

INSTALLATION INSTRUCTIONS



Water Quality

Water quality must be taken into account when installing and maintaining the water heater. Water conditions outside of the levels specified below affect and may damage the water heater. Please note that the limited warranty provided with the water heater does not cover defects, malfunctions or failures resulting from water conditions that are not in accordance with the specifications in the table below

Install a water treatment device or water softener at the same time as the original installation of the water heater. Rheem offers a water treatment accessory that can be installed with the water heater. (See below).

Flush the water heater's heat exchanger regularly. Rheem offers a flush kit and isolation valves to help remove scale build up. (See below)

If you nonetheless install this water heater where the water conditions are not within the levels specified in the table below, Rheem recommends that you take the following steps:

Chart for Recommended Water Quality Levels									
pH	(Total Dissolved Solids) TDS	Free Carbon Dioxide (CO ₂)	Total Hardness	Aluminum	Chlorides	Copper	Iron	Manganese	Zinc
6.5–8.5	Up to 500 mg/L	Up to 15 mg/L	Up to 200 mg/L	0.05 to 0.2 mg/L	Up to 250 mg/L	Up to 1.0 mg/L	Up to 0.3 mg/L	Up to 0.05 mg/L	Up to 5 mg/L

Cited reference: National Secondary Drinking Water Regulations

Accessory part numbers listed below. See Parts and Accessories Catalog for more information.

	Accessory Kit	Replacement Filter		Tankless Flush Kit	Tankless Isolation Valve
AllClear Water Treatment Kit	RTG20251	RTG20252		RTG20124	RTG20220AB
Scale Prevention Device	RTG20246	RTG20247			



Water Supply

Water Supply

⚠ CAUTION:

This water heater **MUST ONLY** be used with the following water supply conditions to prevent product damage and operation failure.

- Clean, potable water free of corrosive chemicals, sand, dirt, and other contaminants.
- Inlet water temperatures above 32°F (0°C), but not exceeding 120°F (49°C).
- **DO NOT** reverse the **HOT** and **COLD** water connections.

- **DO NOT** connect this water heater to water lines previously used for space heating. All water piping and components shall be suitable for potable water.
- With recommended water quality (See chart above).

INSTALLATION INSTRUCTIONS

Thermal Expansion

Determine if a check valve exists in the inlet water line. Check with your local water utility company. It may have been installed in the cold water line as a separate back flow preventer, or it may be part of a pressure reducing valve, water meter or water softener. A check valve located in the cold water inlet line can cause what is referred to as a “closed” water system. A cold water inlet line with no check valve or back flow prevention device is referred to as an “open” water system. As water is heated, it expands in volume and creates an increase in the pressure within the water system. This action is referred to as “thermal expansion”. In an “open” water system, expanding water and the resulting pressure increase which exceeds the capacity of the water heater, flows back into the city main where the pressure is easily dissipated.

A “closed” water system, however, prevents the expanding water from flowing back into the main supply line, and the result of “thermal expansion” can create a rapid and dangerous pressure increase in the water heater and system piping. This rapid pressure

increase can quickly reach the safety setting of the relief valve, causing it to operate during each heating cycle. Thermal expansion, and the resulting rapid and repeated expansion and contraction of components in the water heater and piping system can cause premature failure of the relief valve, and possibly the heater itself.

NOTICE:

Replacing the relief valve will not correct the problem!

The suggested method of controlling thermal expansion is to install an expansion tank in the cold water line between the water heater and the check valve.

The expansion tank is designed with a built-in air cushion that compresses as the system pressure increases. This relieves the over-pressure condition and eliminates the repeat operation of the relief valve. For other approved methods of thermal expansion, contact an installing contractor, water supplier, or plumbing inspector.

Water Supply Connections

⚠ CAUTION:

IMPORTANT—DO NOT apply heat to the HOT or COLD water connections. If sweat connections are used, sweat tubing to the adapter before fitting the adapter to the water connections on the water heater. Any heat applied to the water supply fittings will permanently damage the internal components of the water heater.

NOTICE:

In cold environments, ice can accumulate in the water heater’s connectors. Plug in the water heater power cord for approximately 10 minutes before making these connections. This will melt any ice buildup.

Plumbing should be carried out by a qualified plumbing contractor in accordance with local codes.

Only use approved plumbing materials.

To allow the full flow capacity, it is recommended to keep water inlet and outlet pipes 3/4" (1.9 cm) diameter or larger.

To conserve energy and to prevent freezing, insulate both COLD and HOT water supply lines. **DO NOT** insulate the drain line or pressure-relief valve.

Recirculation

Direct recirculation is allowed, provided the loop is thermostatically controlled, and a timer is used to turn the pump off during off peak periods. The pump must be sized for a minimum of 5 gpm at 25 ft of head plus building head. A 10°F difference between the loop thermostat setting and water heater temperature setting must be maintained.

To ensure proper operation of the water heater, follow these water pressure guidelines.

Operation of the water heater requires a minimum water pressure of 14 psi (97 kPa) and a minimum water flow rate of 0.4 gpm (1.5 lpm).

Water pressure of 40 psi (276 kPa) is required to achieve maximum flow rate.

To maintain proper performance, there must be sufficient water supply pressure. Required Water Pressure =

Min. Operating Water Pressure (14 psi [97 kPa])

+ Pipe Pressure Loss

+ Faucet Pressure Loss

+ Safety Margin (more than 5 psi [34 kPa]).

To supply HOT water to upper floors, additional water pressure will be required (0.44 psi [3 kPa] per foot of height). Calculate the distance between the water inlet of the water heater (ground level) to the HOT water faucet farthest away from the water heater (upper floor level).

Well water systems should be set to ensure a minimum system pressure of 40 psi (276 kPa). The pressure should remain constant and stable during the operation of the water heater.

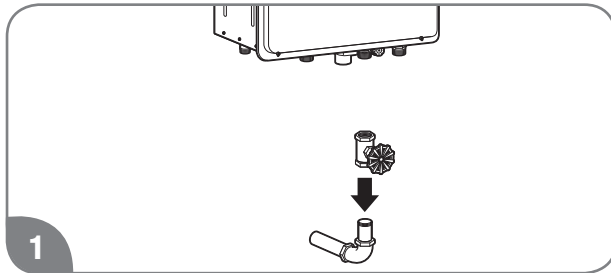
Gravity water pressure is not recommended. When the water is supplied from a water supply tank, the height of the tank, the diameter of the supply pipes, and their relation to water pressure need to be taken into consideration.

INSTALLATION INSTRUCTIONS

Water Supply Installation

NOTICE:

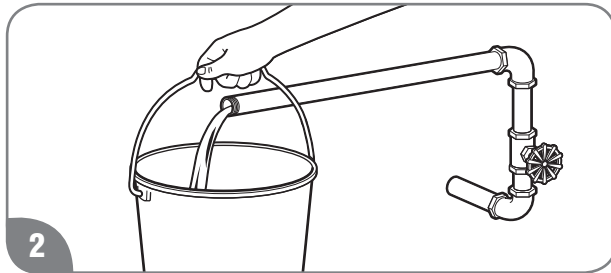
- Use only Teflon tape on all COLD and HOT water connections.
- If the water flow resistance of a showerhead is too high, the burner in the water heater will fail to ignite. Keep all showerheads clean from debris that could cause additional pressure drop.
- If using mixing valves on the outlet, choose one that prevents COLD water pressure from overcoming HOT water pressure.
- If multiple water heaters are installed in a manifold system, the water piping MUST be in “parallel” and the water pressure at each water heater should be 40 psi (276 kPa).



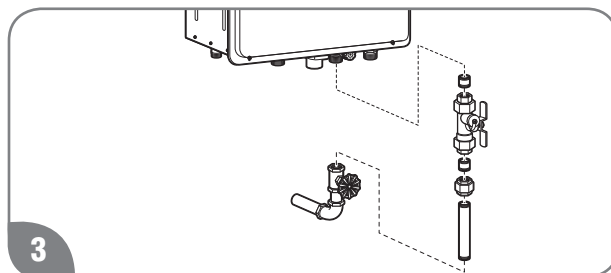
Install a COLD water shut-off valve near the inlet line on the water heater. This valve will be used for servicing and draining purposes.

NOTICE:

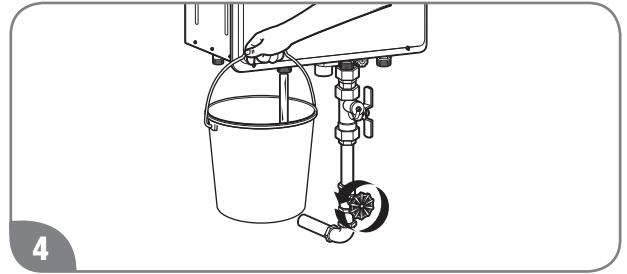
It is not recommended to use pipes with smaller diameters than the water supply connection of the water heater.



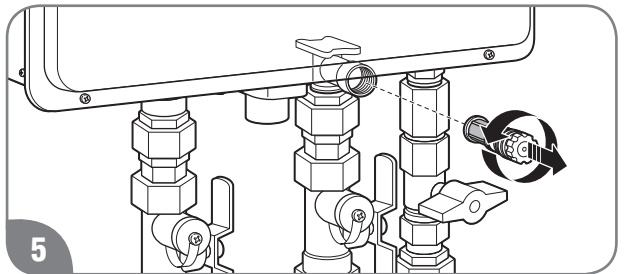
Before attaching the water line to the water heater, open the shut-off valve. Run the water until it has purged all contaminants (sand, debris, air, caulking, etc.).



Install a service valve on the end of the COLD water supply line and connect it to the water inlet on the water heater.



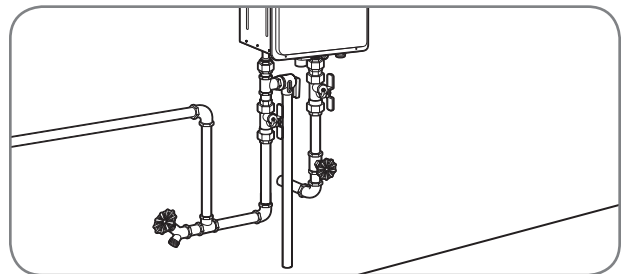
Open the shut-off valve in the COLD water Inlet line to check the water flow through the water heater.



Close the shut-off valve and remove, clean, and replace the water filter.

NOTICES:

- Be sure to connect the COLD water inlet and the HOT water outlet as shown on the water heater. If reversed, the water heater will not function.
- The flow rate of HOT water may vary when more than two faucets (e.g. appliances, fixtures, etc.) are being used simultaneously.
- The pipes MUST be completely drainable. If the HOT water faucets are located at a point higher than the water heater, place a drain valve at the lowest point.



It is recommended to use unions and flexible copper connections at the COLD and HOT water lines. They allow the water heater to be disconnected easily for servicing.

Use the following guidelines when connecting the HOT WATER OUTLET:

Connections between the water heater and point(s) of use should be as short as possible.

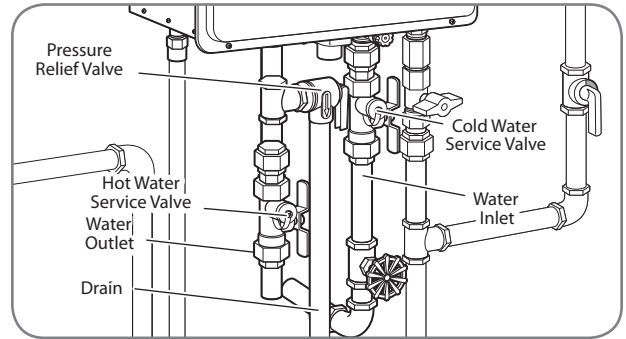
Local codes shall govern the piping used for water connections.

To conserve energy and to prevent freezing, insulate both COLD and HOT water supply lines. DO NOT insulate drain line or pressure-relief valve.

INSTALLATION INSTRUCTIONS

Water Piping Arrangement With Service Valve Kit

Service valve kits can attach to all tankless water heater systems. All kits include two full-port isolation valves to be used in the COLD and HOT water lines. When installed, these valves allow one person full diagnostic testing and ease of flushing the system. Contact your distributor or place of purchase for availability and installation information.



Water Supply (cont.)

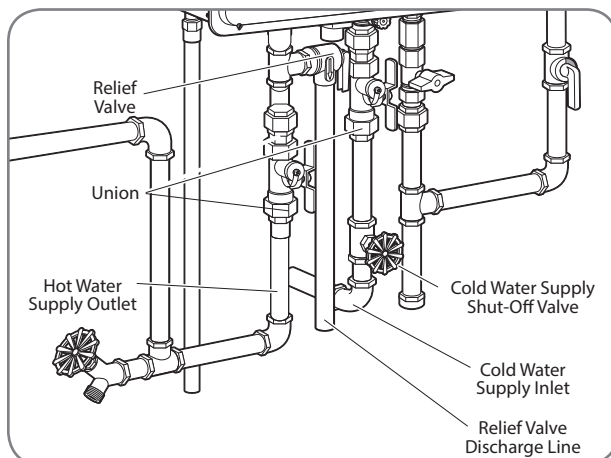
Relief Valve

A new pressure-relief valve, complying with the Standard for Relief Valves and Automatic Gas Shut-Off Devices for Hot Water Supply Systems, ANSI Z21.22/CSA 4.4, must be installed at the HOT water outlet connection of the water heater during installation. Local codes shall govern the installation of any relief valve.

NOTICE:

- The following drawing illustrates a pressure-only relief valve. If local codes require a combination temperature and pressure-relief valve, you may need to install an extension piece to ensure that the valve probe is not directly in the flow path of the water.
- A pressure relief valve supplied with this water heater must be installed as shown below.
- Manual operation of relief valves should be performed at least once a year.
- If the relief valve on the system discharges periodically, a problem exists. Turn off the water heater, unplug the unit, and call for service.

One end of the relief valve discharge line connects to the HOT water outlet pipe as shown above. The other end of the pipe should be routed to a suitable drain to eliminate potential water damage.



For safe operation of the water heater, be sure that:

The pressure rating of the relief valve must not exceed 150 psi (1,034 kPa) or the maximum working pressure of the water heater. (See the rating plate on the water heater.)

The BTUH rating of the relief valve must equal or exceed the BTUH input of the water heater. (See the rating plate on the water heater.)

No valve of any type should be installed between the relief valve and the water heater.

Discharge from the relief valve should be piped to a suitable drain. Piping used should be of a type approved for the distribution of hot water.

HOT and COLD water lines should be insulated up to the water heater. See "Water Supply Installation".

The discharge line must be NO SMALLER than the outlet of the relief valve. The drain line must pitch downward to allow for complete drainage of the line and the valve.

The end of the discharge line should not be threaded or concealed and should be protected from freezing. No valve of any type, restriction, or reducer coupling should be installed in the discharge line.

INSTALLATION INSTRUCTIONS

Hot and Cold Pipe Insulation Installation

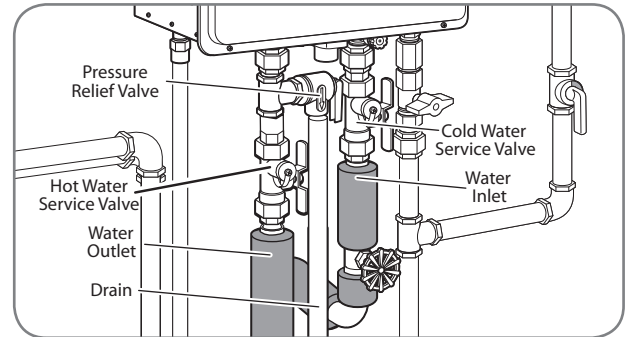
⚠️ WARNINGS:

- When pipe insulation is not rated for the appropriate weather conditions, install electric heat tracing or equivalent to prevent freezing of the pipes.
- DO NOT insulate or block drain valve on the hot outlet fitting.
- If pipes are allowed to freeze, the water heater and the pipes may malfunction or leak due to freezing water.

NOTICE:

The hot and cold water supply pipes should be insulated to provide additional freeze protection.

For increased energy efficiency, use pipe insulation as shown in the diagram. Insulate the pipes all the way to the top. DO NOT cover any drain or pressure-relief valve(s).



Plumbing



Condensate

Condensate Drainage

Be sure the condensate runs freely to a drain and does not accumulate inside the water heater. In cold climates, precautions may need to be taken to ensure that the condensate drain does not freeze.

All condensation must be drained and disposed of per local codes and requirements.

If the condensate drain gets blocked, an error code will display on the remote control. If this occurs, the condensate drain must be cleared.

