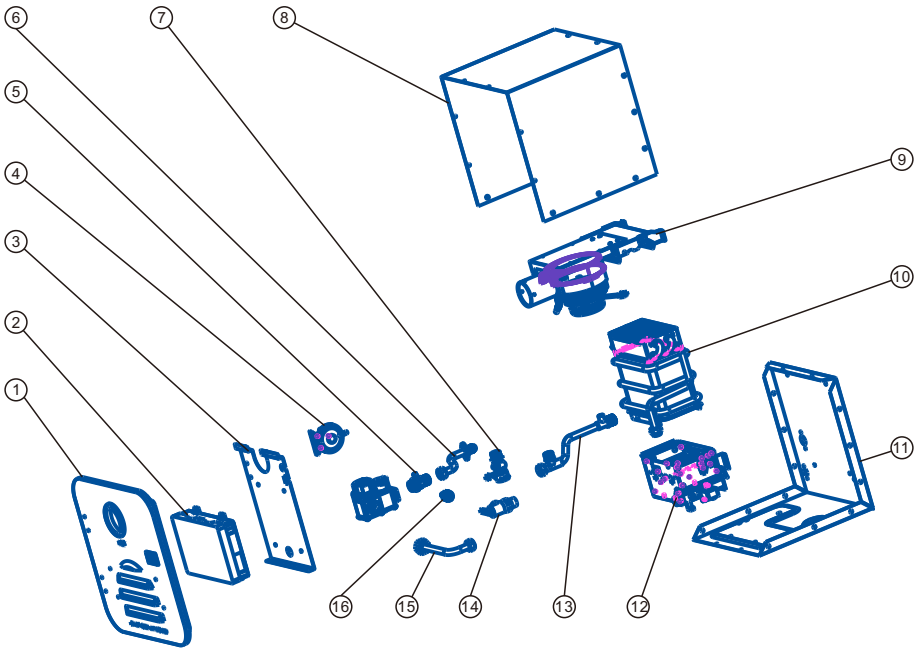
The manufacturer does not accept responsibility for any damages due to NOT observing these instructions.

This water heater is designed to be installed in ventilated applications. This appliance must be installed in a ventilated compartment. This water heater is ONLY installed in Recreation Vehicles (RV's) and is not for use in Marine or Space Heating Applications.

Periodically inspect the vent for obstructions or presence of soot. Soot is formed whenever combustion is incomplete. This is your visual warning that the water heater is operating in an unsafe manner. If soot is present, immediately shut the water heater down and contact your dealer or authorized service person.

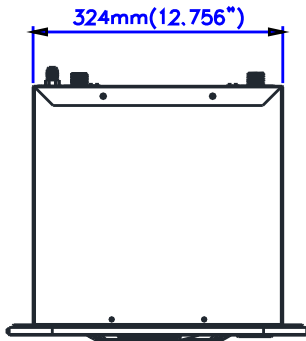
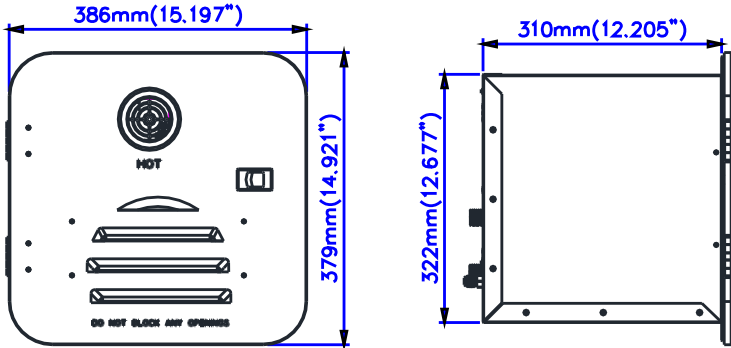
When there is strong wind, please keep the exhaust outlet of blower to the same direction of wind, in order to let it exhaust smoothly. Please understand if wind pressure is too high, this heater will be switched off automatically for safety.

