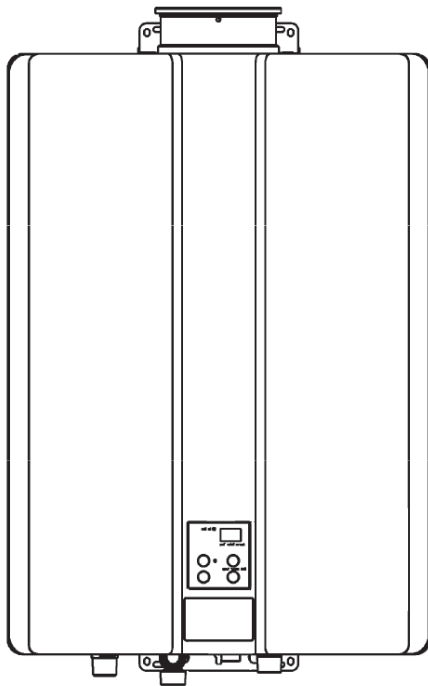


DIRECT VENT TANKLESS WATER HEATERS OWNER'S MANUAL INSTALLATION AND OPERATING INSTRUCTIONS

**FOR INDOOR
APPLICATIONS ONLY**

**UGTC-199N
UGTC-199P
UGTC-152N
UGTC-152P**



ANSI Z21.10.3 • CSA 4.3

⚠ WARNING

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

DO NOT store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

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.
- **From a neighbor's phone, immediately call your gas supplier.** Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

IMPORTANT

READ ALL OF THE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR OPERATING THIS WATER HEATER. THIS MANUAL PROVIDES INFORMATION ON THE INSTALLATION, OPERATION, AND MAINTENANCE OF THE WATER HEATER. FOR PROPER OPERATION AND SAFETY IT IS IMPORTANT TO FOLLOW THE INSTRUCTIONS AND ADHERE TO THE SAFETY PRECAUTIONS. A LICENSED PROFESSIONAL MUST INSTALL THE WATER HEATER ACCORDING TO THE EXACT INSTRUCTIONS. **THE CONSUMER MUST READ THE ENTIRE MANUAL TO PROPERLY OPERATE THE WATER HEATER AND TO HAVE REGULAR MAINTENANCE PERFORMED.**

For your records, write the model and serial number here:

Model # _____

Serial # _____



TABLE OF CONTENTS

Safety Information	2	Installation Instructions (continued)	28
Safety Behaviors	3	Installation of Plumbing	29
Installation Instructions	4	Connect Water Heater to Water Supply	29
Installer Qualifications	4	Checklist for Plumbing	29
General Instructions	4	Installation of Gas Supply	31
Determine Installation Location	5	General Instructions	31
Vent Termination Clearances	6	Connect Electricity	32
Additional clearances	7	Adjust for High Altitude (United States)	32
Unit clearances	8	Adjust for High Altitude (Canada)	32
Freeze Protection	8	Adjust for Vent Length	33
Maximum vent length	8	Checklist for Gas and Electricity	33
Checklist to Determine Installation Location	9	Installation of Temperature Controller	33
Mount to Wall	9	Final Installation Checklist	34
Remove the Front Panel	9	Technical Data	35
Installation of Venting	10	Specifications	35
Venting Guidelines	10	Dimensions	36
Flue Installation with Centrotherm Venting	12	Recirculation Mode	38
Condensate	12	Wiring Diagram	40
Checklist for Venting and Condensate	13	Operating Instructions	41
Twin Pipe Venting Guide	13	Consumer Operation Guidelines for the	
Installation Instructions	14	Safe Operation of your Water Heater	41
Determine Installation Location	15	How to Use the Temperature Controller	42
Determining Vent Length	15	How to Set the Temperature	42
Adaptor Installation	19	Troubleshooting Guide	44
Certified PVC/CPVC Vent Termination Options	20	Diagnostic Codes and Remedies	44
Acceptable Venting Clearances For IPEX Concentric		System Maintenance	46
Vent Kit (CVK) Termination	22	Flushing the Heat Exchanger	47
Venting Installation Sequence	23	Manual Draining of the Water Heater	48
Twin Pipe (PVC/CPVC) Terminations	24	Running a low volume of water through the water heater	
PVC/CPVC Roof (Tee and upside down "U")		to prevent freezing	48
Terminations	25	When the water heater or external piping has frozen . . .	48
		Regulations	49
		Warranty	50

NOTE: Giant sometimes shares customer contact information with businesses that we believe provide products or services that may be useful to you. By providing this information, you agree that we can share your contact information for this purpose. If you prefer not to have your information shared with these businesses, please contact customer service and ask not to have your information shared. We will however, continue to contact you with information relevant to the product(s) you registered and/or you account with us. Should you have any questions or feel that the manual is incomplete, please contact Giant at 1-800-363-9354.

SAFETY INFORMATION

Your safety and the safety of others is extremely important during the installation, operation, and servicing of this water heater. Many safety related messages have been provided in this manual and on your water heater. Always read and obey all safety messages. These messages will point out the potential hazard, tell you how to reduce the risk of injury, and tell you what will happen if the instructions are not followed.



This is the safety alert symbol. This symbol alerts you to potential hazards that can kill or hurt you and others.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

SAFETY BEHAVIORS

⚠ WARNING

- 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.
- Keep the area around the appliance clear and free from combustible materials, gasoline, and other flammable vapors and liquids.
- Combustible construction refers to adjacent walls and ceiling and should not be confused with combustible or flammable products and materials. Combustible and/or flammable products and materials should never be stored in the vicinity of this or any gas appliance.
- Always check the water temperature before entering a shower or bath.
- To protect yourself from harm, before performing maintenance:
 - * Turn off the electrical power supply by unplugging the power cord or by turning off the electricity at the circuit breaker. (The temperature controller does not control the electrical power.)
 - * Turn off the gas at the manual gas valve, usually located immediately below the water heater.
 - * Turn off the incoming water supply. This can be done at the isolation valve immediately below the water heater or by turning off the water supply to the building.
- Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, do not try to repair it; call a licensed professional. Force or attempted repair may result in a fire or explosion.
- Do not use this appliance if any part has been under water. Immediately call a licensed professional to inspect the appliance and to replace any part of the control system and any gas control which has been under water.
- Do not use substitute materials. Use only parts certified with the appliance.
- Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the appliance.
- Do not adjust the DIP switch unless specifically instructed to do so.
- Do not use an extension cord or an adapter plug with this appliance.
- Any alteration to the appliance or its controls can be dangerous and will void the warranty.

⚠ CAUTION

- **BURN HAZARD.** Hot exhaust and vent may cause serious burns. Keep away from the water heater unit. Keep children and animals away from the unit.
- Hot water outlet pipes leaving the unit can be hot to touch. In residential applications, insulation must be used for hot water pipes below thirty-six (36) inches (91.4 cm) due to burn risk to children.

California law requires this notice to be provided:

California Proposition 65 lists chemical substances known to the state to cause cancer, birth defects, death, serious illness, or other reproductive harm. This product may contain such substances, be their origin from fuel combustion (gas, oil), or components of the product itself.



Hot water can be dangerous, especially for infants or children, seniors, or disabled people. There is hot water scald potential if the thermostat is set too high.

Water temperatures over 125°F (52°C) can cause severe burns or scalding resulting in death.

Hot water can cause first degree burns with exposure for as little as:

Three (3) seconds at 140°F (60°C)

Twenty (20) seconds at 130°F (54°C)

Eight (8) minutes at 120°F (49°C)

Test the temperature of the water before placing a child in the bath or shower.

⚠ WARNING

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

INSTALLATION INSTRUCTIONS

Installer Qualifications

A licensed professional must install, inspect, and leak test the appliance before use. The warranty will be voided due to improper installation.

The installer should have skills such as:

- gas sizing
- connecting gas lines, water lines, valves, electricity
- knowledge of applicable national, provincial, and local codes
- installing venting through a wall or roof

If you lack these skills, contact a licensed professional.

Type of installation

- For installation in residential and commercial applications.
- You must follow the installation instructions for adequate combustion air intake and exhaust.

General Instructions

DO NOT

- Do not install the UGTC-152 or the UGTC-199 outdoors.
- Do not install the appliance in an area where water leakage of the unit or connections will result in damage to the area adjacent to the appliance or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the appliance. The pan must not restrict combustion air flow.
- Do not obstruct the flow of combustion and ventilation air. Combustion air shall not be supplied from occupied spaces.
- Do not use this appliance in an application such as a pool or spa heater that uses chemically treated water. (This appliance is suitable for filling large or whirlpool spa tubs with potable water.)
- Do not use substitute parts that are not authorized for this appliance.

MUST DO

- The installation must conform with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1.
- When installed, the appliance must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70, or the Canadian Electrical Code, CSA C22.1.
- The appliance and its appliance main gas valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psi (3.5 kPa) (13.84 in W.C.).
- The appliance must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psi (3.5 kPa) (13.84 in W.C.).
- You must follow the installation instructions for adequate combustion air intake and exhaust.

INFORMATION

- If a water heater is installed in a closed water supply system, such as one having a backflow preventer in the cold water supply line, means shall be provided to control thermal expansion. Contact the water supplier or local plumbing inspector on how to control thermal expansion.
- Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the appliance.
- Keep the air intake location free of chemicals such as chlorine or bleach that produce fumes. These fumes can damage components and reduce the life of your appliance.

Table 1

Prepare for installation	
Parts included	
• Tankless water heater	• MC-91-2 temperature controller (integrated into the front panel)
Tools needed	
• Pipe wrenches (2)	• Gloves
• Adjustable pliers	• Safety glasses
• Screwdrivers (2)	• Level
• Wire cutters	• Manometer
Tools that might be needed	
• Hammer drill with concrete bits	• Core drill with diamond head
• Saw	• Torch set
• Threading machine with heads and oiler	• Copper tubing cutter
	• Steel pipe cutter
Materials needed	
• Soap solution	• Teflon tape (recommended) or pipe compound
• Approved venting	
Materials that may be needed	
• Heat tape	• 5/8" ID PVC flexible tubing
• Pipe insulation	• Two (2) conductor 22 AWG wires for controller
• Electrical wire and conduit per local code	• Single gang electrical box
• Concrete wall anchors	• Wire nuts
• Optional pipe cover	• Unions and drain valves
• Optional temperature controller	

INSTALLATION INSTRUCTIONS

Determine Installation Location

You must ensure that clearances will be met and that the vent length will be within required limits. Consider the installation environment, water quality, and need for freeze protection. Requirements for the gas line, water lines, electrical connection, and condensate disposal can be found in their respective installation sections of this manual.

Water Quality

Consideration of care for your water heater should include evaluation of water quality.

Water that contains chemicals exceeding the levels below will affect and damage the heat exchanger. Replacement of the heat exchanger due to water quality damage is not covered by the warranty.

Table 2

	Maximum Level
Total Hardness	Up to 200 mg / L
Aluminum *	Up to 0.2 mg / L
Chlorides *	Up to 250 mg / L
Copper *	Up to 1.0 mg / L
Iron *	Up to 0.3 mg / L
Manganese *	Up to 0.05 mg / L
pH *	6.5 to 8.5
TDS (Total Dissolved Solids) *	Up to 500 mg / L
Zinc *	Up to 5 mg / L

* Source: Part 143 National Secondary Drinking Water Regulations.

If you install this water heater in an area that is known to have hard water or that causes scale build-up, the water must be treated and/or the heat exchanger flushed regularly.

When scale build-up in the heat exchanger begins to affect the performance of the water heater, the diagnostic code "LC #" will display. Flush the heat exchanger to prevent damage to it. Scale build-up is caused by hard water set at a high temperature.

Environment

Air surrounding the water heater, venting, and vent termination(s) is used for combustion and must be free of any compounds that cause corrosion of internal components. These include corrosive compounds that are found in aerosol sprays, detergents, bleaches, cleaning solvents, oil based paints/varnishes, and refrigerants. The air in beauty shops, dry cleaning stores, photo processing labs, and storage areas for pool supplies often contains these compounds.

The water heater, venting, and vent termination(s) should not be installed in any areas where the air may contain these corrosive compounds. If it is necessary for a water heater to be located in areas which may contain corrosive compounds, the following instructions are strongly recommended.

IMPORTANT CONSIDERATIONS FOR:

Indoor/Internal Water Heaters and Vent Terminations of Indoor/Internal Water Heaters

- **DO NOT** install in areas where air for combustion can be contaminated with chemicals.
- Before installation, consider where air has the ability to travel within the building to the water heater.
- Where possible, install the water heater in a sealed closet so that it is protected from the potential of contaminated indoor air.
- Chemicals that are corrosive in nature should not be stored or used near the water heater.
- Install the water heater termination as far away as possible from exhaust vent hoods.
- Install the water heater termination as far away as possible from air inlet vents. Corrosive fumes may be released through these vents when air is not being brought in through them.
- Chemicals that are corrosive in nature should not be stored or used near the water heater or vent termination.

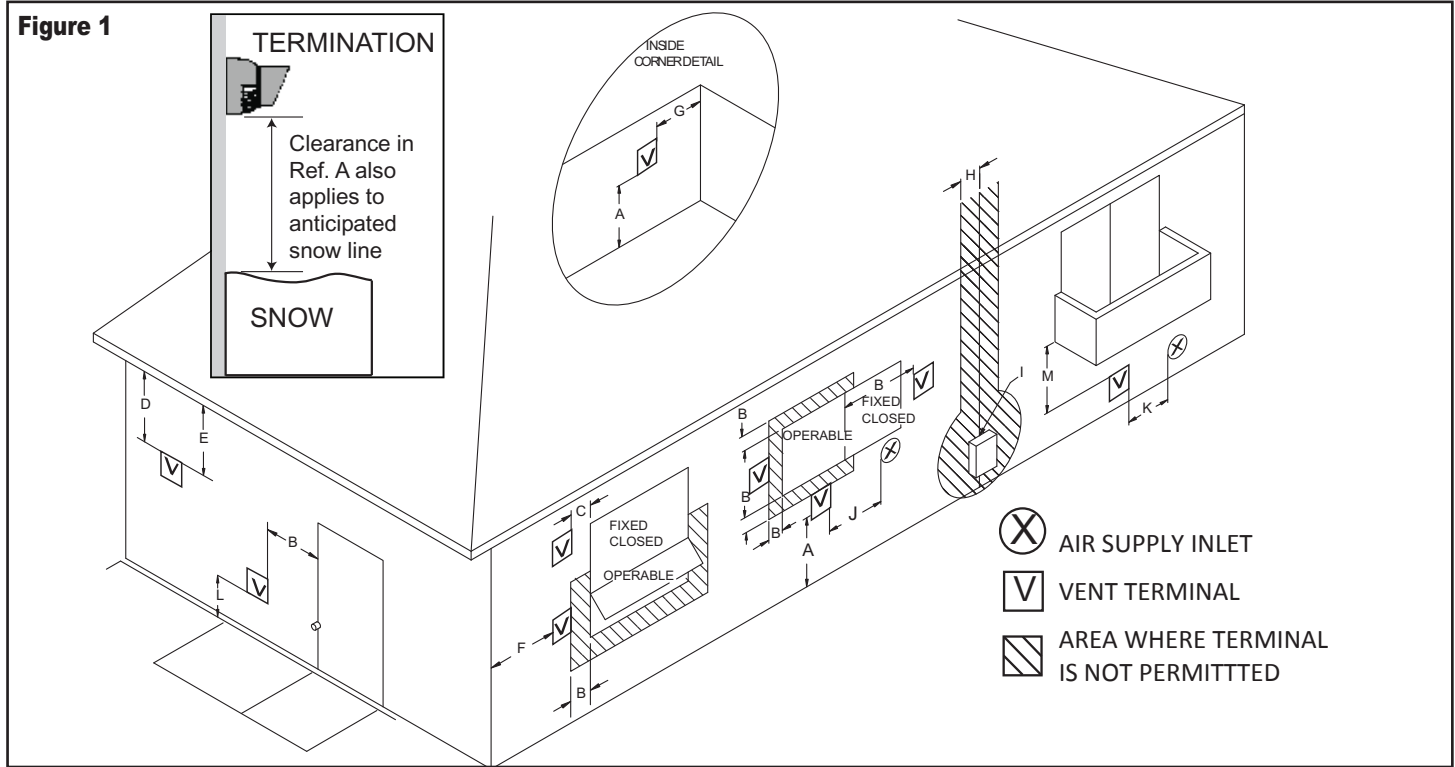
Damage and repair due to corrosive compounds in the air is not covered by warranty.

INSTALLATION INSTRUCTIONS

Vent Termination Clearances

You must install a vent termination to bring in combustion air and expel exhaust.

Figure 1



The Vent Termination must have a:

	Canadian Installations	U.S. Installations
A) Clearance above grade, veranda, porch, deck, or balcony ¹	12 inches (30 cm)	12 inches (30 cm)
B) Clearance to window or door that may be opened	36 inches (91 cm)	12 inches (30 cm)
C) Clearance to permanently closed window	*	*
D) Vertical clearance to ventilated soffit, located above the terminal within a horizontal distance of two (2) feet (61 cm) from the center line of the terminal	*	*
E) Clearance to unventilated soffit	*	*
F) Clearance to outside corner	*	*
G) Clearance to inside corner	*	*
H) Clearance to each side of center line extended above meter/regulator assembly	3 feet (91 cm) within a height of 15 feet (4.5 m) above the meter/ regulator assembly	*
I) Clearance to service regulator vent outlet	36 inches (91 cm)	*
J) Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	36 inches (91 cm)	12 inches (30 cm)
K) Clearance to a mechanical air supply inlet	6 feet (1.83 m)	3 feet (91 cm) above if within 10 feet (3 m)
L) Clearance above paved sidewalk or paved driveway located on public property	7 feet (2.13 m) ¹	*
M) Clearance under veranda, porch, deck, or balcony	12 inches (30 cm)*	*

¹ A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

* For clearances not specified in ANSI Z223.1/NFPA 54, clearances are in accordance with local installation codes and the requirements of the gas supplier. Clearance to opposite wall is twenty-four (24) inches (61 cm).

INSTALLATION INSTRUCTIONS

Additional clearances

Check on whether local codes supersede these clearances.

- Avoid termination locations near a dryer vent.
- Avoid termination locations near commercial cooking exhaust.
- You must install a vent termination at least twelve (12) inches (30.5 cm) from the ground.

The vent for this appliance shall not terminate:

- Over public walkways; or
- Near soffit vents or crawl space vents or other area where condensate or vapor could create a nuisance or hazard or cause property damage; or
- Where condensate or vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment. **Important considerations** for locating vent termination under a soffit (ventilated or unventilated or eave vent; or to a deck or porch);
- Do not install vent termination under a soffit vent such that exhaust can enter the soffit vent;
- Install vent termination such that exhaust and rising moisture will not collect under eaves. Discoloration to the exterior of the building could occur, if installed too close;
- Do not install the vent termination too close under the soffit where it could present recirculation of exhaust gases back into the combustion air intake part of the termination.

Figure 2

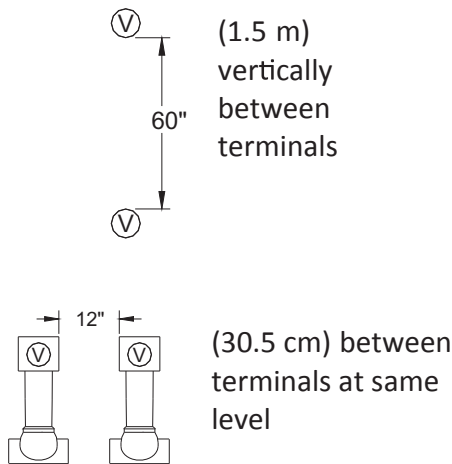


Figure 3

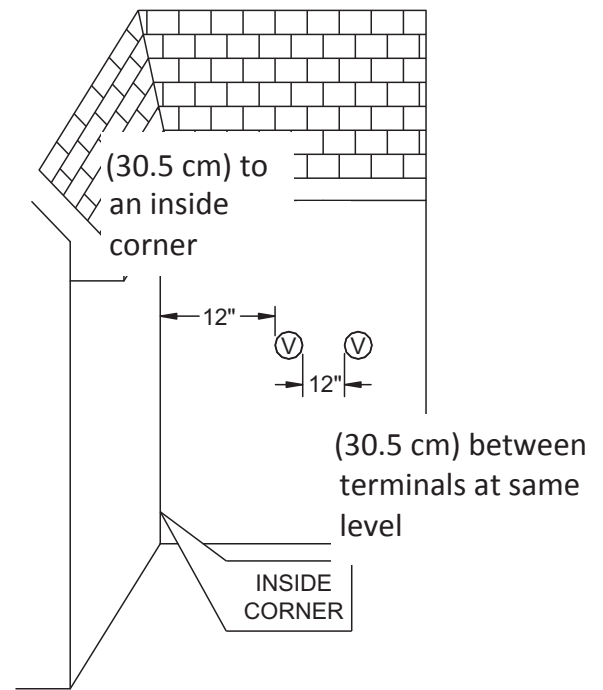


Figure 4

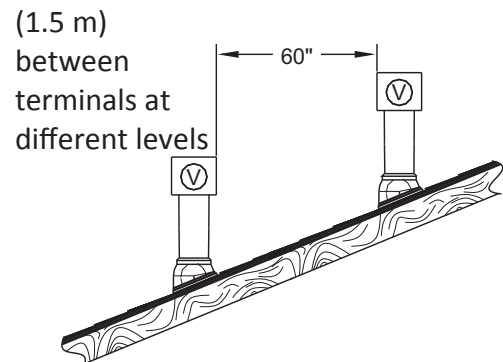
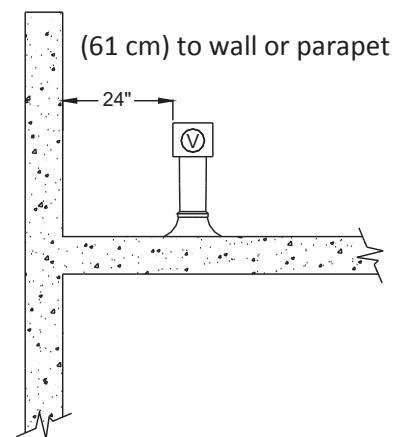


Figure 5



INSTALLATION INSTRUCTIONS

Unit clearances

Figure 6

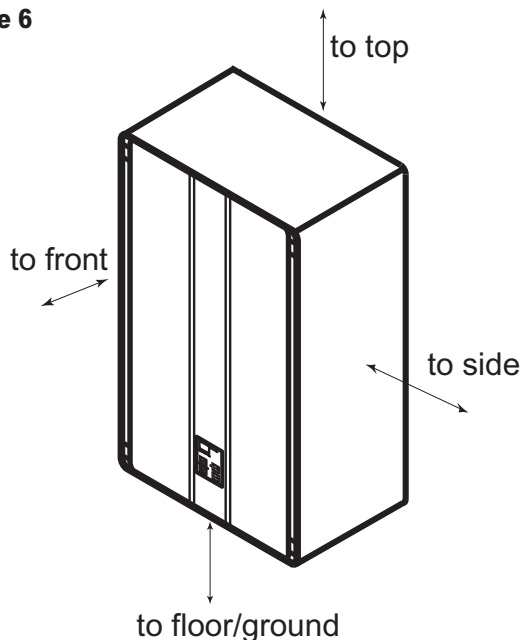


Table 3

	to Combustibles inches (cm)	to Non Combustibles inches (cm)
Top of Heater	6 * (15.2)	2 *(5.1)
Back of Heater	0 (zero)	0 (zero)
Front of Heater	6 (15.2)	6 (15.2)
Sides of Heater	2 (5.1)	1/2 (1.3)
Ground/Bottom	12 (30.5)	12 (30.5)
Vent	0 (zero)	0 (zero)

*0 inch from vent components and condensate drain line
The clearance for servicing is twenty-four (24) inches (61 cm) in front of the water heater.

For closet installation, clearance is six (6) inches (15.2 cm) from the front.

Freeze Protection

In case of freezing weather, make sure that the water heater and its water lines are protected to prevent freezing. Damage due to freezing is not covered by the warranty.

Loss of freeze protection may result in water damage from a burst heat exchanger or water lines.

With electrical power supplied, the water heater will not freeze when the outside air temperature is as cold as -22°F (-30°C) for indoor models, **when protected from direct wind exposure**. Because of the “wind-chill” effect, any wind or air circulation on the unit will reduce its ability to freeze protect.

