



GSW WATER HEATING
599 Hill Street West
Fergus, ON, Canada N1M 2X1



FLAMMABLE VAPOUR IGNITION RESISTANT POWER VENTED WATER HEATER INSTALLATION AND OPERATING INSTRUCTIONS

Read and understand these instructions thoroughly before starting.

⚠ WARNING:

Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information, consult a qualified installer, service agency, or the gas utility.

⚠ FOR YOUR SAFETY

- Do not store or use gasoline or other flammable vapours and liquids in the vicinity of this or any other appliance.
- Installation and service must be performed by a qualified installer, service agency or the gas utility.

⚠ WARNING:

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

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.



This page intentionally left blank. May be used for notes or to record other installation information.

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RETAIN THESE INSTRUCTIONS IN A SAFE LOCATION FOR FUTURE REFERENCE

Your safety and the safety of others is very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.



This is the safety alert symbol.

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" or "WARNING".



DANGER You can be killed or seriously injured if you don't immediately follow instructions.



WARNING You can be killed or seriously injured if you don't follow instructions.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.

The California Safe Drinking Water and Toxic Enforcement Act requires the Governor of California to publish a list of substances known to the State of California to cause cancer, birth defects, or other reproductive harm, and requires businesses to warn of potential exposure to such substances.

WARNING: This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm.

This appliance can cause low-level exposure to some of the substances listed, including formaldehyde, carbon monoxide, and soot.

I) INTRODUCTION

Thank you for purchasing a **Flammable Vapour Ignition Resistant Power Vented Water Heater**. This water heater is designed to reduce the risk of flammable vapour related fires by shutting the burner down before flammable vapours get into the water heater combustion chamber. This is achieved by the means of the flammable vapour sensor. Properly installed and maintained, it will provide years of trouble free service.

This gas-fired water heater has been developed to produce potable hot water for normal residential demands and may also be used in combination with space heating applications. Any deviation from these applications could affect your warranty.

Consumer Responsibilities

This manual has been prepared to acquaint you with the installation, operation and maintenance of your gas fired water heater and provide important safety information in these areas. It is your responsibility to ensure that your water heater is properly installed and cared for.

FAILURE TO FOLLOW THE INSTRUCTIONS IN THIS MANUAL MAY RESULT IN SERIOUS BODILY INJURY AND/OR PROPERTY DAMAGE. THOROUGHLY READ AND UNDERSTAND ALL INSTRUCTIONS BEFORE YOU ATTEMPT TO INSTALL, OPERATE OR MAINTAIN THIS HEATER.

Installation and service requires trade knowledge in the areas of plumbing, electricity, venting, air supply and gas supply. If you lack these skills or have difficulty understanding these instructions, you should not proceed. Enlist the

help of a qualified service technician to install this water heater.

Examples of qualified service technicians include those trained in the plumbing and heating industry, local gas utility personnel or an authorized service person.

Service to the Power Vent System should only be performed by a qualified service technician.

The manufacturer and seller of this water heater will not assume any liability for any property damage, personal injury or death resulting from improper sizing, installation or failure to comply with these instructions.

The warranty on this water heater is in effect only when the water heater is installed and operated in accordance with these instructions. A data plate identifying your water heater can be found above the gas control/thermostat. When referring to your water heater, always have the information listed on the data plate readily available.

Protect your warranty: Regularly service your water heater as directed in the "Maintenance" section of this manual.

Retain your original receipt as proof of purchase.

Do not discard this manual. You or future users of this water heater will need it for reference.

II) SAFETY

This water heater is design-certified by CSA International as a Category I, non-direct vented water heater which takes its combustion air either from the installation area or from air ducted to the unit from the outside.

In addition to the installation instructions found in this manual, the water heater must be installed in accordance with all local and provincial or state codes or, in the absence of such, with the latest editions of the following specifications.

For Installations in Canada:

“Natural Gas and Propane Installation Code” CAN/CSA-B149.1 and “Canadian Electrical Code (CAN/CSA C22.1), Part I” available from:

Canadian Standards Association,
5060 Spectrum Way,
Mississauga, Ontario, Canada
L4W 5N6

For Installations in the United States:

“National Fuel Gas Code” ANSI Z223.1 (NFPA 54) and “National Electrical Code” (NFPA 70)” available from:

American National Standards Institute,
25 West 43rd Street,
New York, NY 10036

Massachusetts code requires this water heater to be installed in accordance with Massachusetts Plumbing and Fuel Gas Code 248 CMR Section 2.00 and 5.00.

Check your phone listings for the local authorities having jurisdiction over your installation.

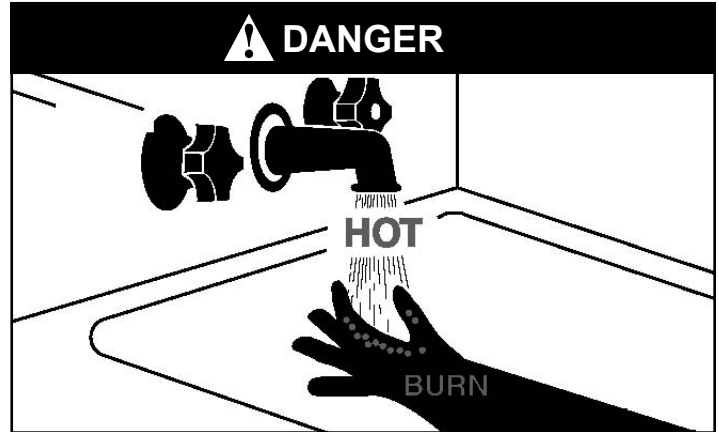
Safety Warning (Flammable Vapours)



There is a risk of property damage, personal injury or death from the by-products of combustion (e.g., flue gases), in using fuel-burning appliances such as water heaters. Areas that may not be suitable for water heater installation include those where flammable liquids, gasoline, solvents, adhesives etc. are stored, or where engine-driven equipment or vehicles are stored, operated or repaired. These, and simi-

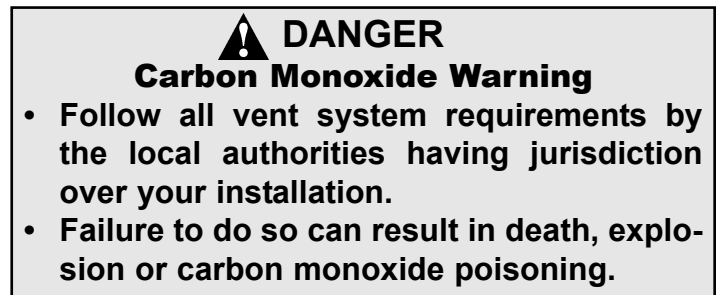
lar products, should not be stored or used near the water heater or air intake. Due to the nature of air movement, flammable vapours can be carried some distance from the point of storage. The gas-fired water heater igniter or burner flame can ignite these vapours causing a flashback, fire or explosion, which may result in severe property damage, serious personal injury or death. If flammable liquids or vapours have spilled or leaked in the area of the water heater, leave the area immediately and call the fire department from a neighbor's home. Do not attempt to clean the spill until all ignition sources have been extinguished.

Safety Warning (Scalding)



Hot water produced by this appliance can cause severe burns due to scalding. The hazard is increased for young children, the aged or the disabled when water temperatures exceed 52°C (125°F). Use tempering valves, also known as mixing valves, in the hot water system to reduce the risk of scalding at point-of-use such as lavatories, sinks and bathing facilities. Such precautions must be followed when this heater is operated in combination with dishwashing or space heating applications.

Safety Warning (Carbon Monoxide)



As with all fuel burning equipment, this heater requires an adequate supply of air for combustion and ventilation. An insufficient air supply can result in poor combustion or the re-circulation of the flue gases. Such a condition can cause soot build-up and present a fire hazard. Flow reversal of flue gases can cause an increase of carbon monoxide inside of the dwelling that could result in serious bodily harm or death from asphyxiation.

MAKE SURE THE FLOW OF COMBUSTION AND VENTILATION AIR IS NOT RESTRICTED.

Relief Valve Requirements (T&P)

All water heaters must be fitted with a proper temperature and pressure relief valve. These valves must be certified as meeting the requirements of the “**Standard For Relief Valves For Hot Water Supply Systems, ANSI Z21.22/CSA 4.4**”.

If this water heater has been exposed to flooding, freezing, fire or any unusual condition, do not put it into operation until it has been inspected and approved by a qualified service technician.

THESE CONDITIONS CAN RESULT IN UNSEEN INTERNAL DAMAGE and are not subject to warranty coverage.

CAUTION

Hydrogen gas can be produced in a hot water system served by this heater that has not been used for a long period of time (generally two (2) weeks or more). **Hydrogen gas is extremely flammable and can ignite when exposed to a spark or flame.** To reduce the risk of injury under these conditions, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. Use caution in opening faucets. If hydrogen is present, there will probably be an unusual sound such as air escaping through the pipe as the water begins to flow. There should be no smoking or open flame near the faucet at the time it is open.

III) INSTALLATION

Unpacking the Water Heater

⚠ WARNING

Excessive Weight Hazard

Use two or more people to move and install water heater. Failure to do so can result in back or other injury.

Important: Do not remove any permanent instructions, labels, or the data label from outside of the water heater or on the inside of panels.

- Remove exterior packaging and place installation components aside.
- Inspect all parts for damage prior to installation and start-up.
- Completely read all instructions before attempting to assemble and install this product.

If you observe damage to the water heater or any of its components, **DO NOT ASSEMBLE OR INSTALL IT OR MAKE ANY ATTEMPT TO FIX THE DAMAGED PART(S).** Contact the place of purchase for further instructions.

- After installation, dispose of packaging material in the proper manner.

IMPORTANT:

This water heater must be installed strictly in accordance with the instructions enclosed, and local electrical, fuel and building codes. It is possible that connections to the water heater, or the water heater itself, may develop leaks. **IT IS THEREFORE IMPERATIVE** that the water heater be installed so that any leakage of the tank or related water piping is directed to an adequate drain in such a manner that it cannot damage the building, furniture, floor covering, adjacent areas, lower floors of the structure or other property subject to water damage. This is particularly important if the water heater is installed in a multi-story building, on finished flooring or carpeted surfaces. **GSW WILL NOT ASSUME ANY LIABILITY** for damage caused by water leaking from the water heater, pressure relief valve, or related fittings. Select a location as centralized within the piping system as possible. In any location selected, it is recommended that a suitable drain pan be installed under the water heater. This pan must limit the water level to a **MAXIMUM** depth of 45mm (1 3/4 in.) and have a diameter that is a minimum of 50mm (2 in.) greater than the diameter of the water heater. Suitable piping shall connect the drain pan to a properly operating floor drain. When used with a fuel-fired heater, this drain pan must not restrict combustion air flow.

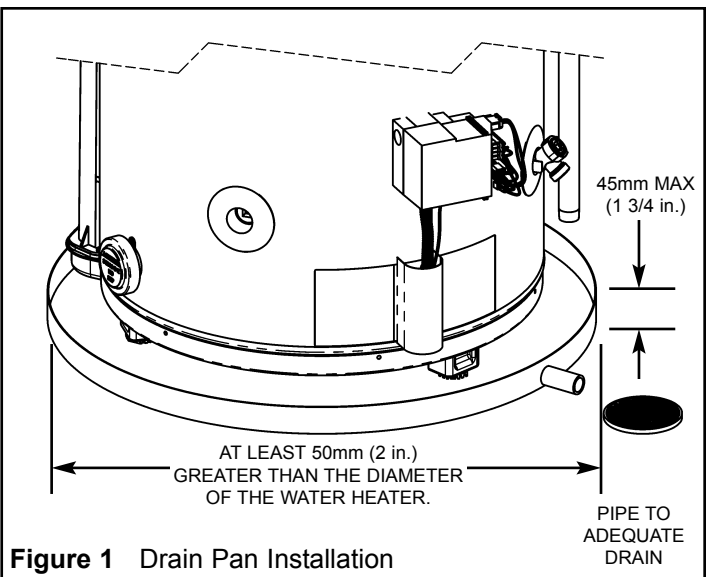


Figure 1 Drain Pan Installation

Location Requirements

The water heater must be installed indoors in an area not subject to freezing temperatures and in a vertical position on a level surface. Water heaters located in unconditioned spaces (e.g., attics, basements etc.) may require insulation of the water piping, drain piping and venting to protect against condensation. The power vented series of water heaters are designed to vent the products of combustion horizontally through the wall or vertically through the roof. The blower expels the products of combustion by means of plastic piping to the outdoors without the need for a conventional chimney.

Select a location as centralized within the piping system as possible. The heater should be located in an area where leakage of the tank or connections will not result in damage

to the area adjacent to the water heater or to lower floors of the structure (see "IMPORTANT" notice on the previous page). Before installing this water heater, consideration and planning must be given to the following details:

- Proximity to walls and other objects (see "Clearance and Accessibility").
- Access to gas supply (see "Gas Supply").
- Routing and support of the vent piping and termination (see "Venting").
- Position of water supply and placement of water piping and floor drain (see "Water Supply").

In Earthquake Zones

Note: The water heater must be braced, anchored, or strapped to avoid moving during an earthquake. Contact local utilities for code requirements in your area.

Note: The water heater may be installed in a closet with a door off a bedroom or bathroom providing the units are installed and vented per the manufacturer's instructions.

Important: If installing over carpeting, the carpeting must be protected by a metal or wood panel beneath the water heater. The protective panel must extend beyond the full width and depth of the water heater by at least 76mm (3 in.) in each direction or if in an alcove or closet installation, the entire floor must be covered by the panel.

Clearances and Accessibility

- The minimum clearances between the heater and combustible materials are:
 Top 200mm (8 in.)
 Front 100mm (4 in.)
 Rear and Sides . . . 25mm (1 in.)

Note: These requirements are also listed on the data plate located on the front of the water heater.

- The water heater is certified for installation on a combustible floor.

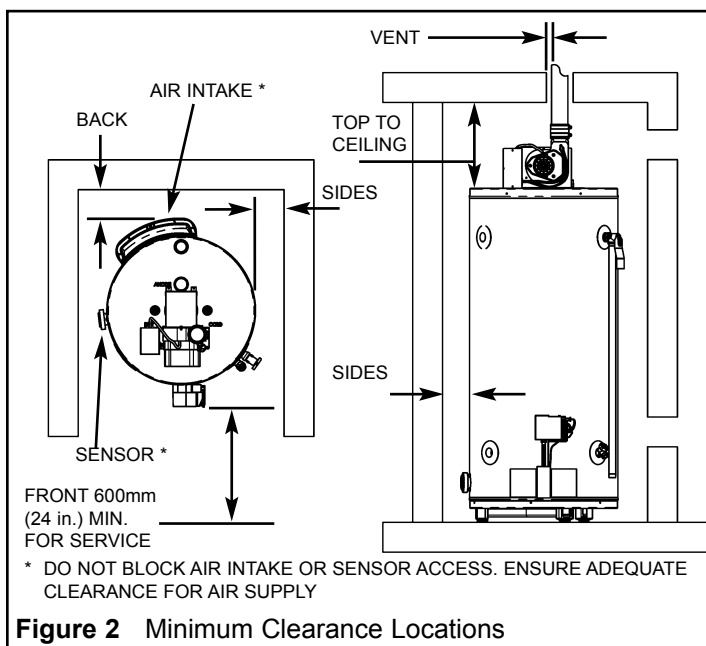



Figure 2 may be used as a reference guide to locate the specific clearance locations. A minimum of 600mm (24 in.) of front clearance and 100mm (4 in.) on each side should be provided for inspection and service.

Gas Supply

⚠ DANGER



Explosion Hazard

- Use a new CSA approved gas supply line.
- Install a gas supply shut-off valve.
- Do not connect a natural gas water heater to a L.P. gas supply.
- Do not connect a L.P. gas water heater to a natural gas supply
- Failure to follow these instructions can result in death, an explosion or carbon monoxide poisoning.

Read the data plate to be sure the water heater is made for the type of gas you will be using in your home. This information will be found on the data plate located above the gas control valve. If the information does not agree with the type of gas available, do not install or attempt to start. Call your dealer.

Note: An odourant is added by the gas supplier to the gas used by this water heater. This odourant may fade over an extended period of time. Do not depend upon this odourant as an indication of leaking gas.

