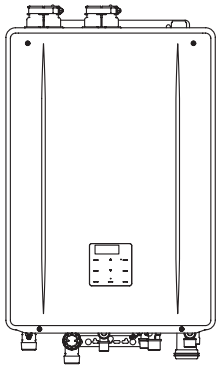
NORITZ

CONDENSING GAS COMBI BOILER

Installation Manual

Models : NRCB199DV (GHQ-C3201WX-FF US)
NRCB180DV (GHQ-C2801WX-FF US)



⚠ WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- WHAT TO DO IF YOU SMELL GAS
  - Do not try to light any appliance.
  - Do not touch any electrical switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
  - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

⚠ CAUTION

Requests to Installers

- In order to use the Combi Boiler safely, read this installation manual carefully, and follow the installation instructions.
- Failures and damage caused by erroneous work or work not as instructed in this manual are not covered by the Noritz America Limited Warranty.
- Check that the installation was done properly in accordance with this Installation Manual upon completion.
- After completing installation, either place this Installation Manual in a plastic pouch and attach it to the side of the Combi Boiler (or the inside of the pipe cover or recess box if applicable), or hand it to the customer to retain for future reference.

FOR USE IN RESIDENTIAL OR MANUFACTURED HOME APPLICATIONS.

Installation must conform with local codes, or in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1 / NFPA 54- latest edition and/or the Natural Gas and Propane Installation Code CSA B149.1- latest edition.
Where required by the authority having jurisdiction, the installation must conform to the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1.
Noritz America reserves the right to discontinue, or change at any time, the designs and/or specifications of its products without notice.

Contact Noritz America at 1-866-766-7489, if you have any questions or concerns.

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

NORITZ America Corporation

SBB80UB-5
Rev. 04/21

Contents

1 Before Installation

Potential dangers from accidents during installation and use are divided into the following four categories. Closely observe these warnings, they are critical to your safety.

⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

⚠ DANGER

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

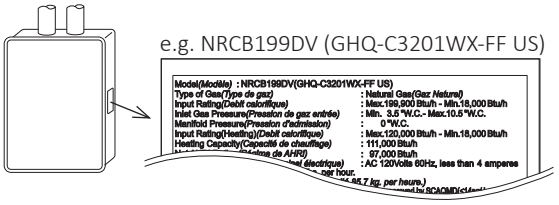
⚠ WARNING

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

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

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

Check the Gas
- Check that the rating plate indicates the correct type of gas.
- Check that the gas supply line is sized for 199,900 Btu/h or 180,000 Btu/h.
  199,900 Btu/h
  : NRCB199DV (GHQ-C3201WX-FF US)
  180,000 Btu/h
  : NRCB180DV (GHQ-C2801WX-FF US)


e.g. NRCB199DV (GHQ-C3201WX-FF US)

Chemicals
This product can expose you to chemicals including lead, lead compounds and carbon bisulfide which are known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ CAUTION

Do Not Use Appliance for Purposes Other Than Those Specified
Do not use for other than increasing the temperature of the water supply, as unexpected accidents may occur as a result.

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

NOTICE

- This appliance is suitable for combination potable water and heating applications.
- Do not use this appliance if any part has been underwater. Immediately call a qualified service technician to inspect the appliance and replace any part of the control system and gas control which has been under water.

Please read if installing in Massachusetts

Massachusetts requires manufacturers of Side Wall Vented products to provide the following information from the Massachusetts code:

- A hard wired carbon monoxide detector with an alarm and battery back-up must be installed on the floor level where the gas equipment is to be installed AND on each additional level of the dwelling, building or structure served by the side wall horizontal vented gas fueled equipment.
- In the event that the side wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.
- Detector(s) must be installed by qualified licensed professionals.
- APPROVED CARBON MONOXIDE DETECTORS: Each carbon monoxide detector shall comply with NFPA 720 and be ANSI/UL 2034 listed and IAS certified.
- SIGNAGE: A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) ft above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (1/2) in. in size, **"GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS"**.
- EXEMPTIONS to the requirements listed above:
  - The above requirements do not apply if the exhaust vent termination is seven (7) ft or more above finished grade in the area of the venting, including but not limited to decks and porches.
  - The above requirements do not apply to a product installed in a room or structure separate from the dwelling, building or structure used in whole or in part for residential purposes.
- This installation manual shall remain with the product at the completion of the installation.

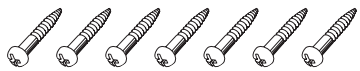
See the latest edition of Massachusetts Code 248 CMR for complete verbiage and also for additional (non-vent related) requirements (248 CMR is available online). If your installation is NOT in Massachusetts, please see your authority of jurisdiction for requirements that may be in effect in your area. In the absence of such requirements, follow the National Fuel Gas Code, ANSI Z223.1/ NFPA 54 and/or CAN/CSA B149.1, Natural Gas and Propane Installation Code.

2 About the Combi Boiler

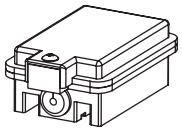
2.1 Included Accessories

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

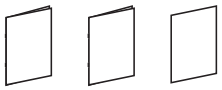
Anchoring Screw (× 7)



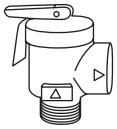
Outdoor Temperature Sensor (× 1)



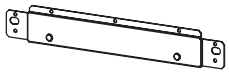
Owner's Guide (including Warranty)
Installation Manual (this document) (1 each)



Pressure Relief Valve for Heating
(ASME Certified) (3/4 in., 30 psi) (× 1)



Wall Mounting Bracket (× 1)



Anchoring Screw & Anchor for Outdoor Temperature Sensor (2 each)

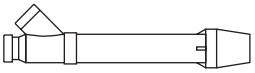
2.2 Optional Accessories

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

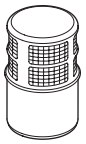
NOTE Additional vent pieces are available; consult the latest product catalogue for details.

Quick Connect Cord (× 1)
[QC-2]

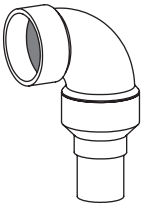
PVC Concentric Termination (× 1)
2 in. (50 mm): [PVC-2CT]
3 in. (75 mm): [PVC-3CT]



2 in. SV Conversion Kit (× 1)
[SV-CK-2-1]



[SV-CK-2]

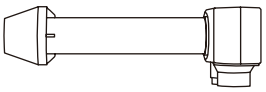


Bird Screen for 2 in. (50 mm) PVC
[VT2-PVCS]

Bird Screen for 3 in. (75 mm) PVC
[VT3-PVCS]

3 in. (75 mm) Horizontal Hood Termination
[PVT-HL]

Universal Concentric Vent Kit
[PVC-UCVK]



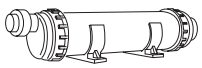
Low Profile Termination Kit
2 in.: [PVC-2LPT]
3 in.: [PVC-3LPT]

ULC S636 / UL 1738 certified for use in both Canada and USA

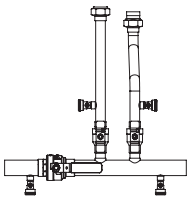
Plastic Rain Cap
[PRC-1]

Not approved for use in Canada.

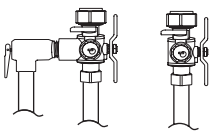
Neutralizer (× 1)
[NC-1S]



Manifold Kit (× 1)
[MK-NRCB-1]



Isolation Valve (1 each)
(Includes pressure relief valve)



Isolation valves are necessary for flushing the Plate Heat Exchanger. They allow for easy flushing and troubleshooting of the system.

2.4 Specifications

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

Item			Specification	
Model Name			NRCB199DV (GHQ-C3201WX-FF US)	NRCB180DV (GHQ-C2801WX-FF US)
Type	Installation		Indoor / Outdoor Wall mounted	
	Air Supply / Exhaust		Power Vented	
Ignition			Direct Ignition	
Operating Pressure		DHW	15-150 psi (Recommended 30 psi for maximum performance)	
		Heating	12-30 psi	
Minimum Activation Flow Rate* Minimum Operating Flow Rate*			0.4 GPM (1.5 L/min) 0.29 GPM (1.1 L/min)	
Dimensions (Height) × (Width) × (Depth)			27.0 in. (687 mm) × 18.5 in. (471 mm) × 12.8 in. (325 mm)	
Weight			95 lbs. (43 kg)	
Water Holding Capacity for DHW			0.37 Gallon (1.4 L)	
Pressure Relief Valve Setting		Heating	30 psi	
Connection Sizes	DHW Cold Water Inlet		NPT 3/4 in.	
	DHW Outlet		NPT 3/4 in.	
	Heating Supply		NPT 1 in.	
	Heating Return		NPT 1 in.	
	Heating Pressure Relief Valve		NPT 3/4 in.	
	Auto Feeder Inlet		NPT 1/2 in.	
	Gas Inlet		NPT 3/4 in.	
	Condensate Drain		NPT 1/2 in.	
Power Supply	Supply		120 VAC (60 Hz)	
	Consumption		NG: 210 W LP: 210 W Freeze Prevention: 125 W	NG: 200 W LP: 200 W Freeze Prevention: 125 W
	Maximum Current		4 Amps	
Materials	Casing		•Front Cover, Side / Top Plate: Hot-dipped zinc-aluminum-magnesiumalloy-coated steel w/ Polyester Coating •Back Plate: Hot-dipped zinc-aluminum-magnesiumalloy-coated steel w/o Coating •Bottom Plate: Zincified Steel Plate / Polyester Coating	
	Flue Collar		PP	
	Primary Heat Exchanger		Stainless Steel 316L	
	Secondary Heat Exchanger		Stainless Steel 316L	
Safety Devices			Flame Rod, High Limit Switch, Lightning Protection Device (ZNR), Freezing Prevention Device, Fan Rotation Detector	
Included Accessories			Anchoring Screws, Wall Mounting Bracket, Outdoor Temperature Sensor, Anchoring Screws & Anchors for Outdoor Temperature Sensor	

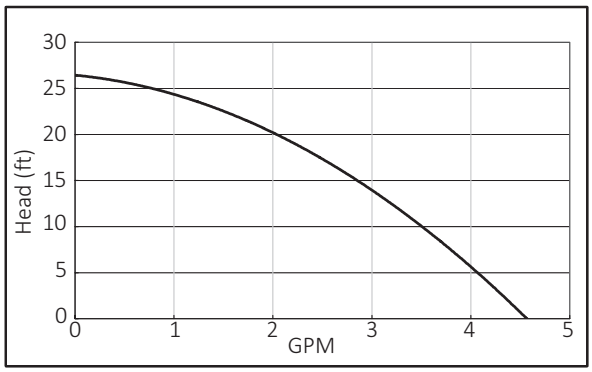
* Minimum flow rate may change by setting temperature and water temperature.

Performances

Item			Performance			
			NRCB199DV (GHQ-C3201WX-FF US)		NRCB180DV (GHQ-C2801WX-FF US)	
Gas Consumption			Maximum	Minimum	Maximum	Minimum
	DHW	NG	199,900 Btu/h	18,000 Btu/h	180,000 Btu/h	18,000 Btu/h
		LP	199,900 Btu/h	18,000 Btu/h	180,000 Btu/h	18,000 Btu/h
	Heating	NG	120,000 Btu/h	18,000 Btu/h	100,000 Btu/h	18,000 Btu/h
		LP	120,000 Btu/h	18,000 Btu/h	100,000 Btu/h	18,000 Btu/h
Maximum Hot Water Capacity (45°F (25°C) Rise)			8.4 GPM (32 L/min)		7.5 GPM (28.2 L/min)	
Capacity Range			0.4-11.1 GPM (1.5-42 L/min)		0.4-9.8 GPM (1.5-37 L/min)	
Temperature Settings	DHW*	°F Mode	90-140°F (In 5°F intervals) (11 Options)			
		°C Mode	32°C, 35°C, 37°C-48°C (In 1°C intervals), 50°C, 55°C, 60°C (17 Options)			
	Heating	°F Mode	100-180°F (In 1°F intervals) (81 Options)**			
		°C Mode	40-82°C (In 1°C intervals) (43 Options)**			

* When you use Quick Connect Multi System, temperature setting range is changed below.
°F Mode: 100-140°F (In 5°F intervals)
°C Mode: 37-48°C (In 1°C intervals), 50°C, 55°C, 60°C
** Heating Temperature range depends on Installer Mode Setting.
Refer to the Installation Manual for details.

Pump Performance(with internal pressure drop)



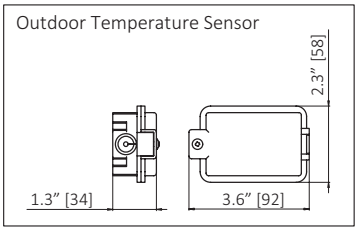
Space Heating Rating

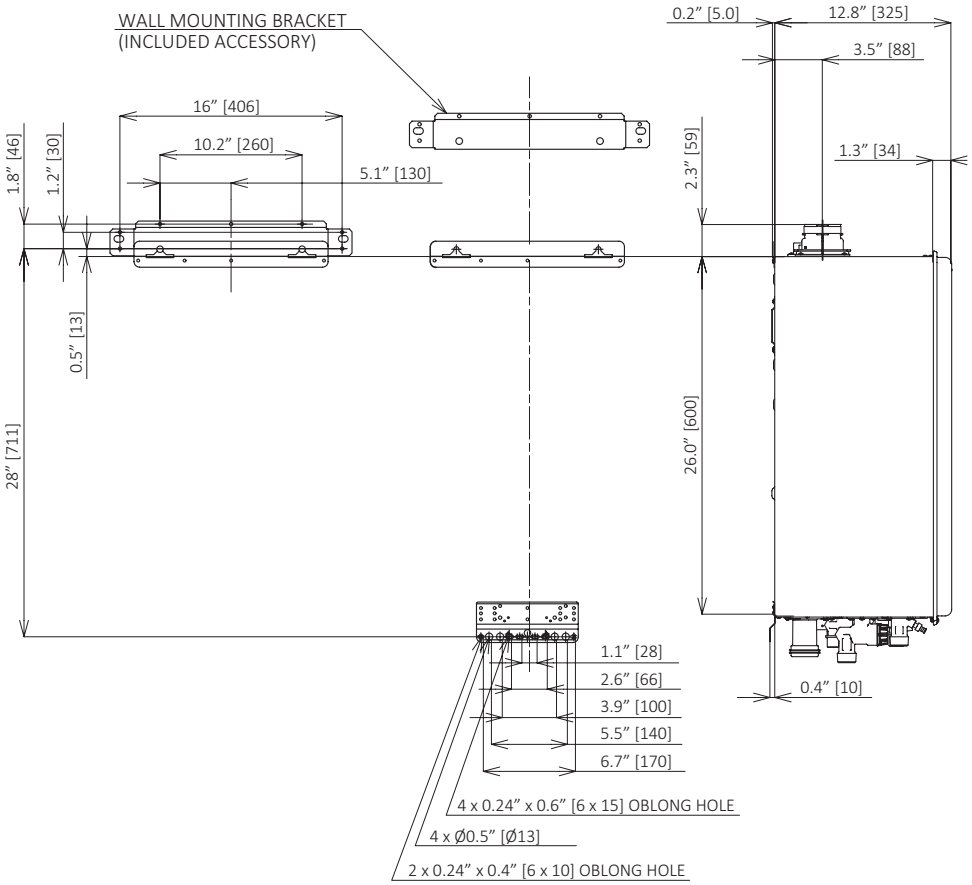
Combination Boiler Space Heating Ratings						
Model Name		Input, MBH		Heating Capacity, MBH*1	Net AHRI Rating Water, MBH*2	AFUE, %
		Maximum	Minimum			
NRCB199DV (GHQ-C3201WX-FF US)	NG	120	18	111	97	95.0
	LP	120	18	111	97	95.0
NRCB180DV (GHQ-C2801WX-FF US)	NG	100	18	92	80	95.0
	LP	100	18	92	80	95.0

* Based on standard test procedures prescribed by United States Department of Energy (DOE).
** The Net AHRI water ratings shown are based on a piping and pickup allowance of 1.15.
Consult Noritz before selecting a boiler for installations having unusual piping and pickup quirements, such as intermittent system operation, extensive piping system, etc.

Memo

2.5 Dimensions

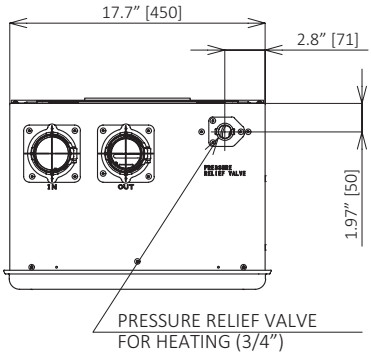


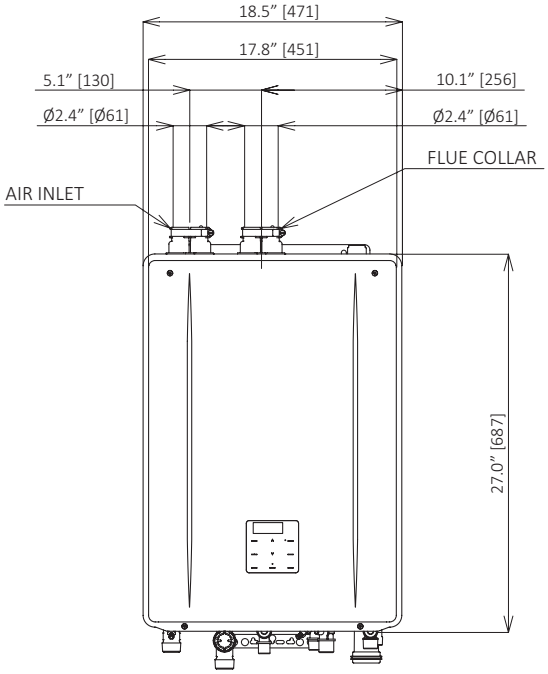


HEIGHT OF EACH FITTING FROM CASE

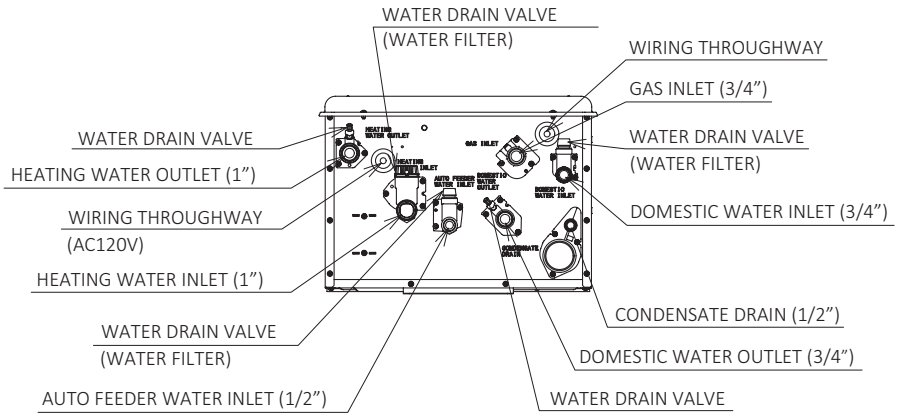
PRESSURE RELIEF VALVE FOR HEATING	TOP	1.0" [26]
DOMESTIC WATER OUTLET	BOTTOM	2.0" [51]
DOMESTIC WATER INLET	BOTTOM	1.9" [49]
HEATING WATER OUTLET	BOTTOM	2.2" [55]
HEATING WATER INLET	BOTTOM	3.4" [86]
AUTO FEEDER WATER INLET	BOTTOM	2.3" [58]
CONDENSATE DRAIN	BOTTOM	1.7" [42]
GAS INLET	BOTTOM	2.2" [55]

<inch [mm]>



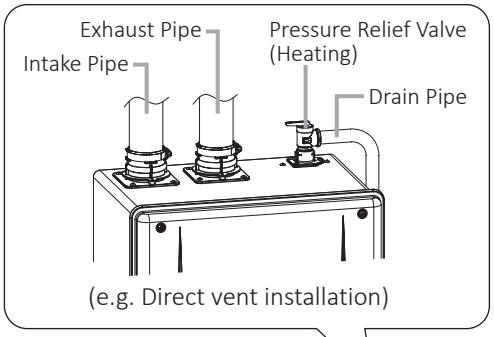


(VIEW FROM BOTTOM)



2.6 External View

Indoor Installation

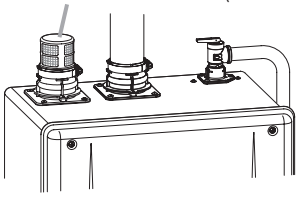


(e.g. Direct vent installation)

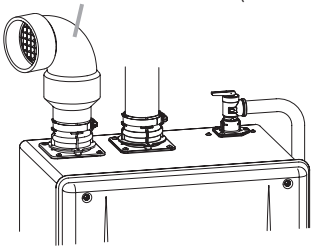
* The exterior view of air intake side ("Intake Pipe") may be different due to the installed item.

(e.g. Non-direct vent installation)

2 in. SV Conversion Kit (SV-CK-2-1)



2 in. SV Conversion Kit (SV-CK-2)



3 Choosing an Installation Location

⚠ DANGER

Locate the vent terminal and make sure there are no obstacles around the termination for exhaust to accumulate or be obstructed.
Do not enclose the termination with corrugated metal or other materials.
Carbon monoxide poisoning or fire may occur as a result.

⚠ WARNING

- Avoid places where fires are common, such as those where gasoline, benzene and adhesives are handled, or places in which corrosive gases (ammonia, chlorine, sulfur, ethylene compounds, acids) are present.
  If you do not follow the above, a fire or explosion may result causing property damage, personal injury or death.
- Avoid installation in places where dust or debris will accumulate.
  Dust may accumulate and reduce the performance of the fan of the appliance. This can result in incomplete combustion.
- Avoid installation in places where special chemical agents (e.g. hair spray or spray detergent) are used.
  Ignition failures and malfunctions may occur as a result.
- Do not install this Combi Boiler in a recreational vehicle or on a boat as this may be a Carbon Monoxide Poisoning Hazard.
- The manufacturer does not recommend installing the Combi Boiler in an attic due to safety issues.
  If you install the Combi Boiler in an attic:
  - Make sure the appliance will have enough combustion air and proper ventilation.
  - Keep the area around the Combi Boiler clean. Dust may accumulate and reduce the performance of the fan of the appliance. This can result in incomplete combustion.
  - A drain pan, or other means of protection against water damage, is required to be installed under the Combi Boiler in case of leaks.

⚠ CAUTION

Outdoor installation

- The Combi Boiler is designed for either indoor or outdoor installation. For information about outdoor installation, contact Noritz America at 1-866-766-7489.
  Never install it in a bathroom, it may be damaged or a fire may be caused.

Do not install in the following places

- A location where it is not free from obstacles and stagnant air.
- Near staircases or emergency exits.
- A place where it may be threatened by falling objects, such as under shelves.
- On common walls as the appliance will make some operational noises while it is running.

Consideration to the surroundings

- Do not install the Combi Boiler where the exhaust will blow on outer walls, other walls or material not resistant to heat. Also consider the surrounding trees and animals. The heat and moisture from the Combi Boiler may cause discoloration of walls and resinous materials, or corrosion of aluminum materials.
- Do not locate the vent termination directed towards a window or any other structure which has glass or wired glass facing the termination.
- Take care that noise and exhaust gas will not affect neighbors.
- If the appliance is installed in a location with very high humidity, condensate may form inside the appliance and/or cause incomplete combustion, damage to the electrical components, or electric leakage.

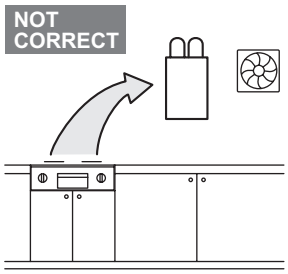
Install according to regulations and manual

- Install the Combi Boiler in an area that allows for the proper clearances to combustible and non-combustible construction. Consult the rating plate on the appliance for proper clearances.
- The Combi Boiler must be installed according to manual.
- Before installing, make sure that the exhaust flue termination will have the proper clearances according to the National Fuel Gas Code (ANSI Z223.1- latest edition) or the Natural Gas and Propane Installation Code (CSA B149.1).

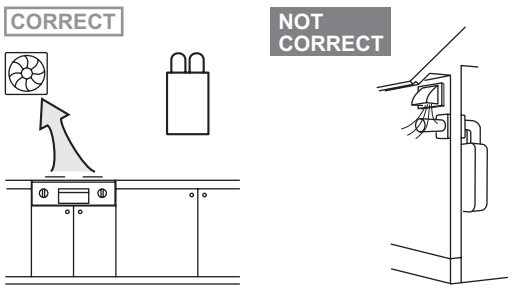
⚠ CAUTION

Installation in the vicinity of gas ranges, stoves, fans, and range hoods

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



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



NOTICE

- Place the appliance for easy access for maintenance and repair.
- Do not install the Combi Boiler in a location where the appliance will be exposed to excessive winds.
- Locate the appliance in an area where leakage from the appliance or connections will not result in damage to the area adjacent to the appliance or to the lower floors of the structure. When such installation locations cannot be avoided, a suitable drain pan, adequately drained, must be installed under the appliance. The pan must not restrict combustion air flow.
- As with any water heating appliance, the potential for leakage at some time in the life of the product does exist. The manufacturer will not be responsible for any water damage that may occur.
- Water quality:
  If this Combi Boiler will be installed in a location where the hardness of the supply water is high, scale Build-up may cause damage to the Plate Heat Exchanger.
  Perform suggested treatment and maintenance measures in reference to “8.2 Water Treatment”.
  Damage to the Combi Boiler as a result of the below is not covered by the Noritz America Limited Warranty.
  - Water in excess of 12 gpg (200 mg/L) of hardness
  - Poor water quality (see the following table)

Contaminant	Maximum Allowable Level
Total Hardness*	200 mg/L (12 gpg) or less
Aluminum	0.05 to 0.2 mg/L or less
Chloride	250 mg/L or less
Copper	1.0 mg/L or less
Iron	0.3 mg/L or less
Manganese	0.05 mg/L or less
pH	6.5-8.5
Total Dissolved Solids	500 mg/L or less
Zinc	5 mg/L or less
Sulfate	250 mg/L or less
Residual chlorine*	4 mg/L or less

Source: EPA National Secondary Drinking Water Regulations (40 CFR Part 143.3)

* Maximum limit suggested/approved by the manufacturer.

NOTE Consult with the customer concerning the location of installation.

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

For Venting Manufacturers Requirements, see the Noritz America website (www.noritz.com).

4 Installation Clearances

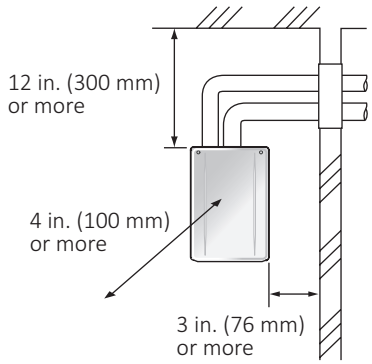
⚠ WARNING

Before installing, check for the following:
Install in accordance with relevant building and mechanical codes, as well as any local, state or national regulations, or in the absence of local and state codes, refer to National Fuel Gas Code ANSI Z223.1 / NFPA 54- latest edition. In Canada, see the Natural Gas and Propane Installation Code CSA B149.1- latest edition for detailed requirements.

4.1 Indoor Installation

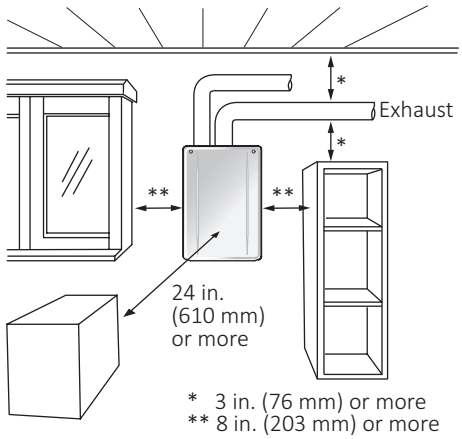
Required Clearances From the Combi Boiler

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



Securing of space for inspection/repair

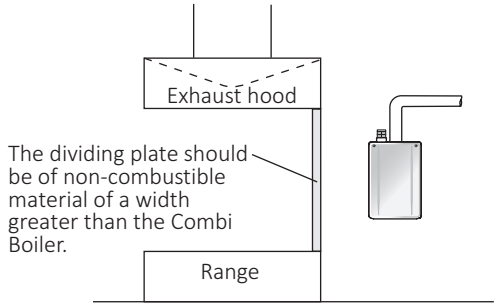
In order to facilitate inspection and repair, the minimum clearances should be met.



* 3 in. (76 mm) or more
** 8 in. (203 mm) or more

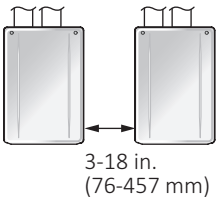
Cooking Equipment

When utilizing an indoor air supply, if the Combi Boiler will be installed in the vicinity of a permanent kitchen range or stove that has the possibility of generating steam that contains fats or oils, use a dividing plate or other measure to ensure that the Combi Boiler is not exposed to air containing such impurities.



4.2 For Quick Connect Multi-System

The Quick Connect Cord is 6 ft (1.8 m) long. Install the units 3-18 in. (76-457 mm) apart from each other to ensure the cord will be able to reach between the units.



5 Installation of the Combi Boiler

5.1 Mounting the Combi Boiler to the wall

⚠ WARNING

Do not drop or apply unnecessary force to the appliance when installing. Internal parts may be damaged and may become highly dangerous.

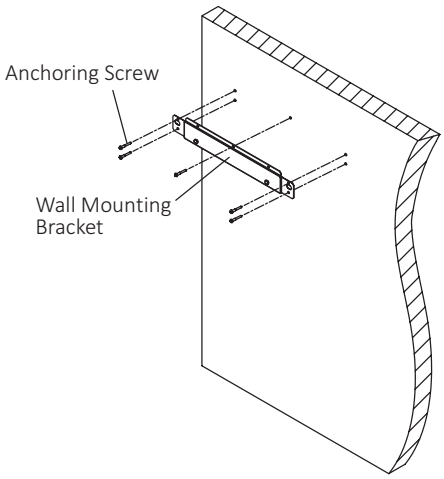
⚠ CAUTION

- Protect your hands with gloves and take caution to not inflict injury.
- Be careful not to hit electrical wiring, gas, or water piping while drilling holes.

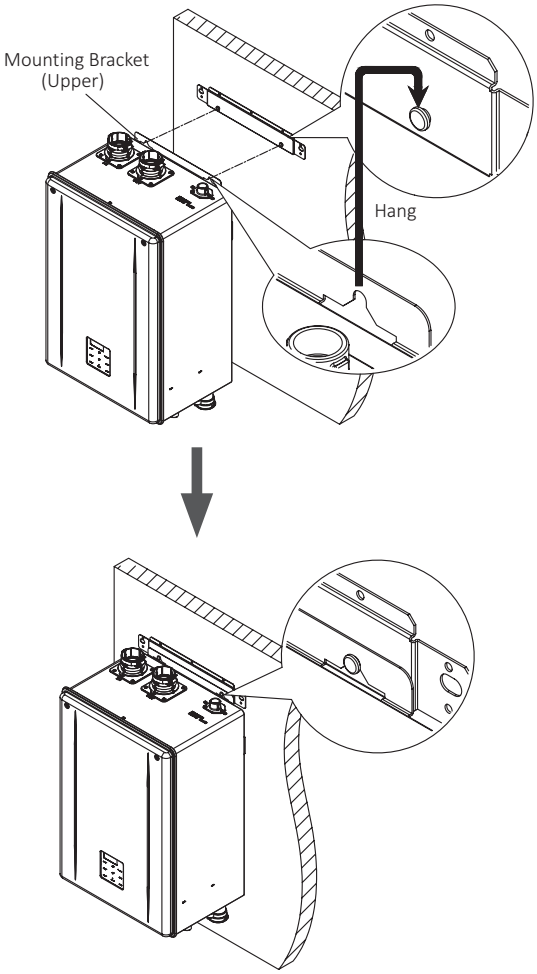
NOTICE

- The weight of the appliance will be applied to the wall. If the strength of the wall is not sufficient, reinforcement must be done to prevent the transfer of vibration.
- Install the appliance on a vertical wall and ensure that it is level.

