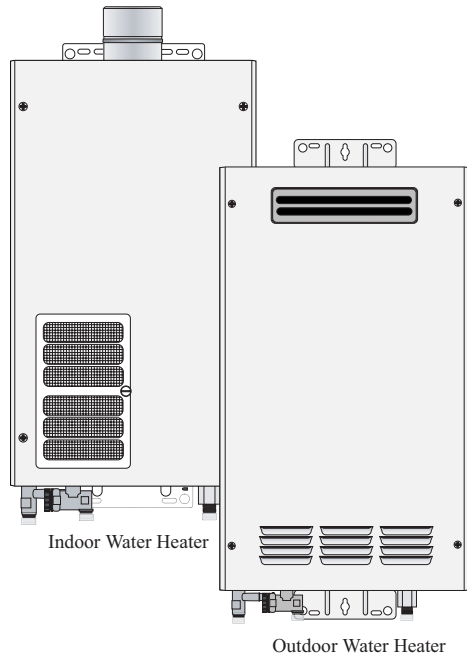


Commercial Indoor and Outdoor Gas

Tankless Water Heater

▲ Warning: This water heater is not suitable for use in manufactured (mobile) homes!



The purpose of this manual is twofold: one, to provide the installer with the basic directions and recommendations for the proper installation and adjustment of the water heater; and two, to the owner-operator, to explain the features, operation, safety precautions, maintenance and troubleshooting of the water heater. This manual also includes a parts list.

It is imperative that all persons who are expected to install, operate or adjust this water heater read the instructions carefully so they may understand how to perform these operations. If you don't understand these instructions or any terms within it, seek professional advice.

Any questions regarding the operation, maintenance, service or warranty of this water heater should be directed to the seller from whom it was purchased, local distributor or Paloma.

Do not destroy this manual. Please read carefully and keep in a safe place for future reference.



Recognize this symbol as an indication of Important Safety Information!



California Proposition 65 Warning: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.



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

▲ FOR YOUR SAFETY!

- Do not store or use gasoline or other flammable vapors or liquids or other combustible materials in the vicinity of this or any other appliance. To do so may result in an explosion or fire.
- WHAT TO DO IF YOU SMELL GAS
 - Do not try to light any appliance.
 - Do not touch any electrical 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.
- Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury, or death. Refer to this manual. Installation and service must be performed by a qualified installer, service agency or the gas supplier.

**Models: PH-28CIFSN (Natural Gas) (Indoor)
PH-28CIFSP (L.P. Gas) (Indoor)
PH-28COFN (Natural Gas) (Outdoor)
PH-28COFP (L.P. Gas) (Outdoor)**



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FOR YOUR RECORDS

Write the model and serial numbers here:

You can find them on a label on the appliance.

Staple sales slip or cancelled check here.

Proof of the original purchase date is needed to obtain service under the warranty.



READ THIS MANUAL

Inside you will find many helpful hints on how to use and maintain your water heater properly. A little preventive care on your part can save you time and money over the life of your water heater.

You'll find many answers to common problems in the Troubleshooting Guide. If you review the chart of Troubleshooting Tips first, you may not need to call for service.



READ THE SAFETY INFORMATION

Your safety and the safety of others are very important. There are many important safety messages in this manual and on your appliance. Always read and obey all safety messages.



This is the safety alert symbol. Recognize this symbol as an indication of Important Safety Information! This symbol alerts you to potential hazards that can kill or hurt you and others.

All safety messages will follow the safety alert symbol and either the word "DANGER", "WARNING", "CAUTION" or "NOTICE".

These words mean:

▲ DANGER

An imminently hazardous situation that will result in death or serious injury.

▲ WARNING

A potentially hazardous situation that could result in death or serious injury and/or damage to property.

▲ CAUTION

A potentially hazardous situation that may result in minor or moderate injury.

Notice:

Attention is called to observe a specified procedure or maintain a specific condition.

IMPORTANT SAFETY INFORMATION

READ ALL INSTRUCTIONS BEFORE USING.

Be sure to read and understand the entire Instruction Manual before attempting to install or operate this water heater. It may save you time and money. Pay particular attention to the Safety Instructions. Failure to follow these warnings could result in serious bodily injury or death. Should you have problems understanding the instructions in this manual, or have any questions, STOP, and get help from a qualified service technician, or the local gas utility.



! DANGER!

INSTALL AND PROPERLY VENT THE WATER HEATER...

Failure to install and properly vent the water heater to the outdoors as outlined in the Venting Section of the Installation Instructions in this manual can result in unsafe operation of the water heater. To avoid the risk of fire, explosion, or asphyxiation from carbon monoxide, never operate this water heater unless it is properly vented and has an adequate air supply for proper operation.

Be sure to inspect the vent outlet on the OUTDOOR water heater, or the vent terminal and the vent system on the INDOOR water heater for proper installation at initial start-up; and at least annually thereafter. Refer to the Care and Cleaning section of this manual for more information regarding vent system inspection.



! WARNING!

Gasoline, as well as other flammable materials and liquids (adhesives, solvents, paint thinners etc.), and the vapors they produce are extremely dangerous. DO NOT handle, use or store gasoline or other flammable or combustible materials anywhere near or in the vicinity of a water heater or any other appliance. Be sure to read and follow the labels on the water heater, as well as the warnings printed in this manual. Failure to do so can result in property damage, bodily injury or death.

! DANGER

FLAMMABLES

Flammable Vapors

! Vapors from flammable liquids will explode and catch fire causing death or severe burns.

Do not use or store flammable products such as gasoline, solvents or adhesives in the same room or area near the water heater.

Keep flammable products:

1. far away from heater,
2. in approved containers,
3. tightly closed and
4. out of children's reach.

Water heater has a main burner flame.

The main burner flame:

1. which can come on at any time and
2. will ignite flammable vapors.

Vapors:

1. cannot be seen,
2. are heavier than air,
3. go a long way on the floor and
4. can be carried from other rooms to the main burner flame by air currents.

Installation:

Do not install water heater where flammable products will be stored or used unless the main burner flame is at least	18" above the floor. This will reduce, but not eliminate, the risk of vapors being ignited by the main burner flame.
--	--

Read and follow water heater warnings and instructions. If owners manual is missing, contact the retailer or manufacturer.

IMPORTANT SAFETY INFORMATION

READ ALL INSTRUCTIONS BEFORE USING.



⚠️ DANGER!

WATER TEMPERATURE SETTING

Safety and energy conservation are factors to be considered when selecting the water temperature setting of a water heater's remote control. Water temperatures above 125°F (52°C) can cause severe burns or death from scalding. Be sure to read and follow the warnings outlined on the label pictured below.

⚠️ DANGER

Water temperature over 125°F can cause severe burns instantly or death from scalds.

Children, disabled and elderly are at highest risk of being scalded.

See instruction manual before setting temperature at water heater.

Feel water before bathing or showering.

Temperature limiting valves are available, see manual.

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)	1½ to 2 minutes
130°F (54°C)	About 30 seconds
135°F (57°C)	About 10 seconds
140°F (60°C)	Less than 5 seconds
145°F (63°C)	Less than 3 seconds
150°F (66°C)	About 1½ seconds
155°F (68°C)	About 1 second

Table courtesy of Shriners Burn Institute

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

⚠️ DANGER: Households with small children, disabled, or elderly persons may require a 120°F (49°C) or lower temperature setting to prevent contact with “HOT” water.

Maximum water temperature occurs while burner is on. To find water temperature being delivered, turn on a hot water faucet and place a thermometer in the water stream and read the thermometer. (See page 27 & 28 for more details.)

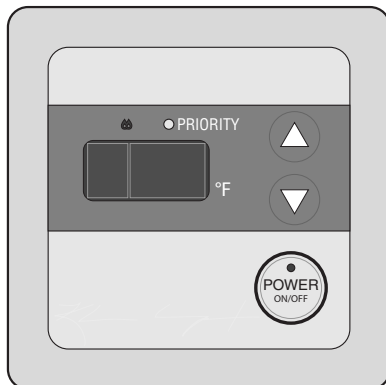
The temperature of the water at the outlet of the water heater can be regulated by setting the temperature on Remote Control. The remote control was set at 100°F (38°C) before it was shipped from the factory.

The illustration to the bottom left illustrates the Remote Control and how to adjust the water temperature.

Notice: The factory setting allows operating temperatures between 100°F (38°C) and 120°F (49°C). Temperatures of up to 180°F (82°C) can be achieved with the MAIN (UMC-117) remote control and a dip switch adjustment. Only qualified service personnel should perform this adjustment. Only factory authorized remote control(s) should be used.

Notice: When this water heater is supplying general purpose hot water requirements for use by individuals, a thermostatically controlled mixing valve for reducing point of use water temperature is recommended to reduce the risk of scald injury. Contact a licensed plumber or the local plumbing authority for further information.

Notice:
Display shows °F only.



▲ Higher (Hotter) ▼ Lower (Cooler)

100 102 104 106 108 110 112 114 116 118 120* 125 130 135 140 150 160 170 180 °F
38 39 40 41 42 43 44 46 47 48 49* 52 54 57 60 66 71 77 82 °C

* Temperatures above 120°F (49°C) can be achieved by adjusting the dip switch. See page 35 for dip switch adjustment.



! DANGER!

NATURAL GAS AND LIQUEFIED PETROLEUM MODELS

Both LP and natural gas have an odorant added to aid in detecting a gas leak. Some people may not physically be able to smell or recognize this odorant. If you are unsure or unfamiliar with the smell of LP or natural gas, ask the gas supplier. Other conditions, such as “odorant fade”, which causes the odorant to diminish in intensity, can also hide or camouflage a gas leak.

- Water heaters utilizing LP gas are different from natural gas models. A natural gas water heater will not function safely on LP gas and vice versa.
- No attempt should ever be made to convert the water heater from natural gas to LP gas. To avoid possible equipment damage, personal injury or fire, do not connect the water heater to a fuel type not in accordance with the unit data plate; propane for propane units and natural gas for natural gas units. These units are not certified for any other fuel type.
- LP appliances should not be installed below grade (for example, in a basement) if such installation is prohibited by federal, state and/or local laws, rules, regulations or customs.
- Propane or LP gas must be used with great caution. It is heavier than air and will collect first in lower areas making it hard to detect at nose level.
- Before attempting to light the water heater, make sure to look and smell for gas leaks. Use a soapy solution to check all gas fittings and connections. Bubbling at a connection indicates a leak that must be corrected. When smelling to detect a gas leak, be sure to sniff near the floor also.
- Gas detectors are recommended in LP and natural gas applications and their installation should be in accordance with the detector manufacturer’s recommendations and/or local laws, rules, regulations or customs.
- It is recommended that more than one method, such as soapy solution, gas detectors, etc., be used to detect leaks in gas applications.

Notice: If a gas leak is present or suspected:

- ***Do not*** attempt to find the cause yourself.
- ***Do not*** try to light any appliance.
- ***Do not*** touch any electrical switch.
- ***Do not*** use any phone in your building.
- Leave the building immediately and make sure your family and pets leave also.
- Leave the doors open for ventilation and contact the gas supplier, a qualified service agency or the fire department.
- Stay away from the building until the service call has been made, the leak is corrected and a qualified agency has determined the area to be safe.

IMPORTANT SAFETY INFORMATION

READ ALL INSTRUCTIONS BEFORE USING.

WARNING!

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



FOR INSTALLATIONS IN THE STATE OF CALIFORNIA

California Law requires that residential water heaters must be braced, anchored or strapped to resist falling or horizontal displacement due to earthquake motions. For residential water heaters up to 52 gallon capacity, a brochure with generic earthquake bracing instructions can be obtained from: Office of the State Architect, 1102 Q Street, Suite 5100, Sacramento, CA 95814 or you may call 916-445-8100 or ask a water heater dealer.

However, applicable local codes shall govern installation. For residential water heaters of a capacity greater than 52 gallons or tankless-style, consult the local building jurisdiction code for acceptable bracing procedures.



SAFETY PRECAUTIONS

Have the installer show you the location of the gas shut-off valve and how to shut it off if necessary. Turn off the manual shut-off valve if the water heater has been subjected to overheating, fire, flood, physical damage or if the gas supply fails to shut off.

- Read this manual entirely before installing or operating the water heater.
- Use this appliance only for its intended purpose as described in this Instruction Manual.
- Be sure your appliance is properly installed in accordance with local codes and the provided installation instructions.
- Do not attempt to repair or replace any part of your water heater unless it is specifically recommended in this manual. All other servicing should be referred to a qualified technician.



READ AND FOLLOW THIS SAFETY INFORMATION CAREFULLY.

SAVE THESE INSTRUCTIONS

Installing the (INDOOR) water heater :

This water heater must be installed in accordance with these instructions, local codes, utility company requirements, and/or in the absence of local codes, use the latest edition of the American National Standard/National Fuel Gas Code. A copy can be purchased from either the American Gas Association, 400 North Capitol Street Northwest, Washington, DC 20001 as ANSI standard Z223.1 or National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269 as NFPA 54. In Canada, the latest edition of the CSA B149.1 Natural Gas and Propane Installation, and the Canadian Electrical Code, CSA C22.1 Part 1, in the absence of local codes.

Location of INDOOR Water Heater

The water heater should not be located in an area where leakage of the heat exchanger or connections will result in damage to the area adjacent to it or to lower floors of the structure.

When such areas cannot be avoided it is recommended that a suitable catch pan, adequately drained, must be installed under the water heater.

The pan must not restrict combustion air flow.

A gas fired water heater or any other appliance should not be installed in a space where liquids which give off flammable vapors are to be used or stored. Such liquids include gasoline, LP gas (butane or propane), paint or adhesives and their thinners, solvents or removers.

Because of natural air movement in a room or other enclosed space, flammable vapors can be carried some distance from where their liquids are being used or stored. The open flame of the water heater's main burner can ignite these vapors causing an explosion or fire which may result in severe burns, death or property damage.

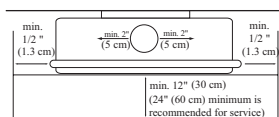
The water heater must be located so it is not subject to physical damage, for example, by moving vehicles, area flooding, etc.

If the water heater is installed in a garage, it should be installed so that the direct ignition system and main burner are no less than 18 inches (45 cm) above the garage floor.

Raising the gas fired water heater will reduce BUT NOT eliminate the possibility of lighting the vapor of any flammable liquids which may be improperly stored or accidentally spilled.

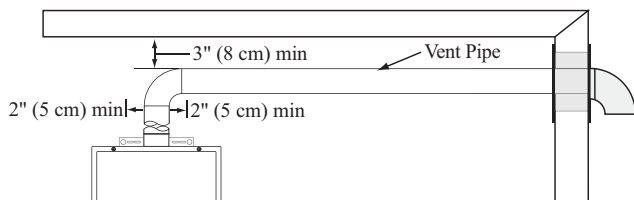
▲WARNING: Combustible construction refers to adjacent walls and ceilings and should not be confused with combustible or flammable products and materials. Combustible and/or flammable products and materials should never be stored in the vicinity of this or any gas appliance.

Minimum Clearance from Combustible and Non-Combustible Construction.



