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Certified to ANSI Z21.10.3 / CSA4.3

LPG GAS ON DEMAND  
 WATER HEATER

**Model ShowerMate M-550-EC**

The Shower-Mate is a power vented automatic instantaneous water heater designed to be installed in ventilated marine applications. This appliance must be installed in a ventilated compartment and in compliance with any applicable Coast Guard and ABYC recommendations.

Every water heater is inspected and tested before it leaves the factory. In order for this unit to operate safely and effectively, all installation instructions must be followed. Failure to comply with all installation and operating instructions will void the warranty. PrecisionTemp, Inc. will not be responsible for anything that is a result of non-compliance.

**FOR YOUR SAFETY**

**WHAT TO DO IF YOU SMELL GAS**

- Extinguish any open flame.
- Shut off the gas supply at the gas container or source
- Do not touch any electrical switch or use any phone or radio in the boat.
- Do not start the boat's engine or electrical generator.
- Contact the nearest gas supplier or qualified service technician for repairs.
- If you can not 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.

**FOR YOUR SAFETY**

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

**WARNING!**

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Refer to the installation instructions and/or operating instructions provided with this appliance. A qualified installer service agency or the gas supplier must perform installation and service.

**WARNING: If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

**Critical Installation Warnings**

- All combustion air must be supplied from outside the Boat, and all products of combustion must be vented to outside the Boat.
- DO NOT vent water heater with venting system serving another appliance.
- DO NOT modify water heater in any way.
- DO NOT alter water heater for a positive grounding system.
- DO NOT HI-POT water heater unless electronic ignition system (circuit board) has been disconnected.
- DO NOT use battery charger to supply power to water heater even when testing.

Keep this book with the water heater at all times. It contains instructions regarding installation, operation and maintenance of your water heater. If you need further information, contact your dealer, your nearest service center or PrecisionTemp.

## ***Please read these instructions thoroughly before starting your installation***

### Installation Instructions for the Shower-Mate Water Heater

The Shower-Mate water heater is designed to be installed in an area that is accessible for servicing and is well ventilated. At least 20 square inches of incoming air is necessary and the power vent of the unit should always be vented to the outside with 2" approved duct. **NEVER** install heater in such a manner that is not vented to the outside. Doing so will void the warranty and cause the heater to malfunction and could result in serious injury or death. Terminus of flue outside boat should be above the water line and not closable.

### **Selecting Installation Location**

The water heater must not be installed in an area where the air intake can be covered and there is an opening to the outside of at least 20 square inches to supply combustion air. It should be mounted so that the 2" duct can be one continuous length to the outside of the boat and above the waterline. The water heater should be located in an area where leakage will not result in damage to other items or the boat structure. Install the heater as close to the gas supply as practical to minimize length of the gas line.

Although the ShowerMate can be mounted with zero clearance around the sides, top and bottom, be sure that the installation does not interfere with any wiring, plumbing inside the boat. There should be ready access to the front access cover for servicing and the fittings on the back and allow for the routing of the gas line into the back of the case.

### **Mounting Unit**

Unit should be located to allow hookups on the back and access to the front panel for servicing. Note the locations of the bottom combustion air opening and mounting holes.

1. Mount the 2 brackets to the bottom of the unit on either side using the supplied 1/4" bolts.

Illustration 1.

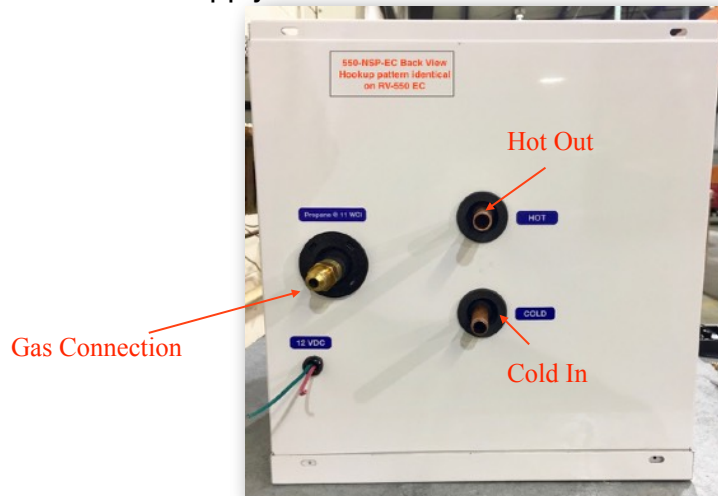
2. Cut 2 - 3/4" thick spacers the length of the mounting bracket and locate under mounting brackets to maintain 3/4" space under unit for combustion air to enter bottom.
3. Place unit and spacers into place to locate 4 mounting holes and mark their positions.
4. Remove the unit and drill the 4 pilot mounting holes in the mounting surface.
5. Screw or bolt unit and spacers into place.