The unit may be drained manually. However, it is highly recommended that drain down solenoid valves are installed that will automatically drain the unit if power is lost. These are available in a kit, P/N 15000029-A. (The condensate trap drain plug and water drain plug are not affected by the auto drain down solenoid valves and will have to be manually opened.)

In addition, the solenoid valves should be connected electrically to a surge protector with terminals. This allows the solenoid valves to operate if the water heater is disabled due to a diagnostic code. The freeze protection features will not prevent the external piping from freezing. It is recommended that hot and cold water pipes are insulated. Pipe cover enclosures may be packed with insulation for added freeze protection.

It is recommended that the condensate trap drain line be insulated. A frozen condensate trap drain line results in diagnostic code #25.

In the event of a power failure at temperatures below freezing, the water heater should be drained of all water to prevent freezing damage. In addition, drain the condensate trap and drain line.

Maximum vent length

Maximum vent length with concentric venting

- 1) Determine the number of 90-degree elbows in the vent system. (Two (2) 45-degree elbows count as one (1) 90-degree elbow.)
- 2) Refer to the table to find the maximum vent length based on the number of elbows.

Table 4

Number of 90° Elbows	Maximum vent length (concentric venting)
0	41 ft (12.5 m) ¹
1	35 ft (10.7 m) ²
2	29 ft (8.8 m) ³
3	23 ft (7.0 m) ⁴
4	17 ft (5.2 m) ⁴
5	11 ft (3.4 m) ⁴
6	5 ft (1.5 m) ⁴

- 3) Adjust switch # 1 in the SW1 DIP switch (tan switches), if required by the applicable note.
 1. If the length is greater than twenty-one (21) feet (6.4 m), then move switch # 1 (SW1) to OFF.
 2. If the length is greater than fifteen (15) feet (4.5 m), then move switch # 1 (SW1) to OFF.
 3. If the length is greater than nine (9) feet (2.7 m), then move switch # 1 (SW1) to OFF.
 4. Move switch # 1 (SW1) to OFF.

Example: If you have one elbow, then your maximum vent length is thirty-five (35) feet (10.7 m). If your actual length is greater than fifteen (15) feet (4.5 m), then move switch # 1 (SW1) to OFF.

INSTALLATION INSTRUCTIONS

NOTICE

If you have a longer vent length (see above), switch # 1 is required to be in the OFF position. This ensures the water heater will run properly. Blocked flue diagnostic codes and shutdowns may result if switch # 1 is not in the correct position.

Maximum vent length for Centrotherm 2 Pipe InnoFlue Vent System (single wall SW, 3-inch (7.6 cm) diameter)

Table 5: Vent length using short radius elbow

Number of 90° Short Radius Elbows	Maximum Straight Vent Length	Switch #1 in the tan DIP switches (If length is greater)
0	42 feet (12.8 m)	18 feet (5.5 m) move switch #1 to OFF
1	27 feet (8.2 m)	3 feet (91.4 cm) move switch #1 to OFF
2	12 feet (3.7 m)	move switch #1 to OFF

Table 6: Vent length using long radius elbow

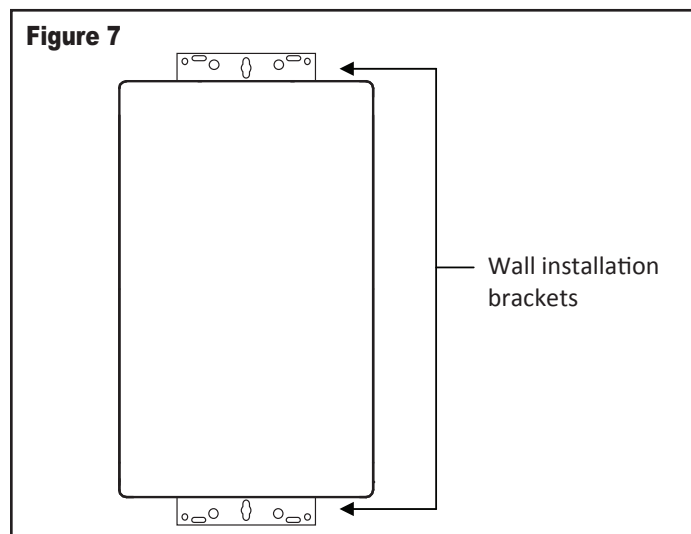
Number of 90° Long Radius Elbows	Maximum Straight Vent Length	Switch #1 in the tan DIP switches (If length is greater)
0	42 feet (12.8 m)	21 feet (6.4 m) move switch #1 to OFF
1	27 feet (8.2 m)	15 feet (4.5 m) move switch #1 to OFF
2	12 feet (3.7 m)	9 feet (2.7 m) move switch #1 to OFF
3	27 feet (8.2 m)	3 feet (91.4 cm) move switch #1 to OFF
4	21 feet (6.4 m)	Move switch # 1 to OFF for any length
5	15 feet (4.5 m)	
6	9 feet (2.7 m)	
7	3 feet (91.4 cm)	

Checklist to Determine Installation Location

- ☐ The water heater is not exposed to corrosive compounds in the air.
- ☐ The water heater location complies with the clearances.
- ☐ The planned venting will not exceed the maximum length for the number of elbows used.
- ☐ The planned venting termination/air intake location meets the clearances.
- ☐ The water supply does not contain chemicals or exceed total hardness that will damage the heat exchanger.
- ☐ A standard 3-prong 120 VAC, 60 Hz properly grounded wall outlet or other 120 VAC, 60 Hz source is available.
- ☐ The installation must conform with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1.
- ☐ **Leave the entire manual taped to the water heater or give the entire manual directly to the consumer.**

Mount to Wall

Figure 7



- 1) Identify the installation location and confirm that the installation will meet all required clearances.
- 2) Securely attach the water heater to the wall using any of the holes in the wall installation brackets which are at the top and bottom of the water heater. Ensure that the attachment strength is sufficient to support the weight. Refer to the weight of the water heater in the Specifications section. Use a leveling tool to ensure that the water heater is level. Proper operation requires that the water heater be level.

NOTE: The water heater should be installed in an upright position. Do not install upside down or on its side.

Remove the Front Panel

Slide the plastic trim pieces on each side of the water heater to expose the screws. Remove the four (4) screws and pull off the front panel.

INSTALLATION INSTRUCTIONS

Installation of venting

Install the correct venting for your model according to the venting manufacturer's instruction and the guidelines below (**see Table 7 and Table 8**). Refer to the manufacturer's technical literature for specific part numbers and instructions.

Venting Guidelines

DO NOT

- Do not use cellular core PVC/CPVC, Radel, or galvanized material to vent this appliance.
- Do not combine vent components from different manufacturers.
- Vent diameter must not be reduced.
- Do not connect the venting system with an existing vent or chimney.
- Do not common vent with the vent pipe of any other manufacturer's water heater or appliance. Giant water heaters can only be common vented using a Giant certified common vent system. Common venting is approved for Canadian and U.S. installations.

MUST DO

- This water heater is a direct vent water heater and therefore is certified and listed with the vent system. You must use vent components that are certified and listed with the water heater model.
- The vent system must vent directly to the outside of the building and use outside air for combustion.
- Avoid dips or sags in horizontal vent runs by installing supports per the vent manufacturer's instructions.

- Support horizontal vent runs every four (4) feet (1.2 m) and all vertical vents run every six (6) feet (1.8 m) or in accordance with local codes.
- Venting should be as direct as possible with a minimum number of pipe fittings.
- Vent connections must be firmly pressed together so that the gaskets form an air tight seal.
- The vent piece connected to the water heater must be secured with one self-tapping screw.

INFORMATION

- Refer to the instructions of the vent system manufacturer for component assembly instructions.
- If the vent system is to be enclosed, it is suggested that the design of the enclosure shall permit inspection of the vent system. The design of such enclosure shall be deemed acceptable by the installer or the local inspector.

NOTICE

If it becomes necessary to access an enclosed vent system for service or repairs, Giant is not responsible for any costs or difficulties in accessing such vent system. The warranty does not cover obtaining access to a vent system in an enclosed environment.

Table 7

Manufacturer	Listed and Tested Vent Products	Telephone	Fax	Contact
Ubbink	Rolux Condensing Vent System	800-363-9354	514-640-0969	www.giantinc.com
	Concentric to Twin pipe adapter			
IPEX	Concentric/low profile termination kit	866-473-9462	514-769-1672	www.ipexinc.com sales@ipexinc.com
Centrotherm	InnoFlue Vent System (single wall SW, 3-inch (7.6 cm) diameter)	877-434-3432	518-618-3166	info@centrotherm.us.com www.centrotherm.us.com
Heat-Fab	Saf-T Vent SC System	800-772-0739	413-863-4803	custsvc@heat-fab.com www.heatfab.com
Metal-Fab	Corr/Guard Vent/Air Intake System	800-835-2830	316-943-2717	info@mtlfab.com www.metal-fabinc.com

Table 8

Manufacturer	Product	Vertical Termination	Horizontal Termination
Ubbink	Rolux	96000050-A	96000051-A, 96000052-A
	PVC/CPVC concentric to twin pipe adapter		
IPEX	Concentric/low profile termination kit		
Centrotherm	InnoFlue	ICRT3539	ISELL0387UV
Heat-Fab	Saf-T Vent	Saf-T Vent CI Plus Wall Termination	Saf-T Vent CI Plus Rain Cap
Metal-Fab	Corr/Guard	3CGRV DK	3CGRVT

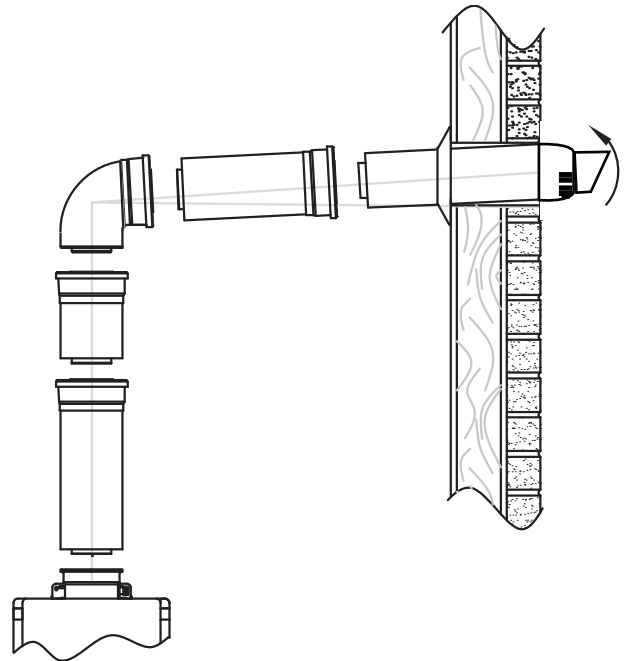
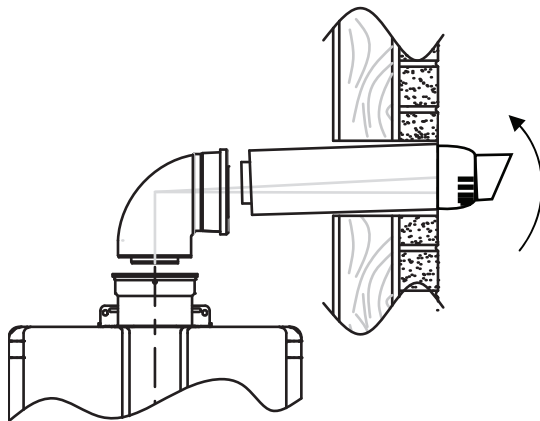
INSTALLATION INSTRUCTIONS

Figure 8

Horizontal Termination

Slope the venting toward the appliance according to the vent manufacturer's installation instructions.

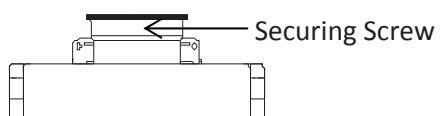
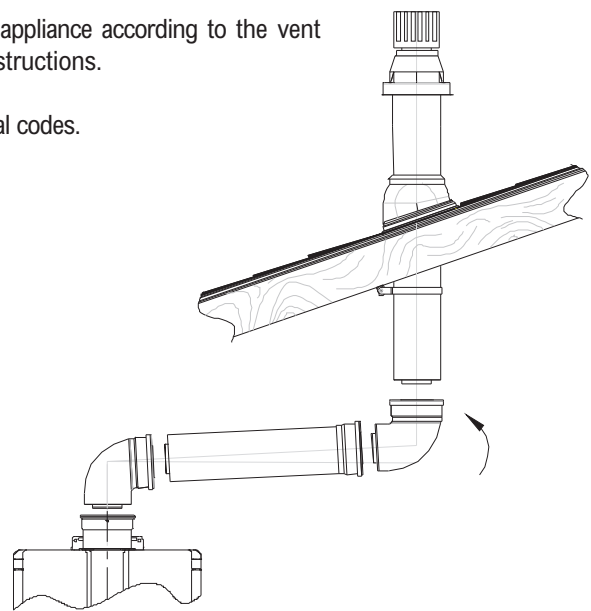
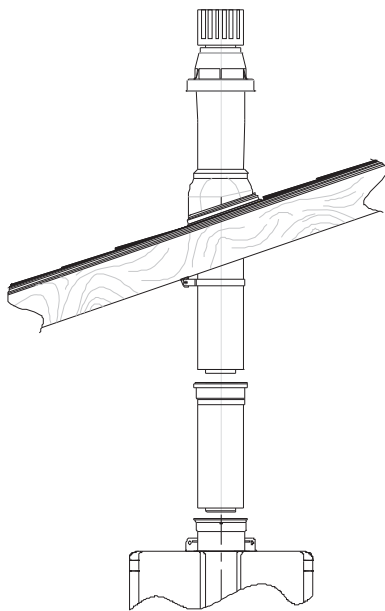
Dispose of condensate per local codes.



Vertical Termination

Slope the venting toward the appliance according to the vent manufacturer's installation instructions.

Dispose of condensate per local codes.



Secure the first vent component to the water heater with one self-tapping screw at the hole.

INSTALLATION INSTRUCTIONS

Flue Installation with Centrotherm Venting

Install the venting termination according to the diagrams and instructions below.

- Comply with the exhaust clearances found in the Giant Installation and Operating Manual.
- Only one appliance can be attached to the vent system.
- Install the system according to the Centrotherm installation instructions.
- Use the 3"/5" (7.6/12.7 cm) concentric to twin pipe adaptor and the 3-inch (7.6 cm) diameter venting.
- The vent termination and air intake must be in the same pressure zone.
- Do not exceed maximum straight vent length with number of elbows as shown in the following tables.
- Maintain the clearances shown in the following Figures.

Condensate

Condensate formation can occur in high efficiency direct vent appliances. Without proper drainage condensate will damage the heat exchanger.

To prevent condensate damage, follow these instructions.

DO NOT

- Do not connect the condensate drain pipe directly to the rain sewer.
- Do not connect the condensate drain line with an air conditioning evaporator coil drain.

MUST DO

- Use only vent that is approved and identified as acceptable for your particular model.
- Slope the venting toward the appliance according to the vent manufacturer's installation instructions.
- All condensate must drain and be disposed of according to local codes.
- Use only corrosion resistant materials for the condensate drain lines, such as PVC pipe or plastic hose.

- The condensate drain pipe (along its entire length) must be at least the same diameter as the drain line, (1/2 inch NPT).
- The end of the condensate drain pipe should be open to the atmosphere. The end should not be under water or other substances.

Figure 10

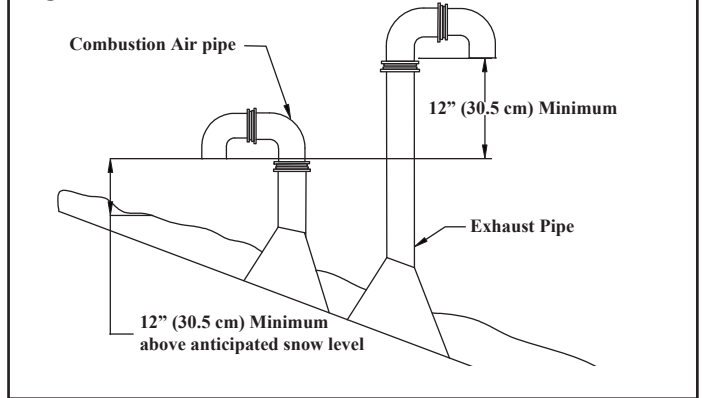


Figure 11

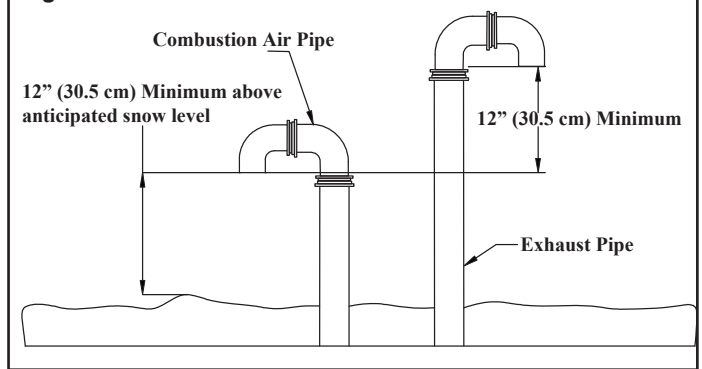
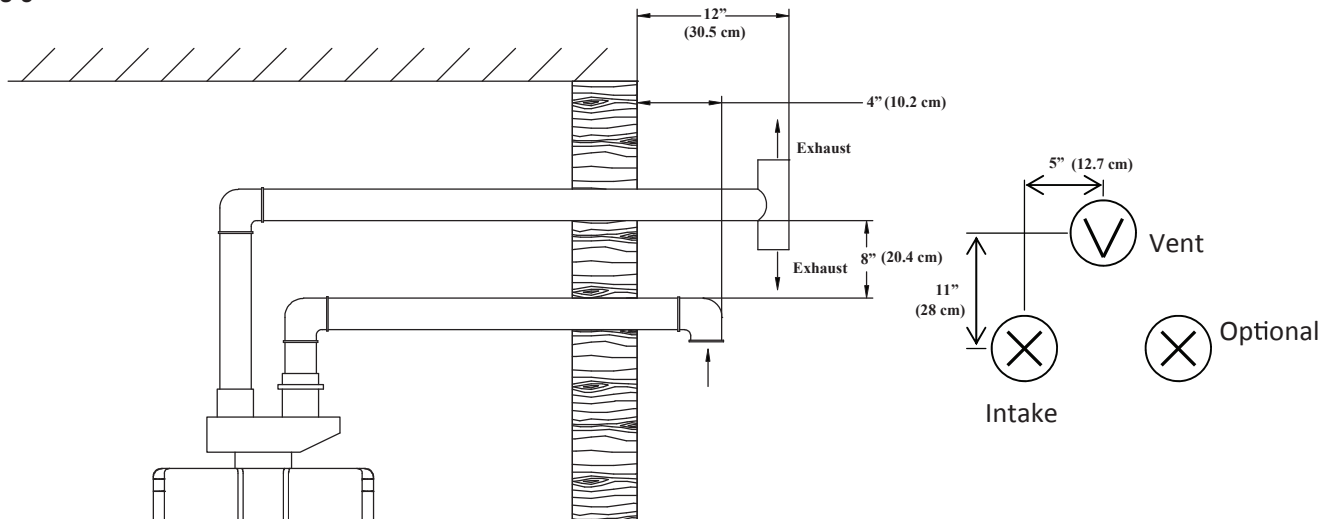


Figure 9



TWIN PIPE VENTING GUIDE

INFORMATION

- Water heaters have an integrated condensate collector.
- Regions of cold climate will create more condensate in the vent system. The condensate collector should be used in cold climates.
- The condensate drain pipe should be as short as possible and have a downward pitch.
- If the condensate drain gets blocked, a diagnostic code will display on the controller. If this occurs, the condensate drain must be cleaned.
- The condensate trap will automatically prime (self-prime) during operation of the unit as condensate forms. Condensate draining from the unit indicates that the trap is full and that there is no blockage in the condensate drain. It is not necessary to add water to the condensate trap.
- A condensate neutralizer kit, P/N 50000100-A, is available from Giant. The kit allows condensate to flow through neutralizing media that raises the pH of the condensate to a level that will help prevent corrosion of the drain and public sewer system.

Checklist for Venting and Condensate

- ☐ Verify proper clearances around the vents and air intakes.
- ☐ Ensure you have used the correct venting products for the model installed and that you have completely followed the venting manufacturer's installation instructions as well as these installation instructions.
- ☐ Verify that the vent system does not exceed the maximum length for the number of elbows used.

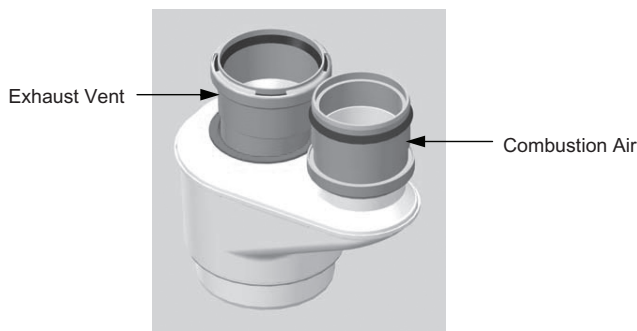
Twin Pipe Venting Guide

The purpose of this guide is to inform about changes with regard to venting for the following tankless water heater products only:

UGTC-199N, UGTC-199P, UGTC-152N, and UGTC-152P

The Ubbink® 3"/5" (7.6/12.7 cm) to 3"/3" (7.6/7.6 cm) Concentric to Twin Pipe Adaptor (see Figure 12) and other venting equipment has been certified to be used with the optional PVC/CPVC twin pipe venting system for both natural and propane units.

Figure 12: Ubbink® 3"/5" (7.6/12.7 cm) to 3"/3" (7.6/7.6 cm) Concentric to Twin Pipe Adaptor



NOTE: The Ubbink Concentric to Twin Pipe Adaptor is ULC S636 approved and is listed by the applicable agencies having jurisdiction and is certified for use throughout the U.S. and Canada. The Concentric to Twin Pipe Adaptor is supplied exclusively through and/or its distributors.

The newly certified vent system is comprised of a Concentric to Twin Pipe Adaptor (adaptable to three (3) (7.6 cm) to four (4) (10.2 cm) sizes), PVC/CPVC pipes, fittings, and either the IPEX Concentric Vent Kit (CVK) Assembly (System 636), snorkel termination, or tee termination.

NOTICE

PVC venting CANNOT be used with the condensing water heater, under the following conditions:

- The water heater is installed in a recirculation system and the thermostat setting is greater than 150°F (65.5°C).
- The water heater is used in a combination domestic water and space heating application which requires a thermostat setting greater than 150°F (65.5°C).

⚠ WARNING

Tankless Water Heaters must be vented and furnished with intake air and exhaust vent using piping and methods described in this guide and the appliance installation instructions. Each water heater must have its own intake and vent. **DO NOT** common vent with any other appliance using this method. Inspect finished vent and intake air piping thoroughly to ensure all are airtight and comply with the instructions provided and with all requirements of applicable codes. Failure to provide a properly installed vent and air system will cause severe personal injury or death.

⚠ WARNING

Combustion Air Intake - Install combustion air inlet piping for the condensing tankless water heaters as described in the Water Heater Manual. The combustion air intake termination fitting must be installed with the clearances and geometry relative to the exhaust (vent) depicted in this document to ensure that flue products do not enter the combustion air intake. Ensure that the intake air will not contain any of the contaminants as outlined in the "**Determine Installation Location**" section of this document. Contaminated intake air will damage the water heater, resulting in possible severe personal injury, death, or substantial property damage.

Exhaust - Provide exhaust (vent) piping to Water Heater as specified in this guide and as required by all applicable codes. The exhaust (vent) termination fitting must be installed with the clearances and geometry relative to the combustion air pipe as depicted in this document to ensure that flue products do not enter the combustion air intake.

TWIN PIPE VENTING GUIDE

NOTICE

If the vent and/or combustion air intake piping configurations covered in the Water Heater Manual cannot be applied to a specific installation, contact Giant for assistance. Other configurations may be available.

