NORITZ

ecoTOUGH™
Super Efficient. Reliable.

CONDENSING TANKLESS GAS WATER HEATER

Installation Manual

Models

NRCP1112-DV / NRCP982-DV (Eco TOUGH)

- **Natural Gas(NG) / Liquid Propane Gas (LP)**

Intertek

ENERGY STAR

AHRI CERTIFIED

LEAD FREE
Safe Drinking Water Act
SDWA Section 1417

Low NOx Approved by SCAQMD 14ng/J or 20ppm (Natural Gas Only)

UPC

Thank you for purchasing this Noritz Tankless Gas Water Heater.
Before using, please:
Read this guide completely for operation instructions.
Completely fill out the warranty registration card (included separately) and mail the detachable portion to Noritz America Corporation. Keep this guide (and the remainder of the warranty registration card) where it can be found whenever necessary.
Installation must conform with local codes, or in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54. Noritz America reserves the right to discontinue, or change at any time, the designs and/or specifications of its products without notice.

⚠ 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 inflammable 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.
  • 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.

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

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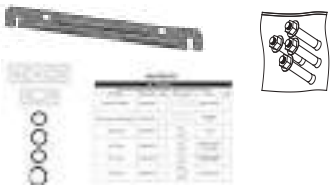
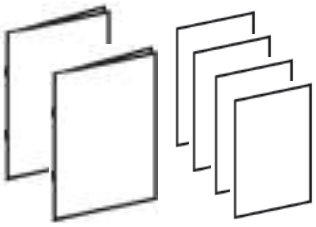
1-1. Included Accessories

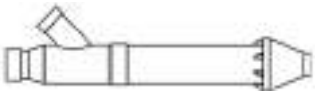
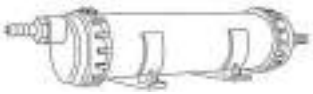
The following accessories are included with the unit. Check for any missing items before starting installation.

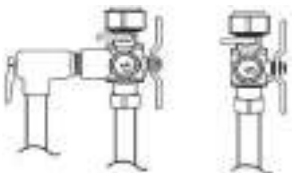
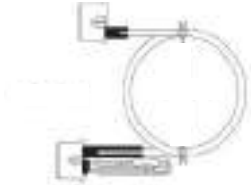
Part	Shape	Q'ty
Water Heater		1
Anchors / Wall mounting bracket / Emergency Kit		1 each

Part	Shape	Q'ty
Owner's Guide, Warranty Card, Installation Manual, Technical Data Sheet, Quick Installation Guide, Part List		1 each
Vent screens with Finishing (3")		2

1-2. Optional Accessories

The accessories listed below are not included with the unit, but may be necessary for installation.

Part	Shape	Q'ty
PVC Terminal VK3-H-PVC		1
VK3-PVC-VAS		1
PVC Terminal PRC-1		1
SV Conversion Kit (#SV-CK-3) •90 Elbow (With Inlet Screen)		1
Neutralizer (NC-1) (For 1 water heater)		1

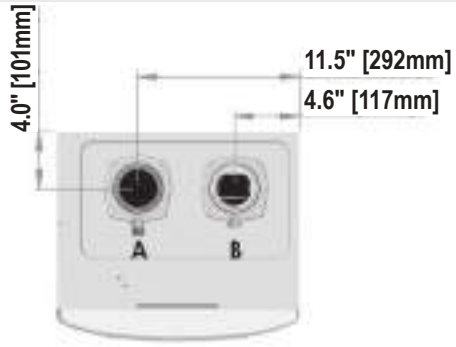
Part	Shape	Q'ty
Horizontal Hood Termination PVT-HL		1 each
Isolation Valves (includes pressure relief valve)		1 each
Vent screens with Finishing (2") (After market)		2
Quick Connect Cord QC-NRCP		1

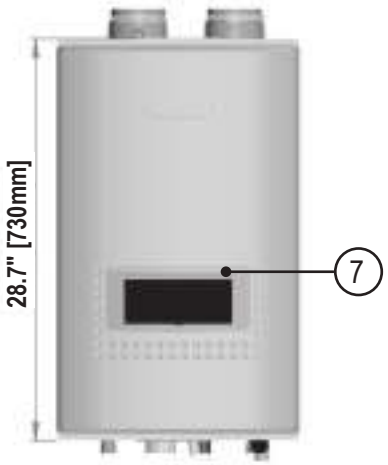
2-1. Specifications

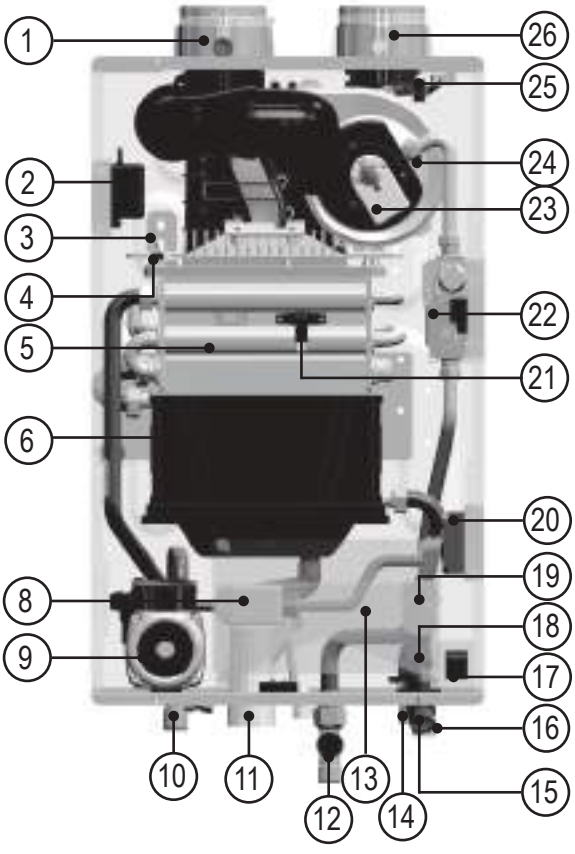
Specifications may be changed without prior notice.The capacity may differ slightly, depending on the water pressure, water supply, piping conditions, and water temperature.

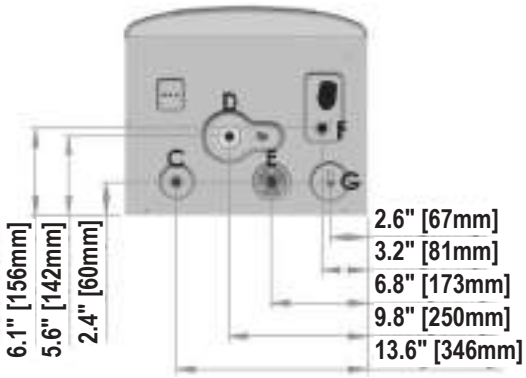
Model Name			NRCP1112-DV		NRCP982-DV	
Gas Input Rate	MAX		199,000 Btu/h		180,000 Btu/h	
	MIN		18,000 Btu/h		18,000 Btu/h	
	High Altitude (2,500~4,500ft)		180,000 Btu/h		180,000 Btu/h	
Hot Water Capacity	35°F Rise		11.1 Gal		10.1 Gal	
	45°F Rise		8.7 Gal		7.8 Gal	
	77°F Rise		5.1 Gal		4.6 Gal	
Installation			Indoor Wall Hung			
Flue System			Sealed Combustion Direct Vent, Single Vent			
Max Vent Run			2"(50ft) / 3"(100ft) Schedule 40 PVC, CPVC, PP			
Orifice Size	NG (Gas / Needle)		0.381"(9.7mm) / 0.389"(9.9mm)			
	LP (Gas / Needle)		0.307"(7.8mm) / 0.315"(8.0mm)			
Gas Supply Pressure	NG		3.5″ WC to 10.5″ WC			
	LP		8.0″ WC to 14″ WC			
Manifold Pressure	Gas Type		NG	LP	NG	LP
	Low Fire	2" VENT	-0.03 WC	-0.06 WC	-0.03 WC	-0.06 WC
		3" VENT	-0.03 WC	-0.06 WC	-0.03 WC	-0.06 WC
	High Fire	2" VENT	-0.04 WC	-0.07 WC	-0.04 WC	-0.07 WC
		3" VENT	-0.04 WC	-0.07 WC	-0.04 WC	-0.07 WC
Power Supply	Main Supply		120V 60Hz			
	Maximum Power Consumption		172W(82W+90W_PUMP)			
Ignition System			Direct Electronic Ignition / Automatic Flame Sensing			
Burner System			Premixed Metal Fiber Burner			
Gas Valve System			Air ratio valve			
Minimum Flow Activation Flow			0.5 GPM			
Internal Pipe Material			STS 304, Copper Tubing			
Dimensions			W17.3" – H28.7" – D14.8"			
Weight			85 lbs			
Water Holding Capacity			Under 2 Gallon			
Control Panel / Main Controller			P-950C / NGTH-9700C			
Water Pressure	MAX		Hot water 150 psi			
	MIN		15 psi			
Materials	Casing		Cold Rolled Carbon Steel			
	Heat Exchanger		Heat Exchanger : STS 304			
Safety Devices			Flame Sensor, Overheat Cut Off Limit Switch , Gas Leak Detector sensor, Water Leak Detector Sensor Exhaust Temperature Sensor, Water Temperature Sensor			

