



Installation Manual

Model: i200X
i250X

Intellihot Direct Vent Combination Water heater.
This product complies with ANSI Z21.10.3 (2011) /
CSA 4.3 Gas Water Heater. For use as potable water
heating and space heating.



WARNING

If the information in these instructions is not followed exactly, a fire or explosion could 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.

AVERTISSEMENT

Assurez-vous de bien suivre les instructions données dans cette notice pour réduire au minimum le risque d'incendie ou d'explosion ou pour éviter tout dommage matériel, toute blessure ou la mort.

- Ne pas entreposer ni utiliser d'essence ou ni d'autres vapeurs ou liquides inflammables à proximité de cet appareil ou de tout autre appareil.

QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ

- Ne pas tenter d'allumer d'appareil.
- Ne touchez à aucun interrupteur; ne pas vous servir des téléphones se trouvant dans le bâtiment.
- Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.
- Si vous ne pouvez rejoindre le fournisseur, appelez le service des incendies.
- L'installation et l'entretien doivent être assurés par un installateur ou un service d'entretien qualifié ou par le fournisseur de gaz.



To avoid product damage, personal injury, or even possible death, carefully read, understand, and follow all the instructions in the Installation and Operation manuals before installing this product. Improper installation, adjustment, alteration, or maintenance can cause injury, loss of life, and/or property damage. This water heater should be installed and serviced by a qualified technician. The lack of proper service can result in a dangerous condition.

This manual contains safety information, installation instructions, and maintenance procedures. It must be left with the homeowner or placed near the water heater in a noncombustible place. The customer should retain this manual for future reference.

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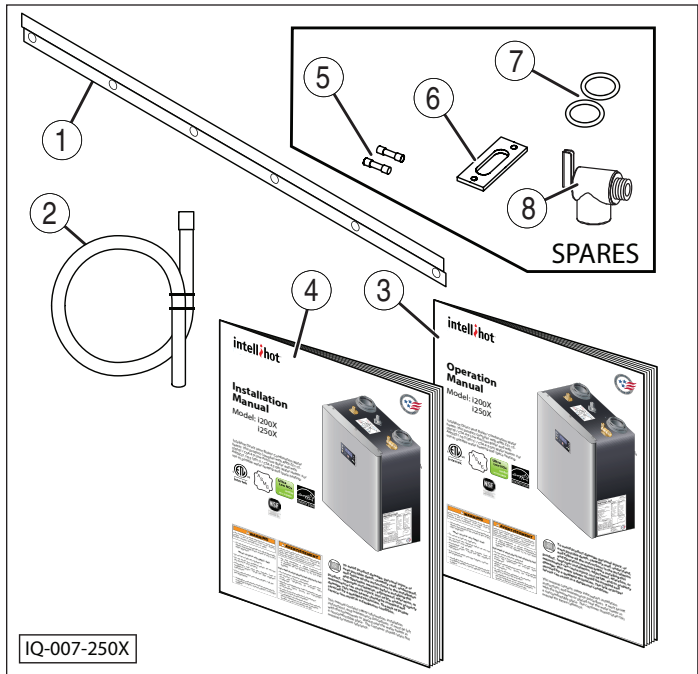
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1. General Information

1.1 Items Shipped With Water Heater

The following items are shipped with the water heater; upper mounting bracket (1), condensate drain (2), Operation manual (3), and Installation manual (4).

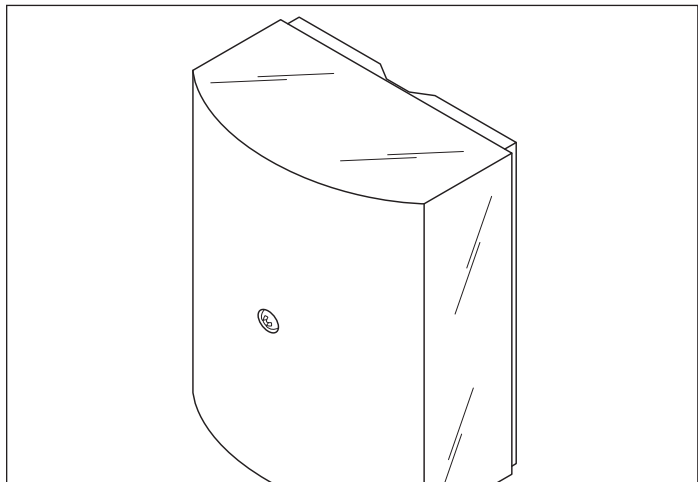
Note: Items 6 through 9 are spare parts shipped with the unit. Two 10A bus fuses (5), electrode seal (6), O-rings #015 (7), and 30psi relief valve (8).