⚠ WARNING

Installations must comply with local requirements and with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 for U.S. installations or CSA B149.1 for Canadian installations. **DO NOT** use cellular core PVC, CPVC, or Radel based pipe materials for the exhaust vent. Vents **MUST** be of solid core pipes ONLY.

⚠ WARNING

Use only the materials listed in the Water Heater Manual for vent, combustion air intake pipe, and fittings (see Table 9). Failure to comply with this warning could result in severe substantial property damage, personal injury, or death.

⚠ WARNING

If used, a masonry chimney can ONLY be used as a PIPE CHASE for the exhaust and combustion air intake pipes. The exhaust and air piping must be installed as instructed in this guide and applicable Water Heater Manual. The chimney must be used only for Water Heater(s) vent chase. NO OTHER appliance or fireplace can be connected to the chimney. Exhaust and air piping materials must comply with this instruction. The chimney must be fitted with a sealed access opening to facilitate interior inspection. The chimney chase (and liner, if installed) to be inspected annually for any degradation. Failure to comply could result in substantial property damage, personal injury, or death.

Installation Instructions

Installation Requirements

- Installation should be performed by a licensed professional.
- All PVC/CPVC IPEX Concentric Vent Kit (CVK) assemblies are certified to ULC S636. Where ULC S636 compliance is required, use only System 636 pipe, fittings, and cement at terminal connection.
- **DO NOT** mix pipe, fittings, cements, or joining methods from different vent manufacturers, this can result in unsafe conditions and will void the certification.
- **DO NOT** use cellular core PVC, CPVC, nor Radel piping for vent.
- **DO NOT** use PVC/CPVC on Non-Condensing Units.
- **DO NOT** operate unit until venting is completely installed and all solvents and glues have bonded.
- All PVC/CPVC exhaust vent material used in Canada must be S636 certified.

If the preferred venting option is a twin pipe PVC/CPVC configuration, the approved twin pipe adaptor must be used.

For further details on listed PVC/CPVC venting material (see Table 9) refer to the installation manual of the PVC/CPVC manufacturer.

NOTE: The listed vent, vent fittings, termination, cleaner, and glue are all certified as part of the water heater vent system.

⚠ DANGER

Failure to correctly install vent and combustion air intake pipes of the water heater to atmosphere as outlined in the VENTING section of the Installation Instructions, will result in death from asphyxiation (from carbon monoxide), fire, or explosion. **NEVER** operate the water heater without proper venting (exhaust and combustion air intake). Always inspect the vent terminal unit, combustion air intake pipe, and the entire vent system affixed to the water heater for proper installation at equipment commissioning and at least annually thereafter.

Table 9: Vent and Air Piping Materials

Item	Material	Standard for Installation in North America	
		United States	Canada
Thermoplastic Piping Materials			
Vent or combustion air intake pipe & Fittings	PVC schedule 40	ANSI/ASTM D1785	Thermoplastic vent pipe must be certified to ULC S636. Intake pipe may be of any material listed (left).
	PVC-DWV	ANSI/ASTM D2665	
	CPVC schedule 40	ANSI/ASTM F441	
PVC pipe cement & primer	PVC	ANSI/ASTM D2564	
	CPVC	ANSI/ASTM F493	
IPEX bird screens (purchase separately)			
Termination Vent Screens	Polyethylene	Three (3) inch (7.6 cm) Vent screen: IPEX part # 196051; Four (4) inch (10.2 cm) Vent screen: IPEX part # 196052 (Screens are friction fitted inside termination fitting bells.)	

TWIN PIPE VENTING GUIDE

Determine Installation Location

Environment

Air surrounding the water heater, venting, and vent termination(s) is used for combustion and must be free of any compounds that cause corrosion of internal components. These include corrosive compounds that are found in aerosol sprays, detergents, bleaches, cleaning solvents, oil based paints/varnishes, and refrigerants. The air in beauty shops, dry cleaning stores, photo processing labs, and storage areas for pool supplies often contains these compounds. Therefore it is recommended that outdoor models be used for these locations where possible.

The water heater, venting, and vent termination(s) should not be installed in any areas where the air may contain these corrosive compounds. If it is necessary for a water heater to be located in areas which may contain corrosive compounds, the following instructions are strongly recommended.

IMPORTANT CONSIDERATIONS:

- **DO NOT** install in areas where air for combustion can be contaminated with chemicals.
- Before installation, consider where air has the ability to travel within the building to the water heater.
- Where possible, install the water heater in a sealed closet so that it is protected from the potential of contaminated indoor air.
- Chemicals that are corrosive in nature should not be stored or used near the water heater.
- Locate the vent outlet where flue gases will not harm surrounding plants and/or cooling equipment. All vent locations must adhere to the recommended vent/combustion air intake terminal position as outlined in **Table 3**.
- Avoid locating vent where prevailing winds could affect the performance of the water heater or cause recirculation of the flue gases.
- **DO NOT** terminate the venting over a public walkway or over an area where condensate or vapor can create a nuisance / hazard or where condensate can be detrimental to the operation of equipment such as regulators or relief valves.
- Water Heater flue gases must be piped from the appliance to the outside, installer MUST adhere to the instructions provided herein and the most recent Water Heater Manual and all applicable codes.
- The exhaust and combustion air must terminate through the same sidewall or roof as the terminations must be in the same pressure zone and face the same direction.
- The vent pipe must terminate either through the sidewall or through the roof, exhaust/vent termination and/or intake air openings shall adhere to clearances as set forth in the Direct Vent Termination Clearances diagram.
- Each Condensing Tankless Water Heater requires a separate vent system.
- If common venting is required, refer to common Vent Installation Manual (latest revision) for instructions on optional venting method as well as to verify which tankless models may be common vented.
- Use only PVC/CPVC three (3) inch (7.6 cm) and four (4) inch (10.2 cm) Venting.

Damage and repair due to corrosive compounds in the air is not covered by warranty.

For PVC/CPVC vent systems reduce the maximum allowable length for each elbow and termination type as follows and as referenced in **Tables 11-14** of this document:

Exhaust and Combustion Air Intake Pipe Diameters and Max Lengths:

- For PVC/CPVC vent systems reduce the maximum allowable length for each elbow and termination type as follows:
 - * 2.5 feet (76.2 cm) for every 45° elbow.
 - * 5 feet (1.5 m) for every 90° elbow.
 - * Termination.
- Exhaust and combustion air intake pipe diameters to be as specified in **Tables 11-14** of this document.
- Do not exceed exhaust and combustion air intake pipe MAXIMUM lengths as outlined in **Tables 11-14** of this document. (Lengths are specific to models and fuel type).

Additional Clearance Requirements:

- Avoid termination locations near a dryer vent.
- Avoid termination locations near commercial cooking exhaust.
- Install vent termination at least twelve (12) inches (30.5 cm) above grade or anticipated snow level.

Vents shall not terminate:

- Over public walkways; or near soffit vents or crawl space vents or other area where condensate or vapor could create a nuisance or hazard or cause property damage.
- Where condensate or vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.

Important considerations for locating vent termination under a soffit (ventilated or unventilated or eave vent; or to a deck or porch):

- **DO NOT** install vent termination under a soffit vent such that exhaust can enter the soffit vent.
- Install vent termination such that exhaust and rising moisture will not collect under eaves. Discoloration to the exterior of the building could occur if installed too close.
- **DO NOT** install the vent termination too close under the soffit where it could present recirculation of exhaust gases back into the combustion air intake part of the termination.

Determining Vent Length

There are two options for determining the vent lengths/components necessary for the installation.

Option 1: The installer can use the vent length calculation sheet, filling in the quantity of the vent components in order to calculate the total equivalent vent lengths.

Option 2: The installer can use the maximum vent length tables on the next pages to determine the amount of straight pipe that can be used with a specific termination type and quantity of elbows.

TWIN PIPE VENTING GUIDE

OPTION 1:

Calculation of equivalent piping lengths for venting system:

Choose the vent type and fill out the following table. When determining equivalent combustion air and vent length, add five (5) feet (1.5 m) for each 90° elbow, 2.5 feet (76 cm) for each 45° elbow.

Example of calculation

(assume three (3) inch (7.6 cm) diameter pipes for natural gas unit):

- Twin pipe (parallel) with snorkel terminal
- Combustion air pipe length: forty (40) feet (12.2 m) straight pipe with three (3) x 90° elbows
- Exhaust pipe length: forty (40) feet (12.2 m) straight pipe with three (3) x 90° elbows (include all interior and exterior elbows)
- Snorkel Termination: ten (10) equivalent feet (**see Table 11**)

Calculation:

- Equivalent Combustion air pipe length: $[40+(3 \times 5)+10] = 65$ feet (19.8 m)
- Equivalent Vent Length: $[40+(3 \times 5)+10] = 65$ feet (19.8 m)
- Total = 65 feet (19.8 m) for both exhaust and combustion air pipes, which is the maximum allowable vent length for three (3) inch (7.6 cm) PVC/CPVC on a natural gas unit. If longer lengths are required, go to the four (4) inch (10.2 cm) diameter pipe configuration which is certified for up to one hundred (100) equivalent feet.

⚠ CAUTION

Maximum equivalent vent lengths are specific to the fuel type of the tankless water heater. It is imperative when performing equivalent vent length calculations, that the following be taken in consideration:

Vent Type	Natural Gas Units Maximum Equiva- lent Vent Length	Propane Units Maximum Equiva- lent Vent Length
3" (7.6 cm) PVC/CPVC	65 Feet (19.8 m)	41 Feet (12.5 m)
Concentric PP	65 Feet (19.8 m)	41 Feet (12.5 m)
4" (10.2 cm) PVC/CPVC	100 Feet (30.5 m)	65 Feet (19.8 m)
Twin Pipe PP (Centrotherm)	41 Feet (12.5 m)	41 Feet (12.5 m)

OPTION 2:

Maximum Equivalent Vent Length Tables:

- 1) Determine the number of 90-degree elbows in the vent system. (Two (2) 45-degree elbows count as one (1) 90-degree elbow.)
- 2) Refer to **Tables 11-14** to find the maximum vent length based on the number of elbows and termination style.

Table 10: Equivalent Vent Length Calculation Sheet

Fitting / Termination Type	Number of fittings		Equivalent Vent Length		Total Equivalent Length
1) 90° elbow	3	x	5	=	15
2) 45° elbow		x	2.5	=	0
3) IPEX Low Profile Termination		x	5	=	0
4) IPEX 4" (10.2 cm) Concentric Termination		x	20	=	0
5) IPEX 3" (7.6 cm) Concentric Termination		x	20	=	0
6) 3" (7.6 cm) Tee Termination		x	5	=	0
7) 4" (10.2 cm) Tee Termination		x	5	=	0
8) 3" (7.6 cm) Snorkel Termination	1	x	10	=	10
9) 4" (10.2 cm) Snorkel Termination		x	10	=	0
10) Length of Straight Section in feet	NA	x	40	=	40
Total (add up lines 1 through 10)					65

(A blank copy of the Vent Length Calculation Sheet is located at the end of this section)

Ensure switch #1 in the bank of eight (8) tan dip switches is in OFF position if vent length is greater than twenty-one (21) feet (6.4 m).

TWIN PIPE VENTING GUIDE

Table 11 - Natural Gas Units

Total Equivalent Vent Length (Intake/outlet) for Twin Pipe three (3) inch (7.6 cm) PVC/CPVC				
Maximum Vent Length	65 feet (19.8 m)			
Termination Type	IPEX Concentric Vent Kit	Snorkel Termination	Side Wall Tee Termination	Low Profile Termination
Termination Equivalent Length in feet (meters) (Already factored into the straight pipe lengths below)	20 (6.1)	10 (3.0)	5 (1.5)	5 (1.5)
# of 90° Elbows (each: 5 equivalent feet)	Max. straight pipe vent length in feet (meters)			
0	45 (13.7) **	55 (16.8) **	60 (18.3) **	60 (18.3) **
1	40 (12.2) **	50 (15.2) **	55 (16.8) **	55 (16.8) **
2	35 (10.7) **	45 (13.7) **	50 (15.2) **	50 (15.2) **
3	30 (9.1) **	40 (12.2) **	45 (13.7) **	45 (13.7) **
4	25 (7.6) **	35 (10.7) **	40 (12.2) **	40 (12.2) **
5	20 (6.1) **	30 (9.1) **	35 (10.7) **	35 (10.7) **
6	15 (4.6) **	25 (7.6) **	30 (9.1) **	30 (9.1) **

Table 12 - Natural Gas Units

Total Equivalent Vent Length (Intake/outlet) for Twin Pipe four (4) inch (10.2 cm) PVC/CPVC				
Maximum Vent Length	100 feet (30.5 m)			
Termination Type	IPEX Concentric Vent Kit	Snorkel Termination	Side Wall Tee Termination	Low Profile Termination
Termination Equivalent Length in feet (meters) (Already factored into the straight pipe lengths below)	20 (6.1)	10 (3.0)	5 (1.5)	5 (1.5)
# of 90° Elbows (each: 5 equivalent feet)	Max. straight pipe vent length in feet (meters)			
0	80 (24.4) **	90 (27.4) **	95 (29.0) **	95 (29.0) **
1	75 (22.9) **	85 (25.9) **	90 (27.4) **	90 (27.4) **
2	70 (21.3) **	80 (24.4) **	85 (25.9) **	85 (25.9) **
3	65 (19.8) **	75 (22.9) **	80 (24.4) **	80 (24.4) **
4	60 (18.3) **	70 (21.3) **	75 (22.9) **	75 (22.9) **
5	55 (16.8) **	65 (19.8) **	70 (21.3) **	70 (21.3) **
6	50 (15.2) **	60 (18.3) **	65 (19.8) **	65 (19.8) **

**Dip switch one (bank of eight (8) - TAN COLORED) off for lengths greater than or equal to twenty-one (21) feet (6.4 m).

⚠ CAUTION

Maximum vent lengths are specific to the fuel type of the tankless water heater. It is imperative when performing equivalent vent length calculations, that the gas type be taken into consideration.

TWIN PIPE VENTING GUIDE

Option 2: Maximum Vent Length Tables (continued)

Table 13: Propane Units

Total Equivalent Vent Length (Intake/outlet) for Twin Pipe three (3) inch (7.6 cm) PVC/CPVC				
Maximum Vent Length	41 feet (12.5 m)			
Termination Type	IPEX Concentric Vent Kit	Snorkel Termination	Side Wall Tee Termination	Low Profile Termination
Termination Equivalent Length in feet (meters) (Already factored into the straight pipe lengths below)	20 (6.1)	10 (3.0)	5 (1.5)	5 (1.5)
# of 90° Elbows (each: 5 equivalent feet)	Max. straight pipe vent length in feet (meters)			
0	21 (6.4) **	31 (9.4) **	36 (11.0) **	36 (11.0) **
1	16 (4.9) **	26 (7.9) **	31 (9.4) **	31 (9.4) **
2	11 (3.4) **	21 (6.4) **	26 (7.9) **	26 (7.9) **
3	6 (1.8) **	16 (4.9) **	21 (6.4) **	21 (6.4) **
4		11 (3.4) **	16 (4.9) **	16 (4.9) **
5		6 (1.8) **	11 (3.4) **	11 (3.4) **
6			6 (1.8) **	6 (1.8) **

Table 14: Propane Units

Total Equivalent Vent Length (Intake/outlet) for Twin Pipe four (4) inch (10.2 cm) PVC/CPVC				
Maximum Vent Length	65 feet (19.8 m)			
Termination Type	IPEX Concentric Vent Kit	Snorkel Termination	Side Wall Tee Termination	Low Profile Termination
Termination Equivalent Length in feet (meters) (Already factored into the straight pipe lengths below)	20 (6.1)	10 (3.0)	5 (1.5)	5 (1.5)
# of 90° Elbows (each: 5 equivalent feet)	Max. straight pipe vent length in feet (meters)			
0	45 (13.7) **	55 (16.8) **	60 (18.3) **	60 (18.3) **
1	40 (12.2) **	50 (15.2) **	55 (16.8) **	55 (16.8) **
2	35 (10.7) **	45 (13.7) **	50 (15.2) **	50 (15.2) **
3	30 (9.1) **	40 (12.2) **	45 (13.7) **	45 (13.7) **
4	25 (7.6) **	35 (10.7) **	40 (12.2) **	40 (12.2) **
5	20 (6.1) **	30 (9.1) **	35 (10.7) **	35 (10.7) **
6	15 (4.6) **	25 (7.6) **	30 (9.1) **	30 (9.1) **

**Dip switch one (bank of eight (8) - TAN COLORED) off for lengths greater than or equal to twenty-one (21) feet (6.4 m).

CAUTION

Maximum vent lengths are specific to the fuel type of the tankless water heater. It is imperative when performing equivalent vent length calculations, that the gas type be taken into consideration.

TWIN PIPE VENTING GUIDE

Adaptator Installation

NOTICE

For installation in Canada, field-supplied PVC/CPVC used for combustion venting must comply with CAN/CGA B149.1 (latest edition) and be certified to Type BH Gas Venting Systems, ULC-S636.

Components of any certified system **CANNOT** be substituted with any other vent system(s) or unlisted pipes and/or fittings. All listed components, primers, and glues are part of the certified vent system and therefore **MUST** be from a single manufacturer.

When installing the Ubbink adaptor with the twin pipe PVC/CPVC system:

- Install the system in according to Ubbink/Rolux and the Installation Instructions.
- Use the 3"/5" (7.6/10.2 cm) Concentric to Twin pipe Adaptor with three (3) inch (7.6 cm) or four (4) inch (10.2 cm) diameter PVC/CPVC venting only.
- It is the responsibility of the installer to follow all national codes, standards, and local ordinances. In addition to instructions laid out in this manual for vent/intake clearances and other safety requirements.
- If venting conflicts arise between this guide and the respective OEM's manual, the manufacturer installation instruction will take precedence providing they meet the intent of all national codes, standards, and local ordinances having jurisdiction. Follow this guide together with applicable codes, standards, and/or ordinances for installation of the intake/vent pipe(s) and all other applicable water heater installation procedures.

⚠ WARNING

Current codes prohibit the application of external insulation on plastic vent pipe together with the use of cellular core PVC, CPVC, and Radel as venting materials.

PVC/CPVC Twin Pipe Adaptor Installation Instructions:

The vent size (diameter) and maximum vent lengths must be followed as detailed in the installation Instructions supplied with the appliance and as stated in **Tables 11-14** of this document. Thoroughly read and understand the venting section of the appliance manual before proceeding with the following steps.

STEP 1:

Carefully read and understand the venting section of the Installation Instructions supplied with the water heater prior to determining a suitable location for the water heater and vent termination. Locate water heater to have the straightest (shortest) practical vent length to outside. Measure the total venting distance required to reach the outside wall or roof. Determine the diameter of venting components to be used based on required vent length (refer to vent tables or **Tables 11-14** of this document).

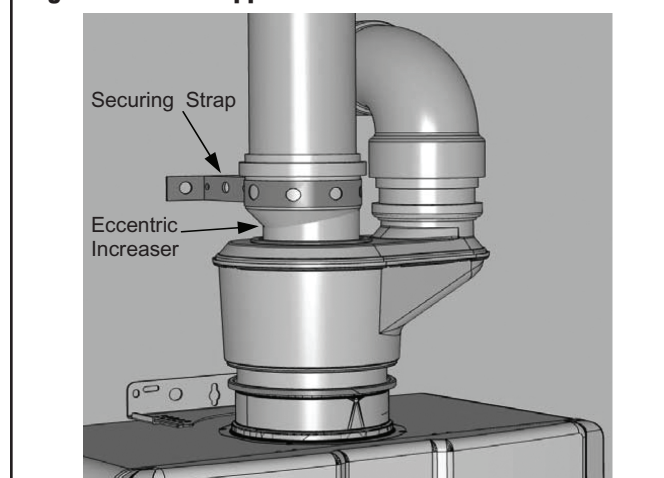
STEP 2:

Before installing the concentric to twin pipe adaptor, inspect each vent component for damage while making sure the gaskets for each component are undamaged. Do not attempt to install or repair damaged components. If a gasket is damaged, these are available through and its distributors. Do not use gaskets from another manufacturer.

STEP 3:

Adaptor vent pipe **MUST** be securely fastened to structure, at the eccentric increaser or as close as possible thereafter (**see Figure 13**). Straps to be field supplied. Use straps, clamps, or other fasteners that will not score or damage pipes and be acceptable by local codes.

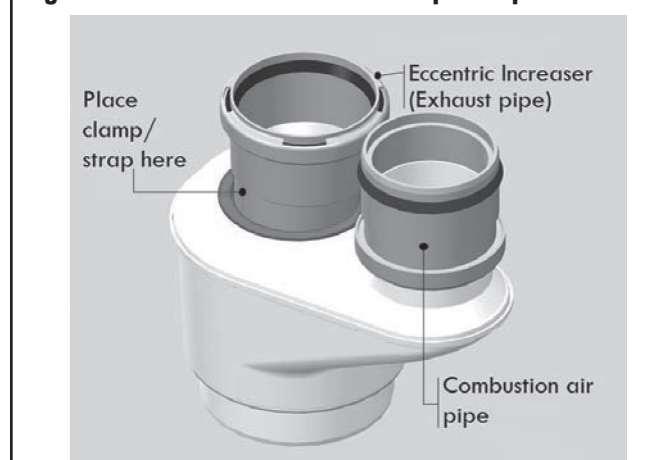
Figure 13: Wall support for Eccentric Increaser



STEP 4:

Use PVC to Polypropylene Eccentric Increaser (supplied with the adaptor) to transition from PP to PVC three (3) inches (7.6 cm); additional PVC/CPVC bushing or other type of reducing fittings is required to transition to four (4) inch (10.2 cm) pipe.

Figure 14: 3/5 Concentric to Twin Pipe Adaptor



STEP 5:

Apply lubricant to the gasket surface and coupling with finger prior to component attachment (**see Figure 15**). To make the insertion of the gasketed fittings into the PVC coupling easier, Centrocerin gasket lubricant is recommended (supplied with adaptor in box).

TWIN PIPE VENTING GUIDE

Figure 15: Applying Lubricant to Gasket



NOTICE

For further details on listed PVC/CPVC venting material (see **Table 2**) and proper handling and installation (e.g. priming, gluing etc.), refer to the installation manual of the respective PVC/CPVC manufacturer.

⚠ WARNING

Use only water or Centrocerein lubricant for lubricating the gaskets and pipe ends to allow easy insertion of fittings onto the vent adaptor. **DO NOT** use any other brand of lubricant as it may cause deterioration of the gaskets, which could result in leakage of dangerous flue gases into the occupied space. If disassembly of vent pipes are required after the gasket has dried, wet joints thoroughly with water to loosen the connection.

⚠ WARNING

Follow vent manufacturer's instructions for additional venting installation instructions, to avoid situations that can lead to property damage, personal injury, or death.

⚠ CAUTION

- **DO NOT** use solvent cement that has become curdled, lumpy, or thickened.
- **DO NOT** thin solvent cement. Observe precautions printed on the containers.
- Use appropriate temperature-type solvent cement for applications below 32°F (0°C).
- Appropriate solvent and cleaner must be used for the type of vent pipe used (PVC or CPVC).

Installation Examples for PVC/CPVC Twin Pipe Venting

Note the correct position of combustion air inlet and gas flue outlet, as these are NOT interchangeable. For the correct position and design of the twin pipe gas flue outlet and combustion air inlet, refer to the installation instructions supplied with the appliance.

The adaptor as supplied requires no additional parts to be used with standard three (3) inch (7.6 cm) 3rd party solid core PVC/CPVC pipes; refer to **Figure 16** for required parts for three (3) inch (7.6 cm) PVC/CPVC assembly configuration.

