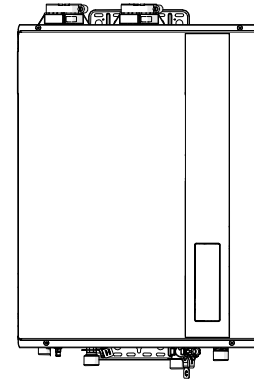


SUPER HIGH EFFICIENCY CONDENSING TANKLESS WATER HEATER USE AND CARE MANUAL

With Installation Instructions
for the Installer

Condensing Direct Vent
199,900 Btu/hr, 180,000 Btu/hr,
157,000 Btu/hr and 120,000 Btu/hr Models



⚠️ WARNING:

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

⚠️ For Your Safety!

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. To do so may result in an explosion or fire.
- Installation and service must be performed by a qualified installer, service agency, or the gas supplier.

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.

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

Print 2D
Bar Code
Here

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IMPORTANT SAFETY INFORMATION

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 can 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.

▲ WARNINGS:

- Improper installation, adjustment, alteration, service, or maintenance can cause death, personal injury, or property damage. Follow the instructions in this manual.

READ ALL INSTRUCTIONS BEFORE USING.

Be sure to read and understand the entire Use and Care 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 death or serious bodily injury. 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.

IMPORTANT SAFETY INFORMATION

Water Heater Venting Safety



⚠ DANGER:

- 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 will result in death from fire, explosion, or asphyxiation from carbon monoxide. NEVER operate this water heater unless it is properly vented and has the air supply piping properly installed and terminated to the outdoors.
- Be sure to inspect the vent terminal, the air intake, and the vent system on the 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.

⚠ WARNINGS:

- Gasoline and other flammable liquids, materials, and vapors (including paint thinners, solvents, and adhesives) are extremely dangerous. DO NOT handle, use, or store gasoline or other flammable or combustible materials anywhere 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 death, bodily injury, or property damage.
- Combustible construction refers to adjacent walls and ceilings and should not be confused with combustible or flammable products and materials. Combustible materials, such as clothing, cleaning materials, or flammable liquids, should never be stored in the vicinity of this or any gas appliance. Fire or explosion can occur causing death, personal injury, and/or property damage. See page 16 for clearances to combustible materials.
- Follow vent manufacturer’s instructions for venting installation, including additional clearances from combustibles, to avoid conditions that can lead to death, personal injury, and/or property damage.
- Use tankless water heater manufacturer-approved Schedule 40 PVC (foam core is not permitted at any time), Schedule 80 PVC, CPVC, ABS, UL 1738-listed Category III Stainless Steel, or InnoFlue® PP. No other vent material is permitted. For Canada, installations must follow ULC S636 for exhaust venting.
- 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 may result in severe damage to the structure or exterior finish of the building.
- For multiple-unit installation, a minimum distance between vent terminations must be maintained to prevent recirculation of vent gases. See page 26 & 27 for information on venting and clearances to multiple terminations.

⚠ DANGER



Flammable Vapors

<p>⚠ Vapors from flammable liquids will explode and catch fire causing death or severe burns.</p> <p>Do not use or store flammable products such as gasoline, solvents or adhesives in the same room or area near the water heater.</p> <p>Keep flammable products:</p> <ol style="list-style-type: none">1. far away from heater,2. in approved containers,3. tightly closed and4. out of children's reach.	<p>Water heater has a main burner flame. The main burner flame:</p> <ol style="list-style-type: none">1. which can come on at any time and2. will ignite flammable vapors. <p>Vapors:</p> <ol style="list-style-type: none">1. cannot be seen,2. are heavier than air,3. go a long way on the floor and4. can be carried from other rooms to the main burner flame by air currents.
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Installation:
Do not install water heater 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.

⚠ CAUTIONS:

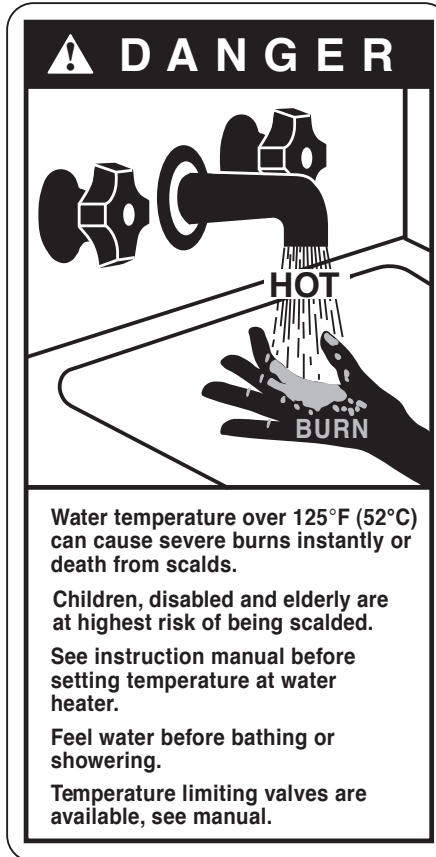
- Ensure that the appliance vent is securely glued and attached to the vent connection on the top of the water heater. DO NOT USE SCREWS.
- DO NOT operate without the condensate drain connected and routed to a proper drain.

IMPORTANT SAFETY INFORMATION

Water Supply Safety

⚠️ DANGERS:

- **WATER TEMPERATURE SETTINGS**
 - 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 death or severe burns from scalding. Be sure to read and follow the warnings outlined on the pictured label.
- There is a hot water scald potential if the water temperature is set too high. Households with small children, the disabled, or elderly persons may require a 120°F (49°C) or lower temperature setting to prevent contact with "HOT" water.
- 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.
- Failure to perform the recommended Routine Preventive 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.



⚠️ CAUTIONS:

- 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 120°F (49°C).
 - DO NOT reverse the hot and cold water connections. The water heater will not operate.
- Even when drained properly, a small amount of water will remain in the water heater. In cold weather conditions, this water can freeze. If this happens, allow the defrost protection on the heater at least 30 minutes to melt the frozen water or the water heater may not work properly.

NOTICE:

The factory setting allows operating temperatures between 100°F (38°C) and 120°F (49°C). Temperatures up to 140°F (60°C) can be achieved with the remote control. Only qualified service personnel should perform this adjustment. Only factory-authorized remote control(s) should be used.

⚠️ WARNINGS:

- **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.
- In case the pipe insulation is not rated for the appropriate weather conditions, install electric heat tracing or equivalent to prevent freezing of the pipes. DO NOT insulate or block the drain valve on the hot outlet fitting. If the pipes are allowed to freeze, the water heater and the pipes may malfunction or leak due to freezing water.
- Failure to drain the water heater as described on "Draining the Water Heater" can cause serious personal injuries from scalding and/or damage the water heater.

Time/Temperature Relationship in Scalds

Water Temperature	Time to Produce a Serious Burn
120°F (49°C)	More than 5 minutes
125°F (52°C)	1 1/2 to 2 minutes
130°F (54°C)	About 30 seconds
135°F (57°C)	About 10 seconds
140°F (60°C)	Less than 5 seconds
145°F (63°C)	Less than 3 seconds
150°F (66°C)	About 1 1/2 seconds
155°F (68°C)	About 1 second

Table courtesy of Shriners Burn Institute

Temperature Conversion Chart °F/°C

100	102	104	106	108	110	112	114	116	118	120	125	130	140	°F
38	39	40	41	42	43	44	46	47	48	49	52	54	60	°C

IMPORTANT SAFETY INFORMATION

Natural Gas and Liquefied Petroleum Safety

⚠️ DANGERS:

- Never attempt to convert the water heater from natural gas to LP or vice versa. The water heater must only use the fuel type in accordance with the listing on the data plate—natural gas for natural gas units and LP for LP units. Any other fuel usage will result in death or serious personal injury from fire and/or explosion. This water heater is not certified for any other fuel type.
- Both natural gas and propane (LP) 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 natural gas or LP, 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 using LP gas are different from natural gas models. A natural gas water heater will not function safely on LP and vice versa.
- LP 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 also sniff near the floor.
- 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.
- Combustible materials, such as clothing, solvents, cleaning materials, or flammable liquids, must not be placed in the vicinity of the water heater.
- If a gas leak is present or suspected:
 - DO NOT attempt to find the cause yourself.
 - Never use an open flame to test for gas leaks. The gas can ignite resulting in death, personal injury, or property damage.
 - Follow the steps listed under “What to Do If You Smell Gas” found on the front cover of this manual.

⚠️ WARNINGS:

- The installation of gas piping must comply with local utility company requirements and/or in the absence of local codes, use the latest edition of National Fuel Gas Code (NFGC), ANSI Z223.1/NFPA 54, or CAN/CSA B149.1, Natural Gas and Propane Installation Code.
- If inlet gas pressure is out of allowable range [4.0” w.c. (1.0kPa) – 10.5” w.c. (2.6kPa)] for Natural Gas, or [8.0” w.c. (2.0kPa) – 13.0” w.c. (3.2kPa)] for LP gas, a gas pressure regulator must be installed to maintain the allowable inlet gas pressure.
- Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the water heater.

⚠️ CAUTIONS:

- DO NOT attempt the repair of any electrical wiring, gas piping, remote control, burners, vent connectors, or other safety devices. Refer repairs to qualified service personnel.
- Turn off the manual gas 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.
- DO NOT turn on the water heater unless the water and gas supplies are completely opened.

IMPORTANT SAFETY INFORMATION

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 death, personal injury, or property damage. Should you have any problems reading or following the instructions in this manual, STOP and get help from a qualified service technician.

FOR YOUR SAFETY READ BEFORE OPERATING

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

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. **DO NOT** try to light the burner by hand.

B. **BEFORE OPERATING** smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

● **DO NOT** try to light any appliance. ● **DO NOT** touch any electric switch; **DO NOT** use any phone in your building. ● Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. ● If you cannot reach your gas supplier, call the fire department.

● **DO NOT** return to your home until authorized by the gas supplier or fire department.

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

D. **DO NOT** use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.

2. Turn off all electric power to the appliance.

3. **DO NOT** attempt to light the burner by hand.

4. Turn the Gas Shutoff Valve located on the outside of the unit clockwise ↻ to the "OFF" position.

5. Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.

6. Turn the Gas Shutoff Valve located on the outside of the unit counterclockwise ↻ to the "ON" position.

7. Turn on all electric power to the appliance.

8. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

GAS SHUTOFF
VALVE



OPEN



CLOSE

TO TURN OFF GAS TO APPLIANCE

1. Turn off all electric power to the appliance if service is to be performed.

2. Turn the Gas Shutoff Valve located on the outside of the unit clockwise ↻ to the "OFF" position.

IMPORTANT SAFETY INFORMATION

Electrical Safety

⚠ DANGER:

- **Shock Hazard** – Make sure the electrical power to the water heater is off to avoid electric shock that will result in death or serious personal injury.

⚠ WARNINGS:

- For your safety, the information in this manual must be followed to minimize the risk of fire, explosion, or electric shock that can result in death, personal injury, and/or property damage.
- Field wiring connections and electrical grounding must comply with local codes or, in the absence of local codes, with the latest edition of the National Electrical Code, ANSI/NFPA 70, or in Canada, Canadian Electrical Code, CAN/CSA C22.1, Part 1.

⚠ CAUTIONS:

- Label all wires prior to disconnecting for service. Wiring errors can cause dangerous and improper operation. Verify correct operation after servicing.
- For your safety, burner inspection and cleaning should be performed only by qualified service personnel.
- Make certain the power to the water heater is OFF before removing the unit cover panel. Exposed electrical components and moving parts can cause personal injuries.
- For your safety, DO NOT attempt the repair of any electrical wiring, gas piping, remote control, burners, vent connectors, or other safety devices. Refer repairs to qualified service personnel.

FOR INSTALLATIONS IN THE STATE OF CALIFORNIA

California law requires that water heaters must be braced, anchored, or strapped to resist falling or horizontal displacement due to earthquake motions. For 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.

IMPORTANT SAFETY INFORMATION

General Installation and Maintenance Safety

⚠️ WARNINGS:

- 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 (NFPA), ANSI Z223.1 and National Fire Protection Association, NFPA 54, or in Canada, CAN/CSA B149.1, Natural Gas and Propane Installation Code, and the latest edition of the National Electrical Code, ANSI/NFPA 70, or in Canada, Canadian Electrical Code, CAN/CSA C22.1, Part 1.
- For your safety, DO NOT attempt to disassemble this water heater for any reason. Improper adjustments, alterations, service, or maintenance can cause death, personal injury, or property damage.

SAFETY PRECAUTIONS:

Read this manual entirely before installing and/or operating the water heater.

Use this water heater only for its intended purpose as described in this Use and Care Manual.

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.

Be sure your water heater 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 service technician.

SAVE THESE INSTRUCTIONS

PRODUCT INFORMATION

For Your Records

Write down and save the following product information along with the original sales slip and/or cancelled check. The model and serial numbers can be found on the top label on the right side of the water heater.

MODEL NUMBER:

SERIAL NUMBER:

DATE OF INSTALLATION:

INSTALLING COMPANY/PHONE NUMBER:

PLUMBING CONTRACTOR/PHONE NUMBER:

See page 76 for additional service information.

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.

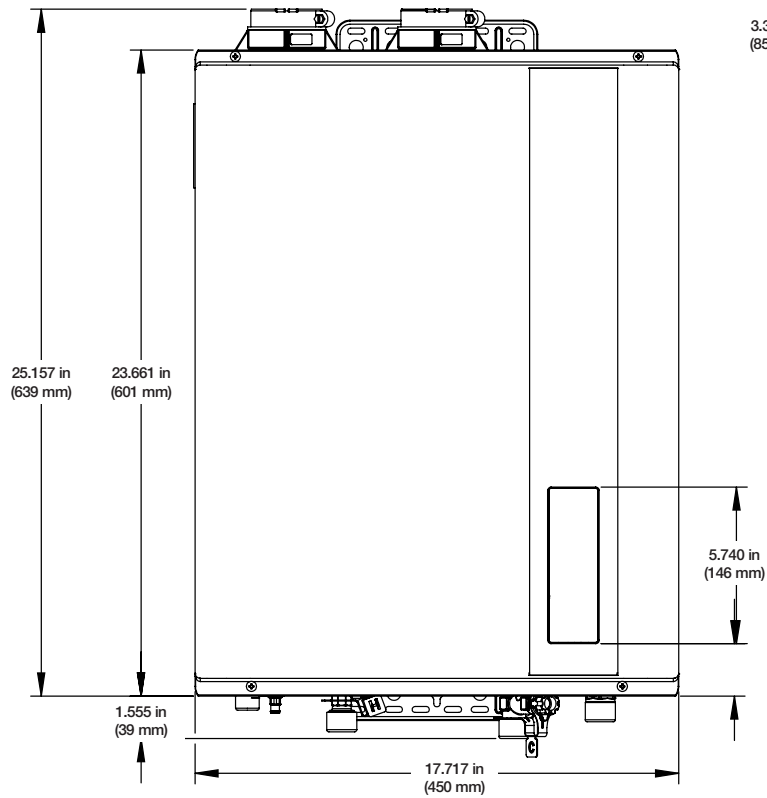
You'll find many answers to common problems in the "Troubleshooting Chart" in this Use and Care Manual. Always refer to this chart before calling for service. Referring to this chart before calling may answer your question(s) and eliminate the need for service.

Preoperating Checklist

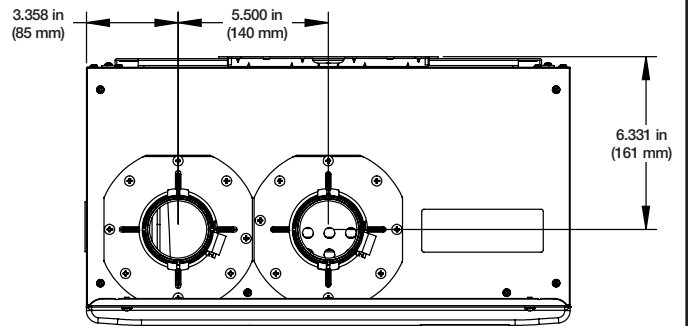
- Is the main gas valve to the water heater turned on?
- Is the fuse in place or is the breaker turned on?
- Does the water heater's electronic ignition light?
- Is the water temperature set to a safe temperature?
- Is the water heater connected to a floor drain?
- Is the water heater properly vented to the outside?
- Is the water heater installed in a safe location away from flammable materials and/or freezing conditions?