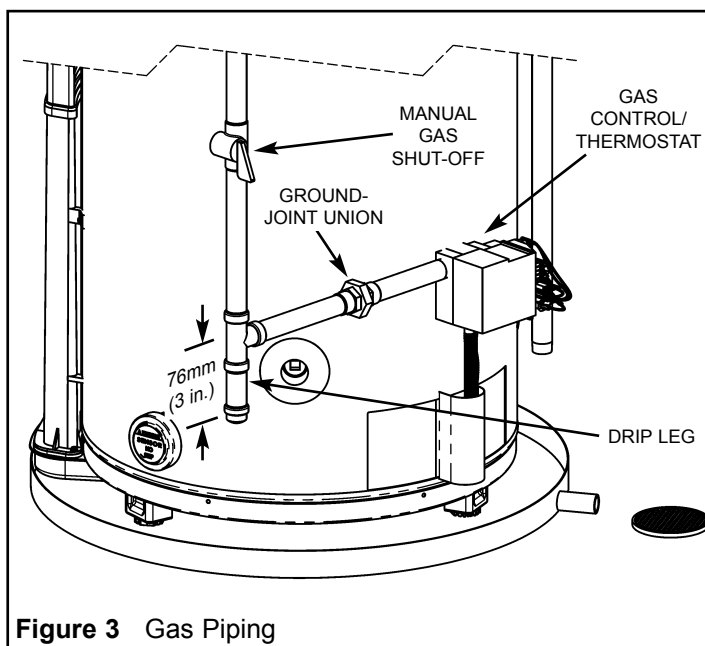


Figure 3 Gas Piping

This gas piping must be installed in accordance with all local and provincial or state codes or, in the absence of such, the latest edition of “**Natural Gas and Propane Installation Code**” **CAN/CSA-B149.1** (Canada), or “**National Fuel Gas Code**” **ANSI Z223.1 (NFPA 54)** (U.S.A.).

Note: When installing gas piping, apply sealing compounds approved for use with natural and propane gas.

1. Install a readily accessible manual shut-off valve in the gas supply line as recommended by the local utility. The owner/operator must be shown the location of this valve and be given instructions on how to use it to shut off the gas to the heater.
2. Install a drip leg (if not already incorporated as part of the water heater) as shown. The drip leg must be no less than 76mm (3 in.) long for the accumulation of dirt, foreign material, and water droplets.
3. Install a ground joint union between the gas control /thermostat and the manual shut-off valve. This is to allow easy removal of the gas control/thermostat.
4. Turn the gas supply on and check for leaks. Use a chloride-free soap and water solution (bubbles forming indicate a leak) or other approved method.

Gas Pressure

WARNING

Exposure to a higher gas supply pressure may cause damage to the control, resulting in explosion or fire. Consult your local gas supplier and gas authorities. DO NOT PUT INTO SERVICE IF OVER-PRESSURIZATION HAS OCCURRED.

Important: The gas supply pressure must not exceed the maximum supply pressure as stated on the water heater's data plate.

Gas Leak Testing

Important: This water heater and its gas connection must be leak tested before placing the appliance in operation.

- If the code requires the gas lines to be tested at a pressure exceeding 14 in. w.c. (3.5 kPa), the water heater and its manual shut-off valve must be disconnected from the gas supply piping system and the line capped.
- If the gas lines are to be tested at a pressure less than 14 in. w.c. (3.5 kPa), the water heater must be isolated from the gas supply piping system by closing its manual shut-off valve.

U.L. recognized fuel gas and (CO) detectors are recommended in all applications and should be installed using the manufacturer's instructions and local codes, rules, or regulations.

Note: Air may be present in the gas lines and could prevent the burner from lighting on initial start-up. The gas lines should be purged of air by a qualified service technician after installation of the gas piping system.

Air Requirements

Important: Air for combustion and ventilation must not come from a corrosive atmosphere. Any failure due to corrosive elements in the atmosphere is excluded from warranty coverage.

Installations in or for certain places including, but not limited to, those listed below will require outdoor air for combustion due to chemical exposure:

- Beauty shops
- Photo processing labs
- Buildings with indoor pools
- Water heaters installed in laundry, hobby or craft rooms
- Water heaters installed near chemical storage areas

In such circumstances, outdoor combustion air may reduce, but will not eliminate the presence of corrosive chemicals in the air. Combustion air must be free of acid-forming chemicals such as sulfur, fluorine and chlorine. These elements are found in aerosol sprays, detergents, bleaches, cleaning solvents, air fresheners, paint and varnish removers, refrigerants and many other commercial and household products. When burned, vapours from these products form highly corrosive acid compounds. These products should not be stored or used near the water heater or air inlet.

The area in which the heater is located is classified as either “an **unconfined space**” or “a **confined space**.”

An **unconfined space** is defined as a space having a volume not less than 50 cubic feet per 1000 BTU/hour (4.8 cubic metres per kilowatt) of combined input rating of all appliances using the space. Adjacent open rooms may be included as part of the unconfined space, **provided there are no closeable doors between these rooms**. An example of this is an open basement.

A **confined space** is one smaller than described above. For buildings using tight construction (newer and renovated structures), the air supply shall be introduced from the outdoors, regardless of whether the space is confined or unconfined.

Confined Space Air Requirements for Canadian Installations

Refer to Figure 4 (a), or (b), and Table 1 for proper sizing and location of combustion air ducts and openings. **CHECK LOCAL CODES.**

a). Two permanent openings shall be provided connecting the confined space (e.g., closet, small room) with the unconfined space. Each opening shall have a free area of one square inch per 1,000 BTU/hour input (22 cm²/kW) of all appliances in the confined space. The top opening shall be located as close to the ceiling as practical but never lower than the top of the heater. (see Figure 4 (a)). The bottom opening shall be located neither more than 450mm (18 in.), nor less than 150mm (6 in.), above floor level.

b). When using a single air supply, the duct shall terminate within 300mm (12 in.) above and within 600mm (24 in.) horizontally of the burner level of the appliance having the largest input. For example: GSW’s water heaters’ burners are 150mm (6 in.) from the floor, plus 300mm (12 in.) equals 450mm (18 in.) as shown in Figure 4 (b). All exterior vent openings are to be at least 300mm (12 in.) above the ground and clear of snow levels.

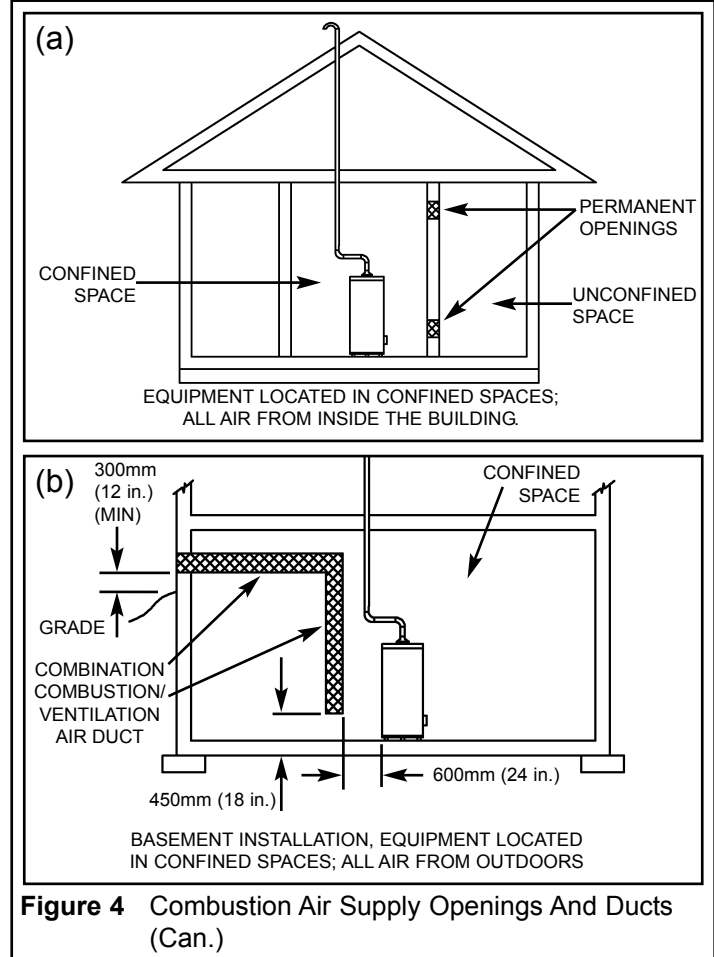


Figure 4 Combustion Air Supply Openings And Ducts (Can.)

Combined Input of All Appliances in Confined Space*		Required Free Area		Acceptable Round Duct Size Diameter			
				A**		B***	
BTU / h	(kW / hr)	cm ²	in. ²	mm	in.	mm	in.
25,000	8	45	7	76	3	100	4
50,000	15	45	7	76	3	100	4
75,000	23	70	11	100	4	125	5
100,000	30	90	14	100	4	125	5
125,000	37	120	18	125	5	150	6
150,000	45	140	22	125	5	150	6

* All appliances refers to, and includes, those appliances using the same air source (e.g. water heater, furnace, boiler, clothes dryer etc.).

** Maximum allowable length of ductwork listed in column A is 6.1 equivalent metres (20 ft.).

*** Maximum allowable length of ductwork listed in column B is 15.2 equivalent metres (50 ft.).

Table 1 Air Supply Sizing (Can.)

Confined Space Air Requirements for U.S. Installations

Refer to Figure 5 (a), (b), (c) or (d) for proper sizing and location of combustion air ducts and openings. **CHECK LOCAL CODES.**

(a) Equipment located in confined spaces; all air from inside the building.

Two permanent openings shall be provided connecting the confined space (e.g., closet, small room) with the unconfined space. Each opening shall have a free area of one square inch per 1,000 BTU/hour input ($22 \text{ cm}^2/\text{kW}$) of all appliances in the confined space, but not less than 100 square inches (645 cm^2). The top opening shall commence within 300mm (12 in.) of the top of space and the bottom opening shall commence within 300mm (12 in.) of the bottom of the enclosure.

(b) Basement installation, equipment located in confined spaces; all air from outdoors.

When supplying air directly from the outdoors, each opening shall have a minimum free area of one square inch per 4,000 BTU/hour input ($5.5 \text{ cm}^2/\text{kW}$) of total input rating of all appliances in the confined space. The inlets shall be a minimum of 300mm (12 in.) above the grade (snow) line. The top opening shall commence within 300mm (12 in.) of the top of the confined space.

(c) Equipment located in confined spaces; all air from outdoors.

When supplying air directly from the outdoors using horizontal ducting, each opening shall have a free minimum area of one square inch per 2,000 BTU/hour ($11 \text{ cm}^2/\text{kW}$) of total input rating of all appliances in the confined space.

(d) Equipment located in confined spaces; all air from outdoors through ventilated attic.

When supplying air directly through vertical ducting, each opening shall have a free minimum area of one square inch per 4,000 BTU/hour ($5.5 \text{ cm}^2/\text{kW}$) of total input rating of all appliances in the confined space.

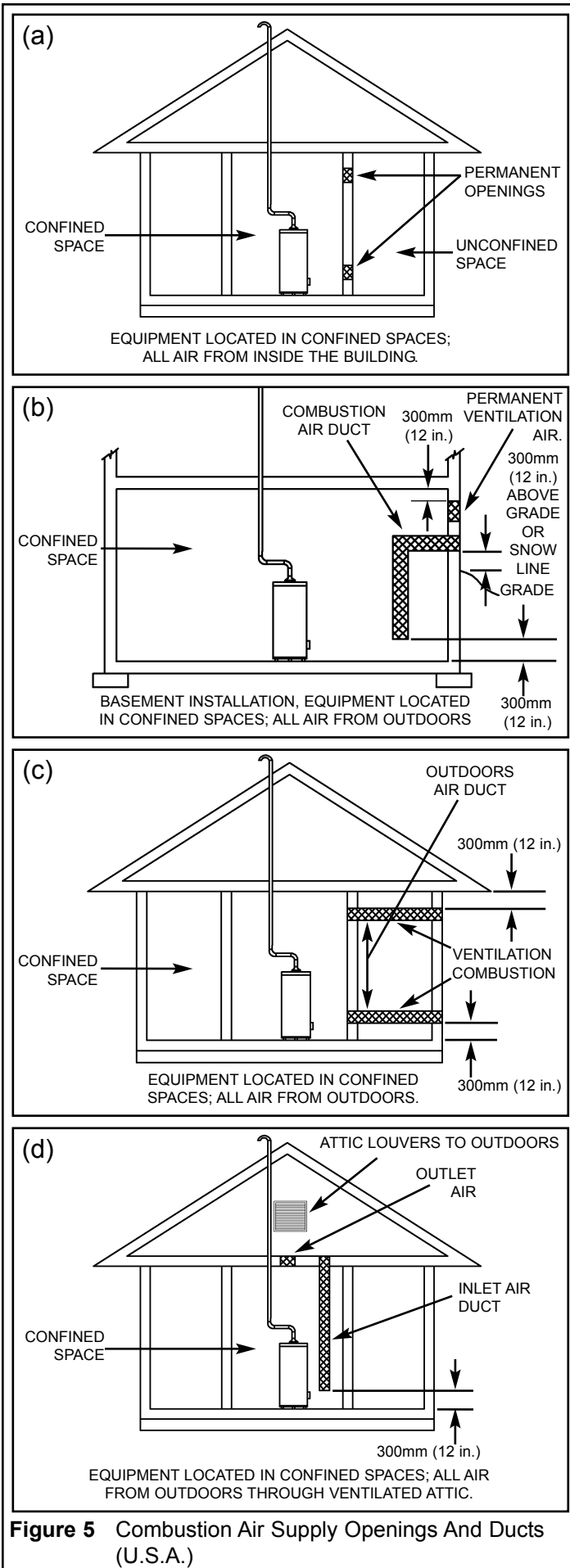
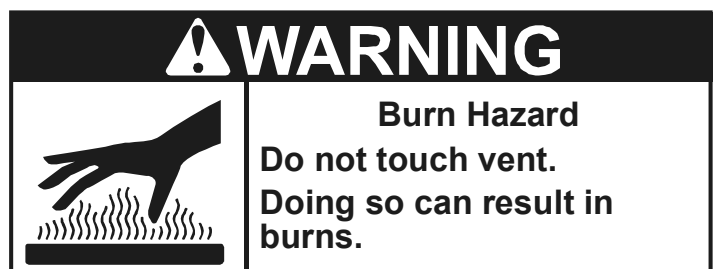


Figure 5 Combustion Air Supply Openings And Ducts (U.S.A.)



Venting

This water heater has a power vent system that discharges all its combustion products outdoors. The heater must be properly vented for removal of exhaust gases. Correct installation of the vent pipe system is mandatory for the safe and efficient operation of this water heater and is an important factor in the life of the unit.

Vent pipe must be installed in accordance with all local and provincial or state codes or, in the absence of such, the latest edition of **"Natural Gas and Propane Installation Code" CAN/CSA-B149.1** (Canada), or **"National Fuel Gas Code" ANSI Z223.1 (NFPA 54)** (U.S.A.).

Note: Do not common vent this water heater with any other appliance. Do not install in the same chase or chimney with a metal or high-temperature plastic from another gas or fuel burning appliance.

Vent Pipe Material

- This heater has been certified to use Schedule 40 ABS, PVC or CPVC venting material.
 - **Check local codes to determine which materials are allowed in your area.**
 - Use only solid (not foam core) piping. All materials must be of the same type for any given installation and must be joined with the proper primer/cleaner and solvent cement. See Table 2 for vent lengths and sizing.
 - Canadian installations using PVC venting require the PVC Vent Conversion Kit P/N 73901 or P/N 73876.
 - U.S.A. installations using PVC piping shall use the pipe assembly adaptor supplied with the heater.
- See also "Vent Pipe Connection to Blower".

Vent Pipe Termination

A "Rodent Screen" must be installed in the termination elbow to prevent foreign objects from entering the venting system. The plastic screens (see Figure 6) supplied with this water heater are designed for use as the vent termination "Rodent Screen". Refer to Figures 8 & 9 for information regarding the vent termination. After determining the total equivalent length of vent pipe for your installation, (see Table 2), use the appropriate "Rodent Screen" to obtain the best possible efficiency. Install only one of the two options listed in Figure 6.

1. Drill a hole through the exterior wall, slightly larger than the vent piping, to allow for final alignment of the vent piping to the heater.