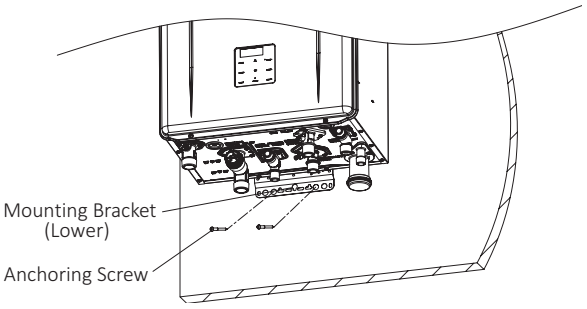
1. Ensure that the Wall Mounting Bracket is leveled.
   Drill holes for the Wall Mounting Bracket and affix the Wall Mounting Bracket securely to the wall by 5 screws.
   Finally, make sure the bracket can support the weight of the Combi Boiler.



2. Hang the Combi Boiler on the Wall Mounting Bracket.



3. Affix the Mounting Bracket (Lower) to the wall by 2 screws.

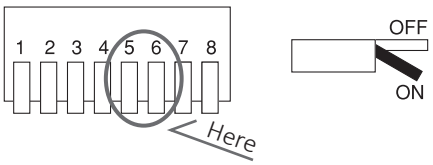


5.2 Elevation Adjustment Above 2,000 ft

- Adjust the DIP switches as illustrated in the table below, if this Combi Boiler is installed at an altitude of 2,000 ft (610 m) or higher.
- Disconnect the electrical power and then adjust the DIP switches.
  Refer to page 67 for the location of the DIP switch bank and how to change the DIP switches.
  Failure to perform this step will result a “73” code displayed on the Operation Display and a cease in operation.
  If this occurs, disconnect, then reconnect the electrical power to the Combi Boiler to reset the system.

NOTE Do not change any other DIP switches.

High elevation adjustment	DIP switches	
	#5	#6
0-2,000 ft (0-610 m)	OFF	OFF
2,001-4,000 ft (611-1,219 m)	ON	OFF
4,001-7,000 ft (1,220-2,134 m)	OFF	ON
7,001-10,000 ft (2,135-3,048 m)	ON	ON



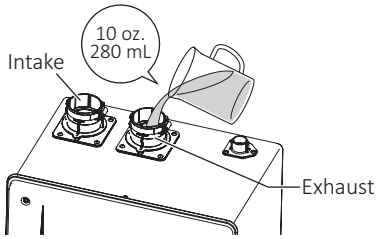
5.3 Filling the condensate container with water

⚠ DANGER

Prior to initial start up, make sure that you fill the condensate container with water.
This is to prevent dangerous exhaust gases from entering the building.
Failure to fill the condensate container could result in severe personal injury or death.

Follow the procedure described below to ensure that the condensate container is filled with water.

Fill the condensate container by pouring approx. 10 oz. (280 mL) of water into the exhaust flue on the top of the Combi Boiler as illustrated below.



If the vent pipe has already been installed:
After installing the condensate drain pipe, make sure that the area around the Combi Boiler is well ventilated; open a window or a door if necessary. Then, operate the Combi Boiler and verify that condensate is coming out of the condensate drain pipe.
(During normal use of the Combi Boiler, condensate will begin to discharge from the condensate drain pipe within 15 minutes of use. However, depending on the season and/or installation site conditions, it may take longer.)

6 Venting the Combi Boiler

⚠ WARNING

CARBON MONOXIDE POISONING
Follow all vent system requirements in accordance with relevant local or state regulation, or, in the absence of local or state code, if in the U.S., refer to the National Fuel Gas Code ANSI Z223.1 / NFPA 54- latest edition, and if in Canada, in accordance with the Natural Gas and Propane Installation Code CSA B149.1 - latest edition.

⚠ CAUTION

Outdoor installation
- The Combi Boiler is designed for either indoor or outdoor installation. For information about outdoor installation, contact Noritz America at 1-866-766-7489.
  Never install it in a bathroom, it may be damaged or a fire may be caused.

6.1 Venting Installation Sequence

1. Install the Combi Boiler.
2. Determine the termination method—horizontal or vertical, etc.
3. Determine proper location for wall or roof penetration for each termination.

   NOTE Do not exceed maximum allowed vent lengths as described in this manual.

4. Install termination assembly as described in this manual or in the vent manufacturer's installation instructions.
   If necessary, install Bird Screen (not supplied with Combi Boiler).
5. Install combustion air and exhaust vent piping from Combi Boiler to termination.
6. Slope the horizontal vent 1/4 in. upwards for every 12 in. (305 mm) toward the termination.
7. Install supports and hanger straps allowing for movement from expansion, or as per vent pipe manufacturer's instructions or local code requirements.

6.2 General Requirements

6.2.1 Vent Piping Material

- **This is a Category IV appliance.**
  Only vent materials approved for use with Category IV appliances shall be used.
- Under normal conditions, this Combi Boiler will not produce an exhaust flue temperature in excess of 149°F (65°C).

For PVC / CPVC / PP / Stainless Steel material

- Schedule 40 PVC pipe may be used as the vent material. **If required by local code, use schedule 40/80 CPVC, PP or Stainless Steel.**
- **If the Combi Boiler set temperature is 160°F (70°C) or higher, use schedule 40/80 CPVC or PP.** Refer to the following.
- This Combi Boiler must be vented with plastic pipe or stainless steel pipe materials as specified in the table below.
  Vent installations in Canada which utilize plastic or stainless vent systems must comply with ULC S636.

[Exhaust Vent / Air Intake]

Material	United States		Canada	
	Exhaust	Air Intake	Exhaust	Air Intake
Schedule 40 PVC	ANSI/ASTM D1785		ULC S636 Certified Materials Only	CSA B137.3
PVC-DWV	ANSI/ASTM D2665			CSA B181.2
Schedule 40 CPVC	ANSI/ASTM F441			CSA B137.3
Polypropylene (PP)*	Centrotherm- InnoFlue® (certified ULC S636), DuraVent PolyPro® (certified ULC S636)			
System 1738™ PVC Fuel Gas Venting	IPEX Management Inc. (certified UL 1738)			
Stainless Steel*	DuraVent- FasNSeal® (certified UL1738 and ULC S636)			

* Only listed manufacture specified vent parts may be used for this Combi Boiler.
Refer to the manufacture's literature for detailed information.
- Approved Vent Manufacture:
  - Centrotherm- InnoFlue® PP

	Parts #
Single Wall Pipe (2 in. / 3 in.)	ISVL02xx(UV)/03xx(UV), ISEP02xx/03xx, ISIA0203
Elbow	ISELL0287(UV)/0387(UV), ISELS0245/0345
Termination**	ISELL0287UV/0387UV, ISTT0220/0320, ICWT242/352***, ICTCR24, ICCT3503, ICTC0335***
Bird Screen	IASPP02/03

  - DuraVent PolyPro® / FasNSeal®

	Parts #
Single Wall Pipe (2 in. / 3 in.)	2PPS-xxBL/3PPS-xxBL, 2PPS-xxL/3PPS-xxL, FSVLxx03, FSAVL3(-2)
Elbow	2PPS-E90(B)L/3PPS-E90(B)L, 2PPS-E45(B)L/3PPS-E45(B)L, FSELB9003/8803/4503/1503
Termination**	2PPS-E90(B)L/3PPS-E90(B)L, 2PPS-T(B)L/3PPS-T(B)L, 2PPS-HKC/3PPS-HKC***, FSTT3, FSTB3, FSRC3
Bird Screen	2PPS-BG/3PPS-BG, FSBS3
FasNSeal Adapter	FSA-2PVCS-3FNSF

** Only listed above terminations are applicable for Combi Boiler.
*** These terminations are concentric vent termination of polypropylene. The PVC to PP adapters are including in the box for each vent manufacture. These adapters shall not be used for connecting the appliance to concentric vent termination. The appliance's flue collars (flue connections) are designed to fit with 2 in. polypropylene diameter.

[Pipe Cement / Primer]

Material	United States	Canada
PVC	ANSI/ASTM D2564	ULC S636 Certified Materials Only
CPVC	ANSI/ASTM F493	

⚠ WARNING

Use of cellular core PVC (ASTM F891), cellular core CPVC, or Radel® (polyphenylsulfone) in non-metallic venting system is prohibited.

- Use only solid PVC / CPVC (schedule 40), PP or Stainless Steel pipe.
- 2 in. or 3 in. schedule 80 pipe may also be used on this Combi Boiler, however the Btu/h input of the Combi Boiler will be reduced by up to 9%.
- Maintain the same vent pipe diameter from the Combi Boiler flue to the termination.
- In Canada, plastic vent systems must be certified to ULC S636. The components of the certified vent system must not be interchanged with other vent systems or unlisted pipe/fittings.
- In Canada, specified primers and glues of the ULC S636 certified vent system must be from a single system manufacturer and not intermixed with other system manufacturer's vent system parts.

NOTE Covering non-metallic vent pipe and fittings with thermal insulation is prohibited.

For flexible pipe for chimney

- During the installation, ambient temperatures must be greater than 40 °F (5 °C). Afterwards, installation site ambient temperature must be greater than -4 °F (-20 °C). Flexible vent pipe breakage may occur if these temperature requirements are not observed.
- Only listed manufacture specified vent parts may be used for this appliance. Refer to the manufacture's literature for detailed information.

- DuraVent®- Flex Through Chimney w/ Air Intake

Exhaust	Flex Chimney Lining Kit (3 in.): 3PPS-FKL, Flex Length (3 in.): 3PPS-FLEXxx
Intake	Aluminum Flex Length (3 in.): 3DFA-xx, Coupler (3 in.): 3DFA-FCP
Exhaust & Intake*	Elbow (3 in.): 3PPS-E45L, 3PPS-E90L, Single-Wall Pipe (3 in.): 3PPS-xxL Appliance Adapter for PVC Coupler (2 in.): 2PPS-ADL, Increaser: 2PPS-X3L

- Centrotherm- InnoFlue® PP

Exhaust	Chimney Kit (3 in.): IFCK03xx, Flexible Pipe PP (3 in.): IFVL03xxx
Intake	Termination**: ISELL0387UV, ISTT0320, Bird Screen: IASPP03
Exhaust & Intake*	Single Wall Pipe (3 in.): ISVL03xx(UV), ISEP03xx Elbow (3 in.): ISELL0387UV, ISELL0345UV, ISEL0387, ISEL0345, Increaser: ISIA0203

* Recommended items.
** Applicable vent termination are "87° elbow" or "Tee type".
Concentric vent termination of polypropylene are prohibited.

6.2.2 Installation Instructions

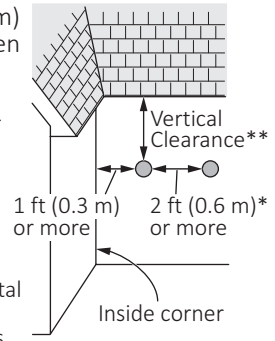
⚠ WARNING

CARBON MONOXIDE POISONING
- Failure to properly seal the vent system could cause flue products to enter the living space.
- (For flexible pipe for chimney)
  Handle the flexible vent carefully.
  Dropping, Crushing and Stacking may cause damage, and may result in fires, property damage or exposure to Carbon Monoxide.

- Follow all general venting guidelines as outlined in this manual.
- Clearance described in this document is the minimum recommendation/required distance. Take appropriate clearance according to the situations of the site.
- Make sure the vent system is gas tight and will not leak.
- Support the vent pipe with hangers at regular intervals as specified by these instructions or the instructions of the vent manufacturer.
- All piping must be fully supported. Use pipe hangers at a minimum of 3 ft (0.9 m) intervals.

NOTE
- Do not use the Combi Boiler to support the vent piping.
- Do not common vent or connect more than one appliance to this venting system.

- Ensure at least 3 ft (0.9 m) or more distance between the near edge of the air intake pipe or exhaust pipe to the inside corner of a wall.



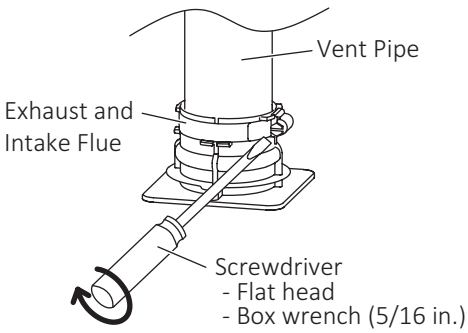
  * The clearance between intake and exhaust terminations must be installed in accordance with page 28 for horizontal vent termination.
  **Clearance requirement is in accordance with page 26. This vertical clearance must be considered to prevent exhaust accumulation under the soffit.

For PVC/CPVC/PP material

- When preparing and assembling the pipe, follow instructions as provided by the pipe manufacturer. In general, the following practices must be observed:
  - Squarely cut all pieces of pipe.
  - Remove all burrs and debris from joints and fittings.
  - All joints must be properly cleaned, primed, and cemented. Use only cement and primer approved for use with the pipe material as outlined on page 20.
- PVC, CPVC or PP pipe has been approved for use on this Combi Boiler with zero clearance to combustibles.
- The pipe shall be installed so that the first 3 ft (0.9 m) of pipe from the Combi Boiler flue outlet is readily accessible for visual inspection.

[How to tighten the Vent Pipe]

1. Continue to insert the Vent Pipe until it reaches to the base of the Combi Boiler Exhaust and Intake Flue.
   - The Vent Pipe will be inserted approximately 2.3 in. (60 mm).
2. Secure the Vent Pipe by tightening the band using a screwdriver.
   - The tightening torque shall be the following:
     - For PVC/CPVC pipe: between 16 and 20 in lb
     - For PP / Stainless Steel pipe: between 12 and 15 in lb



NOTE Do not use electric drivers, impact drivers and so forth.

For flexible pipe for chimney

- Every venting system must be properly planned and installed for optimum performance and safety. A flexible pipe installation always begins with an inspection of the existing masonry chimney (Chimney must be clean, sized correctly, properly constructed and in good condition, if being installed in a chimney as a liner). Inspect chimney to make certain it is constructed according to the latest revision of the NFPA211. Local codes may differ from this code and should be checked. Where there is a conflict, the local code will prevail. In Canada refer to the National Building Code or CSA-A405 as applicable.
- Refer to manufacturer's instructions for assembly of all flexible components including the chimney cap and adaptor to rigid pipe at base of masonry Chimney.
- Ensure none of the vent pipes and chimneys are damaged or blocked.
- Do not use an existing chimney as a raceway for a flue pipe if another appliance or fireplace is vented through the chimney, and do not have any connections inside the chimney chase.
- When using an inoperative chimney as a means of a chase for the vent system, the surrounding space within the chimney cannot be used to draw combustion air or vent another appliance.
- The remaining space surrounding a chimney liner, the flexible pipe within a masonry, metal or factory-built flue shall not be used to supply combustion air to the Combi Boiler. A separate combustion air intake pipe routed back to the Combi Boiler can be used in the remaining space if required, the Combi Boiler venting system is approved for zero clearance, and can be run directly beside the combustion air intake pipe. Bolt or screw joints together to avoid sag.
- Flexible pipe vertical offsets must not exceed 45° and are limited to a maximum number of 2.
- Connect flue pipe to the chimney with the shortest possible length of flue pipe.
- Slope the horizontal vent 1/4 in. upwards for every 12 in. (300 mm) toward the chimney from the Combi Boiler.
- Check and confirm that there is no tension to the flexible pipe by hanging or suspending of anything.
- Check vent piping at least once a season. Verify vent pipe connections to chimney are secure and no obstructions are present. If vent piping shows sign of leaking, replace it immediately.

6.2.3 Termination Considerations

- Do not store hazardous or flammable substances near the vent termination and check that the termination is not blocked in any way.
- Steam or condensed water may come out from the vent termination. Select the location for the termination as to prevent injury or property damage.
- If snow is expected to accumulate, make sure the termination will not be covered with snow or hit by falling lumps of snow.
- (For PVC / CPVC / PP / Stainless Steel material) A bird screen must be installed on the vent terminations to prevent debris or animals from entering the piping. These screens are not supplied with the Combi Boiler and must be purchased separately.

Vent Material	Bird Screen Parts #
2 in. (50 mm) PVC or CPVC	VT2-PVCS
3 in. (75 mm) PVC or CPVC	VT3-PVCS
Centrotherm- 2 in. (50 mm) PP	IASPP02
Centrotherm- 3 in. (75 mm) PP	IASPP03
DuraVent- 2 in. (60 mm) PP	2PPS-BG
DuraVent- 3 in. (80 mm) PP	3PPS-BG
DuraVent- 3 in. (75 mm) Stainless Steel	FSBS3

- The following termination can also be used.
  - Termination Manufacturer: IPEX Management Inc.
  - Item description

Item		Item #
Universal Concentric Vent Kit (UCVK)* (PVC ULC S636/UL 1738- Certified for use in both Canada and USA)		PVC-UCVK (397007)
IPEX Low Profile Termination Kit** (PVC ULC S636/UL 1738- Certified for use in both Canada and USA)	2 in.	PVC-2LPT (397100)
	3 in.	PVC-3LPT (397101)

NOTE Below are additional models approved for use by the manufacturer and supplied by IPEX. Refer to the IPEX literature or web site for additional details.

* Universal Concentric Vent Kit:

<USA>	#397256- PVC System 1738
<Canada>	#196256- PVC System 636
	#197256- CPVC System 636

** Low Profile Termination Kit:

<USA>	#397984- 2” PVC System 1738
	#397985- 3” PVC System 1738
<Canada>	#196984- 2” PVC System 636
	#196985- 3” PVC System 636

6.2.4 Maximum Vent Length

- This Combi Boiler has been designed to be vented with either 2 in. (50 mm) or 3 in. (75 mm) PVC, CPVC, PP, 3 in. (75 mm) Stainless Steel or 3 in. (75 mm) flexible pipe for chimney.
- The total vent length including horizontal and vertical vent runs should be no less than 3 ft (0.9 m).
- The Combi Boiler can be adjusted to accommodate longer vent runs; refer to the table below. Do not exceed the maximum vent length.
- Disconnect the electrical power and then adjust the DIP switches according to the vent condition noted in the tables below.
  Refer to page 67 for the location of the DIP switch bank and how to change the DIP switches.
  Failure to perform this step will result a “73” code displayed on the Operation Display and a cease in operation.
  If this occurs, disconnect, then reconnect the electrical power to the Combi Boiler to reset the system.

NOTE
- When adjusting the DIP switches for longer vent runs, the Btu/h input of the Combi Boiler will be reduced by up to 9%.
- Do not change any other DIP switches.

Maximum Vent Length Configurations (For PVC / CPVC / PP / Stainless Steel material)

- The maximum vent length when using 2 in. (50 mm) pipe is 60 ft.
- The maximum vent length when using 3 in. (75 mm) pipe is 100 ft.

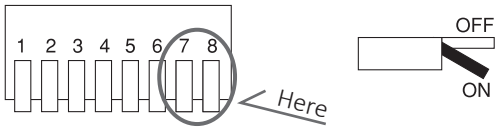
Both maximum lengths are reduced by the number of elbows used, as shown in the following table:

Vent diameter	Maximum equivalent vent length*1 V (Vertical) + H (Horizontal)	Maximum # of elbows*2	Equivalent length
2 in.	60 ft (18 m)	6	90° elbow: 5 ft (1.5 m)
3 in.	100 ft (30 m)	8	45° elbow: 3 ft (0.9 m)

*1 The maximum vent length includes elbows.
*2 Not including the termination.

[DIP Switch Adjustment]

Vent length condition	DIP switches	
	#7	#8
①Less than 33 ft using 2 in. (50 mm) pipe	OFF	OFF
②33 ft or more using 2 in. (50 mm) pipe	ON	OFF
③Less than 50 ft using 3 in. (75 mm) pipe	OFF	ON
④50 ft or more using 3 in. (75 mm) pipe	ON	ON



[Vent length Calculation example]

Step 1:
Vent Diameter
2 in.
Step 2:
Straight pipe length
(Vertical length + Horizontal length)
17 ft
Step 3:
Number of elbows
90° elbows: 2
45° elbows: 2
Step 4:
Calculate equivalent length
90° elbows: 2 × 5 ft = 10 ft
45° elbows: 2 × 3 ft = 6 ft
Step 5:
Total vent length
(Add Step 2 and Step 4 together)
17 ft + 16 ft = 33 ft
Step 6:
Check [DIP Switch Adjustment] and select DIP switch settings.
②[33 ft or more using 2 in. (50 mm) pipe]
(i.e., turn ON DIP switch #7)

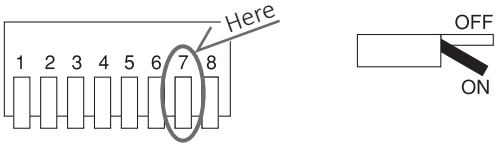
Maximum Vent Length Configurations (For flexible pipe for chimney)

[DuraVent® - Flex Through Chimney w/ Air Intake (Only 3 in.)]

The vent length condition setting depends on the flexible pipe length, the rigid pipe length and number of elbows. Calculate an each ventilation system equivalent length, then adjust the DIP switch.

Vent length condition	DIP switch #7	Maximum equivalent vent length* V (Vertical) + H (Horizontal)	Equivalent length
Short length	OFF	< 50 ft (15 m)	Flexible pipe: 1 ft (0.3 m) Rigid pipe: 1 ft (0.3 m) 90° elbow: 5 ft (1.5 m) 45° elbow: 3 ft (0.9 m)
Long length	ON	50 ft (15 m)–75 ft (22.5 m)	

* The maximum vent length includes elbows.



- Equivalent vent length calculation example:

[Example 1]
- Vent Size: 3 in.
- V (Vertical length): 20 ft
- H (Horizontal length): 6 ft
- 90° elbow: 2

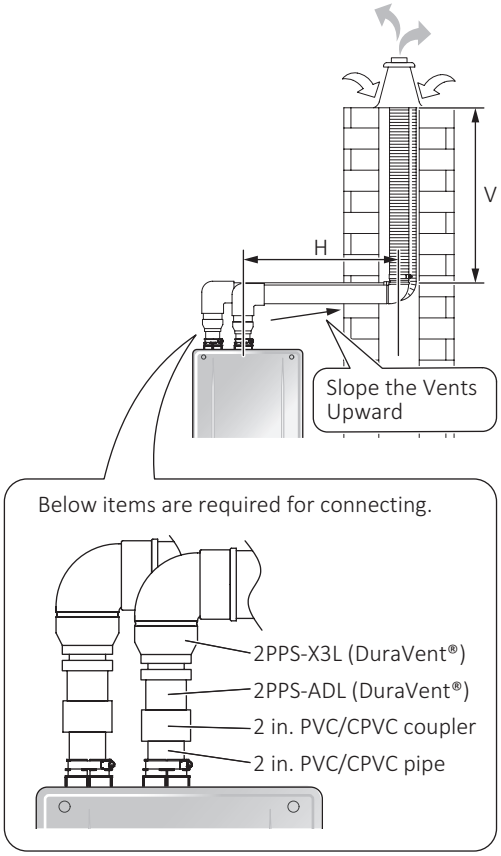
1 ft × 20 + 1 ft × 6 + 5 ft × 2 = 36 ft
Total equivalent length ≤ 50 ft

Select “Short length”

[Example 2]
- Vent Size: 3 in.
- V (Vertical length): 35 ft
- H (Horizontal length): 10 ft
- 90° elbow: 3

1 ft × 35 + 1 ft × 10 + 5 ft × 3 = 60 ft
50 ft < Total equivalent length ≤ 75 ft

Select “Long length”

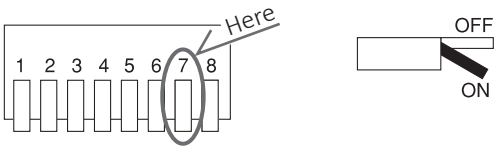


[Centrotherm® - Flex Through Chimney w/ Air Intake (Only 3 in.)]

The vent length condition setting depends on the flexible pipe length, the rigid pipe length and number of elbows. Calculate an each ventilation system equivalent length, then adjust the DIP switch.

Vent length condition	DIP switch #7	Maximum equivalent vent length*	Equivalent length
Short length	OFF	Exhaust vent V (Vertical) + H (Horizontal): < 50 ft (15 m) Air Intake: < 50 ft (15 m)	Flexible pipe: 1 ft (0.3 m) Rigid pipe: 1 ft (0.3 m) 90° elbow: 5 ft (1.5 m) 45° elbow: 3 ft (0.9 m)
Long length	ON	Exhaust vent V (Vertical) + H (Horizontal): 50 ft (15 m)–75 ft (22.5 m) Air Intake: 50 ft (15 m)–75 ft (22.5 m)	

* The maximum vent length includes elbows.



- Equivalent vent length calculation example:

  [Example 1]
  - Vent Size: 3 in.
  - V (Vertical length): 25 ft
  - H (Horizontal length): 5 ft
  - 87° elbow: 2

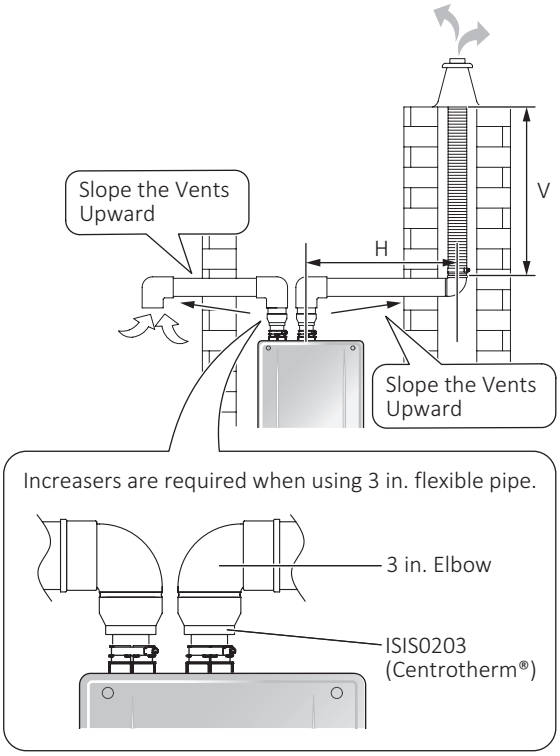
  1 ft × 25 + 1 ft × 5 + 5 ft × 2 = 40 ft
  Total equivalent length ≤ 50 ft

  Select “Short length”

  [Example 2]
  - Vent Size: 3 in.
  - V (Vertical length): 30 ft
  - H (Horizontal length): 10 ft
  - 87° elbow: 3

  1 ft × 30 + 1 ft × 10 + 5 ft × 3 = 55 ft
  50 ft < Total equivalent length ≤ 75 ft

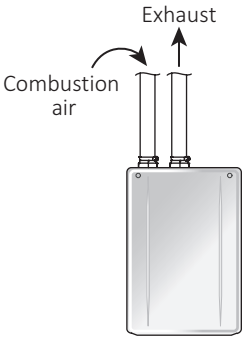
  Select “Long length”



6.3 Select a Vent Type

Direct Vent

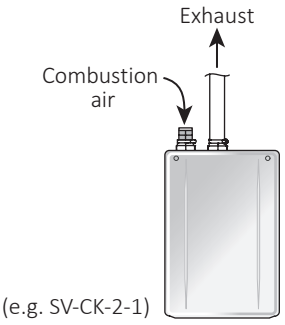
Combustion air is supplied from the outdoors. Combustion air and exhaust are seperate vent pipes.



Non-Direct Vent

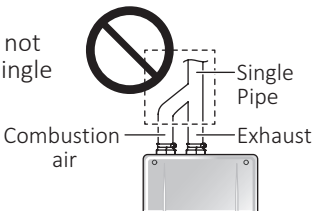
[With SV Conversion Kit (SV-CK-2-1 or SV-CK-2)]

Combustion air is supplied from the surrounding indoor air.



⚠ WARNING

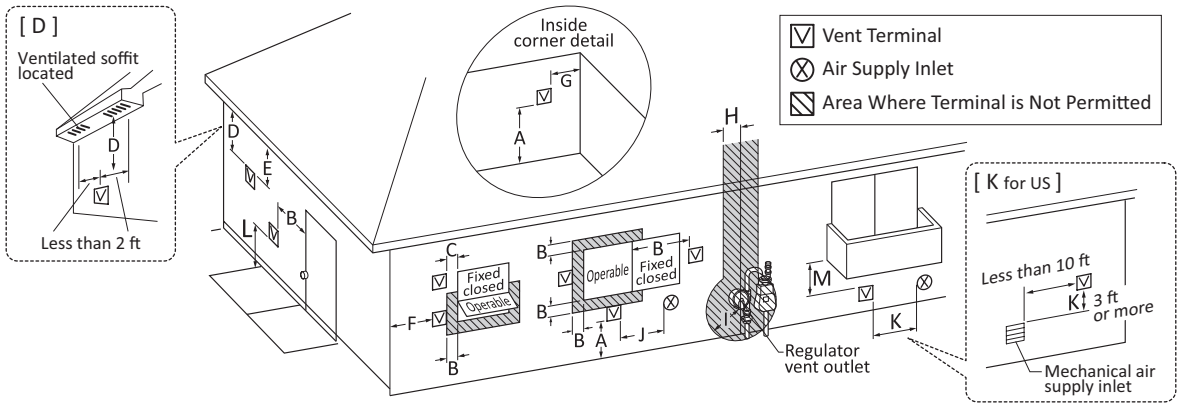
Exhaust gasses and combustion air must not be combined into a single PVC pipe using a "Y" fitting.



6.4 Vent Pipe Installation (Direct Vent)

6.4.1 Clearance Requirements from Vent Terminations to Building Openings [When supplying combustion air from the outdoors]

- All clearance requirements are in accordance with ANSI Z21.10.3 and the National Fuel Gas Code, ANSI Z223.1 and in Canada, in accordance with the Natural Gas and Propane Installation Code CSA B149.1.