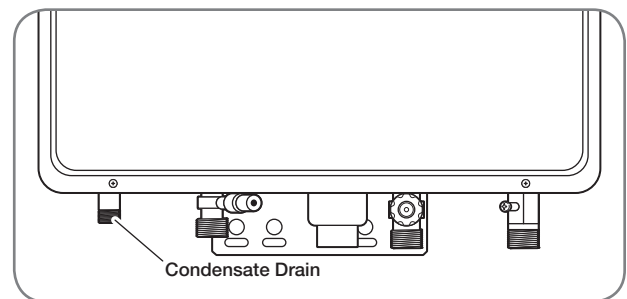
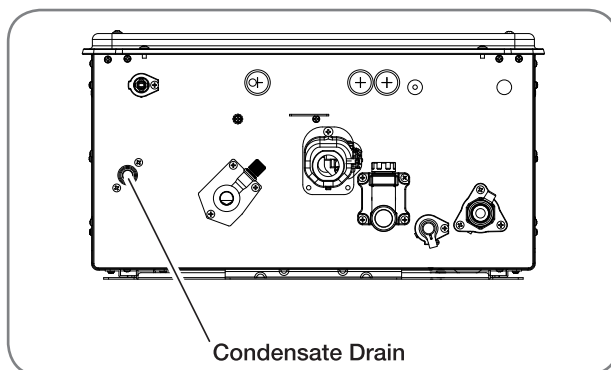
Use only PVC or CPVC pipe or flexible tube for the condensate drain line.

The drain pipe (along its entire length) must be at least the same diameter as the drain line.

The drain line should be as short as possible and have a downward slope toward the end.

The end of the drain pipe should be open to the atmosphere. The end should not be under water or other substances.

DO NOT connect the drain pipe directly to the drain sewer.



INSTALLATION INSTRUCTIONS

Gas Supply

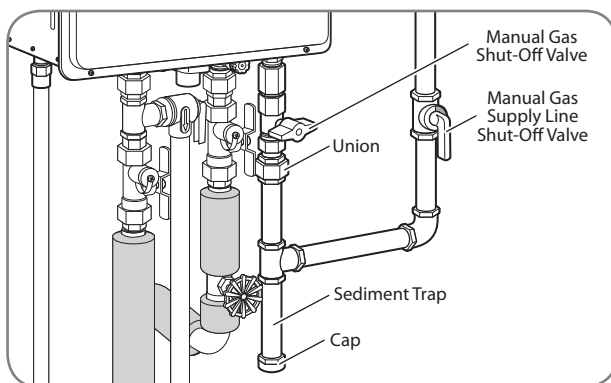
Gas Supply System

⚠ WARNING:

DO NOT attempt to convert this water heater for use with a different type of gas other than the type shown on the rating plate. Doing so could result in death, personal injury, explosion or fire, product damage, and/or poor operating conditions or performance.

NOTICE:

- Gas piping shall be in accordance with local utility company requirements and/or in the absence of local codes, use the latest edition of National Fuel Gas Code (NFGC), ANSI Z223.1. In Canada, use the latest edition of CAN/CSA B149.1, Natural Gas and Propane installation code.
- Apply a thin coat of pipe compound to all threaded male ends. Compound must be of the type resistant to the action of LP gas.
- To ensure proper water heater operation, the gas pipe and gas meter must be sized correctly.
- If flexible connectors are used, the minimum inside diameter must be 3/4" or greater and the rated capacity of the connector must be equal to or greater than the BTU capacity of the water heater. See manufacturer information for the gas connector. Lengths over 36 inches are not recommended.
- DO NOT use excessive force when tightening the pipe sections. Excessive force can damage the water heater, especially when Teflon pipe compound is used.



Gas Piping

Pipe-Sizing Procedure – The gas supply system must be properly sized to ensure the proper operation of this tankless water heater as well as all the gas appliances on the system. Failure to ensure the gas system, (meter, regulators, and piping) are properly sized could result in improper operation of this or other gas appliances. Insufficient gas pressure/supply can cause pilot outages, lockouts, or operating conditions that could lead to an appliance failure, improper combustion, carbon monoxide, sooting, or fire. Gas line sizing is based on gas type, the pressure drop in the system, the gas pressure supplied, and the gas line type. For gas pipe sizing in the United States, refer to the National Fuel Gas Code, (NFPA 54, ANSI Z223.1). For Canadian gas pipe sizing, refer to the Natural Gas and Propane Installation Code CAN/CSA B149.1.

These simplified instructions only address low pressure gas systems using Schedule 40 Metallic Pipe (Black Iron). For hybrid gas systems, high pressure main lines with regulators at the appliances, gas systems piped with corrugated stainless steel tubing (CSST), or Propane gas systems.

Determining the required regulator and gas meter size.

Find the BTU capacity of each appliance on the system. This information is located on a rating label attached to the appliance. Total the BTU of all the appliances together and divide that by the heating value of the fuel (for natural gas the average is 1,024 or 2,546 for propane). This will give you the total cubic feet per hour of gas required for the system.

At your gas meter/regulator there will be a rating plate that gives the cubic feet per hour capacity of that equipment. If the total gas required for the system is greater than the rating of the meter/regulator then the local gas company will need to be contacted in order to upgrade the meter/regulator for the system.

$$\text{Cubic Feet Per Hour (CFH)} = \frac{\text{Gas Input of Water Heater (BTU/HR)}}{\text{Heating Value of Gas (BTU/FT}^3\text{)}}$$



Gas Supply (cont.)

Determining the required pipe size.

The gas system is designed to operate at a certain maximum pressure drop. A pressure drop greater than what is permissible can cause operational issues with the gas appliances. The National Fuel Gas Code (NFPA 54, ANSI Z223.1 2012) allows for three pressure drop levels, a 0.3 inch W.C., (see table 2); a 0.5 inch W.C., (see table 3) and a 3.0 inch W.C., (see table 4) pressure drop for natural gas. Only a 0.5 inch W.C. pressure drop is allowable with Propane (see table 5). For Canadian installations the maximum allowable pressure drop is 0.5 inch W.C., (see table 3).

Measure the inlet gas pressure to the system using a manometer. For Natural Gas, if the inlet pressure is less than 8.0 inches W.C. then use Table 2 or 3 for your gas pipe sizing. **Table 4 can only be used if the inlet gas pressure is 8.0 inches W.C. or greater.** Table 4 cannot be used for Canadian installations.

The gas piping system consists of a main trunk line that runs from the meter/regulator and branch lines that run from the trunk line to the individual appliances. A branch may carry gas for more than one appliance.

The trunk line must be sized to carry the entire load of all the gas appliances on the system. As with determining the meter/regulator size, total the BTU of all the appliances together and divide that by the heating value of the fuel (for natural gas the average is 1,024 or 2,546 for propane). This will give you the total cubic feet per hour of gas required for the trunk line. Measure the total length of the line Refer to Table(s) 2, 3, or 4 and find the number closest to but higher than the total cubic feet per hour requirement calculation. This will tell you the minimum size that the trunk line must be.

Each branch line must be sized to carry the load of the appliance(s) attached to it. If more than one appliance is on a branch total the BTU and as with the trunk line divide that by the heating value of the fuel. Refer to Table(s) 2, 3, or 4 and find the number closest to but higher than the total cubic feet per hour requirement calculation for the branch and appliance(s). This will tell you the minimum size for that branch line and appliance.

Final Considerations

If this water heater is replacing an existing water heater, it is important to verify the capacity of the gas system. Check the capacity of the meter/regulator, and verify the pipe lengths and sizes.

An improperly sized gas system will cause operational issues with this water heater. Other appliances on the gas system may be affected as well.

Flexible Gas Connectors may be used however the BTU capacity of the connector must be checked. Each connector has a capacity label on it, verify that the connector has a BTU capacity greater than that of the water heater. An undersized flexible gas connector will cause operational issues with this water heater.

Half-inch gas lines are permissible provided the gas system meets certain requirements. **First, the gas pressure on the system must be 8.0 inch W.C. or greater.** Second the capacity of the pipe as outlined in Table 4 is followed. If the existing pipes are too small it could cause a pressure drop greater than 3.0 inch W.C. and will cause operational issues with this water heater as well as other gas appliances on the system.

INSTALLATION INSTRUCTIONS

Gas Supply (cont.)

This is an example, in US, refer to current National Fuel Gas Code, NFPA 54 for correct pipe sizing chart, and in Canada, refer to current Natural Gas and Propane Installation Code CAN/CSA B149.1.

Table 2 - Pipe-Sizing - Natural Gas					
Schedule 40 Metallic Pipe (Black Iron)					
Inlet System Pressure: Less than 2 PSI (55 inches W.C.)					
Allowable Pressure Drop: 0.3 inches W.C.					
Specific Gravity : 0.60					
(Capacity in cubic feet per hour)					
Length	Pipe Size (Inches)				
	½	¾	1	1¼	1½
10	131	273	514	1,060	1,580
20	90	188	355	726	1,090
30	72	151	284	583	873
40	62	129	243	499	747
50	55	114	215	442	662
60	50	104	195	400	600
70	46	95	179	368	552
80	42	89	167	343	514
90	40	83	157	322	482
100	38	79	148	304	455
Information in this chart obtained from NFPA 54, ANSI Z223.1 - 2012 Table 6.2(a)					

Table 3 - Pipe-Sizing - Natural Gas					
Schedule 40 Metallic Pipe (Black Iron)					
Inlet System Pressure: Less than 2 PSI (55 inches W.C.)					
Allowable Pressure Drop: 0.5 inches W.C.					
Specific Gravity : 0.60					
(Capacity in cubic feet per hour)					
Length	Pipe Size (Inches)				
	½	¾	1	1¼	1½
10	172	360	678	1390	2090
20	118	247	466	957	1430
30	95	199	374	768	1150
40	81	170	320	657	985
50	72	151	284	583	873
60	65	137	257	528	791
70	60	126	237	486	728
80	56	117	220	452	677
90	52	110	207	424	635
100	50	104	195	400	600
Information in this chart obtained from NFPA 54, ANSI Z223.1 - 2012 Table 6.2(b)					

Table 4 - Pipe-Sizing - Natural Gas					
Schedule 40 Metallic Pipe (Black Iron)					
Inlet System Pressure: 8.0 inches W.C. or greater, but Less than 2 PSI (55 inches W.C.)					
Allowable Pressure Drop: 3.0 inches W.C.					
Specific Gravity : 0.60					
(Capacity in cubic feet per hour)					
Length	Pipe Size (Inches)				
	½	¾	1	1¼	1½
10	454	949	1,787	3,669	5,497
20	312	652	1,228	2,522	3,778
30	250	524	986	2,025	3,778
40	214	448	844	1,733	2,597
50	190	387	748	1,536	2,302
60	172	360	678	1,392	2,085
70	158	331	624	1,280	1,919
80	147	308	580	1,191	1,785
90	138	289	544	1,118	1,675
100	131	273	514	1,056	1,582
Information in this chart obtained from NFPA 54, ANSI Z223.1 - 2012 Table 6.2(c)					

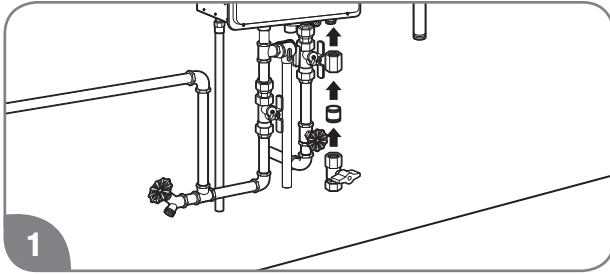
Table 5 - Pipe-Sizing - Undiluted Propane					
Schedule 40 Metallic Pipe (Black Iron)					
Inlet System Pressure: 11 inches W.C.					
Allowable Pressure Drop: 0.5 inches W.C.					
Specific Gravity : 1.5					
(Capacity in cubic feet per hour)					
Length	Pipe Size (Inches)				
	½	¾	1	1¼	1½
10	291	608	1150	2350	3520
20	200	418	787	1620	2420
30	160	336	632	1300	1940
40	137	287	541	1110	1660
50	122	255	480	985	1480
60	110	231	434	892	1340
80	101	212	400	821	1230
100	94	197	372	763	1140
125	89	185	349	716	1070
150	84	175	330	677	1010
Information in this chart obtained from NFPA 54, ANSI Z223.1 - 2012 Table 6.3(d)					

INSTALLATION INSTRUCTIONS

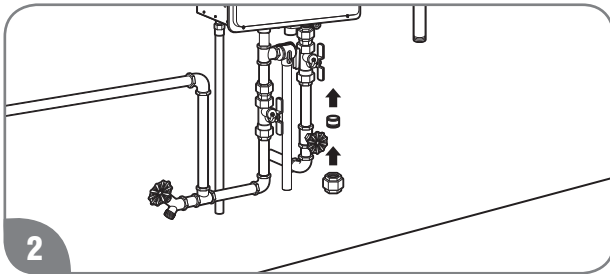


Gas Supply (cont.)

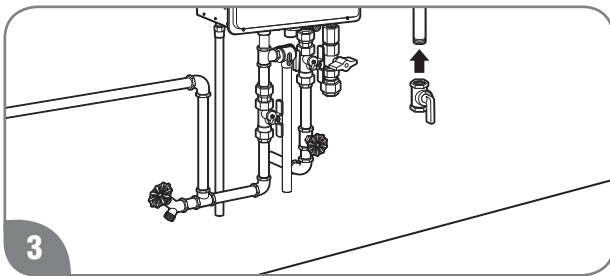
Gas Supply Installation



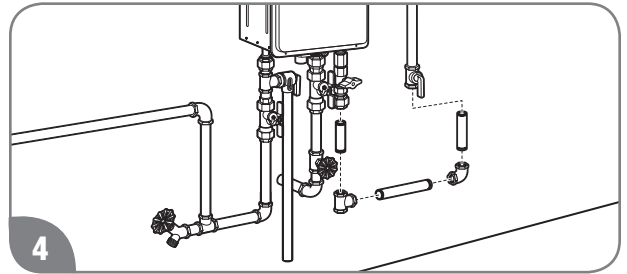
1
Install the manual gas appliance shut-off valve to the gas connection at the water heater. The shut-off is supplied with the water heater.



2
Install a ground joint union or ANSI design-certified semi-rigid or flexible gas appliance connector to the open end of the manual gas appliance shut-off valve. The NFGC, ANSI Z223.1 and CAN/CSA B149.1 codes mandate the use of manual gas shut-off valve.



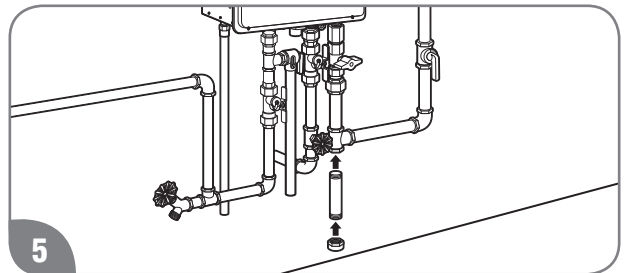
3
Install a manual gas supply line shut-off valve to the end of the gas supply line.



4
Using the proper-size piping, fittings, and components, build the gas supply line to the water heater.

NOTICE:

The gas supply line should be a minimum of 3/4-in. (1.9-cm) black steel pipe or other approved gas piping material.



5
Install a sediment trap at the lowest portion of the gas line.

The inlet gas pressure to the water heater must NOT exceed 10.5 in. w.c. (2.6 kPa) for natural gas and 13 in. w.c. (3.2 kPa) for LP gas. For purposes of input adjustment, the minimum inlet gas pressure (with main burner on) is shown on the water heater rating plate. If high or low gas pressures are present, contact your gas supplier for correction.

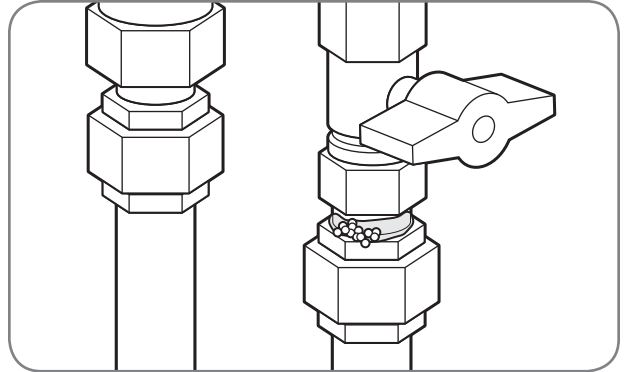
INSTALLATION INSTRUCTIONS

Leak Testing

⚠️ WARNING:

Never use an open flame to test for gas leaks, because death, personal injury, and/or property damage can result.

The water heater and its gas connections **MUST** be leak-tested at normal operating pressures before the unit is placed in operation. These tests should also include all factory connections.

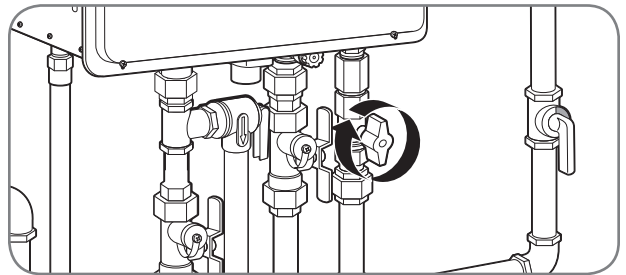


- Turn on the gas shut-off valve(s) to the water heater.
- Use a soapy water solution to test for leaks at all the connections and fittings. If bubbles are seen, it indicates a gas leak that must be corrected.
- Contact a qualified service technician.

Pressure Testing the Gas Supply System

⚠️ WARNING:

If inlet gas pressure is out of allowable range [4.0" w.c. (1.0kPa) – 10.5" w.c. (2.6kPa)] for Natural Gas, or [8.0" w.c. (2.0kPa) – 13.0" w.c. (3.2kPa)] for LP gas, a gas pressure regulator must be installed to maintain the allowable inlet gas pressure.