Specifications – Direct-Vent Models

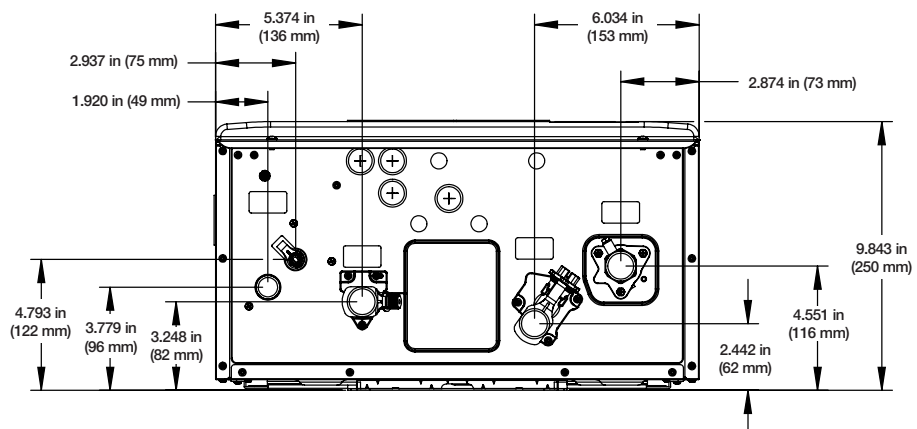
Front View



Top View



Bottom View



PRODUCT INFORMATION

Specifications

The following product information can be found from the rating label on this water heater.

- A. Model Number
- B. Serial Number
- C. Data Bar Code
- D. Heater Type
- E. Installation Type
- F. Type of Gas
- G. Max. Inlet Gas Pressure
- H. Min. Inlet Gas Pressure
- J. Recovery Rating
- K. Max. BTU Input Rating
- L. Min. BTU Input Rating
- M. Manifold Gas Pressure
- N. Certification Stamp
- P. Alternate Approval Stamp
- Q. Clearances

English Rating Label

MODEL NO. A
SERIAL NUMBER **B**

C

D AUTOMATIC INSTANTANEOUS WATER HEATER
CHAUFFE-EAU INSTANTANÉ AUTOMATIQUE

FOR **E** INSTALLATION ONLY
POUR USAGE A

TYPE OF GAS **F** GAS
TYPE DE GAZ: **G** GAS
MAXIMUM INLET GAS PRESSURE **G** "w.c.
PRESSION MAXIMALE D'ALIMENTATION DE GAZ **H** "w.c.
MINIMUM INLET GAS PRESSURE **H** "w.c.
PRESSION MINIMALE D'ALIMENTATION DE GAZ **H** "w.c.
RECOVERY RATING **J** GALLONS/HR
TAUX DE RÉCUPÉRATION **J** GALLONS US/HR
MAXIMUM WORKING PRESSURE **K** psi
PRESSION MAXIMALE DE TRAVAIL **K** psi
ELECTRICAL RATING **L** 120V 60HZ LESS THAN 2 AMPS
ÉTALONNAGE ÉLECTRIQUE **L** 120V 60HZ MOINS DE 2 AMPÈRES

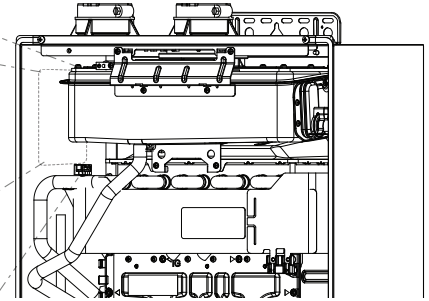
MAXIMUM INPUT: **K** BTU/HR
ENTRÉE MAXIMALE: **K** BTU/HR
MINIMUM INPUT: **L** BTU/HR
ENTRÉE MINIMALE: **L** BTU/HR
MANIFOLD PRESSURE: **M** "w.c.
PRESSION AU COLLECTEUR: **M** "w.c.

This appliance must be installed in accordance with local codes or, in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the CSA B149.1, Natural Gas and Propane Installation Code.

"Suitable for waterpotable heating and space heating." "The water heater shall not be connected to any heating system or components previously used with a nonpotable water heating appliance." "A pressure relief valve listed as complying with the Standard for Relief Valves and Automatic Gas Shut-off Devices for Hot Water Supply Systems, ANSI Z21.22, shall be installed at the hot water outlet connection of the water heater at the time of installation of the heater. Local codes shall govern the installation of relief devices. For safe operation of the water heater, the relief valve(s) must not be removed or plugged. No valve shall be placed between the relief valve and the water heater. The relief from the discharge of the pressure relief valve shall be disposed of in a suitable place where it will cause no damage. Also there shall be no other reducing coupling or other restrictions installed on the discharge line to restrict flow. See Installation Manual Heading: "PRESSURE RELIEF VALVES" for installation and maintenance of relief valve discharge line and other safety precautions. Turn off the electrical power and gas shutoff valve. Lift and release lever on the relief valve and check the manual operation of relief valve at least once a year. "Make certain the discharged water is directed to a suitable drain. Avoid contact with hot water and prevent water damage."

TO WALL: 1" TOP CLEARANCE FROM TOP OF HEATER TO CEILING; 1" BOTTOM CLEARANCE FROM BOTTOM OF HEATER TO FLOOR; 1" FRONT CLEARANCE FROM FRONT OF HEATER TO CASE DOOR; 6" MINIMUM RECOMMENDED FRONT CLEARANCE FOR SERVICE AND MAINTENANCE. "WIRING DIAGRAM BEHIND THE FRONT COVER."

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



English/French Rating Label

MODEL NO. A
NUMÉRO DE MODÈLE **B**

C

D AUTOMATIC INSTANTANEOUS WATER HEATER
CHAUFFE-EAU INSTANTANÉ AUTOMATIQUE

FOR **E** INSTALLATION ONLY
POUR USAGE A

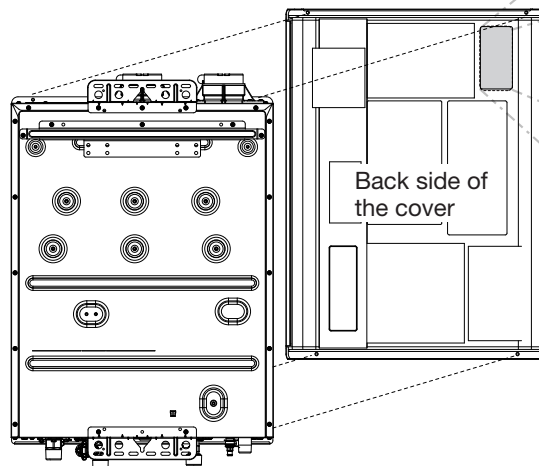
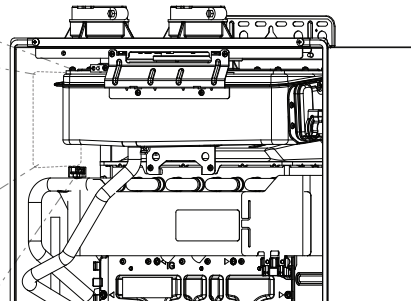
TYPE OF GAS **F** GAS
TYPE DE GAZ: **G** GAS
MAXIMUM INLET GAS PRESSURE **G** "w.c.
PRESSION MAXIMALE D'ALIMENTATION DE GAZ **H** "w.c.
MINIMUM INLET GAS PRESSURE **H** "w.c.
PRESSION MINIMALE D'ALIMENTATION DE GAZ **H** "w.c.
RECOVERY RATING **J** GALLONS/HR
TAUX DE RÉCUPÉRATION **J** GALLONS US/HR
MAXIMUM WORKING PRESSURE **K** psi
PRESSION MAXIMALE DE TRAVAIL **K** psi
ELECTRICAL RATING **L** 120V 60HZ LESS THAN 2 AMPS
ÉTALONNAGE ÉLECTRIQUE **L** 120V 60HZ MOINS DE 2 AMPÈRES

MAXIMUM INPUT: **K** BTU/HR
ENTRÉE MAXIMALE: **K** BTU/HR
MINIMUM INPUT: **L** BTU/HR
ENTRÉE MINIMALE: **L** BTU/HR
MANIFOLD PRESSURE: **M** "w.c.
PRESSION AU COLLECTEUR: **M** "w.c.

This appliance must be installed in accordance with local codes or, in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the CSA B149.1, Natural Gas and Propane Installation Code.

WIRING DIAGRAM BEHIND THE FRONT COVER.
Cet appareil doit être installé conformément aux codes locaux ou, en l'absence de codes locaux, selon le code national du gaz, ANSI Z223.1/NFPA 54 ou la norme CSA B149.1, Code d'installation pour le gaz naturel et propane.
LE SCHEMA DE CÂBLAGE SE TROUVE DERRIÈRE CE COUVERCLE.

FOR YOUR SAFETY: DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.
POUR VOTRE SÉCURITÉ: NE PAS CONSERVER NI UTILISER DE SÉCURITÉ OU D'AUTRES VAPEURS OU LIQUIDES INFLAMMABLES AUX ABOARDS DE CET APPAREIL OU DE TOUT AUTRE.



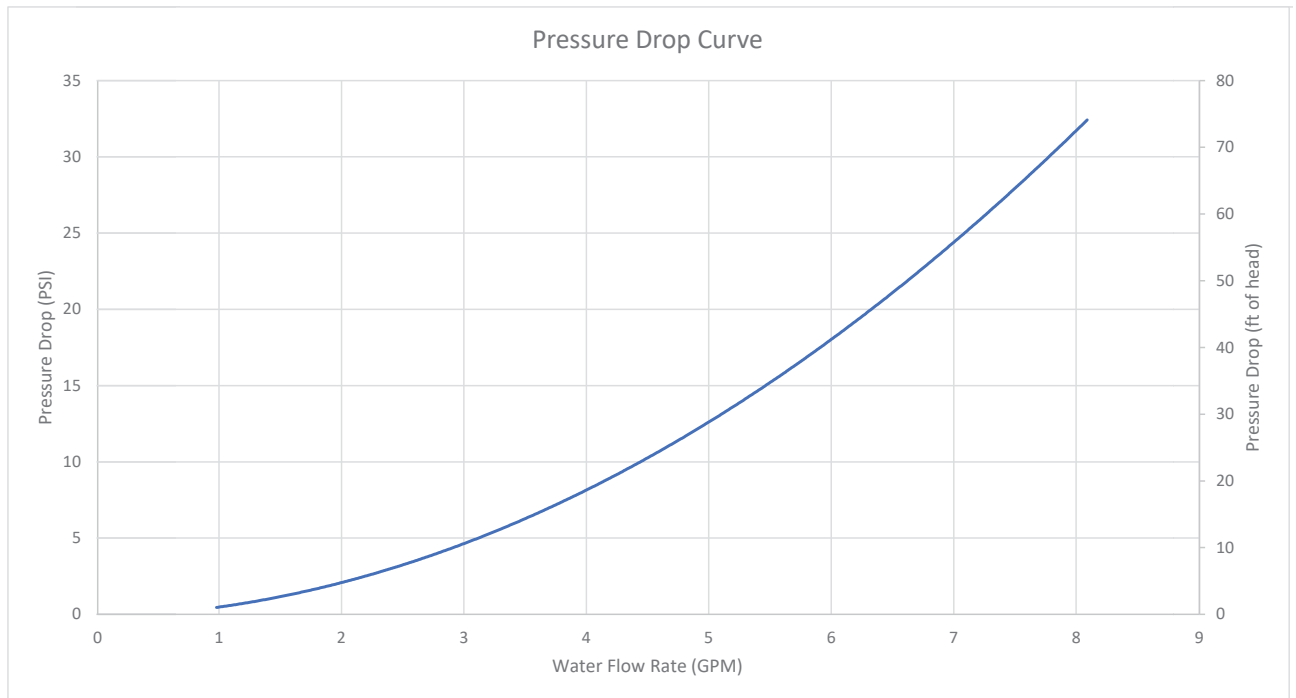
Q

TO WALL: 1" TOP CLEARANCE FROM TOP OF HEATER TO CEILING; 1" BOTTOM CLEARANCE FROM BOTTOM OF HEATER TO FLOOR; 1" FRONT CLEARANCE FROM FRONT OF HEATER TO CASE DOOR; 6" MINIMUM RECOMMENDED FRONT CLEARANCE FOR SERVICE AND MAINTENANCE. "WIRING DIAGRAM BEHIND THE FRONT COVER."

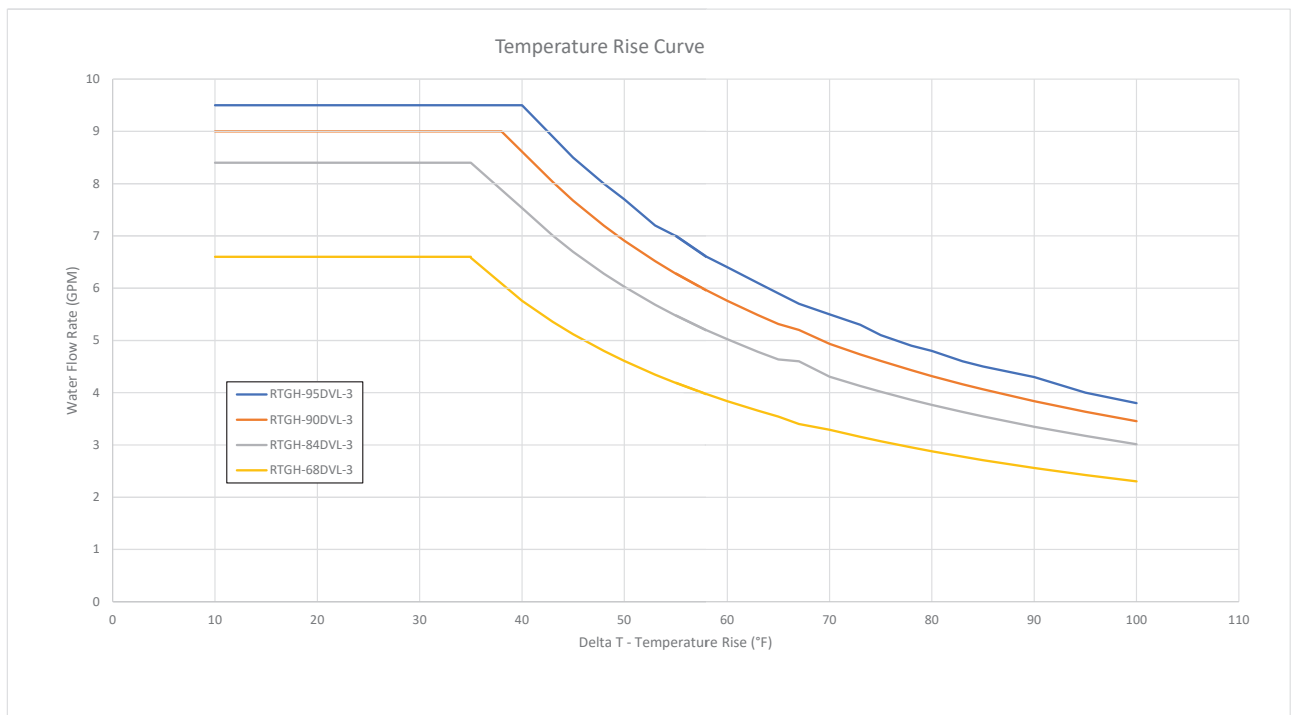
FOR YOUR SAFETY: DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

PRODUCT INFORMATION

The graphic below illustrates the pressure drop across the water heater. Please ensure ample water supply pressure is available to ensure the best performance.



