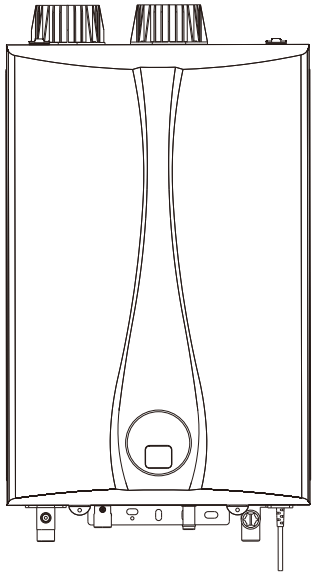
Installation Manual

Condensing Water Heater

Model | VW - 120
VW - 195



Keep this manual near this water heater for future reference whenever maintenance or service is required.

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**.
- **The installation must conform with local codes or, in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and/or CSA B149.1, Natural Gas and Propane Installation Code**.
- **When applicable, the installation must conform with the Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280 and/or CAN/CSA Z240 MH Series, Mobile Homes**.

Requirements for the State of Massachusetts

NOTICE BEFORE INSTALLATION

This appliance must be installed by a licensed plumber or gas fitter in accordance with the Massachusetts Plumbing and Fuel Gas

Code 248 CMR Sections 2.00 and 5.00.

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

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

1. INSTALLATION OF CARBON MONOXIDE DETECTORS. At the time of installation of the side wall horizontal vented gas fueled equipment, the installing plumber or gasfitter shall observe that a hard wired carbon monoxide detector with an alarm and battery back-up is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gasfitter shall observe that a battery operated or hard wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, building or structure served by the side wall horizontal vented gas fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard wired carbon monoxide detectors
   a. In the event that the side wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.
   b. In the event that the requirements of this subdivision cannot be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements; provided, however, that during said thirty (30) day period, a battery operated carbon monoxide detector with an alarm shall be installed.

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

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

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

Contents

Safety Information

- The cautions issued by this installation manual include critical information for the safety while using the product. When the user fails to adhere to the following requirements can cause death, serious damages, and a great property loss.

- For safety, according to the level of danger, we have indicated by “DANGER”, “WARNING”, “CAUTION” and the definitions for these terms are as follow

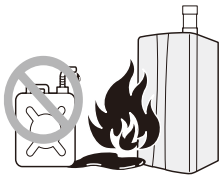
DANGER	When the required terms are not followed, it indicates an urgent danger that may cause death or serious bodily injury
WARNING	When the required terms are not followed, it indicates latent danger that may cause death or serious bodily injury
CAUTION	When the required are not followed, it indicates latent danger that may cause light injury or semi-serious injuries

- The definitions of the symbols indicated on the product and installation manual are as follows

	This symbol indicates a "Must" follow sign
	This symbol indicates a "No touch allowed" sign
	This symbol indicates a "General prohibition" sign.
	This symbol indicates a "No Fire" sign
	This symbol indicates "Grounding for prevention of electric shock"
	This symbol indicates "Caution for electric shock"

WARNING

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



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

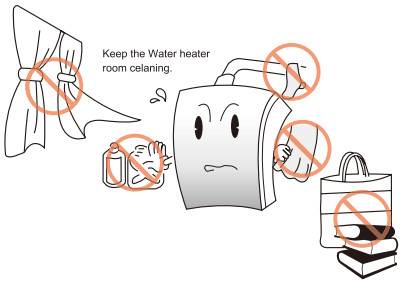
- BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

  WHAT TO DO IF YOU SMELL GAS
  - Do not try to light any appliance.
  - Do not touch any electric switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbor’s phone. Follow the gas supplier’s instructions.
  - If you cannot reach your gas supplier, call the fire department.
  - Do not return to your home until authorized by your gas supplier or the fire department.

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

- Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

WARNING



- **Do not store or use gasoline or other flammable liquids near this boiler**.
  Doing so may result in fire or explosion.
- **Do not place combustibles**, **such as newspapers or laundry**, **near the Water heater or venting system**.
  Doing so may result in a fire.
- **Do not place or use hair sprays**, **spray paints**, **or any other compressed gases near the Water heater or venting system**, **including the vent termination**.
  Doing so may result in fire or explosion.
- **Do not operate the Water heater with the front cover opened**.
  Doing so may result in fire or carbon monoxide (CO) poisoning, which may result in property damage, personal injury, or death.
- **Do not operate this Water Heater without proper venting**.
  Doing so may result in fire or carbon monoxide (CO) poisoning, which may result in property damage, personal injury, or death.
- **Do not touch the power cord or internal components of the Water Heater with wet hands**.
  Doing so may result in electric shock.

· **Do not remove the front cover unless the power to the water heater is turned off or disconnected.**
Failure to do so may result in electric shock.

CAUTION

- **Do not turn on the water heater unless the water and gas supplies are fully opened**.
  Doing so may damage the water heater.
- **Do not turn on the water if the cold water supply shut-off valve is closed**.
  Doing so may damage the water heater.
- **Do not use this water heater for anything other than its intended purpose**, **as described in this manual**.
- **Do not remove the front cover unless the power to the water heater is turned off or disconnected**.
  Failure to do so may result in electric shock.
- **When servicing the controls**, **label all wires prior to disconnecting them**.
  Failure to do so may result in wiring errors, which can lead to improper or dangerous operation. Verify proper operation after servicing.
- **Do not use unapproved replacement or accessory parts**.
  Doing so may result in improper or dangerous operation and will void the manufacturer's warranty.
- **Do not place anything in or around the vent terminals**, **such as a clothes line**, **that could obstruct the air flow in or out of the Water heater**.
- **This water heater has been approved for use in the USA and Canada only**.
  Using the water heater in any other country will void the manufacturer's warranty.

· **Do not use this water heater for anything other than its intended purpose, as described in this manual.**

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

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

DANGER

To prevent burns:

- Use the lowest operating temperature setting necessary to provide comfortably-hot water.
- If your household has children or elderly or disabled residents, consider using a lower temperature setting.
- Read all the instructions in this manual carefully before changing the temperature setting.
- Feel the water before using it on children, the elderly, or the disabled.
- If it is necessary to set the water temperature above 120 ℉ (50 ℃), consider installing a thermostatically-controlled mixing valve or temperature-limiting valve. Contact a licensed plumber or your local plumbing authority for more information.

DANGER

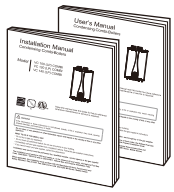
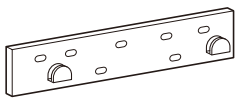
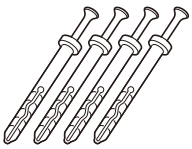
This Water heater's water temperature is set to 120 ℉ (50 ℃) at the factory for your safety and comfort. Increasing the temperature increases the risk of accidental scalding. Water temperatures at or above 125 ℉ (52 ℃) can cause instant scalding, severe burns, or death. Before you decide to change the temperature setting, read the following charts carefully.

Water Temperature	Time in which a young child can suffer a full thickness (3rd degree) burn
160 ℉ (71 ℃)	Less than 1 second
140 ℉ (60 ℃)	1 second
130 ℉ (54 ℃)	10 seconds
120 ℉ (50 ℃)	10 minutes
100 ℉ (38 ℃)	very low scald risk

1. About the Water Heater

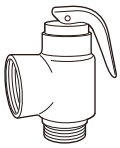
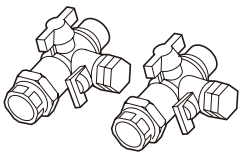
1.1 Items Included

When you open the box, you will find the following items with the Water heater. Check the box for each of the following items before installing the Water heater.

	
Installation and User Manual	Wall Mounting Bracket
	
Tapping screws & anchors	

1.2 Accessories

The following optional accessories are available for the Water heater.

	
Pressure Relief Valve, Heating	Plumb Easy Valve Set

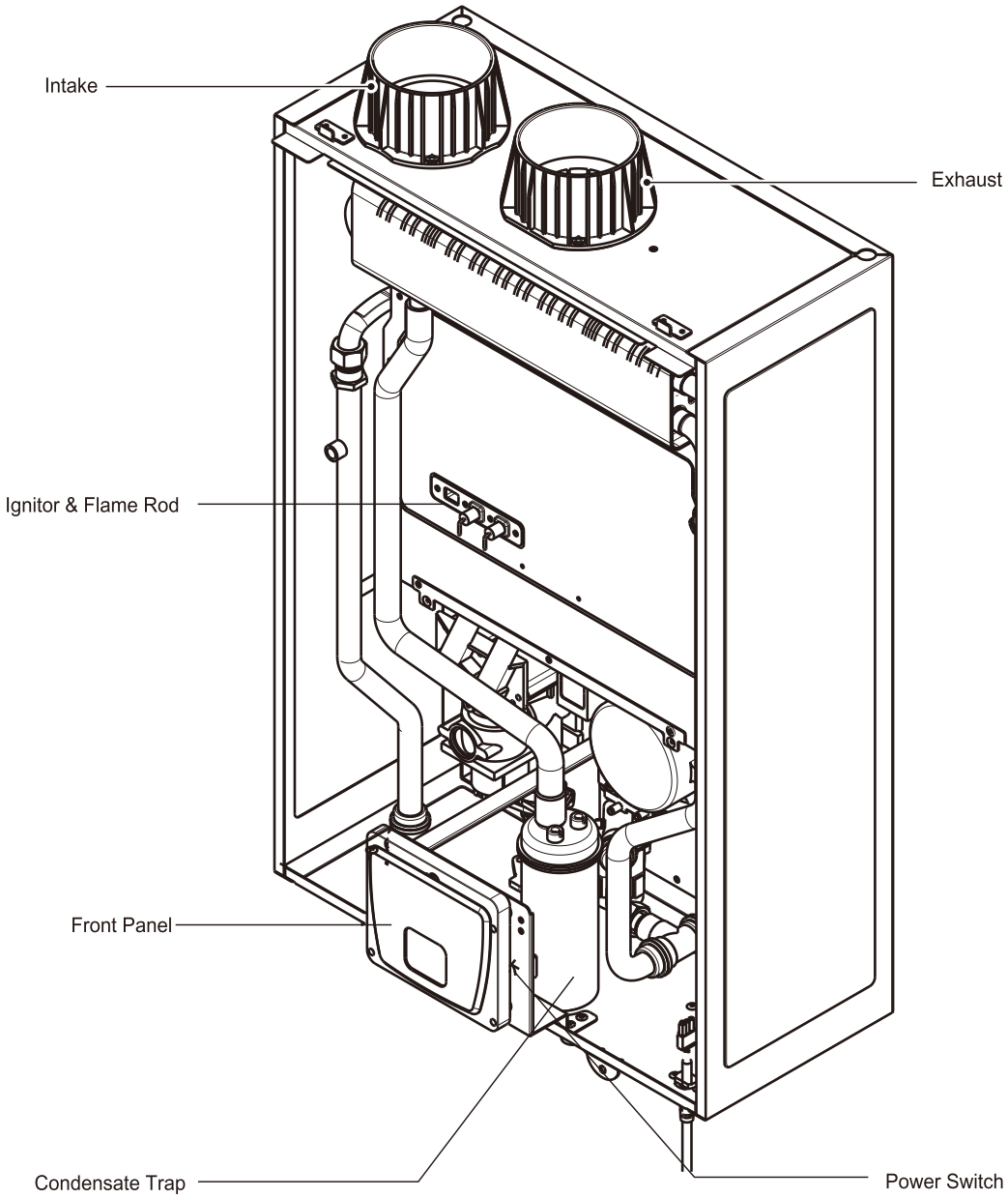
1.3 Specifications

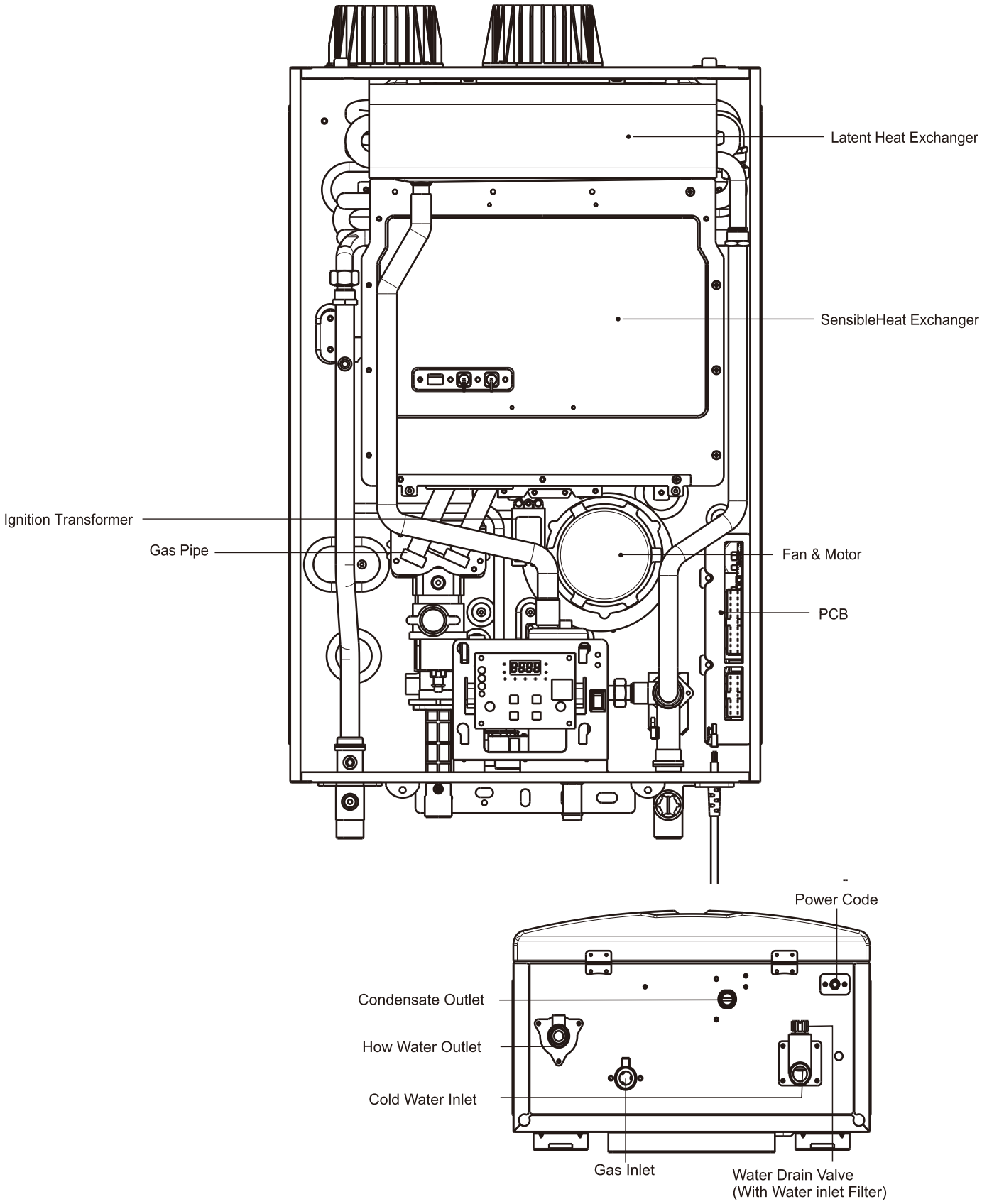
※ Specifications may be changed without prior notice.
※ The capacity may differ slightly, depending on the water and fuel gas quality.