About this Water Heater

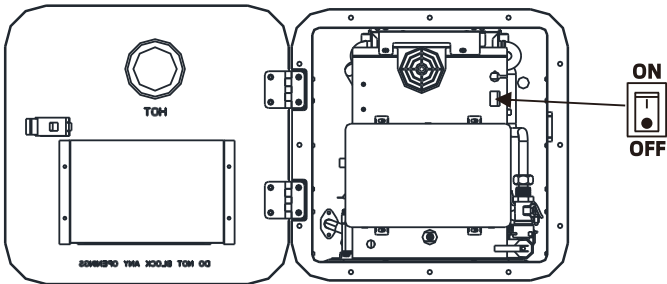


Item	Parts name
1	Door kit
2	MCU
3	MCU rack
4	Wind Pressure Switch
5	Inlet gas pressure testing point
6	Gas inlet piping
7	Water flow sensor
8	Casing(N shape)
9	blower
10	Heat exchanger
11	Casing(L shape)
12	Burner assembly
13	Cold water inlet piping
14	Pressure relief valve
15	Gas relay piping

Dimension :



ON/OFF button:



Features:

- On Demand Tankless Water Heater
- LP Gas / Induced Draft
- Constant Hot Water Temperature
- Linear Gas Control Valve
- Electronic Gas Modulation
- Microprocessor Controls

This gas water heater is designed especially for RV use. It adopts state of the art technology:

Hot Water On Demand And Endless Hot Water

It is activated by water flow. Open up the faucet, it starts working automatically. Close up the faucet, it stops working automatically. In theory, it provides ENDLESS hot water heater.

Please note, when you open your any faucet connected to this water heater, this water heater might be working even though you do not intend to use hot water with wrong operation.

Constant Temperature Hot Water

it is a self regulating water heater, meaning the heater automatically adjusts the gas flow to burners according to the water flow and water temperature, in order to ensure the desired temperature is reached at your tap. Simply set the temperature on the screen and the heater does the rest of the work automatically.

Low Water Flow Started

It is started as low water flow as 2.5L per minute (0.7GPM).

Attention please:

If water flow from hot water outlet is less than 2.5L per minute (0.7 GPM), this heater won't start to work.

Customer Friendly Error Code Display:

Intelligent microcomputer can real-time monitor various safety devices, gas proportional valves and other components, find faults and timely safety shutdown. Advanced fault code display function, easy to use and maintain.

Safety Guard:

Flame out protection: If the flame goes out, the gas supply to the burner is switched off. **Low-Voltage/Over-Voltage Shutdown:** If the voltage drops below 10V DC (or rises above 17V DC), the appliance shuts off. **Over-current Protection:** If there is a short circuit in the appliance (>10 A), a fuse on the control unit is activated and the appliance is switched off.

Flue Blower Monitoring: If there is a failure of the flue blower, the gas supply to the burner is switched off automatically.

Hot Water Temperature Monitoring: A water over-temperature switch avoids excessively high water temperatures in case of an error.

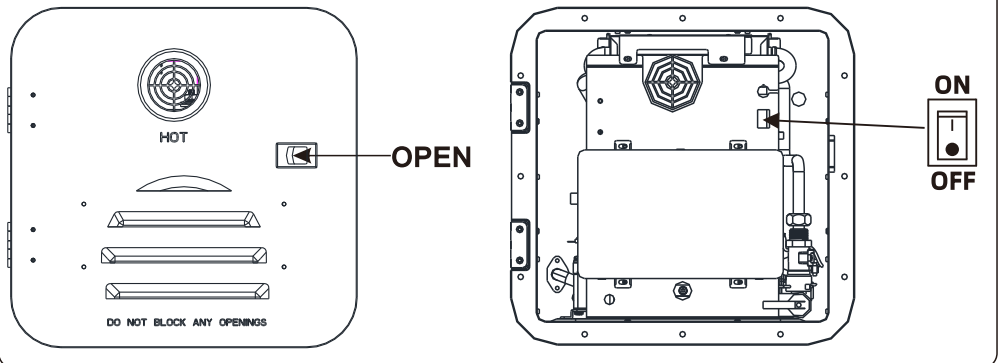
Winterization:

Please understand, even though this water heater is under no working status, there is still small amount water left in the pipeline inside the water heater and inside the pipeline connected to this water heater. Frozen can cause crack of these pipelines. please drain according to the following instructions:

1. Turn of electrical power to water heater.
2. Shut of gas supply to water heater.
3. Turn off pressure pump on water system.