The water heater and its manual gas shut-off valve must be disconnected from the gas supply piping system during any pressure testing of the system at test pressures in excess of 1/2 psi (3.5 kPa).

The water heater must be isolated from the gas supply piping system by closing the manual gas shut-off 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).

INSTALLATION INSTRUCTIONS



Gas Supply (cont.)

High-Altitude Installation

The water heater is certified for installations up to 2000 ft. (610 m) above sea level. The input rating of this water heater is based on sea level operation. At higher elevations, the actual input rate may be lower than the value listed on the rating label due to the derating of Natural Gas and LP Gas.

NOTICE:

For installations above 2000 ft. (610 m) elevation, contact a qualified service technician to make the proper altitude adjustments. See “High Altitude DIP Switch Adjustments” for additional information.

⚠ WARNING:

DO NOT install this water heater at elevations above 2000 ft. (610 m) without the proper adjustments. Please contact your installer, local gas supplier, place of purchase, or the Rheem Customer Service phone number listed in the “Call for Assistance” section.



Electrical Wiring

⚠ DANGER:

Shock Hazard – Before servicing the water heater, turn off the electrical power to the water heater at the main disconnect or circuit breaker. Failure to do so will result in death or serious personal injury.

⚠ WARNING:

Field wiring connections and electrical grounding must comply with local codes or, in the absence of local codes, with the latest edition of the National Electrical Code, ANSI/NFPA 70, or in Canada, Canadian Electrical Code, CAN/CSA C22.1, Part 1.

⚠ CAUTION:

Label all wires prior to disconnecting is recommended. Wiring errors can cause personal injury, product damage, and/or dangerous operating conditions. Verify correct operation after servicing.

NOTICE:

- DO NOT connect power until venting installation is complete (see Venting Installation).
- Wait ninety (90) seconds after power is connected for the first time to initiate operation of the water heater.

Power consumption is up to 100 Watts during normal operation, 3-5 Watts during standby, waiting to run, and up to 200 Watts during the freeze protection operation.

Power Cord

The electric power supply requirement for this water heater is 120 VAC/60 Hz, 2 amps.

A dedicated circuit is recommended for the water heater. DO NOT connect to a GFCI or AFCI circuit. Multiple units may be connected to a single circuit up to the circuit rating.

DO NOT use 3-prong to 2-prong adapters. DO NOT use power strips or multiple outlet adapters.

All direct-vent gas models come with a 3-prong power cord. Only use this power cord and a matching grounded electrical outlet.

All outdoor gas models DO NOT come with a power cord. Only hard-wire to an appropriate power outlet with a ground terminal.

Keep any excess length of the power supply cord on the outside of the water heater.

If local codes require hard-wiring, see instructions for “Hard-Wiring the Electrical Connections” below.

Hard-Wiring the Electrical Connections

Wiring should be performed by a qualified electrician in accordance with local codes.

The water heater requires a properly grounded 120 VAC/60 Hz dedicated power supply. Multiple water heaters may be connected to a single circuit up to that circuit’s rating.

DO NOT connect grounding wire to water pipes, gas pipes, telephone cables, lighting conductor circuits, or to any other grounding circuits that require a GFCI or AFCI (arc fault circuit interrupter).

An ON/OFF switch must be provided and installed for the incoming 120 VAC power supply.

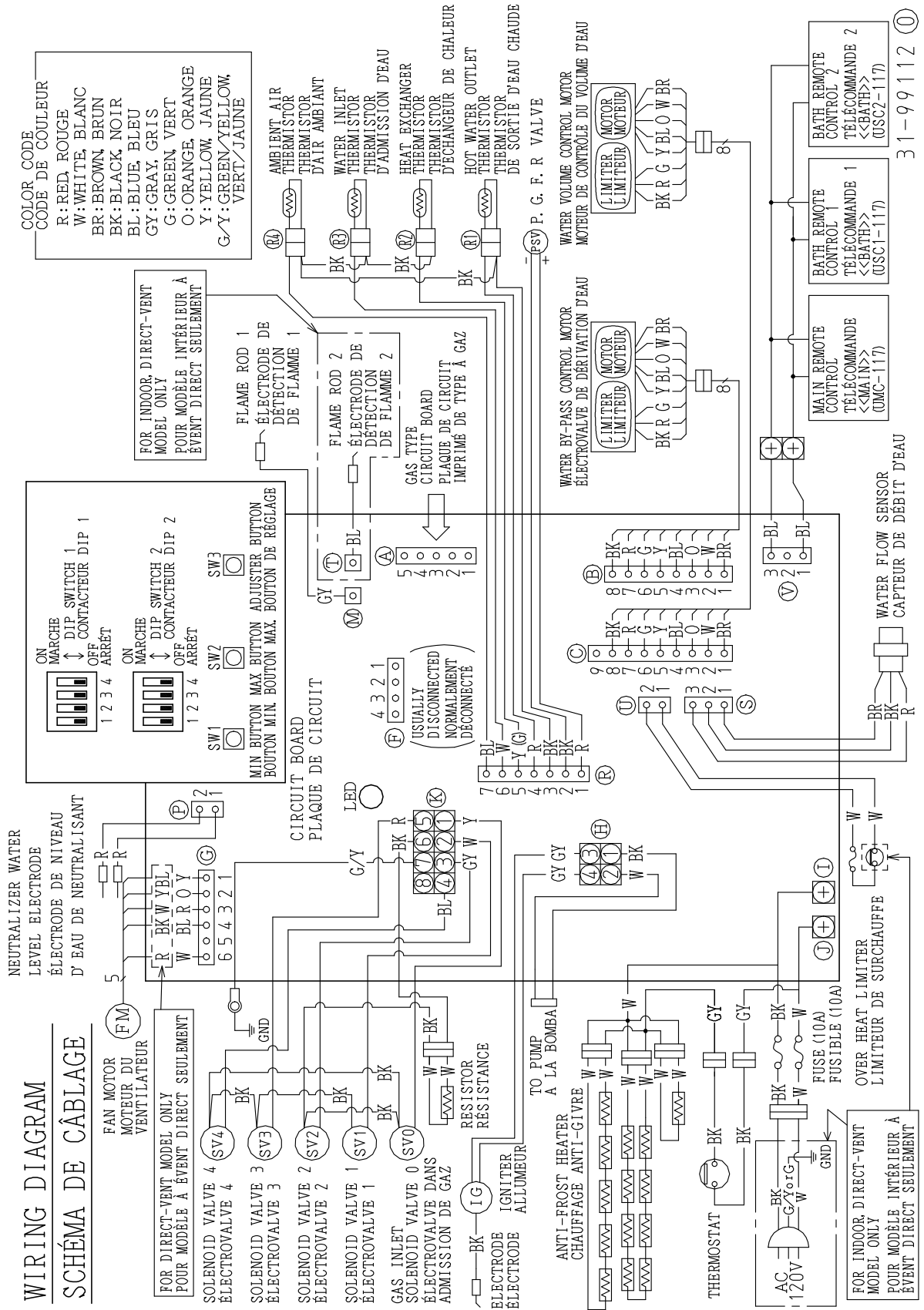
Wire the water heater exactly as shown in the wiring diagram. This wiring diagram can also be found inside the water heater cover panel.

The green screw is provided in the enclosure for a grounding connection.

Connect the live wire to the black wire and neutral wire to the white neutral wire.

INSTALLATION INSTRUCTIONS

Wiring Diagram



INSTALLATION INSTRUCTIONS



Electrical Wiring (cont.)

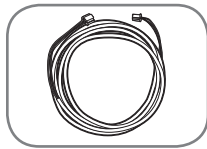
Remote Control Selection and Location

⚠ WARNING:

Field wiring connections and electrical grounding must comply with local codes or, in the absence of local codes, with the latest edition of the National Electrical Code, ANSI/NFPA 70, or in Canada, Canadian Electrical Code, CAN/CSA C22.1, Part 1.

NOTICE:

The provided remote control will allow maximum temperature settings of 120°F (49°C). Temperatures up to 140°F (60°C) for residential applications and up to 185°F (85°C) for commercial applications* can be achieved with the MAIN (UMC-117) remote control. Only qualified service personnel should perform this adjustment.



- An optional cable (EZ Link Cable™) can be purchased separately to manifold two water heaters together.



- DO NOT attempt to disassemble a remote control. All controls are sealed and calibrated for accurate water heater control and operation.

One remote control is provided with the water heater. Additional remote controls may be purchased separately. The available remote controls are listed in the following chart. Up to three remote controls can be used with the water heater. No other manufacturer's controls are suitable for use with this water heater.

Review the following considerations before determining the location of the remote control(s):



- DO NOT install any remote control outdoors or where it can come in contact with water.

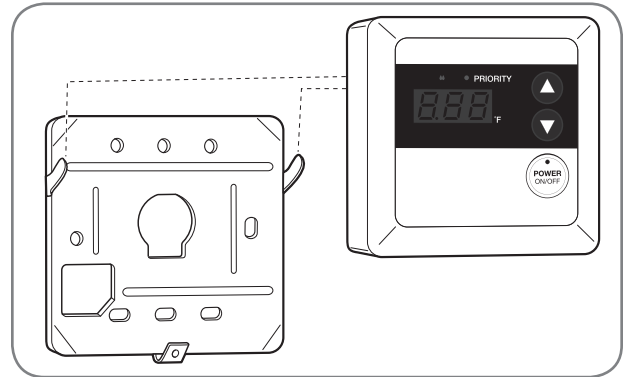


- Avoid installing the remote control in the following areas and/or conditions:
 - area exposed to heat.
 - area exposed to steam.
 - area exposed to oil.
 - area exposed to direct sunlight.
 - areas near stored or used flammable products.

Place remote control out of children's reach.

The remote control should be installed in a convenient location (e.g., kitchen, laundry room, utility room, or directly next to the water heater).

The maximum distance between the water heater and the remote control installation location is limited to 195 ft. (59 m) of wire.



Electrical

Remote Control Model Number	Remote Control Description	Temperature Set Point Range	Availability
UMC-117	MAIN	100°F–120°F (38°C–49°C)	Factory Default
		85°F (29°C)	Qualified Technician
		125°F–140°F (52°C–60°C)	Adjustment for Residential Products
USC1-117	BATH 1	85°F (29°C)	Qualified Technician
		125°F–185°F (52°C–85°C)	Adjustment for Commercial Products*
USC2-117	BATH 2	100°F–120°F (38°C–49°C)	Optional (Sold Separately)
		85°F (29°C)	Qualified Technician Adjustment
MIC-6 or MIC-185** Manifold System	Manifold System		Optional (Sold Separately)

*A commercial conversion kit can be purchased to achieve temperatures up to 185°F (85°C).

**When a manifold system is installed, the main remote control connected to the manifold controller (MIC-6 or MIC-185) has priority over the remote controls connected to the water heater.

INSTALLATION INSTRUCTIONS

Remote Control Installation

⚠ WARNING:

Field wiring connections and electrical grounding must comply with local codes or, in the absence of local codes, with the latest edition of the National Electrical Code, ANSI/NFPA 70, or in Canada, Canadian Electrical Code, CAN/CSA C22.1, Part 1.

NOTICE:

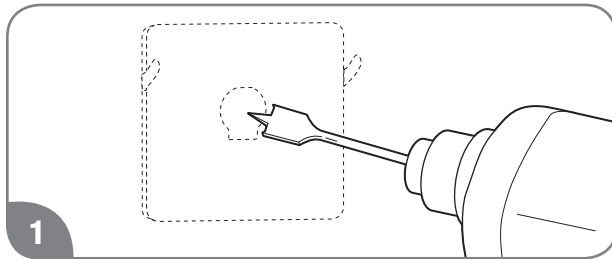
Remote control cable needs to be type CL3R/CMR shielded security wire equivalent (18 AWG) and need not to be polarity-sensitive.

It is not recommended to have wiring exposed.

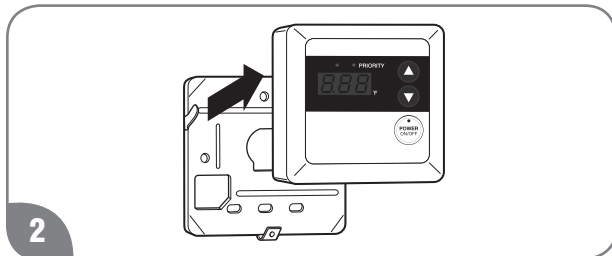
DO NOT apply sealant to remote control cable.

DO NOT use network cable, telephone wire, or any twisted-pair cable.

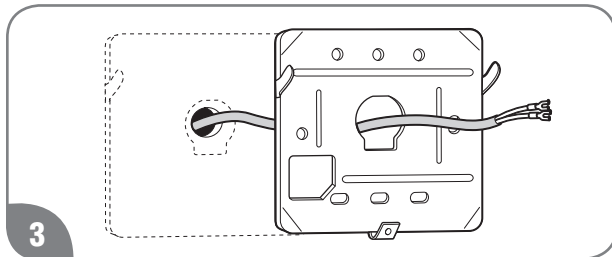
Connecting the MAIN (UMC-117) Remote Control to a Wall:



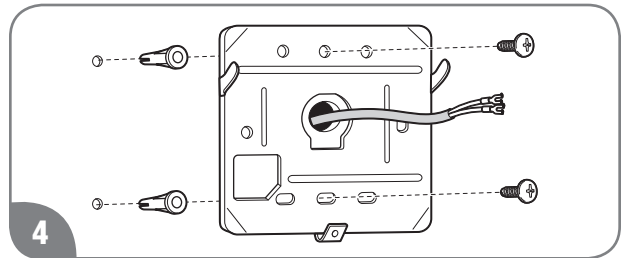
Drill a 1- to 1 1/2-in. (2.5/3.8-cm) hole at the proposed control location. Install the remote control cable between the location of the remote control and the water heater.



Remove the remote control from the base plate.



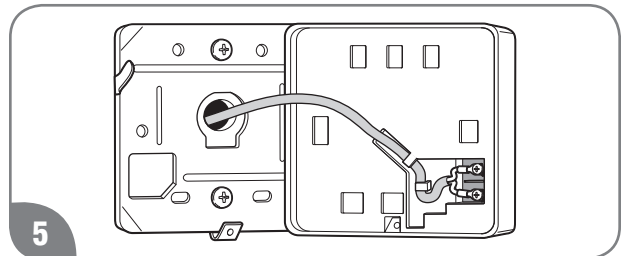
Feed the remote control cable through the large center hole in the base plate.



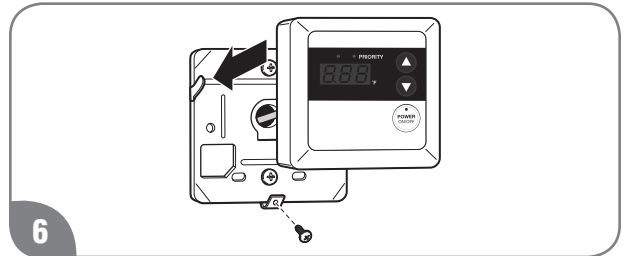
Install the base plate to the wall using suitable screws and wall anchors.

NOTICE:

The tabs on the base plate should always point out.



Connect the remote control to the remote control cable.



Position the remote control on the base plate.

NOTICE:

The tabs on the base plate should line up with the slots on the back of the remote control.

Secure the remote control to the base plate with one screw into the bottom tab.

NOTICE:

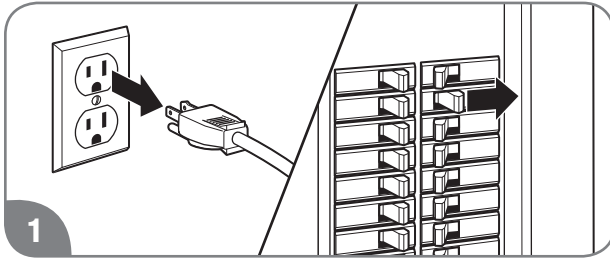
DO NOT attempt to connect the remote control or control wire to the water heater while the water heater has power applied to it. **Damage to the water heater will occur. DO NOT** cut or strip the wiring while it is connected to the water heater or while the water heater has power applied to it.

INSTALLATION INSTRUCTIONS

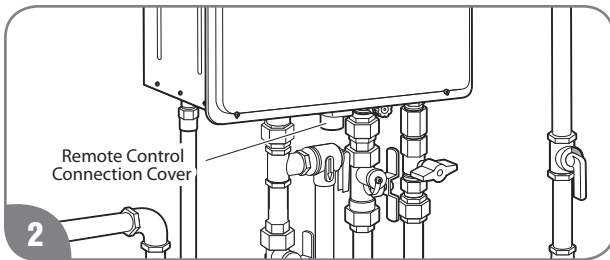


Electrical Wiring (cont.)

Connecting the Remote Control to the Water Heater:



1 Ensure that the power to the water heater has been disconnected.

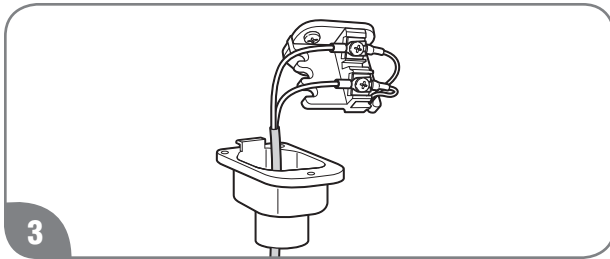


2 Loosen the one screw located on the remote control connection cover. The connection cover is made of white plastic.

NOTICE:

DO NOT REMOVE FRONT PANEL. Remote control wires are connected on the bottom of the unit.