Product name			Tankless Gas Water Heater	
Model			VW - 120	VW - 195
Install Type			Indoor Wall Hanging	
Fule Type			Direct Vent / Sealed Combustion	
Dimesion(W×D×H,inch)			14.88″ × 24.25" × 10.66″	18.1 " × 27.56" × 10.86″
Weight(lbs)			51	64
Igniton			Direct Ignition	
Connection Sizes	Gas Inlet		3/4"	
	Water Inlet		3/4"	3/4"
	How water Outlet		3/4"	3/4"
Gas Consumption	NG	Max.	120,000 Btu/h	195,000 Btu/h
		Min.	18,000 Btu/h	26,000 Btu/h
	LP	Max.	120,000 Btu/h	195,000 Btu/h
		Min.	18,000 Btu/h	26,000 Btu/h
Operation Pressure			15 - 150 PSI	
Minimum Flow Rate			0.52 GPM	0.60 GPM
Power(Voltage/Frequency)			120V / 60Hz	
Power Consumption(W)			60	82
Accessories			Plumb Easy Valve Set, Pressure Relief Valve	
Safety Devices			Flame Rod, Pressure Relief Valve, Overheat Prevention Device, Freezing Prevention Device, Fan Rotation Detector	
Vent Diameter(Inch)			Intake : 3", Exhaust : 3"	
Maximum How Water Capacity	Δ45℉(GPM)		4.8	7.9
	Δ75℉(GPM)		2.9	4.9

1.4 Components

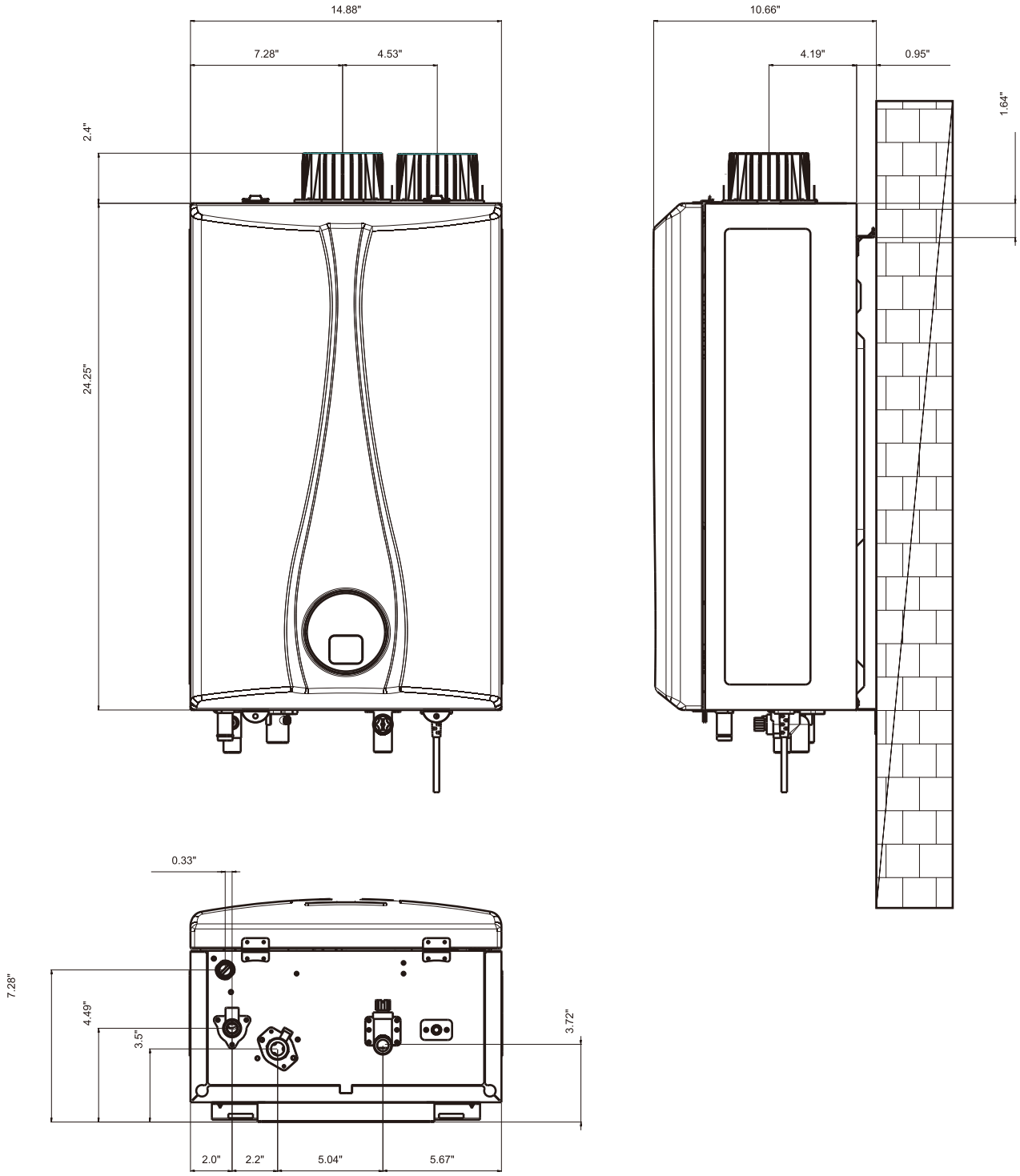
The following diagram shows the key components of the Water heater. Component assembly diagrams and particular parts lists are included in the Appendixes.



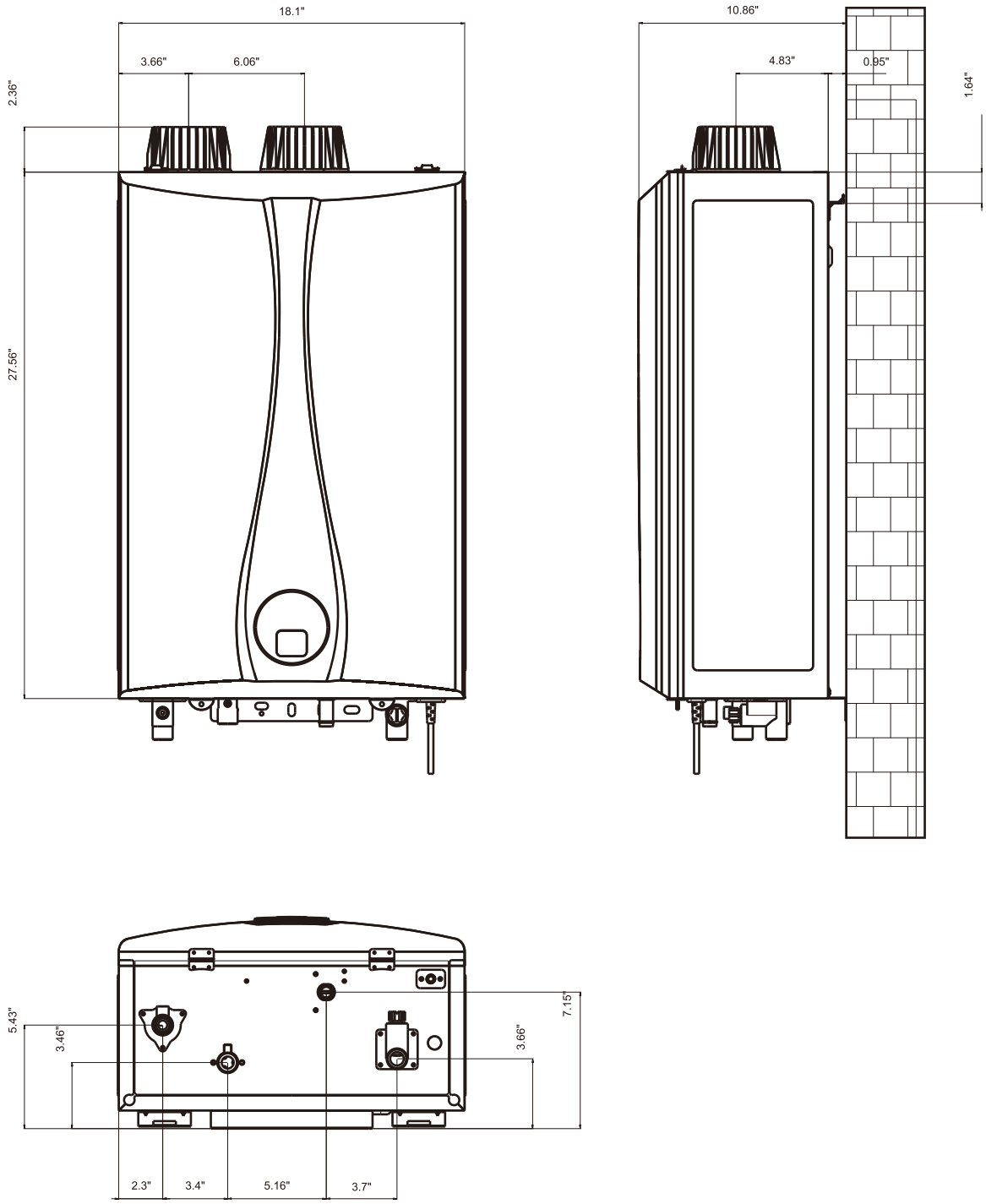

Latent Heat Exchanger
SensibleHeat Exchanger
Ignition Transformer
Gas Pipe
Fan & Motor
PCB
Power Code
Condensate Outlet
How Water Outlet
Cold Water Inlet
Gas Inlet
Water Drain Valve
(With Water inlet Filter)

1.5 Dimensions

VW - 120 Model

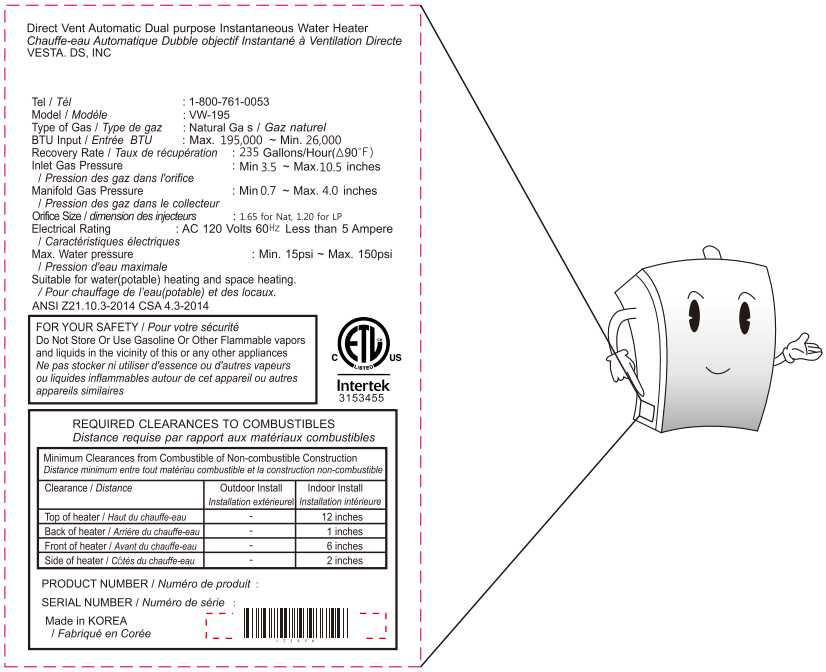


VW - 195 Model


18.1"
3.66"
6.06"
2.36"
27.56"
10.86"
4.83"
0.95"
1.64"
5.43"
3.46"
7.15"
3.66"
2.3"
3.4"
5.16"
3.7"

1.6 Rating Plate

The VESTA VW Water heater come from the factory configured for use with Natural Gas(NG).
Before starting the installation, check the rating plate located on the side of the Water heater to ensure that the Water heater matches the gas type, gas pressure, water pressure, and electrical supply available in the installation location. **If the Water heater does not match each of these ratings, do not install the Water heater.**



WARNING

- Be sure the gas type and electricity voltage match the rating plate.
  Using a different gas type will cause abnormal combustion and Water heater malfuction.
- Using abnormally high or low AC voltage may cause abnormal operation, and may reduce the life expectancy of this product.

2. Installing the Water heater

2.1 Choosing an Installation Location

When choosing an installation location, **you must ensure that the location provides adequate clearance for the Water heater**, adequate venting and drainage options, and sufficient access to gas, water, and electrical supplies. Carefully consider the following factors when choosing an installation location:

Compliance Requirements

- Local, state, provincial, and national codes, laws, regulations, and ordinances.
- National Fuel Gas Code, ANSI Z223.1-latest edition.
- Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1, when required.
- National Electrical Code.
- For Canada only: B149.1 Installation Code, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.

Access to Utilities

- Water – the installation location should be near where the domestic water supply enters the building.
- Gas – the installation location should be near where the gas supply enters the building.
- Electricity – the installation location should be near where the electrical supply enters the building.

Humidity and Contact with Water

When installing the Water heater, avoid places with excessive humidity. The Water heater has electric gas ignition components. Water spray or droppings can get inside the Water heater and damage system. The Water heater must be installed in a way to ensure that the gas the ignition ignition system components are protected from water (dripping, spraying, rain, etc.) during operation and service.

Adequate Drainage

The Waher heater produces a significant amount of condensate during operation. The Water heater should be located near a suitable drain and where damage from a possible leak will be minimal. Installing the Water heater in a location without a drain will void the warranty and VESTA will not be responsible for water damages that occur as a result. For more information about condensate drainage, refer to “3.3 Condensate Drain” on page 18.

The Water heater must be located in an area where leakage of the unit or connections will not result in damage to the area adjacent to the appliance or to lower floors of the structure. When such locations cannot be found, installation of an adequately drained drain pan under the Water heater is highly recommended. When installing the drain pan, ensure that the installation does not restrict combustion air flow.

Adequate Venting and Ventilation

Select a location that requires minimal venting. Consider venting restrictions caused by windows, doors, air intakes, gas meters, foliage, and other buildings. For more information about venting, refer to “5. Venting the Water heater” on page 22.

To ensure adequate venting and ventilation, follow these guidelines:

- Maintain proper clearances from any openings in the building.
- Install the boiler with a minimum clearance of 12 in (300 mm) above an exterior grade or as required by local codes.
- Maintain a minimum clearance of 4 ft (1.2 m) from heating and cooling vents.
- Do not enclose the vent termination.
- Install the exhaust vent in an area that is free from any obstructions, where the exhaust will not accumulate.
- Do not install the Water heater where moisture from the exhaust may discolor or damage walls.
- Do not install the Water heater in bathrooms, bedrooms, or any other occupied rooms that are normally kept closed or not adequately ventilated.