Illustration 1

## Making Connections

1. Connect plumbing to water lines taking care to make correct “COLD” and “HOT” orientation.
2. Connect 3/8” FM flared LP gas line to 3/8” M flared gas fitting. Hand tighten initial connection to assure it is not cross-threaded, then tighten with wrench while backing up fitting with a second wrench. **Note:** This flare fitting is a “dry” fitting, meaning no pipe dope or tape should be used when making the connection. The gas line should be an approved type of one, continuous, unbroken line from the propane locker to the appliance.
3. Turn on the gas and check the water heater and all connections for gas leaks with a leak detecting solution. Never use a flame to check for gas leaks.
4. Turn on water supply line and check for water leaks.



**NOTE:** The appliance must be disconnected from the gas supply piping system during any pressure testing of the system at test pressures in excess of ½ psi. The appliance must be isolated from the gas piping system during any pressure testing at test pressures equal to or less than ½ psi. Pressure inlet to valve, 13” W.C. maximum, 11” W.C. minimum. Pressure at outlet of valve is factory set at 10”. Burner manifold pressure is W.C. 8.9” W.C. +/- .2” at tap on burner manifold.

**WARNING : NEVER install heater in a manner that is not vented to the outside. Doing so will void the warranty and cause the heater to malfunction and could result in serious injury or death. Terminus of flue outside boat should be above the water line.**

## Flue Pipe Installation

After the unit is secured into place, the exhaust pipe is installed as follows:

1. Locate and install the flue terminus on the outside of the vessel. It must be mounted well above the waterline, while keeping the flue pipe run under 10’. If PrecisionTemp’s optional mushroom vent is used, it can be mounted on a vertical or horizontal surface. It must be located so that no water can enter the flue system and no flue gasses can re-enter the living area through hatches or other air intakes.
2. Carefully measure and cut one, continuous length of flex flue pipe to run from the 2” flue pipe on the top of the appliance to the flue terminus. Keep length and bend of the pipe to a minimum. 2” stainless flex duct is recommended. Never use galvanized or CPVC pipe.
3. Now remove the pipe and coat the inside diameter of the flue pipe elbow with high temperature silicone sealant or equivalent.
4. Attach either end of the flex pipe to the appliance outlet and the flue terminus. This can be done with self-tapping screws or by pre-drilling the hole before inserting metal screws. At least two screws must be used to secure the pipe.

## WIRING INSTRUCTIONS

The appliance, when installed, 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*.

It is required that the unit be connected through a switch or breaker that is connected directly to a 12V DC battery or to the filtered side of an AC/DC converter. Avoid unfiltered “linear” voltage sources. Use a minimum of 18 gauge wire, UL and CSA Listed.

Never replace fuse with one rated over 5 amps.

Refer to the **Wiring Diagram**. Install a remote switch in a convenient location. Before making the connections, turn the switch to the OFF position.

**RED is 12V DC Positive power IN.**

**GREEN is 12V DC Ground**

### PRESSURE RELIEF VALVE

**THIS VALVE IS A SAFETY COMPONENT AND MUST NOT BE REMOVED FOR ANY REASON OTHER THAN REPLACEMENT.** This water heater is equipped with a pressure relief valve that complies with the standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Systems, ANSI Z21.22 / CSA 4.4.

This valve protects against excessive water expansion only. This water heater has separate and dedicated protection for excessive heat.