Automatic freezing protection:

When the detector finds out the temperature of the water pipe in the water heater is lower than $6\pm 1^{\circ}\text{C}$ ($43^{\circ}\text{F}\pm 2^{\circ}\text{F}$), this heater will start to burn and keep burning 5 seconds. Then, after another 3 minutes, it will be ready for next recycle. **Automatic freezing protection need gas supply and power on.** If you do not want to use this automatic freezing protection, you could switch off power supply by press “on”/“off” as shown below.



How does it work:

1. Turning on a hot water faucet activates the On Demand Water Heater.
2. The water heater senses the flow of water.
3. The water heater proves that the combustion air fan is working.
4. The combustion chamber is then purged of any remaining raw gas.
5. The burner will ignite and prove the flame.
 - a. The approximate time from turning on the faucet to ignition is 6 seconds. After the initial lighting sequence and the water heater is maintaining temperature, the ignition cycle is reduced to approx. 4 seconds.
 - b. Burners will stay ON until the water flow is shut off.
6. The flow of hot water at the SET point begins approx. 3 seconds after ignition but will not reach the faucet until the hot water lines leading to the faucet are cleared of any remaining water. This time is determined by the length of the hot water line.
7. When the hot water faucet is turned OFF, the water heater shuts down and will remain in a ready state until hot water is called for again.

NOTE: Blower motor will operate for approximately 18 seconds after the hot water faucet is turned OFF.

8. The On Demand Control Center can be left in the ON position and no further action is required by the user.
9. If the water heater fails to light for any reason, a second Trial For Ignition(TFI) will automatically begin. If the second Trial For Ignition(TFI) fails, the water heater will automatically begin a third Trial For Ignition(TFI). If the third Trial For Ignition(TFI) fails, the water heater will go into a lock out mode and will not try to light the burner again. To reset:
 - a. Turn faucet OFF, then back on.

NOTE: This Water Heater has an energy mode circuit that will shut down operation if operating continuously for 20 minutes, for safety reason. To reset, please turn off faucet and turn on again. It will begin from step1.

NOTE: Air in the gas line after changing propane tanks is the main reason for not lighting the burner. A simple method to remove air from the gas line is to ignite a burner on the installed cooking appliance inside your RV.

Installation

CAUTION!!

Installation and service must be performed by a qualified installer, service agency, oem or the gas supplier.

This appliance must be installed in accordance with local codes or, in the absence of local codes, the national fuel gas code, ANSI Z223.1/NFPA 54 or the csa B149.1, natural gas and propane installation code. or, the on recreational vehicles, NFPA 1192 or CAN/CSA Z240 RV.

This heater must be electrically grounded in accordance with local codes or, in the absence of local codes, with the national electrical code, ANSI/NFPA 70, and/or the CSA C22.1, Canadian electrical code, part I.

This heater must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psi(3.5 kPa).

For recreational vehicle (RV) installation only, not for Installation in manufactured home (mobile home).

For installation only on noncombustible floors. Minimum clearance from combustible construction:
sides 20 inches(508mm)
back 20 inches (508mm)
top 20 inches (508mm)

This water heater is provided with a pressure relief valve. For safe operation of the water heater, the relief valve(s) Must not be removed from its designated point of Installation.

The gas pressure regulator must be used with this heater. Combustion air shall not be supplied from occupied spaces.

DO NOT use test pressures higher than 20in-wc to test the gas leakage.