Figure 16: Required Parts For three (3) inch (7.6 cm) PVC/CPVC Assembly Configuration

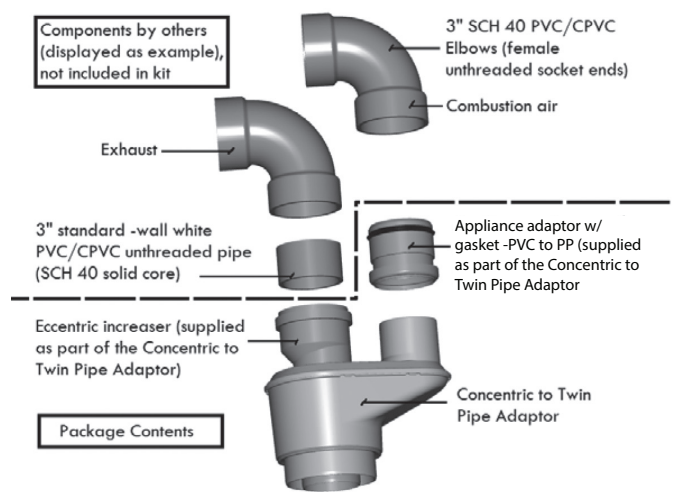
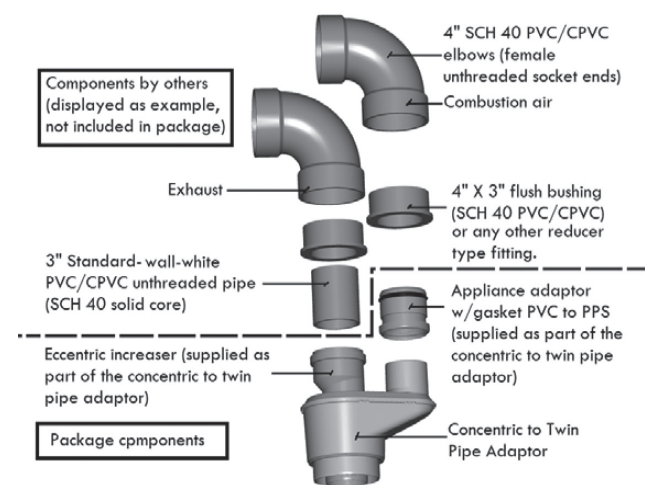


Figure 17: Required Parts For four (4) inch (10.2 cm) PVC/CPVC Assembly Configuration



⚠ WARNING

Failure to correctly assemble the components according to these instructions may result in property damage, serious injury, or death.

Conversely, the concentric to twin pipe adaptor requires two (2) additional (4" x 3" (10.2 x 7.6 cm) Flush – Schedule 40 PVC) bushing to be used with four (4) inch (10.2 cm) PVC/CPVC assembly configuration (see **Figure 17**).

Certified PVC/CPVC Vent Termination Options

Vent Termination Configurations

There are three configurations for vent terminations that can be used:

- 1) Concentric Termination (IPEX Concentric Vent Kit)
 - Allows for only one penetration through a wall or roof.
- 2) Snorkel Termination
 - Allows for easier clearance above grade when having to terminate through lower point
- 3) Side Wall Tee Termination

TWIN PIPE VENTING GUIDE

Termination Installation

- Exhaust and combustion air piping must be securely fastened to structure every four (4) feet (1.2 m), to ensure dimensions shown in Figures throughout this document are maintained.
- DO NOT strap vertical vent too tightly as the strapping must permit the vent to move in the event of expansion and contraction.
- Straps are field supplied. Use straps, clamps, or equivalent that will not score or damage the pipe. Expansion and contraction should be addressed between appliance and termination point.
- All penetrations must be sealed according to local building codes. Caulking for side wall terminations and flashing for roof penetrations are typical. Use only PVC/CPVC compatible sealing material, contact PVC/CPVC manufacturer for a complete list.

IPEX Concentric Vent Kit (CVK) Installation

- For installations with multiple terminations, maintain appropriate clearances between terminals. (see Figures 21a and 21b).
- The pipe length of the concentric vent kit can be shortened; providing that the cutting and cementing procedures adhere to the System 636 guidelines; reference IPEX installation instructions and Figure 18 for further information.
- Pipe lengths and/or fittings CANNOT be added to the socket of the rain cap in order to divert the exhaust gas.

⚠ WARNING

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

⚠ WARNING

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

Figure 18: Twin Pipe to Concentric Termination Physical Data

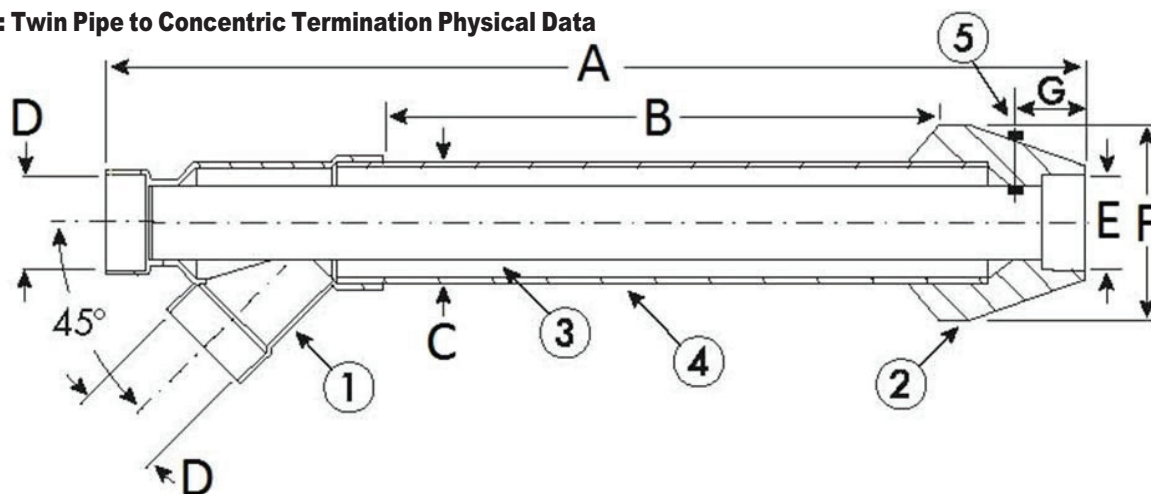
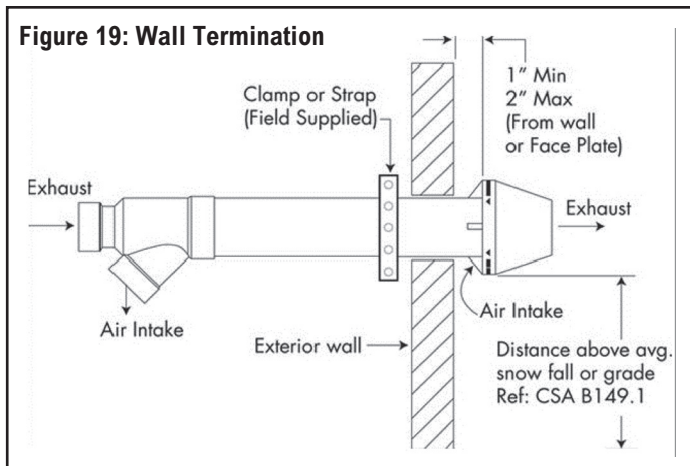


Table 15 : System 636 Concentric Vent Kits

Termination Kits Include:		Nominal Pipe Size (Dimension in Inches)						
Item#	Concentric Kit	A	B*	C+	D	E	F	G
196006	3" x 20" PVC	36.1 (91.7 cm)	20 (50.8 cm)	4.5 (11.4 cm)	3 (7.6 cm)	3 (7.6 cm)	8.75 (22.2 cm)	2.25 (5.7 cm)
196021	4" x 36" PVC	56 (142 cm)	37.3 (94.7 cm)	6.62 (16.8 cm)	4 (10.2 cm)	4 (10.2 cm)	10 (25.4 cm)	3.5 (8.9 cm)
197009	3" x 20" CPVC	36.1 (91.7 cm)	20 (50.8 cm)	4.5 (11.4 cm)	3 (7.6 cm)	3 (7.6 cm)	8.75 (22.2 cm)	2.25 (5.7 cm)
197021	4" x 36" CPVC	56 (142 cm)	37.3 (94.7 cm)	6.62 (16.8 cm)	4 (10.2 cm)	4 (10.2 cm)	10 (25.4 cm)	3.5 (8.9 cm)
1. Wye - (Concentric) 2. Rain Cap 3. Exhaust Vent Pipe (Inner) 4. Fresh Air Intake Pipe (Outer) 5. Stainless Steel Screw & Nut		B* Dimension may be shortened to a minimum of twelve (12) inches (30.5 cm). Inner pipe (item 3) must remain "F" inches longer than the outer pipe (item 4). Cut pipe ends square and solvent cement as outlined in the System 636 installation manual. C+ Installation cutout should be at least 1/2" (12.7 mm) larger than dimension "C". Lengthening the units is not permitted.						

TWIN PIPE VENTING GUIDE

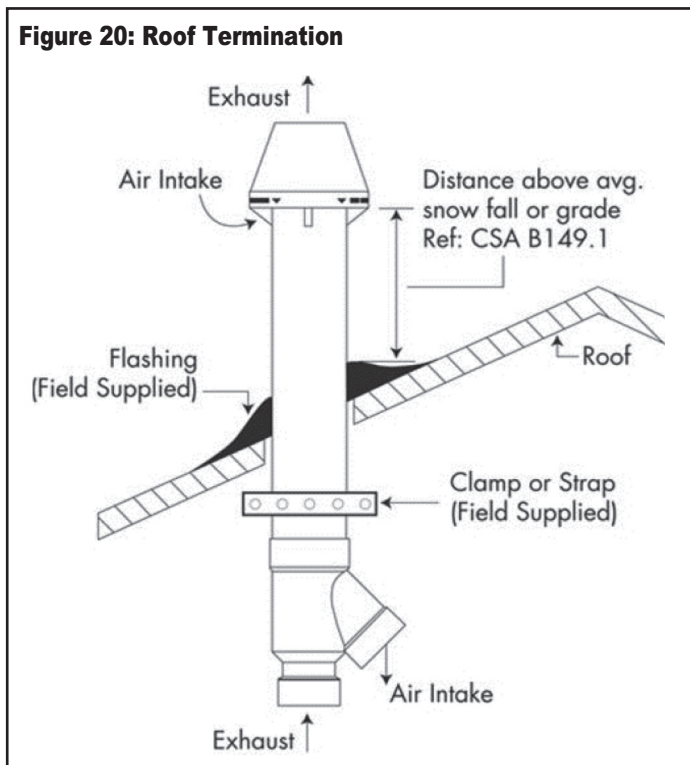
Figure 19: Wall Termination



IPEX Concentric Vent Kit Assembly (System 636):

- 1) Once the proper location has been determined, cut a hole in the roof or wall large enough to accommodate the outer pipe. The size of the hole can vary greatly depending on the roof pitch.
- 2) As per the procedures outlined, solvent cement the inner pipe to the concentric Wye fitting.
- 3) Solvent cement the outer pipe to the concentric Wye fitting.
- 4) Slide the assembly through the roof or wall penetration. (Install flashing as required)
- 5) To permanently affix the rain cap, it should be solvent cemented to the inner pipe. For installations where removal of the cap may be required for service or for cleaning purposes, it can be fastened mechanically (see instructions). For either installation method, the outer pipe is only a friction fit with the cap.

Figure 20: Roof Termination



MECHANICALLY FASTENED RAIN CAP:

The Rain Cap must be installed with the supplied Stainless Steel screw and lock nut, and in accordance with the instructions and diagram below.

- 1) Locate the drill location dimple on the outside of the rain cap.
- 2) At this location, drill through the cap and the inner pipe wall. Ensure that the path of the hole is perpendicular to the inner pipe NOT the outside of the cap. For the three (3) inch (7.6 cm) kit, drill a 3/16" (4.8 mm) hole, for the four (4) inch (10.2 cm) kit, drill a 1/4" (6.4 mm) hole. Clean any resulting debris.
- 3) Insert the screw and tighten. **DO NOT OVER TIGHTEN.**

Acceptable Venting Clearances For IPEX Concentric Vent Kit (CVK) Termination:

Figure 21a: Two Or More Vent Terminals On Same Level

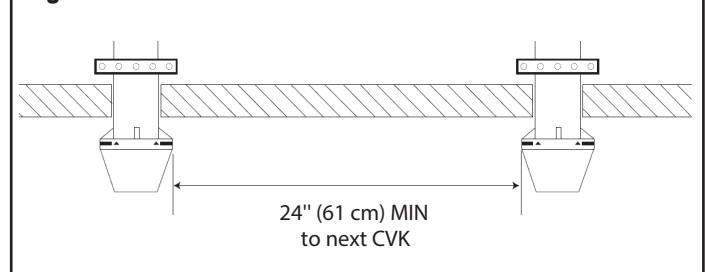
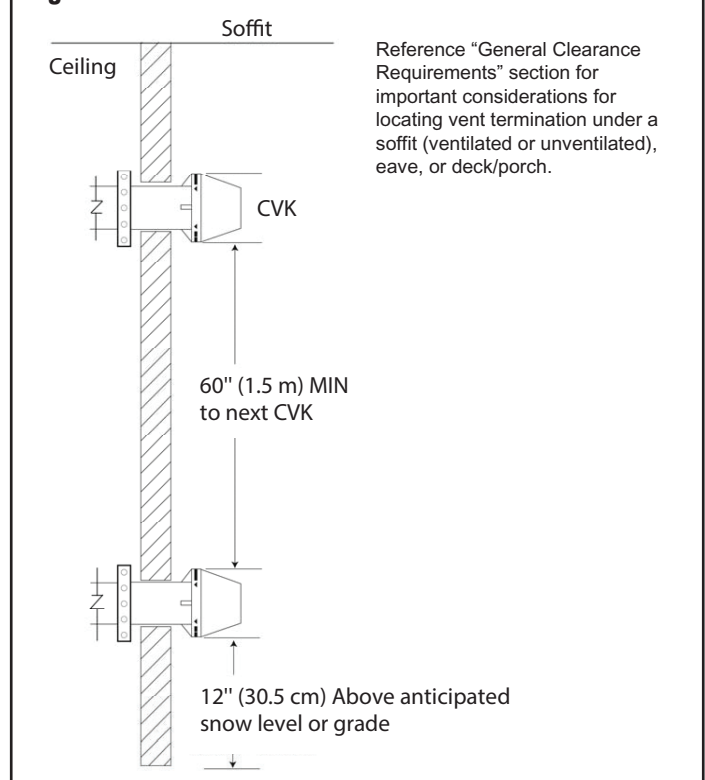


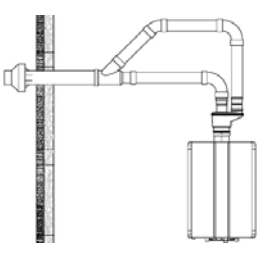
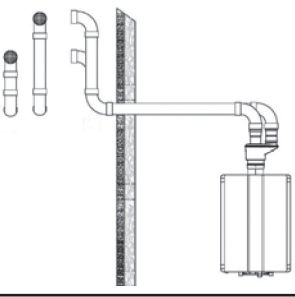
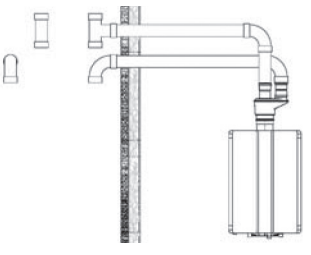
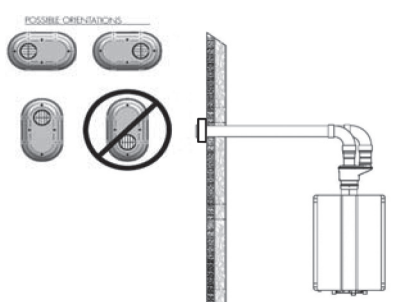
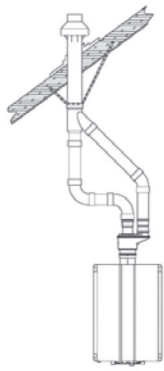
Figure 21b: Vertical between Terminals

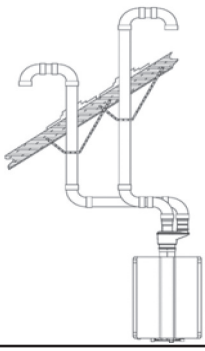
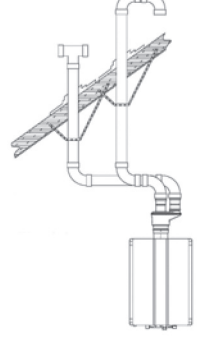


NOTE: Vent spacing depicted above are specific to IPEX PVC/CPVC-FGV Concentric Vent Kit ONLY; for required spacing for all other termination types, refer to **Figures 24 thru 29.**

TWIN PIPE VENTING GUIDE

Figure 22: Approved PVC/CPVC Vent Configurations

Three (3) inch (7.6 cm) or four (4) inch (10.2 cm) PVC/CPVC Concentric Side Wall Termination Configuration	
Three (3) inch (7.6 cm) or four (4) inch (10.2 cm) PVC/CPVC Snorkel Termination Configuration	
Three (3) inch (7.6 cm) or four (4) inch (10.2 cm) PVC/CPVC Tee Side Wall Termination Configuration	
Three (3) inch (7.6 cm) or four (4) inch (10.2 cm) PVC/CPVC Low Profile Termination Configuration	
Three (3) inch (7.6 cm) or four (4) inch (10.2 cm) PVC/CPVC Concentric Vertical Termination Configuration	

Three (3) inch (7.6 cm) or four (4) inch (10.2 cm) PVC/CPVC Standard upside down "U" Vertical Termination Configuration	
Three (3) inch (7.6 cm) or four (4) inch (10.2 cm) PVC/CPVC Tee Vertical Termination Configuration	

Venting Installation Sequence

- 1) Install the water heater.
- 2) Determine the termination method—sidewall or vertical, concentric or separate pipes, etc.
- 3) Determine proper location for wall or roof penetration for each termination.
- 4) Install termination assembly as described in this manual.
- 5) Install air and vent piping from water heater to termination.
- 6) Slope horizontal exhaust run towards the water heater 1/4 per foot. **DO NOT** slope combustion air pipe towards unit. Be sure to dispose of condensate per local codes.
- 7) Install pipe supports and brackets every four (4) feet (1.2 m) allowing for movement from expansion or as per local code requirements.

Three (3) inch (7.6 cm) and four (4) inch (10.2 cm) Low Profile Vent Termination Kits

The following information should be used in conjunction with the IPEX System 636 Installation Guide:

- Termination kits are to be tested and certified for use with the brand of pipe-fitting-cement system that is to be utilized in the application. The IPEX Low Profile termination is fully certified for use with IPEX product only.
- System 636 PVC Low Profile Vent kits are rated to 65°C (149°F) maximum and are made from certified compound.
- All termination kits must be located and installed in accordance with these instructions, local building code, and CSA B149.1 Natural Gas and Propane Installation Code.

TWIN PIPE VENTING GUIDE

Installation:

- 1) Once location is determined, cut two (2) appropriately sized holes in the wall to accommodate the pipe. (Reference the following Low Profile Termination Kit Dimensions table)
- 2) Slide intake and exhaust pipes through the holes. Secure (using solvent cement) both pipes to the base of the vent termination kit. (Be sure to follow guidelines for solvent cementing as described in the System 636 Installation Guide)
- 3) Use the supplied screws and anchors to secure the base to the wall. (a drilled 3/16" (4.8 mm) hole, 1-3/16" (4.8 mm) deep will be needed for the anchors.) Use the base as a template to locate the anchor hole.
- 4) Using the supplied screws, secure the Cap to the Base.
- 5) Upon securing the vent termination and pipes, seal the wall penetrations (from the interior) using a PVC compatible sealant material.

NOTICE

All exhaust vents and air inlets must terminate at the same height to avoid substantial property damage, personal injury, or death.

Low Profile Termination Kits-Dimensions

Item #	Description	Pipe Outside Diameter	Hole Spacing (Ctr to Ctr)
196985	3" (7.6 cm) Flush Mount Vent Kit	3.5" (8.9 cm)	5.6" (14.2 cm)
196986	4" (10.2 cm) Flush Mount Vent Kit	4.5" (11.4 cm)	5.6" (14.2 cm)

Twin Pipe (PVC/CPVC) Terminations

PVC/CPVC Sidewall (Tee and Snorkel) Terminations:

Locate the vent and intake air termination using the following guidelines:

- 1) The total length of the vent or intake air piping must not exceed the limits given in **Tables 11-14**. The equivalent length for 90° elbows and termination associated with the respective vent and intake air piping arrangement **MUST** be subtracted from total length listed in **Tables 11-14**.
- 2) Specific to Side Wall Tee Termination, the vent and intake air piping must terminate at the outside surface of the outer wall, minimum one (1) inch (2.5 cm) between wall, tee, and elbow socket ends (**see Figure 24**).
- 3) Termination must be installed twelve (12) inches (30.5 cm), above the highest anticipated snow level (**see Figures 25 & 26**).
- 4) Refer to **Table 3** this document for recommendation on vent/combustion air intake terminal position.

NOTE: If the vent is terminated on a sidewall which is subject to high winds it is recommended to terminate the vent using a tee. A tee provides the best protection against wind.

- 5) The intake air pipe must terminate using a 90° elbow directed away from the vent termination. Both vent and air intake pipe terminations must be installed twelve (12) inches (30.5 cm) minimum above grade or highest anticipated snow level and as shown in **Figures 25 and 26**.

Figure 23: Kit Contents

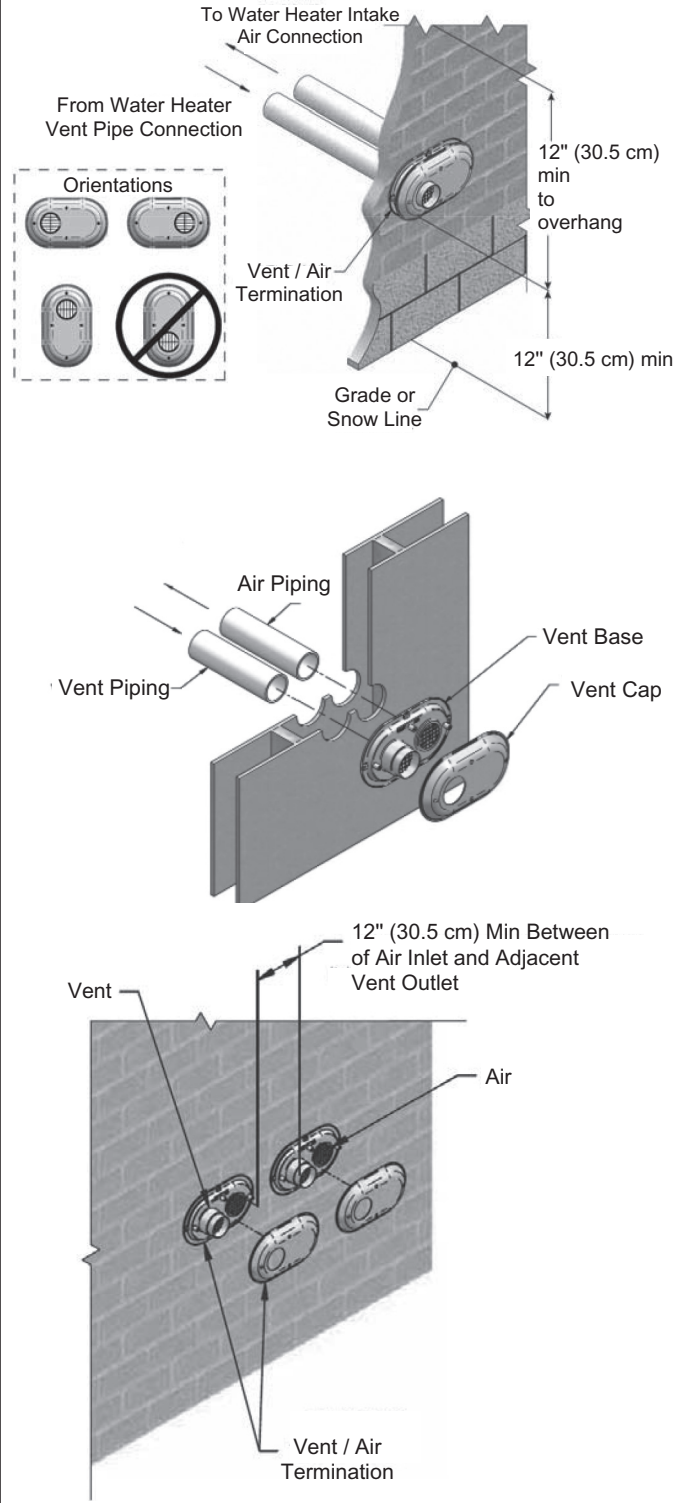


Table 16:

Qty	Item Description
1	Base (Two holes)
1	Cap (One Hole)
8	Stainless Steel Screws
4	Plastic Anchors

TWIN PIPE VENTING GUIDE

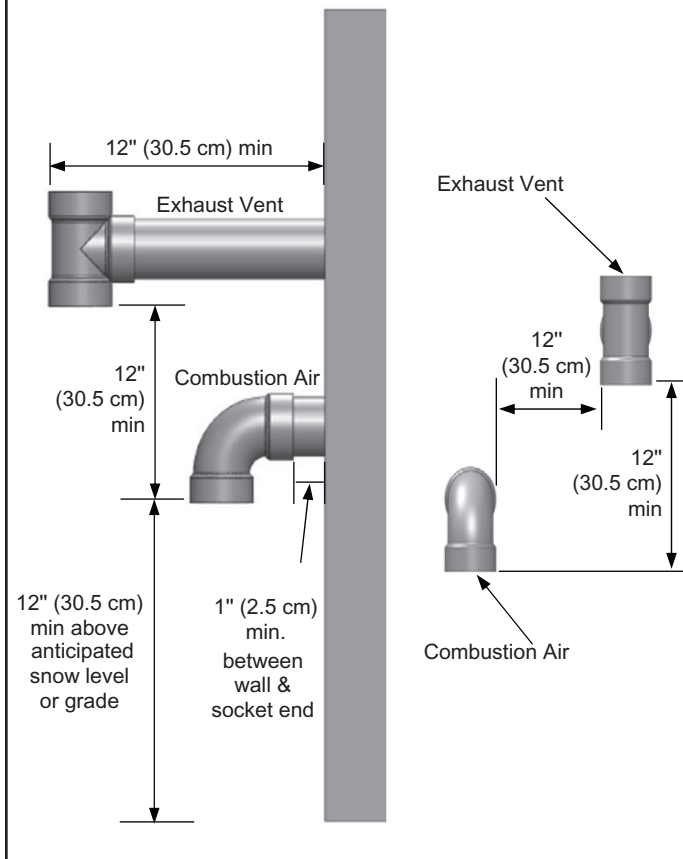
NOTICE

The information and figures depicting method of terminating the vent and combustion air intake pipes are directly related to PVC/CPVC vent systems. When utilizing other than PVC/CPVC vent system there may be some variations. Consult the respective vent manufacturer or the water heater manual for recommendations and clarifications.