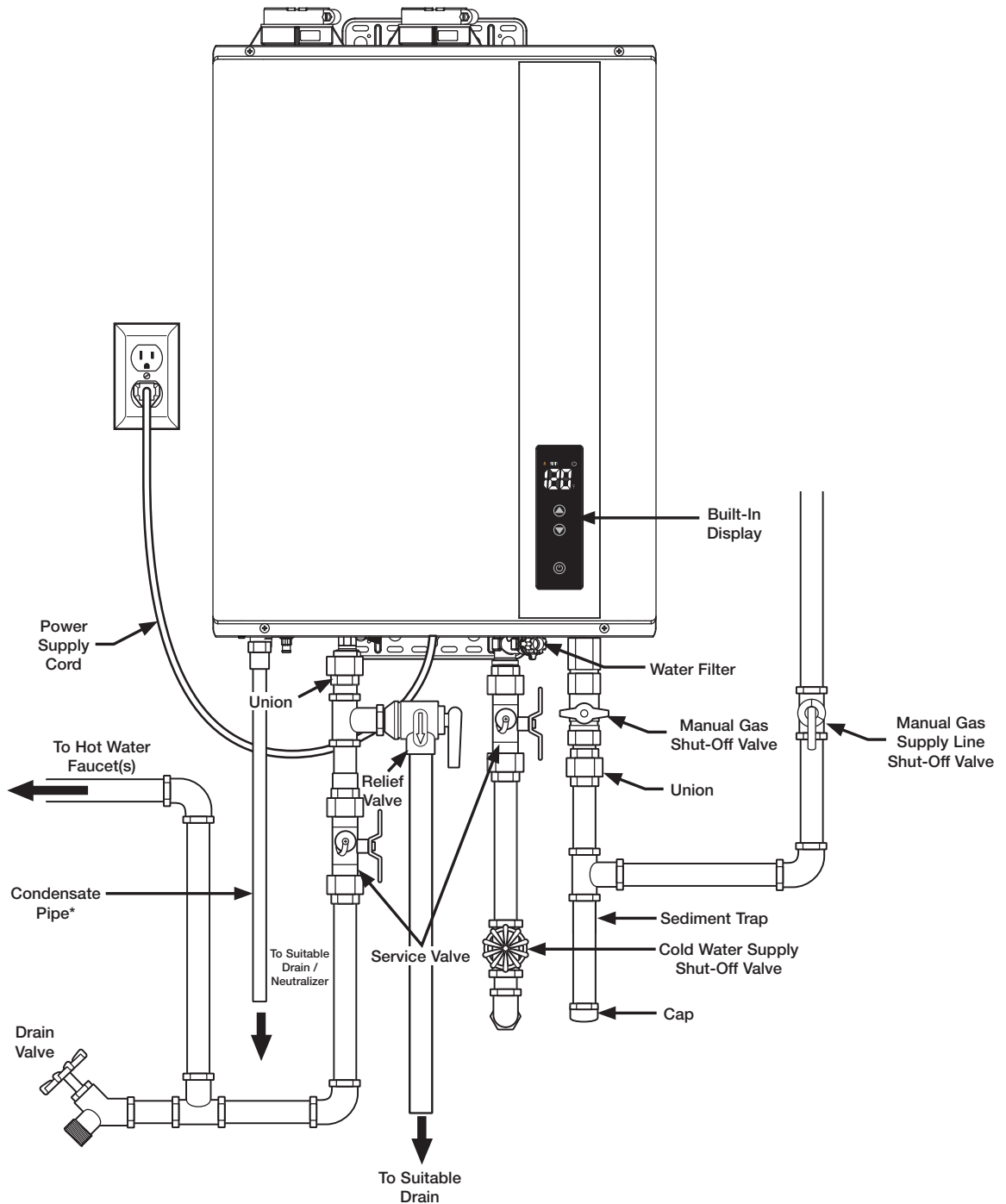
Product Information



PRODUCT INFORMATION

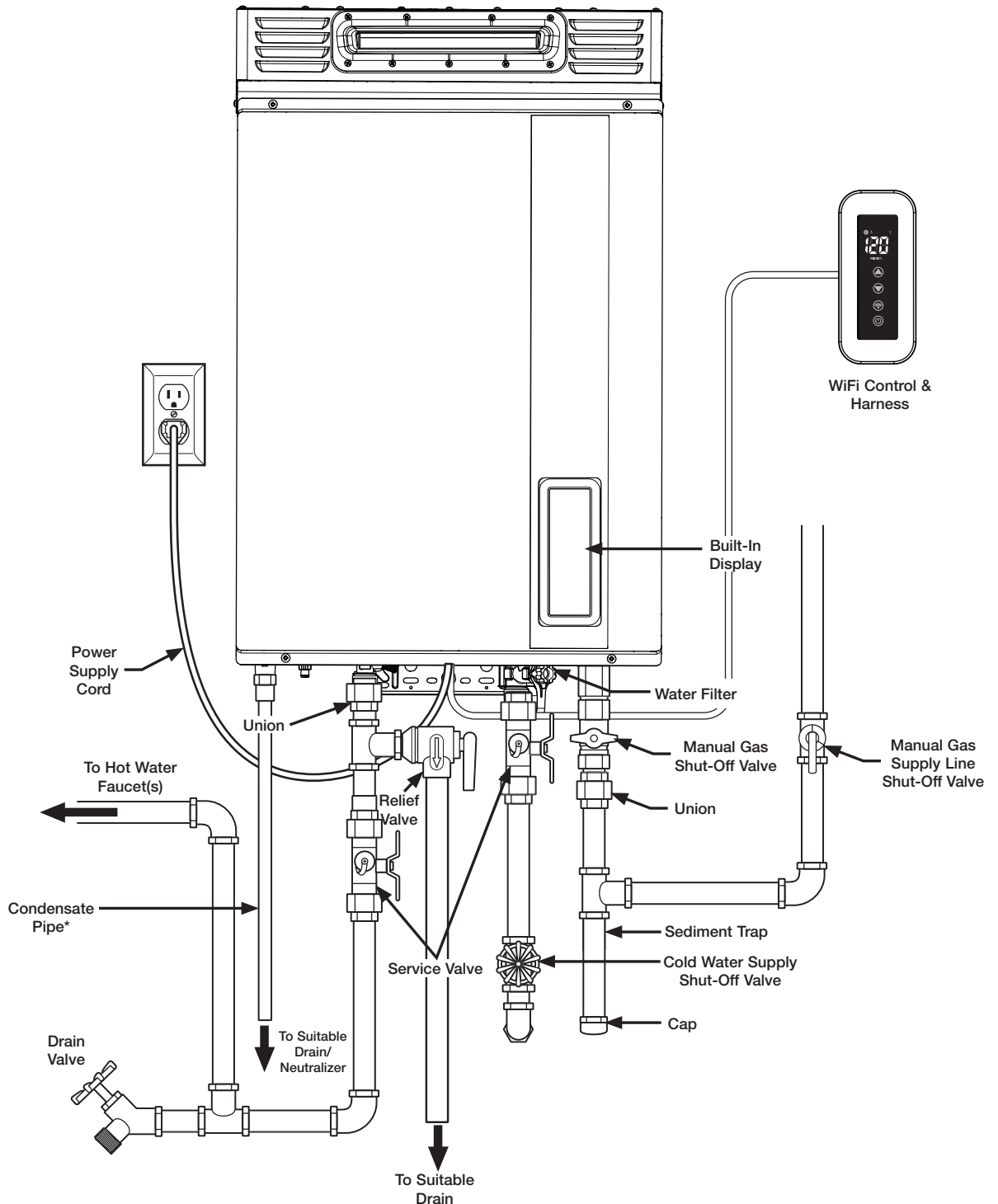
General Descriptions

Typical Direct-Vent Water Heater
(Shown Without Venting)



General Descriptions

Typical Outdoor Water Heater (Outdoor Conversion Kit Required - sold separately)



INSTALLATION INSTRUCTIONS FOR THE CONTRACTOR

INSTALLATION INSTRUCTIONS



Standards Compliance

This water heater must be installed in accordance with these instructions, local codes, and utility company requirements.

In the United States where local codes are not available, use the latest edition of the American National Standard/National Fuel Gas Code. A copy of the Fuel Gas Code 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, MA 02269 as NFPA 54.

In Canada, use the latest edition of the CAN/CSA B149.1 Natural Gas and Propane Installation Code and the Canadian Electrical Code, CAN/CSA C22.1, Part 1.

A copy can be purchased from; Canadian Standards Association, 5060 Spectrum Way, Mississauga, ON L4W 5N6



Choosing a Location

⚠️WARNING:

Fire Hazard –Combustible construction refers to adjacent walls and ceilings and should not be confused with combustible or flammable products and materials. Combustible materials, such as clothing, cleaning materials, or flammable liquids, must not be placed against or next to the water heater. Fire or explosion could occur causing death, personal injury, and/or product or property damage.

A gas-fired water heater should never be installed in a space or room where liquids with flammable vapors are used or stored. Such liquids include gasoline, LP gas (butane or propane), paint, adhesives and their thinners, solvents, or removers. Flammable vapors carry long distances from where they are used or stored. The open flame of the water heater's main burner can ignite these vapors causing an explosion or fire.

NOTICE:

Elevating a gas-fired water heater will reduce but **NOT** eliminate the possibility of lighting the vapor of flammable liquids which may be improperly stored or accidentally spilled.

NOTICE:

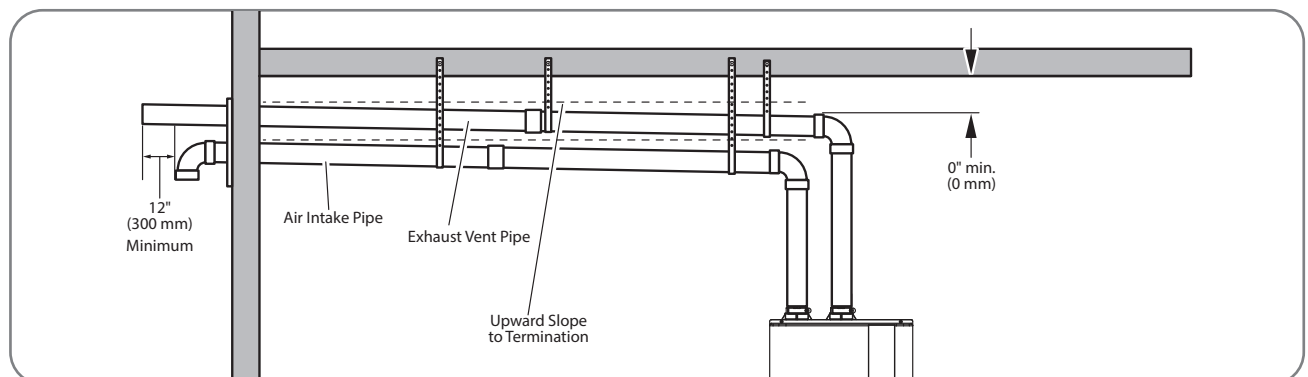
DO NOT connect power until venting installation is complete (see Venting installation).

NOTICE:

This water heater should not be located in an area where water leakage of the heat exchanger or connections will result in damage to the area adjacent to it or to lower floors of the structures. When such areas cannot be avoided, install a suitable catch pan with an adequate drain under the water heater.

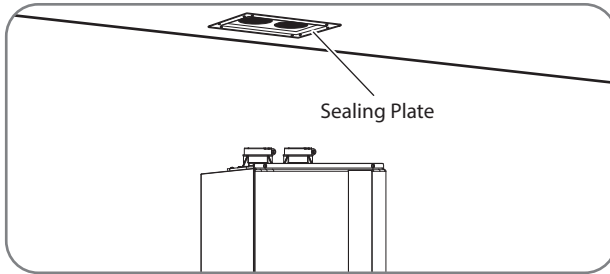
The following requirements will ensure a safe installation:

- The water heater must be located in an area where it won't sustain damage from moving vehicles, flooding, etc. If the water heater is installed in a storage garage, the direct ignition system and main burner should be no less than 18 in. (45 cm) above the garage floor.
- If the water heater is installed in a repair garage or in a private garage, the direct ignition system and main burner should be no less than 4.5 ft (1400 mm) above the garage floor.
- The water heater should be installed as close as possible to the vent exhaust and air intake. This minimizes the vent length and the number of elbows and joints required for venting.
- The water heater should be installed with the correct venting and exhaust materials. See "Venting" in this Use and Care Manual.

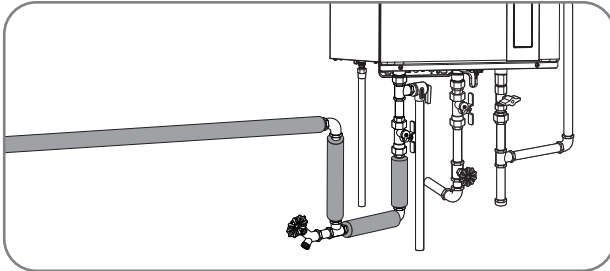


INSTALLATION INSTRUCTIONS

Choosing a Location (cont.)



- Every vent or air intake pipe penetration of a floor or ceiling should be sealed.
- Failure to install and properly vent the water heater to the outdoors as outlined on "Venting" 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 areas prohibited by National Fuel Gas Code in U.S. installation or CAN/CSA B149.1 in Canadian installation.



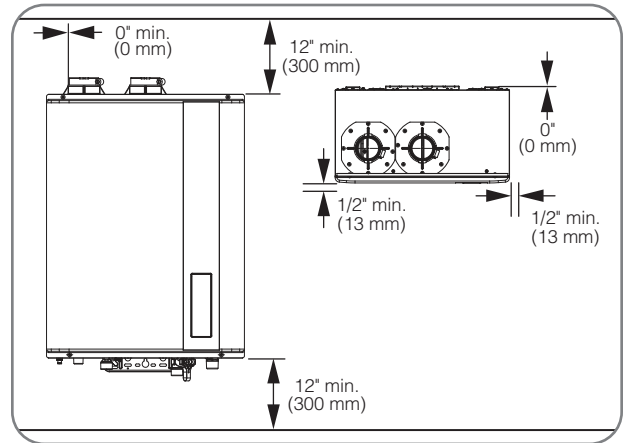
- **DO NOT** install the water heater where it is subject to vibrations.



- **DO NOT** install the water heater in a recreational vehicle, boat, or other watercraft.



- **DO NOT** install the water heater near vents for heating and cooling unless a minimum clearance of 4 ft (1.2 m) is maintained.



- Minimum water heater clearances from combustible and noncombustible construction are as follows:
 - 1/2 in. (1.3 cm) for sides and front
 - 0 in. (0 cm) for rear with support bracket(s)
 - 12 in. (30 cm) from the bottom and top
 - 0 in. (0 cm) for vent or air intake pipe

NOTICE:

Preferred maintenance clearance is 24 in. (61 cm) from top, bottom, and front of unit.

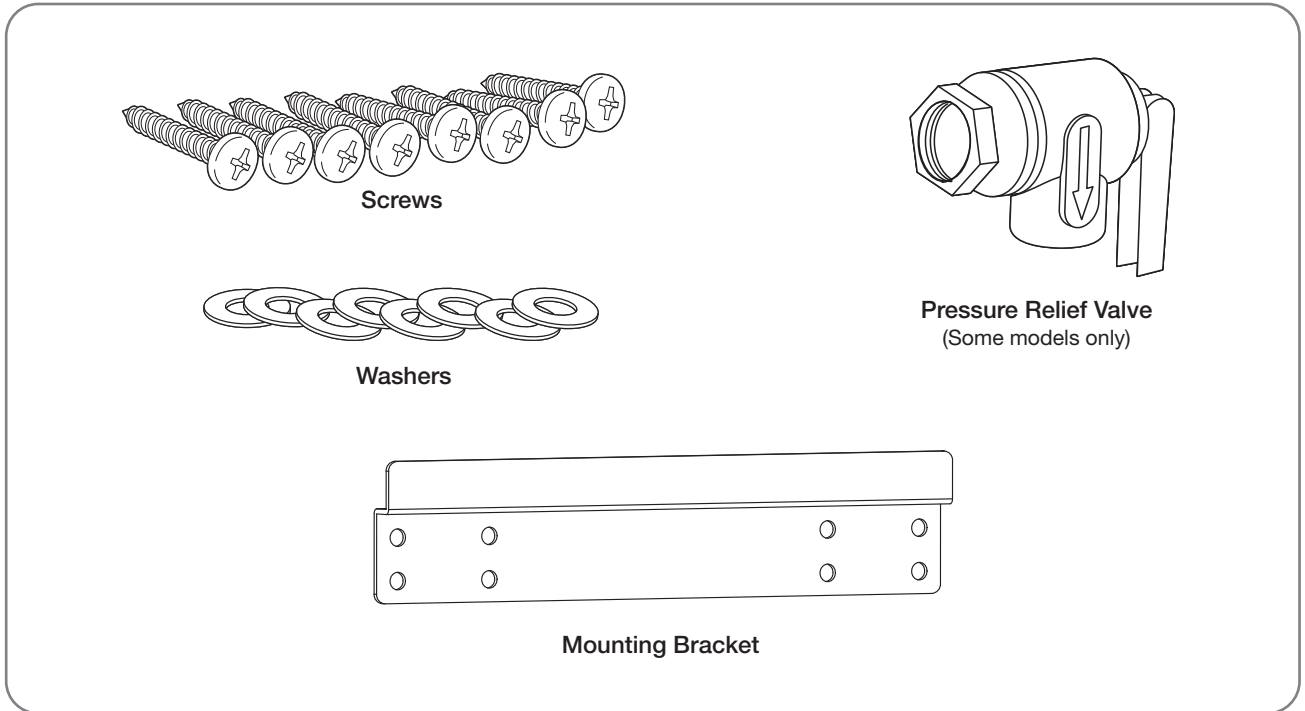
INSTALLATION INSTRUCTIONS

Product Inspection

Visually inspect the water heater for any possible damage.

