Onsen

Gas Water Heater

ONHW26NG50

ONHW26LP50

ONHW26NG60

ONHW26LP60

ONHW30NG60

Installation and Operating Manual

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Important Notes

Dear Customer

Thank you for choosing our product. This appliance is easy to use; however please read this handbook carefully before operatingit. Herein, you will find the correct method of installation and tips for best use and maintenance of the product.

- This appliance is designed to be easy for an adult to use at home. Children should be supervised to ensure they do not play with the appliance.
- Not suitable for use in mobile homes.
- This appliance must be connected in accordance with current water, gas, and electrical regulations. A fixed wiring installation is to be done only by an authorised electrician. Improper installation, adjustment, service, or maintenance can cause death, personal injury, or property damage.
- Authorised personnel must perform all subsequent adjustments or repairs that may be necessary after installation with appropriate level of care and attention.
- Failure to install and vent the hot water heater properly will result in fire, explosion, or carbon monoxide poisoning. ***NEVER*** operate the appliance unless it is properly vented and has air supply piping properly installed and terminated to outdoor.
- Follow the manufacturer's instructions and all local regulations for clearances required from appliance to combustible constructions / materials.
- DO NOT MODIFY THIS APPLIANCE.
- DO NOT SPRAY AEROSOLS IN THE VICINITY OF THIS APPLIANCE WHILE IT IS IN OPERATION.
- DO NOT USE OR STORE FLAMMABLE MATERIALS IN OR NEAR THIS APPLIANCE.
- This appliance MUST NOT be used as a domestic spa or swimming pool heater.
- This appliance has a main burner flame which can come on at any time. Ensure the area is clear of flammable vapours to avoid unexpected fire or explosions.
- Moisture in flue gas may condense while leaving the vent terminals. In cold weather the condensation may freeze on the exterior wall, under eaves, and surrounding objects. Some discolouration to building exterior walls is to be expected, however, improper installation location may lead to severe damage to building structures or exterior finishes.
- Prior to connecting the appliance, please ensure that the rating label data corresponds to the water, gas, and electrical mains rating as described in "Technical Data"
- DO NOT PLACE ARTICLES ON OR AGAINST THIS APPLIANCE.
- For any repairs, always contact authorised Customer Service Centre and insist on original spare parts. Repairs by untrained people may lead to damage and void the warranty.

Installation Instructions

This appliance shall be installed by authorised personnel in accordance to the manufacturer's instructions and current local electrical, gas, and water regulations.
This appliance must be installed in accordance with:

- AS/NZS 3000 – Electrical Installations (Wiring Rules)
- AS/NZS 3500.4 – Plumbing and Drainage (Heater Water Services)
- AS/NZS 5601 – Gas Installations (for Australia)
- Local building, water, and gas fitting regulations
- Local regulations and municipal building codes including local OH&S requirements

Installation Environment

This hot water heater is designed for **OUTDOOR** installation only.
The hot water heater must be installed in a position where it is above ground, in open air with natural ventilation, where, in the case of gas leakage or product combustion, gas can be released and dispersed rapidly by ventilation or convection.

The unit must be mounted vertically with the water and gas connections on the underside pointing downwards.
For appliances installed on elevated structures or under floors specific requirements must be adhered to.
Refer to AS/NZS 5601 Section 6 for more information.
The appliance flue terminal must be located in accordance to Section 6 and Figure 6.2 of AS/NZS 5601. The requirements are reproduced and shown on page 7, Figure 4.

Note:References to AS/NZS 5601 are current at the time of printing but it is the installer's responsibility to ensure any subsequent changes in regulations are adhered with in full.

The appliance must be installed close to the most frequently used hot water outlet to minimise delay time for hot water delivery. Alternatively, it is possible to strategically install multiple units to provide hot water for several outlets with minimal delay time. Contact the authorised Customer Service Centre for further information.

The unit must be installed adjacent to a 240Vac, 10Amp, earthed, power point. For outdoor installations, the power point must be weather proof. This power point must not be in the way of flue exhaust, water pressure relief valve, or gas & water connections to the appliance.
The length of the appliance power cord is 1.5m.

The installed hot water heater must be easily accessible for inspection, servicing, or operational purposes. Sufficient clearances are needed to allow access to, or removal of, all serviceable components.

The unit should not be mounted higher than 2.5m above ground or floor level unless the customer can arrange permanent and safe access to the unit.

The water heater should not be installed near an air supply containing halogenated hydrocarbons where contaminants can be intermixed with non-polluted air supplying the combustion process. The air containing

halogenated hydrocarbons is safe for human breathing, however when passing through a gas flame, corrosive elements are released and will shorten the operating life of the gas appliance.

Warranty is void when failure is due to operation of the appliance in corrosive conditions.

Warning!

- Ensure that the gas supply is as stated in product data label, i.e. natural gas or LP gas. Power connection and product installation must be in accordance with manufacturer's instruction & local regulations.
- Installation must only be carried out by authorised or qualified personnel.
- The hot water heater is an outdoor unit, and **MUST NOT** be installed indoors.
- The unit must be installed in a location where it is easy accessible for maintenance and repair.
- Power plug and socket installation area should be considered waterproof or free from rain splash.
- There must be no electrical wiring and electrical appliances on top of the water heater. Distance between the water heater and electrical appliances should be more than 500mm horizontally.
- Distance between water heater and the flammables should be no less than 150mm. The explosive and volatile flammables, such as gasoline, diesel, alcohol etc must be kept far away from the water heater.
- The water heater should not be installed in a location where it can be adversely impacted by wind.
- If the installation location is made of flammable material, metallic heat insulation should be applied. The distance between metallic insulation and wall should be more than 10mm and size of the insulation should be 100mm larger than the gas water heater.
- Power supply for the water heater is 240Vac, 50Hz. The power point must be reliably earthed.
- Power socket should be at located to the side of the water heater, and NEVER to be under the unit.
- The appliance is controlled by intelligent programmed electronic chips. Electromagnetic interference should be kept at a safe distance from the product.
- Make sure the hot and cold water connections are NOT reversed; the water heater will not operate with reversed water connections.

The manufacture shall not be liable for any direct or indirect damage caused by faulty installation. The installer must ensure that the product installation and connections comply will all regulations in your Country.

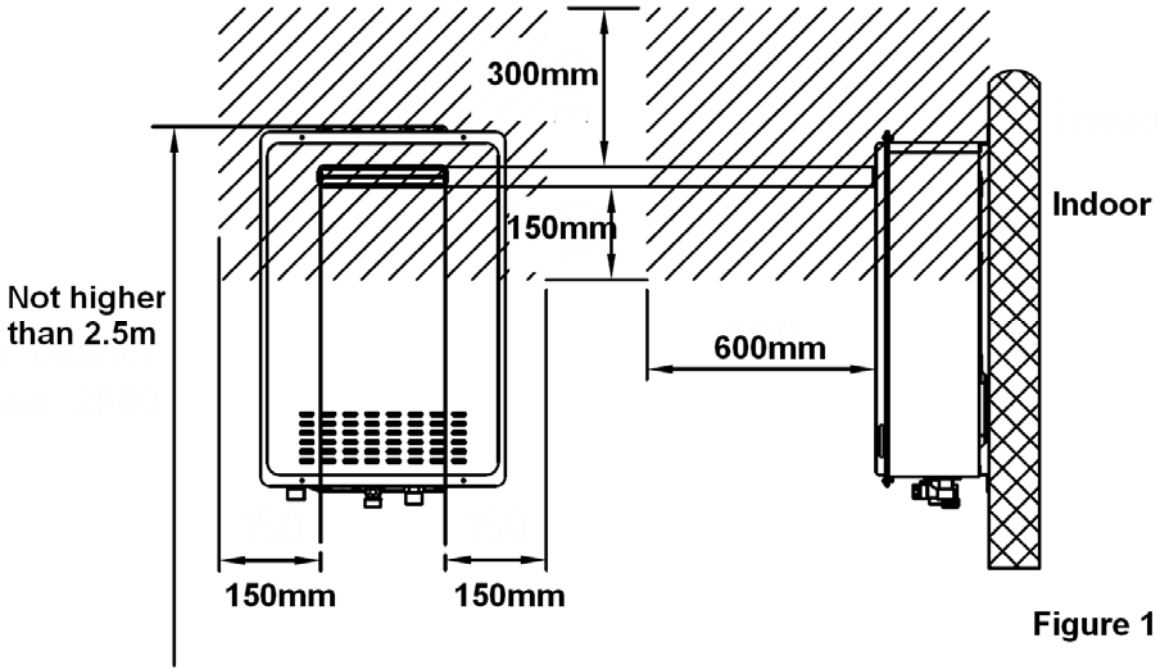


Figure 1

The gas hot water heater must be installed in a location with good ventilation. However, there must be no window or opening holes 600mm in front, 300mm above, 150mm left and/or right, and 150mm lower than the unit's venting holes to avoid flow of combustion exhaust entering the dwelling. The previously mentioned restricted zones are shown as shadow in Figure 1.

Warning!

- Do not install the unit at location subject to vibrations.
- Do not install the unit in a recreational vehicle, mobile home, boat or other watercraft.
- Do not install the unit near vents for heating and cooling without a minimum clearance of 1.2m.

According to AS/NZS 3500, water supplied to areas used primarily for personal hygiene is limited to a maximum of 50°C. If the appliance is pre-set at the factory to deliver water not exceeding 50°C, local regulation may permit its installation without a temperature limiting device. Installation without a temperature limiting device is shown in Figure 2. Contact the local authorities to check if there is an uncertainty.

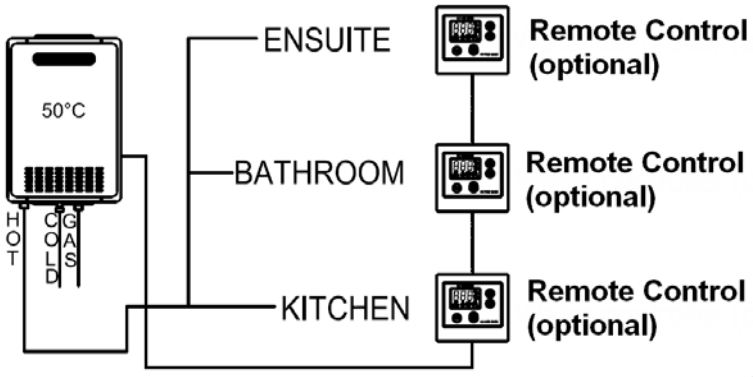


Figure 2

Minimum pipe length from unit hot water outlet to nearest hot water discharge point is 2m

Table 1 shows the gas consumption for each model. Gas pipe size is important must be properly sized in order to gain the full performance of the hot water heater. An approved pipe size chart such as the model shown in AS/NZS 5601 should be considered.

Water pipe size and layout should be in accordance with AS/NZS 3500.4. All hot water pipe work should be insulated for optimal performance and energy efficiency. Water heater and water lines should be protected from exposure to freezing temperatures – see Figure 3.

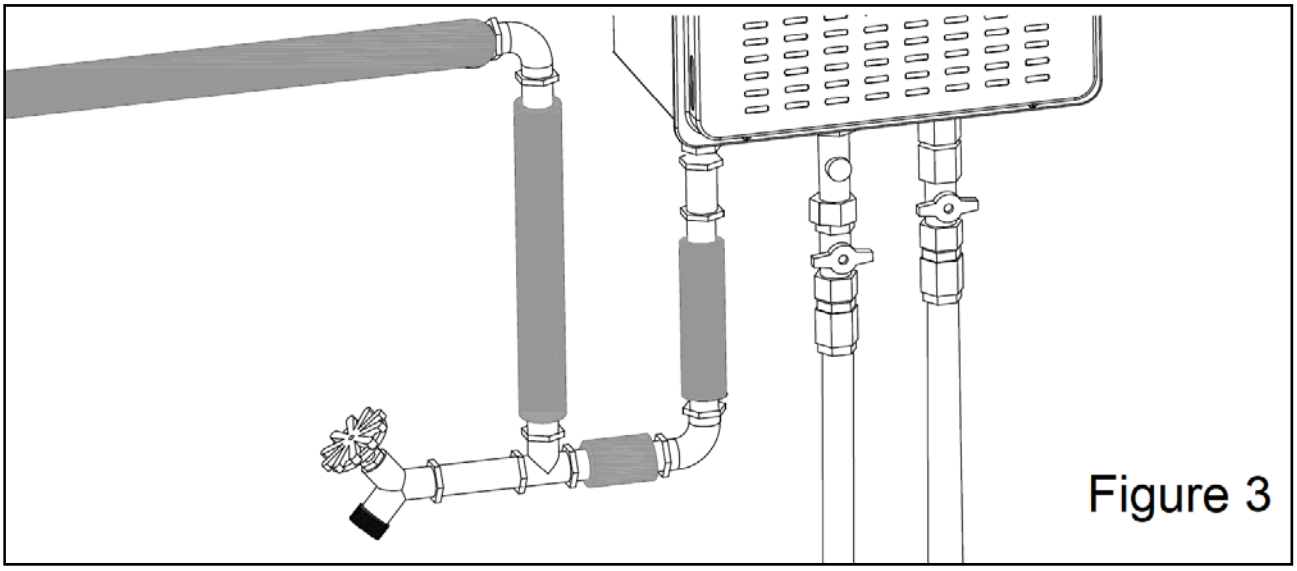
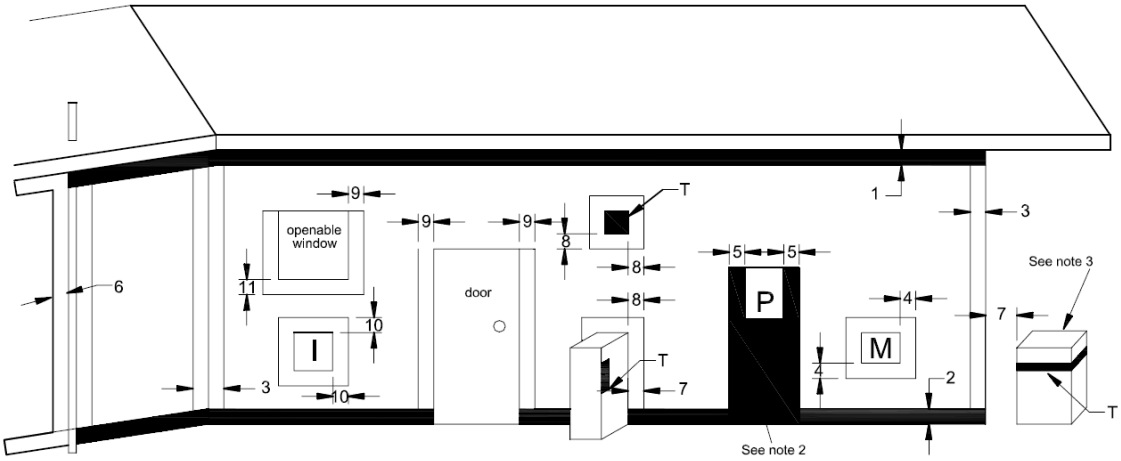


Figure 3

Model Number	Gas Consumption (MJ/hr)	Water Supply Pressure (kPa)		Weight (kg)	Fittings			
		Min.	Max.		Hot	Cold	Gas	Condensate
ONHW26NG50 /ONHW26LP50 / ONHW26NG60 / ONHW26LP60	205	20	1000	19.3	R ¾	R ¾	R ¾	-
ONHW30NG60	235	20	1000	21.4	R ¾	R ¾	R ¾	-

Table 1



T=Flue terminal
M=Gas meter
Shading indicates prohibited areas for flue terminats

P=Eletricity meter or fuse box
I=Mechanical air inlet

Figure 4

Ref	Item	Min Clearance (Fan assisted) (mm)
1	Below eaves, balconies and other projections :	
	- Appliances up to 50MJ/hr input	200
	- Appliances over 50MJ/hr input	300
2	From the ground, above a balcony or other surface*	300
3	From a return wall or external corner*	300
4	From a gas meter (M) see AS/NZS 5601 Cl.5.11.5.9 for vent terminal location of regulator see AS/NZS 5601 Table 6.7 for New Zealand requirements	1000
5	From an electricity meter or fuse box (P) ^	500
6	From a drain pipe or soil pipe	75
7	Horizontally from any building structure* or obstruction facing a terminal	500
8	From any other flue terminal, cowl, or combustion air intake*	300
9	Horizontally from an openable window, door, non-mechanical air inlet, or any other opening into a building with the exception of sub-floor ventilation :	
	- Appliances up to 150MJ/hr input*	300
	- Appliances over 150MJ/hr input up to 200MJ/hr input*	300
	- Appliances over 200MJ/hr input up to 250MJ/hr input*	500
	- Appliances over to 250MJ/hr input*	1500
	- All fan-assisted appliances, in the direction of discharge	1500
10	From a mechanical air inlet, including a spa blower	1000
11	Vertically below an openable window, non-mechanical air inlet, or any other opening into a building with the exception of sub-floor ventilation :	
	- For space heaters up to 50MJ/hr input	150
	- For other appliances up to 50MJ/hr input	500
	- For appliances over 50MJ/hr input and up to 150MJ/hr input	1000
	- For appliances over 150MJ/hr input	1500

*unless appliance is certified for closer installation

^ prohibited area below electricity meter or fuse box extends to ground level

NOTES:

- Where dimensions 3, 9 or 10 cannot be achieved an equivalent horizontal distance measured diagonally from the nearest discharge point of the terminal to the opening may be deemed bythe Technical Regulator to comply.
- See AS/NZS 5601 Cl 6.9.4 for restrictions on a flue terminal under a covered area.
- See AS/NZS 5601 Figure J3 for minimum clearances required from a flue terminal to an LP Gas cylinder. Aflue terminal is considered to be a source of ignition.
- For minimum clearances not addressed above acceptance should be obtained from theTechnical Regulator.
- Minimum clearances 4 and 5 also apply to any combustion air intake openings of appliances.