! WARNING

Condensate drain line (2) is shipped from the factory with a loop held together with plastic ties. Do not remove the ties and/or straighten the loop. This loop forms an air block (trap) which prevents carbon monoxide from exiting the water heater through the drain line. Improper installation of the drain line can result in excessive levels of carbon monoxide, which can lead to severe personal injury or death.

1.1.1 Optional Items



An optional outdoor sensor can be purchased separately connected to this unit (part number: IGT-SPR0074).

1.2 Contact Information

Call us first if you have any questions about this product. We can help you with questions about installation or operation, or if there are damaged or missing parts when you unpack this unit from the shipping box.



Stamp or write your dealer contact information here for future reference.

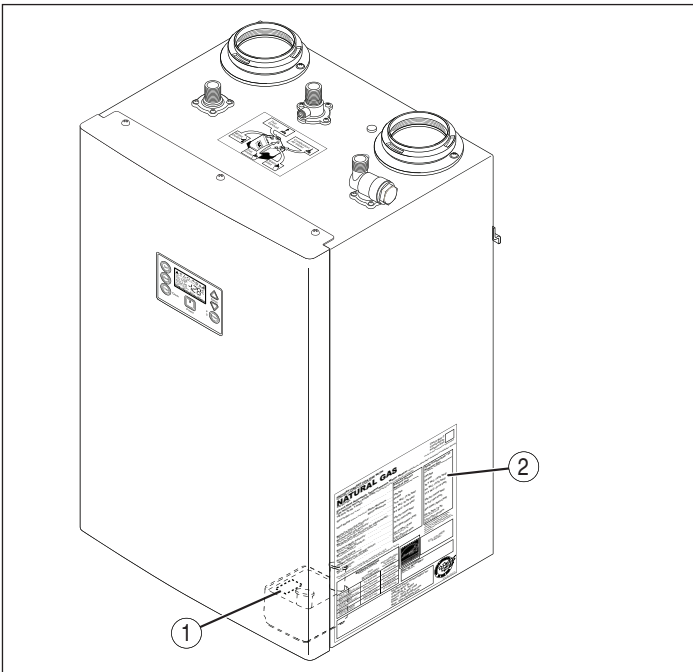
Due to our policy of continuous product improvement and technology, the design and/or technical specifications are subject to change without notice.

Serial Number: _____

Date of Installation: ____ / ____ / ____

1.3 Serial Number Plate Locations

Each unit's heat exchanger module has its own ASME certification plate (1). Rating plate (2) contains serial number for the unit. Please provide this serial number when calling for service or warranty.



2. Safety

2.1 Safety Signal Words

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.

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 that equipment or property damage can result if instructions are not followed.

SAFETY INSTRUCTIONS

Safety instructions (or equivalent) signs indicate specific safety-related instructions or procedures.

Note: Contains additional information important to a procedure.

2.2 Installation Warnings

WARNING

DO NOT use this water heater for any purpose other than water heating.

Read, understand, and follow the Installation and Operation manuals, including all warnings and precautions, before operating this water heater. If you do not follow these instructions exactly, a fire or explosion may result, causing property damage, personal injury, or loss of life.

Follow all local codes and the most recent edition of the National Fuel Gas Code (ANSI Z223.1/NFPA 54) in the USA or the Natural Gas and Propane Installation Code in Canada (CSA B149.1).

This water heater must be installed by a licensed plumber, gas fitter, and/or professional service technician. Installation by unqualified person(s) voids the warranty.

DANGER

A. This water heater does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner manually.

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

WHAT TO DO IF YOU SMELL GAS:

- Do not try to light any appliance.
 - Do not touch any electric switch; do not use any phone in your building.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire or police department.
- C. Use only your hand to turn the manual gas shut-off valve. Never use tools. If manual gas shut-off valve will not turn by hand, don't try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire or explosion.

WARNING

DO NOT use or store flammable liquids around the water heater, including gasoline, oils, spray paints, etc.

DO NOT operate this water heater unless it is properly vented to the outside (the exhaust vent piping must be connected from the unit directly to the outside). Improper venting can cause a build-up of carbon monoxide, which can result in brain damage or death. Exhaust gases must be completely expelled out of the building.

This water heater is factory preset for NATURAL GAS but may be field converted for use with propane. For propane conversion, refer to the Propane (LPG) Conversion section of this manual. Connecting the water heater to any other gas supply can result in property damage, serious injury, or even death.

This water heater is suitable for use in potable water heating applications. The cold and hot water fittings on the top of the water heater **MUST NOT** be connected to any heating system.

The water heater temperature is factory set to 120°F (49°C). Hot water temperatures above 125°F can cause severe burns instantly or death from scalds. If the proposed water heater outlet temperature is to be set above 125°F, installation of a thermostatically controlled (or temperature limiting) mixing valve is recommended for all hot water going to faucets to avoid the risk of scalding. Examples include commercial applications where 140°F (60°C) is often needed or if the space heating temperature required is higher than the domestic hot water. Always check the temperature of the hot water before bathing, showering, washing, etc.