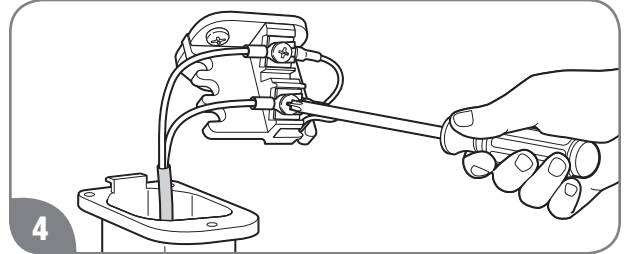
There are NO accessible remote control terminals inside the water heater.



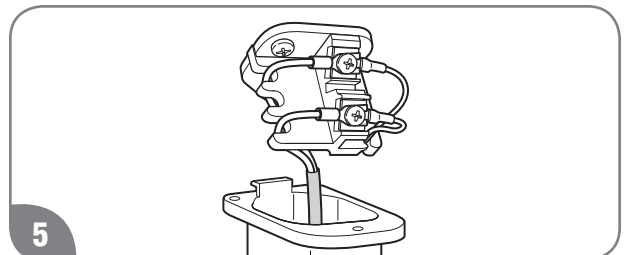
3 Connect the remote control extension cables from the remote control to the remote control connection terminals.

NOTICE:

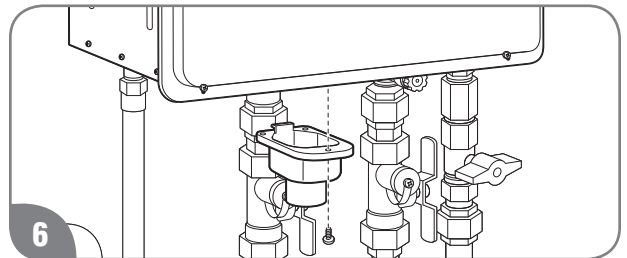
The remote control wire connection terminals are not polarity-sensitive.



4 Firmly tighten the terminal screws by hand.



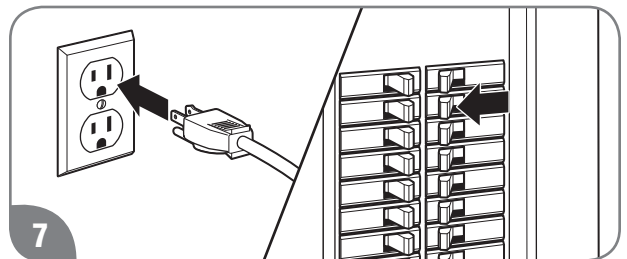
5 Secure the remote control extension cable on the hook located on the side of the remote control connection base.



6 Reinstall the remote control connection cover and secure with the one screw.

NOTICE:

DO NOT connect power until venting installation is complete.



7 Switch on the power supply to the water heater. Check for proper operation of the remote control and the water heater.

INSTALLATION INSTRUCTIONS



Insulation Blankets

In general, insulation blankets for external use on gas water heaters are not necessary. The purpose of an insulation blanket is to reduce the standby heat loss from the water heater's storage tank. Since these water heaters **DO NOT** store water, they eliminate the need for the insulation blanket.

▲WARNING:

Never cover the air inlet, flue outlet, or operating and warning labels attached to the water heater. Covering these components will cause dangerous operating conditions that can lead to death, personal injury, property damage, and/or product damage.

The manufacturer's warranty does not cover any damage or defect caused by insulation, insulation attachment, or use of any type of energy-saving or other unapproved devices (unless authorized by the manufacturer). The use of unauthorized energy-saving devices can result in death, personal injury, and/or property damage. The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized devices.



Installation Precautions

Follow all installation instructions covered in this manual.

Check the inlet gas pressure to make sure it is within the range specified on the rating plate.

Make sure there is adequate air for combustion and ventilation as described on "Venting" in this manual.

Maintain proper clearances to combustibles and noncombustibles as specified on the rating plate.

Make sure the venting system complies with local codes, National Fuel Gas Code (ANSI Z223.1/NFPA 54) or Natural Gas and Propane Installation Code (CAN/CSA B149.1), and the guidelines found on "Venting" in this manual.

Make sure the heater and remote control are properly fastened to their mounting surfaces.

Make sure the heater and remote control are wired in accordance with all regulations and codes without any exposed connections.

Contact the local gas company to make sure the gas meter and gas piping are adequately sized.

Use only Teflon tape on all male water line connections and fittings.

DO NOT block or restrict any outside air intake openings.

DO NOT remove the front cover unless absolutely necessary. This should only be done by a qualified service technician.

DO NOT install this product where standing water may occur.

DO NOT use pipe dope on water line connections and fittings.

DO NOT use Teflon tape on gas line connections and fittings in US.

INSTALLATION INSTRUCTIONS



Installation Checklist

A. Water Heater Location

- Indoor water heaters must be installed indoors.
- Outdoor water heaters must be installed outdoors.
- Close to area of ventilation termination (indoor models).
- Protected from freezing temperatures.
- Proper clearance from combustible material observed.
- Sufficient fresh air supply for proper operation of water heater.
- Air supply free of corrosive elements and flammable vapors.
- Provisions made to protect area from water damage.
- Sufficient room to service heater.
- Combustible materials, such as clothing, cleaning materials, and rags clear of the heater and vent piping.
- Water heater is properly secured to the wall.

B. Vent (Indoor Models)

- Vent pipe material is ULC S636 approved and manufacturer-approved.
- Horizontal air intake pipe and exhaust pipe have a 1/4" per foot UPWARD slope toward the vent terminal.
- Vertical venting is installed as described on "Vertical Vent Installation.
- Connection(s) securely fastened together with cement and airtight.
- All vent runs are properly installed.
- Vent terminal is properly installed.
- Maximum vent length is observed.
- DIP Switches are properly adjusted per vent length and elevation

C. Water Supply/Relief Valve

- Water supply has sufficient pressure.
- Air has been purged from the water heater and the piping.
- Water connections tight and free from leaks.
- Water filter is clean and in place.
- All piping has been assembled as described on "Water Supply".
- Water pipes are insulated and protected from freezing, if necessary.
- Pressure-relief valve properly installed with discharge line running to open drain.
- Discharge line protected from freezing, if necessary.

D. Gas Supply

- Gas type matches listing on rating plate.
- Gas supply pressure is sufficient for the water heater.
- Gas line equipped with shut-off valve, union and sediment trap as described on "Gas Supply System".
- Approved pipe-joint compound has been used on all gas pipe connections.
- All connections and fittings have been checked for leaks with a soapy water solution.
- Gas company inspected installation (if required).

E. Electrical Wiring

- Supply cord and/or wiring meets all local codes, National Electrical Code, ANSI/NFPA 70, in the U.S., or Canadian Electrical Code, CAN/CSA C22.1, Part 1, in Canada.
- Voltage matches listing on rating plate.
- Water heater is properly grounded.

F. Condensate

- Condensate drain is properly installed.

INSTALLATION INSTRUCTIONS



Piping for Space Heaters

Local codes or plumbing authority requirements may vary from the instructions or diagrams provided in this manual and take precedence over these instructions.

Combination Potable and Space Heating Application

⚠ DANGERS:

When this system requires water for space heating at elevated temperatures (above 125°F [52°C]), a mixing or tempering valve **MUST BE** installed in the hot water supply line to the house in order to reduce the scald hazard potential.

Any piping or components used in the installation of this water heater in a combination potable and space heating application must be suitable for use with drinking water.

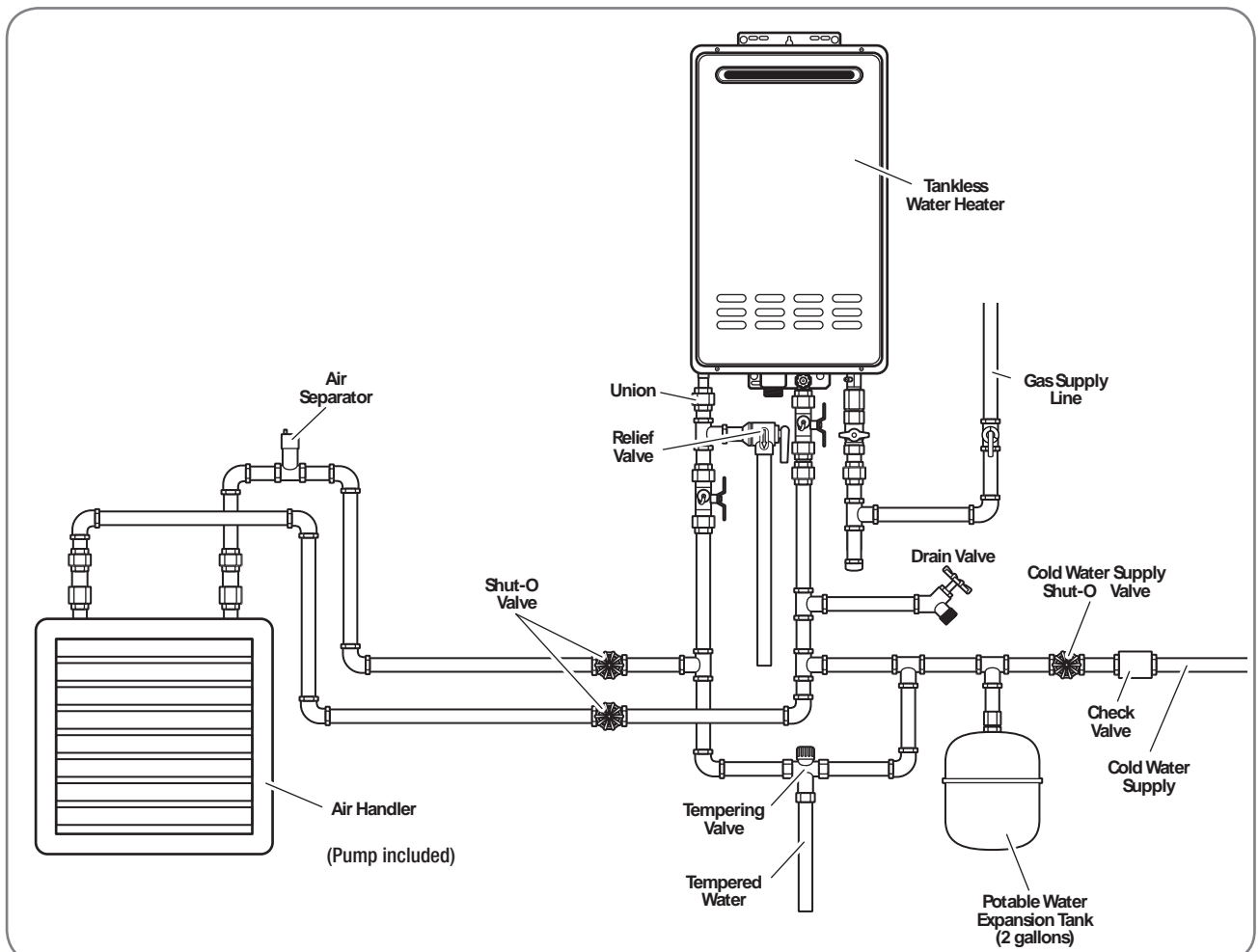
If this water heater is installed in an application intended to supply domestic hot water needs and hot water for space heating purposes, **DO NOT** connect the heater to an existing heating unit or components of a heating system that have previously been used with a nondrinking water system.

Toxic chemicals such as those used for boiler treatment may be present and will contaminate the drinking water supply causing possible health risks. Never introduce toxic chemicals, such as glycol and those used for boiler treatment, into this system.

This water heater is **NOT** approved as the dedicated space heating unit.

This water heater must be used for combination applications with air handler only and not for indoor heating applications.

Typical Combination Installation



INSTALLATION INSTRUCTIONS



Recirculation Control

Local codes or plumbing authority requirements may vary from the instructions or diagrams provided in this manual and take precedence over these instructions.

Your tankless water heater has the ability to control an external recirculation pump. Two modes are available, Energy Saver and Performance, which recirculate the water in the plumbing system to provide hot water more quickly when a faucet is opened. Rheem offers a fully packaged recirculation pump kit. See the Parts and Accessories catalog for more information.

NOTICE:

Recirculation control is for residential application only. Recirculation control cannot be used with an air handler or with multiple water heater installations. The maximum temperature setting is 140°F (60°C) in recirculation control.

Pump Requirements

Voltage: 120V, 60Hz

In-rush current: Less than 2.5 amps

Amperage: less than 2.0 amps

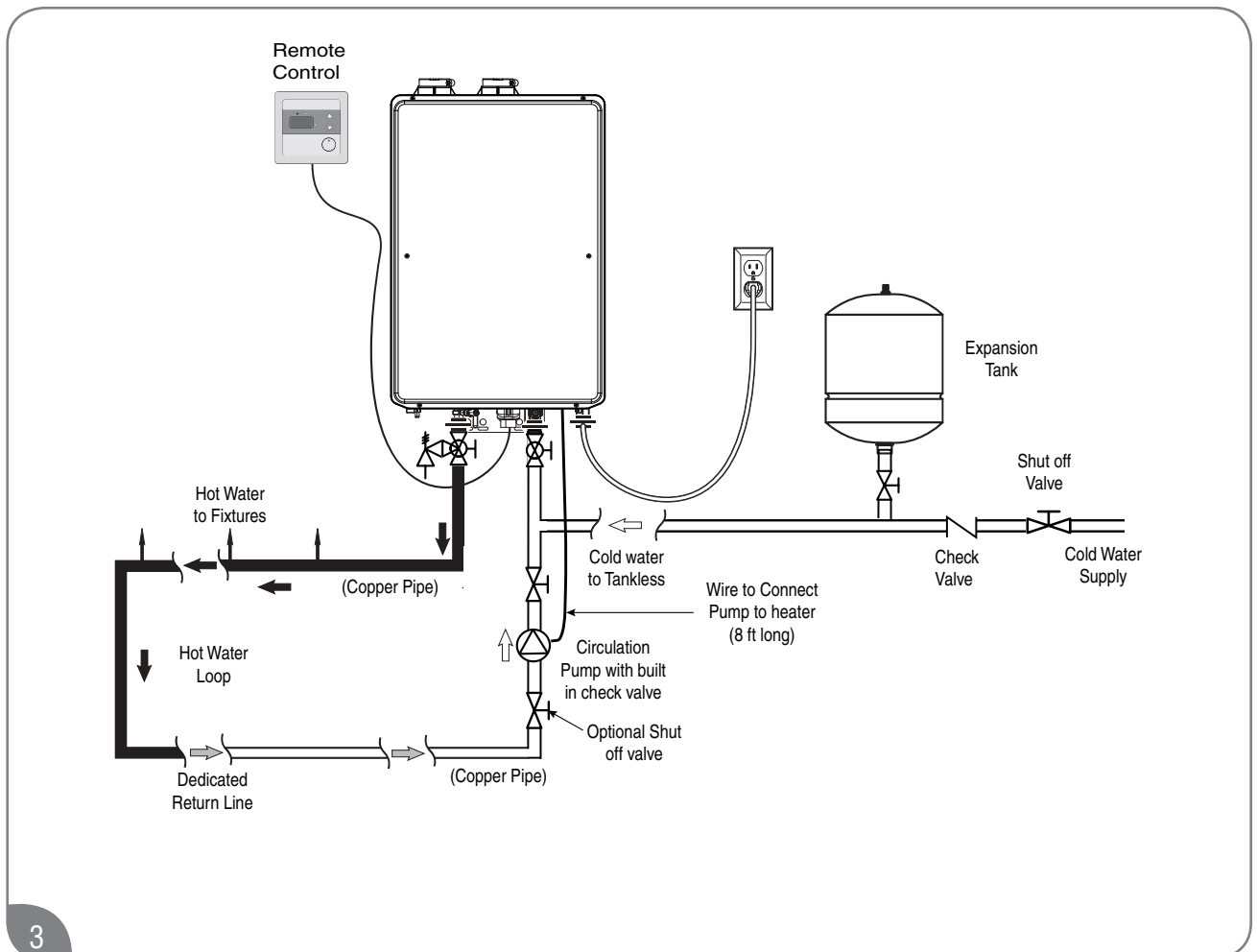
⚠ WARNING:

A control board can be damaged if amperage exceeds 2.0 amps.

Pump Size

The pump should be sized for about 2.5 gpm at the pressure drop through the tankless water heater and the supply and return plumbing in the recirculation loop. Contact service department listed on page 26 of this use and care manual if you need more information.