Check the rating plate on the water heater to make sure the water heater was designed to be used with the supplied type of gas (natural or LP).

Verify that all included supplied parts are present as shown.



Water Heater Installation

Corrosive Atmosphere

NOTICE:

The water heater should not be installed near an air supply containing halogenated hydrocarbons where contaminants can enter the combustion air supply.

Avoid installing a water heater in any of the following locations: beauty shops, dry-cleaning establishments, photo processing labs, and storage areas for liquid and powdered bleaches or swimming pool chemicals. These locations often contain such halogenated hydrocarbons.

The air supply containing halogenated hydrocarbons is safe to breathe, but when passed 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.

NOTICE:

The water heater warranty is void when the failure is due to operation in corrosive conditions.

INSTALLATION INSTRUCTIONS

General



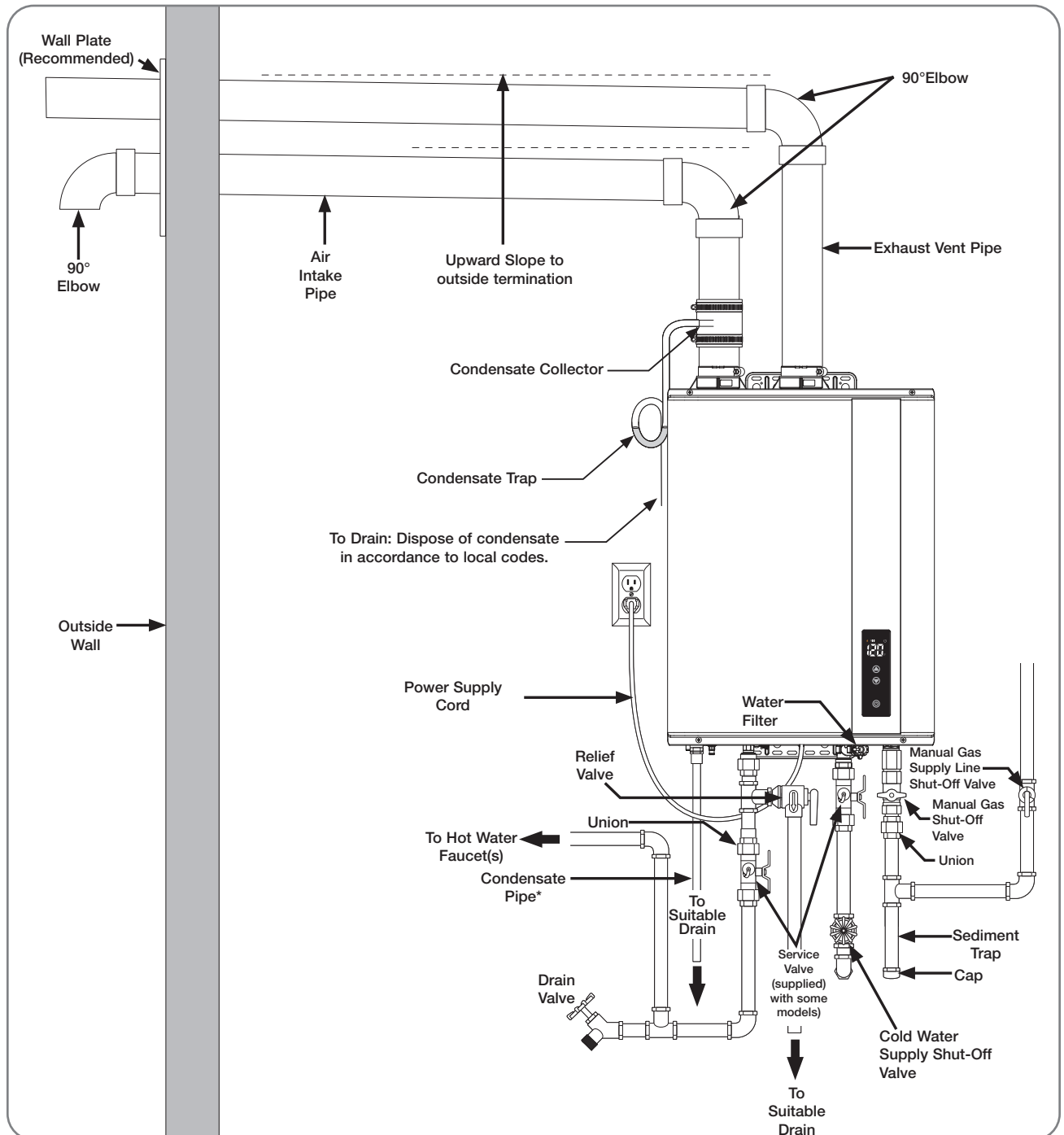
Water Heater Installation (cont.)

NOTICE:

The National Fuel Gas Code (NFPA) and CAN/CSA B149.1 mandate a manual gas shut-off valve.

See NFPA/B149.1 for complete instructions. Local codes or plumbing authority requirements may vary from the instructions or diagrams provided and take precedence over these instructions.

Typical Installation of Direct-Vent Water Heater



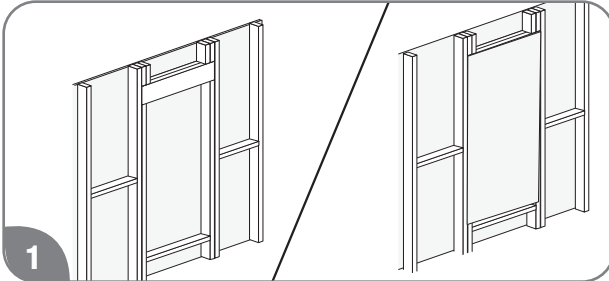
INSTALLATION INSTRUCTIONS

Mounting the Water Heater

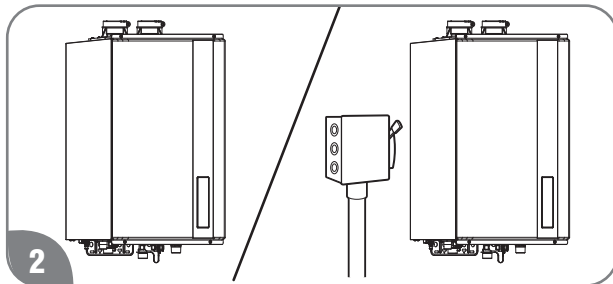
⚠ CAUTION:

Reinforcement of the wall is required where the wall is not strong enough to hold the water heater. Failure to do so could result in personal injury and/or property damage.

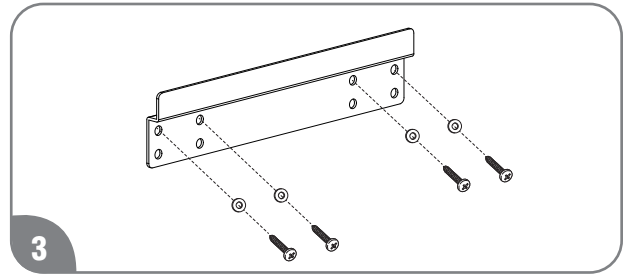
The mounting location for the water heater should allow for easy access and operation.



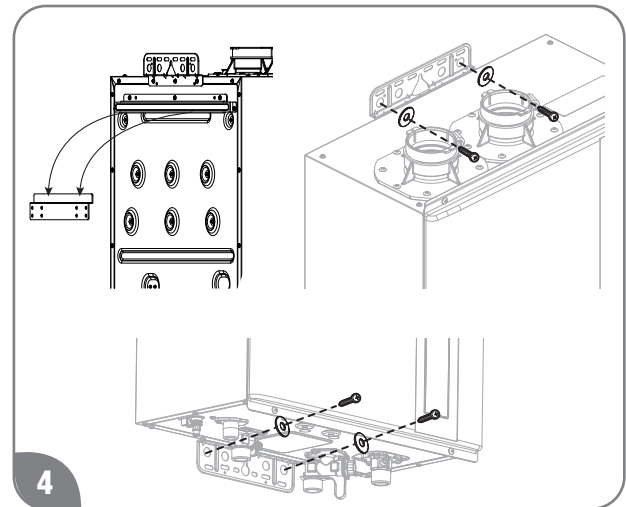
The water heater is designed to be installed either inside the wall cavity, between the wall studs, or outside the wall cavity. Either installation requires the water heater to be supported with a wooden support brace between the wall studs, or a piece of wood that is equal in size to the water heater and securely attached to the wall studs before the water heater is attached to it. This piece of wood can be installed inside or outside of the wall. Use wood screws to secure brackets to wall. If mounting to a concrete wall, use lag bolts designed for concrete.



Make sure the proper electrical outlet or supply (120 VAC/60 Hz) is available and located near the unit. Direct-vent models come with a 6-ft. (1.8-m) power cord, while the outdoor models require hard-wiring or the addition of a plug.



Attach the mounting bracket to the wall and secure it by 4 screws and washers. Make sure it is level and that it can support the weight of the water heater.



NOTICE:

The image above may differ in appearance from your water heater.

Align the groove on the back of the water heater to the tongue on the mounting bracket. When mounted with the mounting bracket, the water heater will have a 5/8" (16 mm) clearance from the back of the wall. Using two screws and washers, secure the top and lower mounting bracket to the wall.

NOTICE:

DO NOT connect power until venting installation is complete (see Venting installation).

INSTALLATION INSTRUCTIONS



Venting for Direct-Vent Water Heater

⚠ DANGER:

Failure to properly vent the water heater to the outdoors as outlined in this Venting section will result in death or serious personal injury. 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 this Venting section. This water heater must have air supply connected and terminated to the outdoors.

⚠ WARNING:

Refer to page 16 for required clearances to combustible materials. Improper clearances can cause explosion or fire resulting in death, personal injury, and/or product damage.

⚠ CAUTIONS:

- Check to make sure flue gases **DO NOT** recirculate into the air intake terminal when using direct venting. If the water heater is having service issues, flue recirculation may be a contributing factor.
- Even when the minimum vent terminal separation distances are followed, recirculation may still occur depending upon the location outside the building, the distance from other buildings, proximity to corners, weather conditions, wind patterns, and snow depth.
- Periodically check to make sure that flue recirculation is not occurring. Signs of flue gas recirculation include frosted or frozen intake terminals and condensate in the intake terminal and venting system.
- Correction to flue recirculation may involve angling the intake away from the exhaust terminal and increasing the distance between them. Check to be sure the intake and exhaust terminals are not obstructed, especially during periods of below-freezing weather.

Venting Requirements

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

The vent exhaust and air intake must terminate outside as described in these instructions. **DO NOT** vent this water heater through a chimney. It must be vented separately from all other appliances.

NOTICE:

The unit can be vented using only the following approved vent pipe material.

Use only 2 or 3 inch diameter pipe. Refer to local codes for restrictions on the use of InnoFlue® PP, PVC, CPVC, or ABS pipe and fittings. All exhaust venting materials for product installed in Canada must meet ULC-S636.

The use of cellular core PVC (ASTM F891), cellular core CPVC, or Radel® (polyphenolsulfone) in non-metallic venting systems is prohibited and that covering non-metallic vent pipe and fittings with thermal insulation is prohibited.

This water heater requires a special venting system. Refer to venting supplier's instruction for complete parts list and method of installation. The manufacturers and product lines listed on the following tables have been tested and authorized to safely operate with Rheem tankless water heater.

Approved Vent Materials, Fittings and Terminations:

	PVC	CPVC	ABS
Acceptable Materials for Exhaust	Schedule 40, ASTM D-1785	Schedule 40, ASTM F-441	Schedule 40, ASTM D-2661
Acceptable Materials for Air Intake	Schedule 40, ASTM D-1785, and DWV, ASTM-D2665	Schedule 40, ASTM F-441, and CPVC 4120, ASTM-D2846	Schedule 40, ASTM D-2661
Fittings	Schedule 40, ASTM D-2665	Schedule 40, ASTM F-438	Schedule 40, ASTM D-2661
Terminations (Manufactured by Polytech)	SP20285	SP21025	
	SP20286	SP21026	
	SP20245		
	SP20897		

ABS is not permitted for exhaust vent in Canada

Approved Polypropylene Vent Manufacturer/Trade Name:

Manufacturer	Centrotherm
Trade Name	InnoFlue®
Single Wall Pipe	ISVL**** or ISVL****UV
Elbow	ISELL**** or ISELL****UV
Adapter	ISAAL0202
Non-Return Valve (NRV)	ISNRV****
Siphon	IASJBVS
Termination	ISLPT**** or ISTT****

*Refers to variations in nominal size.

DO NOT USE Schedule 20, Cell Core, Drain Pipe, Galvanized, Aluminum, B-Vent, or any flexible vent.

INSTALLATION INSTRUCTIONS



Venting for Direct-Vent Water Heater

Appropriate dip switch adjustment shall be required to allow certain vent length. There are 4 vent configuration settings, A-0, A-1, A-2, and A-3 settings at 0-2000 ft (0-610 m) elevation.

Vent Lengths

Before starting the vent installation, careful planning should be given to the routing and termination of the vent pipes. The length of the vent pipes (inlet and outlet) should be kept to a minimum. Also, see pages 26 and 27 for vent terminal placement. Refer to the maximum and minimum vent length charts for the pipe sizes that can be used and the total equivalent length of pipe that can be used. **DO NOT** exceed equivalent length of pipe in maximum vent length chart.

SINGLE UNIT: MAX. EQUIVALENT VENT LENGTHS - STRAIGHT PIPE		
Number of 90° Elbows	Max Length 2" Straight Pipe	Max Length 3" Straight Pipe
0	60 ft. (18.3 m)	150 ft. (45.7 m)
1	54 ft. (16.5 m)	144 ft. (43.9 m)
2	48 ft. (14.6 m)	138 ft. (42.7 m)
3	42 ft. (12.8 m)	132 ft. (40.2 m)
4	36 ft. (11.0 m)	126 ft. (38.4 m)
5	30 ft. (9.1 m)	120 ft. (36.6 m)
6	24 ft. (7.3 m)	114 ft. (34.7 m)

EQUIVALENT FT. OF ELBOWS		
	2" Pipe	3" Pipe
90°	6 ft. (1.83 m)	6 ft. (1.83 m)
45°	3 ft. (0.9 m)	3 ft. (0.9 m)

*The altitude settings for installations at levels greater than 2000 ft (610 m), can be found in the "High-Altitude Dip Switch Adjustments" section of this manual. DIP switch changes will be necessary at higher altitudes.

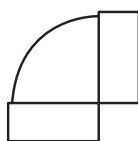
The vent termination is not included in the equivalency calculations.

NOTICE: A 90°, ¼ standard bend or long bend elbow is equivalent to 6 ft. (1.83 m) of straight pipe. A 45°, 1/8 standard bend or long bend elbow is equivalent to 2.5 ft. (0.76 m) of straight pipe. A 90°, short bend radius elbow is equivalent to 12 ft. (3.66 m) of straight pipe.

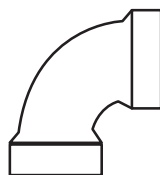
DO NOT use unequal diameters of pipe and fittings for the vent system.

See examples below.

