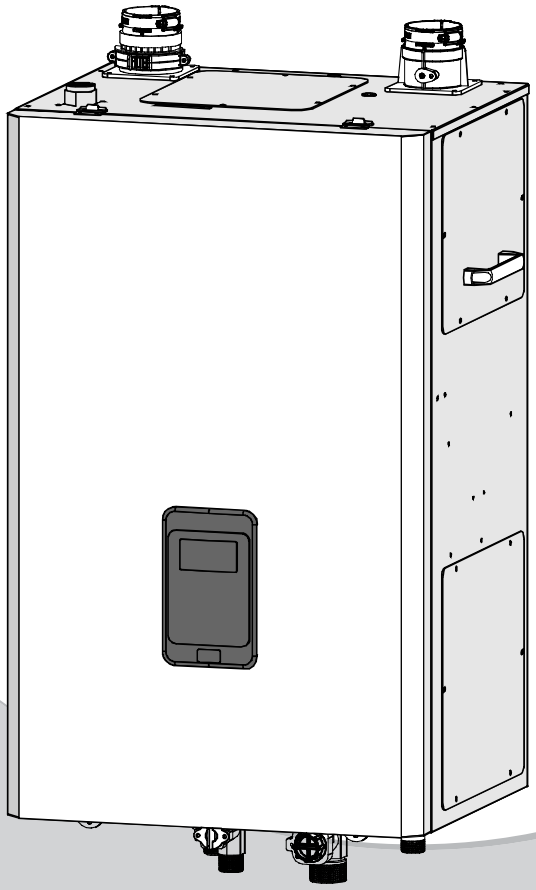


CUSTOM COMFORT

CONDENSING FIRETUBE COMBI

Installation Manual

Model
CCOFTCB199A

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

For Your Safety

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.

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury (exposure to hazardous materials)* or loss of life. Refer to the user's information manual provided with this boiler. Installation and service must be performed by a qualified installer, service agency or the gas supplier (who must read and follow the supplied instructions before installing, servicing, or removing this boiler.
This boiler contains materials that have been identified as carcinogenic, or possibly carcinogenic, to humans).

This boiler must be installed in accordance with local codes. In the absence of local codes, it must be installed in compliance with The Federal Manufactured Home Construction and Safety Stand Title 24 CRF, part 3280 or CAN/CSA Z240 MH series, mobile home. In the absence of such standard, The Standard for mobile Homes (ANSI/NFPA No. 601B-1977).
The installation must conform with local codes or, in the absence of local codes, the National Fuel Gas Code, ANSIZ223.1/NFPA 54 and/or CAN/CSA B149.1, Natural GAS and Propane Installation Code.

Safety Information

The following safety symbols are used in this manual for user's safety. Read this manual carefully and follow all instructions to avoid property damage, fire, explosion, personal injury, or death.

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

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

Caution Indicates a potentially hazardous situation which, if not avoided, could result in property damage.

Danger

If you smell gas:

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

Do not use or store flammable products, such as gasoline, solvents, or adhesives in the same room or area as the boiler.

- Vapors from flammable liquids can explode and/or catch fire causing death or severe burns.
- Keep flammable products far away from the boiler and store them in approved containers. Keep the containers tightly closed and out of the reach of children.
- The Boiler has a main burner flame that can come on at any time and will ignite flammable vapors.
- Vapors cannot be seen and are heavier than air. They can travel long distances along the ground and can be carried from other rooms to the boiler's main burner flame by air current.

Avoid using hot water over 125°F.

- Water temperature over 125°F can cause severe burns or death from scalding.
- If it is necessary to set the water temperature above 125°F (52°C), consider installing a thermostatically-controlled mixing valve. Contact a licensed plumber or your local plumbing authority for more information.
- Children, the disabled and the elderly are at highest risk of being scalded.
- Test water before bathing or showering.

Temperature	Time to Produce Serious Burn	Temperature	Time to Produce Serious Burn
120°F (49°C)	More than 5 minutes	140°F (60°C)	Less than 5 seconds
125°F (52°C)	1.5 to 2 minutes	145°F (63°C)	Less than 3 seconds
130°F (55°C)	Approx. 30 seconds	150°F (65°C)	Approx. 1.5 seconds
135°F (57°C)	Approx. 10 seconds	155°F (68°C)	Approx. 1 second

Warning

- **Do not store combustibles, such as papers or laundry, near the boiler or venting system.**
  Failure to do so may result in fire or explosion.
- **Do not store or use gasoline or other flammable liquids near this boiler.**
  Failure to do so may result in fire or explosion.
- **Do not store or use compressed gases, such as hair sprays or spray paints, near the boiler or venting system, including the vent termination.**
  Failure to do so may result in fire or explosion.
- **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.
- **Do not touch the internal components of the boiler or the power cord with wet hands.**
  Failure to do so may result in electric shock.
- **Do not operate the boiler with the front cover opened.**
  Failure to do so may result in fire or carbon monoxide (CO) poisoning, which may result in property damage, personal injury, or death.
- **Do not operate the boiler without proper venting.**
  Failure to do so may result in fire or carbon monoxide (CO) poisoning, which may result in property damage, personal injury, or death.
- **Shut off the gas supply if the boiler is damaged.**
  Have your installer or plumber show you the location of the gas shut off valve and demonstrate how to close the valve. If the boiler is damaged as a result of overheating, fire, flood, or any other reason, close the manual shut off valve and do not operate the boiler again until it has been inspected by a qualified technician.
- **Should overheating occur or the gas supply fails to shut off, do not turn off or disconnect the electrical supply to the pump. Instead, shut off the gas supply at a location external to the application.**
- **Do not use this boiler if any part has been under water. Immediately call a qualified service technician to inspect the boiler and to replace any part of the control system and any gas control which has been under water.**

Caution

- **Do not use the boiler for anything other than its intended purpose, as described in this manual.**
  Failure to do so may result in property damage, personal injury, or death.
- **Do not turn on the boiler unless the water and gas supplies are fully opened.**
  Failure to do so may damage the boiler.
- **Do not use unapproved replacement or accessory parts.**
  Failure to do so may result in improper or dangerous operation and will void the manufacturer's warranty.
- **When servicing the controls, label all wires prior to disconnecting them.**
  Failure to do so may result in wiring errors.
- **Do not place anything in or around the vent terminals that could obstruct the air flow in or out of the boiler.**
  Failure to do so may result in fire or carbon monoxide (CO) poisoning, which may result in property damage, personal injury, or death.
- **Do not attempt to repair or replace any part of the boiler, unless it is specifically recommended in this manual.**
  For all other service, contact an authorized technician or licensed professional. Improper adjustments, alterations, service, or maintenance may lead to property damage, personal injury, or death and will void your warranty.
- **Do not operate the boiler if you suspect something might be wrong with it.**
  Doing so may result in product damage or personal injury.
- **Do not allow children to operate or have access to the boiler.**
  Doing so may result in product damage or personal injury.
- **Do not use this appliance if any part has been immersed in water.**
  Immediately call a qualified service technician to inspect the appliance and replace any part of the control system and/or any gas control which has been immersed in water.
- **This boiler has been approved for use in the USA and Canada only.**
  Using the boiler in any other country will void the manufacturer's warranty.

Important Note 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 4.00 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 backup 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 backup 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 onehalf (1/2) inch in size, “GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS”.

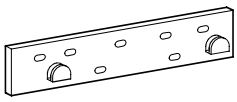
4. INSPECTION. The state or local gas inspector of the side wall horizontally vented gas fueled equipment shall not approve the installation unless, upon inspection, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CMR 5.08(2)(a)1 through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

Table of Contents

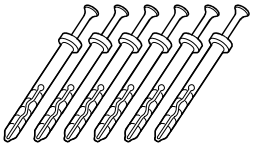
General Information

Included Items

The following items are included with the boiler. Check each of the following items before installation.



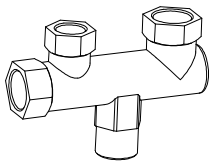
Wall mounting bracket



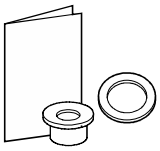
Tapping screws & anchors

Installation and User manual

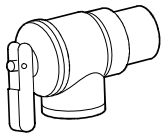
Quick installation manual



Christmas tree connector

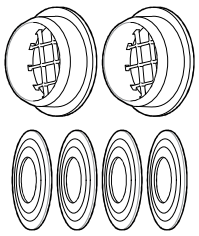


Gas conversion kit

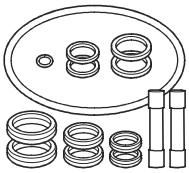


M335-M2(Watts)

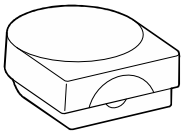
Pressure Relief Valve



2" Vent termination cap& Wall flange



Spare parts



QAC 2030(Siemens)

Outdoor temperature sensor

Notice

If there is a missing item, please contact Technical Support at 877-241-1224.

Specifications

The following table shows the specifications for the boiler. Additional specifications about water, gas, electric, and air supplies (venting) appear in each installation section.

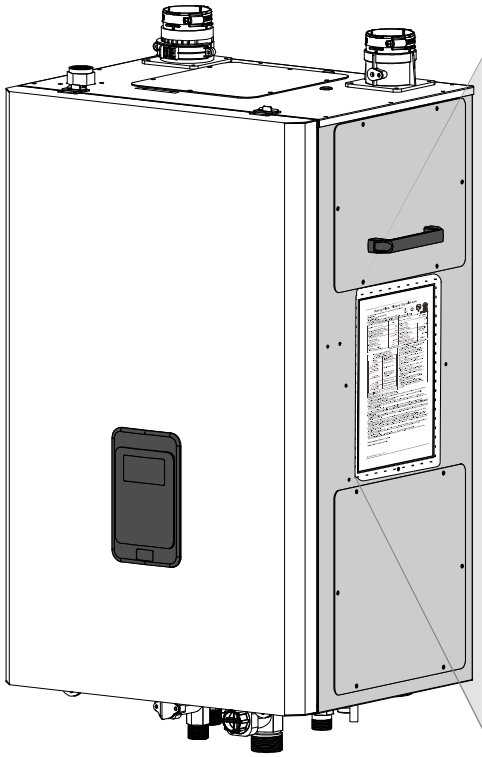
Model			CCOFTCB199A
Heat Capacity (Input)	Space Heating	Min	17,000 BTU/H
		Max	199,000 BTU/H
	Domestic Hot Water	Max	199,000 BTU/H
Flow Rate (DHW)	35 °F (19°C) Temp Rise		9.9 GPM (37.5 L/m)
	45 °F (25°C) Temp Rise		7.7 GPM (29.2 L/m)
	67 °F (37°C) Temp Rise		5.5 GPM (20.8 L/m)
AFUE	Natural Gas (Propane)		95 %
Dimensions (W X D X H)			19.69" X 16.24" X 31.98" (500 mm X 412.4 mm X 812.4 mm)
Water Volume	Main Tank		2.38 Gallons
	Sub Tank		1.45 Gallons
Weight			146.6 lbs (66.5 kg)
Installation Type			Indoor Wall-Hung
Venting Type			Forced draft direct vent
Ignition			Electronic ignition
Water Pressure (Hydronic/DHW)			15~150 psi
Natural Gas Supply Pressure			3.5"-10.5" WC
Propane Gas Supply Pressure			8"-13" WC
Natural Gas Manifold Pressure			-0.01" - -2.05"WC
Propane Gas Manifold Pressure			-0.01" - -2.15"WC
Temp. Range	Space Heating		82 ℉ - 180 ℉ (27 ℃ - 82 ℃)
	DHW		98 ℉ - 140 ℉ (37 ℃ - 60 ℃)
Connection Size	Space Heating Supply / Return		1-1/4" NPT
	Cold water Inlet		3/4" NPT
	Hot water Outlet		3/4" NPT
	Recirculation Inlet		3/4" NPT
	Gas Inlet		3/4" NPT
Power Supply	Main Supply		120V AC, 60 Hz / use less than 5 AMP
	Power Consumption		215 W
Materials	Heat Exchanger		Stainless steel
Venting	Exhaust / Intake		2" or 3" PVC, CPVC, Polypropylene 2" or 3" Special gas vent type BH (Class II, A/B/C)
	Vent Clearances		0" to combustibles
Safety Devices			Flame rod, Over heat preventer, Exhaust temperature high limit sensor, Power surge fuse Burner temperature high limit sensor, Low water cut off switch

Rating Plate

Danger

The gas type and electricity voltage must match the rating plate. Using a different gas type and electricity voltage will cause the boiler to malfunction.

Before the installation, check the rating plate located on the side of the boiler to ensure that the boiler matches the gas type, gas pressure, water pressure, and electrical supply available in the installation location. If the boiler does not match each of these ratings, do not install the boiler. If the gas conversion is required, the included gas conversion kit must be used.



Rating Plate, *Plaque Signalétique

Combination Boiler and Space Heater / Combiné Chaudière et Chauffe-Espace
Custom Comfort
6 Storrs Street, Concord, NH 03301
Tel: 877-241-1224
For either direct vent installation or for installation using indoor combustion air.
/Pour une installation à évacuation directe ou pour une installation utilisant de l'air de combustion à l'intérieur.
For installation on noncombustible floors only. /Pour l'installation sur des sols incombustibles uniquement.

M/C No. 271266

Model No * Numéro de modéle		**Type of Gas** * Type de gaz	Natural Gas
Max. Input Rating (Space Heating) * Max. Entrée Note (espasce de chauffage)	**Btu/h**	**Min Input Rating** * Min. Note d'entrée	**Btu/h**
Max. Input Rating (Hot Water) * Max. Entrée Note (eau chaude)	**Btu/h**	**Heating Capacity** * Capacité de chauffage	**Btu/h**
Category of boiler * Catégorie de chaudière	**Category IV**	**Electrical Rating** * Régime nominal électrique	**AC 120 Volts 60 Hz Use less than 5 Amp**
Inlet Gas Pressure * Pression de gaz d'entrée	**Inch W.C.**	**Manifold Pressure,** * Pression d'admission	**Inch W.C.**
Water temperature limit * limite de température de l'eau	210℉	**Minimum relief valve capacity** * Capacité minimaum soupape	**189 lbs/hr**

※ **Edition of the standard : CSA/ANSI Z21.13:22·CSA 4.9.:22**

INSTALLATION CLEARANCES
(DÉGAGEMENTS D'INSTALLATION)
Indoor Installation (Installation intérieure)

Clearance (dégagement)	**Indoor Installation** (Installation intérieure)
Top of boiler (Haut de la chaudière)	**Min 12 inches** (305 mm)
Back of boiler (Retour de la chaudière)	**Min 0.6 inches** (15 mm)
Front of boiler (Façade de la chaudière)	**Min 6 inches** (152 mm) Clearance for servicing is 24 in. (610mm) in front of boiler
Side of boiler (Côté de la chaudière)	**Min 6 inches** (152 mm)
Bottom of boiler (Bas de la chaudière)	**Min 12 inches** (305 mm)

Minimum Wall Thickness / Épaisseur de paroi minimale : 4Inches (10.2 cm)
Maximum Wall Thickness / Épaisseur de paroi maximale : 20Inches(51 cm)

- The pressure relief valve provide by the manufacture shell be installed at the time of installation of the boiler in the location specified by the manufacturer.
(La soupape de décharge de pression fournie par le Fabricant shell être installé au moment de l'installation de la Chaudière l'emplacement spécifié par le fabricant.)
- For safe operation of the boiler, the relief valve must not be removed or plugged.
(Pour un fonctionnement sûr de la chaudière la soupape de décharge ne doit pas être enlevé ou branché)
- No valve shall be placed of in suitable place where it will cause no damage.
(Aucune vanne doit être placé dans endroit approprié où il ne causera pas de dommages)
- Also there shall be no other reducing coupling or other restrictions installed on the discharge line to restrict flow.
(Aussi il n'y aura pas d'autre raccord de réduction ou d'autres restrictions installées sur la ligne de décharge pour limiter l'écoulement.
- See installation Manual Heading "PRESSURE RELIEF VALVES" for installation and maintenance of relief valve discharge line and safety precation.
(Voir Installation Rubrique Manuel "SOUPAPES DE DÉCHARGE" pour l'installation et l'entretien de la ligne d'év acuation de la soupape de décharge et de précaution de sécurité.)

Orifices necessary for Propane conversion are provided.
* Les injectures nécessaires à la conversion au Propane sont fournis.

This boiler must be installed with vent the vent-air intake system as specified and installed in accordance with the manufacturer's installation instructions.
* Cette chaudière doit être installée de manière à purger le système d'admission d'air-air comme spécifié et installée conformément aux instructions d'installation du fabricant.

Failure to use the correct gas can cause problems which can result in death, serious injury or property damage.
* Le fait de ne pas utiliser le bon gaz peut causer des problèmes qui peuvent mener à la mort, causer des blessures graves ou endommager la propriété.

Consult your installation manual for more informatio.*Consultez votre manual d'installation pour plus d'informatio.

This appliance is certified for use at altitudes up to 2,000 ft (610 m) in accordance to the latest CAN/CGA 2.17.High Altitude Installation procedures at normal manifold pressure. For installation instructions at altitudes higher than 2,000 ft, please contact Custom Comfort.
* Cet appareil est certifié pour une utilisation à des altitudes de 0 à 2,000 pieds (610 m) conformément aux toutes les procedures d'installation à haute altitude CAN/CGV 2.17 à une pression normale. Pour les installations à élévations en hautde 2,000 pieds, appeler le bureau de Custom Comfort.

This boiler must be installed in accordance with local codes, if any; if not, follow the *National Fuel Gas Code*, ANSI Z223.1/NFPA 54, or the *Natural Gas and Propane Installation Code*, CAN/CSA B149.1, as applicable.
* Cette chaudière doit être installée conformément aux codes locaux, le cas échéant. Sinon, respectez le code national de gaz combustible, ANSI Z223.1 / NFPA 54, ou le code d'installation de gaz naturel et propane, CAN/CSA B149.1, selon le cas.

This appliance requires a special venting system. Refer to installation instruction for parts list and method of installation
* Cet appareil nécessite un système de ventilation spécial. Reportez-vous à l'instruction d'installation pour la liste des pièces et de l'installation de la méthode.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other gas appliances.
* Ne rangez pas et n'utilisez pas d'autres liquides ou vapeurs inflammables prés de cet appareil ou de tout autre appareil électroménager.

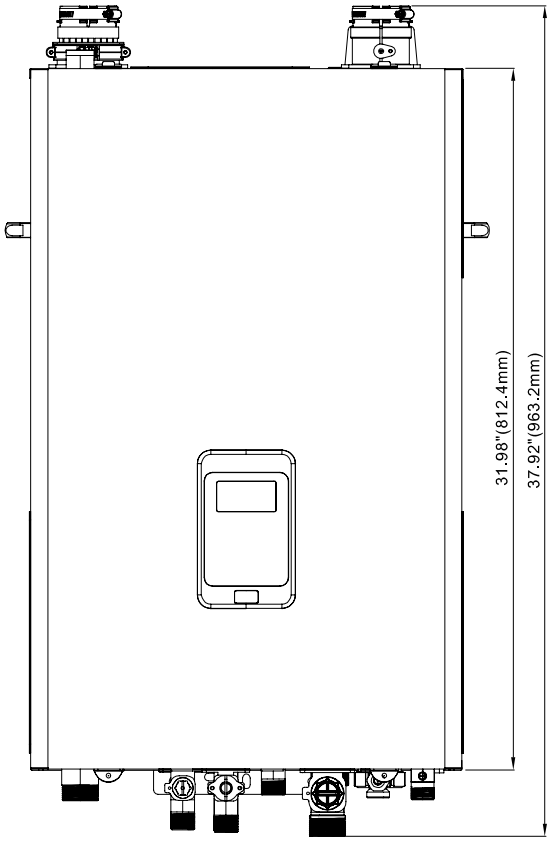
When reinstalling the appliance, check the sealling on the exhaust & air intake vent system.
* Lors de la réinstallation de l'appareil, vérifiez l'étanchéité du système de ventilation d'échappement et d'admission d'air.

PRODUCT NUMBER * NUMÉRO DE PRODUIT

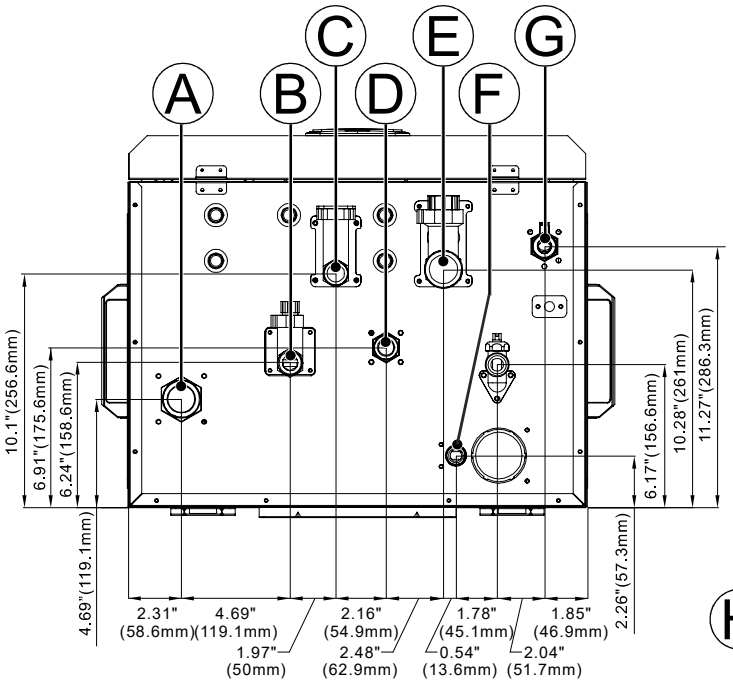
SERIAL NUMBER * NUMÉRO DE SÉRIE

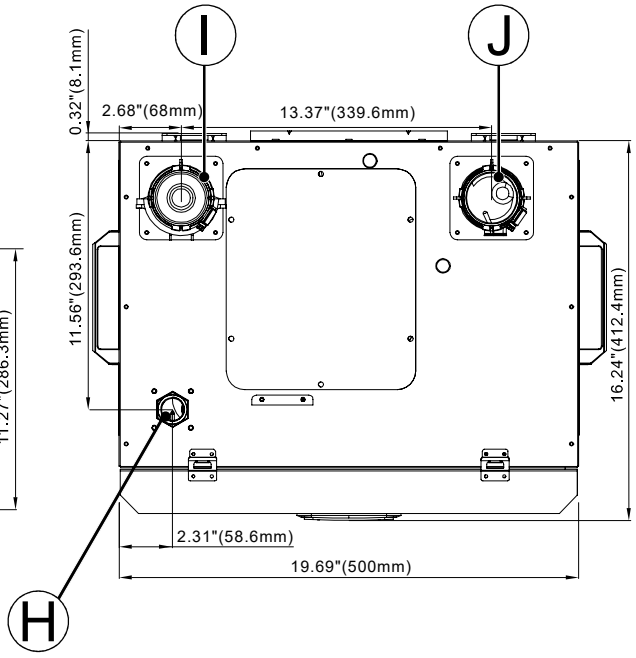
Made in KOREA / *Fabriqué en Corée*

Dimensions

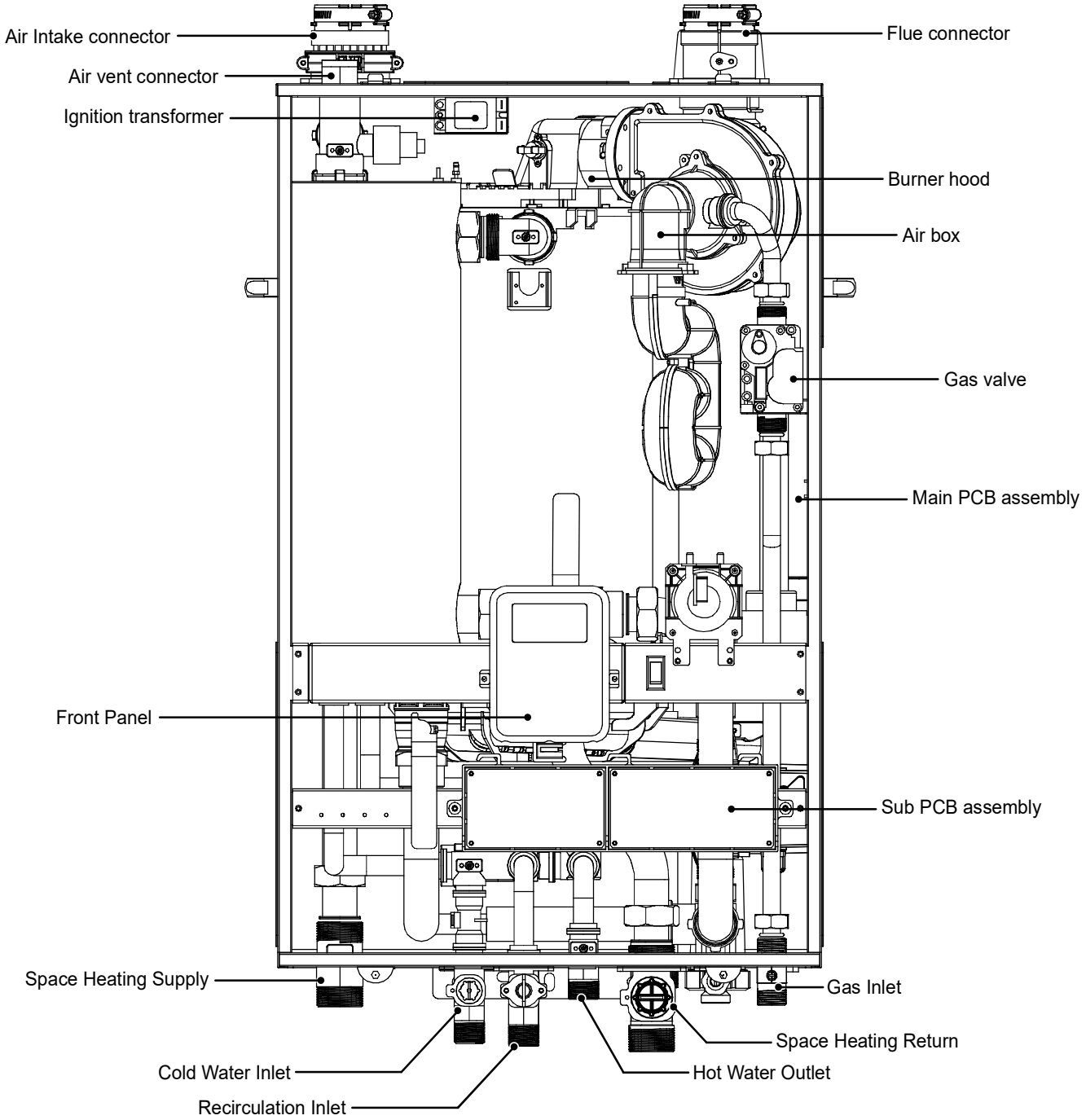


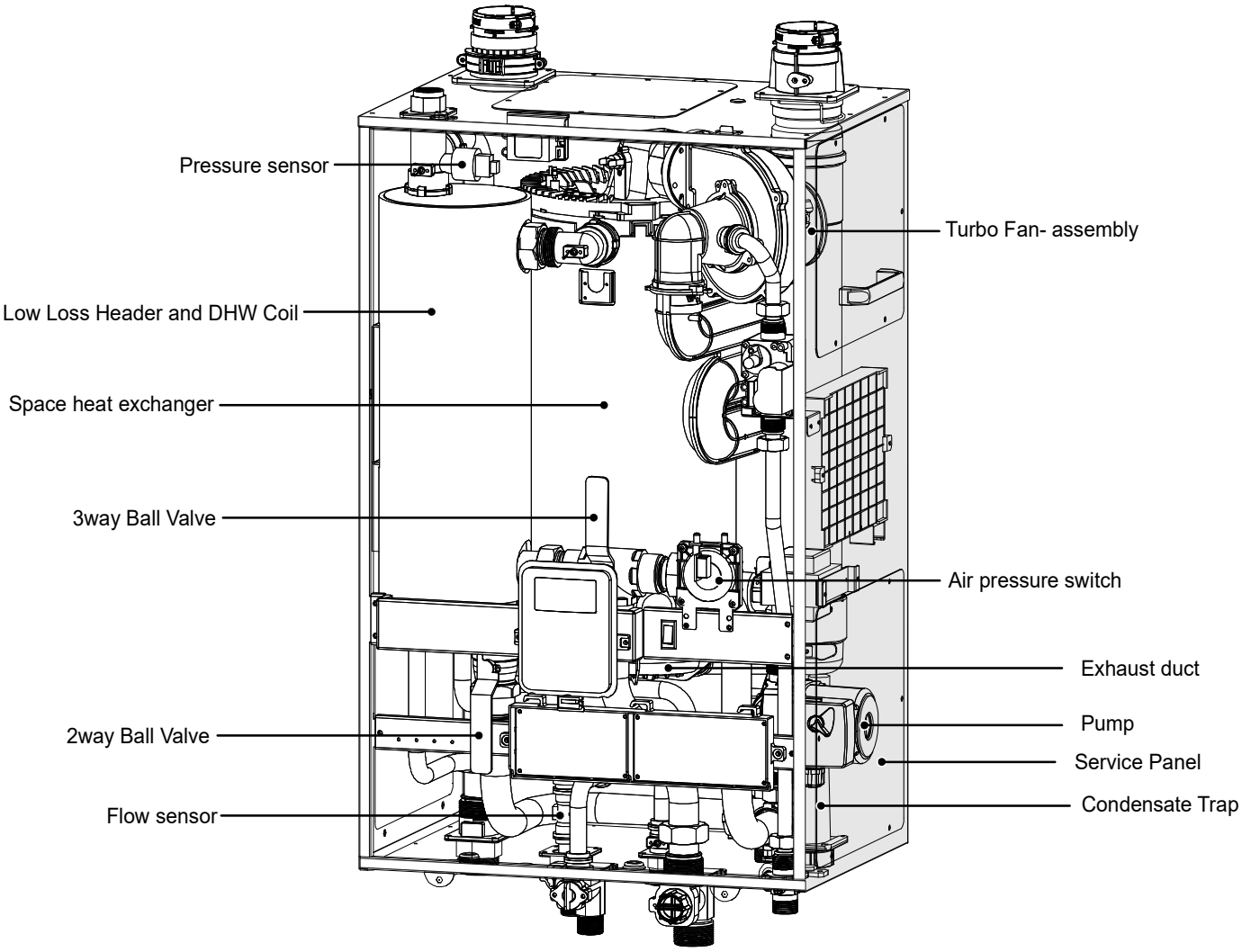
No.	Description	Diameter
Ⓐ	Space heating Supply	1-1/4" NPT
Ⓑ	Cold water Intlet	3/4" NPT
Ⓒ	Recirculation Inlet	3/4" NPT
Ⓓ	Hot water Outlet	3/4" NPT
Ⓔ	Space heating Return	1-1/4" NPT
Ⓕ	Condensate Outlet	1/2" NPT
Ⓖ	Gas Inlet	3/4" NPT
Ⓗ	Air vent Connector	1" NPT
Ⓘ	Air inlet	2" NPT
Ⓙ	Exhaust Vent	2" NPT





