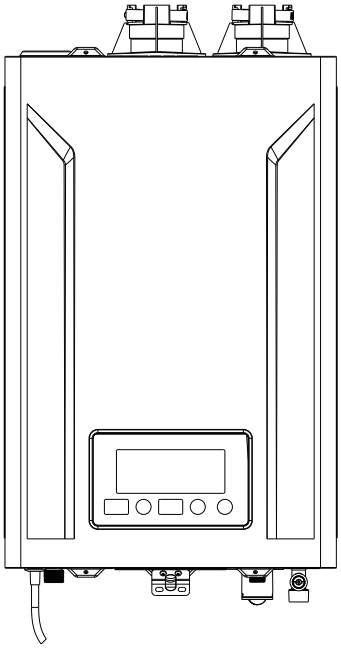
Installation Manual

Tankless Water Heater



S33-95TWH199P-NG / S33-95TWH199-NG
S33-95TWH199P-LP / S33-95TWH199-LP

REGISTER YOUR PRODUCT

Due to updates and constantly improving performance, the information and instructions within this manual are subject to change 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 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.**
  - **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.**

CONTENTS

SAFETY INSTRUCTIONS

Read Before Installation

Incorrect installation may cause serious damage or injury!

The seriousness of potential damage or injuries is classified as either a **WARNING!** or **CAUTION!**

Explanation of Symbols

	**Warning** This symbol indicates ignoring instructions may cause death or serious injury.
	**Caution** This symbol indicates that ignoring instructions may cause moderate personal injury, damage to the unit, or other property.
	**DO NOT** This symbol indicates that you should NEVER perform the indicated action.

INSTALLATION & SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY, OR GAS SUPPLIER!

Please read the manual in its entirety before installing, operating, or repairing.

NOTE: The installation must conform to local codes or, in the absence of local codes, the National Fuel Gas Code, ANSIZ223.1/NFPA 54.

California Proposition 65 Warning:

The product referred to in this manual contains chemicals which are known to the State of California to cause cancer, birth defects, or other reproductive harm.

BEFORE OPERATING, smell all around the area near the appliance for the scent of gas. Be sure to smell next to the floor as some gas is heavier than air and will settle there.

If you smell gas:

- Do not try to light any appliance.
- Do not touch any electrical switches or use landline phones.
- From a neighbor's phone, call your gas provider and follow their instructions.
- If you cannot reach your gas provider, call the fire department.

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

DO NOT store or use gasoline or other flammable substances (vapors or liquids) in the vicinity of this water heater or any other appliance. This could create a hazard that may result in personal injury, fire, and/or an explosion.

DO NOT place newspapers or laundry near the water heater or venting system (including the vent termination outlet), as these could create a fire hazard, which could result in personal injury and property damage.

⊘ **DO NOT** use or store aerosol products (such as hair sprays, spray paints etc.) or any other compressed gases near the water heater or venting system (including the vent termination outlet), as this could result in personal injury, fire, and/or an explosion.

⊘ **DO NOT** use this appliance if any part has been submerged in water. Immediately call a qualified service technician to inspect the appliance and to replace any parts which have been underwater.

⊘ **DO NOT** use tools to push in or turn the manual gas appliance shut-off valve. Use only your hands to perform this action. In the event the valve will not turn, DO NOT attempt to repair it. Using too much force or attempting to repair the manual gas shut-off valve could result in personal injury, fire, and/or an explosion. Call a qualified service technician to perform any repairs.

- Have your installer or plumber show the location of the manual gas shut-off valve and demonstrate how to properly use it.
- Keep the containers closed tightly and out of the reach of children and pets.

OPERATIONAL WARNINGS:

⊘ **DO NOT** operate the water heater with the front cover open. Doing so could cause a fire or carbon monoxide (CO) poisoning, which could result in property damage, personal injury, death, and/or an explosion.

⊘ **DO NOT** operate the water heater without a proper venting system. Operating the unit without a vent could cause fire and/or carbon monoxide poisoning, which could result in property damage, personal injury, or death. Inspect the vent termination and air intake supply annually to ensure proper operation of the water heater. If any of the vent pipes, vent elbows, or intake pipes are damaged in any way (separated at a joint or show signs corrosion, rusting, or melting), turn OFF the water heater and discontinue use until piping is repaired.

⊘ **DO NOT** touch the power cord or internal components of the water heater with wet hands. Doing so could result in electric shock and personal injury. Always disconnect the power supply before servicing.

- If the water heater is damaged for any reason, immediately shut off the gas supply to the appliance.
- If the water heater is damaged as a result of overheating, fire, flood, or any other reason, close the manual shut-off valve and DO NOT operate the unit again until it has been repaired and inspected by a qualified technician.

WHAT TO DO IF YOU SMELL GAS:

⊘ **DO NOT** try to start, ignite/light, or operate any nearby appliance.

⊘ **DO NOT** touch any electrical switch.

⊘ **DO NOT** use any phone within the building where you smell gas.

- EXIT the building IMMEDIATELY and CALL your GAS SUPPLIER. Follow the gas supplier's instructions. If you CANNOT reach the gas supplier, CALL the FIRE DEPARTMENT.

TO PREVENT BURNS:

⊘ **DO NOT** change or adjust the temperature setting of the water heater before reading all of the instructions in this manual carefully.

- Use the lowest operating temperature setting to provide comfortably hot water.
- If your household has children, elderly, or disabled residents, consider using a lower temperature setting.
- Feel the temperature of the hot water before allowing children, the elderly, or disabled to be exposed to it.

IMPORTANT: This water heater is set to a default temperature setting of 120°F at the factory for your safety and comfort. Increasing the temperature above this increases the risk of accidental scalding. Water temperatures at or above 125°F can cause instant scalding, severe burns, or death. If it is necessary to set the temperature of the water heater to 125°F, have a temperature-limiting valve or mixing valve installed on the water heater. Before changing the temperature setting, read & review the chart to the right carefully.

Time/Temperature Relationship in Scalds	
Water Temperature	Time to Produce Serious Burn
120° F	More than 5 minutes
125° F	1½ to 2 minutes
130° F	About 30 seconds
135° F	About 10 seconds
140° F	Less than 5 seconds
145° F	Less than 3 seconds
150° F	About 1½ seconds
155° F	About 1 second

Table courtesy of Shriners Burn Institute

FREEZE PROTECTION:

The water heater is equipped with an anti-freeze protection system that activates based on internal water temperature in the appliance. If the system detects the water temperature is 41°F or below, it will activate internal electric heaters to ensure the water meets the target temperature and maintains the set temperature level.

NOTE: If a power failure occurs during cold weather, the anti-freeze protection system of the water heater will not operate and may allow freezing within the heat exchanger and waterway to occur.

Please note the following information and guidelines regarding the anti-freeze protection function:

- If the water heater is not going to be used and the indoor environment is expected to be near or below freezing temperatures, please drain the water within the appliance.
- The freeze protection function will only operate when the temperature of the inlet water of the water heater is 41°F or lower. However, it cannot be guaranteed that it will provide protection to water pipes connected to the appliance and they could be damaged by freezing.
- The anti-freeze protection of the water heater only applies to the internal water tubing of the appliance. Damage of electrical components caused by a low ambient temperature is not covered by the warranty.

  In the event the water heater is not operating for extended periods of time, be sure to drain any condensate water completely. If this is not done, when the ambient temperature is near or drops below 32°F, the condensate will freeze and could cause damage to the internal condensation system of the water heater.

ALTITUDE ADJUSTMENT:

The parameter setting of the water heater may need to be adjusted depending on the altitude of the location it is being installed in. Please refer to the table below for the proper setting based on your altitude. This adjustment can be made through the water heater control panel.

For US: For operation at elevations above 2000ft - Input rating should be reduced at the rate of 4% for each 1000ft above sea level accordance with local codes or, in the absence of local codes, NFPA54/ANSI Z223.1. Instructions on how to perform this adjustment can be found in the Appliance Servicing section of installation manual. However, this adjustment should only be performed by a qualified technician at the time of installation. If this adjustment is not made, or performed incorrectly, it could cause improper operation of the unit. Improper operation could cause gas leakage, fire, and/or an explosion that can put you at risk of personal injury or death.

Program Data	Altitude Setting	
Altitude above Sea Level	2,000 – 6,500 feet	6,500 – 9,800 feet
L2	05 (Factory Default Setting)	06

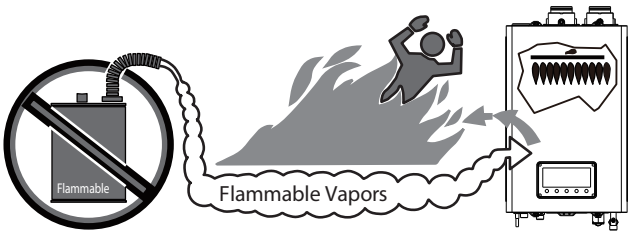
Vapors from flammable liquids will explode and catch fire, causing death or severe burns.

⊘ **DO NOT** use or store flammable products such as gasoline, solvents, or adhesives in the same room or any area near the water heater.

The water heater has a main burner.

Keep flammable products:

1. Far away from the unit.
2. In approved containers.
3. Tightly closed.
4. Away from children -



The main burner flame can:

1. Come on at any time.
2. Will ignite flammable vapors.

Vapors:

1. Cannot be seen.
2. Are heavier than air.
3. Can travel a long distance.

⊘ **DO NOT** install the water heater where flammable products will be stored or used unless the main burner is at least 18 inches above the floor. This will reduce, but not eliminate, the risk of vapors being ignited by the main burner.

Read and follow all water heater warnings and instructions. If the owner's manual is missing, contact the retailer or manufacturer.

IMPORTANT: This water heater has been approved for use in the USA. Installing and operating this water heater in any other country will void the product's warranty.

⚠ Caution

For service or repair, contact an authorized technician or licensed professional. Improper installation, adjustment, alteration, service, or maintenance can cause unit failure or damage, property damage, personal injury, or death, and will void the product's warranty. If you need assistance or further information, please consult the manufacturer or a qualified professional.

⊘ **DO NOT** attempt to repair or replace any part of the water heater unless it is specifically recommended in this manual.

⊘ **DO NOT** operate the water heater if it shows any signs of damage or any part of it has been submerged in water. Doing so could result in personal injury, product failure, and/or property damage. If any part of the unit has been damaged or has been submerged in water, immediately contact a qualified service technician to inspect the unit and replace any parts that are damaged or have been under water.

⊘ **DO NOT** allow children to operate or access the water heater. Doing so could result in personal injury, product failure, and/or property damage.

⊘ **DO NOT** attempt to adjust or change the temperature setting while the water heater is in use, as this could result in personal injury.

⊘ **DO NOT** turn on the water heater unless the water and gas supplies are properly connected and fully opened. Operating the unit without the water and gas connected and flowing could cause damage to the water heater.

⊘ **DO NOT** turn on the water heater if the cold water supply shut-off valve is closed, as this could cause damage to the unit.

⊘ **DO NOT** use this water heater for anything other than its intended purpose, as described within this manual.

⊘ **DO NOT** remove the front cover unless the power to the water heater is turned off and the appliance is disconnected from the outlet. Failure to follow this warning could result in electric shock.

⊘ **DO NOT** use unapproved replacement parts or accessories, as this could cause the unit to operate improperly or fail and void the product's warranty.

⊘ **DO NOT** place anything in or around the vent terminals that could obstruct airflow in or out of the water heater (e.g. clothesline).

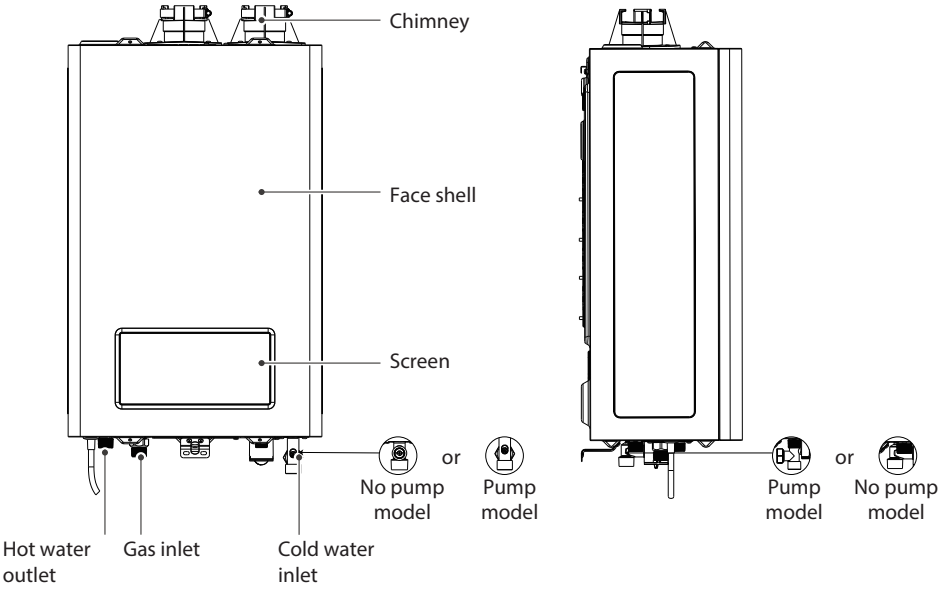
Should overheating occur, or the gas supply fails to shut off, turn off the manual gas valve to the appliance.

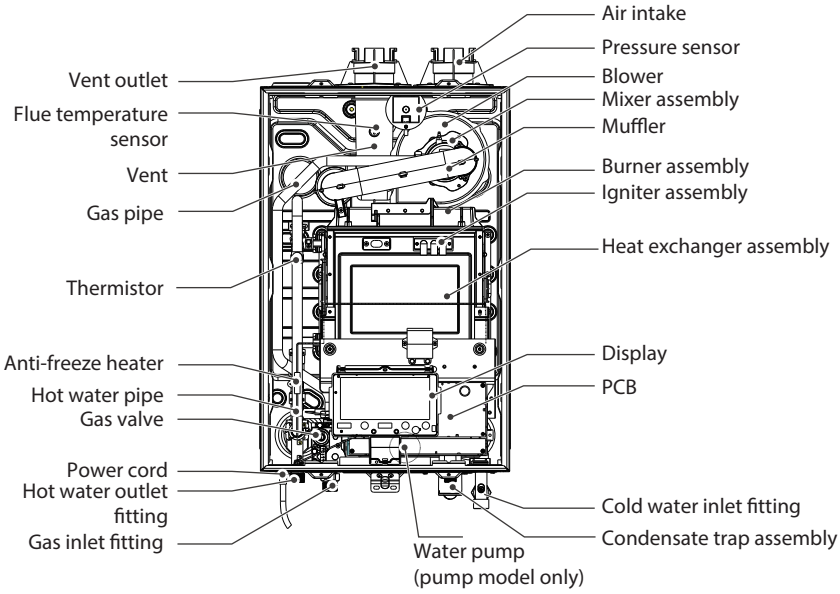
SPECIFICATIONS

Model Name		S33-95TWH199P-NG	S33-95TWH199P-LP	S33-95TWH199-NG	S33-95TWH199-LP
Heat Capacity (Input)		20000-199000 BTU/H			
Uniform Energy Factor		0.95			
Flow Rate (DHW)	37°F (20 °C) Temp Rise	10.7			
	47°F (26 °C) Temp Rise	8.4			
	67°F (37 °C) Temp Rise	5.9			
Dimensions		26.8X17.3X10.6in (680*440*270mm)			
Weight		70.5lbs (32kg)			
Installation Type		Indoor			
Venting Type		Forced draft direct-vent			
Ignition		Electronic Ignition			
Water Pressure		15-150 PSI			
Natural Gas Supply Pressure (from source)		3.5in.WC-10.5in WC (870Pa~2610Pa)			
Propane Gas Supply Pressure (from source)		8in.WC-13in WC (1990Pa-3230Pa)			
Minimum Flow Rate		0.3GPM (1.2L/min)		0.5GPM (1.9L/min)	
Connection Sizes	Cold Water Inlet	3/4 in. NPT			
	Hot Water Outlet	3/4 in. NPT			
	Gas Inlet	3/4 in. NPT			
Power Supply	Main Supply	120V, 60Hz			
	Maximum Power Consumption	150W (+114W when anti-freeze module is on, +45W when pump is on)			
Materials	Casing	SPCC			