Typical Recirculating Pump Installation



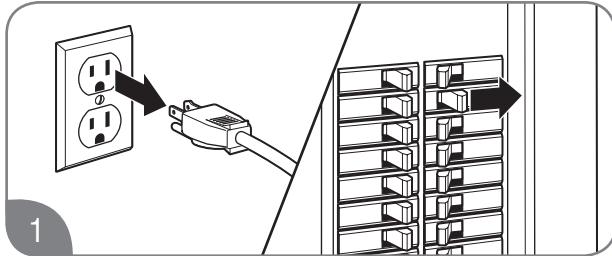
Recirculating Pump

INSTALLATION INSTRUCTIONS

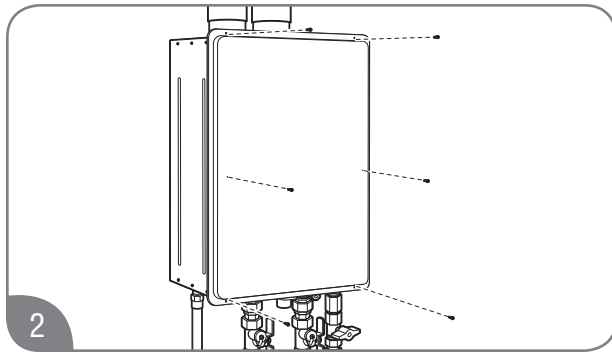


Recirculation Control (cont.)

Installation



1 Disconnect all electric power to the water heater.

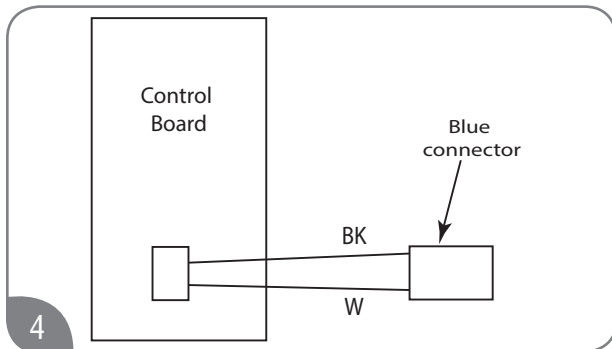


2 Remove the front cover panel on the water heater.

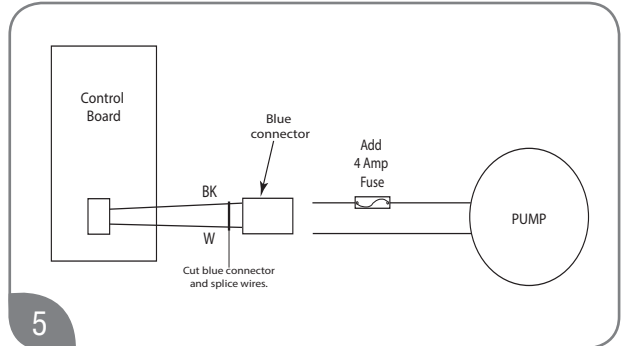
Install the recirculation pump on the return line according to the pump manufacturer installation instructions. Install a check valve in the return line as shown in typical recirculation pump installation if one is not integrated into the pump. See "Typical Recirculation Pump Installation".

* Check valve is included in Rheem recirculation pump kit.

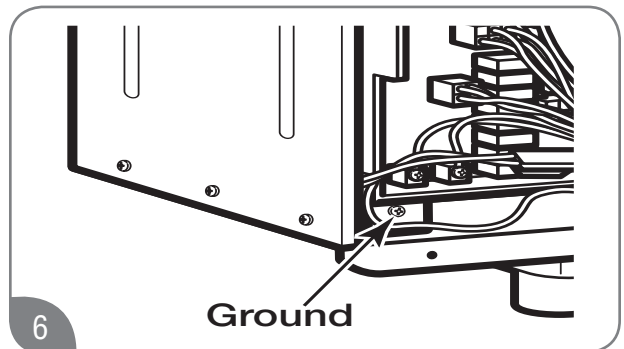
3



4 The wire harness for the recirculation pump is bundled with the wire harness from the control board. Find a blue connector with a black and a white wire.



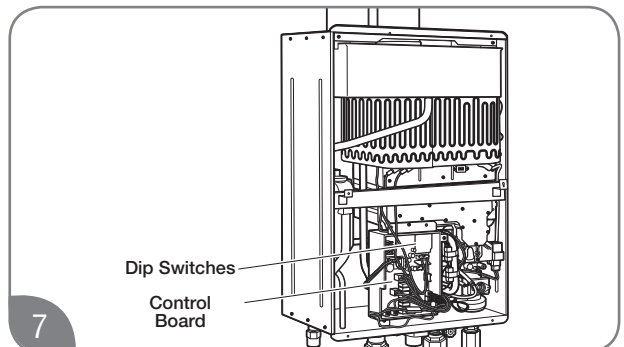
5 To connect to the pump, cut the blue connector, splice the wires, and add a 4 amp fuse to the hot wire of the pump. Rheem recirculation pump kit includes a molex connector and a 4 amp fuse so splicing wires is not required.



6 Connect the ground wire from the pump to a screw at the base of the water heater cabinet.

NOTICE:

Follow any applicable electrical code and the pump manufacture installation instruction referring to the Pump Electrical Connection Diagram in Step 5 of these instructions.

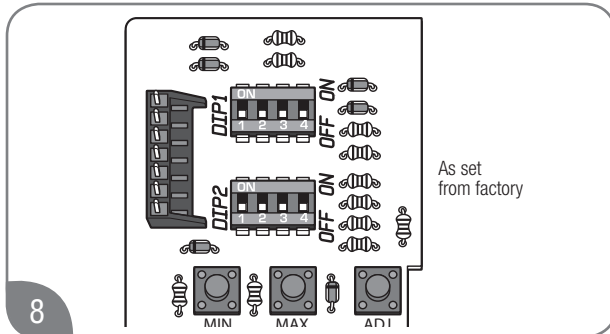


7 Find DIP Switch 2 in the top-right portion of the control board. The switch labeled "DIP 2" is the bottom switch.

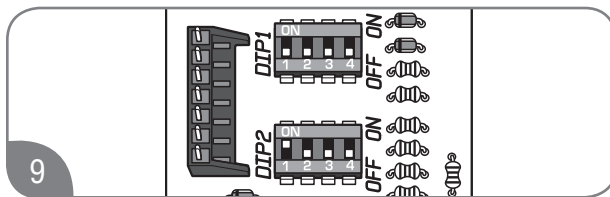
INSTALLATION INSTRUCTIONS



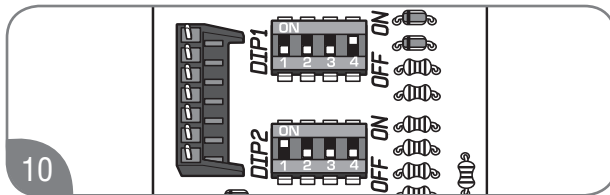
Recirculation Control (cont.)



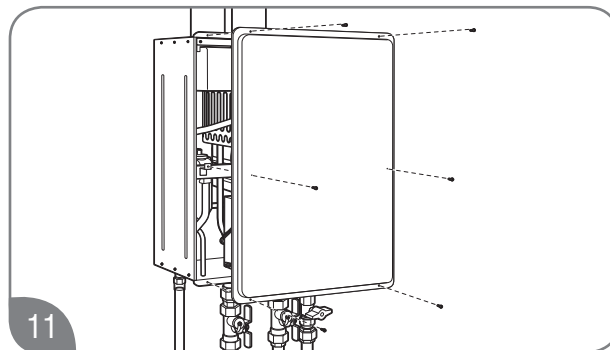
8 The factory setting for this switch should all be in the OFF position (DOWN).



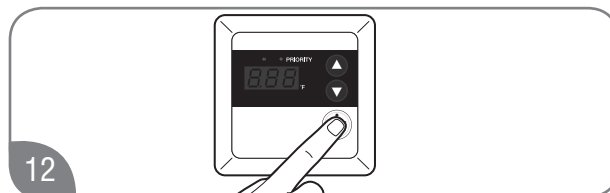
9 Change the first switch on "DIP 2" to the ON position (UP). Performance mode is selected.



10 To select Energy Saver mode, change the fourth switch on "DIP 1" to the ON position (UP).



11 Replace the front cover panel.



12 Turn on all electric power to the water heater.

Turn On the remote control. The pump and water heater will turn on to raise recirculation loop temperature.

Recirculation Operation

The water heater is turned ON when the recirculation pump starts operation. The water heater produces hot water at the setting temperature. When the return water temperature reaches approximately 15°F below the setting temperature, the water heater and the pump will turn OFF. The cycle will restart at the approximate time interval in the table below based on the temperature thermistor readings.

Energy Saver Mode

The Energy Saver mode operates as follows:

- Less energy consumption due to fewer pump cycles
- Pump cycles ON every 30 to 69 minutes

Performance Mode

The Performance mode operates as follows:

- Higher energy consumption due to more pump cycles
- Pump cycles ON every 15 to 35 minutes

Setting Temp [°F]	Typical Pump ON Intervals [Min]	
	Performance	Energy Saver
140	15	30
135	15	30
130	15	30
125	15	30
120	16	31
118	17	33
116	18	35
114	19	38
112	20	40
110	22	44
108	24	47
106	26	51
104	28	56
102	31	62
100	35	69

Actual pump ON intervals may vary based on the setting temperature, insulation, and heat loss in the system.

INSTALLATION INSTRUCTIONS



Activating the Water Heater

⚠️ WARNING:



Before operating this water heater, be sure to read and follow the instructions on the following label, all labels on the water heater, and the "Important Safety Information" section in this manual. Failure to do so can result in unsafe operating conditions that can result in death, personal injury, property damage, and/or product damage.

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING : If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. DO NOT try to light the burner by hand.
- B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
WHAT TO DO IF YOU SMELL GAS
 - DO NOT try to light any appliance. ● DO NOT touch any electric switch; DO NOT use any phone in your building. ● Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. ● If you cannot reach your gas supplier, call the fire department.
 - DO NOT return to your home until authorized by the gas supplier or fire department.
- C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. DO NOT use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Turn off all electric power to the appliance.
3. DO NOT attempt to light the burner by hand.
4. Turn the Gas Shutoff Valve located on the outside of the unit clockwise  to the "OFF" position.
5. Wait five (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
6. Turn the Gas Shutoff Valve located on the outside of the unit counterclockwise  to the "ON" position.
7. Turn on all electric power to the appliance.
8. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

GAS SHUTOFF VALVE



OPEN



CLOSE

TO TURN OFF GAS TO APPLIANCE

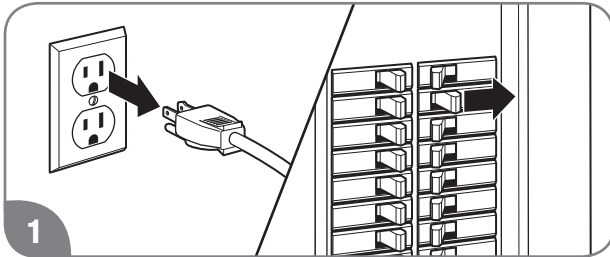
1. Turn off all electric power to the appliance if service is to be performed.
2. Turn the Gas Shutoff Valve located on the outside of the unit clockwise  to the "OFF" position.

INSTALLATION INSTRUCTIONS

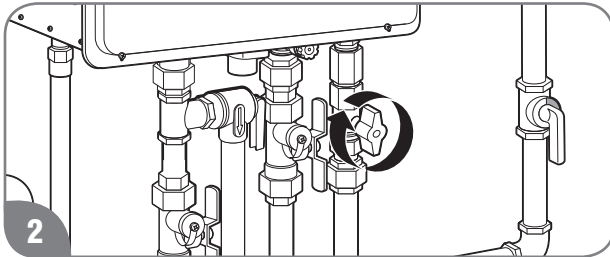
Activating the Water Heater

Operating Instructions

Read, understand, and follow the safety information listed on the operating label and in the “Important Safety Information” section in this manual.



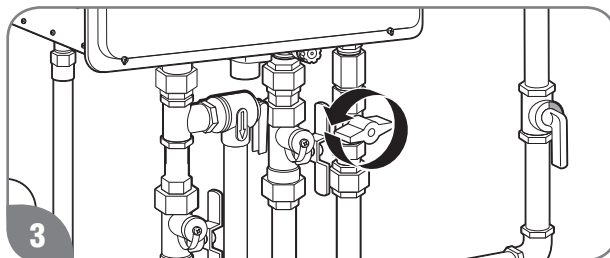
1 Disconnect all electric power to the water heater.



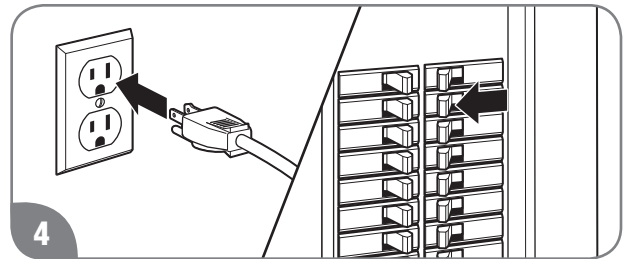
2 Turn the gas shut-off valve clockwise to the OFF position. This valve is located on the outside of the water heater. Wait 5 minutes to clear any gas. If you don't smell gas, proceed to Step 3.

NOTICE:

If you smell gas, STOP and follow the safety instructions listed under B on the operating label or on the front cover of this manual.



3 Turn the gas shut-off valve counterclockwise to the ON position.



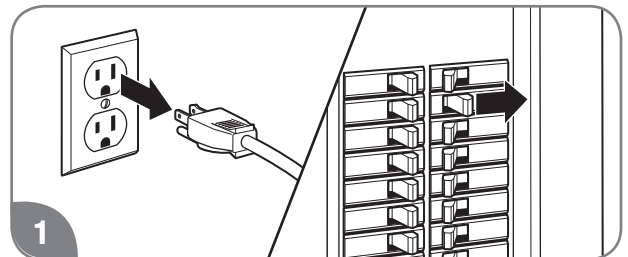
4 Turn on all electric power to the water heater. The water heater burner will automatically light when there is a demand for hot water.

⚠ WARNING:

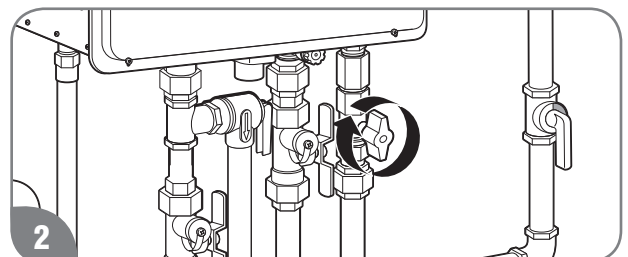
DO NOT attempt to light the burner by hand. Lighting the burner by hand is an unsafe operating condition that can result in death, personal injury, property damage, and/or product damage.

If the water heater burner will not light, turn off the water heater as described below and call your service technician or gas supplier.

Shutting Off the Water Heater



1 Disconnect all electric power to the water heater.



2 Turn the gas shut-off valve clockwise to the OFF position.

INSTALLATION INSTRUCTIONS

The contents on pages 72 through 80 should only be performed by qualified service personnel.



Setting the Water Temperature

⚠️ WARNING:

Improper adjustment, alteration, service, or maintenance can result in death, personal injury, property damage, and/or product damage.

Maximum Temperature Adjustment by the Main Remote Control (UMC-117)

⚠️ DANGER:

Water temperatures above 125°F (52°C) will result in death and/or severe burns from scalding.

⚠️ WARNING:

Refer to chart below and the scald potential warnings on page 4 on this manual before making an adjustment. Changing this setting is done at your own risk.

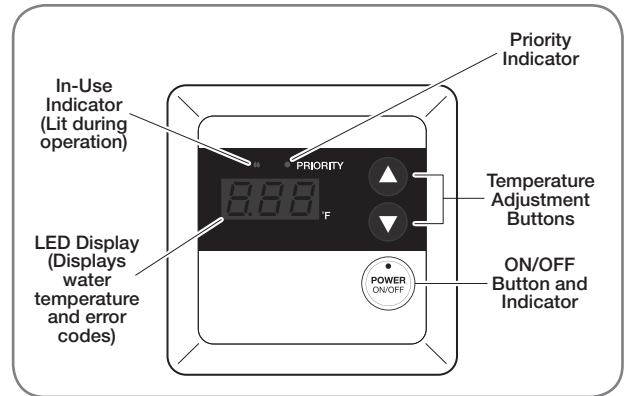
Time/Temperature Relationship in Scalds

Water 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 5 seconds
145°F (63°C)	Less than 3 seconds
150°F (66°C)	About 1 1/2 seconds
155°F (68°C)	About 1 second

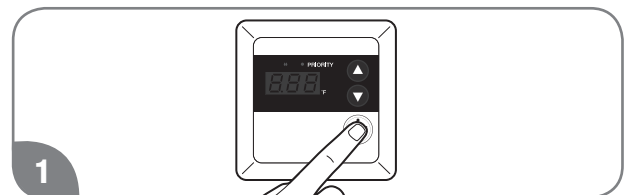
Table courtesy of Shriners Burn Institute

Residential water heater temperatures can be adjusted up to 140°F (60°C). **DO NOT** perform the following adjustment if a setting of up to 140°F (60°C) is not required.