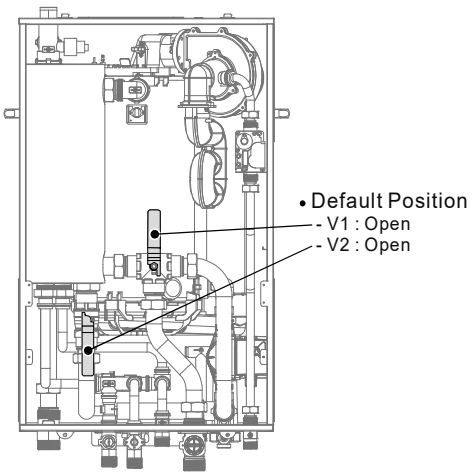
Components

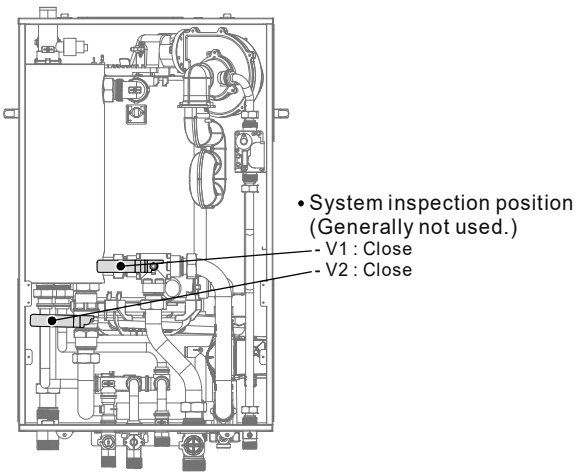

Air Intake connector
Air vent connector
Ignition transformer
Flue connector
Burner hood
Air box
Gas valve
Main PCB assembly
Front Panel
Sub PCB assembly
Space Heating Supply
Gas Inlet
Space Heating Return
Cold Water Inlet
Hot Water Outlet
Recirculation Inlet



Caution

The default position of the 3way ball valve (V1) and 2way ball valve (V2) are as shown in the picture above.
They are used for system inspection, so do not change them.





Installing the Boiler

Installer Qualifications

A licensed professional must install and inspect the appliance. A licensed professional is a person who is licensed for the following:

- Connecting gas lines, water lines, valves, electricity
- Vent installation through walls and roofs
- Applicable of local, state, and national codes

Compliance Requirements

- National electrical code.
- National fuel gas code, ANSI Z223.1/NFPA 54 and/or CAN/CSA B149.1, natural gas and propane installation codes.
- Local, state, provincial, and national codes, laws, regulations, and ordinances.
- Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1, when required.
- For Canada only: B149.1 installation Code, CSA C22.1 Canadian Electricity supply enters the building.

Location

For installation :

This appliance provides for separation of the combustion system from the indoor atmosphere of the manufactured (mobile) home by an installation method.
This appliance shall be installed only in a space closed from the atmosphere within the manufactured (mobile) home.
The doors or access panels serving the space in which the appliance is located shall communicate only to the outdoors.
in the manufactured homes This appliance shall not be installed in a recreational vehicle.

Warning

For appliances that allow indoor installation within a residential living space or home:
The installer must verify that at least one carbon monoxide alarm has been installed within a residential living space or home following the alarm manufacturer's instructions and applicable local codes before putting the appliance into operation

When considering a location for installation, the installer, must ensure the following:

- Access to utilities
- Humidity and contact with water
- Water quality
- Drainage
- Venting and ventilation
- Proximity to fixtures and appliances
- Clearances
- Clean, debris and chemical-free combustion air
- High elevation Installations

Access to utilities

- Electricity – Close to where the electrical supply enters the building
- Water – Close to where the domestic water supply enters the building
- Gas – Close to where the gas supply enters the building

Humidity and contact with water

Avoid places with excessive humidity. The boiler has electric gas ignition components. If water gets inside the boiler, the ignition system can be damaged. The boiler must be installed in such a way as to ensure that the gas ignition system components are protected from water (dripping, spraying, rain, etc.) during operation and service.

Drainage

A significant amount of condensate is produced during the boiler operation. Install the boiler near a suitable drain and where damage from a possible leak will be minimal. Installing the boiler without a drain will void the warranty. For more information about condensate drainage, refer to *"Connection the Condensate Drain"* on page 20.
The Boiler 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-draining drain pan under the boiler is highly recommended. When installing the drain pan, ensure that the installation does not restrict combustion air flow.

Venting and ventilation

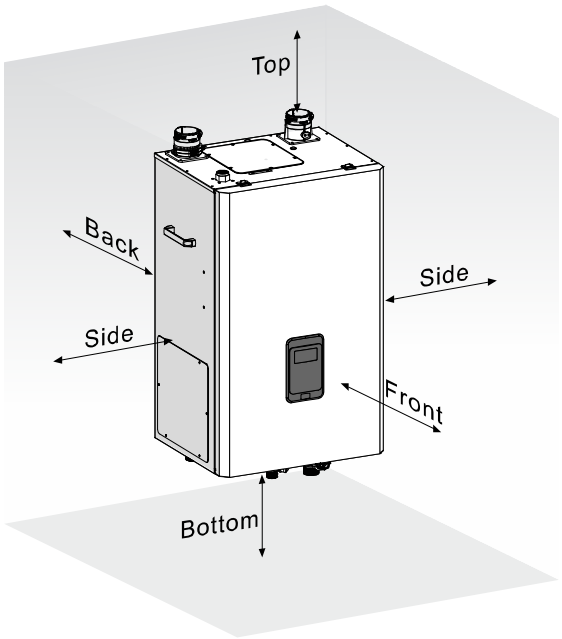
Consider venting restrictions caused by windows, doors, air intakes, gas meters, foliage and other buildings, and select a location that requires minimal venting.
When considering an adequate venting and ventilation, ensure the following:

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

For more information about venting, refer to *"Installing a Vent"* on page 32.

Clearances

The boiler should be installed in an area that allows for service and maintenance access to utility connections, piping, filters, and traps. Ensure the following clearances are maintained:



Clearance From	Wall Mounting
Top	12 inches (305 mm) min.
Back	0.6 inches (15 mm) min.
Front	6 inches (152 mm) min.
Sides	6 inches (152 mm) min.
Bottom	12 inches (300 mm) min.

Caution

Do not install the boiler on carpeting.

Clean, debris and chemical-free combustion air

- Do not install the boiler in areas where dust and debris may accumulate or where combustion air can be contaminated.
- Do not install the boiler in areas with greasy fumes or heavy amounts of steam, if necessary, take measures to prevent fumes and steam from entering the boiler.
- Chemicals that are corrosive in nature should not be stored or used near the boiler.

Position

Caution

Do not mount the boiler to unsubstantial flooring or unreinforced dry wall.

The boiler can be mounted to the wall. For easy installation, use the mounting bracket to mount the boiler to standard wall studs. If the strength of the wall is insufficient and or if the framing is non-standard or uneven, reinforce the area before installation. Avoid installation in unstable locations as the boiler will make some operational noises while it is running.

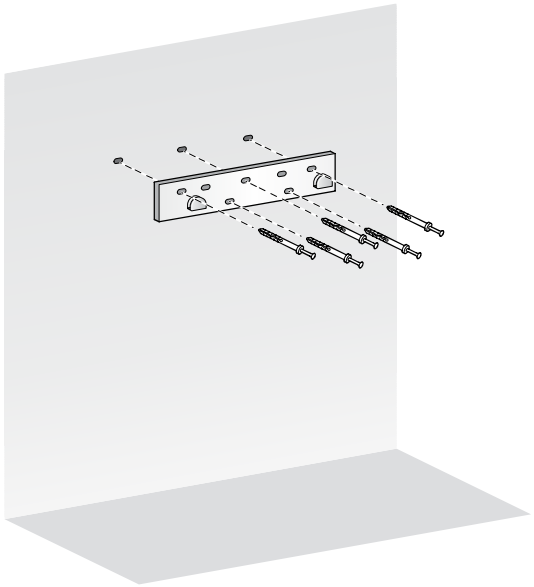
Notice

Consider vent length and surrounding circumstances when mounting the boiler.

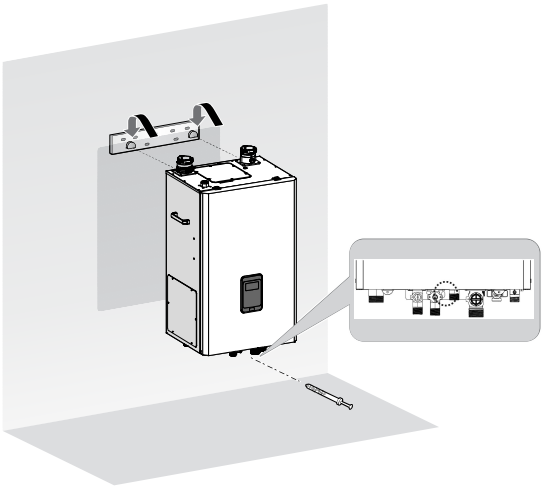
Mounting to the wall

To mount the boiler to the wall:

1. Check that the wall is level and can support the weight of the boiler.
2. Affix the mounting bracket securely to the wall.



3. Align the grooves on the back of the boiler with the tongues on the mounting bracket and hang the boiler from the bracket.



Warning

- The boiler is heavy. Always lift the unit with assistance. Be careful not to drop the boiler while lifting or handling it to avoid bodily injury or damage to the unit.
- Do not rest the boiler on the bottom end after removing it from the shipping carton. Doing so may result in excessive pressure on protruding pipes and cause product damage. If you must put the boiler down, lay it on its back or put it inside the protective shipping base.

Installing the System Piping

Before connecting the pipes to the boiler, clean all systems to remove sediment, flux, solder, scale, debris, or other impurities that may be harmful to the boiler system. It is important to maintain the inside of the pipes free of debris, copper dust, sand, and dirt while installing the heating system.

When installing the Custom Comfort boiler and keeping the existing pipes, all pipes including the radiator should be cleaned.

Warning

If you fail to remove the above-mentioned contaminants from the heating system, your warranty will be void, the heat exchange will break down faster than normal, and property damage may occur as a result.

Installing a Space Heating System

The primary heat exchanger and secondary heat exchanger of the boiler are designed optimally to obtain high thermal efficiency. The primary heat exchanger is configured in the finned tube method and the secondary heat exchanger is configured in the plate to plate method, maximizing the heating surface area to achieve high thermal efficiency. In order to allow the heat exchanger to operate effectively over time without trouble, it is important to follow the rules and guidelines mentioned in this section.

Caution

If you fail to follow the guidelines provided in this section, your warranty will be void and property damage, fire, serious injury, or death may occur as a result.

Guidelines for a Space Heating System

Read the guidelines below for installing the boiler heating system safely and properly.

Freeze protection for the space heating system

- Freeze protection products may be used to prevent the space heating system from becoming frozen. A specially manufactured glycol is necessary for preventing a new or existing piping system from becoming frozen. This glycol should include inhibitors not harmful to metallic system components.
- Before using freeze protection products, it is necessary to check if the amount of glycol use in the space heating water is appropriate and if the inhibitor level in such glycol is appropriate. Custom Comfort recommends against exceeding a 35% concentration of glycol.
- If freeze protection products are used, the system should be tested at least once a year.
- When using the freeze protection products, allowance should be made for expansion of the glycol solution.
- Freeze damage is not covered by the warranty.

Warning

For a system requiring freeze protection, use only inhibited propylene glycol, specially formulated for hydronic heating systems; use of other types of antifreeze may be harmful to the system and will void the warranty.

System Pressure

- The boiler is intended solely for use in a pressurized closed loop heating system operating with 7-30psi water pressure at the boiler outlet. To obtain the minimum system design pressure, comply with the piping diagram in this section.
- The space heating system of the boiler is not approved to operate as an “open system”, and thus cannot be used for direct potable water heating or to process heating of any kind.

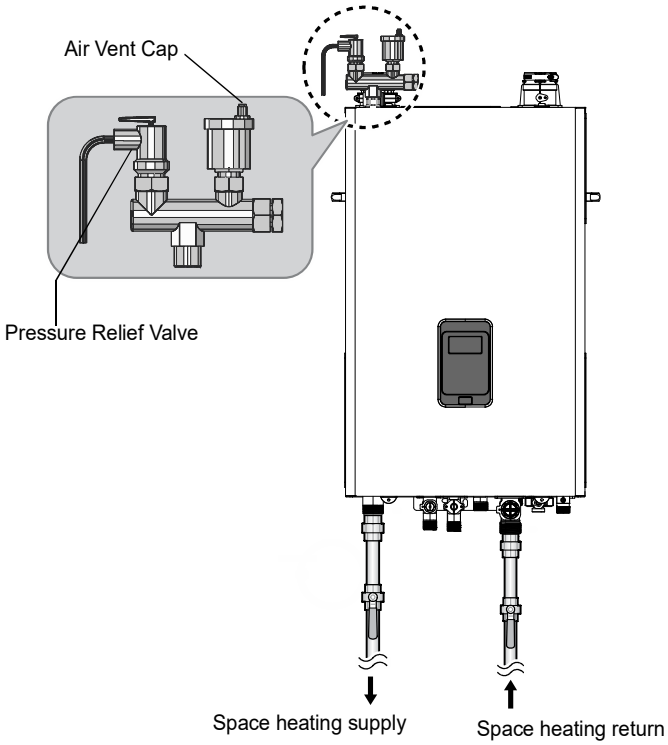
Air Elimination

This boiler can be installed only in a pressurized closed-loop heating system free of air and other impurities.
Install a proper-sized air-purging device at a proper position to eliminate air from the entire heating system.

Essential Elements in a Space Heating System

Air Vent

The air vent efficiently removes the air inside the boiler.
The following illustration shows an example using a PRV air vent.



- Before installing the air vent line and any air vent fittings, you should be familiar with the LWCO and pressure relief valve installation guidelines.

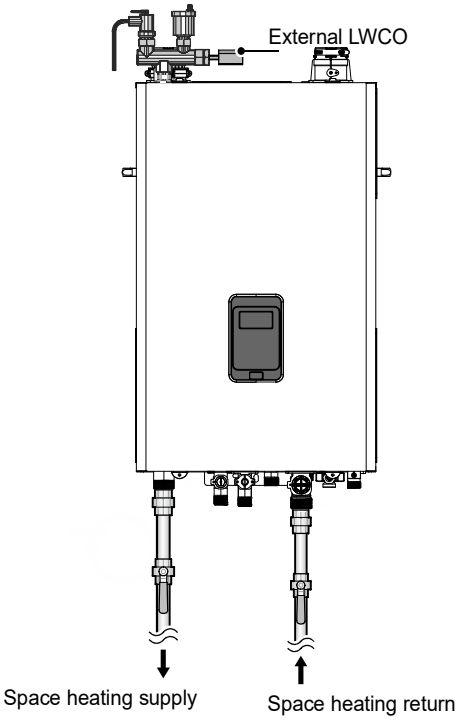
Low Water Cut Off(LWCO) Device

Internal LWCO

The boiler already has a type of low water cut off (LWCO) device that senses the pressure inside of the product. The minimumoperating pressure of this device is 7.1psi.
Refer to the local code to see if LWCO is necessary for the system. In addition, check if the LWCO attached inside meets such code.

External LWCO

Install LWCO if it is required by local code.
THE LWCO can be connected to the included PRV air vent adapter. The following illustration shows an example of an external LWCO separately by installing a PRV air vent adapter.



LWCO installed outside should be installed at least 6 inches (150mm) or more away from the end of the heat exchanger.

Backflow Preventer

When filling the device with water, install a backflow preventer if it is required by local code.

Expansion Tank

The expansion tank should be installed in the system pipes in order to prevent excessive pressure in the heating pipes.
When installing the expansion tank, follow the guidelines below.

- If the air separator is located on the suction side of the system circulator, connect the air separator to the expansion tank.
- When replacing the expansion tank, refer to the literature of the expansion tank manufacturer for selecting the proper size.
- When installing the diaphragm expansion tank, always install an automatic air vent at the top of the air separator in order to remove residual air in the system.
- If an additional water fill connection is necessary for special use, install the water fill connection at the same location as the expansion tank's connection to the system.
- When replacing the expansion tank, refer to the literature of the expansion tank manufacturer for selecting the proper size.
- When installing the diaphragm expansion tank, always install an automatic air vent at the top of the air separator in order to remove residual air in the system.

Isolation Valves and Unions

- This boiler system requires a full port ball valve. If a full port ball valve is not used, water may flow at a limited flow rate through the boiler.
- It is recommended to use unions for the serviceability of the device.

Pressure Relief Valve

This boiler comes with an ASME-approved pressure relief valve to install space heating. To complete the installation of the boiler, you must install an approved 3/4", maximum 30 PSI (for space heating).

Warning

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

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 boiler.

When installing the pressure relief valve, follow the guidelines below.

- The discharge capacity of the valve should be greater than or equal to the maximum pressure rating of the space heating system in the boiler.
- The maximum Btu/h rating of the pressure relief valve should be greater than or equal to the maximum input Btu/h rating of the boiler.
- If the pressure relief valve operates, discharging domestic hot water, domestic hot water may scatter or splash onto other equipment around. Connect the pressure relief valve to the outlet pipe.
- When installing the discharge piping line, do not install a coupling whose internal diameter decreases or has other restrictions.

If the pressure relief valve discharges hot water periodically, thermal expansion may occur due to an expansion tank problem or small expansion tank size. Do not plug the pressure relief valve.

Space Heating Piping

When connecting the space heating system, follow these guidelines.

- Tighten the connection valves carefully in order to avoid damage.
- After installing the boiler, check if the space heating water flows smoothly and if there is a water leak. Inform the boiler owner of the fact that the strainer should be cleaned periodically to maintain the smooth flow of space heating water. (The strainer is located on the side of the space heating return.)

Installing a Domestic Hot Water (DHW) System

The boiler can supply dometic hot water continuously when the flow rate is detected by the flow switch. This is the most appropriate way to minimize standby losses and improve the combustion efficiency.

Guidelines for a DHW System

The boiler is designed to use space heating and domestic hot water.
This boiler is equipped with the flow switch, and when approximately 0.5GPM or more water flows, the flow switch will sense such water flow. The boiler will then switch to the DHW mode immediately regardless of the space heating system's status.
Read and follow the guidelines stated below for the safety and proper installation of DHW system.

Scald Hazard

The hotter the water, the higher the risk of burns. If the DHW temperature is set too high, there is a risk of burns from domestic hot water. Make sure to follow the usage guidelines in the user manual.

About the DHW Quality

If the quality of water cannot meet the EPA standard, appropriate boiler maintenance is required. Any damage resulting from bad quality of water voids the warranty. The following table shows the permitted maximum contaminant levels based on the EPA National Secondary Drinking Water Regulations (40 CFR Part 143.3).

Contaminant	Maximum Allowable Level
Total Hardness	200mg/l
Aluminum	0.05 - 0.2 mg/l
Chloride	250 mg/l
Copper	1.0 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
pH	6.5 - 8.5
Sulfate	250 mg/l
Total Dissolved Solids (TDS)	500 mg/l
Zinc	5 mg/l

Custom Comfort is not responsible for the blockage of the domestic system due to the accumulation of foreign matters or scaling.

The installer or the user should take appropriate measures in order to avoid any problem related to the quality of water.

Freeze Protection

Custom Comfort recommends insulating the DHW pipes. The pipes can be covered using heat-insulating materials. Freeze damage voids the warranty.

Essential Elements in a DHW System

DHW Heat Exchanger

The DHW heat exchanger installed on the boiler is designed to withstand a significant amount of water pressure.

Drain and Isolation Valve

Install drain and isolation valves on the inlet and outlet of the DHW heat exchanger, so it can be flushed free of possible build-up caused by dirt or hard water.

DHW Filter

The boiler has a filter on its cold water inlet nipple. Clean the filter periodically to prevent the interruption of water flow by foreign matters. If such foreign substances adhere to the flow switch, the boiler may malfunction.

Pressure Relief Valve for DHW

To complete the installation of the DHW system, you must install the approved ¾", maximum 150psi pressure relief valve on the hot water outlet.

Warning

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

The DHW pressure relief valve is not provided together with the product. However, it is necessary to install such a valve.

Caution

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

When installing the pressure relief valve, follow the guidelines below.

- The discharge capacity of the valve should be greater than or equal to the maximum pressure rating of the DHW system in the boiler.
- The maximum Btu/h rating of the pressure relief valve should be greater than or equal to the maximum input Btu/h rating of the boiler.
- If the pressure relief valve operates, discharging domestic hot water, domestic hot water may scatter or splash onto other equipment around. Connect the pressure relief valve to the outlet pipe.
- When installing the discharge piping line, do not install a coupling whose internal diameter decreases or has other restrictions.

If the pressure relief valve discharges hot water periodically, it may be caused by thermal expansion of the closed water system. Contact the water supplier or a local plumbing inspector in order to such a problem. Do not plug the pressure relief valve.

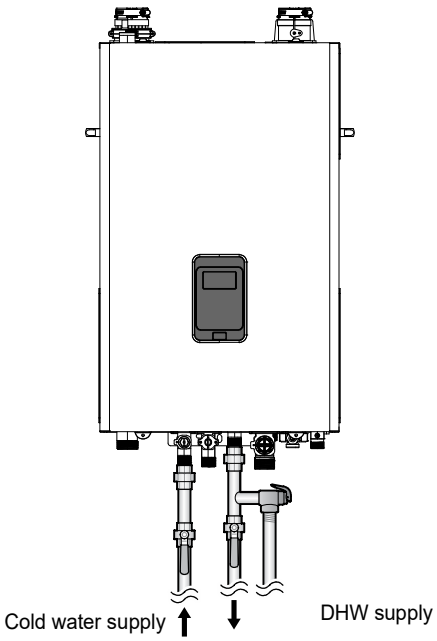
When installing the DHW system, follow the guidelines below.

- Only use permitted pipes, valves and other parts such as a solder for the potable water system.
- Tighten the connection valves carefully in order to avoid damage.
- Custom Comfort recommends the use of unions and manual shut-off valves for 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.
- When installing a mixing valve on the DHW piping, ensure that the cold water pressure does not exceed the hot water pressure.
- 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 boiler, clean the cold water inlet filter. Then, check if domestic water flows properly and check for water leaks. Inform boiler owner that the filter should be cleaned periodically to ensure that domestic hot water flows smoothly.

DHW System Piping

Caution

In order to meet the requirements of ASME or CRN, an additional high temperature limitation device may be necessary. Refer to the requirements of the local code for whether this device is necessary or not.



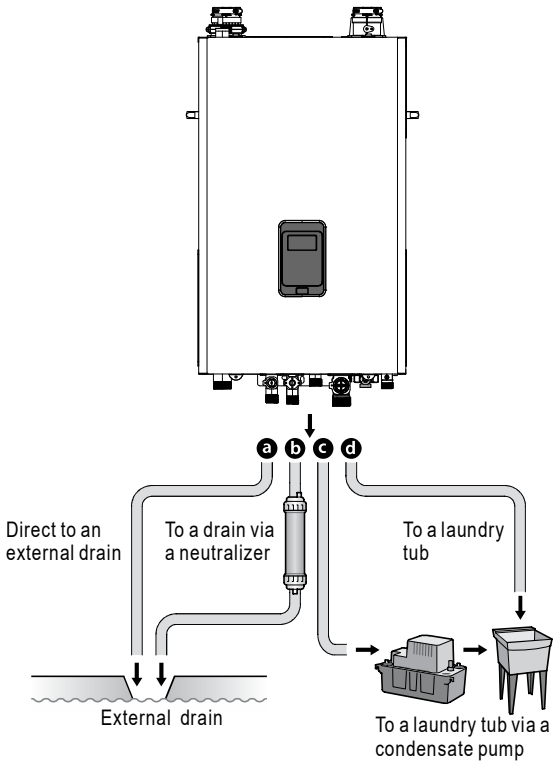
Connection the Condensate Drain

Caution

- All condensate must drain and be disposed of according to local codes.
- Do not cap or plug the integrated condensate line. If prevented from draining, condensate can damage the boiler.
- The condensate line must have a negative slope to drain properly.
- Do not run drain outdoors. Freezing of condensate can cause property damage.
- Do not connect the condensate drain line directly to the rain sewer.
- Do not connect the condensate drain line with an air conditioning evaporator coil drain.
- Use only corrosion resistant materials for the condensate drain lines such as PVC pipe or plastic hose.
- The end of the condensate drain pipe should be open to the atmosphere. The end should not be under water or other substances.
- Periodic cleaning of the condensate collection and disposal system.

The boiler creates condensation when it operates. This condensation has an acidic pH of 3-5. Follow all local codes and regulations when disposing of condensate from the boiler.
We recommend draining the condensate into a laundry tub, as the alkali in laundry detergent will neutralize the acid in the condensate. However, other suitable waste drain locations may be used according to local codes.

Before connecting the condensate drain, choose one of the following disposal options:



(a) From the boiler directly into an external drain.

(b) From the boiler, through a neutralizing agent, and then into an external drain

Notice

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

(c) From the boiler into a condensate pump, and then into a laundry tub.