Top = 12" (30 cm) Back = 0" *
Vent = 2" (5 cm) Side = 1/2" (1.3 cm)
Front = 12" (30 cm) Bottom = 12" (30 cm)
* (with support bracket)

▲WARNING: Follow vent manufacturers instruction while installing vent. If required, provide additional clearances from vent to combustibles per vent manufacturers instruction.



- The water heater should be installed as close as practical to the vent termination to minimize vent length and the number of elbows required for venting.
- The water heater should be installed with the proper venting materials and termination suitable for Category III venting.
- Failure to install and properly vent the water heater to the outdoors as outlined in the Venting Section of this manual can result in unsafe operation.
- Long hot water lines should be insulated to conserve water and energy.
- The water heater and water lines should be protected from exposure to freezing temperatures.
- **Do not** install the water heater in bathrooms, bedrooms, any occupied rooms normally kept closed, or in outdoor areas.
- **Do not** install the water heater in small, poorly ventilated rooms, or in air tight rooms with air-conditioning.
- **Do not** install water heater where subject to vibrations.
- **Do not** install the water heater in Recreational Vehicles, Mobile Homes, Boats and other Watercrafts.
- **Do not** install the water heater near vents for heating or cooling. A minimum of 4 feet (1.2 m) should be maintained.
- Minimum clearance from combustible and non-combustible construction is 1/2" (1.3 cm) sides, 0" rear (with support bracket); 12" (30 cm) from the bottom; 12" (30 cm) from the front of the water heater; and 12" (30 cm) from the top (24" (61 cm) from front and top is recommended for servicing purposes). Maintain a minimum clearance of 2" (5 cm) around the vent pipe to combustible or non-combustible construction. If the clearances stated on the Instruction/Warning Label, located on the front panel of the heater differ, install the water heater according to the clearances stated on the label.

Installing the (OUTDOOR) water heater:

This water heater must be installed in accordance with these instructions, local codes, utility company requirements, and/or in the absence of local codes, use the latest edition of the American National Standard/National Fuel Gas Code. A copy can be purchased from either the American Gas Association, 400 North Capitol Street Northwest, Washington, DC 20001 as ANSI standard Z223.1 or National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269 as NFPA 54. In Canada, the latest edition of the CSA B149.1 Natural Gas and Propane Installation, and the Canadian Electrical Code, CSA C22.1 Part 1, in the absence of local codes.

Location of the OUTDOOR water heater

This water heater is for **OUTDOOR** installation ONLY!

This water heater is an outdoor model and must be mounted vertically. It must not be installed indoors or in a confined space.

The water heater should be installed close to the most frequently used outlet and its position chosen with safety and service in mind.

Make sure people (particular children, disabled, and elderly) will not touch the hot water outlet or the flue terminal. The flue terminal and air inlet must be clear of obstruction and shrubbery.

The water heater should not be located in an area where leakage of the heat exchanger or connections will result in damage to the area adjacent to it or to lower floors of the structure.

A gas fired water heater or any other appliance should not be installed in a space where liquids which give off flammable vapors are to be used or stored. Such liquids include gasoline, LP gas (butane or propane), paint or adhesives and their thinners, solvents or removers.

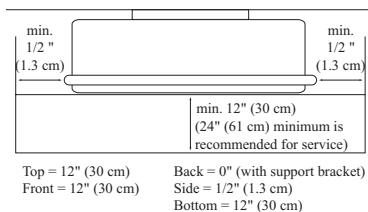
Because of natural air movement in a room or other enclosed space, flammable vapors can be carried some distance from where their liquids are being used or stored. The open flame of the water heater's main burner can ignite these vapors causing an explosion or fire which may result in severe burns, death or property damage.

The water heater must be located so it is not subject to physical damage, for example, by moving vehicles, area flooding, etc.

- The water heater should be installed vertically with the water, gas, and power connections on the underside pointing toward the ground.
- Failure to properly install the water heater outdoors as outlined in this manual can result in unsafe operation.
- Hot and cold water lines should be insulated to conserve water and energy.
- The water heater and water lines should be protected from exposure to freezing temperatures.
- **Do not** install water heater where subject to vibrations.
- **Do not** install the water heater in Recreational Vehicles, Mobile Homes, Boats and other Watercrafts.
- **Do not** install the water heater near vents for heating or cooling. A minimum of 4 feet should be maintained.
- Minimum clearance from combustible and noncombustible construction is 1/2" (1.3 cm) sides, 0" rear (with support bracket); 12" (30 cm) from the bottom; 12" (30 cm) from the front of the water heater; and 12" (30 cm) from the top (24" (61 cm) from front and top is recommended for servicing purposes). If the clearances stated on the Instruction/Warning Label, located on the front panel of the heater differ, install the water heater according to the clearances stated on the label.

▲WARNING: Combustible construction refers to adjacent walls and ceilings and should not be confused with combustible or flammable products and materials. Combustible and/or flammable products and materials should never be stored in the vicinity of this or any gas appliance.

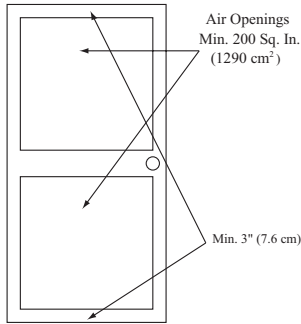
Minimum Clearance from Combustible and Non-Combustible Construction.



Installing the water heater:

Proper operation of the water heater requires air for combustion and ventilation. Provisions for combustion and ventilation air must comply with referenced codes and standards.

Combustion and Ventilation Air (Indoor Water Heater Only)



DANGER: OUTDOOR water heaters must not be installed indoors or in a confined space. Install outdoor water heaters outdoors only.

NOTICE: If the water heater is installed in an unconfined space within a building of conventional frame, masonry or metal construction, infiltration air is normally adequate for proper combustion and ventilation. If the water heater is installed in a confined space, provisions for combustion and ventilation air must be made.

A confined space is one having a volume of less than 50 cubic feet (1.4 cubic meters) per 1000 Btuh of the aggregate input of all appliances within that space.

The air must be supplied through two permanent openings of equal area. One is to be located within 12" (30 cm) above the floor and the other is to be located within 12" (30 cm) below the ceiling.

The minimum net free area of each opening must not be less than one square inch (6.5 sq cm) per 1000 Btuh of the total input rating of all the appliances in the enclosure (but not less than 100 square inches (650 cm²),) if each opening communicates with other unconfined areas inside the building.

Buildings of unusually tight construction shall have the combustion and ventilation air supplied from outdoors, or a freely

ventilated attic or crawl space.

If air is supplied from outdoors, directly or through vertical ducts, there must be two openings located as specified above and each must have a minimum net free area of not less than one square inch (6.5 sq cm) per 4000 Btuh of the total input rating of all the appliances in the enclosure.

If horizontal ducts are used to communicate with the outdoors, each opening must have a minimum net free area of not less than one square inch (6.5 sq cm) per 2000 Btuh of the total input rating of all the appliances in the enclosure. If ducts are used, the minimum dimensions of rectangular air ducts shall not be less than 3" (7.6 cm).

NOTICE: If the duct openings which supply combustion and ventilation air are to be covered with a protective screen or grill, the net free area (openings in the material) of the covering material must be used in determining the size of the openings. Protective screening for the openings **MUST NOT** be smaller than 1/4" (0.64 cm) mesh to prevent clogging by lint or other debris.

NOTICE: The water heater should not be installed near an air supply containing halogenated hydrocarbons.

Corrosive Atmospheres

The air in beauty shops, dry cleaning establishments, photo processing labs, and storage areas for liquid and powdered bleaches or swimming pool chemicals often contain such halogenated hydrocarbons.

An air supply containing halogenated hydrocarbons may be safe to breathe, but when it passes through a gas flame corrosive elements are released that will shorten the life of any gas burning appliance.

Propellants from common spray cans or gas leaks from A/C and refrigeration equipment are highly corrosive after passing through a flame.

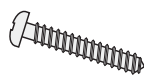
The water heater warranty is voided when failure of the heater is due to operation in a corrosive atmosphere.

Inspect Shipment

Inspect the water heater for possible damage. Check the markings on the rating plate of the water heater to be certain the type of gas supplied corresponds to the water heater requirements. Verify all included parts are present (see below).



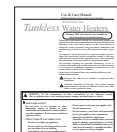
Remote Control Assembly Kit



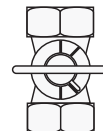
Wood Screw x 5pcs.



Washer x 4 pcs.

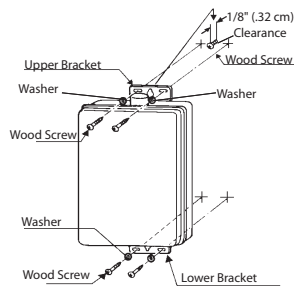


Instruction Manual



Manual Appliance Gas Shut-off Valve

⚠ CAUTION:
Reinforcement of the wall is required in case the wall is not strong enough to hold the appliance.



Mounting the Water Heater

Make sure the location of the appliance allows for easy access and operation.

Wall studs should be utilized when mounting the water heater to the wall. Alternately, a suitable piece of wood may be placed inside or outside of the wall to span the distance between the wall studs. Fasten the water heater mounting brackets to the wood.

In case of dry wall or concrete wall use dry wall anchors or lag bolts.

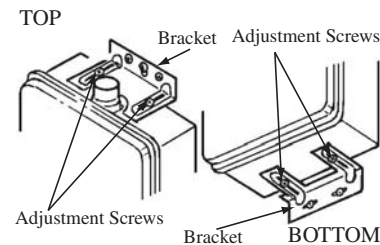
The water heater requires 120VAC/60Hz. Have a receptacle with ground terminal near the water heater. The length of the power supply cord is 10 feet (3 m), (Indoor water heater only.)

Install a wood screw for the upper bracket with a clearance of 1/8" (.32 cm) between the wall and the screw head. Hang the center of the upper bracket on the screw.

Using a wood screw and a washer, affix the lower bracket to the wall (Left and Right). Repeat to affix the top bracket.

The brackets can be adjusted to change the distance between the back of the appliance and the wall within the range of 3/8" (.95 cm) to 1/2" (3.8 cm).

Loosen the adjustment screws of both the top and the bottom brackets to adjust the distance. (See diagram below)



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

⚠ CAUTION: This water heater must only be used with the following water supply system conditions:

- With clean, potable water free of corrosive chemicals, sand, dirt, or other contaminants.
- With inlet water temperatures above 32°F (0°C), but not exceeding 140°F (60°C).
- Free of lime and scale deposits.
- DO NOT reverse the hot and cold water connections. The water heater will not operate.

Water Supply Connections

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

Use approved plumbing materials only.

The diameter of the pipe lines should be a minimum of 3/4".

To conserve energy and to prevent freezing, insulate both cold and hot water supply lines. DO NOT cover the drain or pressure relief valve.

To ensure proper operation of the water heater, the following water pressure guidelines should be followed:

- Operation of the water heater requires the minimum water pressure of 14 psi (97 kPa) and a minimum water flow rate of 0.66 gpm (2.5 lpm).
- A water pressure of 40 psi (276 kPa) is required to achieve maximum flow rate.
- To maintain proper performance, ensure sufficient water supply pressure. The Required Water Pressure = Min. Operating Water Pressure (14 psi) (97 kPa) + Pipe Pressure Loss + Faucet and Shower Pressure Loss + Safety Margin (more than 5 psi) (34 kPa).
- To supply hot water to upper floors,

additional water pressure (0.44 psi/ft) (10 kPa/m) must be ensured. The measurement should be calculated by the distance between the water inlet of the water heater (ground level) to the hot water faucet (upper floor level).

- Well water systems should be set to ensure a minimum system pressure of 40 psi (276 kPa).
- When the water is supplied from a water supply tank, the height of the tank and the diameter of the pipes and their relation to water pressure, should be taken into consideration. **Gravity water pressure is not recommended.**

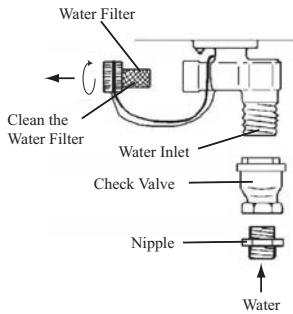
Notice: If the water flow resistance of a shower head is too high, the burner in the water heater will fail to ignite. Keep the shower head clean from debris that could cause additional pressure drop.

Notice: If using mixing valves on the outlet, choose one which prevents cold water pressure from overcoming hot water line pressure.

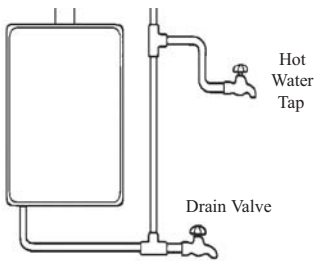
Notice: If multiple water heaters are installed in a manifold system, the water piping must be in "Parallel". A water pressure of 40 psi (276 kPa) is recommended for each water heater for proper operation of the water heaters.

Installing the water heater:

Water Supply Connections Continued



Notice: Use only teflon tape on cold and hot water connections and lines.



Install a shutoff valve near the inlet of the water heater for service and draining purposes.

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

Before connecting the water supply pipe to the water heater, open the shutoff valve and clean out sand, debris, air, caulking material, etc. inside the pipe. Connect to the water inlet, then check water flow. Close the shutoff valve and clean the water filter.

Be sure to connect the water inlet and the hot water outlet as shown on the water heater. If reversed, the water heater will not function.

Installation of unions or flexible copper connections are recommended on the HOT and COLD water lines, so that the water heater may disconnect easily for servicing if necessary.

Install a Check Valve between the water heater and the water shutoff valve. (See illustration the top left).

The following should be addressed in regards to the HOT WATER OUTLET:

- Connections between the water heater and point(s) of use should be as short and direct as possible.
- DO NOT use lead or plastic pipe.
- To conserve energy and minimize heat loss, insulation of hot water piping is recommended. (See Hot and Cold Pipe Insulation Installation on page 24).

Notice: The flow rate of hot water may vary when more than two faucets (appliances, fixtures, etc.) are being used simultaneously.

Notice: 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 (see diagram to the left).

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 at the time of installation. Local codes shall govern the installation of relief valves.

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

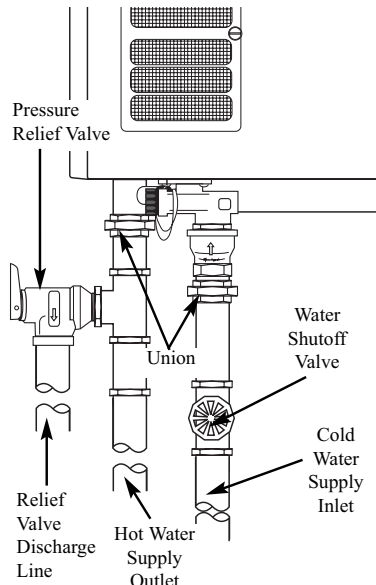
- The pressure rating of the relief valve must not exceed 150 psi (1034 kPa), the maximum working pressure of the water heater as marked on the rating plate.
- The BTUH rating of the relief valve must equal or exceed the BTUH input of the water heater as marked on its rating plate.
- No valve of any type should be installed between the relief valve and the water heater
- Discharge from the relief valve should be piped to a suitable drain to eliminate potential water damage. 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. Refer to page 24 for details.