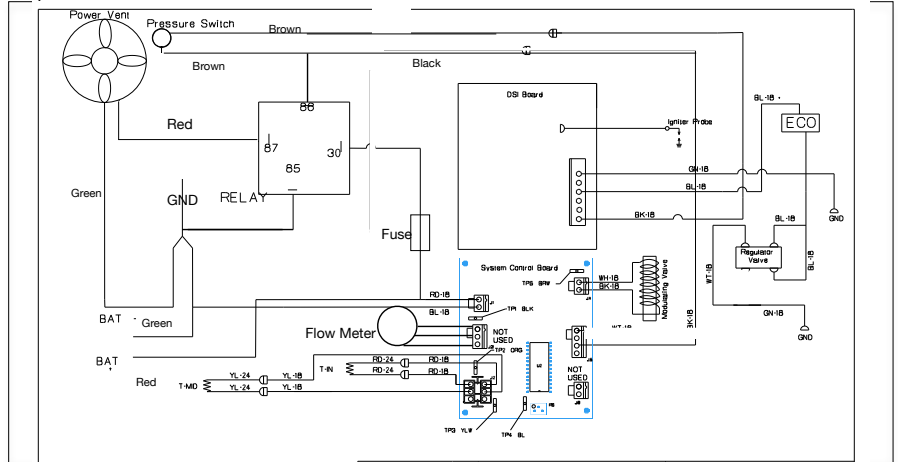
If you use a discharge line, do not use a reducing coupling or other restriction smaller than the outlet of the relief valve. Allow complete drainage of both valve and line.

### FOR REPLACEMENT PARTS:

- DO NOT install anything less than a pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of product of listed equipment or materials, as meeting requirements for Relief Valves and Automatic Gas Shutoff Devices of Hot Water Supply Systems, ANSI Z21.22 / CSA 4.4. Valve must have maximum set pressure **not to exceed 100 psi**.
- Install replacement valve into opening provided and designated for this purpose on water heater.
- Installation must conform with local codes or in the absence of local codes, Standard on Recreational Vehicles, ANSI A119.2 or CAN/CSA-Z240RV.

### How to Operate

- 1) Pressurize the water system by turning on pump or city water pressure.
- 2) Purge all air from the system by turning on the faucets until a steady stream of water flows.
- 3) Turn on the 12V DC power supply.
- 4) Turn on the LP supply at the tank and the manual gas valve (if installed). The water heater will remain dormant until a water tap is opened and the heater senses water flow of at least 0.5 GPM.
- 5) Turn on the hot water tap to full open. The heater will fire up and hot water will flow from the tap in the time it takes to traverse the lines from the heater to the faucet. (If this is the first usage, you may have to turn the water on and off several times to purge the LP gas lines of air. If the heater fails to light, turn the power switch OFF, then ON to reset the ignition control. After ignition, water flow can be reduced and cold water added as desired.
- 6) To shut off the water heater, shut off the water. Shut off power at remote switch or breaker.
- 7) Should overheating occur or the gas supply fail to shut off, turn off the “ON/OFF” power switch.



## **A Note About “Navy Showers”**

It is recommended to take a shower just like you would at home. That is, leave the water running through the entire shower. The hot water system is designed to deliver a continuous, comfortable flow of hot water and that’s the way it works best.

Shutting off the shower with the shower head button wastes water. Each time this is done, the shower head “trickles”, filling the hot water line with cold water. This cold water has to be purged from the line each time the shower head is turned back on. Tests have shown that this will not save water and sometimes uses more water than leaving the shower run continuously.

## **Winter Operation and Winterizing Water**

This heater is equipped with freeze protection that will prevent freezing under most conditions. In order for it to function, 12 VOLT AND GAS SUPPLY MUST REMAIN TURNED ON. This allows the burner to fire and electric elements to protect the system. Any freezing of the water heater or other plumbing components can cause severe damage that is not covered by warranty.

### **Winter Operation:**

**If LPG appliances must remain off**

**when boat in freezing conditions. If this is the case, drain heater as follows:**

1. Turn off water pump and the power and gas to the heater. Open the pressure relief valve by lifting the handle to a 90° position from the normal position.
2. Open at least one hot and cold water tap in the boat. This should drain the system.