	Heat Exchangers	300 series stainless steel
Venting	Exhaust	2 in. or 3 in. PVC, CPVC, approved Polypropylene
	Intake	
Safety Devices		Flue High Limit Switch (158°F / 70°C) • Water Temperature High Limit Switch (185°F / 85°C) • Freeze Protection Ceramic Heater (Turns on at 41°F / 5°C & Turns off at 59°F / 15°C)

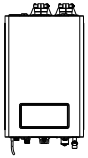
Product


Chimney
Face shell
Screen
or
No pump model
Pump model
Hot water outlet
Gas inlet
Cold water inlet
Pump model
or
No pump model

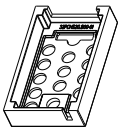

Air intake
Pressure sensor
Blower
Mixer assembly
Muffler
Burner assembly
Igniter assembly
Heat exchanger assembly
Display
PCB
Cold water inlet fitting
Condensate trap assembly
Water pump (pump model only)
Vent outlet
Flue temperature sensor
Vent
Gas pipe
Thermistor
Anti-freeze heater
Hot water pipe
Gas valve
Power cord
Hot water outlet fitting
Gas inlet fitting

Accessories

Tankless Gas Water Heater x1

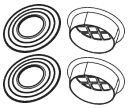


Styrofoam Packing Materials x2



Toggle Bolts x4

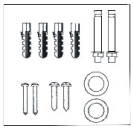
Bird Screens 2 x2 pieces each



3 in. Exhaust Pipe Flow Restrictor x1 (3 in. pipe only)

Wall-Mounting Bracket (upper) x1

Fastener Packet x1

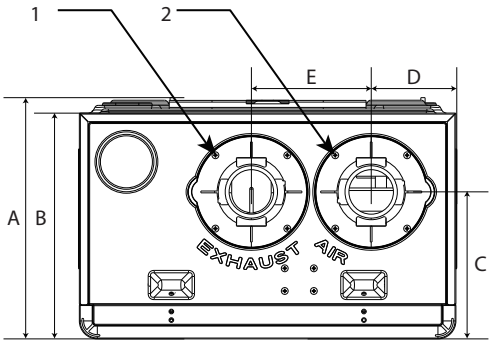


Wall-Mounting Bracket (lower/bottom) x1

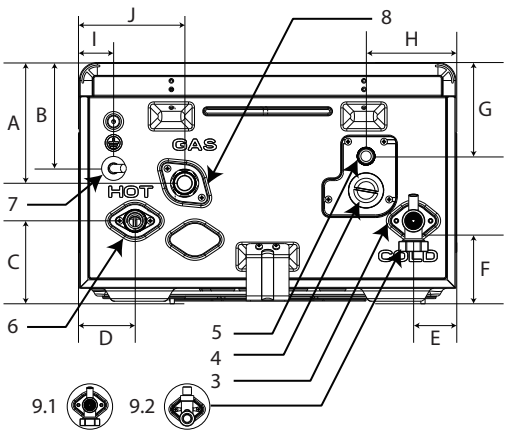
Hose/Pipe Clamps x2

User manual x1
Installation manual x1
Warranty card x1

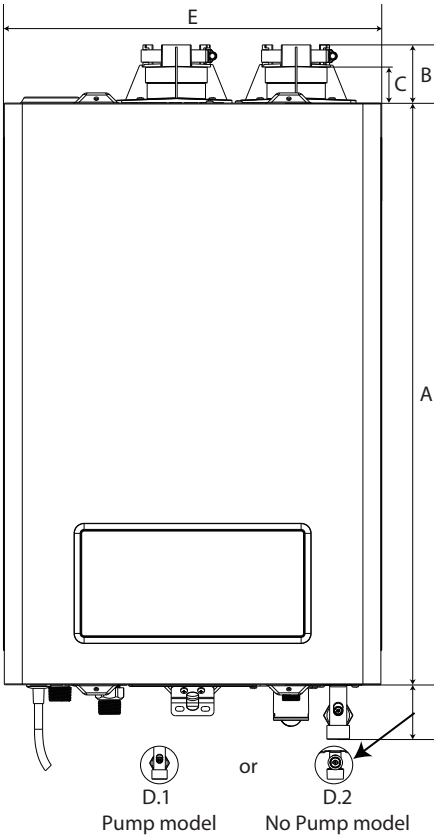
Dimension



Top View



Bottom View



Front View

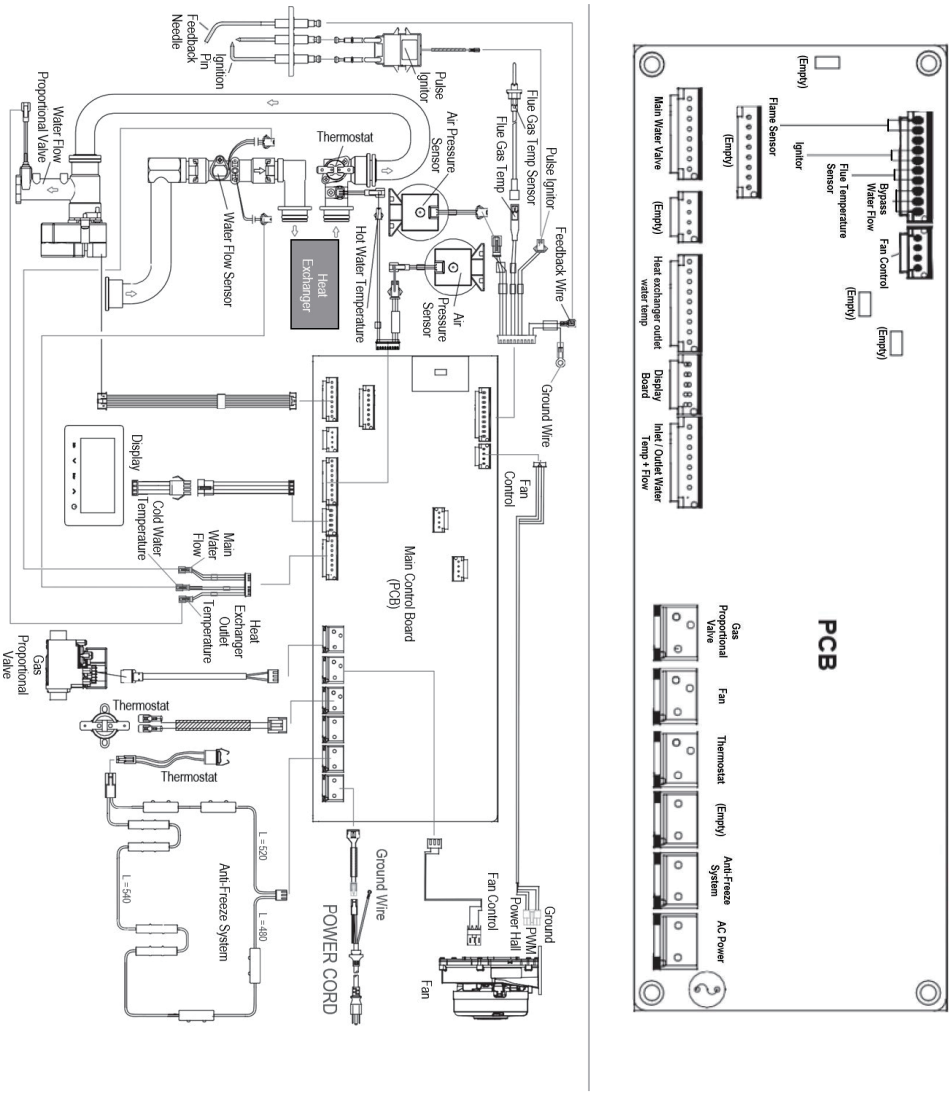
Appliance Components

No.	Description	Size
1	Exhaust Vent	2 in.
2	Air Intake	2 in.
3	Cold Water Inlet	¾ in.
4	Condensate Clean	—
5	Condensate Drain	½ in.
6	Hot Water Outlet	¾ in.
7	Power Cable	120V/60Hz
8	Gas Inlet	¾ in.
9.1	Recirculation Water Inlet	¾ in.
9.2	—	¾ in.

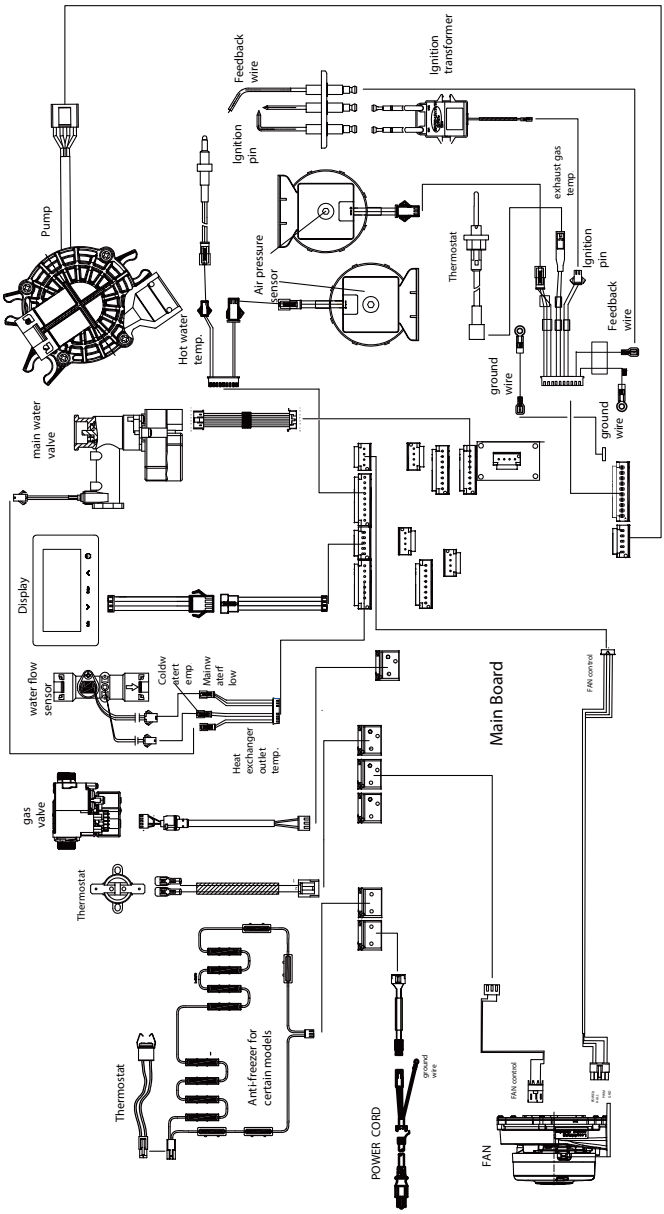
Appliance Dimensions

Item	Top View	Bottom View	Front View
A	10 7/8 in.	26 3/4 in.	5-5/8 in.
B	10 3/8 in.	2 3/4 in.	4-7/8 in.
C	6 3/4 in.	1 3/4 in.	3-1/8 in.
D.1	3 7/8 in.	1 3/4 in.	2-1/2in
D.2	3 7/8 in.	1 3/4 in.	2-5/8 in.
E	5 1/2 in.	17 1/4 in.	2 in.
F	—	—	2-1/2 in.
G	—	—	4-3/8 in.
H	—	—	4-1/8 in.
I	—	—	4-7/8in.
J	—	—	1-5/8 in.

Circuit Diagram



No Pump model


Pump
Feedback wire
Ignition transformer
Ignition pin
exhaust gas temp
Thermostat
Ignition pin
Feedback wire
Air pressure sensor
Hot water temp.
ground wire
ground wire
main water valve
Display
water flow sensor
Coldw ater t emp
Mainw ater t low
Heat exchanger outlet temp.
Main Board
FAN control
gas valve
Thermostat
Thermostat
Anti-freezer for certain models
POWER CORD
ground wire
FAN control
FAN

Pump model

PRODUCT INSTALLATION

When choosing an installation location, the site must provide adequate clearance for the water heater, adequate options for venting and drainage, and sufficient access to gas, water, and electrical supplies.

⚠ Caution

- Review all of the installation information in this manual before starting installation. Consider all the requirements for venting, piping, condensate removal, and wiring.
- The installation location of the water heater should have a minimum clearance of eight (8') feet from any high heat sources (producing temperatures greater than 158°F), as these will cause deformation of plastic parts or plastic pipe fittings of the unit.
- Example: boiler ventilation pipe, space heater, etc.
- The unit must be installed in a fire retardant area away from all combustible materials. The minimum clearances from combustible construction are six (6) in. on the sides, zero (0) in. from the back, and twelve (12) in. from the top.
- The location chosen and installation MUST comply with the Uniform Plumbing Code (latest version).

Water Quality

Proper maintenance of the water heater is required to ensure compliance to EPA water quality standards. Damage caused by poor water quality IS NOT covered under the product warranty. The following table shows the maximum contaminant levels allowed, based in part on the EPA National Secondary Drinking Water Regulations (40 CFR Part 143.3). If you suspect that your water is contaminated in any way, discontinue use of the water heater and contact an authorized technician or licensed professional to investigate further.

Contaminant	Max. Allowable Level	Contaminant	Max. Allowable Level
Total Hardness	Up to 300 mg/l*	Iron	Up to 0.3 mg/l
Aluminum	0.05 to 0.2 mg/l	Manganese	Up to 0.05 mg/l
Chloride	Up to 250 mg/l	pH	6.5 to 8.5 mg/l
Copper	Up to 1.0 mg/l	Sulfate	Up to 250 mg/l
Total Dissolved Solids	Up to 500 mg/l	Zinc	Up to 5 mg/l
Chlorine	Up to 4 mg/l		

*18 grains/gallon

If your local water is hard, please review the following treatment and flushing guidelines. However, first check your local codes for any restrictions on the use of softeners before choosing and purchasing a softener.

Hardness Level : EPA 2018 Water Quality Parameters		Treatment Method	Flush Frequency
Soft	0-4 grains/gallon (0-75mg/l)	None	None
Moderately Hard	4-9 grains/gallon (75-150 mg/l)	None	Annually
Hard	9-18 grains/gallon (150-300 mg/l)	Water Softener is Strongly Recommended for Optimal Performance	Every 6 months
Very Hard	>18 grains/gallon (300 mg/l)	Water Softener REQUIRED for Product Warranty	Threshold exceeds operational capability of the Product

Access to Utilities

The installation location should be near where there is easy access to the cold water supply, natural gas supply, and a GFCI 120V 60Hz 20-Amp electrical outlet, preferably near where these utilities enter the building.

Adequate Drainage

The water heater produces a significant amount of condensate during operation due to its increased natural gas efficiency. The water heater should be located near a suitable drain and where potential water damage from this condensate will be minimal. Installation of the water heater in a location without a suitable drain will void the warranty and Stream33 will not be liable or responsible for any damages that occur as a result. For further information about condensate drainage, please refer to Chapter 12.

The water heater must be located in an area where condensate drainage from the unit or its connections will not result in damage to the area adjacent to the unit, or to lower floors of the building or structure. When such a location cannot be found, it is highly recommended that a condensate drain pan that can drain adequately be installed beneath the unit. When installing the drain pan, ensure that it will not restrict combustion airflow in any way.

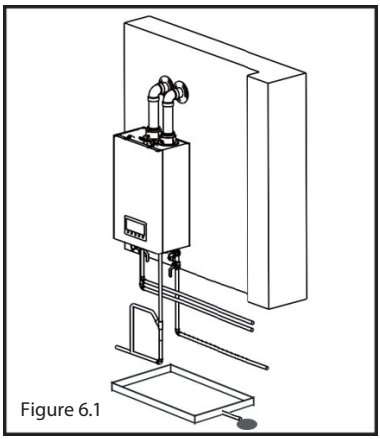


Figure 6.1

Adequate Venting and Ventilation

Select an installation location that will also require minimal venting. Consider venting restrictions caused by windows, doors, air intakes, gas meters, foliage, and other buildings. For more information regarding venting, please refer to Chapters 13-17.

To ensure adequate venting and ventilation, follow these guidelines and restrictions:

⊘ **DO NOT** install the water heater in bathrooms, bedrooms, or any other occupied rooms that are normally kept closed or are not adequately ventilated.

⊘ **DO NOT** install the water heater where moisture from the vented exhaust could discolor or damage exterior walls.

⊘ **DO NOT** enclose the vent termination.