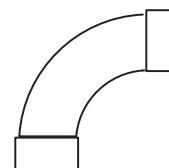
Elbow Examples



Short Bend 90° Elbow
OK to Use



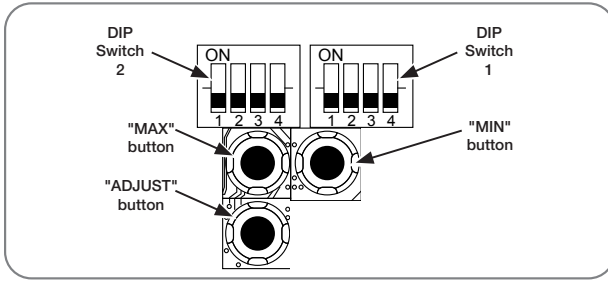
Standard Bend 90° Elbow
OK to Use



Long Bend 90° Elbow
OK to Use

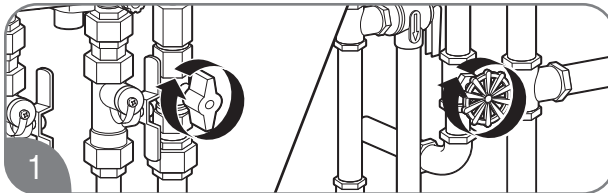
INSTALLATION INSTRUCTIONS

Vent Length and High Altitude DIP switch Adjustments

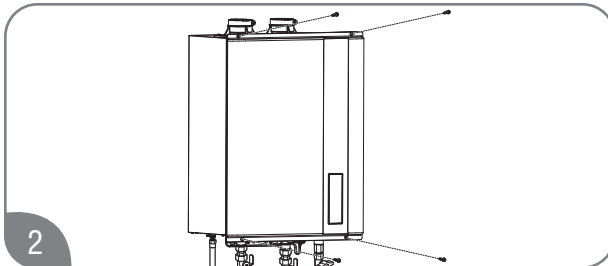


A-0 setting is default and factory setting. All dip switches are off.

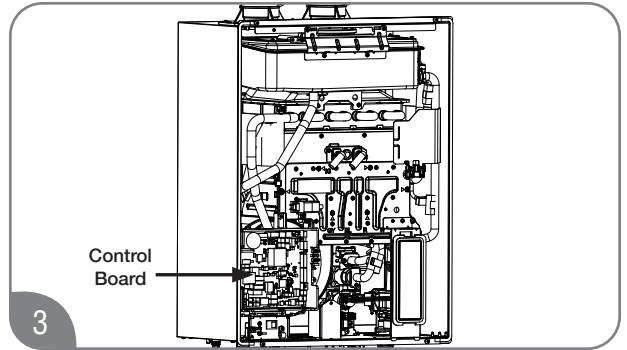
SECTION	HIGH-ALTITUDE
Sea Level (A Setting)	0-2000 ft (0 m - 610 m)
B Setting	2001 ft - 5400 ft (610 m - 1650 m)
C Setting	5401 ft - 7800 ft (1650 m - 2377 m)



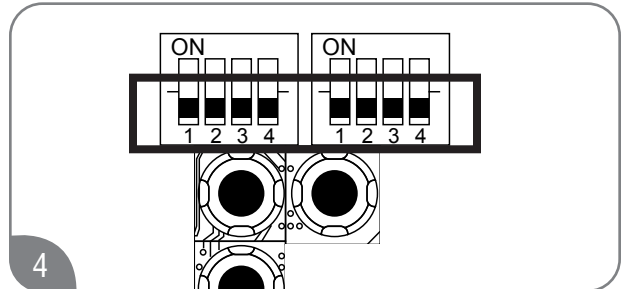
Turn off the gas and water to the water heater by closing the shut-off valves.



Remove the front cover panel on the water heater.



Find DIP Switch 1 and 2 located in the top-right portion of the control board.



The factory settings for this switch should all be in the OFF position (DOWN), which is the A-0 setting.

For longer vent lengths and altitudes above 2000 ft. (610 m), refer to the table below for the necessary DIP switch settings. These setting must be changed to ensure proper operation.

NOTICE

DO NOT alter any other DIP switch settings. Please contact technical service listed on page 76 of this use and care manual if you have any questions of DIP switch adjustments.

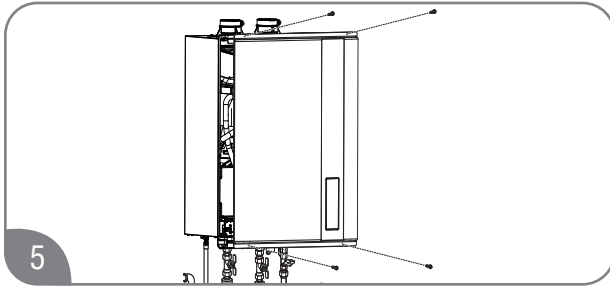
3" VENT SYSTEM DIAMETER						
Identify Vent Length	IDENTIFY ALTITUDE					
	0 - 2,000 ft		2,001 - 5,400 ft		5,400 - 7,800 ft	
		Dip		Dip		Dip
6 to 45 feet (1.8 - 13.7 meters)	A-0 (Factory Setting)		B-0		C-0	
45 to 150 feet (13.7 to 45.7 meters)	A-1		B-1		C-1	

2" VENT SYSTEM DIAMETER						
Identify Vent Length	IDENTIFY ALTITUDE					
	0 - 2,000 ft		2,001 - 5,400 ft		5,400 - 7,800 ft	
		Dip		Dip		Dip
MUST CHANGE FACTORY DIP SETTING	A-0 (Factory Setting)					
6 to 21 feet (1.8 to 6.4 meters)	A-1		B-1		C-1	
21 to 42 feet (6.4 to 12.8 meters)	A-2		B-2		C-2	
42 to 60 feet (12.8 to 18.3 meters)	A-3		B-3		C-3	

INSTALLATION INSTRUCTIONS



Venting for Direct-Vent Water Heater



Replace the front cover panel on the water heater.



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

NOTICE:

To use 3" vent pipe, an increasing adapter will be required.

⚠WARNING:

To use Category III Stainless Steel, a proper transition part will be required to prevent flue gas from leaking. This water heater requires the correct DIP switch adjustments per vent length for proper operation. Incorrect DIP switch adjustments may cause improper water heater operation resulting in serious injury or death.

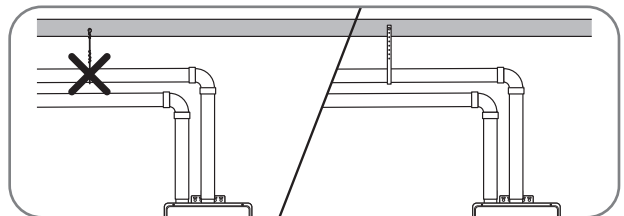
Depending on the size of pipe that is chosen for venting the water heater, it might be necessary to use a fitting for stepping down in pipe size, to connect to the water heater.

All intake and exhaust venting components must have the same diameter size. **DO NOT** use a different size on the intake and exhaust venting.

It is recommend to have a vent length as short as possible. Input rate of the water heater decreases if there is restriction (pressure drop) in the venting system.

The following table shows approximate input rate reduction. Actual input rate reduction may be different at each installation.

Setting	Vent Size	Min Vent Length	Max Vent Length
A-0	3"	0%	5%
	2"	---	---
A-1	3"	5%	10%
	2"	5%	10%
A-2	2"	15%	20%
A-3	2"	20%	25%



The unit may be vented horizontally through a wall or vertically through the roof. Pipe runs must be adequately supported along both vertical and horizontal runs.

Maximum unsupported span is recommended to be no more than 4 feet (1.2 m). It is imperative that the first hanger be located on the horizontal runs immediately adjacent to the first 90-degree elbow from the vertical rise. Only use support isolation hanging bands. **DO NOT** use wire to support pipe runs.

Stress levels in the pipe and fittings can be significantly increased by improper installation. If rigid pipe clamps are used to hold the pipe in place, or if the pipe cannot move freely through a wall penetration, the pipe may be directly stressed, or high thermal stresses may be formed when the pipe heats up and expands. Install accordingly to minimize such stresses.

INSTALLATION INSTRUCTIONS



Venting for Direct-Vent Water Heater

NOTICES:

- It is recommended that the air intake pipe and exhaust pipe have a 1/4" per foot upward slope toward the outdoors.
- Maintain the proper clearance between the vent pipe and combustible or noncombustible materials as described on page 16.
- Recommend use of condensation trap/collar on the air intake to prevent water entering the heater cabinet
- A clearance of 0 in. (0 cm) is allowed between the vent or air intake pipe and combustible material.
- Use proper support for the vent and air intake pipes.
- It is recommended the support method used isolates the vent pipe from floor joists or other structural members. This helps prevent transmission of noise and vibration.
- DO NOT support, pin, or otherwise secure the venting system in a way that restricts the normal thermal expansion and contraction of the chosen venting material.

See page 25 for additional requirements for the Commonwealth of Massachusetts.

Preexisting Venting Notes:

If the water heater is being installed as a replacement for an existing water heater, a thorough inspection of the existing venting and air intake system must be performed prior to any installation work. Verify that the correct materials, vent lengths, and terminal locations as described in this manual have been met. Carefully inspect the entire venting and air intake 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.

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

Refer to "Venting for Direct Vent Water Heaters" on page 22 for the vent lengths at each setting.

NOTICE:

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

Please contact technical service listed on page 76 of this use and care manual if you have any questions of high altitude DIP switch adjustments.

⚠ WARNING:

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

NOTICE:

It is recommend to have a vent length as short as possible. Input rate at high altitude naturally is derated. In addition to that, input rate of the water heater decreases more if there is restriction (pressure drop) in the venting system. Refer to input rate reduction table due to vent length on page 23. Actual input rate reduction may be different at each installation.

INSTALLATION INSTRUCTIONS



Venting for Direct-Vent Water Heater

Venting

In the Commonwealth of Massachusetts

The Commonwealth of Massachusetts requires compliance with regulation 248 CMR 4.00 and 5.00 for installation of through-the-wall vented gas appliances as follows:

5.08: Modifications to NFPA-54, Chapter 10

(1) Revise NFPA-54 section 10.5.4.2 by adding a second exception as follows:

Existing chimneys shall be permitted to have their use continued when a gas conversion burner is installed, and shall be equipped with a manual reset device that will automatically shut off the gas to the burner in the event of a sustained back-draft.

(2) Revise 10.8.3 by adding the following additional requirements:

(a) For all side-wall, horizontally vented, gas-fueled equipment installed in every dwelling, building, or structure used in whole or part for residential purposes, including those owned or operated by the Commonwealth and where the side-wall exhaust vent termination is less than seven (7) feet above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements shall be satisfied.

1. INSTALLATION OF CARBON MONOXIDE DETECTORS.

At the time of installation of the side-wall, horizontally vented, gas-fueled equipment, the installing plumber or gas fitter shall observe that a hard-wired carbon monoxide detector with an alarm and battery backup is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gas fitter shall observe that a battery-operated or hard-wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, building, or structure served by the side-wall, horizontally vented, gas-fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard-wired carbon monoxide detectors.

a. In the event that the side-wall, horizontally vented, gas-fueled equipment is installed in a crawl space or an attic, the hard-wired carbon monoxide detector with alarm and battery backup may be installed on the next adjacent floor level.

b. In the event that the requirements of this subdivision cannot be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements, provided, however, that during said thirty (30) day period, a battery-operated carbon monoxide detector with an alarm shall be installed.

2. APPROVED CARBON MONOXIDE DETECTORS. Each carbon monoxide detector as required in accordance with the above provisions shall comply with NFPA 720 and be ANSI/UL 2034-listed and IAS-certified.

3. SIGNAGE. A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet above grade directly in line with the exhaust vent terminal for the horizontally vented, gas-fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (1/2) inch in size, "GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS."

4. INSPECTION. The state or local gas inspector of the side-wall, horizontally vented, gas-fueled equipment shall not approve the installation unless, upon inspection, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CMR 5.08 (2)(a)(1 through 4).

(b) EXEMPTIONS: The following equipment is exempt from 248 CMR 5.08 (2)(a)(1 through 4):

1. The equipment listed in Chapter 10 entitled "Equipment Not Required To Be Vented" in the most current edition of NFPA 54 as adopted by the Board, and

2. Product-approved side-wall, horizontally vented, gas-fueled equipment installed in a room or structure separate from the dwelling, building, or structure used in whole or in part for residential purposes.

(c) MANUFACTURER REQUIREMENTS – GAS EQUIPMENT VENTING SYSTEM PROVIDED. When the manufacturer of product-approved side-wall, horizontally vented, gas-fueled equipment provides a venting system design or venting system components with the equipment, the instructions provided by the manufacturer for installation of the equipment and the venting system shall include:

1. Detailed instructions for the installation of the venting system design or the venting system components; and

2. A complete parts list for the venting system design or venting system.

(d) MANUFACTURER REQUIREMENTS – GAS EQUIPMENT VENTING SYSTEM NOT PROVIDED. When the manufacturer of product-approved side-wall, horizontally vented, gas-fueled equipment does not provide the parts for venting the flue gases, but identifies "special venting systems," the following requirements shall be satisfied by the manufacturer:

1. The referenced "special venting systems" instructions shall be included with the appliance or equipment installation instructions, and

2. The "special venting systems" shall be product-approved by the Board, and the instructions for that system shall include a parts list and detailed installation instructions.

(e) A copy of all installation instructions for all product-approved side-wall, horizontally vented, gas-fueled equipment, all venting instructions, all parts lists for venting instructions, and/or all venting design instructions shall remain with the appliance or equipment at the completion of the installation.

NOTE: For the State of Massachusetts, use only plastic piping, fittings and vent terminations as specified in this manual which are approved by the Massachusetts Board of State Examiners of Plumbers and Gas for venting of appliances (see link below):

https://licensing.reg.state.ma.us/pubLic/pl_products/pb_pre_form.asp

INSTALLATION INSTRUCTIONS

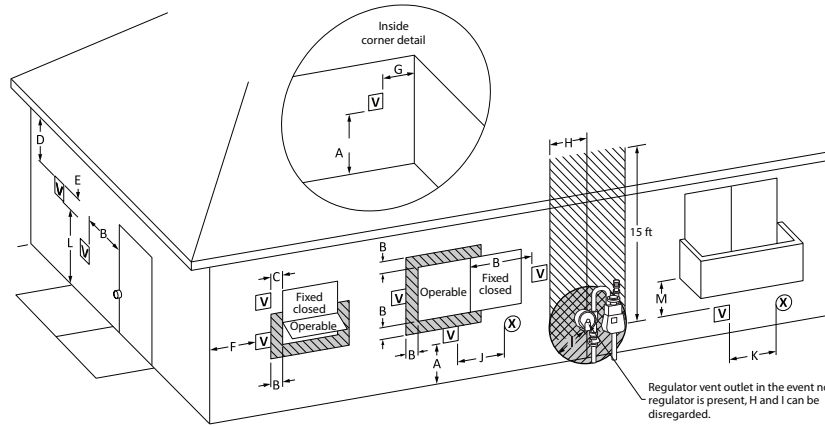


Venting for Direct-Vent Water Heater

The following charts detail the minimal dimensional information needed to determine the proper location of the vent terminal for direct vent and outdoor tankless water heaters.