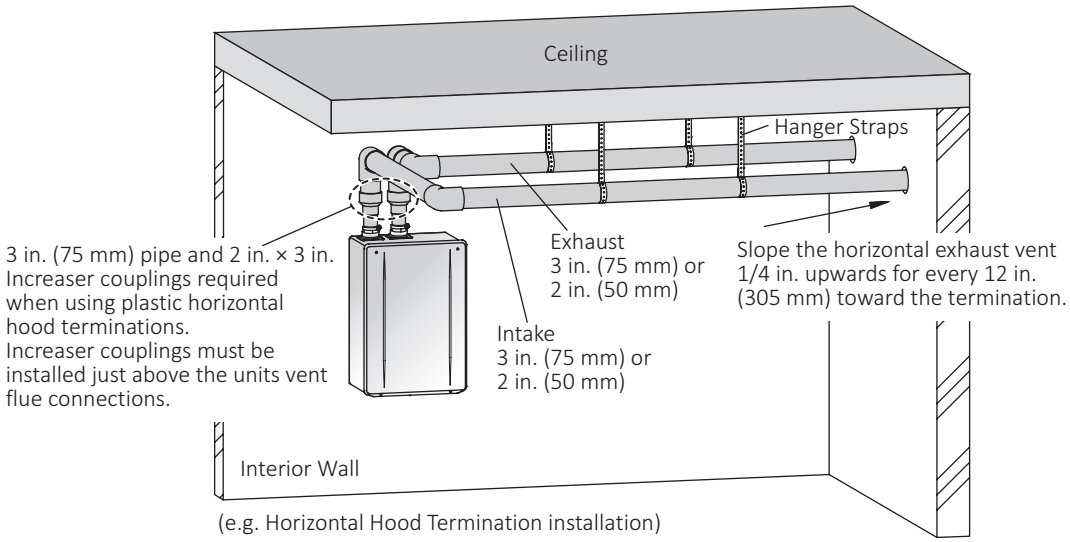
Ref	Description	Canadian Direct Vent Installations [1]	US Direct Vent Installations [2]
A	Clearance above grade, veranda, porch, deck, or balcony	12 in. (30 cm)	12 in. (30 cm)
B	Clearance to window or door that may be opened	6 in. (15 cm) for appliances ≤ 10,000 Btuh (3kW), 12 in. (30 cm) for appliances > 10,000 Btuh (3kW) and ≤ 100,000 Btuh (30 kW), 36 in. (91 cm) for appliances > 100,000 Btuh (30 kW)	6 in. (15 cm) for appliances ≤ 10,000 Btuh (3kW), 9 in. (23 cm) for appliances > 10,000 Btuh (3kW) and ≤ 50,000 Btuh (15 kW), 12 in. (30 cm) for appliances > 50,000 Btuh (15 kW)
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	*	*
E	Clearance to unventilated soffit	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*
H	Clearance to each side of center line extended above meter/regulator assembly	*	*
I	Clearance to service regulator vent outlet	Above a regulator within 3 ft (91 cm) horizontally of the vertical center line of the regulator vent outlet to a maximum vertical distance of 15 ft (4.5 m)	*
J	Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	6 in. (15 cm) for appliances ≤ 10,000 Btuh (3kW), 12 in. (30 cm) for appliances > 10,000 Btuh (3kW) and ≤ 100,000 Btuh (30 kW), 36 in. (91 cm) for appliances > 100,000 Btuh (30 kW)	6 in. (15 cm) for appliances ≤ 10,000 Btuh (3kW), 9 in. (23 cm) for appliances > 10,000 Btuh (3kW) and ≤ 50,000 Btuh (15 kW), 12 in. (30 cm) for appliances > 50,000 Btuh (15 kW)
K	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	3 ft (91 cm) above if within 10 ft (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13 m)†	*
M	Clearance under veranda, porch, deck, or balcony	12 in. (30 cm)‡	*

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

6.4.2 Horizontal Vent Termination

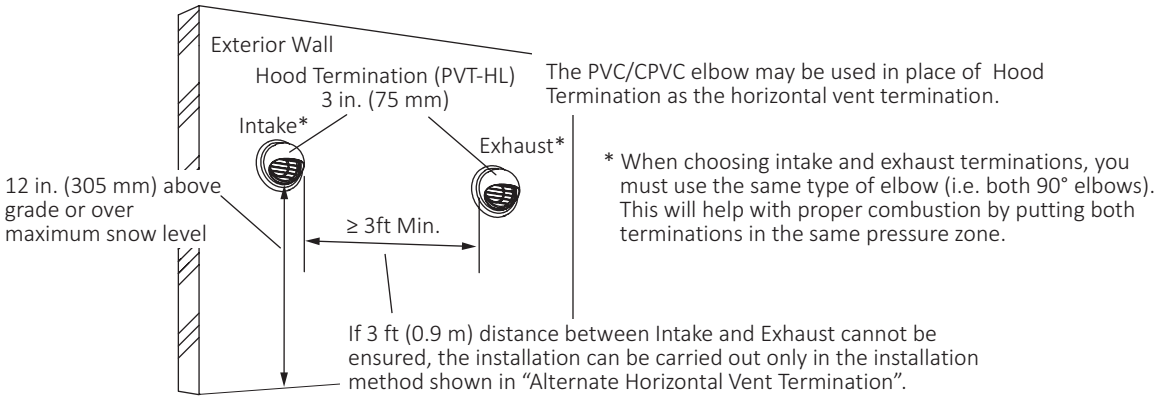
For Horizontal Vent Termination - PVC, CPVC, PP or Stainless Steel Material

- Use a condensation drain if necessary.
- In the Commonwealth of Massachusetts a carbon monoxide detector is required for all side wall horizontally vented gas fuel equipment. Refer to the page 4 for more detail information.

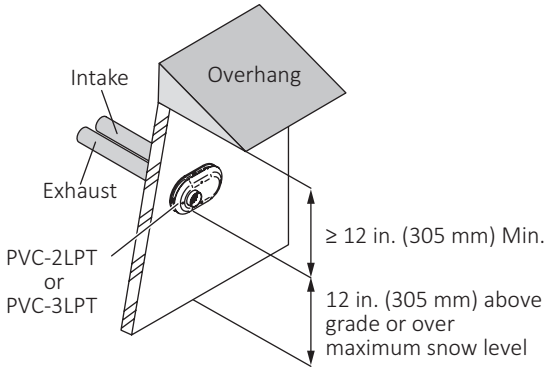


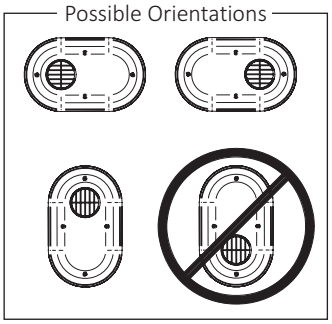
(e.g. Horizontal Hood Termination installation)

(e.g. Horizontal Hood Termination installation)



(e.g. PVT-2LPT installation)





Alternate Horizontal Vent Termination- PVC, CPVC, PP or Stainless Steel Material
(When 3 ft (0.9 m) distance between Intake and Exhaust cannot be ensured.)

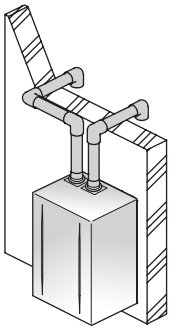
⚠ WARNING

- If the distance between the air inlet and exhaust vent terminations is too short, the Combi Boiler will draw in the exhaust gases through the intake. There is a risk of inadequate combustion air for the Combi Boiler, thus increasing Carbon Monoxide (CO) emissions and noise due to vibration.
- Termination elbows must be oriented vertically, pointing directly downward. Attempts to prevent exhaust air from entering the air inlet by angling termination elbows in directions other than directly downward will increase the risk of freezing.
- Reversing the air intake and exhaust pipes is not allowed. Carbon Monoxide (CO) emissions and noise due to vibration will increase.

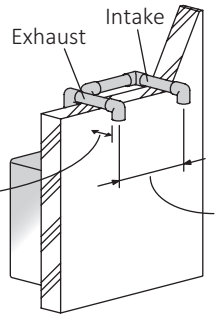
- Insert the bird screen into the 90° elbow installed vertically downward.
- Intake and exhaust should face the same direction. Intake and exhaust should keep the same pressure zone.

NOTE Do not use Hood termination.

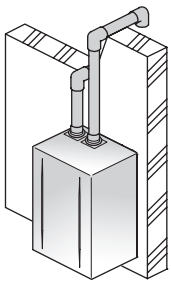
[Interior View]



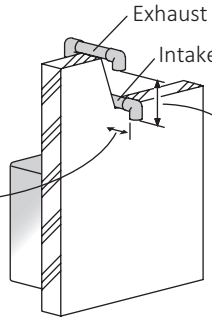
[Exterior View]



[Interior View]



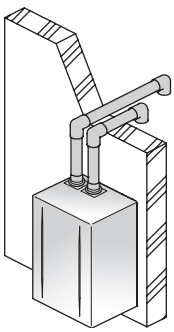
[Exterior View]



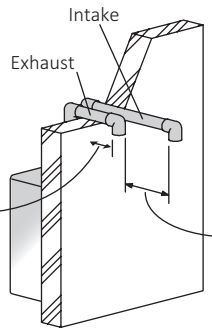
NOTE
Upper side is exhaust, lower side is intake. The reverse orientation is not allowed.

≥ 1 ft Min.
The distance is measured at the outlets of intake port (terminal) and exhaust port (terminal).

[Interior View]



[Exterior View]

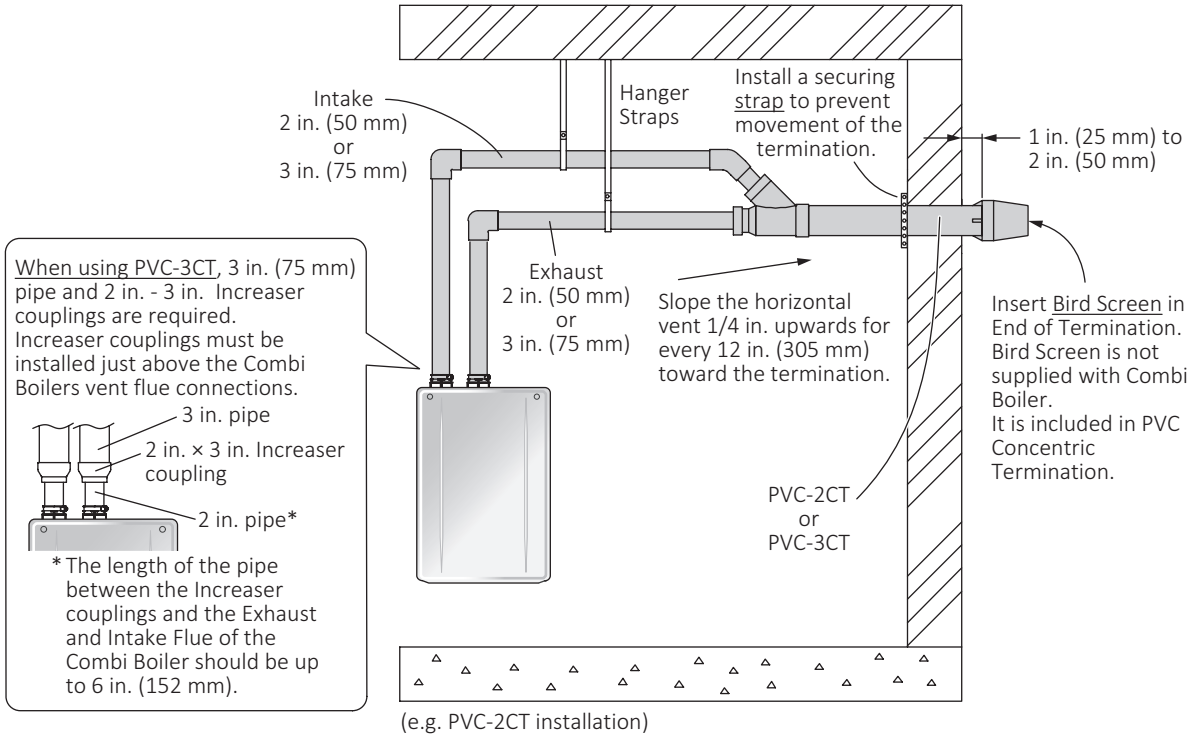


NOTE
The side distant from wall is intake, the side near the wall is exhaust.
The reverse orientation is not allowed.

≥ 1 ft Min.
The distance is measured at inside of pipe to inner dimension.

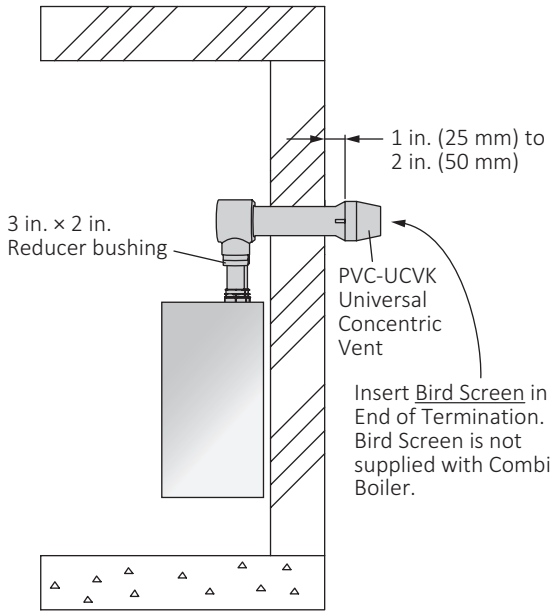
For Horizontal PVC Concentric Termination - PVC/CPVC/PP Material Only

- The concentric termination may be shortened, but not lengthened from its original factory supplied length.
- 2 in. (50 mm) or 3 in. (75 mm) PVC, CPVC or PP pipe may be used with the concentric termination. Maintain the same vent pipe diameter from the Combi Boiler flue to the termination.
- Use a condensation drain if necessary.
- In the Commonwealth of Massachusetts a carbon monoxide detector is required for all side wall horizontally vented gas fuel equipment. Refer to the page 4 for more detail information.



(e.g. PVC-2CT installation)

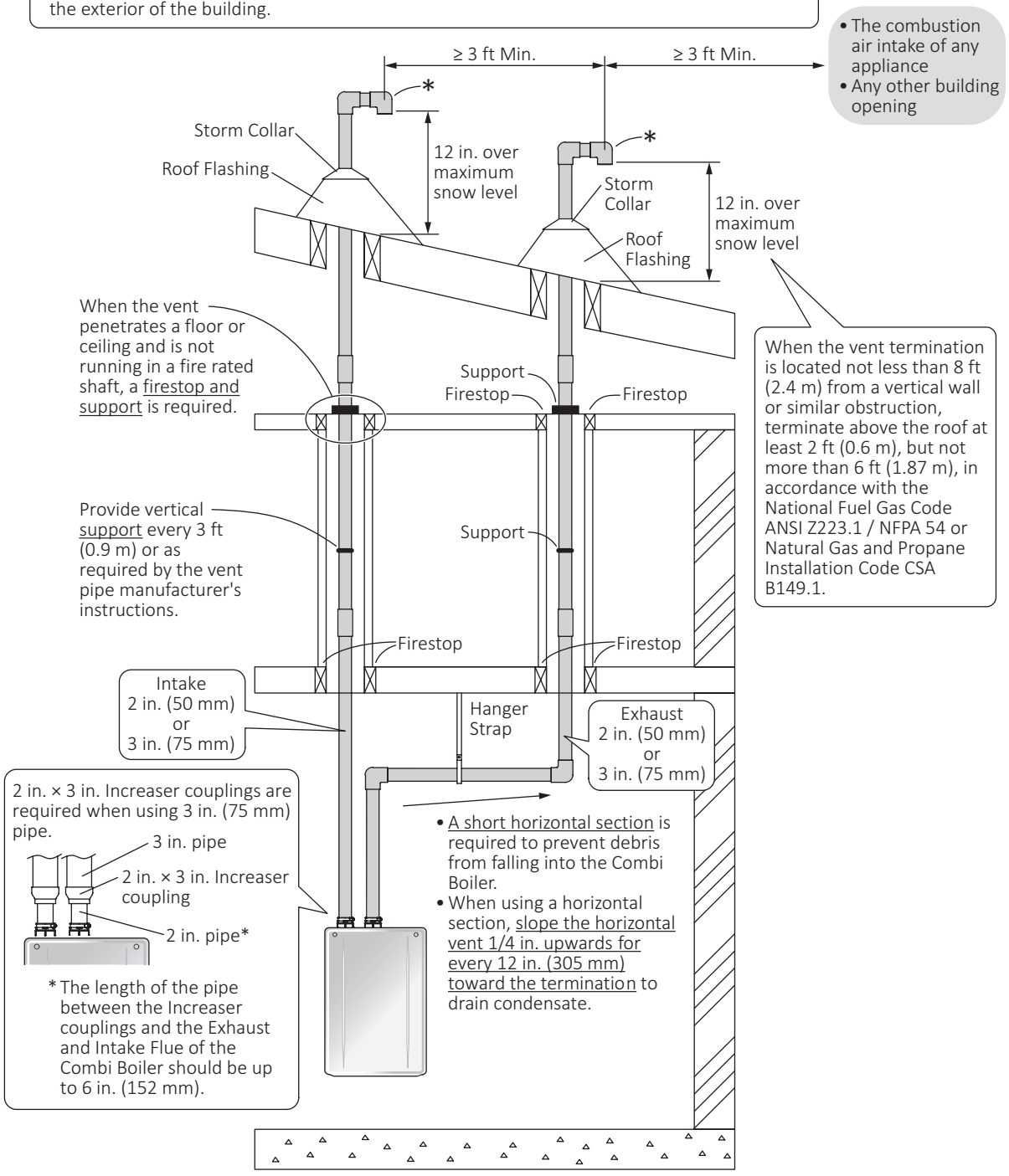
For Universal Concentric Vent Kit



6.4.3 Vertical Vent Termination

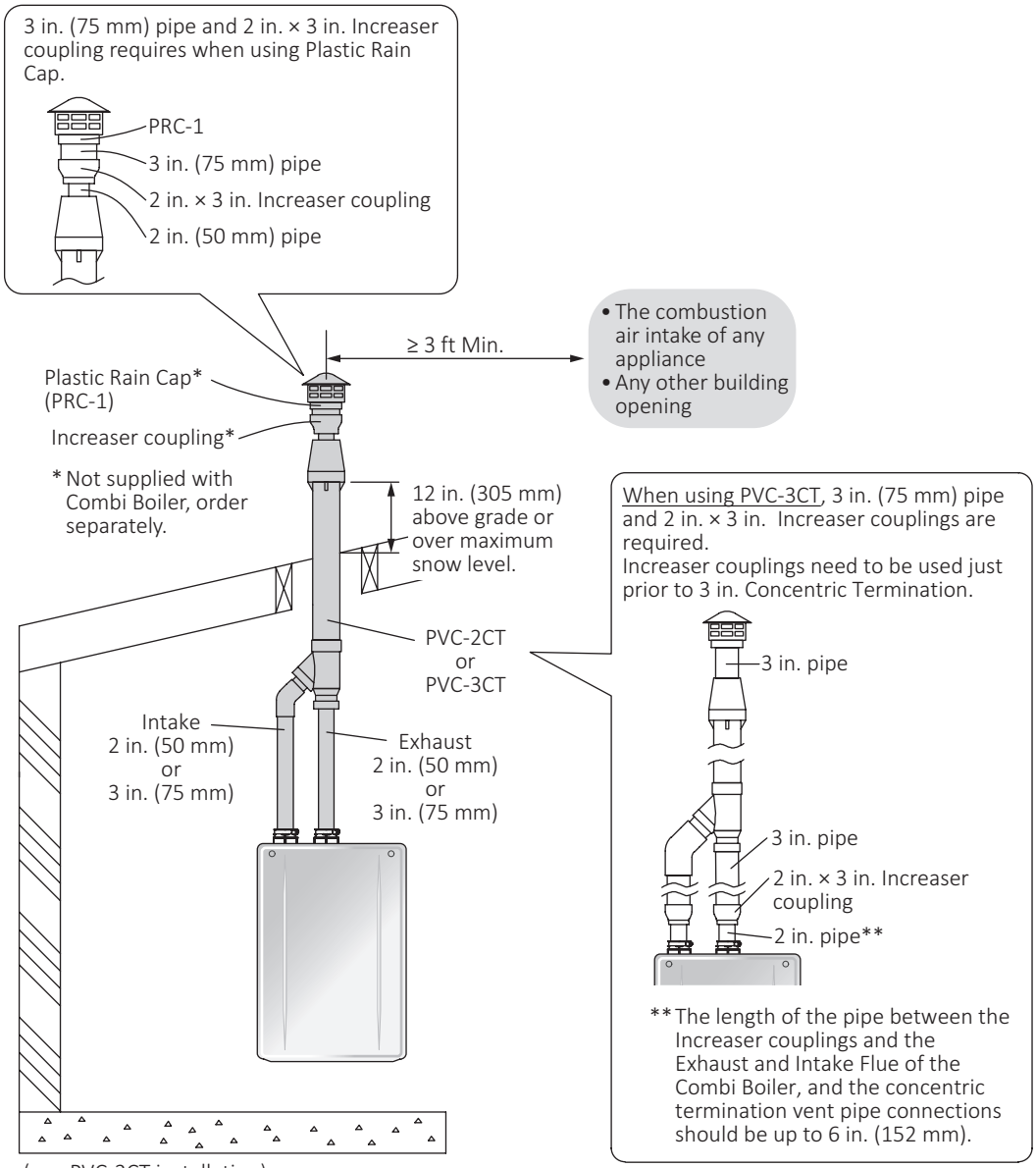
For Vertical Vent Termination - PVC, CPVC, PP or Stainless Steel Material

*About the termination
- When choosing intake and exhaust terminations, you must use the same type of elbow (i.e. both 90° elbows).
  This will help with proper combustion by putting both terminations in the same pressure zone.
- Insert Bird Screen in End of 90° Elbow.
  Bird Screen is not supplied with Combi Boiler, order separately.
- To prevent excessive condensation formation, only the vent termination should be located on the exterior of the building.



For Vertical PVC Concentric Termination - PVC/CPVC/PP Material Only

- The concentric termination may be shortened, but not lengthened from its original factory supplied length.
- 2 in. (50 mm) or 3 in. (75 mm) PVC, CPVC or PP pipe may be used with the concentric termination. Maintain the same vent pipe diameter from the Combi Boiler flue to the termination.
- Use a condensation drain if necessary.
- In the Commonwealth of Massachusetts a carbon monoxide detector is required for all side wall horizontally vented gas fuel equipment. Refer to the page 4 for more detail information.

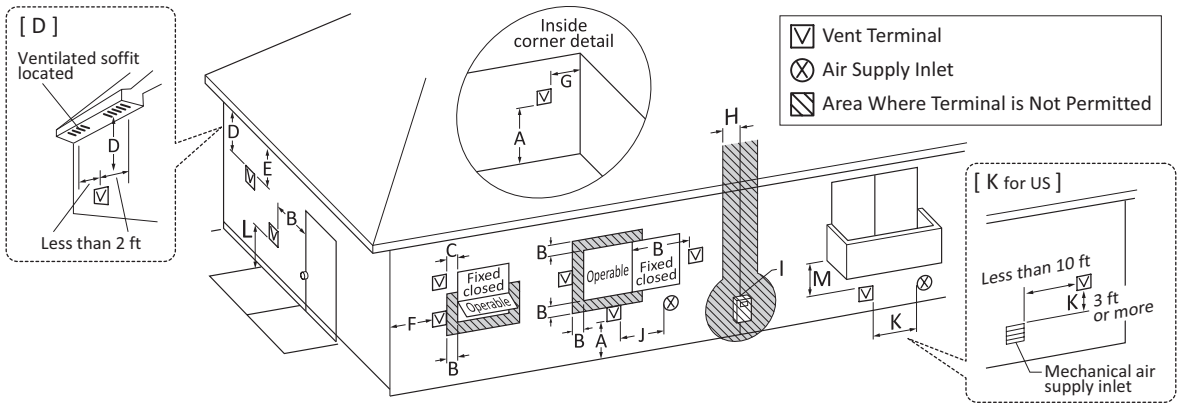


(e.g. PVC-2CT installation)

6.5 Vent Pipe Installation (Non-Direct Vent)

6.5.1 Clearance Requirements from Vent Terminations to Building Openings [Other than Direct Vent]

- All clearance requirements are in accordance with ANSI Z21.10.3 and the National Fuel Gas Code, ANSI Z223.1 and in Canada, in accordance with the Natural Gas and Propane Installation Code CSA B149.1.



Ref	Description	Canadian Non-Direct Vent Installations [1]	US Non-Direct Vent Installations [2]
A	Clearance above grade, veranda, porch, deck, or balcony	12 in. (30 cm)	12 in. (30 cm)
B	Clearance to window or door that may be opened	6 in. (15 cm) for appliances ≤ 10,000 Btuh (3kW), 12 in. (30 cm) for appliances > 10,000 Btuh (3kW) and ≤ 100,000 Btuh (30 kW), 36 in. (91 cm) for appliances > 100,000 Btuh (30 kW)	4 ft (1.2 m) below or to side of opening; 1 ft (300 mm) above opening
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	*	*
E	Clearance to unventilated soffit	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*
H	Clearance to each side of center line extended above meter/regulator assembly	*	*
I	Clearance to service regulator vent outlet	Above a regulator within 3 ft (91 cm) horizontally of the vertical center line of the regulator vent outlet to a maximum vertical distance of 15 ft (4.5 m)	*
J	Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	6 in. (15 cm) for appliances ≤ 10,000 Btuh (3kW), 12 in. (30 cm) for appliances > 10,000 Btuh (3kW) and ≤ 100,000 Btuh (30 kW), 36 in. (91 cm) for appliances > 100,000 Btuh (30 kW)	4 ft (1.2 m) below or to side of opening; 1 ft (300 mm) above opening
K	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	3 ft (91 cm) above if within 10 ft (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13 m)†	*
M	Clearance under veranda, porch, deck, or balcony	12 in. (30 cm)‡	*

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

6.5.2 Consideration for Installation

⚠ DANGER

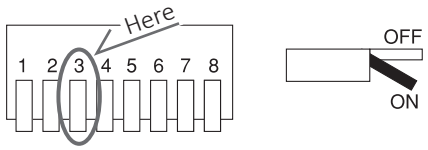
- When installing this Combi Boiler in an area with a large amount of lint such as a commercial Laundromat, direct vent ("-DV") system must be used.
  The "-SV" configuration (using SV Conversion Kit) is prohibited.
- When installing this Combi Boiler in a mobile home, all combustion must be drawn directly from the outdoors.
  The "-SV" configuration (using SV Conversion Kit) is prohibited.

For SV Conversion Kit

⚠ WARNING

Failure to change DIP switch #3 and use SV Conversion Kit (SV-CK-2-1 or SV-CK-2) could result in a fire or explosion causing property damage, personal injury or death.
Refer to the instructions provided with the conversion kit for additional details.

- Disconnect the electrical power and then turn ON DIP switch #3 if combustion air will be supplied from the indoors.
  Refer to page 67 for the location of the DIP switch bank and how to change the DIP switch.
  Failure to perform this step will result a "73" code displayed on the Operation Display and a cease in operation.
  If this occurs, disconnect, then reconnect the electrical power to the Combi Boiler to reset the system.



- SV Conversion Kit (SV-CK-2-1 or SV-CK-2) is required for the air intake.
- It is recommended that a carbon monoxide alarm installed in same room space as Combi Boiler when supplying combustion air from the indoors.

⚠ WARNING

To prevent possible personal injury or death due to asphyxiation, common venting with other manufacturer's induced draft appliances is not allowed.