DO NOT attempt to modify the appliance.

DO NOT alter the appliance for a positive grounding battery system.

DO NOT move the appliance by grabbing the interior components.

Make sure all exhaust gases ate directed outside the RV.

CAUTION!!

Protect all combustible material from the exhaust gases.

DO NOT draw air for combustion from occupied spaces.

Always disconnect the 12V appliance (to protect the control from surgas that may occur) when performing Dielectric (hi-pot) testing, welding, electrical, etc... work on the coach.

Only use with a proven 12V power source such as battery or approved converter.

DO NOT vent the water heater using a venting system serving another appliance.

DO NOT install directly into a shower, or near direct heat.

Installation Requirements:

Do not install the water heater to where the vent can be covered or obstructed when any door on the trailer is opened. If this is not possible, then the travel of the door must be restricted in order to provide a 6" minimum clearance between the water heater vent and any door whenever the door is opened.

Due to the differences in vinyl siding, this appliance should not be installed on vinyl siding without first consulting with the manufacturer of the siding or cutting the siding away from the area around the appliance vent.

In any installation in which the vent of this appliance can be covered due to the construction of the RV or some special feature of the RV such as slide out, pop-up etc., always insure that the appliance cannot be operated by setting the thermostat to the positive "OFF" position and shutting of all electrical and gas supply to the appliance.

Do not install this appliance to where the vent terminates below a slide-out. This appliance is not to be installed under any overhang. It must be free and clear of any type overhang.

Installation Requirements:

A main pressure reducing valve must be installed in the incoming water line with a rating of 350 kPa (50 psi). Please note: Warranty will be void if pressure reducing valve is not installed.

The appliance shall be disconnected from the gas supply piping system during any pressure testing of the system.

The appliance and its gas connections shall be leak tested before placing the appliance in operation.

There must be access for removing unit for service.

Choose a location to place the appliance, based on the following:

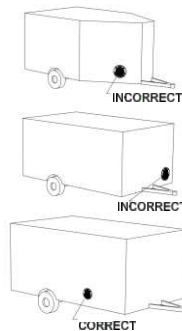
Do not install the water heater in the RV aisle. It should be installed on the exterior wall of the RV.

DO NOT install on the rear or front of the RV to minimize contamination from road grime, debris and wet roads when traveling.

Do not install the appliance in an outdoor enclosed area.

DO NOT install the appliance in any location where the exhaust vent may be covered or obstructed when a swing door, bag door, slide out, pop up, etc. is partially or fully extended.

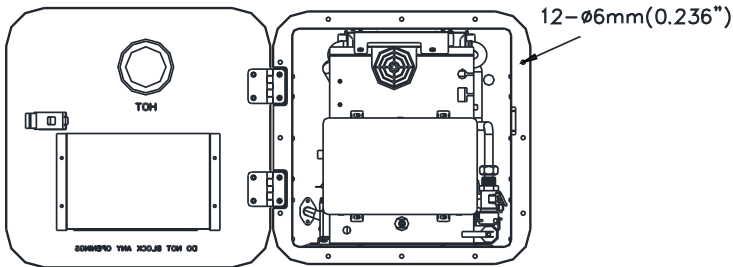
DO NOT install this appliance on any door or slide out area.



The exhaust port should face outside the RV. RV hot water heater should be installed on a solid, noncombustible floor (other than wood flooring) or on a non-combustible frame. In order to install a water heater firmly, the unit's