### **Winterizing Procedure:**

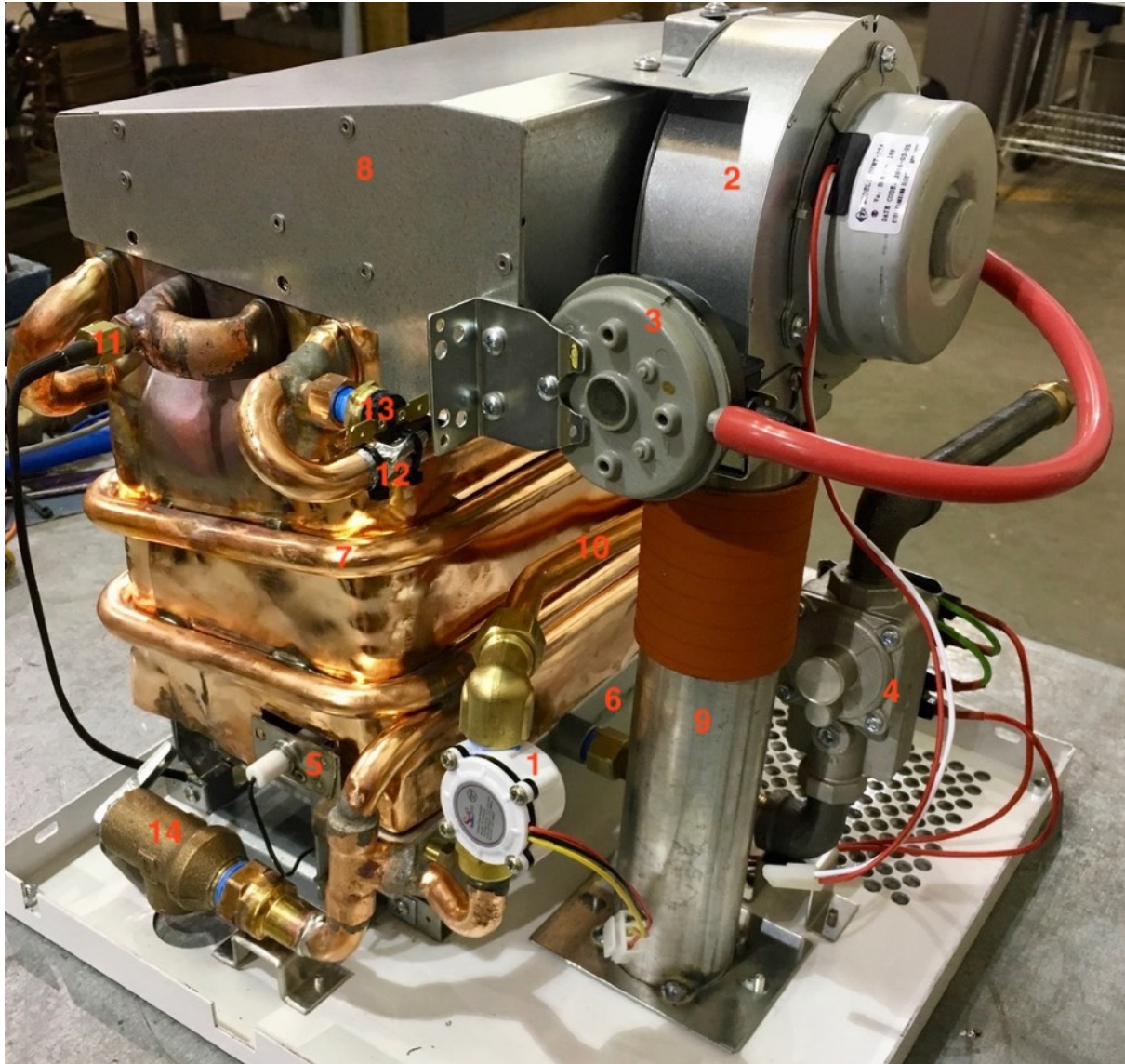
Before storing the system for the winter, the plumbing system must be winterized. This can be done by either of the following methods:

1. All water should be drained from the system. To do this, open one tap at a time using compressed air to purge the system of all water.
2. Recommendations of your boat manufacturer should be followed. The water system can be filled with RV, non-toxic anti-freeze. When you see the anti-freeze coming from the hot water tap, the heater is protected.

## Exploded Parts View

Note: This Illustration Show Unit with Bottom Venting Rather Than Top Venting. All Illustrated Components are Identical on Both Models.