NOTICE

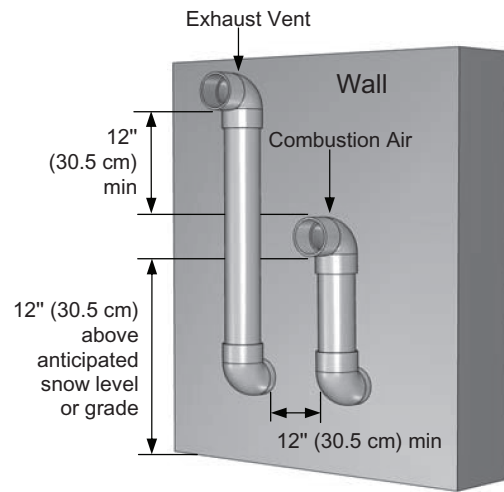
Slope horizontal exhaust piping downward toward the water heater a minimum of 1/4 inch per foot. **DO NOT** slope combustion air piping down towards water heater. Dispose of condensate per local codes.

Figure 24: Sidewall Vent and Combustion Air Piping with Tee Termination



NOTE: All figures shown in this section is in reference to flat roofs. For heights of venting passing through a pitched roof, refer to NFPA 54/ANSI Z223.1-09 (see Figure 29) and/or CSA B149.1-10.

Figure 25: Sidewall Vent and Combustion Air Piping with Snorkel Termination

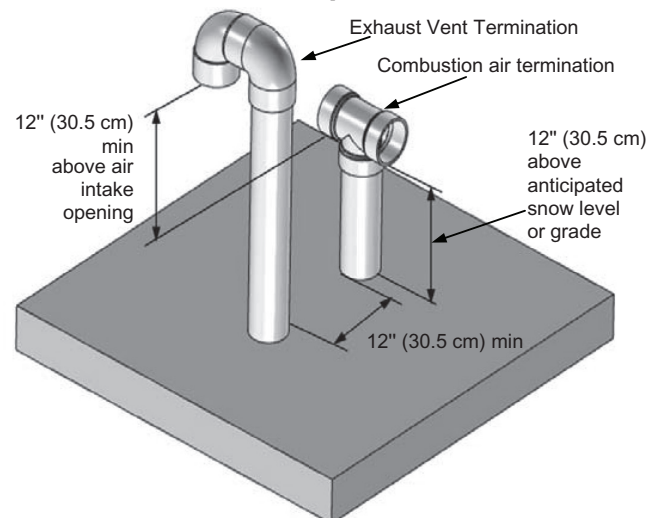


PVC/CPVC Roof (Tee and upside down "U") Terminations

Locate the vent and intake air termination using the following guidelines:

- 1) The total length of the vent or intake air piping must not exceed the limits given in **Tables 11-14**. The equivalent length for 90° elbows and termination associated with the respective vent and intake air piping arrangement **MUST** be subtracted from total length listed in **Tables 11-14**.
- 2) For roof terminations installed as shown in **Figure 27**, the intake air piping must terminate using a tee or combination of elbows per **Figures 26 & 27**. The termination must be installed twelve (12) inches (30.5 cm), above roof or the highest anticipated snow level.
- 3) The vent must terminate vertically with a coupling to facilitate the bird screen and must be located twelve (12) inches (30.5 cm) minimum above the combustion air inlet as shown in **Figures 26 & 27**.
- 4) The vent and intake air terminations must be located a radial distance of twelve (12) inches minimum (30.5 cm) from outer wall of vent termination to outer wall of combustion air intake termination; refer to **Figures 26 & 27**.

Figure 26: Vertical Termination of TEE-Vent and Combustion Air Pipe



TWIN PIPE VENTING GUIDE

Multiple Water Heater Installation – Through the Roof

Locate the vent and intake air termination using the following guidelines:

- 1) For installations with multiple Tankless Water Heaters, refer to **Figure 29** for proper exhaust and combustion air piping placement.
- 2) Roof penetration of the vent and intake air piping should be such that the combustion air intake is a minimum twelve (12) inches (30.5 cm) from the adjacent vent pipe of the other water heater. For installations in the U.S. refer to **Figure 29**. For installations in Canada, refer to clearances required by CAN/CSA B149.1.

Figure 27: Vertical Termination of U-Vent and Combustion Air Pipe

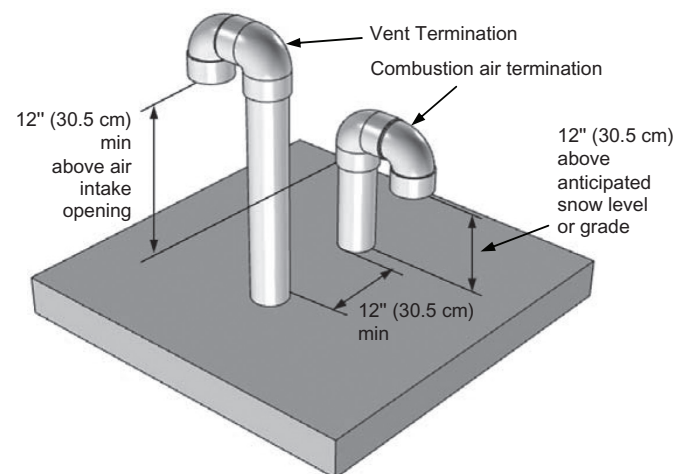
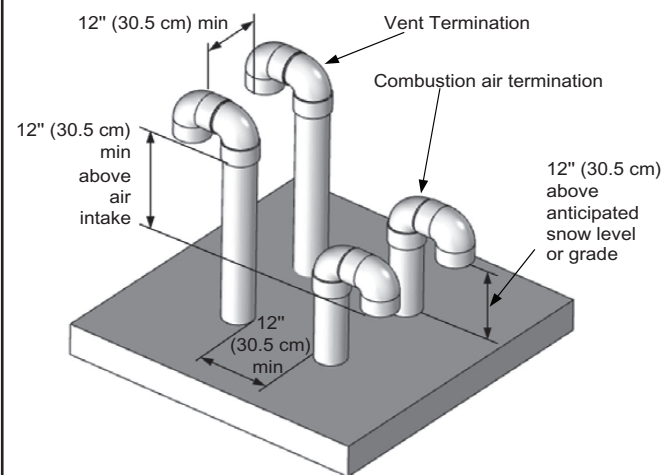


Figure 29: Vertical Termination of Multiple Water Heaters



NOTICE

To prevent possibility of condensate freeze-up, do not install vent kits one above the other. Once the vent terminal location has been determined, make holes through the exterior wall to accommodate the vent pipes. Vent pipes must exit exterior wall horizontally only.

Figure 28: Ubbink® Concentric to Twin Pipe Adaptor

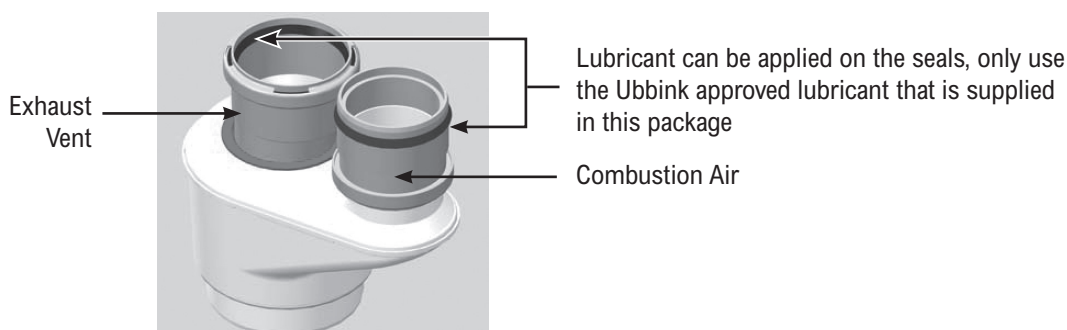

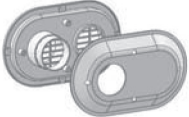







Table 17

Physical Data in inches (cm)				
Part #	Nominal Diameter	Overall Height	Effective Height	Offset
187585PP	3"/5" (7.6/12.5)	9.9" (25.1)	8.6" (21.8)	4.8" (12.2)
Ubbink bv Verhuellweg 9 NL- 6984 AA Doesburg T + 31 (0) 313 480 200 F + 31 (0) 313 473 942 rolux@ubbink.nl www.ubbink.nl		ULc 636 Gas Vent-BH Class IIC-110°C/230°F where applicable		
		⚠ WARNING Improper installation of vent system and components, or failure to follow all installation instructions, can result in property damage or serious injury.		

TWIN PIPE VENTING GUIDE

Table 18: Approved PVC/CPVC Termination Components

OEM	OEM # or Cert.	Product Description	Diagram	Equivalent Length (Ft/m)
IPEX (Purchased separately)	196006 / 197009 (3 inches) (7.6 cm) 196021 / 197021 (4 inches) (10.2 cm) (System 636)	PVC/CPVC-FGV Concentric Vent Kit w/vent screen		20 (6.1 m)
IPEX (Purchased separately)	196985 (3 inches) (7.6 cm) 196986 (4 inches) (10.2 cm) (System 636)	Low Profile Termination Kit		5 (1.5 m)
Field Supplied PVC/CPVC Sch.40 Fittings or Approved Equal	Comply with CAN/ CGA B149.1 & ULC-S636	3 inches (7.6 cm) and 4 inches (10.2 cm) SCH 40 (Solid Core) PVC/CPVC TEE w/vent screen		5 (1.5 m)
Field Supplied PVC/CPVC Sch.40 Fittings or Approved Equal	Comply with CAN/ CGA B149.1 & ULC-S636	3 inches (7.6 cm) and 4 inches (10.2 cm) SCH 40 (Solid Core) PVC/CPVC 90° EL w/vent screen		5 (1.5 m)
Field Supplied PVC/CPVC Sch.40 Fittings or Approved Equal	Comply with CAN/ CGA B149.1 & ULC-S636	3 inches (7.6 cm) and 4 inches (10.2 cm) SCH 40 (Solid Core) PVC/CPVC 45° EL w/vent screen		2.5 (0.76 m)
IPEX (Purchased separately)	196051 (3 inches) (7.6 cm) 196052 (4 inches) (10.2 cm)	Friction fit vent screen 3 inches (7.6 cm) and 4 inches (10.2 cm)		0
Field Supplied PVC/CPVC Sch. 40 Fittings or Approved Equal	Comply with CAN/ CGA B149.1 & ULC-S636	3 inches (7.6 cm) and 4 inches (10.2 cm) SCH 40 (Solid Core) PVC/CPVC Snorkel vent w/vent screen		10 (3.0 m)

INSTALLATION INSTRUCTIONS

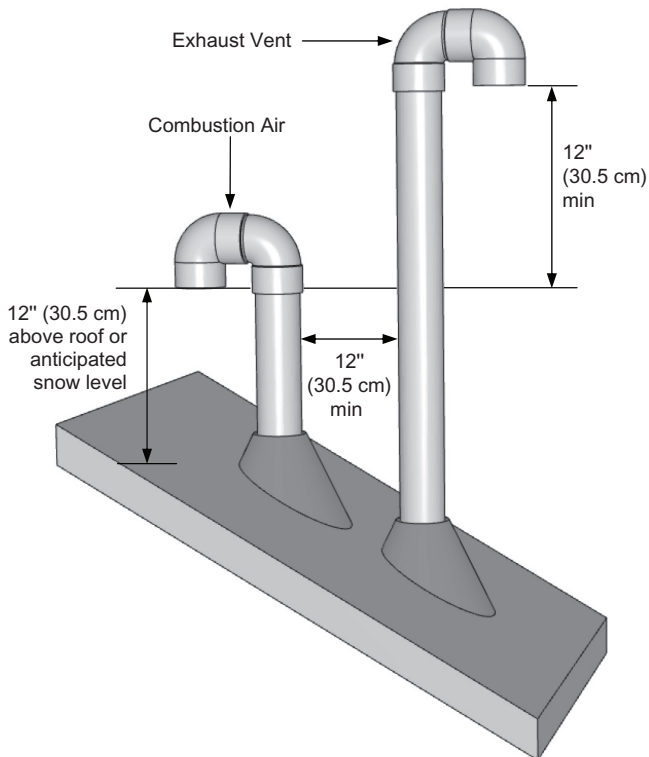
Equivalent Vent Length Calculation Sheet

Fitting / Termination Type	Number of fittings		Equivalent Vent Length		Total Equivalent Length
1) 90° elbow		x	5	=	
2) 45° elbow		x	2.5	=	
3) IPEX Low Profile Termination		x	5	=	
4) IPEX 4" (10.2 cm) Concentric Termination		x	20	=	
5) IPEX 3" (7.6 cm) Concentric Termination		x	20	=	
6) 3" (7.6 cm) Tee Termination		x	5	=	
7) 4" (10.2 cm) Tee Termination		x	5	=	
8) 3" (7.6 cm) Snorkel Termination		x	10	=	
9) 4" (10.2 cm) Snorkel Termination		x	10	=	
10) Length of Straight Section in feet	NA	x	40	=	
Total (add up lines 1 through 10)					

Note: Ensure switch #1 in the tan bank of dip switches is in OFF position if vent length is greater than twenty-one (21) feet (6.4 m).

Pitched Roof Termination Clearances:

Figure 30: Vertical Termination of U-Vent and Combustion Air Pipe on a Pitched Roof






NOTICE

DO NOT use lubricant between two (2) PVC/CPVC components. Refer to cement manufacturer instruction for specific instructions and handling.

Basic Instructions for Cementing Joints:

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

Table 19: Types of Acceptable PVC/CPVC Elbows for Venting System

ACCEPTABLE	ACCEPTABLE	NOT ACCEPTABLE
 <p>90° Elbows, Female Unthreaded Socket Ends: (Long Turn) Long Sweep</p>	 <p>90° Elbows, Female Unthreaded Socket Ends: (1/4 Bend) Short Sweep</p>	 <p>90° Elbows, Female Unthreaded Socket Ends: Close Turn</p>

INSTALLATION INSTRUCTIONS

Vent Components and Assigned Equivalent Lengths:

The following fittings and accessories (by others) are certified for use with the above mentioned condensing products:

- Vent screens are not ULC S636 Certified.
- Friction fit vent screens inside termination fitting are to avoid debris and/or small animals from entering vent.
- Primer shall be used when installing System 636 and other PVC/CPVC products at temperatures below 32°F (0°C).
- Primer is required in some jurisdictions regardless of temperature, verify with your local authority having jurisdiction.
- Use only System 636 cements and primers with System 636 components; substituting other cements and primers will void IPEX's certification and warranty; (see OEM's literature).
- For Schedule 40 PVC/CPVC, any glue and primer approved by your local authority having jurisdiction may be substituted.

Installation of Plumbing

Pressure-Relief Valve Requirements

Install the pressure-relief valve according to these instructions.

An approved pressure-relief valve is required by the *American National Standard (ANSI Z21.10.3)* for all water heating systems and shall be accessible for servicing.

DO NOT

- Do not plug the relief valve or install any reducing fittings or other restrictions in the relief line. The relief line should allow for complete drainage of the valve and the line.
- Do not place any other type of valve or shut off device between the relief valve and the water heater.

MUST DO

- The relief valve must comply with the standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems ANSI Z21.22 and/or the standard Temperature, Pressure, Temperature and Pressure-Relief Valves and Vacuum-Relief Valves, CAN1 4.4.
- The relief valve must be rated up to 150 psi and to at least the maximum BTU/hr of the appliance.
- The discharge from the pressure-relief valve should be piped to the ground or into a drain system to prevent exposure or possible burn hazards to humans or other plant or animal life. Follow local codes. Water discharged from the relief valve could cause severe burns instantly, scalds, or death.
- The pressure relief valve must be manually operated once a year to check for correct operation.
- The relief valve should be added to the hot water outlet line and near the hot water outlet according to the manufacturer's instructions. **DO NOT** place any other type valve or shut off device between the relief valve and the water heater.

INFORMATION

- If a relief valve discharges periodically, this may be due to thermal expansion in a closed water supply system. Contact the water supplier or local plumbing inspector on how to correct this situation. Do not plug the relief valve.

- The American National Standard (ANSI Z21.10.3) does not require a combination temperature and pressure-relief valve for this appliance. However, local codes may require a combination temperature and pressure-relief valve.

Isolation Valves

Giant strongly recommends the installation of isolation valves on the cold and hot water lines because they provide the ability to isolate the water heater from the structure's plumbing and allow quick access to flush the heat exchanger. Flushing the heat exchanger regularly is required as part of the proper maintenance for this water heater.

Piping Requirements

A manual water control valve must be placed in the water inlet connection to the water heater before it is connected to the water line. Unions may be used on both the hot and cold water lines for future servicing and disconnection of the unit.

DO NOT

- Do not introduce toxic chemicals such as those used for boiler water treatment to the potable water used for space heating.

MUST DO

- The piping (including soldering materials) and components connected to this appliance must be approved for use in potable water systems.
- Purge the water line to remove all debris and air. Debris will damage the water heater.
- If the appliance will be used as a potable water source, it must not be connected to a system that was previously used with a non-potable water heating appliance.
- Ensure that the water filter on the water heater is clean and installed.

Connect Water Heater to Water Supply

Water connections to the tankless water heater should follow all provincial and local plumbing codes.

If this is a standard installation, refer to the Piping Diagram for Basic Installation.

- 1) Plumb water supply to the tankless water heater on the 3/4" MNPT connection at the bottom of the unit marked "Water Inlet", which is the cold water supply.
- 2) Plumb the building hot water supply to the 3/4" MSPT connection marked "Water Outlet", which is the hot water supply.

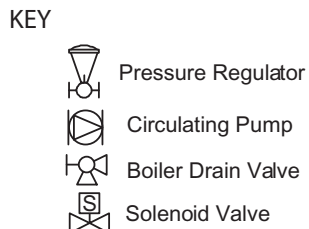
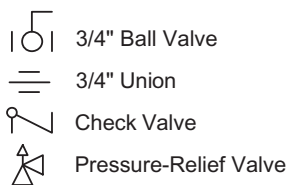
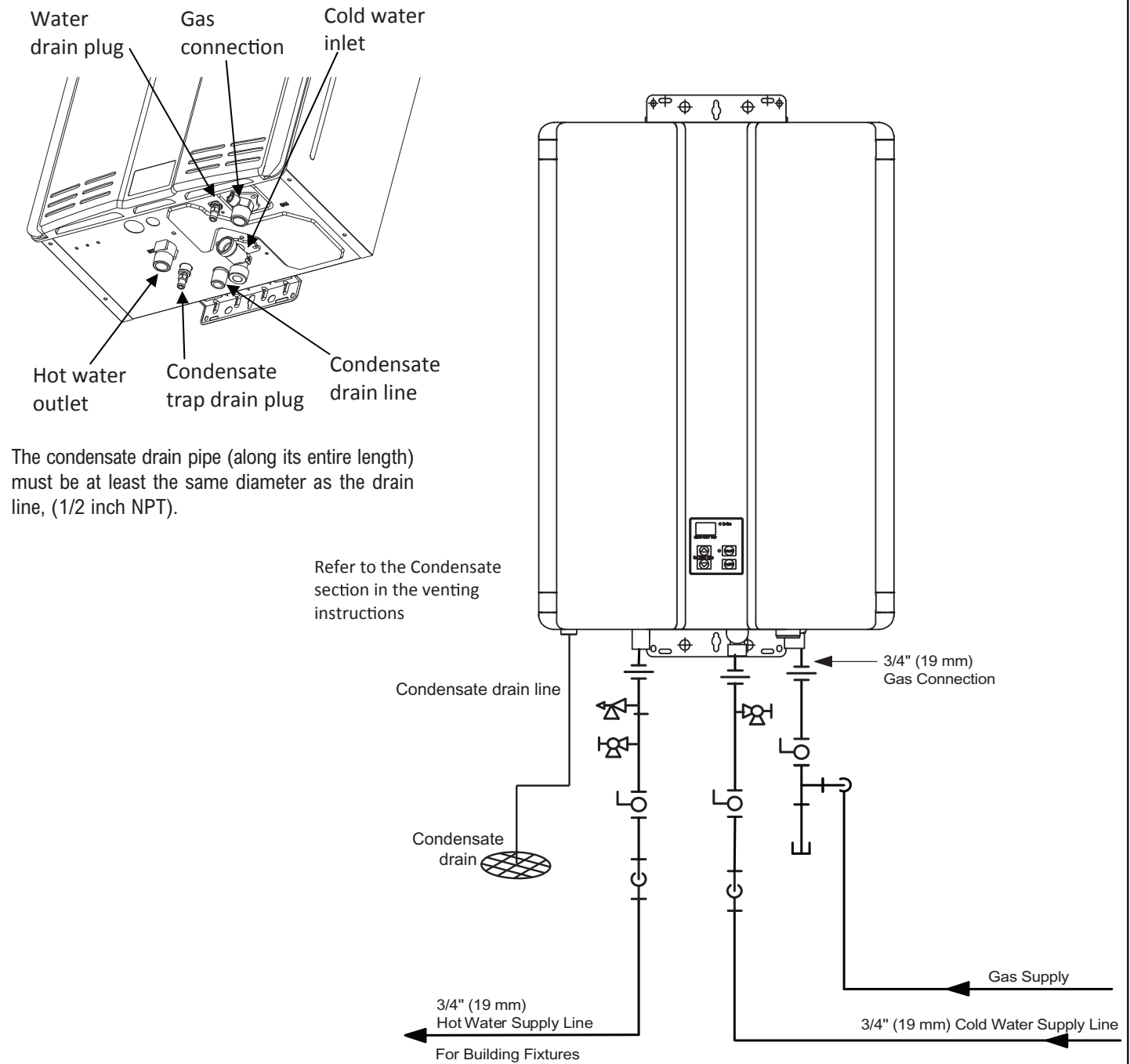
If a pipe cover will be installed, make sure water lines to the water heater fit.

Checklist for Plumbing

- ☐ Purge the water line of all debris and air by closing the hot isolation valve and opening the cold isolation valve and its drain. Debris will damage the water heater. Use a bucket or hose, if necessary.
- ☐ Ensure that hot and cold water lines are not crossed to the unit and are leak-free.
- ☐ Ensure that a pressure-relief valve is installed with a rating that exceeds the BTU input of the water heater model. Refer to the rating plate on the side of the water heater for BTU input.