- Maintain proper clearances from any openings in the building.
- Install the water heater with a minimum clearance of twelve (12) in. above an exterior grade or as required by local codes.
- Maintain a minimum clearance of four (4') feet from heating and cooling vents.
- Install the exhaust vent in an area that is free from obstructions and does not allow the exiting exhaust to accumulate.

Proximity to Fixtures and Appliances

Install the water heater near fixtures that deliver or use hot water, such as near the bathroom, kitchen, and laundry room fixtures. Select a location that will minimize the amount of water piping required between major fixtures. Insulate as much of the hot water pipes as possible. For more information regarding the water supply, refer to Chapter 10.

Install the water heater in an area that will allow for front panel removal for service & maintenance as well as access to the utility connections, piping, filters, and traps. Based on the installation location, ensure the clearances listed in the table below are maintained.

Minimum Installation Clearance	Top	Bottom	Front	Back	Sides
Inches	9 in.	12 in.	4 in.	0 in.	6 in.

Install in an Area Free from Debris + Chemical-Free Air for Optimal Combustion

Follow the installation guidelines listed below regarding the air surrounding the unit and storage of potentially dangerous items in the vicinity of the unit.

⊘ **DO NOT** install the water heater in areas where dust and debris may accumulate.

⊘ **DO NOT** install the unit where hair sprays, spray detergents, chlorine, or similar chemicals are used or stored.

⊘ **DO NOT** install the water heater in areas where gasoline or other flammables are used or stored.

⊘ **DO NOT** allow hanging laundry or any similar items to obstruct access to the water heater or its venting system.

- Ensure that any combustible materials are properly and securely stored away from the water heater.

NOTE

The combustion air must be free of flammable vapors or corrosive chemical fumes. Common corrosive chemical fumes to avoid include: fluorocarbons, other halogenated compounds such as freon, trichloroethylene, perchloroethylene, and chlorine, all of which can be found in refrigerants or solvents. When these chemicals burn, they produce acids that can corrode the stainless steel heat exchanger, gaskets, the flue, and venting system.

Coastal Installations

For installations around salt water marine environments, the salt in the air can cause corrosion to the water heater. The water heater should be protected and enclosed to minimize exposure to this corrosive atmosphere. Damage caused by a corrosive environment is not covered under the warranty.

Operating Temperature

The ambient temperature at the installation location must be above freezing. Steps should be taken to ensure the water inlet and outlet pipes will not freeze. Frozen pipes should be allowed to fully thaw, and the appliance should be drained, fully thawed, and inspected by a professional before use after a freezing event. Operation of the appliance after it has been frozen without the procedure above or the water pipes have frozen without proper thawing will void the product warranty.

The 1:1 drawing was supplied to help locate the holes on the wall quickly. Put the drawing on the wall and make the holes at the shown position.

NOTE

The ambient air temperature for operation of the appliance is between 33° to 120°F.

The anti-freeze system activates when the inlet water temperature of the appliance is below 41°F.

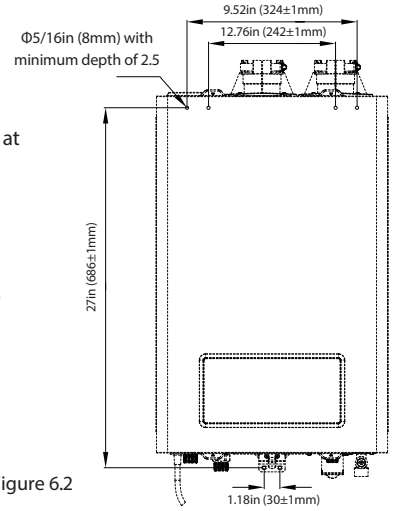


Figure 6.2

Mounting the Water Heater to the Wall

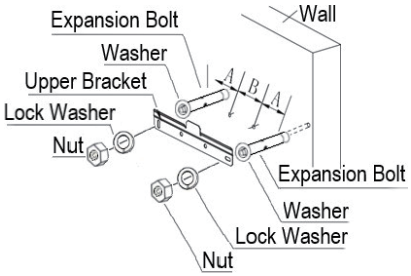
Mounting the Water Heater to the Wall

The water heater referenced in this manual comes with an upper mounting bracket that is pre-drilled for easy installation. If the strength of the wall is insufficient or if the framing is uneven, reinforce the area before installing the water heater. Avoid installation on common walls as the unit will make some operational noises while operating.

To mount the water heater to the wall:

Upper Bracket secured with Expansion Bolts

1. Make two (2) 5/16 (8mm) holes in the wall with the drill that align with the outer holes on the upper bracket. If additional support is required, utilize the supplied 1¼ wood screws and plastic anchors or toggle bolts in the middle holes of the upper bracket. Place the expansion bolts with washers inside of drilled hole, ensuring bolt extends from wall. Affix the upper bracket to the protruding bolts, ensuring that the bracket is level, the center tab on the bracket is facing upwards, and that the area where the bolts insert into the bracket is flush with the wall. Add the lock washers and nuts to secure bracket to the wall. Tighten the nuts until the lock washers engage. Do not over tighten the nuts on the expansion bolts to prevent stripping bolt threads.



Measurements
A: 2 15/16
B: 3 1/8
D:≥ 2 9/16
L:> 14 3/8 to
≤ 26 3/8

Ø 5/16 in. (8mm) with a minimum depth of 2.5

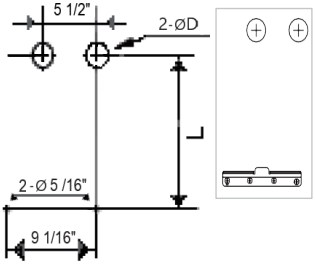


Figure 6.3

Bottom Bracket Installation

2. Use the two (2) pre-installed screws (illustration on the right) on the bottom of the unit to fasten the lower bracket to the bottom of the water heater.

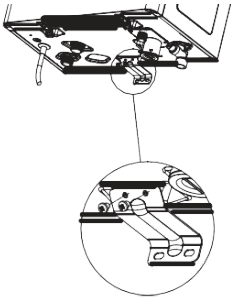


Figure 6.4

3. Lift the unit with two people. Align the lip of the pre-installed hanging bracket on the back of the water heater with the lip of the upper bracket. The tab on the upper bracket should insert into the slot of the pre-installed bracket on the water heater.

4. Gently hang the unit on the upper bracket attached to the wall.

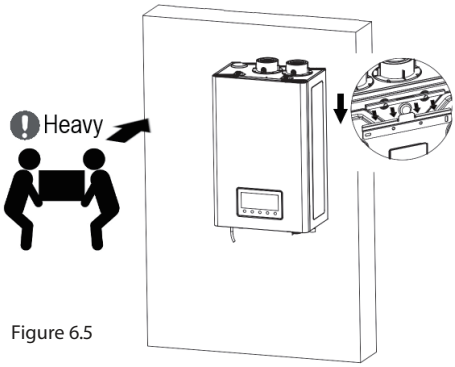


Figure 6.5

5. Secure the lower bracket to the wall with the smaller 1 wood screws and plastic anchors supplied.

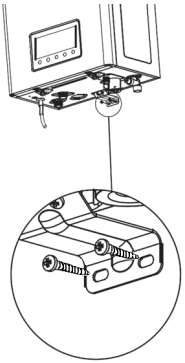


Figure 6.6

Connecting the Gas Line

If possible, we recommend connecting the water heater as the first gas appliance to the meter to ensure a sufficient gas supply.

⚠ Warning

Before connecting the gas supply, determine the gas type and pressure for the water heater by referring to the appliance rating plate. Only use the same gas type indicated on the rating plate. Using a different gas type will result in abnormal combustion and water heater malfunction which will void the product warranty. Gas supplies should be connected by a licensed professional only.

⊘ DO NOT use a flame to check for a gas leakage. Perform a bubble test and/or utilize a commercial combustible gas detector around the joints to check for gas leaks. If a leak exists, bubbles from the bubble test will form at the leaking joint. A gas leak could result in substantial property damage, severe personal injury, or death.

⊘ DO NOT attempt a field conversion of this water heater from natural gas to propane. This water heater CANNOT be converted from one type to another. Doing so will result in dangerous operating conditions and will void the warranty.

⊘ DO NOT allow the piping to be supported by the water heater or its accessories. Properly support the piping with hanging bands.

- To avoid damaging the connectors on the water heater, use two wrenches when tightening piping to the water heater. Use one wrench to prevent the connector at the water heater from turning, and the other wrench to tighten the connection. Damaged connectors may result in system leaks.
- Ensure that the gas piping is protected from physical damage. Failure to follow these instructions could result in gas leakage, which can result in fire, explosion, property damage, severe personal injury, or death.
- The appliance and its gas connection must be leak tested before initial operation of the appliance.
- The inlet gas pressure must be within the range specified in Chapter 2: Product Specifications of this manual (Refer to Max. Inlet Gas Pressure & Min. Inlet Gas Pressure).

To connect the gas supply:

1. Determine the gas type and pressure for the water heater by referring to the appliance's rating plate.
2. Perform a pressure test on the main gas supply line.
3. Purge the gas line of any debris.
4. Determine the proper size and type of piping for the gas line. Refer to the diagrams and tables on the following pages.
5. Install the full port manual gas shut-off valve on the gas supply line and water heater.
6. Connect the gas supply line.
7. Test the supply line, all connection points, and the water heater for gas leaks.

Connecting the Gas Supply

Illustration of typical rigid pipe installation

- The connection fitting on the water heater is ¾ in.
- ½ in. rigid pipe may be used. (Refer to the Gas Pipe Sizing Tables on the adjacent page for limitations.)
- Check with the local jurisdiction to verify the use of ½ in. gas pipe is allowed/approved in the area where the water heater is being installed.

⊘ **DO NOT** use ½ in. corrugated tubing or connectors as these could cause excessive noise during appliance operation.

- When using flexible gas lines, ensure that the inner diameter of the pipe and connector are sufficient to supply the required amount of BTUs. Also, ensure the flexible line has no crimps or tight bends in it, as these will restrict gas flow.
- When using rigid pipe, installation of a union on the gas supply line close to the water heater is recommended. This will facilitate any future maintenance or service required.
- Tighten the water heater connection valves with care to avoid damaging them.

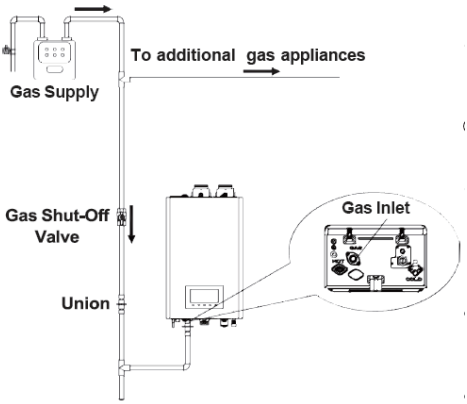


Figure 6.7

⚠ **Caution**

Prior to using an Excess Flow Valve (EFV) in the gas line, check the manufacturer's minimum and maximum flow capacity rating. An improperly sized EFV will not allow for full gas flow to the water heater. If this occurs, it could cause improper operation of the water heater.

Figure 6.8

Gas Pipe Sizing Tables

NOTE: The tables below are for reference only. Please consult the gas pipe manufacturer for actual pipe capacities. The tables below are referenced from the 2012 National Fuel Gas Code.

Maximum Natural Gas Delivery Capacity

In Cubic Feet (ft^3) per hour (0.60 Specific Gravity; 0.5 in. WC Pressure Drop). Contact your gas supplier for BTU/ft^3 ratings. Use 1,000 BTU/ft^3 for simplified calculations. This table is recommended for supply pressures less than 6 in. WC.

Pipe Size	Length (including fittings)										
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft
3/4 in.	360	247	199	170	151	137	126	117	110	104	92
1 in.	678	466	374	320	284	257	237	220	207	195	173
1 ¼ in.	1,390	957	768	657	583	528	486	452	424	400	355
1 ½ in.	2,090	1,430	1,150	985	873	791	728	677	635	600	532
2 in.	4,020	2,760	2,220	1,900	1,680	1,520	1,400	1,300	1,220	1,160	1,020
2 ½ in.	6,400	4,400	3,530	3,020	2,680	2,430	2,230	2,080	1,950	1,840	1,630
3 in.	11,300	7,780	6,250	5,350	4,740	4,290	3,950	3,670	3,450	3,260	2,890
4 in.	23,100	15,900	12,700	10,900	9,660	8,760	8,050	7,490	7,030	6,640	5,890

In Cubic Feet (ft^3) per hour (0.60 Specific Gravity; 3.0 in. WC Pressure Drop). Contact your gas supplier for BTU/ft^3 ratings. Use 1,000 BTU/ft^3 for simplified calculations. This table is recommended for supply pressures less than 6 in. WC.

Pipe Size	Length (including fittings)										
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft
1/2 in.	454	312	250	214	190	172	158	147	138	131	116
3/4 in.	949	652	524	448	397	360	331	308	289	273	242
1 in.	1,790	1,230	986	844	748	678	624	580	544	514	456
1 ¼ in.	3,670	2,520	2,030	1,730	1,540	1,390	1,280	1,190	1,120	1,060	936
1 ½ in.	5,500	3,780	3,030	2,600	2,300	2,090	1,920	1,790	1,670	1,580	1,400
2 in.	10,600	7,280	5,840	5,000	4,430	4,020	3,690	3,440	3,230	3,050	2,700
2 ½ in.	16,900	11,600	9,310	7,970	7,060	6,400	5,890	5,480	5,140	4,860	4,300
3 in.	29,800	20,500	16,500	14,100	12,500	11,300	10,400	9,690	9,090	8,580	7,610
4 in.	60,800	41,800	33,600	28,700	25,500	23,100	21,200	19,800	18,500	17,500	15,500

Measuring the Inlet Gas Pressure

⚠ Warning

The water heater cannot function properly without sufficient inlet gas pressure (refer to the name plate of the unit for gas pressure rating). Measuring the inlet gas pressure should ONLY be performed by a licensed professional.

- The inlet gas pressure must be maintained between 3.5 in. and 10.5 in. WC for natural gas.
- The appliance and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system when test pressures are in excess of 1/2 psi (3.5 kPa). 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)

NOTE:
If gas pressure is out of the acceptable range or an excessive pressure drop is observed, contact the gas supplier or a qualified installer to supply proper gas pressure to the unit.

To measure the inlet gas pressure:

1. Close the manual gas shut-off valve on the gas supply line. (See Figure 6.9 on the following page)
2. Open a hot water faucet. The water heater should turn on and the gas in the gas supply line will be purged.
3. Leave the faucet on until the water heater shuts down due to a lack of gas supply, and then turn off the hot water faucet.
4. Loosen the four (4) Phillips head screws that attached the front panel to the casing of the unit (two on the top and two on the bottom). (Figure 6.10)
5. Carefully raise the front cover approximately 2 inches.
6. Find the control panel cable and unplug it from the main control board.

NOTE:
Before removing the front cover, you must unplug the control display cable first. Failing to do so will damage the water heater (Some models apply)

1. Fully remove the front cover. (Figure 6.11)
2. Loosen the screw indicated in Figure 6.12 and connect a manometer to the pressure port. Reset the manometer to zero before use.
3. Re-open the manual gas valve and check for leaks.
4. Open multiple fixtures that have high flow rates, such as bathtub and shower faucets, to ramp the water heater up to its maximum firing rate.
5. When the water heater reaches its maximum firing rate, check the inlet gas pressure reading on the manometer. The gas pressure must fall within the ranges specified in Chapter 2. (Figure 6.13)
6. After checking the intake pressure, tighten the screw again.