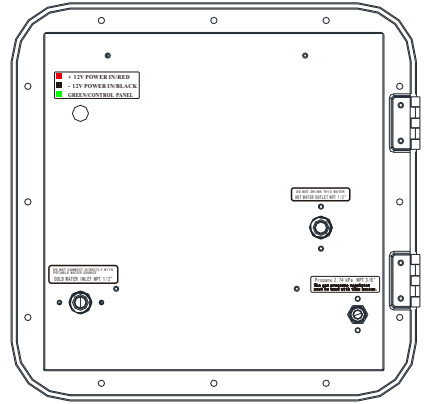
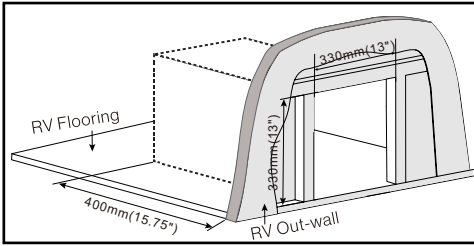
bottom should be supported by a non-combustible floor or frame. If the surrounding of the opening is a combustible material, use a flame retardant insulating material such as heat-insulating felt or heat-insulating board to completely separate the back surface of the water heater from the combustible surface. And the minimum thickness of the filling material must be greater than 20mm(0.8"). The housing connection gap behind the water heater should be sealed with a high temperature sealant during installation to isolate it from the inside of the RV. In this way, the burning air does not come from the inside of the RV, but from the outside of the RV. The exhaust gas generated by the combustion is discharged outside the vehicle..

Fix this heater on your RV



Cut a hole sizing 330x330mm(13"x 13"). The opening depth should be sufficient to accommodate the gas pipe, wire, and water pipe when the water heater is pulled out of the hole. We suggest 400mm(15.75") at least in depth. It should be accessible to this heater from inside of your RV, for maintenance or water drain for winterization.

And at the bottom or back of the hole, please reserve gas inlet, inlet, outlet pipe, power line and other channel holes. Reserve extra gas pipe, wire, pipe length should be greater than the opening depth 1.5 times for maintenance and testing. The perimeter of the hole should ensure sufficient strength to fix the water heater. The water heater flange cover should be glued with 18mm(0.7") wide single-sided adhesive EVA. The paste should be flat and connected seamlessly, (Be careful not to be too thick) Then press this product into the opened hole. Secure the water heater to the RV body with 12 screws (ST5x25mm) Air and water should be isolated from openings to prevent entry into the interior of the RV.



Connect Cold Water Inlet and Hot Water Outlet

The cold water inlet and the hot water outlet is located in the back of this heater. Identify it by the sticker on it.

The cold water inlet and the hot water outlet are connected via 2 standard 1/2" male fitting. Use a rubber seal or other removable sealants to prevent water leakage.

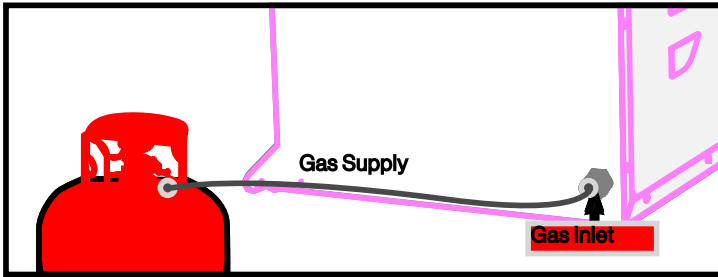
The input cold water must NOT contain sediment, which will let the Flow Meter of this water heater not work properly. Inside the flow meter, it has a rotary wheel to send detect water flow speed and sediment could block the wheel and wheel can not rotate.

Input Water flow:

The RV's cold water system deriving its water input from a pressurized (45 PSI or greater) source such as a shore connection or an RV water pump connected to the RV's fresh water storage tank.

- A steady water flow (no pulsating) will ensure a consistent temperature and performance.
- Water Pressure regulators are commonly recommended but they often decrease water flow to unacceptable levels.
- Water filters are highly recommended to keep sediment out of the plumbing system but the need to be maintained or they can restrict water flow. This water heater is started
- Winterization by-pass kits are not recommended in a tankless water heater systems. The can cause a number of plumbing issues that will affect the operation of the water heater.
- City water connections at RV parks can have low or varying water pressure.

· City water connections at RV parks can have low or varying water pressure. If this condition occurs and cannot be resolved, then we recommend filling the fresh water tank and using the onboard water pump.