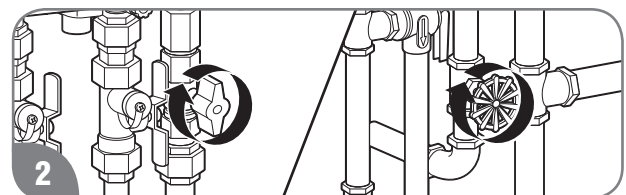
Temperature Conversion Chart °F/°C									
85	100	102	104	106	108	110	112	114	116
29	38	39	40	41	42	43	44	46	47
118	120	125	130	140	150	160	170	185	°F
48	49	52	54	60	66	71	77	85	°C



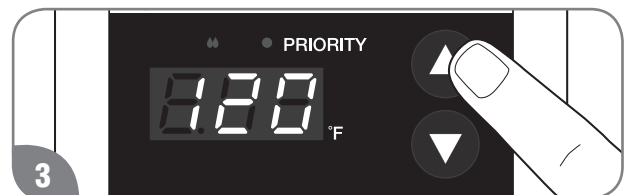
To change the temperature settings up to 140°F (60°C):



1 Turn on the remote control.



2 Turn off the gas and water to the water heater by closing the shut-off valves.



3 Press the UP adjustment button repeatedly until 120°F (49°C) shows in the LED display. Hold the UP button until the "120" on the display starts to blink.

NOTICE:

LED display only shows °F.

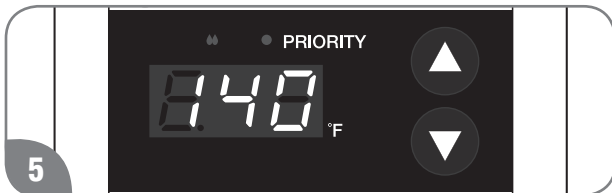
INSTALLATION INSTRUCTIONS



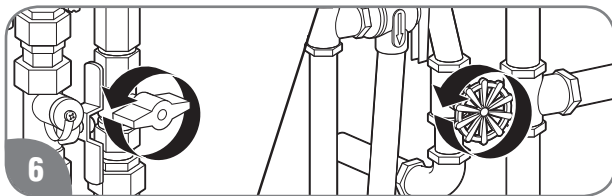
Setting the Water Temperature (cont.)



4 While “140” is blinking, press the UP and DOWN adjustment buttons at the same time. “140” will appear without blinking.

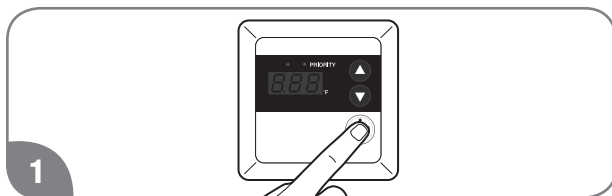


5 Press the UP or DOWN adjustment button to set the desired temperature.

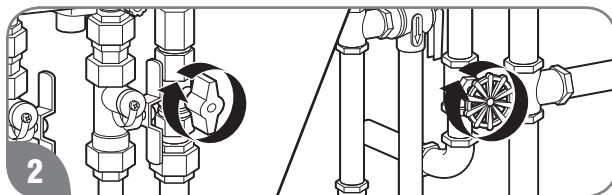


6 Turn on the gas and water to the water heater by opening the shut-off valves.

To limit maximum water temperature setting to 120°F (49°C):



1 Turn on the remote control.



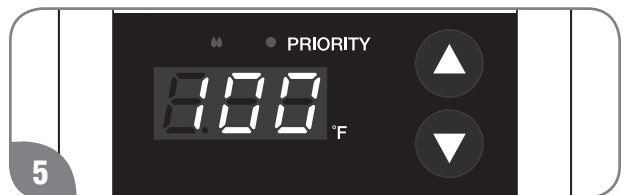
2 Turn off the gas and water to the water heater by closing the shut-off valves.



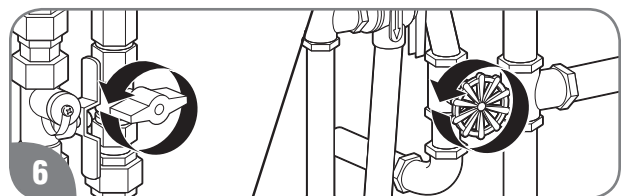
3 Press the DOWN adjustment button repeatedly until 100°F (38°C) or 85°F (29°C) shows in the LED display. Hold the DOWN button until the number on the display starts to blink.



4 While the number is blinking, press the UP and DOWN adjustment buttons at the same time. The number will stop blinking.



5 Press the UP or DOWN adjustment button to set the desired temperature.



6 Turn on the gas and water to the water heater by opening the shut-off valves.

INSTALLATION INSTRUCTIONS

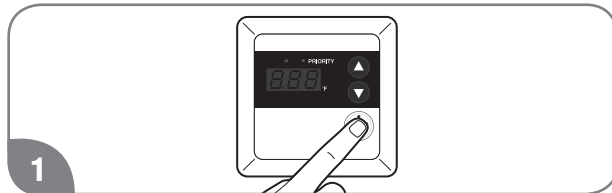


Setting the Water Temperature (cont.)

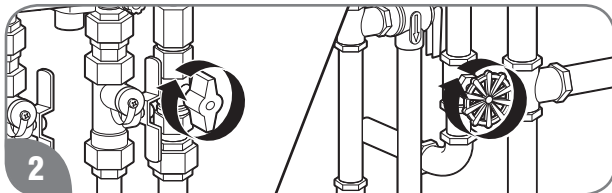
Minimum Temperature Adjustment by the Main Remote Control (UMC-117, USC1-117, and USC2-117)

Residential water heater temperatures can be adjusted down to 85°F (29°C), when required.

To change the temperature settings down to 85°F (29°C):



1 Turn on the remote control.



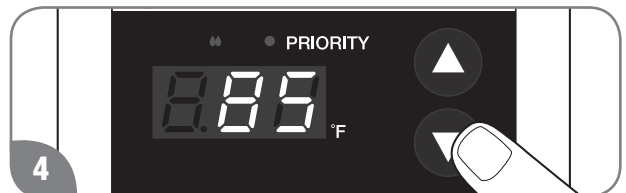
2 Turn off the gas and water to the water heater by closing the shut-off valves.



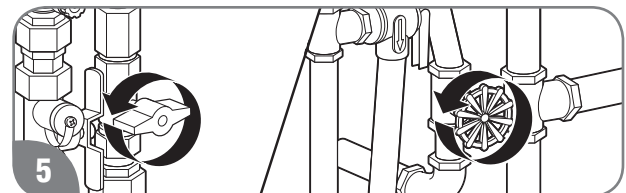
3 Press the DOWN adjustment button repeatedly until 100°F (38°C) shows in the LED display.

NOTICE:

LED display only shows °F.



4 Press the DOWN adjustment button 3 times within 5 seconds. The display will show "85."



5 Turn on the gas and water to the water heater by opening the shut-off valves.

NOTICE:

The maximum flow rate at 85°F (29°C) is 1.3 gpm (5.0 L/m).



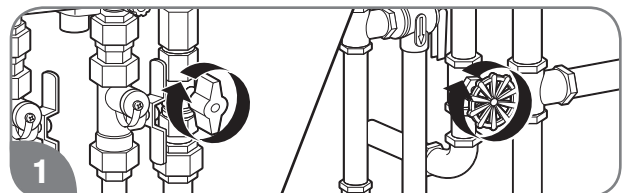
High-Altitude DIP Switch Adjustments

When the water heater is installed above 2000 ft. (610 m), the settings on the DIP switch located on the control board need to be changed per vent length and altitude. If these settings are not changed, the water heater may not function properly.

NOTICE:

If the water is installed under 2000 ft. (610m) altitude, refer to "Vent Lengths and DIP Switch Adjustments".

Verify the altitude that the water heater is installed.

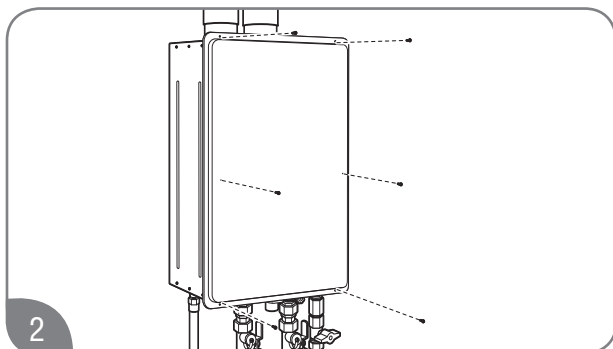


1 Turn off the gas and water to the water heater by closing the shut-off valves.

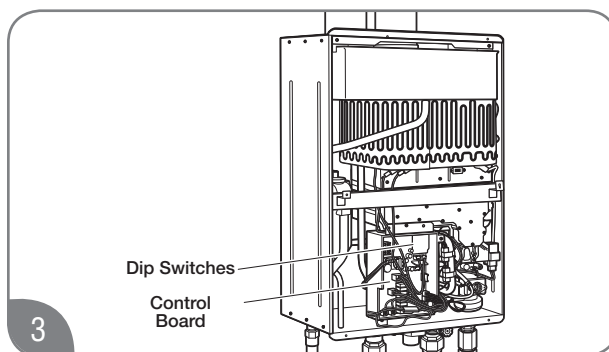
INSTALLATION INSTRUCTIONS



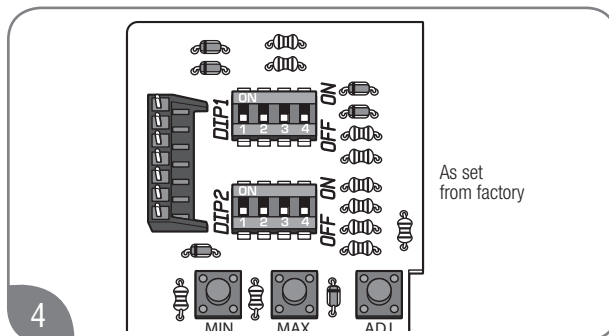
High-Altitude DIP Switch Adjustments (cont.)



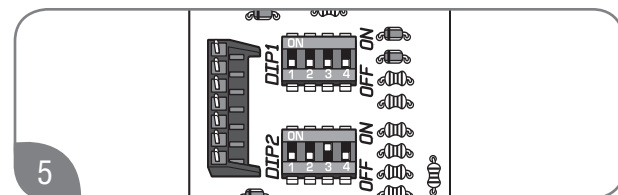
2 Remove the front cover panel on the water heater.



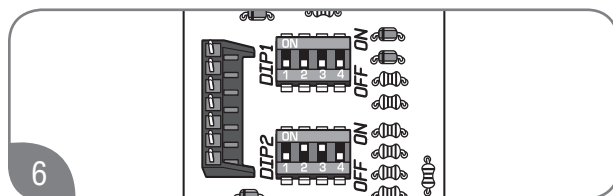
3 Find DIP Switch 2 located in the top-right portion of the control board. The switch labeled "DIP 2" is the bottom switch.



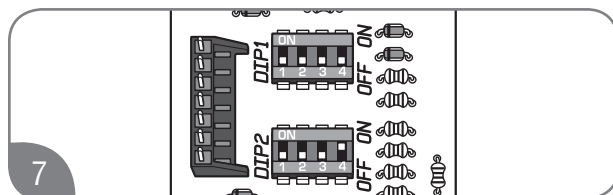
4 The factory settings for this switch should all be in the OFF position (DOWN).



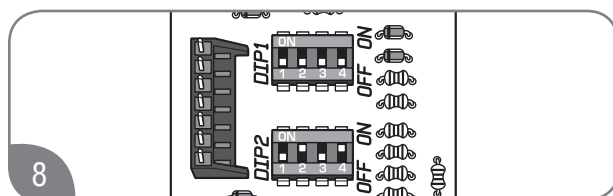
5 If altitude is above 2000 ft. (610 m) and below 5,400 ft. (1650 m), change the third switch on "DIP 2" to the ON position (UP). B-1 setting completes.



6 If your vent length is relatively longer, B-2 setting is required. Change the second switch on "DIP 2" to the ON position (UP).



7 If altitude is above 5,400 ft. (1650 m) and below 8,500 ft. (2590), change the fourth switch to the ON position (UP). C-1 setting completes.

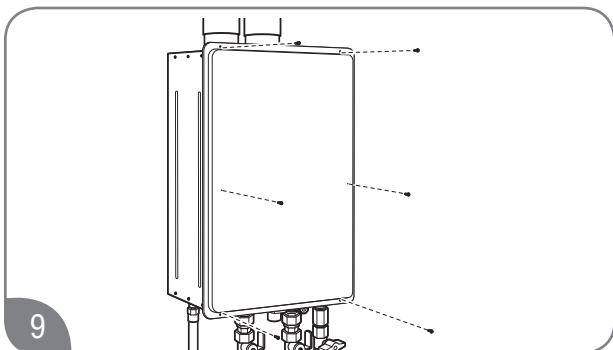


8 If your vent length is relatively longer, C-2 setting is required. Change the second switch on "DIP 2" to the ON position (UP).

NOTICE:

DO NOT alter any other DIP switch settings. The manifold pressure will be reduced accordingly.

Some models are not available at higher than 5400 ft (1650m). Please contact technical service listed on page 26 of this use and care manual if you have any questions of high altitude DIP switch adjustments.

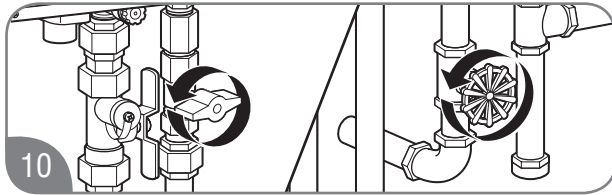


9 Replace the front cover panel.

INSTALLATION INSTRUCTIONS



High-Altitude DIP Switch Adjustments (cont.)



Turn on the gas and water to the water heater by opening the shut-off valves.

Minimum / Maximum vent lengths at B-1, B-2, C-1 and C-2 setting are as follows:

Minimum Vent Length (intake/outlet) each at B-1 and C-1 Setting

Number of 90° Elbows	Maximum Length of 2" or 3" Straight Pipe
1	1.0 ft (0.3 m)

Maximum Vent Length (intake/outlet) each at B-1 and C-1 Settings

Number of 90° Elbows	Maximum Length of 2" Straight Pipe	Maximum Length of 3" Straight Pipe
1	22.0 ft (6.7 m)	148.5 ft (45.3 m)
2	19.0 ft (5.8 m)	147.0 ft (44.8 m)
3	16.0 ft (4.9 m)	145.5 ft (44.3 m)
4	13.0 ft (4.0 m)	144.0 ft (43.9 m)
5	10.0 ft (3.0 m)	142.5 ft (43.4 m)
6	7.0 ft (2.1 m)	141.0 ft (43.0 m)

Minimum / Maximum Vent Length (intake/outlet) each at B-2 and C-2 Settings

Number of 90° Elbows	Minimum Length of 2" Straight Pipe	Maximum Length of 2" Straight Pipe	3" Pipe
1	22.0 ft (6.7 m)	57.0 ft (17.4 m)	Not allowed
2	19.0 ft (5.8 m)	54.0 ft (16.5 m)	Not allowed
3	16.0 ft (4.9 m)	51.0 ft (15.5 m)	Not allowed
4	13.0 ft (4.0 m)	48.0 ft (14.6 m)	Not allowed
5	10.0 ft (3.0 m)	45.0 ft (13.7 m)	Not allowed
6	7.0 ft (2.1 m)	42.0 ft (12.8 m)	Not allowed

WARNING:

This water heater requires the correct DIP switch adjustments per vent length and altitude for proper operation. Incorrect DIP switch adjustments may cause improper water heater operation resulting in serious injury or death.

NOTICE:

It is recommend to have a vent length as short as possible. Input rate at high altitude naturally is derated. In addition to that, input rate of the water heater decreases more if there is restriction (pressure drop) in the venting system. Refer to input rate reduction table due to vent length on page 36. Actual input rate reduction may be different at each installation.

INSTALLATION INSTRUCTIONS

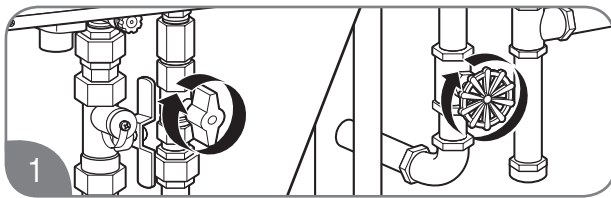


Water Saving Control

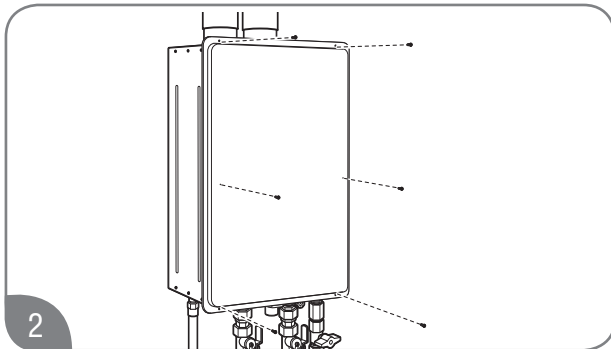
Water saving control is optional and is inactive as default. To activate this control, appropriate procedures must be followed.

Water saving control can reduce waste water at initiation of hot water demand by reducing flow until outlet hot water reaches set temperature. It is recommended to turn ON this control if the water heater is installed in a drought area or anywhere water conservation is needed.