Protect against snow and debris accumulation around the vent terminations. Regularly inspect the exhaust vent pipe and the air intake pipe to ensure they remain clear from obstructions at all times.

CAUTION

Make sure you know the location of the gas shut-off valve and how to operate it. Immediately close the gas shut-off valve if the water heater is subjected to fire, overheating, flood, physical damage, or any other damaging condition that might affect the operation of the unit. Have the water heater checked by a qualified technician before resuming operation.

If the water quality is known to have high acidity and/or high hardness, water treatment is recommended. Consult the local water authority.

SAFETY INSTRUCTIONS

DO NOT use this appliance if any part has been under water.

DO NOT reverse the cold water and gas connections as this will damage the gas valve.

DO NOT overtighten fittings as damage may occur, causing internal leakage.

The appliance should be located in an area where leakage within the unit or at its connections will not result in damage to the surrounding area. The manufacturer will not be responsible for any damage resulting from leaking if adequate drainage is not provided.

WARNING

All piping and components connected to the water heater for the space heating application shall be suitable for use with potable water.

Do not use toxic chemicals, such as used for boiler treatment, in potable water, in potable water heating systems.

Suitable for water (potable) heating and space heating. the water heater **MUST NOT** be connected to any heating system or components previously used with a non-potable water heating appliance.

If the system requires water for space heating at temperatures higher than required for other uses, a mixing valve must be installed to temper the water for those other uses in order to reduce scald and hazard potential.

Water heaters used for combination water/space heating **CANNOT** be used in space heating applications only.