2-2. Dimensions & Connections









	Description	Size
A	Exhaust	3"
B	Air Intake	3"
C	Hot Water	3/4"
D	Condensate	1/2"
E	Recirculation Return	3/4"
F	Cold Water	3/4"
G	Gas	3/4"

NO	Name of Component
1	Exhaust
2	Igniter
3	Ignition Plug
4	Burner High Limit Switch
5	Primary Heat Exchanger
6	Secondary Heat Exchanger
7	Control Panel
8	Water Mixing Valve
9	Recirculation Pump
10	Hot Water Connection
11	Condensate Trap
12	Recirculation Return Connection with Filter
13	Computer Board
14	Cold Water Connection
15	Cold Water Filter
16	Gas Connection
17	Manual Power Switch
18	Flow Sensor
19	Water Control Valve
20	Air Pressure Switch
21	Flame Sensor
22	Gas Valve
23	AGM (Air Gas Mixer)
24	Fan Motor
25	Internal Air Intake Filter
26	Air Intake

3-1. Safety Precautions

⚠ WARNING

To avoid product damage, personal injury, or even possible death, carefully read, understand, and follow all the instructions in the Installation and Owner's Guide before installation, operation and service the Water Heater.

Noritz cannot anticipate every circumstance that might involve a potential hazard. Therefore, all possible incidents are not included in our warnings. Proper installation, operation, and service are your responsibility.
You must make sure that the operation and settings of the Water Heater are safe for you and for others.

This manual provides Safety Symbols. When the user fails to adhere to the following requirement, it will cause death, serious damages, and a great property loss.

For safety symbols, 'DANGER', 'WARNING', 'CAUTION' are indicated and the definitions for these terms are as follow:

⚠ DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.

⚠ WARNING

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

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It is also used to alert against unsafe practices and hazards involving only property damage.

3-2. Before Installation

⚠ DANGER

Check the fixing brackets and vent pipe yearly for damage or wear. Replace if necessary.

⚠ WARNING

Precautions on Vent Pipe Replacement

The vent system will almost certainly need to be replaced when this appliance is being installed. Only use vent materials that are specified in this Installation Manual for use on this appliance. Refer to the “Vent Pipe Installation” section for details. If PVC, CPVC, or Category IV listed pipe is already installed, check for punctures, cracks, or blockages and consult with the vent pipe manufacturer before reusing.
Improper venting may result in fires, property damage or exposure to Carbon Monoxide.

Snow Precaution

If this product will be installed in an area where snow is known to accumulate, protect the vent termination from blockage by snow drifts or damage from snow falling off of roofs.

Check the Gas

Check that the rating plate indicates the correct type of gas.
Check that the gas supply line is sized for 199,000 Btu/h.

Check the Power

The power supply required is 120VAC, at 60Hz.
Using the incorrect voltage may result in fire or electric shock.

⚠ CAUTION

Do Not Use Equipment for Purposes Other Than Those Specified.

Do not use for other than increasing the temperature of the water supply, as unexpected accidents may occur as a result.

Check Water Supply Quality

If the water supply is in excess of 12 grains per gallon (200 mg/L) of hardness, acidic or otherwise impure, treat the water with approved methods in order to ensure full warranty coverage.

3-3. Choosing Installation Site

Locate the appliance in an area where leakage from the unit or connections will not result in damage to the area adjacent to the appliance or to the lower floors of the structure. When such locations cannot be avoided, it is required that a suitable drain pan, adequately drained, be installed under the appliance.
The pan must not restrict combustion air flow.

⚠ DANGER

Locate the vent terminal so that there are no obstacles around the termination and so that exhaust can't accumulate. Do not enclose the termination with corrugated metal or other materials.

⚠ WARNING

Avoid places where fires are common, such as those where gasoline, benzene and adhesives are handled, or places in which corrosive gases (ammonia, chlorine, sulfur, ethylene compounds, acids) are present. Using the incorrect voltage may result in fire or cracking.

Avoid installation in places where dust or debris will accumulate. Dust may block the air-supply opening, causing the performance of the device fan to drop and incomplete combustion to occur as a result.

Avoid installation in places where special chemical agents (e.g., hair spray or spray detergent) are used. Ignition failures and malfunction may occur as a result.

Carbon Monoxide Poisoning Hazard. Do not install this water heater in a mobile home, recreational vehicle or on a boat.

⚠ CAUTION

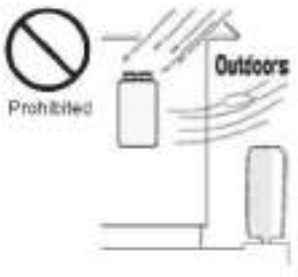
The water heater is designed for indoor installation only. Never install it outdoors or in a bathroom, it may be damaged or a fire may be caused.

Consult with the customer concerning the location of installation.

Install the water heater in an area that allows for the proper clearances to combustible and noncombustible construction. Consult the rating plate on the appliance for proper clearances.

Do not install the water heater in a place where it may be threatened by falling objects, such as under shelves.

The water heater must be installed in a place where supply and exhaust pipes can be installed as directed.



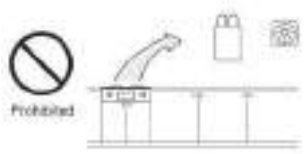
Do not install the water heater where the exhaust will blow on outer walls or material not resistant to heat. Also consider the surrounding trees and animals.

The heat and moisture from the water heater may cause discoloration of walls and resinous materials, or corrosion of aluminum materials.

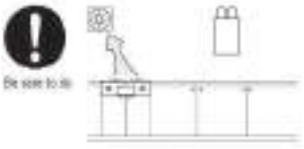
⚠ CAUTION

Avoid installation above gas ranges or stoves.

Avoid installation between the kitchen fan and stove. If oily fumes or a large amount of steam are present in the installation location, take measures to prevent the fumes and steam from
entering the equipment.



Install the unit in a location where the exhaust gas flow will not be affected by fans or range hoods.



Take care that noise and exhaust gas will not affect neighbors. Avoid installation on common walls as the unit will make some operational noises while it is running.

Before installing, make sure that the exhaust flue termination meets clearance requirements proper clearances according to the National Fuel Gas Code (ANSI Z223.1).

State of California:
The water heater must be braced, anchored or strapped to avoid moving during an earthquake. Contact local utilities for code requirements in your area or call: 1-866-766-7489 and request instructions.

3-4. High Elevation Installations

•This unit is only ANSI/CSA certified for installation up to 4500 ft. (1,350 m) above sea level.
•For installations at higher elevations, please refer to the directions below or contact Noritz America.