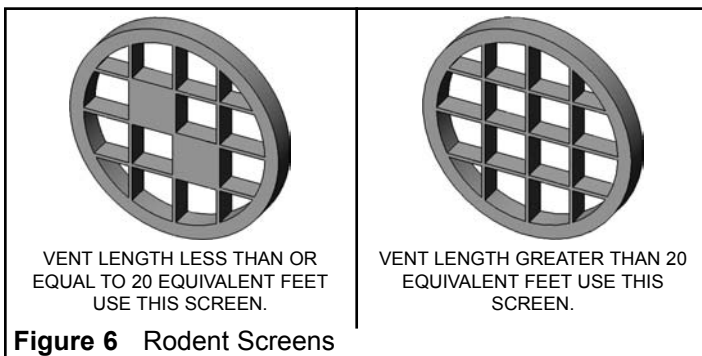


Figure 6 Rodent Screens

2. Install "Rodent Screen" in the termination elbow as shown in Figure 7 and fasten in place using silicone sealant.

Note: Apply only enough sealant to hold the screen in place inside the termination elbow. This will allow for annual screen removal, inspection and cleaning of the vent pipe system of lint or debris.

3. Fit the termination elbow to a short length of vent pipe 600mm (2 ft.) min., 1.5m (5 ft.) max. and join with solvent cement.
4. Push this termination assembly through the wall from the outside until the joint with the elbow is within 25mm - 50mm (1 in. - 2 in.) of the outside face of the wall.
5. Point the elbow down and temporarily hold the assembly in position with a small wedge or a splinter of wood.

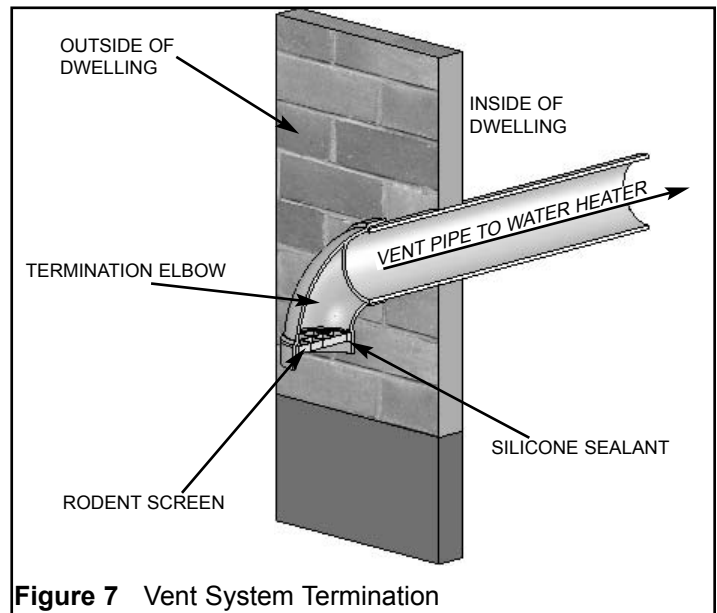


Figure 7 Vent System Termination

If a Vent Riser is Required

1. Fabricate the vent riser to lift the termination elbow to the height required.
2. Fasten the vent riser assembly to the outside wall with brackets (see Figure 9). Brackets to be supplied by installer.
3. Extend the horizontal run of pipe a convenient distance through the wall to make further work easy.
4. Connect the vent riser assembly to the rest of the venting system.

CAUTION:

Use of Solvent Cement and Primer

- Use only in well-ventilated areas.
- Do not use near flame or open fire.
- Use only the Solvent Cement and Primer appropriate for the venting material being used.
- Solvent cements for plastic pipe are flammable liquids and must be kept away from all sources of ignition.

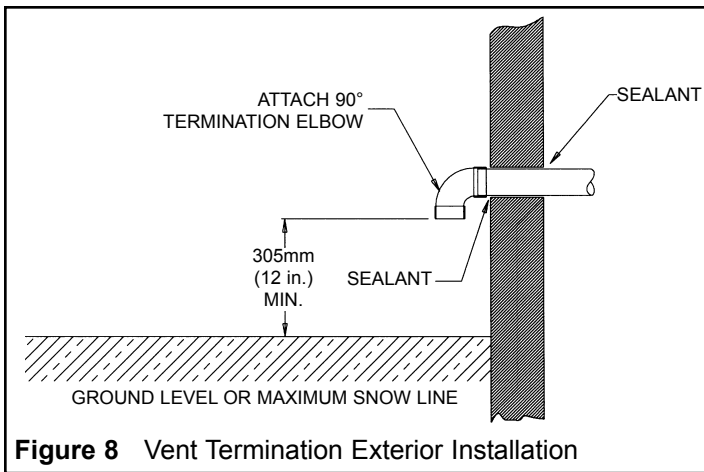
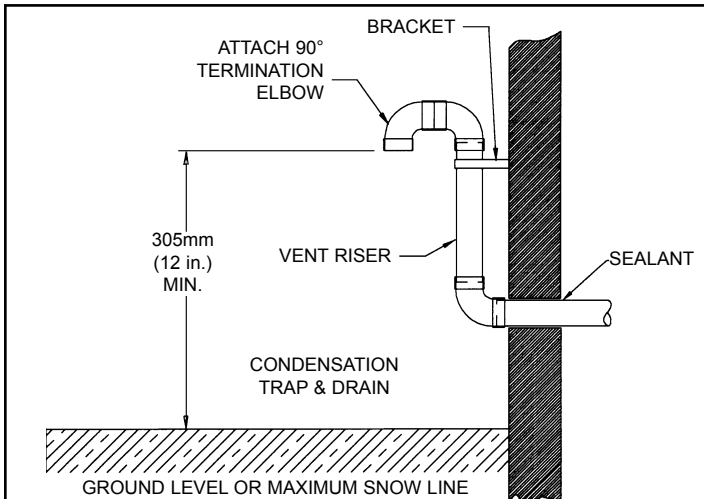


Figure 8 Vent Termination Exterior Installation



VENT PIPING MAY BE SLOPED IN ANY DIRECTION, AS LONG AS A WATER TRAP IS NOT CREATED IN THE VENTING SYSTEM. THE SLOPE SHOULD BE KEPT TO A MINIMUM SO AS NOT TO EXERT ANY UNDUE STRESS ON THE PIPE.

Figure 9 Installation Of Fabricated Vent Riser.

Horizontal Vent Terminal Installations

The following requirements are illustrated in Figure 10:

1. ("A") Minimum 2.1m (7 ft.) above a paved sidewalk or paved driveway that is located on public property.
2. ("B") Minimum 900mm (3 ft.) above any forced air or mechanical air supply inlet located within 1.8m (6 ft.) horizontally (Canada) or 3m (10 ft.) (U.S.A.).
3. ("C") Within 900mm (3 ft.) of any gas service regulator vent outlet.
4. ("D") Minimum 900 mm (3ft) horizontally of the vertical centerline above the regulator vent outlet to a maximum vertical distance of 4.5m (15ft).
5. ("E") Minimum 305mm (1 ft.) above grade level or anticipated snow level.
6. ("F") Within 305mm (1 ft.) of any window or door that can be opened, of any non-mechanical air supply inlet or of the combustion air inlet of any other appliance.
7. ("G") Minimum 305mm (1 ft.) distance between the top of the vent termination and the underside of a veranda, porch or deck.
8. ("H") The manufacturer recommends the vent termination shall not be mounted directly above or within 900mm (3 ft.) horizontally from an oil tank or gas meter to avoid potential freeze-up from condensation.
9. ("J") The manufacturer recommends the vent terminal not to be installed closer than 900mm (3 ft.) from an inside corner or 610mm (2 ft.) from outside corner on an "L" shaped structure.

Vertical Vent Terminal Installation

Important: When terminating the vents through a roof, the following specifications pertaining to terminal location must be followed.

1. The exhaust vent termination shall extend at least 450mm (18 in.) above the roof or snow accumulation level.

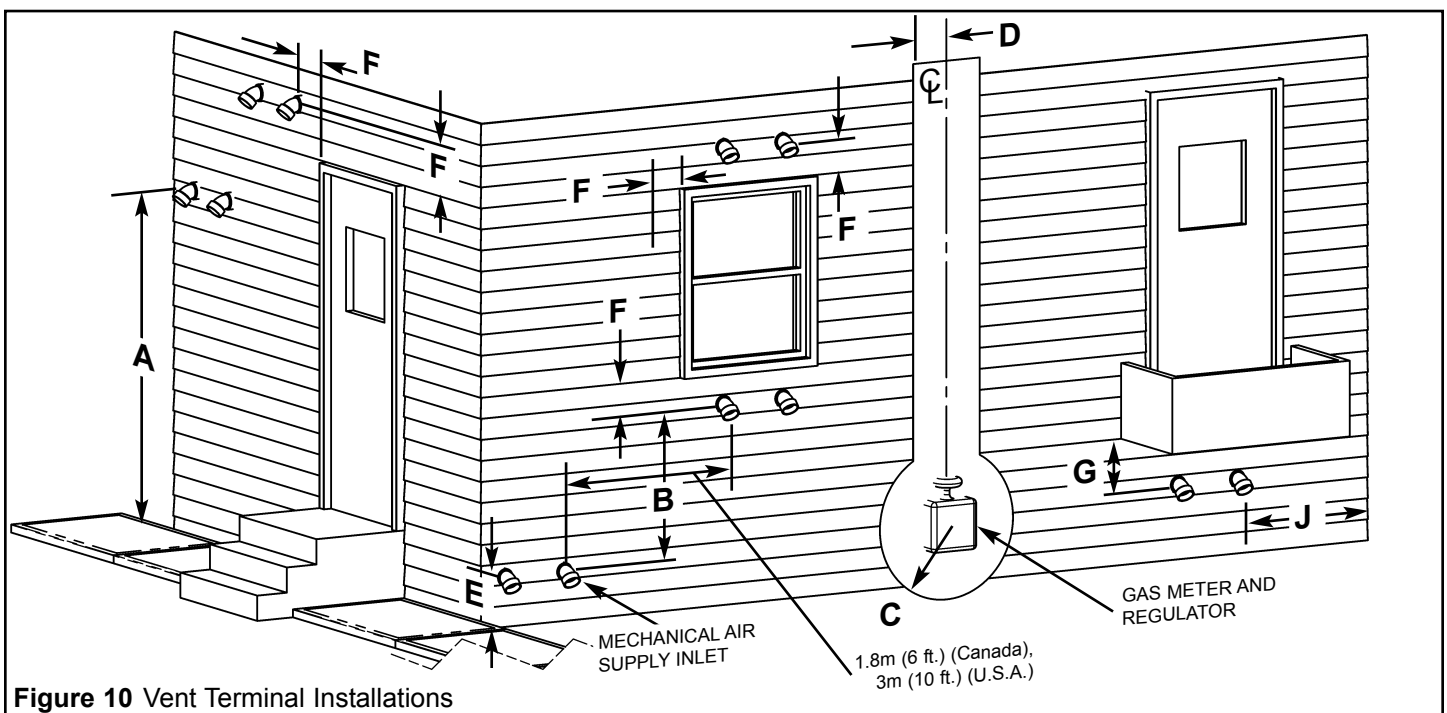
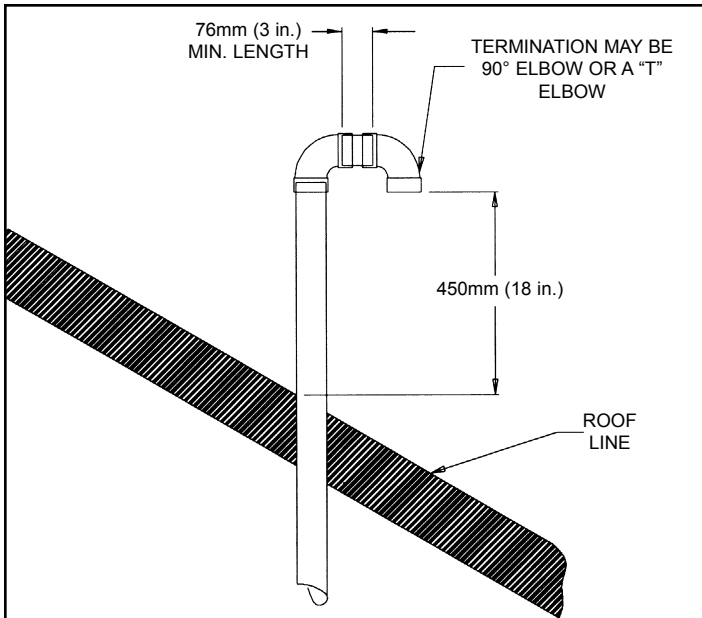


Figure 10 Vent Terminal Installations



A VENT USED IN A **SPECIAL VENTING SYSTEM** WITH POSITIVE VENT PRESSURE AND PASSING THROUGH A ROOF SHALL EXTEND AT LEAST 450mm (18 in.) ABOVE THE HIGHEST POINT WHERE IT PASSES THROUGH THE ROOF SURFACE AND ANY OTHER OBSTRUCTION WITHIN A HORIZONTAL DISTANCE OF 450mm (18 in.). A **VERTICAL VENTING SYSTEM MUST BE SUPPORTED EVERY 2.4m (8 ft.)**.

Figure 11 Vertical Venting

2. Must provide proper support for all pipes protruding through roof.
 3. The vertical roof terminations should be sealed with a plumbing roof boot or equivalent flashing.
- The specifications are displayed in Figure 11.

Vent Pipe Installation

Refer to Table 2 for maximum and minimum vent length. Plan the vent system layout so that proper clearances are maintained from plumbing and wiring. Vent pipes serving power vented appliances are classified by building codes as "vent connectors". Required clearances from combustible materials must be provided in accordance with information in this manual under "Location Of Heater" and with the latest edition of "**Natural Gas and Propane Installation Code**" **CAN/CSA-B149.1** (Canada), or "**National Fuel Gas Code**" **ANSI Z223.1 (NFPA 54)** (U.S.A.) and local codes.

1. Construct and route vent pipe connections to the water heater.
2. Ensure all vent components fit properly.
3. When all the components fit properly apply solvent cement to join them permanently.
4. Proceed to attach the venting system to the rubber coupling of the water heater (see Figures 15 & 16).

Important: The following guidelines, and those shown in Figures 12 & 13 are good, recommended practice for venting installations. Applicable local codes supersede this set of venting guidelines:

- Venting should be as direct as possible with a minimum number of pipe fittings.
- Vent diameter must not be reduced unless specifically noted in the installation instructions.

- Support all horizontal pipe runs every 1.2m (4 ft.) and all vertical pipe runs every 1.5m (5 ft.) or according to local codes.
- Vents run through unconditioned spaces where below freezing temperatures are expected, are not recommended.
- If a run through an unconditioned space is unavoidable, the pipe must be insulated to reduce condensation.
- The length and number of the 90° elbows must be kept to a minimum.
- No back-to-back 90° elbows should be used.
- If re-direction of flue gases is required, use 45° elbows where possible, to minimize the number of 90° elbows used.
- Do not use short radius elbows.
- No Street elbows (female-male) should be used.
- Pipes must be cut at a 90° angle.
- Deburr the outside and inside of the cut pipe so that solvent cement is not pushed away by sharp edges.
- Dry fit all pipes and fittings before joining the parts with solvent cement.
- Parts must fit well and not put stress on any sections.