3. Technical Data

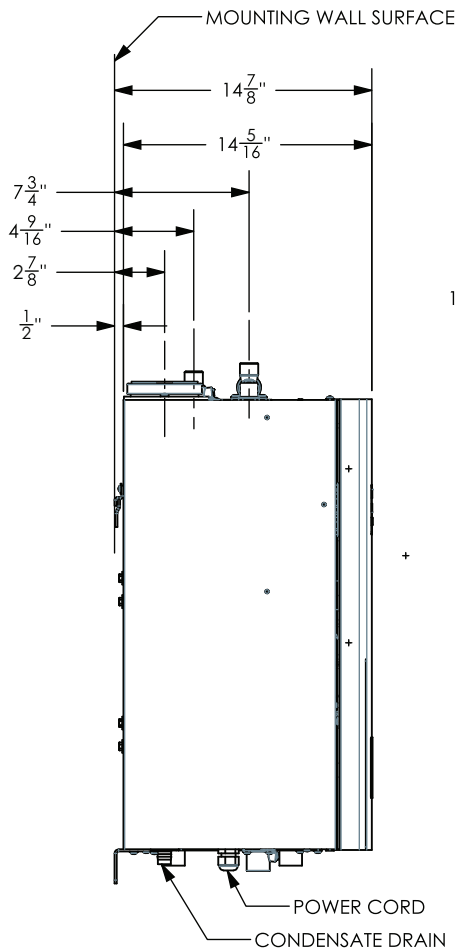
3.1 Specifications Chart

Parameters	i200X	i250X
Type	Indoor, Wall hung, Fully Condensing, direct ignition	
Fuel	Preset for NG / LP convertible	
Minimum / Maximum Input (Btu/h)	30,000 / 199,950	30,000 / 250,000
Thermal Efficiency	94%	92%
Energy factor	0.93	N/A
AFUE	91.2%	N/A
Combined Appliance Annual Fuel Utilization Efficiency (CAFUE)	91.4%	N/A
Dimensions H X W X D (inches)	26 X 17.4 X 14.9 (3.9 cu. ft)	
Weight (lbs)	98	
Water and Gas connections	3/4" NPT	
Space heating Connections	1" NPT	
Minmum Flow Rate	No minimum flow rate in learned or prograded modes	
Venting Materials	Sch. 40 PVC, Sch. 40 CPVC, Polypropylene, Stainless Steel	
Max 3" Vent Length - Single Pipe / Power Vent	200 ft, deduct 5 ft per 90° elbow	130 ft, deduct 5 ft per 90° elbow
Max 3" Vent Length - Two pipe / Direct Vent	100 ft, deduct 5 ft per 90° elbow	65 ft, deduct 5 ft per 90° elbow
Max 2" Vent Length - Single Pipe / Power Vent (2" not allowed at elevations above 4,000 ft)	26 ft, deduct 5 ft per 90° elbow	N/A
Max 2" Vent Length - Two Pipe / Direct Vent (2" not allowed at elevations above 4,000 ft)	21 ft, deduct 5 ft per 90° elbow	
Safety	Flame Rod, Thermal Fuse, Overheat Prevention Device, Fan Speed Monitor, Flue Temperature Monitor, Blocked Vent Detector, Water Shut Off Valve, 2X10A Fuse, Dual Flame Sensing	
Water Pressure Min / Max (PSI)	30 / 150	
NG/LP- Minimum Static Gas Pressure 1/2" black iron (non-corrugated)	5"	6"
NG/LP- Minimum Static Gas Pressure 3/4" black iron (non-corrugated)	2.5"	
NG/LP - Maximum Static Gas Pressure	14"	
Gas Pressure for Adjustments	8" for NG, 11" for LP	
Electrical	120V AC, 60 Hz	
Power Consumption	500W (Max 4.2 Amps), 8W (Standby)	
Features	i200X	i250X
Space Heating heat exchanger	Stainless brazed plate, Maximum flow 15 GPM	
Domestic Water Heat exchanger	Stainless 316L	
Performance	i200X	i250X
Hot Water Capacity (35F Rise)	10.8	13.2
Hot Water Capacity (45F Rise)	8.4	10.3
Hot Water Capacity (77F Rise)	5.0	6.0
Domestic Hot Water Temp. Settings	100 – 140°F	
Space Heating Temp. Settings	100 – 170°F	
Warranty (with recirculation)	Residential - Heat Exchanger coil - 12 years, Parts – 3 years, Labor – 1 year Commercial - Heat Exchanger coil – 6 years, Parts – 1 years	
Note: Due to Intellihot's Policy of continuous product improvements, design and technical specifications are subject to change without notice		

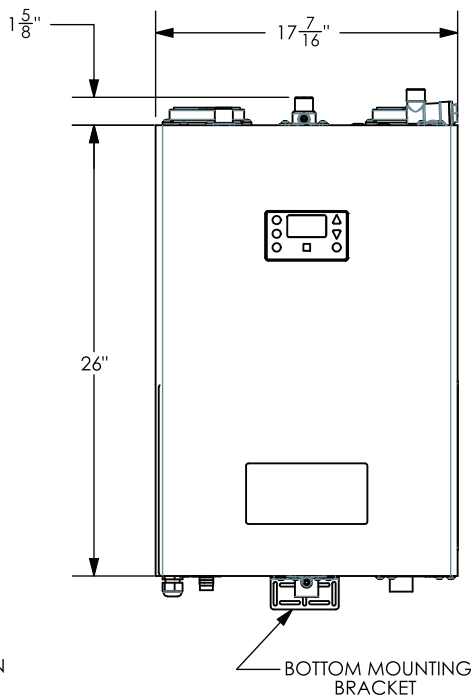
3.2 High Elevation Installations

For operation at elevations above 2,000 feet, the hot water delivery capacity should be reduced by 4% for each 1,000 feet above sea level.