Connect the Gas Supply

Note: This heater ONLY use Liquid Propane (LP). The max pressure of LP can not exceed 2.74 kPa. The gas pressure regulator must be used with this heater. Connect an approved gas line at the male threaded 3/8" standard gas inlet and use an approved sealant for this connection. Ensure the fastener securing the gas line to the unit is done up securely and tested with soapy water or a leak detector, to verify there are no leaks, as part of commissioning the unit.

Connect Power Supply

This heater only use 12VDC. Please ensure to connect + and - PROPERLY to your RV's power supply. Red is positive, black is negative;

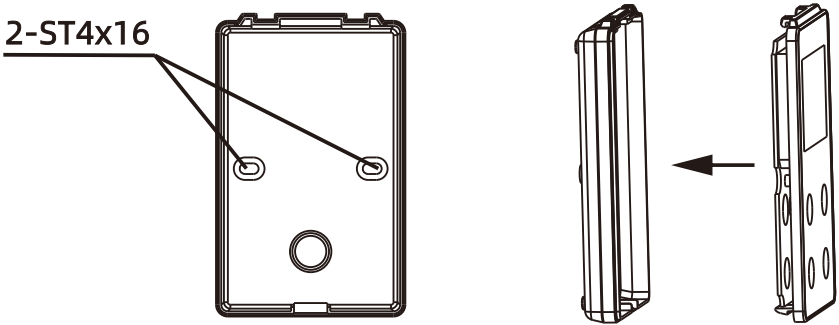
Connect Water

Correctly connect the NPT 1/2" cold and hot water pipe to the back of the water heater. Correctly install the 3/8" NPT liquefied gas pipe and the 3/8" NPT gas intake connector on the back of the water heater. Correctly connect the volt power cable to the power cable on the back of the water heater. Red is positive, black is negative; connect the line controller with the two green cables on the back of the water heater, it is not necessary to divide the positive and negative poles; pay attention to the water pipe, trachea, and wires on the back of the water heater to leave enough length to put the water heater from the mounting hole. The water heater flange cover is glued with 18mm(0.7") wide single-sided adhesive EVA. The paste should be flat and connected seamlessly, (Be careful not to be too thick) Then press this product into the opened hole. Secure the water heater to the car body with 12 screws (St5x25mm) Air and water should be isolated from openings to prevent entry into the interior of the RV.

Hot water/Cold water Faucet in RV showering cabinet:

All faucets is operated the same as in your home. Cold water must be added to achieve the desired hot water temperature.

Choose a convenient location to place the remote controller.



The connection between the line controller and the water heater should be reasonably laid out according to the specific environment. Fix the bottom shell with two ST4x16 screws. (Note: The screw should be screwed to the position to prevent the screw head from short circuit contact with PCB) cover the front shell, complete the installation of the wire controller.

After fixing the screws, please use the insulation strip inside the installation kit to well wrap the screw head in case of the damage of line controller causing the short circuit.

the user confirms whether the water heater is installed correctly before the initial use, carefully check that the connections are properly connected and leak free.

Operating Instructions

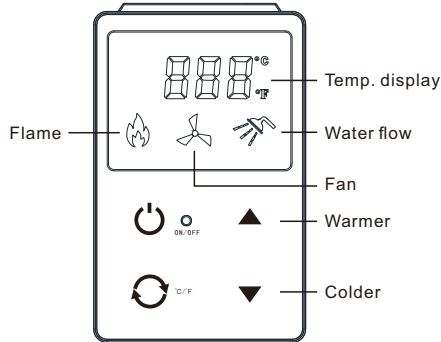
Lighting And Shutdown Instructions

1. turn on gas supply to the appliance,
2. turn electrical switch to "on" position. wait 5 minutes for the gas to clear.
3. open a hot water faucet to operate demand water heater and adjust temperature with cold water faucet.
4. should burner flame fail to ignite, close hot water faucet, then open for another time, to let it re-start, to let propane fill the piping to burner.
5. to shutdown demand water heater, just close hot water faucet. for long period not using, turn electrical switch to "off", shut off gas and water supply to the appliance.

also please refer to “how does it work” in page?? in this manual.
all faucets must be operated the same as you use in your home.
cold water must be added to achieve the desired hot water temperature.