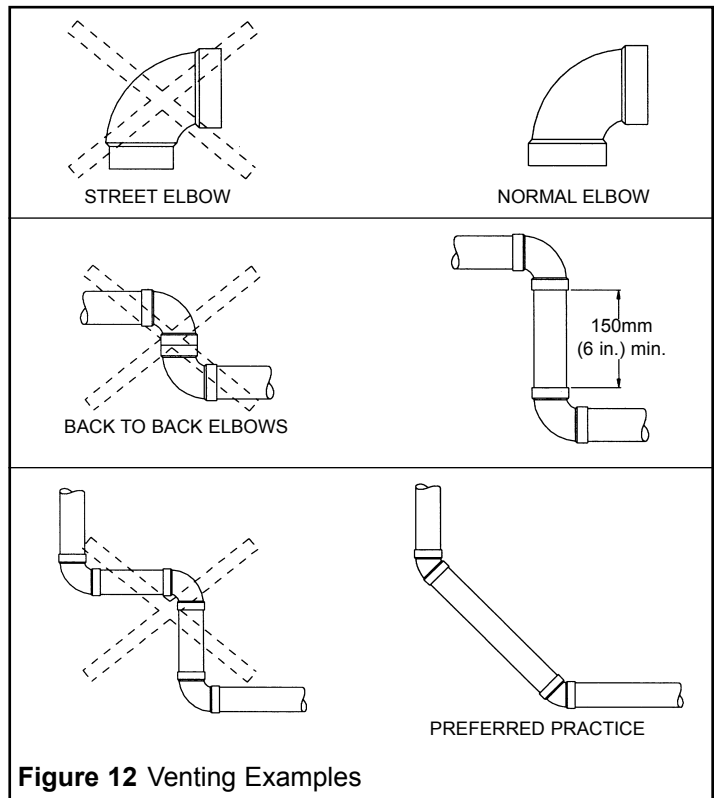


Figure 12 Venting Examples

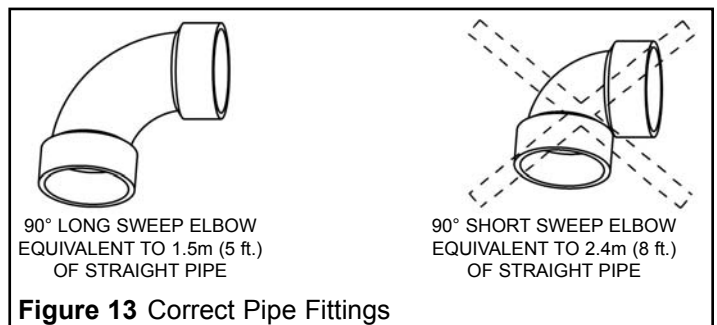


Figure 13 Correct Pipe Fittings

Vent Pipe Runs

All Power Vented water heaters generate a certain amount of operational noise. In order to minimize noise transmission to floor joists through hangers, place some soft material such as foam rubber, approximately 12mm (1/2 in.) thick, between hangers and the vent pipes.

1. Horizontal runs must not, under any circumstances, run downhill then run uphill thus forming a valley where condensation can accumulate and block the vent pipe.
2. Horizontal runs require a minimum 3mm (1/8 in.) rise per 1.5m (5 ft) and a support every 1.2m (4 ft.). Ensure there is enough height between heater and termination to raise vent pipe runs the required distance.
3. Vertical runs require a support every 1.5m (5 ft.) that must provide proper support to prevent stress on the pipes.

Vent Pipe Connection to Blower

A rubber coupling is supplied with the water heater to connect the venting to the blower using gear clamps (supplied). Important: These connections must be properly sealed to prevent the leakage of the products of combustion into the living area.

Rubber Coupling Connection

ABS and CPVC vent piping may be directly connected to the blower assembly as shown in Figures 15 & 16. For heaters installed as shown in Figure 15 (c), order 50mm (3 in.) rubber coupling connector (P/N 63234).

PVC vent pipe installations must use a PCV vent conversion kit as shown in Figure 14. Order PVC Vent Conversion Kit P/N 73901 for 50mm (2 in.) vent pipe installations. For 76mm (3 in.) vent pipe installations order PVC Vent Conversion Kit P/N 73876.

1. Clean and lightly sand the end of the vent pipe that will connect to the rubber coupling. This will ensure a good mechanical connection between the coupling and the pipe.
2. Apply solvent cement and join the PVC coupling of the adaptor to the venting system. (PVC Only).
3. At the rubber coupling, loosen the upper gear clamp to allow the vent piping to be inserted fully 32mm (1-1/4 in.) deep. Do not use sealant or glue.

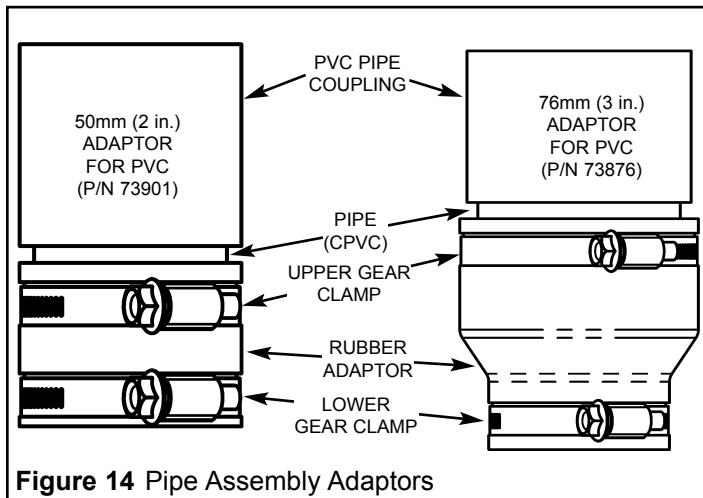


Figure 14 Pipe Assembly Adaptors

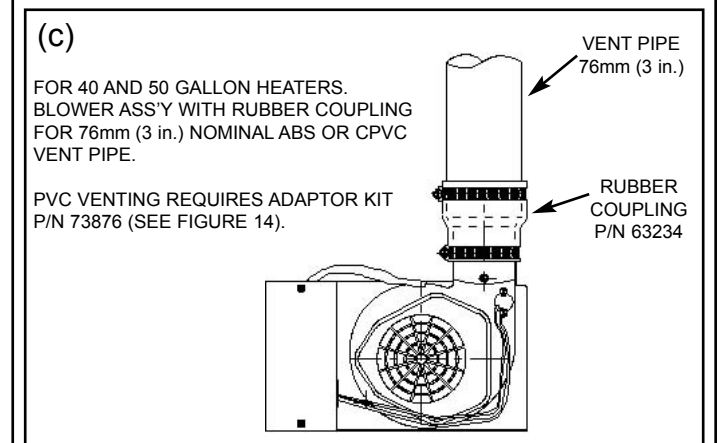
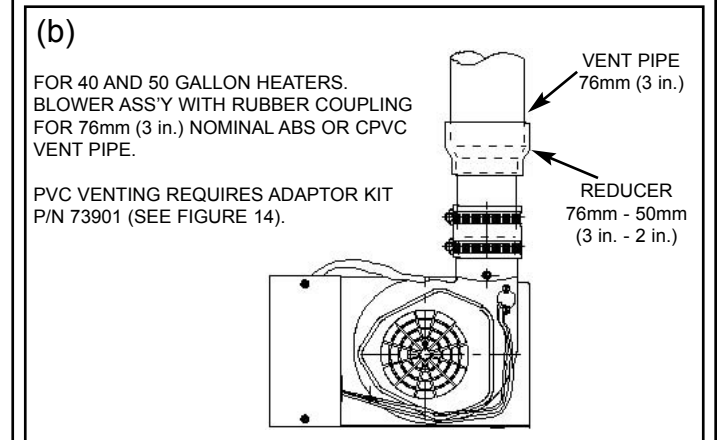
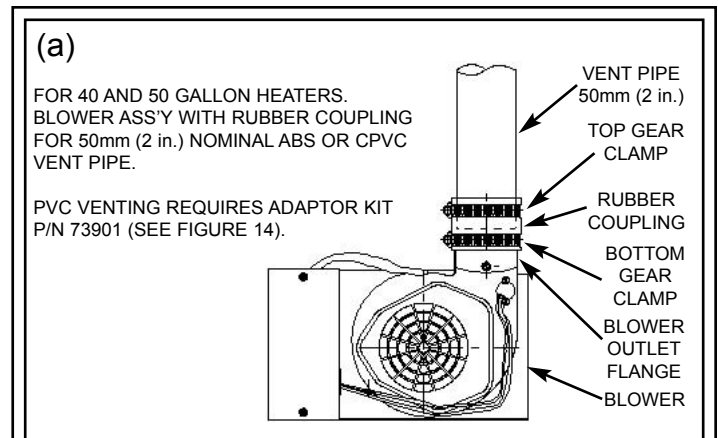


Figure 15 Blower, Fittings and Vent Pipe Options

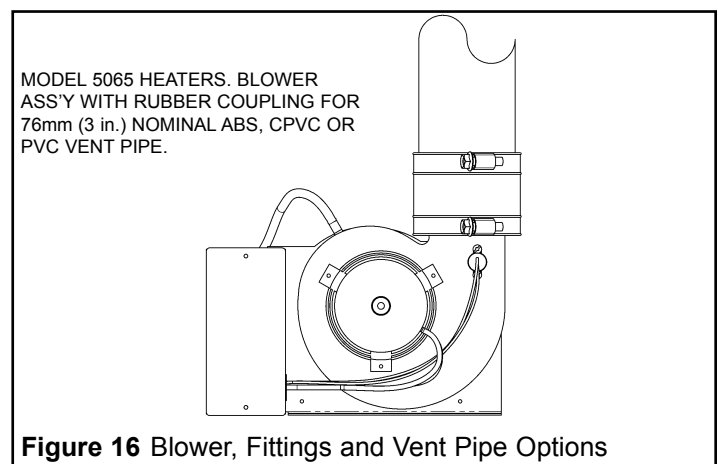


Figure 16 Blower, Fittings and Vent Pipe Options

4. Tighten the upper gear clamp to ensure the vent pipe is firmly secured and gas tight.
5. Check that the lower gear clamp is firmly seated, secured and gas tight.
6. As a final check, the vent pipe should be gently moved side to side and vertically. There should be no slippage or movement of the vent pipe within the coupling.
7. Seal around the termination assembly where it passes through the wall, inside and out, with silicone sealant.

WATER HEATER MODEL	SUFFIX	VENT PIPE SIZE	PRESSURE SWITCH SETTING	* VENT MATERIAL (SCHEDULE 40)	MAXIMUM EQUIVALENT VENT LENGTH	MINIMUM EQUIVALENT VENT LENGTH
G/JW40, 50	NVH, PVH	50mm (2 in.)	- 0.15 in. w.c. (-0.037 kPa)	ABS, PVC**, CPVC	15.2m (50 ft.) + termination elbow	0.76m (2.5 ft.) + one 90° elbow + termination elbow
	NVH, PVH	76mm (3 in.)	- 0.15 in. w.c. (-0.037 kPa)	ABS, PVC**, CPVC	24.4m (80 ft.) + termination elbow	15.2m (50 ft.) + termination elbow
G/JW5065	SNV, SPV	76mm (3 in.)	- 0.55 in. w.c. (-.137 kPa)	ABS, PVC, CPVC	15.2m (50 ft.) + termination elbow	0.91m (3 ft.) + one 90° elbow + termination elbow
G/JW5065	LNV	76mm (3 in.)	- 0.50 in. w.c. (-.124 kPa)	ABS, PVC, CPVC	19.8m (65 ft.) + termination elbow	6.9m (20 ft.) + termination elbow

Notes:

1. Each 50mm (2 in.), 90° long radius elbow is equivalent to 1.5m (5 ft.) of vent length.
2. Each 76mm (3 in.), 90° long radius elbow is equivalent to 2.1m (7 ft.) of vent length.
3. Each 50mm (2 in.), 45° long-radius elbow is equivalent to 0.9m (3 ft.) of vent length.
4. Each 76mm (3 in.), 45° long radius elbow is equivalent to 1.2m (4 ft.) of vent length.
5. Minimum distance between elbows is 150mm (6 in.).
6. Do not mismatch venting materials. *Check local codes to determine which materials are allowed in your area.
7. **Pipe assembly adaptor must be used with PVC venting material (see Figure 14).

Table 2 Allowable Vent Lengths and Materials (Vert. and Horiz.).

Water Supply Piping Installation

Piping, fittings, and valves should be installed according to the installation drawing (Figure 17). A pressure-reducing valve and/or an expansion tank may be required for instal-

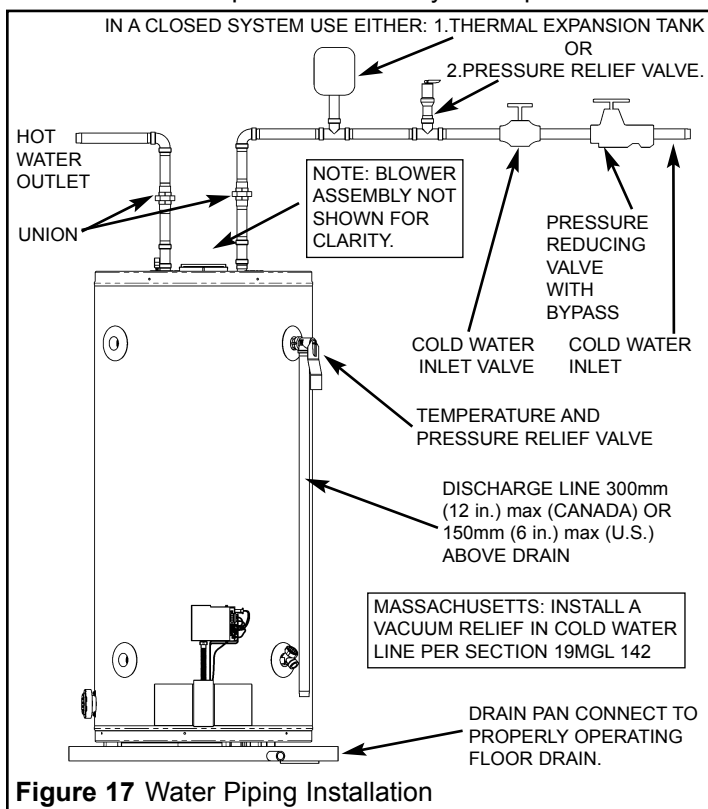
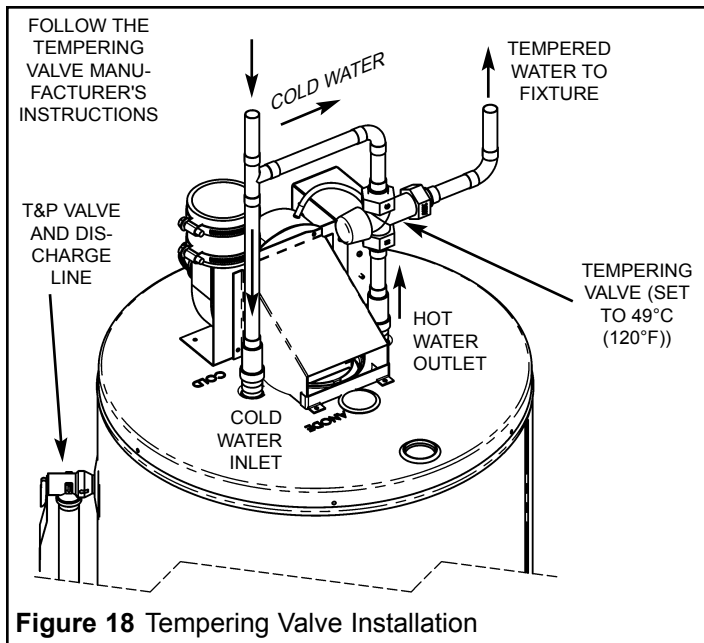


Figure 17 Water Piping Installation

lations where the water pressure is high. The pressure-reducing valve should be located on the supply to the entire house in order to maintain equal hot and cold water pressure.

Important:

- Do not apply heat to the water fittings on the heater as they may contain nonmetallic parts. If solder connections are used, solder the pipe to an adaptor before attaching the adaptor to the hot and cold water fittings.
 - Some models may contain energy saving heat traps to prevent the circulation of hot water within the pipes. Do not remove the inserts within the heat traps.
 - Always use a proper grade of joint compound and be certain that all fittings are drawn up tight.
1. Install the water piping and fittings as shown in Figure 17. Connect the cold water supply to the fitting (3/4" NPT) marked "COLD" (or "C"). Connect the hot water supply to the fitting (3/4" NPT) marked "HOT" (or "H").
 2. The installation of unions in both the hot and cold water supply lines is recommended.
 3. The manufacturer of this water heater recommends installing a tempering valve in the domestic hot water line as shown in Figure 18. These valves reduce the point-of-use water temperature by mixing cold and hot water. Contact a licensed plumber or the local plumbing authority.
 4. If installing the water heater in a closed water system, install an expansion tank in the cold water line as specified under "Closed System/Thermal Expansion".



5. Install a shut-off valve in the cold water inlet line. It should be located close to the water heater and be easily accessible. The owner/operator must be shown the location of this valve and be given instructions on how to use it to shut off the water to the heater.

Filling the Water Heater

Do not insert the power cord into the electrical receptacle until all the following steps have been completed.

1. Make sure the drain valve is closed.
2. Open all hot water faucets served by the system to allow air to escape from the tank.
3. Open the cold water inlet valve.