Notice

A pump can be used when there is a long distance between the boiler and the laundry tub or when the bottom of the boiler is lower than the top of the laundry tub.

(d) From the boiler into a laundry tub.

Notice

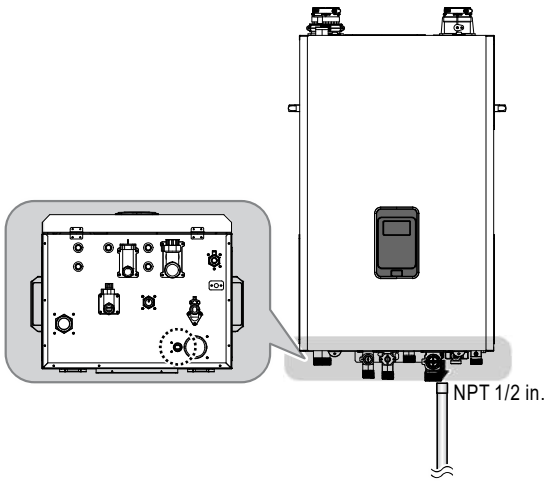
The bottom of the boiler must be higher than the top of the laundry tub to use this option.
The condensate line must have a negative slope to drain properly.

To connect the condensate drain:

1 Connect a drain line to the boiler.

Notice

Use only corrosion-resistant material for the drain line, such as PVC or CPVC. Do not reduce the size of this fitting or the drain line to less than 1/2".



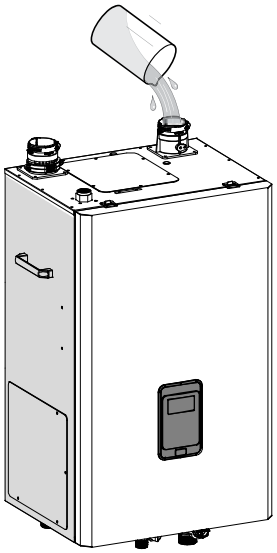
2 Place the free end of the drain line into an appropriate drain.

Notice

- If you are using a condensate pump, ensure that the pump allows for up to 2 GPH of drainage for each boiler in the system.
- If you are not using a condensate pump, ensure that the drain line is pitched downward at a minimum slope of 1/4" per foot.

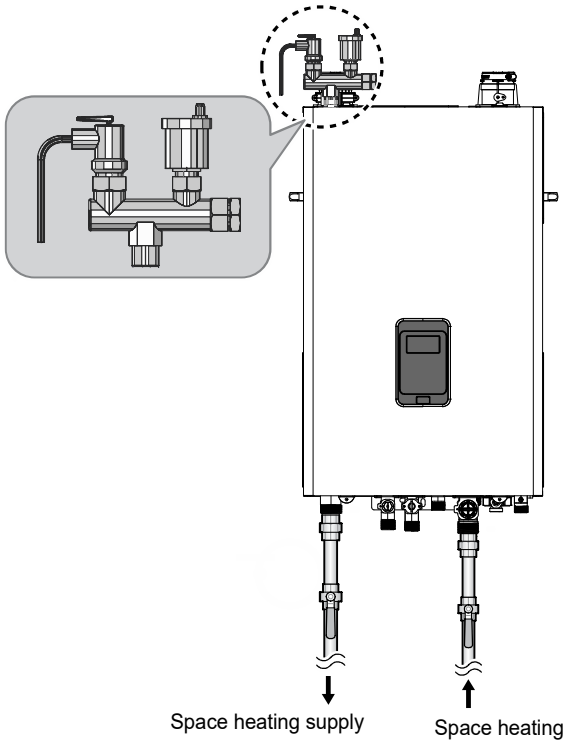
Filling the Condensate Trap

Before operating the boiler, fill the condensate trap with water through the flue connector. The boiler may be severely damaged unless filled with water prior to operation. Pour more than 0.1 gallon (400 ml) of water into the exhaust duct. Deflate air sufficiently or equip the air vent with an outlet pipe prior to filling the condensate trap with water (there must be no air inside the heat exchanger).



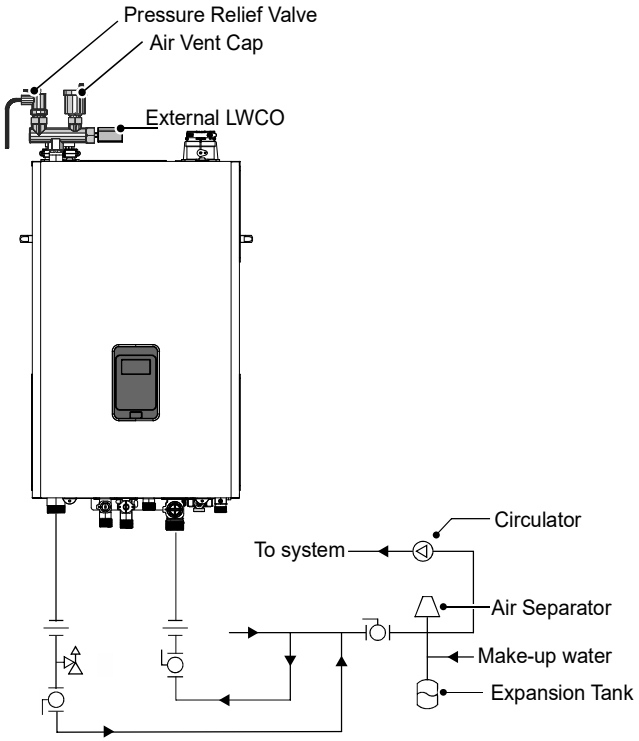
System Filling

Before filling the boiler, fully open the air vent cap and allow it to be filled correctly.



External Water Fill Connection

External water fill connection may be installed on the system piping if it is required for specific applications. See the following figure for an example of external water fill installation on the system piping.



Test the Water System

Warning

Ensure that the boiler is full of water before firing the burner. Operating the unit without filling it will damage the boiler. Such damage is not covered by the warranty, and may result in property damage, severe personal injury, or death.

Perform fill test after installing the boiler's water system to make sure that the system has been installed properly. Follow the instructions below to perform a fill test on the water system.

- Fill the boiler with water after checking that the chemical composition of water meets the requirements mentioned in this manual.
- Close the drain valve of the boiler.
- Fill the boiler with water. The correct pressure will vary with each application. The normal pressure of the residential system is 12psi. The operating pressure must never exceed the relief valve pressure setting.
- While filling with water for the first time and carrying out the operation test, check for water leaks from the pipes. If there is a water leak, stop the operation, repair the leak, and continue the operation.

This system may have residual substances that could affect water chemistry. After filling the system with water and completing the water leak test, verify that water PH and chlorine concentrations are within the acceptable range by performing sample testing.

Caution

Before operating the boiler for the first time, check if the boiler is filled with water. To avoid boiler damage, remove all air from the system.

Example of System Applications

Refer to the following examples to properly implement a system for space heating, DHW supply, or both. These examples are provided to suggest basic guidelines when you install the boiler system. However, the actual installation may vary depending on the circumstances, local building codes, or state regulations. Check the local building codes and state regulations thoroughly before installation, and comply with them fully.

External Water Fill Connection

Read and follow the guidelines below for system piping of the boiler.

- System application drawings are intended to explain the system piping concept only.
- When installing a mixing valve on the DHW piping, ensure that the cold water pressure does not exceed the hot water pressure.
- For the upstream side of all circulator, use straight pipes with a minimum diameter of ½" (12mm).
- Provide a system expansion tank following the guidelines on page 16.
- Installations must comply with all local codes, IN Massachusetts, a vacuum relief valve must be installed in the cold water line per 248 CMR.

Air Removal

The boiler and system plumbing layout must be configured to promote the removal of air from the water. Air vents and bleeders must be strategically placed throughout the system to aid in purging the air from the system during commissioning of the boiler. The system must also employ the use of a strategically located air removal device, such as an air scoop or micro-bubbler, designed to remove the air from the water as it flows through the system.

Follow the installation instructions included with the air removal device when placing it in the system ; air removal devices generally work better when placed higher in the system. Always locate air removal devices in areas of the system that have a guaranteed positive pressure, e.g., in close proximity to the water fill and expansion tank

Notice

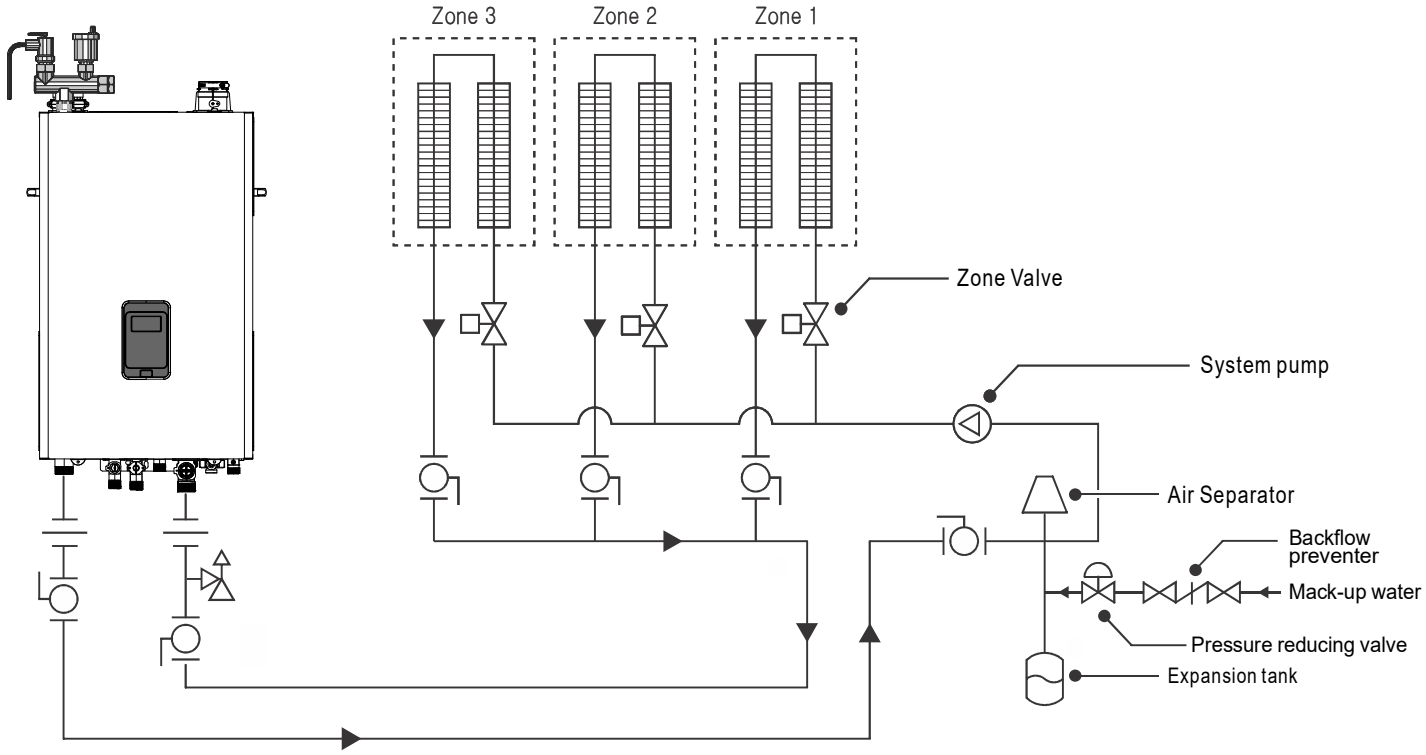
The boiler has an air vent inside the product in order to purge air in the system.

Expansion Tank

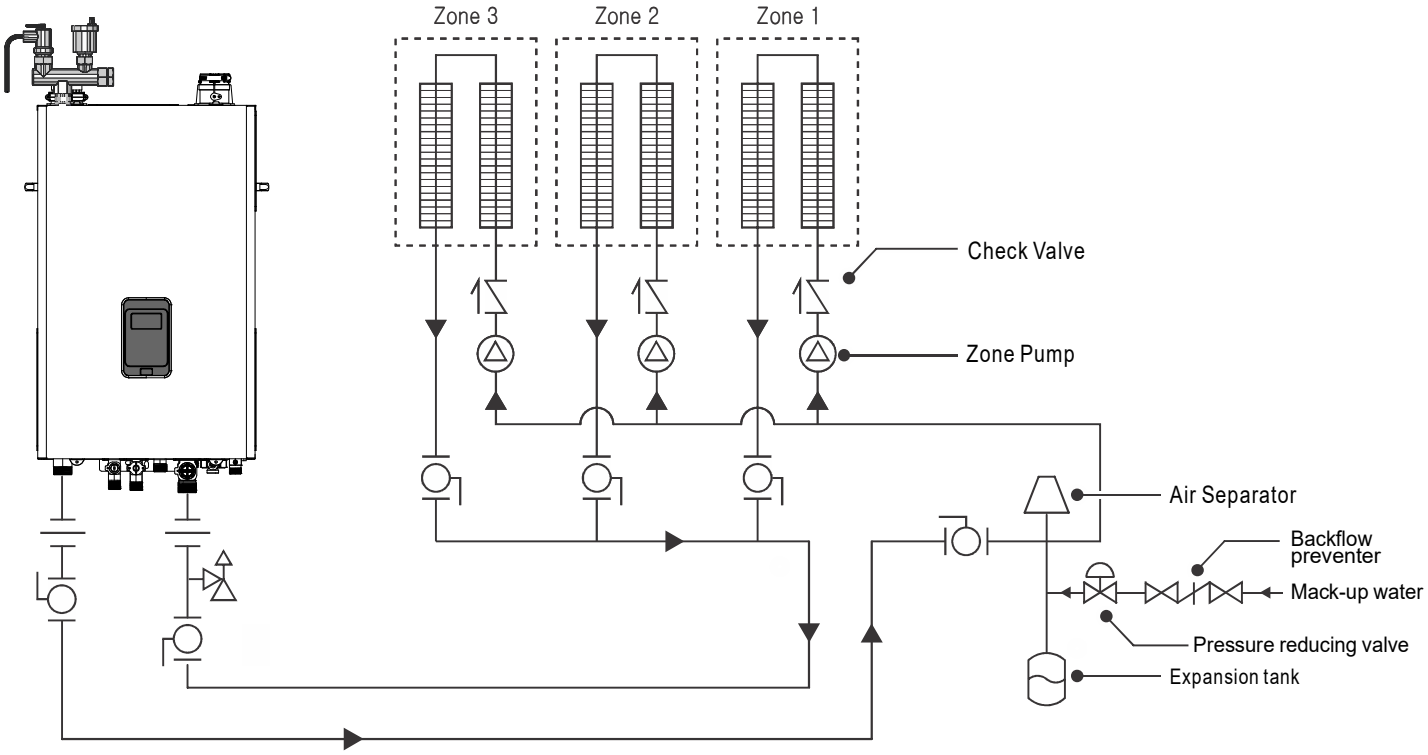
The size of expansion tank should be decided according to the boiler capacity and the amount of water in the system. It is important to locate the expansion tank, and make-up water fill, on the inlet side of any circulator in the system, as doing so will guarantee the lowest pressure in the system will be at least equal to the tank and make-up water pressure.

Ensure the expansion tank cannot become isolated from the boiler anytime the system is operating. Failure to follow these instructions may lead to discharge form the pressure relief valve, which may result in property damage or injury.

System Application - Zone System with Zone Valves

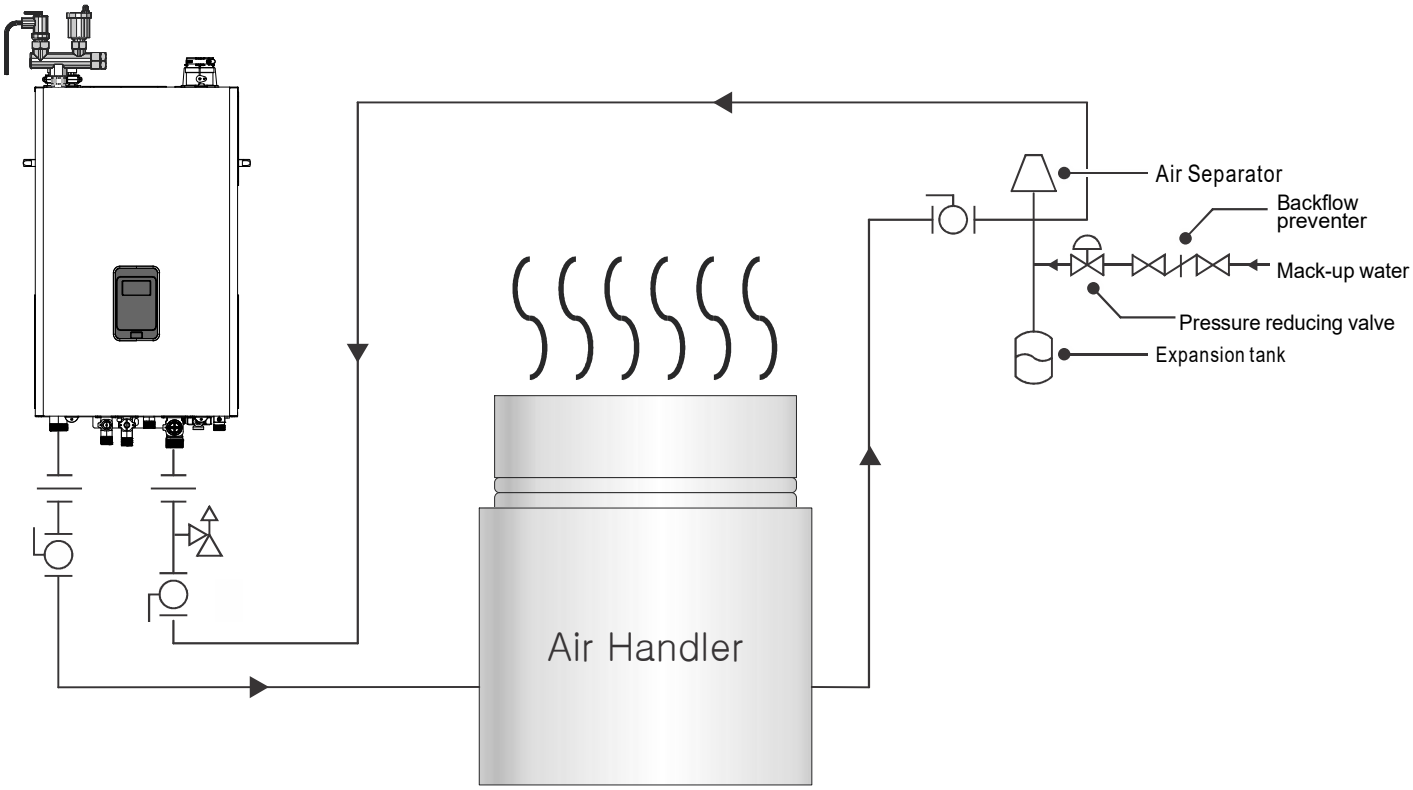


System Application - Zone System with Circulators



- System application drawings are intended to explain the system piping concept only.
- Refer to “System Filling” on page 21 and requirements of local regulations for compliance.
- Use a pump with an integrated check valve or install the check valve on the pump outlet side.
- To use the zone system, you need to set the ‘SH External Pump’ on the front panel. see page 52 for detail on how to setting up.

System Application - Air Handler System



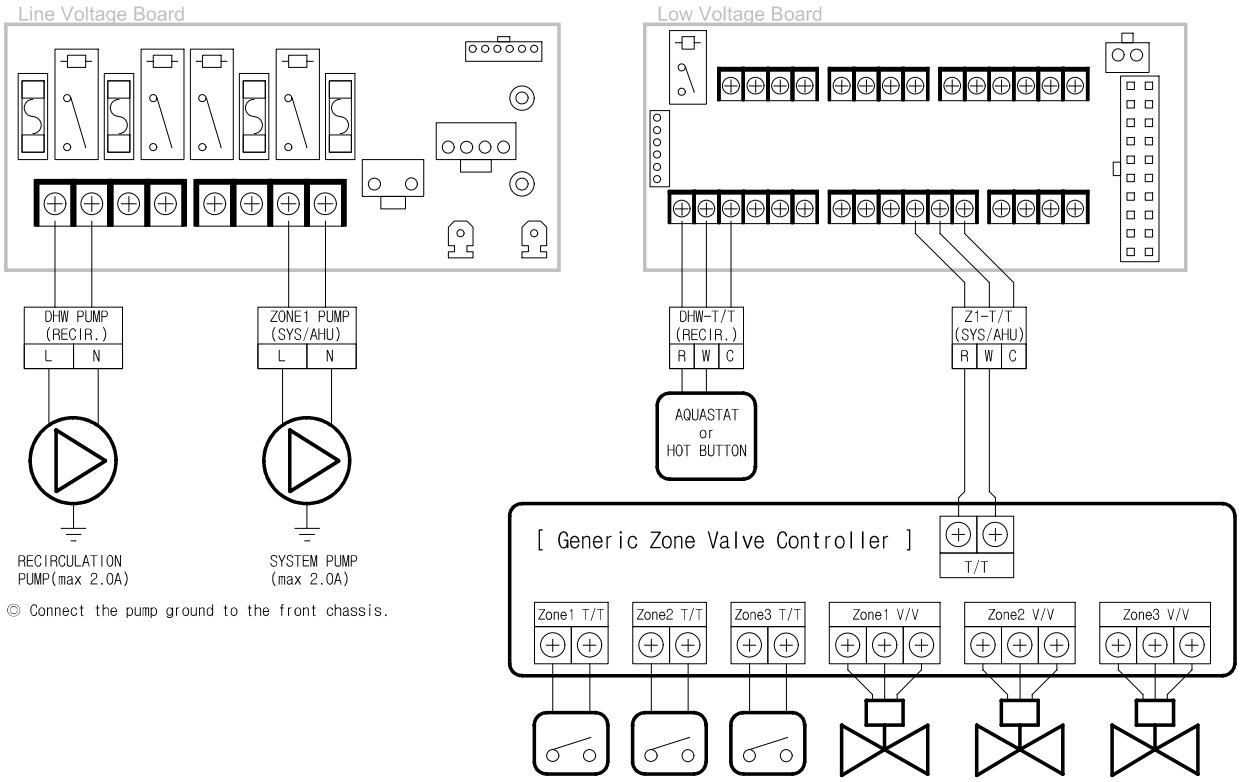
- System application drawings are intended to explain the system piping concept only.
- Refer to “System Filling” on page 21 and requirements of local regulations for compliance.
- To use the air handler system, you need to set the ‘Air Handler Setup’ on the front panel. see page 60,61 for detail on how to setting up.

Electrical Connections - Generic Zone Controller with DHW Recirculation

1) Heating can be supplied by connecting a generic zone controller to the boiler.
2) When using zone system, connect the pump and generic zone controller to Zone 1 terminal.
3) When using external DHW recirculation, connect the pump and aquastat to DHW terminals.
4) After wiring the pump and thermostat, settings are required on the front panel for the system and DHW recirculation pumps.

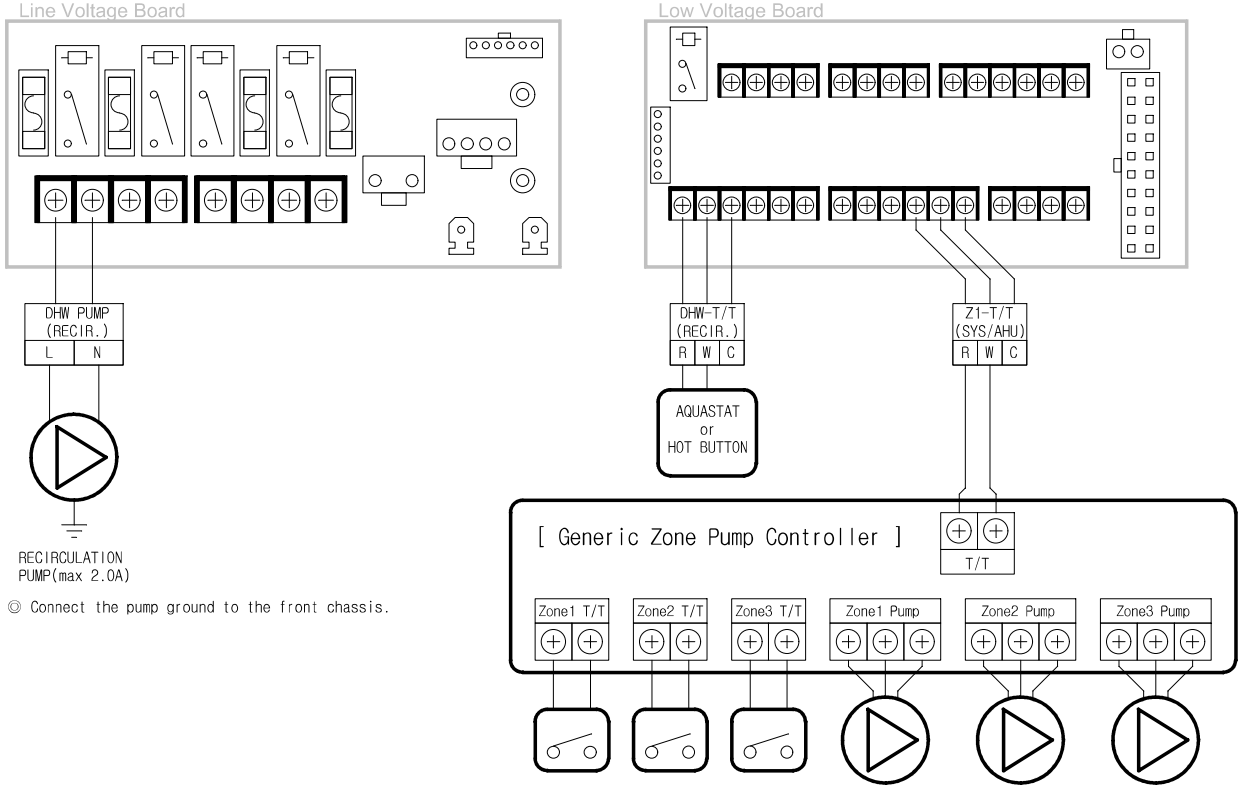
· Generic Zone Valve Controller

(Refer to page 52 for SH external pump, and 53 for recirculation timer setup.)



◎ Connect the pump ground to the front chassis.

· Electrical Connections - Generic Zone Pump Controller

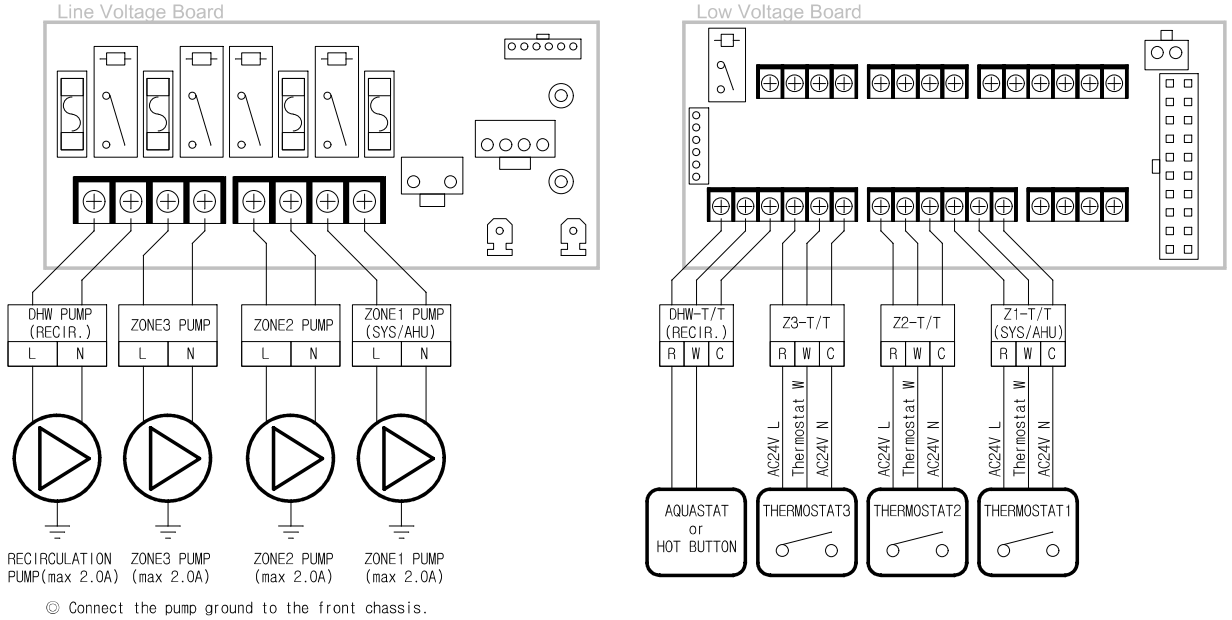


◎ Connect the pump ground to the front chassis.