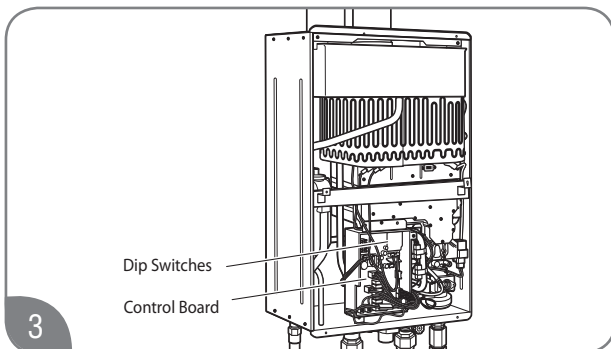
Follow the steps below to turn ON the water saving control.



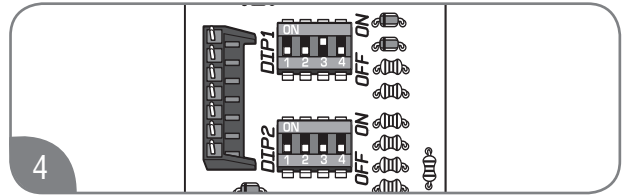
Turn off the gas and water to the water heater by closing the shut-off valves.



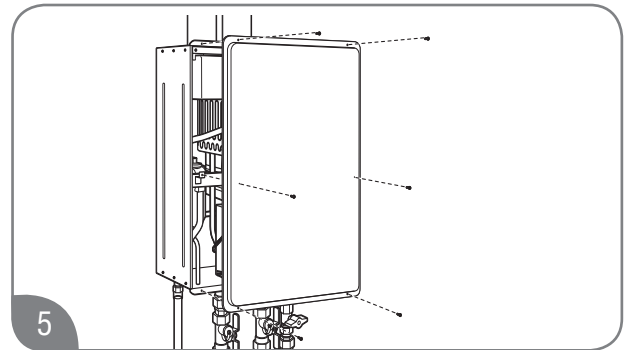
Remove the front cover panel on the water heater.



Find DIP Switch 1 located in the top-right portion at the control board. The switch labeled "DIP 1" is the top switch.



Change the third switch on "DIP 1" to the ON position (UP).



Replace the front cover panel.



Turn on the gas and water to the water heater by opening the shut off valves.

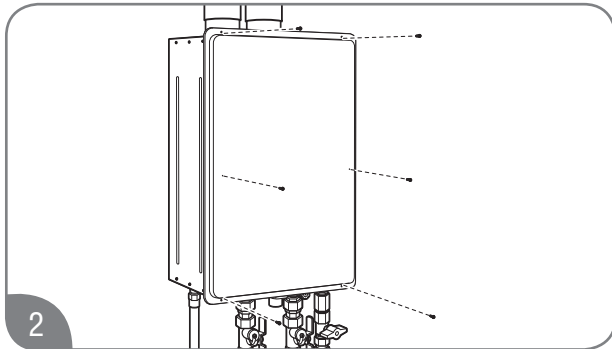
Follow the below steps to turn OFF the water saving control.



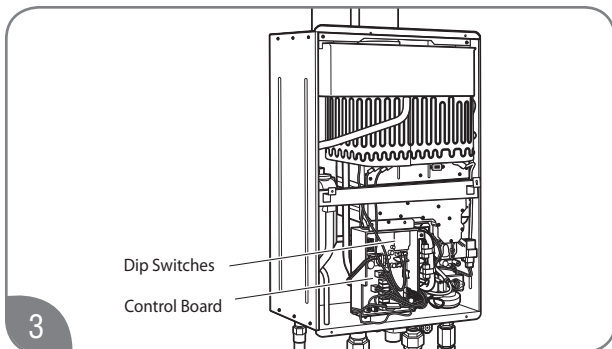
Turn off the gas and water to the water heater by closing the shut-off valves.

INSTALLATION INSTRUCTIONS

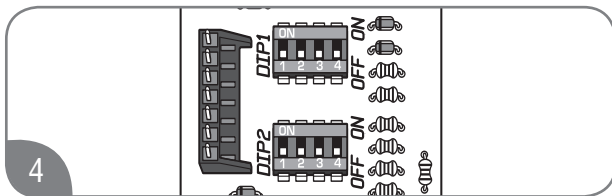
Water Saving Control (cont.)



Remove the front cover panel on the water heater.



Find DIP Switch 1 located in the top-right portion at the control board. The switch labeled “DIP 1” is the top switch.



Change the third switch on “DIP 1” to the OFF position (DOWN).



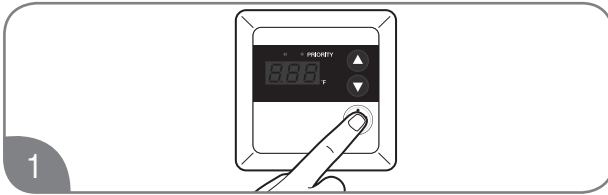
Turn on the gas and water to the water heater by opening the shut-off valves.

INSTALLATION INSTRUCTIONS

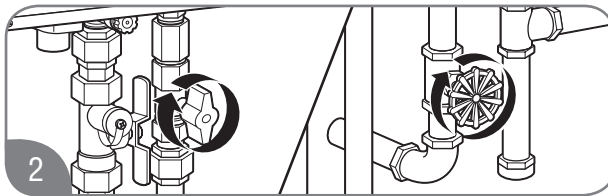


Maintenance Notice

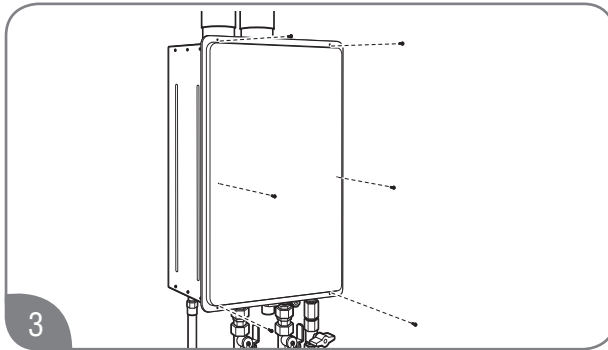
Maintenance notice is an optional control and is inactive as default. Maintenance notice reminds users of water heater maintenance activities such as flushing the heat exchanger or replacing the water treatment filter (if applicable) in order to maximize the life of your tankless water heater. Contact technical service department listed on page 26 of this use and care manual if you are not familiar with these maintenance activities.



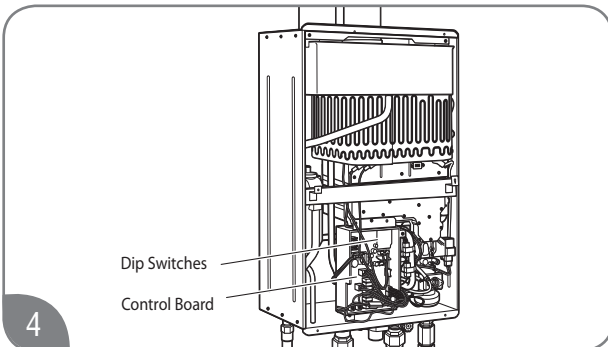
1 Turn off the remote control.



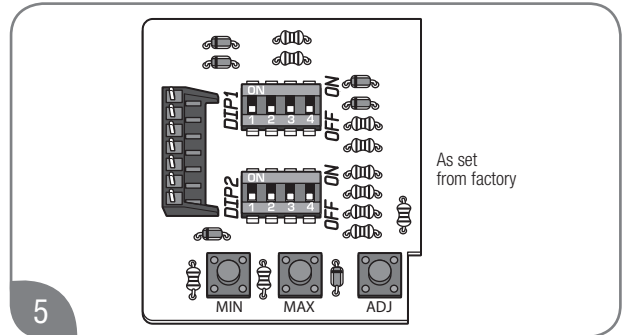
2 Turn off the gas and water to the water heater by closing the shut-off valves.



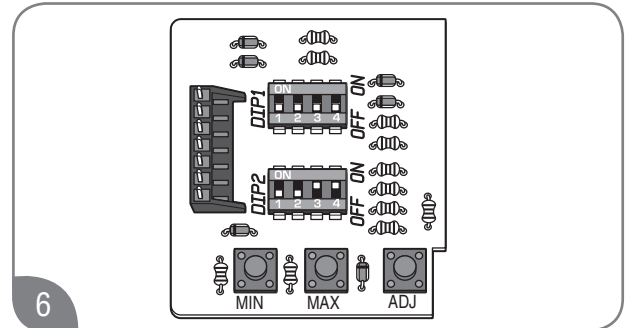
3 Remove the front cover panel on the water heater.



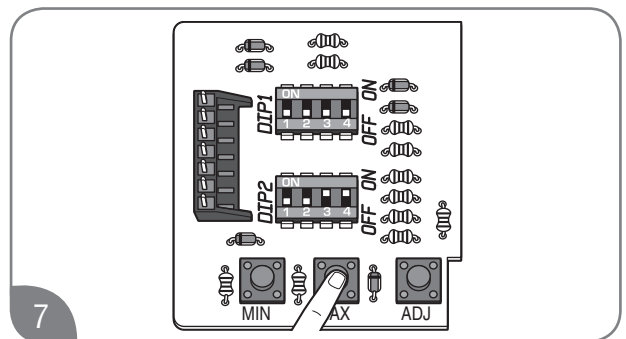
4 Find DIP switch 2 located in the top-right portion of the control board. The switch labeled "DIP 2" is the bottom switch.



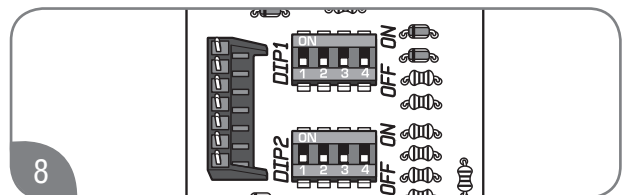
5 The factory settings for this switch should all be in the OFF position (DOWN).



6 Change the third and fourth switches on "DIP 2" to the ON position (UP).



7 Push and hold "Max" button until "ON" is shown on the display of the remote control.

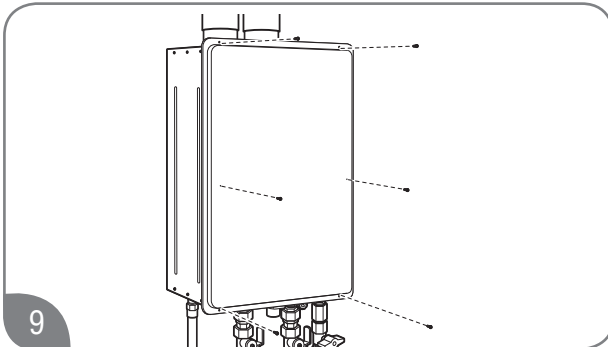


8 Change the third and fourth switches on "DIP 2" to the OFF position (OFF).

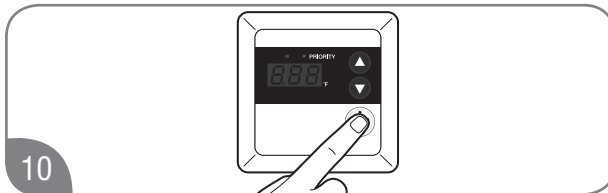
INSTALLATION INSTRUCTIONS



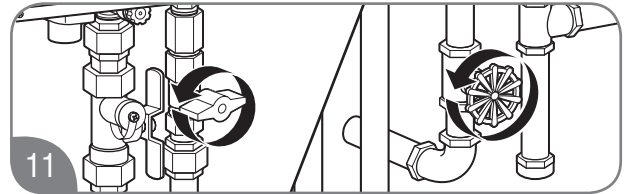
Maintenance Notice (cont.)



Replace the front cover panel.



Turn on the remote control.

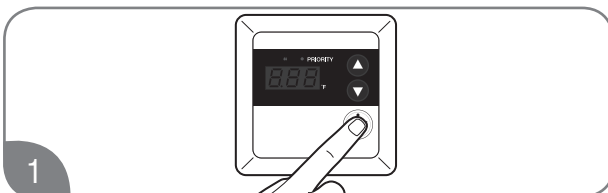


Turn on the gas and water to the water heater by opening the shut off valves.



Error Code 88 Clearing

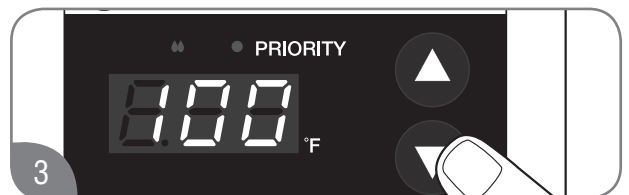
When a tankless water heater has a certain number of hours of combustion, error code “88” is shown on the remote control. It is highly recommended to perform water heater maintenance activities such as flushing the heat exchanger and/or replacing the water treatment filter (if applicable). After these maintenance activities are made, follow the steps below in order to clear error code “88”.



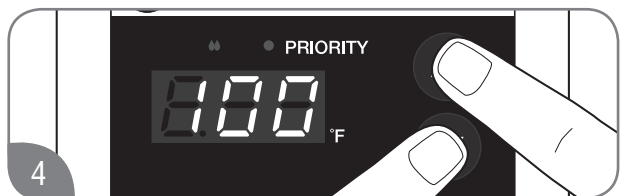
Turn on the remote control.



Turn off the gas and water to the water heater by closing the shut-off valves.



Press the DOWN adjustment button repeatedly until the lowest setting temperature shows in the LED display.



Press and hold the DOWN and UP adjustment button for 5 to 10 seconds.



Turn on the gas and water to the water heater by opening the shut off valves.
If error code “88” is still shown, repeat steps 1 through 5 above.



Parts Ordering

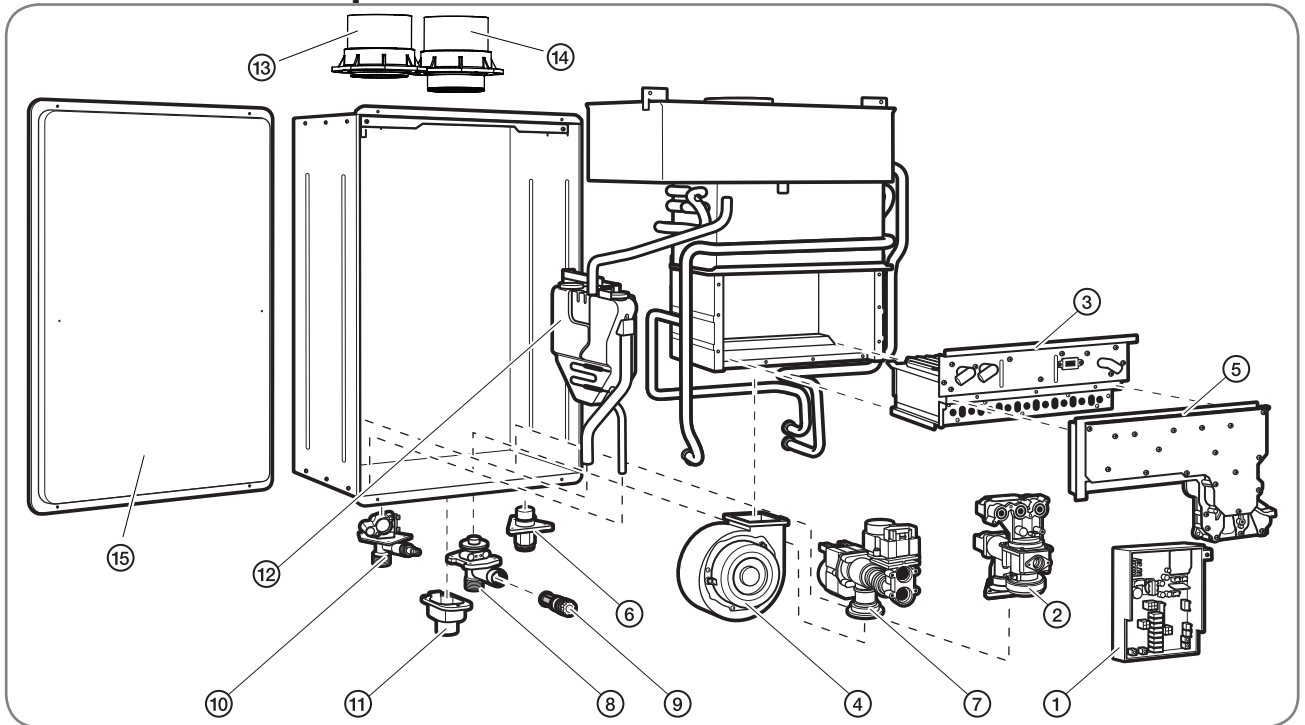
⚠ WARNING:

For your safety, **DO NOT** attempt to disassemble, repair, or replace any portion of this unit. Refer all repairs, service, and/or adjustments to qualified service personnel.

Address all parts orders to the distributor or store where the water heater was purchased. All parts orders should include:

1. The model and serial number of the water heater from the rating plate.
2. Specify the gas type (natural or LP) as marked on the rating plate.
3. Parts description (as shown below) and number of parts desired.