NOTE: When filling, avoid water leakage. Do not allow the insulation of the water heater to get wet as water can reduce the effectiveness of the insulation.

4. When an uninterrupted stream of water, without apparent air bubbles, flows from the open hot water faucets, the tank is full.
5. Close the hot water faucets and check the system for leaks. Repair as required and retest.
6. Connect a hose to the drain valve and route to a suitable drain.
7. Open the drain valve and let water run to flush out any foreign matter that may have entered the system. Continue flushing until clean water flows.
8. Close the drain valve, disconnect the hose, ensure the drain valve does not drip and re-fill the tank.

Please note the following:

DO NOT install this water heater with iron piping. The system should be installed only with piping that is suitable for potable (drinkable) water such as copper, CPVC or polybutylene. **DO NOT** use PVC water piping.

DO NOT use any pumps, valves, or fittings that are not compatible with potable water.

DO NOT use valves that may cause excessive restriction to water flow. Use full flow ball or gate valves only.

DO NOT use any lead based solder in potable water lines. Use appropriate tin-antimony or other equivalent material.

DO NOT tamper with the gas control/thermostat, igniter, flammable vapour sensor or temperature and pressure relief valve. Tampering voids all warranties. Only qualified service technicians should service these components.

DO NOT use with piping that has been treated with chromates, boiler seal, or other chemicals.

DO NOT add any chemicals to the system piping which will contaminate the potable water supply.

Closed System/Thermal Expansion

Periodic discharge of the temperature and pressure relief valve may be due to thermal expansion in a closed water supply system. The water utility supply meter may contain a check valve, backflow preventer or water pressure-reducing valve. This will create a closed water system. During the heating cycle of the water heater, the water expands causing pressure inside the water heater to increase. This may cause the temperature and pressure relief valve to discharge small quantities of hot water. To prevent this, it is recommended that a diaphragm-type expansion tank (suitable for potable water) be installed on the cold water supply line. The expansion tank must have a minimum capacity of 5.6 litres (1.5 US gallons) for every 190 litres (50 US gallons) of stored water and be rated at the working pressure of the water heater. Contact the local water supplier or plumbing inspector for information on other methods to control this situation.

Important: Do not plug or remove the temperature and pressure relief valve.

Temperature and Pressure (T&P) Relief Valve

For protection against excessive pressures and temperatures, a temperature and pressure relief valve must be installed in the opening marked "T&P RELIEF VALVE" (see Figure 19). This valve must be design certified by a nationally recognized testing laboratory that maintains periodic inspection of the production of listed equipment or materials as meeting the requirements of the "Standard For Relief Valves For Hot Water Supply Systems", ANSI Z21.22/CSA 4.4". The function of the temperature and pressure relief valve is to discharge water in large quantities in the event of excessive temperature or pressure developing

WARNING



Explosion Hazard

- If the temperature and pressure relief valve is dripping or leaking, have a licensed plumber repair it.
- Do not plug valve.
- Do not remove valve.
- Failure to follow these instructions can result in death or an explosion.

in the water heater. The valve's relief pressure must not exceed the working pressure of the water heater as stated on the data plate.

Important: Only a new temperature and pressure relief valve should be used with your water heater. Do not use an old or existing valve as it may be damaged or not adequate for the working pressure of the new water heater. Do not place any valve between the relief valve and the tank.

The Temperature and Pressure Relief Valve:

- Must not be in contact with any electrical part.
- Must be connected to an adequate discharge line.
- Must not be rated higher than the working pressure shown on the data plate of the water heater.

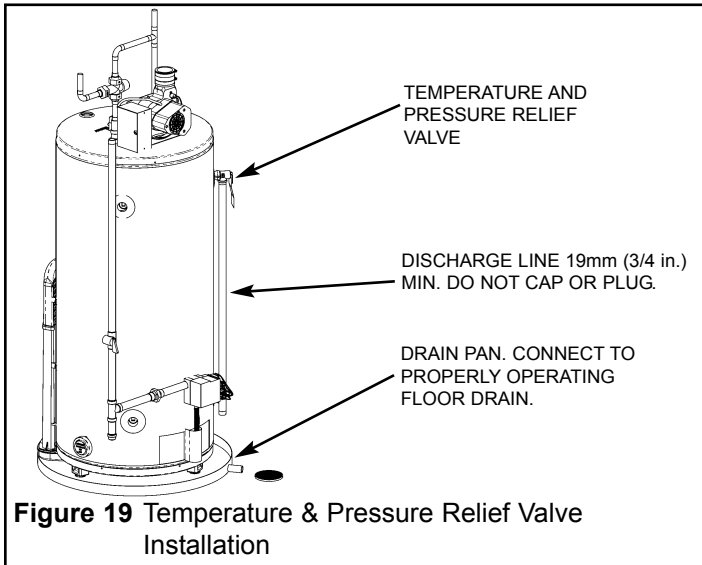


Figure 19 Temperature & Pressure Relief Valve Installation

The Discharge Line/Driptide:

- Must not be smaller than the pipe size of the relief valve or have any reducing coupling installed in the discharge line.
- Must not be capped, blocked, plugged or contain any valve between the relief valve and the end of the discharge line.
- Must terminate a maximum of 300mm (12 in.) (Canada) or 150mm (6 in.) (U.S.A.) above the floor.
- Must be capable of withstanding 121°C (250°F) without distortion.
- Must be installed to allow complete drainage of both the valve and discharge line.

Electrical Supply

IMPORTANT: The electrical controls used inside the gas control/thermostat mounted on this water heater are **polarity sensitive**. Ensure the electrical supply is connected correctly in the receptacle box. Failure to connect correctly will prevent the unit from functioning properly (see Figures 20 &

⚠ WARNING:
When the unit is plugged in, 120VAC is present at the electric connections of the gas control/thermostat.

22). Before performing any electrical service work, label all wires to avoid connection errors. If wiring has to be replaced, use only **TYPE TEW 105°C** wire, (except igniter wires). If there is a problem with igniter wires, replace igniter assembly in its entirety. In locations where a sump pump failure, flooding or exposure to water may be present, a ground fault receptacle is recommended.

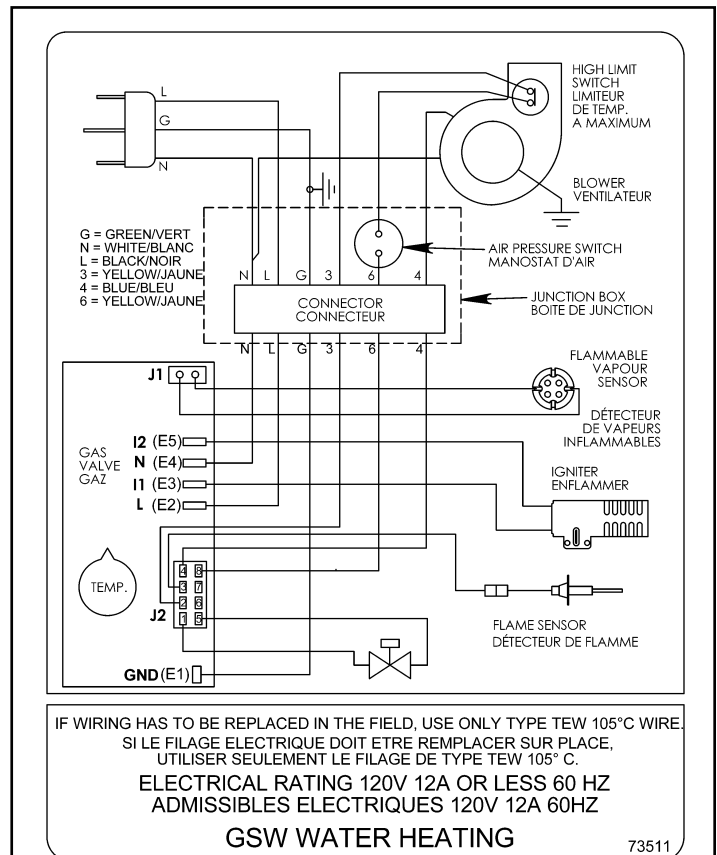
Important: Do not use an extension cord to connect the water heater to an electrical outlet.

- Ensure that the water heater and the outlet are properly grounded. Failure to properly ground the heater can prevent the unit from operating.
- Ensure that the water heater is installed in accordance with prevailing provisions of local codes, or, in the absence of such, the latest edition of “**Canadian Electrical Code (CAN/CSA C22.1), Part I**” (Canada) or “**National Electrical Code**” (NFPA 70) (U.S.A.).

Before plugging in the water heater, always make sure:

- The voltage and frequency correspond to that specified on the water heater wiring diagram.
- The electrical outlet has the proper overload fuse or breaker protection.
- Fill the tank with water and check all connections for leaks. Open the nearest hot water faucet and let it run for 3 minutes to purge the water lines of air and sediment and to ensure complete filling of the tank. The electrical power may then be turned on. Verify proper operation after servicing.

Note: Always reference the wiring diagram for the correct electrical connections.



IF WIRING HAS TO BE REPLACED IN THE FIELD, USE ONLY TYPE TEW 105°C WIRE.
 SI LE FILAGE ELECTRIQUE DOIT ETRE REMPLACER SUR PLACE,
 UTILISER SEULEMENT LE FILAGE DE TYPE TEW 105° C.
 ELECTRICAL RATING 120V 12A OR LESS 60 HZ
 ADMISSIBLES ELECTRIQUES 120V 12A 60HZ
GSW WATER HEATING 73511

Figure 20 Robertshaw Wiring Diagram - Junction Box.

WARNING

Electrical Shock Hazard



- Disconnect power before servicing.
- Replace all parts and panels before operating.
- Failure to do so can result in death or electrical shock.

* ROTATE LEFT (CCW) TO REMOVE

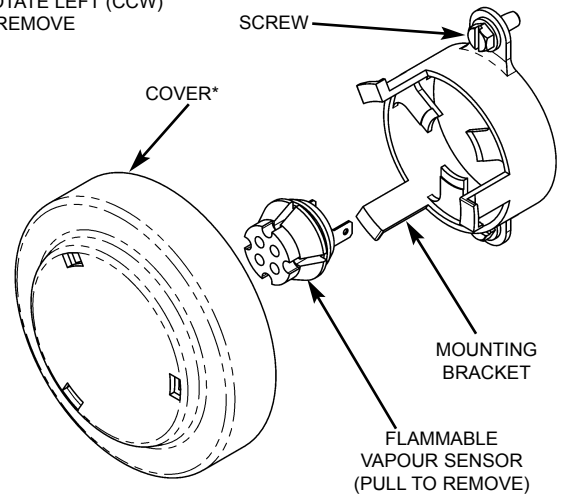


Figure 21 Flammable Vapour Sensor (exploded view)

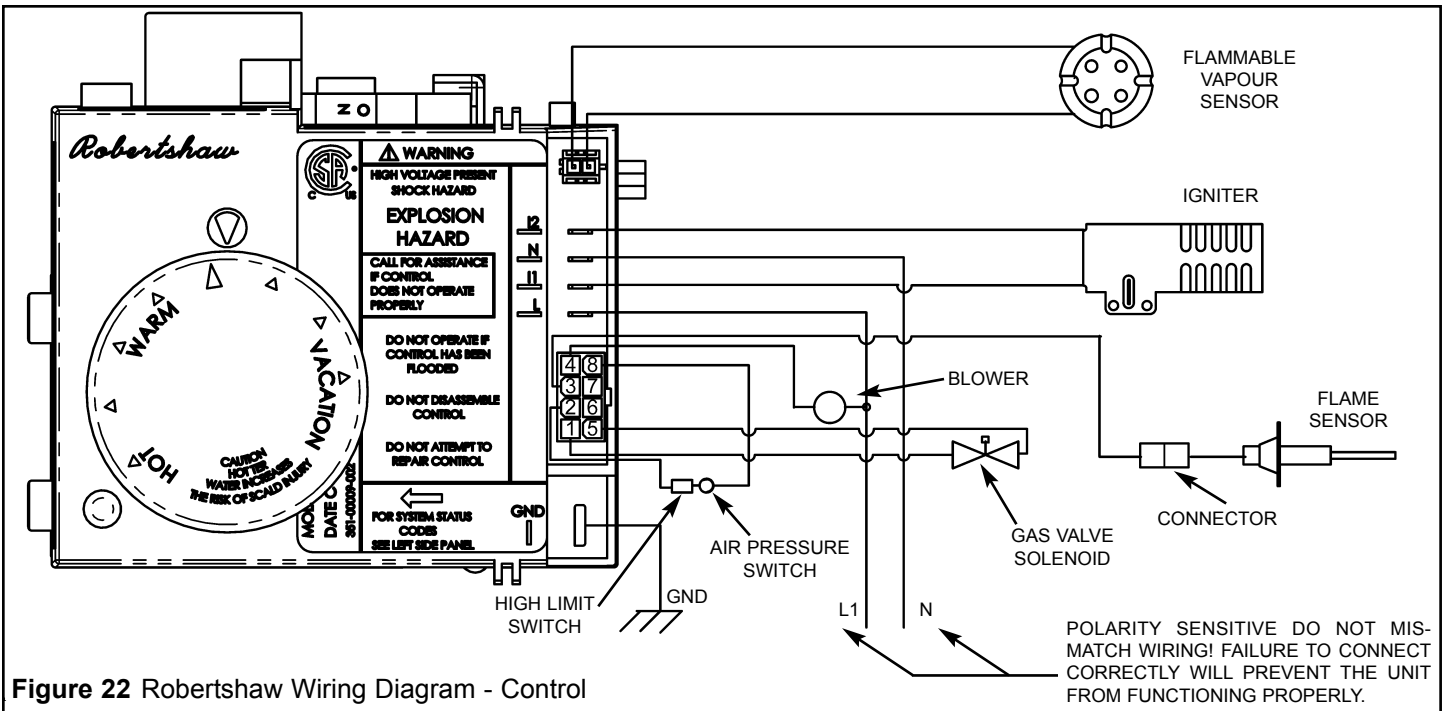


Figure 22 Robertshaw Wiring Diagram - Control

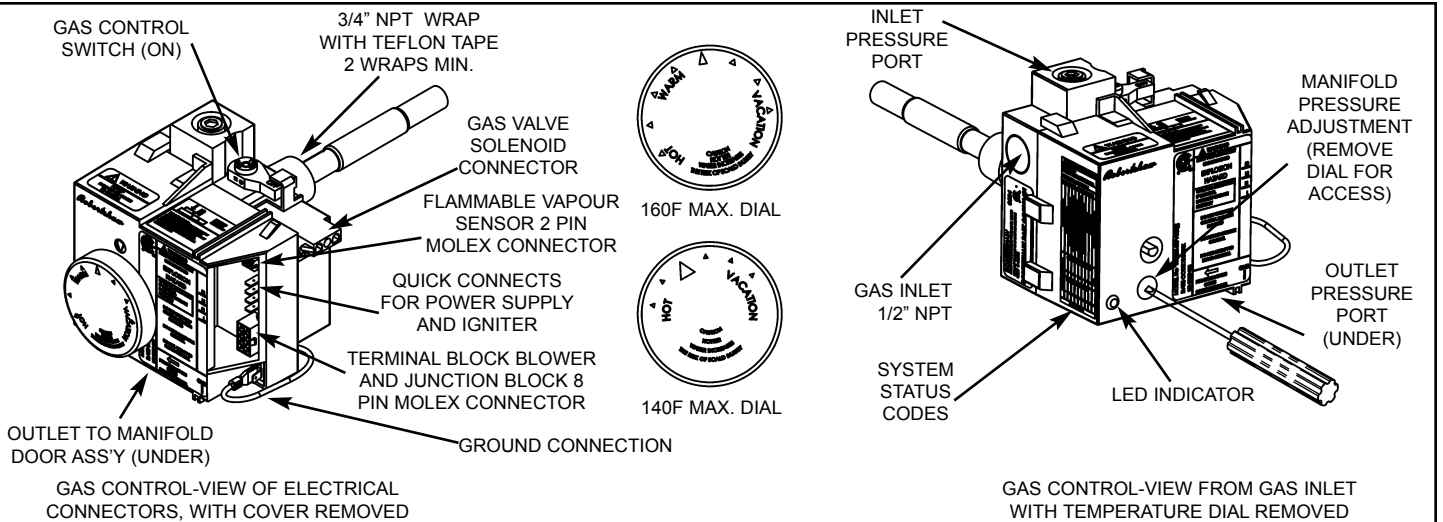


Figure 23 Gas Control/Thermostat Details (Robertshaw)

Installation Checklist

Check Here

Check Here

Water Heater Location

1. Centrally located with the water piping system. Located as close to gas piping and vent pipe system as possible.
2. Located indoors and in a vertical position. Protected from freezing temperatures.
3. Proper clearances from combustible surfaces maintained and not installed directly on a carpeted floor.
4. Provisions made to protect the area from water damage. Drain pan installed and piped to an adequate drain.
5. Installation area free of corrosive elements and flammable material.
6. Sufficient room to service the water heater.