Note:
This water heater may be installed at elevation up to 10,000 ft for use with Natural Gas and Propane. The water heater must be set for a specific altitude using the Installer Mode Setting described below.
Above 2,000 ft (610 m), the water heater will de-rate by 4% for each 1,000 ft (305 m) of altitude gain.

[Installer Mode]

Display	Operation	Description
5:EL	High Elevation	Select an altitude range from the following four options based on where the water heater is installed.
0 ~ 2	Default	0 ~ 1,999 ft (0 ~ 609 m)
2 ~ 5		2,000 ~ 4,999 ft (610 ~ 1,523 m)
5 ~ 8		5,000 ~ 7,999 ft (1,524 ~ 2,438 m)
8 ~ 10		8,000 ~ 10,000 ft (2,439 ~ 3,048 m)

＊ Please refer to page 34 for more detail setting method on control panel.

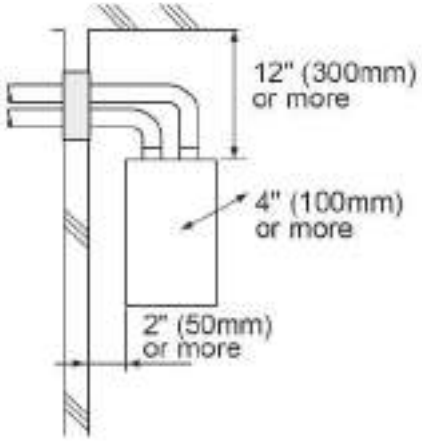
3-5. Installation Clearances

⚠ WARNING

Before installing, check for the following:
Install in accordance with relevant building and mechanical codes, as well as any local, state or national regulations, or in the absence of local and state codes, to the National Fuel Gas Code ANSI Z223.1/ NFPA 54 – latest edition. In Canada, see NSCNGPIC for detailed requirements.

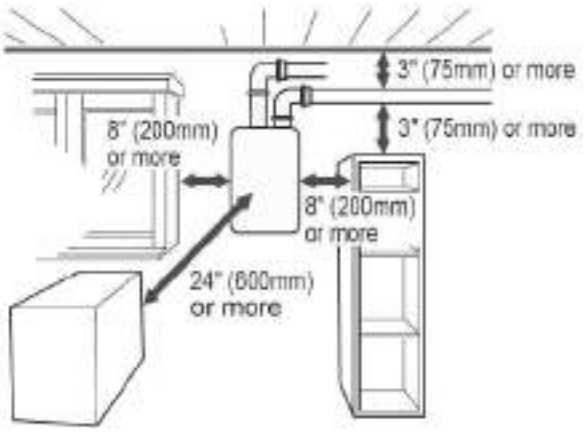
Distance from combustibles

Maintain the following clearances from both combustible and non-combustible materials.



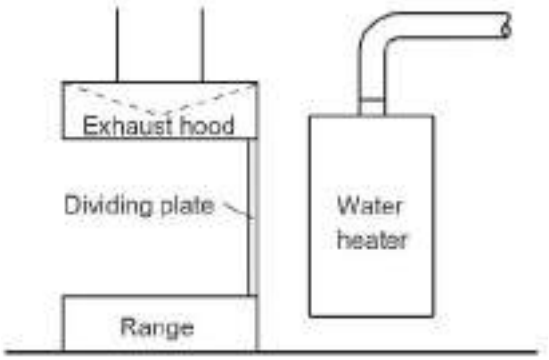
Securing of space for repair/inspection

If possible, leave 8" (200mm) or more on either side of the unit to facilitate inspection.
If possible, leave 24" (600mm) or more in front of the unit to facilitate maintenance and service if necessary.
If possible, leave 3" (75mm) or more above and below the vent pipe to facilitate inspection and repair if necessary

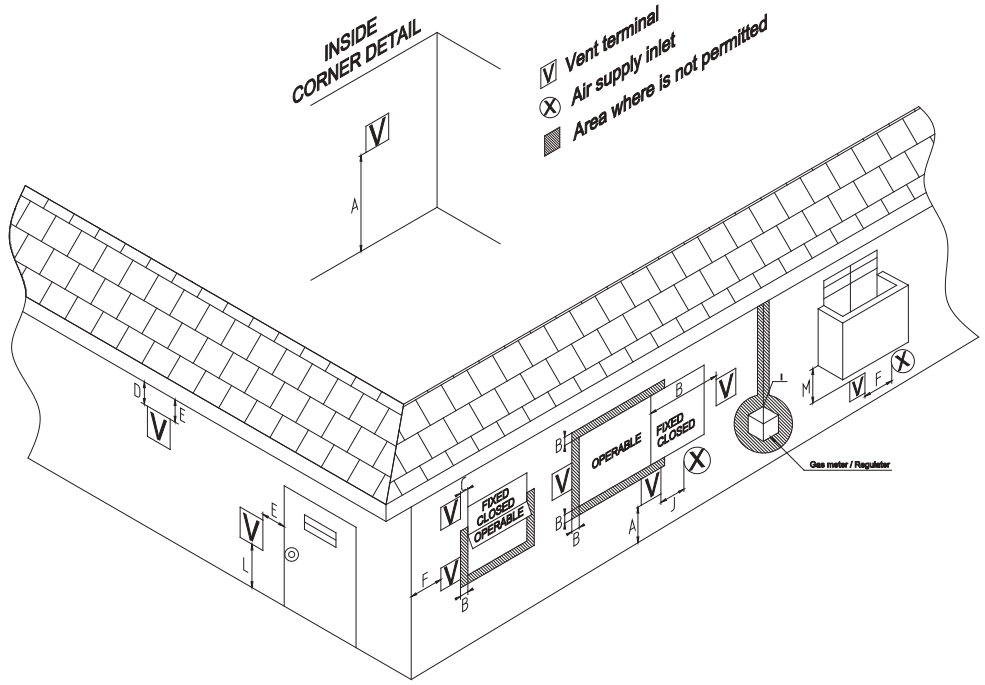


Cooking Equipment

<When the indoor air supply>
• If the unit will be installed in the vicinity of a permanent kitchen range or stove that has the possibility of generating steam that contains fats or oils, use a dividing plate or other measure to ensure that the unit is not exposed to air containing such impurities.
* The dividing plate should be of noncombustible material of a width greater than the water heater.



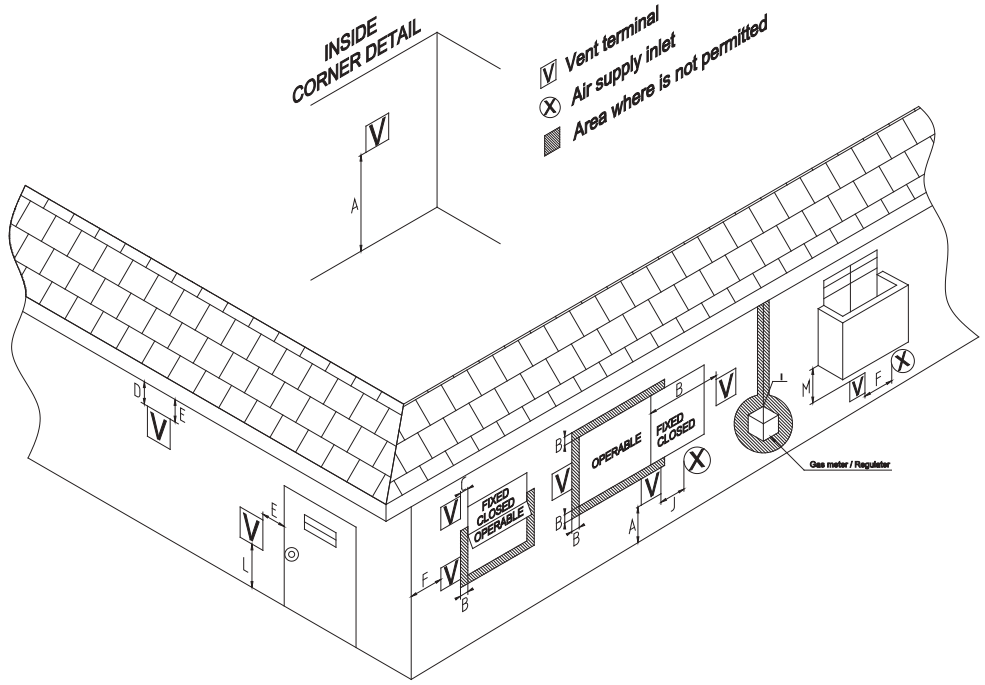
Clearance Requirements from Vent Terminations to Building Openings <When supplying combustion air from the outdoors (Direct Vent)>