INSTALLATION INSTRUCTIONS

Figure 31: Piping Diagram for Basic Installation



This is not an engineered drawing. It is intended only as a guide and not as a replacement for professionally engineered project drawings. This drawing is not intended to describe a complete system. It is up to the contractor/engineer to determine the necessary components and configuration of the particular system being installed. This drawing does not imply compliance with local building code requirements. It is the responsibility of the contractor/engineer to ensure installation is in accordance with all local building codes. Confer with local building officials before installation.

INSTALLATION INSTRUCTIONS

- Clean the inlet water filter by closing the cold and hot water inlet isolation (shut-off) valves. Put a bucket under the filter at the bottom of the water heater to catch any water that is contained inside the unit. Unscrew the water filter. Rinse the filter to remove any debris. Install the filter and open the isolation valves.
- Check for proper water pressure to the water heater. Minimum water pressure is 50 psi. Giant recommends 60-80 psi for maximum performance.

Installation of Gas Supply

⚠ WARNING

- 1) If you are not knowledgeable or qualified to install gas lines or connections, then contact a licensed professional to install the gas supply.
- 2) Turn off 120 V power supply.
- 3) Turn off the gas.
- 4) Gas is flammable. Do not smoke or provide other ignition sources while working with gas.
- 5) Do not turn on the water heater or gas until all fumes are gone.

General Instructions

MUST DO

- A manual gas control valve must be placed in the gas supply line to the water heater. A union can be used on the connection above the shut-off valve for the future servicing or disconnection of the unit.
- Check the type of gas and the gas inlet pressure before connecting the water heater. If the water heater is not of the gas type that the building is supplied with, DO NOT connect the water heater. Contact the dealer for the proper unit to match the gas type.
- Check the gas supply pressure immediately upstream at a location provided by the gas company. Supplied gas pressure must be within the limits shown in the Specifications section with all gas appliances operating.
- Before placing the appliance in operation all joints including the heater must be checked for gas tightness by means of leak detector solution, soap, and water, or an equivalent non-flammable solution, as applicable. (Since some leak test solutions, including soap and water, may cause corrosion or stress cracking, the piping shall be rinsed with water after testing, unless it has been determined that the leak-test solution is non-corrosive.)
- Use approved connectors to connect the unit to the gas line. Purge the gas line of any debris before connection to the water heater.
- Any compound used on the threaded joint of the gas piping shall be a type which resists the action of liquefied petroleum gas (propane / LPG).
- The gas supply line shall be gas tight, sized, and so installed as to provide a supply of gas sufficient to meet the maximum demand of the heater and all other gas consuming appliances at the location without loss of pressure.

INFORMATION

- Refer to an approved pipe sizing chart, if in doubt about the size of the gas line.

Size the gas pipe

The gas supply must be capable of handling the entire gas load at the location. Gas line sizing is based on gas type; the pressure drop in the system, the gas pressure supplied, and gas line type. For gas pipe sizing in the United States, refer to the National Fuel Gas Code, NFPA 54. The below information is provided as an example. The appropriate table from the applicable code must be used.

- 1) For some tables, you will need to determine the cubic feet per hour of gas required by dividing the gas input by the heating value of the gas (available from the local gas company). The gas input needs to include all gas products at the location and the maximum BTU usage at full load when all gas products are in use.
- 2) Use the table for your gas type and pipe type to find the pipe size required. The pipe size must be able to provide the required cubic feet per hour of gas or the required BTU/hour.

**Cubic Feet
per Hour =
(CFH)**

Gas Input of all gas products (BTU / HR)
Heating Value of Gas (BTU / FT³)

Example:

The heating value of natural gas for your location is 1,000 BTU/FT³. The gas input of the UGTC-199N is 199,000 BTU/hr. Additional appliances at the location require 65,000 BTU/hr. Therefore the cubic feet per hour = (199,000 + 65,000) / 1,000 = 264 FT³/hr. If the pipe length is ten (10) feet (3.0 m), then the 3/4 inch (1.9 cm) pipe size is capable of supplying 264 FT³/hr of natural gas.

Table 20

Pipe Sizing Table - Natural Gas				
Schedule 40 Metallic Pipe				
Inlet Pressure: less than 2 psi (55 inches W.C.)				
Pressure Drop: 0.3 inches W.C.				
Specific Gravity: 0.60				
cubic feet per hour				

Length	Pipe Size (inches)			
	3/4	1	1 1/4	1 1/2
10	273	514	1,060	1,580
20	188	353	726	1,090
30	151	284	583	873
40	129	243	499	747
50	114	215	442	662
60	104	195	400	600
70	95	179	368	552
80	89	167	343	514
90	83	157	322	482
100	79	148	304	455

INSTALLATION INSTRUCTIONS

Table 21

Pipe Sizing Table - Propane Gas Schedule 40 Metallic Pipe Inlet Pressure: 11.0 inches W.C. Pressure Drop: 0.5 inches W.C. Specific Gravity: 1.50 Capacity in Thousands of BTU per Hour				
Length	Pipe Size (inches)			
	1/2	3/4	1	1 1/4
10	291	608	1,150	2,350
20	200	418	787	1,620
30	160	336	632	1,300
40	137	287	541	1,110
50	122	255	480	985
60	110	231	434	892
80	101	212	400	821
100	94	197	372	763

Connect Electricity

⚠ WARNING

Do not use an extension cord or an adapter plug with this appliance.

The water heater must be electrically grounded in accordance with local codes and ordinances or, in the absence of local codes, in accordance with the National Electrical Code, ANSI/NFPA No. 70.

Water heaters are equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding terminal from this plug.

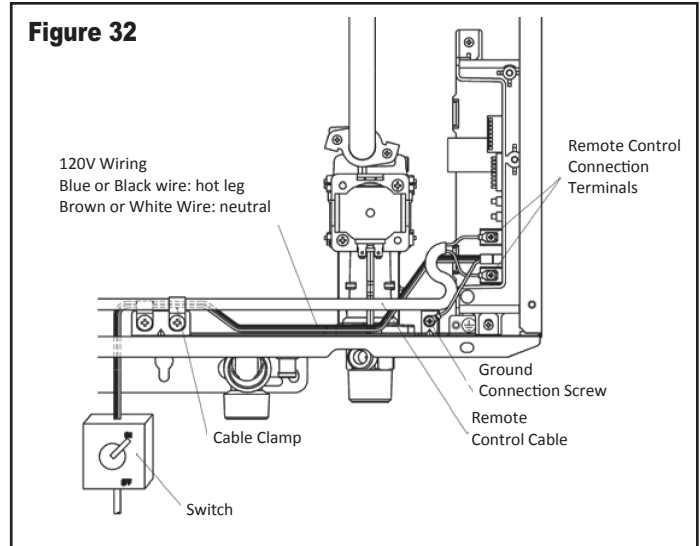
Do not rely on the gas or water piping to ground the water heater. A screw is provided in the junction box for the grounding connection.

The water heater requires 120 VAC, 60 Hz power from a properly grounded circuit.

If using the five (5) foot (1.5 m) long power cord, plug it into a standard 3-prong 120 VAC, 60 Hz properly grounded wall outlet.

The wiring diagram is located on the Technical Sheet attached to the inside of the front cover.

Figure 32



Adjust for High Altitude (United States)

The gas and power to the water heater should be turned off. On the SW1 DIP switch (tan switches), set switches # 2 and # 3 to the values shown in table below for your altitude. The default setting for the appliance is 0-2,000 feet (0-610 m) with switches # 2 and # 3 in the OFF position.

When the DIP switch is adjusted, it is not necessary to adjust the gas pressure setting for high altitude.

Table 22

Altitude	SW1 Switch # 2	SW1 Switch # 3
0-2,000 ft (0-610 m)	OFF	OFF
2,001-5,200 ft (610-1,585 m)	OFF	ON
5,201-7,700 ft (1,585-2,347 m)	ON	OFF
7,701-10,200 ft (2,347-3,109 m)	ON	ON

Adjust for High Altitude (Canada)

(2,001 – 4,500 feet (610-1,372 m))

The gas and power to the water heater should be turned off. On the SW1 DIP switch (tan switches), set switches # 2 and # 3 to the values shown in table below for your altitude. The default setting for the appliance is 0-2,000 feet (0-610 m) with switches # 2 and # 3 in the OFF position.

When the DIP switch is adjusted, it is not necessary to adjust the gas pressure setting for high altitude.

Table 23

Altitude	SW1 Switch # 2	SW1 Switch # 3
0-2,000 ft (0-610 m)	OFF	OFF
2,001-4,500 ft (610-1,372 m)	OFF	ON

The conversion shall be carried out by a manufacturer's authorized representative, in accordance with the requirements of the manufacturer, provincial, or territorial authorities having jurisdiction and in accordance with the requirements of the CAN/CGA-B149.1 or CAN/CGA-B149.2 Installation Codes.

INSTALLATION INSTRUCTIONS

Adjust for Vent Length

Adjust switch # 1 in the SW1 DIP switch (tan switches), if required. Refer to the section "Maximum vent length".

Checklist for Gas and Electricity

- A manual gas control valve is placed in the gas line to the water heater.
- Check the gas lines and connections for leaks.
- Confirm that the gas inlet pressure is within limits.
- Confirm that the water heater is rated for the gas type supplied.
- Confirm that the electricity is supplied from 120 VAC, 60 Hz power source and is in a properly grounded circuit.
- An extension cord or an adapter plug has not been used with the water heater.

Installation of Temperature Controller

⚠ WARNING

Turn the power off. Do not attempt to connect the temperature controllers with the power on. Although the controller is a low voltage device, there is 120-volt potential next to the temperature controller connections inside the unit.

Do not connect the temperature controller to the 120VAC terminals provided for the optional solenoid drain valves.

Models have their controller built into the front panel. Additional controllers can be installed.

Controller Location

- The controller should be out of reach of children.
- Avoid locations where the controller may become hot (near the oven or radiant heater).
- Avoid locations in direct sunlight. The digital display may be difficult to read in direct sunlight.
- Avoid locations where the temperature controller could be splashed with liquids.
- Do not install in locations where it can be adjusted by the public.

Cable Lengths and Sizes

The cable for the temperature controller should be a non-polarized two-core cable with a minimum gauge of 22 AWG. The maximum cable length from each controller to the water heater depends on the total number of wired controllers connected to the water heater.

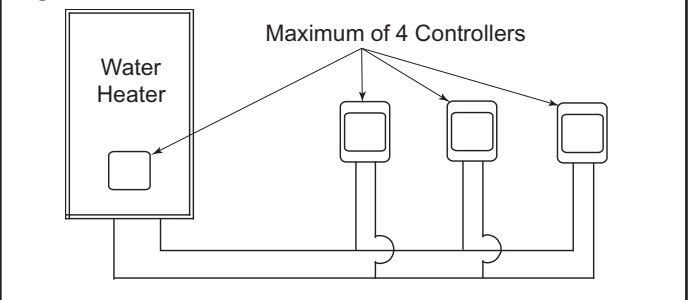
Table 24

Number of Wired Controllers	Maximum Cable Length for each Controller to Water Heater
1	328 feet (100 m)
2	164 feet (50 m)
3	65 feet (20 m)

Configurations

A maximum of four (4) temperature controllers can be installed for a water heater or group of water heaters. This includes the controller built into an indoor water heater. Controllers can only be wired in parallel. Controllers cannot be wired in series.

Figure 33



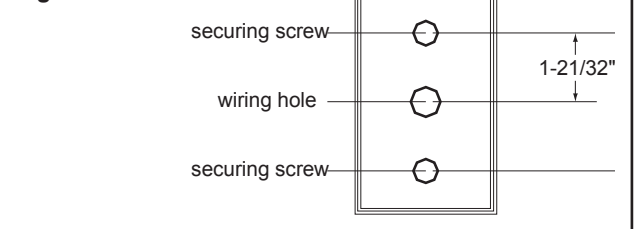
The four (4) temperature controllers can consist of multiple MC-91-2 or MCC-91-2.

If four (4) MC-91's are installed, simultaneously press the Priority and On/Off buttons on the fourth controller until a beep sounds.

Mounting the controller

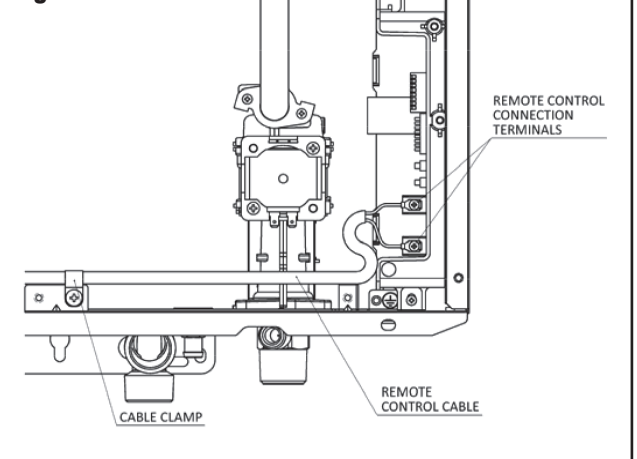
- 1) Make three (3) holes in the wall as shown.

Figure 34



- 2) Run the cable between the controller and the water heater or the controller and another controller.
- 3) Remove the face plate from the temperature controller using a screwdriver.
- 4) Connect the cable to the temperature controller.
- 5) Mount the controller to the wall using the holes drilled in step 1.
- 6) Disconnect the power from the water heater.
- 7) Remove the plastic cover from the PCB and electrical connections.
- 8) Thread the cable through the access hole at the base of the unit and connect the wires to the controller terminals on the right hand side bottom of the PCB.
- 9) Secure the controller cable using the clamp provided.
- 10) Replace plastic cover over PCB and then replace the cover of the water heater.

Figure 35



INSTALLATION INSTRUCTIONS

Final Installation Checklist

Location

- The water heater is not subject to corrosive compounds in the air..... ☐
- The water supply does not contain chemicals or exceeds total hardness that will damage the heat exchanger..... ☐
- Clearances from the water heater unit are met.. ☐
- Clearances from the vent termination / air intake are met..... ☐

Venting

- Ensure you have used the correct venting products for the model installed and that you have completely followed the venting manufacturer's installation instructions..... ☐
- Verify that the vent system does not exceed the maximum length for the number of elbows used..... ☐
- Verify that switch # 1 in the SW1 DIP switch (tan switches) has been adjusted for vent length, if necessary.
Refer to the section on Maximum Vent Length..... ☐

Piping

- Purge the water line of all debris and air by closing the hot isolation valve and opening the cold isolation valve and its drain.
Debris will damage the water heater. Use a bucket or hose, if necessary.. ☐
- Ensure that hot and cold water lines are not crossed to the unit and are leak-free.. ☐
- A manual gas control valve has been placed in the gas line to the water heater.. ☐
- Ensure that a pressure-relief valve is installed with a rating that exceeds the BTU input of the water heater model.
Refer to the rating plate on the side of the water heater for BTU input.. ☐
- Clean the inlet water filter by closing the cold and hot water inlet isolation (shut-off) valves. Put a bucket under the filter
at the bottom of the water heater to catch any water that is contained inside the unit. Unscrew the water filter. Rinse the
filter to remove any debris. Install the filter and open the isolation valves..... ☐
- Check the gas lines and connections for leaks..... ☐

Power and Gas Supply

- Confirm that the gas inlet pressure is within limits..... ☐
- Confirm that the water heater is rated for the gas type supplied..... ☐
- Confirm that the electricity is supplied from a 120 VAC, 60 Hz power source, is in a properly grounded circuit, and turned on..... ☐
- Verify the temperature controller is functioning properly..... ☐
- Verify that switches # 2 and # 3 in the SW1 DIP switch (tan switches) is set correctly for your altitude..... ☐
- Verify the system is functioning correctly by connecting your manometer to the gas pressure test port on the water heater.
Operate all gas appliances in the home or facility at high fire. The inlet gas pressure at the water heater must not drop below
that listed on the rating plate.. ☐

General

- If the water heater is not needed for immediate use, then drain the water from the heat exchanger.. ☐
- Install the front panel..... ☐
- Explain to the customer the importance of not blocking the vent termination or air intake..... ☐
- Explain to the customer the operation of the water heater, safety guidelines, maintenance, and warranty..... ☐
- The installation must conform with local codes or, in the absence of local codes, with the
National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1..... ☐
- Inform the consumer if the isolation valves are not installed or if a water softening system is not installed.. ☐
- Leave the entire manual taped to the water heater or give it directly to the consumer..... ☐

TECHNICAL DATA

Specifications

Model		UGTC 152	UGTC 199
Minimum Gas Consumption BTU/hr		15,200	
Maximum Gas Consumption BTU/hr		152,000	199,000
Hot water capacity (Min - Max) *		0.26 - 8.0 GPM (1.0 - 30 L/min)	0.26 - 9.8 GPM (1.0 - 37 L/min)
Temperature Setting (no controller)		120°F (49°C) or 140°F (60°C)	
Maximum Temp Setting (residential)		Selectable at 120°F (49°C) or at 140°F (60°C)	
Maximum Temp Setting (MCC-91-2 controller)		185°F (85°C)	
Minimum Temperature Setting		98°F (37°C)	
Weight		61.7 lb (28 kg)	
Energy Factor		0.96	0.95
Noise level		41 dB	
Electrical Data	Normal	42 W	64 W
	Standby	2 W	
	Anti-frost Protection	146 W	
	Max Current	Without recirculation pump: 4 A With recirculation pump: 8 A (exact value depends on the pump)	
	Fuse	10 A	
By-Pass Control		Electronic	
Gas Supply Pressure	Natural Gas	4.0 - 10.5 inch W.C.	
	Propane	8.0 - 13.5 inch W.C.	
Type of Appliance		Condensing, Tankless, Temperature controlled continuous flow gas hot water system	
Connections		Gas Supply: 3/4" MNPT, Cold Water Inlet: 3/4" MNPT, Hot Water Outlet: 3/4" MNPT	
Ignition System		Direct Electronic Ignition	
Electric Connections		Appliance: AC 120 Volts, 60Hz. Temperature Controller: DC 12 Volts (Digital)	
Water Temperature Control		Simulation Feedforward and Feedback	
Water Supply Pressure		Minimum Water Pressure: 50 PSI (Recommended 60-80 PSI for maximum performance)	
Maximum Water Supply Pressure		150 PSI	
Remote Control Cable		Non-Polarized Two-Core Cable (Minimum 22 AWG)	
Energy Star Qualified		Yes	
Complies with South Coast Air Quality Management District 14 ng/J or 20 ppm NOx emission levels		Yes	

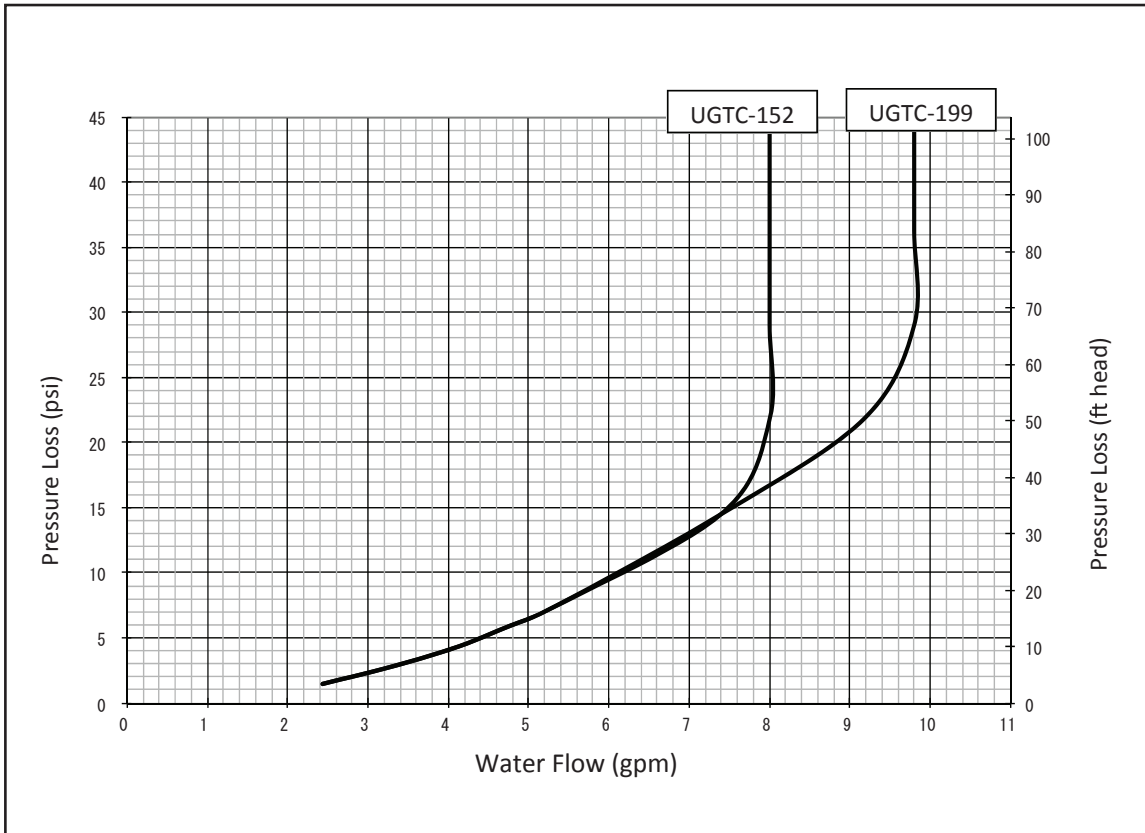
* Minimum flow may vary slightly depending on the temperature setting and the inlet water temperature. Minimum activation flow is 0.4 GPM (1.5 L/min).

Our products are continually being updated and improved; therefore, specifications are subject to change without prior notice.

The maximum inlet gas pressure must not exceed the value specified by the manufacturer. The minimum value listed is for the purpose of input adjustment.

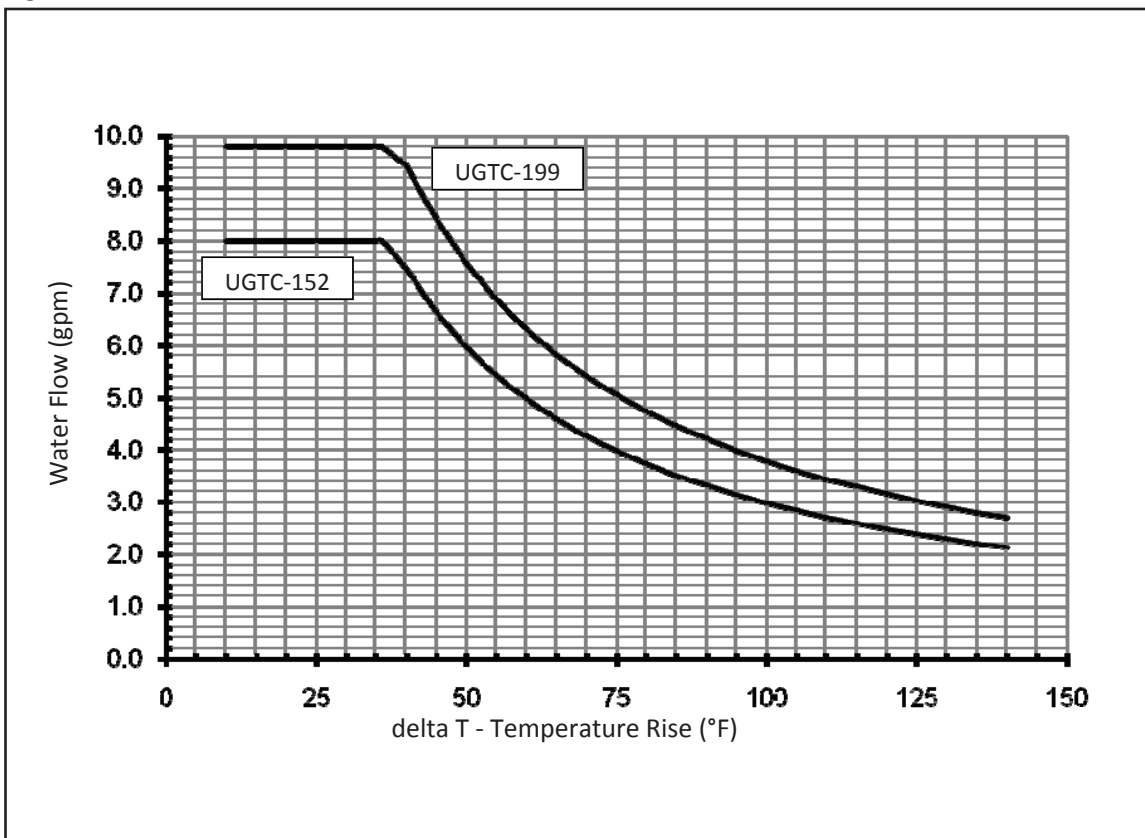
TECHNICAL DATA

Figure 38: Pressure Drop Curve and Water Heater



NOTE: The chart below only applies to incoming water temperatures of 70°F (21°C) or less. For incoming water temperatures greater than 70°F (21°C), please contact Giant.