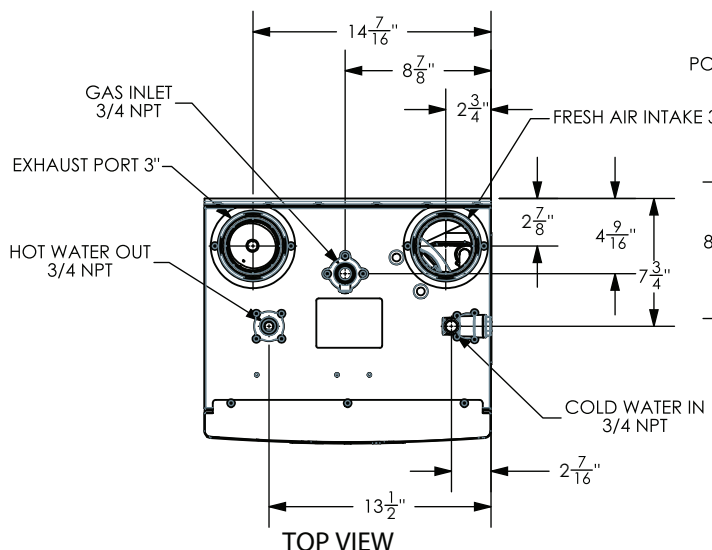
3.3 Dimensional Specifications



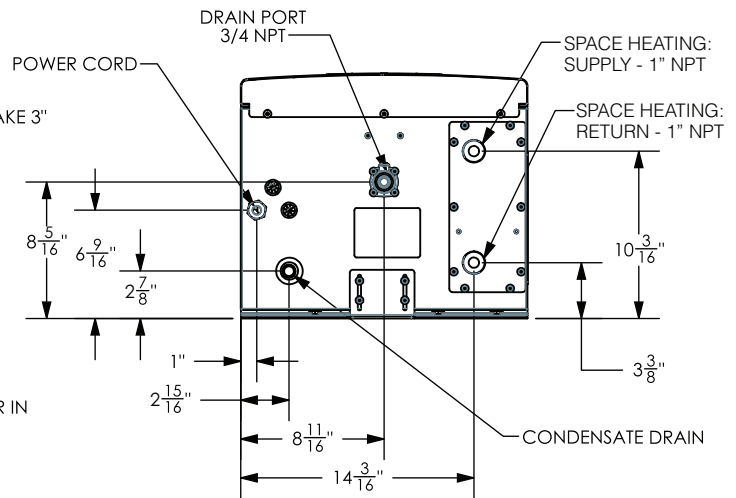
SIDE VIEW



FRONT VIEW



TOP VIEW



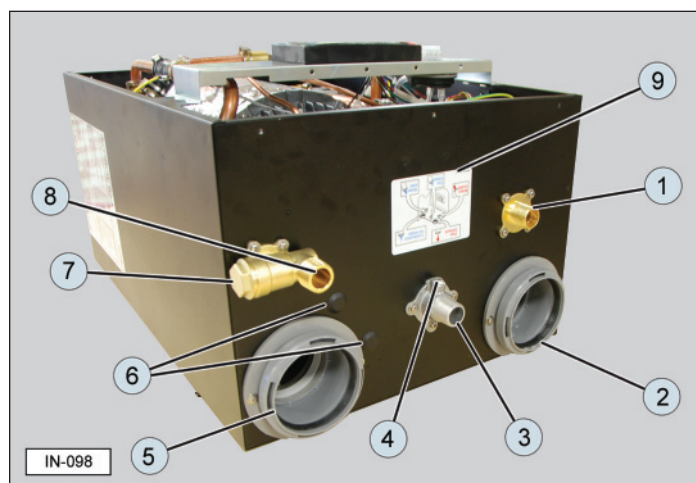
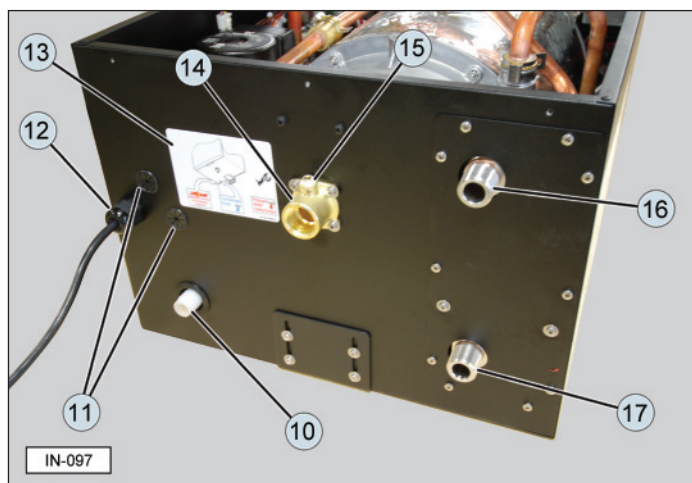
BOTTOM VIEW

IQ-001-250X

3.4 Inlet and Outlet Connections

Top and Bottom Connections		
Item	Description	Specification ¹
1	Hot Water Outlet Connection	3/4" Male NPT
2	Exhaust Gas Vent	3" O.D. PVC Schedule 40
3	Gas Supply Inlet Connection	3/4" Male NPT
4	Gas Pressure Analyzer Port	1/8" Female NPT
5	Fresh Air Intake	3" O.D. PVC Schedule 40
6	Access Ports for Blower Mounting Hardware	—
7	Water Inlet Strainer	—
8	Cold Water Supply Inlet Connection	3/4" Male NPT
9	Connections Location Decal	—
10	Condensate Drain Connection	3/4" Nipple (3/4" flex hose)
11	Wiring Ports for Space Heating Pump Control Wiring and Thermostat Wiring	120V AC Power Cord
12	Power Supply	—
13	Connections Location Decal	—
14	Drain Connection (Domestic)	3/4" Female NPT
15	Heat Exchanger Drain Port (Domestic)	1/8" Female NPT
16	Space Heating - Supply	1" Male NPT
17	Space Heating - Return	1" Male NPT

¹ Using sizes other than specified can cause damage to the water heater and will void the warranty.



4. Preparation Before Installation

4.1 Selecting an Installation Site

Note: When installing the water heater, follow all local building codes and the current edition of the National Fuel Gas Code (ANSI Z223.1/NFPA 54) in the USA, or National Gas and Propane Installation Code (CAN/CGA B149.1) in Canada when installing this product.

Note: For water heater installations in Massachusetts, the unit must be installed by a plumber or gas-fitter licensed within the Commonwealth of Massachusetts. Refer to the Requirements for the State of Massachusetts section in this manual for additional information.