Proximity to Fixtures and Appliances

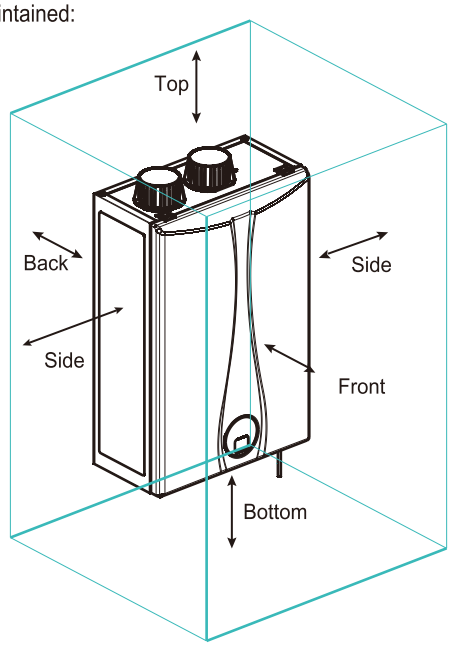
Install the Water heater near fixtures that deliver or use hot water, such as bathroom, kitchen, and laundry room faucets. Select a location that minimizes the water piping required between major fixtures. If the distances are long or if the user requires “instant“ hot water, installation of a recirculation line which circulates domestic hot water back to the Water heater from the furthest fixture is recommended. Insulate as much of the hot water supply and recirculation lines as possible. For more information about the water supply, refer to "3.2 Installing a Domestic Hot Water (DHW) System” on page 16.

Adequate installation clearances

CAUTION

Do not install the Water heater on carpeting.

Install the Water heater in an area that allows for service and maintenance access to utility connections, piping, filters, and traps. Based on the installation location, ensure that the following clearances are maintained:



Clearance from:	Indoor Installation
Top	12 inch
Back	1 inch
Front	6 inch
Sides	2 inch
Bottom	12 inch

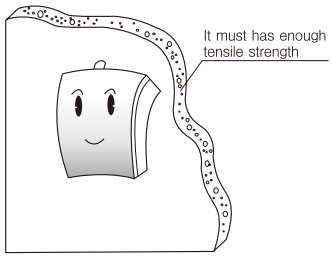
Clean, debris and chemical-free combustion air

- Do not install the Water heater in areas where dust and debris may accumulate or where hair sprays, spray detergents, chlorine, or similar chemicals are used.
- Do not install the Water heater in areas where gasoline or other flammables are used or stored.
- Ensure that combustible materials are stored away from the Water heater and that hanging laundry or similar items do not obstruct access to the Water heater or its venting.

2.2 How to install

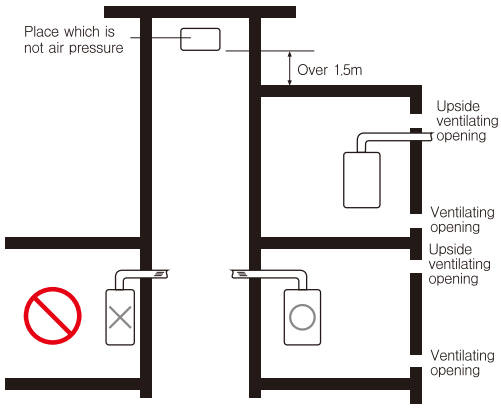
Please install on a durable wall.

- When install the product, about 66 lb(31kg) is added in a wall. So if it is not installed on solid wall, it may cause damages, submersion, gas leak and a fire by falling the product
- If there is not enough strength to preserve the product, please do reinforcement work.
- The weight of the product is marked on 8page of this manual.
- Make sure the unit is mounted on a non-combustible material.



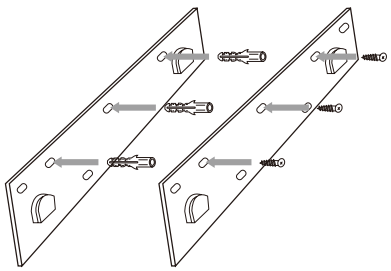
Please don't install on a froup exhaust port wall.

- It may cause mounting screw corrosion and result in failure.
- It may cause damages, submersion, gas leak and a fire from unit falling.



Please fix the mounting plate securely

- If the mounting bracket is not strong enough, the appliance can fall.
- It may cause damages, submersion, gas leak and a fire from unit falling.



CAUTION

- When installing, be careful to not to injure yourself.
- Be sure not to hit electrical wiring, gas, or water piping while drilling holes
- Make sure the unit is mounted on a non-conbustible material.

The method for attaching mounting bracket.

- Please mark attached position on the wall
- Please drill (Φ10) three screw holes.
- Insert the wall anchors to the holes.
- Please tighten the sticking clip by using screws supplied.

3. Installing the System Piping

Prior to connecting plumbing to the Water heater, flush the entire system to ensure it is free of sediment, flux, solder, scale, debris or other impurities that may be harmful to the system and Water heater. During the assembly of the heating system, it is important to keep the inside of the piping free of any debris including construction and copper dust, sand and dirt.

For retrofits, all system piping including radiators, must be cleaned of all build-up including sludge and scale. All systems, old and new, must be cleaned to remove flux, grease and carbon residue. VESTA recommends cleaning the Water heater system with cleaning products specially formulated for Water heater systems. For retrofit applications with heavy limescale and sludge deposits, a heavier duty cleaner may be required. For information on performing the cleaning, follow the instructions included with the boiler system cleaner products.

3.1 Installing a Domestic Hot Water (DHW) System

The VESTA VW Water heater provides domestic hot water continuously when flow is sensed by the flow sensor. This method is the most efficient means of heating water by allowing the Water heater to operate at a lower return water temperature by minimizing standby losses, thus increasing combustion efficiency.

3.1.1 Guidelines for a DHW System

With its multi-purpose design, the VESTA VW Water heater provides hot water on demand. This means that the Water heater produces DHW only when the user demands it.

The Water heater recognizes a DHW demand when the flow sensor detects a DHW flow of approximately 0.7 GPM or greater. Once the flow sensor detects the flow, the Water heater immediately goes into DHW mode regardless of the status of the space heating system.

Read and follow the guidelines listed below to ensure safe and proper installation of a Water heater heating system.

Backflow Preventer

Install a backflow preventer valve in the make-up water supply to the unit as required by local codes.

Scald Hazard

Hotter water increases the risk of scald injury. There is a hot water scald potential if the DHW temperature is set too high. Be sure to follow the adjustment instructions in the Water heater's operation manual.

Pressure Relief Valve for DHW

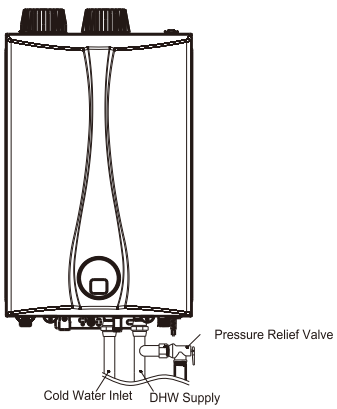
To complete the installation of the DHW system, you must install an approved $^{3}/_{4}$ in, maximum 150 psi pressure relief valve on the hot water outlet. The VESTA VW Water heater has a built-in high temperature shut off switch, so install a “pressure only“ relief valve.

WARNING

- Installing the pressure relief valve improperly may result in property damage, personal injury, or death. Follow all instructions and guidelines when installing the pressure relief valve. The valve should be installed only by a licensed professional.
- The pressure relief valve must be installed at the Water heater outlet and in the vertical position, as shown in the example below, with the drain pipe outlet exiting the side of the pressure relief valve horizontally and elbowing down.

The DHW pressure relief valve is not supplied, **but is required**. The following examples are pressure relief valves approved for use with the Water heater:

- Wilkins P-1000A (Zurn Industries)
- Conbraco 17-402-04
- Watts Industries 3L (M7)
- Cash Acme FWL-2, $^{3}/_{4}$ in



CAUTION

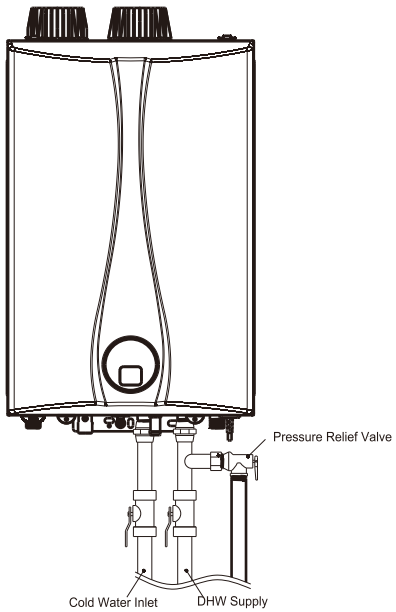
Install the pressure relief valve as close to the boiler as possible. No other valve should be installed between the pressure relief valve and Water heater.

When installing pressure relief valve, follow these guidelines:

- Ensure that the valve’s discharge capacity is equal to or greater than the maximum pressure rating of the Water heateres DHW system.
- Ensure that the maximum BTU/H rating on the pressure relief valve is equal to or greater than the maximum input BTU/H rating of the Water heater.
- Direct the discharge piping of the pressure relief valve so that hot water does not splash on operator, or any nearby equipment.
- Attach the discharge line to the pressure relief valve and run the end of the line to within 6-12 in (150-300 mm) of the floor.
- Ensure that the discharge line allows for free and complete drainage without restriction. Do not install a reducing coupling or other restrictions on the discharge line.
- 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 the situation. Do not plug the relief valve.

3.1.2 DHW System Piping

Refer to the following illustration for a typical DHW piping example for the Water heater.



When installing the DHW system, follow these guidelines:

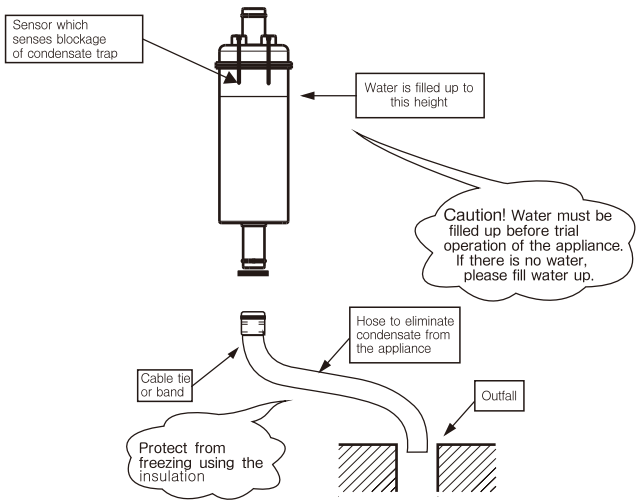
- Use only pipes, fittings, valves, and other components (such as solder), that are approved for use in potable water systems.
- Tighten the connection valves with care to avoid damage.
- VESTA recommends using unions and manual shut-off valves on the cold water inlet and DHW outlet.
- Keep the hot water piping system as short as possible, to deliver hot water to the fixtures more quickly.
- To conserve water and energy, insulate the DHW supply and DHW recirculation lines (if applicable). Do not cover the drains or pressure relief valves.
- After installing the Water heater, clean the cold water inlet filter. Then, test the Water heater for proper DHW supply and inspect for leaks. Instruct the boiler owner that the filter must be cleaned periodically to maintain proper DHW flow.

3.2 Condensate Drain

- Condensing gas water for dual purpose needs discharge in the appliance due to condensed water.
- Please connect in reserve condensed water discharge hose to condensed water trap and please tie them with cable tie or hose band
- Please put the end of hose into sewers or discharge.
- Condensed water trap in the appliance always should be full of water. Please check it is full or not when operate again after not. using for a while.
- Please supply water in a condensed water trap through pipe connection or condensed water rubber pipe
- Please don't use condensed water as drinking water.
- Please clean condensed water trap more than once in a year.
- Please untie a fixing screw and hose band when clean and please clean a rubber hose separately
- Please take necessary action to prevent freezing when install condensed water discharge hose.

CAUTION

Please connect condensed water rubber pipe as it was when supply through this pipe.
Please be careful not to splash to other parts when supply water.



4. Connecting the Gas Supply

WARNING

- Before connecting the gas supply, determine the gas type and pressure for the Water heater by referring to the rating plate. Use only the same gas type indicated on the rating plate. Using a different gas type will result in abnormal combustion and malfunction of the Water heater. Gas supplies should be connected by a licensed professional only.
- The appliance and its gas connection must be leak tested before placing the appliance in operation.

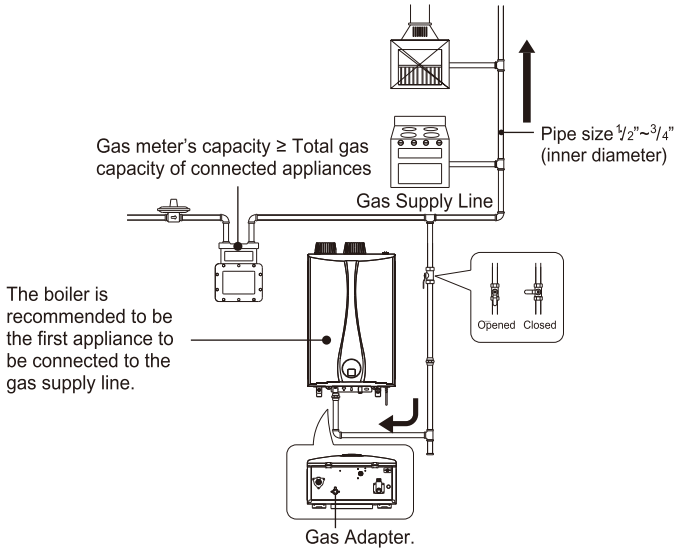
VESTA recommends connecting the Water heater as the first device downstream of the gas meter, to ensure a sufficient gas supply.

To connect the gas supply:

1. Determine the gas type and pressure for the Water heater by referring to the 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 for the gas line. Refer to the tables that follow.
5. Install full port valves 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.

CAUTION

- Install a manual gas shut-off valve between the gas supply line and the Water heater.
- A sediment trap must be provided upstream of the gas controls.



4.1 Gas Pipe Sizing Tables

This table below is for Natural Gas piping supply straight to the appliance without any tabs to other gas appliances.