Product Accessories

The hot water heater comes with the accessories listed below. Please verify the accessories have been supplied before installation.

Parts		Quantity	Remark
• Installation & Operating manual		1	Keep it properly for future reference
• Expandable screw		1	Water heater installation
• Wall anchor		6	Water heater installation
• Mounting screw		4	Water heater installation
• Remote Control (Optional)		1	Models with remote control
• Remote control cable (Optional)		1	Remote control installation
• Screw (Optional)		2	Remote control installation

Typical Installation of Outdoor Hot Water Heater (No Venting Required)

Note:ONSEN hot water heater is for outdoor installation ONLY

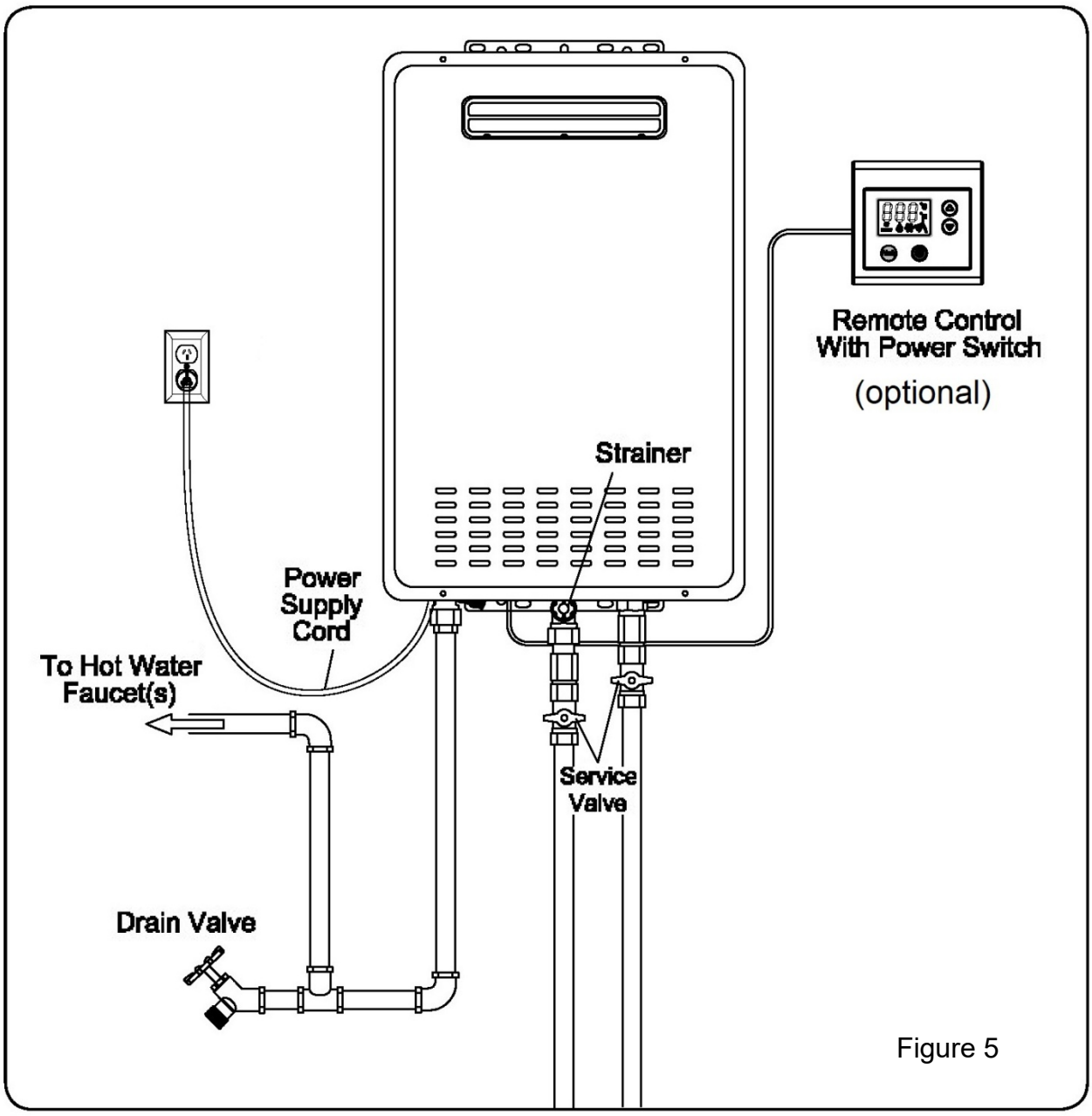


Figure 5

Installation (Hot Water Heater)

Wall reinforcement is required when the wall is not strong enough to hold the water heater. Failure to do so could result in personal injury and / or property damage.

The water heater should be installed in a position where it is easy to access and operate.

The water heater is designed to be installed either inside the wall cavity between wall studs or outside wall cavity.

Make sure a properly earthed power outlet (240Vac / 50Hz) is available beside the unit. The hot water heater comes with a 1.5m length power cord – see Figure 6.

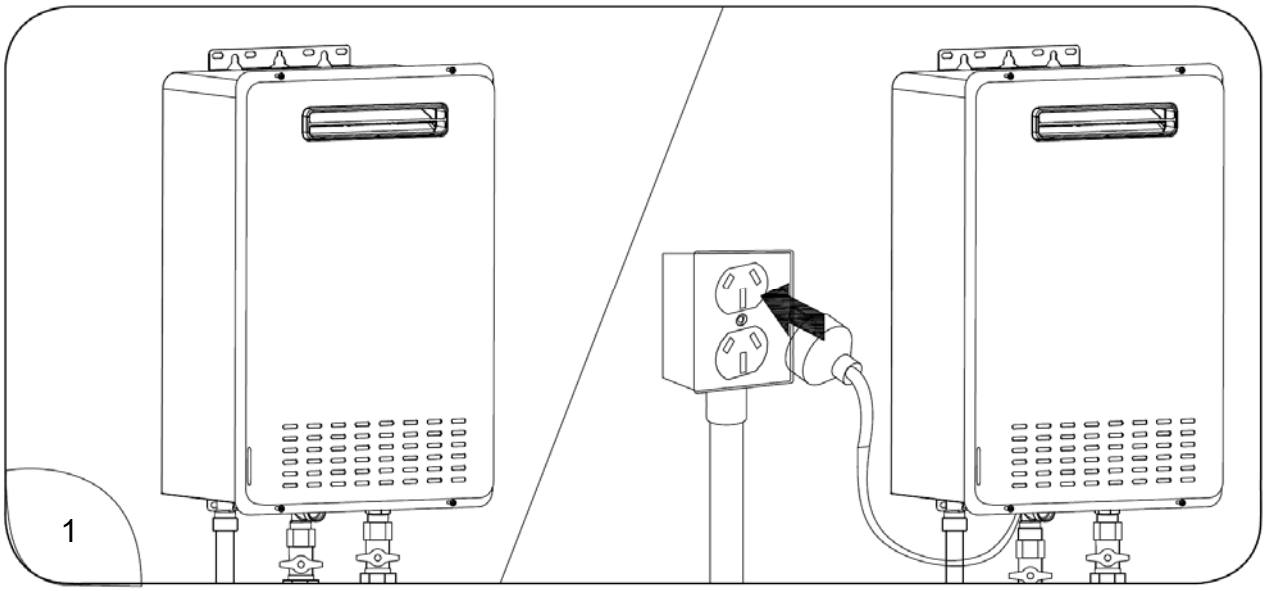


Figure 6

Position the upper mounting bracket and partially screw the expandable screw in place. The clearance between the screw head and the wall should be about 3mm. Hang the upper bracket onto the screw – see Figure 7.

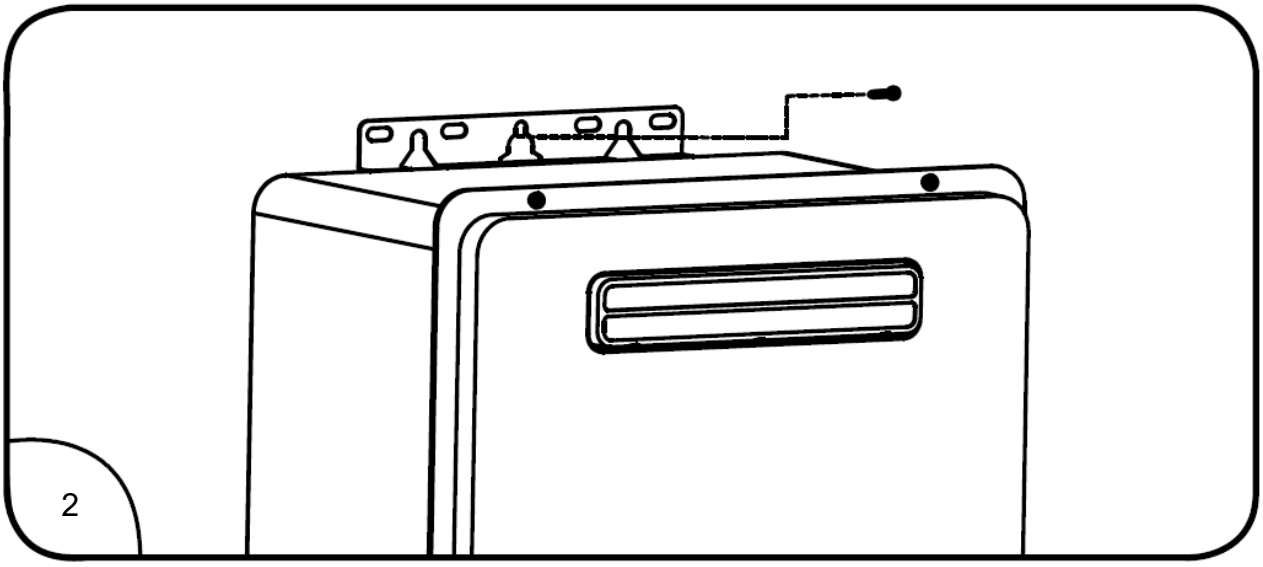


Figure 7

Secure the top mounting bracket to the wall with two mounting screws, and upon completing this task, secure the lower mounting bracket to the wall with two mounting screws as shown in Figure 8.

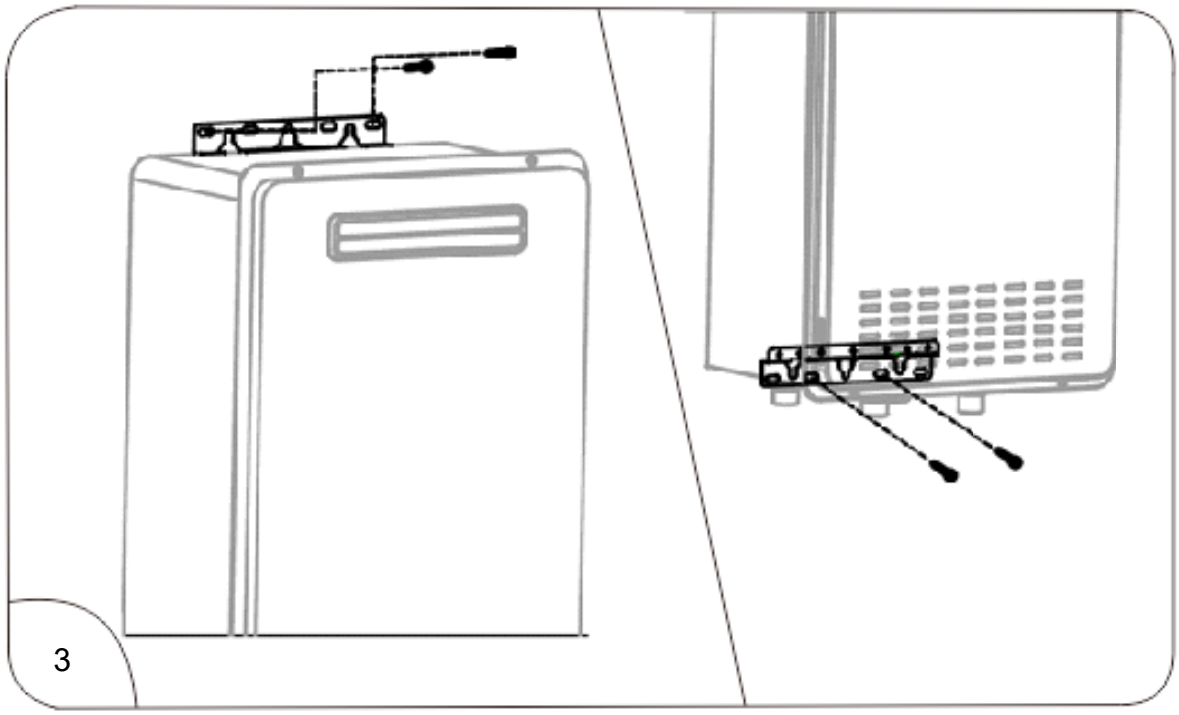


Figure 8

Horizontal Obstructions

AS/NZS 5601 stipulates a minimum horizontal clearance of 500mm between a building structure and obstruction facing the terminal. Structure with an area and shape that could cover the whole appliance casing, or extend vertically above and below the front cover is acceptable. Structure only partially obstructing the appliance casing does not comply with this regulation and may result in the heater failing to operate in windy conditions – see Figure 9.

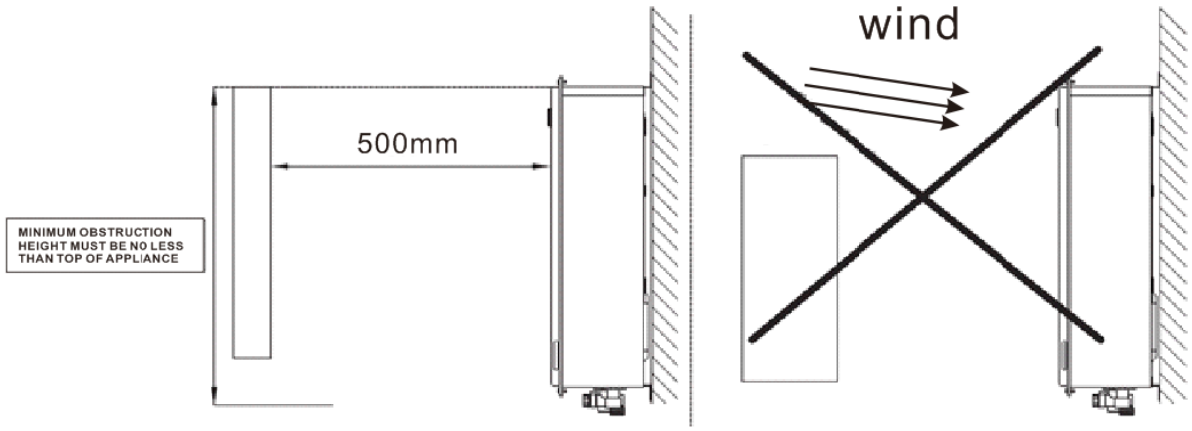


Figure 9

Water Supply

Refer to Table 1, Page 6, for water supply pressure requirements. An approved pressure limiting valve may be required if the maximum water pressure exceeds the figure shown in Table 1. In order to obtained optimal hot water flow, minimum water supply pressure stated in Table 1 must be met. The hot water heater may operate at lower pressure, however rated flow may not be achieved. Contact ONSEN for gravity fed or low pressure installations.

Water supply in most cities will meet the water quality requirements as shown in Table 2. If you are unsure about your local water quality, contact the water authority. If sludge or foreign objects are present in the water supply, a suitable filter or strainer should be incorporated in the water supply to water heater.

The water heater **MUST ONLY** be used in the following water supply conditions to prevent product damage and operation failure.

- Clean, potable water free from corrosive chemicals, sand, grit, and other contaminants.
- Inlet water temperature above 1°C , but not exceeding 48°C .
- Do NOT reverse HOT and COLD water connections.
- Do NOT connect this water heater to water lines previously used for space heating. All water piping and components shall be suitable for potable water lines.
- With recommended water quality as shown in Table 2.

pH	TDS (Total Dissolved Solids)	Free Carbon Dioxide (CO2)	Total Hardness	Aluminium	Chlorides	Copper	Iron	Manganese	Zinc
6.5 - 8.5	Up to 500mg/L	Up to 15mg/L	Up to 200mg/L	Up to 0.2mg/L	Up to 200mg/L	Up to 1.0mg/L	Up to 0.3mg/L	Up to 0.05mg/L	Up to 1.0mg/L

Table 2

Installation (Water Supply Lines)

Install the service valve at the Cold water inlet port to the heater. This valve is used when servicing and draining the unit – see Figure 10.

The water piping supplying the heater should be the same nominal size as the water heater fittings on the unit.