6.5.3 Combustion Air

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

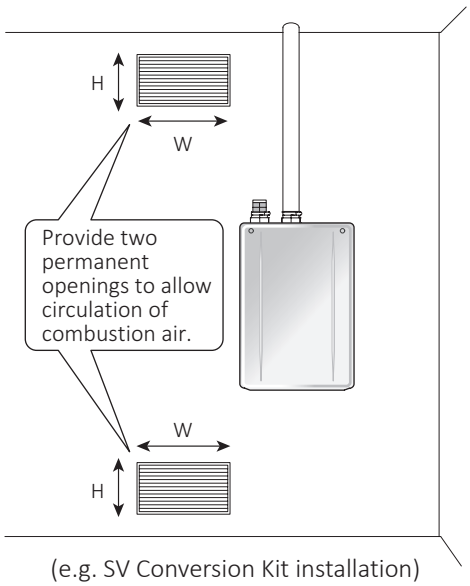
- Supply combustion air to the Combi Boiler as per the National Fuel Gas Code, ANSI Z223.1- latest edition and in Canada, in accordance with the Natural Gas and Propane Installation Code CSA B149.1 - latest edition.
- A minimum free area of each opening:

[NRCB199DV (GHQ-C3201WX-FF US)]

Indoor make up air is provided			200 in.²
		example	20 in. (W) × 10 in. (H)
Outdoor make up air is provided	Direct or Vertical ducts		50 in.²
		example	10 in. (W) × 5 in. (H)
	Horizontal ducts		100 in.²
		example	20 in. (W) × 5 in. (H)

[NRCB180DV (GHQ-C2801WX-FF US)]

Indoor make up air is provided			180 in.²
		example	20 in. (W) × 9 in. (H)
Outdoor make up air is provided	Direct or Vertical ducts		45 in.²
		example	10 in. (W) × 4 1/2 in. (H)
	Horizontal ducts		90 in.²
		example	20 in. (W) × 4 1/2 in. (H)

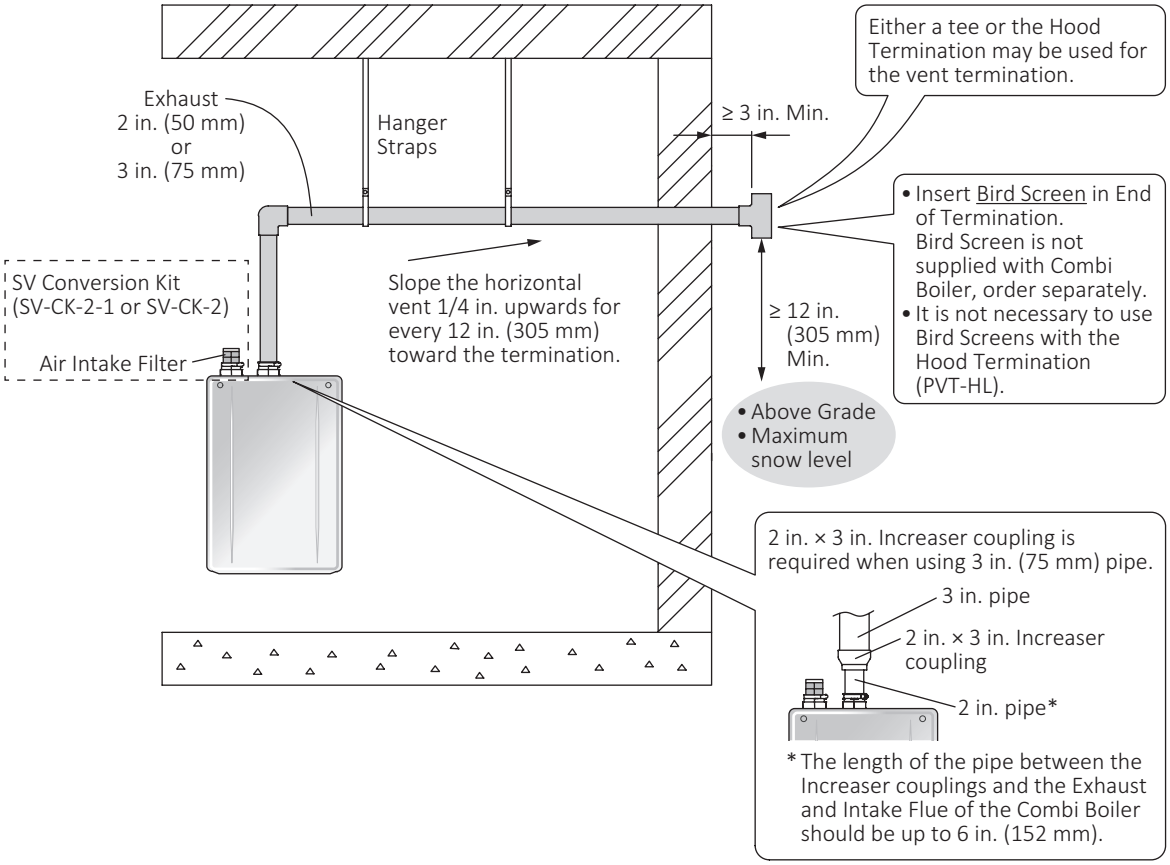


(e.g. SV Conversion Kit installation)

- If the Combi Boiler is installed in a mechanical closet, a minimum of permanent clearance of 4 in. or more in front of the Combi Boiler is required. In order to facilitate maintenance and repair, a minimum clearance (24 in. or more) should be met.
- If combustion air will be provided through a duct, size the duct to provide as below.
  - NRCB199DV (GHQ-C3201WX-FF US): 70 ft^3 of fresh air per minute
  - NRCB180DV (GQ-C2801WX-FF US): 63 ft^3 of fresh air per minute

6.5.4 Horizontal Vent Termination

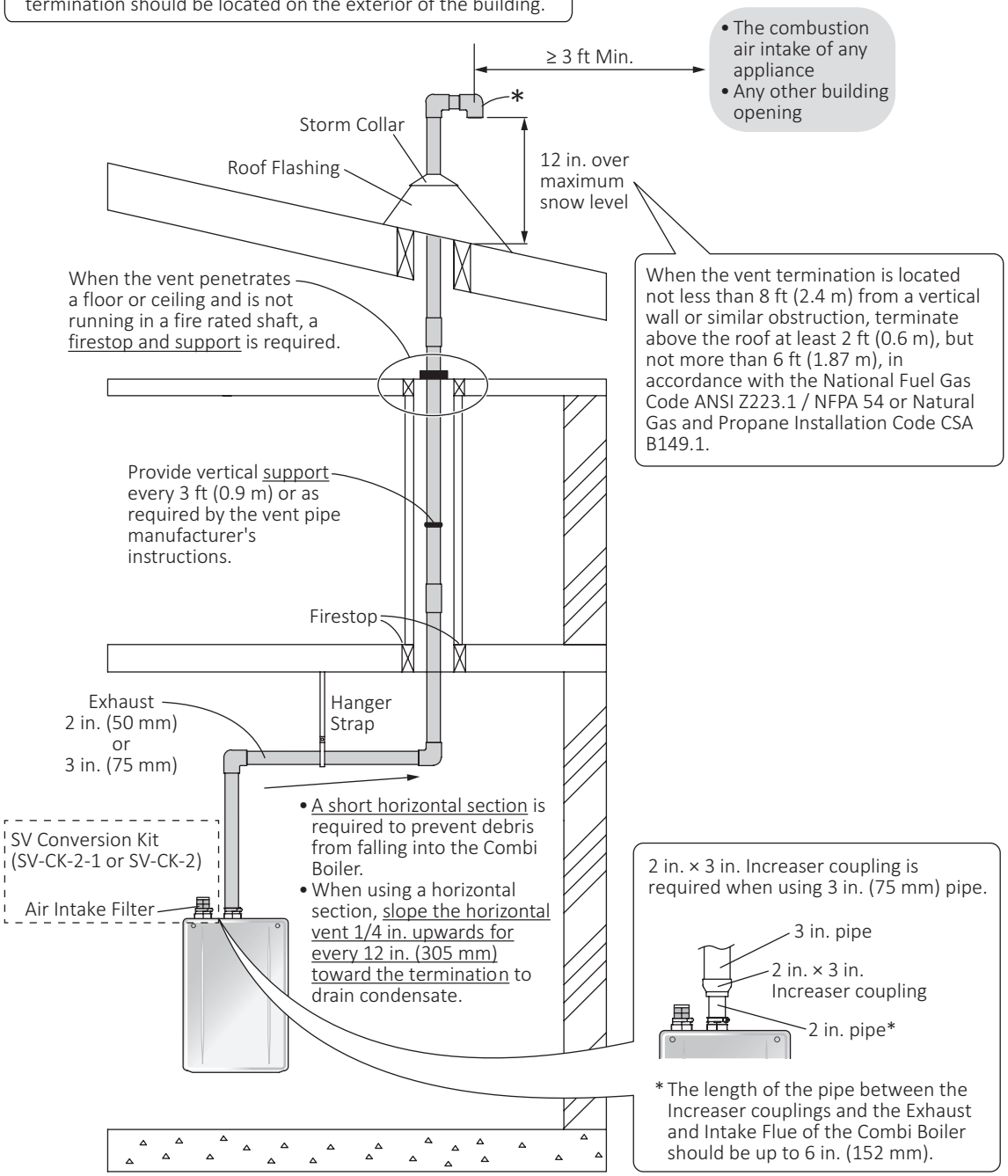
- Use a condensation drain if necessary.
- In the Commonwealth of Massachusetts a carbon monoxide detector is required for all side wall horizontally vented gas fuel equipment. Refer to the page 4 for more detail information.



6.5.5 Vertical Vent Termination

For SV Conversion Kit

*About the termination
- Insert Bird Screen in End of 90° Elbow.
  Bird Screen is not supplied with Combi Boiler, order separately.
- To prevent excessive condensation formation, only the vent termination should be located on the exterior of the building.



7 Connecting the Gas Supply

Follow the instructions from the gas supplier.

⚠ WARNING

The sizing and installation of the gas system for this Combi Boiler, as with any gas appliance, is the sole responsibility of the installer.
The installer must be professionally trained to do such work and must always follow all local and national codes and regulations.

Gas Type

The gas type indicated on the Combi Boiler's rating plate (NG or LP) must match the type of gas being supplied to the Combi Boiler.

Gas Conversions

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

Meter

- The gas meter must be sized properly for the Combi Boiler and other gas appliances to operate properly.
- Select a gas meter capable of supplying the entire Btu/h demand of all gas appliances in the building.

Regulators

⚠ WARNING

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

Pressure

- Check the gas supply pressure immediately upstream at a location provided by the gas company.
- Supplied gas pressure must be within the limits shown in the specifications section with all gas appliances operating.

⚠ WARNING

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

Pressure Test

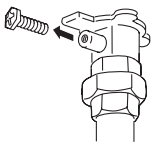
The appliance and its gas connections must be leak tested before placing the appliance in operation.

- Test at test pressures equal to or less than ½ psi (3.5 kPa).
- The appliance must be isolated from the gas supply piping system by closing its individual manual shut off valve during any pressure testing of the gas supply piping system.
- If test pressures are in excess of 1/2 psi (3.5 kPa), the appliance and its individual shut off valve must be completely disconnected from the gas supply piping system during the test process.

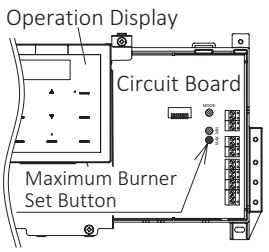
Measuring Gas Pressure

In order to check the gas supply pressure to the Combi Boiler, a tap is provided on the gas inlet.

1. Remove the **9/32 in. hex head /Phillips screw** from the tap.



2. Connect a manometer using a silicon tube.
3. Open up at least two fixtures with hot water side fully.
4. Hold in the "Maximum Burner Set Button" on the circuit board.



Pipe Sizing

- A gas shut off valve must be installed on the supply line.
- Gas piping shall be in accordance with local utility company requirements and/or in the absence of local codes, use the latest edition of National Fuel Gas Code (NFPA54GC), ANSI Z223.1. In Canada, use the latest edition of CSA B149.1, Natural Gas and Propane installation code.
- Size the gas line according to total Btu/h demand of the building and length from the meter or regulator so that the following supply pressures are available even at maximum demand.

	Supply Pressure	
	Natural Gas	LP Gas
Min	3.5 in. W.C.	8 in. W.C.
Max	10.5 in. W.C.	14 in. W.C.

⚠ WARNING

Gas pressures below the required minimum pressure may result in ignition failure, personal injury or death.

Flexible Connectors

Flexible gas lines are not recommended unless the minimum inside diameter is ¾ in. or greater and the rated capacity of the connector is equal to or greater than the Btu/h demand of the Combi Boiler.

Reference Tools & Sample Calculations

NOTICE

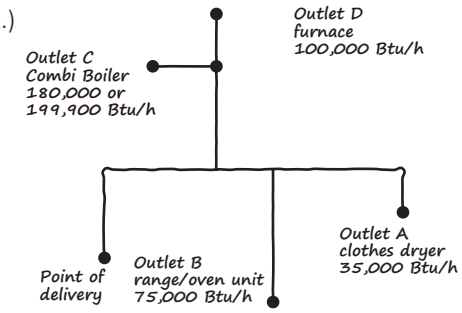
The tables and samples below are for reference only. The professional sizing and installing the gas line should always run the appropriate calculations before all installations.

[Calculation Example]

A partial set of sizing tables are printed on page 39. In cases where these tables are not appropriate, refer to the NFPA.

1. Draw a sketch of a piping system. Enter the system information.

(e.g.)



2. • Determine the gas type used and supply gas Pressure, and enter it.
   • Determine the piping material and enter it to the below.
   • Select the appropriate pipe sizing table from page 39 and enter it to the below.

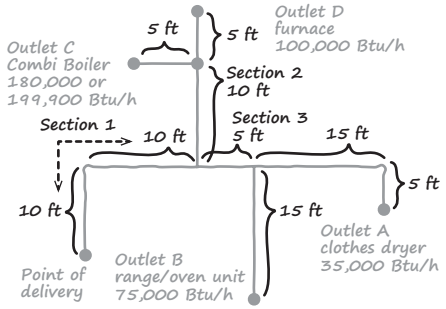
(e.g.)

Gas type: Natural
Supply gas pressure: 6 in. W.C.
Piping material: Sch 40 steel
Table used: 2
Pressure drop: 1.0 in. W.C.

Gas type: _____
Supply gas pressure: _____
Piping material: _____
Table used: _____
Pressure drop: _____

3. • On the sketch, label the section of pipe from the point of delivery (meter or regulator) to the first tee as Section 1.
   • Label the section from the first tee to the second tee as Section 2, and label the section from the first tee to the third tee as Section 3. Use similar section numbers for additional sections.

(e.g.)



4. • Enter the demand is the amount of gas flowing through a section of pipe in the table below.
   - For natural gas, use total Btu/h rating/1000 (ft^3/h).
   - For propane, use total Btu/h.
   • For each section, determine the longest piping from the point of delivery to the furthest appliance through each section. Enter this length for all pipe sections in the table below.
   • Round up to the lengths in the appropriate table on page 39. Read across until a capacity equal to or greater than the required demand for the section is found. Read up to find the size. Repeat for each section of piping. Enter this size in the table below.

   (e.g.)

Section	Demand	The longest length	Size
1	409.9	45 ft	1 in.
2	299.9	35 ft	1 in.
3	110	45 ft	3/4 in.
4			
5			

Section	Demand	The longest length	Size
1			
2			
3			
4			
5			

5. • Enter the input rating for each appliance in the table below.
   - For natural gas appliances, enter the input rating in Btu/h/1000 (ft^3/h).
   - For propane appliances, enter the input rating in Btu/h.
   • Enter the outlet length from each appliance to the point of delivery in the table below.
   • Round up to the lengths in the appropriate table on page 39. Read across until a capacity equal to or greater than the required demand for the section is found. Read up to find the size. Repeat for each appliance. Enter this size in the table below.

   (e.g.)

Appliance	Demand	Outlet length	Size
Outlet A	35	45 ft	1/2 in.
Outlet B	75	40 ft	1/2 in.
Outlet C	199.9	35 ft	3/4 in.
Outlet D	100	35 ft	1/2 in.

Appliance	Demand	Outlet length	Size
Outlet A			
Outlet B			
Outlet C			
Outlet D			

Final Check

1. Turn on and operate all gas appliances including the Combi Boiler.
2. Check the inlet pressure at each appliance shall be such that the supply pressure at the appliance is greater than or equal to the minimum pressure required by the appliance.

NOTE If all appliances are not receiving the minimum inlet pressure, the gas piping system may need to be changed.

[Gas pipe sizing tables]

- These tables are for reference only. Consult gas pipe manufacturer for actual pipe capacities.
- It is an example of Schedule 40 Metallic Pipe.
- (Only Table 1- 4) Values in Table are in ft³ of Gas per Hour. Contact your gas supplier for Btu/ft³ ratings. For simplification of your calculations, 1 ft³ of Gas is approximately equivalent to 1,000 Btu.

1. Maximum Natural Gas Delivery Capacity (For Less than 6 in. W.C. initial supply pressure)

0.5 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)													
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(21 m)	(24 m)	(27 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	172	118	95	81	72	65	60	56	52	50	44	40	37	34
3/4 in.	360	247	199	170	151	137	126	117	110	104	92	83	77	71
1 in.	678	466	374	320	284	257	237	220	207	195	173	157	144	134
1 1/4 in.	1,390	957	768	657	583	528	486	452	424	400	355	322	296	275
1 1/2 in.	2,090	1,430	1,150	985	873	791	728	677	635	600	532	482	443	412
2 in.	4,020	2,760	2,220	1,900	1,680	1,520	1,400	1,300	1,220	1,160	1,020	928	854	794
2 1/2 in.	6,400	4,400	3,530	3,020	2,680	2,430	2,230	2,080	1,950	1,840	1,630	1,480	1,360	1,270

2. Maximum Natural Gas Delivery Capacity (For 6 - 7 in. W.C. initial supply pressure)

1.0 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)													
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(21 m)	(24 m)	(27 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	250	172	138	118	105	95	87	81	76	72	64	58	53	50
3/4 in.	524	360	289	247	219	199	183	170	160	151	134	121	111	104
1 in.	986	678	544	466	413	374	344	320	300	284	252	228	210	195
1 1/4 in.	2,030	1,390	1,120	957	848	768	707	657	617	583	516	468	430	400
1 1/2 in.	3,030	2,090	1,680	1,430	1,270	1,150	1,060	985	924	873	774	701	645	600
2 in.	5,840	4,020	3,230	2,760	2,450	2,220	2,040	1,900	1,780	1,680	1,490	1,350	1,240	1,160
2 1/2 in.	9,310	6,400	5,140	4,400	3,900	3,530	3,250	3,020	2,840	2,680	2,380	2,150	1,980	1,840

3. Maximum Natural Gas Delivery Capacity (For 7 - 8 in. W.C. initial supply pressure)

2.0 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)													
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(21 m)	(24 m)	(27 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	364	250	201	172	153	138	127	118	111	105	93	84	77	72
3/4 in.	762	524	420	360	319	289	266	247	232	219	194	176	162	151
1 in.	1,440	986	792	678	601	544	501	466	437	413	366	332	305	284
1 1/4 in.	2,950	2,030	1,630	1,390	1,230	1,120	1,030	957	898	848	751	681	626	583
1 1/2 in.	4,420	3,030	2,440	2,090	1,850	1,680	1,540	1,430	1,350	1,270	1,130	1,020	938	873
2 in.	8,500	5,840	4,690	4,020	3,560	3,230	2,970	2,760	2,590	2,450	2,170	1,970	1,810	1,680
2 1/2 in.	13,600	9,310	7,480	6,400	5,670	5,140	4,730	4,400	4,130	3,900	3,460	3,130	2,880	2,680

4. Maximum Natural Gas Delivery Capacity (For 8 - 10.5 in. W.C. initial supply pressure)

3.0 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)													
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	90 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(21 m)	(24 m)	(27 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	454	312	250	214	190	172	158	147	138	131	116	105	96	90
3/4 in.	949	652	524	448	397	360	331	308	289	273	242	219	202	188
1 in.	1,790	1,230	986	844	748	678	624	580	544	514	456	413	380	353
1 1/4 in.	3,670	2,520	2,030	1,730	1,540	1,390	1,280	1,190	1,120	1,060	936	848	780	726
1 1/2 in.	5,500	3,780	3,030	2,600	2,300	2,090	1,920	1,790	1,680	1,580	1,400	1,270	1,170	1,090
2 in.	10,600	7,280	5,840	5,000	4,430	4,020	3,700	3,440	3,230	3,050	2,700	2,450	2,250	2,090
2 1/2 in.	16,900	11,600	9,310	7,970	7,070	6,400	5,890	5,480	5,140	4,860	4,300	3,900	3,590	3,340

5. Maximum Undiluted Propane (LP) Delivery Capacity in Thousands of Btu/h

0.5 in. W.C. Pressure Drop

Pipe Size	Length (including fittings)											
	10 ft	20 ft	30 ft	40 ft	50 ft	60 ft	80 ft	100 ft	125 ft	150 ft	175 ft	200 ft
	(3 m)	(6 m)	(9 m)	(12 m)	(15 m)	(18 m)	(24 m)	(30 m)	(38 m)	(45 m)	(53 m)	(60 m)
1/2 in.	291	200	160	137	122	110	101	94	89	84	74	67
3/4 in.	608	418	336	287	255	231	212	197	185	175	155	140
1 in.	1,150	787	632	541	480	434	400	372	349	330	292	265
1 1/4 in.	2,350	1,620	1,300	1,110	985	892	821	763	716	677	600	543
1 1/2 in.	3,520	2,420	1,940	1,660	1,480	1,340	1,230	1,140	1,070	1,010	899	814
2 in.	6,790	4,660	3,750	3,210	2,840	2,570	2,370	2,200	2,070	1,950	1,730	1,570

8 Connecting the DHW pipe

- Installation and service must be performed by a qualified plumber.
- In the Commonwealth of Massachusetts, this product must be installed by a licensed plumber or gas fitter in accordance with the Massachusetts Plumbing and Fuel Gas Code 248 CMR Sections 2.00 and 5.00.
- Observe all applicable codes.
- Components used in domestic piping must meet requirements in NSF/ANSI 61 Drinking Water System Components.

8.1 Installation

8.1.1 Guidelines

Installation location

- If the Combi Boiler is installed in a closed water supply system, such as one having a backflow preventer on the DHW cold water supply line, means shall be provided to control thermal expansion. Contact the water supplier or a local plumbing inspector on how to control this situation.
- If installing the Combi Boiler on a roof:
  If the Combi Boiler is installed on a roof to supply hot water to the levels below, make sure that the water pressure supplied to the Combi Boiler does not drop below 29 psi. It may be necessary to install a pump system to ensure that the water pressure is maintained at this level or to decrease the flow rate by adjusting the water fixture.
  Check the pressure before putting the Combi Boiler into operation.
  Failure to supply the proper pressure to the Combi Boiler may result in noisy operation, shorter lifetime of the Combi Boiler, and may cause the Combi Boiler to shut down frequently.

Potable water

- DHW Piping and components connected to the Combi Boiler shall be suitable for use with potable water.
- Toxic chemicals, such as those used for boiler treatment, shall not be introduced into the potable water.
- A Combi Boiler used to supply potable water may not be connected to any heating system or components previously used with a nonpotable water heating appliance.

Pressure Relief Valve

- A pressure relief valve must be installed near the DHW outlet that is rated in accordance with and complying with either The Standard for Relief Valves and Automatic Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22, or The ANSI/ASME Boiler and Pressure Vessel Code, Section IV (Heating Boilers).
- A pressure relief valve must be capable of an hourly Btu rated temperature steam discharge capacity of 199,900 Btu/h.
  Multiple valves may be used.
  The pressure relief capacity in DHW must not exceed 150 psi. (The pressure relief capacity on the heating pressure relief valve connection must not exceed 30 psig.)
- Do not install a shutoff valve between a relief valve and the Combi Boiler.
  The relief valve must be installed such that the discharge will be conducted to a suitable place for disposal when relief occurs.
- No reducing coupling or other restriction may be installed in the discharge line.
  The discharge line must be installed to allow complete drainage of both the valve and the line.
- If this Combi Boiler is installed with a separate storage vessel, the separate vessel must have its own temperature and pressure relief valve.
- Temperature and pressure relief valve must also comply with The Standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22 (in the U.S. only).
- A temperature relief valve is not required, but if one is used, do not install the valve with the probe directly in the flow of water.
  This may cause unwarranted discharge of the valve.
- When the system requires water for space heating at temperatures higher than required for other uses, a means such as a mixing valve shall be installed to temper the water for those uses in order to reduce scald hazard potential.

Connnecting water supply

- Flush water through the pipe to clean out metal powder, sand and dirt before connecting it.
- Use a union coupling or flexible pipe for connecting the pipes to reduce the force applied to the piping.

NOTE
- Do not use piping with a diameter smaller than the coupling.
- Avoid using joints as much as possible to keep the piping simple.
- Avoid piping in which an air holdup can occur.

Cold water supply

- Be sure to check the water pressure.
  - In order for the client to use the Combi Boiler comfortably, 15 to 150 psi* (103.4 to 1034 kPa) of pressure is needed from the water supply.
    * Recommended 30 psi for maximum

performance.
- If the water pressure is low, the Combi Boiler cannot perform to its full capability, and may become a source of trouble for the client.
- If the water pressure is too high, use a Pressure Reducing Valve and a Water Hammer Arrester.

- Recommend installing a pressure meter on the DHW inlet.
- Mount a check valve (near the DHW inlet) when required by local code.
- Mount a shut off valve (near the DHW inlet).

NOTE Do not use PVC, iron, or any piping which has been treated with chromates, boiler seal or other chemicals.

Hot water supply

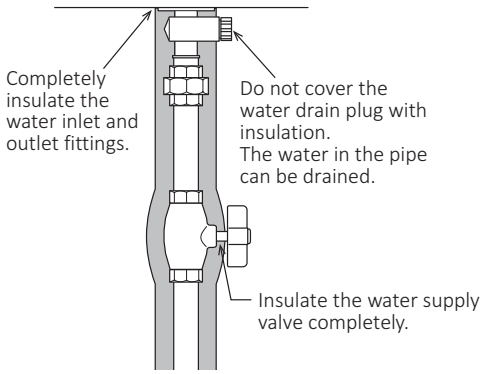
- Try to make the piping as short as possible. The longer the piping, the greater the heat loss.
- Use mixing valves with low water flow resistance.
- Use shower heads with low pressure loss.

NOTE Do not use lead, PVC, iron or any piping which has been treated with chromates, boiler seal or other chemicals.

8.1.2 Freeze Prevention

Perform the following insulation measures for prevention of freezing.

- Take appropriate heat insulation measures (e.g. wrapping with heat insulation materials, using heat tape, electric heaters, solenoids, or pipe covers) according to the climate of the region to prevent the plumbing external to the Combi Boiler from freezing.
  The freeze prevention heaters will not prevent this plumbing from freezing.
- Make sure that there are no water leaks from the cold and hot water supply lines, then insulate the pipes completely.
- Be sure to also completely insulate the water supply valve and the cold and hot water connections on the Combi Boiler.
- For temporary freeze protection measures, refer to the Owner's Guide.



Indoor Installation

- This Combi Boiler has functions to protect itself from freezing by operating the pump and turning on the burner when the thermistor detects lower than 39°F(4°C).
- Freezing is prevented within the Combi Boiler automatically unless the outside temperature without wind is below -30°F (-35°C).
- If this model is installed in an area where the outside temperature can approach freezing conditions of -30°F (-35°C) or below, then additional freeze protection measures must be used. For temporary freeze protection measures, refer to the Owner's Guide.

NOTE The room temperature must be greater than 32°F (0°C) to prevent freezing and the room inside must not have negative pressure.

Outdoor Installation

- For information about outdoor installation, contact Noritz America at 1-866-766-7489.

Both Indoor and Outdoor Installation

- The freeze prevention will not prevent freezing in the external plumbing of the unit.
  Protect this plumbing with insulation, heat tape or electric heaters, solenoids, or pipe covers.
- In order for the freeze prevention to operate, the unit must have power at all times.

NOTE Freeze damage is not covered by the warranty.

- Freezing is prevented within the Combi Boiler automatically unless the outside temperature without wind is below -4°F (-20°C).
- If this model is installed in an area where the outside temperature can approach freezing conditions of -4°F (-20°C) or below, then additional freeze protection measures must be used.

8.2 Water Treatment

If this Combi Boiler will be installed in a location where the hardness of the supply water is high, scale Build-up may cause damage to the Plate Heat Exchanger.
Perform suggested treatment and maintenance measures to be taken based on the water hardness level according to the below table.

Treatment Guidelines

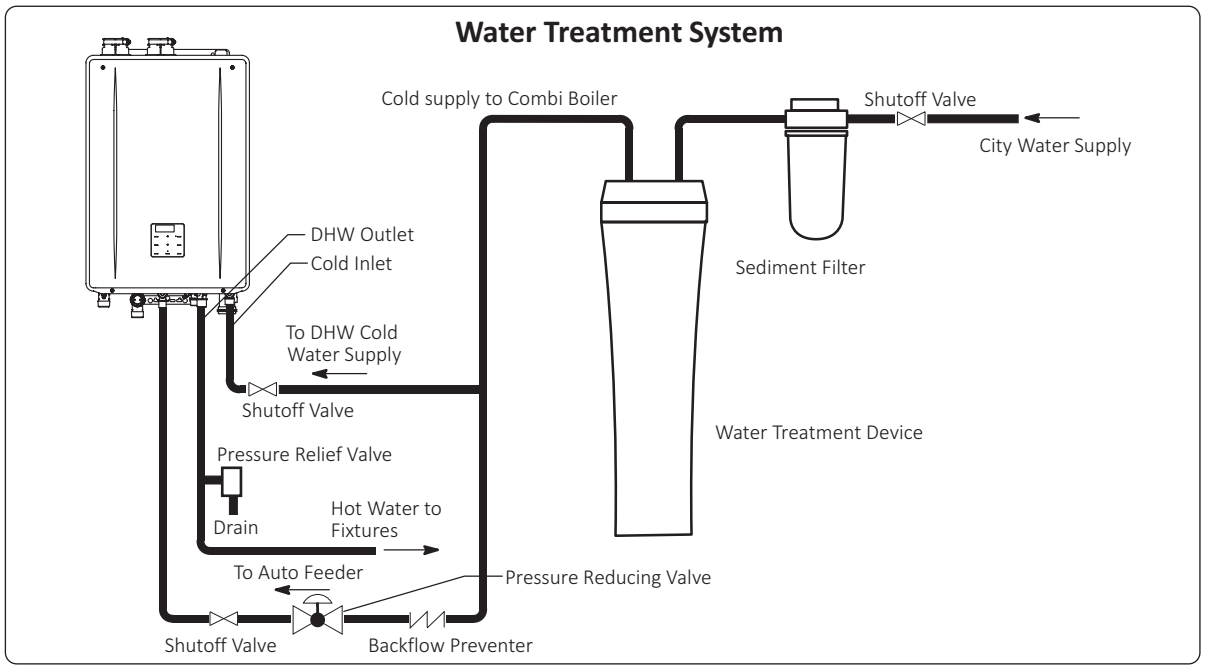
Type of Water	Hardness Level	Treatment Device*1	Flush Frequency*2
Soft	0-1 gpg (0-17 mg/L)	None	None
Slightly Hard	1-3 gpg (17-51 mg/L)		
Moderately Hard	3-7 gpg (51-120 mg/L)	Scale Shield or Water Softener	Once a Year*3
Hard	7-10 gpg (120-171 mg/L)		
Very Hard	10-12 gpg (171-200 mg/L)		
Extremely Hard	> 12 gpg (> 200 mg/L)		

*1 When selecting a treatment device, you must consult with the device's spec sheet and installation manual for guidelines and limitations.
Not all water supplies are compatible. A water test may be required.
*2 Install Isolation Valve to allow for flushing.
*3 Flushing is required if a water treatment device is not installed.

NOTE Damage to the Combi Boiler as a result of the items below is not covered by the Noritz America Limited Warranty.
- Water in excess of 12 gpg (200 mg/L) of hardness
- Poor water quality (See the Water Quality List on page 14).

Water treatment device

- The water must be treated with either the a Noritz Scale Shield or a water softener.
- Water softeners may be regulated by the local water jurisdiction, consult with the manufacturer for code, sizing, and installation guidelines.
  The below diagram is for reference only. For more information about Scale Shield, contact Noritz America at http://support.noritz.com/ or 1-866-766-7489.



The illustration is an example. Check with the actual Combi Boiler about the position of piping, and form.

Flushing the Plate Heat Exchanger

- The Plate Heat Exchanger regularly needs to be flushed to prevent damage from Scale Build-up. Refer to the “Procedure for flushing the Plate Heat Exchanger” on page 82 or contact Noritz America at http://support.noritz.com/ or 1-866-766-7489.

9 Connecting the Heating Pipe

⚠ WARNING

Immediately repair any leaks in the system plumbing to avoid the addition of make-up water, make-up water provides a source of oxygen and minerals that may lead to heat exchanger failure to follow these instructions will result in poor performance, unnecessary wear of system components and premature failure.

9.1 General Requirements

System Pressure

- The Combi Boiler is intended solely for use in pressurized closed loop heating systems operating with 12-30 psi water pressure at the Combi Boiler outlet.
- To obtain the minimum system design pressure, follow the piping diagrams illustrated in this section.
- The Combi Boiler's Heating system is not approved for operation in an "open system", thus it cannot be used for direct potable water heating or to process heating of any kind.

Backflow Preventer

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

Expansion Tank

An expansion tank must be installed in the heating piping to prevent excessive from building in the system.
See the examples of system application at the end of this section for the installation location.
Refer to the expansion tank manufacturer's instructions for additional details.
Follow the guidelines below when installing an expansion tank.

- Connect an air separator to the expansion tank only if the air separator is located on the suction side of the system circulator.
- The Combi Boiler is equipped with an auto-feeding water connection and motorized feeding valve.
  Therefore, installation of additional system water fill connection is not necessary in most cases.
- If an additional water fill connection is required for a specific use, install the water fill connection at the same location as the expansion tank's connection to the system.
- When replacing an expansion tank, consult the expansion tank manufacturer's literature for proper sizing.
- For diaphragm expansion tanks, always install an automatic air vent on the top side of the air separator to remove residual air from the system.

Oxygen Elimination

This Combi Boiler may only be installed in a pressurized closed-loop heating system, free of air (oxygen) and other impurities.
To avoid the presence of oxygen, ensure all of the air is removed from the system during commissioning via strategically placed and adequately sized air removal devices, located throughout the heating system.

9.2 Low Water Cutoff (LWCO)

Internal of the Combi Boiler

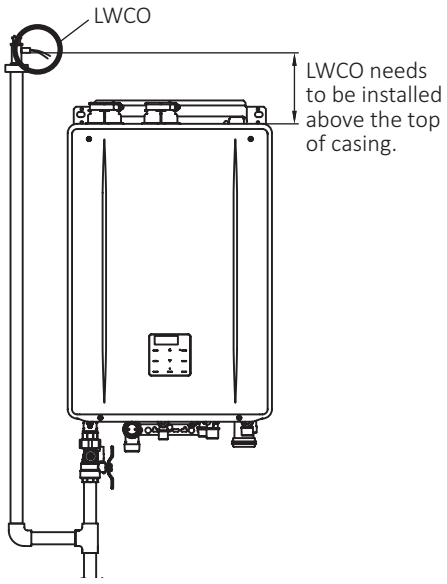
- The Combi Boiler is equipped with a factory installed, pressure sensor type low water cutoff device.
- The lowest operation pressure for this device is 8 psi. (operation pressure = (default valve 12 psi)-(4 psi))
  The Combi Boiler performs water replenishment automatically when the built-in water pressure sensor detects insufficient water level in the Combi Boiler system.