Electrical Connections - Zone Pump System(Single or Multi) with DHW Recirculation

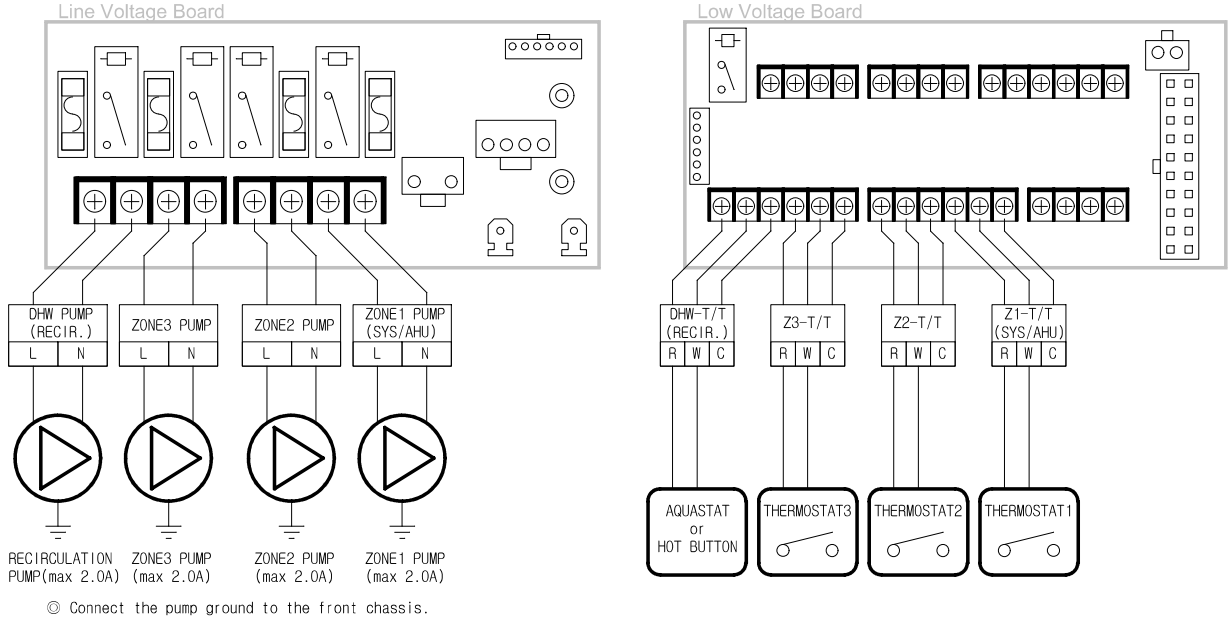
1) Both 24VAC thermostats and dry contact thermostats can be used.
2) When using a single zone, connect the pump and thermostat to Zone 1 terminals.
3) When using Multi zone, connect the pump and thermostat to Zone 1, 2, and 3 terminals.
4) When using external DHW recirculation, connect the pump and aquastat to DHW terminals.
5) After wiring the pump and thermostat, settings are required on the front panel for the system and DHW recirculation pumps.
(Refer to page 52 for SH external pump, and 53 for recirculation timer setup.)

· With 24VAC Thermostat



◎ Connect the pump ground to the front chassis.

· Without 24VAC(Dry Contact) Thermostat



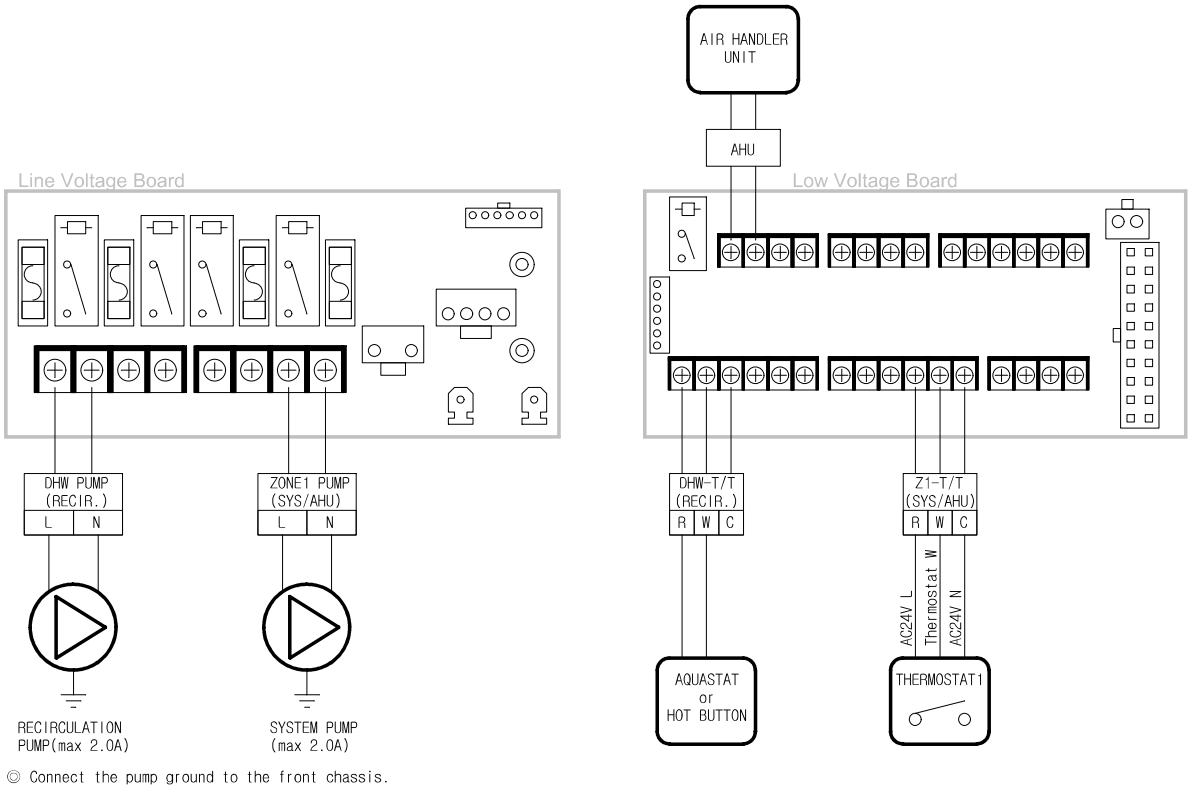
◎ Connect the pump ground to the front chassis.

Electrical Connections - Air Handler Unit

1) Heating can be supplied by connecting an air handler unit to the boiler.
2) When using Air Handler system, connect the pump, thermostat and air handler to Zone 1 and AHU terminals.
3) When using external DHW recirculation, connect the pump and aquastat to DHW terminals.
4) After wiring the pump and thermostat, settings are required on the front panel for the system and DHW recirculation pumps.

(Refer topage 52 for SH external pump, 53 for recirculation timer, and 60 for air handler setup.)

· Air Handler Unit



◎ Connect the pump ground to the front chassis.

Connecting the Gas Supply

Gas Pipe Sizing Tables

Gas pipe sizing is based on the gas type, supplied gas pressure, pressure drop in the system, and gas line type. The tables below are for reference only (when the gas supply is piping straight to the boiler with no connections to any other gas appliances). For gas pipe sizing, refer to the latest National Fuel Gas code, NFPA 54 and consult the gas pipe manufacturer for actual gas pipe capacities.

Natural gas

Table 1. For less than 6" WC supply pressure.

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

Pipe Size	kBTU/H of Natural Gas												
Length	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'	125'	150'	200'
3/4"	360	247	199	170	151	137	126	117	110	104	92	83	71
1"	678	466	374	320	284	257	237	220	207	195	173	157	134
1 1/4"	1390	957	768	657	583	528	486	452	424	400	355	322	275
1 1/2"	2090	1430	1150	985	873	791	728	677	635	600	532	482	412
2"	4020	2760	2220	1900	1680	1520	1400	1300	1220	1160	1020	928	794
2 1/2"	6400	4400	3530	3020	2680	2430	2230	2080	1950	1840	1630	1480	1270
3"	11300	7780	6250	5350	4740	4290	3950	3670	3450	3260	2890	2610	2240
4"	23100	15900	12700	10900	9660	8760	8050	7490	7030	6640	5890	5330	4560

Table 2. For 6" WC or greater supply pressure.

Maximum Capacity of Natural Gas Based on a 0.60 specific gravity at a 3.0" WC pressure drop.

Pipe Size	kBTU/H of Natural Gas												
Length	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'	125'	150'	200'
1/2"	454	312	250	214	190	172	158	147	138	131	116	105	90
3/4"	949	652	524	448	397	360	331	308	289	273	242	219	188
1"	1790	1230	986	844	748	678	624	580	544	514	456	413	353
1 1/4"	3670	2520	2030	1730	1540	1390	1280	1190	1120	1060	936	848	726
1 1/2"	5500	3780	3030	2600	2300	2090	1920	1790	1670	1580	1400	1270	1090
2"	10600	7280	5840	5000	4430	4020	3690	3440	3230	3050	2700	2450	2090
2 1/2"	16900	11600	9310	7970	7060	6400	5890	5480	5140	4860	4300	3900	3340
3"	29800	20500	16500	14100	12500	11300	10400	9690	9090	8580	7610	6890	5900
4"	60800	41800	33600	28700	25500	23100	21200	19800	18500	17500	15500	14100	12000

Liquid propane gas

Maximum Capacity of propane Gas Based on 11" WC supply pressure at a 0.5" WC pressure drop.

Pipe Size	kBTU/H of Propane Gas												
Length	10'	20'	30'	40'	50'	60'	80'	100'	125'	150'	175'	200'	250'
1/2"	291	200	160	137	122	110	101	94	89	84	74	67	62
3/4"	608	418	336	287	255	231	212	197	185	175	155	140	129
1"	1150	787	632	541	480	434	400	372	349	330	292	265	243
1 1/4"	2350	1620	1300	1110	985	892	821	763	716	677	600	543	500
1 1/2"	3520	2420	1940	1660	1480	1340	1230	1140	1070	1010	899	814	749
2"	6790	4660	3750	3210	2840	2570	2370	2200	2070	1950	1730	1570	1440

Gas Piping

Danger

- Do not connect to an unregulated or high pressure propane line or to a high pressure commercial natural gas line.
- The boiler must be isolated from the gas supply piping system during any pressure testing of that system at test pressures equal to or more than 0.5 psig.

Warning

- Only a licensed professional should connect the gas supplies.
- Before connecting the gas supply, determine the gas type and pressure for the boiler by referring to the rating plate. Using a different gas type will result in abnormal combustion and malfunction of the boiler causing fire or explosion.
- Leak test the appliance and its gas connection before operating the boiler.
- Do not attempt a field conversion without a Custom Comfort conversion kit. Use the Custom Comfort conversion kit to convert from natural gas to propane or vice versa. Failure to do so may result in dangerous operating conditions and will void the warranty.
- A sediment trap must be provided upstream of the gas controls.

In the United States: The installation must conform with local codes or, in the absence of local codes, the National Fuel Gas Code ANSI Z223.1/NFPA 54.
In Canada: The Installation must conform to CGA B149 INSTALLATION CODES and/or local installation codes.

To ensure a sufficient gas supply, it is recommended that the boiler be the first appliance to be connected to the gas supply line.

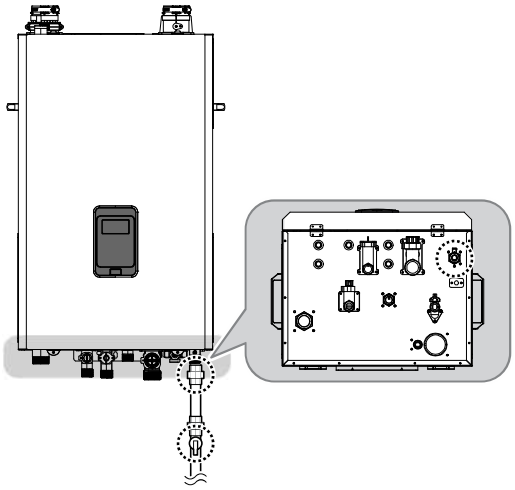
To connect the gas supply:

1. Determine the gas type and pressure 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 type and size for the gas line. Refer to the gas pipe sizing tables on page 28.
5. Install a union.
6. Install a manual gas shut off valve on the gas supply line within easy reach of the appliance.

Warning

- The manual gas shut off valve is not provided together with the product.
- Improper installation of the manual gas shut-off valve may result in property damage, personal injury or death.
- Only a licensed professional, in accordance with the ANSI Z21.1/CSA 9.1, should install the manual gas shut-off valve.

7. Connect the gas supply line.

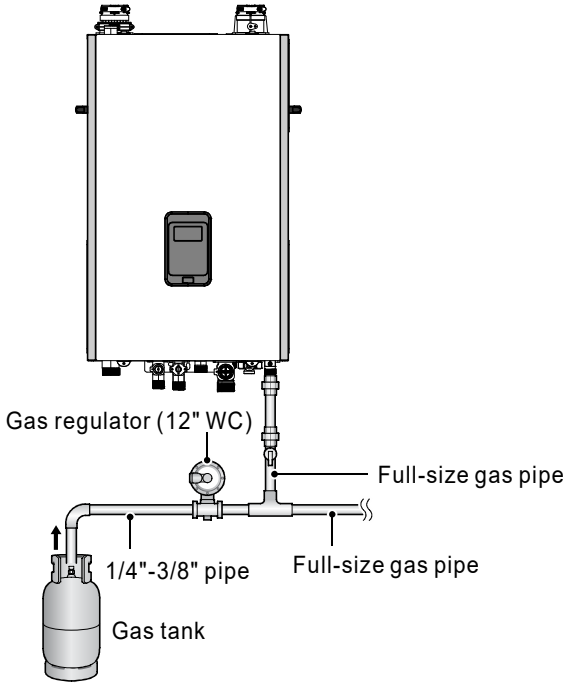


8. Check for gas leaks at all joints.

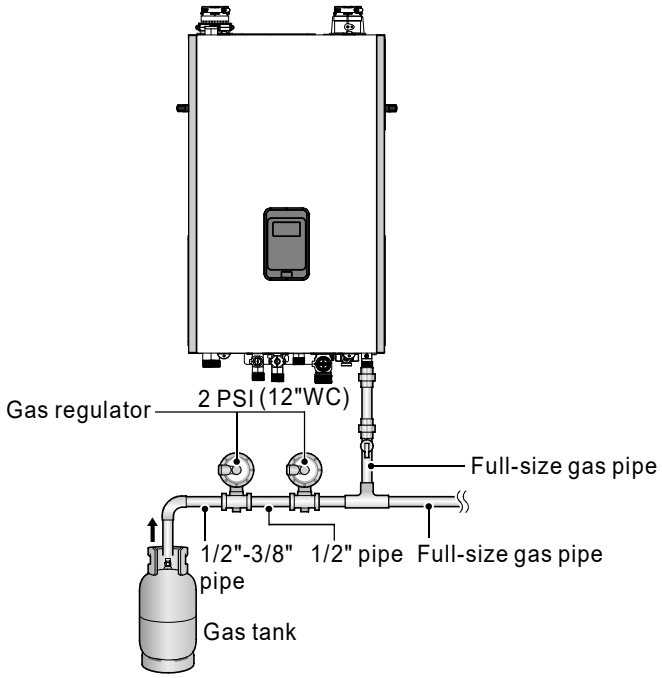
Notice

- Tighten the boiler connection valves with care to avoid damage.
- Apply gas leak detection solution to all gas fittings.
- The minimum internal diameter required for any appliance connector is 3/4".
- When using flexible gas lines, ensure that the pipe's inner diameter and connector is sufficient to supply the required BTUs. Also, ensure that the flexible line has no crimps or tight bends in it, as this will restrict gas flow.
- To facilitate any future maintenance or service, the installation of a union on the gas supply line close to the boiler is recommended.

- The following is a Propane gas piping example for the single regulator system



- The following is a Propane gas piping example for the 2-lb. system with multiple regulators.



Inlet Gas Pressure

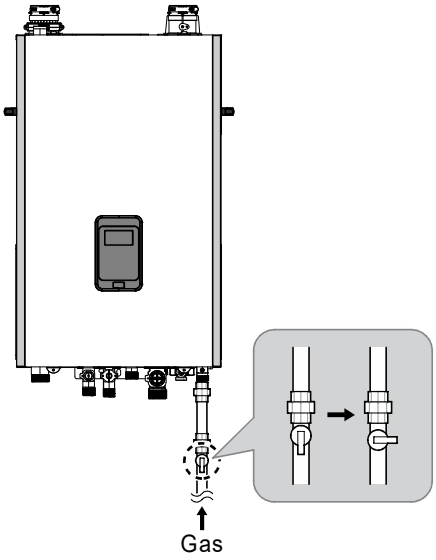
Warning

Inlet gas pressure should be measured by a licensed professional only. The boiler cannot function properly without sufficient inlet gas pressure.

- The boiler must be isolated from the gas supply piping system during any pressure testing of that system at test pressures equal to or more than 0.5 psig. If overpressure has occurred, through improper testing of the gas lines or malfunction of the supply system, the gas valve must be checked for safe operation.
- The inlet gas pressure must be maintained between 3.5" and 10.5" WC for natural gas and between 8" and 13" WC for liquefied propane.

To measure the inlet gas pressure:

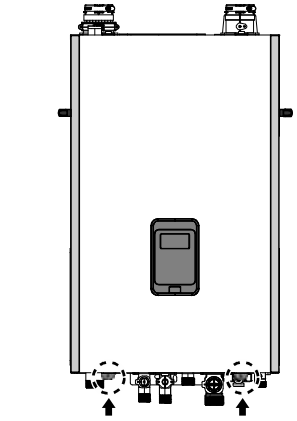
1 Shut off the manual gas valve on the gas supply line.

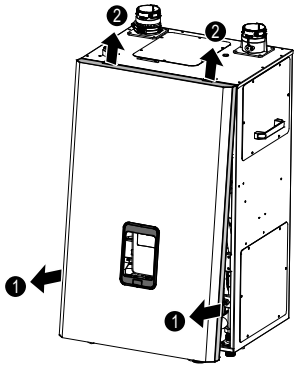


2 Open a hot water faucet. The boiler should turn on and the gas in the gas supply line will be purged.

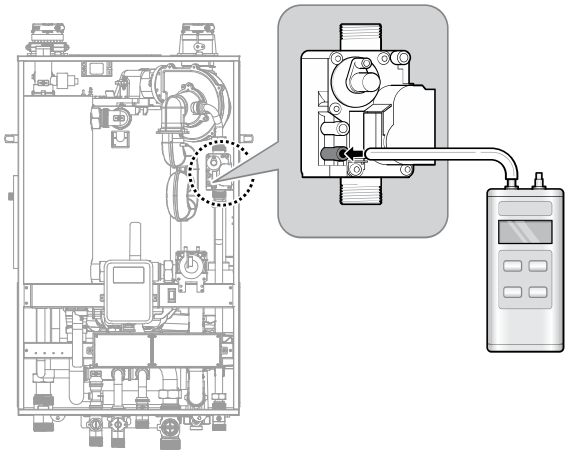
3 Leave the faucet on until the boiler shuts down due to a lack of gas supply, and then turn off the hot water faucet.

4 Remove the boiler front cover by loosening the 2 Phillips screws securing it to the case.





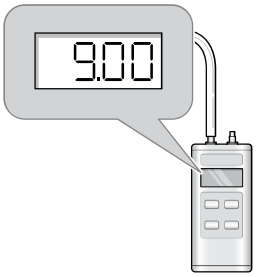
5 Loosen the screw indicated in the figure below and connect a manometer to the inlet pressure port. Reset the manometer to zero before use.



6 Re-open the manual gas shut-off valve and check for leaks.

7 Open multiple fixtures that have high flow rates, such as bathtub and shower faucets, to ramp up the boiler to its maximum firing rate.

8 When the boiler reaches its maximum firing rate, check the inlet gas pressure reading on the manometer. The gas pressure must fall within the ranges specified in *"Specifications"* on page 7.



9 Tighten the inlet gas pressure screw.

10 Replace the front cover and tighten the 2 Phillips screws to secure it to the case.

Installing a Vent

Warning

Improper venting of the boiler can result in excessive levels of carbon monoxide, which can lead to severe personal injury or death. This boiler 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 boilers" section of the latest version of Clause 8.2, 8.3 or 8.4 of Natural Gas and Propane Installation Code, CAN/CSA B149.1 in Canada, as well as all applicable local building codes and regulations.
Follow all instructions and guidelines when venting the boiler.
Venting should be performed only by a licensed professional.

The boiler 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 boiler, follow these guidelines:

- Do not install the boiler in areas with contaminated air (containing a high level of dust, sawdust, sand, four 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 boiler 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 boiler vent to a vent for any other gas boiler or vent stack.
- For horizontal runs, slope the horizontal section upward toward the vent termination at a rate of 1/4" per foot (2% slope).
- Create an airtight seal at each joint in the exhaust and intake air pipes from the boiler 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 fumes away from buildings, as long as the restrictions on total allowable vent lengths, maximum number of elbows, and distances to air intake are observed.
- Do not store hazardous or flammable substances near the vent termination.
- If this boiler is to be installed in an area where snow is known to accumulate, protect the vent termination from blockage.
- Ensure that the vent termination is at least 12" (305mm) above ground, 12" (305mm) above the hightest anticipated snow level, or as required by local codes, witchever is greater.
- Support the vent pipe with hangers at regular intervals or as required by local codes.
- Exhaust and intake air pipes must be supported at least every 4 feet (1.2m).
- The vent for this appliance shall not terminate over public walkways; or near soft 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.

Vent Type

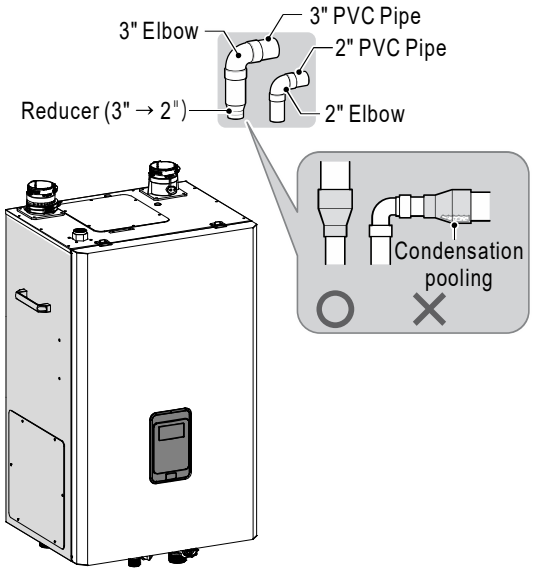
All boilers are prepared at the factory to be direct vent (sealed combustion) boilers that draw all of their required combustion required combustion air directly from outside the building. Custom Comfort recommends direct air vent installations whenever possible to avoid back drafting cold air through the boiler. Custom Comfort recommends direct air vent installations when installing the boiler in your attic to get fresh air into the boiler. If you cannot use a direct vent, ensure that an ample supply of make-up air is available in the installation location. Custom Comfort 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. When using non-direct venting, must provide two openings as specified in the table on page 28.

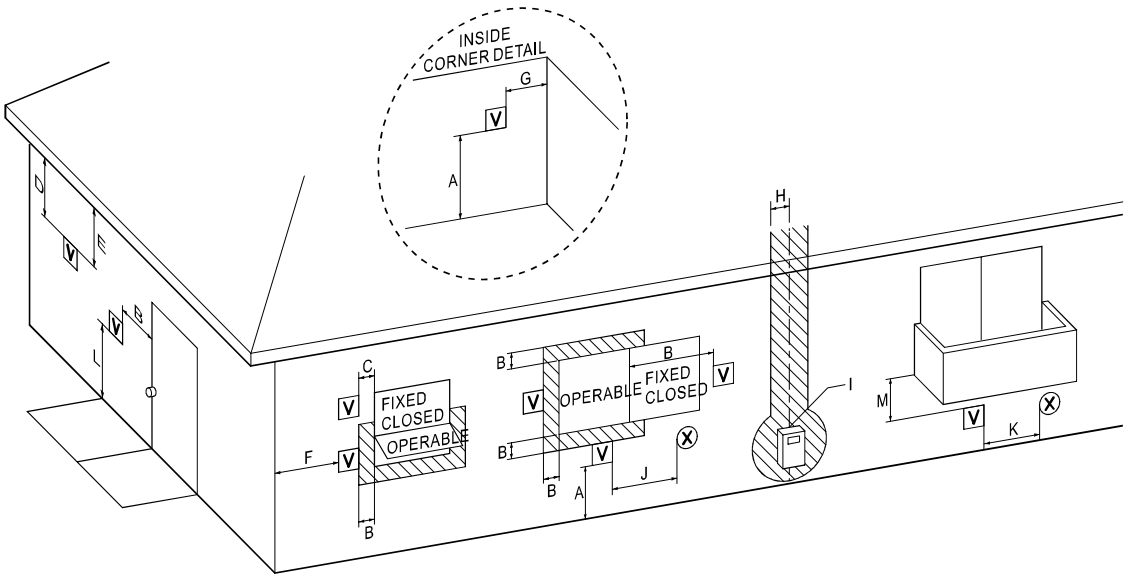
Direct

The boiler uses 2" or 3" diameter exhaust and 2" or 3" 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 similar 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/CSA B149.1 Natural Gas and Propane Installation Code.

To use direct venting for the boiler:

- Install the 2" vent directly. Ensure the vent is properly seated.
- To install the 3" vent, reducer (3" to 2") must be used.
- Install the reducer (3" to 2") vertically. If installed horizontally, water may stagnate.





V VENT TERMINAL X AIR SUPPLY INLET AREA WHERE TERMINAL IS NOT PERMITTED

Ref.	Description	Canadian Direct Vent Installations [1]	U.S Direct Vent Installation [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 soft located above the vent termination within a horizontal distance of 2 feet (61cm) from the center line of the termination	*	*
E	Clearance to unventilated soft	*	*
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 feet above 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 application	36 in. (91 cm)	12 in. (30 cm)
K	Clearance to mechanical air supply inlet	72 in. (182 cm)	36 in. (91 cm) above if within 10 feet horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	84 in. (213 cm) [3]	*
M	Clearance under veranda, porch deck or balcony	12 in. (30 cm) [4]	*

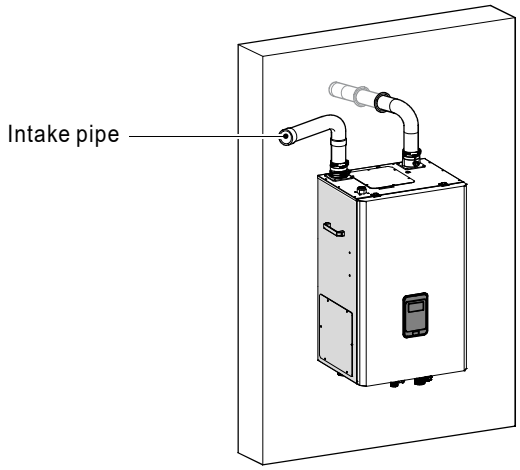
1) In accordance with the current CAN/CSA B149.1 Natural Gas and Propane Installation Code.
2) In accordance with the current ANSI Z223.1 / NFPA 54 National Fuel Gas Code.
3) A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.
4) Permitted only if veranda, porch, deck or balcony is fully open on a minimum of two sides beneath the floor.
5) If locally adopted installation codes specify clearances different than those illustrated, then the most stringent clearance shall prevail.
[*] For clearances not specified in ANSI Z223.1 / NFPA 54 or CAN/CSA B149.1, one of the following shall be indicated:
a) A minimum clearance value determined by testing in accordance with section 2.20, or;
b) A reference to the following footnote:
"Clearance in accordance with local installation codes and the requirements of the gas supplier."
c) Information on protecting building materials from degradation by flue gases.