- The discharge line must be NO SMALLER than the outlet of the relief valve and must pitch downward to allow complete drainage (by gravity) of the relief valve and discharge line.
- The end of the discharge line should not be threaded or concealed and should be protected from freezing. No valve of any type, restriction or reducer coupling should be installed in the discharge line.

Notice: Local codes govern the installation of relief valves. If local codes require that a temperature and pressure relief valve should be installed the manufacturer recommends a type 40XL Watts T&P relief valve or an equivalent model be used.

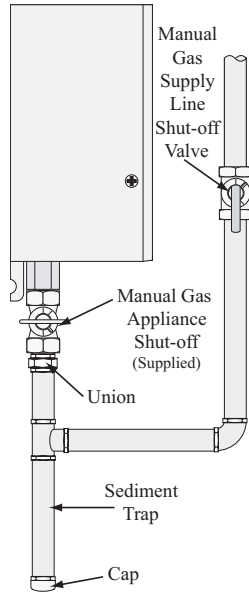
Notice: Manual operation of relief valves should be performed at least once a year. Turn off the electrical power and gas shutoff valve. Lift and release lever on the relief valve and check the manual operation of the relief valve. You should take precaution to avoid contact with the hot water coming out of the relief valve and to prevent water damage.

Notice: If the relief valve on the system discharges periodically, a problem exists and service to the water system is required.



Notice: The above illustrates a pressure only relief valve. If local codes require a combination temperature and pressure relief valve be installed, an extension piece may be needed. (Refer to page 22 or 23 for example of extension piece for T&P relief valve installation.) The T&P relief valve probe should not be directly in the flow path of the water.

⚠ 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. Such conversion could result in hazardous operating conditions.



Gas Supply

The supplied Manual Gas Appliance Shutoff Valve must be installed at the gas connection of the water heater at the time of installation (see diagram to the left).

The branch gas supply line to the water heater should be a minimum of 3/4" black steel pipe or other approved gas piping material.

A ground joint union or ANSI design certified semi-rigid or flexible gas appliance connector should be installed in the gas line close to the water heater. The National Fuel Gas Code (NFGC) ANSI Z223.1 and CAN B149 code mandates a manual gas shut-off valve: See NFGC & B149 for complete instructions.

If flexible connectors are used, the maximum length shall not exceed 36" (91 cm).

If lever type gas shut offs are used, they shall be T-Handle type.

Compound used on the threaded joints of the gas piping must be of the type resistant to the action of LP gas. Use compound sparingly on male threads only.

A sediment trap should be installed at the bottom of the gas line.

Do not use excessive force (over 31.5 ft lbs.) (42.7 Nm) in tightening the pipe, particularly if teflon pipe compound is used, as the unit may be damaged.

The inlet gas pressure to the water heater must not exceed 10.5" w.c. (2.6 kPa) for natural or 14" w.c. (3.5 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.

NOTICE: To ensure proper operation of the heater the gas pipe and gas meter must be sized correctly.

Gas piping shall be in accordance with local, utility company requirement and/or in the absence of local codes, use the latest edition of the National Fuel Gas Code. In Canada the latest edition of CSA B149.1 Natural Gas and Propane installation code.

⚠ WARNING: Never use an open flame to test for gas leaks, as property damage, personal injury, or death could result.

Leak Testing

The water heater and its gas connections must be leak tested at normal operating pressures before it is placed in operation.

- 1 Turn on the gas shut-off valve(s) to the water heater.

- 2 Use a soapy water solution to test for leaks at all connections and fittings. Bubbles indicate a gas leak that must be corrected.

The factory connections should also be leak tested after the water heater is placed in operation.

⚠ WARNING: Install a gas pressure regulator, in the gas supply line, which does not exceed the maximum supply pressure.

DO NOT use an industrial type gas regulator.

Pressure Testing the Gas Supply System

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 pressures in excess of 1/2 psi (14" w.c.) (3.5 kPa).

The water heater must be isolated from the gas piping system by closing the manual gas shut-off valve during any pressure testing of the gas supply piping at pressures equal to or less than 1/2 psi (14" w.c.) (3.5 kPa).

High Altitude

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. This water heater can be installed at elevations up to 3,280 feet (1000 m) without any change or adjustment.

NOTICE: For installations above 3,280 feet (1000 m) elevation, the connector on the PC board must be replaced. Do not install this water heater at elevations above 3,280 feet (1000 m) without installing the proper high altitude connector. Please contact your local distributor, dealer, or Paloma for replacement connector.

Installing the water heater:

The water heater must be installed with a vent adapter such as 9401RHM or FSAA4 or a UL approved Category III Stainless Steel equivalent.

⚠ DANGER: Failure to install the vent adapter and properly vent the water heater to the outdoors as outlined in the Venting section of this manual will result in unsafe operation of the water heater causing death, serious injury, explosion, or fire. To avoid the risk of fire, explosion, or asphyxiation from carbon monoxide, NEVER operate the water heater unless it is properly vented and has adequate air supply for proper operation as outlined in the Venting section of this manual.

⚠ WARNING: Use UL approved Category III Stainless Steel vent material only. No other vent material is permitted.

⚠ WARNING: Refer to page 7 for clearances to combustible material.

Venting

The installation of venting must comply with national codes, local codes, and the vent manufacturer's instructions.

The water heater must be vented to the outdoors as described in these instructions. **DO NOT** connect this water heater to a Chimney. It must be vented separately from all other appliances.

All vent components (adapters, pipe, elbows, terminals, etc.) should be UL1738 Certified Stainless Steel Venting Material (e.g. AL29-4C).

The specified vent termination must be used. The termination should be a 90° elbow type with screen. (Refer to page 17)

Use a vent pipe with an anti-disconnection structure.

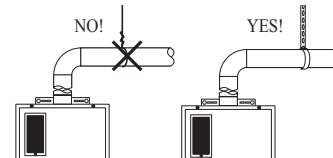
The use of a High Temperature Silicone (500°F) (260°C) may be required to seal vent connections. To prevent accidental gas exhaust leakage, apply a 1/4" (6 mm) wide bead approximately 1/4" (6 mm) from the end and another bead against the joint side of the stop bead.

Follow vent manufacturer's installation instructions.

The unit can be vented either horizontally or vertically.

Vent pipe runs must be adequately supported along both horizontal and vertical runs.

The maximum recommended unsupported span should be no more than five (5) feet (1.5 m) Support isolation hanging bands should be used. **DO NOT** use wire. (See diagram below).



Notes on pre-existing vent:

If the water heater is being installed as a replacement for an existing water heater, a thorough inspection of the existing venting system must be performed prior to any installation work. Verify that the correct materials, vent lengths and terminal locations as detailed in this instruction manual have been met. Carefully inspect the entire venting system for any signs of cracks or fractures, particularly at the joints between elbows or other fittings and the straight runs of vent pipe. Check the system for signs of sagging or other stresses in the joints as a result of misalignment of any components in the system. If any of these conditions are found, they must be corrected in accordance with the venting instructions in this manual before completing the installation and putting the water heater into service.

Number of 90° elbows (bends)	Maximum Length of Straight Pipe
1	47' 6" (14.4 m)
2	42' 6" (13 m)
3	37' 6" (11.4 m)

Venting Lengths

MAXIMUM VENT LENGTH - The system will not operate if there is excessive restriction (pressure drop) in the venting system. A maximum of 47 feet 6 inches (14.4 m) of vent pipe may be used provided there is only one 90° elbow in the system. If additional elbows are required: two elbows can be used with 42 feet 6 inches (13 m), and three elbows can be used with 37 feet 6 inches (11.4 m) of vent pipe.

A 90° elbow is equivalent to 5 feet (1.5 m) to straight pipe. A 45° elbow is equivalent to 2 feet 6 inches (76 cm) of straight pipe.

The termination elbow does not count as an elbow when determining total vent lengths.

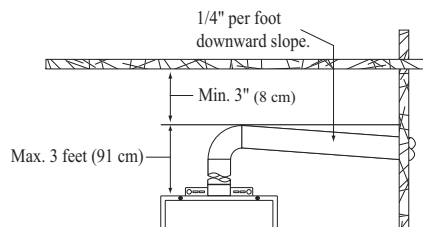
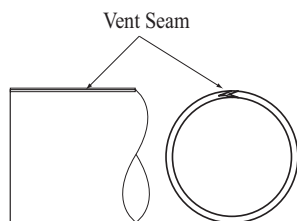
The vent can be installed with a slight downward slope of 1/4" per foot of

horizontal run toward the vent terminal (see diagram below). This ensures that any condensate formed during operation of the unit is evacuated from the appliance.

A 1/4" per foot upward slope is acceptable when it is not possible to vent with a downward slope, however, a UL approved Category III Stainless Steel condensate trap MUST be installed at the beginning of the horizontal run (See page 17 "Typical Horizontal Termination w/ 1/4" per foot UPWARD Slope" or page 18, "Standard Vertical Termination" for examples).

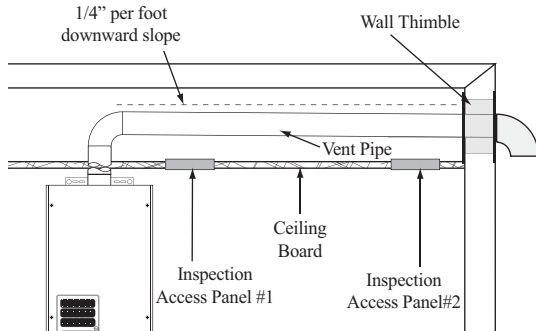
MINIMUM VENT LENGTH - The venting may be as short as 12" (30 cm), provided one vent termination is installed to the outdoors through a sidewall, one 90° elbow is included in the installation, and the wall thimble is installed.

Notice: Make sure that the seam of the vent pipe in horizontal runs is toward the top of the installation (see illustration to the far left).



Venting Through Closed Spaces

If the vent piping passes through a closed space, a minimum clearance of 8" (20 cm) when installed horizontally, 6" (15 cm) when installed vertically should be maintained between the vent pipe and combustibles and noncombustibles. Be sure to follow local codes.



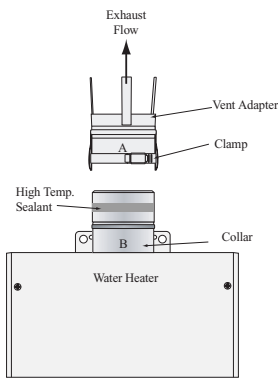
For maintenance and inspection purposes, the following access panels are required.

- Two (2) inspection access panels large enough to allow access for venting inspection. One (1) of these access panels should be close to where the vent pipe enters the ceiling. The other access panel should be near the vent termination.
- A ventilation access panel with a 16 in² (103 cm²) opening should be provided every 10 ft (3 m).

Vent Adapter

A UL 1738 approved stainless steel vent adapter is required for vent connection.

Read the following instructions before installation.



- Test fit the adapter over the water heater collar before proceeding. Adjust clamp as needed.
- With an alcohol wipe, clean inside surface "A" of adapter and outside surface of "B" of heater collar.
- Apply 1/4" (6 mm) wide bead of high temperature silicone (500°F) (260°C) around outside of heater collar "B".
- Slide adapter end "A" down over heater collar "B" as far as it will go.

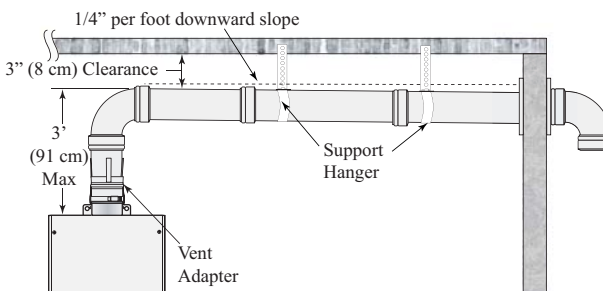
- Tighten the clamp around the collar.
- Inspect the inside of the adapter to verify that the collar and adapter are sealed. If more sealant is required, apply sealant to a flat tool, then spread around the collar edge on inside of adapter.
- Ensure that the clamp does not interfere with the damper shaft.

NOTICE: Follow the vent adapter manufacturer's instructions

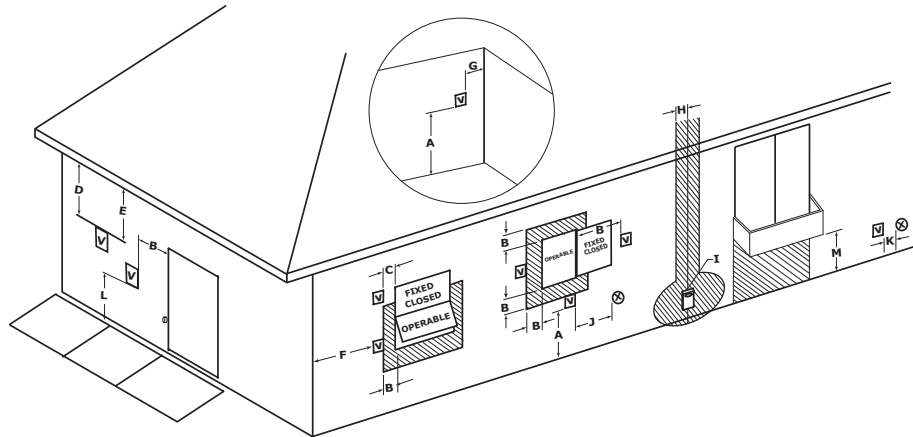
Draining the Condensate

In order to prevent condensate from draining back into the water heater, a condensate trap and drain must be installed in a horizontal vent section as close as practical to the water heater vent connection, unless the water heater is vented horizontally with a 1/4" per foot **DOWNWARD** slope towards the vent terminal as shown below.

Condensate is known to be acidic; refer to local, state (provincial) or federal codes for proper handling and discharge methods.



Installing the water heater.



☐ VENT TERMINAL

☒ AIR SUPPLY INLET

▨ AREA WHERE TERMINAL IS NOT PERMITTED

Horizontal Vent Terminal Location

The following information should be used for determining the proper location of the vent terminal for indoor and outdoor tankless water heaters.

	Canadian Installations ¹	US Installations ²
A= Clearance above grade, veranda, porch, deck or balcony.	12 inches (30 cm) above anticipated snow level.	12 inches (30 cm) above anticipated snow level.
B= Clearance to window or door that may be opened.	6 inches (15 cm) for appliances < 10,000 Btuh (3 kW), 12 inches (30 cm) for appliances > 10,000 Btuh (30 kW), 36 inches (91 cm) for appliances > 100,000 Btuh (30kW).	4 feet (1.2 m) below or to side of opening; 1 foot (300 mm) above opening.
C= Clearance to permanently closed window.	*	*
D= Vertical Clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal.	4 feet (1.2 m)	4 feet (1.2 m)
E= Clearance to unventilated soffit.	*	*
F= Clearance to outside corner.	*	*
G= Clearance to inside corner.	*	*
M = Clearance under veranda, porch, deck or balcony.	3 feet (91 cm)	3 feet (91 cm)

¹ In accordance with current CAN/CGA-B149 Installation Codes.