Figure 39



TECHNICAL DATA

Recirculation Mode

The Giant water heater has the ability to control a recirculation pump. Two modes are available, Economy and Comfort, which recirculate the water in the plumbing system to provide hot water more quickly when a tap is opened.

Recirculation mode is for residential installations only. Recirculation mode cannot be used with an air handler or with multiple Giant water heaters.

The maximum Giant temperature setting while in recirculation mode is 140°F (60°C).

Pump Requirements

Voltage: 120V, 60 Hz

Amperage: less than 2 amps

NOTE: The Giant PC board will be damaged if amperage exceeds 2 Amps.

In-rush current: Less than 2.5 Amps.

Check valve: An integral flow check (IFC) valve is required. See plumbing diagram.

Pump Size

The pump should be sized for 2.5 GPM at the pressure loss through the tankless water heater and the supply and return plumbing in the recirculation loop.

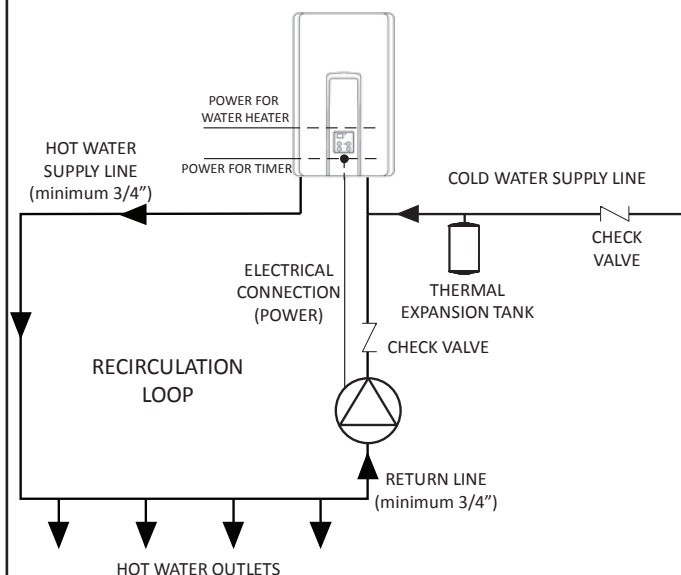
Installation

- 1) Turn off the electrical power supply by unplugging the power cord or by turning off the electricity at the circuit breaker.
- 2) Install the recirculation pump on the return line according to the pump manufacturer's installation instructions. Install a check valve in the return line as shown in the Plumbing Diagram if one is not integrated into the pump.
- 3) The wire harness for the recirculation pump is bundled with the wire harness from the PC board. The connector has a black and white wire with the label "Cut wire to connect to pump". To do so, cut the connector, splice the wires, and add 4-Amp fuse to the hot wire (black) of the pump. Connect the ground wire from the pump to a screw at the base of the water cabinet. Refer to the Pump Electrical Connection Diagram. Follow Electrical Code and pump manufacturer's recommendations.
- 4) Adjust the dip switch by moving the switch # 4 in the white set of switches (SW2) to ON. For Economy mode, set the switch # 8 in the white set of switches (SW2) to OFF (default). For Comfort mode, set the switch # 8 in the white set of switches (SW2) to ON.
- 5) Connect power to the water heater. Press the Power button on the controller. The pump and water heater will turn on to raise the recirculation loop temperature.

Table 25

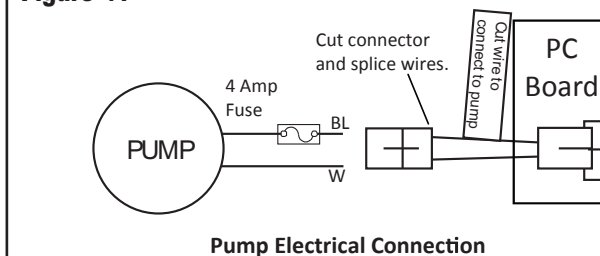
	Settings for SW2 (bank of white switches)	
	Switch # 4	Switch # 8
Economy Mode	ON	OFF
Comfort Mode	ON	ON

Figure 40



Plumbing Diagram

Figure 41



Pump Electrical Connection

Sequence of Operation

DIP switches (SW2 - white switches, #4, #8) should be set correctly for recirculation and mode. The Giant water heater should be turned on.

Pump recirculation begins when the water heater is turned on. The Giant inlet and outlet thermistors measure the water temperature.

The water heater produces hot water at the temperature setting. If the inlet thermistor detects abnormal temperature, then diagnostic code 51 is generated and the pump will turn off.

When the return water temperature reaches approximately 15°F (8.3°C) below the temperature setting, the water heater and pump will turn off.

The cycle will restart at the approximate time interval in the table based on the temperature thermistor readings.

Economy Mode

The Economy mode operates as follows:

- Less energy consumed due to fewer pump cycles
- Assumes plumbing is insulated (minimal pipe heat loss)
- Pump cycles on every 31 to 79 minutes (see table).

TECHNICAL DATA

Comfort Mode

The Comfort mode operates as follows:

- Higher energy consumption due to more pump cycles
- Assumes plumbing is not insulated resulting in higher pipe heat loss
- Pump cycles on every 15 to 39 minutes (see table).

Table 26

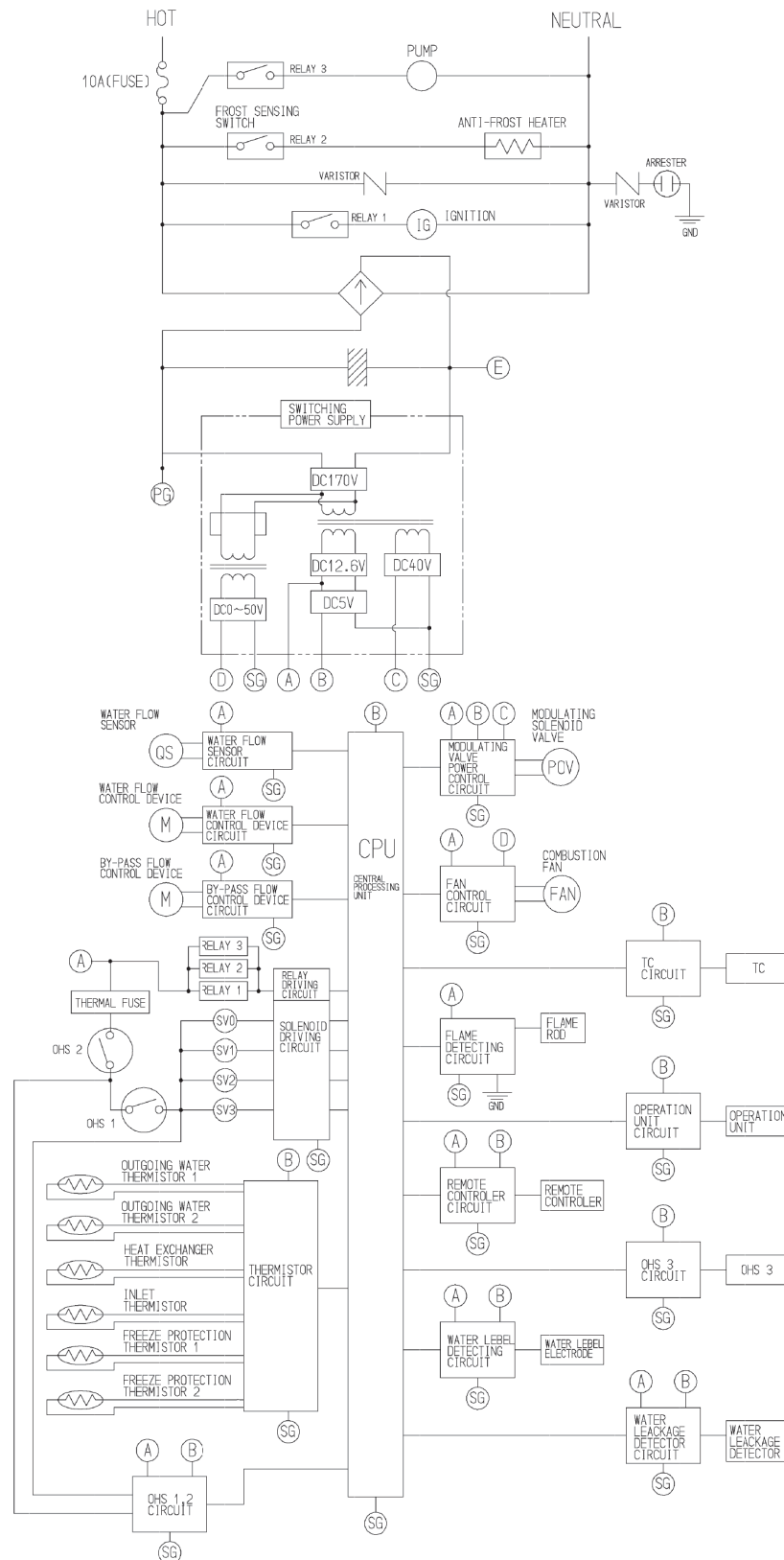
Water Heater Temperature Setting		Typical Pump ON Intervals* (minutes)	
°F	°C	Economy Mode	Comfort Mode
140	60	31	15
135	57	31	15
130	54	31	15
125	52	31	15
120	49	31	15
115	46	35	18
110	43	42	21
108	42	45	22
106	41	49	24
104	40	54	27
102	39	60	30
100	38	68	34
98	37	79	39

* The pump will cycle on at these calculated intervals which are based on the temperature setting, insulation, and estimated heat loss in the system. The values for your installation may vary.

TECHNICAL DATA

Wiring Diagram

Figure 42



OPERATING INSTRUCTIONS

Consumer Operation Guidelines for the Safe Operation of your Water Heater

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 death.



BEFORE LIGHTING: ENTIRE SYSTEM MUST BE FILLED WITH WATER AND AIR PURGED FROM ALL LINES.



- 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 knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
 - d) Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS



- 1)  STOP! Read the safety information above on this label.
- 2) Set the thermostat to the lowest setting.
- 3) Turn off all electric power to the appliance using the ON/OFF button.
- 4) This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
- 5) Locate the manual gas valve on the side of the heater. Turn the manual valve clockwise to the full OFF position ↻.
- 6) Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas,  STOP! Follow "B" in the safety information above. If you don't smell gas, go to the next step.
- 7) Turn the manual gas valve counter clockwise to the full ON position ↻.
- 8) Turn on all electric power to the appliance using the ON/OFF button.
- 9) Set the thermostat to desired setting.
- 10) Open a hot water tap. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your licensed professional or gas supplier. See manual for additional information.

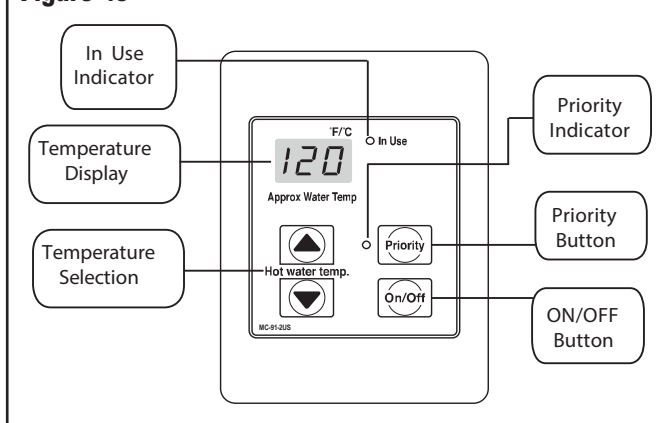
TO TURN OFF GAS TO APPLIANCE

- 1) Turn off all electric power to the appliance using the ON/OFF button.
- 2) Set the thermostat to lowest setting.
- 3) Locate the manual gas valve on the side of the heater. Turn the manual valve clockwise to the full OFF position ↻.

OPERATING INSTRUCTIONS

How to use the Temperature Controller

Figure 43



The MC-91-2 controller is the standard temperature controller that is supplied with the water heater. On indoor models it is integrated into the front panel.

The MCC-91-2 controller is for commercial and hydronic applications requiring higher temperatures. When the MCC-91-2 controller is connected, these higher temperatures are available on all controller models in the system. Refer to the section on temperature ranges.

DO NOT repeatedly operate the water heater and then use a hot water tap while the controller is turned off. Operating the water heater in such way to alternately produce hot water may cause water to condense on the outside of internal parts and accumulate in the water heater cabinet.

⚠ WARNING

- 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.
- Keep the area around the appliance clear and free from combustible materials, gasoline, and other flammable vapors and liquids.
- Always check the water temperature before entering a shower or bath.
- Do not use this appliance if any part has been under water. Immediately call a licensed professional to inspect the appliance and to replace any part of the control system and any gas control which has been under water.
- Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the appliance.
- Do not adjust the DIP switch unless specifically instructed to do so.
- Do not use an extension cord or an adapter plug with this appliance.
- Any alteration to the appliance or its controls can be dangerous and will void the warranty.

⚠ WARNING

If you install this water heater in an area that is known to have hard water or that causes scale build-up the water must be treated and/or the heat exchanger flushed regularly. Damage and repair due to corrosive compounds in the air is not covered by warranty.

Keep the air intake location free of chemicals such as chlorine or bleach that produce fumes. These fumes can damage components and reduce the life of your appliance. Damage and repair due to scale in the heat exchanger is not covered by warranty.

How to Set the Temperature

This water heater requires a minimum flow rate to operate. This rate can be found on the specification page in this manual. In some cases when you are not getting hot water or if the water alternates between hot and cold, it is due to the water flow being below or close to the minimum flow rate. Increasing the flow rate should resolve these problems in these cases.

If you are experiencing issues with higher temperature settings, then reduce the temperature setting. Selecting a temperature closer to that which is actually used at the faucet will increase the amount of hot water being delivered to the faucet, due to less cold water mixing at the fixture.



- 1) If the water heater is off, press the Power button to turn on.
- 2) If the Priority light is off, then press the "Priority button" on the temperature controller. The orange Priority light will glow indicating that this controller is controlling the temperature and that the water heater is ready to supply hot water. (The priority can only be changed while no hot water is running.)
- 3) Press the UP or DOWN buttons to obtain the desired temperature setting.

All hot water sources are able to provide water at this temperature setting until it is changed again at this or another temperature controller.

NOTICE

While any hot water is being provided, the temperature setting can only be adjusted between 98°F (36.7°C) and 110°F (43.3°C). Check local codes for the maximum water temperature setting allowed when used in nursing homes, schools, day care centers, and all other public applications.

NOTICE

If a newly installed unit with a controller has not been powered for at least six (6) hours then the temperature will return to the default setting of 104°F (40°C), if power is interrupted.

There may be a variation between the temperature displayed on the temperature controller and the temperature at the tap due to weather conditions or the length of pipe to the water heater.

Temperatures Available with a Controller

The water heater can deliver water at only one temperature setting at a time. The available temperatures are provided **Table 27**.

OPERATING INSTRUCTIONS

Temperatures lower than 98°F (37°C) can be obtained at the tap by mixing with cold water. To change the temperature scale from Celsius to Fahrenheit or vice versa, press and hold the On/Off button for five (5) seconds while the water heater is OFF.

⚠ WARNING

DO NOT adjust the other switches unless specifically instructed to do so.

These temperatures are suggestions only:

- Kitchen: 120°F (49°C)
- Shower: 98 - 110°F (37 - 43°C)
- Bath Fill: 102 - 110°F (39 - 43°C)

Alternate Temperature Settings

A different range of temperature settings is available by setting switches # 2 and # 3 of the SW2 dip switch (white) to ON. The **Table 28** shows the settings available with the MC-91-2 and MCC-91-2 controller.

⚠ WARNING

MC-91-1, MCC-91-1, MC-100V-1, and BC-100V-1 controllers are not compatible with Alternate Temperature Settings. Alternate Temperature Settings are for commercial applications only.

DO NOT use the MC-91-1, MCC-91-1, MC-100V-1, or BC-100V-1 controllers when dip switches # 2 and # 3 (white) are in the ON position.

Temperature Options without Temperature Controller

The default temperature setting for this appliance installed without a temperature controller is 120°F (49°C). If desired, the temperature setting can be changed to 140°F (60°C) by adjustment of a switch.

In the SW1 tan switches, set switch # 5 to ON to obtain 140°F (60°C) water temperature setting. Set switch # 5 to OFF (default) to obtain 120°F (49°C) water temperature setting. If a temperature controller is installed, then switch # 5 has no effect on temperature settings.

Table 27

Temperature Settings Available																
Fahrenheit (°F)	98	100	102	104	106	108	110	115	120	125*	130*	135*	140*	150**	160**	185**
Celsius (°C)	37	38	39	40	41	42	43	46	49	52	54	57	60	66	71	85

* Temperature settings from 125-140°F (52-60°C) are available by setting switch # 6 to ON in the SW1 tan switches. These models have a default maximum temperature of 120°F (49°C) and an option (switch # 6) to increase the maximum temperature to 140°F (60°C).

** These settings require the MCC-91-2 controller. When the MCC-91-2 controller is connected, these higher temperatures are available on all controller models in the system. Use of an MCC-91-2 controller in a residential dwelling will reduce the warranty coverage to that of a commercial warranty application.

Table 28

Alternate Temperature Settings Available																
Fahrenheit (°F)	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
Celsius (°C)	43	46	49	52	54	57	60	63	66	68	71	74	77	79	82	85

MC-91-2

MCC-91-2

Setting Controller to Mute

On the MC-91-2 to eliminate beeps when keys are pressed or to turn the beeps back on, press and hold both the UP and DOWN buttons until a beep is heard (approximately five (5) seconds).

Locking the Controller

The MC-91-2 controller can be locked by pressing the Priority button and the UP button together for five (5) seconds. A beep will sound confirming that the controller is locked. The display will alternately show "LOC", the temperature setting, and a diagnostic code, if one has been activated. All of the controllers in the system are also locked.

To unlock the controller, press the Priority button and the UP button together for five (5) seconds.

Diagnostic Codes

This water heater is designed to display diagnostic codes. If there is a potential operation concern, refer to the code and remedy on the next page.

To Display Diagnostic Information

To display the most recent diagnostic information code, press and hold the "On/Off" button for two (2) seconds on the MC-91-2 controller. While holding the "On/Off" button, press the UP button. The last nine (9) diagnostic codes will flash one after the other. To exit this mode, press the "On/Off" and UP button as before.

To enter or exit the maintenance monitor information mode, press and hold the DOWN button for two (2) seconds and without releasing it, press the ON/OFF button.

To obtain the water flow rate: press the UP or DOWN buttons until "01" displays. The water flow rate will then appear. For example, "58" means 5.8 gal/min.

To obtain the outgoing water temperature, press the UP or DOWN buttons until "02" displays. The temperature will appear in degrees Fahrenheit.

Table 29

No.	Data	Unit
01	Water flow rate	0.1 gal/min
02	Outgoing water temperature	Degrees Fahrenheit

TROUBLESHOOTING GUIDE

⚠ WARNING

Some of the checks below should be done by a licensed professional. Consumers should never attempt any action that they are not qualified to perform.

Code	Definition		Remedy
03	Power interruption during Bath Fill (Water will not flow when power returns).		Turn off all hot water taps. Press ON/OFF twice.
05	Bypass servo		Contact a licensed professional.
10	Air Supply or Exhaust Blockage		Check that nothing is blocking the flue inlet or exhaust. Check all vent components for proper connections.
		licensed professional only	Ensure approved venting materials are being used. Ensure vent length is within limits. Verify dip switches are set properly. Check fan for blockage. Burner Sensor (see code 31)
11	No Ignition (heater not turning on)		Check that the gas is turned on at the water heater, gas meter, or cylinder. If the system is propane, make sure that gas is in the tank. Ensure appliance is properly grounded.
		licensed professional only	Ensure gas type and pressure is correct. Ensure gas line, meter, and/or regulator is sized properly. Bleed all air from gas lines. Verify dip switches are set properly. Ensure igniter is operational. Check igniter wiring harness for damage. Check gas solenoid valves for open or short circuits. Remove burner cover and ensure all burners are properly seated. Remove burner plate and inspect burner surface for condensation or debris. Check the ground wire for the PC board.
12	No Flame		Check that the gas is turned on at the water heater, gas meter, or cylinder. Check for obstructions in the flue outlet. If the system is propane, make sure that gas is in the tank.
		licensed professional only	Ensure gas line, meter, and/or regulator is sized properly. Ensure gas type and pressure is correct. Bleed all air from gas lines. Ensure proper venting material was installed. Ensure condensation collar was installed properly. Ensure vent length is within limits. Verify dip switches are set properly. Check power supply for loose connections. Check power supply for proper voltage and voltage drops. Ensure flame rod wire is connected. Check flame rod for carbon build-up. Disconnect and reconnect all wiring harnesses on unit and PC board. Check for DC shorts at components. Check gas solenoid valves for open or short circuits. Remove burner plate and inspect burner surface for condensation or debris.
14	Thermal Fuse has activated		Check for restrictions in air flow around unit and vent terminal.
		licensed professional only	Check gas type of unit and ensure it matches gas type being used. Check for low water flow in a circulating system causing short-cycling. Ensure dip switches are set to the proper position. If switch #5 in the SW2 bank is in the OFF position, turn it to the ON position. Check for foreign materials in combustion chamber and/or exhaust piping. Check heat exchanger for cracks and/or separations. Check heat exchanger surface for hot spots which indicate blockage due to scale build-up. Refer to instructions in manual for flushing heat exchanger. Hard water must be treated to prevent scale build up or damage to the heat exchanger. Measure resistance of safety circuit. Ensure high fire and low fire manifold pressure is correct. Check for improper conversion of product.
16	Over Temperature Warning (safety shutdown because unit is too hot)		Check for restrictions in air flow around unit and vent terminal.
		licensed professional only	Check for low water flow in a circulating system causing short-cycling. Check for foreign materials in combustion chamber and/or exhaust piping. Check for blockage in the heat exchanger.