Non-direct

If, at any time, the installation location could experience negative pressure, there is a possibility of back-drafting cold air through the boiler's heat exchanger. This situation could lead to the freezing of the heat exchanger and malfunction of the boiler.
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 Custom Comfort warranty. If there is any question about the possibility of back-drafting in the installation location, use a direct venting system for the boiler. When installed in a manufactured home (mobile home), all combustion air must be supplied from the outdoors as described on page 32. When using non-direct venting, maintain non-direct vent clearances shown on page 34 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.

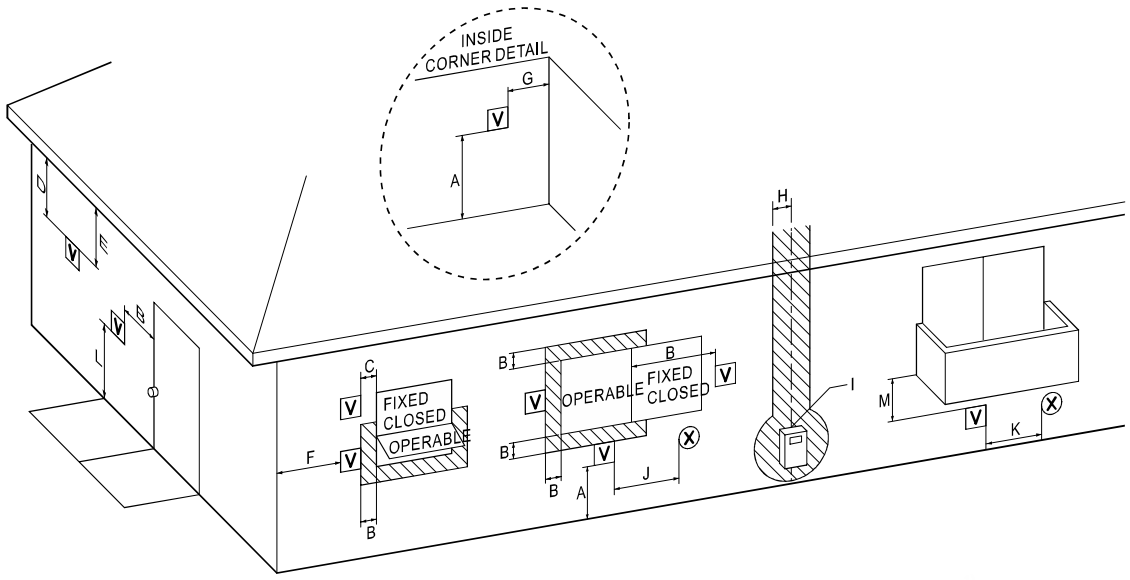
To use non-direct venting for the boiler:

- Insert the elbow into the intake air duct.



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

Model	Maximum Input (BTU/H)	If outdoor make up air is provided, a minimum free area of 1 in^2, per 4,000 BTU/H	If indoor make up air is provided, a minimum free area of 1 in^2 per 1,000 BTU/H
CCOFTC B199A	199,000	50 in^2 10"(W) X 3"(H) or 8" round	199 in^2 14 1/4"(W) X 14 1/4"(H)



V VENT TERMINAL X AIR SUPPLY INLET AREA WHERE TERMINAL IS NOT PERMITTED

Ref.	Description	Canadian Non-Direct Vent Installations [1]	U.S Non-Direct Vent Installation [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)	4 feet below or to side of opening; 1 foot above opening
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soft located above the vent termination within a horizontal distance of 2 feet (61cm) from the center line of the termination	*	*
E	Clearance to unventilated soft	*	*
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 feet above 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 application	36 in. (91 cm)	12 in. (30 cm)
K	Clearance to mechanical air supply inlet	72 in. (182 cm)	36 in. (91 cm) above if within 10 feet horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	84 in. (213 cm) [3]	84 in. (236 cm)
M	Clearance under veranda, porch deck or balcony	12 in. (30 cm) [4]	*

1) In accordance with the current CAN/CSA B149.1 Natural Gas and Propane Installation Code.
2) In accordance with the current ANSI Z223.1 / NFPA 54 National Fuel Gas Code.
3) A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.
4) Permitted only if veranda, porch, deck or balcony is fully open on a minimum of two sides beneath the floor.
5) If locally adopted installation codes specify clearances different than those illustrated, then the most stringent clearance shall prevail.
[*] For clearances not specified in ANSI Z223.1 / NFPA 54 or CAN/CSA B149.1, one of the following shall be indicated:
a) A minimum clearance value determined by testing in accordance with section 2.20, or;
b) A reference to the following footnote:
"Clearance in accordance with local installation codes and the requirements of the gas supplier."
c) Information on protecting building materials from degradation by flue gases.

Vent Pipe Materials

Caution

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/CSA B149.1, as well as all applicable local codes and regulations when selecting vent pipe materials.
Do not use cellular core PVC (ASTM F891), cellular core CPVC, Radel® (polyphenolsulfone) for the exhaust vent.
Covering non-metallic vent pipe and fittings with thermal insulation shall be prohibited.

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) • Thpe BH Special Gas Vent Class IIC (Polypropylene)

* For installation in Canada, field-supplied plastic vent piping must comply with CAN/CSA 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 boiler has a built-in control to limit the exhaust temperature to 149°F (65°C). As a result, the Custom Comfort boiler 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.
- In systems with 2 in. vents, if the exhaust temperature exceeds 149°F (65°C), CPVC pipe (field supplied) must be used for the first 3 feet of equivalent pipe length. For systems with 3 in. vents, if the exhaust temperature exceeds 149°F (65°C), CPVC pipe (field supplied) must be used for the first 5 in. of equivalent pipe length.

- Generally, the boiler limits the flue gas to remain below 150°F (65°C) to use the flue pipe.
- When the return water temperature to the boiler is higher than 140°F (60°C), the vent material must be set to CPVC or PP in the advanced menu of the front panel. CPVC or PP must be used in such case.

Notice

- The vent material in the advanced menu of the front panel is set to PVC as factory default.
- When you set the vent material setting value to CPVC or PP, ensure that corresponding piping shall be used.
- For more information on setting up for front panel, please see 'Accessing Advanced Menu' on page 60.

Vent Length

The maximum vent length when using 2" exhaust ducts is 50'. The maximum vent length when using 3" vent ducts is 150'. The intake duct length can be of equal length to the exhaust duct length. Both maximum lengths are reduced by the number of elbows used, as shown in the following table:

Vent Size	Maximum Length	Maximum # of Elbows	Equivalent Lengths
2"	50' (15 m)	6	Reduce the maximum vent length accordingly for each elbow used: • Each 90° elbow equates to 8 linear feet (2.4 m) of vent • Each 45° elbow equates to 4 linear feet (1.2 m) of vent
3"	150' (45 m)	8	Reduce the maximum vent length accordingly for each elbow used: • Each 90° elbow equates to 5 linear feet (1.5 m) of vent • Each 45° elbow equates to 3 linear feet (0.9 m) of vent

Notice

- The maximum length does not include any elbows.
- If using a concentric termination as shown on pages 37, count this as 8 linear feet (2.4 m) of vent.

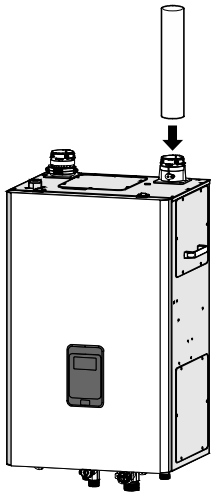
Connecting the Vent

Caution

To connect the exhaust vent firmly, must use the vent clip included with boiler.

To connect the vent clip:

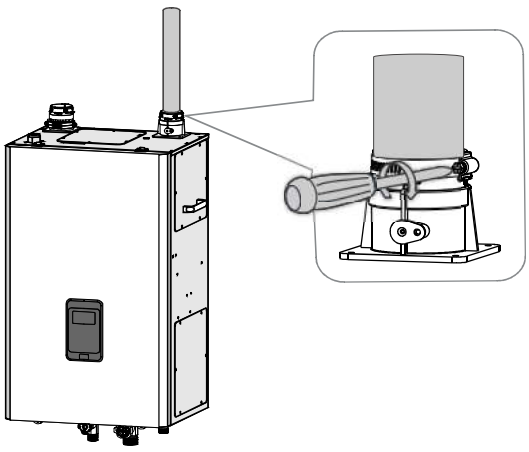
1 Connect the vent pipe to the flue connector.



Caution

- Do not use 2'' straight 90 or 45

2 Tighten the screws and fix the vent clip.



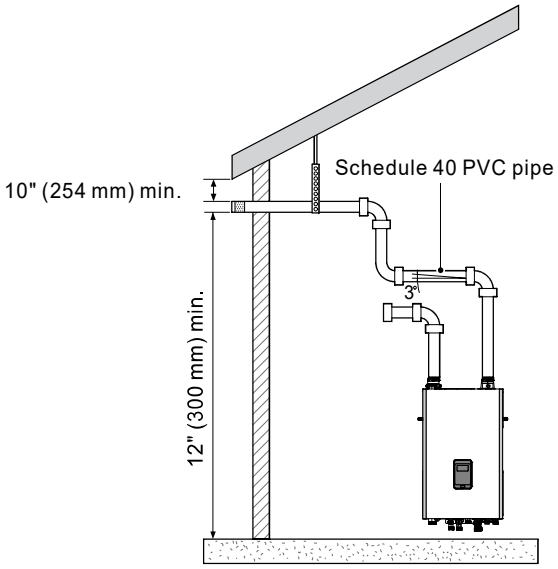
Vent Termination

Caution

- Air intake must be protected from any debris.
- When connecting the air intake connector and the flue connector with the vent, connecting parts must be sealed with PVC, glue and high temp silicon.
- Maintain 12" (300 mm) min. (18" (450 mm) min. for Canada) clearance above highest-anticipated snow level. Maximum of 24" (600 mm) above roof.
- Install a bird screen at the end of the intake air pipe and exhaust pipe.
- Periodic cleaning of the screens in the vent terminal.

Determine what type of vent termination is appropriate for the installation location and situation before installing the boiler. The following subsections describe some venting configurations, but do not include all possible options.

Single-pipe sidewall venting



Caution

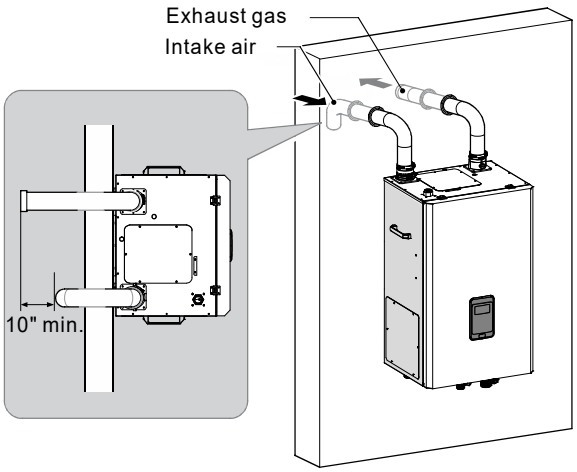
- Maintain 12" (300 mm) min. (18" (450 mm) min. for Canada) clearance above highest-anticipated snow level. Maximum of 24" (600 mm) above roof.
- Install a bird screen at the end of the intake air pipe and exhaust pipe.

Notice

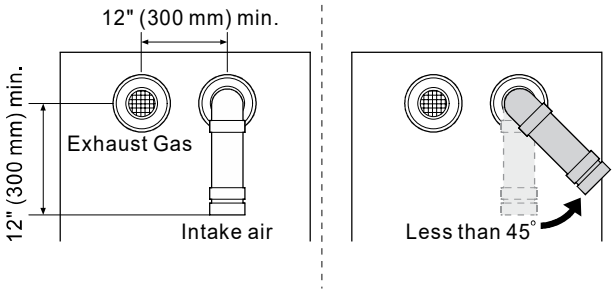
Single-pipe venting requires that adequate combustion air be provided in end-use installations per NFPA 54 C.9.3.2.

Two-pipe sidewall venting

Internal view



External view



Caution

- Maintain 12" (300 mm) min. (18" (450 mm) min. for Canada) clearance above highest-anticipated snow level. Maximum of 24" (600 mm) above roof.
- Install a bird screen at the end of the intake air pipe and exhaust pipe.

Notice

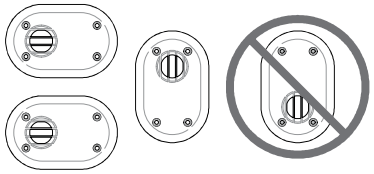
It is recommended to install the intake air vent terminal as far from the exhaust gas vent terminal as possible.

Caution

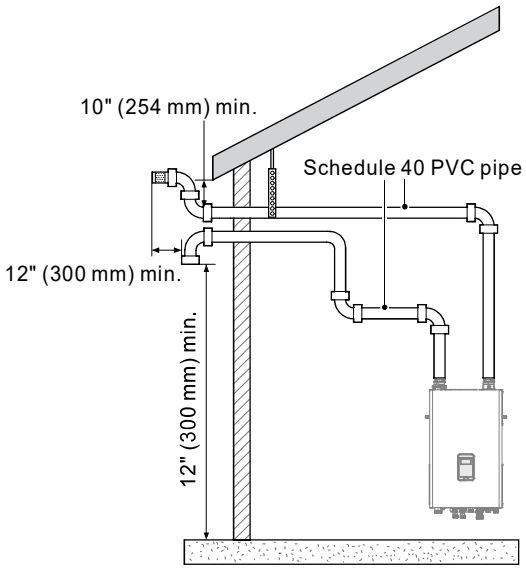
If the side wall vent termination kit is used, refer to the figure below for the orientation of the vent.

The following terminations can also be used:
IPEX Low Profile Termination Kits:

- 2 in Low Profile Vent Kit #196984
- 3 in Low Profile Vent Kit #196985



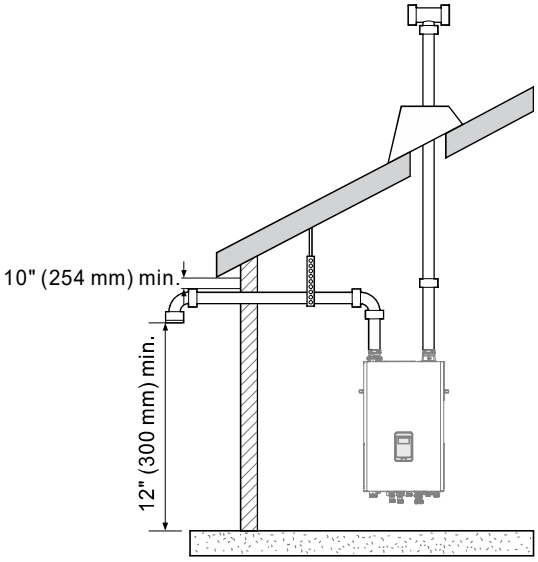
Snorkel flue



Caution

- Maintain 12" (300 mm) min. (18" (450 mm) min. for Canada) clearance above highest-anticipated snow level. Maximum of 24" (600 mm) above roof.
- Install a bird screen at the end of the intake air pipe and exhaust pipe.

Non-concentric sidewall venting



Caution

- Maintain 12" (300 mm) min. (18" (450 mm) min. for Canada) clearance above highest-anticipated snow level. Maximum of 24" (600 mm) above roof.
- Install a bird screen at the end of the intake air pipe and exhaust pipe.

Notice

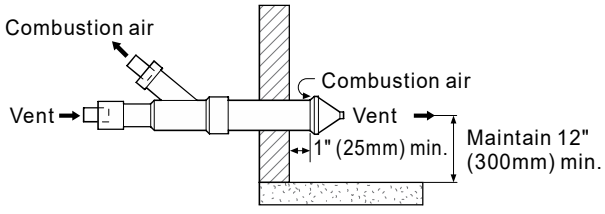
Air is drawn from a different location at a minimum of 12" (300mm) from the exhaust termination. Try to minimize the length of the intake air pipe with this venting.

Concentric sidewall venting

The following terminations can also be used:

Duravent PolyPro Horizontal Concentric Termination Kit.

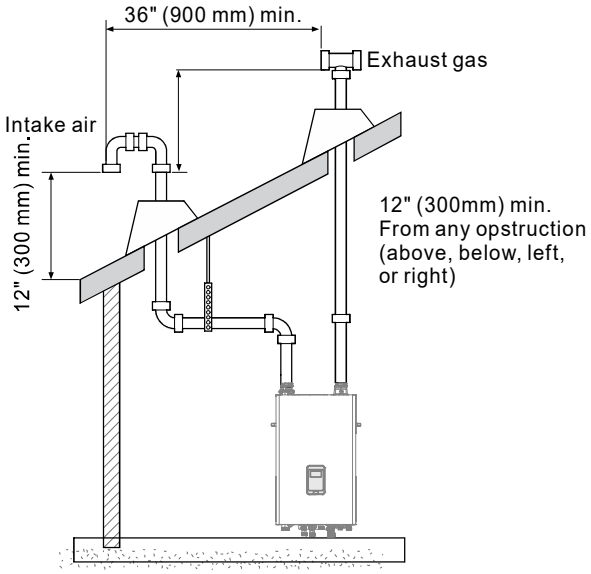
- 2 in x 4 in Concentric Vent Kit #2PPS-HK
- 3 in x 5 in Concentric Vent Kit #3PPS-HK



Caution

Maintain 12" (300 mm) min. (18" (450 mm) min. for Canada) clearance above highest-anticipated snow level. Maximum of 24" (600 mm) above roof.

Two-pipe vertical venting



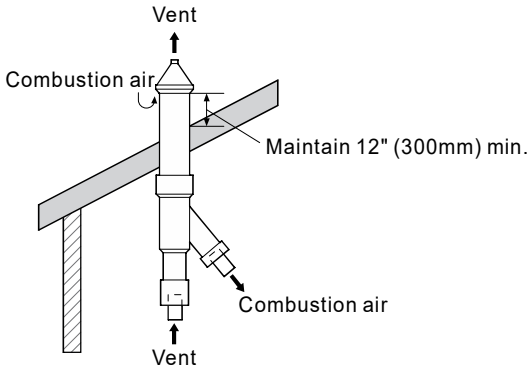
Caution

- Maintain 12" (300 mm) min. (18" (450 mm) min. for Canada) clearance above highest-anticipated snow level. Maximum of 24" (600 mm) above roof.
- Install a bird screen at the end of the intake air pipe and exhaust pipe.

Notice

Intake and exhaust pipes do not have to terminate in the same area.

Concentric roof venting

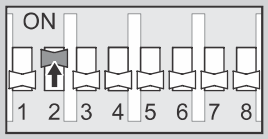


Caution

Maintain 12" (300 mm) min. (18" (450 mm) min. for Canada) clearance above highest-anticipated snow level. Maximum of 24" (600 mm) above roof.

Setting the DIP Switches

The boiler has a DIP switch on th main circuit board(PCB).
Set the DIP switch appropriately, depending on the installation environment.

Switch	Function	Description
	Minimum heat capacity operation	ON : Minimum operation OFF : Normal operation
	Maximum heat capacity operation	ON : Maximum operation OFF : Normal operation
	Type of the boiler	ON : CCOFTCB199A OFF : Not available

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 boiler has been filled with water.
- Do not connect the boiler to a 220–240V AC power supply. Doing so will damage the boiler and void the warranty.
- All boilers come with a factory-installed, 3-pronged (grounded) plug. The boiler can be plugged into any grounded electrical outlet nearby, as it requires only 5A. It is not necessary to run a dedicated electrical line to the boiler.
- If local codes require the boiler to be wired directly, remove and discard the factory- installed plug. Install a power switch between the breaker and the boiler to facilitate end-user maintenance and servicing. Connect the boiler to a 110–120V AC at 60 Hz with a maximum of 5A rating electrical supply.
- The boiler must be electrically grounded. If using the power plug, ensure that the electrical outlet you connect the boiler to is properly grounded. If wiring the boiler 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 boiler from power surges.
- If there is a power failure in cold weather areas, the freeze prevention system in the boiler 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 boiler to prevent damage if the power is expected to 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.

Installation Checklist

After the boiler installation, examine the following checklist. If you are not able to answer "Yes" to all of the items in the checklist, review the appropriate sections. To troubleshoot any operational problems, refer to "Troubleshooting" in the User's Manual.

If there are additional questions or if you need assistance, contact technical support at 877-241-1224.

Installing the boiler	Check
Have you maintained the required clearances from building openings and intake air vents?	☐
Have you minimized the distance between the boiler and the vent termination?	☐
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 boiler and vent piping clear of combustible materials, including clothing, cleaning materials, and rags?	☐

Connecting the Gas Supply	Check
Does the gas supply match the type specified on the boiler'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	Check
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 the Space Heating Piping	Check
Has the system been filled (less than 30 psi) and purged of air?	☐
Does the piping incorporate means for air removal (scoop, separator, etc.)?	☐
Is there an expansion tank installed and set to the proper system pressure?	☐
If antifreeze has been used, is it the proper type and is the concentration appropriate?	☐

Connecting a Pressure Relief Valve	Check
Have you installed an approved pressure relief valve on the boiler?	☐
Does the rating of the pressure relief valve match or exceed the maximum BTU rating of the boiler?	☐
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 space heating and hot water outlet pipe near the boiler?	☐
Have you installed a discharge drain tube from the pressure relief valve to within 6-12 in (150-300 mm) of the floor?	☐

Operating the boiler	Check
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?	☐

Connecting the Condensate Drain	Check
Have you installed a condensate drain line from the boiler to a drain or laundry tub?	☐

Venting the boiler	Check
Have you vented the boiler with 2/3 in PVC, CPVC, Polypropylene, Type BH Special Gas Vent (ULC-S636) for Category IV boilers (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 boiler?	☐
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	Check
Is the supplied voltage 110–120V AC?	☐
Is the boiler 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?	☐
Is the system properly set up for cascading operation (master and slave boiler), if applicable?	☐

Front Panel

Digital Display and Icons

The digital display and icons on the front panel provide important information required for the operation of the boiler. Refer to the table below for detailed information.

No.	Icon	Description
A		**IoT** indicates the use of the IoT mode.
		Combustion indicates the gas burner operation.
		Error indicates error.
		Freeze and burst prevention Indicates freeze and burst prevention operation.
		Smart Control - Outdoor Reset Indicates Outdoor Reset mode.
		Smart Control - 0~10V DC Input Indicates 0~10V DC Input mode.
		Re-Circulation (Internal) Indicates the internal re-circulation type.
		Re-Circulation (External) Indicates the External re-circulation type.
	LP	**Propane Gas** Indicates Propane Gas is set to use.
B		**Heating set temperature** Indicates the heating set temperature.
		Hot water set temperature Indicates the hot water set temperature.
		Input of Smart Control Indicates the outdoor temperature or DC Input.
	bar PSI	**Pressure** Indicates the piping water pressure.

Buttons

Using the buttons on the front panel, you can turn the boiler on or off, adjust each temperature, and change modes to monitor the operation status. Refer to the table below for detailed information.

No.	Button	Description
C		**POWER** Turns the boiler on or off.
D	MENU	**MENU** Enters the Main Menu.
E		**Return** Returns to the previous page or item.
F		**UP** Increases the temperature and parameter.
G		**Down** Decreases the temperature and parameter.
H		**Enter** Enters the selected item or confirms the value.

Colors

The front panel displays different colors for each mode or situation. Refer to the table for detailed information.

Color	Description
White	**Normal Operation** Displays a white screen when operation normally.
Blue	**Main Menu** Displays a blue screen in Main Menu.
Green	**Advanced Menu** Displays a green screen in Advanced Menu.
Yellow	**Startup Wizard&Air Purge** Displays a yellow screen during the operation for start-up.
Red	**Error** Displays a red screen when error occurs.

Operating the Boiler

Operating the Boiler for the First Time

DANGER

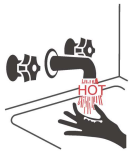
Vapeurs inflammables

Keep flammable products: / Garder les produits inflammables:
1.Far away from boiler. / Très loin du Chaudière.
2.In approved containers. / Dans des récipients approusvès.
3.Tightly closed. / Fermer hemétiquement.
4.Out of childeren's reach. / Hors de la portée des enfants.

Vapors from flammable liaquids explode and catch fire causing death or severe burns. Do not use or store flammable products such as gasoline, solvents or adhesives in the same room or area near the boiler
/ Les vapeurs des liquides inflammables exploseront, s'enflammeront et entraineront la mort ou des brulures graves. Ne pas utiliser ni stocker des produits inflammables, comme de l'essence, des solvants ou des adhésifs, dans la même pièce que le Chaudière, ni près de celui-ci.

Vapors: / Les vapeurs:
1.Cannot be seen. / Sont invisibles.
2.Vapors are heavier than air. / Sont plus lourdes que l'air.
3.Go a long way on the floor. / Se propagent sur le plancher sur une grande distance.
4.Can be carried from other rooms to the main burner by air currents. / Peuvent être transportées a partir d'autres pièce, jusqu'à la flamme de veilleuse, par les courants d'air.

DANGER



The boiler's water temperature over 125°F can cause severe burns instantly or death from scalding. Children, disabled and elderly are at the highest risk of being scalded. Feel water temperature before bathing or showering. Temperature limiting valves are available, ask professional person.
L'eau àune temperature supérleure à 125ÿ peut instantanément causer des brûlures graves ou entraîner la mort. Le risque de brûlures est plus élève chez les enfants, les personnes handicapees et les personnes âgées. Lisez la noticed' instruction avant de réglar la température du Chaudière. Verifier la température de l'eau avant de prendre un bain ou une douche. Des robinets limiteurs de température sont disponibles. Consultez la notice.

WARNING : Californis proposition 65 lists chemical substances know to the state to cause cancer, birth defects, death, serious illness or other reproductive harm. This product may contain such substances, be their origin from fuel combustion (gas, oil) or components of the product it self.

A temperature and pressure relief valve listed as complying with the standard for Relief Valve and Automatic Gas Shutoff Devices for Hot Water Supply System, ANSI Z21.22, shall be installed at the time of installation of the heater in the location specified by the manufacturer. Local codes shall govern the installation of relief devices for safety operation of the boiler. The relief valve must not be removed or plugged.
/ Une vanne de décharge de pression et de température répertoriée, conformément aux normes relatives aux vannes de décharge et aux dispositifs d'arrêt automatique de gaz pour le système d'alimentation en eau ANSI Z21.22, doit être installée lors de l'installation du Chaudière, à un emplacement spécifié par le fabricant. l'installation des dispositifs de décharge doit respecter les règlements locaux afin de garantir un fonctionnement sécurisé du de celui-ci. La vanne de décharge ne doit être ni déplacée ni bouchée.

FOR YOUR SAFETY READ BEFORE OPERATING / Pour votre sécuritélisez avant d'allumer

WARNING : If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life. / AVERTISSEMENT. Quiconque ne respecte pas à la lettre les instructions dans la présente notice risque de déclencher un incendie ou une explosion entrainant des dommages, des blessures ou la mort.

A.This appliance does not have a pilot. It is equipped with an ignition device that automatically lights the burner. Do not try to light the buner by hand. / Cet appareil est muni d'une veilleusé qui doit etre allumee manuellement. Respectez les instructions ci-dessous alà lettre.

B.BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. / Avant d"allumer la veilleuse, reniflez tout autour de l'appareil pour deceler une odeur de gaz. Reniflez près du plancher, car certains gaz sont plus lourds que l'air et peuvent s"accumuler au niveau du sol.

WHAT TO DO IF YOU SMELL GAS / QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ

1.Do not try to light any appliance / Ne pas tenter d'allumer d'appareil
2.Do not try touch any electric switch; do not use any phone in your building.
/ Ne touchez aaucun interrupteur; ne pas vous servir des téléphones se trouvant dans le bâtiment.
3.Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
/ Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur
4.If you cannot reach your gas supplier, call the fire department. / Si vous ne pouvez rejoindre le fournisseur, appelez le service des incendies.