	Description	US Direct Vent Installations [1]	Canadian Direct Vent Installations [2]
A	Clearance above grade, veranda, porch, deck, or balcony	12 in (30 cm)	12 in (30 cm)
B	Clearance to window or door that may be opened	12 in (30 cm)	36 in (91 cm)
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet 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 ft (91 cm) within a height 15 ft above the meter/regulator assembly
I	Clearance to service regulator vent outlet	*	3 ft (91 cm)
J	Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	12 in (30 cm)	36 in (91 cm)
K	Clearance to a mechanical air supply inlet	3 ft (91 cm) above if within 10 ft (3 m) horizontally	6 ft (1.83 m)
L	Clearance above paved sidewalk or paved driveway located on public property	*	7 ft (2.13 m) †
M	Clearance under veranda, porch, deck, or balcony	*	12 in (30 cm) ‡

1 In accordance with the current CSA B149.1 Natural Gas and Propane Installation Code
2 In accordance with the current ANSI Z223.1 / NFPA 54 National Fuel Gas Code
† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.
‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.
* Clearance in accordance with local installation codes and the requirements of the gas supplier. Clearance to opposite wall is 24 inches (60 cm).

Clearance Requirements from Vent Terminations to Building Openings <When supplying combustion air from the indoors (Non-Direct Vent)>



	Description	US Non-Direct [1]	Canadian Non-Direct [2]
A	Clearance above grade, veranda, porch, deck, or balcony	12 in (30 cm)	12 in (30 cm)
B	Clearance to window or door that may be opened	48 in (120 cm) below or to side of opening; 12 in (30 cm) above opening	36 in (91 cm)
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet 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	*	36 in (91 cm) within a height 15 ft (4.57 m) above the meter/ regulator assembly
I	Clearance to service regulator vent outlet	*	36 in (91 cm)
J	Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	48 in (120 cm) below or to side of opening; 12 in (30 cm) above opening	36 in (91 cm)
K	Clearance to a mechanical air supply inlet	36 in (91 cm) above if within 10 ft (3 m) horizontally	6 ft (1.83 m)
L	Clearance above paved sidewalk or paved driveway located on public property	*	7 ft (2.13 m) †
M	Clearance under veranda, porch, deck, or balcony	*	12 in (30 cm) ‡

1 In accordance with the current CSA B149.1 Natural Gas and Propane Installation Code
2 In accordance with the current ANSI Z223.1 / NFPA 54 National Fuel Gas Code
† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.
‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.
* Clearance in accordance with local installation codes and the requirements of the gas supplier. Clearance to opposite wall is 24 inches (60 cm).

4-1. Securing to the wall

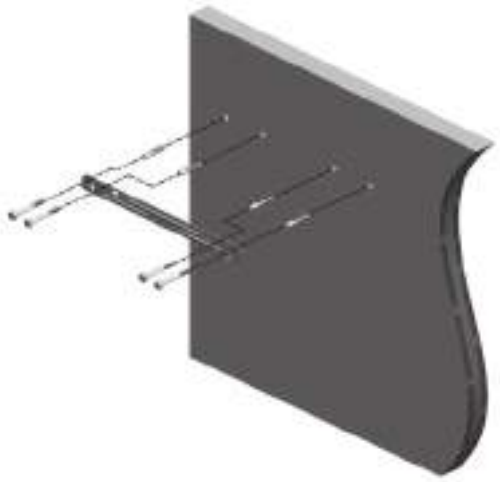
⚠ WARNING

CLEARANCES FOR SERVICE ACCESS

The water heater must be installed on a wall that can bear its weight.
If you try to install the heater on a wall which cannot support its weight, please reconsider.
The Water heater can be installed on any suitable internal wall (suitable sound proofing may be required when installing onto a stud partition wall).

Method of positioning the water heater on a wall

- Drill in the supplied anchor screws after considering where the vent termination will be located.
- After four anchor screws are inserted in the holes, mount the wall bracket.
- Affix the wall bracket securely to the wall.
- Make sure that it is leveled, and it can support the weight of the water heater.



- Lift up the water heater, rest the unit on the hooks provided on the wall bracket on the wall.

4-2. Vent Pipe Installation (Indoor Installation Only)

■ General Requirements

- Under normal conditions, this appliance will not produce an exhaust flue temperature in excess of 149°F (65°C) and schedule 40 PVC pipe may be used as the vent material. If the water heater set temperature is 160°F (70°C) or higher and there is a return line to the water heater from either a recirculation pump, schedule 40 CPVC must be used.
- Make sure the vent system is gas tight and will not leak.
- Support the vent pipe with hangers at regular intervals as specified by these instructions or the instructions of the vent manufacturer.
- Do not common vent or connect more than one appliance to this venting system.
- The total vent length including horizontal & vertical vent runs should be no less than 3' (0.9m).
- Do not store hazardous or flammable substances near the vent termination and check that the termination is not blocked in any way.

■ Venting With PVC or CPVC

This appliance can be vented with non cellular core plastic pipe materials as specified in the below table.
Vent installations in Canada which utilize plastic vent systems must comply with ULC S636.

Item	Material	United States	Canada
Exhaust Vent /Air Intake	Schedule 40 PVC	ANSI/ASTM D1785	ULC S636 Certified Materials Only
	PVC-DWV	ANSI/ASTM D2665	
	Schedule 40 CPVC	ANSI/ASTM F441	
Pipe Cement/Primer	PVC	ANSI/ASTM D2564	
	CPVC	ANSI/ASTM F493	
Note: Do Not Use Cellular Foam Core Pipe			

- Use only solid PVC or CPVC schedule 40 pipe. Cellular foam core piping is not allowed.
- In Canada, plastic vent systems must be certified to ULC S636. The components of the certified vent system must not be interchanged with other vent systems or unlisted pipe/fittings.
- In Canada, specified primers and glues of the ULC S636 certified vent system must be from a single system manufacturer and not intermixed with other system manufacturer's vent system parts.
- PVC or CPVC pipe has been approved for use on this appliance with zero clearance to combustibles.
- Follow all general venting guidelines as outlined on this page.
- The pipe shall be installed so that the first 3' (0.9m) of pipe from the appliance flue outlet is readily accessible for visual inspection.
- When preparing and assembling the pipe, follow instructions as provided by the pipe manufacturer. In general, the following practices must be observed:
  * Squarely cut all pieces of pipe.
  * Remove all burrs and debris from joints and fittings.
  * All joints must be properly cleaned, primed, and cemented. Use only cement and primer approved for use with the pipe material as outlined in the above table.
- All piping must be fully supported. Use pipe hangers at a minimum of 3' (0.9m) intervals. Do not use the water heater to support the vent piping.
- A bird screen must be installed on the vent terminations to prevent debris or animals from entering the piping.

Maximum Vent Length

The unit can be adjusted to accommodate longer vent runs; refer to the below table to find the maximum vent length based on the number of elbows.

Allowable Schedule 40 Vent Length (PVC, CPVC, PP)

Pipe diameter	3" (75mm)	2" (50mm)
No. of Elbows	Max. straight Vent Length*	
6	70´	N/A
5	75´	N/A
4	80´	18´
3	85´	26´
2	90´	34´
1	95´	42´
0	100´	50´

- 5 feet (1.5M) for each additional 3-inch 90-degree elbow
- 2.5 feet (0.75M) for each additional 3-inch 45-degree elbow
- 8 feet (2.4M) for each additional 2-inch 90-degree elbow
- 4 feet (1.2M) for each additional 2-inch 45-degree elbow

* The termination elbow must be included in the total number of elbows.