1. Select an interior location for the installation. Each installation is unique; therefore, take the time to find the best location for the water heater.
 - a. Install the water heater near locations that use hot water, such as bathroom, kitchen, or laundry room faucets.
 - b. Select a location that minimizes the length of the water pipe.
 - c. If the distances are long or if the faucet or appliance requires "instant" hot water, we recommend running a recirculation line back to the water heater from the farthest fixture.
 - d. Insulate the hot water supply and recirculation lines.
 - e. Select a location away from foot traffic and away from areas where dust, debris, chemical agents, or other combustible materials could accumulate.
 - f. Allow sufficient space for service and maintenance access to all gas, water, and drain connections.
 - g. Make sure the location meets all building code requirements.
 - h. Make sure the wall surface that the water heater is mounted on will support the weight of the unit (90 lbs. minimum).
2. Minimize the distance that the exhaust gas vent and fresh air intake must travel to an exterior wall.
 - a. The exhaust vent outlet must not be located next to a walkway, near soffit vents, crawl space vents, or other areas where condensate (water vapor) could cause damage or create a hazard. Refer to the Venting Clearance Specifications section for additional information.
 - b. The fresh air inlet vent must be located at least 12" from the exhaust vent.
 - c. Contaminated or dirty air drawn into the intake pipe can damage the water heater. The warranty does not cover damage caused by airborne contaminants.

3. Locate the unit close to a drain and near gas and water connections.

The water heater produces a significant amount of condensate during normal operation and should be located near a suitable drain where damage from a possible leak will be minimal. Installing the water heater in a location without a drain will void the warranty and the manufacturer will not be responsible for any resulting water damages that may occur. For additional information, refer to the Condensate Line Installation section.

4. Locate the water heater and all the water pipes in an area where the ambient temperature always remains above freezing.
 - a. When the water heater is connected to an electrical power supply, it will automatically prevent the water from freezing inside the unit.
 - b. The unit's freeze protection system will not prevent the water in surrounding pipes from freezing.

NOTICE

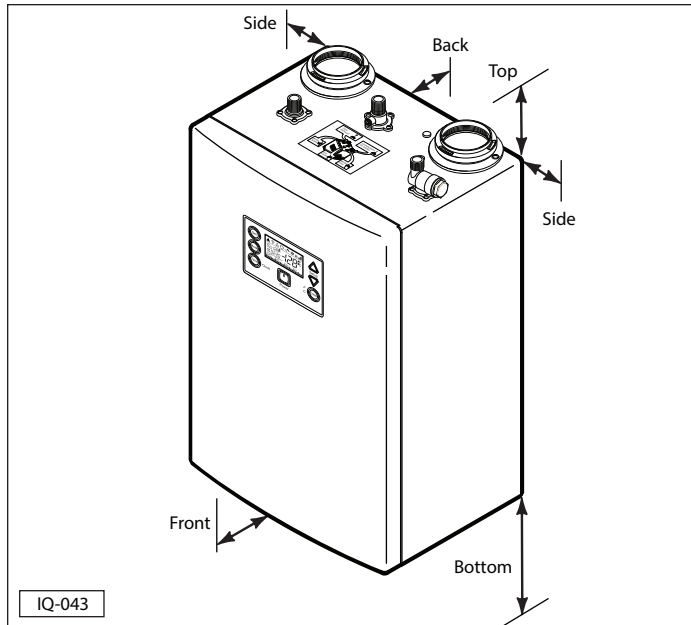
In cold climates, if there is a power failure, the unit's freeze protection system will not operate and can result in water freezing inside the heat exchanger. To prevent damage to the water heater, turn OFF the gas supply and inlet water valve. Completely drain the unit. Damage caused by freezing water is not covered by the warranty.

5. Select an appropriate location for the combustion air and exhaust pipes to exit the building, as shown in the Venting Clearance Specifications section in this manual.

5. Wall Mounting

5.1 Clearance Requirements

In order for the water heater to operate properly and efficiently, the clearances specified in the table are required.



Required Mounting Clearances			
Location	From Combustibles	From Non-Combustibles	Service Clearance ¹
Top	6" (15.2 cm)	2" (50.8 cm)	12" (30.4 cm)
Back ²	5/8" (15.8 mm)	5/8" (15.8 mm)	5/8" (15.8 mm)
Sides	1" (25.4 mm)	1/2" (12.7 mm)	5/8" (15.8 mm)
Front	2" (5.1 cm)	2" (5.1 cm)	30" (76.2 cm)
Bottom	12" (30.4 cm)	12" (30.4 cm)	12" (30.4 cm)

¹ Service clearances are suggested to allow for normal service.

² Mounting bracket automatically sets this dimension.