External of the Combi Boiler

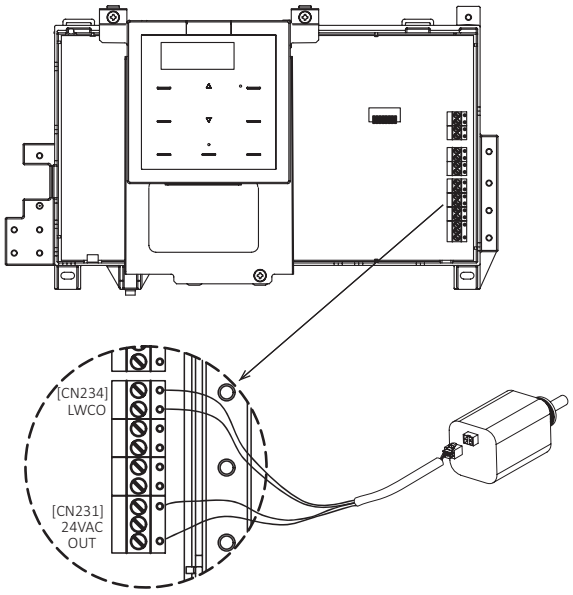
- Low water cutoffs shall comply with the Safety Standard for Limit Controls, ANSI/UL 353, or the Standard for Temperature Indicating and Regulating Equipment, CAN/CSA C22.2, No. 24, as applicable. The following illustrates example of typical LWCO installation.
- Install the probe above the minimum safe water level.

  NOTE This may be in a tapping on the Combi Boiler or in the Combi Boiler supply or return piping.

- Install the probe to extend into the Combi Boiler cavity or piping to make contact with the water.
- Low water cutoffs shall be located so as to provide adequate access for cleaning, repairing, testing and inspection.



- Remove the factory installed jumper on the LWCO terminals (CN234) prior to connecting the LWCO.
- The Combi Boiler supplies 24 VAC from the terminal (CN231) (see below illustration).

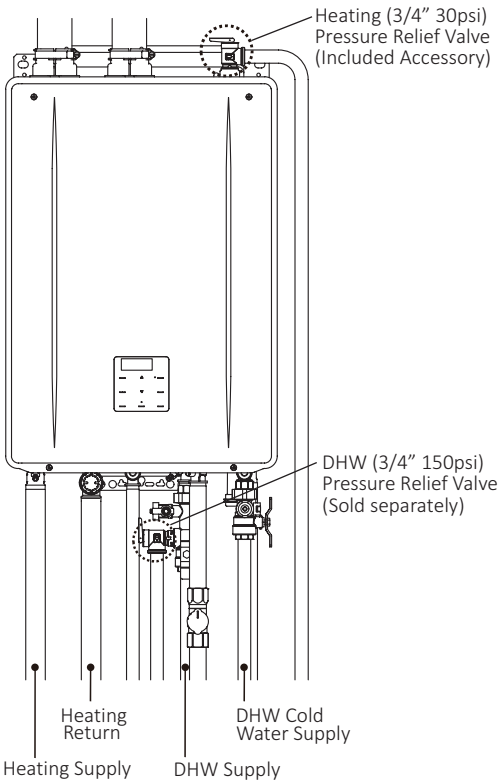


9.3 Pressure Relief Valve

- External pressure relief valve must be installed. Observe the following. Failure to comply with the guidelines on installing the pressure relief valve and discharge piping can result in personal injury, death or substantial property damage.

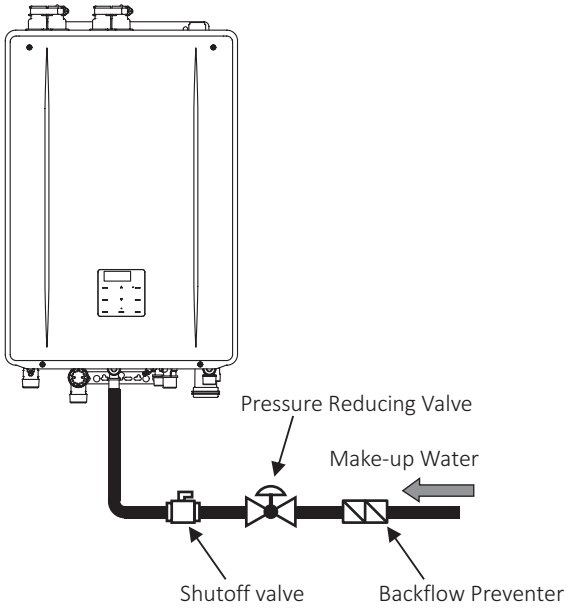
  NOTE DO NOT install a relief valve (DHW pipe line) with pressure higher than 150 psi and relief valve (Heating pipe line) with pressure higher than 30 psi. This is the maximum allowable relief valve setting for the Combi Boiler.

- Approved "Pressure Relief Valve" must be used. An approved ASME HV Valve must be installed on the DHW supply line for hydronic domestic hot water loop as close to the unit as possible. (Valve size 3/4", maximum 150 psi) Refer to the figure below for more information on approved pressure relief valves. (Install "pressure relief valve", Field Supplied).
- No other valve should be installed between the pressure relief valve and Combi Boiler.
- Direct the discharge piping of the pressure relief valve so that hot water will not splash on anyone or any nearby equipment. Attach the discharge line to the pressure relief valve and run the end of the line to within 6- 12" (150- 300 mm) of the floor.
- Isolation Valve should be installed, sold separately.



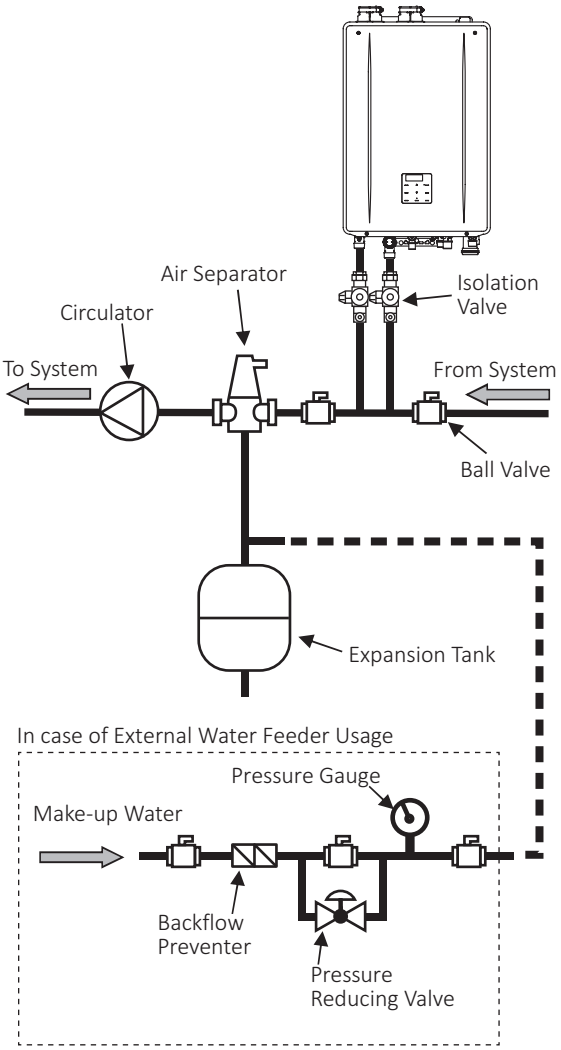
9.4 Auto Feeder Connection

- The Combi Boiler is equipped with an auto feeder valve.
  Therefore, installation of additional system water fill connection is not necessary in most cases.
  See the following figure for an example of a water fill installation using the built-in connection.



NOTE Even though this Combi Boiler is equipped with an auto feeder valve, it may not be enough to fill the whole heating system (e.g. pipes, appliance, each zone) with water.
The built-in Auto Feeder will be used for filling primary loop and maintaining the system pressure.
Therefore, the manufacturer recommends to fill the whole heating system with water and to purge all air from the whole system manually.
DO NOT fire up the Combi Boiler before filling the entire system.
Refer to the page 68 for water filling procedure.

- External water feeder may be installed on the system piping if it is required for specific applications. See the following figure for an example of external water feeder installation on the system piping.
- If the heating system does not require the Auto Feeder (the internal water feeder) operation, plug the Auto Feeder Water Inlet Connection. And set "Auto Feeder Activation" OFF.
  * Refer to page 62 for changing "Auto Feeder Activation" Setting.



9.5 Freeze Prevention

9.5.1 Unit

Indoor Installation

- This Combi Boiler has functions to protect itself from freezing by operating the pump and turning on the burner when the thermistor detects lower than 39°F (4°C).
- Freezing is prevented within the device automatically unless the outside temperature without wind is below-30°F (-35°C).
  * When combustion air is supplied from the indoors, the room temperature must be greater than 32°F (0°C) to prevent freezing and the room inside must not have negative pressure.
- If this model is installed in an area where the outside temperature can reach freezing conditions of-30°F (-35°C) or below, then additional freeze protection measures must be used. For temporary freeze protection measures, refer to the Owner's Guide.

Outdoor Installation

For information about outdoor installation, contact Noritz America at 1-866-766-7489.

Both Indoor and Outdoor Installation

- The freeze prevention will not prevent freezing in the external plumbing of the unit.
  Protect this plumbing with insulation, heat tape or electric heaters, solenoids, or pipe covers.
- In order for the freeze prevention to operate, the unit must have power at all times.

⚠ CAUTION

- Freezing is prevented within the Combi Boiler automatically unless the outside temperature without wind is below -4°F (-20°C).
- If this model is installed in an area where the outside temperature can approach freezing conditions of -4°F (-20°C) or below, then additional freeze protection measures must be used.

9.5.2 Heating System

- Freeze protection products may be used for the heating system. Freeze protection for new or existing systems requires specially formulated glycol, which contains inhibitors to prevent the glycol from attacking the metallic system components.
- Before using freeze protection products, ensure that system fluid contains proper glycol concentration and the inhibitor level is appropriate. It is recommended that against exceeding a 35% concentration of glycol.
- When using freeze protection products, the system must be tested at least once a year, and as recommended by the manufacturer of the glycol solution.
- When using the freeze protection products, allowance should be made for expansion of the glycol solution.

NOTE Freeze damage is not covered by the warranty.
When using freeze protection products, it is recommended to plug the Auto Feeder Water Inlet Connection and set "Auto Feeder Activation" OFF.
* Refer to page 62 for changing "Auto Feeder Activation" Setting.

10 Connecting the Condensate Drain

Condensing Combi Boiler

- In order to ensure proper operation of this Combi Boiler, need to install the condensate drain pipe to drain acidic condensate which produces during operation.
- The pH level of the condensate is approximately 2-3.
  An external neutralizer must be installed on the condensate drain piping prior to disposal when required by local code or when the condensate could cause damage.

NOTE Damage caused by improperly handled condensate is not covered by the Noritz America Limited Warranty.

Location of the condensate drain piping

In climates where temperature routinely reaches below freezing, do not drain the condensate to the outdoors.
If the condensate drain pipe freezes during cold weather, the pipe will not drain condensate and the Combi Boiler will stop operating.

Material of the condensate drain piping

Use plastic pipe, such as PVC, for the drain line.

NOTE Do not use steel, black iron, or any other material which can corrode when placed into contact with acidic condensate.

Sizing of the condensate drain piping

In order to drain the condensate, a 1/2 in. threaded fitting is provided at the base of the Combi Boiler.

NOTE Do not reduce the size of the fitting or the condensate drain piping to less than 1/2 in.

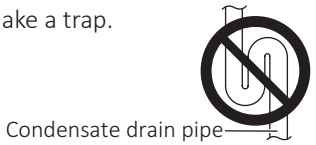
Long runs or applications where the nearest drain is above the Combi Boiler

Require the use of a condensate pump.
Size the pump to allow for a maximum condensate discharge of 2 GPH from the Combi Boiler.

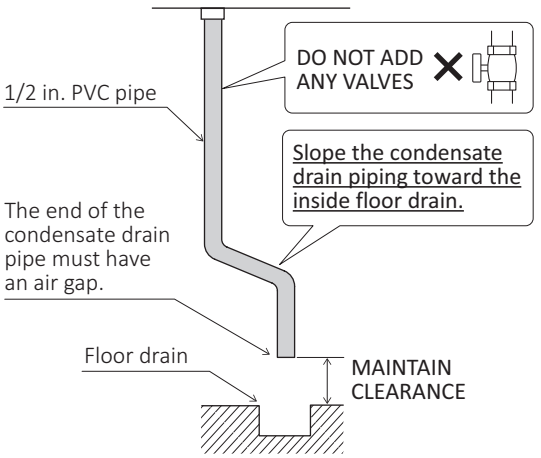
Condensate drain piping

Make the condensate drain piping run as short as possible.

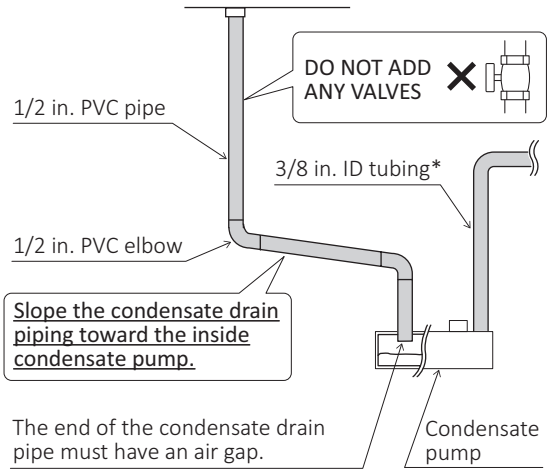
NOTE Do not make a trap.



[Condensate drain piping to floor drain]



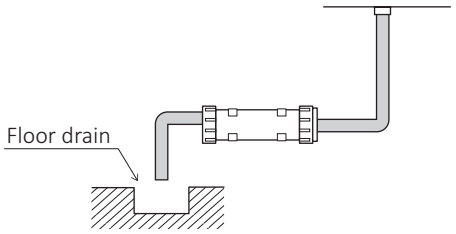
[Condensate drain piping with pump]



* Install tubing according to pump manufacturer's instructions.

[If an external neutralizer is installed]

Periodic replacement of the neutralizing agent will be required.
Refer to the instructions supplied with the neutralizer for suggested replacement intervals.

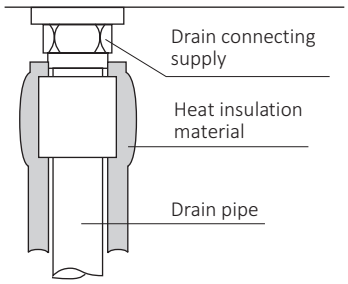


After installing the condensate drain piping

- Make sure that there are no obstructions blocking the condensate drain line from discharging condensate.
- Be sure to check that condensate is freely flowing from the condensate drain piping.
  Condensate will begin flowing out of the Combi Boiler **within 15 minutes after operation has started**.

Freeze prevention

Take measures to prevent the condensate drain lines from freezing (insulation, heat tape, electric heaters, etc.).



11 Connecting Electricity

Consult a qualified electrician for the electrical work.

11.1 Combi Boiler

This appliance must be electrically grounded in accordance with local codes, or in the absence of local codes, with the National Electrical Code, ANSI/ NFPA 70. In Canada, the latest CSA C22.1 Electrical Code.

⚠ WARNING

Electrical Shock Hazard
Do not connect the electrical power to the appliance until all electrical wiring has been completed.
Failure to do so may result in death or serious injury from electrical shock.

⚠ CAUTION

- Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.
  Verify proper operation after servicing.
- Electrostatic discharge can affect electronic components.
  Take precautions to prevent electrostatic discharges from personnel or hand tools during the Combi Boiler installation and servicing to protect product's electronic control.

Power Supply

- The electrical supply required by the Combi Boiler is 120 VAC at 60 Hz.
  The power consumption may be up to 210 W or higher if using optional accessories.
  Use an appropriate circuit.
- Tie the redundant power cord outside the Combi Boiler. Putting the redundant length of cord inside the Combi Boiler may cause electrical interference and faulty operation.

NOTE
- Do not let the power cord contact the gas piping.
- Do not disconnect the electrical power when not in use. When the power is off, the freeze prevention in the Combi Boiler will not activate, resulting in possible freezing damage.

Ground

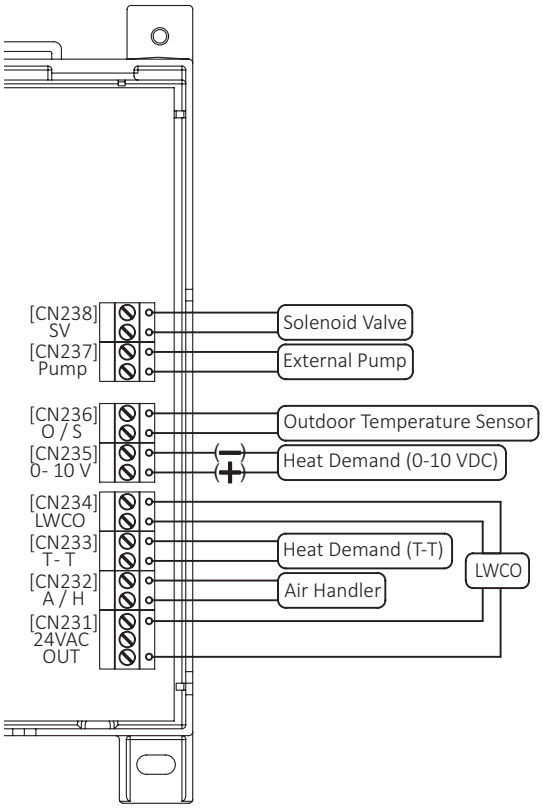
To prevent electrical shock, provide a ground with resistance less than 100 Ω.
An electrician should do this work.

NOTE
- Do not connect the ground to the city water or gas piping.
- Do not tie the ground to a telephone line.

Breaker Installation

Mount a device which shuts off the electrical path automatically (leakage breaker) to detect electrical leakage.

Wiring Diagram for External Options



	Connection Item	Pages	Note
[CN231] 24VACOUT	24 VAC for LWCO	44-45	
[CN232] A/H *	Air Handler	61, 78	
[CN233] T-T	Heat Demand Input (T-T)	76-78	
[CN234] LWCO	LWCO	44-45	The factory installed a jumper on the terminals.
[CN235] 0-10V	Heat Demand Input (0-10 VDC)	57-58	This terminal has electrical polarity.
[CN236] O/S	Outdoor Temperature Sensor	53-56	
[CN237] Pump **	External Pump	61, 76, 78	120 VAC / Max 2.0 A
[CN238] SV	Solenoid Valve for Quick Connect Multi System	51-52, 80	120 VAC / Max 1.5 A

* Air Handler Terminal: [I:08_Air] should be “on” in Installer Mode to activate this terminal.
** External Pump Terminal: [I:09_EP] should be “on” in Installer Mode to activate this terminal.

11.2 Quick Connect Cord

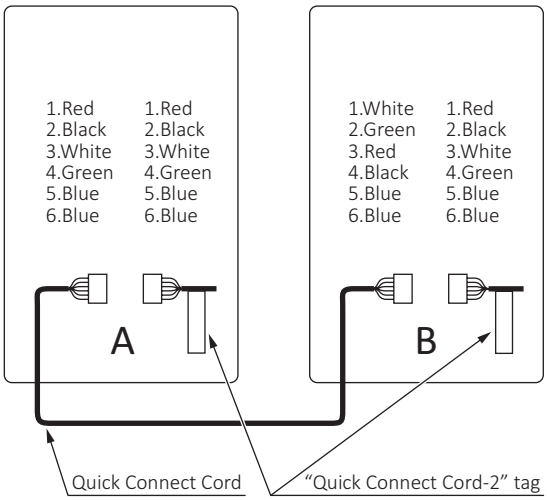
NOTE The Quick Connect Multi System allows the installation of two units together utilizing only the Quick Connect Cord (QC-2).
For Quick Connect Multi-System installation only use the Quick Connect Cord (QC-2), sold separately (See the optional accessory list on page 5).

⚠ WARNING

Electrical Shock Hazard
Do not turn power on until electrical wiring is finished. Disconnect power before servicing. Failure to do so may result in death or serious injury from electrical shock.

NOTE When connecting two units, use only the Combi Boiler’s Operation Display. This system is operated by the Combi Boiler’s Operation Display. Don’t connect the remote controller to the other unit.

- The wire coloring on the Quick Connect Cord will not be the same as the wire coloring of the connection plug inside the unit.

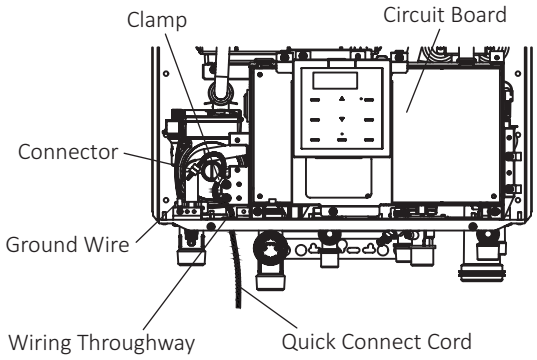


Connecting the Quick Connect Cord

1. Check the electrical power is disconnected from the both units.
2. Remove the front cover (4 screws).
3. Pass the Quick Connect Cord through the wiring throughway and into the unit.
4. Plug the connector on the Quick Connect Cord to the connector inside the unit.
5. Connect the ground wire (gray color wire) to the screw at the base of the unit.

NOTE If the ground wire is not attached, electrical noise may cause problems.

6. Secure the Quick Connect Cord with a clamp.
7. Reattach the front cover (4 screws).

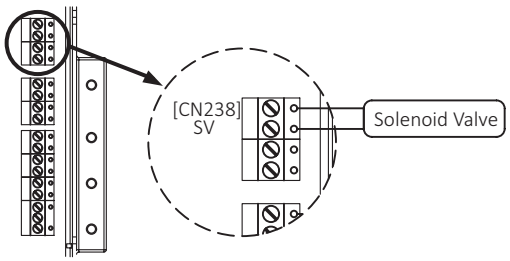


* Connecting the cord to the other unit, refer to the unit's Installation Manual.

Specifications for a solenoid valve

- Pipe size: 3/4 in.
- Voltage: 120 VAC
- Current: Max 1.5 A
- Normally closed (Closed when de-energized)

* A slow-closing solenoid is recommended to prevent water hammer from occurring.



Check the Quick Connect Multi System Installation

After install the Quick Connect System, do the following step to check proper installation.

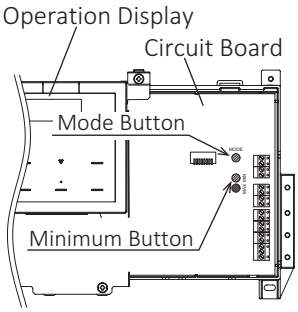
1. The **ON/OFF button** is ON.
2. Press the **MAINTENANCE button**.

(td: technical data)

3. Press the **ENTER button** to view the "Technical Data".

(Data No. 03) (e.g.: 100)

4. Press the △ / ▽ **buttons** to navigate through the "Technical Data".
   * Pressing and holding the button to change it in increments of 10.
5. Check the Quick Connect Cord connection.
   - Select 74, then check 002 appears.
   - If 001 appears, check the Quick Connect Cord connection.
6. Open the front cover and a hot water fixture. Press and hold the "Mode" and "Minimum" Buttons on the Circuit Board simultaneously for more than 3 seconds.
   Check step 7 within 30 minutes.



7. Check the Combi Boiler operation.
   - Select 75, then check 002 appears.
   - If 001 appears, check the plumbling and the Solenoid Valve.
     When you are done, press the "Mode" Button for more than 3 seconds, then close the hot water fixture and the front cover.
8. Press the **BACK button** twice or let it sit for approximately 10 minutes to return to the home screen.

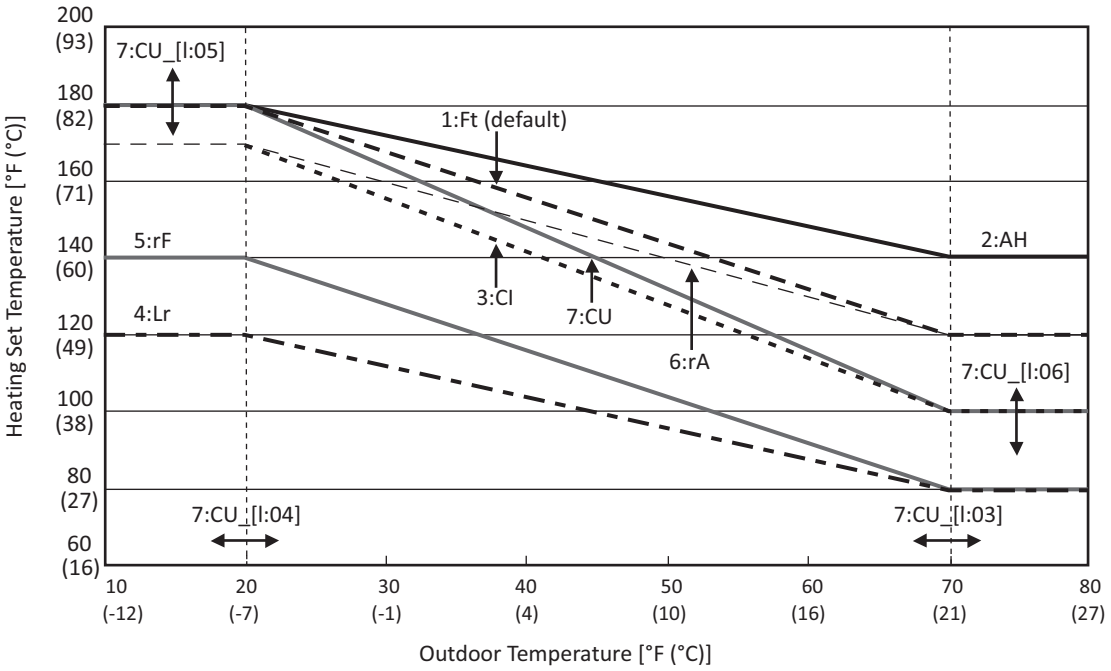
NOTE The Water Heater can be set as the master unit in the quick connect multi system. The master unit controls the DHW ON/OFF status of the Combi Boiler in the system. Once turned on by the master unit, the Combi Boiler will operate in stages to satisfy the DHW demands.

* Please contact Noritz America at 1-866-766-7489 if you have any questions or concerns.

11.3 Outdoor Reset Control with Outdoor Temperature Sensor

Outdoor Reset Control

- The Outdoor Reset Control feature may be used to enhance energy efficiency while maintaining optimal heating performance.
  With the Outdoor Reset Control, the heating temperature setting automatically changes according to the outdoor temperature and the current heating system application.
- There are various pre-defined temperature range options available to assist matching the system heat load with the applicable outdoor temperature range.
- The built in outdoor reset control provides simple heating curve selection based upon pre-defined Combi Boiler set temperature ranges determined by the type of heating application. This can be adjusted either by selecting the appropriate menu option, or by utilizing the fully customizable mode.lor wire) to the screw at the base of the unit.



NOTE The optimal set up should be determined for each job location.
[7:CU] default setting: Max Temperature: 180°F, Min Temperature: 100°F

Setting the Outdoor Reset Control Mode [I:01_HCt]

1. Connect Outdoor Temperature Sensor to terminal. (Refer to pages 55, 56 for details.)
2. The **ON/OFF button** is OFF.
   The Operation Display must be off.
3. Press the **SETTING button**.
   Select 2:n using the △ / ▽ **buttons**, and then press the **ENTER button**.
   - The "Installer Mode" screen appears.
4. When entering the "Installer Mode", display will change to
   1:01 1 sec. HCt , or
   1:00 1 sec. FC .
   - This function will appear within the first 10 minutes of connecting electrical power and before pressing the **ON/OFF button**.
5. When display shows 1:00 after 1sec. FC , press the △ / ▽ **buttons** to navigate 1:01 1 sec. HCt in the "Installer Mode".
6. Select 1:01 1 sec. HCt , then press the **ENTER button** to enter the function.
   1:St
   (St: Standard)
7. Press the △ / ▽ **buttons** to change the parameter value 2:or , and then press the **ENTER button** to save the settings and to exit the function.
   And additional menu items will become available to adjust.
   - The icon will flash if the outdoor sensor is not detected.

Adjusting Outdoor Reset Control Options

1. The **ON/OFF button** is OFF.
   The Operation Display must be off.
2. Press the △ / ▽ **buttons** to navigate 1:02 1 sec. t HS in the "Installer Mode".
3. Select 1:02 1 sec. t HS , and then press the **ENTER button** to enter the function.
4. Press the △ / ▽ **buttons** to navigate into desired system.

Types of Heating System

Type of Heating System	Screen Display	Temperature (°F)		Temperature (°C)	
		LOW	HIGH	LOW	HIGH
[1:Ft] (Default) Fin Tube Baseboard	1:Ft	120	180	49	82
[2:AH] Air Handler	2:AH	140	180	60	82
[3:CI] Cast Iron Baseboard	3:CI	100	170	38	76
[4:Lr] Low Mass Radiant Floor	4:Lr	80	140	27	60
[5:rF] Mass Radiant Floor	5:rF	80	120	27	49
[6:rA] Radiator	6:rA	120	170	49	76
[7:CU] Custom	7:CU	100*	180*	38*	82*

* Factory Default.

5. When you are done, press the **ENTER button** to save the settings and to exit the function. If you select 7:CU , refer to page 55, 59-61.
6. To exit the "Installer Mode" or another function, press the **BACK button**.

Customized Settings

1. The **ON/OFF button** is OFF.
   The Operation Display must be off.
2. Select 
   (Refer to page 54 for Adjusting Outdoor Reset Control Options.)
3. (e.g. To set Highest Outdoor Temperature)
   Press the △ / ▽ **buttons** to navigate  in the "Installer Mode".

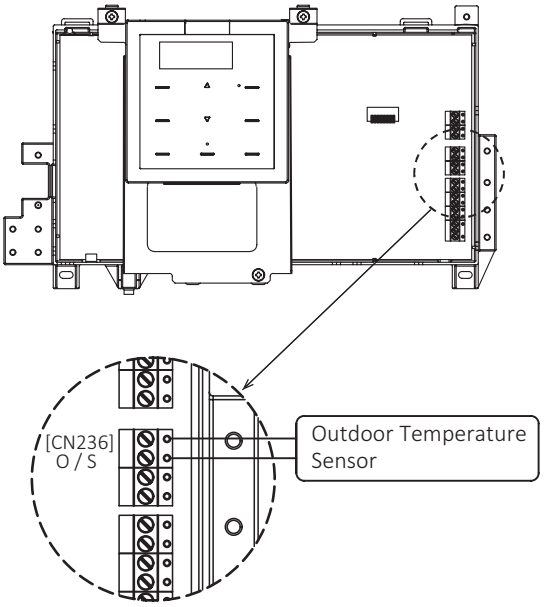
   Installer Mode [I:03_Hot] : Highest Outdoor Temperature
   Installer Mode [I:04_Lot] : Lowest Outdoor Temperature
   Installer Mode [I:05_HHt]: Heating High Temp Range
   Installer Mode [I:06_HLt] : Heating Low Temp Range

4. Select  , and then press the **ENTER button** to enter the function.

   
   (Default setting = 70°F)
5. Press the △ / ▽ **buttons** to navigate into desired temperature.
6. Press the **ENTER button** to save the settings and to exit the function.
   - The others are similar to the above mentioned method.