Figure 6.9

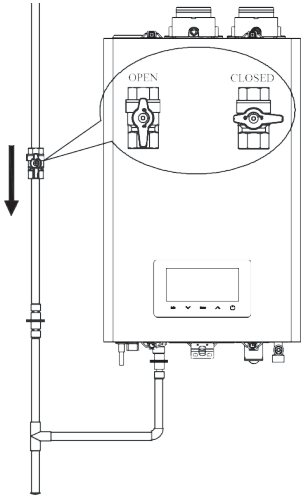
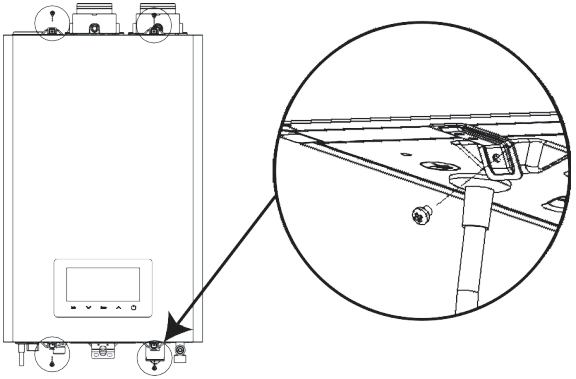


Figure 6.10



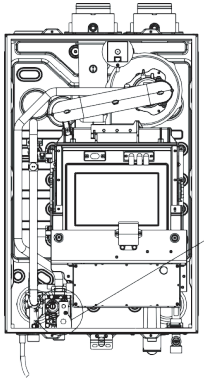


Figure 6.12

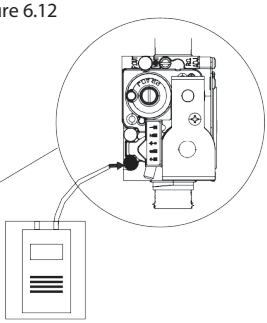


Figure 6.11

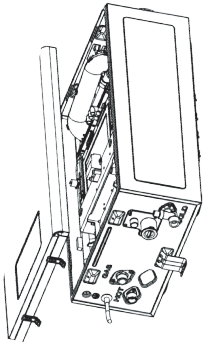


Figure 6.13

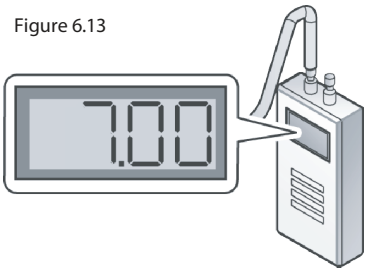
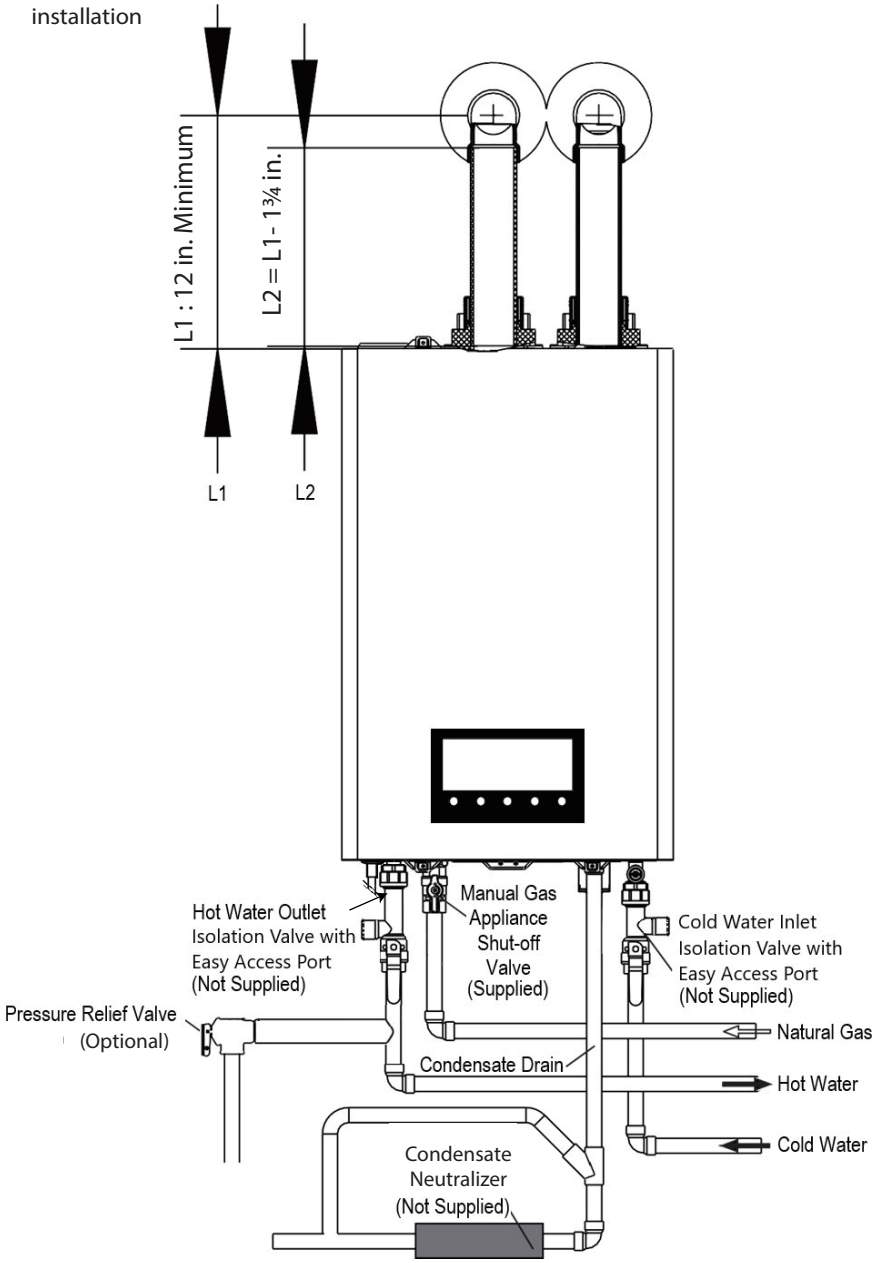
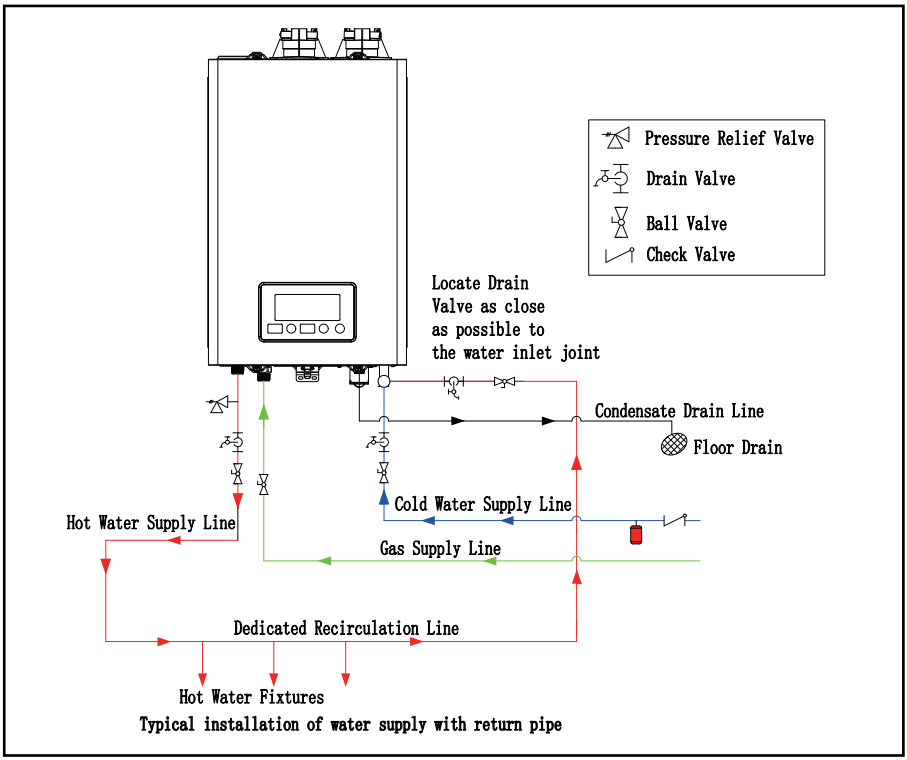


Figure 6.14

Example of typical installation



Installation of recirculation pipe or valve (Pump model only)



Typical installation of water supply with return pipe

General Guidelines:

- For the licensed installer / professional.
- For installation in commercial and residential domestic hot water applications only.
- Strongly recommends installing insulation to the hot water and dedicated return lines to
- Decrease the amount of heat loss.
- **DO NOT** install in combination with hydronic heating applications.

02: PUMP Settings (HQ)

Manual Mode: Adjust parameter setting to 02 for manual recirculation applications. Maximum recirculation loop length of 300 ft (90m) with 3/4 in. pipe or 80 ft (25m) with 1/2 in. pipe.

Maximum Pipe Length (Maximum pipe length includes the hot water supply line and dedicated return line.)		
Pipe Diameter	3/4 in.	1/2 in.
Total	300 ft. (90m)	80 ft. (25m)

*Take equivalent elbow lengths into consideration when calculating pipe length.

Note: If your recirculation loop length exceeds the length listed in the above table, the recirculation loop may not be heated up properly.

Water Supply Guidelines

The water fittings on the water heater are ¾ in. If the installation site only has ½ in. plumbing throughout, it is not necessary to up-size the water lines to ¾ in. if you are installing a single water heater.

When connecting the water supply, follow these guidelines:

⚠ Warning

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 this situation.

- Water quality is tested and is within the acceptable EPA guidelines listed on Page 14 of this manual.
- Water hardness is tested, the hardness level is identified, and a water softening system is added, if required or recommended, before this appliance to ensure this appliance's proper operation. Failure to achieve the appropriate water hardness level will void this product's warranty.
- Use only pipes, fittings, valves, and components (e.g. solder) that are approved for use in potable water systems.
- Tighten the water heater connection valves with care to avoid damage.
- It is recommended to use unions on the cold water inlet and hot water outlet.
- Use the supplied rubber gaskets for inlet and outlet connections to the water heater.
- It is mandatory to use isolation valves with easy access ports on the cold water inlet and hot water outlet assemblies from the appliance for required routine maintenance purposes.
- Make the hot water piping system as short as possible to deliver hot water to the fixtures quickly.
- To conserve water and energy, insulate all water piping, especially the hot water lines. DO NOT cover the drain or pressure relief valve.
- After installing the water heater, clean the inlet water filter that is located inside the cold water inlet, and then test the water heater for proper flow and inspect for leaks. Instruct the water heater owner that the filter must be cleaned initially every six (6) months to maintain proper water flow. If debris is often present, more frequent cleaning should occur.

⚠ Warning

Failure to follow the instructions in this section and the warnings listed below will not only void the warranty but could also result in property damage, severe personal injury, or death.

⊘ **DO NOT** pipe the water heater with black iron, steel, galvanized steel, lead, or aluminum water pipe, as it could result in premature product failure.

⊘ **DO NOT** apply a torch within twelve (12) in. of the water heater. If sweat connections are used, sweat tubing to the adapter before fitting the adapter to the water connections of the heater.

⊘ **DO NOT** use dielectric unions or galvanized steel fittings in a system with this unit. Use only copper, brass, or stainless steel fittings. Teflon thread sealant must be used on all connections.

Connecting a Pressure Relief Valve

Connecting a Pressure Relief Valve

To complete the installation of the water heater, you must install an approved ¾ in. maximum 150 PSI pressure relief valve on the hot water outlet. The water heater has a built-in, high temperature shut-off switch, so install a "pressure only" relief valve. This valve is not supplied; however, it is required. The pressure relief valve should be placed as close to the water heater as possible. No other valve outside of the isolation valve with easy access port should be placed between the pressure relief valve and the water heater. See illustration on Page 24 for reference.

⚠ Warning

Improper installation of the pressure relief valve may result in property damage, personal injury, or death. Follow all instructions and guidelines when installing the pressure relief valve.

- The valve should ONLY be installed by a licensed professional.
- To avoid water damage or scalding direct the discharge line to a safe place for disposal.

When installing the pressure relief valve, follow these guidelines:

⊘ **DO NOT** plug the relief valve. If the 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** direct the discharge line to a location where freezing could occur.

⊘ **DO NOT** install a reducing coupling or other restriction on the discharge line.

- Ensure that the discharge capacity of the pressure relief valve is equial to or greater than the maximum pressure rating of the water heater.
- Ensure that the maximum BTU/hr rating on the pressure relief valve is equal to or greater than the maximum pressure rating of the water heater.
- Direct the discharge piping of the pressure relief valve and run the end of the line to within 6-12 in. of the floor drain, making discharge clearly visible.
- Ensure that the discharge line will allow free and complete drainage without restriction.
- Ensure that the discharge line is not plugged or obstructed.
- After filling and pressurizing the system, test the relief valve operation by lifting the lever. If the valve fails to operate correctly, immediately replace the relief valve.

⚠ Caution

- To avoid potential property damage or personal injury, check the pressure relief valve at least once every three years by manually operating the valve to ensure proper operation.
- Before manually operating the valve, check the discharge line and make sure that the hot discharge water will not cause personal injury or property damages. Contact with the discharge water may result in severe injury.

Connecting the Condensate Drain

Connecting the Condensate Drain - Overview

This water heater creates condensation as part of its normal operation. The condensation produced is acidic and generally ranges from 3-5 on the pH scale. Be sure to follow all local codes and regulations when disposing of condensate from the water heater. Check local codes for suitable waste drain locations, if applicable.

⚠ Caution

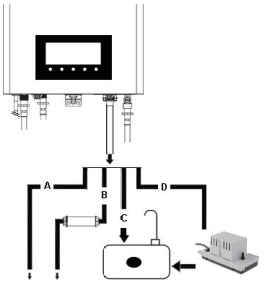
⊘ **DO NOT** cap or plug the integrated condensate line, if the condensate line is obstructed impeding its ability to drain, it could damage the water heater.

⊘ **DO NOT** allow people or animals to drink the condensate water.

- The condensate line must have a negative slope to drain properly.
- Once the condensate drainpipe has been installed, fill the condensate trap with water to ensure it flows through the drainpipe freely.

Condensate Drainage Options:

A. From the water heater directly into an external drain.
B. From the water heater, through a neutralizing agent, and then into an external drain.
C. From the water heater into a laundry tub.
D. From the water heater into a water heater condensate pump, and then into a laundry tub.



To External Drain To Laundry Tub

Figure 12.1

NOTE

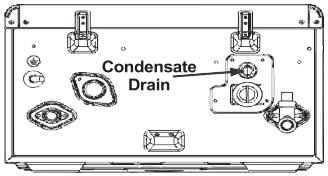
If you choose option B, the neutralizing agent must be replaced periodically. Depletion of the neutralizing agent will vary, based on the usage rate of the water heater. During the first year of operation, the neutralizer should be checked every few months for depletion and replaced as needed.

If you choose option C, the bottom of the water heater must be higher than the top of the laundry tub. The condensate line must have a negative slope to drain properly.

If you choose option D, a pump can be used when there is a long distance between the water heater and the laundry tub, or when the bottom of the water heater is lower than the top of the laundry tub

Connecting the Condensate Drain

1. Locate the condensate drain on the bottom of the water heater and remove the drain cap. (See Figure 12.2)
2. Connect a drain line to the ½ in. fitting at the bottom of the unit. NOTE: Use only corrosion-resistant material for the drain line, such as PVC or CPVC.
3. Place the free end of the drain line into an appropriate drain.
4. Fill the condensate trap inside the water heater by pouring water through the exhaust vent on top of the unit until water flows through the condensate drain. Ensure the water flows through the condensate drain line smoothly. (Figure 12.3)



⊘ **DO NOT** reduce the size of this fitting or the drain to less than ½ in.

NOTE

If you are using a condensate pump, ensure that the pump allows for up to 2 GPH of drainage for each water heater in the system.

If you are not using a condensate pump, ensure that the drain line is pitched down dward at a minimum slope of ¼ in. per foot.

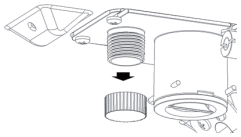


Figure 12.2

⚠ **Caution**

The condensate line must remain unobstructed, allowing for the free flow of condensate. If condensate freezes in the line, or if the line is obstructed in any other manner, condensate can exit the appliance in other areas due to an overflow of the condensate trap, resulting in potential water damage.

Condensate Neutralizer Kit

⚠ **Warning**

⊘ **DO NOT** allow exhaust flue gases to vent through the neutralizer. Leakage can cause injury or death from carbon monoxide.

⊘ **DO NOT** connect more than one appliance to the neutralizer.

- To avoid damaging the appliance, the neutralizer inlet and discharge must be lower than the condensate drain.
- The connection between the appliance and the neutralizer must be installed to prevent the back flow of condensate into the appliance.