² In accordance with current ANSI Z223.1/ NFPA 54 National Fuel Gas Code.

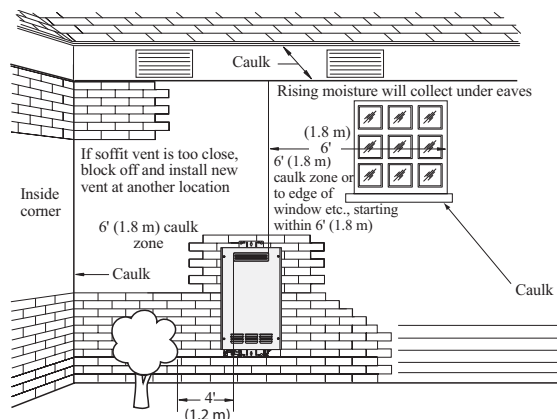
	Canadian Installations ¹	US Installations ²
H = Clearance to each side of center line extended meter/regulator assembly above	3 feet (91 cm) within a height 15 feet (4.57 m) above the meter/regulator assembly.	*
I = Clearance to service regulator vent outlet.	3 feet (91 cm)	*
J = Clearance to nonmechanical air supply inlet to the combustion air inlet to any building or other appliance.	6 inches (15 cm) for appliances < 10,000 Btuh (3 kW), 12 inches (30 cm) for appliances > 10,000 Btuh (30 kW), 36 inches (91 cm) for appliances > 100,000 Btuh (30kW).	4 feet (1.2 m) below or to side of opening; 1 foot (300 mm) above opening.
K = Clearance to mechanical air supply inlet.	6 feet (1.83 m)	3 feet (91 cm) above if within 10 feet (3 m) horizontally.
L = Clearance above paved side walk or paved driveway located on public property.	7 feet (2.13 m)	7 feet (2.13 m)
M = Clearance under veranda, porch, deck or balcony.	Not Allowed	Not Allowed

+ A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

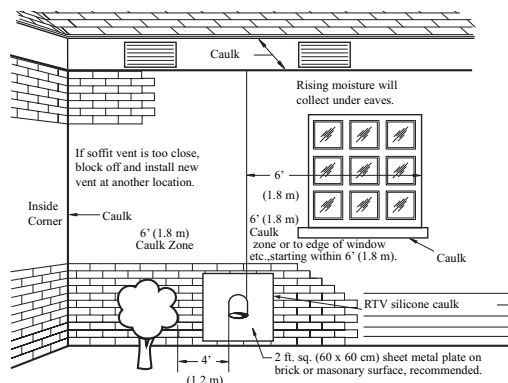
* If clearances are not specified then follow local installation codes and the requirement of the gas supplier.

Installing the water heater:

Outdoor Water Heater



Indoor Water Heater

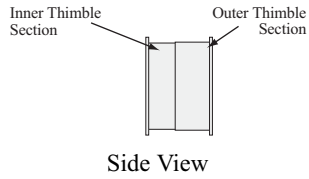


⚠ WARNING: Moisture in the flue gas will condense as it leaves the vent terminal. In cold weather this condensate can freeze on the exterior wall, under the eaves and on surrounding objects. Some discoloration to the exterior of the building is to be expected. However, improper location or installation can result in severe damage to the structure or exterior finish of the building

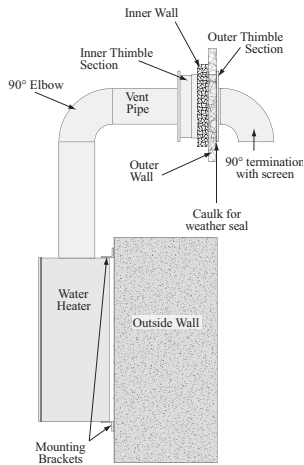
Additional Considerations

- 1 Do Not install vent terminal under any patio or deck.
- 2 To help prevent moisture from freezing on walls and under eaves, do not locate vent terminal on the side of a building with prevailing winter winds.
- 3 To help prevent water lines from freezing do not locate vent terminal on the side of a building with prevailing winter winds.
- 4 Do Not terminate vent directly on brick or masonry surfaces. A rust-resistant sheet metal backing plate (2 x 2 feet) (60 x 60 cm) is recommended behind vent. (See illustration.)
- 5 Do Not locate vent terminal too close to shrubbery, as flue gasses may damage them.
- 6 Caulk all cracks, seams and joints within six (6) feet (1.8 m) of vent terminal.
- 7 Caulk around thimble face plate for weather tight seal.
- 8 All painted surfaces should be primed to lessen the chance of physical damage. Painted surfaces will require maintenance.
- 9 Insulate vent pipe of indoor water heaters exposed to cold conditions (attics, crawl spaces, etc.) with inflammable material to help prevent moisture from accumulating in vent pipe.
- 10 Do Not extend exposed vent pipe of indoor water heaters outside of building.
- 11 Guard vent against accidental contact with people and pets.

Vent Horizontal Wall Thimble Installation



Side View



Side View

⚠ WARNING: Use UL approved Category III vent material only. No other vent material is permitted.

⚠ CAUTION: Follow the vent manufacturers installation instructions as design might vary from manufacturer to manufacturer.

An approved 4 inch (10 cm) Vent Horizontal Wall Thimble must be used.

The Wall Thimble requires mechanical support from the wall sufficient to support any incidental loads on the system. If the wall is not sufficient enough to support the Wall Thimble, then appropriate additional framing and/or blocking is required.

INSTALLATION PROCEDURE:

Prepare an opening for the Wall Thimble in the wall. The opening must be 6-1/2 inches (16 cm) in diameter for a 4 inch (10 cm) vent system.

If there are not sufficient support members to secure the Wall Thimble or if there is a semirigid foam insulation layer under the sheathing, appropriate fasteners must be used to secure the Wall Thimble to the support members.

The Wall Thimble is designed to adapt to any wall thickness from 3-1/2" (9 cm) to 6" (15 cm) thick. If the wall is thicker than 6" (15 cm) the Wall Thimble may be extended using a piece of 6" (15 cm) diameter snaplock or welded seam galvanized pipe up to 6" (15 cm) long.

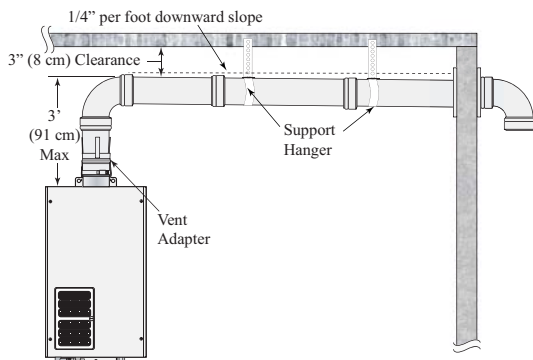
Select the larger diameter half of the Wall Thimble for the outside of the wall.

- Apply a continuous bead of high quality silicone or silicone/latex caulk on the inside of the outer flange. This will be the only weather seal to keep moisture outside the building. Ensure a sufficient seal is made.
- Position this portion of the Wall Thimble into the prepared hole from the outside. Secure the assembly into the prepared opening using fasteners as indicated by sheathing or structural members, sealing the screw heads with

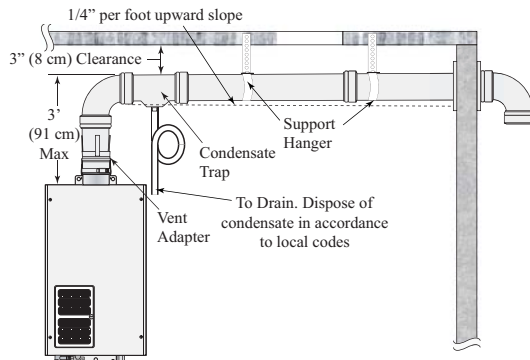
more caulking.

Use 4 hollow wall anchors, at least 1/8" (.32 cm) in diameter and of appropriate length for the thickness of the sheathing, if sheathing is particle board or other composite material. Use 4 #10x1-1/4" wood screws for plywood, solid wood sheathing or members. Use suitable masonry anchors when passing through solid masonry walls. Reinstall the decorative sheathing around the Wall Thimble. This assembly may be painted to match the exterior decor.

- Attach a screened 4 inch termination fitting to the female end of a vent section or slip connector. Use the method described in the Venting installation instructions (page 13). Slide the vent in through the outside of the Thimble and seal the annular space with a thick bead of caulk.
- Slide the interior portion of the Thimble into the inside hole. Be certain the interior and exterior Thimble halves overlap at least 1" (2.5 cm). If insufficient overlap exists, extend the interior portion with single wall galvanized pipe.
- Secure the Wall Thimble to the interior sheathing using suitable fasteners.
- Secure the vent section or slip connector that protrudes through the Wall Thimble to the rest of the vent system as described in the Venting installation instructions (page 13).



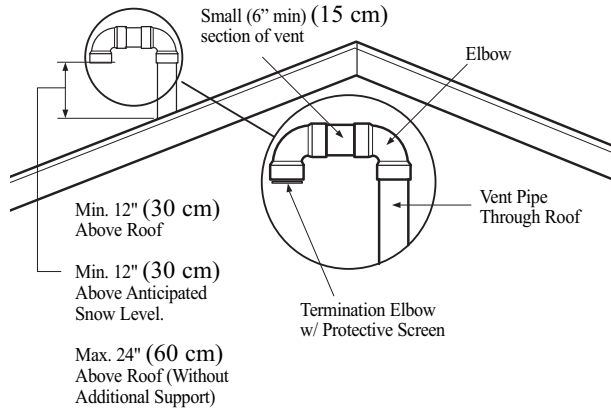
Typical Horizontal Termination
w/ 1/4" per foot DOWNWARD Slope



Typical Horizontal Termination
w/ 1/4" per foot UPWARD Slope

Installing the water heater.

Vertical Vent Termination Location



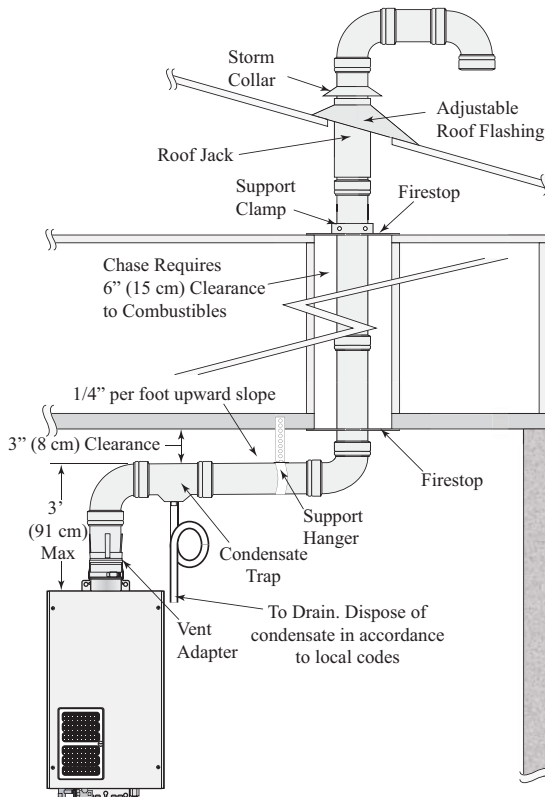
The location of the vent terminal depends on the following minimum clearances and considerations (see illustration):

- 1** Minimum twelve (12) inches (30 cm) above roof.
- 2** Minimum twelve (12) inches (30 cm) above anticipated snow level.
- 3** Maximum twenty-four (24) inches (60 cm) above roof level without additional support for vent.
- 4** Four (4) feet (1 m) from any gable, dormer or other roof structure with building interior access (i.e., vent, window, etc.).
- 5** Ten (10) feet (3 m) from any forced air inlet to the building. Any fresh or make-up air inlet such as a dryer or furnace area is considered to be a forced air inlet.

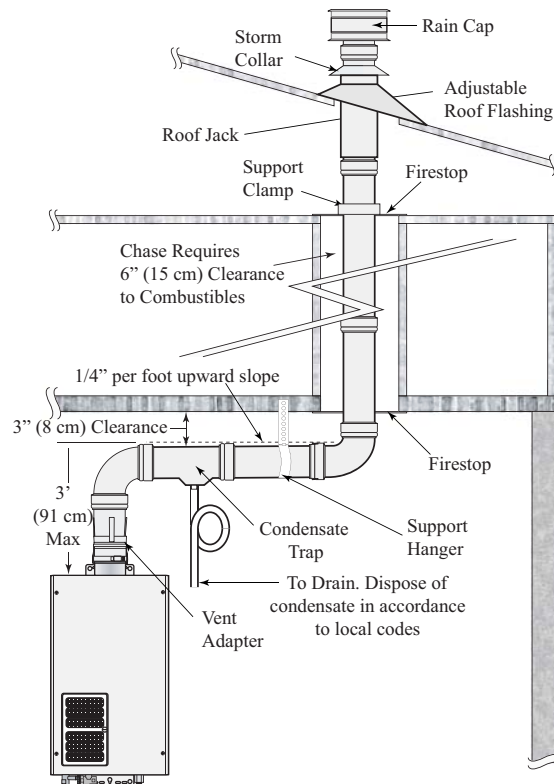
Vertical Vent Installation

Once the vent terminal location has been determined, make a hole through the roof and interior ceiling to accommodate the vent pipe. Complete the vent pipe installation to the water heater's vent connector fitting on the water heater vent collar outlet. Support vertical or horizontal runs as previously mentioned. If required, use silicone sealant at the point the vent connector joins the water heater.

Install adequate flashing where the vent pipe passes through the roof. Determine the vent terminal height and install the vent pipe accordingly. Refer to the illustration above for proper vent terminal height. Connect vent elbow on to vertical pipe through roof. Connect short piece of vent pipe (approximately 6" long (15 cm) to elbow, and the terminal elbow with the protective screen.



Standard Vertical Vent Termination



Alternate Vertical Vent Termination with Rain Cap

▲ 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, CSA C22.1 Part 1.

Remote Control Installation

NOTICE: The provided remote control will allow a maximum temperature setting of 120°F (49°C). Temperatures of up to 180°F (82°C) can be achieved with dip switch adjustment. Only qualified service personnel should perform this adjustment.

One (1) remote control is provided with the water heater.

The following are considerations for determining the location of the remote control(s):

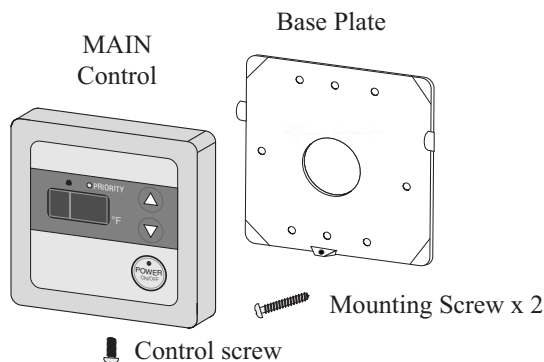
- **DO NOT** install any remote control outdoors or areas where it can come in contact with water.
- Place remote control out of children's reach.
- The remote control can be installed in convenient locations such as the kitchen, laundry room, utility room, or directly beside the indoor water heater.
- Avoid areas where the remote control may be exposed to heat, e.g. stove ranges or heaters.
- Avoid areas where the remote control may be subjected to oil and/or steam from cooking.
- Avoid areas where chemical agents (such as thinner, benzine and alkaline) are used.
- Avoid areas of direct sunlight.