5.2 Mounting the Unit to the Wall

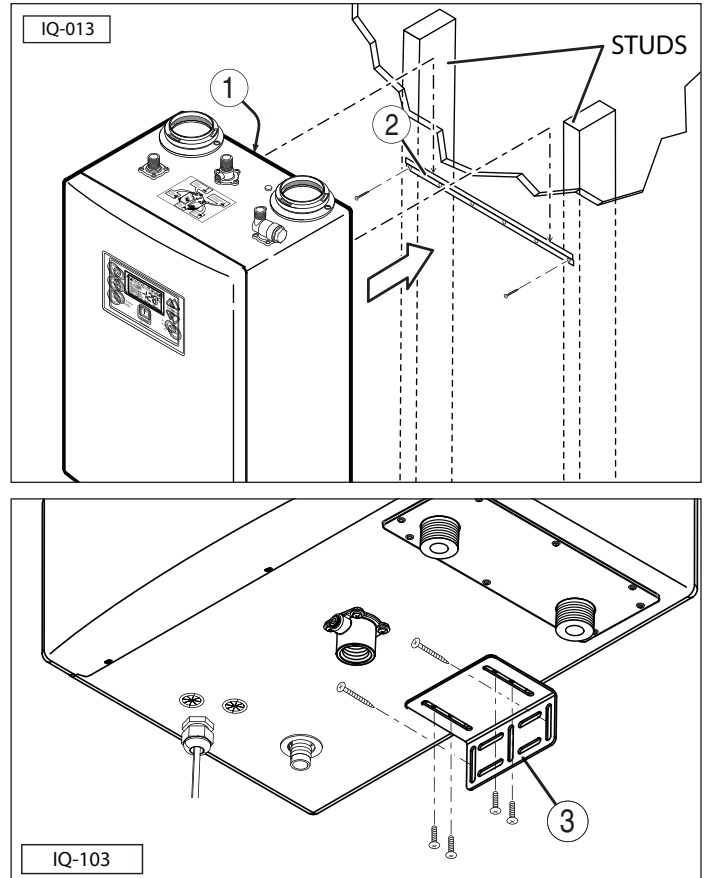
All water heaters come with an upper mounting bracket with predrilled holes spaced on 16 inch centers to facilitate easy installation on standard wall studs.

If the strength of the wall is insufficient or if the framing is non-standard or uneven, reinforce the area using a sheet of plywood before installing the water heater.

Avoid installation on inside walls that can transmit operational noises to occupants while the unit is operating.

To mount the water heater to the wall:

1. Place the upper mounting bracket on the wall and ensure that it is level. Use two appropriately sized wood screws to mount the bracket securely to the studs. Ensure that it is affixed securely and can support the weight of the 100 pound unit.



SAFETY INSTRUCTIONS

Only the included brackets should be used to mount the unit. Water heaters weigh approximately 100 lbs., and must be securely attached to the wall.

CAUTION

According to the National Institute for Occupational Safety and Health, the recommended maximum safe lifting weight is 51 lbs., with all lifting conditions perfect; minimal forward reach, steady load close to the body, straight back, load between knees and shoulders, and good grips. To avoid personal injury, always use these proper lifting techniques and use two people to move the water heater which weighs 100 lbs.

2. With assistance, hang the unit on the upper wall bracket, interlocking bracket (1) on the back of the unit, and wall bracket (2).
3. Install two appropriately sized wood screws in lower bracket (3) to secure the unit to the wall.
4. Make sure the unit is plumb and level, and tighten the four sheet metal screws on bottom bracket (3). When properly installed, there should be a 5/8" air space between the back of the water heater and the wall.

6. Gas Connections

6.1 Installation Guidelines

WARNING

To avoid serious injury or even death, the gas line installation and the gas line inlet pressure test must be done by a licensed professional.

The water heater is factory preset for natural gas.

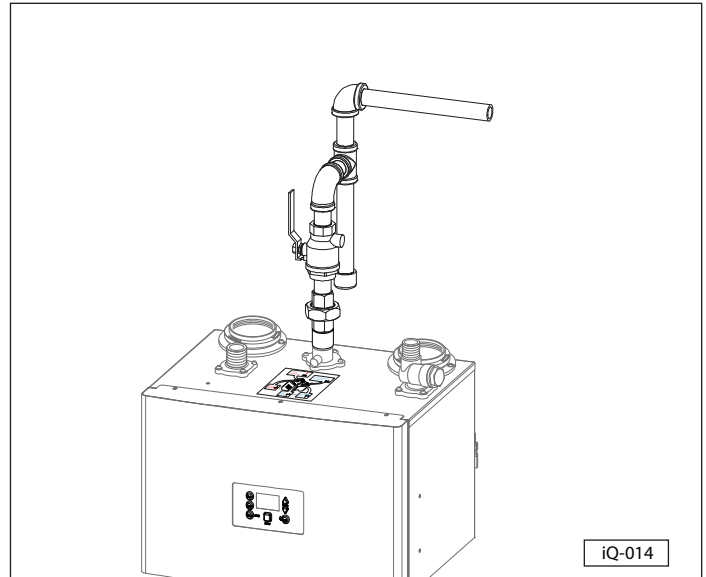
Make sure the gas line pressures are within normal limits. Pressures outside normal limits can result in poor performance and hazardous operating conditions.