Direct-Vent Gas Components



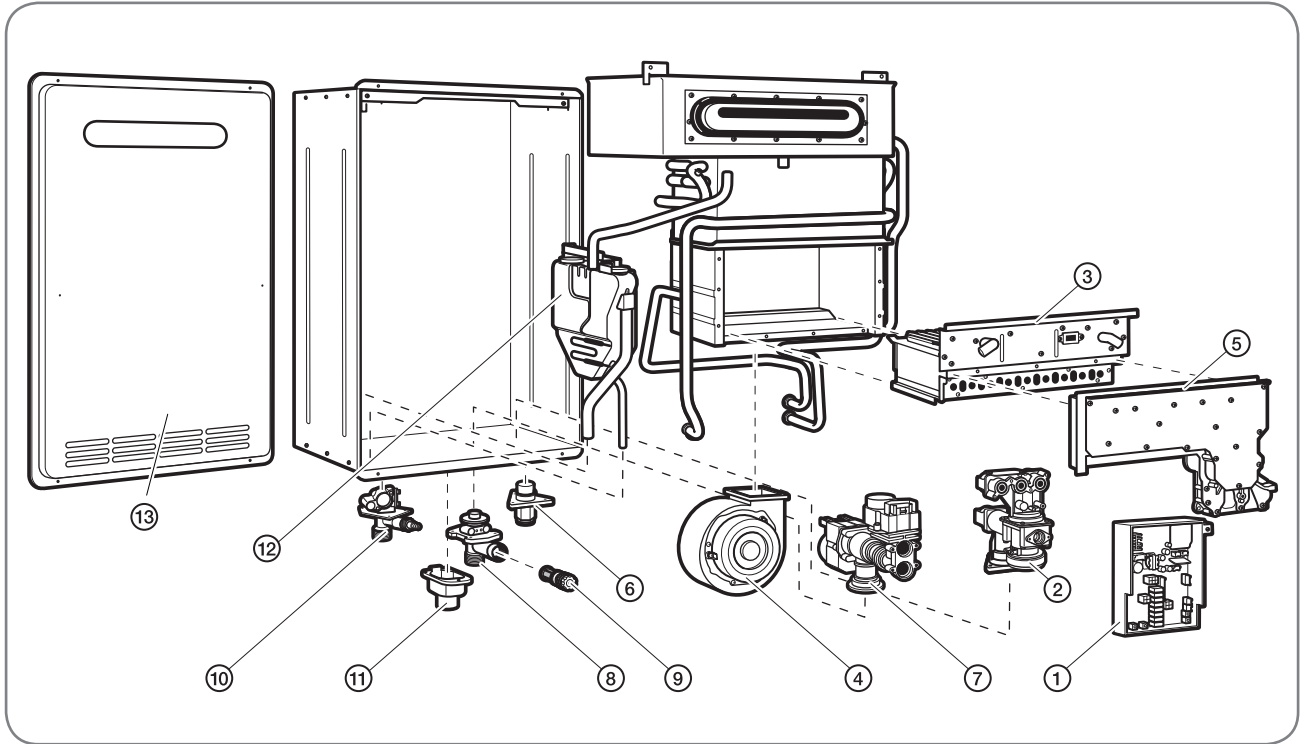
Ref #	Description
1	Control Board
2	Gas Valve
3	Burner Assembly
4	Blower Motor
5	Burner Manifold
6	Gas Inlet Connector 3/4"
7	Water Control Valve
8	Water Inlet Connector 3/4"
9	Inlet Water Filter
10	Hot Outlet Connector
11	Remote Control Terminal Block
12	Neutralization kit
13	Air Intake Connector
14	Flue Connector
15	Front Cover

PARTS REPLACEMENT



Parts Ordering (cont.)

Outdoor Gas Components



Ref #	Description
1	Control Board
2	Gas Valve
3	Burner Assembly
4	Blower Motor
5	Burner Manifold
6	Gas Inlet Connector 3/4"
7	Water Control Valve
8	Water Inlet Connector 3/4"
9	Inlet Water Filter
10	Hot Outlet Connector
11	Remote Control Terminal Block
12	Neutralization kit
13	Front Cover

LIMITED WARRANTY

For the RHEEM®, RUUD®, Richmond®, Paloma®, and EcoSmart® Residential Tankless Gas Water Heaters.

GENERAL

This Limited Warranty is only available to the original owner of the water heater at the original installation location. This Limited Warranty is not transferable.

Rheem Sales Company, Inc. (Rheem) warrants this tankless gas water heater, and its component parts, to be free from defects in materials and manufacture, under normal use and service, for the Applicable Warranty Period specified below. At its option, Rheem will repair or replace the defective water heater, or defective component part(s), in accordance with the terms of this Limited Warranty, if it fails in normal use and service during the Applicable Warranty Period. The replacement water heater must be manufactured by Rheem under one of the covered brand names. The replacement component part(s) must be Rheem authorized component part(s). The replacement unit will be warranted only for the unexpired portion of the original unit's Applicable Warranty Period.

Rheem strongly recommends that this tankless water heater be installed by a contractor that is licensed, state qualified and trained on Rheem's tankless products because improper installation may invalidate warranty coverage.

EFFECTIVE DATE

The Effective Date of warranty coverage (or the beginning of the Applicable Warranty Periods) is the date of the original installation of the water heater, if properly documented. Otherwise, it is the date of manufacture of the water heater plus ninety (90) days.

APPLICABLE WARRANTY PERIODS: The Applicable Warranty Period depends on the type of installation, as described below:

Residential: a Single Family Dwelling

Twelve (12) years from the Effective Date for the heat exchanger, five (5) years from the Effective Date for the component parts, and one (1) year from the Effective Date for certain labor as described under the heading, LABOR, SHIPPING AND PROCESSING COST.

Residential: a Single Family Dwelling used with Hydronic Force Air Heating

Ten (10) years from the Effective Date for the heat exchanger, five (5) years from the Effective Date for the component parts, and one (1) year from the Effective Date for certain labor as described under the heading, LABOR, SHIPPING AND PROCESSING COST. Provided that a Rheem manufactured/Rheem approved potable water hydronic air handler is installed with the system.

Residential: a Single Family Dwelling with recirculation, controlled loop

Twelve (12) years from the Effective Date for the heat exchanger, five (5) years from the Effective Date for the component parts, and one (1) year from the Effective Date for certain labor as described under the heading, LABOR, SHIPPING AND PROCESSING COST. Provided that the recirculation system is an on demand type system or the pump is controlled with a temperature sensor (aquastat) and timer.

Residential: a Single Family Dwelling with recirculation, uncontrolled loop

Three (3) years from the Effective Date for the heat exchanger, three (3) years from the Effective Date for the component parts, and one (1) year from the Effective Date for certain labor as described under the heading, LABOR, SHIPPING AND PROCESSING COST, if the water heater is installed in a system in which the water is re-circulated using a continuously operating pump.

Commercial: any installation that is not a single family dwelling

Five (5) years from the Effective Date for the heat exchanger, five (5) years from the Effective Date for the component parts, and one (1) year from the Effective Date for certain labor as described under the heading, LABOR, SHIPPING AND PROCESSING COST.

Commercial: with recirculation, controlled loop

Five (5) years from the Effective Date for the heat exchanger, five (5) years from the Effective Date for the component parts, and one (1) year from the Effective Date for certain labor as described under the heading, LABOR, SHIPPING AND PROCESSING COST. Provided that the recirculation system is an on demand type system or the pump is controlled with a temperature sensor (aquastat) and timer.

Commercial: with recirculation, uncontrolled loop

Three (3) years from the Effective Date for the heat exchanger, three (3) years from the Effective Date for the component parts, and one (1) year from the Effective Date for certain labor as described under the heading, LABOR, SHIPPING AND PROCESSING COST, if the water heater is installed in a system in which the water is re-circulated using a continuously operating pump.

WARRANTY EXCLUSIONS

This Limited Warranty will **not** cover:

a) Damages, malfunctions or failures resulting from:

Chart for Recommended Water Quality Levels

pH	(Total Dissolved Solids) TDS	Free Carbon Dioxide (CO ₂)	Total Hardness	Aluminum	Chlorides	Copper	Iron	Manganese	Zinc
6.5-8.5	Up to 500 mg/L	Up to 15 mg/L	Up to 200 mg/L	0.05 to 0.2 mg/L	Up to 250 mg/L	Up to 1.0 mg/L	Up to 0.3 mg/L	Up to 0.05 mg/L	Up to 5 mg/L

Cited reference: National Secondary Drinking Water Regulations

1. Installation of the water heater in environments in which water quality levels DO NOT fall within the ranges listed in the table below:
- b) Operating the water heater in a corrosive or contaminated atmosphere, including without limitation damages, malfunctions or failures caused by lime, mineral build-up, or scale.
- c) Service trips to your business to teach you how to install, use, or maintain this water heater or to bring the water heater installation into compliance with local building codes and regulations or manufacturer's installation requirements.
- d) Water heater unit installed for use in: spa or pool heating; a recreational vehicle; a boat or any other watercraft.
- e) Water heater unit installed in any circulating system in which the temperature of the incoming water to the water heater is in excess of 140° f.
- f) Water heater unit that is installed in any installation supplying radiant heat, such as in floor, baseboard, radiators, snow melt or closed loop systems, or any system using glycol or non-potable water.
- g) Damages, malfunctions or failures resulting from failure to install the water heater in accordance with applicable building codes/ordinances or good plumbing and electrical trade practices.
- h) Damages, malfunctions or failures resulting from improper installation or failure to operate and maintain the unit in accordance with the manufacturer's instructions.
- i) Performance problems caused by improper sizing of the water heater or the gas supply line, the venting connection, combustion air openings, electric service voltage, wiring, or fusing.
- j) Damages, malfunctions or failures caused by improper conversion from natural gas to LP gas or LP gas to natural gas fuel source.
- k) Damages, malfunctions or failures caused by operating the water heater with any parts removed or with modified, altered, or unapproved parts installed.
- l) Damages, malfunctions or failures caused by abuse, accident, fire, flood, freeze, lightning, acts of God and the like.
- m) Heat exchanger failures (leaks) caused by operating the water heater in a corrosive or contaminated atmosphere or damages, malfunctions or failures caused by lime, mineral build-up, or scale.
- n) Damages, malfunctions or failures caused by operating the unit at water temperatures exceeding the maximum setting of the operating, or high limit, control.
- o) Heat exchanger failures caused by operating the water heater when it is not supplied with potable water, free to circulate at all times.
- p) Damages, malfunctions or failures caused by subjecting the heat exchanger to pressures, or firing rates, greater than those shown on the rating label.
- q) Damages, malfunctions or failures resulting from the use of any attachment, including any energy saving device, not authorized by Rheem.
- r) Units installed outside the fifty states (and the District of Columbia) of the United States of America and Canada.
- s) Units removed from the original installation location and reinstalled elsewhere.
- t) Units that have had their rating labels altered, tampered with, or removed. A water heater should not be operated if the rating label is removed.

LABOR, SHIPPING, AND PROCESSING COSTS

For one (1) year after the Effective Date, Rheem will cover reasonable labor costs necessary to repair or replace a tankless water heater or component part that Rheem determines to be defective and covered by this Limited Warranty. The warranty service must be performed by a contractor that is licensed, state qualified, and trained to install and service Rheem's tankless water heaters. This Limited Warranty does not cover any labor expenses for general service, inspection, reinstallation, permits, removal and disposal of the failed water heater or defective component part(s), or updating the installation to meet manufacture or local code requirements. All such expenses are your responsibility.

Rheem will pay the transportation costs for an "in-warranty" replacement water heater, or "in-warranty" replacement component part(s), to a convenient delivery point (selected by Rheem) near the place the original water heater, or original component part(s), is located: such as a local water heater distributor. You must pay any local freight charges, including the cost of returning the failed water heater, or defective component part(s) to a convenient shipping location (selected by Rheem): such as a local Rheem distributor.

Rheem does not authorize, recommend, or receive any benefit from any claims processing or similar fees charged by others to process warranty claims for any water heater or component part(s). Rheem will not reimburse any party for these, or any other, fees not specifically covered in this Limited Warranty document.

HOW TO OBTAIN WARRANTY CLAIM ASSISTANCE

Any claim for warranty assistance must be made promptly. First, determine if your water heater is "in-warranty" (that is, within the Applicable Warranty Period). You can determine your unit's warranty status by adding its Applicable Warranty Period to its date of installation. However, if you **DO NOT** have documentary proof of your water heater's date of installation, your unit's warranty status will be based on its date of manufacture as determined from the serial number. Add the Applicable Warranty Period plus ninety (90) days to the date of manufacture to determine whether the water heater is still covered by this Limited Warranty. You may also determine your unit's warranty status by obtaining the complete model number, complete serial number, and date of installation of your water heater and then accessing the "Warranty Verification" information on Rheem Water Heaters' internet website (www.rheem.com) or contacting Rheem's Claims Department (telephone (800) 621-5622) during normal business hours (in the Central Time Zone) to determine if the Applicable Warranty Period has expired.

If your water heater is "in-warranty", contact the plumber, or mechanical contractor, that installed it for assistance with the warranty repairs, or replacement, required. Rheem Water Heaters' Technical Service personnel are available to assist you (by telephone at (866) 720-2076) in obtaining "in-warranty" service or to answer your questions about the operation or repair of your water heater during normal business hours (in the Central Time Zone). Be prepared to provide the plumber, mechanical contractor, or Rheem Technical Service person you call with the complete model number, the complete serial number, and the date of installation of your water heater in addition to an explanation of your water heater problem.

If an exact replacement is not available, Rheem will provide you with the current model of your water heater, or component part(s), or a replacement unit with comparable operating features. If government regulations or industry certification or similar standards require the replacement water heater, or replacement component part(s), to have features not found in the defective water heater, or the defective component part(s), you will be charged for the difference in price represented by those required features. If you pay the price difference for those required features and/or to upgrade the size and/or other features available on a replacement new water heater, you will also receive a complete new Limited Warranty (with the full Applicable Warranty Period) for the replacement new water heater.

Rheem reserves the right to inspect, or require the return of, the failed water heater or the defective component part(s). Each "in-warranty" failure water heater must be made available to Rheem (with the rating label and all the component parts intact) in exchange for the replacement water heater. Each defective "in-warranty" component part to be replaced must be returned to Rheem in exchange for the replacement component part.

Warranty compensation is subject to validation of "in-warranty" coverage by Rheem Claims Department personnel.

- To obtain warranty compensation for an "in-warranty" water heater failure, you must provide Rheem with the failed water heater (with the rating label and all the component parts intact) the complete model number and the complete serial number of the Rheem or Ruud water heater that replaced the failed unit; and the date the original water heater failed. You may also be required to provide documentary proof of the failed water heaters date of installation to establish its "in-warranty" status.
- To receive warranty compensation for an "in-warranty" defective component part, you must provide Rheem with: the defective component part; the complete model number and the complete serial number of the Rheem or Ruud water heater from which the defective component part was removed; and the date the defective component part failed. You may also be required to provide documentary proof of the date of installation of the Rheem or Ruud water heater from which the defective part was removed – or the date of purchase of the part (if it was purchased separately) – to establish the "in-warranty" status of the defective component part.
- If Rheem determines that the water heater or component part returned to Rheem is free of defects in material and manufacture and/or that it was damaged by improper installation or other cause not covered by this Limited Warranty, the warranty claim for the product, component part and/or labor maybe denied.

Warranty claim documentation should be mailed promptly to Rheem Water Heaters, Claims Department, 800 Interstate Park Drive, Montgomery, Alabama 36109, or in Canada, 125 Edgeware Rd. Unit 1, Brampton, ON, Canada L6Y 0P5

EXCLUSIVE WARRANTY – LIMITATION OF LIABILITY

THIS LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY PROVIDED IN CONNECTION WITH THIS RHEEM®, RUUD®, RICHMOND®, PALOMA® AND ECOSMART® RESIDENTIAL TANKLESS GAS WATER HEATER UNIT (THE "WATER HEATER"). No one is authorized to make any other warranties on behalf of Rheem. **ANY IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE APPLICABLE WARRANTY PERIODS, SPECIFIED PREVIOUSLY. RHEEM'S SOLE LIABILITY, WITH RESPECT TO ANY DEFECT, SHALL BE AS SET FORTH IN THIS LIMITED WARRANTY, AND ANY CLAIMS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGE FROM WATER LEAKAGE) ARE EXCLUDED.** Some states **DO NOT** allow limitations on how long an implied warranty lasts, or for the exclusion of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This Limited Warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

DO NOT RETURN THIS WATER HEATER OR PART TO RHEEM WITHOUT A RETURN AUTHORIZATION.

This document is for reference only and does not replace the original warranty document found in the back of the Use and Care manual provided with the tankless water heater.

DO NOT RETURN THIS DOCUMENT TO RHEEM.

KEEP IT WITH YOUR WATER HEATER OR BUSINESS RECORDS.

Name of Owner: _____

Owner's Address: _____

Name of Plumber/
Mechanical Contractor – Installer: _____

Address of Plumber/
Mechanical Contractor – Installer : _____

Telephone Number of Plumber/
Mechanical Contractor – Installer: _____

Date of Water Heater Installation: _____

Model Number of Your Water Heater: _____

Serial Number of Your Water Heater: _____