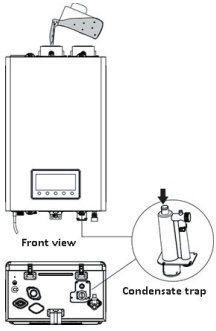


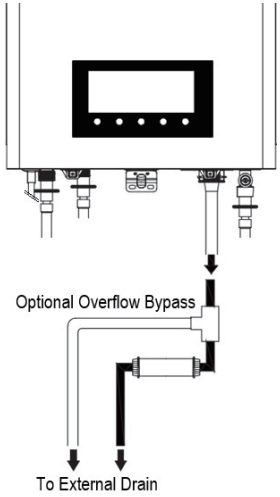
Figure 12.3

If option B from Page 24 is selected for condensate disposal (condensate flows through the neutralizer and directly into an external drain), the condensate will flow through the neutralizing media and its pH level will increase. An increased pH level will help prevent corrosion of the installation's drainage system and the public sewer system.

Neutralizer Installation Guidelines:

- The inlet of the neutralizer has a center connection point and the outlet will have an offset connection point.
- Install the neutralizer on the wall or the floor and secure it using the brackets.
- If the neutralizer is installed horizontally, rotate the neutralizer to position the outlet at the highest point. (Refer to Figure 12.4)
- If the neutralizer is mounted vertically, ensure that the outlet is higher than the inlet. (Refer to Figure 12.5)
- Ensure that the condensate runs freely to the drain.
- Ensure all connections are made to prevent the back-flow of condensate.
- Use the corrosion resistant piping and secure it to prevent movement.
- For increased safety, in the event there is a blockage in the condensate drain, install a Y fitting. Connect the Y fitting (as shown in the diagrams to the right) and ensure condensate can run freely to the drain.
- Ensure that the discharge connection is accessible, as access is required for maintenance and pH testing.
- If there is an insufficient gradient for drainage, install a drainage pump designed for water heater & boiler condensate removal.

Figure 12.4



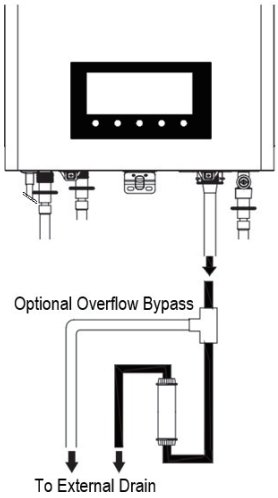


Figure 12.5

Maintenance of Neutralizer

Periodically monitor the level of media in the neutralizer and test the pH level at the condensate drain outlet. We recommend an annual pH test using recognized test strips or an electronic pH meter to obtain precise measurements.

Replace the neutralizing media when the pH drops below the minimum level required by the local water authority. If the pH level is not specified, replace the neutralizing media when the pH is below 6.0.

NOTE

⊘ **DO NOT** install condensate piping in areas where the temperature drops below the freezing point.

Protect piping in high pedestrian areas from damage and vibration.

Venting the Water Heater - Overview

Venting the Water Heater

⚠ Warning

This appliance is certified as a "Category IV" appliance and requires a special venting system. The vent system will operate with a positive pressure in the pipe. Exhaust gases must be piped directly outdoors using the vent materials and rules outlined in these instructions. Follow the venting instructions carefully. Failure to follow these instructions will result in substantial property damage, severe personal injury, or death.

A water heater shall not be connected to a chimney flue serving a separate appliance designed to burn solid fuel. Provisions for adequate combustion and ventilation air in accordance with one of the following:

A) the National Fuel Gas Code, ANSI Z223.1/NFPA 54;

B) CSA B149.1, Natural Gas and Propane Installation Code;

C) applicable provisions of the local building code.

⊘ **DO NOT** connect vent connectors serving appliances vented by natural draft into any portion of mechanical draft systems operating under positive pressure.

- Improper venting fo the water heater can result in excessive levels of carbon monoxide, which can lead to severe personal injury or death. This water heater must be vented in accordance with the "Venting of Equipment" section of the latest edition of the ANSI Z223.1/NFPA 54 Natural Fuel Gas Code in the USA, as well as all applicable local building codes and regulations. Follow all instructions and guidelines when venting the water heater. Installation of a venting system should ONLY be performed by a licensed professional.
- The venting system must be sealed airtight to prevent flue gas spillage and carbon monoxide emissions; both spillage and emissions will result in severe personal injury or death.
- The end user is responsible for keeping the air intake and exhaust termination free of snow, ice, or other potential obstructions, as well as scheduling routine maintenance. Blocked or obstructed vent piping terminations could result in property damage, severe personal injury, or death.

The water heater must be properly vented to ensure a constant supply of clean intake air and to ensure that exhaust air is properly removed from living areas. When venting the water heater, follow these guidelines:

⊘ **DO NOT** install the water heater in areas with contaminated air (high levels of sawdust, dust, sand, flour, aerosols, halogenated compounds, or any other airborne contaminants), as this could cause the unit to have operational issues. Please refer to Pages 12 and 13 for more information. Damage that is caused as a result of the unit being operated and installed in an area with contaminated air WILL NOT be covered by the warranty. If you must install the water heater in an area with contaminated air, use direct venting to supply air from outside of the building. It is recommended that more frequent intervals of maintenance and filter cleaning be performed when installed in these areas.

⊘ **DO NOT** connect the water heater vent to a vent for any other gas water heater or vent stack.

⊘ **DO NOT** obstruct heater air intake or exhaust. Support all vent piping per the vent pipe manufacturer's installation instructions.

⊘ **DO NOT** place chemical vapor emitting products near the unit.

⊘ **DO NOT** operate the heater unless it is vented to the outdoors.

- Install the water heater as close as possible to the vent termination.
- For horizontal runs, slope the horizontal section upward toward the vent termination at a rate of 1/4 in. per foot (2% slope).
- Create an airtight seal at each joint in the exhaust and intake air pipes from the water heater collar to the vent termination connecting the pipe to the vent collar by using the supplied Hose/Pipe Clamps. Please refer to Page 31 for more information.
- Analyze the entire vent system to make sure that condensate in the vent pipe will not become trapped in a section of vent pipe and reduce the open cross-sectional area of the vent. Condensate in the vent pipe shoul dbe disposed via a condensate trap.
- According to NFPA 720, carbon monoxide detectors should be installed outside each sleep area. Venting the Water Heater - Overview © 2024 Salt Lake Iron & Steel Ltd. Co.

Venting the Water Heater

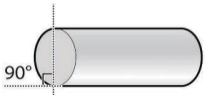
NOTE

⊘ **DO NOT** use primer or cement on the appliance connection.

- The products covered in this manual are designed for two (2) in. vent pipes. Both vent pipes can be installed without an external adapter. When installing the vent pipe, please refer to the following pages for selection & installation of the correct vent piping for your application.
- Three (3 in.) vent pipe may be used, however the supplied Flue Gas Flow Limiting ring must be used in the exhaust pipe to help increasing the resistance for the outlet.
- Covering non-metallic vent pipe and fittings with the thermal insulation is prohibited.

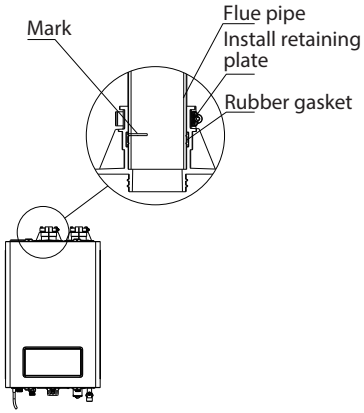
⚠ Warning

Ensure the ends of the vent pipe are properly beveled to 90° prior to installation. Also ensure the pipe is fully connected to the exhaust gas vent fitting. Failure to properly bevel and install the pipe correctly could lead to gasket failure and flue gas leakage, which could result in serious injury or death.



Vent Pipe Installation

1. Measure 1 1/2 in. from the end of the vent pipe and then draw a mark at that distance.
2. Insert the pipe into the vent collar to start the vent run. Make sure to completely slide the vent into the collar until the end makes contact with the bottom of the socket.
3. Verify that over 1-1/2 in. of the pipe has been completely inserted into the collar and that the mark is no longer visible. The pipe will be tightened and sealed by the rubber gasket.
4. Fasten the install retaining plate to fix the flue pipe.



⚠ Caution

⊘ **DO NOT** start the vent run with a street elbow at the vent collar.

- Using an elbow directly at the collar will not allow for a tight seal between the appliance and the vent pipe. A section of straight pipe must be used when starting the vent run.

⚠ Warning

- If the connections leak, harmful gas could cause severe personal injury or death.
- After completing the installation, and the unit is filled with water, turn on the water heater and test it for leaks using a bubble test kit. After applying the soap solution, bubbles will form on the connections if leaks exist.

Selecting a Vent Type

The water heater referenced in this manual is classified as Category IV appliances and are prepared at the factory to be direct vent (sealed combustion) appliances that draw all of the required combustion air directly from the outdoors. Direct air vent installations are recommended whenever possible to avoid the back-drafting of cold air through the water heater. If you cannot use a direct vent, ensure that there is an ample supply of usable air available in the installation location.

Installation of a new vent system with this appliance is also recommended. In the event an existing vent system is reused, ensure it is thoroughly inspected for punctures, cracks, or blockages before it is connected to the water heater.

Vent Termination Guidelines:

⊘ **DO NOT** store hazardous material or flammable substances near the vent termination.

- To avoid moisture and forost build-up and to maintain clearances on adjacent homes, 45° & 90° elbows and tees may be attached to the end of the termination vent pipe to direct the exhaust plumes away from buildings. However, the total allowable vent lengths, maximum number of elbows, and distances to air intake restrictions must be observed.
- If this water heater will be installed in areas where snow is known to accumulate, protect the vent termination from blockage.
- Ensure that the vent termination is at least 12 in. above the highest anticipated snow line, or as required by local codes, whichever is greater.
- Support the vent pipe with hangers at regular intervals, or as required by local codes.
- Exhaust and intake air pipes must be suppored at least every four (4) feet.
- The vent for this appliance shall not terminate over public walkways, near soffit vents or crawl space vents, where condensate or vapor could create a nuisance, hazard, or cause property damage, nor where condensate or vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.

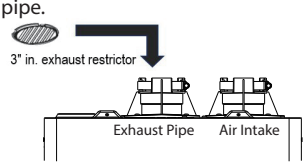
Direct Venting

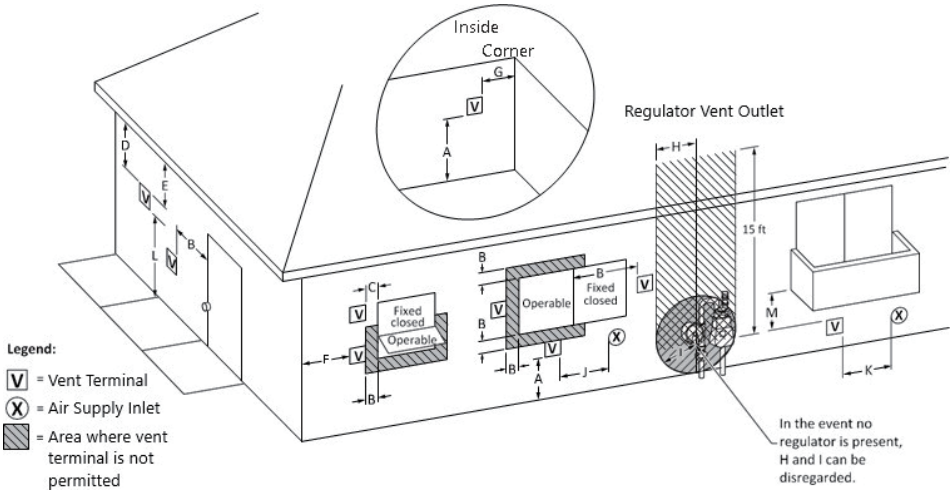
The water heater uses two (2) in. diameter exhaust and two (2) in. diameter intake air ducts. To ensure the draw of air directly from and exhaust of air directly to the outside of the building, create an airtight seal from the water heater collar to the vent termination. Do not install the restrictor in the exhaust pipe for two (2) inch vent pipes.

NOTE

Three (3) inch vent pipe option:

If installation of three (3) inch diameter pipes for venting is desired, install the supplied exhaust pipe restrictor according to the placement shown below. The restrictor should be placed fully inside the exhaust pipe, level, until resting firmly in the pipe.





	Description	US Direct Vent
A	Clearance above grade, veranda, porch, deck, or balcony.	12 in.
B	Clearance to window or door that may be opened.	12 in.
C	Clearance to permanently closed window.	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 ft (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.	*
I	Clearance to service regulator vent outlet.	*
J	Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance.	12 in.
K	Clearance to a mechanical air supply inlet.	36 in. above if within 10 ft
L	Clearance above paved sidewalk or paved driveway located on public property.	*
M	Clearance under veranda, porch, deck, or balcony.	*

- In accordance with the current with the current CSA B149.1 Natural Gas & Propane Installation Code.
- In accordance with the current ANSI Z223.1/NFPA 54 National Fuel Gas Code.

* Clearance in accordance with local installation codes and the requirements of the gas supplier and the vent manufacturer's instructions.

Selecting Vent Pipe Materials

Consult the following chart, or the most recent edition of ANSI Z223.1/NFPA 54, as well as all applicable local codes and regulations when selecting vent pipe materials.

⊘ **DO NOT** use cellular core PVC (ASTM F891), cellular core CPVC, or Radel (polyphenol sulfone) for the exhaust vent.

⚠ Warning

⊘ **DO NOT** mix components from different systems. The vent system could fail and harmful elements from the flue could leak into the living space. In the event this occurs, it could cause serious personal injury or death.

- Mixing of vent materials WILL VOID THE WARRANTY and certification of the appliance.

Intake materials can be made of ABS, PVC, CPVC, PP, galvanized steel, corrugated aluminum or any other such materials. If you use a corrugated material, ensure that there is not crimping or damage to the intake airpipe.

When using direct venting, maintain the following venting clearances, as required by ANSI Z21.10.3 and the National Fuel Gas Code, ANSI Z223.1/NFPA 54:

Failure to provide a properly installed vent and air system will cause personal injury or death!

Location	Recommended Vent Materials
USA	• PVC/CPVC Schedule 40 or 80 (Solid Core) • Approved Polypropylene (PP)

NOTE

These installation instructions reference snow levels in establishing a minimum height for the installation of the exhaust vent or air intake terminations. Snow levels are determined as follows:

A. The installation location, by ordinance, designate the calculation of the snow levels in that location.

B. In the absence of specific ordinances, snow levels should be calculated from the average of monthly maximum depth of snow accumulation as indicated by the 10-year statistics for the installation/geographical area by the National Weather Service.

The supplied vent connectors and vent termination methods outlined on Pages 32 through 35 are certified as part of the water heater.

Measuring Vent Length

The maximum vent length when using two (2) in. exhaust ducts is 60 feet and 150ft for the three (3) in. The intake duct length may be identical to the exhaust duct length. One (1) foot straight pipe and a 90° elbow are not included in the vent length. The maximum vent length is reduced by the number of elbows used, as shown in the table below:

Vent Size	Max. Length	Equivalent Lengths
2 in	60 ft	Reduce the maximum vent length accordingly for each elbow used: • Each 90° elbow equates to five (5) linear feet of vent length. • Each 45° elbow equates to two and a half (2.5) linear feet of vent length. • The number of 90° elbows cannot exceed seven (7). • The number of 45° elbows cannot exceed fourteen (14).
3 in	150 ft	

NOTE: The use of a PVC or polypropylene concentric termination counts as 5 linear feet of vent.

NOTE

When the exhaust pipe is too long, the gas load will be reduced due to the influence of air resistance

⊘ **DO NOT** exceed the maximum length of the vent. Excessive length may result in heater shutdown and property loss.

⊘ **DO NOT** make the exhaust pipe shorter than the minimum length allowed. If the length of the pipe is too short, the exhaust gas generated by gas combustion could enter into the air inlet of the machine, which could lead to incomplete combustion, and result in heater failure, property loss, personal injury, or death.

Terminating the Vent

Before installing the water heater, determine what type of vent termination is appropriate for the installation location and materials. The following sections describe some typical venting configurations, but do not include all possible options. The examples shown on the following pages are possible venting options.

The following "low profile" PVC terminal listed in the table below has been approved to be adequate for the unit mentioned in this manual.

Brand	Part #	Type	Note
DiversiTech	HVENT-2	Low profile	2 in.
DiversiTech	HVENT-3	Low profile	3 in.