Preset Hot water temperature

User could preset the hot water temperature on UCP (User Control Panel), this water heater will adjust automatically the gas input to reach the wanted water temperature.



Each time you press the hotter or colder key, the temperature will change by 1 °C. Usually, human body is sensitive to 3-5 centigrade. For first time use, you might take time to find what temperature is suitable in different climate.

Operating Troubleshooting

NOTE: For first time use, inside the gas pipeline to this water heater, there might be air. So, for first time using, this water heater might not ignite successfully. Please turn on the hot water faucet and keep it for 3-4 seconds, let it ignite. Then turn off how water faucet. Repeat this for several times till ignition succeeds. For your understanding, each ignition will help drain some air in the piping.

NOTE: A minimum of 0.67gpm(2.5 Lpm) is required for water heater to operate.

NO WATER FLOWS FROM FAUCET WHEN TURNED ON:

Be sure water supply is turned ON and there are no water restrictions.

BURNER TURNS ON, TEMPERATURE FLUCTUATES ERRATICALLY:

Clean all shower heads, faucet aerators or water strainers as required and remove any flow restrictions to assure the minimum 0.67gpm(2.5Lpm) of water flow.

HEATER COMES ON AND RAPIDLY CYCLES ON AND OFF:

1. Water flow is too low. Increase flow at faucet.
2. Clean all shower heads, faucet aerators or water strainers as required and remove any flow restrictions to assure the minimum 0.67gpm(2.5Lpm) of water flow.

3. Verify the water pump is functioning properly.
4. Bleed air out of plumbing lines by opening all water faucets.
5. If the On Demand Water Heater cycles as the pump cycles, an accumulator tank is needed in the water system. If accumulator tank is already installed, check for water inside the tank and drain tank until only air is present.
6. Water source pressure fluctuates too low causing loss of flow. Check the incoming water source for a minimum of 30 psi (207 kPa).

WATER TEMPERATURE IS TOO LOW WITH LOWER WATER FLOW:

Water flow is too low. Increase flow at faucet to assure the minimum 0.67gpm (2.5Lpm) of water flow.

Maintenance Instruction

Periodic examination of water leaks and gas leaks with soap. DO NOT use a naked flame for detecting leaks. I.

Periodic examination of venting systems to make sure the air inlet openings in the door panel are without any blocks, such as leaves, heavy dust, mud, etc.

Cleaning of burner: A burner that is covered in soot and debris will not heat your water efficiently and will cause your gas consumption to increase. Periodically (at least once a year) cleaning your water heater's burner will keep the unit operating at peak performance, save on utilities, and extend the life of the appliance. Steps: Remove the Cover panel; Disconnect the Burner assembly from the gas valve and heat exchanger; Clean with a soft bristle brush and a vacuum cleaner.

Periodic visual check of burner flames If the gas burner produces a blue flame that means that everything is OK. A yellow flame occurs when there is not enough air coming to the flame. An orange or red flame happens when the dust and other debris burn together with the gas. When yellow, red or orange color frame is seen, please contact service center or qualified after sales engineer.

Make sure that keeping appliance area clear and free from combustible materials, gasoline, and other flammable vapors and liquids.

Make sure that not obstructing the flow of combustion and ventilation air;

It is not allowed to do any manual operation of relief valve to drain, when this heater is working. If you want to do that, switch off the water heater and wait for 10 minutes in order to avoid contact with hot water coming out of the relief valve and to prevent water damage.

DRAINING AND STORAGE INSTRUCTIONS If RV is to be stored during winter months, the water heater system must be drained to prevent damage from freezing.