Horizontal Vent Terminal Location for Other than Direct Vent/Outdoor Heater

Venting



V VENT TERMINAL
 X AIR SUPPLY INLET
 AREA WHERE TERMINAL IS NOT PERMITTED

Canadian Installations ¹

US Installations ²

	Canadian Installations ¹	US Installations ²
A= Clearance above grade, veranda, porch, deck or balcony.	12 inches (30 cm)	12 inches (30 cm)
B= Clearance to window or door that may be opened.	<ul style="list-style-type: none"> • 6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), • 12 in (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW), • 36 in (91 cm) for appliances > 100,000 Btuh (30 kW) 	4 ft (1.2) below or to side of opening; 1 ft (300 mm) above opening.
C= Clearance to permanently closed window.	0 in (0 cm)	0 in (0 cm)
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.	12 in (30 cm)	12 in (30 cm)
E= Clearance to unventilated soffit.	12 in (30 cm)	12 in (30 cm)
F= Clearance to outside corner.	24 in (61 cm)	24 in (61 cm)
G= Clearance to inside corner.	18 in (46 cm)	18 in (46 cm)
H= Clearance to each side of center line extended meter/regulator assembly, above	3 feet (91 cm) within a height 15 feet (4.6 m)	3 ft (91 cm) within a height of 15 ft (4.6 m)
I= Clearance to service regulator vent outlet.	3 feet (91 cm)	3 feet (91 cm)
J= Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance..	<ul style="list-style-type: none"> • 6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), • 12 in (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW), • 36 in (91 cm) for appliances > 100,000 Btuh (30 kW) 	4 ft (1.2) below or to side of opening; 1 ft (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) for mechanical draft systems (Category I appliances); vents for Category II and IV appliances cannot be located above public walkways or other areas where condensate or vapor can cause a nuisance or hazard.
M= Clearance under veranda, porch, deck or balcony.	12 in (30 cm) ‡	12 in (30 cm) ‡

¹ In accordance with the current *CSA B149.1 Natural Gas and Propane Installation Code*

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

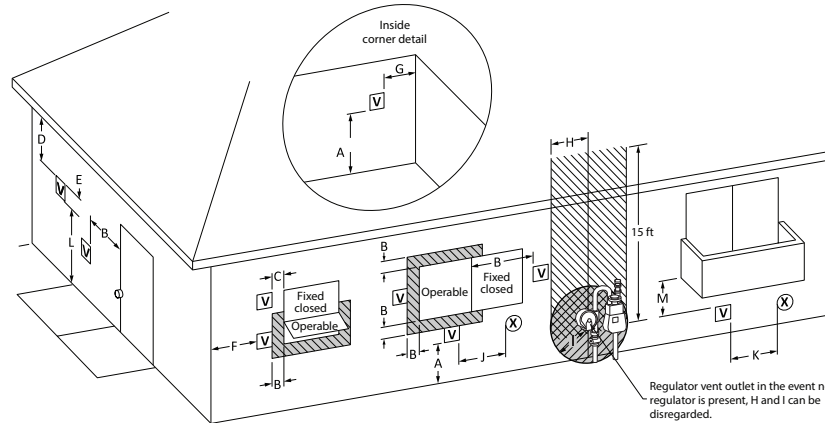
‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

INSTALLATION INSTRUCTIONS



Venting for Direct-Vent Water Heater

Horizontal Vent Termination Location for Direct-Vent Water Heater



V VENT TERMINAL
 X AIR SUPPLY INLET
 AREA WHERE TERMINAL IS NOT PERMITTED

Canadian Installations ¹

US Installations ²

	Canadian Installations ¹	US Installations ²
A= Clearance above grade, veranda, porch, deck or balcony.	12 inches (30 cm)	12 inches (30 cm)
B= Clearance to window or door that may be opened.	<ul style="list-style-type: none"> • 6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), • 12 in (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW), • 36 in (91 cm) for appliances > 100,000 Btuh (30 kW) 	<ul style="list-style-type: none"> • 6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), • 12 in (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 50,000 Btuh (15 kW), • 12 in (30 cm) for appliances > 50,000 Btuh (15 kW)
C= Clearance to permanently closed window.	0 in (0 cm)	0 in (0 cm)
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.	12 in (30 cm)	12 in (30 cm)
E= Clearance to unventilated soffit.	12 in (30 cm)	12 in (30 cm)
F= Clearance to outside corner.	24 in (61 cm)	24 in (61 cm)
G= Clearance to inside corner.	18 in (46 cm)	18 in (46 cm)
H = Clearance to each side of center line extended meter/regulator assembly. above	3 feet (91 cm) within a height 15 feet (4.6 m)	3 ft (91 cm) within a height of 15 ft (4.6 m)
I = Clearance to service regulator vent outlet.	3 feet (91 cm)	3 feet (91 cm)
J = Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance..	<ul style="list-style-type: none"> • 6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), • 12 in (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW), • 36 in (91 cm) for appliances > 100,000 Btuh (30 kW) 	<ul style="list-style-type: none"> • 6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), • 12 in (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 50,000 Btuh (15 kW), • 12 in (30 cm) for appliances > 50,000 Btuh (15 kW)
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) for mechanical draft systems (Category I appliances); vents for Category II and IV appliances cannot be located above public walkways or other areas where condensate or vapor can cause a nuisance or hazard.
M = Clearance under veranda, porch, deck or balcony.	12 in (30 cm) ‡	12 in (30 cm) ‡

¹ In accordance with the current *CSA B149.1 Natural Gas and Propane Installation Code*

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

‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

INSTALLATION INSTRUCTIONS



Venting for Direct-Vent Water Heater (cont.)

Horizontal Vent Considerations

⚠ 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.

- DO NOT locate vent terminal on the side of a building with prevailing winter winds. This will help prevent water lines from freezing and moisture from freezing on walls and under eaves.
- DO NOT locate vent terminal too close to shrubbery, as flue gasses may damage them. A minimum distance of 4 ft. (1.22 m) is recommended.
- All painted surfaces should be primed to lessen the chance of physical damage. Painted surfaces will require maintenance.
- Guard against accidental contact with people and pets.

Indoor Tankless Water Heaters

⚠ WARNING:

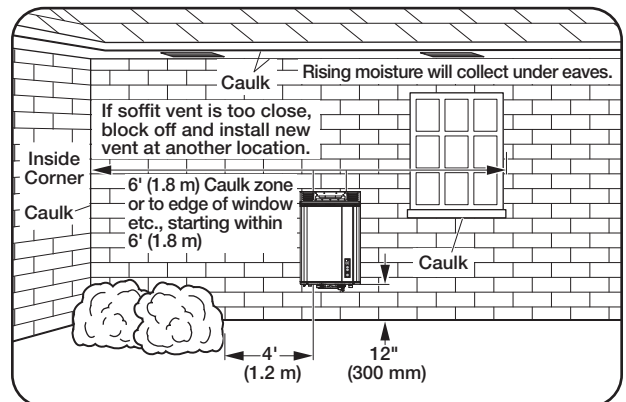
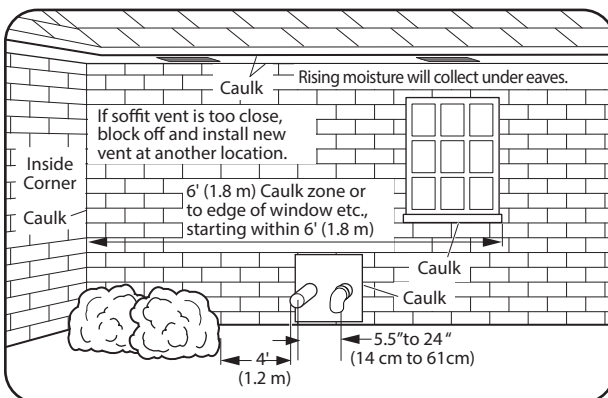
For multiple-unit installations, a minimum distance between vent terminations must be maintained to prevent recirculation of vent gases. Maintain a center-to-center distance between each pair of vent terminations as listed below:

24 in. (61 cm) for a two-unit installation;

24 in. (61 cm) and 36 in. (91.4 cm) for a three-unit installation;

24 in. (61 cm), 36 in. (91.4 cm), and 24 in. (61 cm) for a four-unit installation.

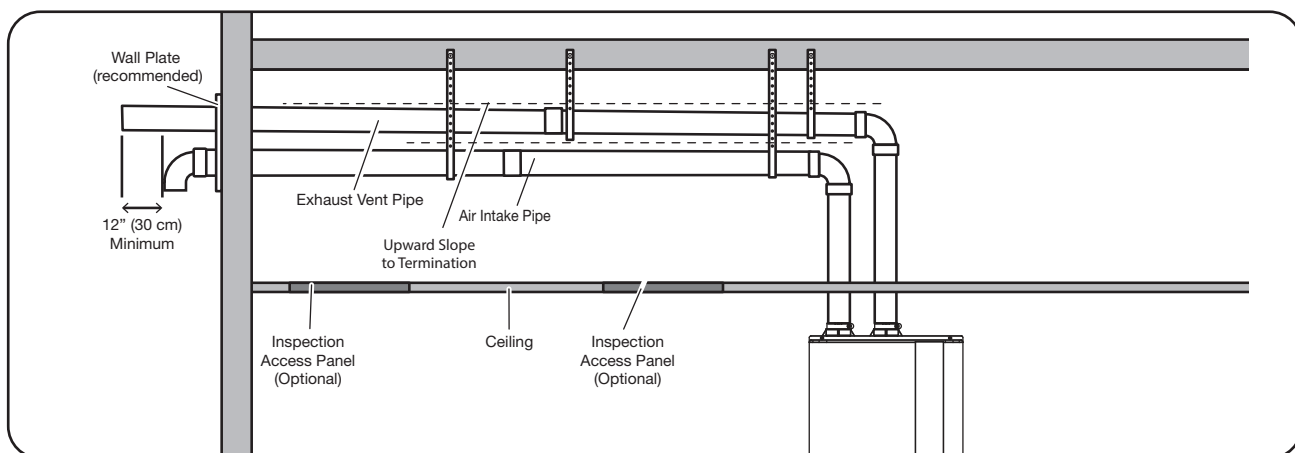
- DO NOT terminate vent directly on brick or masonry surfaces. Use rust-resistant, sheet-metal backing plate behind the vent.
- The vent for this appliance shall not terminate
 - Over public walkways; or
 - Near soffit vents or crawl space vents or other area where condensate or vapor could create a nuisance or hazard or cause property damage; or
 - Where condensate or vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.
- Caulk all cracks, seams, and joints within 6 ft. (1.8 m) of the vent terminal.
- Caulk around wall faceplate for weather-tight seal.
- DO NOT extend exposed vent pipe of indoor water heaters outside of the building.
- This water heater requires its own separate venting system. DO NOT connect the exhaust vent to an existing vent pipe or chimney.
- Observe minimum clearances. Vent terminals must be a minimum of 5.5 inches (14 cm) and a maximum of 24 inches (61 cm) apart horizontally.
- Install indoor and outdoor water heaters such that air inlet and flue outlet are above anticipated snow level.



INSTALLATION INSTRUCTIONS



Venting for Direct-Vent Water Heater (cont.)



Venting

Horizontal Vent Installation

⚠WARNING:

Danger of fire or bodily injury – Solvent cements and primers are highly flammable. Provide adequate ventilation and DO NOT assemble near heat source or open flame. DO NOT smoke. Avoid skin or eye contact. Observe all cautions and warnings on material containers.

⚠CAUTION:

Use tankless water heater manufacturer-approved Schedule 40 PVC (foam core is not permitted at any time), Schedule 80 PVC, CPVC, ABS or UL 1738-listed Category III Stainless Steel or InnoFlue® PP. No other vent material is permitted. For Canada, installations must follow ULC S636 for exhaust venting.

Joining Pipes and Fittings

All pipe, fittings, solvent cement, primers, and procedures, for the U.S., must conform to American National Standards Institute and American Society for Testing and Materials (ANSI/ASTM) standards. For Canada, all pipe, fittings, solvent cement, primers, and procedures must conform to ULC-S636 and vent manufacturer specifications.

⚠CAUTIONS:

- **DO NOT** use solvent cement that has become curdled, lumpy, or thickened.
- **DO NOT** thin solvent cement. Observe shelf precautions printed on the containers.
- For applications below 32°F, use only lower temperature-type solvent cement.
- Appropriate solvent and cleaner must be used for the type of vent pipe used (PVC, CPVC, or ABS).

Cleaner-Primer and Medium-Body Solvent Cement

All joints in vent piping must be properly sealed, and we recommend using the following material:

PVC materials should use ASTM D-2564-grade cement.

CPVC materials should use ASTM F-493-grade cement.

ABS materials should use ASTM D-2235-grade cement (ABS is not allowed for exhaust vent in Canada).

Cementing Joints

1. Cut pipe end square; remove jagged edges and burrs. Chamfer end of pipe and clean fitting socket and pipe joint area of all dirt, grease, or moisture.
2. After checking pipe and socket for proper fit, wipe socket and pipe with cleaner-primer. Apply a liberal coat of primer to inside surface of socket and outside of pipe.
3. Apply a thin coat of cement evenly in the socket. Quickly apply a heavy coat of cement to the pipe and insert pipe into fitting with a slight twisting motion until it bottoms out.
4. Hold the pipe fitting for 30 seconds to prevent the tapered socket from pushing the pipe out of the fitting.
5. Wipe all excess cement from the joint with a rag. Allow 15 minutes before handling. Cure time will vary according to fit, temperature, and humidity.

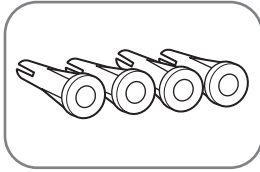
NOTICE:

- Cement must be fluid; if not, recoat with fresh cement.
- Stir the solvent frequently while using. Use a natural bristle brush or the dauber supplied with the can. The proper brush size is one inch.
- **DO NOT** use cement for InnoFlue® PP.

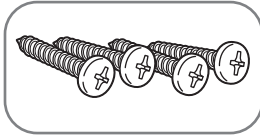
INSTALLATION INSTRUCTIONS

Horizontal Vent Installation (cont.)

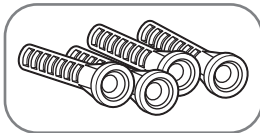
Fasteners will vary depending on the wall type.



For particle board or composite sheathing, use 4 hollow wall anchors. The anchors should be at least 1/8 in. (0.3 cm) in diameter and the appropriate length for the sheathing thickness.



For plywood or solid wood sheathing or members, use 4 #10 x 1 1/4-in. wood screws.



For masonry walls, use suitable masonry anchors long enough to pass through the wall.

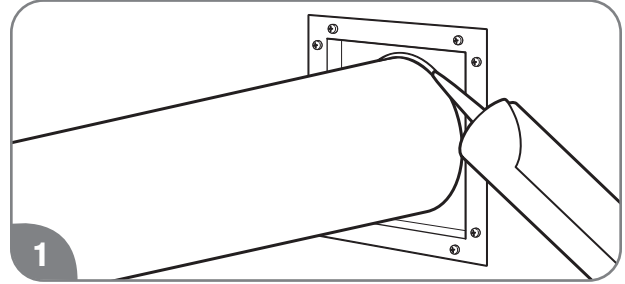
NOTICE:

- The exhaust vent terminal must extend a minimum of 12 inches (30.5 cm) more than the air intake terminal from the exterior wall. Also, an edge to edge distance between an air intake termination and an exhaust termination shall be at least 12 inches (30.5 cm) for any directions to prevent recirculation of vent gases.
- To prevent possibility of condensate freeze-up, DO NOT install vent kits one above the other.

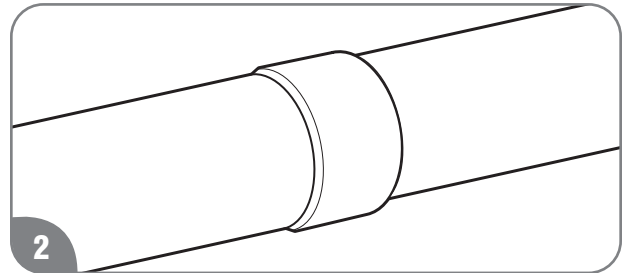
Once the vent terminal location has been determined, make holes through the exterior wall to accommodate the vent pipes. Vent pipes must exit exterior wall horizontally only.

The standard horizontal air intake termination is a 2-inch or 3-inch 90 degree elbow. This prevents rain or any other liquid from getting into air intake and the pipe from being pushed back into the structure. The standard horizontal exhaust outlet termination is a 2-inch or 3-inch pipe which terminates 12 inches from the air intake termination. Insert a small length of vent pipe through the wall and connect the coupling. Connect vent cap or terminal to the vent pipe on the exterior of the building.

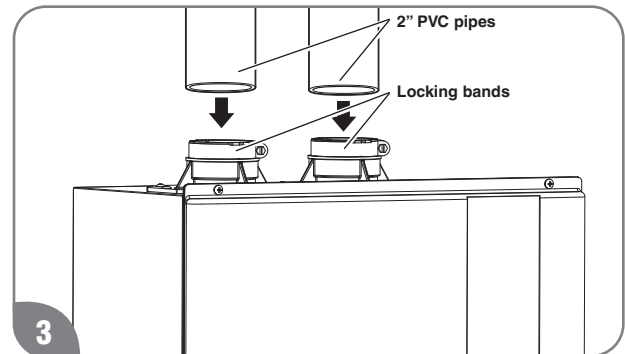
1. Observe minimum clearances. Vent terminals must be a minimum of 5.5 inches (14 cm) and a maximum of 24 inches (61 cm) apart horizontally.
2. Cut two 2 1/2" (6.4 cm) diameter holes [for a 2" (5.1 cm) diameter pipe] or 3 1/2" (8.9 cm) diameter holes [for a 3" (7.6 cm) diameter pipe] for the exhaust vent and air intake openings.