Recommended Gas Pipe Size for VW Water heater (Example for NG)	
Distance from Gas Meter	Pipe Size
0'-20'	3/4"
30'-80'	1"
90'-200'	1-1/4"

Natural Gas Supply Piping

Maximum Capacity of Natural Gas Based on a 0.60 specific gravity at a 0.5" WC pressure drop

Pipe Size	kBTU of Natural Gas												
Length	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'	125'	150'	200'
3/4"	372	255	205	175	156	142	130	121	114	107	95	86	74
1"	702	482	387	331	293	266	245	228	213	202	179	162	139
1 1/4"	1441	990	795	680	603	546	503	468	439	415	367	332	285
1 1/2"	2158	1483	1191	1019	903	819	753	701	658	621	550	499	427
2"	4155	2856	2293	1963	1740	1576	1450	1349	1266	1195	1060	960	822

Propane(LP) Gas Supply Piping

Maximum Capacity of propane(LP) Gas Based on 11" WC supply pressure at a 1.0" WC pressure drop

Pipe Size	kBTU of Natural Gas												
Length	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'	125'	150'	200'
3/4"	567	393	315	267	237	217	196	185	173	162	146	132	112
1"	1071	732	590	504	448	409	378	346	322	307	275	252	213
1 1/4"	2205	1496	1212	1039	913	834	771	724	677	630	567	511	440
1 1/2"	3307	2299	1858	1559	1417	1275	1181	1086	1023	976	866	787	675
2"	6221	4331	3465	2992	2646	2394	2205	2047	1921	1811	1606	1496	1260

To turn off gas to appliance

- Turn off all electric power to the appliance if service is to be Performed.
- Turn the manual gas valve located on the outside of the unit clockwise to the off position.(This unit has a switch(gas cut-off device) on front panel in the appliance, locate the switch button to off position)

For your safety, read before operating

- This appliance does not have a pilot. It is equipped with an electronic ignition device that automatically lights the burner. Do not try to light the burner manually
- Before operating, check all around the appliance area for gas leaks. Be sure to check next to the floor as some gases are heavier than air and will settle on the floor.
- Use only your hand to turn the gas valve knob. Never use tools. If the knob will not turn by hand, do not attempt to repair it. Call a qualified service technician. For or attempted repair may result in a fire or explosion
- Check that the type of gas matches the rating plate located on the cover if your appliance.
- The minimum and maximum inlet gas pressure are :

Natural Gas	Min. 3.5" WC ~ Max. 10.5" WC
Propane Gas	Min. 8.0" WC ~ Max. 13.0" WC

- Gas pressure below this specified range for the VC models and/or insufficient gas volume will abversely affent performance. Inlet gas pressure must not exceed the above maximum values; gas pressure above the specified range will cause dangerous operating conditions and damage to the unit. Until testing of the main gas line supply pressure is completed, ensure the gas line to the VC models is disconnected to avoid any damage to the appliance.
- Size the gas pipe appropriately to supply the necessary volume of gas required for the VC models using ANSI 223.1/NAPA 54 in the USA or CAN/CSA B149.1 in Canada or local codes. Install a manual gas shut-off valve between the VC models and the gas supply line. When the gas connections are completed, it is necessary to perform a gas leak test either by appling soapy water to all gas fittings and observing for bubbles or by using a gas leak detection device. Always purge the gas line of any debris before connecting to the appliance gas inlet.

4.2 Measuring the Inlet Gas Pressure

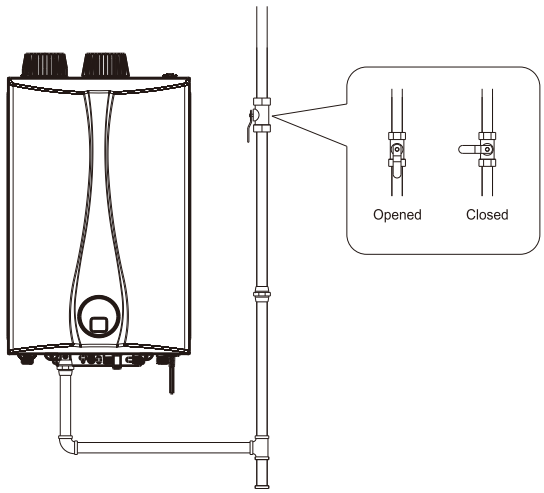
WARNING

- The Water heater cannot function without sufficient inlet gas pressure. Measuring the inlet gas pressure should be performed by a licensed professional only.

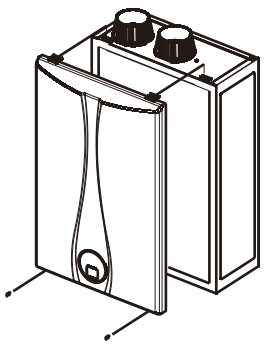
- The inlet gas pressure must be maintained between 3.5 in and 10.5 in W.C for natural gas and between 8.0 in and 13.5 in W.C propane.
- The appliance and its individual shutoff valve must be disconncted from the gas supply piping system during any pressure testing of that system at test pressure in excess of 1/2psi(3.5 kPa).
- The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressure equal to or less than ½ psi(3.5kPa).

To measure the inlet gas pressure:

1. Shut off the manual gas valve on the gas supply line.



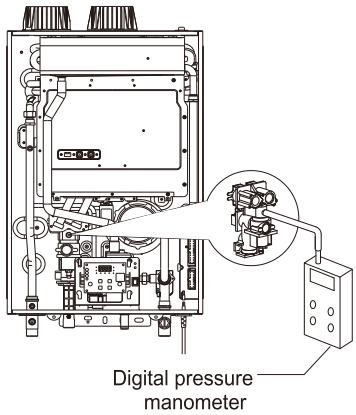
2. Open a hot water faucet. The boiler should turn on and the gas in the gas supply line will be purged.
3. Leave the faucet on until the Water heater shuts down due to a lack of gas supply, and then turn off the hot water faucet.
4. Remove the front cover by loosening the 2 Phillips head screws securing it to the case.



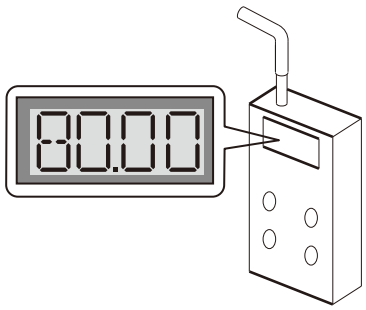
CAUTION

Ensure that no cables are in the way before folding down the PCB assembly. If the assembly is stuck, do not force it. Doing so may damage the cables and result in serious malfunctions. Check again to ensure that no cables or any other parts are in the way before you proceed.

5. Loosen the screws indicated in the figure below and connect a manometer to the pressure port. Reset the manometer to zero before use.



6. Re-open the manual gas valve and check for leaks.
7. 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.
8. 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 on page 8.



5. Venting the Water heater

WARNING

Improper venting of 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 and/or the "Venting systems and air supply for Water heaters"section of the latest version of the CAN/CGA B149.1 Natural Gas and Propane Installation Code in Canada, as well as all applicable local building codes and regulations.** Follow all instructions and guidelines when venting the Water heater. Venitng should be performed only by a licensed professional.

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 (containing a high level of dust, sawdust, sand, flour, aerosols, or any other such airborne contaminants), as contaminants can cause operational problems. The warranty does not cover damage caused by contaminants in the installation area. If you must install the Water heater in an area with contaminated air, use direct venting to supply air from outside the building. We recommend regular filter cleaning and maintenance in these areas.
- For best results, keep the venting system as short and straight as possible.
- Locate the boiler as close as possible to the vent termination.
- Do not connect the Water heater vent to a vent for any other gas Water heater or vent stack.
- 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.
- To avoid moisture and frost build-up and to maintain clearances to openings on adjacent homes, 45° elbows, 90° elbows, or tees may be attached to the end of the termination vent pipe to direct the exhaust plumes away from buildings, as long as the total allowable vent lengths, maximum number of elbows, and distances to intake restrictions are observed.
- Must provide for adequate combustion and ventilation air.
- Do not store hazardous or flammable substances near the vent termination.
- If this Water heater will be installed in areas where snow is known to accumulate, protect the vent termination from blockage.
- Provide a minimum of 1 foot clearance from the bottom of the exhaust above the expected snow accumulation level. Snow removal may be necessary to maintain clearance.
- Ensure that the vent termination is at least 12 in (305 mm) above ground, or as required by local codes.
- Support the vent pipe with hangers at regular intervals or as required by local codes.
- Exhaust and intake air pipes must be glued and properly supported at least every 4 ft (1.2 m).
- The vent for this appliance shall not terminate over public walkways; or near soffit vents or crawl space vents or where condensate or vapor could create a nuisance or hazard or cause property damage; or where condensate or vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.

5.1 Selecting a Vent Type

All Water heater are prepared at the factory to be direct vented (sealed combustion). VESTA recommends direct air vent installations whenever possible to avoid back drafting cold air through the Water heater unit. If you cannot use a direct vent, ensure that an ample supply of make-up air is available in the installation location.

VESTA also recommends installing a new vent system with this appliance. If reusing an existing vent system, thoroughly inspect it for punctures, cracks, or blockages prior to connecting it to the boiler.

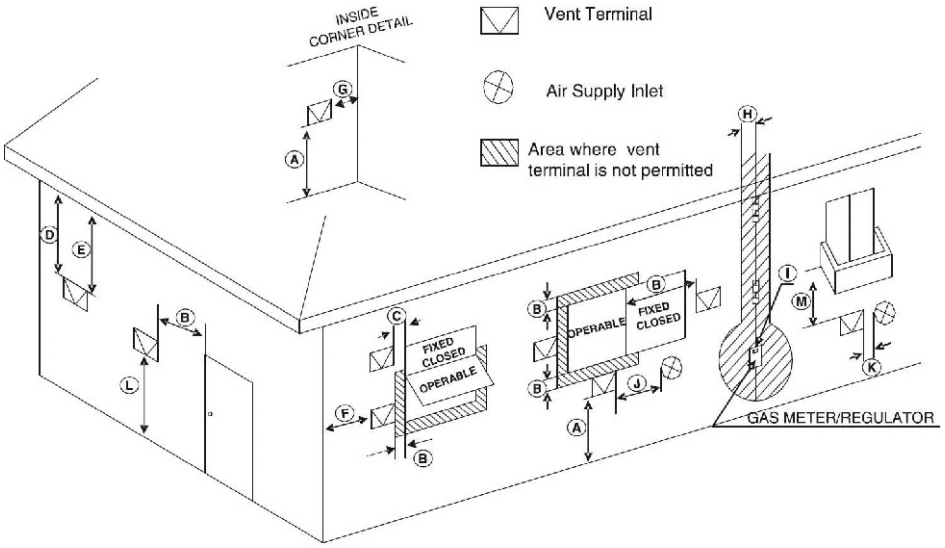
Direct Venting

The Water heater uses 3 in diameter exhaust and 3 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 boiler collar to the vent termination.

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 inadvertent crimping of, or damage to, the intake air pipe.

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**, **and CAN/CGA B149.1 Natural Gas and Propane Installation Code**:

- The appliance should be located in an area where leakage at the tack or connections will not result in damage to the area adjacent to the appliance or to lower floors of the structure, when such locations can not be avoide, it is recommended that a suitable drain pan, adequately drained, he installed.



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

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

Non-Direct Venting (Single Pipe)

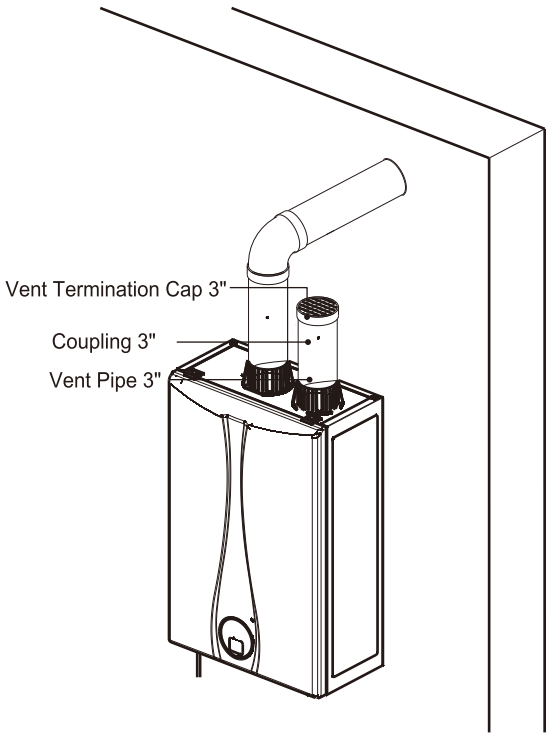
If, at any time, the installation location could experience negative pressure, there is a possibility of back drafting cold air through the Water heater's heat exchanger. This situation could lead to the freezing of the heat exchanger and malfunction of the Water heater.

However, building codes in most jurisdictions disallow negative pressures in residences. In a home with a well-balanced air supply, the heat exchanger should not be in danger of freezing. Because the cause of back drafting is not considered a manufacturing problem, any freezing damage which occurs from back drafting will not be covered by the VESTA warranty. If there is any question about the possibility of back drafting in the installation location, use a direct venting system for the Water heater.

When using non-direct venting, maintain non-direct vent clearances shown on page 43 as required by **ANSI Z21.10.3 and the National Fuel Gas Code**, **ANSI Z223.1/NFPA 54**, **and CAN/CSA B149.1 Natural Gas And Propane Installation Code**.

To use non-direct venting for the Water heater :

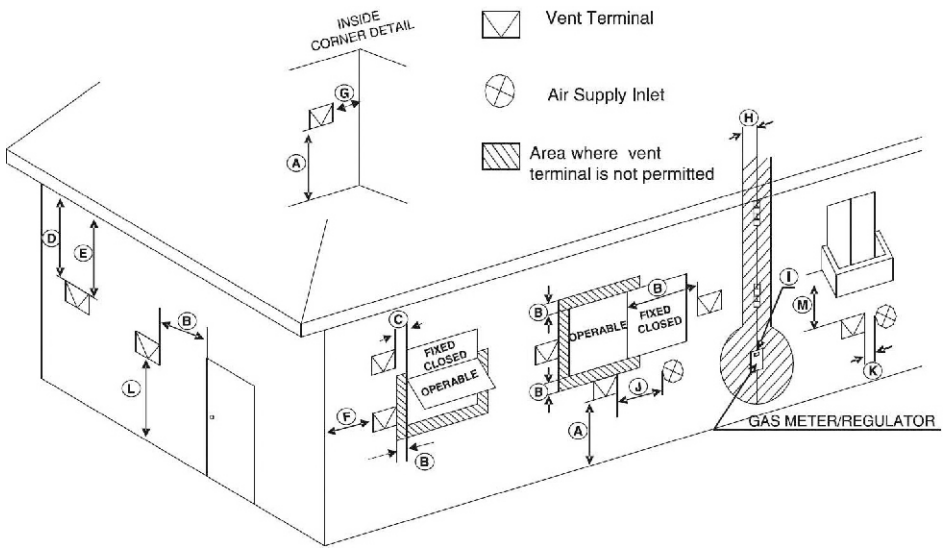
1. Insert the termination end cap into the intake air duct. Do not glue the end cap, to allow for easy removal and cleaning of the cap.



2. Provide two openings to allow for circulation of combustion air as specified by ANSI Z223.1/NFPA 54 or CAN/CGA B-149.1:

CAUTION

- For other than a direct vent appliance, the appliance must be located as close as practicable to a chemney or gas vent.



Ref	Description	Canadian Non-Direct Vent Installations[1]	US Non-Direct Vent Installations[2]
A	Clearance above grade, veranda, porch, deck, or balcony	12 in (30 cm)	12 in (30 cm)
B	Clearance to window or door that may be opened	36 in (91 cm)	48 in (120 cm) below or to side of opening; 12 in (30 cm) above opening
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	*	*
E	Clearance to unventilated soffit	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*
H	Clearance to each side of center line extended above meter/regulator assembly	36 in (91 cm) within a height 15 ft (4.57 m) above the meter/ regulator assembly	*
I	Clearance to service regulator vent outlet	36 in (91 cm)	*
J	Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	36 in (91 cm)	48 in (120 cm) below or to side of opening; 12 in (30 cm) above opening
K	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	36 in (91 cm) above if within 10 ft (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13 m†)	*
M	Clearance under veranda, porch deck, or balcony	12 in (30 cm‡)	*

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

5.2 Selecting Vent Pipe Materials

Venting requirements differ in the US and Canada. Consult the following chart or the most recent edition of ANSI Z223.1/NFPA 54 or CAN/CGA B149.1, as well as all applicable local codes and regulations when selecting vent pipe materials. Do not use cellular core based pipe materials for the exhaust vent.