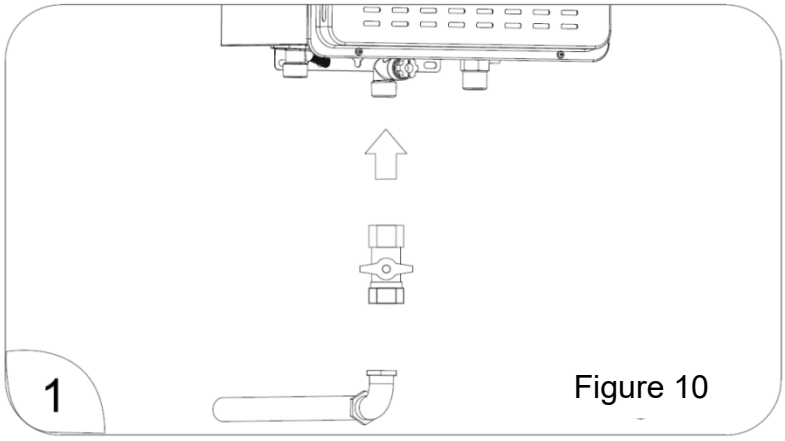


Figure 10

Before connecting the service valve to water heater, run water through the supply pipe to purge sand, debris, air, caulking, etc – see Figure 11.

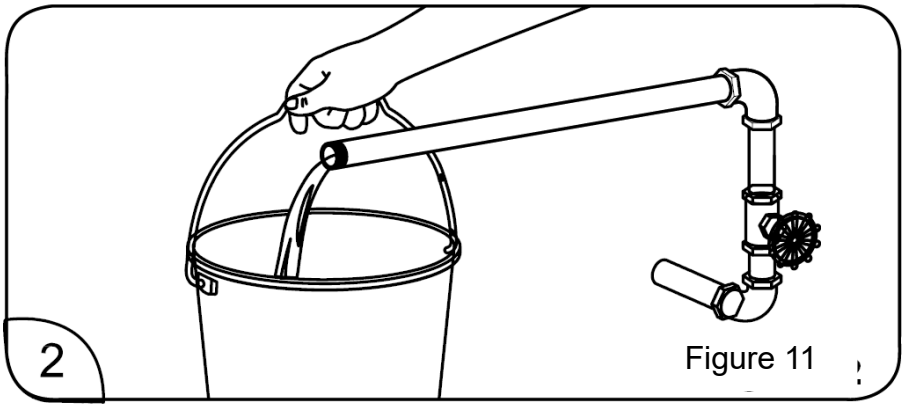


Figure 11

Position a bucket at the water outlet of the heater and open the service valve. Allow the cold water flow through the water heater for approximately 15 seconds and close the service valve – see Figure 12.

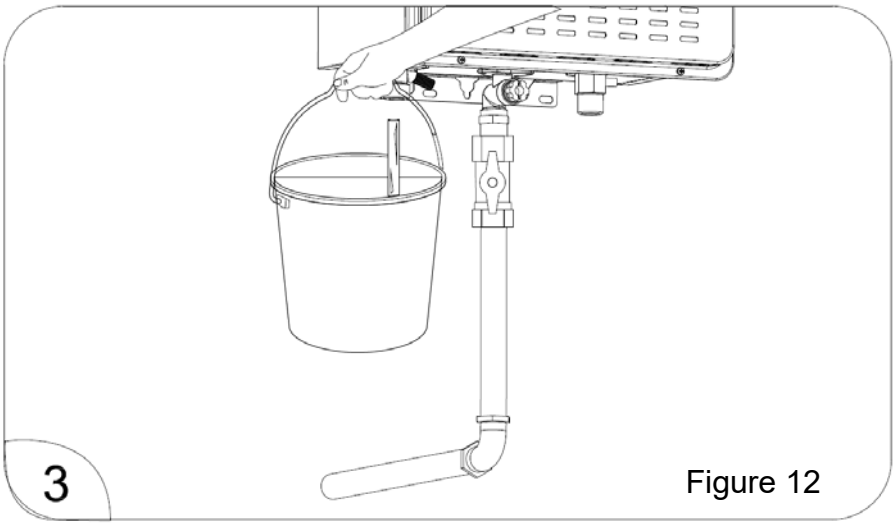


Figure 12

With the service valve closed, remove the water filter, clean it, and refit the filter – see Figure 13.

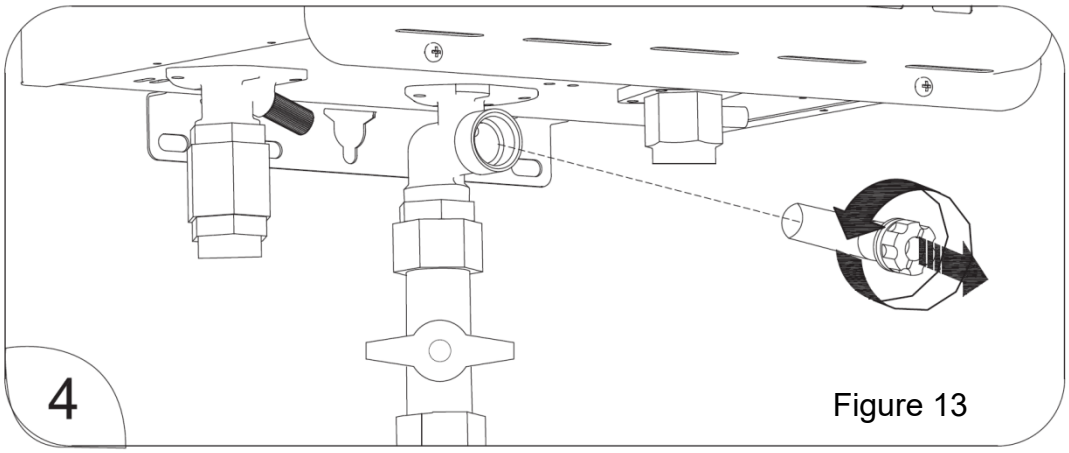


Figure 13

Warning!
Do NOT reverse HOT and COLD water connections.

The flowrate of hot water may vary when there is more than one water outlet being used at the same time. The piping must be completely drainable. If any water outlet is located higher than the water heater, it is recommended a drain valve is installed at the lowest point – see Figure 14.

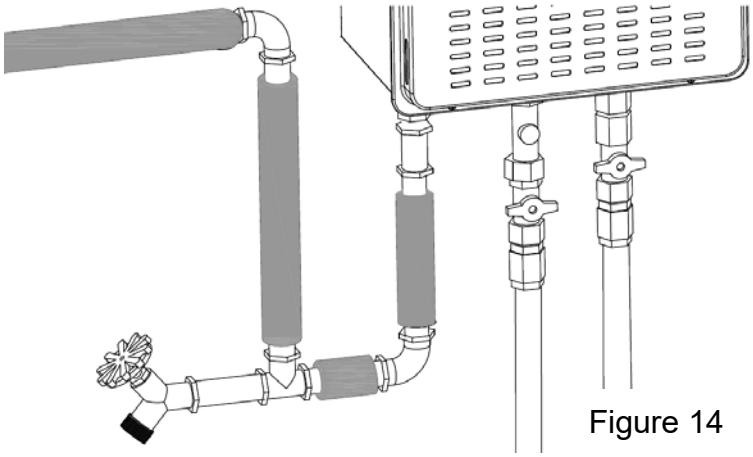


Figure 14

Union connections are recommended for the Cold and Hot water lines. These allow water heater to be disconnected easily for servicing.

For the Hot water outlet connections:

- Connection between water heater and the closest hot water outlet should be as short as possible but not less than 2 metres.
- Local codes shall govern the piping used for water connections.
- For energy conservation and to prevent freezing, both Cold and Hot water supply lines should be insulated.

Installation (Gas Supply Lines)

Install a service valve to the gas inlet of the appliance – see Figure 15.

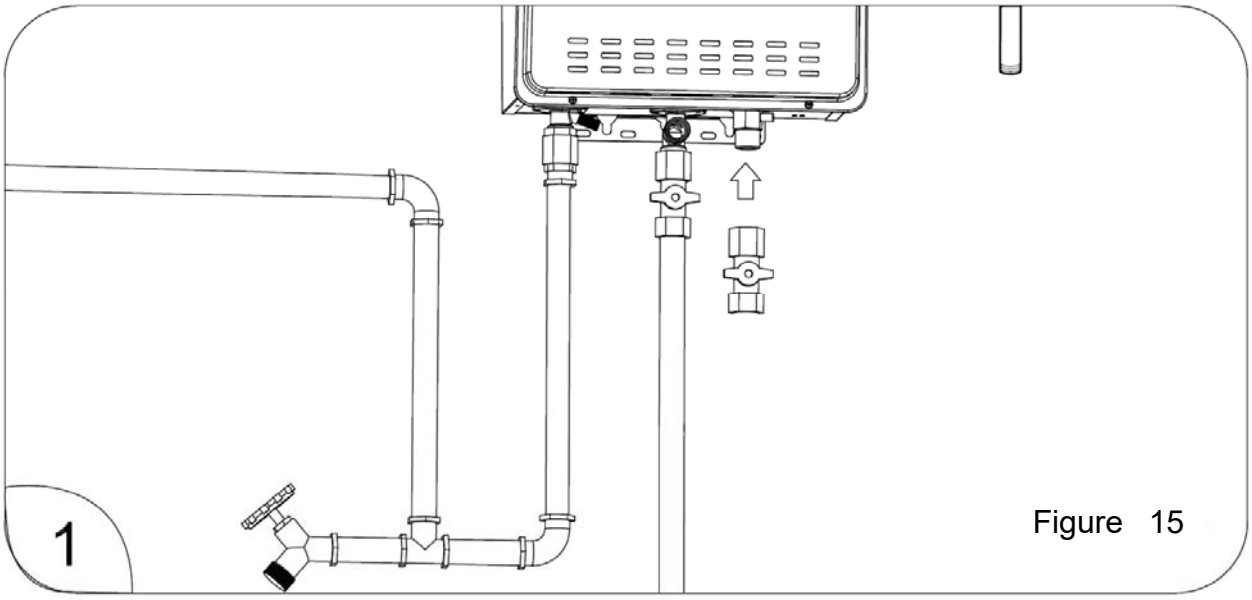


Figure 15

Using proper size piping, fittings, and components to connect the gas line to the water heater. It is recommended that a sediment trap be fitted at the lowest point in the gas supply line – see Figure 16.

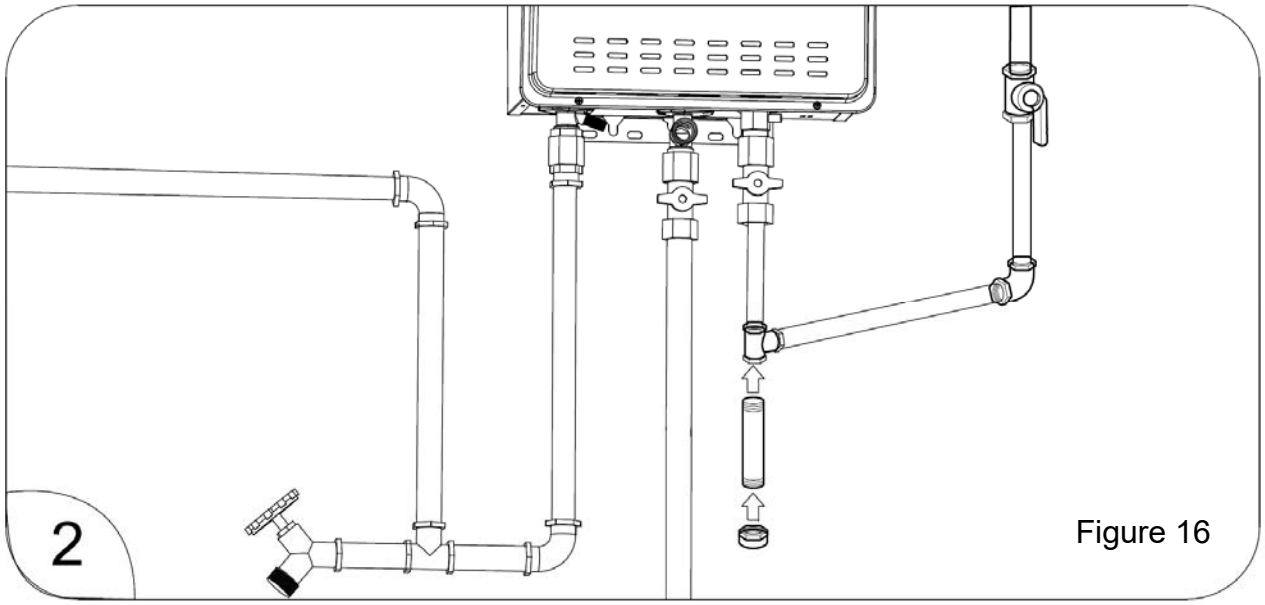


Figure 16

The gas operating limit must NOT exceed 5.0kPa for Natural Gas (NG) or 7.0kPa LP gas. For input adjustment, minimum gas inlet pressure (with main burner on) is stated on the water heater data label. Contact your gas supplier for correction if gas pressure is out of the normal range.

After the water heater is installed, the appliance and its gas connection, including factory connections, MUST be leak-tested at normal operating pressure.

Warning!

NEVER use an open flame to test for gas leak!

- Turn on the gas service valve.
- Use soapy water to test for leakage at all gas connections and fittings. If bubbles are seen, it indicates there is a leak and MUST be rectified – see Figure 17.

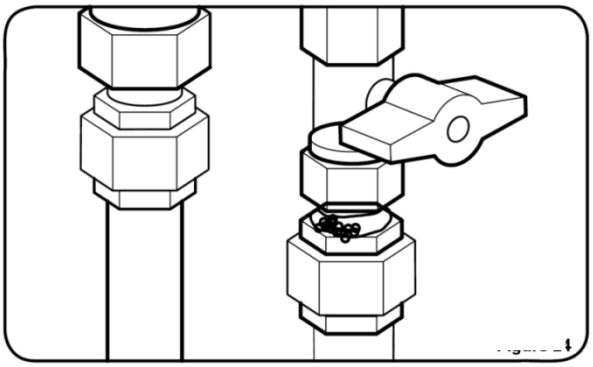


Figure17

High Altitude Installation

The water heater is suitable for installation up to 2000ft (600m) above sea level. The input rating of this water heater is based on sea level operation. At higher elevations, the actual input rate may be lower than the value listed in product data label.

For installation above 2000ft (600m) elevation, contact a qualified service technician to make proper altitude adjustments.

Warning!

Do NOT install the water heater at elevations above 2000ft (600m). Please contact ONSEN customer service for future advice.

Hot and Cold Supply Line Insulation

Suitable pipe insulation and/or electric heat-tracing should be used to prevent water in the pipes from freezing.

If water in the piping is frozen, the water heater will malfunction.

Both Hot and Cold water lines should be insulated for protection in areas prone to freezing conditions – see Figure 18.

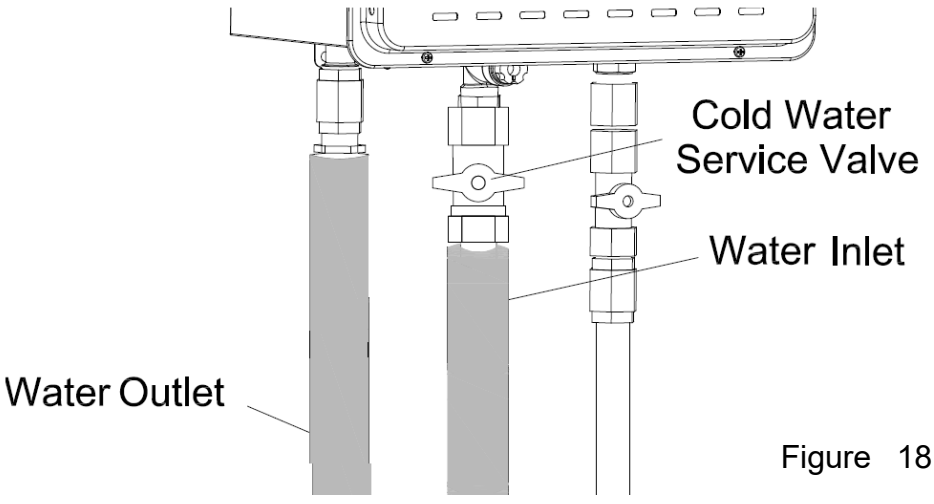


Figure 18

Power Connections

The power supply used for the water heater is 240Vac / 50Hz.
A dedicated circuit is recommended for the water heater. Do NOT connect to a GFCI or AFCI circuit. Multiple units may be connected to a single circuit up to the circuit rating.

Wait for 90 seconds after power is connected for the first time to initiate water heater program and operation.

The power consumption for ONSEN water heater:

- Maximum at 60W during normal operation
- 2W in standby mode
- Up to 140W during freeze protection function

Warning!

- Do NOT use 3-prong to 2-prong adapters.
- Do NOT use power strips or multiple outlet adapters.
- Field wiring connections and electrical grounding must comply with local codes & AS/NZS 3000.
- Do NOT connect power before venting installation is complete.

Before servicing the water heater, turn off the power at the mains by disconnecting the circuit breaker.
Label all wires prior to disconnection.

Figure19 on page 18 shows the electrical schematic diagram of the hot water heater.