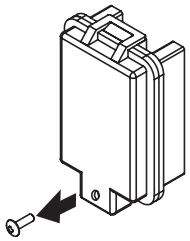
Outdoor Temperature Sensor Installation Guidelines

- Avoid areas with direct sunlight and where temperatures may not be representative of true outdoor temperature.
- Avoid placing sensor in close proximity of heat sources that may affect correct temperature sensing. (fans, exhausts, vents, lights)
- Avoid installing the sensor in areas where the sensor is subjected to excessive moisture.
- Make sure wiring connections are secure before closing the cap.
- The sensor is a water resistant device.
- Any damage to the device may require the replacement of the entire component.
- If the system requires a fixed operating temperature, the outdoor sensor is not required and should not be installed.
  There is no connection required if an outdoor sensor is not used in the installation.
- Use a minimum 22 AWG wire for runs of 100 ft or less and minimum 18 AWG wire for runs of up to 150 ft.
- Mount the outdoor sensor on an exterior surface of the building, preferably on the North or Northeast side, in an area that will not be affected by direct sunlight or will be exposed to varying weather conditions.
- For correct mounting procedures, follow instructions provided with the sensor.
- If sensor wires are located in an area with sources of potential electromagnetic interference (EMI), the sensor wires should be shielded, or the wires routed in a grounded metal conduit.
  If using shielded cable, the shielding should be connected to the common ground of the appliance.

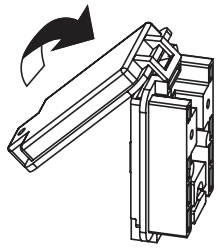


Outdoor Temperature Sensor Installation

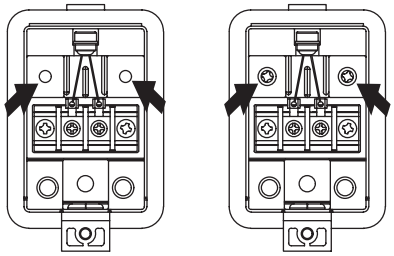
1. Loosen the screw by hand using a Phillips screwdriver indicated in the figure.



2. Remove the cover by lifting it and pulling it outward.

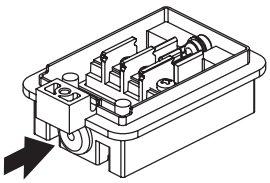


3. Mount the outdoor sensor onto an exterior surface of the building with the supplied screws (2 pcs) by hand using a Phillips screwdriver.

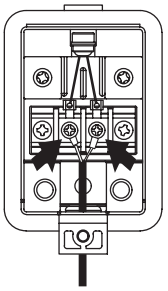


- if neccesarry, use anchors(Included Accessory).

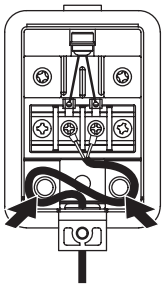
4. There is a through hole to pass wire into the case.



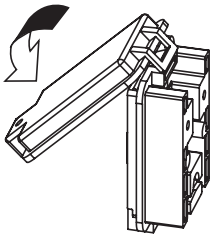
5. After leading wire into the case, connect wire to the terminal by hand using a Phillips screwdriver.



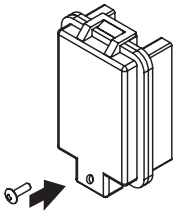
6. You can use two knobs to relieve stress of wire.



7. Replace the cover.
The hook should be attached to the stopper.



8. Tighten the screw by hand using a Phillips screwdriver indicated in the figure.

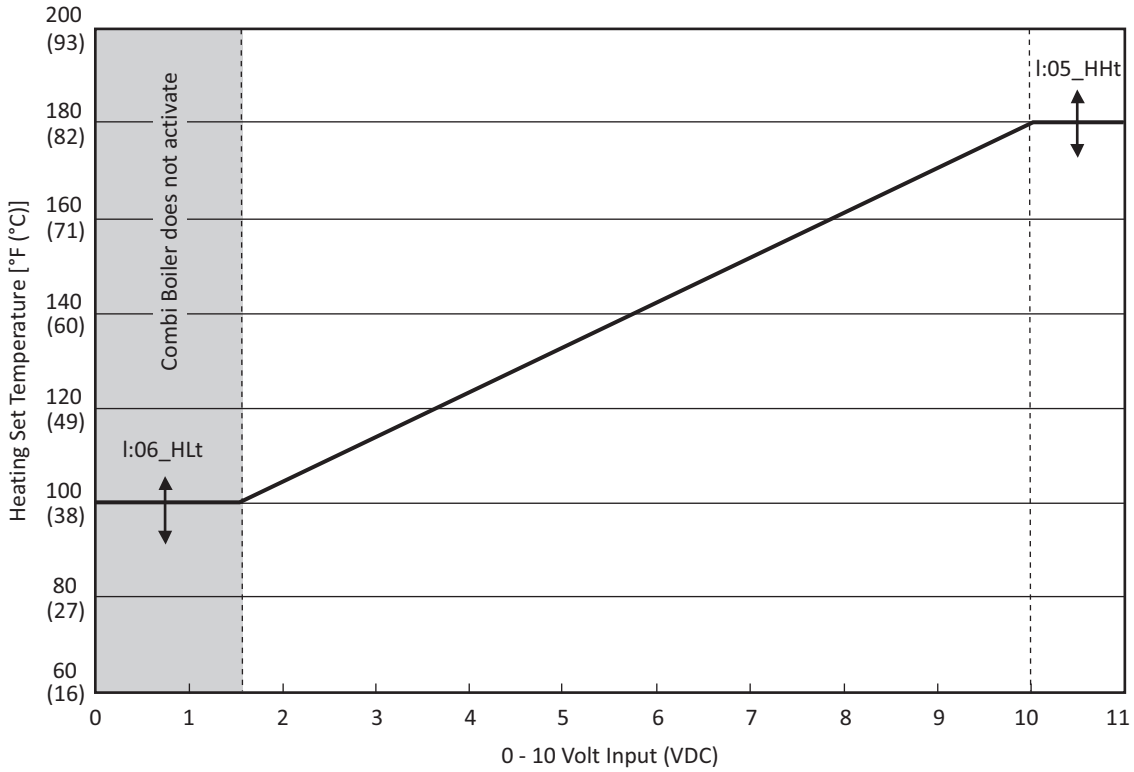


Outdoor Reset Control [0-10 Volt Input Control]

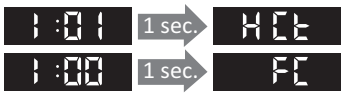
- The Outdoor Reset Control feature may be used to enhance energy efficiency while maintaining optimal heating performance.
  With the Outdoor Reset Control, the heating temperature setting automatically changes according to the voltage input from external controller that is decided by outdoor temperature.
- Blinking on the Operation Display is not an Error Code.
- is lit on the Operation Display, when the Combi Boiler receive 1.5 VDC or more and the Outdoor Reset (Energy Saving) is enabled.
- A signal from external (i.e. building management system) may be connected to the Combi Boiler to enable remote control.
  This signal should be a 0-10 volt positive DC signal. When this input is enabled (1.5 VDC or more), an external control system can be used to control the set point temperature of the Combi Boiler.
- The control interprets the 0-10 volt signal as follows; when the signal is between 0 and 1.5 volts, the Combi Boiler will be in standby mode, not firing [Blinking on the Operation Display. This is not an Error Code.]
  When the signal rises above 1.5 volts, the Combi Boiler will ignite. As the signal continues to rise towards its maximum of 10 volts, the Combi Boiler will increase the set point temperature.
- Connect an external control system to the terminals marked for this purpose on the Combi Boiler terminal block (refer to page 58). Caution should be used to ensure that the 0-10 volt connection does not become connected to ground.

NOTE

- Ensure that the polarity of the connections from the external modulating controller to the Combi Boiler is correct.
  Reversed polarity could lead to erratic and/or no response from the Combi Boiler controller.
- will flash if an external control system does not supply 1.5 VDC or more.



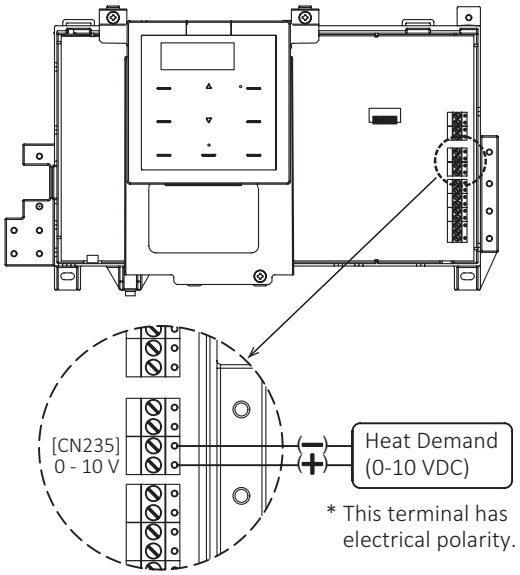
Setting the Outdoor Reset Control
[0-10 Volt Input control] - [I:01_HCt]

1. Connect Heat Demand (0-10 VDC) to terminal. (Refer to the figure on the right for details.)
2. The **ON/OFF button** is OFF.
   The Operation Display must be off.
3. Press the **SETTING button**.
   Select  using the △ / ▽ **buttons**, and then press the **ENTER button**.
   - The "Installer Mode" screen appears.
4. When entering the "Installer Mode", display will change to
   

   , or .
   - This function will appear within the first 10 minutes of connecting electrical power and before pressing the **ON/OFF button**.
5. When display shows  after 1sec.  , press the △ / ▽ **buttons** to navigate  in the "Installer Mode".
6. Select  , then press the the **ENTER button** to enter the function.
   
   (St: Standard)
7. Press the △ / ▽ **buttons** to change the parameter value  , and then press the **ENTER button** to save the settings and to exit the function.
   - The icon will flash if the Heat Demand Input (0-10 VDC) is not detected.

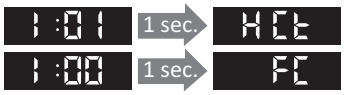
- Do NOT connect room thermostat to heat demand (T-T) when an external control system is connected.
  * The Combi Boiler is activated only by receiving voltage.

NOTE DO NOT mix [Room Thermostat Control], [External Voltage Control System (without Room Thermostat)] and [Outdoor Temperature Control with Outdoor Temperature Sensor and Room Thermostat]



12 Installer Mode (Parameter Settings)

How to enter "Installer Mode"

1. The **ON/OFF button** is OFF.
   The Operation Display must be off.
2. Press the **SETTING button**.
   Select  using the △ / ▽ **buttons**, and then press the **ENTER button**.
   - The "Installer Mode" screen appears.
3. When entering the "Installer Mode", display will change to
   
   , or

   .
   - This function will appear within the first 10 minutes of connecting electrical power and before pressing the **ON/OFF button**.
4. Press the △ / ▽ **buttons** to navigate into the desired function in the "Installer Mode".
5. Select the desired function, then press the the **ENTER button** to enter the function.
6. Press the △ / ▽ **buttons** to change the parameter value.
7. When you are done, press the **ENTER button** to save the settings and to exit the function.
8. To exit the "Installer Mode" or another function, press the **BACK button**.

Parameter Settings

[I:00_FC (Fahrenheit/Celsius)]

This mode is for changing temperature and flow rate units on the Operation Display.
To change the setting: Press and hold the △ or ▽ **button** for approximately 5 seconds.
(°F→°C: △ **button**, °C→°F: ▽ **button**)

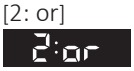
[1: F] 	F: Fahrenheit & Gallon All of the units shown on the display screen are °F & GPM.
[2: C] 	C: Celsius & Liter All of the units shown on the display screen are °C & LPM.

(Default setting = 1: F)

NOTE This function will appear within the first 10 minutes of connecting electrical power and before pressing the **ON/OFF button**.

[I:01_HCt (Heating Control Type)] (page 53,57)

This mode is for changing heating control type.

[1: St] 	St: Standard You can change the Heating Set Temperature by Operation Display.
[2: or] 	or: Outdoor Reset Control Outdoor Reset Control is activated.
[3: EC] 	EC: External Control (0-10 V) External Control (0-10 V) is activated.

(Default setting = 1: St)

[I:02_tHS (Type of Heating System)] (page 53-56)

This mode is for choosing Type of Heating System, when [I:01_HCt] setting is "2:or".
There are 6 typical Heating Systems that are available.
For these 6 heating types the low and high temperature points are pre-programmed.
(See ranges to the below)
If "2:AH" is selected, additional steps are needed to be programmed, see [I:08_Air].
To use custom low and high temperature points, select "7:CU" and follow [I:03_Hot], [I:04_Lot], [I:05_HHt] and [I:06_HLt] to set custom low and high temperature points.

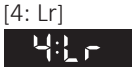
	LOW [°F (°C)]	HIGH [°F (°C)]
1:Ft	120 (49)	180 (82)
2:AH	140 (60)	180 (82)
3:CI	100 (38)	170 (76)
4:Lr	80 (27)	140 (60)
5:rF	80 (27)	120 (49)
6:rA	120 (49)	170 (76)
7:CU	80 (27) or more [Max Set-point- 30 (17)]	[Min Set-point +30 (17)] or more 180 (82)

[1: Ft] Ft: Fin Tube Baseboard

[2: AH] AH: Air Handler

[3: CI] CI: Cast Iron Baseboard

[4: Lr] Lr: Low Mass Radiant Floor



[5: rF] rF: Mass Radiant Floor

[6: rA] rA: Radiator

[7: CU] CU: Custom

(Default setting = 1: Ft)

NOTE When [I:01_HCt] setting is "1:St" or "3:EC", this function will not appear.

[I:03_Hot (Highest Outdoor Temperature)] (page 53)

This should be set to the highest average outdoor temperature during the winter season.
(not the highest possible outdoor temperature.)

settings:
[Min Set-point + 10°F (5°C)] or more 110°F (43°C)

(Default setting = 70°F (21°C))

[I:04_Lot (Lowest Outdoor Temperature)] (page 53)

This should be set to the lowest average outdoor temperature during the winter season.
(not the lowest possible outdoor temperature.)

settings:
-4°F (-20°C) or more [Max Set-point- 10°F (5°C)]

(Default setting = 20°F (-7°C))

[I:03_Hot] and [I:04_Lot] are for changing the highest and the lowest outdoor temperature range. You can set the Highest Outdoor Temperature [I:03_Hot] and the Lowest Outdoor Temperature [I:04_Lot], when [I:02_tHS]_"7:CU" is selected.

NOTE When [I:02_tHS] setting is "7:CU", [I:03_Hot] and [I:04_Lot] functions will appear.

[I:05_HHt (Heating High Temp Range)]
(page 53,57)

settings:
[Min Set-point + 30°F (17°C)] or more 180°F (82°C)

(Default setting = 180°F (82°C))

[I:06_HLt (Heating Low Temp Range)]
(page 53,57)

settings:
80°F (27°C) or more [Max Set-point- 30°F (17°C)]

(Default setting = 100°F (38°C))

[[I:05_HHt] and [I:06_HLt] are for changing the heating high temperature range and low temperaturerange.
You can change the Highest Set Temperature [I:05_HHt] and the Lowest Set Temperature [I:06_HLt] by adjusting the numbers on the display.
If [I:01_HCt]_"2:or" is selected then the settings for [I:05_HHt] and [I:06_HLt] will beoverridden by [I:02_tHS] settings. (except below)

If [I:02_tHS]_"7:CU" is selected then the settings for [I:05_HHt] will be the heating hightemperature range and [I:06_HLt] will be heating low temperature range.

[I:07_bSt (Boost Timing)]

This setting is to increase the set temperature during unit cold start up if the actual room temperature doesn't reach the thermostat set temperature quick enough, the Boost time function will increase the set temperature of the Combi Boiler by 10°F (5°C) after the selected Boost time setting has passed.
Example:
Room thermostat set at 72°F, Combi Boiler set temp at 140°F, and Boost time function set to 30 min.
If the room temperature does not reach 72°F within 30 min then the Combi Boiler will increase its set temp from 140°F to 150°F.

settings:
OFF (Boost Timing is deactivated.),
1- 120 min (Time before starting the boost operation.)

(Default setting = OFF)

NOTE When [I:01_HCt] setting is "2:or" or "3:EC", this function will appear.

[I:08_Air (Air Handler)] (page 51)

This function needs to be turned "on" if an Air Handler is being used as a heating type.
The Air Handler function is designed to stop the Air Handler's pump and fan operation when the Combi Boiler's operation is not suitable for the Air Handler.

settings:
OFF (When an air handler is not used.),
ON (When an air handler is used.)

(Default setting = OFF)

[I:09_EPP (External Pump)] (page 51)

This setting can activate or deactivate the terminals in the Combi Boiler for an External Pump (secondary pump) on the circuit board.

settings:
OFF (When an external pump is not used.),
ON (When an external pump is used.)

(Default setting = OFF)

[I:10_rFt (Re Fire Time)]

This function is to set up the interval time in Heating Mode to prevent inconsistent heating.
If the selected time passes and the Combi Boiler's inside temperature drops, this function will automatically reignite the burner in the Combi Boiler.

settings: 0- 20 min

(Default setting = 0 min)

[I:11_Pot (Pump Overrun Time)]

This mode is to control how long the pump will run after the heating demand is satisfied.
This setting is to prevent unnecessary running of the pump and extend the life of the pump.

settings: OFF, 1- 40 min

(Default setting = OFF)

[I:12_bFt (Differential Burner OFF Temperature)]

settings: 0- 27°F (0- 15°C)

(Default setting = 13°F (7°C))

[I:13_bot (Differential Burner ON Temperature)]

settings: 5- 27°F (3- 15°C)

(Default setting = 18°F (10°C))

When the internal temperature of the Combi Boiler is too high or low the unit will stop burning or start burning.
Burner OFF Temperature
= Heating Set Temperature + [I:12_bFt]
Burner ON Temperature
= Heating Set Temperature- [I:13_bot]

[I:14_HPS (Heating Water Pressure Setting)]

This function is to control the water pressure on the heating side of the Combi Boiler.
This will insure there is enough water inside the Combi Boiler to operate correctly.
When using the external water feeder, set to the proper pressure for the external waterfeeder. If not, the Combi Boiler may shut down frequently.
Water Refilling Pressure
= Setting Pressure- 4 PSI
Water Refilling Stop Pressure
= Setting Pressure + 2 PSI

settings: 12- 26 PSI

(Default setting = 12 PSI)

[I:15_AFA (Auto Feeder Activation)]

This setting can activate or deactivate the Auto Feeder.
If the heating system does not require the Auto Feeder operation, set [I:15_AFA] OFF and plug the Auto Feeder Water Inlet Connection.
To change the setting: Press and hold the △ or ▽ **button** for approximately 2 seconds. (ON→OFF: △ **button**, OFF→ON: ▽ **button**)

settings:
ON (The Auto Feeder is activated.),
OFF (The Auto Feeder is deactivated.)

(Default setting = ON)

[I:16_dHP (DHW / Space Heating Priority)]
(page 64-65)

This mode is for choosing the Combi Boiler operation “Simultaneous use of DHW &Heating” or “DHW Priority”.
This Combi Boiler can operate DHW / Heating at the same time.*
But if a heating system is not suitable for simultaneous use of DHW & Heating, set [I:16_ dHP] “2:dH”.
To change the setting: Press and hold the △ or ▽ **button** for approximately 2 seconds. (“1:St”→“2:dH”: △ **button**, “2:dH”→“1:St”: ▽ **button**)
* Depend on the conditions (refer to pages 64-65).

[1:St] 	St: Standard Mode Simultaneous use of DHW & Heating.
[2:dH] 	dH: dHW DHW Priority.

(Default setting = 1:St)

[I:17_dHt (DHW Wait Time)]

This setting is when the duration of the Combi Boiler maintains the DHW supply mode after a DHW demand.
(The circulation pump will keep running and if necessary, burner will ignite.)
With the DHW Wait Time is enabled, a faster DHW supply may be available when there is a subsequent DHW demand.

settings: OFF, 1- 30 min

(Default setting = OFF)

[I:18_CLr (Setting CLear)]

This setting may be used to reset all the parameters in installer mode to their factory default settings. (Except [I:00_FC] setting.)
Press and hold the △ **button** for approximately 5 seconds to reset all parameters. (The ▽ **button** cannot accept.)

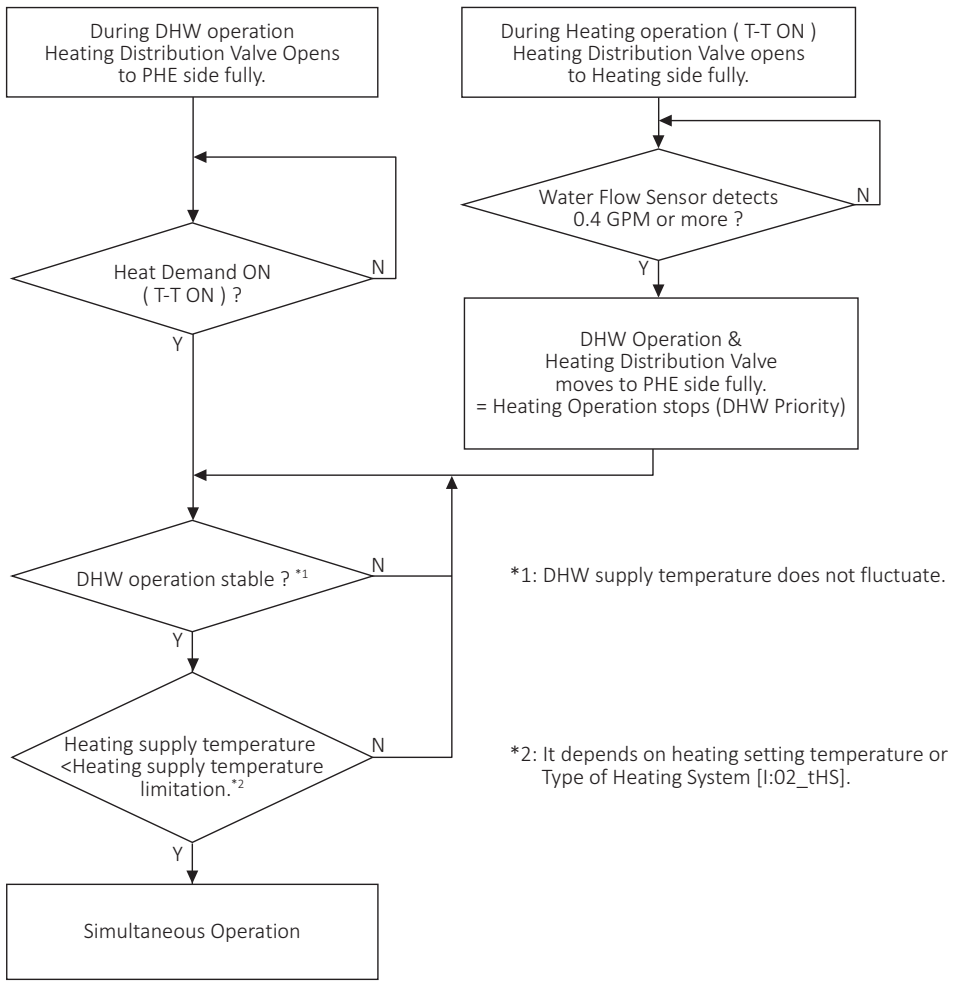
settings: OFF, ON

(Default setting = OFF)

Using DHW and Heating at the same time

This Combi Boiler is designed for using DHW and Heating at the same time. Simultaneous operations are not always available and suitable. It depends on DHW and Heating setting temperatures.
Contact Noritz America for more information about simultaneous use for DHW and Heating. (Phone #: 1-866-766-7489)

[Simultaneous Operation Flow]



NOTE When the DIP switch #2 is ON, Heating temperature setting is increased up to approximately 30°F during simultaneous operation. Damage caused by increasing Heating temperature is not covered by the Noritz America Limited Warranty. Check whether for the hydronic heating appliance and plumbing are acceptable it.

[To expand simultaneous range]

Below charts show simultaneous operation is available or not. By default, the Combi Boiler has been set to the "①" area. When adjusting the DIP switch #2 to ON, the Combi Boiler will be set the "①+②" area. This adjustment allows the Combi Boiler to operate simultaneous more flexible.
If [I:01_HCt] is set to [2:or] or [3:EC], the Combi Boiler operates simultaneously DHW and Heating automatically by increasing the heating supply temperature.

<Relationship between simultaneous operation and setting temperatures on below Charts>

Setting Temperature		Mark on Charts	DIP Switch #2 Setting	simultaneous operation Available or Unavailable
DHW	Heating			
120°F	170°F	○	OFF	Available
			ON	Available
130°F	90°F	□	OFF	Unavailable
			ON	Unavailable
110°F	130°F	●	OFF	Unavailable
			ON	Available

<Relationship between simultaneous operation and temperature settings>

Chart1

Faucet Flow Rate 2.0 GPM (7.6 L/min)
Faucet Water Outlet Temp 107°F (42°C)
DHW Water Inlet Temp 40°F (4.4°C)

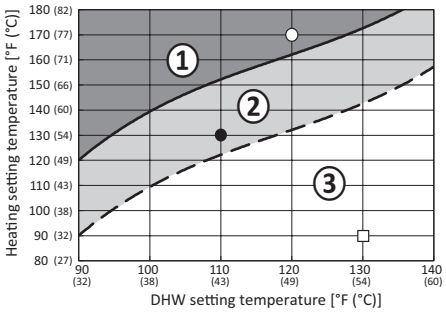


Chart2

Faucet Flow Rate 2.5 GPM (9.5 L/min)
Faucet Water Outlet Temp 107°F (42°C)
DHW Water Inlet Temp 40°F (4.4°C)

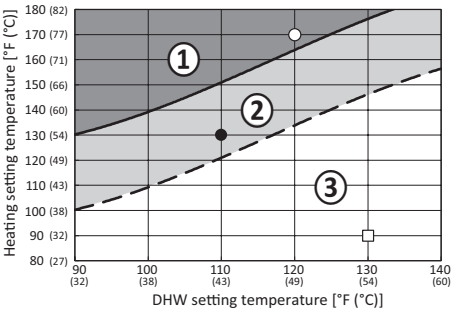


Chart3

Faucet Flow Rate 2.0 GPM (7.6 L/min)
Faucet Water Outlet Temp 107°F (42°C)
DHW Water Inlet Temp 50°F (10°C)

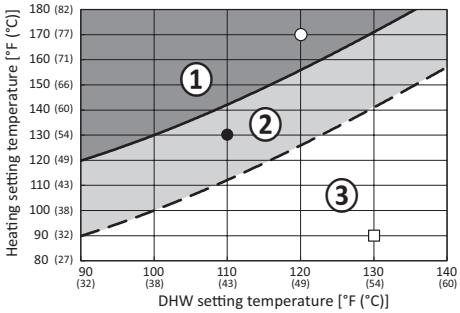
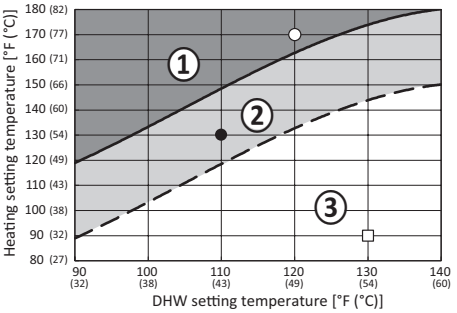


Chart4

Faucet Flow Rate 2.5 GPM (9.5 L/min)
Faucet Water Outlet Temp 107°F (42°C)
DHW Water Inlet Temp 50°F (10°C)

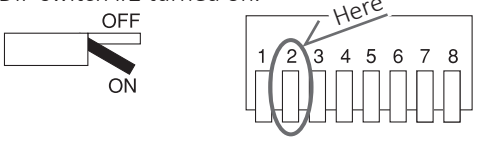


* The "③" area is unavailable for simultaneous operation.
* When DHW setting temperature is under 107°F (42°C), Faucet Water Outlet Temp equals DHW setting temperature.

[DIP Switch Adjustment]

Disconnect power and turn ON DIP switch #2 if the Combi Boiler operates using area①+② in simultaneous operation.

* DIP switch #2 turned on.



13 Setting Temperature

How to Set Heating Temperature

The following Heating Temperature Setting can be changed when the “Outdoor Reset Control” is disabled (Refer to page 53-56).

1. The **ON/OFF button** is ON.

(e.g.: 10:15AM)

2. Press the **TEMP button** once.

(e.g.: 180°F)

- The current “Heating Temperature Setting” and “Heating Icon” will be blinking.
- Initial factory setting is 180°F (82°C in °C mode).

3. Set the temperature using the △ / ▽ **buttons**.

- To return to the home screen, press the **BACK button** or let panel sit for approximately 20 seconds.

How to Set DHW Temperature

⚠ DANGER

- When changing the temperature, make sure to confirm with the customer that the temperature of the Hot Water will be very high and that there is a risk of scalding.
- Hot water temperatures over 125°F (52°C) can cause severe burns instantly or death from scalding.
- To ensure outlet temperatures do not exceed 120°F at faucets, a mixing valve must be installed.

1. The **ON/OFF button** is ON.

(e.g.: 10:15AM)

2. Press the **TEMP button** twice.

(e.g.: 110°F)

- The current “DHW Temperature Setting” and “DHW Icon” will be blinking.
- Initial factory setting is 110°F (40°C in °C mode).

3. Set the temperature using the △ / ▽ **buttons**.

- To return to the home screen, press the **BACK button** or let panel sit for approximately 20 seconds.

Temperature Setting Range

DHW*	°F Mode	90-140°F(In 5°F intervals) (11 Options)
	°C Mode	32°C,35°C,37°C-48°C (In 1°C ntervals), 50°C,55°C,60°C (17 Options)
Heating	°F Mode	100-180°F (In 1°F intervals) (81 Options)**
	°C Mode	40-82°C (In 1°C intervals) (43 Options)**

* When you use Quick Connect Multi System, temperature setting range is changed to below.
°F Mode: 100-140°F (In 5°F intervals)
°C Mode: 37- 48°C (In 1°C intervals), 50°C, 55°C, 60°C

** Heating Temperature range depends on Installer Mode Setting (I:05_HHt, I:06_HLt).

14 Service Reminder

The Combi Boiler is equipped with a Service Reminder to announce for maintenance.
The factory default of this Service Reminder is "OFF".
The customer or installer needs to set the Service Reminder to ON or OFF.

How to select the Service Reminder

1. The **ON/OFF button** is OFF.
   The Operation Display must be off.
2. Press the **MAINTENANCE button**.
   Select 2:d1 using the △ / ▽ **buttons**, and then press the **ENTER button**.
   - The "Diagnostic Mode" screen appears.
3. When entering the "Diagnostic Mode", display will change to
   d:01 1 sec. ECC .
4. When display shows d:01 after 1sec.
   ECC , press the △ / ▽ **buttons** to navigate d:03 1 sec. SEr in the "Diagnostic Mode".
5. Select d:03 1 sec. SEr , and then press the **ENTER button** to enter the function.
6. Press the △ / ▽ **buttons** to change the parameter value.