Locale	Recommended Vent Materials
USA	• PVC Schedule 40 (Solid Core) • CPVC Schedule 40 or 80 (Solid Core) • Approved Polypropylene*
Canada**	• Type BH Special Gas Vent Class IIA (PVC) • Type BH Special Gas Vent Class IIB (CPVC) • Type BH Special Gas Vent Class IIC (Polypropylene)

* Approved polypropylene systems include:
Durevent Polypro (Single Wall): 2PPS-xxx (2”), 3PPS-xxx (3”)
Centrotherm Innoflue SW: ISxx02xx (2”), ISxx03xx (3”)
Refer to manufacturer’s literature for detailed information.

** For installation in Canada, field-supplied plastic vent piping must comply with CAN/CGA B149.1 (latest edition) and be certified to the Standard For Type BH Gas Venting Systems, ULC-S636. Components of this listed system must not be interchanged with other vent systems or unlisted pipes or fittings. All plastic components and specified primers and glues of the certified vent system must be from a single system manufacturer and must not be intermixed with another system manufacturer’s parts. The supplied vent connector and vent termination are certified as part of the boiler.

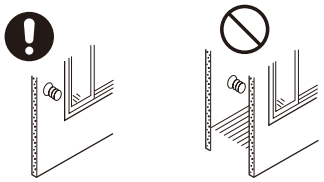
CAUTION

- This Water heater has a built-in control to limit the exhaust temperature to 149°F (65°C). As a result, the Water heater can be vented with Schedule 40 PVC.
- In high temperature applications, the exhaust temperature can exceed 149°F (65°C). In that case, you must use Schedule 40 or 80 CPVC or Approved Polypropylene in the USA or Type BH Special Gas Vent Class IIB (CPVC) or Class IC (Polypropylene) that conforms to ULC-S636 in Canada.

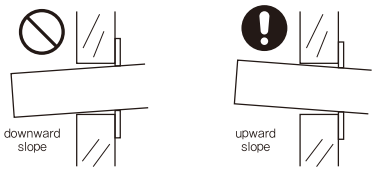
5.3 Venst Terminal Installation Precautions

Note the following vent terminal installation requirements

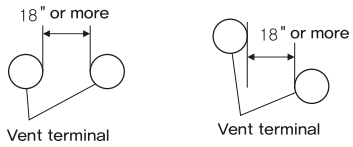
- Do not install the vent terminal indoors.



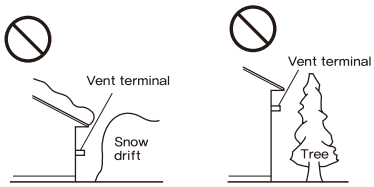
- Install the vent terminal with a upward slope(2~3˚)



- If multiple units are installed, terminals must be separated by 18" or more in a plain view regardless of the vertical clearance.

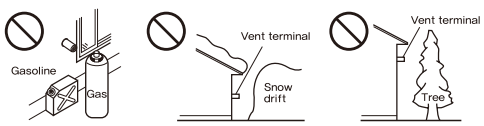


- Avoid installing the terminal where obstacles will block it.



- Do not install the vent terminals vertically in-line. Do not cover the vent terminal with any type of protective screen or enclosure. In-line or blocked terminals can cause abnormal combustion resulting inundesired performance from the appliance.

- Avoid storing hazardous objects near the terminal.



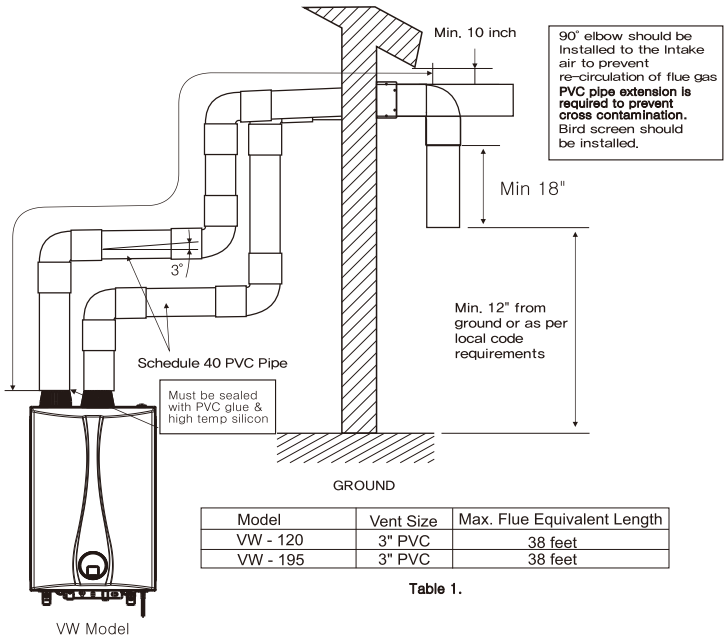
5.4 Terminating the Vents

> **CAUTION**
>
> • In cold climate, freezing air can enter into the vent and cause freeze damage to unit. See Freeze Protection page in manual for appropriate precautions.

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, and CAN/CGA B149.1 Natural Gas and Propane installation Code :

Typical Venting Design

- VW : 3" Schedule 40 PVC
- Maximum Three 90 ˚ Elbows.(one elbow is equal to 5ft length)
- Maximum Vent Length : See table below.
- Sloping 1" in 10" - 1" in 12"



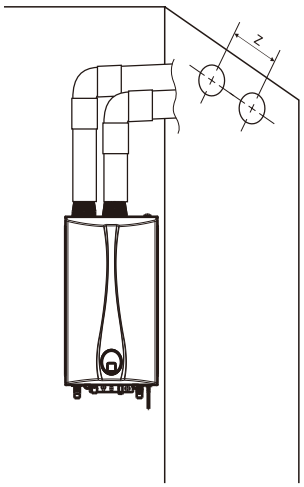
Model	Vent Size	Max. Flue Equivalent Length
VW - 120	3" PVC	38 feet
VW - 195	3" PVC	38 feet

Table 1.

Vent Termination Installation Procedure(3" PVC)

1. Drill 2 holes.(Air intake hole and flue gas outlet hole)
2. The length, Z, is as following

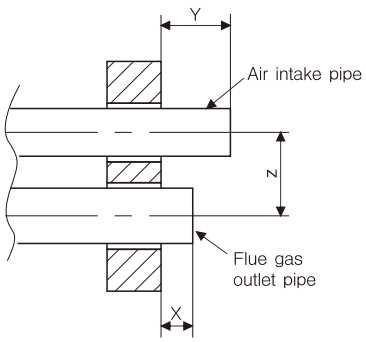
Model	Z
VW	115mm (4 ½ “)



3. Insert the air intake and flue gas outlet PVC pipe.

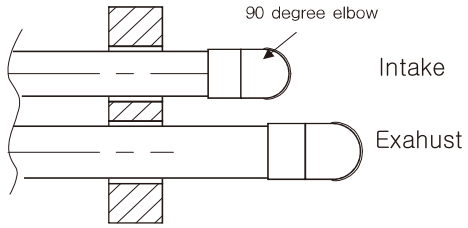
   The lenght of PVC pipe from the wall is as following

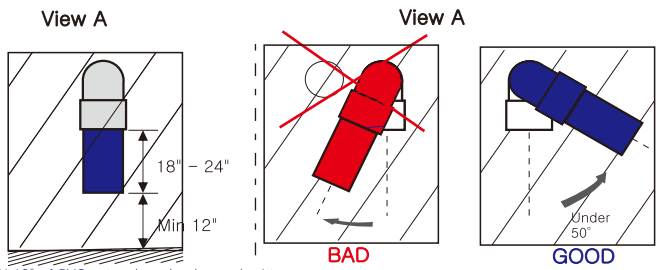
Model	X	Y
VW	50 ~ 60mm (2 ~ 2 3/8")	120 ~ 130mm (4 3/4" ~ 5 1/8")



4. Insert the 90˚ PVC elbow field supplied to the air intake pipe.
   The 90˚ PVC elbow must have a bird screen(field supplied)
   The 90˚ PVC elbow must face in downward position to prevent intake of water or snow

<Top view>





MIN 18˚ of PVC extension pipe is required to eliminate cross contamination .
MIN 12" of clearance from ground or as per local code requirements is required.

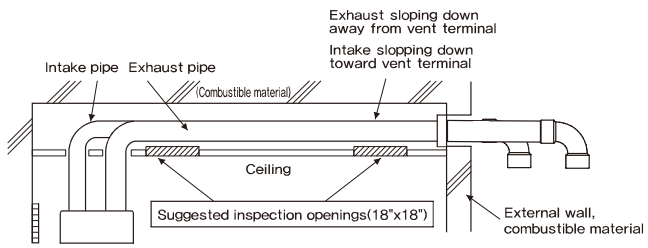
⚠ Warning

- **When using PVC elbows or fittings, please make sure to use silicon gel or PVC glue around the connecting area to prevent the exhaust gas or condensate leakage.**
- **Appliance 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 and/or the "Venting systems and air supply for water heaters" section of the latest version of the CAN/CGA B149.1 Natural Gas and Propane Installation Code in Canada, as well as all applicable local building codes and regulations.**

Vent Piping through an enclosed space

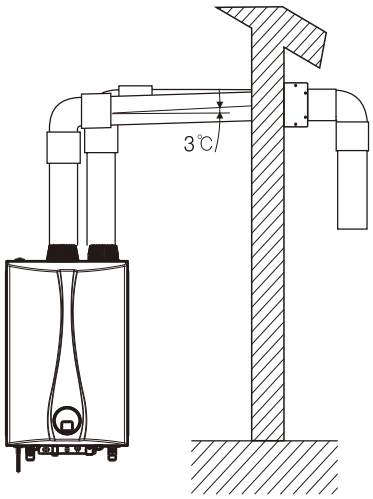
When the intake /exhaust pipes pass through an enclosed space:

- Inspection openings are suggested for the vent intake and exhaust pipes if they are installed in and enclosure. Those openings should be near the entrance and exit of the vent into the enclosure.



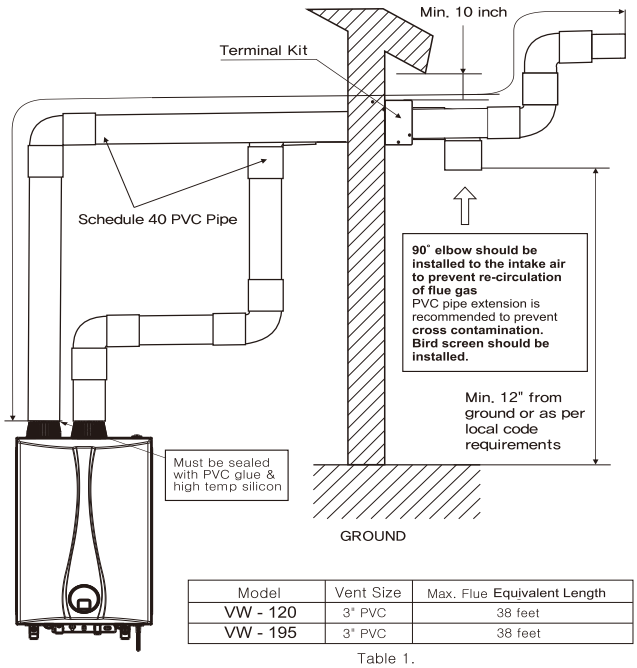
Other Venting Design(Single pipe venting)

- VW : 3" Schedule 40 PVC
- Maximum Three 90 ˚ Elbows.
  (Each 90˚ elbow is equivalent to 5ft linear vent pipe)
- Maximum Vent Length : See tabel 1 below.
- Sloping 1" in 10" - 1" in 12"



Other Venting Design(Snorkel flue)

- VW : 3" Schedule 40 PVC
- Maximum Three 90 ˚ Elbows.
  (One elbow is equal to 5ft length)
- Maximum Vent Length : See table 1 below.
- Sloping up 2 ~ 3˚

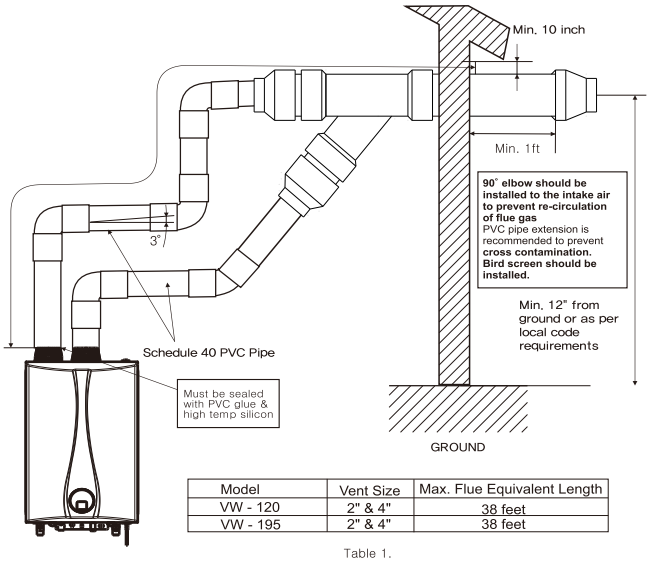


Model	Vent Size	Max. Flue Equivalent Length
VW - 120	3" PVC	38 feet
VW - 195	3" PVC	38 feet

Table 1.

Other Venting Design(Concentric Vent Termination)

- VW : 4" & 2" Concentric vent Schedule 40 PVC
- Maximum Three 90 ˚ Elbows.
  (One elbow is equal to 5ft length)
- Maximum Vent Length : 38ft Equivalent
- Sloping 1" in 10" - 1" in 12"

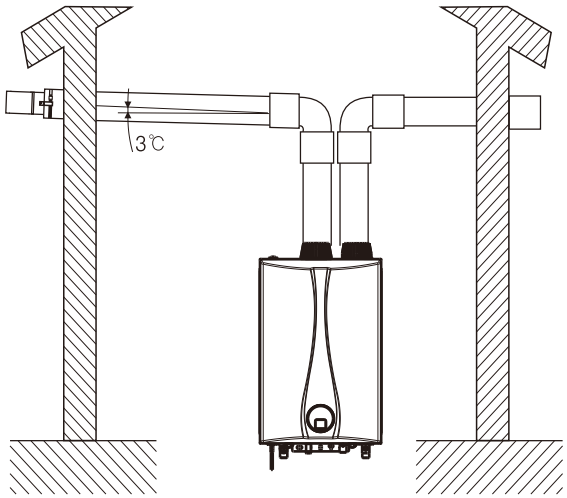


Model	Vent Size	Max. Flue Equivalent Length
VW - 120	2" & 4"	38 feet
VW - 195	2" & 4"	38 feet

Table 1.