TROUBLESHOOTING GUIDE

Diagnostic Codes and Remedies

Code	Definition		Remedy
19	Electrical Grounding	licensed professional only	Check all components for electrical short.
25	Condensate Trap is full	licensed professional only	Check condensate trap and drain line for blockage.
31	Burner Sensor		Replace condensate trap.
32	Outgoing Water Temperature Sensor		Measure resistance of sensor. Replace sensor.
33	Heat Exchanger Outgoing Temperature Sensor		Check sensor wiring for damage. Measure resistance of sensor. Clean sensor of scale build-up. Replace sensor.
41	Outside Temperature Sensor		
51	Inlet Water Temperature Sensor		
52	Modulating Solenoid Valve Signal		
57	Burner		Check modulating gas solenoid valve wiring harness for loose or damaged terminals. Measure resistance of valve coil.
58	Secondary heat exchanger		Contact a licensed professional.
61	Combustion Fan		There is scale build-up in the secondary heat exchanger and it needs to be flushed to prevent damage. Refer to the flushing instructions in the manual. Hard water must be treated to prevent scale build-up or damage to the heat exchanger.
65	Water Flow Control		Ensure fan will turn freely. Check wiring harness to motor for damaged and/or loose connections. Measure resistance of motor winding.
70	PC Board		The water flow control valve has failed to close during the bath fill function. Immediately turn off the water and discontinue the bath fill function. Contact a licensed professional to service the appliance.
71	Solenoid Valve Circuit		Check PC board DIP switches for correct position. Check the connection harness at the connection on the PC board. Replace PC board.
72	Flame Sensing Device		Replace the PC Board.
73	Burner Sensor Circuit		Verify flame rod is touching flame when unit fires. Check all wiring to flame rod. Remove flame rod and check for carbon build-up; clean with sand paper. Check inside burner chamber for any foreign material blocking flame at flame rod. Measure micro amp output of sensor circuit with flame present. Replace flame rod.
79	Water Leakage Detected		Check sensor wiring and PC board to be sure that they have not been damaged. Replace sensor.
LC # (LC0, LC1, LC2,...)	Scale Build-up in Heat Exchanger (when checking maintenance code history, "00" is substituted for "LC")		Turn off water supply and contact licensed professional.
FF	Maintenance has been performed		LC0-LC9 indicates that there is scale build-up in the heat exchanger and that the heat exchanger needs to be flushed to prevent damage. Refer to the flushing instructions in the manual. Hard water must be treated to prevent scale build-up or damage to the heat exchanger. To operate the water heater temporarily until the heat exchanger can be flushed, push the On/ Off button on the temperature controller five (5) times. Repeated LC codes will eventually lock out the water heater. Please call Giant technical department at 1-800-363-9354.
No code	Nothing happens when water flow is activated.		Indicates a licensed professional performed maintenance or corrected an issue.
			Clean inlet water supply filter. On new installations ensure hot and cold water lines are not reversed. Verify you have at least the minimum flow rate required to fire unit.
		licensed professional only	Check for cold to hot cross over. Isolate circulating system, if present. Turn off cold water to the unit, open pressure relief valve; if water continues to flow, there is bleed over in your plumbing. Verify if turbine spins freely. Measure the resistance of the water flow control sensor. If the display is blank and clicking is coming from the unit, disconnect the water flow servo motor (GY, BR, O, W, P, BL, R). If the display comes on, replace the water flow servo motor.

SYSTEM MAINTENANCE

⚠ WARNING

To protect yourself from harm, before performing maintenance:

- Turn off the power supply by unplugging the power cord or by turning off the electricity at the circuit breaker. (The temperature controller does not control the electrical power.)
- Turn off the gas at the manual gas valve, usually located immediately below the water heater.
- Turn off the incoming water supply. This can be done at the isolation valve immediately below the water heater or by turning off the main water supply to the building.

⚠ WARNING

Keep the appliance area clear and free from combustible materials, gasoline, and other flammable vapors and liquids.

The following maintenance items are required for the proper operation of your water heater.

The appliance must be inspected annually by a licensed professional. Furthermore, repairs and maintenance should be performed by a licensed professional. Such licensed professional must also verify proper operation after servicing.

Cleaning

It is imperative that control compartments, burners, and circulating air passageways of the appliance be kept clean.

Clean as follows:

- 1) Turn off and disconnect electrical power. Allow to cool.
- 2) Close the water shut off valves. Remove and clean the water inlet filter.
- 3) Remove the front panel by removing four (4) screws.
- 4) Use pressurized air to remove dust from the main burner, heat exchanger, and fan blades. Do not use a wet cloth or spray cleaners on the burner. Do not use volatile substances, such as benzene and thinners. They may ignite or fade the paint.
- 5) Use soft dry cloth to wipe cabinet.

Vent System

The vent system should be inspected at least annually for blockages or damage. If the vent is blocked, contact a licensed professional.

Motors

Motors are permanently lubricated and do not need periodic lubrication. However, you must keep fan and motor free of dust and dirt by cleaning annually.

Temperature Controller

Use a soft damp cloth to clean the temperature controller. Do not use solvents.

Lime / Scale Build-up

If you receive diagnostic code "LC#" (LC1, LC2, etc.), refer to the procedure, *Flushing the Heat Exchanger*. Refer to the section on Water Quality to see if your water needs to be treated or conditioned. (When checking maintenance code history, "00" is substituted for "LC#".)

Snow Accumulation

Keep the area around flue terminal free of snow and ice. The appliance will not function properly if the intake air or exhaust is impeded (blocked or partially blocked) by obstructions.

Clean the water filter

Clean the inlet water filter by closing the cold and hot water inlet isolation (shut-off) valves. Put a bucket under the filter at the bottom of the water heater to catch any water that is contained inside the unit. Unscrew the water filter. Rinse the filter to remove any debris. Install the filter and open the isolation valves.

⚠ WARNING

Testing the pressure-relief valve should only be performed by a licensed professional. Scalding hot water may be released under pressure.

Pressure-Relief Valve

Operate the valve manually once a year. In doing so, it will be necessary to take precautions with regard to the discharge of potentially scalding hot water under pressure. Ensure discharge has a place to flow. Contact with your body or other property may cause damage or harm.

Visual Inspection of Flame

Verify proper operation after servicing.

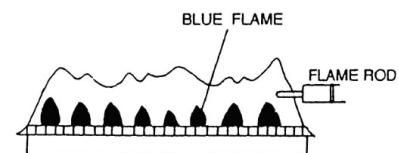
The burner must flame evenly over the entire surface when operating correctly. The flame must burn with a clear, blue, stable flame. See the parts breakdown of the burner for the location of the view ports.

The flame pattern should be as shown in the figure below.

Figure 44

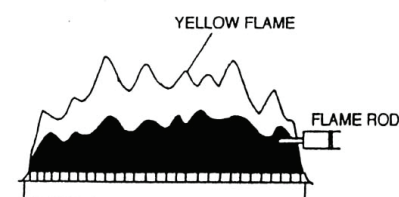
SATISFACTORY

FRONT VIEW



UNSATISFACTORY

FRONT VIEW



SYSTEM MAINTENANCE

Freeze Protection

In case of freezing weather, make sure that the water heater and its water lines are adequately protected to prevent freezing. Damage due to freezing is not covered by the warranty.

Winterizing

These recommendations are intended to suggest practices which are effective for winterizing the water heater. They should be used as a guide only. No liability is assumed for any issues resulting from the use of this information.

GAS

Shut off the gas to the water heater. It is generally preferable to shut off the gas service to the entire location if gas is not going to be used.

WATER

Shut off the cold water supply to the water heater. It is generally preferable to shut off the water to the entire location if water is not going to be used.

Drain the water heater by opening the drain valves on the cold water line and hot water line.

Open several hot water taps and remove the filter assembly at the water inlet in order to allow room for expansion in case there is water in the lines that freeze.

ELECTRIC

Disconnect the power supply by either unplugging the electrical cord or by turning off the circuit breaker to the water heater to prevent potential damage from irregular power surges or interruptions.

VENT TERMINATION

Place a cover over the vent termination (intake and exhaust) if it can be safely accessed. The cover should be easy to apply and remove. This will prevent debris, leaves, and small animals from entering the venting and water heater which could cause air flow issues upon return to service.

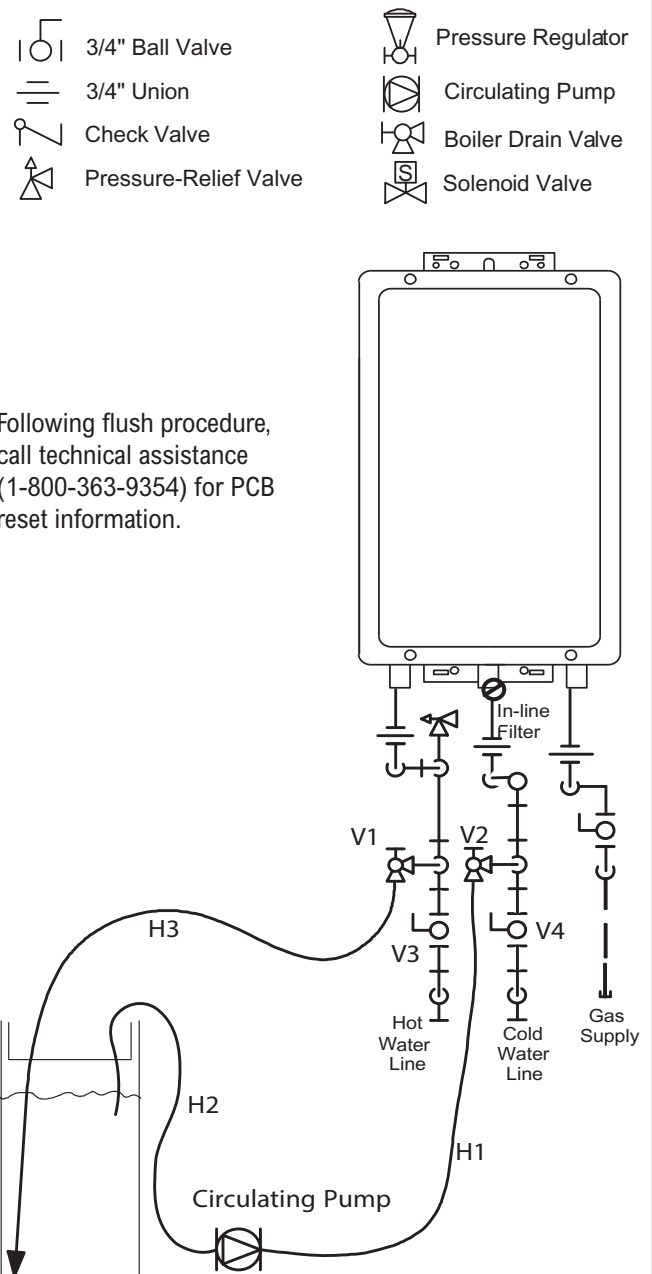
Flushing the heat exchanger

A LC0~LC9 or "00", or 58 diagnostic code indicates the unit is beginning to lime up and must be flushed. Failure to flush the appliance will cause damage to the heat exchanger. Damage caused by lime build-up is not covered by the unit's warranty. Giant strongly recommends installation of isolation valves to allow for flushing of the heat exchanger.

- 1) Disconnect electrical power to the water heater.
- 2) Close the shutoff valves on both the hot water and cold water lines (V3 and V4).
- 3) Connect pump outlet hose (H1) to the cold water line at service valve (V2).
- 4) Connect drain hose (H3) to service valve (V1).
- 5) Pour four (4) gallons (15.1 litres) of undiluted virgin, food grade, white vinegar into pail.
- 6) Place the drain hose (H3) and the hose (H2) to the pump inlet into the cleaning solution.
- 7) Open both service valves (V1 and V2) on the hot water and cold water lines.
- 8) Operate the pump and allow the vinegar to circulate through the water heater for at least one (1) hour at a rate of four (4) gallons (15.1 litres) per minute.

- 9) Turn off the pump.
- 10) Rinse the vinegar from the water heater as follows:
 - a) Remove the free end of the drain hose (H3) from the pail. Place in sink or outside to drain.
 - b) Close service valve, (V2), and open shutoff valve, (V4). Do not open shutoff valve, (V3).
 - c) Allow water to flow through the water heater for five (5) minutes.
 - d) Close shutoff valve (V4). When unit has finished draining remove the in-line filter at the cold water inlet and clean out any residue. Place filter back into unit and open valve (V4).
 - e) Close service valve, (V1), and open shutoff valve, (V3).
- 11) Disconnect all hose.
- 12) Restore electrical power to the water heater.

Figure 45



SYSTEM MAINTENANCE

Manual draining of the water heater

⚠ WARNING

To avoid burns, wait until the equipment cools down before draining the water. The water in the appliance will remain hot after it is turned off.

If the water heater is not going to be used during a period of possible freezing weather, it is recommended that the water inside the water heater be drained.

To manually drain the water:

- 1) Shut off cold water supply and gas supply.
- 2) Turn off the temperature controller.
- 3) Disconnect the power to the water heater.
- 4) Place a container to catch the water. Open hot water tap or open hot water drain plug at the hot water outlet.
- 5) Remove water filter to drain the cold water.
- 6) Unscrew the water drain plug from the drain line next to the hot water outlet.
- 7) Remove the condensate trap drain plug and allow draining.

To resume normal operation:

- 1) Confirm that all water drain plugs are removed, that the gas supply is turned off, and that all taps are closed.
- 2) Insert the condensate trap drain plug.
- 3) Screw in the water drain plugs.
- 4) Screw in the water filter in the cold water inlet.
- 5) Open the cold water supply.
- 6) Open a tap and confirm that water flows, and then close.
- 7) Turn on the power.
- 8) After confirming that the temperature controller is off, turn on the gas supply.
- 9) Turn on the temperature controller.

Running a low volume of water through the water heater to prevent freezing

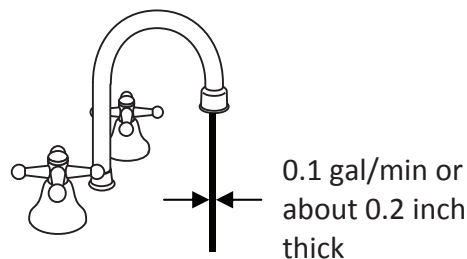
If the temperature exceeds the ability of the water heater to freeze protect itself, or if power is lost, the following steps may prevent the water heater and external piping from freezing. (Units connected with EZ Connect (2-unit link) should be drained to prevent freezing if not in use.)

- 1) Turn the water heater off.
- 2) Close the gas supply valve.
- 3) Turn on a hot water tap to flow water about 0.1 gal/min or where the stream is about 0.2 inches (5 mm) thick.

When the water heater or external piping has frozen

- 1) Do not operate the water heater if it or the external piping is frozen.
- 2) Close the gas and water valves and turn off the power.
- 3) Wait until the water thaws. Check by opening the water supply valve.
- 4) Check the water heater and the piping for leaks.

Figure 46



REGULATIONS

NOTICE BEFORE INSTALLATION

This direct vent appliance must be installed by a licensed professional. If you are not properly trained, you must not install this unit.

IMPORTANT: In the State of Massachusetts (248 CMR 4.00 & 5.00)

For all sidewall horizontally vented gas fueled equipment installed in every dwelling, building, or structure used in whole or in part for residential purposes, including those owned or operated by the Commonwealth and where the sidewall exhaust vent termination is less than seven (7) feet (2.1 m) above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements shall be satisfied:

1) INSTALLATION OF CARBON MONOXIDE DETECTORS

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

- a) In the event that the sidewall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.
- b) In the event that the requirements of this subdivision cannot be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements; provided, however, that during said thirty (30) day period, a battery operated carbon monoxide detector with an alarm shall be installed.

2) APPROVED CARBON MONOXIDE DETECTORS

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

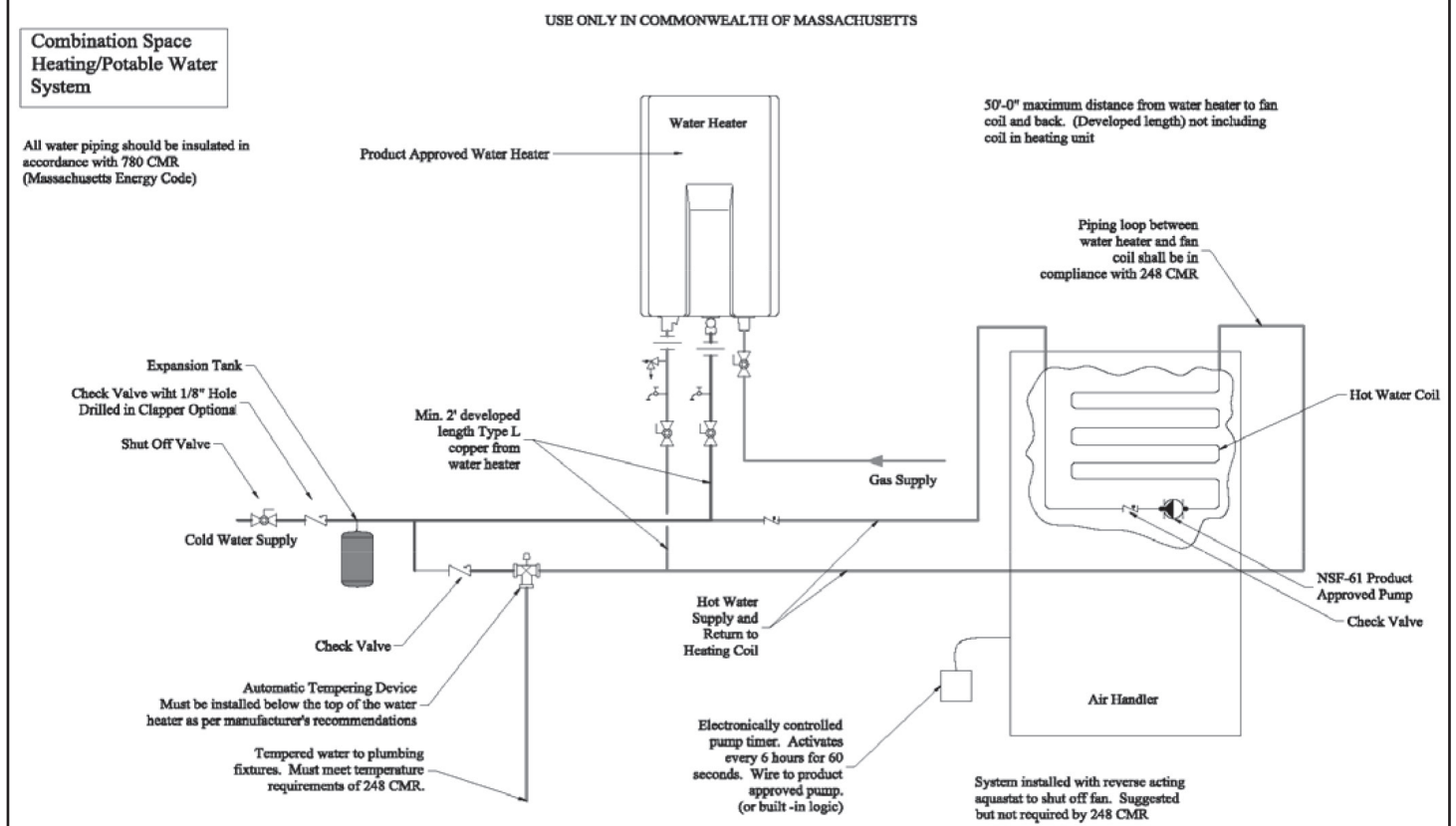
3) SIGNAGE

A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet (2.4 m) above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (1/2) inch (1.3 cm) in size: **"GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS"**.

4) INSPECTION

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

Figure 47



LIMITED WARRANTY FOR PERFORMANCE SERIES UGTC-152, UGTC-199

The manufacturer warrants that, subject to verification of a warranty claim within the warranty period as described below, it will take the necessary corrective action to either repair or replace a water heater or component part which is determined to be defective in material or workmanship, subject to the terms and conditions outlined in this document. Further, any replacement water heater or component part supplied under warranty will carry only the unexpired portion of the original water heater's warranty. The number of replacement water heaters is limited to one (1) per original unit purchased. If due to some extremely unusual circumstances, a replacement water heater or component part is found by our inspection and testing department to be defective, another heater or component part will be supplied to fulfill the obligation of the warranty of the original heater.

What is covered?

The Giant Standard Limited Warranty covers any defects in materials or workmanship when the product is installed and operated according to Giant written installation instructions, subject to the terms within this Limited Warranty document. This Limited Warranty applies only to products that are installed correctly. Improper installation may void this Limited Warranty. Giant strongly suggests that you use a licensed professional who has attended a Giant installation training class before installing this water heater. This Limited Warranty coverage as set out in the table below extends to the original purchaser and subsequent owners, but only while the product remains at the site of the original installation. This Limited Warranty only extends to the first / original installation of the product and terminates if the product is moved or reinstalled at a new location.

THIS WARRANTY WILL NOT APPLY

- 1) To defects or malfunctions resulting from failure to properly install, operate, or maintain the unit in accordance with the printed instructions.
- 2) If the installation does not conform to CSA and/or ETL Standards as well as any applicable national or local building codes.
 - a) Product being installed in a corrosive environment
 - b) Condensate damage
 - c) Improper venting
 - d) Incorrect gas type
 - e) Incorrect gas or water pressure

- 3) To any damage or failure caused by abuse, accident, fire, floods, freezing, or other acts of God.
 - 4) To any damage or failure caused by operating the heater without an approved temperature and pressure-relief valve having been installed.
 - 5) To any damage or failure caused by utilizing the heater in conjunction with any other energy saving device or other source(s) of energy not approved Giant; or for other than use with potable water without any additives such as salt, chlorine, or chemicals other than those added for the purpose of rendering the water fit to drink.
 - 6) To any damages or failure caused by having affixed to the heater any replacement part(s) manufactured by another company or replacement part(s) not approved by the manufacturer.
 - 7) To any damage caused by not having the water heater installed adjacent to a free-flowing drain in the event of water leakage.
 - 8) If the heater is operated at water temperatures exceeding the maximum setting of the operating and/or high limit control or the heater is not supplied with potable water, free to circulate at all times.
 - 9) Incorrect sizing.
 - 10) Improper maintenance (such as but not limited to scale build-up, freeze damage, or vent blockage).
 - 11) Problems or damage due to fires, flooding, electrical surges, freezing or any acts of God.
 - 12) If the heater is installed outside of Canada or the United States.
- There is no warranty coverage on product installed in a closed loop application, commonly associated with space heating only applications.
- Use of an MCC-91-2 controller in a residential dwelling will reduce the warranty coverage to that of a commercial warranty application except when an MCC-91-2 is used with a hydronic air handler for temperatures no higher than 160°F (71°C).
- This Limited Warranty does not apply to any product whose serial number or manufacture date has been defaced.
- This Limited Warranty does not cover any product used in an application that uses chemically-treated water such as a pool or spa heater.

SHIPPING COSTS

If a water heater or component part is deemed to be replaced, the manufacturer will pay the transportation costs of the replacement unit to a convenient authorized distributor or retailer as selected by us. You must

pay any local cartage including the cost of returning the replaced item to the authorized distributor or retailer from whom the replacement is coming from.

HOW TO MAKE A CLAIM

Any claim for warranty service should be made to your contractor, wholesaler, or retailer from whom the water heater was purchased. In turn, said contractor, wholesaler, or retailer will contact the manufacturer from whom they purchased the heater. If this procedure cannot be followed, you must contact any other local contractor, wholesaler, or retailer handling our water heaters. Also, for warranty information you may call the manufacturer's customer service department at (514) 645-8893 or 1-800-363-9354, option 1. We suggest that prior to calling the factory that you make sure to have the model number and serial number that is to be found on the outside casing of the heater. Proof of purchase showing the date, name, and place of the business from whom the water heater was purchased is essential to settle any warranty claim dispute over the length of the period of installation. If an exact replacement is not available, a current model water heater or component part with comparable operating features will be provided by the manufacturer. If government regulations or industry standards require the replacement model water heater or component part to have features not found on the defective model water heater or component part, you will be charged the difference in price associated with these required features. If you pay the difference in price for these required features, you will receive a complete new Standard Basic Limited Warranty for the replacement water heater.

MISCELLANEOUS

No one is authorized to make any other warranties on the manufacturer's behalf. Any implied warranties of any nature offered by a third party other than what is stated in this Standard Basic Limited Warranty will not be honoured. No claims for incidental or consequential damages (including damages from leakage) will be accepted.

LIMITATION ON WARRANTIES

Giant Factories Inc. shall not be liable for indirect, incidental, special, consequential or other similar damages that may arise, including lost profits, damage to person or property, loss of use, inconvenience, or liability arising from improper installation, service, or use.

How long does warranty coverage last?

Period of coverage is reduced to three (3) years from date of purchase when used as a recirculating water heater within a hot water recirculation loop, where the water heater is in series with a recirculation system and all recirculating water flows through the water heater, and where an aquastat / thermostat / timer, or an on-demand recirculation system is not incorporated.

Item	Residential Applications	Period of Coverage (from date of purchase)	
		If used for both residential water heating and space heating purposes	Commercial Applications
Heat Exchanger	12 years (1) (2) (3)	10 years (1) (3)	5 years
All Other Parts and Components		5 years	
Reasonable Labor		1 year	

On-demand recirculation is defined as a hot water recirculating loop or system that utilizes existing hot and cold lines or a dedicated return line, and only activates when hot water is used. It can be activated by a push button, motion sensor, or voice activation but not by a temperature sensor. A timer added to a standard recirculating pump is not considered as on demand.

(1) Period of coverage is reduced to five (5) years from date of purchase if the Giant water heater temperature setting exceeds 160°F (71°C).

NOTE: The integrated controller on indoor models has a one (1) year warranty on parts.

NOTE : _____

[illegible]

NOTE : _____

[illegible]