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

NOTICE: Only main remote control (UMC-117) and manifolding control can be connected to the water heater.

No other manufacturer's controls are suitable for use with this water heater.

DO NOT attempt to disassemble the remote control.



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
		125°F - 180°F (52°C)-(82°C)	With Dip Switch Adjustment

NOTICE:

Manifolding Applications: Certain Commercial installations may require more than one water heater piped together in a manifold to supply enough capacity for high temperature and/or water flow applications. Special manifolding control kits are available for operating multiple heaters together. Contact your dealer for details.

Installing the Main Remote Control.

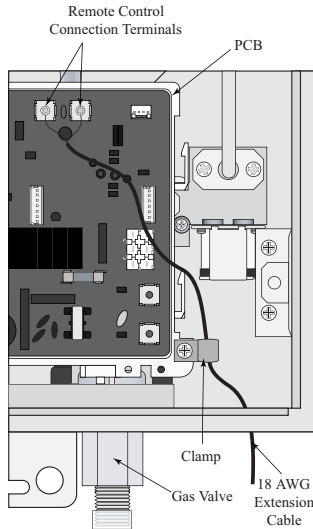
⚠ WARNING: Field wiring connections and electrical grounding must comply with local codes, or in the absence of local codes, with the latest edition of the National Electrical Code, ANSI/NFPA 70, or in Canada, Canadian Electrical Code, CSA C22.1 Part 1.

Remote Control Installation

NOTICE: Extension cable can be any Type-T 18 AWG wire similar to a thermostat wire and need not be polarity sensitive.

Do Not apply sealant to the remote control cable.

It is not recommended to have wiring exposed.



Connecting the MAIN (UMC-117) remote control to the water heater:

- Drill a 1" (2.5 cm) to 1.5" (4 cm) hole at the proposed control location.
- Install the extension cable between the location of the remote control and the water heater.
- Remove the base plate from the control.
- Draw the remote control extension cable through the central in the base plate.
- Fix the base plate to the wall using suitable screws and wall anchors. Ensure the projections on the base plate are pointing upwards.
- Connect the remote control cables to the extension cable from the water heater.
- Place the remote control over the base plate. Ensure the projections in the base plate fit into the housings in the remote control.
- Fix the control to the base plate at the bottom of the remote control using the screw provided.
- Proceed to "Connecting the remote control to the water heater", to complete installation.

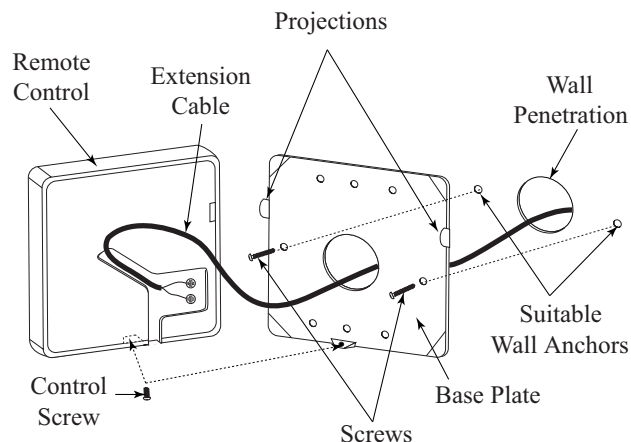
Connecting the remote control to the water heater:

- Ensure that the power to the water heater has been disconnected.
- Remove the front cover of the water heater.
- Insert the remote control extension cable through the hole at the bottom right hand corner of the water heater.
- Connect the wires to the terminals on the top right hand side of the Printed Circuit Board (PCB) as shown in illustration to the left.

NOTICE: The remote control wire connection terminals are not polarity sensitive.

- Firmly tighten the terminal screws.
- Secure the remote control extension cable using the appropriate clamp.
- Replace the front cover of the water heater.
- Switch on the power supply to the water heater.
- Ensure proper operation of the remote control and water heater.

NOTICE: If water heaters are in a manifold system the main remote control connected to the manifold controller (MIC-180) has priority over remote controls connected to the water heaters.



⚠ 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, CSA C22.1 Part 1.

Electrical Connection

⚠ WARNING: Shock hazard line voltage is present. 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 could result in severe personal injury or death.

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

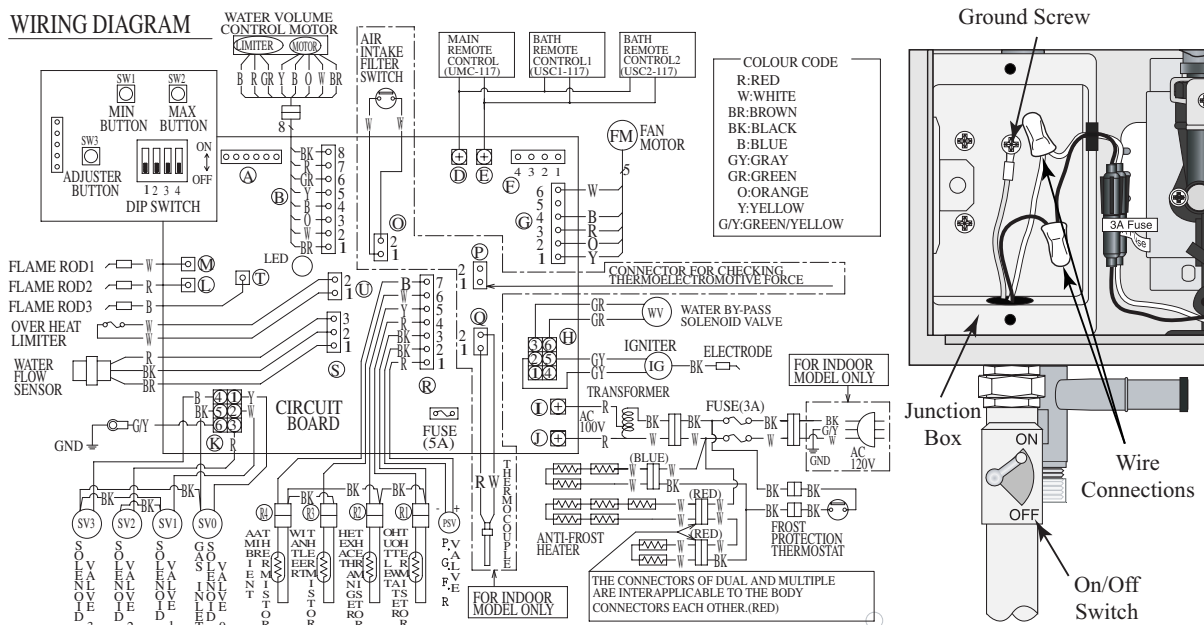
POWER CORD (Indoor water heaters only):

- The electric power supply requirement for this water heater is 120 VAC/60HZ, 2 Amps.
- The water heater comes with a three (3) pin power supply cord (INDOOR MODELS ONLY). Use only a power outlet with a ground terminal.
- The installation of an electric leakage breaker is recommended.
- Keep any excess of the power supply cord on the outside of the water heater.
- If local codes require hardwiring, see instructions for “Hardwiring the Electrical Connections”.

HARDWIRING THE ELECTRICAL CONNECTIONS (Indoor or Outdoor water heaters):

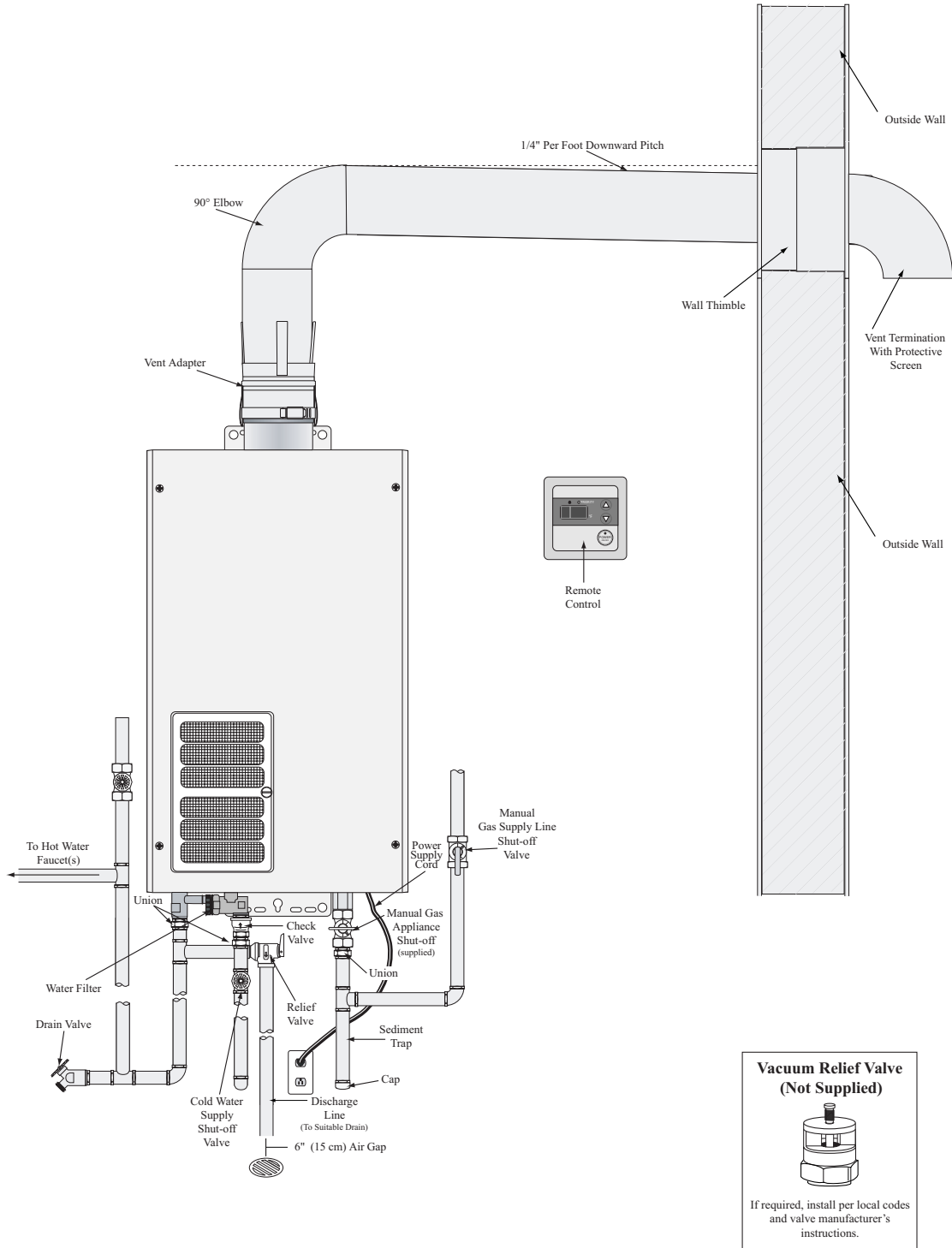
- Wiring should be carried out by a qualified electrician in accordance with local codes.
- The water heater requires 120 VAC/60Hz and should be properly grounded.
- DO NOT connect grounding wire to water pipes, gas pipes, telephone cables, lightning conductor circuits and to grounding circuit of other equipment that carry a ground-fault interrupter.
- An ON/OFF switch must be provided and installed for the incoming 120VAC power.
- Wire the water heater exactly as shown below. A wiring diagram is also found inside of the cover panel.
- A green screw is provided in the junction box for grounding connection.
- Connect the live wire to black leg wire and the neutral wire to the white neutral wire.

WIRING DIAGRAM



Installing the water heater.

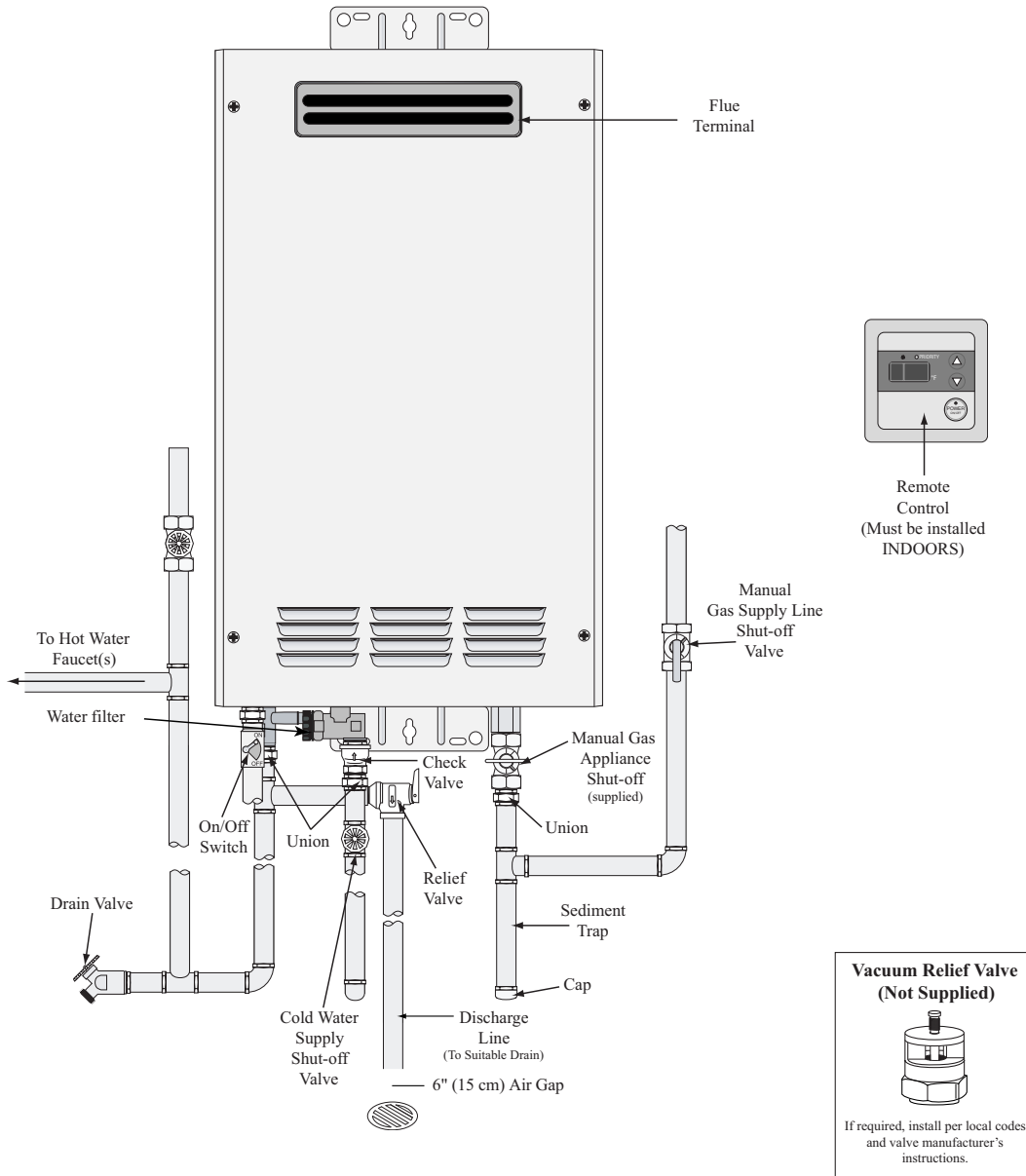
Typical Installation of Indoor Water Heater



NOTICE: The National Fuel Gas Code (NFGC) and B149 mandates a manual gas shut-off valve: See NFGC/B149 for complete instructions. Local codes or plumbing authority requirements may vary from the instructions or diagrams provided and take precedent over these instructions.