Vent Termination

Vent Screen Installation

- Install vent screen (Only 3" vent screens are included as accessories), see the below figure for appropriate configuration.
- After connecting vent/air inlet terminal, it is required to install screen for the terminal to prevent incoming of debris and animals, which might cause damage to the unit.
  (2" vent screen (1/4" mesh) must be purchased for 2" venting installation)

Tightening

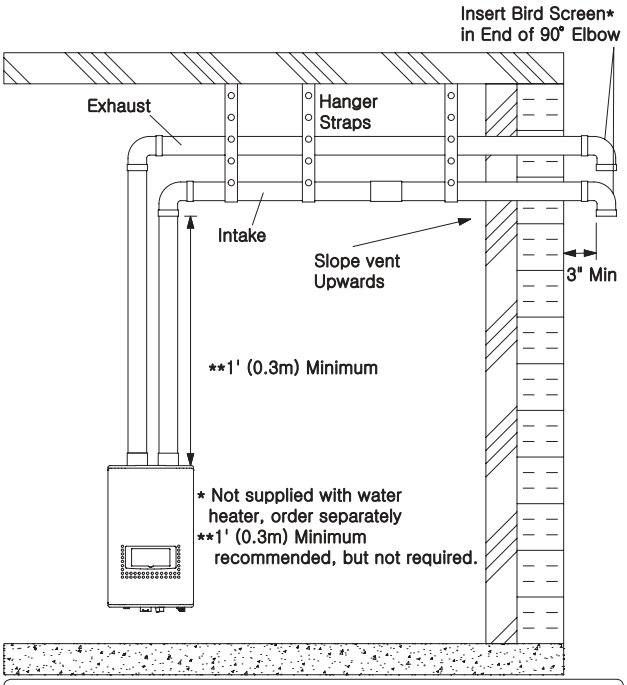
- You can select the size of vent pipe(2" or 3") according to the installation conditions.
- Push the pipe into the unit flue until it touches the bottom.
- Tighten the band clamps using a screwdriver.
- Finally, make sure that both pipes(exhaust & air intake) are securely fixed.

3 inch pipe	2 inch pipe (Use the pvc reducer bushing purchased as an after market.)
	

Vent Pipe Installation (DV-Direct Vent)

■ Horizontal Vent Termination- PVC/CPVC Materials Only

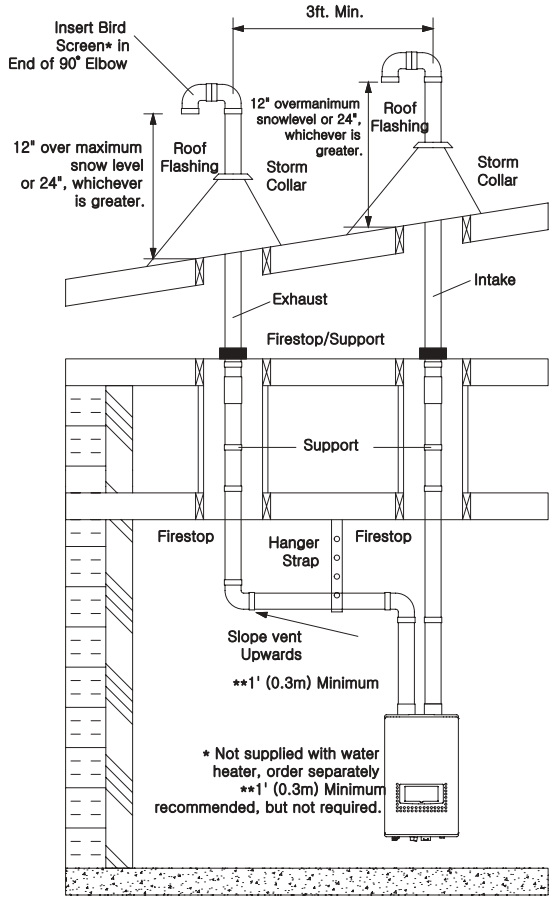
• As illustrated on the right, make sure to keep a distance of 3' (0.9m) or wider between the intake and exhaust when installing the vent piping.
* If 3' (0.9m) remote distance between Intake and Exhaust cannot be ensured, the installation can be carried out only in the installation method shown in page 18.
• The PVT-HL termination may be used in place of elbows as the horizontal vent terminations. It is not necessary to use bird screens with the PVT-HL termination.
• Terminate at least 12" (300mm) above grade or above snow line.
• Terminate at least 7' (2.1m) above a public walkway, 6' (1.8m) from the combustion air intake of any appliance, and 3' (0.9m) from any other building opening, gas utility meter, service regulator etc.
• Terminate at least 3' (0.9m) above any forced air inlet within 10' (3m) , 1' (0.3m) below, 1' (0.3m) horizontally from or 1' (0.3m) above any door, window, or gravity air inlet into any building per National Fuel Gas Code ANSI Z223.1/NFPA 54.
• Slope the horizontal vent 1/4" upwards for every 12" (300mm) toward the termination.
• Use a condensation drain if necessary.
• In the Commonwealth of Massachusetts a carbon monoxide detector is required for all side wall horizontally vented gas fuel equipment. Please refer to Technical Bulletin TB 010606 for full installation instructions.



When choosing intake and exhaust terminations, you must use the same type of elbow (i.e. both 90° elbows).
This will help with proper combustion by putting both terminations in the same pressure zone.

■ Vertical Vent Termination- PVC/CPVC Materials Only

• As illustrated on the right, make sure to keep a distance of 3' (0.9m) or wider between the intake and exhaust when installing the vent piping.
• Terminate at least 6' (1.8m) from the combustion air intake of any appliance, and 3' (0.9m) from any other building opening, gas utility meter, service regulator etc.
• Enclose exterior vent systems below the roof line to limit condensation and protect against mechanical failure.
• When the vent penetrates a floor or ceiling and is not running in a fire rated shaft, a firestop and support is required.
• When the vent termination is located not less than 8' (2.4m) from a vertical wall or similar obstruction, terminate above the roof at least 2' (0.6m), but not more than 6' (1.87m), in accordance with the National Fuel Gas Code ANSI Z223.1/NFPA 54.
• Provide vertical support every 3' (0.9m) or as required by the vent pipe manufacturer's instructions.
• A short horizontal section is recommended to prevent debris from falling into the water heater.
• When using a horizontal section, slope the horizontal vent 1/4" upwards for every 12" (300mm) toward the termination to drain condensate.

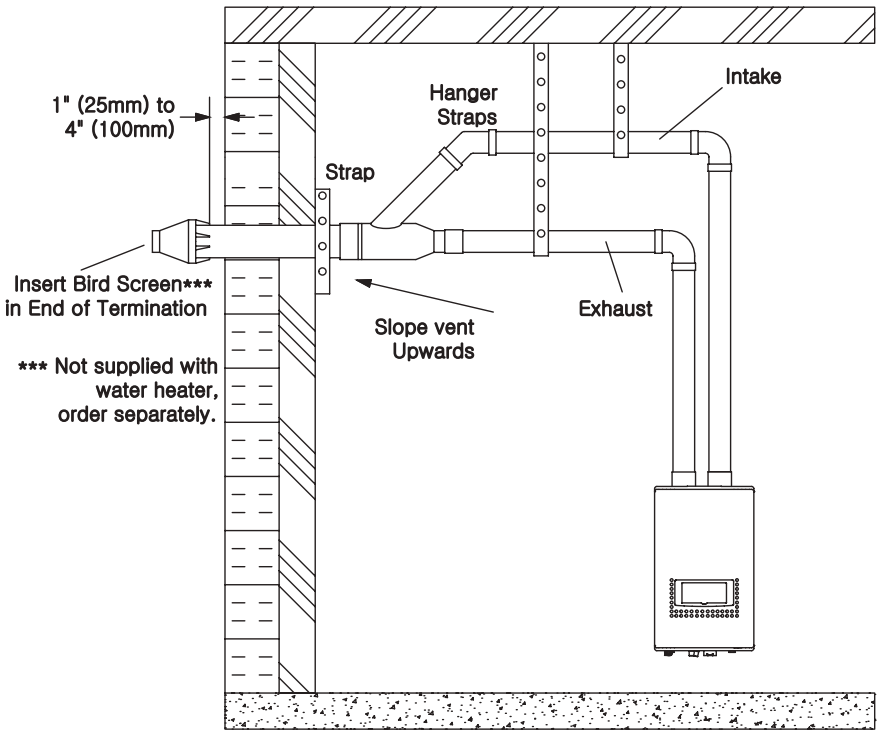


When choosing intake and exhaust terminations, you must use the same type of elbow (i.e. both 90° elbows).
This will help with proper combustion by putting both terminations in the same pressure zone.