## RV-550- EC and NSP-550-EC Component



- |                               |  |
|-------------------------------|--|
| 1. Hall Sensor Flow Meter     | 13. 165°F ECO                            |
| 2. Power Vent                 | 14. 100 PSI Pressure Relief Valve        |
| 3. Fluing Vacuum Switch       | 15. Gas Modulation Valve<br>NOT PICTURED |
| 4. Combination Gas Valve      | 16. 12 VDC Relay                         |
| 5. Igniter / Proofing Probe   | 17. Control Board                        |
| 6. Manifold and Burner        | 18. Direct Spark Ignition Board          |
| 7. Finned Tube Heat Exchanger |  |
| 8. Flue Hood                  |  |
| 9. Flue Pipe                  |  |
| 10. T-In Thermistor           |  |
| 11. T-Mid Thermistor          |  |
| 12. T-Out Thermistor          |  |

## TROUBLESHOOTING

Most problems are easily remedied by consulting the trouble-shooting guide. If problems still persist, contact PrecisionTemp for assistance. Only a qualified technician should do any work involving the gas system.

A periodic visual check of the burner flames should be done by observing the flame through the “peep hole” in the heat exchanger. There should be blue flame with minimum or no yellow tipping. There should be nothing obstructing the flow of combustion and ventilation air.

Burner maintenance should be performed by a PrecisionTemp Authorized Service Technician.

**NOTE: The heater is dormant until it senses water flow. When a water tap is turned on to at least .5 GPM the burner will fire until water flow is turned off and the heater again goes dormant.**

### **Heater Does Not Come On When The Water is turned on. (Power vent not running)**

1. Be sure power is on and panel breaker is not tripped.
2. Check electrical contacts. Be sure the connector is plugged into board. Using a voltmeter, check for 12Volts on this connector.
3. Be sure all electrical connectors are secure and the polarity is correct. (Red wire to positive terminal).
4. Fuse in power wire might be blown. Replace fuse.
5. Locate the ECO, high temperature switch (two red wires) at the upper left hand of the heat exchanger. Check for open circuit condition.
6. Be sure there is a battery in the system. Never connect the heater directly to a power converter. Some converters have circuits that are not pure DC. This can cause malfunctions or damage to the heater and is not covered by warranty.
7. Be sure that no water-mixing valve has been left in the on position or using the shower head as a shut off. This will permit water to bypass the water heater and bleed cold water into the hot water system. Always turn off both hot and cold water valves after using.

### **There Is No Ignition When Water Is On (Power vent is running)**

1. Be sure the gas valve at the tank is “On”, there is gas in the tank and the gas line is purged of all air.
2. Be sure that flue terminus is not blocked
3. Check that the ignition wire is plugged into the spark tower on the ignition control and is not touching anything else.
4. Check flame site hole to see if igniter is sparking from the probe to the burner. Bend ignition wire to adjust to proper gap or contact *PrecisionTemp* or your nearest authorized service representative.
5. Check that there are no cuts or breaks in the ignition wire.
6. Be sure that the power vent fan has 12 volts to it when there is water flowing and there are no obstructions in the flue pipe.
7. Safety vacuum switch may be out of adjustment. Contact PrecisionTemp or your nearest authorized service representative.

### **No Water Flows From Tap When Tap is Turned on.**

1. Be sure that water supply is turned on and that there are no obstructions.
2. Check for plumbing bypass.

### **Burner Turns On But Temperature Fluctuates Erratically.**

1. May be caused by excessive restriction at the water outlets, shower heads, aerators or water strainers. These should be cleaned and any shower head flow restrictor removed.
2. If temperature fluctuates as the pump cycles, a pressure accumulator tank is needed in the water system. If you have an accumulator tank, check to see if it has become filled with water. If it has, drain it so that it contains air only.

### **Heater Comes On But Rapidly Cycles On And Off.**

1. Water flow is too low. Increase flow at a tap. Clean all aerators and shower head screens to assure at least .5 GPM of water flow
2. Water pump is not functioning properly. Repair or replace pump.
3. If the heater cycles as the pump cycles, a pressure accumulator tank is needed in the water system. If you have an accumulator tank, check to see if it has become filled with water. If it has, drain it so that it contains air only.
4. Air is in the water line. Bleed air by turning on all water taps.