Installing the water heater:

Typical Installation of Outdoor Water Heater



NOTICE: The National Fuel Gas Code (NFGC) and B149 mandates a manual gas shut-off valve: See NFGC/B149 for complete instructions. Local codes or plumbing authority requirements may vary from the instructions or diagrams provided and take precedent over these instructions.

Insulation Blankets

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

Insulation blankets, available to the general public, for external use on gas water heaters are not necessary. The purpose of an insulation blanket is to reduce the standby heat loss encountered with storage tank heaters. This water heater does not store water making an insulation blanket unnecessary.

The manufacturer's warranty does not cover any damage or defect caused by installation, attachment or use of any type of energy saving or other unapproved devices (other than those authorized by the manufacturer) into, onto or in conjunction with the water heater. The use of unauthorized energy saving devices may

shorten the life of the water heater and may endanger life and property.

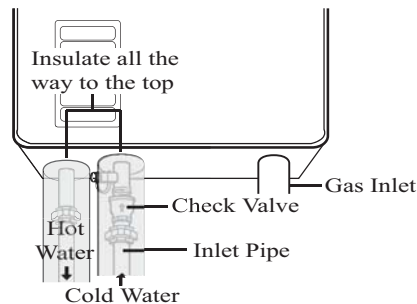
The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized devices.

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

- Do not cover the air inlet, flue outlet, or operating and warning labels attached to the water heater or attempt to relocate them on the exterior of insulation blanket.

Hot and Cold Pipe Insulation Installation

NOTICE: The hot and cold pipes should be insulated as shown to provide additional freeze protection.



For increased energy efficiency, use pipe insulation. Please install the insulation, according to the illustrations above,

making sure to insulate all the way to the top. **Do not** cover any drain or pressure relief valve(s).

During Installation of this water heater.....

Do's

- Do** follow all installation instructions covered in this manual.
- Do** check inlet gas pressure to ensure that it is within the range specified on the rating plate.
- Do** provide adequate air for combustion and ventilation as discussed in the Instruction Manual and the National Fuel Gas Code (CAN/CGA B149 in Canada).
- Do** maintain proper clearances to combustibles and non-combustibles as specified on the nameplate.
- Do** ensure that the venting system complies with the guidelines found in the Instruction Manual and National Fuel Gas Code (CAN/CGA B149 in Canada).
- Do** contact local gas company to ensure gas meter and gas piping are adequately sized.
- Do** use teflon tape on water line connections and fittings.

Don'ts

- Don't** block or restrict Air Intake Opening located bottom left corner of the water heater.
- Don't** remove the front cover unless absolutely necessary. This should only be done after being examined by a qualified service technician.
- Don't** install this product where standing water may occur.
- Don't** use pipe dope on water line connections and fittings.

Installing the water heater:

Installation Check List

A. Outdoor Water Heater Location

- Outdoor water heaters must be installed outdoors.
- Protected from freezing temperatures.

B. Indoor Water Heater Location

- Close to area of vent termination.
- Indoors and protected from freezing temperatures .

C. Outdoor and Indoor Water Heater Location

- Proper clearance from combustible surfaces 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, rags, etc. clear of the heater and vent piping.
- Water heater is properly attached to the wall.

D. Water Supply

- Water supply has sufficient pressure.
- Air purged from water heater and piping.
- Water connections tight and free of leaks
- Water filter is clean and in place.
- Materials used are as instructed in this manual.
- Water pipes are insulated and protected from freezing.

E. Gas Supply

- Gas type matches rating plate.
- Gas supply pressure is sufficient for the water heater.
- Gas line equipped with shut-off valve, union and sediment trap.
- Approved pipe joint compound used.
- Soap and water solution used to check all connections and fittings for possible gas leak.
- Gas Company inspected installation (if required).

F. Relief Valve

- Pressure Relief Valve properly installed and discharge line run to open drain
- Discharge line protected from freezing.

G. Venting (Indoor Water Heaters Only)

- Materials used are as instructed in the manual.
- Vent connector(s) pitched downward to termination (1/4" per foot of length minimum) See page 13.
- Vent connector(s) securely fastened together with high temperature silicone (500°F) (260°C) and air-tight.
- All vent runs are properly supported.
- Vent terminal is properly installed.
- Sufficient combustion air is available.
- Maximum and minimum vent lengths are observed.

H. Electrical Wiring

- Voltage matches rating plate.
- Water heater is properly grounded.
- Supply cord and/or wiring meets all local codes.

Lighting the water heater:

Before operating this water heater, be sure to read and follow the instructions on the label pictured below and all other labels on the water heater, as well as the warnings printed in this manual. Failure to do so can result in unsafe operation of the water heater resulting in property damage, personal injury, or death. Should you have any problems reading or following the instructions in this manual, STOP, and get help from a qualified person.

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.

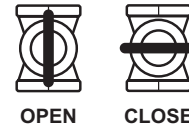
- A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
- B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and 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.

31-16962(0)

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



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.

Operating the water heater:

Safety Precautions

- A** Do turn off manual gas shut-off valve if water heater has been subjected to over heating, fire, flood, physical damage or if the gas supply fails to shut off.
- B** Do Not turn on water heater unless water and gas supplies are fully opened.
- C** Do Not turn on water heater if cold water supply shut-off valve is closed.
- D** Do Not allow combustible materials such as newspaper, rags or mops to accumulate near water heater.
- E** Do Not store or use gasoline or other flammable vapors and liquids, such as adhesives or paint thinner, in vicinity of this or any other appliance. If such flammables must be used, open doors and windows for ventilation, and all gas burning appliances in the vicinity should be shut off including their pilot lights, to avoid vapors lighting.
- F** If there is any difficulty in understanding or following the Operating Instructions or the Care and Cleaning section, it is recommended that a qualified person or serviceman perform the work.

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

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

Water Temperature Setting

The temperature of the water in the water heater can be regulated by setting the temperature on the front of the remote control.

Safety factors should be considered when selecting the water temperature setting of the water heater's remote control.

The remote control was set at 100°F (38°C) before the water heater was shipped from the factory. This is the recommended starting point.

Water temperatures above 125°F (52°C) can cause severe burns or death from

scalding. Be sure to read and follow the warnings outlined in this manual and on the label located on the water heater.

Mixing valves are available for reducing point of use water temperature by mixing hot and cold water in branch water lines. Contact a licensed plumber or the local plumbing authority for further information. (See page 4 for more details.)

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

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)	1½ to 2 minutes
130°F (54°C)	About 30 seconds
135°F (57°C)	About 10 seconds
140°F (60°C)	Less than 5 seconds
145°F (63°C)	Less than 3 seconds
150°F (66°C)	About 1½ seconds
155°F (68°C)	About 1 second

Table courtesy of Shriners Burn Institute

Water Temperature Setting...

Maximum water temperature occurs while the burner is on. To determine the water temperature, turn on a hot water faucet and place a thermometer in the water stream. Water temperature at the faucet may vary depending on season and length of pipe from the water heater.

The factory setting of the remote control temperature range is between 100°F (38°C) and 120°F (49°C).

The remote control is factory preset to 100°F (38°C).

To turn the remote control ON or OFF, press the POWER button.

To adjust the temperature to a required setting, press the UP arrow temperature button.

Pressing the UP or DOWN temperature adjustment buttons will change the temperature set point.

The temperature set point on the remote control cannot be increased above 112°F (44°C) when a hot water faucet is in the open position.

Notice: The remote controller cannot be turned on when water is flowing or circulating through the water heater.

Notice: The factory setting allows operating temperatures between 100°F (38°C) and 120°F (49°C). Temperatures of up to 180°F (82°C) can be achieved with the MAIN (UMC-117) remote control and a dip switch adjustment. Only qualified service personnel should perform this adjustment. Only factory authorized remote control(s) should be used.

The hottest temperature water will be at the hot water faucet closest to the water heater.

Always remember to test the water temperature with your hand before use and remember that hotter water increases the risk of scald injury.

Always supervise young children or others who are incapacitated.

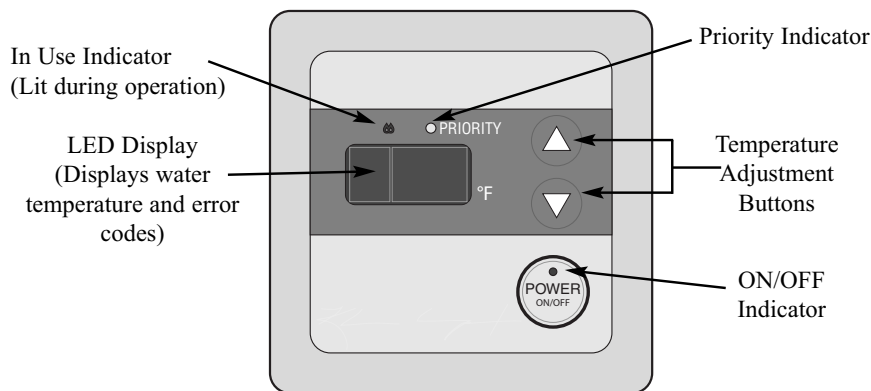
The water heater is equipped with a device that will shut off the gas supply to the burner if the water heater exceeds normal operating temperatures. Refer to the (Before You Call For Service) section located near the back of this manual, or contact your dealer.

▲ WARNING: Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the appliance.

If the water heater has been subjected to fire, flood or physical damage, turn off the manual gas shut-off valve(s), and do not operate the water heater again until it has been checked by qualified personnel.

Notice: The water heater may not operate with a small water flow. In such case, increase the water flow. If water heater still does not operate and hot water faucet is completely open, increase the temperature setting on the remote control.

Notice: Display shows °F only.



100	102	104	106	108	110	112	114	116	118	120*	125	130	135	140	150	160	170	180
38	39	40	41	42	43	44	46	47	48	49*	52	54	57	60	66	71	77	82

* Temperatures above 120°F (49°C) can be achieved by adjusting the dip switch. See page 35 for dip switch adjustment.

Care and cleaning of the water heater:

▲ DANGER: Before manually operating the relief valve, make certain no one will be exposed to the danger of the hot water released by the valve. The water may be hot enough to create a scald hazard. The water should be released into a suitable drain to prevent injury or property damage.

▲ DANGER: Hotter water increases the potential for Hot Water Scalds.

▲ DANGER: Failure to perform the recommended Routine Preventative Maintenance can harm the proper operation of this water heater, which can cause carbon monoxide dangers, excessive hot water temperatures and other potentially hazardous conditions.

▲ DANGER: Shock Hazard
Make sure the electrical power to the water heater is off to avoid potential serious injury or damage to components.

▲ DANGER: Combustible materials, such as clothing, cleaning materials, or flammable liquids, etc., must not be placed against or next to the water heater.

Routine Preventative Maintenance

Properly maintained, your water heater will provide years of dependable trouble-free service.

It is recommended that a periodic inspection of the burner, relief valve, air intake filter, water filter and venting system should be made by service personnel qualified in gas appliance repair.

It is suggested that a routine preventive maintenance program be established and followed by the user.

At least once a year, lift and release the lever handle on the pressure relief valve, located in the hot outlet piping of the water heater, to make certain the valve operates freely. Allow several gallons to flush through the discharge line to an open drain.

NOTICE: If the pressure relief valve on the hot water heater discharges periodically, this may be due to a problem in the water system. Contact the water supplier or your plumbing contractor on how to correct this. **DO NOT plug the relief valve outlet.**

Rapid closing of faucets or solenoid valves in automatic water using appliances can cause a banging noise heard in a water pipe. Strategically located risers in the water pipe system or water hammer arresting devices can be used to minimize the problem.

Housekeeping

Before performing Housekeeping tasks to this water heater, turn the unit off and disconnect the power supply.

Vacuum around the water heater for dust, dirt and lint on a regular basis.

Clean the water heater and remote control by using a damp soft cloth with a few drops of mild detergent and gently wiping the surfaces of the unit. Wipe any remaining moisture with a dry soft cloth.

To ensure sufficient ventilation and combustion air supply, proper clearances must be maintained.

DO NOT block or obstruct the air intake opening located at the lower left corner of the water heater. A minimum of 12" (30 cm) is required between this combustion air inlet opening and any obstruction.

The Air Intake and Water filters should be cleaned on a monthly basis.

Inspect the area around the water heater to ensure a safe operating environment. Keep appliance area clear and free from combustible materials, gasoline, and other flammable vapors and liquids.

Ensure the unit has not been damaged. If damage or denting is present, contact a service personnel to verify proper operation.

Check for any abnormal sounds during normal operation of the water heater.

All piping should be checked for gas and/or water leaks. Refer to page 12 of this manual for instructions on leak testing.

The air intake and cold water supply filters should be cleaned monthly. Refer to the "Housekeeping" section for further information.

DO NOT operate the water heater if you feel something is wrong with the unit.

DO NOT allow children to operate or otherwise handle the unit.

Notice: After inspection, maintenance, and/or cleaning, ensure proper operation by turning on a hot water faucet.

HOW TO CLEAN THE WATER FILTER:

- Make sure the unit is OFF and the electrical power supply has been disconnected.
- Turn the water supply OFF to the heater.
- **Drain heater.** See "Draining The Water Heater" section on page 31.
- Unscrew the water filter, and slide the filter out.
- **DO NOT** tap the filter as it may deform and/or damage the filter.
- To remove severe sediment and dirt, use a soft brush and wash with running water.
- Return the filter to the water heater and screw in the filter.
- Turn the electrical power supply and cold water supply ON to the water heater.

Care and cleaning of the water heater:

▲ DANGER: DO NOT attempt to operate the water heater without the air intake filter. DO NOT alter the proving switch to force the unit to operate without the air intake filter.

Notice: The water heater may not work if the air intake filter is severely clogged.

Housekeeping continued

CLEANING THE AIR INTAKE FILTER/AIR FILTER:

- Make sure the unit is OFF and the electrical power supply has been disconnected.
- Unscrew the holding screw to the right of the filter, and slide the filter down.
- Using a vacuum cleaner, remove any loose dust particles. DO NOT tap the filter as it may deform and/or damage the filter.
- To remove severe dust, use a soft brush and wash with running water.
- Allow the filter to dry completely before reinstalling the filter on the water heater. Be sure to secure the filter by lining the guide tab in the hole and

tightening the screw.