Gas Supply and Piping

1. Gas supply is the same type as listed on the water heater data plate.
2. Gas line equipped with shut-off valve, union and drip leg
3. Approved pipe joint compound used.
4. Adequate pipe size and of approved material.
5. Chloride-free soap and water solution or other approved means used to check all connections and fittings for possible gas leaks.

Vent Pipe System

1. Vent pipe and fittings of approved material.
2. Acceptable size, length and number of elbows on air intake system.
3. Acceptable size, length and number of elbows on exhaust vent system.
4. Installed in accordance with prevailing provisions of local codes, or in the absence of such, the latest edition of “**Natural Gas and Propane Installation Code**” **CAN/CSA-B149.1** (Canada), or “**National Fuel Gas Code**” **ANSI Z223.1 (NFPA 54)** (U.S.A.).
5. Horizontal piping slopes at an upward pitch of 3mm (1/8 in.) rise per 1.5m (5 ft). away from the water heater.
6. Not obstructed in any way.

Vent Termination

Horizontal

1. 305mm (12 in.) min. above grade/snow level.
2. Away from corners, other vents, windows etc.

Vertical

1. Exhaust vent termination 450mm (18 in.) min. above roof/snow level.

Water System Piping

1. Temperature and Pressure relief valve properly installed with a discharge line run to an open drain and protected from freezing.
2. All piping properly installed and free of leaks.
3. Heater completely filled with water.
4. Closed system pressure build-up precautions installed.

Electrical Connections

1. Unit connected to a dedicated power supply.
2. Unit connected to a 120V electrical supply.
3. Proper polarity.
4. Water heater properly grounded.
5. Installed in accordance with prevailing provisions of local codes, or in the absence of such, the latest edition of “**Canadian Electrical Code (CAN/CSA C22.1), Part I**” (Canada) or “**National Electrical Code**” (**NFPA 70**)” (U.S.A.).

If the answer to all of the questions above is “Yes”, proceed with lighting the heater.

IV) LIGHTING & OPERATING INSTRUCTIONS

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.
- C. Use only your hand to push in or turn the gas control switch. Never use tools. If the switch will not push in or turn by hand, do not 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.

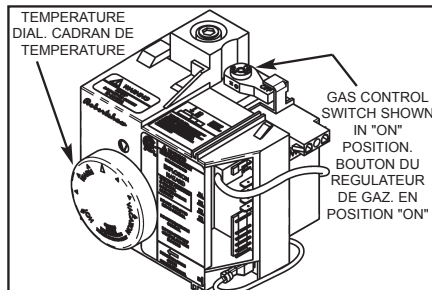
POUR VOTRE SÉCURITÉ, LISEZ AVANT DE METTRE EN MARCHÉ

ATTENTION: Quiconque ne respecte pas à la lettre les instructions dans la présente notice risque de déclencher un incendie ou une explosion entraînant des dommages, des blessures ou la mort.


- A. Cet appareil ne comporte pas de veilleuse. Il est muni d'un dispositif d'allumage qui allume automatiquement la brûleur. Ne tentez pas d'allumer le brûleur manuellement.
- B. **AVANT DE FAIRE FONCTIONNER**, reniflez tout autour de l'appareil pour détecter une odeur de gaz. Reniflez près du plancher, car certains gaz sont plus lourds que l'air et peuvent s'accumuler au niveau du sol.
- QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ:**
- Ne pas tenter d'allumer d'appareil.
 - Ne touchez à aucun interrupteur; ne pas vous servir des téléphones se trouvant dans le bâtiment.
 - Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.
 - Si vous ne pouvez rejoindre le fournisseur, appelez le service des incendies.
- C. Ne poussez ou tournez le manette d'admission du gaz qu'à la main; ne jamais utiliser d'outil. Si la manette reste coincée, ne pas tenter de le réparer; appelez un technicien qualifié. Le fait de forcer la manette ou de la réparer peut déclencher une explosion ou un incendie.
- D. N'utilisez pas cet appareil s'il a été plongé dans l'eau, même partiellement. Faites inspecter l'appareil par un technicien qualifié et remplacez toute partie du système de contrôle et toute commande qui ont été de plongés dans l'eau.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above (to the left) on this label.
2. Set the thermostat to the lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Press gas control switch. It will automatically turn to "OFF."
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you then smell gas, **STOP!** Follow "B" in the safety information above (to the left) on this label. If you do not smell gas, proceed to the next step.
7. Turn gas control switch counterclockwise  to "ON".
8. Turn on all electric power to the appliance.
9. Set thermostat dial to desired setting.
10. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.



INSTRUCTIONS DE MISE EN MARCHÉ

1. **ARRETEZ!** Lisez les instructions de sécurité sur la portion supérieure (à gauche) de cette étiquette.
2. Réglez le thermostat à la température la plus basse.
3. Coupez l'alimentation électrique de l'appareil.
4. Le present appareil est muni dispositif d'allumage qui allume automatiquement la brûleur. **NE PAS TENEZ D'ALLUMER LA BRÛLEUR MANUELLEMENT.**
5. Tourner le bouton du regulateur de gaz vers la droite jusqu'à la position "OFF".
6. Attendre cinq (5) minutes pour laisser échapper tout le gaz. Reniflez tout autour de l'appareil, y compris près du plancher, pour détecter une odeur de gaz. Si vous sentez une odeur du gaz, **ARRETEZ!** Passez à l'étape "B" des instructions de sécurité sur la portion supérieure (à gauche) de cette étiquette. S'il n'y a pas d'odeur de gaz, passez à l'étape suivante.
7. Tourner le bouton du regulateur de gaz vers la gauche  jusqu'à la position "ON".
8. Mettez l'appareil sous tension.
9. Réglez le thermostat à la température désirée.
10. Si l'appareil ne se met pas en marche, suivez les instructions intitulées "Comment Couper L'admission De Gaz De L'appareil" et appelez un technicien qualifié ou le fournisseur de gaz.

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat dial to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Press gas control switch. It will automatically turn to "OFF."

COMMENT COUPER L'ADMISSION DE GAZ DE L'APPAREIL

1. Réglez le thermostat à la température la plus bas.
2. Coupez l'alimentation électrique de l'appareil s'il faut procéder à l'entretien.
3. Tourner le bouton du regulateur de gaz vers la droite a la position "OFF".

V) OPERATION

First Lighting



CAUTION:

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

This appliance is equipped with an ignition device, which automatically lights the pilot. Do not try to light manually with a match.

The temperature dial is adjusted to its lowest temperature position when shipped from factory.

Gas Control/Thermostat

This heater is equipped with a Robertshaw 2000WDER combination gas control/thermostat and a hot surface igniter. A green LED on the front of the control is used to flash a system status code indicating the operational state of the control (see Table 3). When initially energized, with temperature dial set at vacation, the control will:

1. Perform a self-diagnostic check. The LED will flash a system status code to indicate that it is in vacation mode.
2. On a call for heat, the control checks to ensure the air pressure switch on the blower is in the open position. If closed the sequence pauses and the blower is not energized.
3. With the air pressure switch proven open, the control energizes the blower.
4. With the blower energized the control checks to ensure the air pressure switch closes. At this point the air pressure switch must close or the blower will run continuously.
5. The high limit switch on the blower is wired in series with the air pressure switch, so both switches must be closed or the blower will run continuously. With proven airflow and the high limit switch closed, a flame safety check is undertaken to ensure a flame is not present prior to ignition.
6. Providing a flame present signal is not detected, the hot surface igniter is energized and a warm up period of approximately 17 seconds is initiated.
7. Following the igniter warm up period, the control allows gas to flow to the burner initiating a 4 second trial for ignition period.
8. If a flame cannot be established within the trial for ignition period, is extinguished or the flame signal drops below 0.7 microamps, the control will stop the flow of gas to the burner.
9. The blower continues to be energized and a 30 second inter-purge is undertaken.
10. The control will attempt for ignition again. If a flame cannot be established after three attempts, it will go into a soft lockout state.
11. The LED on the control will flash a system status code indicating the lockout state due to ignition failure (see Table 3).

12. Unplugging the power cord then reinserting it into the electrical receptacle will reset the control. Alternatively, the control will automatically reset itself approximately 20 minutes after entering the soft lockout state.
13. The control will normally establish a flame and maintain the flame until the call for heat is satisfied.
14. After the burner is lit, the gas control/thermostat will electronically monitor the presence of a flame.
15. When the desired water temperature has been reached, the gas control/thermostat will stop the flow of gas to the burner.

When heater is ready to be put into service:

1. Turn the manual gas shut-off valve to the "ON" position.
2. Turn the gas control switch to "ON".
3. Smell all around the appliance area for gas. Be sure to smell next to the floor because some gases are heavier than air and will settle on the floor.

What to Do If You Smell Gas

- Turn the manual gas shut-off valve to the "OFF" position.
- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Evacuate all occupants from 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.

If You Do Not Smell Gas

1. Turn the temperature dial to the lowest setting and set the gas control switch to the "OFF" position.
2. Ensure the power cord is plugged into the electrical receptacle and correct voltage is supplied to the appliance.
3. With the gas control switch "OFF", check the pressure of the gas supply to the control:
 - Natural Gas pressure should be at 7 in. w.c. (1.74 kPa).
 - Propane Gas pressure should be at 11 in. w.c. (2.73 kPa).
4. Turn the gas control switch to "ON".
5. Turn the temperature dial to the desired setting, (e.g., from "VACATION" toward "HOT"). This will start the lighting process:
 - a. The blower will be turned on after 20 seconds.
 - b. The igniter will be at full glow after the next 17 seconds.
 - c. The main gas valve opens.
 - d. The burner lights up, the flame envelops the flame sensor, and the burner flame verification process begins.
6. While the burner is on, again check all gas connections with a chloride-free soap and water solution or equivalent leak test liquid. Correct any poor connections that may be indicated by the presence of soap bubbles.
Shut off electric and gas supply before making such corrections.

Important: When using a leak test solution around the control, do not splash any liquid on the flammable vapour sensor, electric connections or electronic components of the gas control/thermostat. The gas control/thermostat can be damaged. **DO NOT** use a flame to detect gas leaks.

7. Turn the temperature dial to the lowest setting. The burner will stop in approximately 20 seconds.

NOTE: If the burner does not stop as described above, the water temperature may be below the lowest temperature that the thermostat is able to sense ((32°C) 90°F). Wait until the water temperature has risen.

8. Re-cycle the system by turning the temperature dial up toward the “HIGH” position to call for heat a second time.

9. To check the lockout on the ignition control, turn the temperature dial to the lowest setting possible. Wait for the system to shut down completely. Then, set the gas control switch to the “OFF” position.

10. Now turn the temperature dial to the highest setting.

11. The igniter will be energized. However, since there is no main gas flow, the burner cannot be lit. After three trials, a lockout will occur, deactivating the system.

12. To reactivate the system, remove the power by unplugging the power cord. Turn the gas control switch to “ON”. Then restore power by reinserting the power cord into the electrical receptacle. The LED on the control will flash a system status code to indicate that the lockout has been reset (see Table 3).

13. Follow instructions given in the “Lighting & Operating Instructions” section when heater is ready to be put back into service.

14. Turn the temperature dial to desired temperature setting. Instruct the owner/operator in the correct use and setting of the control.

15. **If the LED is on continuously**, it indicates a control failure. Call for assistance.

Flammable Vapour Sensor

When using a gas fired water heater there is a risk of flammable vapours entering the combustion chamber, being ignited by the burner flame and causing a flashback. In order to detect such flammable vapours before they enter the combustion chamber, this water heater is equipped with a flammable vapour sensor (FVS). It is a chemical-absorption based sensor that is connected to the gas control/thermostat (see Figures 21 & 22). When exposed to flammable vapours it will trigger the control to stop the flow of gas and enter the FVS lockout state. While in the FVS lock-out state the LED on the control will flash the 2-and-1 Gas lock-out code. If this occurs, check around the water heater for sources of chemical contamination such as: flammable vapours including gas vapours, solvents, paint and thinners as well as sources of water and detergents. Remove any such sources, check the surrounding area for damage and call a qualified service technician to service the water heater and replace the flammable vapour sensor. If there is a problem with the wiring of the flammable vapour sensor or the flammable vapour interface the LED will flash the 2-and-3 status code.

Steady ON		Control Failure or Miswiring.*		
Slow Flash		Water Heater is in Stand-by Mode.		
Fast Flash		Water Heater is in Heat Mode.		
1 flash	Pause for 1 second	1 flash	Pause for 3 seconds & repeat	Ignition Failure.**
2 flashes		1 flash		Flammable Vapour Detected.*
2 flashes		3 flashes		Flammable Vapour Sensor Interface Failure or Miswiring.*
3 flashes		1 flash		Pressure Switch Fails to Open.***
3 flashes		3 flashes		Pressure Switch Fails to Close or Hi-Limit Switch is Open.***
4 flashes		1 flash		Line/Neutral Polarity Failure.***
4 flashes		2 flashes		ECO Failure.***
4 flashes		3 flashes		Flame is Present at the End of Heat Cycle.***
5 flashes		-		Vacation Mode.
<p>* System lock out. Call your service provider for assistance. ** Excessive moisture on the gas control/thermostat. *** System interruption/safety shutdown. Resettable lock out condition.</p>				

Resettable Lock Out: The gas control/thermostat can be reset by unplugging the power cord to remove power and then reinserting the plug to restore the power. Alternatively, the control will automatically attempt to reset after a 20 minute wait period. Also see “Troubleshooting Guide”.

Temperature Regulation

The temperature dial is adjusted to its lowest temperature position when shipped from factory.

The temperature of the water can be selected by setting of the temperature dial on the front of the gas control (see Figure 23). The large arrow position on the thermostat is the preferred starting point for setting the temperature control. Each division on the thermostat dial represents a 3°C (5°F) water temperature change. Energy conservation is a consideration when selecting the water temperature setting. For most economical operation, select a water temperature that is adequate for your needs. There is a hot water scald potential if the thermostat is set too high.

⚠ WARNING:
Risk of scalding
Hot water can produce third degree burns
in 6 seconds at60°C (140°F)
in 30 seconds at54°C (130°F)
in 5 minutes at49°C (120°F)

In households with children, disabled or the elderly, select a lower temperature setting. Valves for reducing point-of-use temperature by mixing hot and cold water are available. Consult a licensed plumber or the local plumbing authority.

Water Heater Operation

⚠ WARNING:

Keep the area around the heater clear and unobstructed.

Figure 24 shows the water heater's sequence of operation when a call for heat is initiated. The ignition control module will attempt to light the burner three times. If the ignition control does not detect ignition it will enter lockout mode, indicated by a three flash error code.