NOTE

- Only the "low profile" termination model listed in this manual is certified for use with this appliance, IPEX and Centrotherm branded "Low Profile" terminations may be used, however they must be the same dimensions as the SKU listed above. This product is not recommended for use with Centrotherm concentric terminations.
- Only terminations produced by the same manufacturer as the vent system shall be used.
- Refer to the vent manufacturer's instructions for detailed installation procedures and guidelines.

Two-Pipe Sidewall Venting

⚠ Warning

The vent system must be installed by an authorized technician or licensed professional. Improper installation may cause appliance failure, property damage, severe personal injury, or death.

Improper installation will also void the warranty of the water heater.

If the distance between the air inlet and exhaust vent terminations is less than seven (7) in., the water heater will draw in exhaust gases through the intake. This creates a risk of inadequate combustion air for the water heater, which can increase the amount of Carbon Monoxide (CO) emissions and noise due to vibration.

Termination elbows must be oriented vertically, ensuring they point directly downward. Attempt to prevent exhaust air from entering the air inlet by angling termination elbows in directions other than directly downward will increase the risk of freezing.

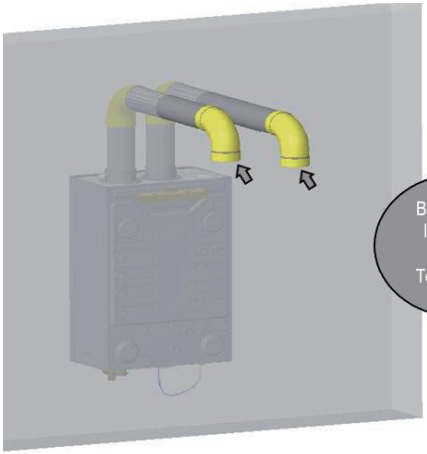
Reversing the air intake and exhaust pipes is not allowed. Carbon Monoxide (CO) emissions and noise due to vibration will increase.

In case of earthquake, tornado, or other natural disasters, have a trained professional check the vent pipe for any damage, that the exhaust flows normally, and the unit functions properly after such extreme event.

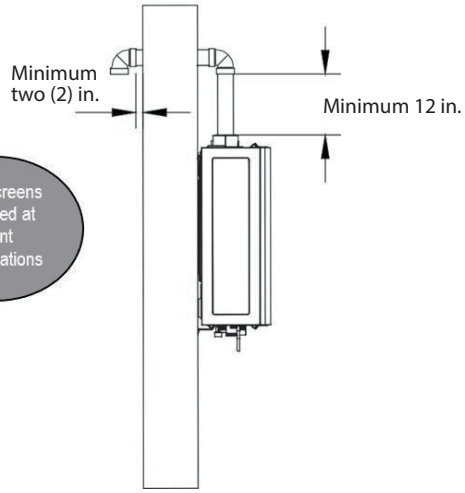
NOTE

- Install the bird screen at the end of the terminal elbow when a two-pipe sidewall venting method is applied.
- If glue and other solvent cement are used during the installation, please follow the manufacturer's instructions when using.
- Please refer to the illustrations on the following page for the dimension requirements when using this method of venting.

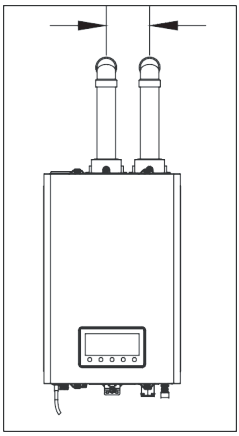
Two-Pipe Sidewall Venting
Example 1:

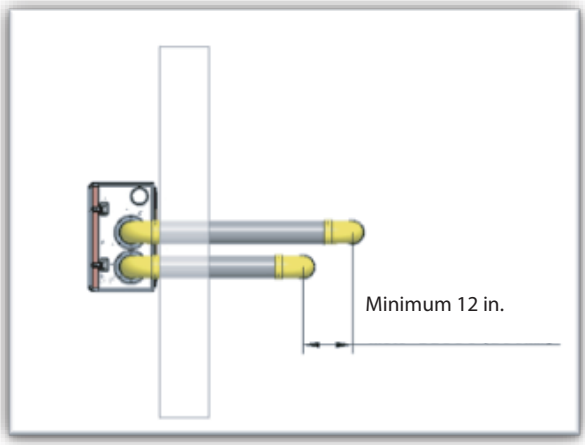


Bird Screens Installed at Vent Terminations

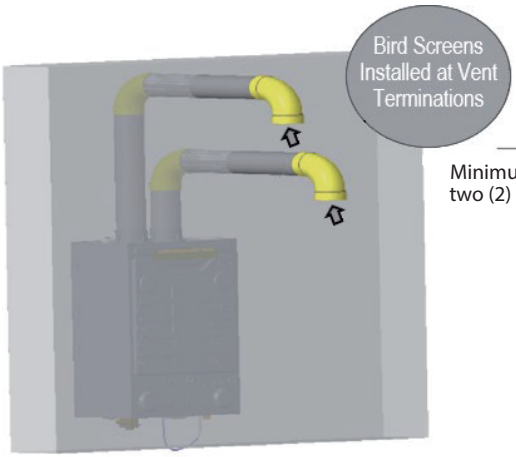


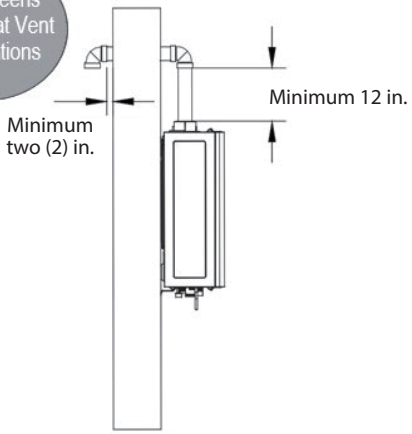
5 ½ in.

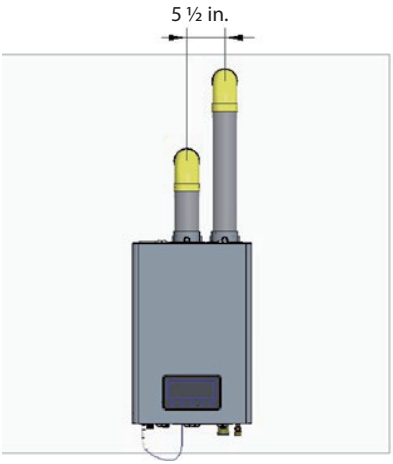


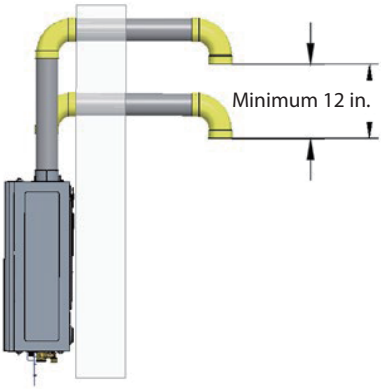


Two-Pipe Sidewall Venting
Example 2:

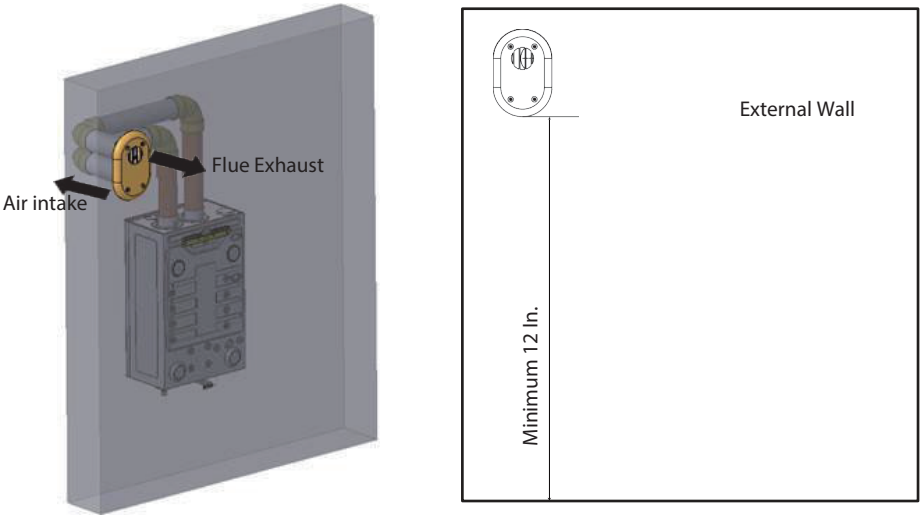








Low Profile Two-Pipe Sidewall Venting:



Clearance above the highest anticipated snow level or grade, or as required by local codes, whichever is greater.

NOTE

Only the following orientations are allowed for twin pipe low profile terminations.

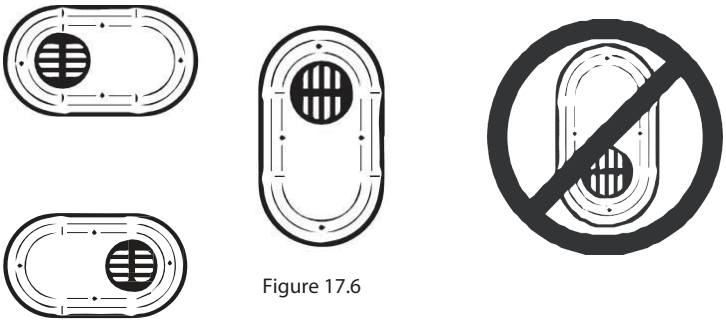


Figure 17.6

Connecting the Power Supply

⚠ Warning

The products referred to in this manual utilize an external electrical source. When installed, the unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code ANSI/NFPA 70. and/or the CSA C22.1, Canadian Electrical Code, Part 1.

Improperly connecting the power supply could result in personal injury, electrical shock, and/or death! Extension sockets are forbidden.

When connecting the power supply, follow these guidelines:

⊘ **DO NOT** connect the electrical supply until all plumbing and gas piping is complete and the water heater has been filled with water.

⊘ **DO NOT** connect the water heater to a 220 - 240V AC power supply. Doing this will damage the water heater and void the warranty.

⊘ **DO NOT** run a dedicated electrical line to the water heater. All water heaters come with a 3-pronged (grounded) plug. The water heater can be plugged into any grounded electrical outlet nearby to the installation location, as the unit only requires 2-4 Amps to operate.

⊘ **DO NOT** use a broken or modified power cord.

⊘ **DO NOT** bind, bend, or stretch power cords.

- Keep power cord free of dust.
- If local codes require the water heater to be wired directly, remove and discard the factory-installed plug. Install a power switch between the breaker and the water heater to facilitate any end-user maintenance and servicing. Connect the water heater to a 110-120V AC, 60 Hz rated electrical supply that has a maximum of 2 Amps.
- The water heater must be electrically grounded. If using the power plug, ensure the electrical outlet that the water heater will be connected to is properly grounded. If wiring the water heater directly to a water supply, DO NOT attach the ground wire to the gas or water piping, as plastic piping or dielectric unions could prevent proper grounding.
- It is recommended to use a surge protector to protect the water heater from power surges.
- If there is a power failure in cold weather areas, the anti-freeze system in the water heater will not operate and could result in freezing of the heat exchanger. In cold weather areas, where power failures are common, the water heater must be completely drained to prevent damage if the power will be off for an extended period of time. A battery back-up can be used to supply hot water during power outages. Damage caused by freezing temperatures due to a power loss is NOT covered by the warranty.

If the water heater will not be used for an extended period of time, follow these steps:

1. Disconnect the power supply to the water heater.
2. Completely drain the water out of the water heater.

⚠ Caution

Label all wires before disconnecting them when you work on the controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

Installation Checklist

No.	Items	Check box
Water Heater Installation		
1.	Have you maintained the required clearances from building openings and intake air vents?	
2.	Have you minimized the distance between the water heater and the vent termination?	
3.	Have you minimized the distance between the water heater and major fixtures?	
4.	Have you maintained the proper service and maintenance clearances?	
5.	Is the water heater and vent piping clear of combustible materials, including clothing, cleaning materials, and rags?	
Gas Supply Connection		
6.	Does the gas supply match what is specified on the water heater rating plate?	
7.	Is the gas line at least ½ or ¾ in. inner diameter?	
8.	Is the gas supply line sufficient in length and diameter to deliver the required BTUs?	
9.	Have you measured the pressure of the gas supply line?	
10.	Is the gas supply pressure within the recommended ranges specified in this manual?	
11.	Is the gas supply line equipped with a manual full port valve?	
12.	Have you tested the gas line pressure and all fittings for leaks?	
13.	Has the gas company inspected the installation, if required?	
Water Supply Connection		
14.	Is the water supply pressure sufficient (greater than 20 PSI)?	
15.	Have you installed shut off valves on the inlet and outlet to facilitate cleaning of the inlet water filter?	
16.	Have you bled the air out at each fixture?	
17.	Have you checked each fixture to ensure hot water is being supplied?	
18.	Have you cleaned the inlet water filter?	
Pressure Relief Valve Connection		
19.	Have you installed an approved pressure relief valve on the water heater?	
20.	Does the rating of the pressure relief valve match or exceed the maximum BTU rating of the water heater?	
21.	Is the pressure relief valve at least ¾ in. inner diameter?	
22.	Have you installed the pressure relief valve on the hot water outlet pipe near the water heater?	
23.	Have you installed a discharge drain tube from the pressure relief valve to within 6-12 in. of the floor?	
Condensate Drain Connection		
24.	Have you installed a condensate drain line from the water heater to a drain or laundry tub?	

Venting the Water Heater (Checklist continued)		
25.	Have you vented the water heater with 2 in. or 3 in. PVC, CPVC, Polypropylene, Type BH Special Gas Vent (ULC -S636) for this water heater, or in accordance with all local codes and the guidelines in this manual?	
26.	Have you ensured that PVC solid core pipe has not been used as venting for the water heater?	
27.	Is the vent sloped upward toward the vent termination at a rate of ¼ inch per foot (2% grade)?	
28.	Are all vent runs properly supported?	
29.	Have you properly supported the vent termination?	
30.	Have you properly sealed all air intake and exhaust joints, from the flue collar to the to the vent termination?	
31.	Have you installed bird screens on the exhaust and intake terminations?	
32.	Have you checked the venting for leaks?	
33.	Is the vent termination at least 12 in. above the exterior grade?	
34.	Is the total vent length within the maximum vent length restriction?	
Power Supply		
35.	Is the supplied voltage 110 -120 VAC?	
36.	Is the water heater plugged into a properly grounded outlet?	
37.	Have you checked the polarity of the electrical connection?	
Water Heater in Operation		
38.	Have you shown the owner how to clean the inlet water filter?	
39.	Have you given the Manuals to the owner for future reference?	
40.	Have you shown the owner how to shut off the gas in case of an emergency?	

OPERATION INSTRUCTIONS

⚠ Warning

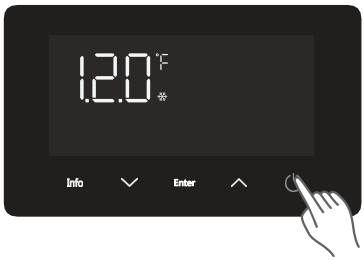
Follow the instructions below to avoid unsafe operating conditions that could cause property damage, severe personal injury, or even death.

- Ensure the water heater is filled with water before using the water heater. if the water heater's internal gas valve cannot shut off the gas supply, use the manual gas shut-off valve and call a qualified technician.
- If any part of the water heater has been submerged in water, do not use this appliance, immediately cut off the power supply, and call a qualified technician.

Turning the Water Heater On or Off

Power On/off

Press the POWER button to turn on/off. When the unit is turnedON, the temperature setting will show on the display and the buzzer will sound once.



Temperature setting

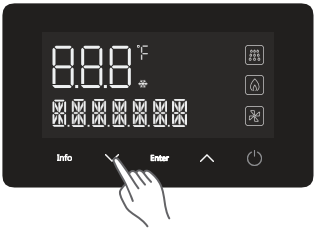
⚠ Warning

Before adjusting the temperature, pay attention to whether the water heater is properly functioning.

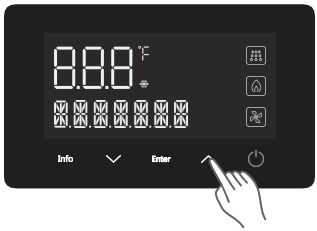
Water temperatures above 118°F can cause skin to scald instantly leading to severe burns or death.