### **Burner Ignites But Water Temperature Is too low**

1. The water flow may be so high as to exceed the capacity of the heater particularly if your supply water is very cold. Slow the water flow.
2. The gas pressure may be too low. Be sure the tanks are full and tank selector is not in center position.
3. Check the dynamic gas pressure while the water is on at full flow. The LPG pressure should be the "manifold pressure" as shown on the specification label while the heater is running. A gas-testing gauge should be installed on the manifold tap so that it may be read while heater is running. If it is too low, turn up the gas regulator to the proper pressure. Regulator may be defective and needs to be replaced. This should only be done by a qualified technician.
4. The gas flow may be too low due to improper gas line diameter (under 3/8 inch outside diameter). The gas line may be excessively long (over 20-30 feet) or the on/off solenoid at the tank (if you have one) may have an orifice that is too small (under 3/16th of an inch).
5. Check the heater air inlet openings and flue pipe for airflow obstructions and clean.

### **Low Heat Rise and Excessive Water Flow Is Required To Trigger Water Heater**

If you find that your heater requires excessive flow to activate it (much over .5 gallon per minute), it is likely that you have cold water bleeding into the hot water side of your water system.

1. Check that valves and faucets are closed when not in use. If there is an on/off button on your shower head, always turn the water valves off after the shower to prevent cold water from bleeding into the hot water system. This will keep the heater from functioning properly.
2. Be sure that the bypass valve at the water plumbing connections is in the "off" position. An open valve can also permit water to bypass heater, causing it not to fire.

**If any problem persists, contact an *PrecisionTemp*.**

### ***PrecisionTemp, Inc.* WATER HEATER LIMITED WARRANTY**

PrecisionTemp, Inc warrants to the original owner and subject to the below mentioned conditions, that this product will be free of defects in material or workmanship for a period of two years from the original date of purchase. PrecisionTemp's liability hereunder is limited to the replacement of the product, repair of the product, or replacement of the product with a reconditioned product at the discretion of the manufacturer. This warranty is void if the product has been damaged by accident, unreasonable use, neglect, tampering or other causes not arising from defects in material workmanship. This warranty extends to the original owner of the product only and is subject to the following conditions:

1. For a period of two years from the date of purchase, PrecisionTemp will replace the complete water heater if the heat exchanger leaks due to corrosion. This warranty includes reasonable labor charges required to replace the complete water heater.
2. For two years from the date of purchase, PrecisionTemp will repair or replace any part defective in material or workmanship. This warranty includes reasonable labor charges, required to remove and replace the part. Service calls to customer's location are not considered part of these charges and are, therefore, the responsibility of the owner.
3. This warranty does not cover the following items classified as normal maintenance:

- a. adjustment of gas pressure
- b. cleaning or replacement of burner orifices
- c. cleaning or adjustment of burner assembly
- d. cleaning or adjustment of flue
- e. adjustment of pressure relief valve
- f. adjustment of spark probe

**4. In the event of a warranty claim, the owner must contact, in advance, either an authorized PrecisionTemp Service Center or the PrecisionTemp Service Department. Warranty claim service must be performed at an authorized PrecisionTemp Service Center (a list will be provided at no charge) or as approved, PrecisionTemp, Inc**

3428 Hauck road Suite Cincinnati, OH 45241, 800-934-9690 Ext. 109.  
5. Return parts (or water heater) must be shipped to PrecisionTemp "Prepaid". The defective parts (or water heater) become the property of PrecisionTemp and must be returned to the Service Department, PrecisionTemp, Inc. 3428 Hauck Rad Suite G Cincinnati, OH 45241

6. This warranty applies only if the unit is installed according to the installation instructions provided and complies with local and state codes.
7. The warranty period on replacement parts (or water heater) is the unused portion of the original warranty period or ninety (90) days, whichever is greater.
8. Damage or failure resulting from misuse (including failure to seek proper repair service), misapplication, alterations, water damage, or freezing are the owner's responsibility.
9. PrecisionTemp does not assume responsibility for any loss of use of vehicle, loss of time, inconvenience, expense for gasoline, telephone, travel, lodging, loss or damage to personal property or revenues. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.
10. Any implied warranties are limited to two (2) years. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.
11. Replacement parts purchased outside of the original water heater warranty carry a 90 day warranty. This includes the part at no charge. This PrecisionTemp heater is designed for use in recreational vehicles, park models, mobile food carts and marine applications for the purpose of heating water as stated in the "data plate" attached to the water heater. Any other use, unless authorized in writing by the PrecisionTemp Engineering Department, voids this warranty.

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