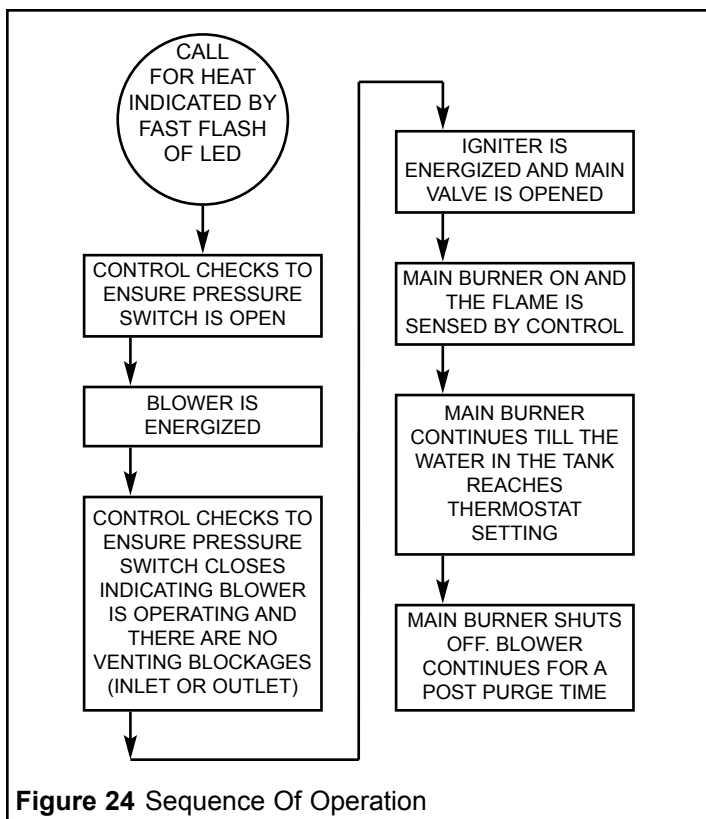


Figure 24 Sequence Of Operation

Burner Flames

Inspect the burner flames through the viewport and compare them to the drawings in Figure 25. A properly operating burner should produce a soft blue flame. Blue tips with light blue inner cones are satisfactory. The tips of the flame may have a slight yellow tint. The flame should not be all yellow or have a sharp blue-orange colour. Contaminated air may cause an orange coloured flame. Contact a qualified service technician if the flame is not satisfactory.

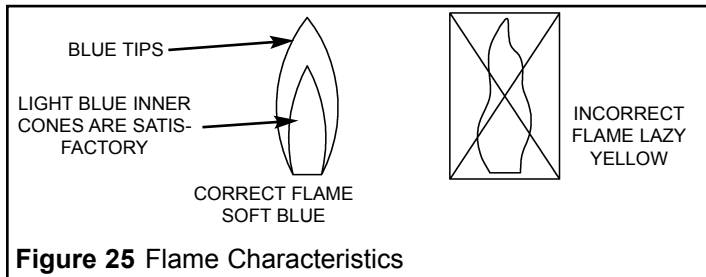


Figure 25 Flame Characteristics

Stacking

Stacking occurs when a series of short draws of hot water

(11 litres (3 US gallons) or less) are taken from the water heater tank. This causes increased cycling of the burner and can result in increased water temperatures at the hot water outlet. A tempering device is recommended in the hot water supply line to reduce the risk of scald injury.

Emergency Shut Down

Important: Should overheating occur or the gas supply fails to shut off, turn off the water heater's manual gas control valve and call a qualified service technician.

Operational Conditions

Condensation

Moisture from the products of combustion condenses on the tank surface and forms drops of water which may fall onto the burner or other hot surfaces. This will produce a "sizzling" or "frying" noise. This condensation is normal and should not be confused with a leaking tank. Condensation may increase or decrease at different times of the year.

High efficient energy saver water heaters will produce larger amounts of condensation on initial start-up or when a large amount of hot water is being used. Do not confuse this with a "tank leak". Once the water reaches a temperature of 49°C (120°F) and the tank warms up (usually 1-2 hours), the condensation will stop.

Important: It is always recommended that a suitable drain pan be installed under the water heater to protect the area from water damage resulting from condensation, a leaking tank or piping connections. Refer to "Location Requirements". Under no circumstances is the manufacturer to be held responsible for any water damage in connection with this water heater.

Water Heater Sounds

During the normal operation of the water heater, sounds or noises may be heard. These noises are common and may result from the following:

1. Normal expansion and contraction of metal parts during periods of heat-up and cool-down.
2. Condensation causes sizzling and popping within the burner area and should be considered normal.
3. Sediment buildup in the tank bottom will create varying amounts of noise and may cause premature tank failure. Drain and flush the tank as directed under "Draining and Flushing".

Smoke/Odour

The water heater may give off a small amount of smoke and odour during the initial start-up of the unit. This is due to the burning off of oil from metal parts of a new unit and will disappear after a few minutes of operation.

Anode Rod/Water Odour

Each water heater contains at least one anode rod, which will slowly deplete while protecting the glass-lined tank from corrosion and prolonging the life of the water heater. Once the anode is depleted, the tank will start to corrode, eventually developing a leak. Certain water conditions will cause a reaction between this rod and the water. The most common

complaint associated with the anode rod is a “rotten egg smell” produced from the presence of hydrogen sulfide gas dissolved in the water. **Do not remove this rod permanently as it will void any warranties, stated or implied.** A special anode can be ordered if water odour or discoloration occurs. **This rod may reduce, if not eliminate, water odour problems.** The water supply system may require special filtration equipment from water conditioning company to successfully eliminate all water odour problems. Artificially softened water is exceedingly corrosive because the process substitutes sodium ions for magnesium and calcium ions. The use of a water softener may decrease the life of the water heater tank. The anode rod should be inspected every year. If the rod is more than 50% depleted, the anode rod should be replaced.

To replace the anode:

1. Turn off gas supply to the water heater.
2. Shut off the water supply and open a nearby hot water faucet to depressurize the water tank.
3. Drain approximately 20 litres (5 US gallons) of water from tank (Refer to “Draining and Flushing” for proper procedures.) Close drain valve.
4. Remove old anode rod.
5. Use Teflon® tape or approved pipe sealant on threads and install new anode rod.
6. Turn on water supply and open nearby hot water faucet to purge air from water system.
7. Restart the water heater as directed under “Operating Your Water Heater.” See the “Repair Parts Illustration” for anode rod location.

VI) MAINTENANCE

Draining and Flushing

It is recommended that the tank be drained and flushed every 6 months to remove sediment that may build up during operation. The water heater should be drained if being shut down during freezing temperatures. To drain the tank, perform the following steps:

1. Turn off the gas to the water heater at the manual gas shut-off valve.
 2. Turn off the electrical supply to the water heater.
 3. Close the cold water inlet valve.
 4. Open a nearby hot water faucet.
 5. Connect a hose to the drain valve and terminate it to an adequate drain.
- Note:** The drain hose should be rated for at least 93°C (200°F). If the drain hose does not have this rating, open the cold water inlet valve and a nearby hot faucet until the water is no longer hot.
6. Open the water heater drain valve and allow all the water to drain from the tank. Flush the tank with water as needed to remove sediment.
 7. Close the drain valve, refill the tank, and restart the heater as directed under “Water Heater Operation”.

If the water heater is going to be shut down for an extended period, the drain valve should be left open.

Important: Condensation may occur when refilling the tank and should not be confused with a tank leak.

Routine Preventative Maintenance

Important: If you lack the necessary skills required to properly perform this visual inspection, you should not proceed, but get help from a qualified service technician.

At least annually, a visual inspection should be made of the venting and air supply system, piping systems and main burner. Check the water heater for the following:

- Build up of soot and carbon on the main burner. Check for a soft blue flame.
- Leaking or damaged water and gas piping.
- Presence of flammable or corrosive materials in the installation area.
- Presence of combustible materials near the water heater.
- Verify proper operation after servicing this water heater.

Venting System and Blower

Inspect the venting system periodically (minimum twice annually) to make certain that the vent passageways, vent terminal and blower assembly are free and unobstructed. Ensure that any condensate is draining freely. Clean as necessary.

- Inspect the vent piping, elbows and connections for signs of stress cracking or deterioration. Make certain the venting is free to move and that all pipe hangers and isolation supports are properly positioned and securely attached. Replace any broken components and rectify any installation problems.
- Particles, especially lint, can clog the vent blower wheel. This can be problematic, especially where condensation is present, as particles may adhere to the venting surfaces. These conditions can result in nuisance failures. In areas that have a high level of airborne particulate (e.g. lint, sawdust, process smoke, laundry areas, etc.) inspection and cleaning may need to be done more frequently. Clean the blower wheel and venting as required to ensure proper performance.
- Inspect the flue collector area for signs of corrosion. This can be an indication of contaminated air, a wet environment, poor burner set up, or high levels of condensation occurring at the flue collector. Determine and correct any poor operating conditions.

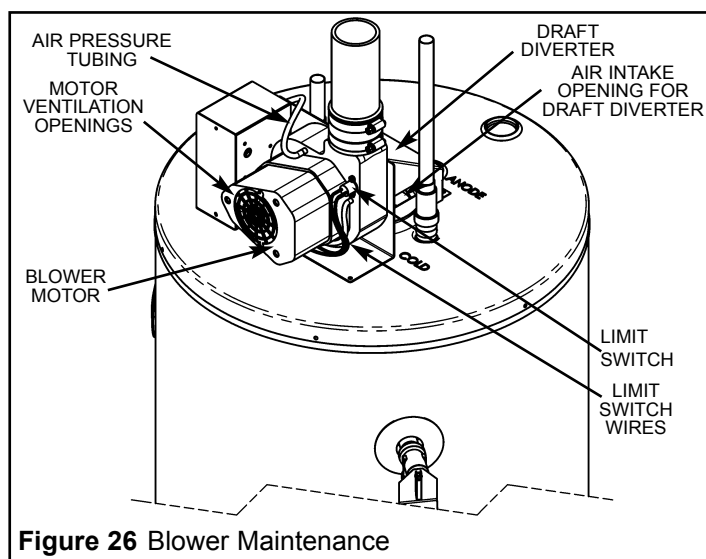


Figure 26 Blower Maintenance

Temperature and Pressure Relief Valve

⚠️ WARNING



Explosion Hazard

- If the temperature and pressure relief valve is dripping or leaking, have a licensed plumber repair it.
- Do not plug valve.
- Do not remove valve.
- Failure to follow these instructions can result in death or an explosion.

Manually operate the temperature and pressure relief valve at least once a year to make sure it is working properly (see Figure 27). To prevent water damage, the valve must be properly connected to a discharge line that terminates at an adequate drain. Standing clear of the outlet (discharged water may be hot), slowly lift and release the lever handle on the temperature and pressure relief valve to allow the valve to operate freely and return to its closed position. If the valve fails to completely reset and continues to release water, immediately shut off the manual gas valve and the cold water inlet valve and call a qualified service technician.

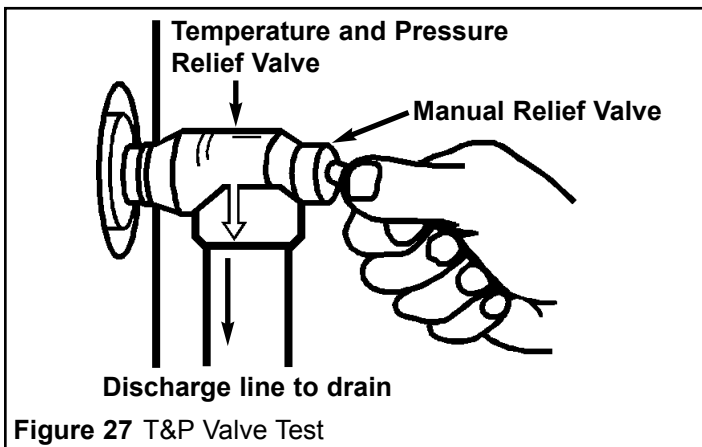


Figure 27 T&P Valve Test

Replacement Parts

Replacement parts may be ordered through your plumber or the local distributor. When ordering replacement parts, always have the following information ready:

1. model, serial and product number
2. type of gas
3. item number
4. parts description

See "Replacement Parts Illustration" for a list of available repair parts.

VII) COMBO HEATING

⚠️ WARNING:

Keep the area around the heater clear and unobstructed.

This section serves as a guide for the installation and use of "Combo" heating systems utilizing a domestic water heater that has been specifically approved for such use. It is written for those knowledgeable in the required trades and professionals involved in the design and installation of Combo Heating Systems.

It is the responsibility of the installer/designer to follow all applicable codes to ensure the effectiveness and safety of the installation.

Read Before Proceeding

⚠️ CAUTION:

Keep safety your first priority. Take all precautions to avoid creating a fire, health or safety hazard.

The following requirements must be met for the installation of Combo Heating Systems:

1. All components used for the distribution of water in the heating loop must be suitable for potable water. These include all piping, fittings, solder and fluxes, pumps for circulation of water, valves, etc.
2. The water heater **must not** be connected to a hydronic heating system that has been used previously.
3. No boiler treatment chemicals of any kind shall be introduced into the system.
4. The Combo System components must be selected and sized to meet and maintain the total calculated demands for both domestic service hot water and space heating requirement. The sizing and installation must be performed in accordance with good engineering practice such as "ASHRAE Handbooks", HRAI, "Hydronics Institute Manuals", CSA B149.1, NFPA 54, ANSI Z223.1, CSA F280, National/Provincial Building Codes, CSA C22.1, ANSI/NFPA 70, CSA B51 and/or codes having jurisdiction.
5. The air handler (fan coil) and/or the circulating pump in a baseboard hydronic loop will require a dedicated 120V circuit. This must be provided and identified for this purpose.
6. All piping between the water heater and the air handler or hydronic baseboard loop must be adequately insulated to reduce heat loss.
7. If the local jurisdiction requires a back-flow preventer in the cold water line, an expansion tank of adequate size must be installed.
8. "Combo" Heating Systems require higher water temperatures than other applications. When the system is used to supply water for Combo Heating applications, a means, such as mixing valve, must be installed to temper the water in order to reduce scald hazard potential (see Figures 28 & 29).

Installation

The heating mode may be one of the following options:

- A. A fan coil/air handler (Figure 28).
- B. A hydronic baseboard (finned tube) loop/In floor heating (Figure 29).

The following is a list of requirements for the installation of the heating loop to the water heater.

1. Install shut-off valves and unions so that the water heater can be isolated from the heating module should servicing of the water heater become necessary.
2. Install a drain valve at the lowest point of the heating loop so that water can be drained from the heating module without affecting the water heater.
3. If the air handler does not have a venting means at the highest point of the piping arrangement, install an air bleed at the highest point of the plumbing arrangement.