C.Use only your hand to turn the gas valve knob. Never use tools. If the knob will not turn by hand, don't try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire of explosion. / Ne poussez ou tournez la manette d"admission du gaz qu'ala main; ne jamais utiliser d"outil. Si la manette reste coincee, ne tentez pas de la réparer; appelez un technicien qualifie. Le fait de forcer la manette ou de la réparer peut declencher une explosion ou un incendie.

D.Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water. / N"utilisez pas cet appareil s'il a eté plongé dans l'eau, même partiellement. Faites inspecter l'appareil par un technicien qualifié et remplacez toute partie du systeme de controle et toute commande qui ont été plongés dans l'eau

OPERATING INSTRUCTIONS / Instructions d'allumage

1.STOP! Read the safety information above on this label. / ARRÊTEZ! Lisez les consignes de sécurité ci-dessus.
2.Set the thermostat to lowest setting. / Réglez le thermostat au plus bas.
3.Turn off all electric power to the appliance. / Coupez l'alimentation électrique de l'appareil.
4.This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand. / Cet appareil est équipé d'un dispositif d'allumage qui allume automatizuement le brûleur. Ne pas essayer d'allumer le brûleur manuellement.
5.Turn the gas control manual valve (installed on the gas supply line external to the unit) colackwise ↻ to the position. / Tournez la vanne de contrôl du gaz manuelle (installée sur la conduite d'alimentation en gaz exteme de l'unité) dans le sens des aiguilles d'une montre jusqu'à la position.
6.Wait five (5)minutes to clear out any gas then smell for gas including near the floor. If you smell gas, STOP! Follow"B"in the safety information above on this label. If you don't smell gas, go to the next step. / Attendez cinq (5)minutes pour laisser échapper tout gaz. Si vous sentez une odeur de gaz, ARRÊTEZ! Suivez "B"dans les consignes de sécurité ci-dessus sur cette étiquette. Si vous ne sentez pas de gaz, passez à l'étape suivante.
7.Turn the gas control manual valve(installed on the gas supply line external to the unit) counterclockwise ↺ to the full ON position. / Tournez la soupape de contrôl du gaz manuelle (installée sur la conduite d'alimentation en gaz à l'extérieur de l'unité) dans le sens contraire des aiguilles d'une montre jusqu'à la position ON complète.
8.Turn on all electric power to the appliance. / Mettez l'alimentation électrique de l'appareil.
9. Set the thermostat to desired setting. / Réglez le thermostat à la position désirée.
10. .If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier / Si l'appareil ne fonctionne pas, suivez les instructions <<Pour couper le gaz de l'appareil>> et appelez votre technicien d'entretien ou fournisseur de gaz.

TO TURN OFF GAS TO APPLIANCE / Comment couper l'admission de gaz de l'appareil

1.Set the thermostat to lowest setting. / Réglez le thermostat au plus bas.
2.Turn off all electric power to the appliance if service is to be performed.
/ Coupez l'alimentation électrique de l'appareil si le service doit être exécuté.
3. Turn the gas control manual valve (installed on the gas supply line external to the unit) clockwise ↻ to the full OFF position.
/ Tourner la soupape de commande manuelle du gaz (installée sur la conduite d'alimentation en gaz externe de l'unité) dans le sens des aiguilles d'une montre jusqu'à la position OFF complète.

Turning the Boiler On

To turn the boiler on, press the button.

When the boiler is on, each temperature which has been set recently will appear on the digital display.

Startup Wizard

When the power is applied for the first time after installing the boiler, the basic setting necessary for operation is performed.

Start-Up Wizard
Starting CCOFTCB199A start-up wizard. Press enter to continue.

1 Date Setting.

2 Time Setting.

3 Units Setting. (Temperature, Flow Rate, Pressure, Distance)

4 Gas Type.

5 Vent Materials.

6 Flue Pipe Length.

7 Altitude.

8 SH External Pump.

9 Smart Control.

10 Recirculation (Type, Cycle)

Notice

The Items that can be set in the startup wizard can be reset in the Main Menu and Advanced menu. To check more detail setting method, please refer to other description on 'Operating the Boiler' and 'Accessing the Advanced Menu' tap.

11 Check the setting result.

Setting Result 1/4
1.Date: 01/01/2023
2.Time: 12:00:00 AM
3.Units:℉ ,GPM,psi,ft
4.Gas: Natural Gas

Setting Result 2/4
5.Vent Materials:
PVC
6.Flue Pupe Length
0 ~ 16ft

Setting Result 3/4
7.Altitude
0 ~ 2,000ft
8.External Pump:
Zone-1 Only

Setting Result 4/4
9.Smart Control:
None
10.Recirculation:
None

Wizard Finish
Please refer to the
"Installation Manual"
for additional
setting options.

12 After the Startup Wizard is finished, it is followed by the setup screen for the Air Purge.

Press the ↵ button to move to next step.

Air Purge

After the Startup Wizard is finished, it is followed by the setup screen for the Air Purge.
You can set whether to operate the Air Purge, or adjust the operating time.

1 Select whether to activate the Air Purge.

Air Purge
Are you sure
you want to activate
the Air Purge?
□Yes ■No

2 If you selected “Yes”, set the Air Purge Time for the Air Purge to operate.

Air Purge Time
▲
15min
▼

3 When the boiler is prepared for the Air Purge, it displays a progress screen showing the remaining time.

Air Purge
Preparing now.
Please wait...

If the water pressure is low, it occurs the following warning message.

<CAUTION!>
Fill with water so
that the pressure is
more than 7.2psi
> Current: 31 psi

If the water pressure is normal, it displays a progess screen showing the remaining time.

If you want to stop the Air Purge, press the ↵ button.

Air Purge
In Progress...
15 minutes left
■STOP

4 When the Air Purge is finished, the completion message is displayed.

Press the ↵ button to complete the operation.

Notice

You can retry to activate the Air Purge in ’Advanced Menu - 6.Reset Option - 2)Air Purge’.

Setting the SH/DHW Temperature

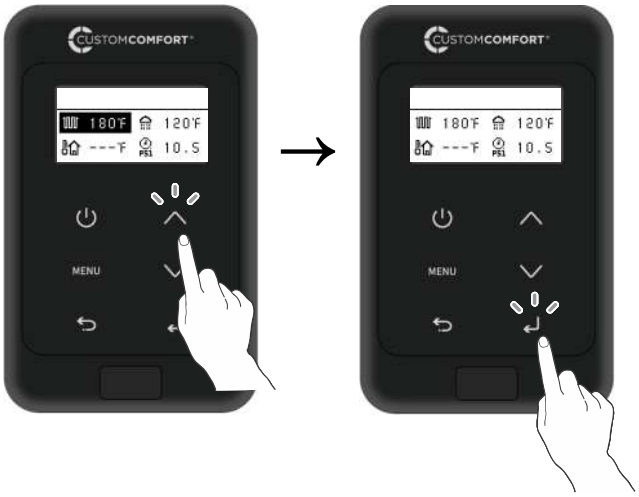
SH(Space Heating) Temperature

To adjust the space heating water temperature:

1 Press the ^ or v buttons, and then select the .

2 Press the ↵ button.

3 Press the ^ or v button to increase/decrease setting value.
Press the ↵ button to confirm after making changes.



Temperature range	Adjusting the water temperature
82–180°F (Fahrenheit mode) 27–82°C (Celsius mode)	2°F increments 1°C increments

Notice

SH(Space Heating) temperature can't be set if 'Smart Control' is enabled.

DHW(Domestic Hot Water) Temperature

Danger If your household includes children, or elderly or disabled individuals, consider using a lower temperature setting.

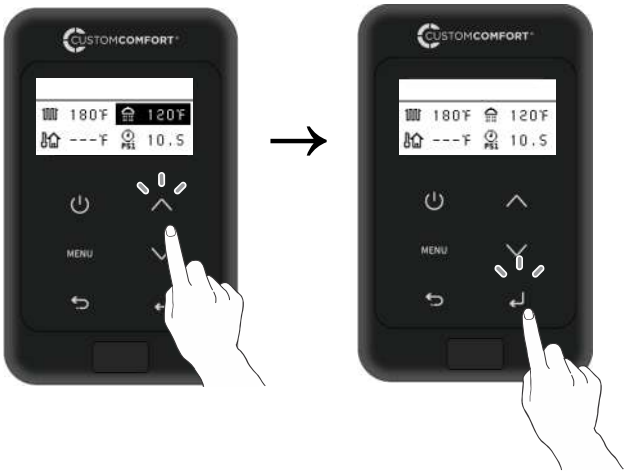
Caution Water above 120°F (50°C) can cause instant scalding, severe burns or death.

To adjust the domestic hot water temperature:

1 Press the ^ or v buttons, and then select the .

2 Press the ↵ button.

3 Press the ∧ or ∨ button to increase/decrease setting value.
Press the ↵ button to confirm after making changes.



Temperature range	Adjusting the water temperature
100°F - 140°F (Fahrenheit mode) 37°C - 60°C (Celsius mode)	2°F increments 1°C increments

Notice
The set temperature can't be set above 120°F(50°C) while using hot water.

Setting for SH Operation

Press the MENU button to access the 2. SH Setup menu.

Main Menu
1.System Status
2.SH Setup
3.DHW Setup
4.Error History ▼

SH Control Method

1 Press the MENU button.
Enter the 2.SH Setup - 2)SH Control Method menu.

2.SH Setup
1)Temperature Set
2)SH Control Method
3)Smart Control
4)SH External Pump

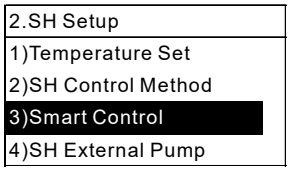
2 Set either Supply Based or Return Based as SH Control Method.

2)SH Control Method
■Supply Based
Return Based

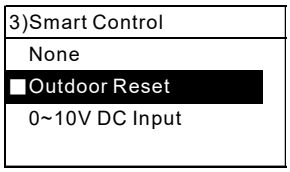
3 Press the ↵ button to complete setting.

Heat Load for the Outdoor Reset

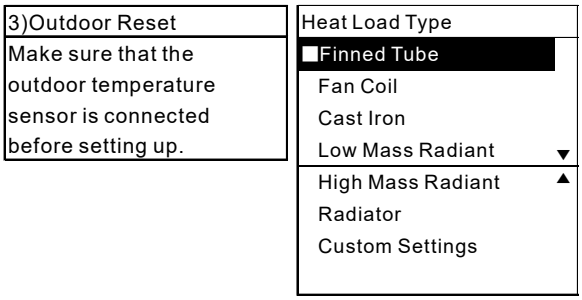
1 Enter the 2.SH Setup - 3)Smart Control menu.



2 Select the Outdoor Reset item.



3 The following confirmation message is displayed, and the Heat Load Type can be set.

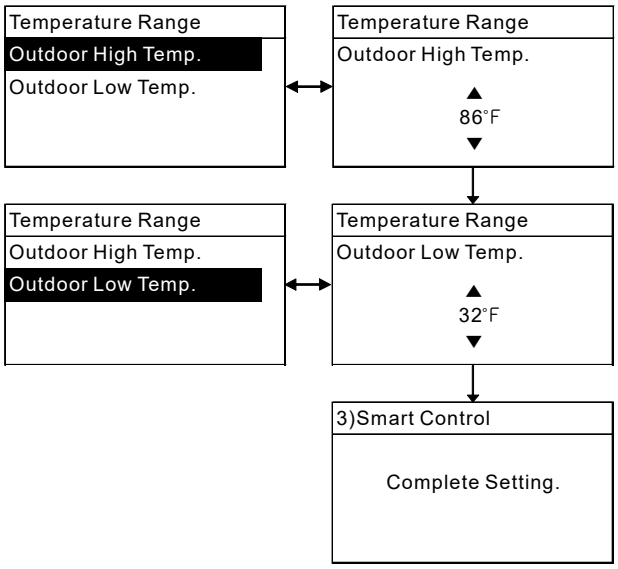


The set-point temperature for each heat load type is as follows.

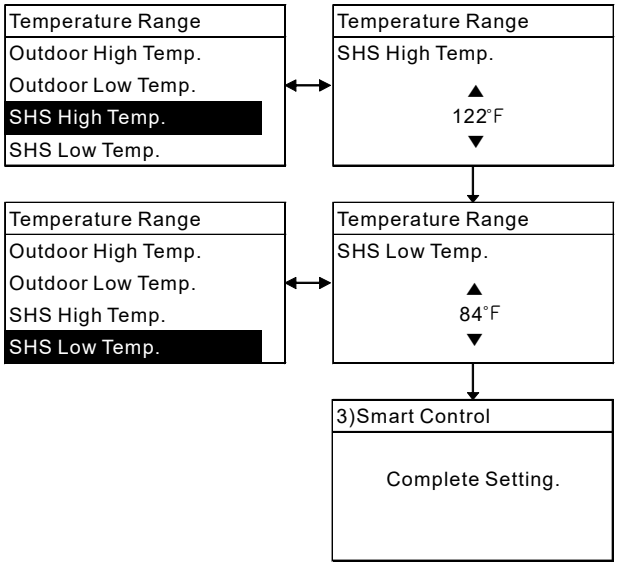
Heat load	Supply		Return	
	Maximum set-point	Minimum set-point	Maximum set-point	Minimum set-point
Finned tube	180°F(82°C)	120°F(48°C)	146°F(63°C)	102°F(38°C)
Fan coil	180°F(82°C)	140°F(60°C)	146°F(63°C)	116°F(46°C)
Cast iron	170°F(76°C)	100°F(37°C)	140°F(59°C)	86°F(30°C)
Low mass Radiant	140°F(60°C)	80°F(26°C)	116°F(46°C)	70°F(21°C)
High mass Radiant	120°F(48°C)	80°F(26°C)	102°F(38°C)	70°F(21°C)
Radiator	170°F(76°C)	120°F(48°C)	140°F(59°C)	102°F(38°C)
Custom	118°F(82°C)	104°F(40°C)	150°F(65°C)	86°F(30°C)

Outdoor Temperature	
Maximum set-point	Minimum set-point
104°F(40°C)	-4°F(-20°C)

4 Press the ↵ button to set the Outdoor High/Low Temp sequentially.



5 If 'Custom Settings' is selected, proceed 2 additional settings. (Space Heating High/Low temperature)



* 'SH' is displayed as 'SHS' or 'SHR', depending on SH Control Method.

6 Press the ↵ button to complete the setting.

0~10V DC Input

1 Enter the 2.SH Setup - 3)Smart Control menu.

2.SH Setup
1)Temperature Set
2)SH Control Method
3)Smart Control
4)SH External Pump

2 Select the 0~10V DC Input item.

3)Smart Control
None
Outdoor Reset
■0~10V DC Input

3)Smart Control
Make sure that the
External DC Input
is connected
before setting up.

3 Press the ↵ button to set the SH High Temp. SH Low Temp sequentially.

0~10V DC Input
SHS High Temp.
SHS Low Temp.

0~10V DC Input
SHS High Temp.
▲ 122°F ▼

0~10V DC Input
SHS High Temp.
SHS Low Temp.

0~10V DC Input
SHS Low Temp.
▲ 84°F ▼

3)Smart Control
Complete Setting.

* 'SH' is displayed as 'SHS' or 'SHR', depending on SH Control Method.

4 Press the ↵ button to complete the setting.

SH External Pump

1 Enter the 2.SH Setup - 4)SH External Pump menu.

2.SH Setup
1)Temperature Set
2)SH Control Method
3)Smart Control
4)SH External Pump

2 Set the external pump type. (Zone or System)

4)SH External Pump
■Zone Pump
System Pump

3 If Zone Pump is selected, set each pump to turn on or off .
Press the ∧ or ∨ button to set Z-1 or 2 or 3 to ON or OFF.
and press the ↵ button to set it and move to next item.

Zone Pump		
Z-1	Z-2	Z-3
▲		
ON	OFF	OFF
▼		

Zone Pump		
Z-1	Z-2	Z-3
	▲	
ON	OFF	OFF
	▼	

Zone Pump		
Z-1	Z-2	Z-3
		▲
ON	OFF	OFF
		▼

Notice

If a generic zone pump controller is connected to the boiler, 'Z-1' needs to be set to ON.

4 Press the ↵ button to complete the setting.

Setting for DHW Operation

Press the MENU button to access the 3.DHW Setup menu.

Main Menu
1.System Status
2.SH Setup
3.DHW Setup
4.Error History

Re-circulation

1 Enter the 3.DHW Setup - 2)Recirculation menu.

1) If Recirculation Type is set to “None”, “Aquastat”, “Hot-Button” :

3.DHW Setup
1)Temperature Set
2)Recirculation
3)Holiday Setting
4)Descaling Alarm

2) If Recirculation Type is set to “Internal”, “External”, “T-Valve” :

3.DHW Setup
1)Temperature Set
2)Recirculation Type
3)Recirculation Time
4)Holiday Setting

2 Set the Recirculation Type.
If “None” or “Aquastat” or “Hot-Button” is set, the setting is completed.
and if one of other items is set, move to Recirculation Cycle display.

2)Recirculation Type
■None
Internal(Pre-Heat)
External
T-Valve
Aquastat
Hot-Button

3 Set the Recirculation Cycle.
If “None” is set, the setting is completed.
and if one of other items is set, move to Timer setting display.

3)Recirculation Cycle
■Always On
Every Day
Weekday
Weekend

Notice

Always On : Recirculation operates all the time.
Every Day : The timers you set work every day.
Weekday : The timers you set only work on weekdays.
Weekend : The timers you set only work on weekend.

4 Set recirculation timer. (up to 5)

, : Select a timer, 'Delete', 'OK' or adjust each time value.

: Enter the setting mode, or move to next item, or Complete the setting mode.

: Release the setting mode, or move to previous item.

Every Day Timer	
No Start End	
1) : ~ :	
2) : ~ :	
3) : ~ :	
No Start End	
4) : ~ :	
5) : ~ :	
Delete OK	

< Select Mode >

Every Day Timer	
No Start End	
▶1) 12:00am~12:00am	
2) : ~ :	
3) : ~ :	
No Start End	
4) : ~ :	
5) : ~ :	
Delete OK	

< Setting Mode >

5 To delete each timer setting value :

1) Press the button on line ‘Delete’.
2) Press the , buttons to select the timer you want to delete.
3) Press the button to delete it.

Every Day Timer
No Start End
4) : ~ :
5) : ~ :
▶Delete: Timer1

Every Day Timer
Timer1 Deleted.

6 To complete the setting :

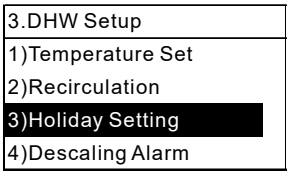
1) Press the button on line ‘OK’.
2) Press the button to complete the setting.

Every Day Timer
No Start End
4) : ~ :
5) : ~ :
Delete OK

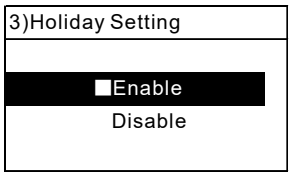
Every Day Timer
Complete Setting.

Holiday Setting

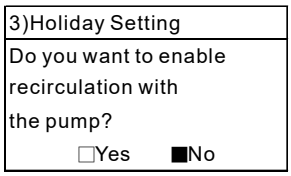
1 Enter the 3.DHW Setup - 3)Holiday Setting menu.



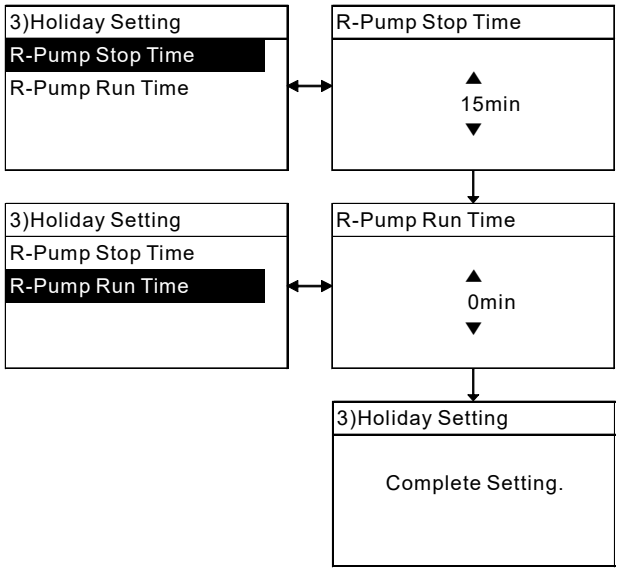
2 Select whether to enable Holiday Setting.



3 Select whether to enable Recirculation for Holiday Setting.

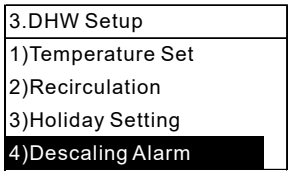


4 If Recirculation is enabled, press the ↵ button to set the Pump Stop/Run Time for Recirculation sequentially.

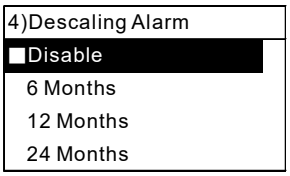


Descaling Alarm

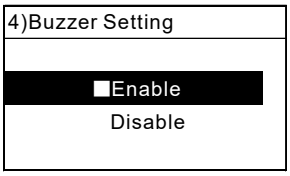
1 Enter the 3.DHW Setup - 4)Descaling Alarm menu.



2 Select the cycle of Descaling Alarm, or set it to disable.



3 If one of cycle options is selected,
set whether to enable buzzer about Descaling Alarm.



4 Press the ↵ button to complete the setting.

Viewing System Status

Press the MENU button to access the 1.System Status menu.

Main Menu
1.System Status
2.SH Setup
3.DHW Setup
4.Error History
5.Configuration
6.System Information
7.Advanced Setup

1.System Status
1)Operation Status
2)Fan Status
3)Temperature Info.
4)Water Pressure
5)DHW Flow Rate
6)Valve Status

Notice

This Menu provides information related to boiler operation including operation·fan·valve status, temperature, pressure and flow rate.

Operation Status

Displays the status of boiler operation for each heating mode.

- SH Operation

1)Operation Status	
SH Operation	RUN

- DHW Operation

1)Operation Status	
DHW Operation	RUN
Heat Load	50%

- Outdoor Reset

1)Operation Status	
Outdoor Reset	RUN
Curve Load Type:	
Finned Tube	

- 0~10V DC Input

1)Operation Status	
Ext.Set-Point	RUN
DC Input	2.0V

- Anti-Freeze

1)Operation Status	
Anti-Freeze	RUN

Fan Status

Displays the status of fan RPM and Air Pressure Switch.

2)Fan Status	
RPM	4500
APSW	ON

Temperature

Displays each temperature information.

3)Temperature Info.	
SH Supply	140°F
SH Return	100°F
DHW Outlet	98°F
DCW Inlet	82°F
Outdoor	50°F
Exhaust	114°F
Exchanger	122°F

* If 'Smart Control' is not set to 'Outdoor Reset', 'Outdoor' temperature is displayed as '----'.

Water Pressure

Displays water pressure in psi or bar.

4)Water Pressure
43.5 psi

DHW Flow Rate

Displays Domestic Hot Water flow rate in GPM or LPM.

5)DHW Flow Rate
1.58 GPM

Valve Status

Displays the status of Flow valve and Bypass valve.

6)Valve Status	
Bypass V/V Open	100%

Viewing System Information

Press the MENU button to access the 6.System Information menu.

Main Menu
1.System Status
2.SH Setup
3.DHW Setup
4.Error History
5.Configuration
6.System Information
7.Advanced Setup

6.System Information
1)Date/Time
2)Accumulated Data
3)Model Information
4)Firmware Version

Notice

This Menu provides system information including date/time, accumulated data, model name, capacity and firmware version.

Date/Time

Displays the current date and time.

1)Date/Time
Mon, Jan 1, 2024 12:00:00 AM

Accumulated Data

Displays the accumulated data about boiler operation,

- System Operation

System Operation Data
Power-up time
10,000 Hours
Gas valve open time
8,760 Hours
SH operation count
14,600 Cycles
SH operation time
4,380 Hours
DHW operation count
14,600 Cycles
DHW operation time
4,380 Hours
Recirculation count
14,600 Cycles
Recirculation time
4,380 Hours
Air purge count
20 Cycles

- Combustion Events

Combustion Events
Ignition count
14,600 Cycles
Ignition failed
23 Cycles
Flame loss count
11 Cycles

- Pump Operation

Pump Operation Data
Pri-pump on count
14,600 Cycles
Pri-pump on time
8,760 Hours

- Water Usage

Water Usage Data
Total usage
15,000 Gallons
Maximum flow rate
40 GPM
Minimum flow rate
0.3 GPM

Model Information

Displays the model name and capacity.

3)Model Information	
Model Name	CCOFTCB199A
Capacity	199,000Btuh

Firmware Version

Displays the firmware version for the main PCB, and front panel.

4)Firmware Version	
Main PCB(M)	V1.00
(S)	V1.00
Front Panel	V1.00

Front Panel Configuration

Press the MENU button to access the 5.Configuration menu.

Main Menu
1.System Status
2.SH Setup
3.DHW Setup
4.Error History
5.Configuration
6.System Information
7.Advanced Setup

5.Configuration
1)Unit Setup
2)Date Setting
3)Time Setting
4)Buzzer Setting

Notice

In this menu. you can set each unit(temperature, pressure, flow rate, distance), date, time, and whether to use buzzer.

Temperature Unit

You can set the temperature display unit.

1) Enter the 5.Configuration - 1)Unit Setup - 'Temperature' menu.

2) Set either ℃ or ℉ as the temperature display unit.

1)Unit Setup	
Temperature	:°F
Water Pressure	:psi
Water Flow Rate	:GPM
Distance	:ft

Temperature Unit
℃
■°F

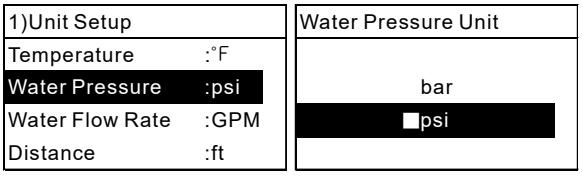
3) Press the ↵ button to complete the setting.

Pressure Unit

You can set the pressure display unit.

1) Enter the 5.Configuration - 1)Unit Setup - 'Water Pressure' menu.

2) Set either bar or psi as the pressure display unit.



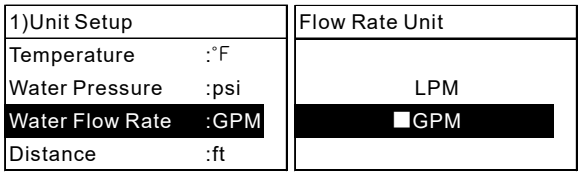
3) Press the ↵ button to complete the setting.

Flow Rate Unit

You can set the flow rate display unit.

1) Enter the 5.Configuration - 1)Unit Setup - 'Water Flow Rate' menu.

2) Set either LPM or GPM as the flow rate display unit.



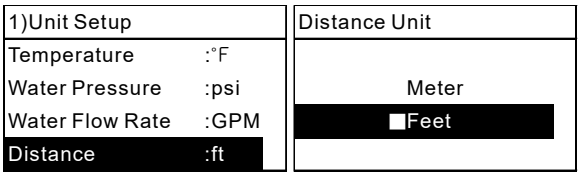
3) Press the ↵ button to complete the setting.

Distance Unit

You can set the distance display unit.

1) Enter the 5.Configuration - 1)Unit Setup - 'Distance' menu.

2) Set either Meter or Feet as the distance display unit.



3) Press the ↵ button to complete the setting.

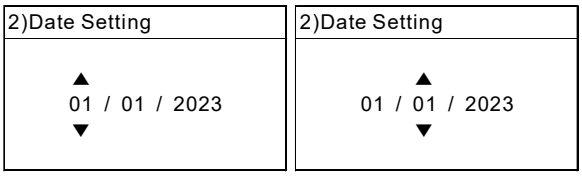
Date Setting

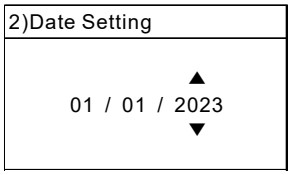
You can set the current date.