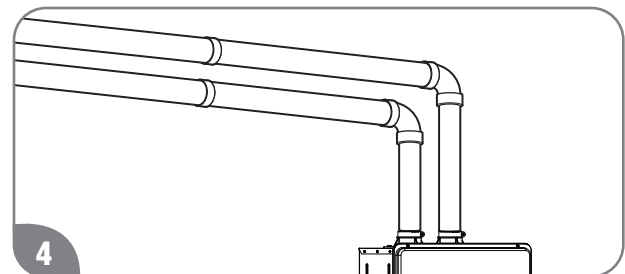
1 Apply silicone sealant or silicone/latex caulk to seal the vent pipe to the vent coupling to permit field disassembly for annual inspection and cleaning. Completely seal where it passes through the wall plate and where it is attached to the structure.



2 Attach the female end of the next vent pipe section to the male end of the 2-in./3-in. (5.1-cm/7.6-cm) vent pipe. See "Cementing Joints" on this Use and Care Manual.



3 Insert a 2" PVC pipes slowly into an air intake connector and a flue connector located on top of the water heater until they stop. DO NOT use cement. Tighten 2 locking bands to secure 2" PVC pipes.



4 Complete the rest of the vent pipe installation to the water heater's flue outlet and air intake.

INSTALLATION INSTRUCTIONS

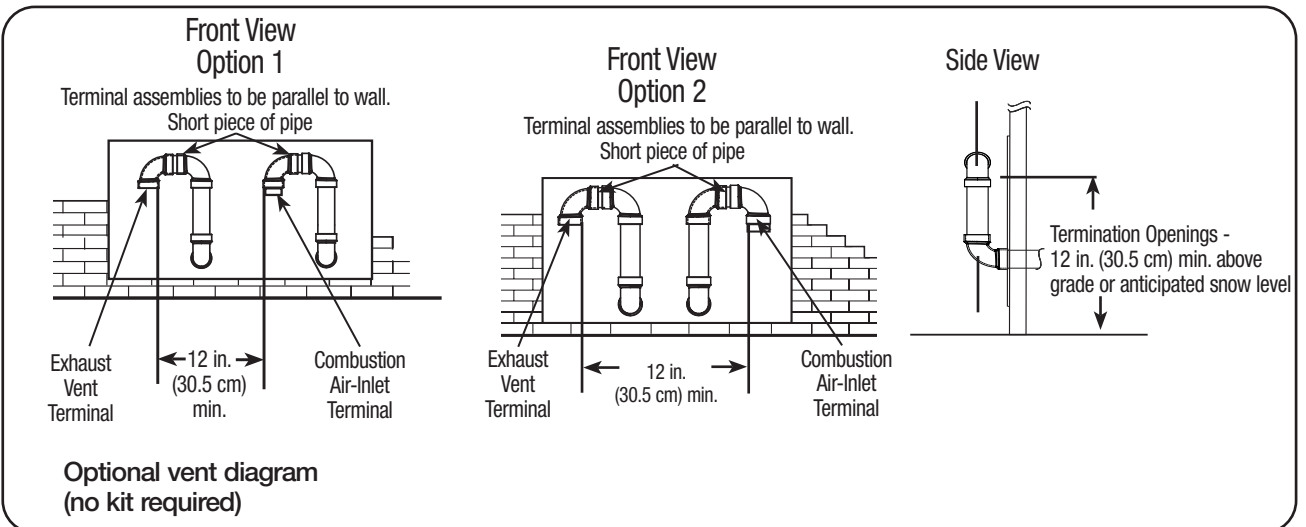
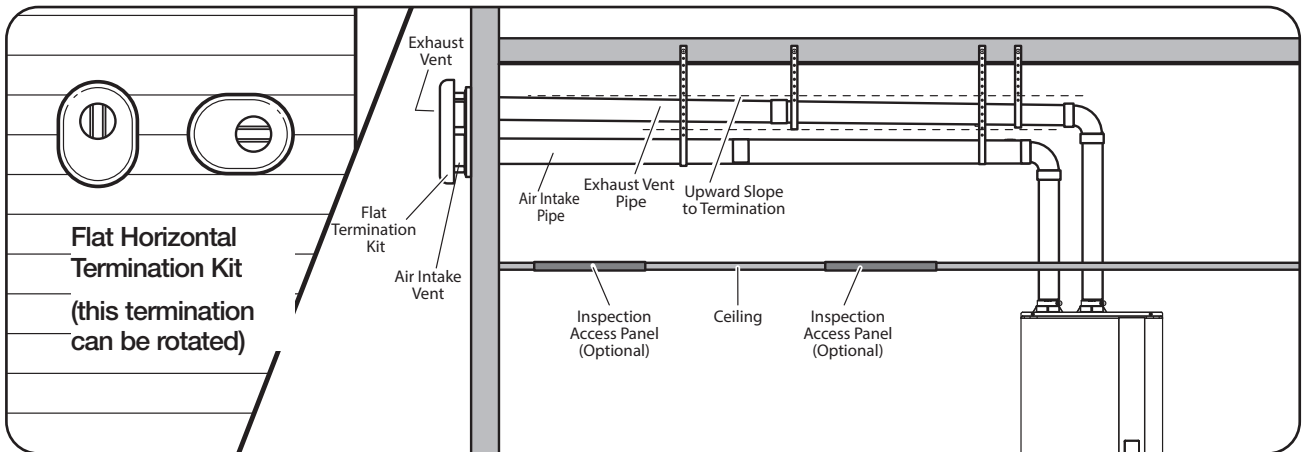
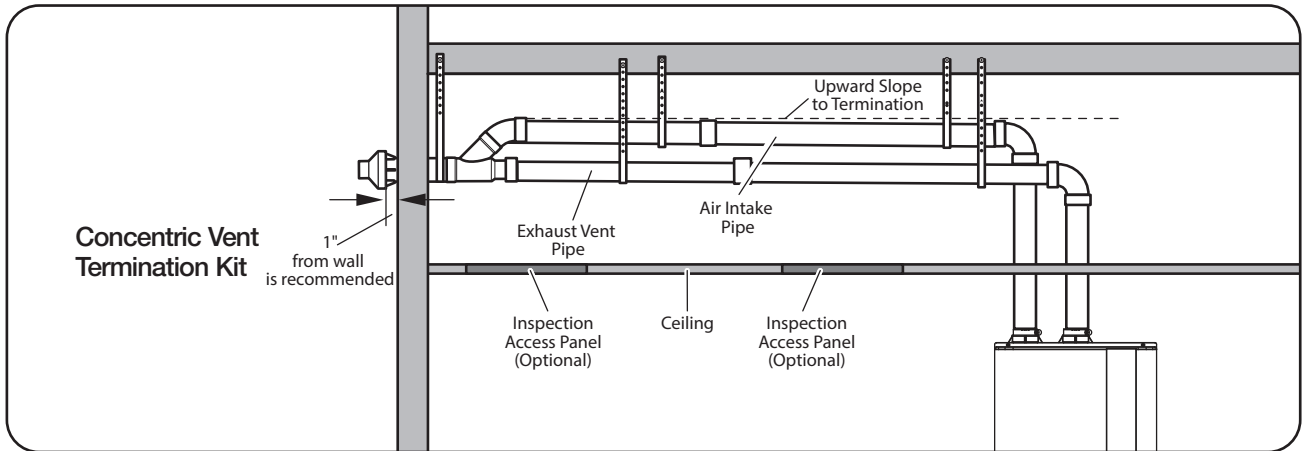


Venting for Direct-Vent Water Heater (cont.)

Alternative Horizontal Vent Installations

Alternative horizontal vent termination kits are commercially available. Please refer to the instruction sheet packaged with the kit for complete installation instructions.

Venting



INSTALLATION INSTRUCTIONS

Horizontal Vent and Combustion, Air-Inlet Alternate Vent Riser Terminal Installation

Read these instructions thoroughly and make sure you understand all steps and procedures before proceeding with the installation.

Determine the locations for the vent and combustion air-inlet terminals then make two (2) holes through the exterior wall to accommodate the vent and combustion air-inlet pipes.

The horizontal distance between the vent and combustion air-inlet terminal centerlines must be from 12 in. (30.5 cm) minimum to 36 in. (91.4 cm) maximum.

The vertical distance between the outlet of the vent terminal to the outlet of the combustion air-inlet terminal must be from 0 in. (0 cm) minimum to 36 in. (91.4 cm) maximum.

WARNING:

⚠ The vent terminal must always be installed at the same height or vertically higher than the combustion air-inlet terminal.

Maintain a minimum distance from the outlets of the vent and combustion air-inlet terminals of not less than 12 in. (30.5 cm) above grade or average snowfall whichever is greater.

IMPORTANT:

The vent terminal must always be installed at the same height or vertically higher than the combustion air-inlet terminal.

Insert lengths of vent and combustion air-inlet pipes through the wall as shown.

Allow sufficient length of pipe to extend beyond the exterior wall of the building for attachment of the vent riser assemblies as shown.

Place the supplied 1/2 in. (1.3 cm) mesh metal screen inside exhaust vent terminal fitting (optional).

NOTICE:

For cold climates the screen may be removed.

Connect the vent riser assemblies to the vent and combustion air-inlet pipes which are extending out of the building.

Ensure that the back of the 90° elbows are flush with the outside wall surface and that the vent and combustion air-inlet terminations of the vent risers are parallel with the outside wall.

IMPORTANT:

Remember to include the additional 90° elbows and vertical height of vent and combustion air-inlet pipes of the vent riser when calculating the maximum equivalent vent and combustion air-inlet system lengths. The maximum equivalent vent and combustion air-inlet system lengths must be as specified by the tables shown in the Use and Care Manual.

The vent and combustion air-inlet terminations are not included in the equivalency calculations.

Complete the installation of the remainder of the vent system and attach it to the vent connector fitting on the water heater's blower assembly.

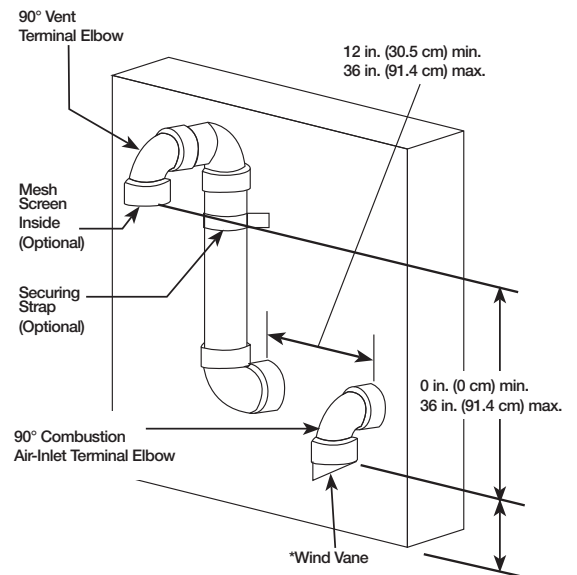
Horizontal sections of the vent system must slope downward toward the water heater a minimum of 1/8 in. per foot (10 mm per m).

DO NOT use unequal diameters of pipe and fittings for the vent and combustion air-inlet systems except as defined previously.

NOTICE: The difference between the vent and combustion air-inlet system equivalent lengths must be no greater than 5 ft. (1.5 m).

Complete the installation of the remainder of the combustion air-inlet system and attach it to the combustion air-inlet connector fitting on the water heater's combustion air-inlet tube assembly.

Support vertical and horizontal lengths of the vent and combustion air-inlet systems as previously mentioned.



*For installations using 3 in. (7.6 cm) pipe and fittings, a 90 elbow equipped with a wind vane deflector must be used for the combustion air-inlet terminal. Contact Manufacturer's National Service Department for the elbow.

Termination Openings - 12 in. (30.5 cm) min. above grade or anticipated snow level

INSTALLATION INSTRUCTIONS

Vertical Vent Installation

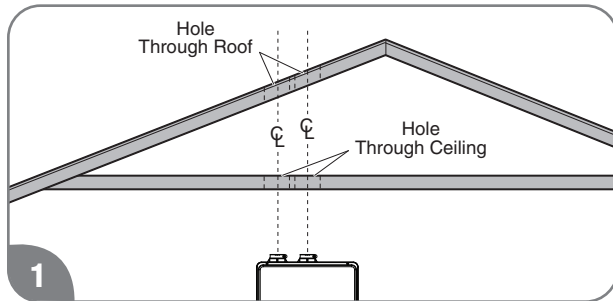
⚠ WARNING:

Improper vent installation can result in death, personal injury, product damage, and/or poor performance.

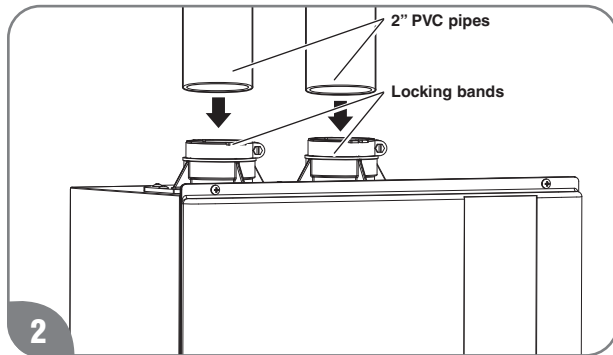
NOTICE:

Only Rheem-approved AND ULC S636 approved termination and parts must be used during installation.

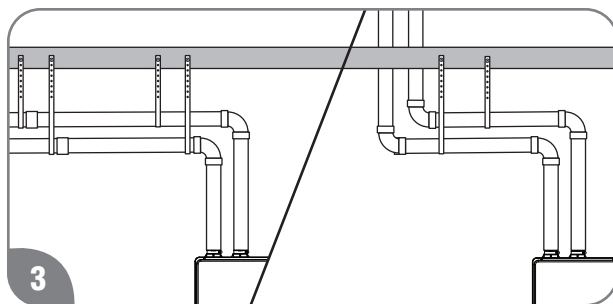
Maintain the recommended air space clearance to combustible materials and building insulation.



Cut a hole through the roof and interior ceiling to accommodate the vent pipes.



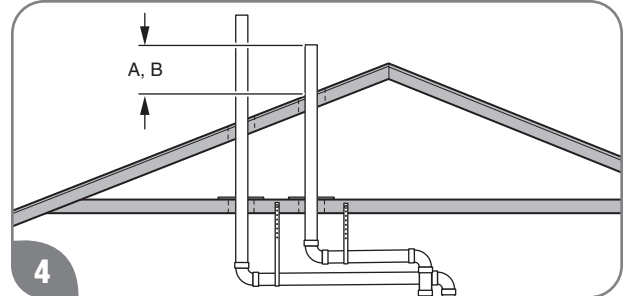
Insert a 2" PVC pipes slowly into an air intake connector and a flue connector located on top of the water heater until they stop. Tighten 2 locking bands to secure 2" PVC pipes.



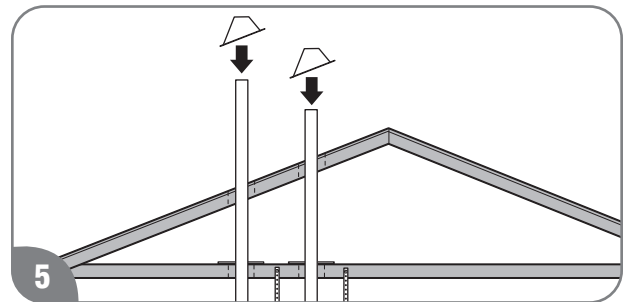
Support vertical and horizontal runs as described on page 23. Vertical supports are required every 4 ft. (1.2 m) along a vertical pipe route, after every transition to vertical, and after every offset elbow.

NOTICE:

Free-standing vent pipe that penetrates a roof/ceiling requires another means of support from a second location.