CLEANING THE WATER HEATER AND REMOTE CONTROL(S):

- Make sure the unit is OFF and the electrical power supply has been disconnected.
- **DO NOT** scrub the appliance with a brush.
- Use only mild soapy water, other cleaners may damage the surface of the water heater.
- **DO NOT** remove any label including the rating plate while cleaning or servicing.
- **DO NOT** splash water on the remote controls when cleaning.

Venting System Inspection

The venting system of an indoor water heater should be inspected annually to ensure all of the vent sections are secure and air-tight.

It is recommended that qualified service personnel familiar with Category III venting inspect the venting system.

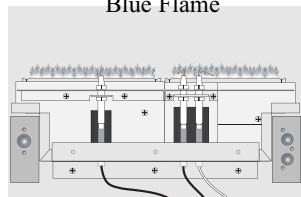
Check vent connection joint sections with a solution of soapy water to assure airtightness while the unit is operating.

Bubbles around a joint connection indicates a seal leak. Refer to page 13 for vent sealing instructions.

DO NOT operate the unit if vent system shows signs of leaking exhaust.

Check to make sure that the air intake and vent outlet on the OUTDOOR water heater or the air intake filter and the vent terminal on the INDOOR water heater has not been blocked or contain debris.

Blue Flame



Proper burner pattern.

Burner Inspection

Visually inspect the main burners annually.

Through the sight glass, inspect the burner flame with the main burner off and inspect the main burner while firing.

If any unusual burner operation is noted, the water heater should be shut off until qualified service assistance can be obtained.

▲ CAUTION: For your safety, burner inspection and cleaning should be performed only by qualified service personnel.

For cleaning, a vacuum cleaner can be used on the burner.

Vacation and Extended Shut-Down

NOTICE: Refer to the Freeze Protection Section on page 31.

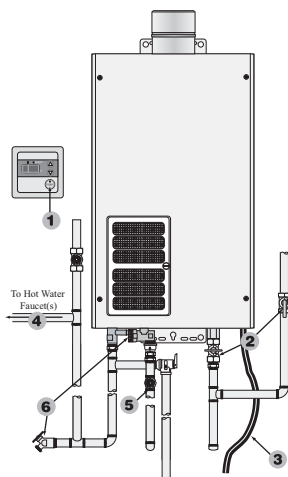
If the water heater is to remain idle for an extended period of time, the power and water to the appliance should be turned off.

The water heater and piping should be drained if they might be subjected to freezing temperatures.

After a long shut-down period, the water heater's operation and controls should be checked by qualified service personnel.

Care and cleaning of the water heater:

Draining the Water Heater



Draining the water heater

⚠ WARNING: Failure to follow these instructions while draining the water heater can cause serious damage to the water heater as well as personal injury including scalding.

Below are instructions for draining water out of the water heater.

- 1 Turn off the switch on the remote control.
- 2 Close the gas shut-off valve(s).
- 3 Unplug the power supply cord (or disconnect breaker) at least 10 seconds after step #1.
- 4 Open all hot water faucets. Before proceeding to the next step, make sure that COLD water is coming out of all hot water faucets.
- 5 Close the water shut-off valve.
- 6 Using a suitable container to catch water, remove the water filter from heater. Attach a garden hose to the drain valve installed in the hot water outlet line and direct the stream of water to a suitable drain where it will cause no damage. Leave water heater as is until next use.

To put the water heater back into operation after draining, follow the steps below.

- 1 Reinstall the drain plug and water filter. Close the hot water outlet drain valve.
- 2 Open the water shut-off valve and close again after making sure that water comes out from hot water faucets. (This step is to remove air from the water lines.)
- 3 Plug into an electrical outlet, fully open the gas shut-off valve and the water shut-off valve.

NOTICE: The water heater may not operate unless the above procedure is followed correctly.

⚠ WARNING: Failure to drain the water heater can cause serious damage to the water heater as well as personal injury.

NOTICE: DO NOT unplug the electric power supply cord for freeze protection.

Freeze Protection

Where the water heater may be exposed to freezing conditions, even for a short period of time, be sure to drain all water from the unit as instructed above.

Exposure to freezing conditions can occur from down draft of venting system or from installation in areas exposed to cold air.

The water heater is equipped with a Freeze Protection Electric Heater. As long as the electricity is supplied to the water heater, it prevents freezing inside the water heater up to an ambient temperature of approximately minus 30°F (-34°C) (without wind conditions)

This device only protects the internal components of the water heater. It does NOT protect piping and valves. Therefore, piping and valves should be wrapped with insulation material as instructed on page 24.

Another method of freeze prevention is by running a small volume of water. Running water will protect the water heater, piping and valves.

Follow the steps below to ensure proper water flow through the water heater and piping:

- 1 Turn off the switch on the remote control.
- 2 Close the gas shut-off valve.
- 3 Open the hot water faucet slightly until a stream of approximately 1/8" (.32 cm) is flowing. Be sure to check the flow periodically.

Before You Call For Service...



Troubleshooting Tips

Save time and money! Review the charts on the following pages first and you may not need to call for service.

Problem	Possible Cause	What To Do
Not enough or no hot water.	Water shutoff valve is not fully opened.	● Check shutoff valve and open fully.
	Hot water faucet is not fully opened.	● Open hot water faucet completely. (The main burner goes off when incoming water volume is inadequate.)
	Water piping is frozen.	● Allow piping to thaw.
	No electricity or water supply is cut off.	● Check that proper power is being supplied and/or water supply is adequate.
	Unit is not "ON".	● Turn the unit "ON" by the button on the remote control.
	The temperature may be set too low.	● Increase the temperature setting.
	Mixing Valve Malfunctions (if applicable)	● Check and replace if necessary.
	Error code displayed on remote controller.	● See instructions for Error Code and if required, contact a dealer for service.
	Not enough water demand.	● Increase water flow.
	Water inlet filter clogged.	● Clean water inlet filter.
	Fixture aerator is clogged.	● Clean aerator.
	Scale build up in heat exchanger.	● Check for error code. If required, contact a dealer for service.
	Hot and cold water lines reversed.	● Reverse water connections.
Water not hot enough.	The temperature may be set too low.	● Check and open the gas valve fully.
	The gas valve is not fully opened.	● Call your gas company to verify the gas meter and gas piping size.
	Gas supply pressure is low.	● Call dealer for service.
	Bleed over in one of the hot water fixtures.	● Decrease the temperature setting.
Water too hot.	Temperature is set too high.	● Check shutoff valve and open fully.
	Water shutoff valve is not fully opened.	● Allow more water to flow.
	Small amount of water has been heated.	● Normal operation. There is no need to call for service.
Fan continues to rotate after hot water faucet is closed.	This function is to supply hot water when the hot water faucet is reopened.	● Normal operation. There is no need to call for service.

⚠ CAUTION: Make certain power to water heater is "OFF" before removing protective cover FOR ANY REASON.

⚠ CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. VERIFY PROPER OPERATION AFTER SERVICING.

⚠ CAUTION: For your safety DO NOT attempt repair of electrical wiring, gas piping, remote control, burners, vent connectors or other safety devices. Refer repairs to qualified service personnel.

Error Code Guide

When an error code is displayed:

- Close the hot water faucet, turn off the switch on the remote control.
- Wait for about 5 minutes before turning the switch on again.
- Open the hot water faucet.

If the error code remains shown:

- Close the hot water faucet and turn off the switch on the remote control.
- Take the proper action shown below and attempt operation of the appliance again.

If the error code is still shown:

- Turn off the hot water faucet and turn off the switch on the remote control.
- Take note of the error code displayed and contact your Paloma dealer or distributor for service.

Notice: If an error code other than those listed below is displayed, immediately turn off the hot water faucet, take note of the error code, turn off the switch on the remote control and contact your Paloma dealer or distributor for service.

Error Code	Possible Cause	What To Do
11	The Gas Shutoff Valve is not opened completely.	<ul style="list-style-type: none"> ● Open the Gas Shutoff Valve completely.
12	Gas Service has been interrupted. LP Gas is running low. (LP models only)	<ul style="list-style-type: none"> ● Contact Gas Utility Company. ● Fill up LP Gas container or replace with a new cylinder of LP Gas.
15	The hot water faucet is not opened enough.	<ul style="list-style-type: none"> ● Open the faucet more to secure enough volume.
16	The method of restarting the unit after draining the water from it was not performed in sequence.	<ul style="list-style-type: none"> ● See the section "Draining the Water Heater"
21 Indoor Water Heater Only	Air intake filter may not be attached, or may not be firmly in place.	<ul style="list-style-type: none"> ● See the section "Cleaning the Intake Filter".
05 (Every 60 seconds you hear an alarm or when the faucet is closed, the alarm stops.) Indoor Water Heater Only	<p>Air intake of the unit and/or vent termination may be blocked.</p> <p>Ventilator or other vents of the room may be blocked.</p> <p>The air inside the room may be contaminated due to long use of a fireplace or space heater.</p> <p>Heavy ventilation by other equipment or appliances causing the lack of air intake to the water heater.</p> <p>Air shortage may be caused by too much steam in the unit.</p> <p>Air intake filter is clogged.</p>	<ul style="list-style-type: none"> ● Remove any obstructions of the air intake or vent termination. ● Clean the air intake of any dust or grease build up. ● Open a window or vent to keep the air inside the room fresh. ● Lower the level of the ventilation of other equipment or appliances. ● Avoid direct contact from steam. ● Clean the air intake filter.
13 Indoor Water Heater Only	If the error code is still displayed after taking the above steps.	<ul style="list-style-type: none"> ● Please contact a dealer for service.
1L	Water heater has build up of lime deposits.	<ul style="list-style-type: none"> ● Contact a dealer for service.
99 Outdoor Water Heater Only	Decrease of blower motor ventilation amount. (Operation Stops)	<ul style="list-style-type: none"> ● Clean any blockage from heat exchanger fins and/or blower motor

⚠ CAUTION: Make certain power to water heater is "OFF" before removing protective cover FOR ANY REASON.

⚠ CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. VERIFY PROPER OPERATION AFTER SERVICING.

⚠ CAUTION: For your safety DO NOT attempt repair of gas piping, remote control, burners, vent connectors or other safety devices. Refer repairs to qualified service personnel.

Replacement Parts.

⚠ WARNING: For your safety, **DO NOT** attempt to disassemble this unit for any reason.

Instructions For Placing a Parts Order

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

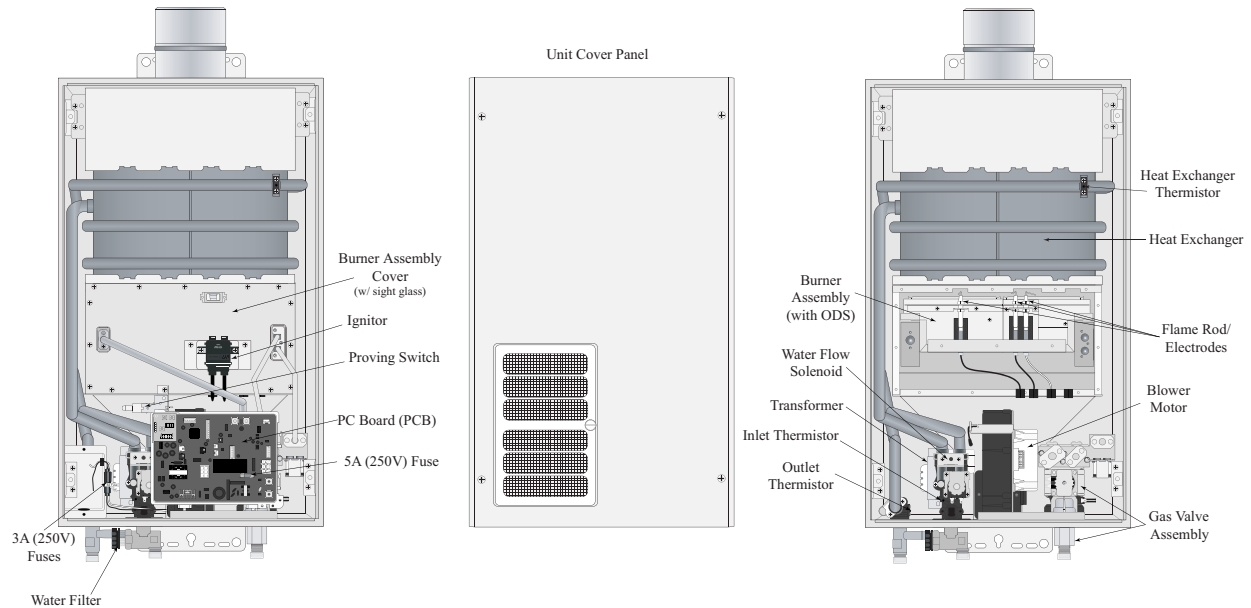
All parts orders should include:

- 1 The model and serial number of the water heater from the rating plate.
- 2 Specify type of gas (natural or LP) as marked on the rating plate.

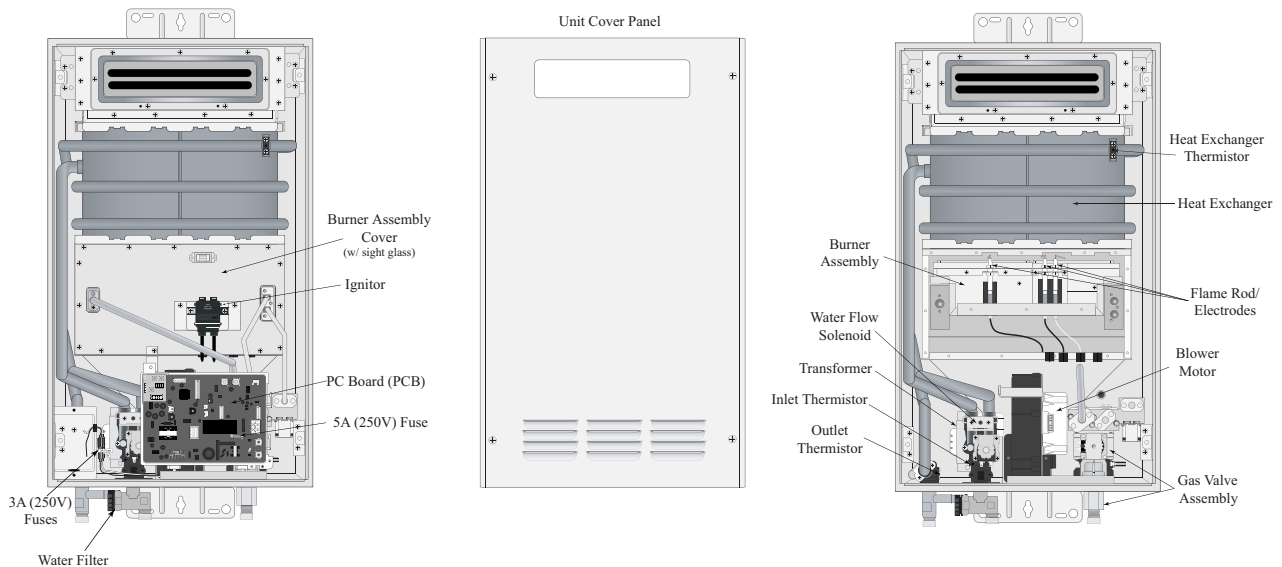
- 3 Part description (as noted below) and number of parts desired.