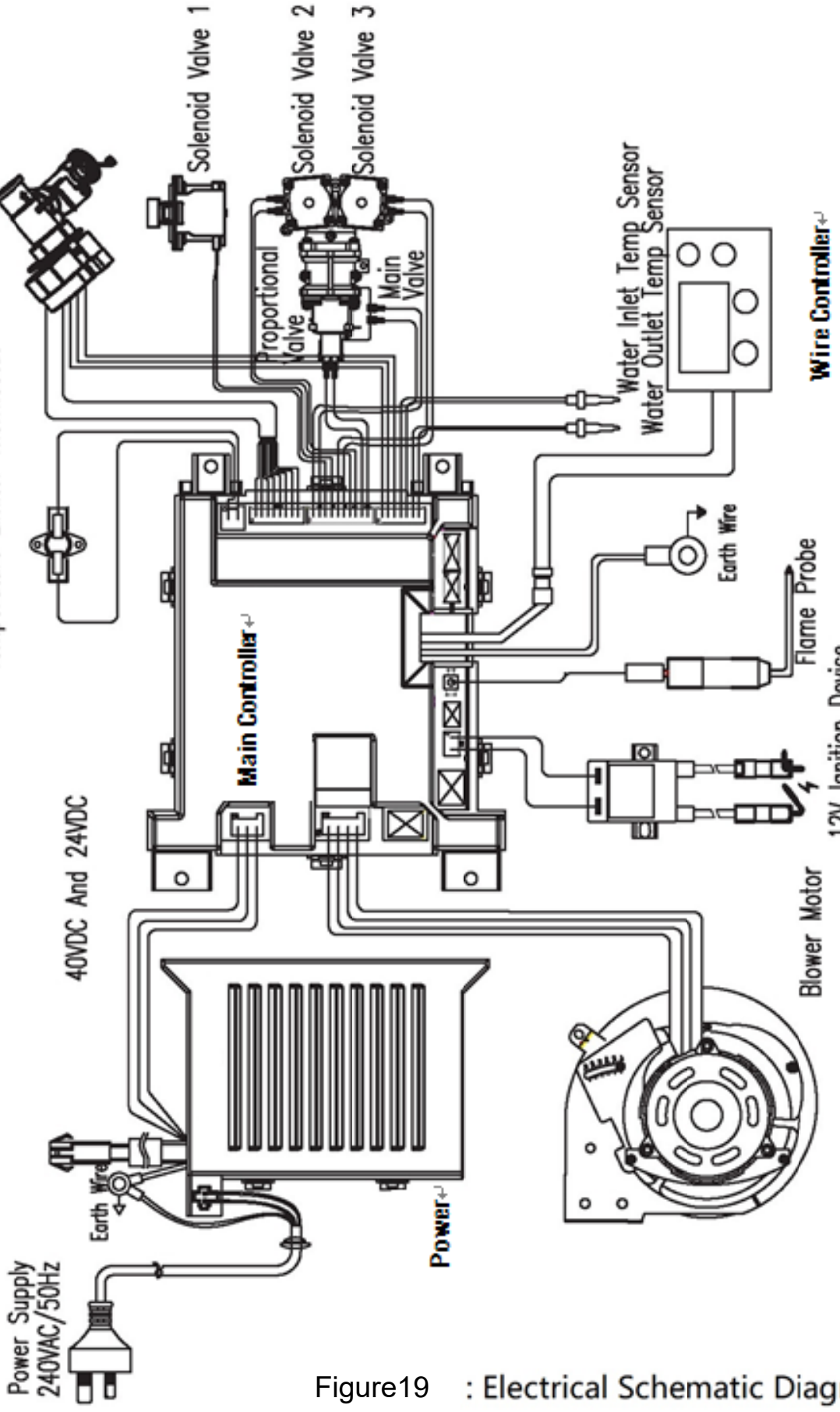


Figure19 : Electrical Schematic Diagram

Remote ControlInstallation(For Certain Models ONLY)

Do NOT install remote control in the following locations:

- Outdoor
- Area which it may in contact with water
- Area exposed to heat
- Area exposed to steam
- Area exposed to oil
- Area exposed to direct sunlight
- Area where flammable products are stored or used

Remote control should be installed out of children's reach but in an easily accessible location, e.g. kitchen, laundry room, utility room.

The maximum distance between water heater and a remote control is 30m, limited by the wire length provided.

One water heater can connect up to 3 remote controls at a time.

Remote control cables can be any Type T 18 AWG wire similar to a thermostat wire but not sensitive to polarity. Wiring MSUT NOT be exposed. Do NOT apply sealant to remote control cable. Do NOT use network cable, telephone wire, or any twisted pair cable.

Installation

Drill a hole (1 to 1 ½ inch / 2.5-3.8cm) at the predetermined remote control installation location. Run the remote control cable from the water heater to the hole – see Figure 20.

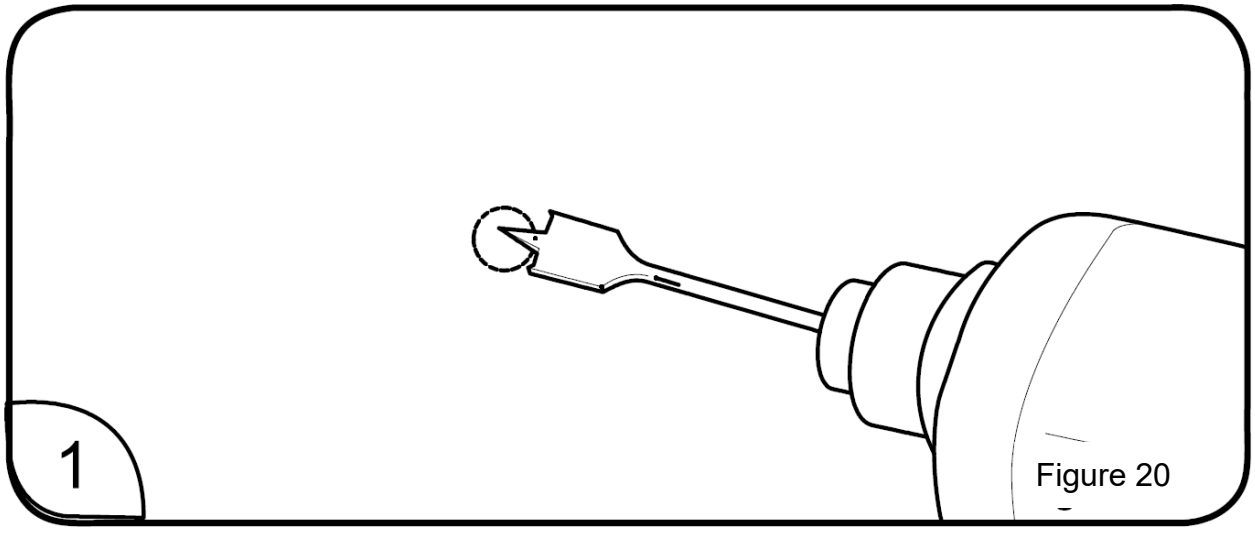


Figure 20

Connect the cable to the remote control – see Figure21

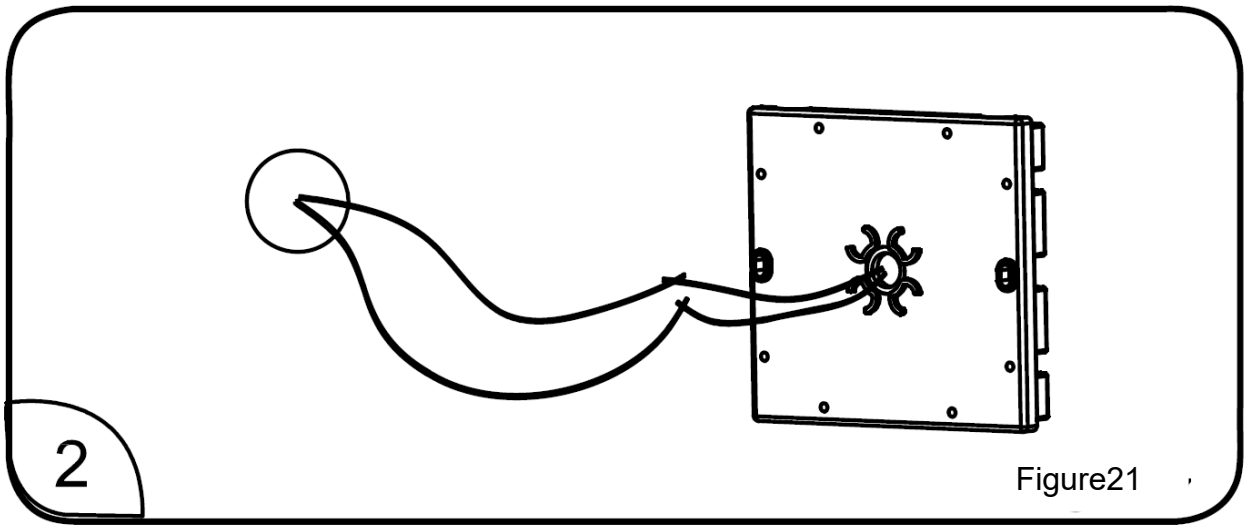


Figure21

Remove the cover of the remote control – see Figure 22.

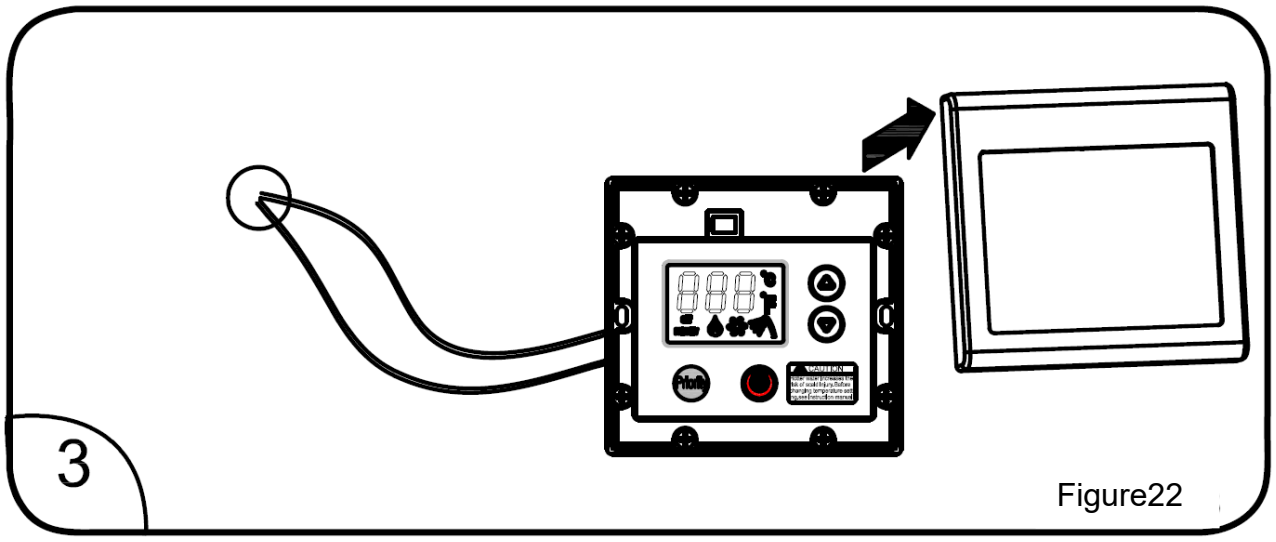


Figure22

Fix the remote control to the wall by using suitable screws and wall anchors – see Figure 23.

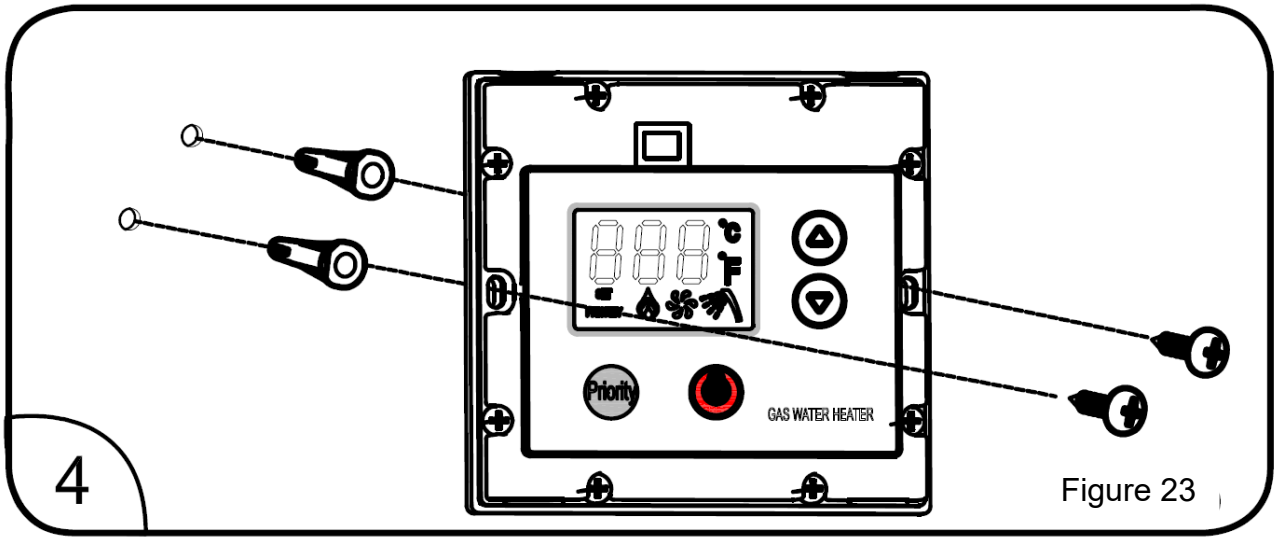


Figure 23

Put the cover back onto the remote control. The tabs on the cover should line up with the slots at the back of the remote control. Secure the cover to the remote control with one screw into the bottom tab – see Figure 24.

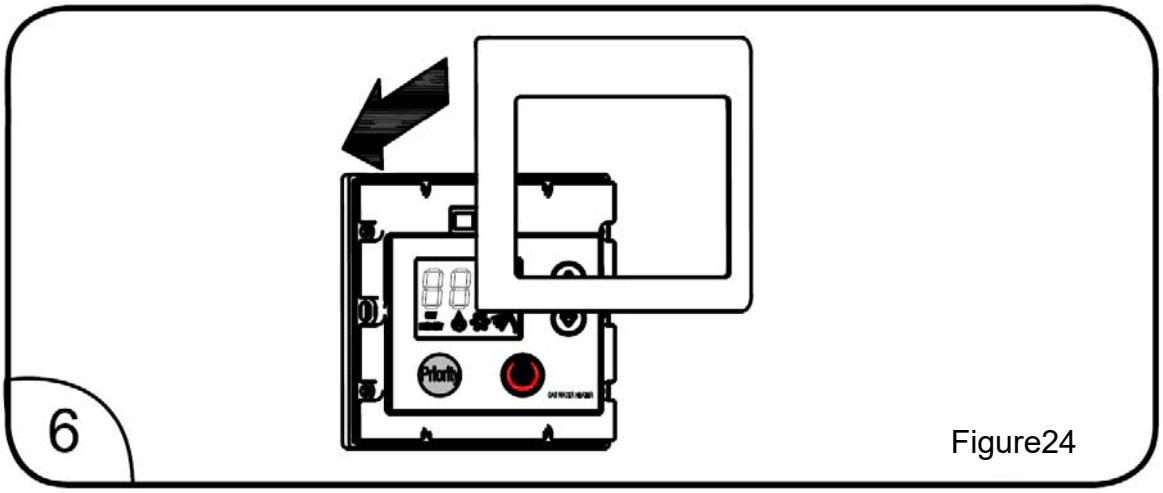


Figure24

Warning!

Do NOT attempt to connect the remote control or control wire while the water heater power is ON or the water heater may be damaged.

Do NOT cut or strip the remote control cable while it is connected to water heater or while the water heater power is ON.

Connecting the remote control to water heater (For Certain Models ONLY)

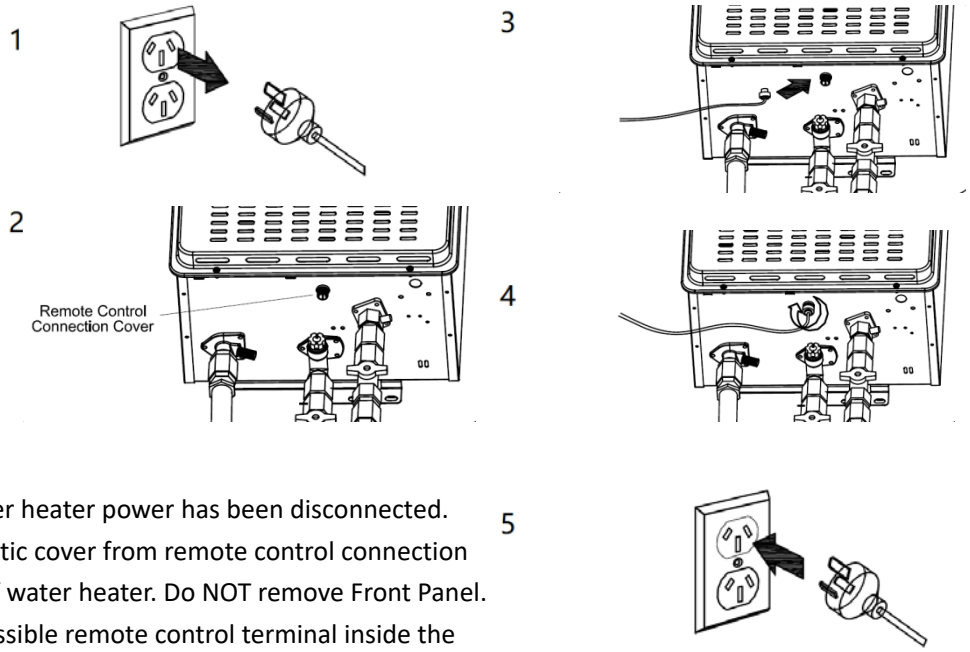


Figure 25

Instructions:

1. Ensure that water heater power has been disconnected.
2. Remove the plastic cover from remote control connection at the bottom of water heater. Do NOT remove Front Panel. There is no accessible remote control terminal inside the water heater.
3. Connect the cable to the connection terminal. The terminals are not sensitive to polarity.
4. Tighten the terminal firmly by hand.
5. Connect the water heater power plug and check if the remote control functions properly.
6. See Figure 25.