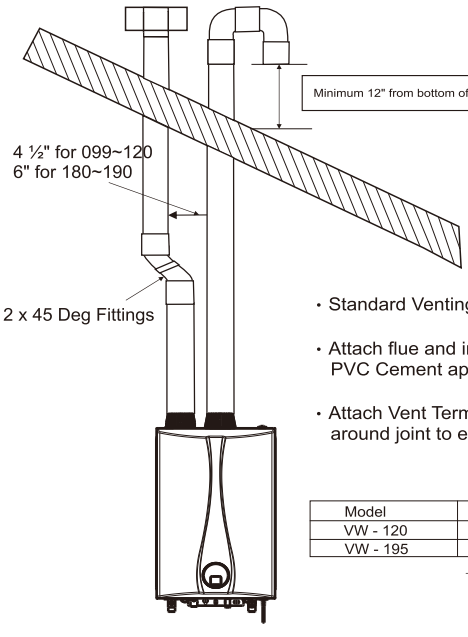
Other Venting Design(Side Wall)

- VW : 3" Schedule 40 PVC
- Maximum Three 90 ˚ Elbows.
  (One elbow is equal to 5ft length)
- Maximum Vent Length : See table below



Other Venting Design

- VW : 3" Schedule 40 PVC
- Maximum Three 90 ˚ Elbows.
  (One elbow is equal to 5ft length)
- Maximum Vent Length : See table 1 below.



VW Model

- Standard Venting rules apply
- Attach flue and intake pipes to unit with PVC Cement approved for this type of application.
- Attach Vent Termination to Flue Pipe and caulk around joint to ensure seal

Model	Vent Size	Max. Flue Equivalent Length
VW - 120	3" PVC	38 feet
VW - 195	3" PVC	38 feet

Table 1.

Venting Precautions

- Maximum vent lengh of VW - 120

Number of 90˚ elbows	Maximum straight pipe distance (Vertical and Horizontal)	Maximum total equivalent feet (meters) of vent pipe
1	40	38 (11.6 meters)
2	35	38 (11.6 meters)
3	30	38 (11.6 meters)

- Maximum vent lengh of VW - 195

Number of 90˚ elbows	Maximum straight pipe distance (Vertical and Horizontal)	Maximum total equivalent feet (meters) of vent pipe
1	32	38 (11.6 meters)
2	27	38 (11.6 meters)
3	22	38 (11.6 meters)

Each 90˚ elbow is equivalent to 5 feet in straight vent pipe length.
Each 45˚ elbow is equivalent to 1.5 feet(0.46m) in straight pipe length.

- Exceeding the maximum vent pipe through enclosed area. If necessary, consult the pipe manufacture's instructions for clearances.
- If possible, don't run the vent pipe through enclosed area. If necessary, consult the pipe manufacture's instructions for clearances.
- Do not store hazardous or flammable substances near the vent terminal.
- For VW models, slop the intake pipe at 1 on 10" or 1 in 12" down towards the termination and slop the exhaust pipe at 1 in 10" or 1 in 12" up towards the termination.
- Dry assemble, then glue vent pipe sections together per manufacturer's instructions using an approved adhesive/primer conforming to all local, state and national codes.
- Steam or condensed water may drip out of the vent terminal. Dispose of this condensed water according to local codes and in order to prevent injury or property damage.
- If this product will be installed in an area where snow is known to accumulate, protect the vent termination from blockage by snow drifts or damage from snow falling off of roofs.
- Support the vent pipe with hangers a 3ft intervals.

Removing a Water heater from a common vent system

- When removing an existing Water heater, the following steps must be followed

1. Seal any unused openings in the common venting system.
2. Visually inspect the venting system for proper size and horizontal pitch to determine if there is blockage, leakage, corrosion or other deficiencies that could cause an unsafe condition.
3. If practical, close all building doors, windows and all doors between the common venting system and other spaces in the building. Turn on clothes dryers and any Water heater not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhaust, at maximum speed. Do not operate a summer exhaust fan. Close all fireplace dampers.
4. Place in operation the Water heater being inspected. Follow the lighting instructions. Adjust the thermostat so the boiler will operate continuously.
5. Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle or smoke from a cigarette.
6. After it has been determined that each Water heater remaining connected to common venting system properly vents when tested as outlined, return doors, windows, exhaust fans, fireplace dampers and any other gas burning boiler to their previous condition of use.
7. Any improper operation of the common venting system should be corrected so the installation conforms to the National Fuel Gas Code, ANSI Z223.1. When resizing any portion of the common venting system, the common venting system should be resized to approach the minimum size as determined using the appropriate tables in Appendix G in the National Fuel Code, ANSI Z223.1.

6. Setting the DIP Switches

CAUTION

Do not remove the front cover unless the power to the boiler is turned off or disconnected. Failure to do so may result in electric shock.

pending on the application of the VW unit it may be necessary to alter the Dip Switch settings from the standard positions

The unit has 5 Dip Switches located on the Microprocessor

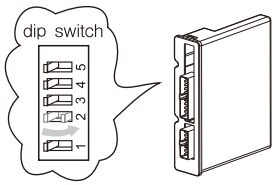
Dip Switch	Standard Setting	Controls
1	ON	Fuel Gas Type
2	OFF	Fuel Gas Type
3	OFF	Unit Options
4	OFF	Forced Maximum Firing rate
5	OFF	Forced Minimum Firing rate

Setting for Natural Gas Operation

Dip Switch	Setting for NG
1	ON
2	OFF

Setting for LP Gas Operation

Dip Switch	Setting for LP
1	OFF
2	ON



Use of cellular core PVC(ASTM F891), cellular core CPVC, or Radel(R)(polyphenysulfone) in nonmetallic venting systems is prohibited. Covering non-metallic vent pipe and fittings with thermal insulation is prohibited.

Unit Option

1. Switch Dip switch #3 to ON
2. On front panel press the “+” and “-” buttons simultaneously for 5 seconds. This will allow unit to enter the programming mode.
3. Temperature display can be changed between °F and °C by pressing the Timer button 3 times until Lc is display in the top RH corner of the unit display, and f is displayed in the center of the screen.
4. Press the Up temperature arrow and the °F will change to a °C
5. Hit the Power On/Off button to exit and switch Dip switch #3 to OFF, the unit will now display in °C

7. Connecting the Power Supply

WARNING

Improperly connecting the power supply can result in electrical shock and electrocution. Follow all applicable electrical codes of the local authority having jurisdiction. In the absence of such requirements, follow the latest edition of **the National Electrical Code (NFPA 70) in the USA or the latest edition of CSA C22.1 Canadian Electrical Code Part 1 in Canada**. Connecting the power supply should be performed only by a licensed professional.

When connecting the power supply, follow these guidelines:

- Do not connect the electric 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 so will damage the Water heater and void the warranty.
- All the VESTA VW Water heater come with a factory-installed, 3-pronged (grounded) plug. The Water heater can be plugged into any grounded electrical outlet nearby, as it requires only 2 Amps. It is not necessary to run a dedicated electrical line to the boiler.
- 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 end-user maintenance and servicing. Connect the Water heater to a 110-120V AC at 60 Hz with a maximum of 2A.
- The Water heater must be electrically grounded. If using the power plug, ensure that the electrical outlet you connect the Water heater to is properly grounded. If wiring the Water heater directly to a power supply, do not attach the ground wire to either the gas or the water piping as plastic pipe or dielectric unions may prevent proper grounding.
- We recommend using a surge protector to protect the Water heater from power surges.
- If there is a power failure in cold weather areas, the freeze prevention system in the Water heater will not operate and may result in freezing of the heat exchanger. In cold weather areas where power failures are common, you must completely drain the Water heater to prevent damage if the power will be off for any extended period of time. A battery back-up (available at most computer retailers) may be used to supply hot water during periods of power outages. Damage caused by freezing is not covered under warranty.

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.

8. Installation Check list

After installing the Water heater, review the following checklist. You should be able to answer “Yes” to all of the items in the checklist. If not, review the appropriate sections to complete the installation. To troubleshoot any operational problems refer to “Troubleshooting” in the User’s Manual.

If you have additional questions or need assistance with installation, contact Technical Support at 1-800-761-0053 or refer to the technical support section of VESTA’s website (www.vestahws.com).

Installing the Water heater	Yes	No
Have you maintained the required clearances from building openings and intake air vents?		
Have you minimized the distance between the Water heater and the vent termination?		
Have you minimized the distance between the Water heater and major fixtures?		
Have you maintained the proper service and maintenance clearances?		
Is the make-up air supply sufficient for proper operation?		
Is the make-up air supply free from dust, dirt, corrosive elements, and flammable vapors?		
Is the Water heater and vent piping clear of combustible materials, including clothing, cleaning materials, and rags?		

Connecting the Gas Supply	Yes	No
Does the gas supply match the type specified on the Water heater’s rating plate?		
Is the gas line at least 1/2 or 3/4 in ID (Inner Diameter)?		
Is the gas supply line sufficient in length and diameter to deliver the required BTUs?		
Have you measured the pressure of the gas supply line?		
Is the gas supply pressure within the recommended ranges specified in this manual?		
Is the gas supply line equipped with a manual shut-off valve?		
Have you tested the gas line pressure and all fittings for leaks?		
Has the gas company inspected the installation, if required?		

Connecting the Domestic Water Supply	Yes	No
Is the water supply pressure sufficient (greater than 40 psi)?		
Have you installed shut off valves on the inlet and outlet to facilitate cleaning of the inlet water filter?		
Have you bled the air out at each fixture?		
Have you checked each fixture to ensure hot water is being supplied?		
Have you cleaned the inlet water filter?		
If you installed a recirculation line, have you insulated the hot water pipes and the return line?		

Connecting a Pressure Relief Valve	Yes	No
Have you installed an approved pressure relief valve on the Water heater?		
Does the rating of the pressure relief valve match or exceed the maximum BTU rating of the Water heater?		
Is the pressure relief valve 3/4 in on the hot water outlet and 3/4 in at the pressure relief valve adapter?		
Have you installed the pressure relief valve on the hot water outlet pipe near the Water heater?		
Have you installed a discharge drain tube from the pressure relief valve to within 6-12 in (150-300 mm) of the floor?		

Connecting the Condensate Drain	Yes	No
Have you installed a condensate drain line from the Water heater to a drain or laundry tub?		

Venting the Water heater	Yes	No
Have you vented the Water heater with 3 in PVC, CPVC, Polypropylene, Type BH Special Gas Vent (ULC-S636) for Category IV Water heaters (Canada), or in accordance with all local codes and the guidelines in this manual?		
Have you ensured that ABS or PVC cellular core pipe has not been used as venting for the Water heater?		
Is the vent sloped upward toward the vent termination at a rate of 1/4 in per foot (2% grade)?		
Are all vent runs properly supported?		
Have you properly supported the vent termination?		
Have you properly sealed all air intake and exhaust joints, from the flue collar to the vent termination?		
Have you installed end caps on the exhaust and intake pipes?		
Have you checked the venting for leaks?		
Is the vent termination at least 12 in (300mm) above the exterior grade?		
Have you ensured that sufficient make-up air is available?		
Is the total vent length within the maximum vent length restriction?		

Connecting the Power Supply	Yes	No
Is the supplied voltage 110-120V AC?		
Is the Water heater plugged into a properly grounded outlet?		
If you have made a direct power supply connection, have you installed a power switch to facilitate end-user maintenance?		
Have you checked the polarity of the electrical connection?		

Operating the Water heater	Yes	No
Have you shown the owner how to clean the inlet water filter?		
Have you given the Installation Manual and User's Manual to the owner for future reference?		
Have you shown the owner how to shut off the gas in case of an emergency?		

9. Operating the Water heater

9.1 Turning the Water heater On or Off

1. To turn the Water heater on or off, press the Power button

When power is ON, the Water heater appear the ‘ ‘ mode and CH Temperature. If the Water heater is not operating for 30 seconds, “A6" Error will appear I on the Front panel.

2. Press the + (Up) or – (Down) buttons until the desired temperature appears on the display.

You can adjust the temperature while the display is blink for 5 seconds. Once the display stops flashing, the temperature setting is stored.

If don’t press the + (Up) or – (Down) buttons, appear the setting temperature value after blank for 5 seconds.

Temperature range	Adjusting the water temperature
86 ℉, 120-180 ℉ (Fahrenheit mode) 30 ℃, 50-80 ℃ (Celsius mode)	2 ℉ or 1 ℃ increments

9.2 Adjusting the CH(Space Heating) Temperature

9.2.1 Adjusting the Space Heating Temperature

To adjust the heating temperature:

1. Press the Mode button once. The ‘ ‘(space heating display) is blink for 5 seconds and appear the space Heating outlet temperature.

9.2.2 Adjusting the DHW (Domestic Hot Water) Temperature

WARNING

Before adjusting the water temperature, read “To prevent burns:” on page 6 carefully. Water above 120 ℉(52 ℃) can cause instant scalding, severe burns, or death.

To adjust the water temperature:

1. Press the Mode button. The ‘ ‘ (DHW display) is blink for 5 seconds and appear the DHW temperature.

2. Press + (Up) or – (Down) buttons until the desired temperature appears on the display.

You can adjust the temperature while the display is blink for 5 seconds. Once the display stops flashing, the temperature setting is stored.

If don’t press the + (Up) or – (Down) buttons, appear the setting temperature value after blank for 5 seconds.

Temperature range	Adjusting the water temperature
98-120 ℉ (Fahrenheit mode) 37-49 ℃ (Celsius mode)	2 ℉ or 1 ℃ increments
120-140 ℉ (Fahrenheit mode) 49-60 ℃ (Celsius mode)	Press for 2 seconds to adjust in 5 ℉ or 2 ℉ increments

9.3 Setting DHW Outlet Temperature mode

1. This mode is to see the DHW outlet temperature
2. Press the ‘MODE’ + ‘••••• ‘ button for 5 seconds.
   The ‘RPM ‘ (DHW outlet temperature) is blink.