⚠ CAUTION: For your safety, **DO NOT** attempt repair of electrical wiring, gas piping, burners, vent connectors or other safety devices. Refer repairs to qualified service personnel.

Indoor Water Heater



Outdoor Water Heater



The content on this page is intended for use by qualified installation/service personnel ONLY.

▲WARNING: Improper adjustment, alteration, service or maintenance can cause property damage, personal injury, or death.

▲DANGER: Hotter water increases the potential for Hot Water SCALDS.

Temperature Setting DIP Switch Adjustment

Required adjustment for up to 180°F (82°C) water temperature settings

▲WARNING: Refer to scald potential warnings on page 4 before making adjustment. Changing this setting is done at your own risk.

NOTICE: Raising the water temperature setting above 120°F (49°C) will lead to increased lime buildup. Error code (1L) will be displayed when lime build up occurs. Contact your dealer for service when this error code is displayed.

DO NOT alter the #4 DIP Switch if the setting of up to 180°F (82°C) is not required.

Follow the instructions below if it is determined that a setting of up to 180°F (82°C) is required.

- Turn off remote control. Turn off the gas and water shutoff valves.
- Remove the front cover.
- Find the DIP Switch #4 located at the top left hand side of the PCB. (See illustration to the right for DIP Switch location)
- Change the DIP Switch #4 setting to the “ON” position. DO NOT alter any other DIP Switch. The LED on the PCB is flashing. At the same time, the display of the Main Remote Control starts to flash.
- Press the “Max” button on the left hand side of the PCB for more than 1 second. The LED on the PCB starts illuminating continuously. At the same time, the display of the Main Remote Control is on continuously.
- Change the DIP Switch #4 setting back to the “OFF” position. DO NOT alter any other DIP Switch. The LED on the PCB will stop illuminating. At the same time, the display of the Main Remote Control will turn off.
- Attach the unit’s front cover.
- Turn on the remote control, gas and water shutoff valves.
- Check and ensure safe operation and performance of the water heater.

See steps below to **LIMIT maximum water temperature setting to 120 (49°C).**

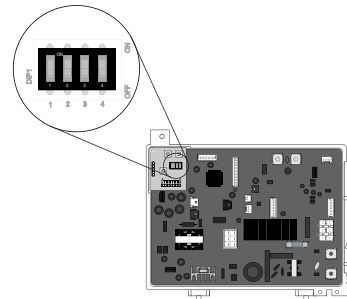
Follow first four bullets points listed above, then continue as listed below:

- Press the “Min.” button on the left hand side of the PCB for more than 1 second. The LED on the PCB starts illuminating continuously. At the same time, the display of the Main Remote Control is on continuously.
- Change the DIP Switch #4 setting back to the “OFF” position. DO NOT alter any other DIP Switch. The LED on the PCB will stop flashing. At the same time, the display of the Main Remote Control turn off.
- Attach the unit’s front cover.
- Turn on the remote control, gas and water shutoff valves.
- Check and ensure safe operation and performance of the water heater.

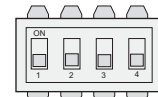
Time/Temperature Relationship in Scalds

Water Temperature	Time To Produce a Seroius Burn
120°F (49°C)	More than 5 minutes
125°F (52°C)	1 ½ 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 ½ seconds
155°F (68°C)	About 1 second

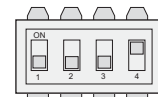
Table courtesy of Shriners Burn Institute



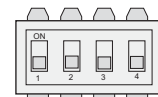
Location of DIP Switches on PC Board.



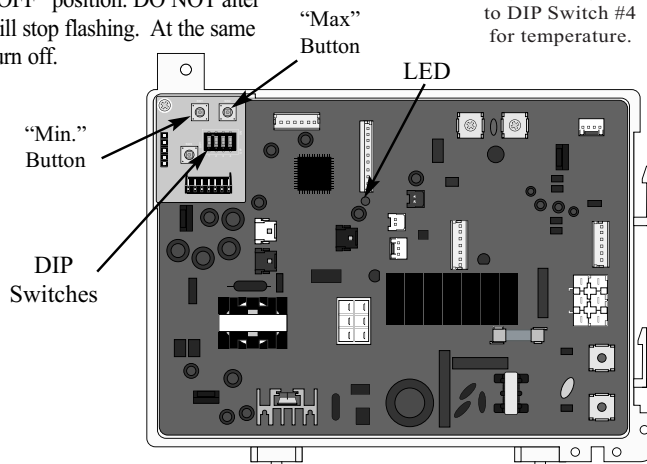
As set from factory



Setting during adjustment to DIP Switch #4 for temperature.



Setting after adjustment to DIP Switch #4 for temperature.



IF YOU NEED SERVICE



-
1. Should you have any questions about your new water heater, or if it requires adjustment, repair, or routine maintenance, it is suggested that you first contact your Paloma dealer or distributor, installer, plumbing contractor or previously agreed upon service agency. In the event the firm has moved, or is unavailable, refer to the telephone directory, commercial listings or local utility for qualified service assistance.
 2. Should your problem not be solved to your complete satisfaction, you should then contact the following address:

2151 Eastman Avenue
Oxnard, CA 93030
Phone: (805) 278-5499

When contacting the manufacturer, the following information will be requested:

- a. Model and serial number of the water heater as shown on the rating plate attached to the front panel of the heater.
- b. Address where the water heater is located and physical location.
- c. Name and address of installer and any service agency who performed service on the water heater.
- d. Date of original installation and dates any service work was performed.
- e. Details of the problem as you can best describe them.
- f. List of people, with dates, who have been contacted regarding your problem.

LIMITED WARRANTY

For the PALOMA Gas Water Heater Models listed on the front of this manual.

GENERAL

This Limited Warranty is only available to the original owner of this water heater. It is not transferable.

Paloma Industries, Inc. (Paloma) warrants this Paloma water heater, and its component parts, to be free from defects in materials and workmanship, under normal use and service, for the Applicable Warranty Period. At its option, Paloma will replace the defective component part(s), in accordance with the terms of this Limited Warranty, if it falls in normal use and service during the Applicable Warranty Period. The replacement component part(s) must be Paloma component Part(s). The replacement component part(s) will be warranted only for the unexpired portion of the original component part's Applicable Warranty Period.

EFFECTIVE DATE

The Effective Date of warranty coverage (or the beginning of the Applicable Warranty Periods) is the date of purchase of this 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 Periods are three (3) years from the Effective Date for the heat exchanger and one (1) year from the Effective Date for all other component parts.

WARRANTY EXCLUSIONS

This Limited Warranty will **not** cover:

- a) Service trips to your home 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.
- b) 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 or defective fittings.
- c) Damages, malfunctions, or failures resulting from improper installation or failure to operate and maintain the water heater in accordance with the manufacturer's instructions provided, including outside of recommended water quality levels as listed in the chart below.

pH	TDS (Total Dissolved Solids)	Free Carbon Dioxide (CO2)	Total Hardness	Aluminum	Chlorides	Copper	Iron	Manganese	Zinc
6.5 to 8.5	Up to 500 mg/L	Up to 15mg/L	Up to 200 mg/L	Up to 0.2 mg/L	Up to 200 mg/L	Up to 1.0 mg/L	Up to 0.3 mg/L	Up to 0.05 mg/L	Up to 1.0 mg/L

- d) 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.
- e) Damages, malfunctions, or failures caused by improper conversion from natural gas to LP gas or LP gas to natural gas fuel source.
- f) Damages, malfunctions, or failures caused by operating the water heater with any parts removed or with the water heater modified, altered, or unapproved parts installed.
- g) Damages, malfunctions, or failures caused by abuse, accident, fire, flood, freeze, lightning, acts of God, misuse, alteration, and the like.
- h) Heat Exchanger failures (leaks) caused by operating the water heater in a corrosive or contaminated atmosphere or damages, malfunctions or failures caused by lime or mineral build-up.
- i) Damages, malfunctions, or failures caused by operating the unit at water temperatures exceeding the maximum setting of the operating, or high limit control.
- j) Heat Exchanger failures caused by operating the water heater when it is not supplied with potable water at all times.
- k) Damages, malfunctions, or failures caused by subjecting the heat exchanger to pressures, or firing rates, greater than those shown on the rating plate.

- l) Damages, malfunctions, or failures resulting from the use of any attachment, including any energy saving device, not authorized by Paloma.
- m) Units installed outside the fifty states (and the District of Columbia) of the United States of America and the Dominion of Canada.
- n) Units removed from the original installation location and reinstalled elsewhere.
- o) Units that have had their rating plates removed. A water heater should not be operated if the rating plate is removed.
- p) This water heater if it is installed for use in: spa or pool heating; a mobile home; a recreational vehicle; a boat or any other watercraft.
- q) Units installed in any circulating system in which the temperature set point of the water heater is in excess of 140°F.

LABOR, SHIPPING, AND PROCESSING COSTS

This Limited Warranty does **not** cover any **labor expenses** for service, repairs, reinstallation, permits, or removal and disposal of the failed water heater, or defective component part(s). All such expenses are your responsibility. Paloma will pay the **transportation costs** for an “In-warranty” replacement component part(s), to a convenient delivery point (selected by Paloma) near the place where the original water heater, or original component part(s), is located: such as a local Paloma water heater distributor. You must pay any local freight charges, including the cost of returning the defective component Part(s) to a convenient shipping location (selected by Paloma): such as a local Paloma distributor.

Paloma does **not** authorize, recommend, or receive any benefit from any **claims processing or similar fees** charged by others to process warranty claims for any Paloma water heater or component part(s). Paloma 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

You may make a warranty claim by calling the local Paloma water heater distributor or Paloma Industries, Inc. at 2151 Eastman Avenue, Oxnard, CA 93030, Telephone number (805) 278-5499 (Call collect). If, upon reasonable inspection of parts, Paloma determines that a defect exists, Paloma shall furnish replacement part(s) in full settlement of its warranty obligations. Purchasers shall be required to return, at purchasers’ expense, the defective part(s) to the local Paloma water heater distributor or Paloma to permit inspection. Paloma shall not be responsible for any shipment or labor costs incurred in making warranty claims or repairs. To receive warranty compensation for an “In-warranty” defective component part, you must provide the local Paloma water heater distributor or Paloma with: the defective component part; the complete model number and the complete serial number of the Paloma water heater from which the defective component part was removed; and the date the defective component part failed. You are also required to provide documentary proof of the date of purchase of the Paloma water heater from which the defective part was removed to establish the “In-warranty” status of the defective component part.

EXCLUSIVE WARRANTY - LIMITATION OF LIABILITY

This Limited Warranty is the only Warranty for this unit given by Paloma. No one is authorized to make any other warranties on behalf of Paloma. ANY IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE APPLICABLE WARRANTY PERIODS SPECIFIED ABOVE. PALOMA’S SOLE LIABILITY, WITH RESPECT TO ANY DEFECT, SHALL BE AS SET FORTH IN THIS LIMITED WARRANTY, AND ANY CLAIMS FOR DIRECT, INDIRECT, SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGE FROM WATER LEAKAGE) ARE EXCLUDED. THE HEATER IS NOT DESIGNED NOR INTENDED FOR USE IN ANY SPA OR POOL HEATING SYSTEMS. 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.

Please fill the enclosed warranty card out and mail it to Paloma within fourteen (14) days of the date of purchase.

Paloma Industries, Inc.
 2151 Eastman Avenue, Oxnard, CA 93030
 Telephone Number: (805) 278-5499 (Call collect)

SPECIFICATIONS (Approx.)

Model	PH-28CIFSN Indoor (Natural Gas) PH-28CIFSP Indoor (L. P. Gas)	PH-28COFN Outdoor (Natural Gas) PH-28COFP Outdoor (L.P. Gas)	
Rated Gas Input (Btu/Hr.)	19,000 (Min.) 199,900 (Max.) (Modulating)	19,000 (Min.) 199,900 (Max.) (Modulating)	
Installation	Indoor Wall Mounting Type Vent Horizontally (Side-Wall) or Vertically	Outdoor Wall Mounting Type	
Dimensions (inches)	14 7/8 (W) x 25 3/8 (H) x 11 1/8 (D)		
Net Weight (lbs)	55		
Working Water Pressure	14 psi (Min.); 150 psi (Max.)		
Min. Water Flow	0.66 Gallons/Minute		
Max. Flow Rate	7.4 GPM at 45°F Temperature Rise, 23 psi		
Gas Connection	3/4" NPT Female (With Supplied Gas Shutoff Valve)		
Water Connection	3/4" NPT Male		
Manifold Pressure (in. w.c.)	Contact your distributor, dealer whom you purchased or Paloma		
Vent Size	4" Special Venting	N/A (Outdoor Installation)	
Efficiency Rating	84%		
Energy Factor	0.82		
Inlet Gas Pressure before water heater	Natural Gas: Min.: 4.0" w.c.; Max.: 10.5" w.c. L.P. Gas: Min.: 8.0" w.c.; Max.: 14.0" w.c.	(Do not exceed maximum pressure.)	
Hot Water Supply	Factory Setting	100°F ~ 120°F	
	Adjusting Range	Main Control	100°F ~ 180°F
		Bath Control	100°F ~ 120°F
Max. Setting	Up to 180°F (With Main Control & Dip Switch)		
Combustion	System	Fan Assisted Combustion	
	Main Burner	Bunsen Type Burner	
	Ignition	Electric Continuous Sparking Ignition	
Electric Portion	Electric Rating	120 VAC/60Hz, Less than 2 Amps	
	Wire	3 Pin Power Supply Cord 10 Feet (Indoor)	
	Fuse	3A Fuse x 2	
	Fan Motor	Turbo Fan	
Safety Devices	Oxygen Depletion Safety Device	Sensing Burner (Indoor Model Only)	
	Overheat Limiter for Heat Exchanger	Film Type Overheat Limiter for Entire Heat Exchanger	
	Flame Failure Safety Device	Flame Rod Type	
Max. Vent Length	37 Feet 6 Inches Three 90 Degree Elbows		
Freeze Protection	Minus 30°F (Without Wind-Chill Factor)		
Remote Control	One Digital Main Remote Control (UMC-117) is included.		
Manifold Installation	Manifold Installation 2 Units ~ 6 Units (With Optional MIC-180 Control) Manifold Installation 7 Units ~ 20 Units (With Optional MICS-180 Control) Optional Communication Cables (16, 32 & 65 feet)		
Optional Controls	Digital First Bath Remote Control (USC1-117) Digital Second Bath Remote Control (USC2-117)		

Hot Water Flow Rate and Temperature Rise							
Temperature Rise (°F)	45	50	60	70	80	90	100
Water Flow Rate (GPM)	7.4	6.7	5.6	4.8	4.2	3.7	3.4

Special Venting (Adapter, vent pipe, elbow, vent terminal, etc.) should be UL 1738 Certified Category III Stainless Steel Venting Material (e.g. AL29-4C) in order to avoid damage from possible condensation.

"B" vent is not permitted.

Since we are constantly improving our products, all specifications are subject to change without notice.

Paloma Industries, Inc.
2151 Eastman Avenue
Oxnard, CA 93030

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