Installation Checklist

- □ Follow all installation instructions covered in this manual.
- □ Check the gas supply pressure to make sure it is within the range as stated in data label.
- □ Make sure there is adequate air for combustion and ventilation as described in this manual.
- □ Maintain proper clearances to combustibles and non-combustibles as specified.
- □ Make sure venting system complies with local codes.
- □ Make sure the remote control cable (if any) is properly fastened to the water heater terminal.
- □ Make sure the remote control (if any) is connected in accordance with all wiring codes and regulations without any exposed connections.
- □ Contact the local gas company to ensure gas supply pressure is within limits.
- □ Do NOT block or restrict any outside air intake openings.
- □ Do NOT remove the water heater front cover unless absolutely necessary. This should only be done by qualified personnel.
- □ Do not install this water heater where ground water may collect.

Water Heater Location

- □ ONLY to be installed OUTDOORS.
- □ Protected from freezing temperatures.
- □ Proper clearance from combustible material to be observed.
- □ Sufficient fresh air supply for proper operation of water heater.
- □ Air supply is free from corrosive elements and flammable vapours.
- □ Sufficient room to service the water heater.
- □ Combustible materials are not to be kept near the heater and vent.
- □ Water heater is properly secured to the wall.

Water Supply

- □ Water supply has sufficient pressure.
- □ Air has been purged from water heater and piping.
- □ Water connections are tight and leak free.
- □ Water filter is clean and in place.
- □ Water pipes are insulated and protected from freezing.

Gas Supply

- □ Gas type matches the water heater data label.
- □ Gas supply pressure is sufficient and within the range as stated in the water heater data label.
- □ Gas line equipped with a service valve and sediment trap as described in the installation instructions.
- □ Approved pipe joint compound has been used on all gas pipe connections.
- □ All connections and fittings have been checked for leaks with soapy water.

Power Connection

- □ Supply cord and / or wiring meet all local codes, and national electrical code AS/NZS 3000.
- □ Voltage supply matches the listing in data label.
- □ Water heater is properly earthed.

Test the Unit

- □ Purge air and foreign objects in the gas & water supply lines before connecting the supply lines to water heater.
- □ Turn the gas and water supplies ON. Test for leaks.
- □ Isolate the gas supply. Remove test point screw located at the gas inlet connection and attach pressure gauge.
- □ Turn on the hot water heater & the gas supply.
- □ If remote controls are fitted, turn the remote control on. Select maximum delivery temperature and open ALL available hot water outlets in the house including the shower. If remote control is not fitted, simply open all available hot water outlets. (CAUTION: Ensure building occupants do not have access to hot water outlets during the test)
- □ Operate all other gas appliances at their maximum gas rate, in according to the appliances manufacturers' instructions.
- □ With all gas appliances & hot water heater operated at their maximum gas rate, the gas pressure gauge should read between 1.13 - 5.0kPa for Natural Gas (NG), and LPG should be 2.75 – 7.0kPa.
- □ If pressure reads lower, the gas supply is inadequate and the appliances will not perform to specification. If is the installer's responsibility to check the gas meter, service regulator and pipe work for correct operation & pipe size and rectify as required. The gas regulator in the hot water heater is electronically controlled and factory preset, and under normal circumstances, DOES NOT need adjustment during installation.
- □ Close all hot water outlets including the shower.
- □ Inspect and clean the strainer located at the water heater cold water inlet connection. This procedure may need to be repeated to ensure the strainer remains clean, especially at a site of a new dwelling.
- □ If remote control is fitted, it is necessary to test the all functions & operations of the remote control.
- □ Confirm the hot water heater delivery temperature by using a thermometer. If remote control is fitted, ensure temperature exceeding 50°Ccannot be selected at bathroom or en-suite remote control.
- □ After all tests are completed, the inhabitants of the dwelling should be made aware of the functions and operations of the hot water heater and remote control (if fitted).
- □ Ensure the Product Record on page 44 is filled in and this booklet is handed to the inhabitants.

About the Gas Water Heater

ONSEN water heaters models

- ONHW26NG50
- ONHW26LP50
- ONHW26NG60
- ONHW26LP60
- ONHW30NG60

The water heaters use gas as fuel, and can supply continuous flow of hot water for shower, washing, kitchen etc.

ONSEN gas hot water heaters MUST NOT be used for pool heating.

ONSEN hot water heaters features

- Easy to operate – the operations are intelligent, automatic-control with the advanced microcomputer chips controlling proportional valve, infinite speed, exhaust fan speed, and heavy load combustion device.
- Rainproof outdoor installation – the water heater itself is installed outdoors, with special hermitical rainproof structures. Air for combustion is extracted from the atmosphere and the exhaust emitted back to atmosphere.
- Multiple remote controls (optional) – the hot water heater is capable of taking up to 3 remote controls installed at different rooms at the same time. Controlling priority can be switched among all the remote controls.
- Non-polar double frequency signal carrier remote control (optional) – the advanced method of signal carrier & communication is used between the remote control and water heater control board. The installation is easy and convenient by using non-polar and low voltage wires.
- Automatic error detection – when the hot water heater is in operation, the control board will monitor the working state of control circuits, safety units, fan, proportional valve etc. if there is problem, the water heater will stop working, and an error code will be displayed on the remote control if fitted.
- Intelligent oxygen-supply, safety protection – to ensure a complete & highly efficient combustion process is maintained, the microcomputer will automatically detect if the oxygen content and air flow is sufficient. Fan speed will be raised automatically to avoid incomplete combustion when there is a blockage to guarantee smooth ventilation. When the fan speed reaches a certain point (CO boundary), the intelligent Oxygen supply safety protection is triggered and flame is automatically extinguished.
- Microcomputer smart control – the microcomputer in the water heater will work out the perfect working parameters to ensure constant hot water temperature delivery based on input data such as inlet water temperature, preset temperature etc.
- Digital control temperature – real time temperature is monitored by a sensor probe and provides feedback to microcomputer. An automatic adjustment of gas and air supply is maintained according to feedback data to ensure a constant temperature of the water delivery.
- High energy efficiency – the water heater microcomputer not only precisely controls the amount of supply gas through gas regulator, it also adjusts the amount of air needed for complete combustion. ONSEN water heaters have two built-in functions (intensified combustion and forced heat transfer) that allow the water heater rated efficiency to be higher than national standard requirements.

- Low start-up water pressure – the minimum working water pressure can be as low as 0.02MPa with an approximate flowrate of 3Lpm which is ideal for regions with low water pressure.
- Artificial intelligent & power off memory function – when the water heater is restarted, the last temperature setting will be recalled.
- Multiple safety protections – automatic error detector, flame failure device, dual gas valve safety device, strong wind pressure protection, incomplete combustion detection, delay ignition cleaning system, over heat protection, anti frozen protection (anti freezing models only)

Technical Specifications

Product	:**ONHW26NG50**
Voltage	: 240 Vac / 50Hz
Installation	: Outdoor ONLY
Capacity	: 26Lpm (25°C and above) , 14Lpm (45°C and above)
Gas type	: Natural Gas (NG)
Remote Control	: No
Min / Max Gas Supply Pressure	: 1.13 – 5.0 kPa
Main Injector (mm)	: 1.47/0.75
Min / Max Gas Consumption	: 20 - 205 MJ/hr
Min / Max Temp Setting	: 37 – 60°C
Factory Preset Temp	: 50°C
Efficiency	: 84%
Energy Star Rating	: 6
Min / Max Water Supply Pressure	: 0.02 – 1.0 MPa
Ignition System	: Water controlled, full automatic pulse discharge ignition
Water Temp Control	: Intelligent automatic control
Gas Valve Certified Temp	: -20 – 70°C
Water Valve Certified Temp	: 0 – 80°C
Control Board Certified Temp	: -20 – 65°C
Combustion Fan Case Certified Temp	: <105°C
IP Rating	: IPX4
Dimensions	: 570 x 394 x 166mm
Net Weight	: 19.3kg

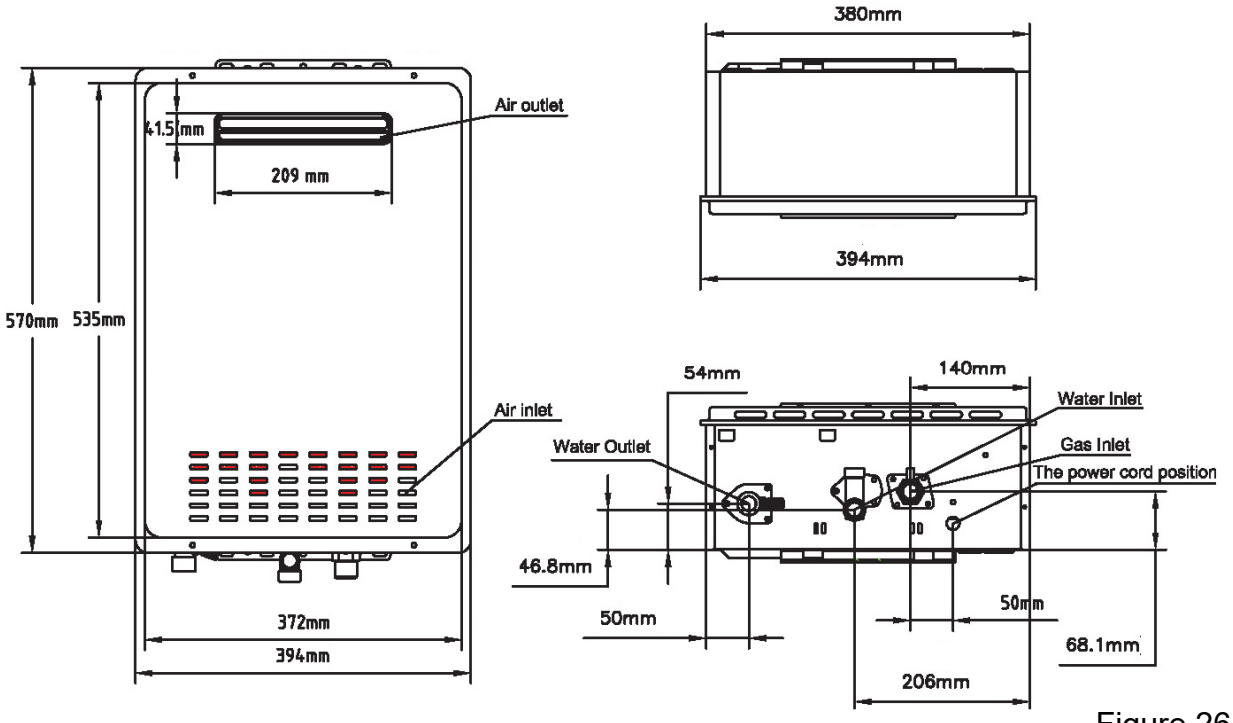


Figure 26

Product	:**ONHW26LP50**
Voltage	: 240 Vac / 50Hz
Installation	: Outdoor ONLY
Capacity	: 26Lpm (25°C and above) , 14Lpm (45°C and above)
Gas type	: Propane (LPG)
Remote Control	: No
Min / Max Gas Supply Pressure	: 2.75 – 7.0 kPa
Main Injector (mm)	: 1.13/0.55
Min / Max Gas Consumption	: 20 - 205 MJ/hr
Min / Max Temp Setting	: 37 – 60°C
Factory Preset Temp	: 50°C
Efficiency	: 84%
Energy Star Rating	: 6
Min / Max Water Supply Pressure	: 0.02 – 1.0 MPa
Ignition System	: Water controlled, full automatic pulse discharge ignition
Water Temp Control	: Intelligent automatic control
Gas Valve Certified Temp	: -20 – 70°C
Water Valve Certified Temp	: 0 – 80°C
Control Board Certified Temp	: -20 – 65°C
Combustion Fan Case Certified Temp	: <105°C
IP Rating	: IPX4
Dimensions	: 570 x 394 x 166mm
Net Weight	: 19.3kg

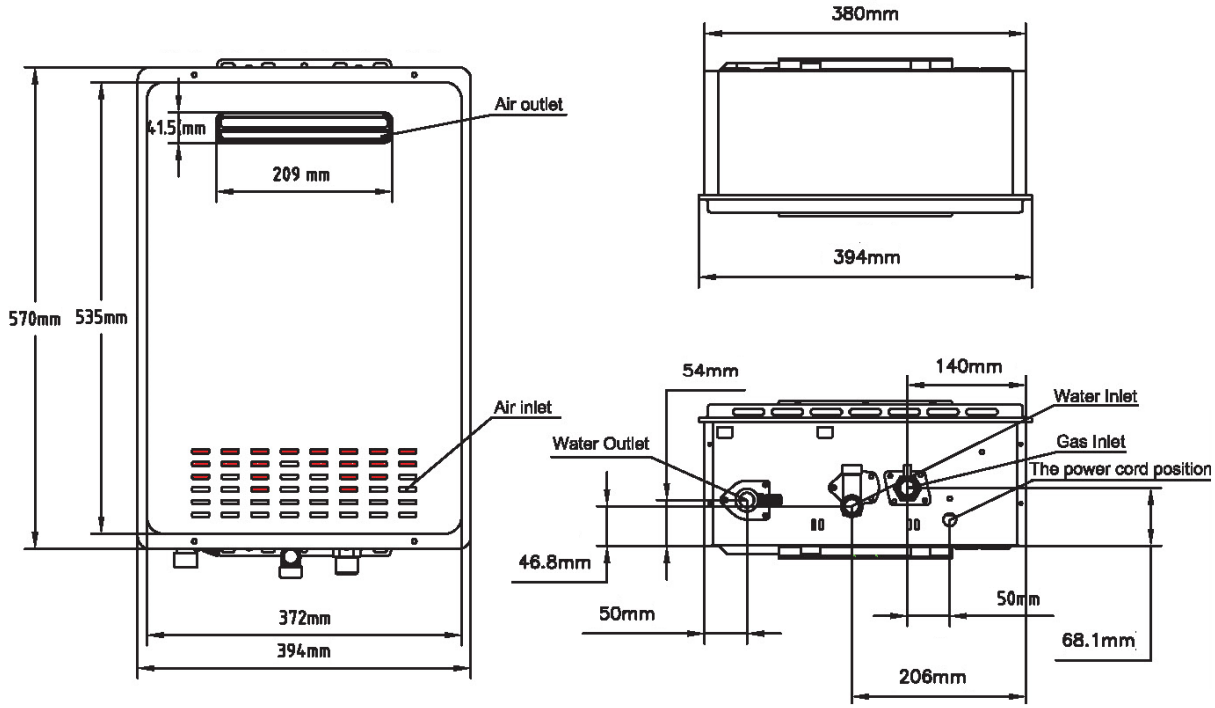


Figure 27

Product	:**ONHW26NG60**
Voltage	: 240 Vac / 50Hz
Installation	: Outdoor ONLY
Capacity	: 26Lpm (25°C and above) , 14Lpm (45°C and above)
Gas type	: Natural Gas (NG)
Remote Control	: Yes
Min / Max Gas Supply Pressure	: 1.13 – 5.0 kPa
Main Injector (mm)	: 1.47/0.75
Min / Max Gas Consumption	: 20 - 205 MJ/hr
Min / Max Temp Setting	: 37 – 60°C
Factory Preset Temp	: 60°C
Efficiency	: 84%
Energy Star Rating	: 6
Min / Max Water Supply Pressure	: 0.02 – 1.0 MPa
Ignition System	: Water controlled, full automatic pulse discharge ignition
Water Temp Control	: Intelligent automatic control
Gas Valve Certified Temp	: -20 – 70°C
Water Valve Certified Temp	: 0 – 80°C
Control Board Certified Temp	: -20 – 65°C
Combustion Fan Case Certified Temp	: <105°C
IP Rating	: IPX4
Dimensions	: 570 x 394 x 166mm
Net Weight	: 19.3kg