The default temperature setting is 120°F (48.9°C). To adjust the temperature while the power is on, press the ^ or v buttons. Pressing the button will change the temperature by 1 degree and the buzzer will sound with each press. Holding the button will down will rapidly adjust the temperature setting.

Decrease Temperature Setting



Increase Temperature Setting



Range of Temperature Setting	Accuracy
95°F ~ 140°F	1°F

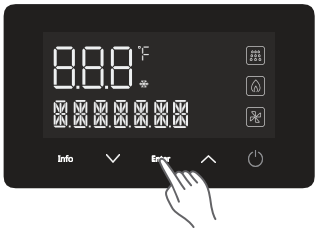
NOTE

- The set temperature may be changed from 95 to 140°F while the burner is off but the appliance is"ON".
  If the current set temperature is below 120°F and the burner is on, then the temperature setting is locked from 95 to 120°F to help prevent scalding from temperature adjustment.
  If the set temperature is above 120°F, the set temperature can be changed from 95 to 140°F.
- However, if set temperature is adjusted to a value that is lower than 120°F, the range becomes locked between 95-120°F to help prevent accidental scalding.

Set the default temperature

Set the default temperature while the power is "ON", press the ENTER button for 3 seconds until the default temperature on the display flashes, then press the ^ or ˇ keys to set the default temperature.

Restore to the default temperature while the burner is off, press the ENTER button



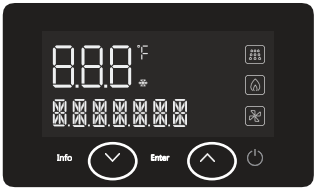
NOTE

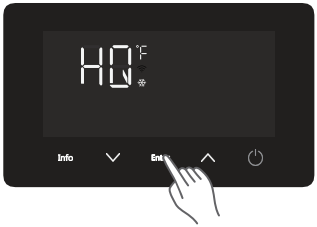
If you try to change the set temperature above 118°F while burner is on and the previous set temperature was below 118°F, the system will not allow this and the buzzer will sound twice.

Pump Setting (Pump model only)

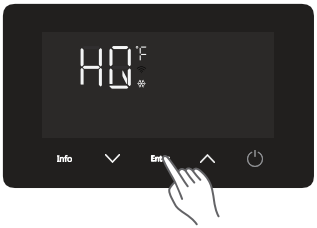
Step 1: Press and hold the ENTER and INFO buttons together for 3 seconds to enter the after-sales information interface.

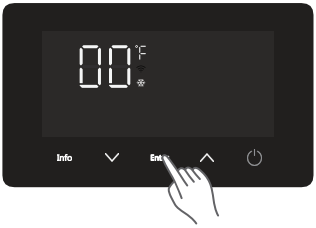
Press the ˇ and ^ buttons until HQ is displayed on the screen.





Step 2: Press the Enter button, and then press the ⌄ and ⌃ buttons to adjust the HQ value according to the table below.

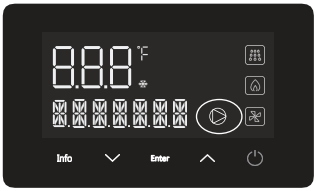




Program Data	Pump Setting			
PUMP	Standby	Boost Mode	Circulation 1 Manual	Circulation 2 Always On
HQ	00	01	02	03

Pressurize Mode

When the water flow rate exceeds 0.3GPM and lasts for more than 5 seconds, the pump icon on the panel lights up, and the pump starts to increase water pressure.



Circulation Mode

When the pump is running, the pump icon on the panel lights up, and there are two states of the circulation mode during operation, as follows:

Circulation 1 (Manual): Turn on and off the water trap twice within 5 seconds at the water point, and start a single cycle.

Circulation 2 (Always On): When the outlet water temperature is below a certain value of the circulation target temperature, the circulation will be automatically started.

⚠ Caution

The air in the return pipe may cause noise and heat loss. Drain up all the air in the water pipe before use.

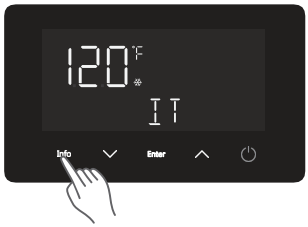
Information

1. Press the info button to enter the information query interface while the power is on. IT displays as default.
2. Press the ⌄ or ⌃ buttons to select the information item.
3. Press ENTER to show details.
4. Press ENTER again to return to the display Info screen

Menu Item	Description	Units
IT	Inlet Water Temperature	°Fahrenheit
WF	Water Flow Rate	Gallons Per Minute

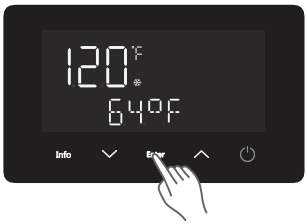
Step 1:

Display shows after pressing INFO key.



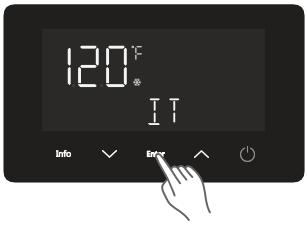
Step 2:

Press ENTER to see the actual IT.



Step 3:

Press ENTER again to return to the display Info screen.

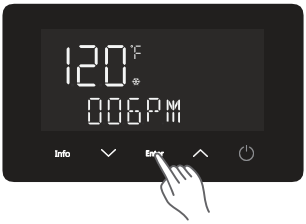


Step 4:

Press the ⌃ key to select WF .

Step 5:

Press ENTER again to view the actual WF.



⚠ CAUTION

*This operation MUST ONLY be performed by licensed professionals or with the specific guidance of an authorized Stream33 representative.

Adjusting Parameters for High-Altitude Performance

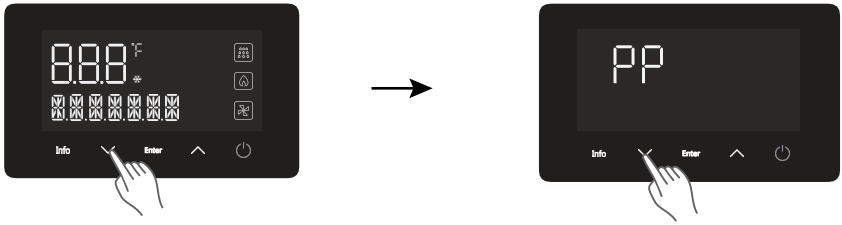
To change program data:

Step 1: Connect the unit to a power supply.

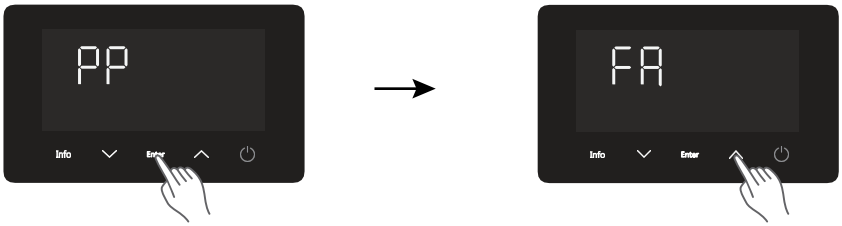
Step 2: Turn "OFF" the water heater by pressing the POWER button.

Step 3: Disconnect the unit from the power supply.

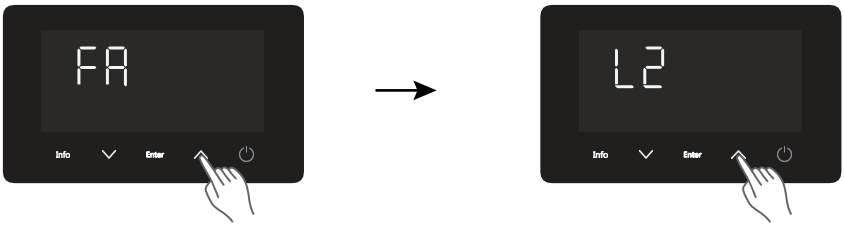
Step 4: Reconnect the power supply, however, do not turn "ON" the unit. Instead press and hold the ⌄ button for at least 5 seconds until PP is displayed on the screen.



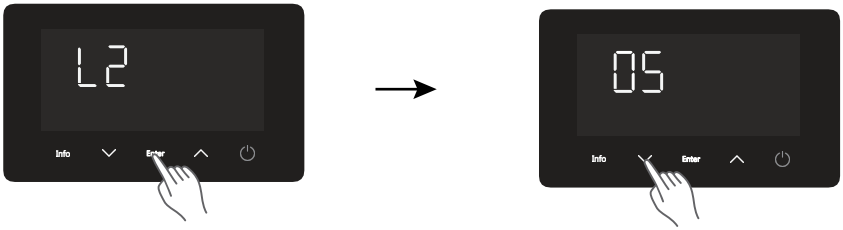
Step 5: Press the ENTER button and FA will display on the screen.



Step 6: Use the ⌃ button to scroll through the parameter codes until L2 is displayed on the screen.

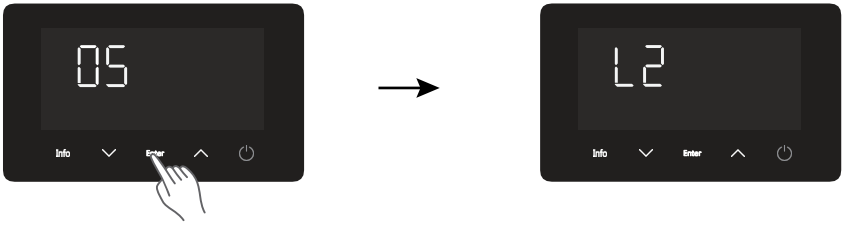


Step 7: Press the ENTER button, and then press the ⌄&⌃buttons to adjust the L2 value according to the table below and the appliance's operating elevation.

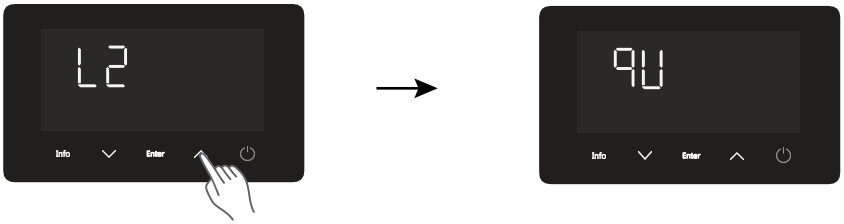


Program Data	Altitude Setting	
Altitude	2000 ft - 6500 ft	6500 ft - 9800 ft
L2	05	06

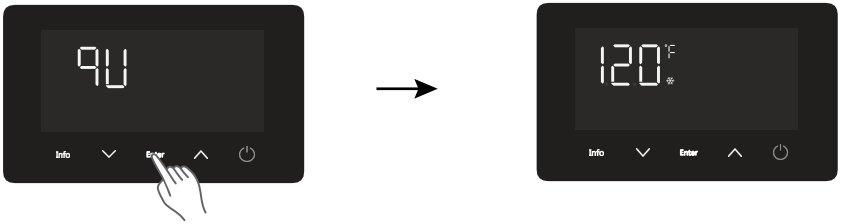
Step 8: Press the ENTER button again to exit the parameter code adjustment mode.



Step 9: Use the button until " qU" is displayed on the screen.



Step 10: Press the ENTER button to save the L2 code and exit the adjustment mode. Several beeps will sound.



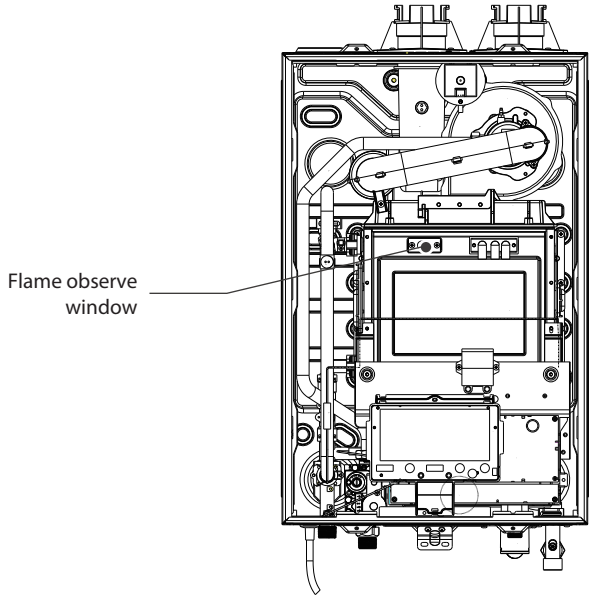
CLEANING AND MAINTENANCE

Cleaning

- Check frequently to see if the gas supply pipelines are in good condition without cracks.
- Pay attention to any rubber hoses or gaskets. In order to prevent gas leakage, check the joints of pipelines frequently by using suds to see if there are bubbles that form. If bubbles form, there is a leak.
- A water heater must be examined and cleaned after it has been used for a period of time (generally about six months to a year) to guarantee normal operation of the heater.
- Clean the external casing of the unit with water and light soap. Use of harsh chemical cleaners or volatile solvents will cause the paint to fade or lose its luster.
- Clean the inlet water filter regularly.

Burner

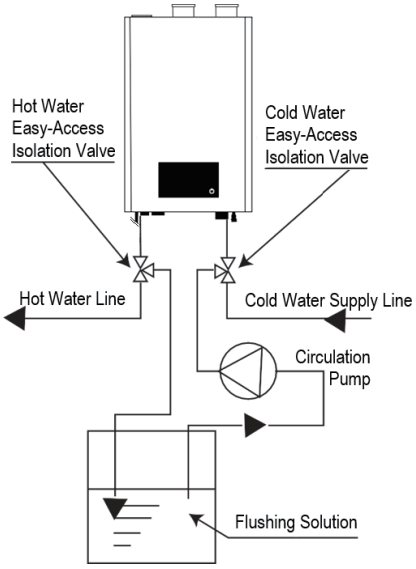
- Remove the screw of the front cover and check burner flame for proper color from the flame observe window. Once ignited, the flame must cover the surface of the burner. The flame must burn with a clear, blue or orange stable flame. If the flame does not have this appearance, call the licensed professionals or authorized Stream33 representative for help.



Flush the Heat Exchanger

Due to the hardness of the water in your area, scale may build up inside the heat exchanger and block efficient water flow. Periodic flushing is mandatory in order to ensure smooth water flow. It is recommended the heat exchanger be flushed on the schedule on the bottom of Page 11 based on your water hardness. Damage to the water heater which results from water scale deposit WILL NOT be covered under the product warranty.
Please follow these steps when the appliance is flushed to descale the heat exchanger. It is recommended that you contact a licensed professional to carry out this procedure.

1. Ensure the isolation valves are fully closed before beginning this procedure.
2. Connect the empty connection of the isolation valve on the cold water side to the outlet of the circulation pump.
3. Connect the empty connection of the isolation valve on the hot water valve to a tube leading to the solution tank.
4. Connect the inlet of the circulation pump to a tube that leads to the solution tank.
5. Make sure there is no leakage in any of the connectors.
6. Fill the solution tank with descaling solution above the tube connected to the circulation pump. If using commercial descaling kit, please properly follow the instructions of the descaling kit.
7. Run the circulation pump until solution begins exiting the tubing connected to the hot water isolation valve. Ensure this tubing returns fluid to the flushing solution container.
8. Continue running the circulation pump until the solution that comes out from the hot water side is clean.
9. Fully drain solution from unit. Disconnect all tubes for flushing and fully close the empty connectors of the isolation valves.
10. Open the isolation valves to switch back to normal water flow.
11. Restore the power supply, gas supply, and water supply.
12. Run the water heater for at least five (5) minutes to make sure there is no solution remaining in the unit.



Clean the Inlet Water Filter (No pump model only)

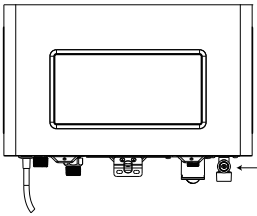
⚠ CAUTION

Before performing any maintenance, please follow these steps:

- Disconnect the power supply, disconnect power to the outlet that services this unit, and close the manual gas shut-off valve.
- After the power is turned OFF, drain the hot water from a nearby faucet until it runs cold. Then close the water supply isolation valves (cold and hot) of the water heater.