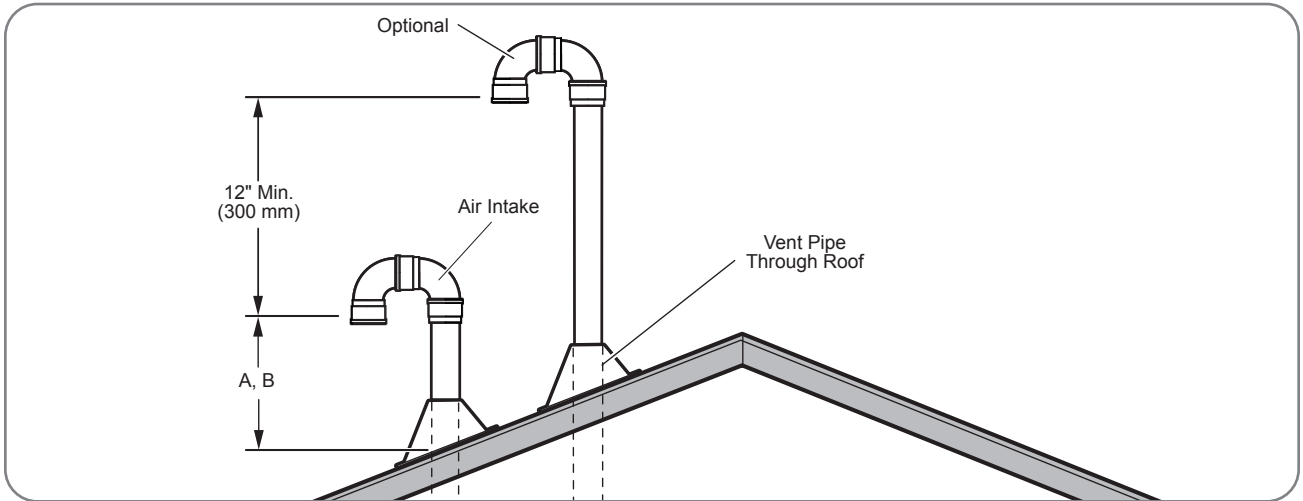
Determine the vent terminal height and install the vent pipe accordingly. Refer to "Vertical Vent Terminal Location" for clearance requirements.



Install adequate flashing where the vent pipe passes through the roof.

INSTALLATION INSTRUCTIONS

Vertical Vent Terminal Location



The following chart with diagrams details the minimum dimensional information needed to determine the proper location of the vertical vent terminal for direct-vent indoor tankless water heaters:

Location	U.S. Installation Requirements ¹	Canadian Installation Requirements ²
A = Minimum clearance above the roof level.	12 in. (30 cm) above roof level.	18 in. (45.7 cm) above roof level.
B = Maximum clearance above roof level (without additional support for vent pipe).	24 in. (61 cm) above roof level.	24 in. (61 cm) above roof level.
C = Required vent clearance from any gable, dormer, or other roof structure with building interior access (i.e., vent, window).	4 ft. (1.2 m)	4 ft. (1.2 m)
D = Required vent clearance from any forced air inlet, including dryer and furnace air inlets.	10 ft. (3 m)	6 ft. (1.8 m)
E = Minimum/maximum horizontal distance between vent terminals	5.5 in. (14 cm)/24 in. (61 cm)	5.5 in. (14 cm)/24 in. (61 cm)

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

² In accordance with current CAN/CSA B149.1 Installation Codes.

The vertical intake air termination requires a return bend or two short or long sweep radius 90° elbows to keep the inlet downward and prevent entry of rain. Refer to figure above for the proper location of the air intake with respect to the exhaust outlet termination.

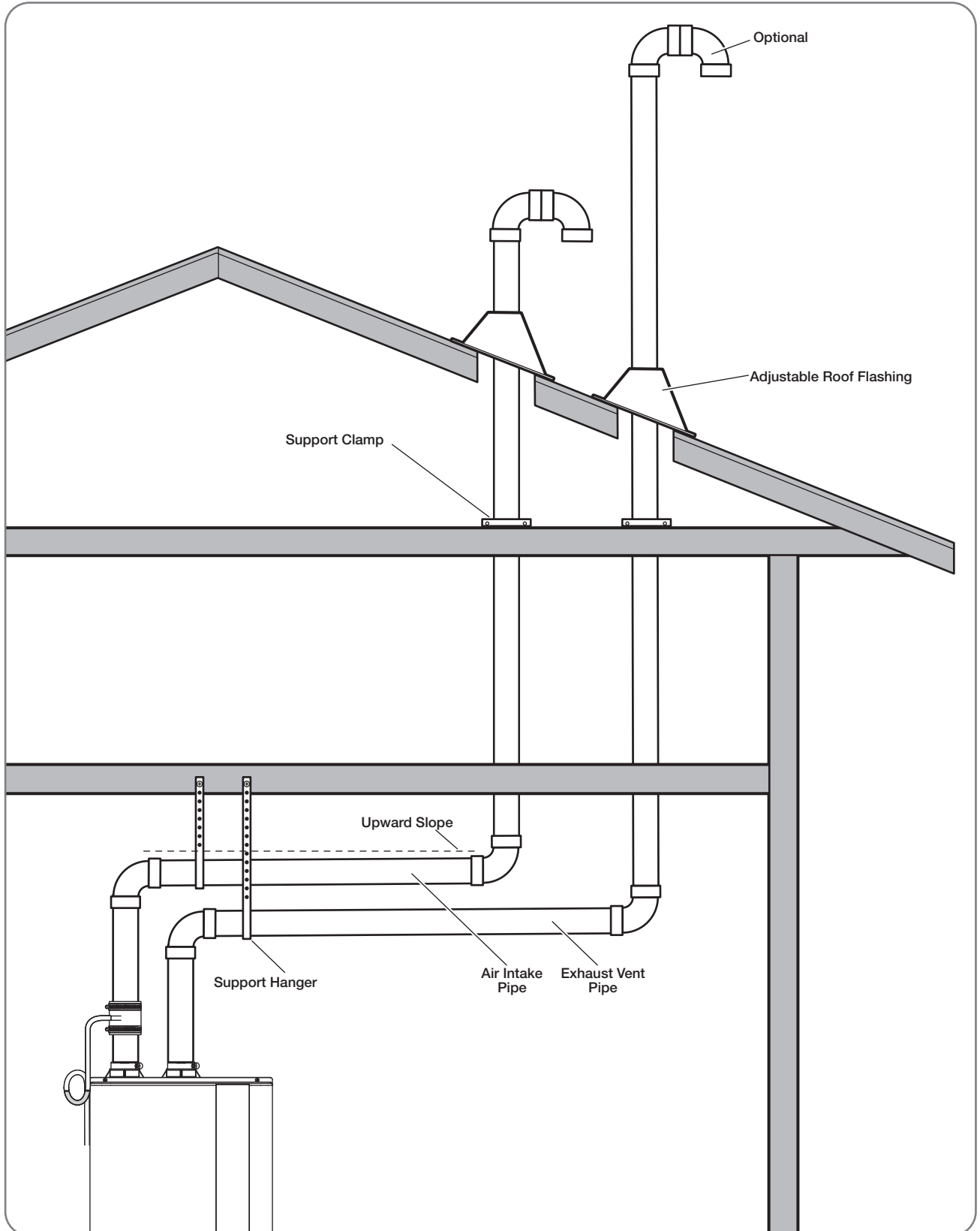
The vertical exhaust outlet termination is a 2-inch or 3-inch pipe which terminates at least 12 inches (30 cm) above the air intake termination. The exhaust outlet terminations must be at least 12 inches (30 cm) in US [at least 18 inches (46 cm) in Canada] above the roof line or anticipated snow levels.

INSTALLATION INSTRUCTIONS



Venting for Direct-Vent Water Heater (cont.)

Standard Vertical Vent Termination



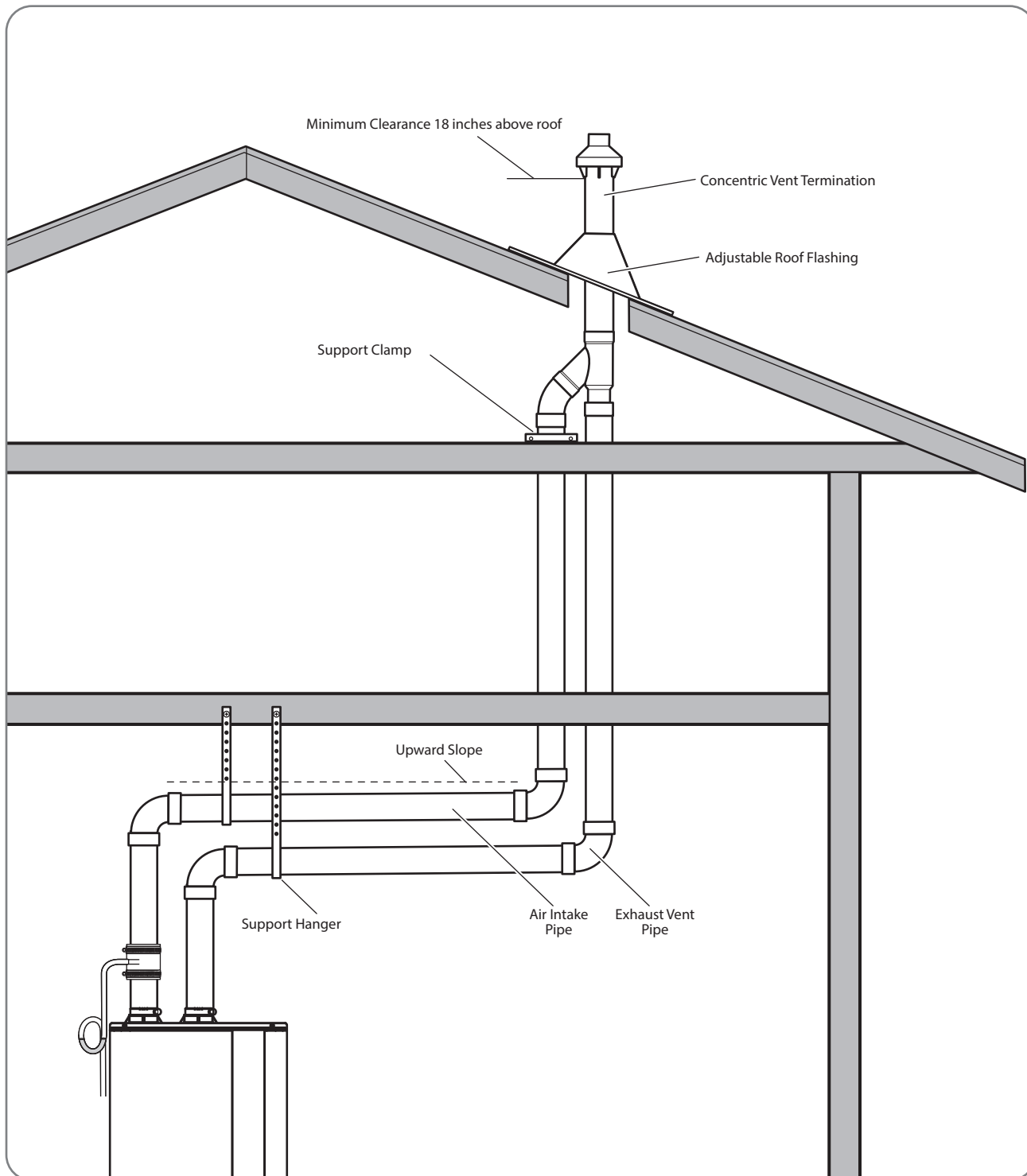
INSTALLATION INSTRUCTIONS

Alternative Vertical Vent Termination

Alternative vertical vent termination kits are commercially available. Please refer to the instruction sheet packaged with the kit for complete installation instructions.

⚠️ WARNING:

Under no circumstances should the exhaust pipe and the air intake pipe be connected together.



INSTALLATION INSTRUCTIONS



Water Quality

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

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

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

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

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

Cited reference: National Secondary Drinking Water Regulations

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

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



Water Supply

Water Supply

CAUTION:

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

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

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

INSTALLATION INSTRUCTIONS

Thermal Expansion

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

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

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

NOTICE:

Replacing the relief valve will not correct the problem!

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

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

Water Supply Connections

⚠ CAUTION:

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

NOTICE:

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

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

Only use approved plumbing materials.

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

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

Recirculation

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

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

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

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

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

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

+ Pipe Pressure Loss

+ Faucet Pressure Loss

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

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

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

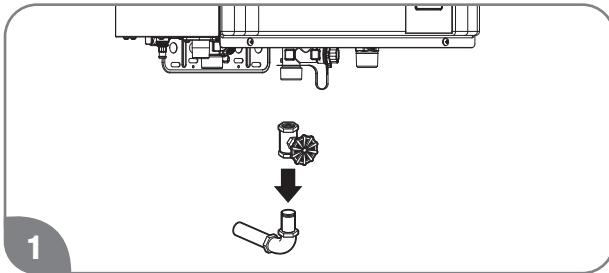
Gravity water pressure is not recommended. When the water is supplied from a water supply tank, the height of the tank, the diameter of the supply pipes, and their relation to water pressure need to be taken into consideration.

INSTALLATION INSTRUCTIONS

Water Supply Installation

NOTICE:

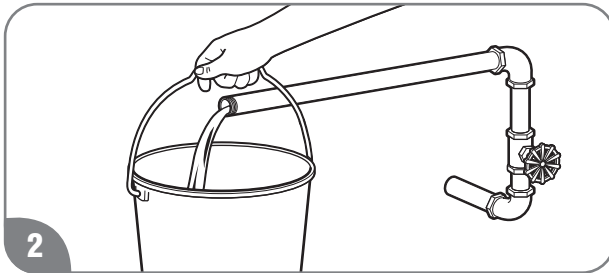
- Use only Teflon tape on all COLD and HOT water connections.
- If the water flow resistance of a showerhead is too high, the burner in the water heater will fail to ignite. Keep all showerheads clean from debris that could cause additional pressure drop.
- If using mixing valves on the outlet, choose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



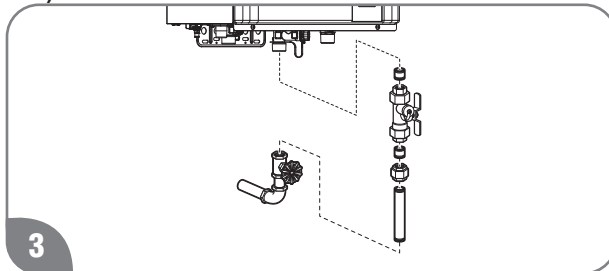
Install a COLD water shut-off valve near the inlet line on the water heater. This valve will be used for servicing and draining purposes.

NOTICE:

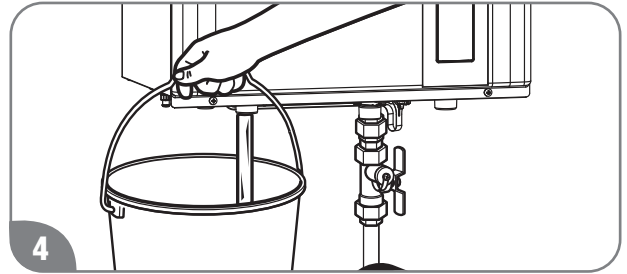
It is not recommended to use pipes with smaller diameters than the water supply connection of the water heater.



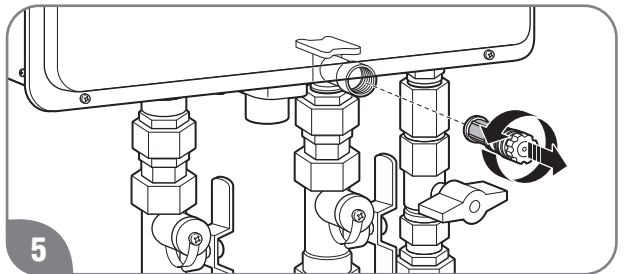
Before attaching the water line to the water heater, open the shut-off valve. Run the water until it has purged all contaminants (sand, debris, air, caulking, etc.).



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



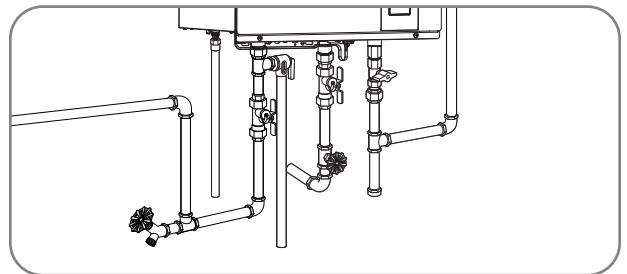
Open the shut-off valve in the COLD water Inlet line to check the water flow through the water heater.



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

NOTICES:

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



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

Use the following guidelines when connecting the HOT WATER OUTLET:

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

Local codes shall govern the piping used for water connections.

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