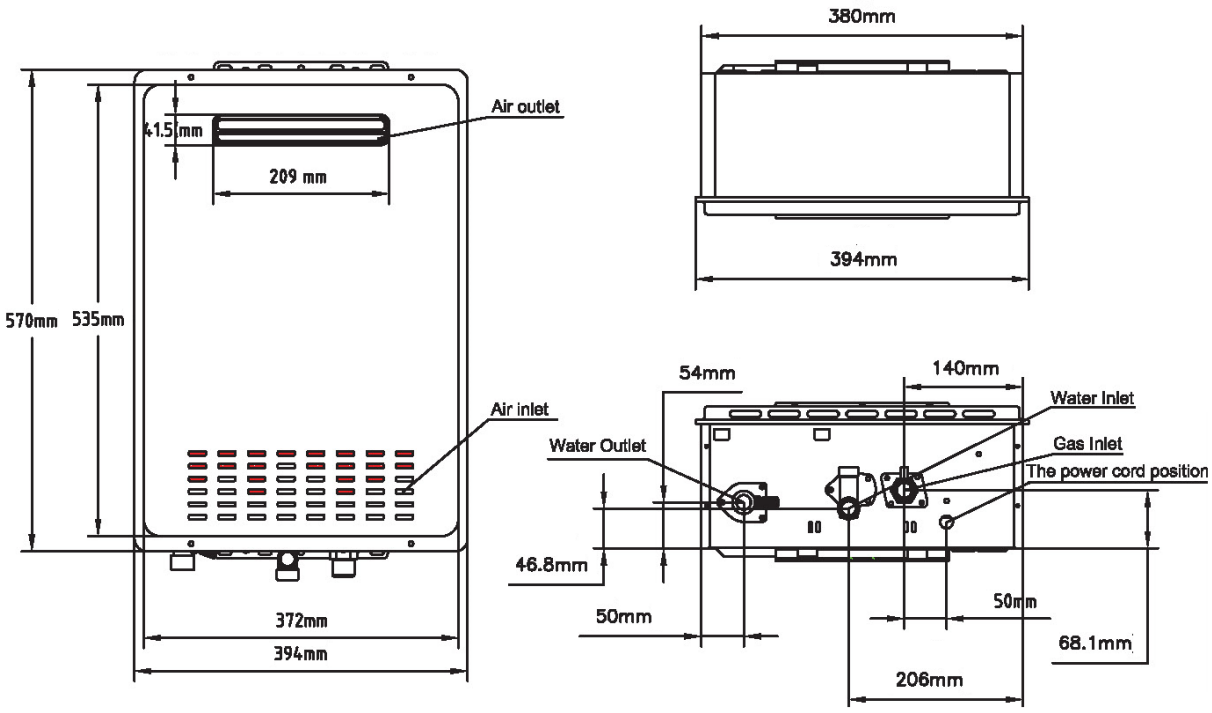


Figure 28

Product	:**ONHW26LP60**
Voltage	: 240 Vac / 50Hz
Installation	: Outdoor ONLY
Capacity	: 26Lpm (25°C and above) , 14Lpm (45°C and above)
Gas type	: Propane (LPG)
Remote Control	: Yes
Min / Max Gas Supply Pressure	: 2.75 – 7.0 kPa
Main Injector (mm)	: 1.13/0.55
Min / Max Gas Consumption	: 20 - 205 MJ/hr
Min / Max Temp Setting	: 37 – 60°C
Factory Preset Temp	: 60°C
Efficiency	: 84%
Energy Star Rating	: 6
Min / Max Water Supply Pressure	: 0.02 – 1.0 MPa
Ignition System	: Water controlled, full automatic pulse discharge ignition
Water Temp Control	: Intelligent automatic control
Gas Valve Certified Temp	: -20 – 70°C
Water Valve Certified Temp	: 0 – 80°C
Control Board Certified Temp	: -20 – 65°C
Combustion Fan Case Certified Temp	: <105°C
IP Rating	: IPX4
Dimensions	: 570 x 394 x 166mm
Net Weight	: 19.3kg

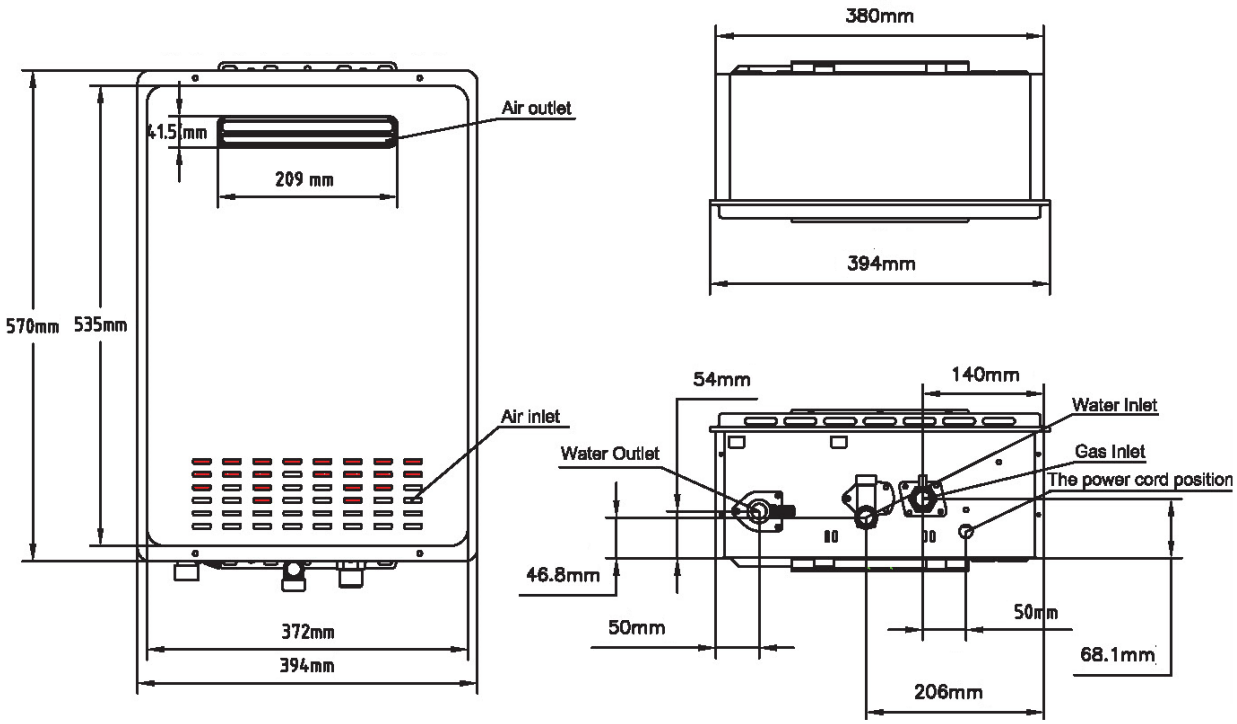


Figure 29

Product	:**ONHW30NG60**
Voltage	: 240 Vac / 50Hz
Installation	: Outdoor ONLY
Capacity	: 30Lpm (25°C and above) , 16Lpm (45°C and above)
Gas type	: Natural Gas (NG)
Remote Control	: Yes
Min / Max Gas Supply Pressure	: 1.13 – 5.0 kPa
Main Injector (mm)	: 1.55/0.84
Min / Max Gas Consumption	: 20 - 235 MJ/hr
Min / Max Temp Setting	: 37 – 60°C
Factory Preset Temp	: 60°C
Efficiency	: 84%
Energy Star Rating	: 6
Min / Max Water Supply Pressure	: 0.02 – 1.0 MPa
Ignition System	: Water controlled, full automatic pulse discharge ignition
Water Temp Control	: Intelligent automatic control
Gas Valve Certified Temp	: -20 – 70°C
Water Valve Certified Temp	: 0 – 80°C
Control Board Certified Temp	: -20 – 65°C
Combustion Fan Case Certified Temp	: <105°C
IP Rating	: IPX4
Dimensions	: 566 x 373 x 240mm
Net Weight	: 21.4kg

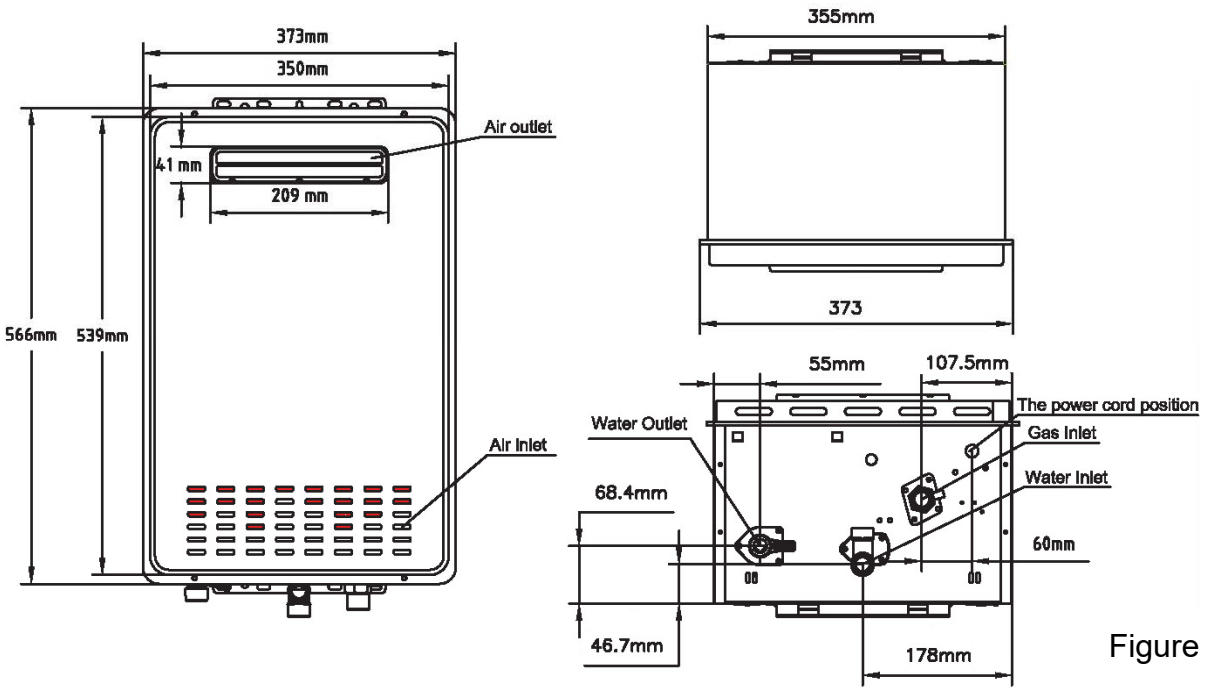


Figure 30

Turn ON the Hot Water Heater

Warning!

Before operating the hot water heater, make sure to read and follow the below instructions, all labels on the water heater, and the “Important Notes” contained in this user manual.

- ONSEN hot water heaters do not have a pilot. The hot water heater is equipped with ignition device which automatically lights up the burner. Do not try to light the burner by hand.
- Before operating, smell around the appliance to determine if there is a gas leak. Be sure to also note any smell coming from ground level because some gases are heavier than air and will settle on the ground.
- If you smell gas,
    - Do NOT try to light any appliance.
    - Do NOT touch any electrical switch.
    - Do NOT use a phone within the vicinity of the heater.
    - At a safe distance from the heater, immediately call your plumber or gas supplier for advice.
    - Do NOT return to your home until being authorised to do so by the plumber or gas supplier.
- Do NOT use this appliance if the internals have been wet or submerged in water. Call a qualified service technician to inspect the appliance for damage.
- The temperature setting and the delivered water temperature could be different due to the heat dissipated through pipes and / or seasonal change. It is sound practice to occasionally measure the actual output water temperature, particularly in systems where a temperature control valve is installed.
- Reduce water delivery flow if the flow exceeds the water heater specification to avoid a hot water shortage.
- Increase water delivery flow if the temperature of the delivered water is higher than the set temperature setting, this might due to higher water supply temperature.
- ONSEN hot water heater will stop working if the hot water delivery volume is lower than 2.5Lpm.
- After an installation or a gas cylinder change, allow for a fluctuation with water delivery temperature until the air in the gas pipe is purged.
- If any water outlet is turned on before the hot water heater is powered on, the hot water heater will not function and it will be in safety protection mode. Please turn off the water outlet and power on the water heater again.
- CLOSE mechanical service valve at gas line if the water heater is subjected to overheating fire, flood, physical damage, or if the gas supply fails to shut off.
- Do NOT turn on the water heater unless the heater has uninterrupted water supply.
- Do NOT turn on the water heater unless the heater has uninterrupted gas supply.
- Water temperatures above 50°C can cause severe burns; such scalding may result in death – see Figure 31.
- Safety MUST be considered while setting the hot water delivery temperature. Table 3 shows that a person will receive a second degree burn in 3 seconds of exposure and a third degree burn in 5 seconds of exposure to water of 60°C. A maximum temperature of 50°C at the water outlet will ensure the most safety for users.
- Children, disabled and elderly are at most risk of being scalded.
- Test delivery water temperature before showering or taking bath.

- Activating the water heater :
    - Disconnect the water heater power plug.
    - Turn the gas service valve clockwise to the OFF position. This valve is located on the outside of the water heater. Wait for 5 minutes to clear any gas. If gas can't be smelt, proceed to the next step. If a gas smell can be detected, STOP and refer to instructions on page 31.
    - Turn the gas service valve counter clockwise to the ON position.
    - Reconnect and turn on power supply to the water heater. The water heater burner will automatically light up when there is a demand for hot water.

Water Temperature (°C)	2nd Degree Burn No Irreversible Damage	3rd Degree Burn Full Thickness Injury
45	2 hours	3 hours
47	20 minutes	45 minutes
48	15 minutes	20 minutes
50	8 minutes	10 minutes
55	17 seconds	30 seconds
60	3 seconds	5 seconds

Table 3

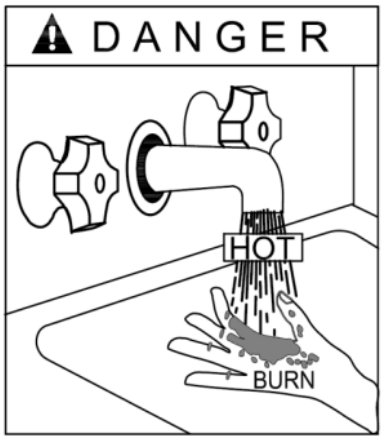


Figure31

Setting Water Temperature

Maximum water delivery temperature occurs while the water heater burner is ON. To determine the water temperature, turn on the water outlet and place a thermometer to measure the water stream – see Figure 32. Note: water temperature at the outlet may vary depending on the weather and season and the length of pipe from the water heater.

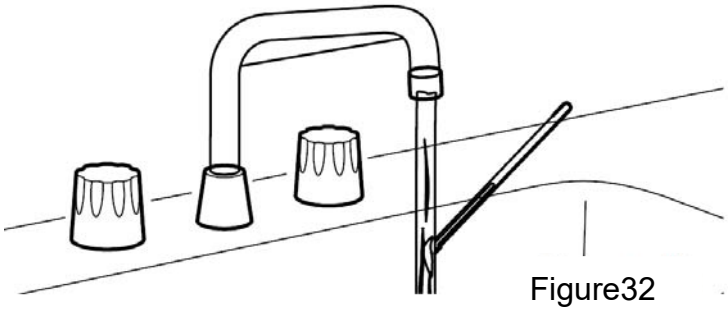


Figure32

The water heater temperature range is from 37°C to 60°C. To adjust the water temperature, refer to the ONSEN remote control instructions on page 34.

The water heater may not operate with insufficient water flow. If full flow at an outlet does not activate the hot water heater, increase the temperature setting of the water heater via a remote control.

ONSEN Remote Control (For certain models ONLY)

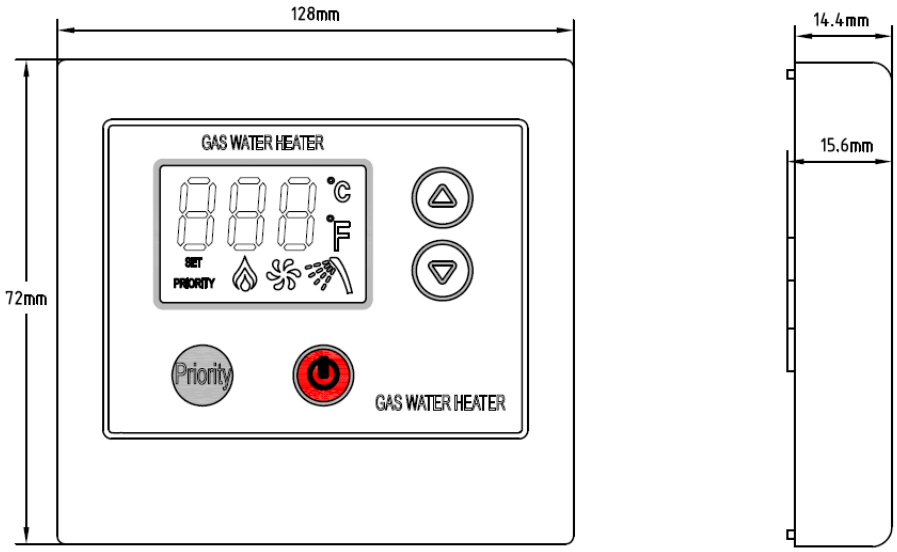


Figure 33

Warning!

Do NOT try to disassemble the remote control. All controls are sealed and calibrated for accurate control and operation.

No other manufacturer's controls are suitable for ONSEN water heaters.