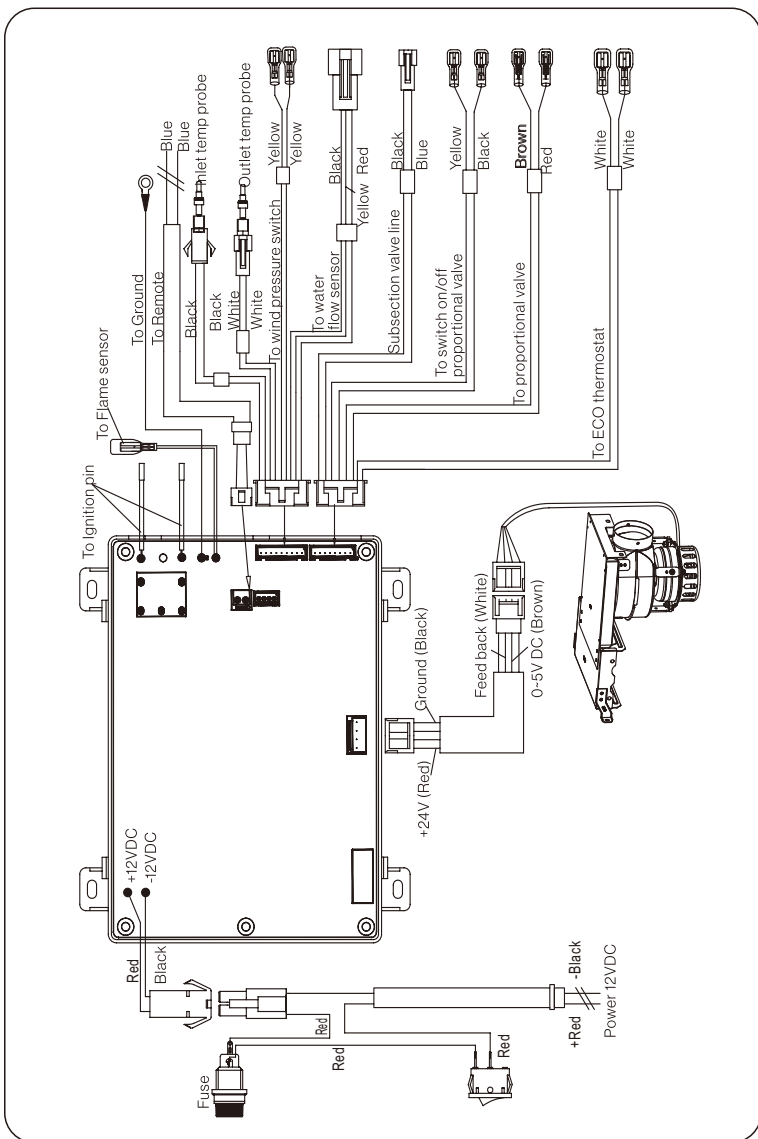
1. Turn of electrical power to water heater.
2. Shut of gas supply to water heater.
3. Turn of pressure pump on water system.
4. Open both hot and cold water faucets.
5. Remove Service Panel to access system

Trouble shooting

Error Code	Failure description and treatment
E0	The hot water outlet temperature probe is broken circuit or short circuit.
E1	Ignition failure, no ignition. Please check whether the gas is supplied normally and check it before use.
E2	flame signal was detected BEFORE ignition, and the beeping alarm prompted a failure.
E3	The thermostat malfunctions is detected during the start-up or water heater operation.
E4	The hot water outlet temperature probe is broken circuit or short circuit.
E5	no fan working signal detected during start-up or water heater operation.
E6	Over-temperature fault. The display will show faulty code when the water temperature keeps continuous 3 seconds in more than 60°C (140°F) . Please check if the water supply pressure is too low or water pipe blocked.
E7	Solenoid of gas valve is broken circuit or short circuit.
E8	Fan motor speed exceeds preset .
E9	Pseudo-fire fault, when the start-up ignition detected a flame signal, buzzer alarm.
En	Water heater set timer time to ("nE" is set to open).

Appendix

Wiring Diagram



Electrical Schematic Diagram