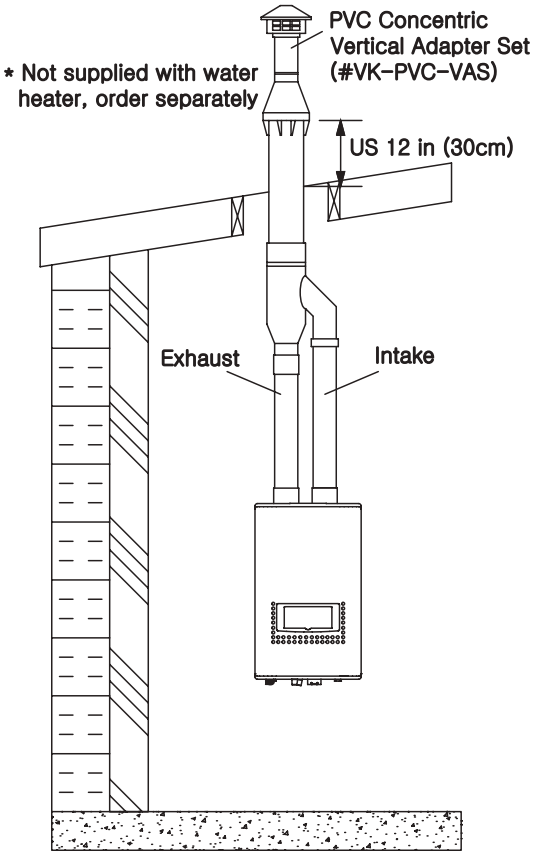
Vent Pipe Installation (DV-Direct Vent)

■ Concentric PVC/CPVC Termination

- The concentric termination may be shortened, but not lengthened from its original factory supplied length.
- 2" (50mm) & 3" (75mm) PVC or CPVC pipe may be used with the concentric termination. Reducers will be needed to connect 2" pipe. Maintain the same vent pipe diameter from the water heater flue to the termination.
- Do not exceed the maximum vent lengths as specified in this section.
- There must be a 1" (25mm) to 4" (100mm) clearance between the outside wall and the air intake section of the termination as illustrated on the left.
- Install a securing strap to prevent movement of the termination.
- Terminate at least 12" (300mm) above grade or above snow line.
- Terminate at least 7' (2.1m) above a public walkway, 6' (1.8m) from the combustion air intake of any appliance, and 3' (0.9m) from any other building opening, gas utility meter, service regulator etc.
- Terminate at least 3' (0.9m) above any forced air inlet within 10' (3m), 1' (0.3m) below, 1' (0.3m) horizontally from or 1' (0.3m) above any door, window, or gravity air inlet into any building per National Fuel Gas Code ANSI Z223.1/NFPA 54.
- Slope the horizontal vent 1/4” upwards for every 12" (300mm).
- Use a condensation drain if necessary.



Horizontal



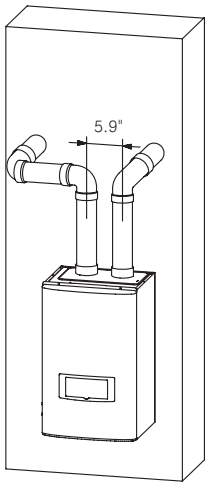
Vertical

Vent Pipe Installation (DV-Direct Vent)

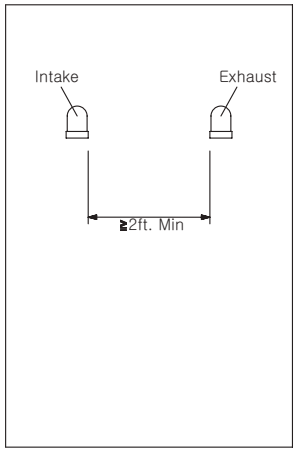
■ Horizontal Vent Termination- PVC/CPVC Materials Only

* When 3' (0.9m) remote distance between Intake and Exhaust cannot be ensured.
* Can not use Hood termination (PVT-HL)

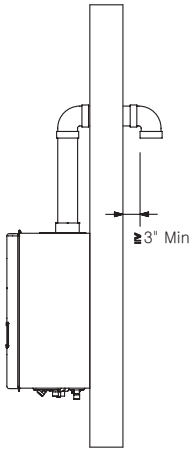
• Intake and exhaust should face the same direction. Intake and exhaust should stay within the same pressure zone.
• Insert the bird screen. 90° elbow vertical setting (downward).
• Ensure at least 3ft (0.9m) or more distance between the near edge of the air intake pipe or exhaust pipe to the inside corner of a wall.
• Ensure at least 2ft (0.6m) or more distance between intake pipe and exhaust pipe. The distance is measured at inside of pipe to inner dimension.



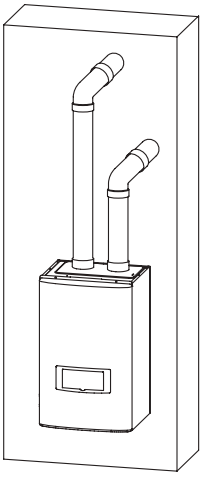
Interior View

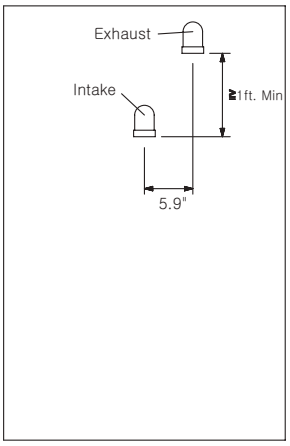


Exterior View

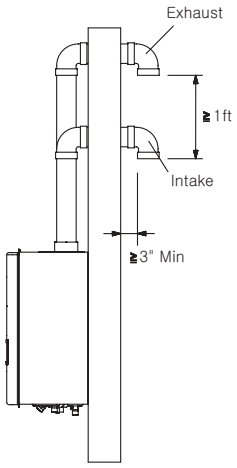


• Intake and exhaust should face the same direction. Intake and exhaust should stay within the same pressure zone.
• Insert the bird screen. 90° elbow vertical setting (downward).
• Ensure at least 3ft (0.9m) or more distance between edge of air intake pipe or exhaust pipe and corner wall.
• Upper side is exhaust, lower side is intake. The reverse orientation is not allowed.
• Ensure at least 1ft (0.3m) or more distance between intake pipe and exhaust pipe. The distance is measured at the outlets of intake port (terminal) and exhaust port (terminal).