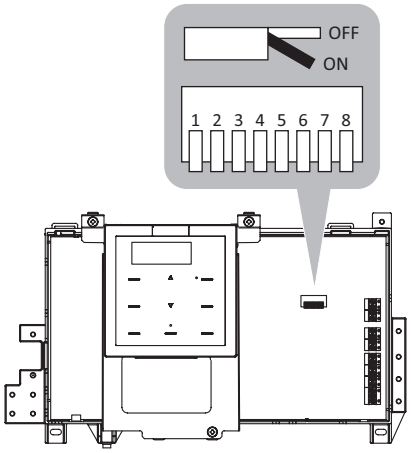
   

   (e.g.: OFF)
   - OFF(default), 6, 12, 18, 24, 30, 36, 42, 48, 54, 60 months.
7. Press the **ENTER button** to save the settings and to exit the function.
8. To exit the "Diagnostic Mode", press the **BACK button**.
   - When the set time period has been reached, the Error Code 88 will flash on the Operation Display.
     When the code 88 appears, press the **ON/OFF button** 5 times in 5 seconds. The Service Reminder will be reset.

15 Setting the DIP Switches

The location of DIP switch bank

The DIP switch bank is placed on the circuit board.



How to change the DIP switches

1. Disconnect the electrical power to the Combi Boiler before changing the DIP switches.*
2. Open the front cover of the Combi Boiler (4 screws).
3. Adjust the DIP switches.
4. Close the front cover of the Combi Boiler (4 screws).
5. Reconnect the electrical power to the Combi Boiler.

* Failure to perform this step will result a "73" code displayed on the Operation Display and a cease in operation.
If this occurs, disconnect, then reconnect the electrical power to the Combi Boiler to reset the system.

DIP Switch Listing

[For using 2 in. SV Conversion Kit]
Turn ON DIP switch #3.

[For installing at an altitude of 2,000 ft (610 m) or higher]
Change DIP switch #5 and #6 by following the table below.

High elevation adjustment	DIP switches	
	#5	#6
0-2,000 ft (0-610 m)	OFF	OFF
2,001-4,000 ft (611-1,219 m)	ON	OFF
4,001-7,000 ft (1,220-2,134 m)	OFF	ON
7,001-10,000 ft (2,135-3,048 m)	ON	ON

[For adjusting to accommodate longer vent runs]

- **When using PVC / CPVC / PP / Stainless Steel material**

Change DIP switch #7 and #8 by following the table below.

Vent length condition	DIP switches	
	#7	#8
①Less than 33 ft using 2 in. (50 mm) pipe	OFF	OFF
②33 ft or more using 2 in. (50 mm) pipe	ON	OFF
③Less than 50 ft using 3 in. (75 mm) pipe	OFF	ON
④50 ft or more using 3 in. (75 mm) pipe	ON	ON

Refer to page 22 for more details on ① to ④ .

- **When using flexible pipe for chimney**

Change DIP switch #7 by following the table below.

(DuraVent®- Flex Through Chimney w/ Air Intake (Only 3 in.))

Vent length condition	DIP switch #7	Maximum equivalent vent length* V (Vertical) + H (Horizontal)	Equivalent length
Short length	OFF	< 50 ft (15 m)	Flexible pipe: 1 ft (0.3 m) Rigid pipe: 1 ft (0.3 m) 90° elbow: 5 ft (1.5 m) 45° elbow: 3 ft (0.9 m)
Long length	ON	50 ft (15 m)–75 ft (22.5 m)	

* The maximum vent length includes elbows.

(Centrotherm®- Flex Through Chimney w/ Air Intake (Only 3 in.))

Vent length condition	DIP switch #7	Maximum equivalent vent length*	Equivalent length
Short length	OFF	Exhaust vent V (Vertical) + H (Horizontal): < 50 ft (15 m) Air Intake: < 50 ft (15 m)	Flexible pipe: 1 ft (0.3 m) Rigid pipe: 1 ft (0.3 m) 90° elbow: 5 ft (1.5 m) 45° elbow: 3 ft (0.9 m)
Long length	ON	Exhaust vent V (Vertical) + H (Horizontal): 50 ft (15 m)–75 ft (22.5 m) Air Intake: < 75 ft (22.5 m)	

* The maximum vent length includes elbows.

16 Water Filling and Trial Operation

The installer should test operate the Combi Boiler, explain to the customer how to use the Combi Boiler, and give the owner this manual before leaving the installation.

Water Filling for Combi Boiler and Heating System

The piping of the complete heating system, typical Heating and DHW Diagram shown on page 71, must be completed before filling the Combi Boiler with water. **Never turn on the heat demand (T-T signal) and fire up the Combi Boiler until the system is filled with water completely.**

⚠ DANGER

There is a scald potential if the setting temperature is too high.

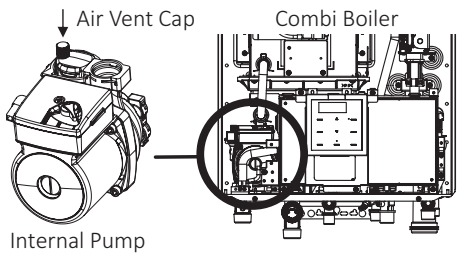
⚠ WARNING

Be sure that the Combi Boiler, water pipes and heating appliances are filled with water completely before firing the Combi Boiler.
Make certain purge all air from the system.
Firing the Combi Boiler without filling water and purging air may damage the Combi Boiler.
Failures and damages caused by improper procedure are not covered by the Noritz America limited warranty.

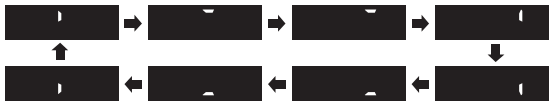
NOTE

- Even though this Combi Boiler is equipped with an Auto Feeder Valve function, it may not be enough to fill the whole heating system (e.g. pipes, appliance, each zone) with water.
- The built-in Auto Feeder will be used for filling primary loop and maintaining the system pressure. Therefore, Noritz recommends to fill the whole heating system with water and to purge all air from the whole system manually.
  DO NOT fire up the Combi Boiler before filling the entire system.

1. Loose the Air Vent Cap on the internal pump of the unit.



2. Open the Auto Feeder Supply Line.
3. Plug in the power cord, and then press **ON/OFF button** on the Operation Display. The unit will be activated and then start filling to the unit with water automatically. The Operation Display will be displaying the following rotation patterns during the auto feeder process.



4. (In case of using external Circulation Pump and Zone Heating System)
   Turn the external Circulation Pump (Circulator) ON and open all Zone Valves to fill the whole system inculding all zones (all heating appliances) with water.
5. Open the "System Purge Ball Valve" for purging all air from the whole system. Make sure that supplied water is flushing out through this Valve without air.
   Flush and purge all air completely from the whole system.
6. The unit will repeat auto feeder process for filling water automatically. Once heating water pressure reaches to a certain pressure (default: 12 psi), the unit will stop auto feeder process (water filling process).
7. Close the Air Vent Cap on the internal pump inside of the unit.
8. Turn the external Circulation Pump (Circulator) OFF, and then close the "System Purge Ball Valve" and all Zone Valves.
9. Make sure that no water leakage from all of pipes, connections and all zones (all heating appliances).
10. Make sure that heating system pressure is 12 to 30* psi at the unit outlet. Noritz recommended system pressure is 12 psi.
    * Noritz recommends to install a pressure gauge on the heating outlet line.

    NOTE If error code 57 appears on the Operation Display after finishing auto feeder process, the Combi Boiler and heating system are not filled with water completely.
    In this case, fill the unit with water and purge all air from the Combi Boiler and heating system again in accordance to steps (1)- (10).

11. Unplug the power cord, and then move to step for Trial Operation.

Trial Operation

Before trial operation, make sure that all wiring connections and DIP Switches are set correctly according with Wiring Diagram and DIP Switch Settings.

NOTE
- White smoke may be noticed from the exhaust vent during cold weather. This is not a malfunction of the Combi Boiler.
- If the Combi Boiler does not operate normally, refer to "Troubleshooting" in the Owner's Guide.

1. Open the Gas Supply Valve.
   Plug in the power cord, and then press **ON/OFF button** on the Operation Display.
   (The unit will start to fill with water again, but it will be stopped shortly.)
2. Press **ON/OFF button** ON, and then set the Heating Temperature and DHW temperature. (Refer to the Owner's Guide for detail information of setting temperature.)
   1) For Heating Temperature;
      Press **TEMP button** once, and then set the desired temperature by using the △ / ▽ **buttons**.
   2) For DHW Temperature;
      Press **TEMP button** twice, and then set the desired temperature by using the △ / ▽ **buttons**.
3. DHW and Heating Operations
   For Heating Side Operation;
   1) Turn on the heat demand (T-T signal) to activate and fire up the unit.
   2) Make sure that the unit and heating appliance operation is normal.

   For DHW Side Operation;
   1) Open the DHW outlet valve and a fixture (i.e. shower or bathtub).
   2) Make sure that Hot Water can be delivered and the unit's operation is normal.

⚠ CAUTION

- Error Code 20: High Limit Switch triggered.
  If the error code 20 is displayed on the Operation Display, it may be caused by air remaining in the Combi Boiler, heating system or internal pump. In this case, purge air from the heating system and Combi Boiler according with pages 68- 69.
- Error Code 64: Air Lock of Internal Pump.
  If the error code 64 is displayed on the Operation Display, it may be caused by air lock of internal pump.
  In this case, purge air from the internal pump and Combi Boiler according with pages 68 - 69. This error code 64 will be displayed on the Operation Display after reconnecting the electrical power. After reconnecting power,

error code 64 will continue to be displayed on the Operation Display. This warning indicator will allow the Combi Boiler to operate. To completely clear error code 64, refer to the "How to reset error code 64" section on this page.

- **DO NOT ignore this condition (Error Code 20 and 64).**
  Without purging air from the Combi boiler, heating system and internal pump, the error code 20 or 64 will continuously appear and potentially damage the Heat Exchanger.

[How to reset error code 64]
Before resetting the error code 64, purge air from the internal pump in the Combi Boiler completely according with pages 68- 69. Failure to properly remove air from the internal pump will cause this error to continuously appear and potentially damage the Heat Exchanger. To reset the error code 64, turn off the Maintenance Writer (MW) "3E"*.

* Maintenance Writer (MW)

1. Disconnect the electrical power and wait for 10 seconds (Leave the Operation Display off).
2. Reconnect the electrical power.
3. Hold the △ **button** until the display blinks "99". Now in the MW mode.
4. Scroll to MW "3E" by using the △ or ▽ **button**. The display blinks "3E".
5. Press and hold the **ENTER button** for approximately 1 second. "DHW Icon" will be OFF if the procedure is done correctly.
6. Once complete, hold and press both the △ / ▽ **buttons** together for 5 seconds until the the Operation Display starts beeping.

[If installed a single Combi Boiler]

4. Open a hot water fixture and confirm that the Flame symbol comes on, and that hot water is being produced.

   NOTE If an error code "11" appears on the Operation Display, air may be trapped in the gas line.
   1) Close a hot water fixture.
   2) Turn the Combi Boiler off and then back on.
   3) Reopen a hot water fixture.
   4) If necessary, repeat until the air is completely purged from the gas line.

5. Check that the hot water temperature changes by changing the temperature setting.

Proceed to Steps 6 and 7

[If installed with a Quick Connect Multi-System]

4. Slowly open a hot water fixture and check that a unit ignites independently. Check to see that the hot water temperature is the same as the temperature displayed on the Operation Display.

   NOTE If an error code "11" or "F11" appears on the Operation Display, air may be trapped in the gas line.
   1) Close a hot water fixture.
   2) Turn the Combi Boiler off and then back on.
   3) Reopen a hot water fixture.
   4) If necessary, repeat until the air is completely purged from the gas line.

5. Make sure the proper installation and proper operation according with on page 52.

   NOTE If step 4 and 5 cannot be done, the Quick Connect Cord may not be properly connected.
   Check that the cord is connected according with on page 51 and 52.

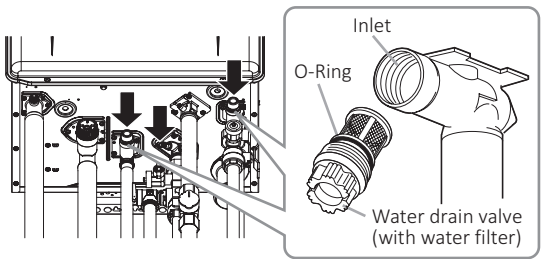
Proceed to Steps 6 and 7

[Procedure to follow after step 5 for both installation of a single Combi Boiler and installation with a Quick Connect Multi-System]

6. • Make sure that there are no obstructions blocking the condensate drain line from discharging condensate.
   • Be sure to check that condensate is freely flowing from the condensate drain piping. Condensate will begin flowing out of the Combi Boiler **within 15 minutes after operation has started**.

7. After the trial operation, clean the filters in the cold water inlet according to the procedure as follows.

   1) Close the hot water valve and the water supply valve.



   2) With a bucket ready, remove the water drain valves.

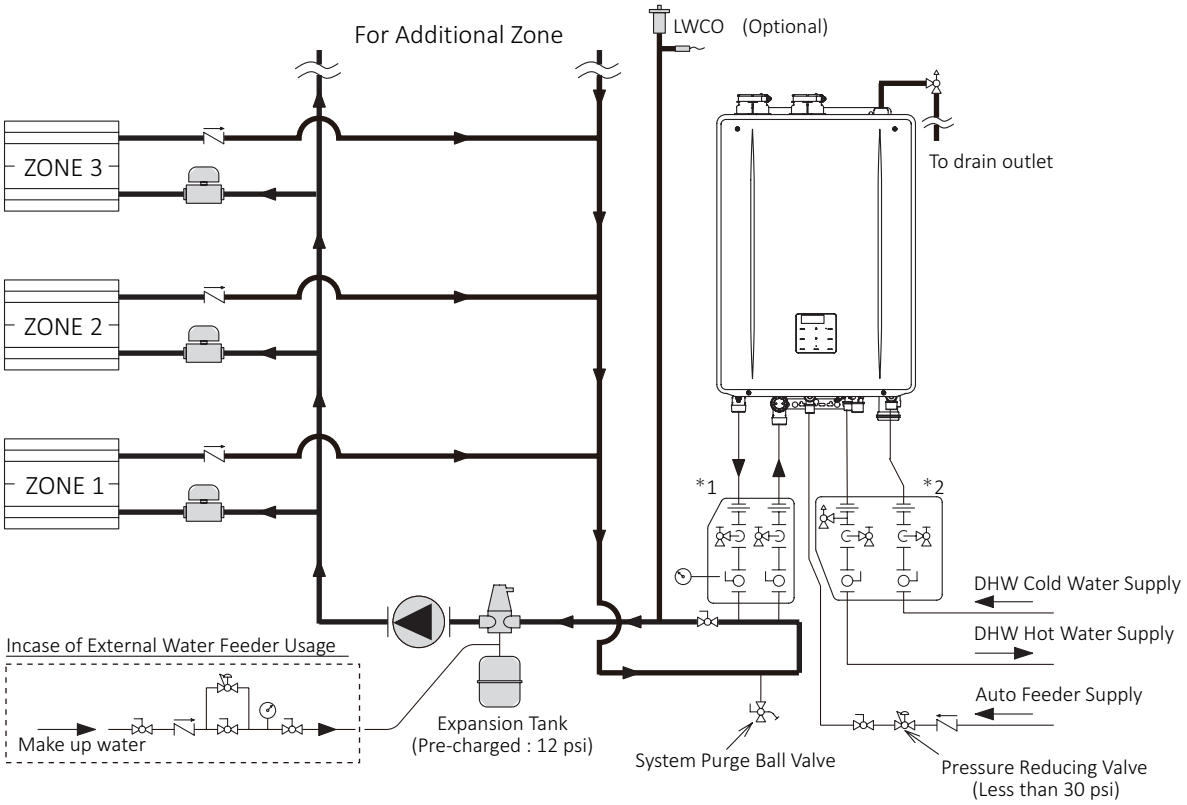
   NOTE Approximately 0.13 gallon (0.5 L) of water will drain out.

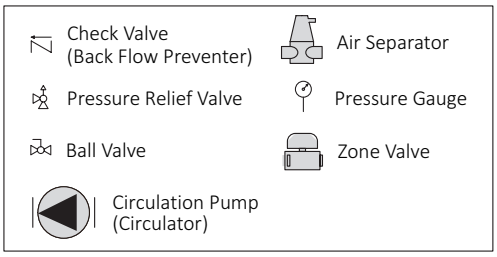
3) Clean the water filters with a brush under running water.
4) Reattach the water drain valves (with water filter).

NOTE Do not to lose the O-Ring.

5) Open the hot water valve and the water supply valve.
Check that water does not leak from the water drain valves.

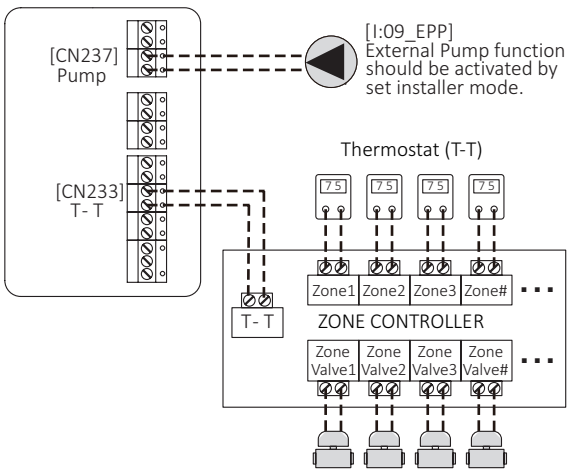
[Typical Heating and DHW diagram]





Wiring Diagram

Wiring Terminal on the Computer Board



*1 Noritz stocks the “Manifold Kit” for easy heating installation.
The “Manifold Kit” allows to install primary and secondary heating loop easier and has shut off valves and service ports for connecting hoses.
Refer to the Combi Boiler’s Installation Manual for detail information.

*2 Noritz stocks the “Isolation Valve (Service Valve Kit)” for easy DHW installation.
The “Isolation Valve (Service Valve Kit)” is necessary for flushing the Plate Heat Exchanger.

If error codes “11”, “12”, and “90” appear, check the following contents.

[“11”: Ignition failure, “12”: Flame loss]
- Check that the gas supply line is appropriately sized.
- Check that the gas supply pressure is within the ranges required in this manual.
- Check that the gas supply matches the type indicated on the Combi Boiler’s rating plate.
- Air may be left in the gas piping. Cycle the power ON/OFF.
- Check that the settings of all DIP switches are appropriate.

[“90”: Combustion abnormality]
- Check that the air supply / exhaust vent for blockage.
- Check that the gas supply pressure is within the ranges required in this manual.
- Check that the condensate piping is not frozen or clogged.
- Check that the condensate piping is in a downward slope.
- Check that the settings of all DIP switches are appropriate.

Handling after trial operation

- Explain the “Important Safety Information”, “Operation Procedures” and “Follow-up Service” according to the Owner's Guide supplied with the Combi Boiler.
- If the Combi Boiler will not be used immediately, close off all gas and water shut off valves, drain all of the water out of the Combi Boiler and the plumbing system to prevent the Combi Boiler and system from freezing, and bleed the gas out of the gas line.
  Refer to the procedure for preventing damage from freezing in the Owner’s Guide.

NOTICE

Freezing is not covered by the Noritz America Limited Warranty.

Lighting Instructions

⚠ WARNING

A fire or explosion may result if these instructions are not followed, which may cause lose of life, personal injury or property damage.

This Combi Boiler does not have a pilot. It is equipped with an ignition device that automatically lights the burner.
Do not try to light the burner by hand.
1. Read the safety information in the installation manual or on the front of the Combi Boiler
2. Turn off all electrical power to the Combi Boiler.
3. Do not attempt to light the burner by hand.
4. Turn the gas control manual valve (external to the Combi Boiler) clockwise to the off position.
5. Wait five minutes to clear out any gas. If the smell of gas remains, stop, and follow the instructions on page 3 of Owner's Guide.
6. Turn the gas control manual valve counterclockwise to the on position.
7. Turn on the electrical power to the Combi Boiler.
8. The Combi Boiler will now operate whenever hot water is called for. If the Combi Boiler will not operate, follow the shutdown instructions and call a service technician.

Shutdown Instructions

1. Stop any water demand.
2. Turn off the electrical power.
3. Turn the gas control manual valve clockwise to the off position.

17 Checklist After Installation

After installing the Combi Boiler, review the following checklist. You should be able to answer "Yes" to all of the items in the checklist. If you answer NO to any item, installation is not complete. Review the appropriate sections to complete the installation.
If you have additional questions or need assistance with installation, contact Noritz America at 1-866-766-7489.

Choosing an Installation Location *(See page 13 - 15)*	**Yes**	**No**
Make sure that the Combi Boiler is not installed in the following places. • Places where gasoline, benzene and adhesives are handled • Places in which corrosive gases (ammonia, chlorine, sulfur, ethylene compounds, acids) are present in the air • Places dust or debris will accumulate		
Installation Clearances *(See page 16)*	**Yes**	**No**
Make sure that the Combi Boiler meets the required clearances.		
Installation of the Combi Boiler *(See page 17 - 18)*	**Yes**	**No**
Make sure that the condensate container is filled with water.		
Venting the Combi Boiler *(See page 19 - 35)*	**Yes**	**No**
Make sure that required combustion air is supplied to the Combi Boiler.		
Make sure using vent materials approved for use with category IV appliances.		
Make sure that there is no leakage or loose connection in the venting system.		
Make sure that the vent length is within the requirement.		
Make sure that bird screen(s) is installed on the vent termination.		
Make sure that the termination meets the clearance requirements.		
When using a horizontal section, make sure that the horizontal vent slope is 1/4 in. upwards for every 12 in. (300 mm) toward the termination.		
Make sure that the intake pipe and exhaust pipe are properly installed.		
Make sure that the vent system comforms with local codes, state codes, or national codes as ANSI/NFPA and CSA.		
Connecting the Gas Supply *(See page 36 - 39)*	**Yes**	**No**
Make sure that the gas type is compatible with the type indicated on the Combi Boiler's rating plate.		
Clean out any debris from the gas piping before connecting the Combi Boiler.		
Make sure that the gas piping size is appropriate.		
Make sure that the inlet gas pressure is within the specified range.		
Make sure that there are no leaks from the Combi Boiler and its gas connection.		
Connecting the DHW pipe *(See page 40 - 43)*	**Yes**	**No**
Clean out metal powder, sand and dirt from the water piping before connecting the Combi Boiler.		
Make sure to check and test the water quality to see if water treatment is necessary.		
Make sure that the water supply pressure is 15 to 150 psi (103.4 to 1034 kPa).		
Make sure that there is no water leakage from the cold water supply pipe and the hot water supply pipe.		
Make sure that the pressure relief valve is installed.		

Make sure that the cold water supply line and the hot water supply line are properly connected to the Combi Boiler.		
Make sure that appropriate heat insulation measures are taken according to regional climate. (e.g. wrapping with heat insulation materials, using electric heaters)		
Connecting the Heating Pipe *(See page 44 - 47)*	**Yes**	**No**
Make sure that heating system pressure is 12 to 30 psi at the Combi Boiler outlet.		
Make sure that no water leakage from heating supply pipe, heating return pipe and all of connections.		
Make sure that the backflow preventer is installed as required by local codes.		
Make sure that expansion tank is installed. And check precharged pressure should equal the system fill pressure for the Combi Boiler.		
Make sure that air separator is installed.		
Make sure all of the air is removed from the heating system.		
Connecting the Condensate Drain *(See page 48 - 49)*	**Yes**	**No**
Make sure that the condensate drain piping is connected.		
Make sure that corrosion resistant material is used for the condensate drain piping.		
Make sure that the size of the condensate drain piping is 1/2 in or larger.		
Make sure that the condensate drain piping slopes towards the inside floor drain or condensate pump.		
Make sure that the end of the condensate drain pipe is open to the atmosphere.		
Make sure that the condensate has been treated before disposal as necessary. (when required by local code or when the condensate could cause damage)		
Make sure that measures are taken to prevent the condensate drain lines from freezing. (e.g. insulation material, heat tape or electric heater)		
Connecting Electricity *(See page 50 - 58)*	**Yes**	**No**
Make sure that the electrical supply is 120 VAC at 60 Hz.		
Make sure the grounding resistance is less than 100 Ω.		
Setting the DIP Switches *(See page 67 - 68)*	**Yes**	**No**
Make sure that all DIP switches are set correctly.		
Water Filling and Trial Operation *(See page 68 - 72)*	**Yes**	**No**
Open a hot water fixture, make sure the BURNER ON indicator or the Flame indicator is displayed on the Operation Display and hot water is present at the fixture.		
Clean the filter in the cold water inlet after the trial operation.		
If the Combi Boiler will not be used immediately, do the following. • Close all gas and water shutoff valves. • Drain all the water in the Combi Boiler and the plumbing system. • Disconnect the electrical power to the Combi Boiler.		
Explain the “Important Safety Information”, “Operation Procedures” and “Follow-up Service” according to the Owner's Guide to the customer.		
Quick Connect Multi-System Installation *(See page 51-52, 80)*	**Yes**	**No**
Make sure that the Water Heater’s Remote Controller is disconnected*. * Quick Connect Multi System is operated by Combi Boiler’s Operation Display.		

18 Plumbing Applications

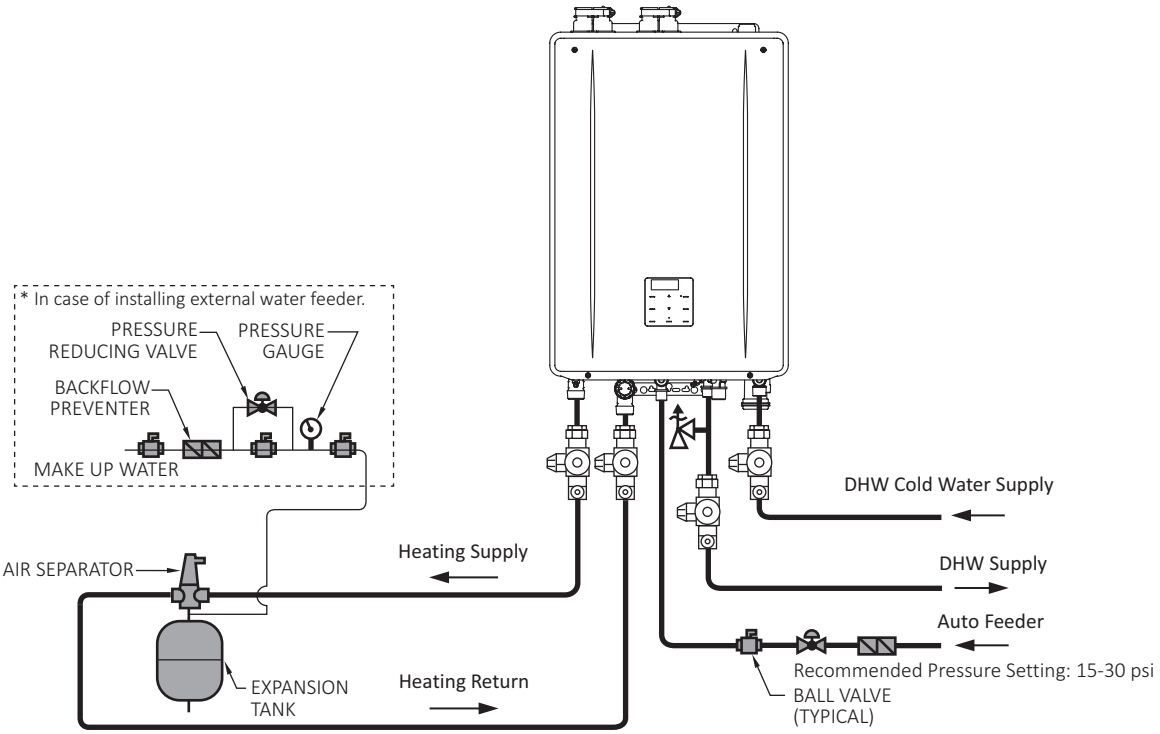
18.1 General Requirements

1. This drawing is meant to show system piping concept only. Installer is responsible for all equipment and detailing required by local codes.
2. All closely spaced tees shall be within 4 pipe diameters or max 12 in. center to center spacing.
3. A minimum of 6 pipe diameters of straight pipe shall be installed upstream and downstream of all closely spaced tees.
4. The minimum pipe size of DHW piping should be 3/4" diameter and Heating piping should be 1" in diameter.
5. Piping shown is Primary/Secondary. System flow (secondary loop) must be greater than the appliance's primary loop flow.
6. Install a minimum of 12 diameters of straight pipe upstream of all circulators.
7. In a valve-based system, each heating zone has a zone valve which opens when that zone calls for heat.
   Each zone thermostat is wired to its corresponding zone valve. Contacts in the zone valves provide a signal to the appliance to operate when there is a call for heat.
8. Unit is equipped with built-in primary pump for the heating loop. This pump is sized to ensure proper flow rate through the appliance heat exchanger and related piping. On long pipe runs, it is recommended to keep the pump at maximum speed (setting 3). DO NOT lower it from the factory default.
9. Install a backflow preventer valve in the make-up water supply to the unit as required by local codes.
10. Do not install an external pump upstream an expansion tank in heating supply pipe.
11. The expansion tank must be sized in accordance with the water volume of the system as well as the firing rate of the appliance. The tank precharge pressure should equal the system fill pressure for best operation.

* Equip a cap (1/2 in.) with the Auto Feeder Water Inlet Connection when piping has not been connected to the Auto Feeder Water Inlet Connection (refer to pages 46, 62 [I:15_AFA]).