3. Pressing the ‘MODE‘ button once more changed th ‘OUT‘ mode.
4. And DHW outlet temperature appearon the dispaly.

9.4 Setting FAN revolutions per minute (RPM)

1. This mode is to see FAN revolutions per minute.
2. Press the ‘MODE’ + ‘••••• ‘ button for 5 seconds.
   The ‘RPM ‘ (DHW outlet temperature) is blink.
3. And FAN revolutions per minute (RPM) on the display

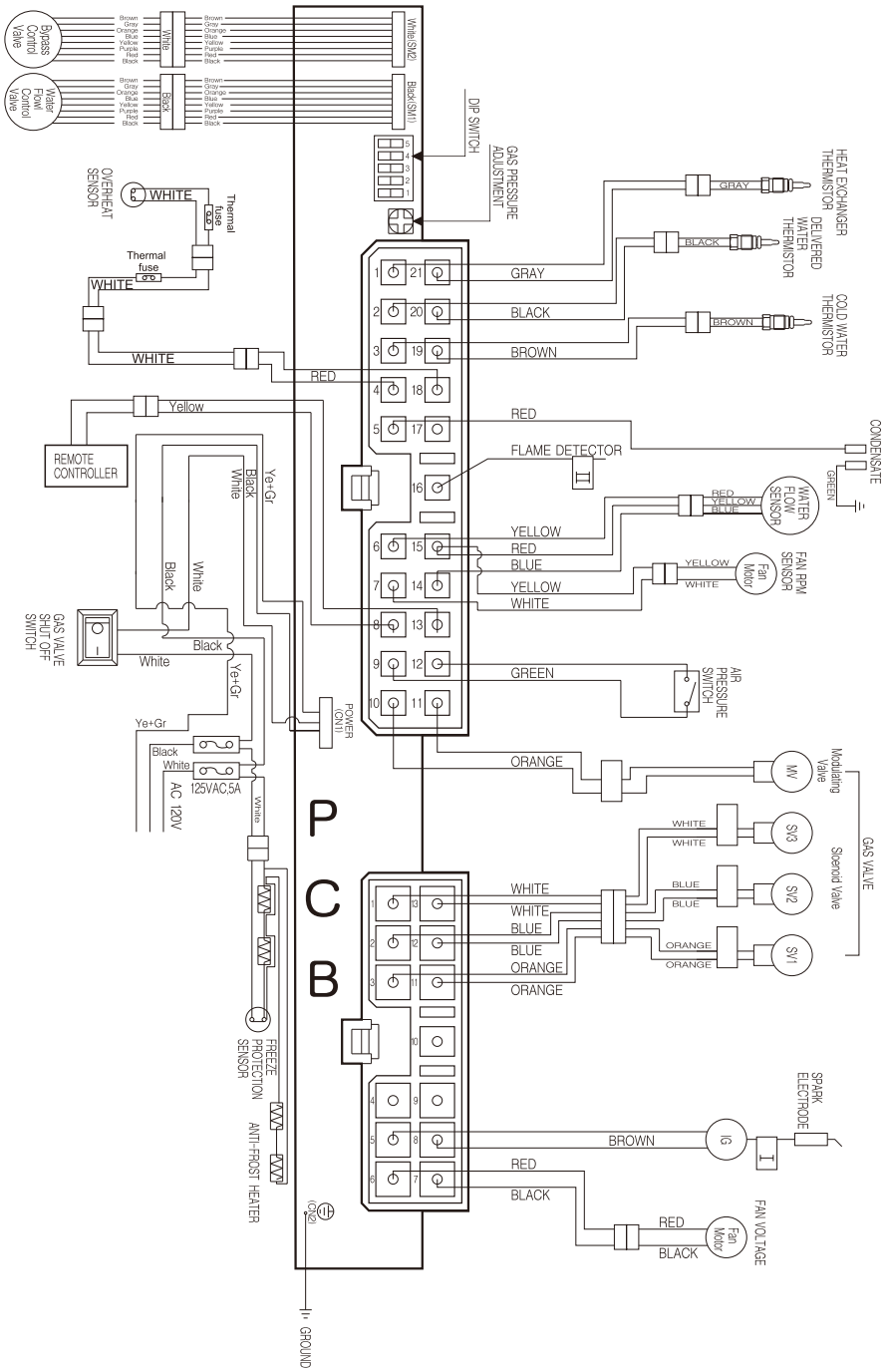
9.5 Check the Hmode value

1. This mode is to check Hmode value
2. You can check Hmode state, Press the ‘MODE’ + ‘••••• ‘ button for 5 seconds.
3. Pressing the ‘MODE‘ button check the Hmode value in regular sequence

Display	Description	Division	
H0	Fan output data	BYTE	0
H1	Gasvalve output data	BYTE	1
H2	FAN revolution	BYTE	2
H3	Flow meter revolution data	BYTE	3
H4	Program version number	BYTE	4
H5	Check the Error gistory	BYTE	5
H6	Multiple Error Code	BYTE	6
H7	Input Sstatus Code	BYTE	7

10. Appendixes

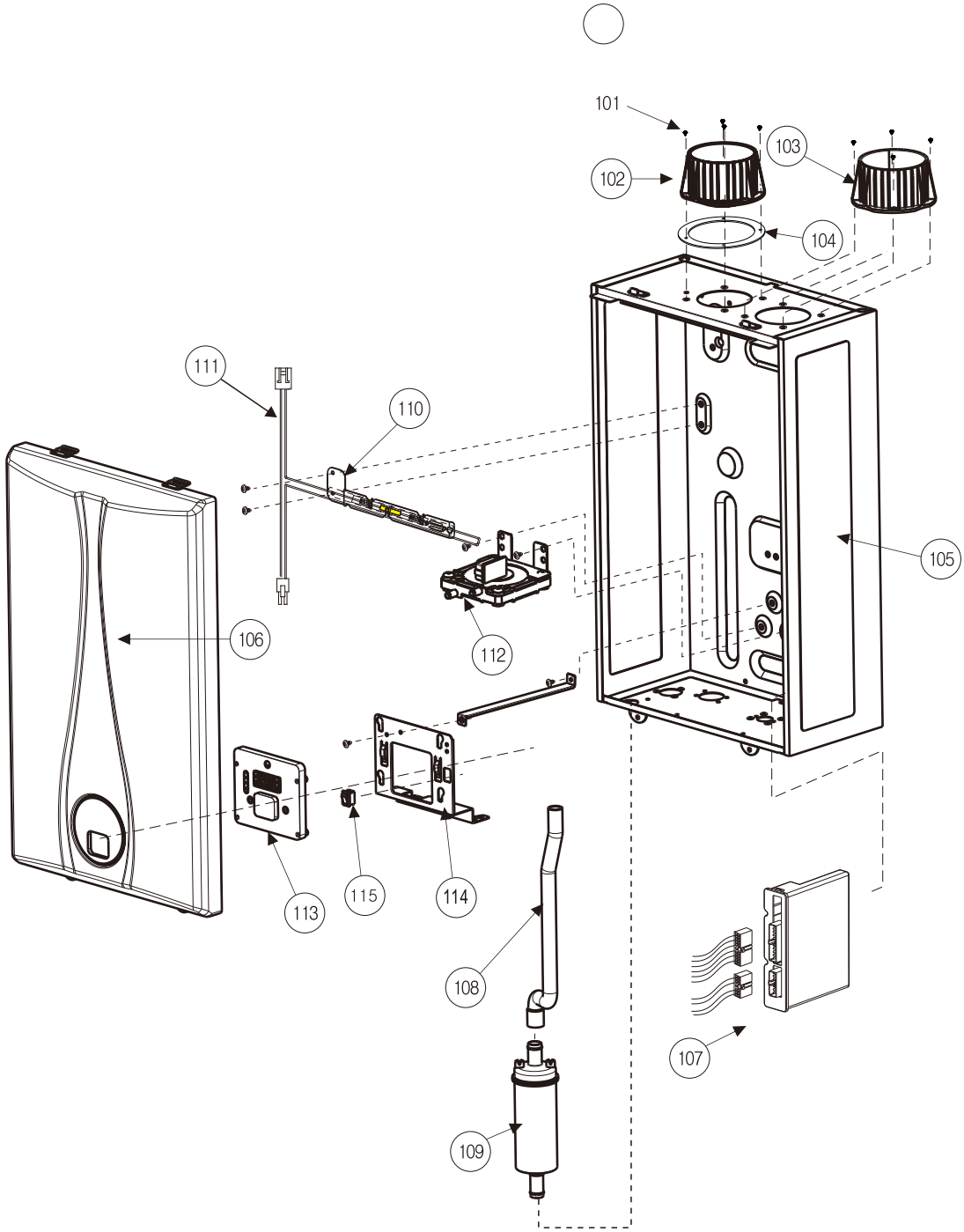
10.1 Wiring Diagram



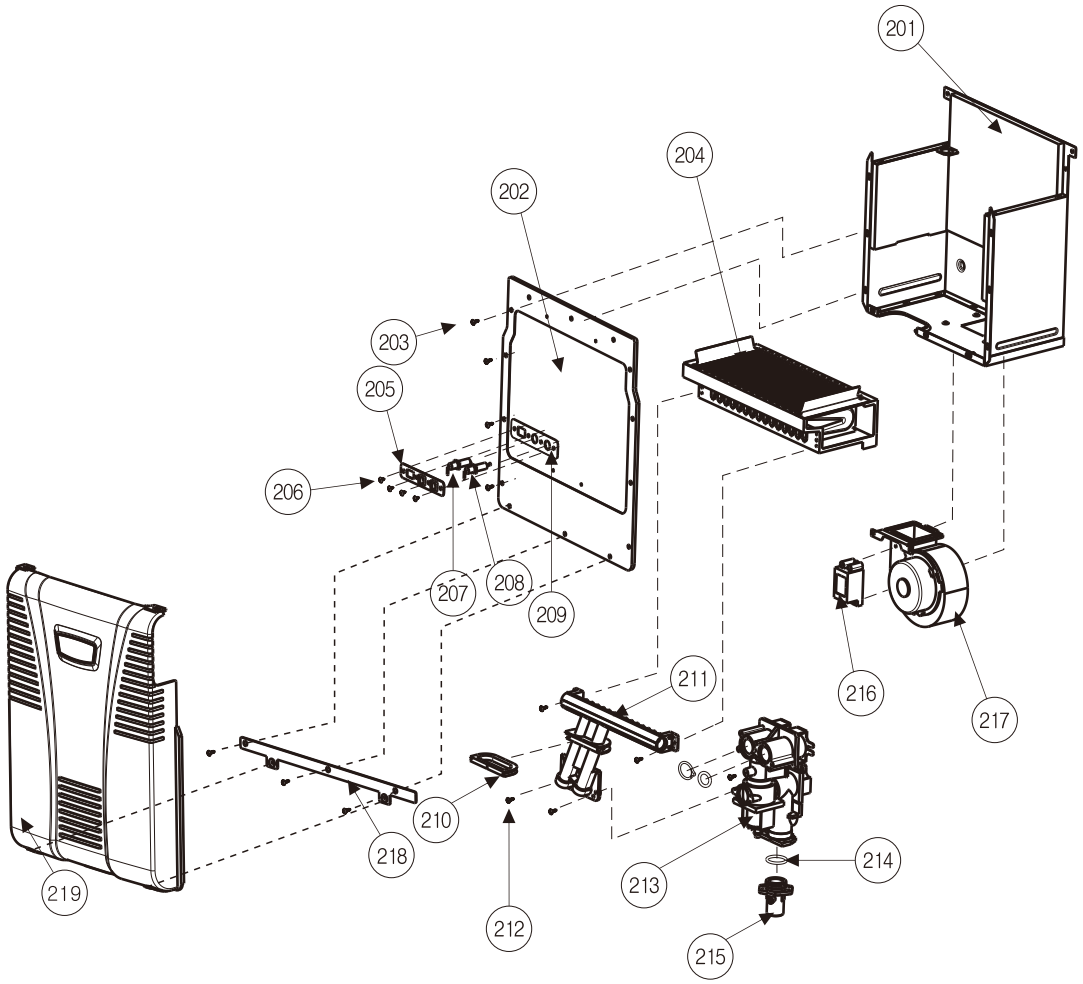
If any of the original wire as supplied the Water heater must be replaced, they must be replaced their equivalent.