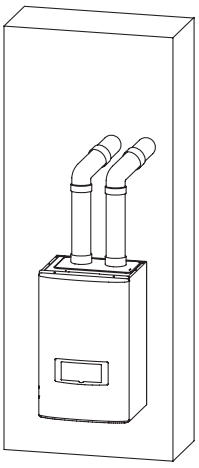

Interior View

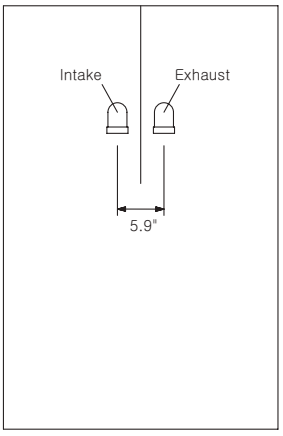


Exterior View

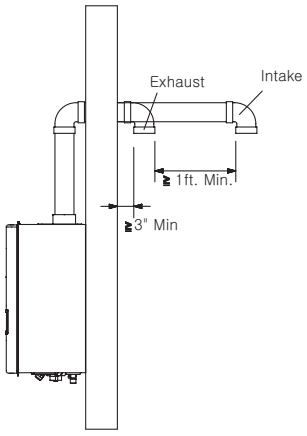


• Intake and exhaust should face the same direction. Intake and exhaust should stay within the same pressure zone.
• Insert the bird screen. 90° elbow vertical setting (downward).
• Ensure at least 3ft (0.9m) or more distance between edge of air intake pipe or exhaust pipe and corner wall.
• The pipe farther from the wall is intake, the side near the wall is exhaust. The reverse connection is not allowed.
• Ensure at least 1ft (0.3m) or more distance between intake pipe and exhaust pipe. The distance is measured at inside of pipe to inner dimension.


Interior View



Exterior View

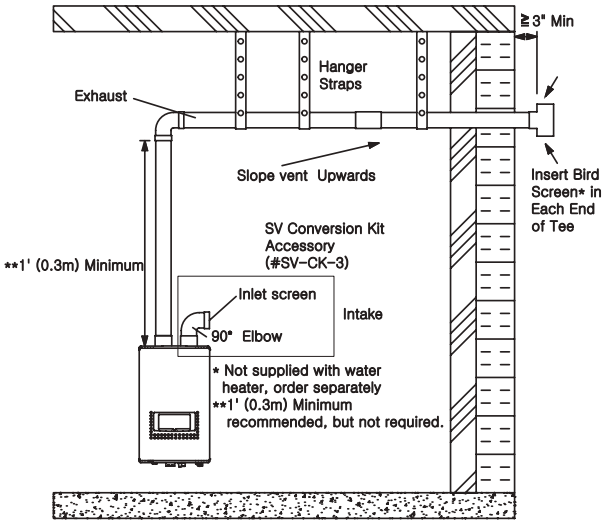


Vent Pipe Installation (SV-Non Direct Vent)

*** When supplying combustion air from the indoors (SV-CK-3 Conversion Kit is required)**

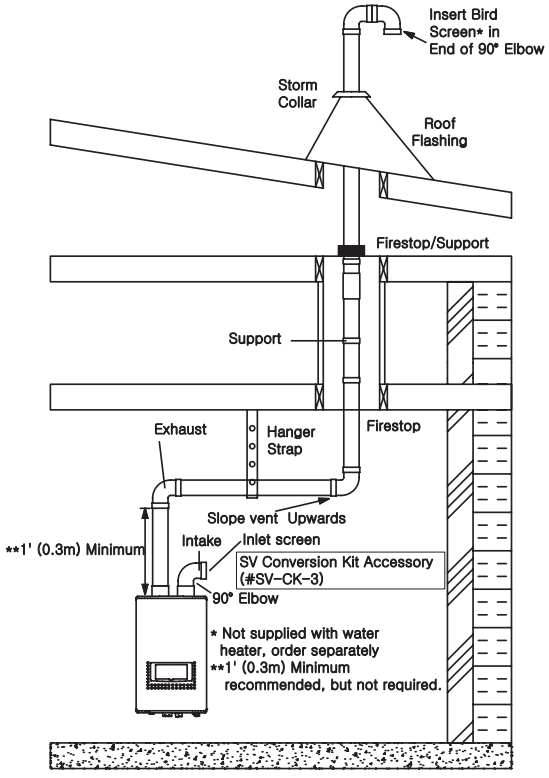
■ Horizontal Vent Termination- PVC/CPVC Materials Only

• A tee, the PVT-HL termination may be used for the vent termination. It is not necessary to use bird screens with the PVT-HL termination.
• Terminate at least 12" (300mm) above grade or above snow line.
• Terminate at least 7' (2.1m) above a public walkway, 6' (1.8m) from the combustion air intake of any appliance, and 3' (0.9m) from any other building opening, gas utility meter, service regulator etc.
• Terminate at least 3' (0.9m) above any forced air inlet within 10' (3m) , 4' (1.2m) below, 4' (1.2m) horizontally from or 1' (0.3m) above any door, window, or gravity air inlet into any building per National Fuel Gas Code ANSI Z223.1/NFPA 54.
• Slope the horizontal vent 1/4" upwards for every 12" (300mm) toward the termination.
• Use a condensation drain if necessary.
• In the Commonwealth of Massachusetts a carbon monoxide detector is required for all side wall horizontally vented gas fuel equipment.



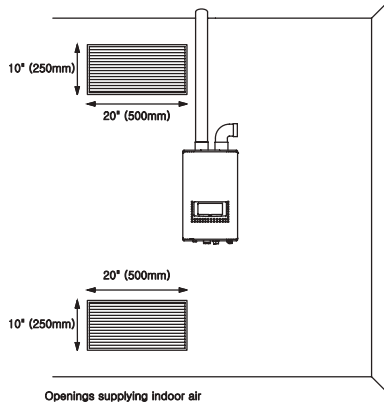
■ Vertical Vent Termination- PVC/CPVC Materials Only

• Terminate at least 6' (1.8m) from the combustion air intake of any appliance, and 3' (0.9m) from any other building opening, gas utility meter, service regulator etc.
• Enclose exterior vent systems below the roof line to limit condensation and protect against mechanical failure.
• When the vent penetrates a floor or ceiling and is not running in a fire rated shaft, a firestop and support is required.
• When the vent termination is located not less than 8' (2.4m) from a vertical wall or similar obstruction, terminate above the roof at least 2' (0.6m), but not more than 6' (1.87m), in accordance with the National Fuel Gas Code ANSI Z223.1/NFPA 54.
• Provide vertical support every 3' (0.9m) or as required by the vent pipe manufacturer's instructions.
• A short horizontal section is recommended to prevent debris from falling into the water heater.
• When using a horizontal section, slope the horizontal vent 1/4" upwards for every 12" (300mm) toward the termination to drain condensate.



■ Provide adequate combustion air so as to not create negative pressure within the building.

• Provide two permanent openings to allow circulation of combustion air.
• Make each opening 199 square inches if they provide indoor air, and 100 square inches for outdoor air.
• If the unit is installed in a mechanical closet, provide a 24" (600mm) clearance in front of the unit to the door.
• If combustion air will be provided through a duct, size the duct to provide 60 cubic feet of fresh air per minute.



Openings supplying indoor air

4-3. Gas Piping

In order to choose the proper size for the gas line, consult local codes or the National Fuel Gas Code ANSI Z223.1.

⚠ CAUTION

The guidelines and examples we have provided in this manual section are for reference only.
The sizing and installation of the gas system for this water heater, as with any gas appliance, is the sole responsibility of the installer. The installer must be professionally trained to do such work and must always follow all local and national codes and regulations. Gas line sizing calculations must be performed for every installation. Please contact Noritz America at 866-766-7489 if you have any questions or concerns.

Gas Type

The gas type indicated on the water heater rating plate (NG or LP) must match the type of gas being supplied to the water heater.

Gas Conversions

If the gas type supplied does not match the gas type on the rating plate, contact your water heater supplier for a replacement unit with the proper gas type. If a gas type conversion must be made, there are conversion kits available for some models. [The conversion kit shall be installed by a qualified service agency in accordance with the manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. The qualified service agency is responsible for the proper installation of this kit. Improper installation of this kit will void the warranty. Conversion kits will only be shipped directly to the Distributor or Agency performing the conversion.]

Meter

The gas meter must be sized properly for the water heater and other gas appliances to operate properly.
Select a gas meter capable of supplying the entire btu/h demand of all gas appliances in the building.

⚠ CAUTION

Regulators

Ensure that all gas regulators used are operating properly and providing gas pressures within the specified range of the water heater being installed. Excess gas inlet pressure may cause serious accidents.

⚠ CAUTION

Pressure

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. The inlet gas pressure must be within the range specified. This is for the purposes of input adjustment. Low gas pressure may cause a loss of flame or ignition failure at other appliances in the home, which may result in unburned gas in the home. Serious accidents such as fire or explosion may result.