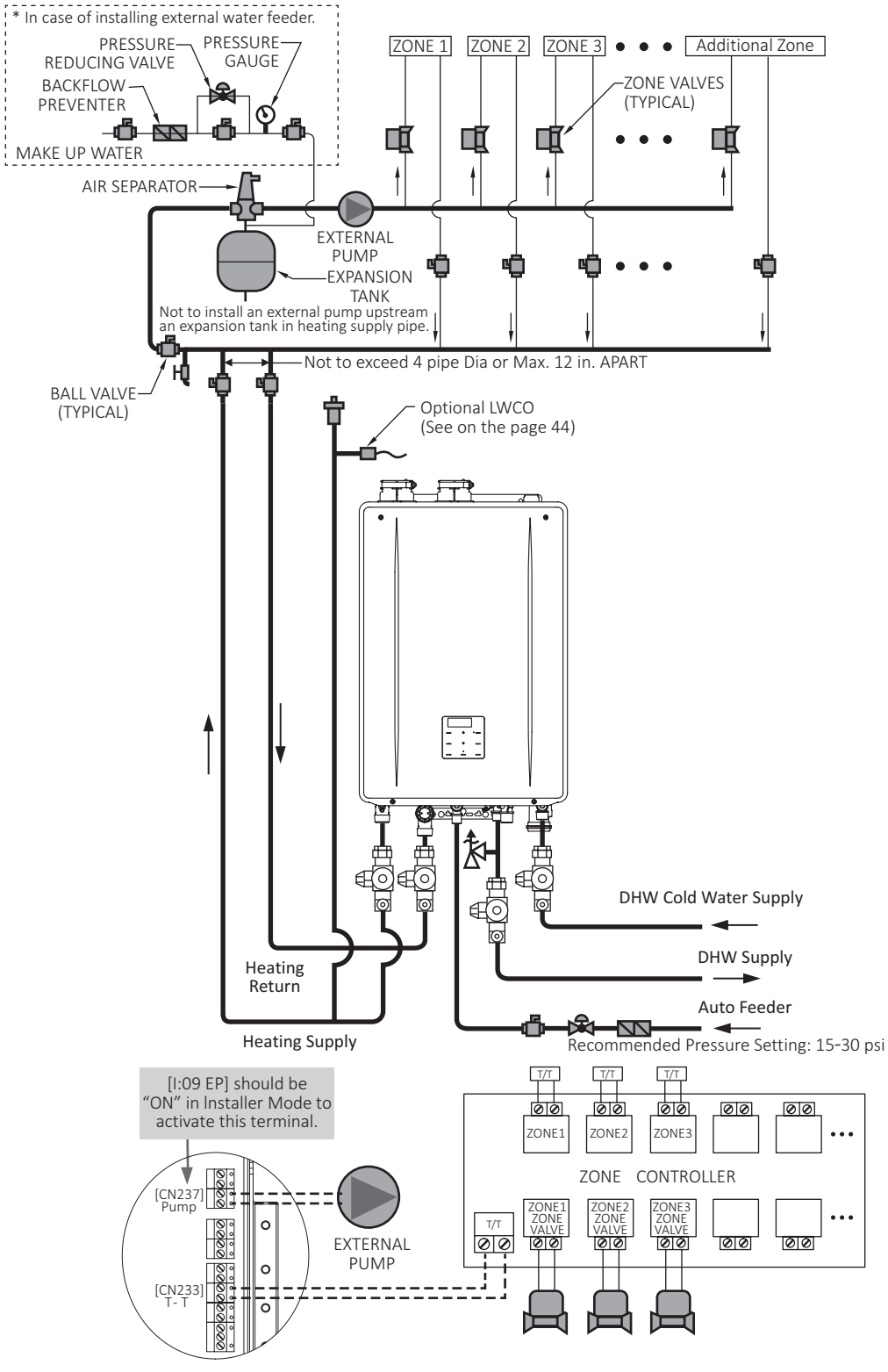
18.2 Only install Combi Boiler as a Water Heater (Install Heating in the future)

This drawing is meant to show system piping concept only. Installer is responsible for all equipment & detailing required by local codes.



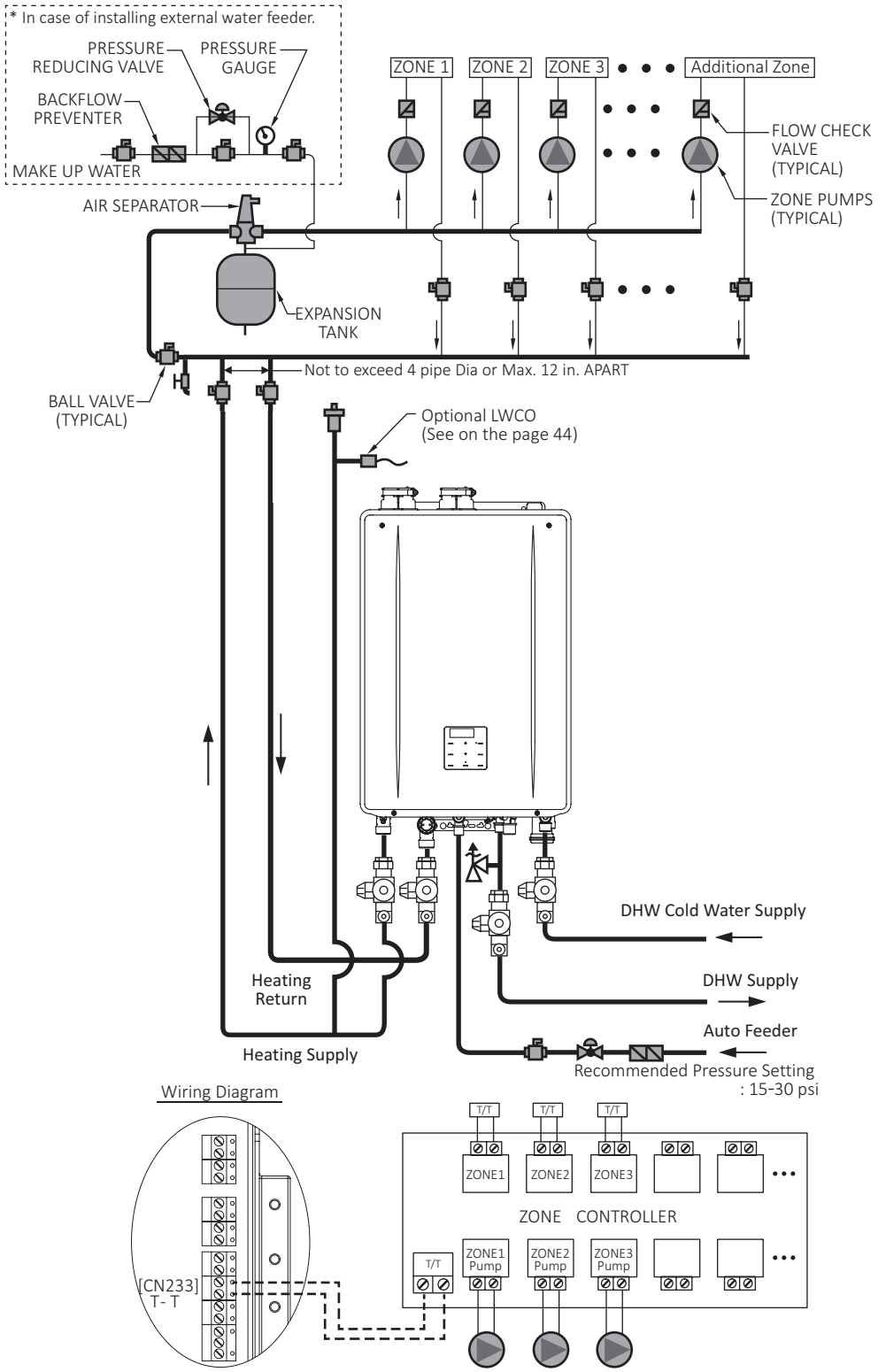
18.3 Zoned with Valves

This drawing is meant to show system piping concept only. Installer is responsible for all equipment & detailing required by local codes. Refer to page 51 for electrical wiring instructions.



18.4 Zoned with Pumps

This drawing is meant to show system piping concept only. Installer is responsible for all equipment & detailing required by local codes. Refer to page 51 for electrical wiring instructions.

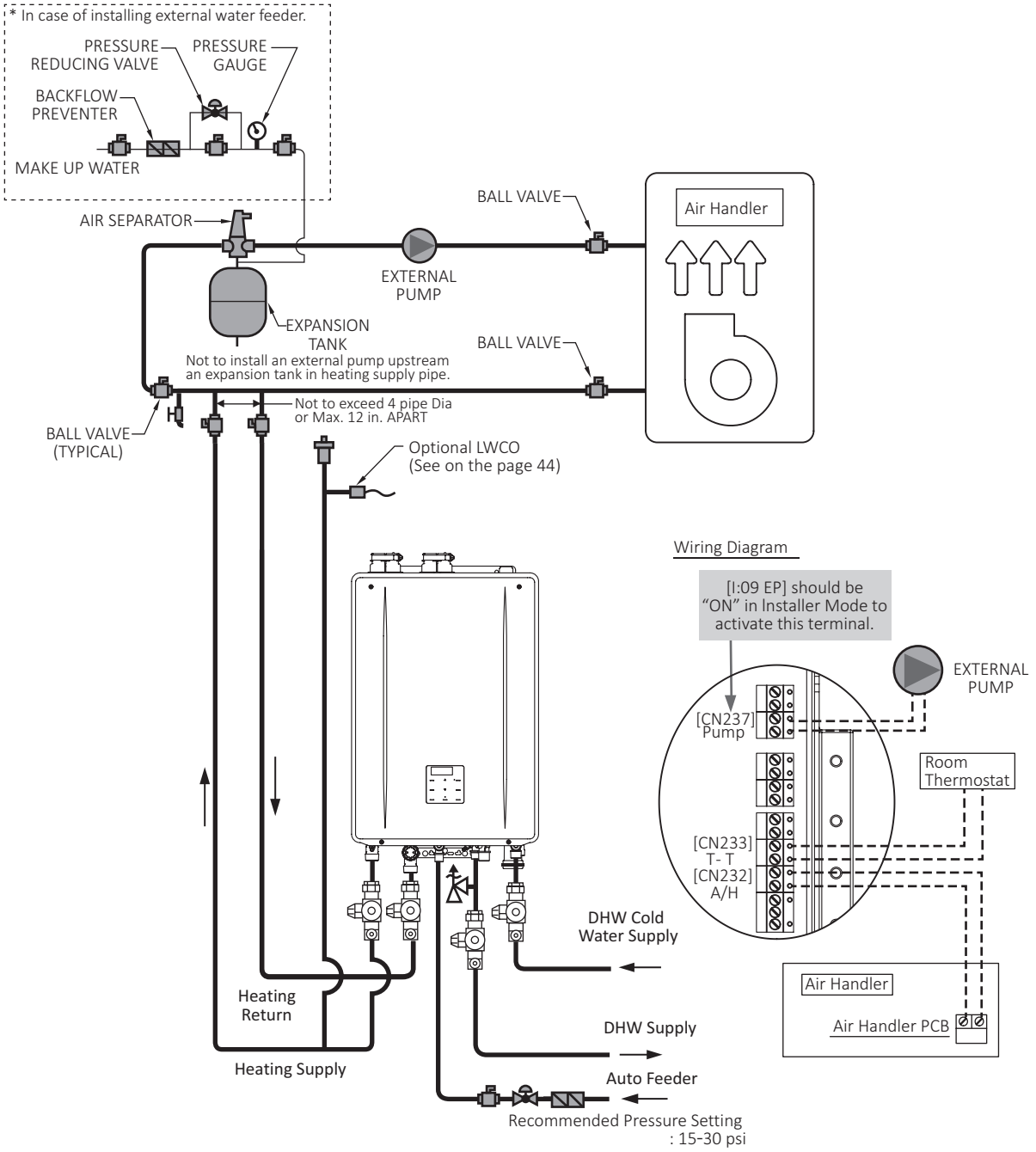


18.5 Air Handler

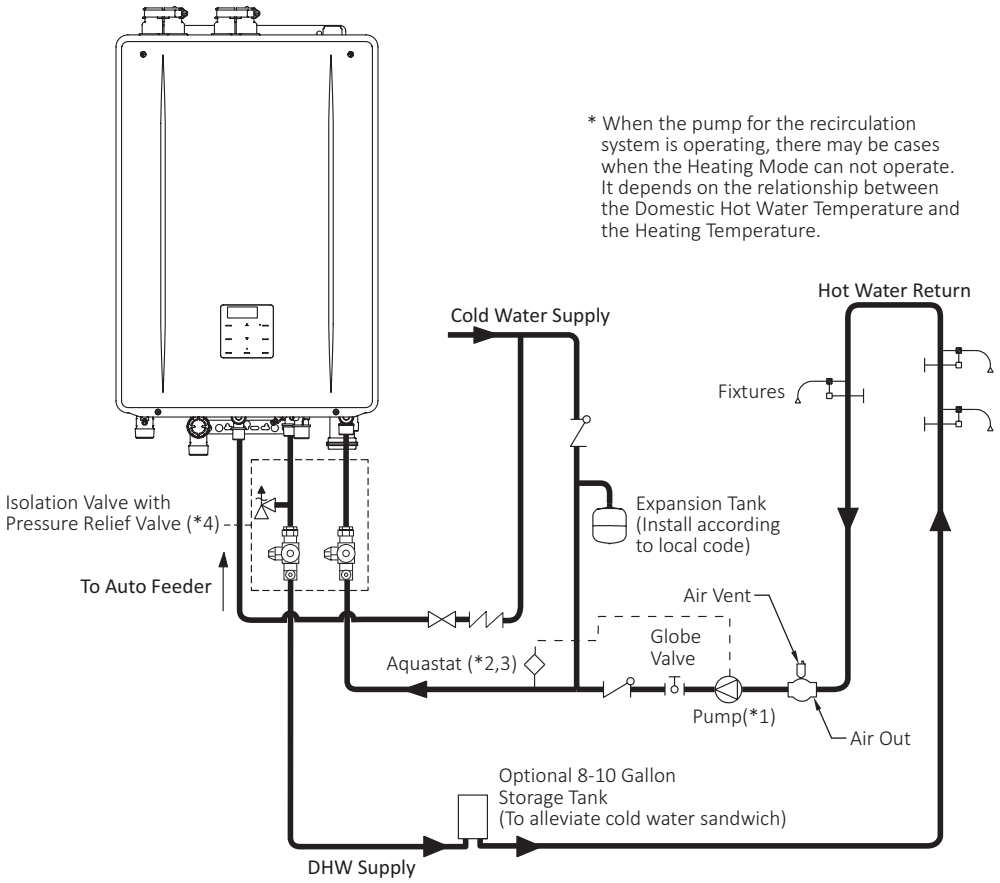
The Combi Boiler can control the operation of an Air Handler when thermostat is used in combination with the Air Handler.
The Air Handler function is designed to stop the Air Handler's pump and fan operation when the Combi Boiler's operation is not suitable for the Air Handler.

* In order to set up the Air Handler, from Installer Mode [I:08_Air] should be activated. (Refer to page 61)

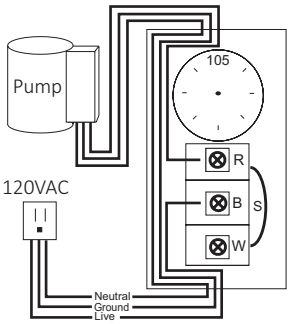
Refer to page 51 for electrical wiring instructions.



18.6 Recirculation System



*1 Size the pump to provide a maximum of 2 GPM (7.5 L/min) through the system at 10 ft (3m) of head plus piping losses. Adjust the flow using a globe valve and verify the flow rate with the maintenance monitors.
*2 An Aquastat must be used to control the pump.
*3 Set the Aquastat to 10˚F below the DHW Temperature Setting. An aquastat is the minimum pump control requirement in order to maintain the full recirculation warranty.
*4 Noritz recommends the use of an Isolation Valve Kit with the installation. The kit includes an integrated shut-off and service valve with unions and a pressure relief valve.



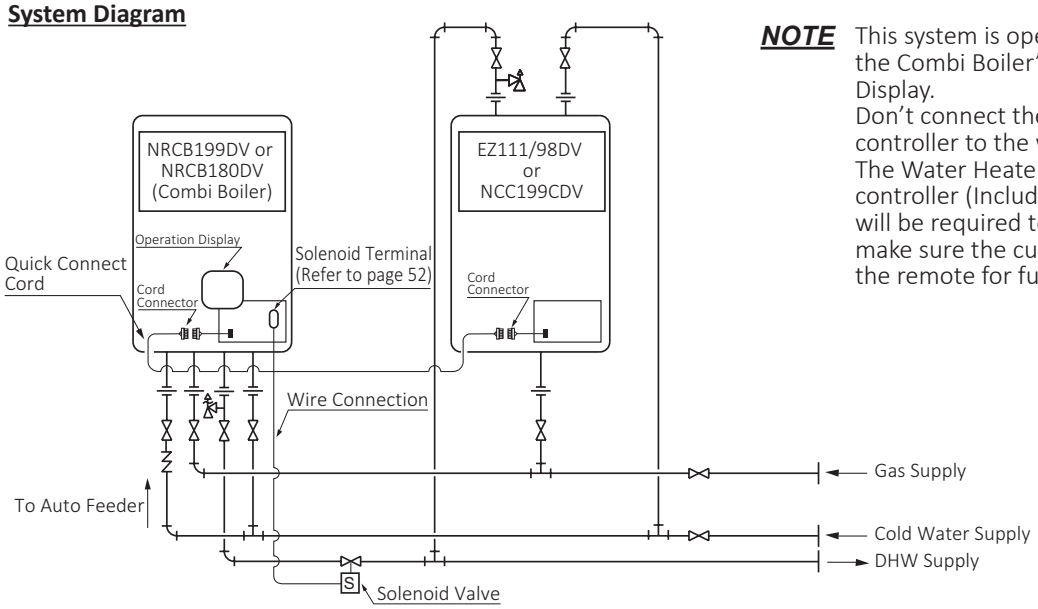
Aquastat Wiring
Use Honeywell Aquastat
(Model L6006A or L6006C)

* The heating might not operate in some conditions during recirculation.
Be sure to make sure the following requirement when install the recirculation system.
• Insulate the DHW Supply and Return pipe completely to prevent the recirculation operation continuously.

18.7 Quick Connect Multi System Installation

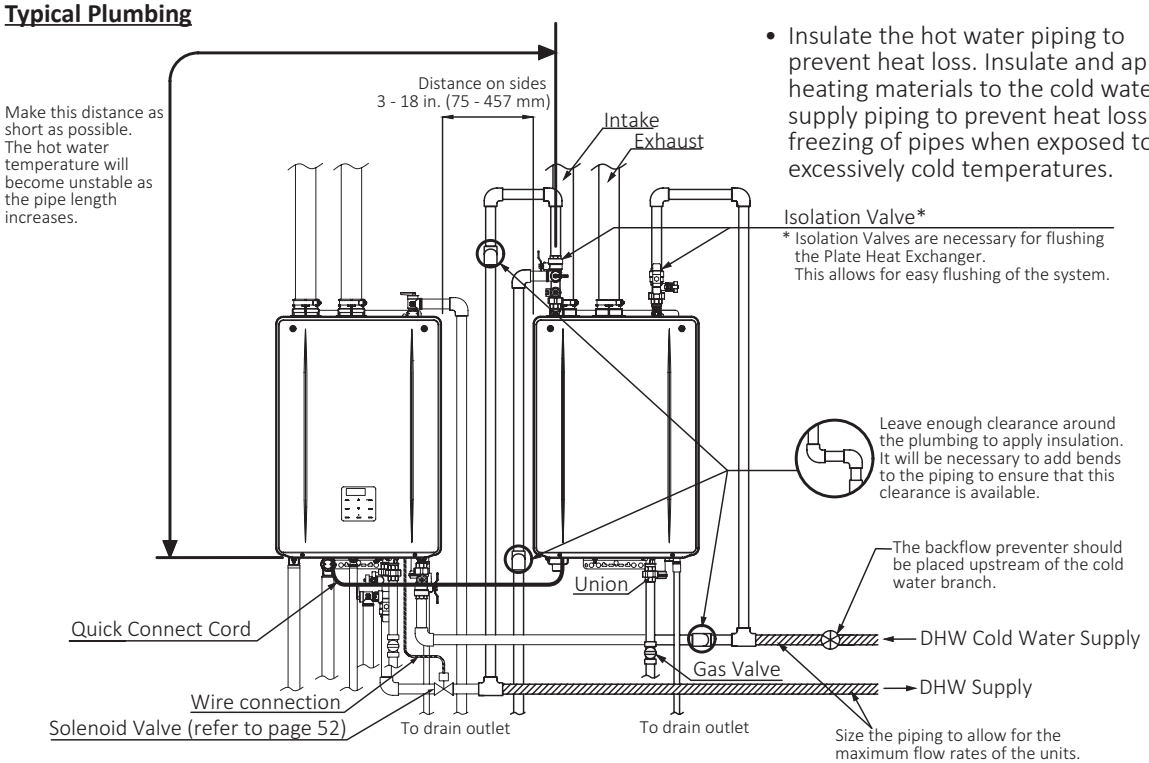
- The Quick Connect Multi System allows the installation of two units together utilizing only the Quick Connect Cord (QC-2). Unit's MAX Btuh must be same in order to quick connect. e.g. When installing NRCB199DV (GHQ-C3201WX-FF US), you must install EZ111DV (GQ-C3259(60)WX-FF US) or NCC199CDV (GQ-C3259(60) WZ-FF US).
- The Quick Connect Cord (QC-2) is 6 ft. (2m) long. Install the units 3-18 in. (75-457 mm) apart from each other to ensure the cord will be able to reach between the units. (See Typical Plumbing diagram).
  (If the distance between the two units is too great, not only will the cord not be able to reach, but the water temperature may also become unstable because of the difference in pipe length between the two units).

System Diagram



NOTE This system is operated by the Combi Boiler's Operation Display.
Don't connect the remote controller to the water heater. The Water Heater's remote controller (Included Accessory) will be required to troubleshoot, make sure the customer keeps the remote for future use.

Typical Plumbing



- Insulate the hot water piping to prevent heat loss. Insulate and apply heating materials to the cold water supply piping to prevent heat loss and freezing of pipes when exposed to excessively cold temperatures.

19 Maintenance

19.1 Periodic Check

- Check the following to ensure proper operation of the Combi Boiler periodically .
- Also check the items of maintenance described in the Owner's Guide.

[Venting System]
- The venting system must be examined periodically by a qualified service technician to check for any leaks or corrosion.
- Do not obstruct the flow of combustion and ventilation air.

[Burner]
- Check the burner flame periodically for a proper blue color and consistency.
- If the flame does not appear normal, the burner may need to be cleaned by a qualified service technician.

[Pressure relief valve]
- Operate the pressure relief valve once a year to ensure that it is functioning properly and there is no obstruction. Turn the power off to the Combi Boiler before opening the pressure relief valve, and make sure that water draining out of the valve will not cause any damage.
- If the pressure relief valve discharges periodically, it may be due to thermal expansion in a closed water system. Contact the water supplier or a local plumbing inspector on how to correct this situation. Do not plug the pressure relief valve.

[Water filter]
- Check and clean the filter inside of cold inlet (DHW inlet) connection.

NOTICE

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.

19.2 Procedure for Flushing the Plate Heat Exchanger

NOTE This procedure is only intended for use by a qualified service professional or authorized Service Representative. Any unauthorized use of this procedure may result in voiding the Noritz America Limited Warranty. Contact Noritz America at 1-866-766-7489 for additional support.

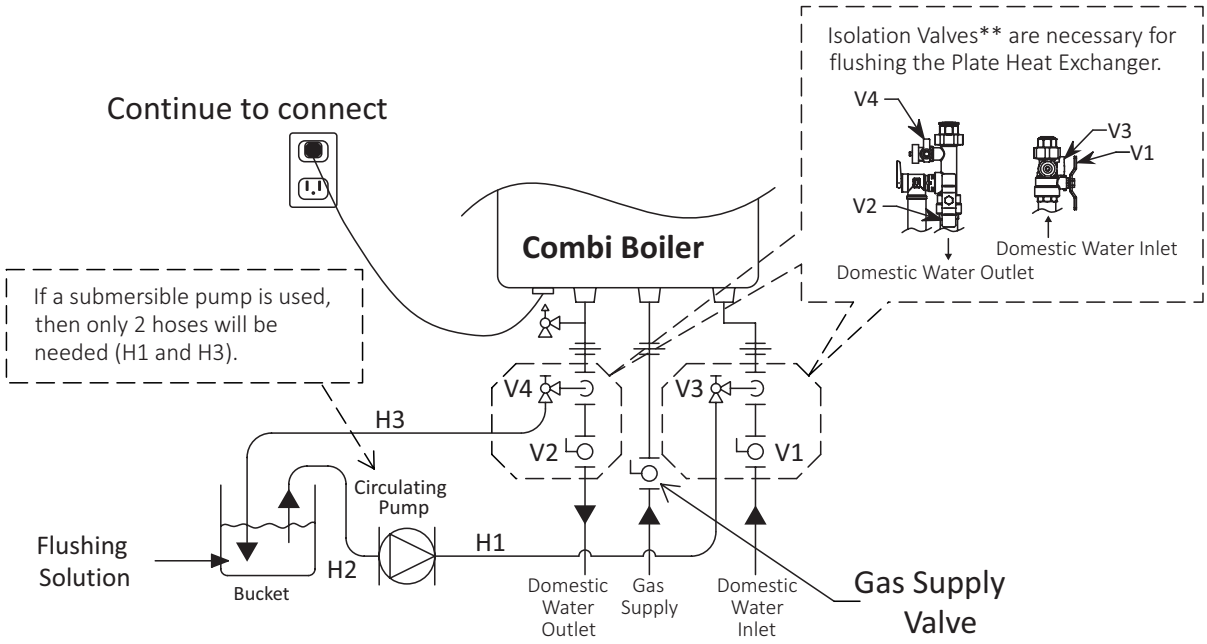
To prevent damage to the Plate Heat Exchanger from Scale Build-up, the Plate Heat Exchanger needs to be flushed* to remove the Scale Build-up.
Damage to the Combi Boiler due to Scale Build-up is not covered by the Combi Boiler's warranty.

* Connect the blue connector marked "FLUSH" for flushing near the Circuit Board when flushing the Plate Heat Exchanger.

NOTE The Combi Boiler must remain connected to the electrical power when flushing the Plate Heat Exchanger.

The preparation of the flushing system

1. Close the gas supply valve.
2. Close the Domestic Water Inlet valve (V1) and the Domestic Water Outlet valve (V2).
3. Connect the one drain hose (H1) to the drain valve (V3), and then the other to the circulating pump.
4. Connect the drain hose (H2) to the circulating pump.
5. Connect the drain hose (H3) to the drain valve (V4).
6. Pour 1 gallon of "Calcium, Lime and Rust Removal Product" and 1 gallon water into the bucket.
   It is recommended "Calcium, Lime and Rust Removal Product" for flushing.
7. Place the both drain hoses (H2 and H3) into the bucket filled with the flushing solution.
8. Open the both drain valves (V3 and V4).



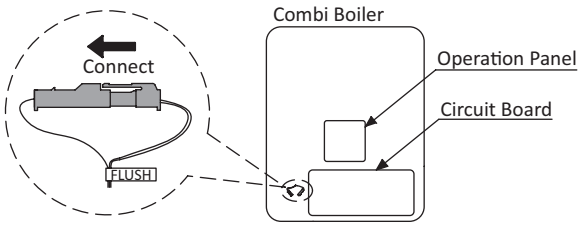
** Isolation Valves may be purchased as an accessory from an authorized manufacturer's wholesaler.
This allows for full diagnostic testing and easy flushing of the system.
Contact Noritz America for more information. (1-866-766-7489)

For Single Unit

[Procedure 1. Flushing the Plate Heat Exchanger]

1. Open the front cover.
2. Connect the blue connector* marked "FLUSH" for flushing near the Circuit Board.

* The connector color is blue and labeled "FLUSH".



3. Then the code "CCC" is displayed on the Operation Display.
4. Turn on the circulating pump to circulate the flushing solution through the Combi Boiler for 1 hour at a rate of 1.5 gallons per minute or more.
5. CCC → C60 → C59 → C00

The code "C60" is displayed on the Operation Display when the Combi Boiler detects the flow of the flushing solution.

When 1 minute passes, the code "C60" will change to "C59" on the Operation Display.

When 1 hour passes, the code "C00" is flashing on the Operation Display.

Do not disconnect the blue connector marked "FLUSH" for flushing.

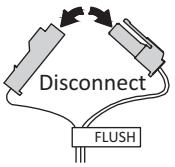
NOTE Check whether the reverse connection of the hose (H1) and (H3) if the display number will not change. In that case, the flow rate of the flushing solution may be under 1.5 GPM.

6. Turn off the circulation pump.

[Procedure 2. Cleaning the Plate Heat Exchanger]

The flushing solution needs to be rinsed and cleaned out of the Combi Boiler.
Below is the way to rinse and clean the flushing solution.

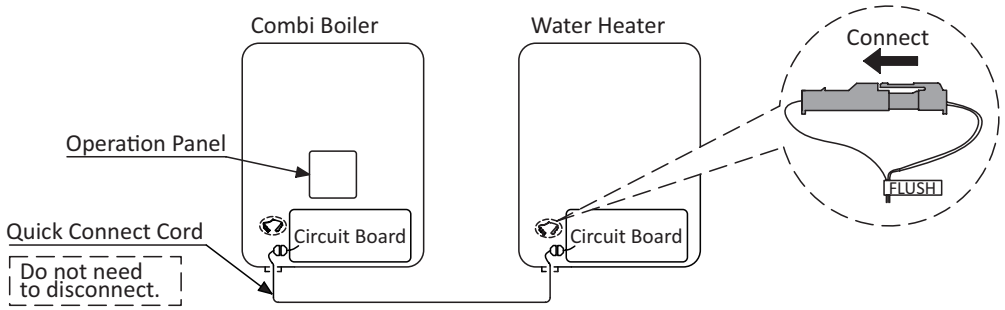
1. Remove both drain hoses (H2 and H3) from the bucket. And then place the drain hose (H3) into the sink or outside to drain.
2. Close the drain valve (V3) and then open the Domestic Water Inlet valve (V1).
   Do not open the Domestic Water Outlet valve (V2).
3. Clean the Combi Boiler with fresh water for 3 minutes or more.
   (Needs to have enough time to clean the Combi Boiler.)
4. Close the drain valve (V4) and then remove the drain hose (H3) from the drain valve (V4).
5. Remove the drain hose (H1) from the drain valve (V3).
6. Disconnect the blue connector marked "FLUSH" for flushing.
   The code "C00" goes out on the Operation Display.



7. Close the front cover.
8. Open the gas supply valve and Domestic Water Outlet valve (V2).
9. Check for correct operation of the Combi Boiler.

For Quick Connect Multi-System

1. Open the front covers.
2. Connect the blue connector marked "FLUSH" for unit needing to be flushed.
   (The unit is isolated from Quick Connect Multi System when the blue connector marked "FLUSH" for flushing is connected. Not need to disconnect the Quick Connect Cord.)



3. Then the code **CCC** or **FCC** is displayed on the Operation Display.
   - "CCC" is displayed when the Combi Boiler's blue connector is connected.
   - "FCC" is displayed when the Water Heater's blue connector is connected.
4. Turn on the circulating pump to circulate the flushing solution through the units for 1 hour at a rate of 1.5 gallons per minute or more.
5. **CCC** or **FCC**
   - The code "C60" is displayed on the Operation Display when the Combi Boiler detects the flow of the flushing solution.
   - **C60**
   - When 1 minute passes, the code "C60" will change to "C59" on the Operation Display.
   - **C59**
   - When 1 hour passes, the code "C00" is flashing on the Operation Display.
   - **C00**

   Do not disconnect the blue connector marked "FLUSH" for flushing.

(e.g. The display when the both units are flushed at the same time)

Connect the Blue Connector of the Combi Boiler

CCC

Detects the flow

C50

(10 minutes pass)

Connect the Blue Connector of the Water Heater

FCC

The remaining time of flushing gives indication priority to the connector which is connected later.

C60

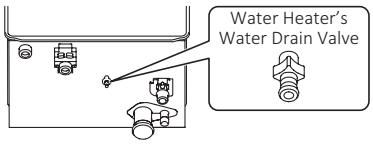
Detects the flow

(1 hour passes)

C00

Flashing

6. Turn off the circulation pump.
7. Rinse and clean the flushing solution out of the units in accordance with [Procedure 2]".
   (See the "Procedure 2.1-2.5".)



NOTE For Water Heater, place a bucket under the unit to drain water from the "Water Drain Valve".
Carefully unscrew the "Water Drain Valve" to rinse flushing solution out of the unit for about 10 seconds. Then close the "Water Drain Valve".

8. Disconnect the blue connector marked "FLUSH" for flushing. The Code "C00" goes out on the Operation Display.
9. Close the front covers.
10. Open the gas supply valves and water outlet valves.
11. Check for correct operation of the unit.