1) Enter the 5.Configuration - 2)Date Setting menu.

2) The date is displayed in the order of month / day / year.

Press the ↵ button to set it and move to next item.





3) Press the ↵ button to complete the setting.

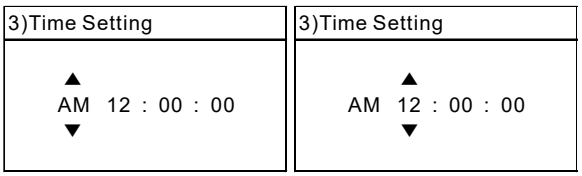
Time Setting

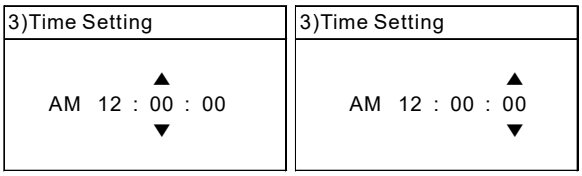
You can set the current time.

1) Enter the 5.Configuration - 3)Time Setting menu.

2) The date is displayed in the order of AM·PM / hour / minute / second.

Press the ↵ button to set it and move to next item.





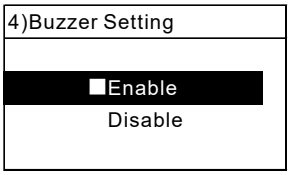
3) Press the ↵ button to complete the setting.

Buzzer Setting

You can set whether to use the buzzer when you touch the button.

1) Enter the 5.Configuration - 4)Buzzer Setting menu.

2) Select whether to use the buzzer.



3) Press the ↵ button to complete the setting.

Error Codes

If an error code appears on the LCD display, refer to the following chart for the reason, and a possible remedy for the situation.

Code	Cause	Self-diagnosis / Action
A0	Water flow control bypass valve fault	• Ensure that the flow control valve connector is properly connected. • Contact original installer or licensed professional.
A1	DC FAN power supply fault	• Contact original installer or licensed professional.
A2	DC FAN fault	• Ensure that the fan connector is properly connected. • Contact original installer or licensed professional.
A4	Overheating of the heat exchanger	• Turn off the system for at least 30 minutes, and then restart it. • Contact original installer or licensed professional.
A5	Low water pressure	• Water supplementation of manual • Contact original installer or licensed professional.
A6	Ignition failed (flame failure) 6 times	• Ensure that the main gas supply valve is open. • Ensure that the gas type setting is the same as the supplied gas. • Contact original installer or licensed professional.
A7	Gas valve fault (does not open)	• Turn off the main gas valve. • Contact original installer or licensed professional.
A8	Pseudo flame detection	• Turn off the main gas valve. • Contact original installer or licensed professional.
AA	Overheating of the heat exchanger water	• Turn off the system for at least 30 minutes, and then restart it • Contact original installer or licensed professional.
AB	Heat exchanger thermistor fault	• Ensure that the heat exchanger thermistor wiring connection. • Contact original installer or licensed professional.
AC	DHW outlet thermistor fault	• Ensure that the DHW outlet thermistor wiring connection. • Contact original installer or licensed professional.
AD	Clog of condensate trap	• Clean the condensate trap. • Contact original installer or licensed professional.
AE	Blockage of flue pipe	• Clean the vent terminal. • Contact original installer or licensed professional.
AF	Overheating of the burner	• Turn off the system for at least 30 minutes, and then restart it. • Contact original installer or licensed professional.
E0	Outdoor temperature sensor fault	• Ensure that the outdoor temperature sensor wiring connection. • Contact original installer or licensed professional.
E1	Exhaust thermistor fault	• Ensure that the exhaust thermistor wiring connection. • Contact original installer or licensed professional.
E2	Overheating of the exhaust	• Ensure that the vent materials setting is the same as the vent installed. • Contact original installer or licensed professional.
E3	SH return water thermistor fault	• Ensure that the SH return water thermistor wiring connection. • Contact original installer or licensed professional.
E4	Water pressure sensor fault	• Ensure that the water pressure sensor wiring connection. • Contact original installer or licensed professional.
E5	DCW inlet thermistor fault	• Ensure that the DCW inlet thermistor wiring connection. • Contact original installer or licensed professional.
E6	Flame loss 20 times	• Contact original installer or licensed professional.
E7	Gas valve fault (does not close)	• Turn off the main gas valve. • Contact original installer or licensed professional.
E8	Overheating of the SH supply water	• Turn off the system for at least 30 minutes, and then restart it • Contact original installer or licensed professional.
E9	SH supply water thermistor fault	• Ensure that the SH supply thermistor wiring connection. • Contact original installer or licensed professional.
EA	LWCO protection	• Ensure that the LWCO terminal is well connected by short wire. (factory connected) • Ensure that it is connected to the LWCO terminal. • Ensure that the water pressure in the pipe is appropriate. • Contact original installer or licensed professional.
EB	Overheating of the DHW	• Turn off the system for at least 30 minutes, and then restart it • Contact original installer or licensed professional.
ED	Main PCB internal safety protection	• When the monitoring status is restored to normal, it is automatically released. • If the error is not released, turn off the AC and power back on after 5 seconds. • If the error is still not cleared, contact original installer or licensed professional.
EE	Communication failure with Main PCB	• When communication is restored to normal, it is automatically released. • If the error is not released, turn off the AC and power back on after 5 seconds. • If the error is still not cleared, contact original installer or licensed professional.

Please contact original installer, licensed professional, or Custom Comfort technical support at 877-241-1224

Accessing Advanced Menu

You can set the program data and activate the reset options in the Advanced Menu.

1 Connect the power supply.

2 To turn the boiler on, press the button.

3 Press the MENU button.

4 Enter the 7.Advanced Menu. And then, press the , and MENU button to enter the password 1234.

Main Menu	Password
5.Configuration ▲	0 0 0 0
6.System Information	
7.Advanced Setup	

Notice

In Advacned Menu, you can set the data that affects operating environment of the boiler, including gas type, vent material, etc. and you can check each input and output status, or retry the Startup Wizard and Air Purge, or reset all data to factory default.

Gas Type

You can set the type of gas used for the product.

1) Enter the 1.Boiler Setup - 1)Gas Type menu.

2) Set the type of gas used for the product.

1)Gas Type
■Natural Gas
Propane Gas

3) Press the button to complete the setting.

Vent Materials

You can set the material of vent for the product.

1) Enter the 1.Boiler Setup - 2)Vent Material menu.

2) Set the material of vent for the product.

2)Vent Material
■PVC
CPVC
PP

3) Press the button to complete the setting.

Flue Pipe Length

You can set the length of flue pipe used for the product.

1) Enter the 1.Boiler Setup - 3)Flue Pipe Length menu.

2) Set the length of flue pipe used for the product.

3)Flue Pipe Length
■0 ~ 16ft
16 ~ 26ft
26 ~ 39ft
More than 39ft

3) Press the button to complete the setting.

Altitude

You can set the altitude option to match actual location.

1) Enter the 1.Boiler Setup - 4)Altitude menu.

2) Set the altitude option to match actual location of the product.

4)Altitude
■0 ~ 2,000ft
2,000 ~ 5,400ft
5,400 ~ 7,700ft
7,700 ~ 10,100ft

3) Press the button to complete the setting.

Air Handler

You can select whether to use the Air Handler.

1) Enter the 2.Air Handler Setup menu.

2) Select whether to use the Air Handler.

2.Air Handler Setup
■ Enable
Disable

3) Press the ↵ button to complete the setting.
Please check the message if 'Enable' is selected.

2.Air Handler Setup
Make sure that the
Air Handler
is connected
before setting up.

2.Air Handler Setup
Complete Setting.

I/O Status

You can view input and output status information of the boiler.

1) Enter the 5.I/O Status menu.

2) Check each I/O status information.

5.I/O Status	
Primary Pump Out	OFF
Ext.Recirc. In	OFF
Ext.Recirc. Out	OFF
LWCO In	OFF ▼
Air Handler In	OFF ▲
Air Handler Out	OFF
Zone1 T/S In	OFF
Zone1 Pump Out	OFF ▼
Zone2 T/S In	OFF ▲
Zone2 Pump Out	OFF
Zone3 T/S In	OFF
Zone3 Pump Out	OFF

Notice

If a generic zone controller is connected to the boiler, you only need to check items 'Zone1 T/S In' and 'Zone1 Pump Out' for zone system.

Reset Options

In this menu, you can activate Startup Wizard, Air Purge and Factory Reset .
About '1)Start-Up Wizard' and '2)Air Purge', please refer to 'Startup Wizard' and 'Air Purge' tap.

To reset the boiler data to factory reset :

1) Enter the 6.Reset Options - 3)Factory Reset.

2) Press the ↵ button to continue the factory default.

3)Factory Reset
Reset all settings
to factory defaults.
■ Continue

3) Make sure again that you want to reset to factory default.

3)Factory Reset
Are you sure
you want to reset
to factory defaluts?
□ Yes ■ No

4) If you select 'YES', the Factory Reset will proceed.
And if Factory Reset is completed, the system will restart automatically.

3)Factory Reset
Factory Reset
In Progress...

3)Factory Reset
Operation Done.

Appendix

Gas Conversion

This boiler is configured for Natural Gas from the factory. If conversion to Propane Gas is required, the conversion kit supplied with the boiler must be used.

Danger

Inspect the packing between the gas valve and gas pipe whenever they are disassembled. The packing must be installed and must be in good condition. Failure to comply will cause a gas leak, resulting in severe personal injury or death.

Warning

This conversion kit shall be installed by a qualified service agency* in accordance with Custom Comfort instructions and all applicable codes and requirements of the authority having jurisdiction. The information in these instructions must be followed to minimize the risk of fire or explosion and/or to prevent property damage, personal injury or death. The qualified service agency is responsible for the proper installation of this kit. The installation is not proper and complete until the operation of the converted appliance is checked as specified in the manufacturer's instructions supplied with the kit.

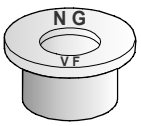
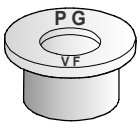
* A qualified service agency is any individual, firm, corporation or company which either in person or through a representative is engaged in and is responsible for the connection, utilization, repair or servicing of gas utilization equipment or accessories; who is experienced in such work, familiar with all precautions required, and has complied with all of the requirements of the authority having jurisdiction.

In Canada: The conversion shall be carried out in accordance with the requirements of the provincial authorities having jurisdiction and in accordance with the requirements of the CAN/CSA B149.1 and CAN1 B149.2 Installation Codes.

Included Item

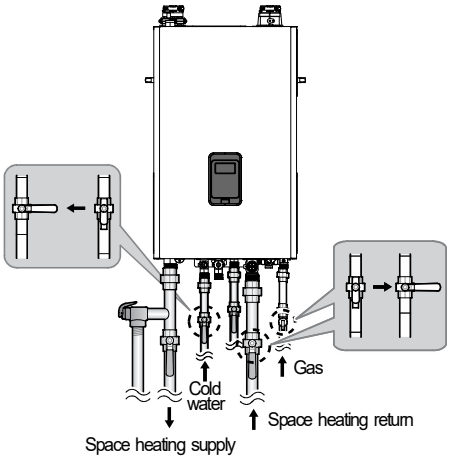
Included Items (Item No : CCOB2110564S)

- Inline Orifice
- Gas Packing
- 3/4" Packing
- Conversion Manual
- Rating Plate(Conversion sticker)

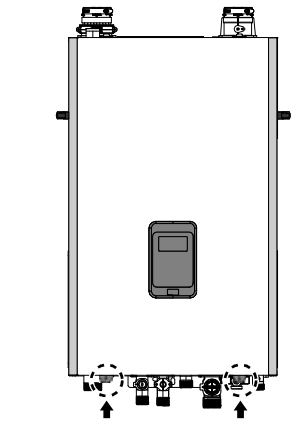
Gas Type	Natural Gas	Propane Gas
Orifice		

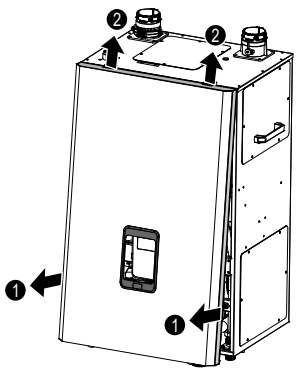
To convert the gas:

1 Disconnect the electrical power.
Turn off the manual gas shut off valve and the water supply to the boiler.

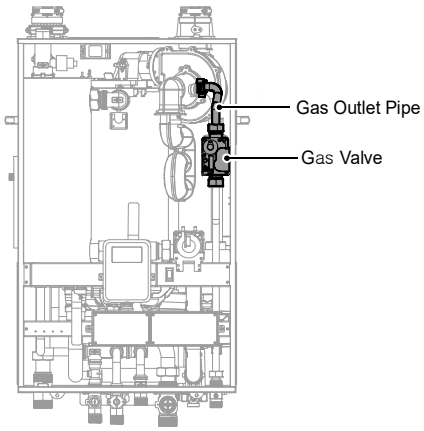


2 Remove the boiler front cover by loosening the 2 Phillips screws securing it to the case.

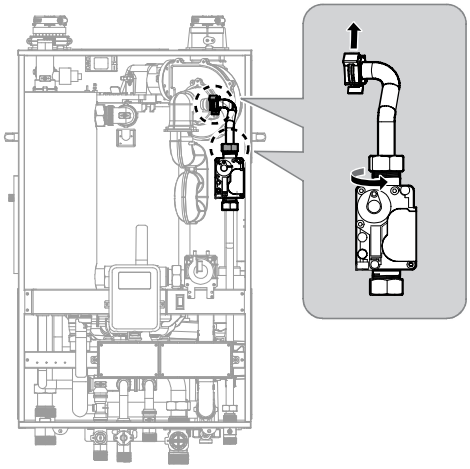




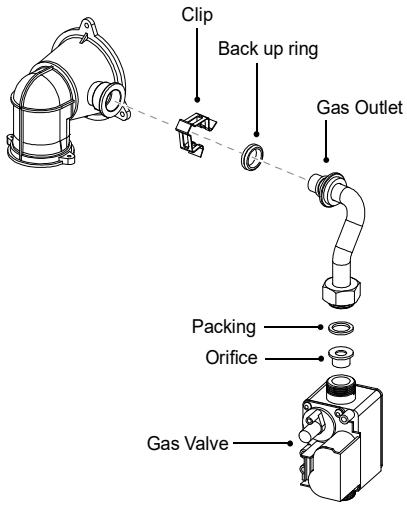
3 Once the front cover is removed, place it in a safe location to prevent accidental damage. With the internal components exposed, locate the gas connector and the gas valve.



4 Loosen the nut connecting the gas outlet pipe and the gas valve. Carefully separate the clip.



5 Once the gas orifice is exposed, remove the gas orifice from gas valve.



6 Replace the old orifice piece and the packing with new part for use with Propane. Ensure that the orifice is properly seated inside the gas valve

Danger

Inspect the packing whenever they are disassembled. The packing must be in good condition and must be installed. Failure to comply will cause a gas leak, resulting in severe injury or death.

7 Restore the gas valve and gas outlet pipe to their original position and secure all connections.

8 Check the gas leakage before operating the boiler.

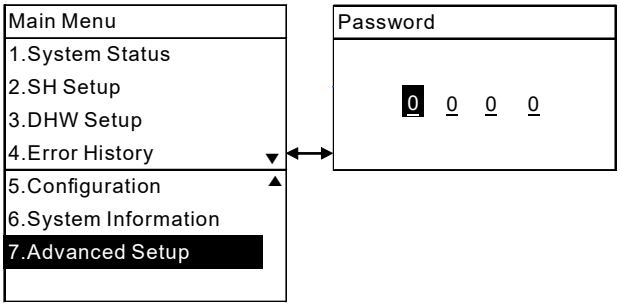
9 Connect the power set the Propane Gas mode on the front panel.

You can set the type of gas used for the product.

1) To turn the boiler on, press the ⏻ button.

2) Press the MENU button.

3) Enter the 7.Advanced Menu. And then, press the ∧, ∨ and MENU button to enter the password 1234.

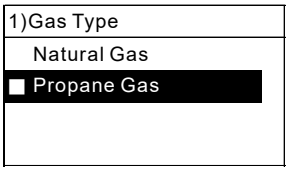


Notice

In Advacned Menu, you can set the data that affects operating environment of the boiler, including gas type, vent material, etc. and you can retry the Startup Wizard and Air Purge, or reset all data to factory default.

4) Enter the 1.Boiler Setup - 1)Gas Type menu.

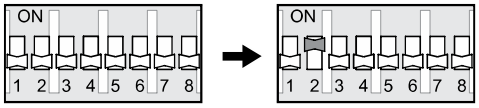
5) Set the type of gas used for the product.



6) Press the ↵ button to complete the setting.

10 Set the DIP switch to minimum heat capacity operation.

Danger Be sure to turn off the power before changing the DIP switch setting



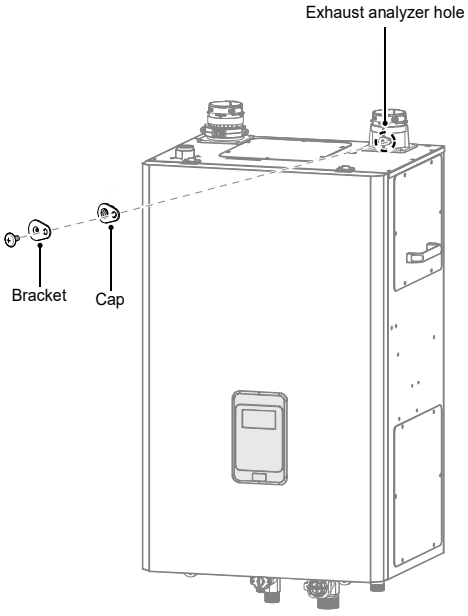
Original position Minimum setting

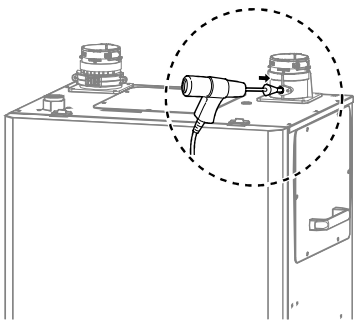
Notice

For more information about setting the DIP switches, refer to "Setting the DIP Switches" on page 40 of the installation manual.

11 Turn on the gas and water supply to the boiler.

12 Loosen the screw, remove the bracket and the cap to access the exhaust analyzer hole.



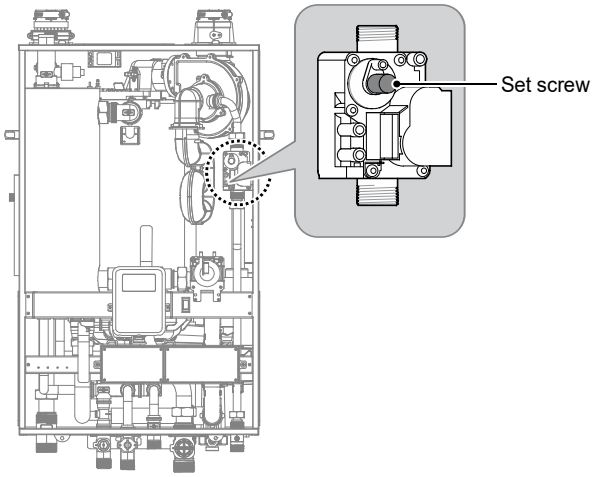


13 Insert analyzer into the exhaust analyzer hole and measure the gas/air ratio (using combustion analyzer is recommended).

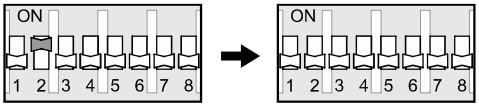
Type	High fire	Low fire
	CO_2 (%)	CO_2 (%)
NG	10.1 ± 0.5	9.4 ± 0.5
Propane	11.9 ± 0.5	11.0 ± 0.5

14 Fully open several hot water fixtures and if the CO_2 value at low fire is not within 0.5% of the value listed in the table above, the gas valve set screw will need to be adjusted. If adjustment is necessary, locate the set screw. Using a 5/32" or 4mm Allen wrench, turn the set screw no more than 1/4 turn clockwise to raise or counterclockwise to lower the CO_2 value.

Danger Improper gas valve settings can cause severe injury, death or property damage.



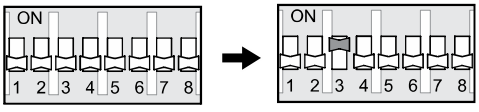
15 Put the DIP switch back to the original position.



Minimum setting Original position

16 Set the DIP switch to maximum heat capacity operation.

Danger Be sure to turn off the power before changing the DIP switch setting



Original position Maximum setting

Notice

For more information about setting the DIP switches, refer to "Setting the DIP Switches" on page 40 of the installation manual.

17 Fully open several boiler fixtures and if the CO_2 value at high fire is not within 0.5% of the value listed in the table above, do not adjust the gas valve set screw and check if the gas orifice is properly installed.

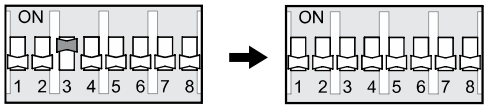
Danger

Improper gas valve settings can cause severe injury, death or property damage.

Notice

While measuring the gas/air ratio in maximum heat capacity operation, do not adjust the gas valve set screw.

18 Put the DIP switch back to the original position.



Maximum setting Original position

19 When the gas conversion is completed, attach the conversion sticker to the top of the rating plate.

This appliance was converted on
_____ / _____ / _____ / (day/month/year)
to _____ gas
with Kit No._____
by _____
(name and address of organization making this conversion), that accepts the responsibility for the correctness of this conversion.

Conversion Sticker

This appliance has been converted to
Propane fuel /
Cet appareil a été converti au propane
Orifice Size / injecteur
Ø 5.6
Inlet Gas Pressure / Pression d'entree du gaz
Min. 8.0 to Max. 13.0" WC
Manifold Pressure /
Pression à la tubule d'alimention
Min. -0.01 to Max. -2.15" WC
Input (Btu/hr) / Débit calorifique
Min.17,000 to Max.199,000
Conversion Kit No. CCOB2110564S

Conversion Rating Plate

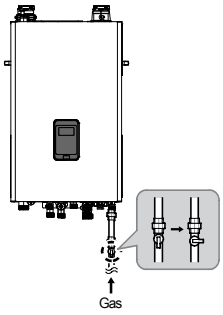
Notice

The inlet gas pressure must be maintained between 3.5" and 10.5" WC for natural gas and between 8" and 13" WC for liquefied propane.
Refer to the installation manual page 30, for measuring the inlet pressure.
Keep this manual near the water heater for future reference whenever maintance or service is required.

20 Put the front cover back on the unit.

To measure the inlet &manifold gas pressure:

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

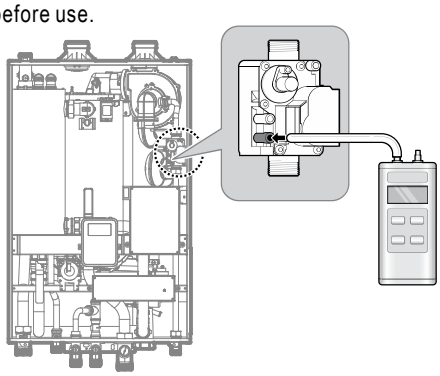


2 Run space heating. The boiler should turn on and the gas in the gas supply line will be purged.

3 Leave the boiler on until the boiler shuts down due to a lack of gas supply, and then turn off the boiler.

4 Remove the boiler front cover by loosening the 2 Phillips screws securing it to the case.

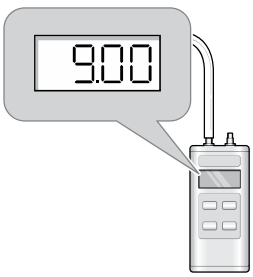
5 Loosen the screw indicated in the figure below and connect a manometer to the inlet pressure port. Reset the manometer to zero before use.



6 Re-open the manual gas shut-off valve and check for leaks.

7 Open multiple fixtures that have high flow rates, such as bathtub and shower faucets, to ramp up the boiler to its maximum firing rate.

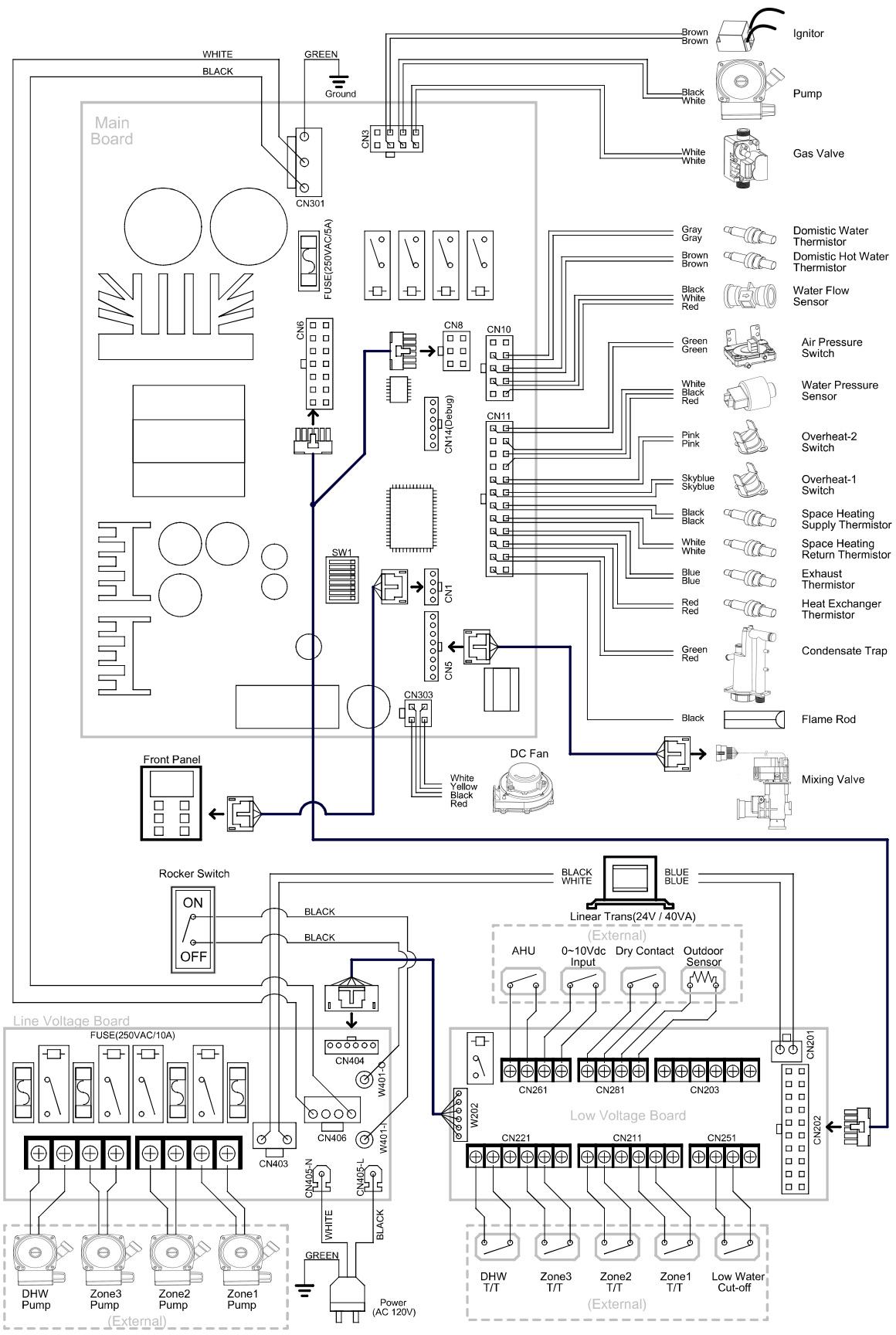
8 When the boiler reaches its maximum firing rate, check the inlet gas pressure reading on the manometer. The gas pressure must fall within the ranges specified in "Specifications" on page 7.