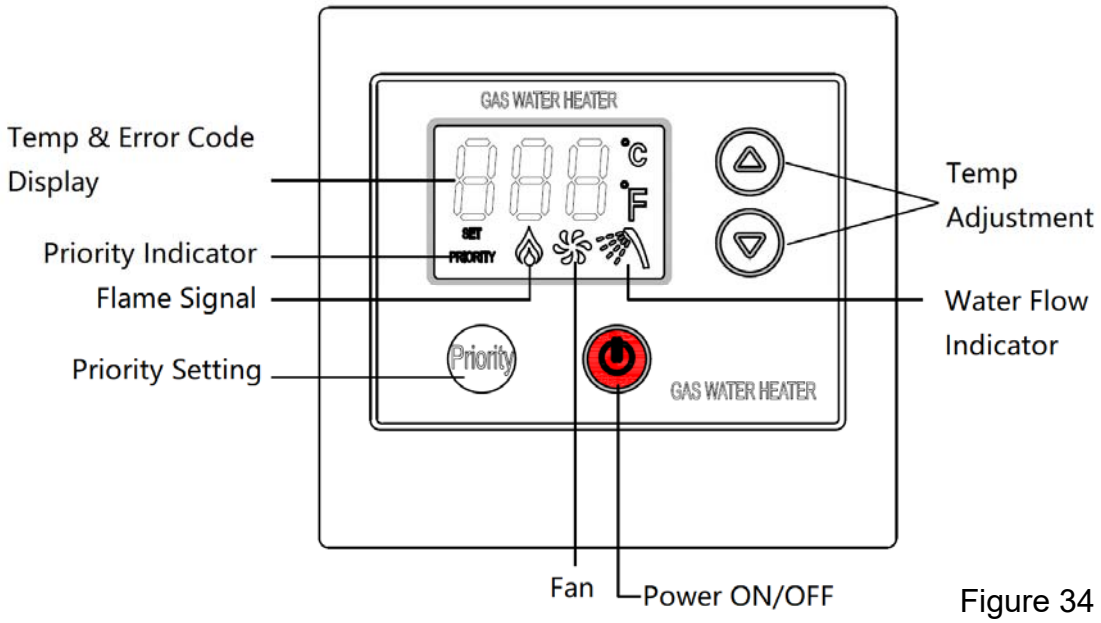


Figure 34

Remote Control Operation

1. Press the power ON/OFF button once, the digital display will light up and will automatically recall the previous setting for temperature output.
2. For water heater installations with more than one remote control installed, press the priority setting button once to assign priority status to the controller. If successful, the priority indicator will illuminate and the controller can be used to adjust the water temperature setting – see Figure 34. Water temperature can only be adjusted higher than 48°C with the hot water supply OFF at all outlets. Always press the priority button before adjusting water temperature. Priority reassignment can only take place when there is no hot water delivery. Refer to point 6 in page 35 for multiple controllers priority switching.
3. Adjust the desired water temperature by using temperature adjustment buttons . Temperature settings range is from 37°C to 60°C, with adjustments made in 1 degree increments.
4. With hot water flowing, the temperature of the hot water cannot be adjusted higher than 48°C. To adjust the temperature higher than 48°C, all hot water outlets must be shut off and press temperature adjustment button .

   Note: for ONHW26NG50 & ONHW26LP50, when the hot water heater is powered ON, the temperature setting will default to 50°C. For ONHW26NG60, ONHW26LP60 and ONHW30NG60, when the hot water heater is powered ON, the temperature setting will resume at the previous remote control setting.
5. A single ONSEN water heater is capable of connecting with a maximum of 3 remote control units installed at any one time. Controlling priority can be reassigned to any one of the remote controls. The installation is parallel connection regardless of polarity as shown in Figure 35.

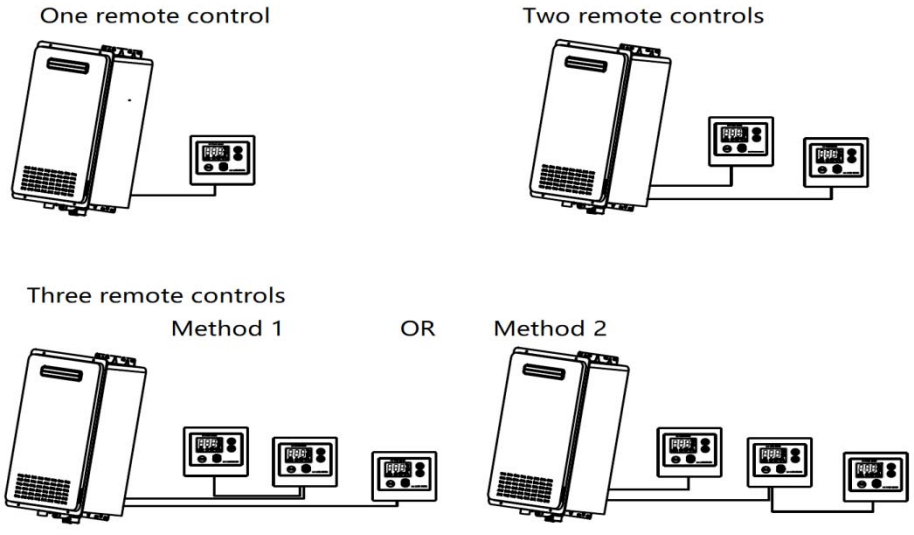


Figure 35

6. If there is more than one remote control installed, the following priority switching operations apply :
    i. Turn off hot water delivery at all outlets.
    ii. With power ON, in standby mode, and display OFF, press ON button of the remote control to assign it priority status. The priority indicator will illuminate and the remote control can now adjust water temperature. After priority has been assigned to a specific controller, the priority light on all other controllers will dim and temperature adjustment from these controllers is not possible.
    iii. With powered ON, in standby mode, and display ON, press any button of any remote control to assign it priority status. The priority indicator will illuminate and the remote control can now adjust water temperature. After priority has been assigned to a specific controller, the priority light on all other controllers will dim and temperature adjustment from these controllers is not possible.
    iv. When the water heater is in operation and delivering hot water, the priority cannot be reassigned to other remote controls. Priority reassignment can only take place when there is no hot water delivery.
    v. When the ON/OFF button of the remote control with priority is pressed, it will turn off the water heater as well as all other remote controls. The controller will retain its priority with indicator on.
    vi. To determine the priority and address codes of multiple controllers, turn OFF all controllers and press and hold for 5seconds until buzzer sounds. The display will now show previous set address code, or default address “11”. Press button to set the address code of each remote control to “12” or “13”. After setting the address code, press the power button or wait for 3 seconds to automatically save any updated settings. This setting will be saved and remain in place even when powered off. Press ON/OFF button again to exit setting.

Cleaning and Maintenance

Caution: Prior to cleaning or maintenance, always disconnect the power supply.
Regular cleaning and maintenance will help to make sure the water heater is always in good condition & prolong the working-life of the water heater.

1) Cleaning of Hot Water Heater

Ensure the heater has not been in operation for at least 1 hour and the casing is not hot. Use a vacuum cleaner to clean around the water heater to remove any dust, dirt, and/or lint build up, particularly near the air intake or vent outlet – see Figure 34.Use a damp cloth to clean the hot water heater casing. Dry the surface afterwards.Never use gritty or abrasive sponges. Acidic materials like vinegar and citric juices etc can damage the most resistant surfaces.

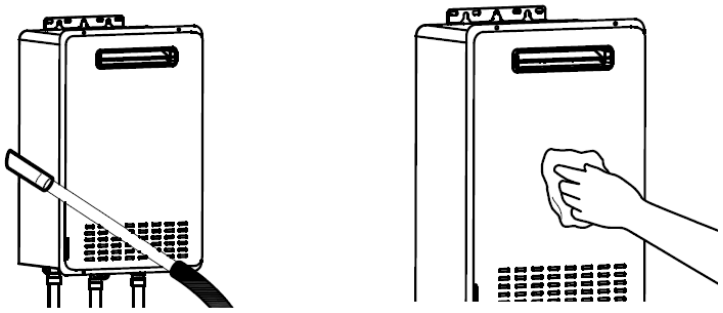


Figure 36

Check the air intake and vent outlet for blockage and / or debris. The air intake requires a minimum of 300mm clearance between the air intake opening and any obstruction – see Figure 37.

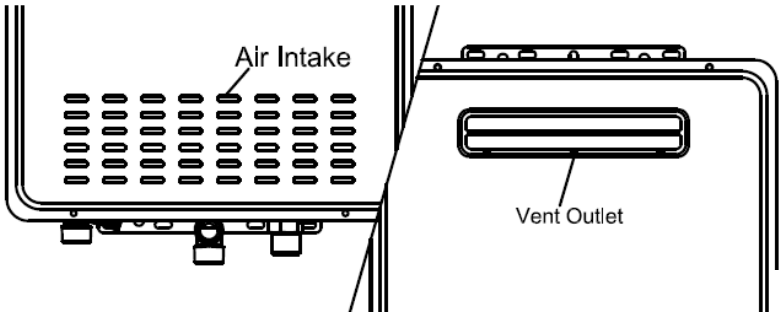


Figure 37

2) Strainer

Clean the built-in strainer on a monthly basis to prevent a restriction to hot water flow. Turn off the water heater and disconnect the power lead from the outlet. Close the cold water service valve to terminate the water supply to the water heater – see Figure 38.

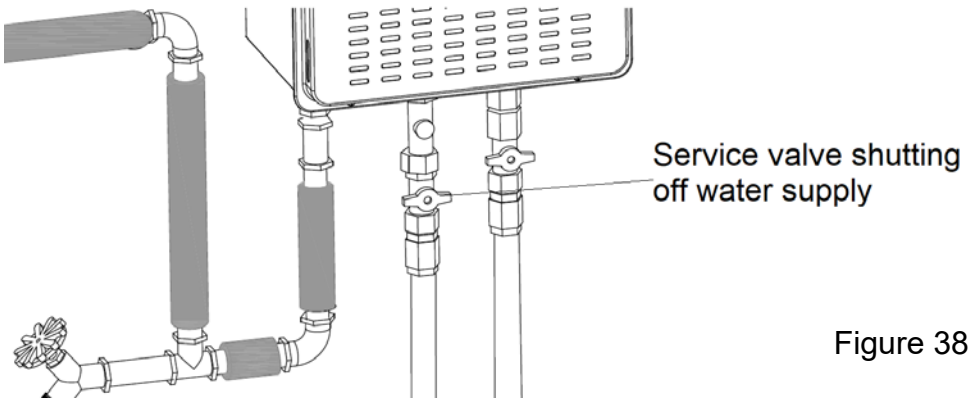


Figure 38

Drain the water heater. Refer to instructions of draining the water heater – see Figure 39.

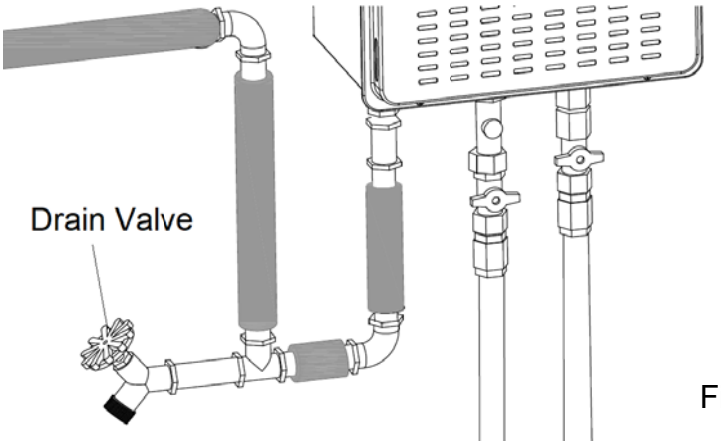


Figure 39

Unscrew and remove the strainer. Do not use excessive force while removing it to avoid deformation and/or damage to the strainer. Clean the strainer under running water. Use a soft brush to remove sediment and grit – see Figure 40.

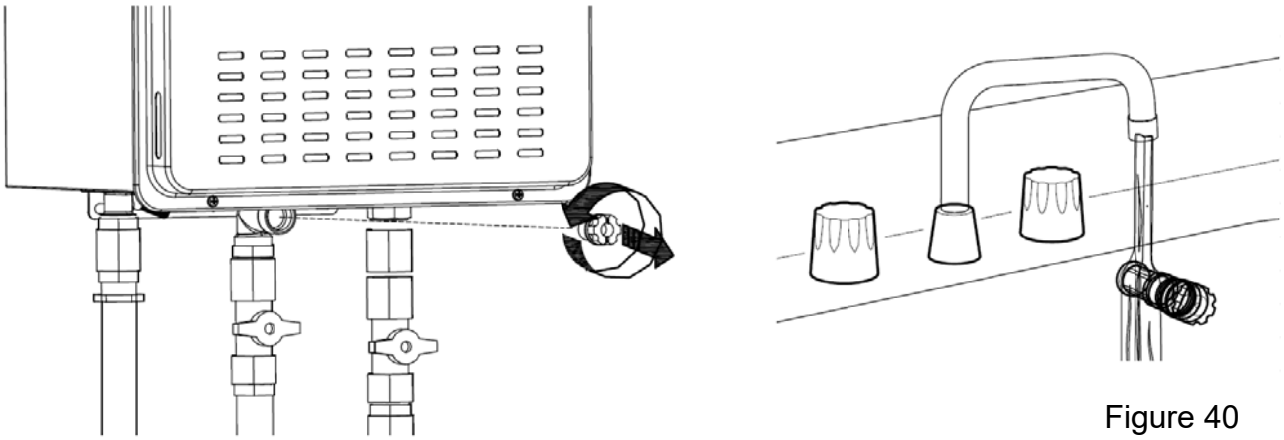


Figure 40

Refit the strainer while being careful NOT to over tighten it. Turn on the water supply by opening the cold water service valve. Reconnect the power lead and turn the water heater on.

3) Draining the Water Heater

Turn the water heater power OFF, wait for 10 seconds and disconnect power supply. Close the gas service valve – see Figure 41.

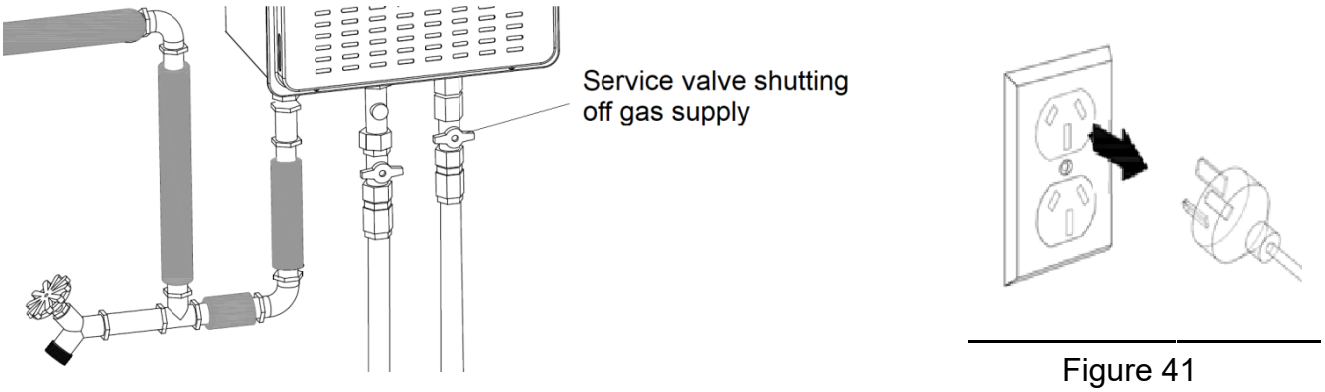


Figure 41

Open all water outlets and let the water flow until water becomes cold, then shut off the water outlets – see Figure 42.

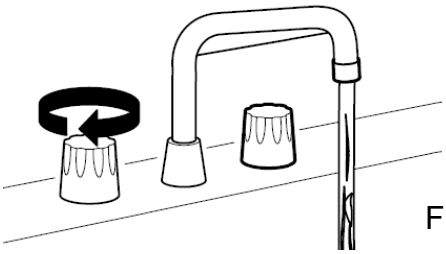


Figure 42

Close the water supplyservice valve. Remove the strainer and use a suitable container to collect water from strainer port and hot water outlet – see Figure 43.

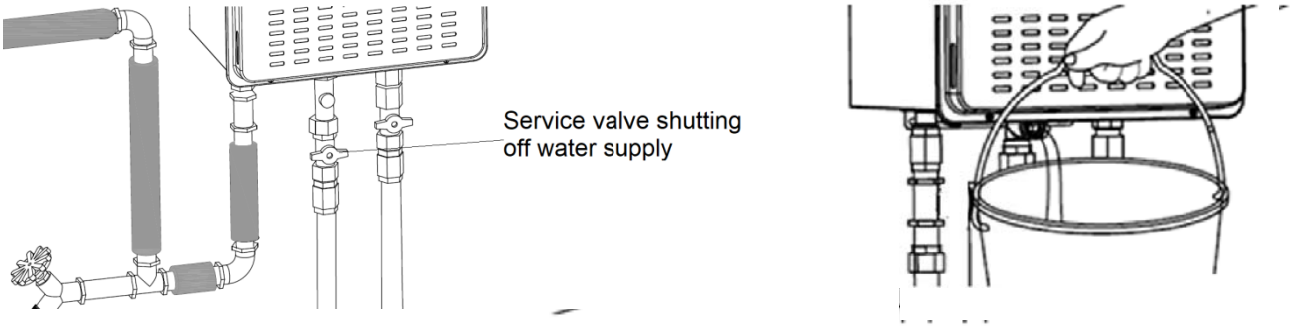


Figure 43

When fully drained a small amount of water will still remain in the water heater.

In cold weather conditions, this remaining water can be frozen. If this happens, allow the automatic defrost protection 30 minutes to melt the frozen water. ONSEN water heaters will not work properly until the frozen water is thawed.

To put water heater back in service, reinstall hot water line and strainer – see Figure 44.

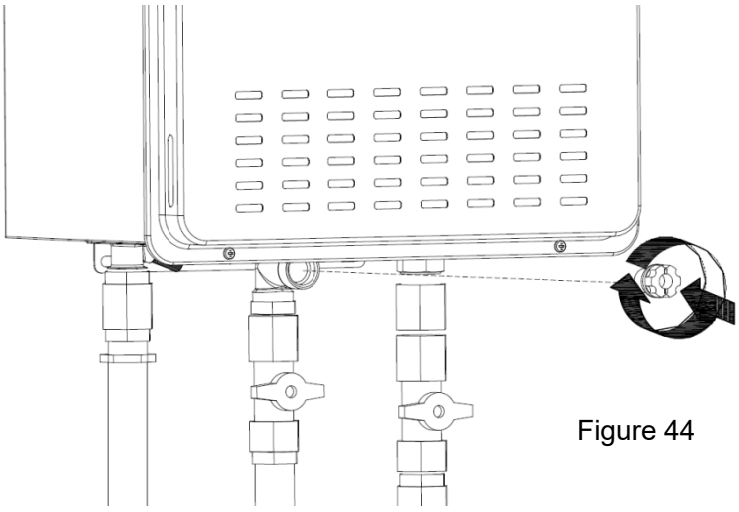


Figure 44

Open the water service valve. Open all water outlets and let water run till air has been purged from water lines – see Figure 45.