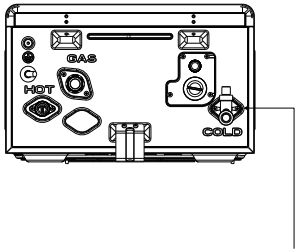
1. Drain the water heater.
2. Locate the cold water inlet to the water heater.
3. Unscrew the brass end facing towards you on the cold water inlet assembly by turning it counterclockwise until it becomes loose. Remove the brass end and filter from the water inlet assembly.
4. Rinse the filter screen with clean water, brush with an unused toothbrush, or wipe it when necessary. Do not tap the screen on a hard surface or with your hand. Tapping the screen might deform the filter, affecting filtering ability.
5. Insert the cleaned filter and tighten it by turning clockwise until it is securely back in the cold water inlet assembly.

Front View



Water Filter location

Bottom View



Water Filter location

Picture of brass end and clean water filter removed from water heater (Enlarged).

Water Filter Screen

Brass End

S33-95TWH199-NG

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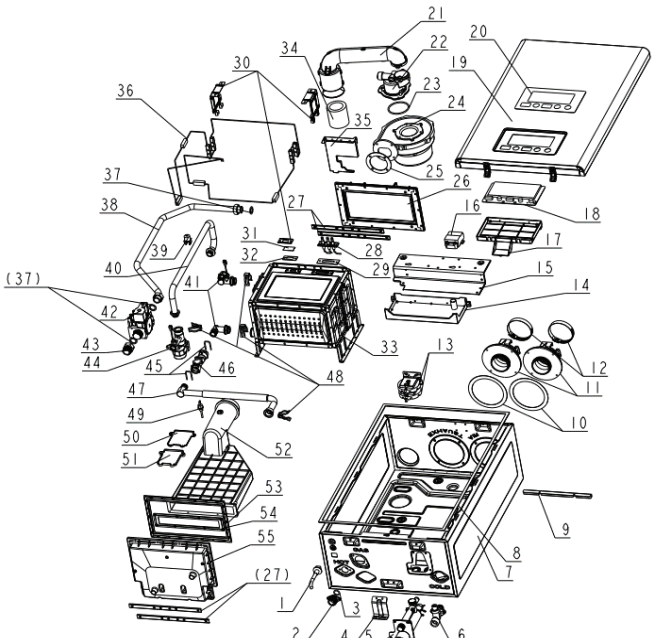

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Part #	Replacement Part	Part Name	Qty
1	17451100000003	Power cord	1
2	12951100003186	Outlet connection	1
3	12651100000701	Seal ring	1
4	12951100004507	Install retaining plate	1
5	12151100006548	Component for condensation box	1
6	12951100003185	Component of inlet valve body	1
7	12251100A09385	Bottom plate assembly	1
8	12651100001183	Seal	2
9	12251100A09405	Hook	1
10	12451100000201	Gasket	2
11	12151100007828	Decorative ring (smoke pipe holder)	2
12	12951100008744	Install retaining plate (collar)	2
13	17451100008508 17451100A01701	Air pressure sensor	1
14	17251100003146	Power panel	1
15	12251100007553	Controller support	1
16	17227600000601	Pulse igniter	1
17	12151100A02028	Control box	1
18	17251100004508	Display panel	1
19	12251100A09386	Front shell	1
20	16051100A13015	Export paster	1
21	12151100003755	Muffler	1
22	12951100004511	Mixer	1
23	12151100007231	Seal ring	1
24	17451100004926	Fan	1
25	12151100003752	Sealing washer	1
26	12951100007624	Burner body	1
27	12951100004510	Install retaining plate	4
28	12951100004506	Spark electrode	1

Part #	Replacement Part	Part Name	Qty
29	12151100003753	Sealing washer	1
30	12951100008824	Accessories of heating exchanger	1
31	12151100006134	Mica sheet	1
32	12151100004728	Sealing washer	1
33	12951100004064	Heating exchanger	1
34	12451100000221	Gasket	1
35	12951100004509	Install retaining plate	1
36	17451100005531	Electric heating antifreezing unit	1
37	12127600000147	Flat gasket	3
38	15551100000864	Componenet of air inlet pipe	1
39	17451100000066	Antifreeze thermostat	1
40	15551100000863	Component of connecting pipe	1
41	12951100005724	Connector of water inlet	1
42	17451100004928	Gas ratio valve	1
43	12951100005725	Air inlet adapter	1
44	17451100005530	Water ratio valve	1
45	12951100007484	Bolt	2
46	17451100003661	Water flow sensor	1
47	15551100000862	Component of water inlet	1
48	12251100010022	Circlip	5
49	15551100000862	Component of water inlet	1
50	17451100005468	Flue temperature sensor	1
51	12951100004764	Cover plate	1
52	12651100001022	Gasket	1
53	12651100000982	Gasket	1
54	12651100001021	Gasket	1
55	12151100004070	Lower casing	1

S33-95TWH199P-LP

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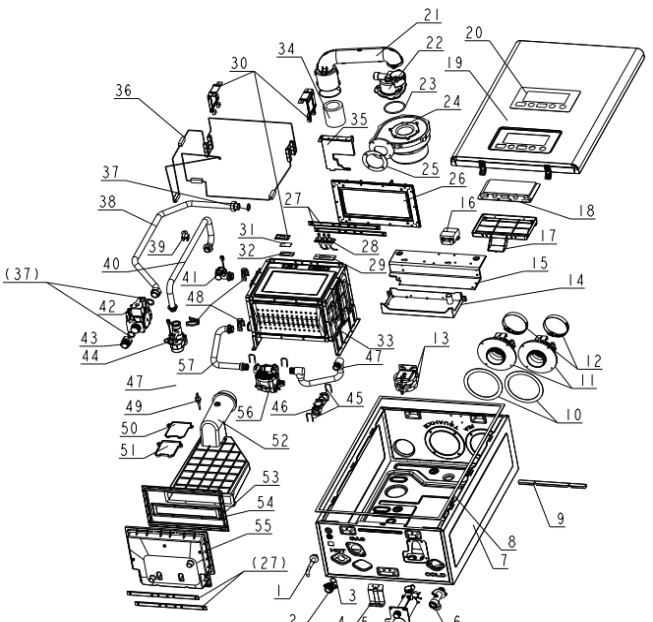

S33-95TWH199P-LP

.3598642

Part #	Replacement Part	Part Name	Qty
1	17451100000003	Power cord	1
2	12951100003186	Outlet connection	1
3	12651100000701	Seal ring	1
4	12951100004507	Install retaining plate	1
5	12151100006548	Component for condensation box	1
6	12951100008247	Component of inlet valve body	1
7	12251100A09385	Bottom plate assembly	1
8	12651100001183	Seal	2
9	12251100A09405	Hook	1
10	12451100000201	Gasket	2
11	12151100007828	Decorative ring (smoke pipe holder)	2
12	12951100008744	Install retaining plate (collar)	2
13	17451100008508 17451100A01701	Air pressure sensor	1
14	17251100009852	Power panel	1
15	12251100007553	Controller support	1
16	17227600000601	Pulse igniter	1
17	12151100A02028	Control box	1
18	17251100010132	Display panel	1
19	12251100A09386	Front shell	1
20	16051100A13015	Export paster	1
21	12151100003755	Muffler	1
22	12951100004520	Mixer	1
23	12151100007231	Seal ring	1
24	17451100004926	Fan	1
25	12151100003752	Sealing washer	1
26	12951100007624	Burner body	1
27	12951100004510	Install retaining plate	4
28	12951100004506	Spark electrode	1

Part #	Replacement Part	Part Name	Qty
29	12151100003753	Sealing washer	1
30	12951100008824	Accessories of heating exchanger	1
31	12151100006134	Mica sheet	1
32	12151100004728	Sealing washer	1
33	12951100004064	Heating exchanger	1
34	12451100000221	Gasket	1
35	12951100004509	Install retaining plate	1
36	17451100005531	Electric heating antifreezing unit	1
37	12127600000147	Flat gasket	3
38	15551100000864	Componenet of air inlet pipe	1
39	17451100000066	Antifreeze thermostat	1
40	15551100000863	Component of connecting pipe	1
41	12951100005724	Connector of water inlet	1
42	17451100004928	Gas ratio valve	1
43	12951100005725	Air inlet adapter	1
44	17451100005530	Water ratio valve	1
45	12951100007484	Bolt	4
46	17451100003661	Water flow sensor	1
47	15551100001886	Component of connecting pipe	1
48	12251100010022	Circlip	4
49	15551100000862	Component of water inlet	1
50	17451100005468	Flue temperature sensor	1
51	12951100004764	Cover plate	1
52	12651100001022	Gasket	1
53	12651100000982	Gasket	1
54	12651100001021	Gasket	1
55	12151100004070	Lower casing	1
56	12951100007244	Pump	1
57	15551100001885	Component of connecting pipe	1

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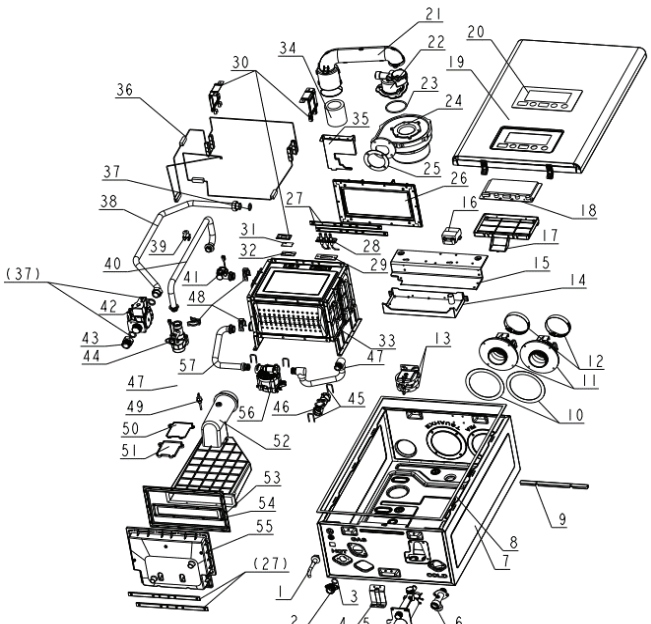

S33-95TWH199P-NG

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Part #	Replacement Part	Part Name	Qty
1	17451100000003	Power cord	1
2	1295110003186	Outlet connection	1
3	12651100000701	Seal ring	1
4	12951100004507	Install retaining plate	1
5	12151100006548	Component for condensation box	1
6	1295110008247	Component of inlet valve body	1
7	12251100A09385	Bottom plate assembly	1
8	12651100001183	Seal	2
9	12251100A09405	Hook	1
10	12451100000201	Gasket	2
11	12151100007828	Decorative ring (smoke pipe holder)	2
12	12951100008744	Install retaining plate (collar)	2
13	17451100008508 17451100A01701	Air pressure sensor	1
14	17251100009852	Power panel	1
15	12251100007553	Controller support	1
16	17227600000601	Pulse igniter	1
17	12151100A02028	Control box	1
18	17251100010132	Display panel	1
19	12251100A09386	Front shell	1
20	16051100A13015	Export paster	1
21	12151100003755	Muffler	1
22	12951100004511	Mixer	1
23	12151100007231	Seal ring	1
24	17451100004926	Fan	1
25	12151100003752	Sealing washer	1
26	12951100007624	Burner body	1
27	12951100004510	Install retaining plate	4
28	12951100004506	Spark electrode	1

Part #	Replacement Part	Part Name	Qty
29	12151100003753	Sealing washer	1
30	12951100008824	Accessories of heating exchanger	1
31	12151100006134	Mica sheet	1
32	12151100004728	Sealing washer	1
33	12951100004064	Heating exchanger	1
34	12451100000221	Gasket	1
35	12951100004509	Install retaining plate	1
36	17451100005531	Electric heating antifreezing unit	1
37	12127600000147	Flat gasket	3
38	15551100000864	Componenet of air inlet pipe	1
39	17451100000066	Antifreeze thermostat	1
40	15551100000863	Component of connecting pipe	1
41	12951100005724	Connector of water inlet	1
42	17451100004928	Gas ratio valve	1
43	12951100005725	Air inlet adapter	1
44	17451100005530	Water ratio valve	1
45	12951100007484	Bolt	4
46	17451100003661	Water flow sensor	1
47	15551100001886	Component of connecting pipe	1
48	12251100010022	Circlip	4
49	15551100000862	Component of water inlet	1
50	17451100005468	Flue temperature sensor	1
51	12951100004764	Cover plate	1
52	12651100001022	Gasket	1
53	12651100000982	Gasket	1
54	12651100001021	Gasket	1
55	12151100004070	Lower casing	1
56	12951100007244	Pump	1
57	15551100001885	Component of connecting pipe	1

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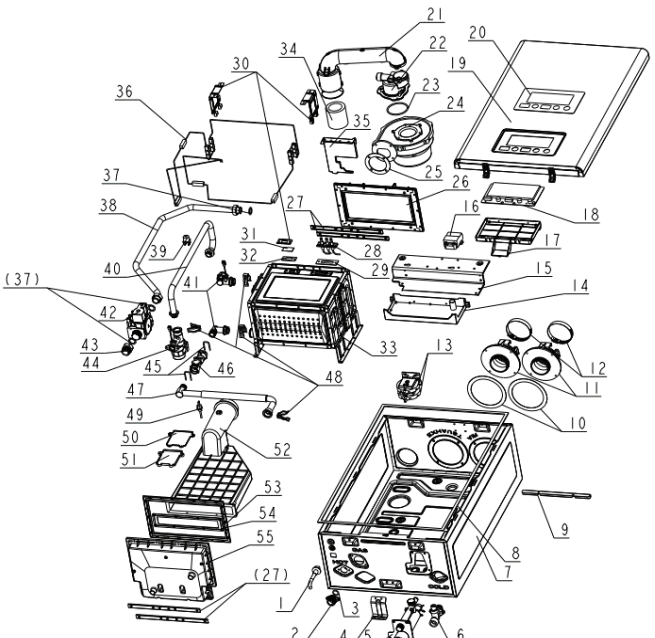

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Part #	Replacement Part	Part Name	Qty
1	17451100000003	Power cord	1
2	12951100003186	Outlet connection	1
3	12651100000701	Seal ring	1
4	12951100004507	Install retaining plate	1
5	12151100006548	Component for condensation box	1
6	12951100003185	Component of inlet valve body	1
7	12251100A09385	Bottom plate assembly	1
8	12651100001183	Seal	2
9	12251100A09405	Hook	1
10	12451100000201	Gasket	2
11	12151100007828	Decorative ring (smoke pipe holder)	2
12	12951100008744	Install retaining plate (collar)	2
13	17451100008508 17451100A01701	Air pressure sensor	1
14	17251100003146	Power panel	1
15	12251100007553	Controller support	1
16	17227600000601	Pulse igniter	1
17	12151100A02028	Control box	1
18	17251100004508	Display panel	1
19	12251100A09386	Front shell	1
20	16051100A13015	Export paster	1
21	12151100003755	Muffler	1
22	12951100004520	Mixer	1
23	12151100007231	Seal ring	1
24	17451100004926	Fan	1
25	12151100003752	Sealing washer	1
26	12951100007624	Burner body	1
27	12951100004510	Install retaining plate	4
28	12951100004506	Spark electrode	1

Part #	Replacement Part	Part Name	Qty
29	12151100003753	Sealing washer	1
30	12951100008824	Accessories of heating exchanger	1
31	12151100006134	Mica sheet	1
32	12151100004728	Sealing washer	1
33	12951100004064	Heating exchanger	1
34	12451100000221	Gasket	1
35	12951100004509	Install retaining plate	1
36	17451100005531	Electric heating antifreezing unit	1
37	12127600000147	Flat gasket	3
38	15551100000864	Componenet of air inlet pipe	1
39	17451100000066	Antifreeze thermostat	1
40	15551100000863	Component of connecting pipe	1
41	12951100005724	Connector of water inlet	1
42	17451100004928	Gas ratio valve	1
43	12951100005725	Air inlet adapter	1
44	17451100005530	Water ratio valve	1
45	12951100007484	Bolt	2
46	17451100003661	Water flow sensor	1
47	15551100000862	Component of water inlet	1
48	12251100010022	Circlip	5
49	15551100000862	Component of water inlet	1
50	17451100005468	Flue temperature sensor	1
51	12951100004764	Cover plate	1
52	12651100001022	Gasket	1
53	12651100000982	Gasket	1
54	12651100001021	Gasket	1
55	12151100004070	Lower casing	1

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