10.2 Component Assembly Diagrams and Parts Lists [VW -120 Model]

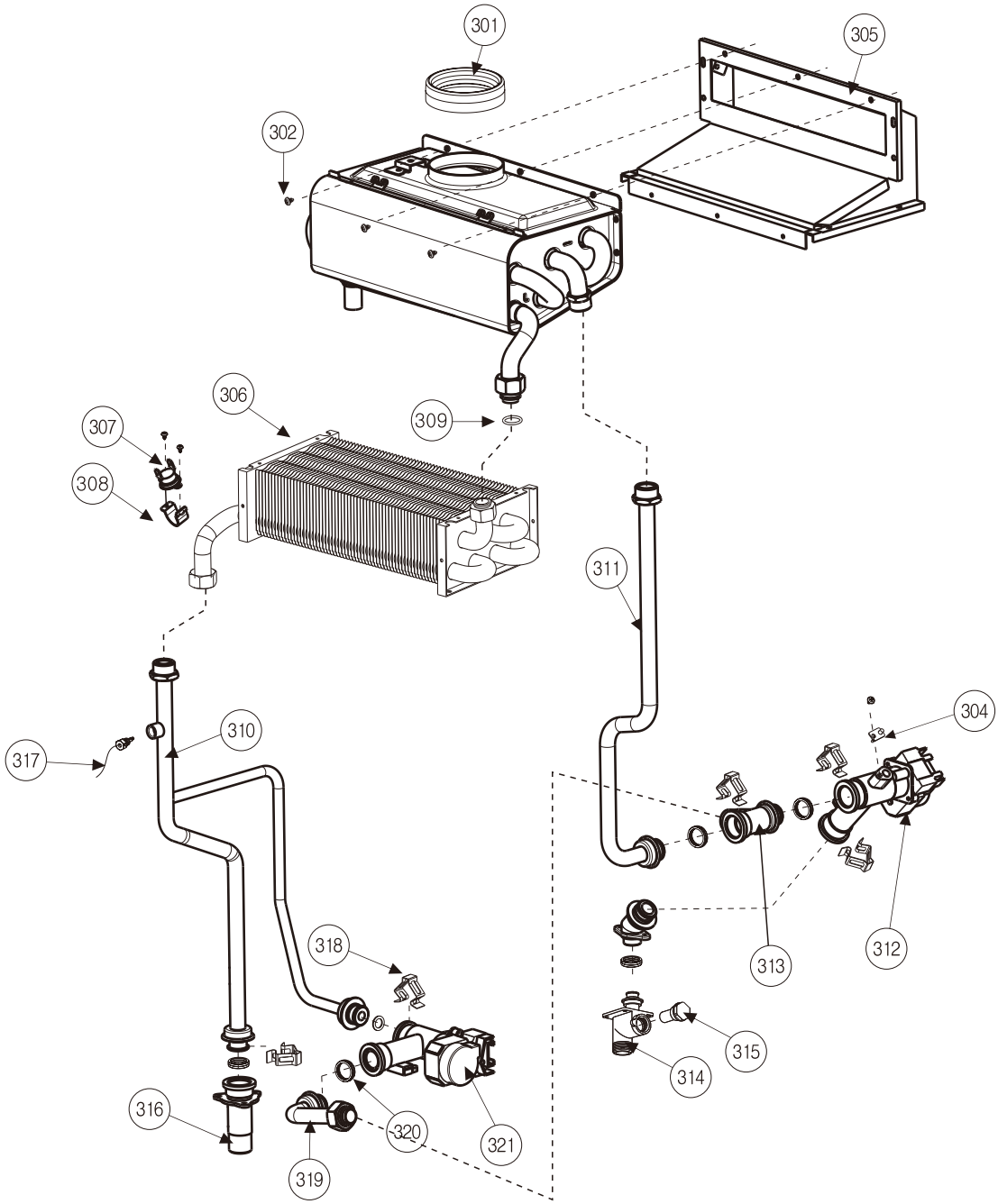
10.2.1 Case Assembly



10.2.2 Burner Assembly



10.2.3 Waterway Assembly



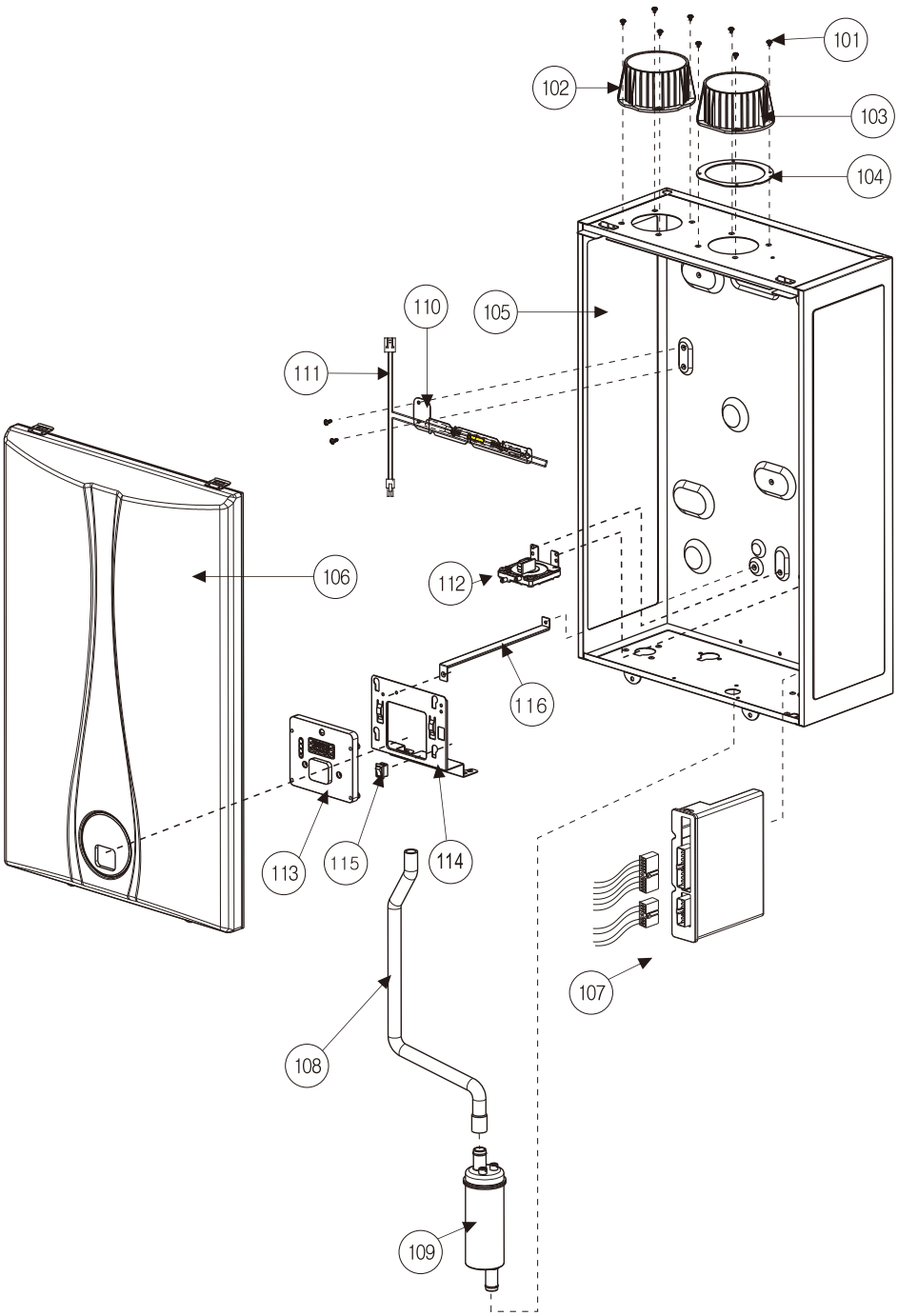
Part List

No	Part No	Part Name
101	3100132	4×12 tapping screw(STS)
102	3040379	Exhaust
103	3040378	Intake
104	3090257	Exhaust sealing packing
105	2070657	Chassis assembly
106	2010571	Case assembly
107	2081090	PCB Box assembly
108	3080257	Condensate outlet hose
109	2060365	Condensate trap assembly
110	3011566	Thermal Fuse Braket
111	2081089	Thermal Fuse
112	2100280	Air pressure switch
113	2081091	Front Panel
114	3011564	Front Panel Bracket
115	2080736	Emergency switch
201	2010520	Combustion chamber surround assembly
202	2010589	Combustion chamber front plate assembly
203	3100051	4×10 tapping screw
204	3010834	Burner assembly
205	3011107	Spark plug bracket
206	3100121	4×8 tapping screw(STS 410)
207	2020405	Spark plug
208	2020361	Flames sensing rod
209	3011107	Spark plug bracket gasket
210	3080150	Manifolder sealing packing
211	2020355	Manifolder assembly(LNG)
212	3100132	4×12 tapping screw(STS)

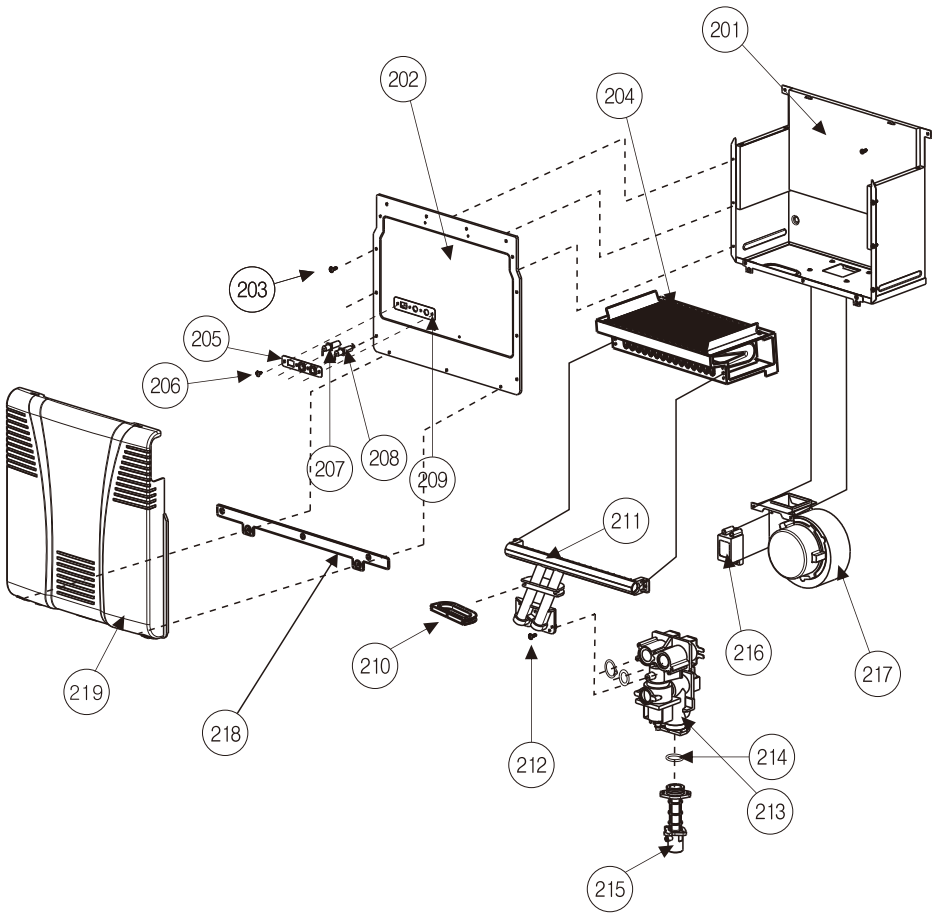
No	Part No	Part Name
213	2030278	Gas valve(UP - 34-42)
214	3080115	Gas valve O-ring
215	3050092	Gas inlet connection nipple
216	208030S	Gas inlet connection nipple
217	2100320	Ignitor + wire
218	3011559	Deco plate Braket
219	3011053	Mask
301	3080175	Sealing packing
302	3100121	4×8 tapping screw(STS)
303	2130511	Latent heat exchanger assembly
304	3130380A	Cold water inlet temperature sensor
305	2130052	Duct assembly
306	2070447	Sensible heat exchanger assembly
307	2080538	Overheat thermostat
308	3010933	Overheat thermostat bracket
309	3080103	P14 O-ring
310	2090895	Hot water outlet pipe
311	2090894	Cold water outlet pipe
312	2061302	Flow rate control valve
313	3030192	T-socket
314	3030246	Inlet Nipple
315	3120136	Inlet Nipple Filter
316	3030207	Hot water connection nipple (3/4")
317	3130378A	Hot water temperature sensor
318	3011010	Joint clip
319	2090896	By-pass pipe
320	3080142	Back up ring (P16)
321	2060263	By-pass control valve

10.3 Component Assembly Diagrams and Parts Lists [VW - 195 Model]

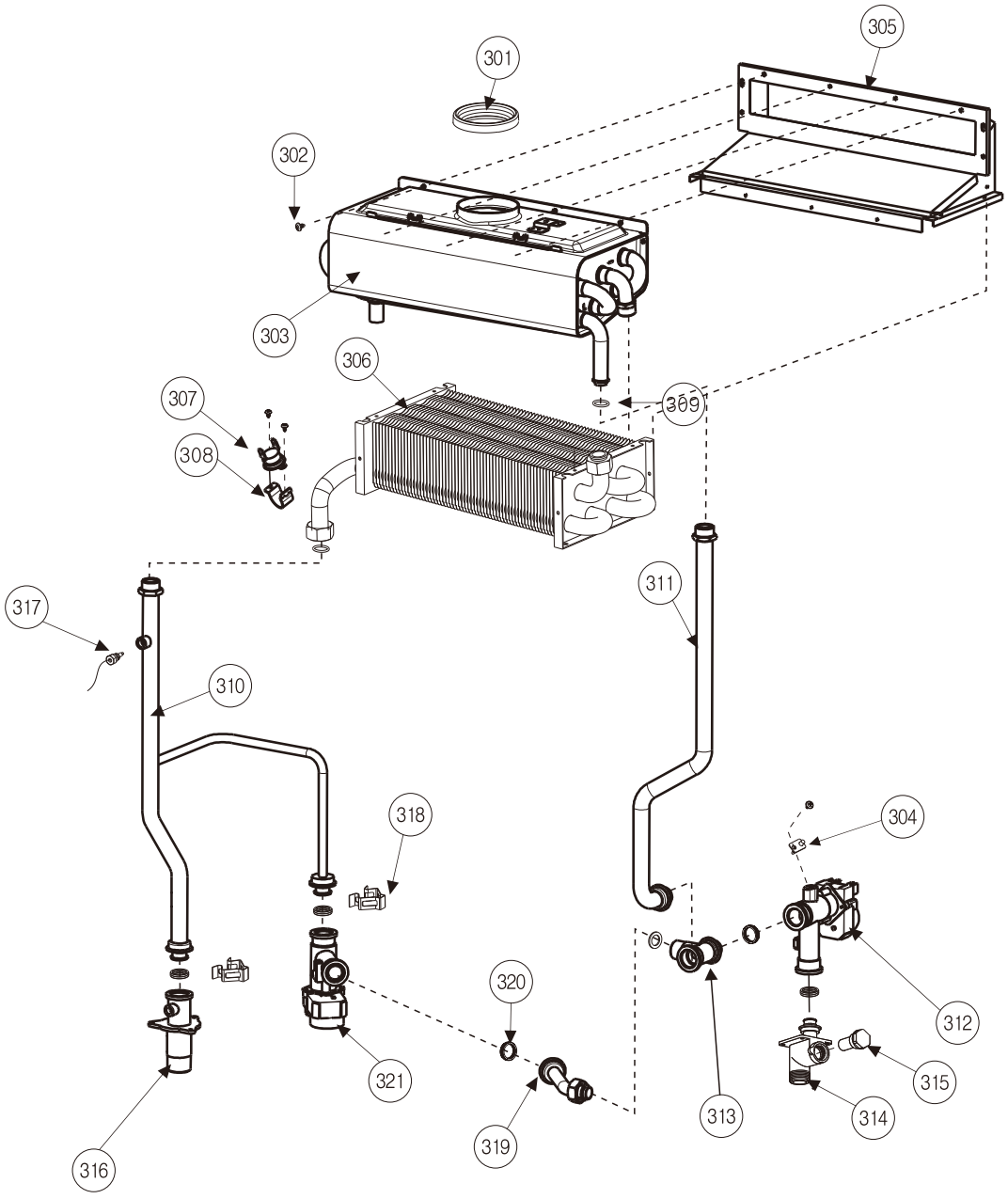
10.3.1 Case Assembly



10.3.2 Burner Assembly



10.3.3 Water Line Assembly



Part List

No	Part No	Part Name
101	3100132	4×12 tapping screw(STS)
102	3040379	Exhaust
103	3040378	Intake
104	3090257	Exhaust sealing packing
105	2070657	Chassis assembly
106	2010571	Case assembly
107	2081090	PCB Box assembly
108	3080257	Condensate outlet hose
109	2060365	Condensate trap assembly
110	3011566	Thermal Fuse Braket
111	2081089	Thermal Fuse
112	2100280	Air pressure switch
113	2081091	Front Panel
114	3011564	Front Panel Bracket
115	2080736	Emergency switch
201	2010520	Combustion chamber surround assembly
202	2010589	Combustion chamber front plate assembly
203	3100051	4×10 tapping screw
204	3010834	Burner assembly
205	3011107	Spark plug bracket
206	3100121	4×8 tapping screw(STS 410)
207	2020405	Spark plug
208	2020361	Flames sensing rod
209	3011107	Spark plug bracket gasket
210	3080150	Manifolder sealing packing
211	2020355	Manifolder assembly(LNG)
212	3100132	4×12 tapping screw(STS)

No	Part No	Part Name
213	2030278	Gas valve(UP - 34-42)
214	3080115	Gas valve O-ring
215	3050092	Gas inlet connection nipple
216	208030S	Gas inlet connection nipple
217	2100320	Ignitor + wire
218	3011559	Deco plate Braket
219	3011053	Mask
301	3080175	Sealing packing
302	3100121	4×8 tapping screw(STS)
303	2130511	Latent heat exchanger assembly
304	3130380A	Cold water inlet temperature sensor
305	2130052	Duct assembly
306	2070447	Sensible heat exchanger assembly
307	2080538	Overheat thermostat
308	3010933	Overheat thermostat bracket
309	3080103	P14 O-ring
310	2090895	Hot water outlet pipe
311	2090894	Cold water outlet pipe
312	2061302	Flow rate control valve
313	3030192	T-socket
314	3030246	Inlet Nipple
315	3120136	Inlet Nipple Filter
316	3030208	Hot water connection nipple (3/4")
317	3130378A	Hot water temperature sensor
318	3011010	Joint clip
319	2090896	By-pass pipe
320	3080142	Back up ring (P16)
321	2060263	By-pass control valve

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Installation Manual

Version: 1.0 (May 30, 2016)

Getting Service

If your VW Water heater requires service, you have several options for getting service:

- Contact Technical Support at 1-800-761-0053 or on the website: www.vestahws.com
  For warrantyservice, always contact Technical Support first.
- Contact the technician or professional who installed your Water heater.
- Contact a licensed professional for the affected system (for example, a plumber or electrician).

When you contact Technical Support, please have the following information at hand:

- Model number
- Serial number
- Date purchased
- Installation location and type
- Error code, if any appears on the front panel display.