Measuring Gas Pressure

In order to check the gas supply pressure to the unit, a tap is provided on the gas inlet. Remove the round head philips screw from the tap, and connect a manometer using a silicon tube.
In order to check the gas manifold pressure, a tap is provided on the gas valve inside the unit. The pressure can be checked either by removing the screw and connecting the appropriate pressure gauge.

⚠ CAUTION

Pressure Test

The appliance and its gas connections must be leak tested before placing the appliance in operation. The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than ½ psig (3.5 kPa). We do not recommend pressure testing in excess of ½ psig (3.5kPa). If it must be done, the appliance and its individual shutoff valve must be completely disconnected from the gas supply piping system during the test process.

Pipe Sizing/Flexible Connectors

A gas shutoff valve must be installed on the supply line. Gas flex lines are not recommended unless the minimum inside diameter is ¾" or greater and the rated capacity of the connector is equal to or greater than the BTU capacity of the water heater. Gas piping shall be in accordance with local utility company requirements and/or in the absence of local codes, use the latest edition of National Fuel Gas Code (NFPA54GC), ANSI Z223.1. In Canada, use the latest edition of CSA B149.1, National Gas and Propane installation code. Size the gas line according to total btu/h demand of the building and length from the meter or regulator so that the following supply pressures are available even at maximum demand.

Natural Gas Supply Pressure	LP Gas Supply Pressure
Min 3.5" WC	Min 8" WC
Max 10.5" WC	Max 14" WC

Reference Tools & Sample Calculations

⚠ CAUTION

The tables and samples below are for reference only. The professional sizing and installing the gas line should always run the appropriate calculations before all installations..

Which Table to Use

- For NG installations with the initial supply pressure at point of delivery (at the meter, for example) is less than 8" WC, use the 0.5" WC pressure drop table (Table 1 on page 22).
- For NG installations with the initial supply pressure at point of delivery is greater than or equal to 8" WC, use the 3.0" pressure drop table (Table 2 on page 22).
- For all LP installation use (Table 3 on page 22)

The inlet pressure must be at least 5" WC for NG or 8" WC for LP for all appliances in the gas system. If the inlet gas pressure drops below 5" WC for NG or 8" WC for LP, the heater may continue to operate, but the other appliances in the house may experience flame loss or ignition failure, which can result in gas leakage into the home. Refer to the NFPA 54 for details.

Please contact Noritz for details. For corrugated stainless steel tubing (CSST) capacity tables, please consult with the manufacturer.

Gas Line Sizing for a Noritz Condensing Tankless Gas Water Heater

Table 1. For Less than 8" WC initial supply pressure

Maximum Natural Gas Delivery Capacity (0.5" WC Pressure Drop)

Pipe size	Length (ft)										
	10'(3m)	20'(6m)	30'(9m)	40'(12m)	50'(15m)	60'(18m)	70'(21m)	80'(24m)	90'(27m)	100'(30m)	125'(37.5m)
3/4″	360	247	199	170	151	137	126	117	110	104	92
1″	678	466	374	320	284	257	237	220	207	195	173
1-1/4″	1390	957	768	657	583	528	486	452	424	400	355
1-1/2″	2090	1430	1150	985	873	791	728	677	635	600	532
2"	4020	2760	2220	1900	1680	1520	1400	1300	1220	1160	1020
2 1/2"	6400	4400	3530	3020	2680	2430	2230	2080	1950	1840	1630
3"	11300	7780	6250	5350	4740	4290	3950	3670	3450	3260	2890
4"	23100	15900	12700	10900	9660	8760	8050	7490	7030	6640	5890

Contact the Gas Supplier for Btu/Cubic Ft. of the Supplied Gas. 1000 BTU/Cubic Ft. is a Typical Value

Table 2. For 8" WC ~ 10.5" WC initial supply pressure

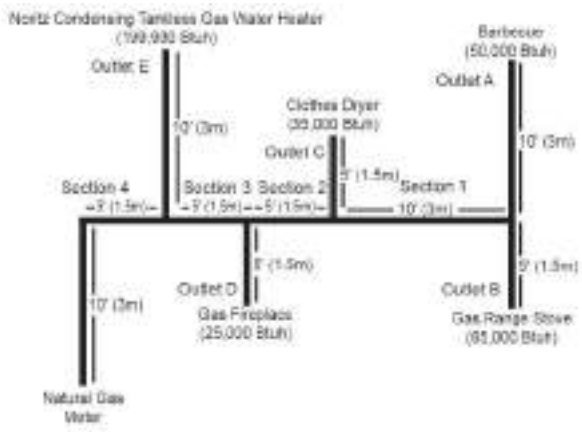
Maximum Natural Gas Delivery Capacity (3.0" WC Pressure Drop).

Pipe size	Length (ft)										
	10'(3m)	20'(6m)	30'(9m)	40'(12m)	50'(15m)	60'(18m)	70'(21m)	80'(24m)	90'(27m)	100'(30m)	125'(37.5m)
1/2″	454	312	250	214	190	172	158	147	138	131	116
3/4″	949	652	524	448	397	360	331	308	289	273	242
1″	1787	1228	986	844	748	678	624	580	544	514	456
1-1/4″	3669	2522	2025	1733	1536	1392	1280	1191	1118	1056	936
1-1/2″	5497	3778	3034	2597	2302	2085	1919	1785	1675	1582	1402
2"	10588	7277	5844	5001	4433	4016	3695	3437	3225	3046	2700
2 1/2"	16875	11598	9314	7971	7065	6401	5889	5479	5140	4856	4303
3"	29832	20503	16465	14092	12489	11316	10411	9685	9087	8584	7608
4"	43678	30020	24107	20632	18286	16569	15243	14181	13305	12568	11139

Table 3. Maximum Undiluted Propane (LP) Delivery Capacity in Thousands of Btu/H (0.5" WC Pressure Drop)

Pipe size	Length (ft)												
	10'(3m)	20'(6m)	30'(9m)	40'(12m)	50'(15m)	60'(18m)	80'(24m)	100'(30m)	125'(38m)	150'(45m)	175'(53m)	200'(60m)	250'(76m)
1/2″	275	189	152	129	114	103	96	89	83	78	69	63	55
3/4″	567	393	315	267	237	217	196	185	173	162	146	132	112
1″	1071	732	590	504	448	409	378	346	332	307	275	252	213
1-1/4″	2205	1496	1212	1039	913	834	771	724	677	639	567	511	440
1-1/2″	3307	2299	1858	1559	1417	1275	1181	1086	1023	976	866	787	675
2″	6221	4331	3465	2992	2646	2394	2205	2047	1921	1811	1606	1496	1260

** For reference only. Please consult gas pipe manufacturer for actual pipe capacities.



■ Instructions

1. Size each outlet branch starting from the furthest using the Btu/h required and the length from the meter.
2. Size each section of the main line using the length to the furthest outlet and the Btu/h required by everything after that section.

■ Sample Calculation

Outlet A: 45' (13.5m) (Use 50' (15m)), 50,000 Btu/h requires 1/2"
Outlet B: 40' (12m), 65,000 Btu/h requires 1/2"
Section 1: 45' (13.5m) (Use 50' (15m)), 115,000 Btu/h requires 3/4"
Outlet C: 30' (9m), 35,000 Btu/h requires 1/2"
Section 2: 45' (13.5m) (Use 50' (15m)), 150,000 Btu/h requires 3/4"
Outlet D: 25' (7.5m) (Use 30' (9m)), 25,000 Btu/h requires 1/2"
Section 3: 45' (13.5m) (Use 50' (15m)), 175,000 Btu/h requires 1"
Outlet E: 25' (7.5m) (Use 30' (9m)), 199,900 Btu/h requires 3/4"
Section 4: 45' (13.5m) (Use 50' (15m)), 374,900 Btu/h requires 1-1/4"

** For reference only. Please consult gas pipe manufacturer for actual pipe capacities.