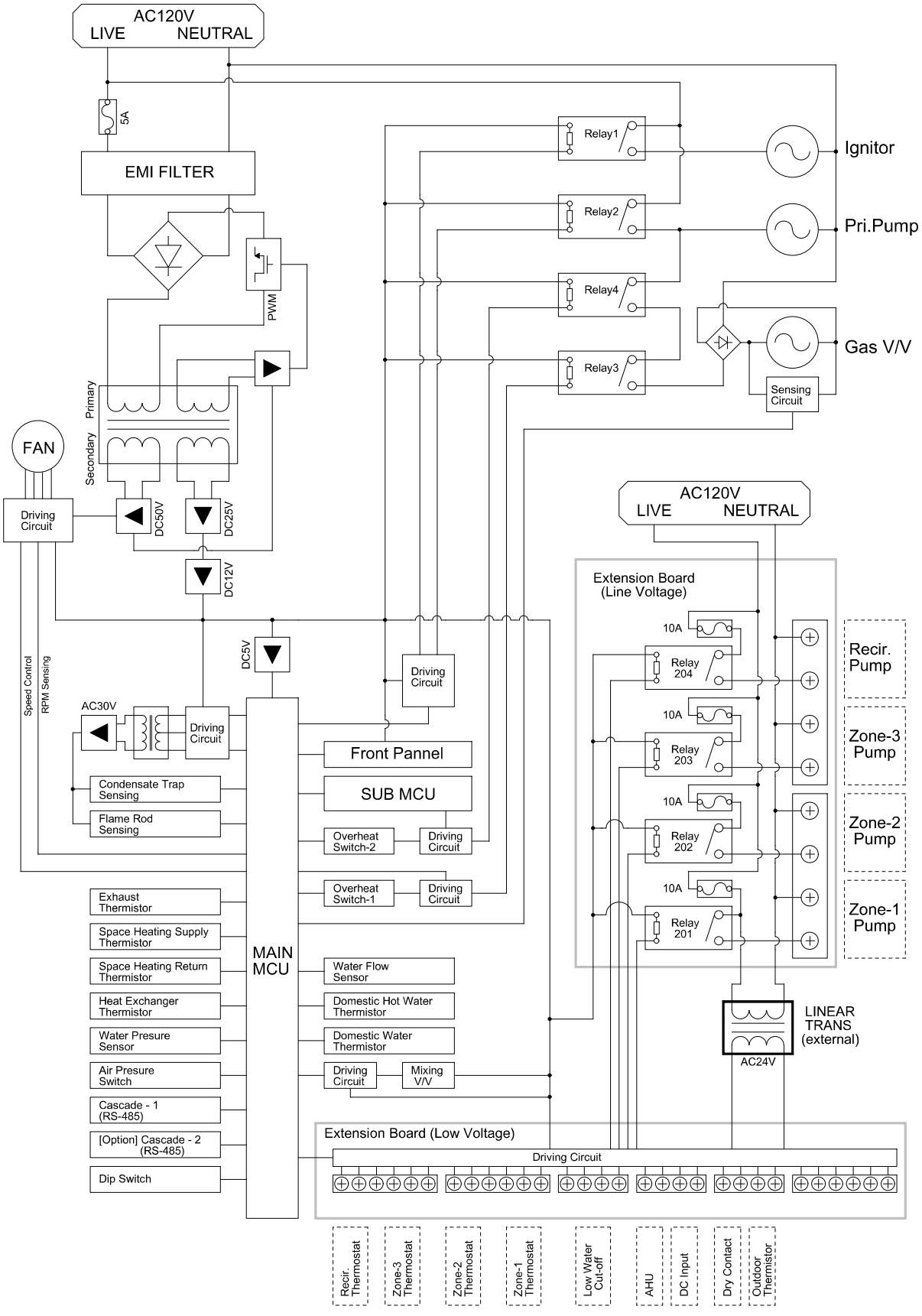
9 Tighten the inlet gas pressure screw.

10 Replace the front cover and tighten the 2 Phillips screws to secure it to the case.

Wiring Diagram

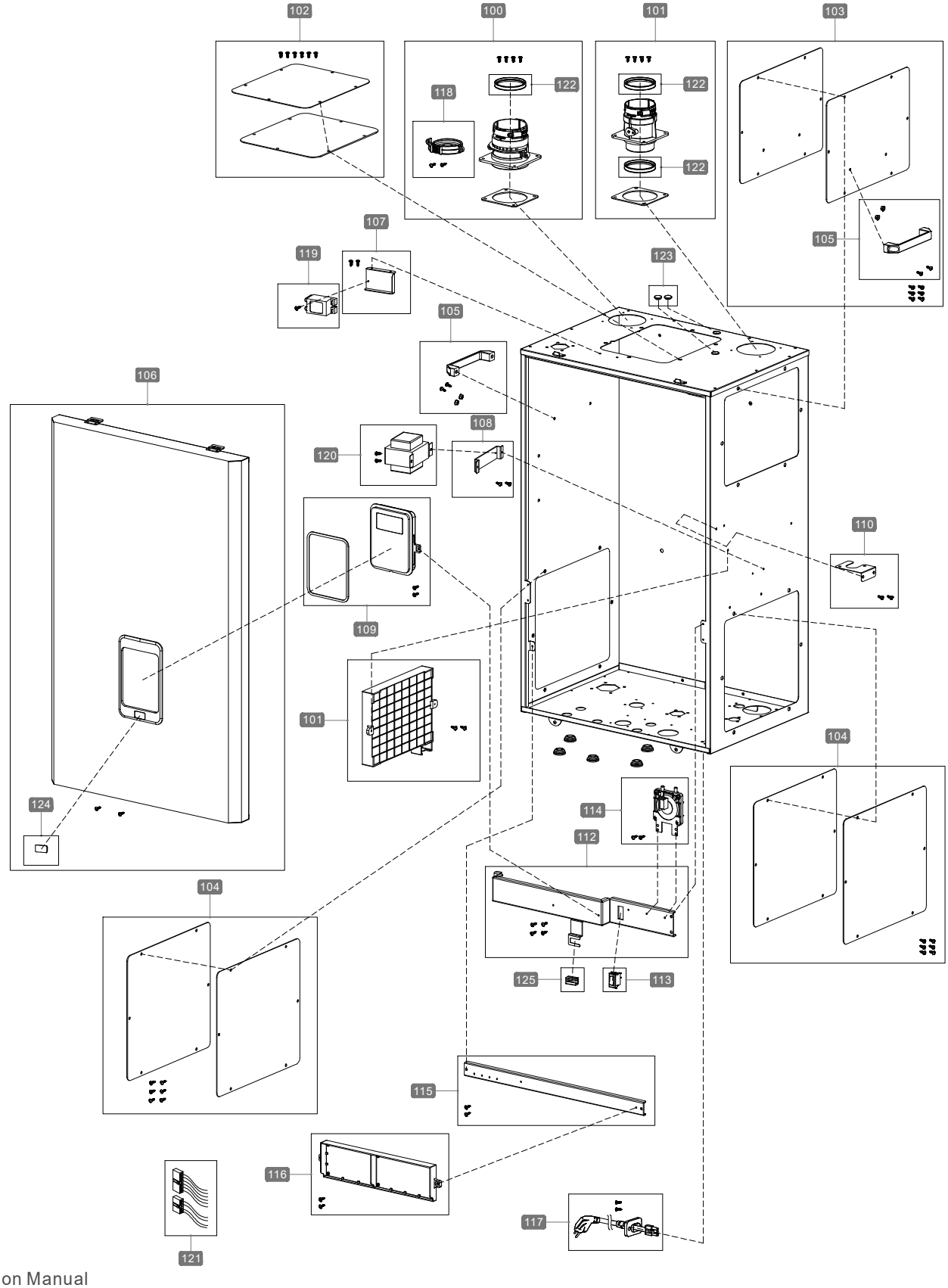


Ladder diagram



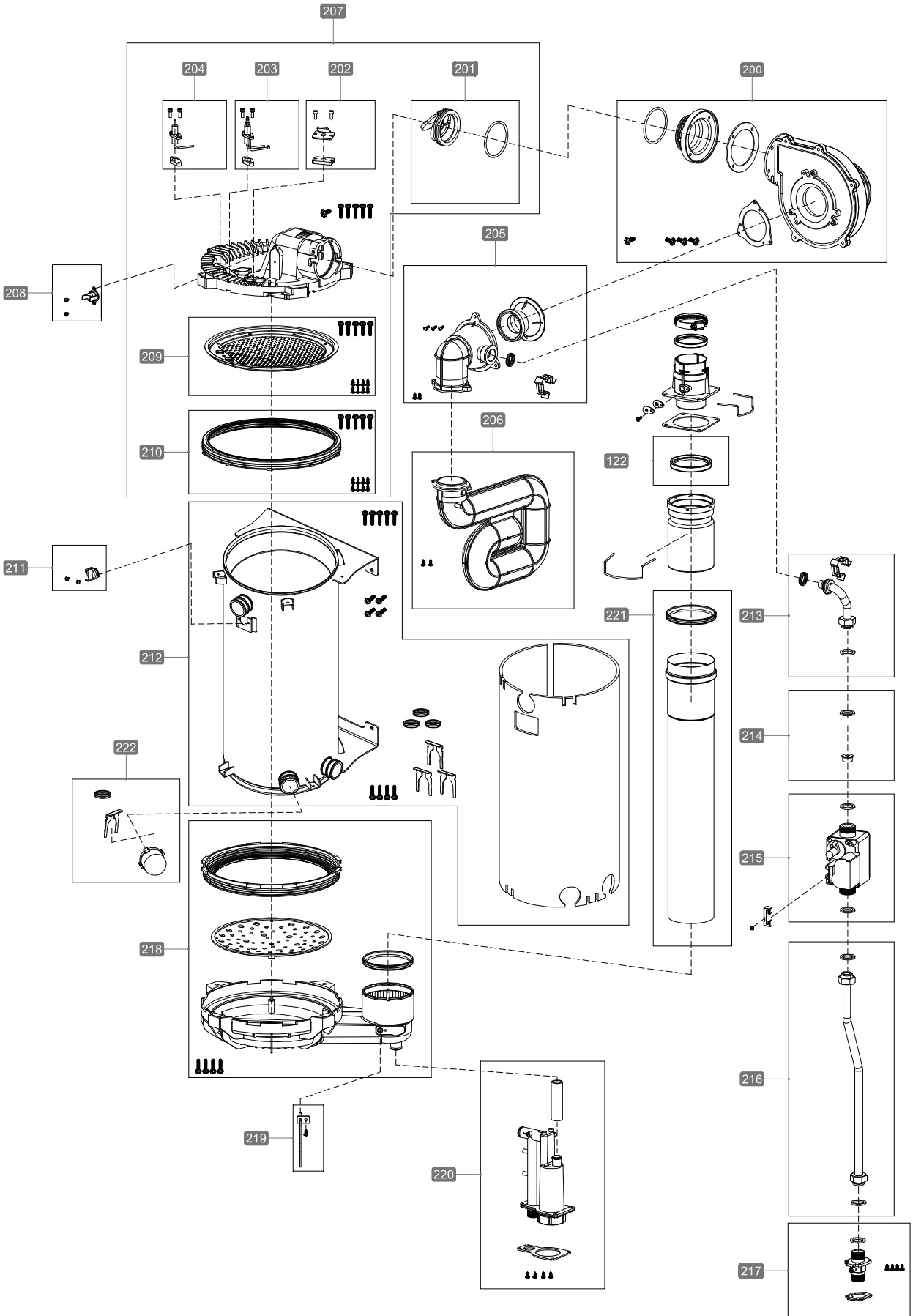
Component Assembly Diagrams and Parts Lists

Case Parts



No.	Part No.	Part Name
100	CCOB2110524S	Intake adapter FTCB
101	CCOB2110525S	Exhaust adapter FTCB
102	CCOB3012874S	Service Panel Top FTCB
103	CCOB3012872S	Service Panel Side Top FTCB
104	CCOB3012873S	Service Panel Bottom FTCB
105	CCOB3810013S	Handle FTCB
106	CCOB2011017S	Front Cover FTCB
107	CCOB3012882S	Ignitor Bracket FTCB
108	CCOB3012883S	Trans Bracket FTCB
109	CCOB2085920S	Remote Controller FTCB
110	CCOB3012881S	Gas Valve Bracket FTCB
111	CCOB2085919S	PCB FTCB
112	CCOB3012884S	Remote Controller bracket FTCB
113	CCOB2085918S	Main Power Supply FTCB
114	CCOB2100590S	Air Pressure Switch FTCB
115	CCOB3012886S	Expansion PCB Bracket FTCB
116	CCOB2085922S	PCB expansion FTCB
117	CCOB3131340S	Power Code FTCB
118	CCOB3045152S	Intake adapter FTCB
119	CCOB2082795S	Ignition Transformer FTCB
120	CCOB2085917S	Trans FTCB
121	CCOB3131341S	Wire Harness FTCB
122	CCOB3080235S	Flue Sealing O-ring FTCB
123	CCOB3080578S	Service Burner hood cap FTCB
124	CCOB3080591S	Case Hole Cap FTCB
125	CCOB3080590S	Update port packing FTCB

Flue Parts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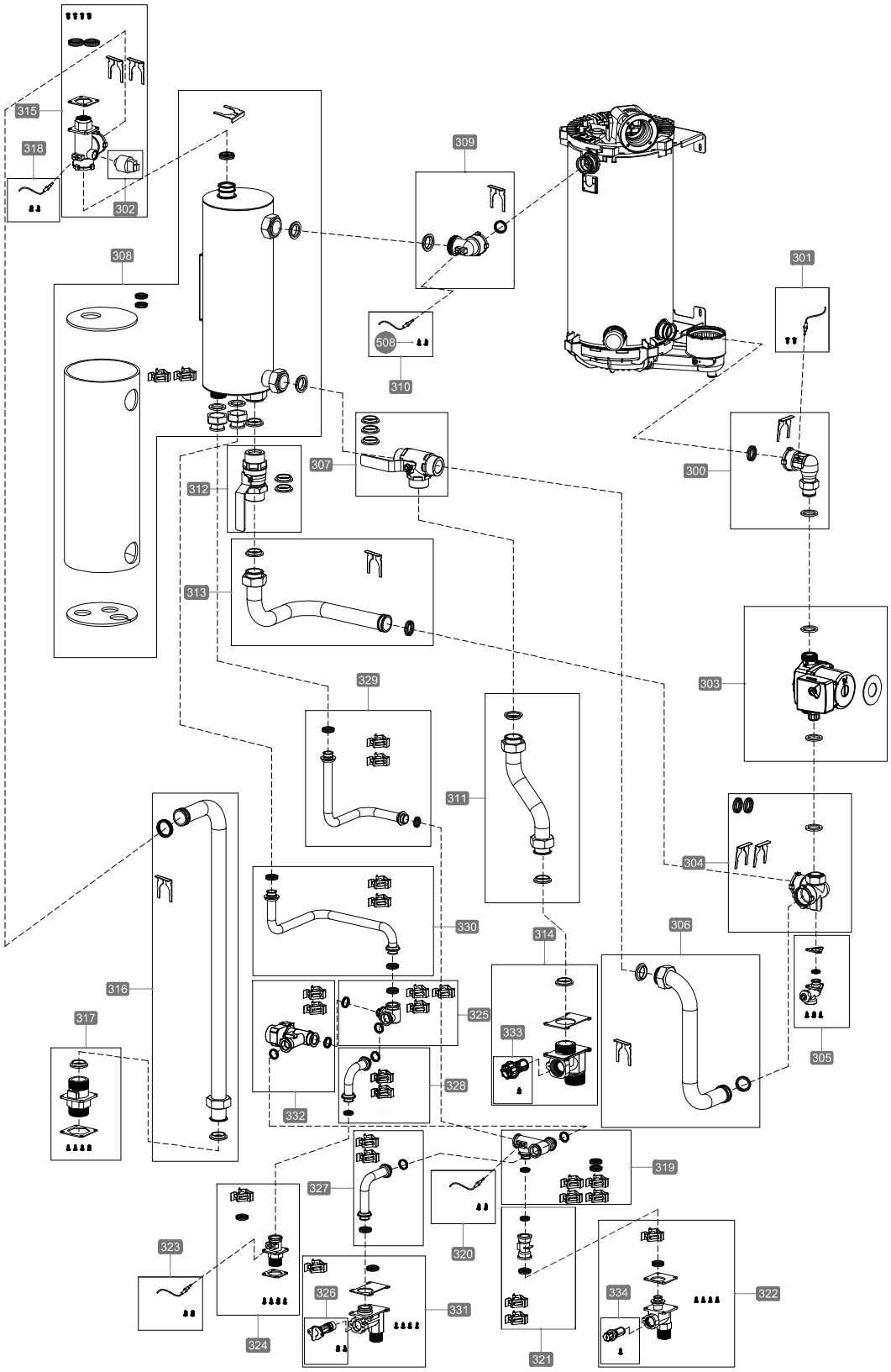
No.	Part No.	Part Name
200	CCOB3050204S	Fan FTCB
201	CCOB3080550S	Damper FTCB
202	CCOB3012762S	Bracket, Flame view
203	CCOB2020642S	Ignitor FTCB
204	CCOB2020643S	Flame rod FTCB
205	CCOB3041133S	Venturi FTCB
206	CCOB3041134S	Silencer FTCB
207	CCOB3050203S	Burner hood FTCB
208	CCOB2085912S	High limit switch (482℉) FTCB
209	CCOB2020644S	Metal fiber Burner FTCB
210	CCOB3080551S	Burner hood seal
211	CCOB2083446S	High limit switch (185℉) FTCB
212	CCOB2070970S	Heat exchanger FTCB
213	CCOB2091644S	Gas outlet pipe FTCB
214	CCOB3050205S	NG Orifice FTCB
	CCOB3015273S	LP Orifice FTCB
215	CCOB2030291S	Gas Valve CB & B & FTCB (A) Series ALL
216	CCOB2091718S	Gas Inlet Pipe FTCB
217	CCOB3050209S	Gas Pipe FTCB
218	CCOB3090701S	Exhaust duct FTCB
219	CCOB3130751S	Exhaust gas Thermistor CB & B & FTCB (A) Series ALL
220	CCOB2060810S	Condensate trap FTCB
221	CCOB2100589S	Flue pipe FTCB
222	CCOB3030594S	32A Cap FTCB

Water Parts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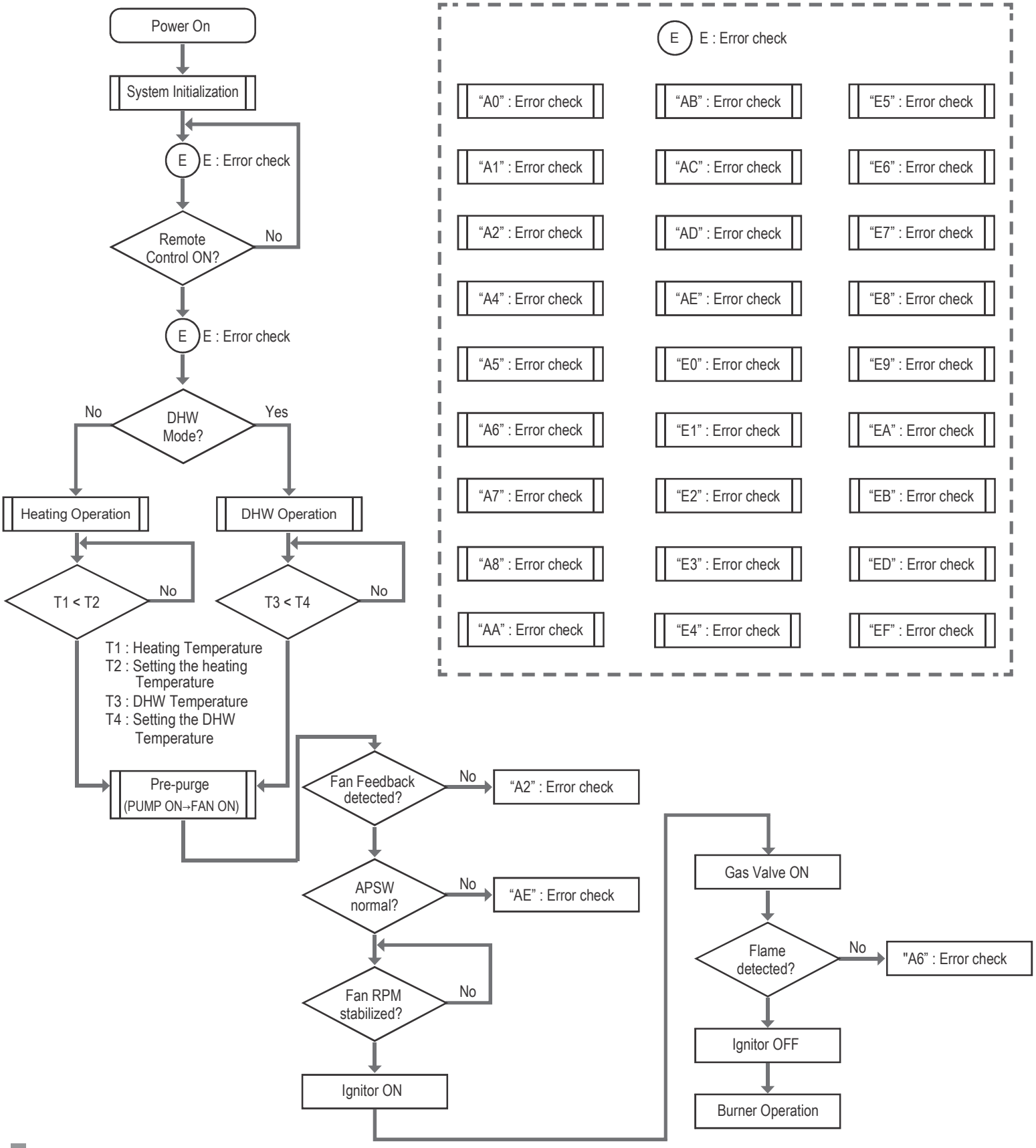
No.	Part No.	Part Name
300	CCOB3030585S	Heat exchanger inlet connector FTCB
301	CCOB2085926S	Heating return temperature Sensor FTCB
302	CCOB2060323S	Pressure Sensor FTCB
303	CCOB2050252S	Pump FTCB
304	CCOB3030586S	Pump Inlet 4way Connector FTCB
305	CCOB2060356S	Drain Valve FTCB
306	CCOB2091726S	Heating water Pump inlet pipe 32A FTCB
307	CCOB2040295S	3Way Ball Valve FTCB
308	CCOB2070969S	Hot water heat exchanger tank FTCB
309	CCOB3030584S	Heat exchanger Outlet elbow FTCB
310	CCOB2085927S	Heat exchanger outlet temperature Sensor FTCB
311	CCOB2091724S	Heating water return pipe 32A FTCB
312	CCOB2040294S	2Way Ball Valve FTCB
313	CCOB2091722S	Heating internal circulation pipe 32A FTCB
314	CCOB3030587S	Heating return nipple FTCB
315	CCOB3030583S	Heating water Outlet & Air Vent Connector FTCB
316	CCOB2091723S	Heating water supply pipe 32A FTCB
317	CCOB3030588S	Heating Supply nipple FTCB
318	CCOB2085925S	Heating supply temperature Sensor FTCB
319	CCOB3030592S	DHW 4way Connector FTCB
320	CCOB2085929S	Cold water temperature Sensor FTCB
321	CCOB2060364S	Water flow Sensor FTCB
322	CCOB3030589S	Cold water nipple FTCB
323	CCOB2085928S	Hot water temperature Sensor FTCB
324	CCOB3030591S	Hot water nipple FTCB
325	CCOB3030593S	Hot water bypass connector FTCB
326	CCOB2060807S	Check valve FTCB
327	CCOB2091721S	Hot water recirculation pipe FTCB
328	CCOB2091719S	Hot water outlet pipe FTCB
329	CCOB2091720S	Cold inlet pipe FTCB
330	CCOB2091722S	Hot water heat exchanger outlet pipe FTCB
331	CCOB3030590S	Check valve nipple FTCB
332	CCOB2040159S	Bypass valve FTCB
333	CCOB3045169S	Return filter FTCB
334	CCOB3040671S	Cold water filter FTCB

Normal Operating Sequence



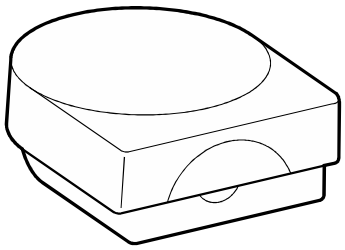
Outdoor Temperature Sensor Installation

Outdoor Temperature Sensor

Outdoor Temperature Sensor Installation

Separate the sensor body from the sensor cap.

- Attach the sensor body to the wall using the provided screws.
- Run the wires into the device body through the grommet opening.
- Connect the wires to the terminal block.
- Attach the cap to the sensor body.



QAC 2030 (Siemens)

Outdoor Temperature Sensor Installation Guidelines

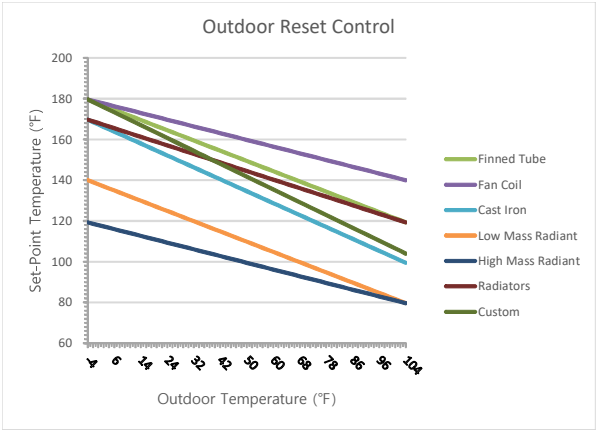
- Avoid installing the temperature sensor in a location where the temperature may change due to direct sunlight or a location where the representative outdoor temperature is not indicated.
- The best place to install the temperature sensor is to the north or northeast of the eaves, where direct sunlight can be avoided.
- Do not install the sensor near a heat source that may affect sensing of a correct temperature (fans, exhaust vents, lights).
- Avoid installing the sensor in a location with a high amount of moisture.
- Use 18 gauge wiring with no splices
- Before attaching the cap, ensure the wiring is fixed firmly.
- The sensor is a water resistant device.

Outdoor Reset Control (Available with Optional Outdoor Temperature Sensor)

The outdoor reset control can be used in order to improve the energy efficiency. With the Outdoor Reset Control, the space heating temperature setting automatically changes according to the outdoor temperature and the current space heating system application(system load).

Notice

The outdoor reset control can be used only when the outdoor temperature sensor is installed. In addition, it only works when the boiler is running in the normal operation mode. It does not work when the boiler is running in either the Minimun(MIN) or Maximum(MAX) mode, or When the boiler's front panel display a fault.
To use the outdoor reset control, you need to set 'Outdoor Reset' on the front panel. see page 51 for detail on how to setting up.



Space Heating Temperature Setting for the Outdoor Reset Control

The following table lists the default space heating temperature ranges by system heat load and the applicable outdoor temperature ranges.

Heat load	Supply		Return	
	Maximum set-point	Minimum set-point	Maximum set-point	Minimum set-point
Finned tube	180°F(82°C)	120°F(48°C)	146°F(63°C)	102°F(38°C)
Fan coil	180°F(82°C)	140°F(60°C)	146°F(63°C)	116°F(46°C)
Cast iron	170°F(76°C)	100°F(37°C)	140°F(59°C)	86°F(30°C)
Low mass Radiant	140°F(60°C)	80°F(26°C)	116°F(46°C)	70°F(21°C)
High mass Radiant	120°F(48°C)	80°F(26°C)	102°F(38°C)	70°F(21°C)
Radiator	170°F(76°C)	120°F(48°C)	140°F(59°C)	102°F(38°C)
Custom	118°F(82°C)	104°F(40°C)	150°F(65°C)	86°F(30°C)

Outdoor Temperature	
Maximum set-point	Minimum set-point
104°F(40°C)	-4°F(-20°C)

Memo

Memo

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