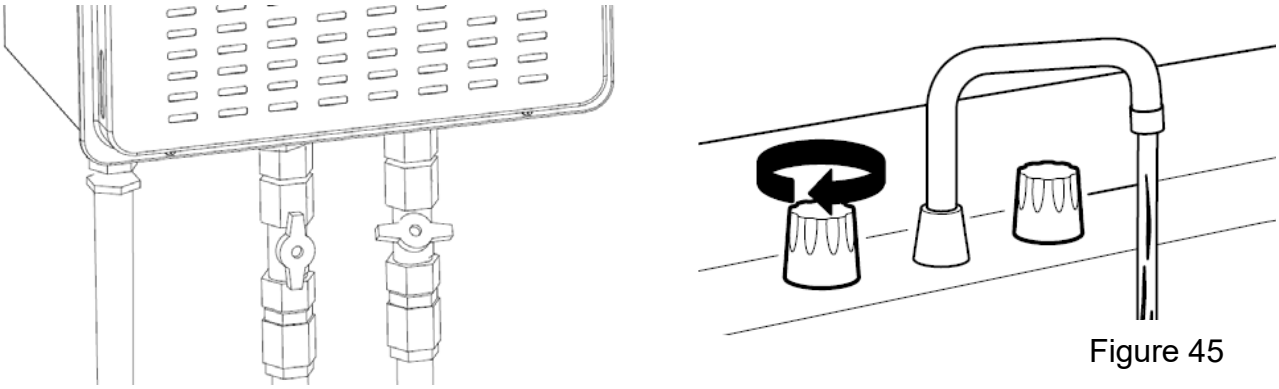


Figure 45

Plug in the power supply. Open the gas service valve. Restart the hot water heater – see Figure 46.

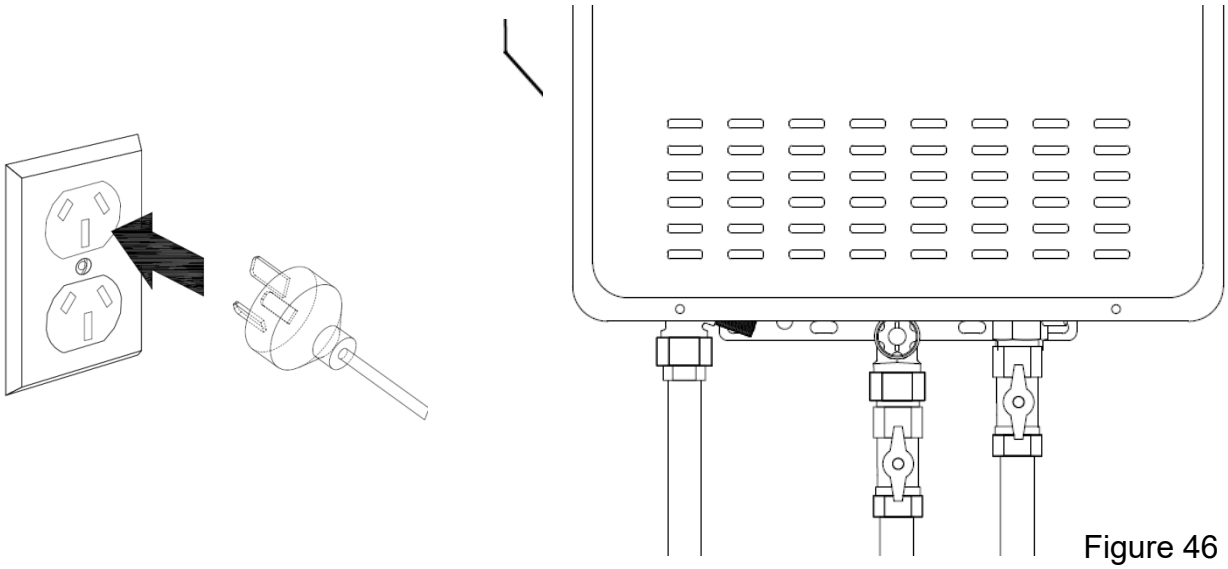


Figure 46

4) Regular Visual Check

Check and keep the hot water heater installation area clean and free from flammable materials. Visually inspect the water heater for damage and / or denting. Check for abnormal noise during operation of water heater, e.g. hissing or banging noise. Check if there is any leakage of the water or gas lines. Contact a qualified plumber to check if any of the above mentioned are present.

5) Freeze Protection

ONSEN water heaters come with freeze protection function. The heaters automatically prevent freezing inside the water heater to as low as -14°C. This freeze protection function only protects the internal components of the water heater.

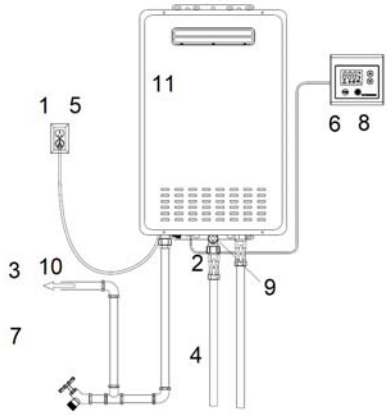
6) Vacation and Extended Shutdown

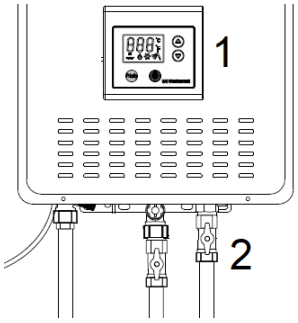
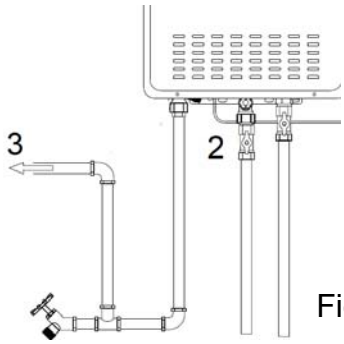
If the water heaters were to remain idle for an extended period of time, the power, gas, and water supply should be turned off. The water heater and piping should be drained if they might be subjected to freezing temperatures. After an extended shutdown, the water heater operation and controls should be checked by a qualified plumber.

Troubleshooting

Warning!

For your own safety, do NOT try to repair the electrical wiring, gas and water piping, remote control, burners, vent connectors, or other safety devices. Always contact a qualified service technician if you have any queries.

Problem	Possible Causes	Solution
Hot water flow is low or no hot water delivery.  Figure 47	1. Hot water heater is not powered ON.	1. Power ON the hot water unit.
	2. Water service valve not completely opened.	2. Check the service valve and open it completely.
	3. Water outlet temperature is not HOT or flow is low.	3. Increase the flow at the hot water outlet. Inadequate flow will cause the hot water heater burner to turn off automatically.
	4. Water piping is frozen.	4. Allow piping to thaw.
	5. Power is disconnected or water supply is shut off.	5. a) Reconnect the power plug or check the circuit breaker. b) Open the water service valve.
	6. Temperature setting of water heater is too low.	6. Increase the water heater temperature setting.
	7. Water outlet mixing valve malfunction.	7. Check and replace the mixing valve.
	8. Error code display on the remote control.	8. Refer to “Error Code” section. If required, contact a qualified service plumber.
	9. Water heater built in strainer is clogged or dirty.	9. Clean the strainer. Refer to “Cleaning & Maintenance” section.
	10. Water outlet aerator is clogged or dirty.	10. Clean the aerator.
	11. Scalebuild up at the heat exchanger.	11. Refer to “Error Code” section. If required, contact a qualified service plumber.
	12. Hot and Cold water lines connections are reversed.	12. Reverse the water line connections.
Water is not hot enough.	1. Water heater temperature setting maybe too low.	1. Increase the water heater temperature setting.
	2. Gas service valve not completely opened.	2. Check and open the gas service valve completely.
	3. Gas supply pressure is low.	3. Contact gas supplier or contractor to verify gas meter and gas piping size.

 Figure 48		
Problem	**Possible Causes**	**Solution**
Water temperature is too hot.  Figure 49	1. Water heater temperature setting is too high.	1. Lower the water heater temperature setting.
	2. Water service valve is not completely opened.	2. Check and open completely the water service valve.
	3. Water outlet flow is too low.	3. Increase the water outlet flowrate.
	4. Strainer is blocked.	4. Clean strainer.
Fan continues to operate after water outlet is off.	The post purge cycle is clearing flue gas.	Normal operation.

ONSEN water heater has a built-in electronic diagnostic system. When an error occurs, the remote control will show the error code. Refer to the error codes found below and possible faults for further information.

When an error code is shown, turn OFF all hot water outlets. Turn OFF the water heater by pressing Power ON/OFF on the remote control. Wait for about 5 minutes, then restart the water heater again by pressing Power ON/OFF on the remote control. Turn on a hot water outlet and recheck the display to determine if there is still an error.

If error still exists, turn off the hot water outlet and water heater. Unplug the power supply, wait for 30 seconds and reconnect it. Restart the hot water heater and turn on a hot water outlet to check again.

If there is still error shown in the display, take a note of the displayed error and turn OFF the water heater. Contact authorised service centre for servicing.

Error Code **Faults**

- 01 Water supply temperature circuit
- 10 Flame detection malfunction
- 11 Ignition failure
- 12 Unexpected flameout
- 13 Thermostat circuit error
- 30 Flue pressure signal initial detection failure
- 31 Flue pressure pretest malfunction
- 32 Flue blockage error
- 34 Pretest malfuction for fan blockage
- 35 Fan blockage error

- 40 Fan circuit error
- 50 Water outlet over heating
- 51 Water inlet over high
- 60 Water outlet temperature circuit malfunction
- 70 Program error

Note: if the displayed error is not listed above, immediately turn off the water heater can contact authorised service centre.

Replacement Parts

Warning!

Always contact a qualified plumber or repairer for any servicing and repairing job. Always purchase original parts from ONSEN by stating the model number and serial number, specify gas type (LPG or NG), part description and number of parts desired.

For model:ONHW26NG50 /ONHW26LP50 / ONHW26NG60 / ONHW26LP60

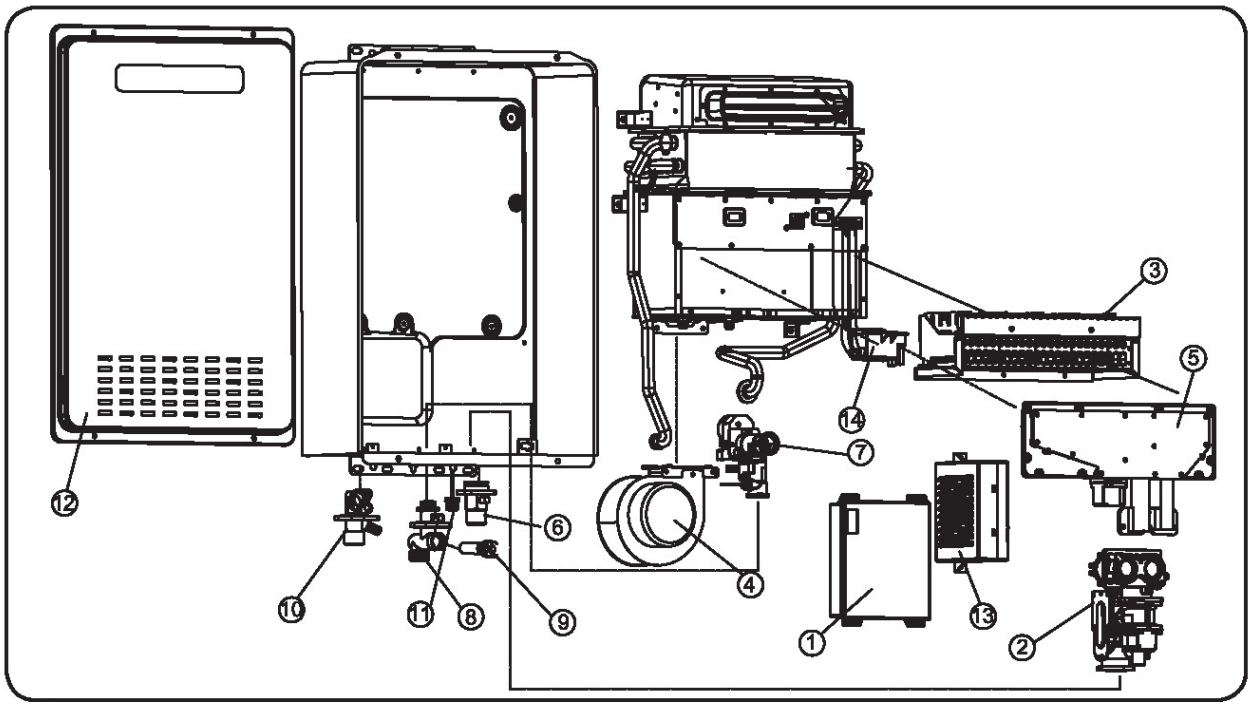


Figure 50

1. Control board
2. Gas valve
3. Burner assembly
4. Blower motor
5. Gas manifold
6. Gas inlet connector R ¾
7. Water valve
8. Water inlet connector R ¾
9. Strainer
10. Hot water outlet connector R ¾
11. Remote control terminal block

12. Front cover
13. Power box
14. Ignition device

For model:ONHW30NG60

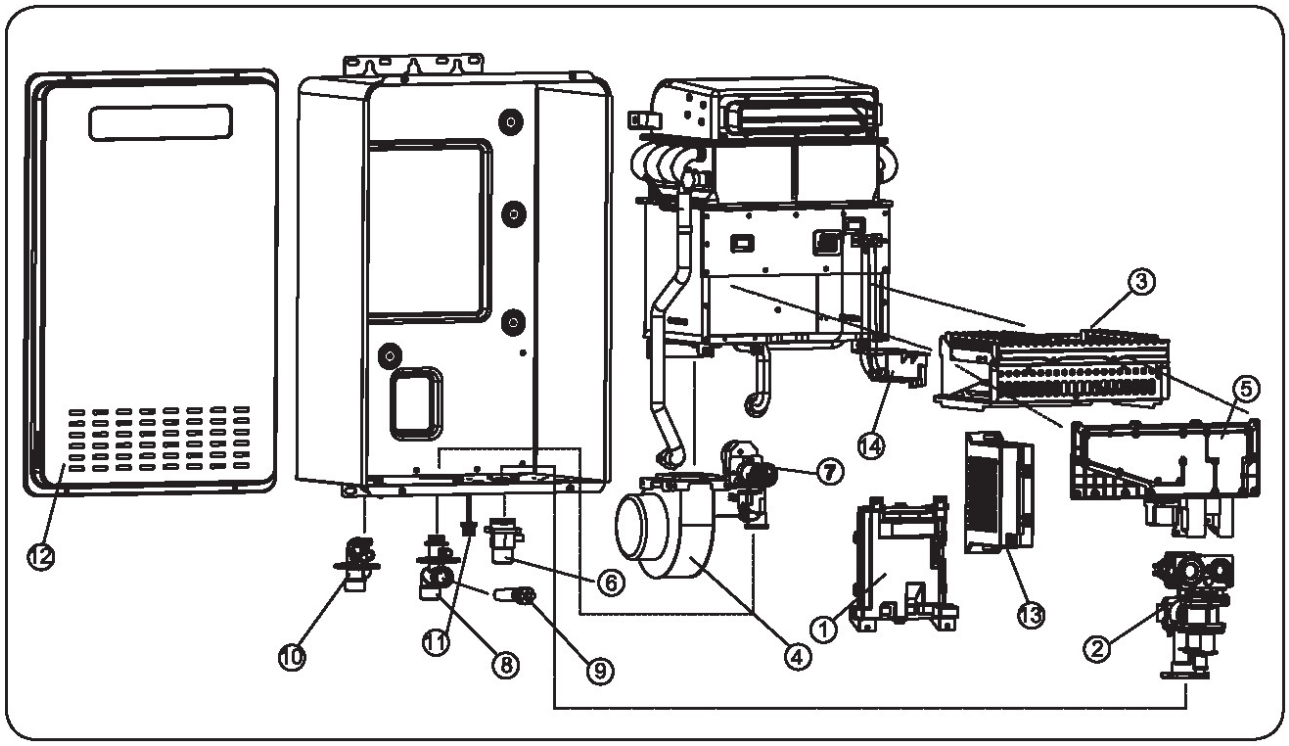


Figure 51

1. Control board
2. Gas valve
3. Burner assembly
4. Blower motor
5. Gas manifold
6. Gas inlet connector R ¾
7. Water valve
8. Water inlet connector R ¾
9. Strainer
10. Hot water outlet connector R ¾
11. Remote control terminal block
12. Front cover
13. Power box
14. Ignition device

Product Record

Customer Name :_____

Mobile No. : _____

Address : _____

Email : _____

Hot Water Heater Model Purchased : _____

Unit Serial Number : _____

Purchased Date & Installation Date : _____

Purchase Order &Quantity : _____

Installation Location : □ Kitchen □ Bathroom □ Balcony

□Others : _____

Installed by : _____

Signature : _____

Please fill in this card and keep it as a record.

Maintenance Record

Maintenance Date	Error Description	Repair Details	Service Personnel Signature	House owner confirmation