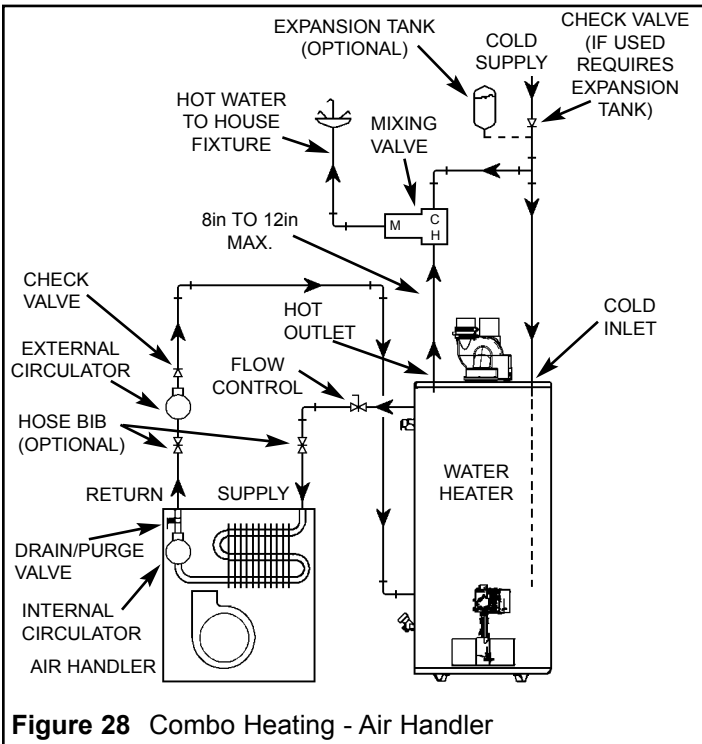


Figure 28 Combo Heating - Air Handler

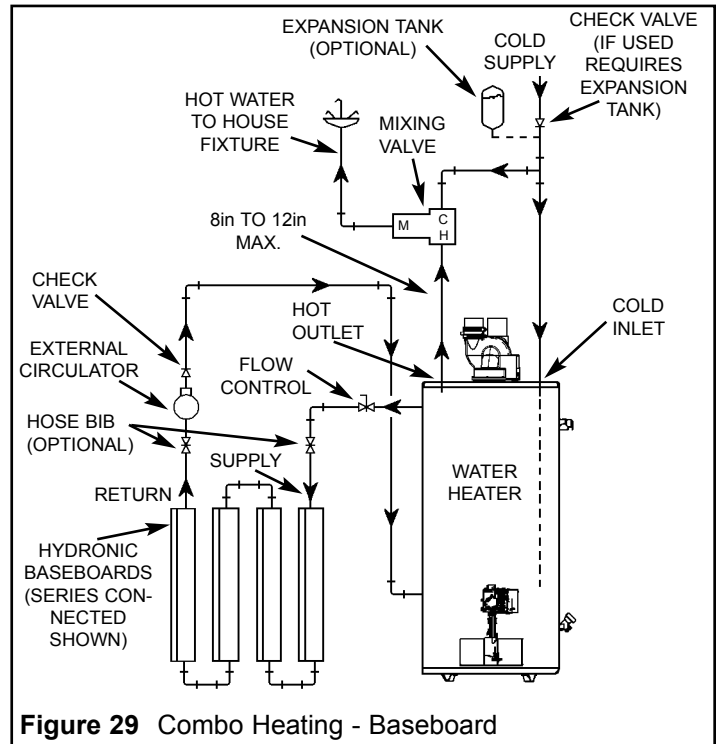
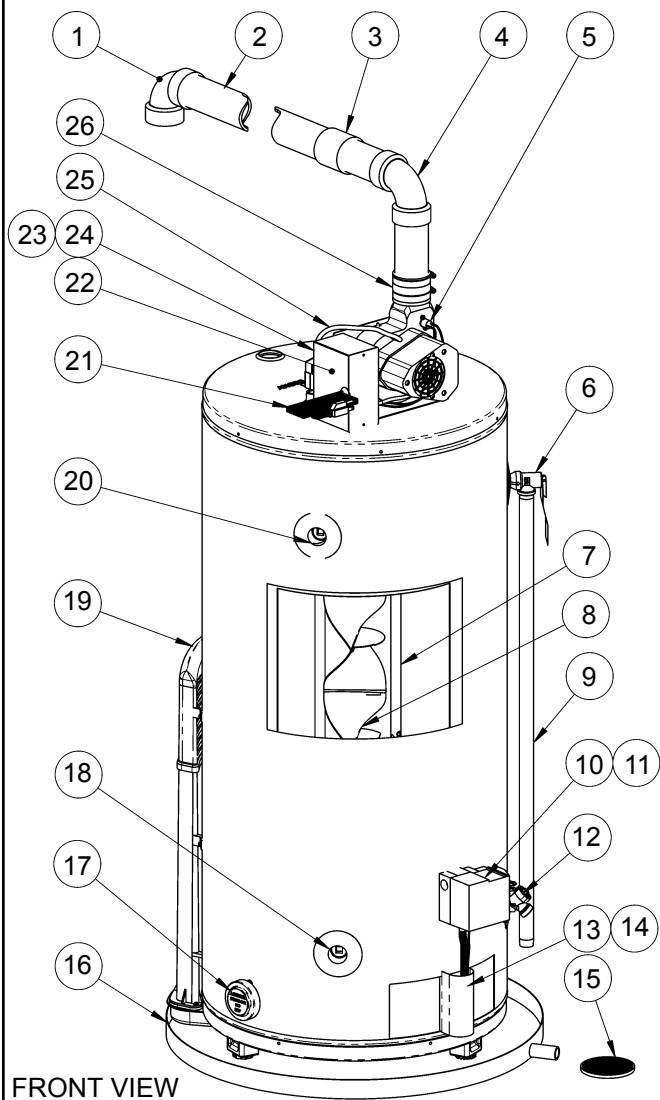


Figure 29 Combo Heating - Baseboard

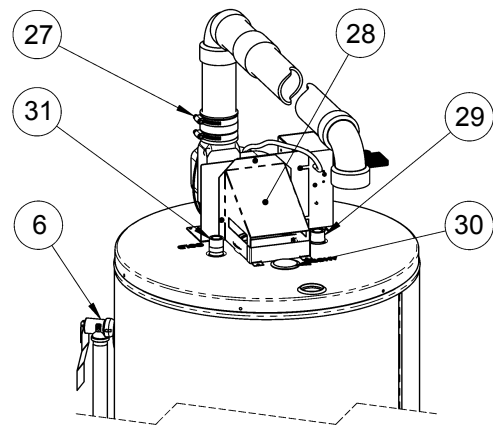
VIII) TROUBLESHOOTING GUIDE (Robertshaw 2000WDER)

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
BLOWER WILL NOT START.	<ol style="list-style-type: none"> 1. No Power to unit. 2. Thermostat setting too low. 3. Defective air pressure switch (must be open at start-up before blower is energized). 4. Defective blower. 5. Disconnected or loose wire. 6. Control locked-out. 	<ol style="list-style-type: none"> 1. Plug in power cord, check fuses/supply voltage. 2. Increase thermostat temperature setting. 3. Replace air pressure switch. 4. Replace blower. 5. Repair/reconnect wires. 6. Reset – determine cause of lockout.
BLOWER RUNS CONTINUOUSLY.	<ol style="list-style-type: none"> 1. Air pressure switch not closing due to insufficient draft - check for: <ol style="list-style-type: none"> a) vent piping blocked, b) piping length too long, c) frozen vent termination, d) clogged/dirty blower. 2. Disconnected, torn or blocked pressure sensing tubing from air pressure switch to blower housing. 3. Air pressure switch not closing due to defective switch. 4. High limit switch open due to excessive vent temperature or defective switch. 	<ol style="list-style-type: none"> 1. Determine cause of insufficient draft. Check draft with manometer at pressure switch (refer to Table 2 for minimum acceptable draft settings). <ol style="list-style-type: none"> a) remove blockage, b) reduce vent length/increase vent size, c) clear termination of snow/ice, d) clean blower wheel. 2. Reconnect or replace pressure sensing tubing. 3. Replace defective pressure switch. 4. Determine cause of overheating check for: overfiring, insufficient air supply, high ambient air temperature (once activated high limit must be replaced).
HOT SURFACE IGNITER NOT GLOWING FOLLOWING WARM-UP PERIOD.	<ol style="list-style-type: none"> 1. 120VAC polarity reversed at 120VAC outlet receptacle. 2. Defective hot surface igniter. 3. Defective Control. 4. Defective Flammable Vapour Sensor. 	<ol style="list-style-type: none"> 1. Reverse polarity at 120VAC outlet receptacle. 2. Replace igniter (Check for 120 VAC supply to igniter across I1 & I2). 3. Replace control. 4. Replace Flammable Vapour Sensor.
CONTROL LOCKED-OUT.	<ol style="list-style-type: none"> 1. No gas supply. 2. Gas control switch in “OFF” position. 3. Insufficient gas supply. 4. Incorrect manifold gas pressure. 5. Incorrect gas type. 6. Defective igniter/loose or disconnected wire. 7. Improperly positioned, dirty, or defective flame rod/loose or disconnected wire. 8. Burner orifice clogged. 9. Blocked water heater flue. 10. Defective control. 11. Defective Flammable Vapour Sensor. 	<ol style="list-style-type: none"> 1. Check/turn on gas supply. 2. Turn control switch to “ON” position. 3. Ensure correct supply pressure for gas type (Nat Gas 7.0 in. w.c. (1.74 kPa)) (Propane 11.0 in. w.c. (2.74 kPa)). 4. Check/adjust for correct manifold gas pressure (NG 3.5 in. w.c.(0.87 kPa)), (Propane 10.0 in. w.c. (2.49 kPa)). 5. Ensure correct gas type for water heater model. 6. Replace defective igniter/reconnect wiring. 7. Reposition, clean, or replace defective flame rod/reconnect wiring. 8. Remove obstruction. 9. Remove blockage/clean flue. 10. Replace Control. 11. Replace Defective Flammable Vapour Sensor.
CONTROL LOCKED-OUT. *SOLID GREEN LED.	<ol style="list-style-type: none"> 1. Internal control fault. 2. ECO failure – excessive water temperature. 3. Excessive humidity/damp environment. 	<ol style="list-style-type: none"> 1. Replace control. 2. Replace control. 3. Allow control to dry.

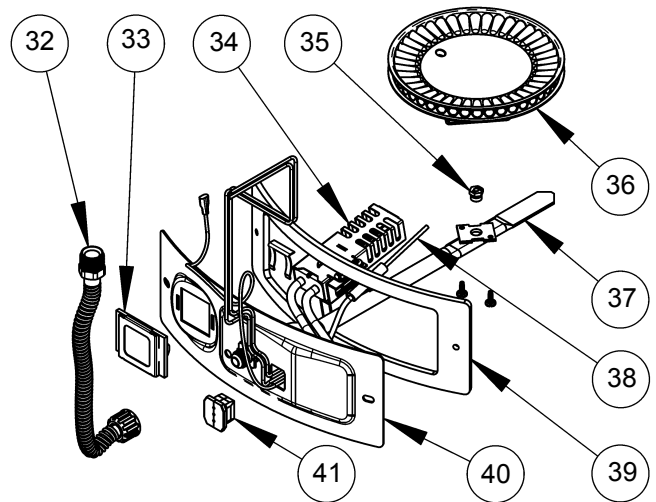
IX) PARTS REFERENCE ILLUSTRATION



FRONT VIEW



REAR VIEW



1. Vent Termination Elbow with Rodent Screen
2. **Vent Pipe
3. **Vent Pipe Coupling (if required)
4. **Vent Pipe Elbow (long radius)
5. Limit Switch
6. T&P Valve
7. Driptube
8. Baffle Assembly
9. Driptube
10. Gas Control/Thermostat
11. Gas Control/Thermostat Cover
12. Drain Valve
13. Outer Gas Door
14. Manifold Door Assembly (behind outer door)
15. Floor Drain
16. **Drain Pan
17. Flammable Vapour Sensor (under cover)
18. Combo Heating System Return Inlet (Optional)
19. Air Inlet Snorkel
20. Combo Heating System Supply Outlet (Optional)
21. Power Cord

22. Air Switch (inside box)
23. Junction Box
24. Junction Box Cover
25. Air Tubing
26. Rubber Coupling
27. Gear Clamp
28. Draft Diverter
29. Hot Water Outlet Nipple
30. Anode (under cap)
31. Cold Water Inlet Nipple
32. Flexible Manifold Tube
33. Viewport
34. Hot Surface Igniter
35. Gas Orifice
36. Sheet Metal Burner
37. Gas Manifold
38. Flame Sensor Rod
39. Manifold Door Gasket
40. Manifold Door
41. Two Piece Grommet With Clip

** **Items not supplied with the water heater.**

Figure 29 Parts Reference

~ Certificate of Warranty ~

See Rating Label Serial Number prefix for Warranty Code. Reduced warranty period applies to Newfoundland.

Warranty Code:	P	R	S	T	U	V	W	Y
Standard Warranty Years:	3	5	6	7	8	9	10	12
Reduced Warranty Years:	2	3	3	5	5	5	5	7

For its GSW and John Wood water heaters and storage boosters ("Unit"), GSW Water Heating ("GSW") warrants that, upon receipt of a properly verified Warranty claim within the Warranty Period, it will, at its election, repair or replace: units which leak or parts which are defective in material or workmanship, subject to the terms and conditions set forth in this certificate. GSW will not assume any expense or liability for unauthorized returns, nor repairs made by a person who has not been authorized by GSW or one of its authorized dealers. GSW Units/parts must be replaced with GSW or John Wood products to be eligible for Warranty. This Warranty is available to the original owner of a Unit installed within the boundaries of continental United States, of Canada, or their territories. **Consumers must retain point-of-sale proof of purchase to validate warranty entitlement.** This Warranty does not cover components not manufactured by GSW, such as oil burners, which carry the warranty given by the manufacturer thereof, copy of which warranty GSW will make available, to the extent supplied by the manufacturer, without recourse to GSW.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THIS EXPRESS WARRANTY IS, WHERE PERMITTED BY LAW, IN LIEU OF AND EXCLUDES AND REPLACES ALL OTHER CONDITIONS, WARRANTIES, GUARANTEES, REPRESENTATIONS, OBLIGATIONS OR LIABILITIES OF GSW OF ANY NATURE OR KIND, EXPRESS OR IMPLIED, HOWEVER ARISING (WHETHER BY CONTRACT, CONDUCT, STATEMENT, STATUTE, NEGLIGENCE, PRINCIPLES OF MANUFACTURER'S LIABILITY, OPERATION OF LAW OR OTHERWISE) WITH RESPECT TO THE UNIT OR ITS FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INSTALLATION, OPERATION, REPAIR OR REPLACEMENT. GSW EXPRESSLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES. IN NO EVENT WILL GSW'S LIABILITIES EXCEED THE COST OF THE DEFECTIVE PART(S) OR UNIT. GSW WILL NOT PAY FOR ANY TRANSPORTATION, LABOUR, INSTALLATION, OR OTHER INCIDENTAL COSTS ASSOCIATED WITH THE REPAIR OR REPLACEMENT OF A DEFECTIVE PART OR UNIT.

This warranty and GSW's obligations shall be construed and determined in accordance with the laws of both the Province of Ontario, and of Canada in force therein. This Warranty does not affect specific legal rights of a consumer under applicable law, except to the extent that such rights may be waived or replaced, and the provisions hereof are deemed to be amended to the extent necessary. The unenforceability of any provision, in whole or in part, of this Certificate shall not affect the remaining provisions. Any and all repair and/or replacement of part(s) or Unit are the sole and exclusive remedy available against GSW.

LIABILITY OF GSW COVERED BY THIS WARRANTY IS CONDITIONAL UPON THE FOLLOWING:

1. The Unit shall be installed in accordance with all manufacturers' instructions, all applicable equipment and building codes, ordinances and regulations (hereinafter referred to as the "standards").
2. The Unit must not be installed where water damage can result from a leak, while provision(s) shall be made for directing any water escaping from the Unit, to a properly operating drainpipe. As all units of this type may eventually leak, you must protect against any potential water damage. GSW accepts no responsibility for such damage, nor any incidental or consequential loss, nor damage(s) related thereto, suffered by the owner of the Unit nor by any third party.
3. The Unit shall not be installed where it will be exposed to adverse or unusual environmental or corrosive conditions. No warranty extends, for example, and without limitation of the foregoing, to Units exposed to: salts; chemicals; exhausts; pollutants or contaminants. Further, no warranty extends to Units affected by fire, freezing or flood, "Acts of God", or any other contingency beyond the control of GSW.
4. The Unit shall be equipped with a properly operating temperature and pressure relief valve as specified by GSW and applicable standards. The Unit shall be operated at temperatures not exceeding the maximum setting of the thermostat and/or high limit control provided by GSW, and at water pressures not exceeding the pressure reading stated on the Unit.
5. The Unit must be carefully inspected, maintained, and operated in accordance with the manufacturer's instructions. No warranty extends, for example, and without limitation of the foregoing, to any Unit operated: without the tank being completely filled with water; without an operating anode; with levels of sediment or lime precipitate which cause failure; in connection to any attachment(s), energy saving device(s), or other means of heating, except as approved by GSW for the Unit; other than with potable water without any additives such as salts, chlorine or chemicals, except those added for the sole purpose of rendering the water fit for domestic use.
6. All repairs must be made by a competent and qualified person who is certified, by GSW or one of its authorized dealers, to work on the Unit, using factory approved replacement parts, and the Unit shall not be otherwise modified, altered or improperly repaired.
7. A properly documented claim shall be received by GSW or one of its authorized dealers, or point of purchase, within the following Warranty Period, except as provided otherwise below*:
 - a) for any defective part, within one (1) year; or
 - b) for any Unit that develops leaks in the inner tank due to rust, corrosion or other chemical reactions caused by the potable domestic water supplied to your home, within the period of time shown in table at the top of this page.

* Residential units installed and used in a commercial application carry a warranty period of one (1) year from date of installation; and, Any repair or replacement of any part, tank, or Unit under this Warranty will not extend the Warranty Period beyond that calculated from the date of first installation of the original Unit. The date of first installation will be deemed to be the later of the date indicated by the Unit's serial number, or if supplied with the Warranty claim, the sales receipt, or installer's receipt.
8. A claim under this Warranty must include the model and serial number of the Unit, proof of date on which the Unit was first installed, and the identity of the defective part(s) for which a claim is being made and be submitted within 15 days following discovery of the defect(s), by personal delivery to a GSW authorized dealer, point of purchase, or GSW itself at:

GSW Water Heating
599 Hill Street West
Fergus, ON Canada N1M 2X1

Should you have questions, please call our Technical Support Line at **1-888-479-8324**.
9. If requested by GSW, information relating to the purchase, transportation, operation and installation of the Unit must be supplied. The defective part(s) or Unit, with all components properly and securely packed, shall be returned transportation pre-paid, to the address designated by GSW in the written request. All claims are subject to validation by GSW.