1. Determine if the unit will use natural gas (factory preset) or LP (propane) gas. To convert the unit to propane, refer to the Propane (LPG) Conversion section in this manual.
2. Ensure the gas supply pressure meets the requirements for the unit, as shown below.

Gas Pressures	i200X	i250X
NG/LP- Minimum Static Gas Pressure 1/2" black iron (non-corrugated)	5"	6"
NG/LP- Minimum Static Gas Pressure 3/4" black iron (non-corrugated)	2.5"	
NG/LP - Maximum Static Gas Pressure	14"	
Gas Pressure for Adjustments	8" for NG, 11" for LP	

3. Select the proper gas piping.
 - a. All gas piping and components must comply with NFPA local codes and utility requirements. Only gas approved fittings, valves, or pipes should be utilized.
 - b. Assembled piping should be clean of all scale, debris, metal particles, or foreign material.
 - c. The piping must be supported by the floor, ceiling, or walls.
4. Make sure the pipe diameter for the length being used is correctly sized to meet maximum output of the water heater(s) being installed.
 - a. The maximum gas flow rate required is the sum of the maximum inputs of each unit divided by the heat of combustion of the fuel supplied at the location (use 1,030 BTU per cubic foot for natural gas and 2,520 BTU per cubic foot for propane).
 - b. The fuel supplier or utility company should be consulted to confirm that sufficient volume and normal pressure is provided to the building at the discharge side of the gas meter or supply pipe.
 - c. Use the Gas Pipe Sizing tables in this manual or refer to the gas line manufacturer's sizing information to determine the correct diameter for the supply pipe.
5. Make sure a drip leg is installed on the gas piping.
 - a. Drip legs are required at the gas supply of each water heater to prevent any dirt, condensation, or debris from entering the gas inlet.

- b. The bottom of the gas drip leg should be removable without disassembling any gas piping.
- c. The gas pipe should not be supported by the bottom of the drip leg.



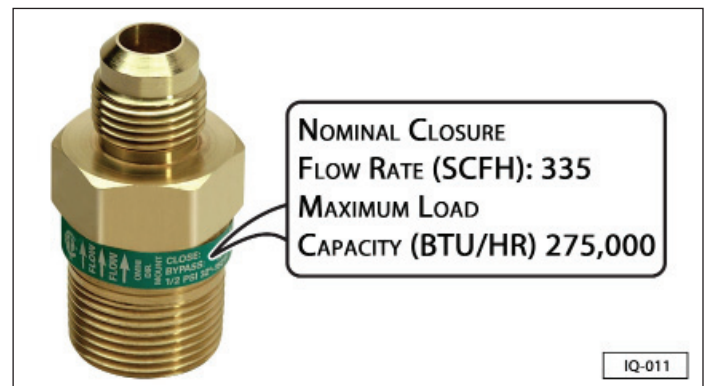
Note: Always clean the inside of the gas line of any dirt or debris before connecting the piping to the unit.

NOTICE

Do not start the water heater until all connections have been completed, leak-tested, and the heat exchanger is filled with water.

6.2 Excess Flow Valve (EFV)

If an excess flow valve (EFV) is installed in the gas line, check the manufacturer's minimum and maximum flow capacity rating. An improperly sized EFV will not allow for the full flow of gas to the water heater and will cause the unit to malfunction.



6.3 Gas Pipe Sizing Tables

This information is for reference only. Refer to gas pipe manufacturer specifications for actual delivery capacity. Contact the local gas supplier for actual BTU/ft³ rating. This data copied from the National Fire Protection Association Article 54 (NFPA 54).

Pipe Sizes and BTU/h Capacity (Natural Gas). Use this table for static gas pressure less than 5"								
Length Including fittings	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
10	360,000	678,000	1,390,000	2,090,000	4,020,000	6,400,000	11,300,000	23,100,000
20	247,000	466,000	957,000	1,430,000	2,760,000	4,400,000	7,780,000	15,900,000
30	199,000	374,000	768,000	1,150,000	2,220,000	3,530,000	6,250,000	12,700,000
40	-	320,000	657,000	985,000	1,900,000	3,020,000	5,350,000	10,900,000
50	-	284,000	583,000	873,000	1,680,000	2,680,000	4,740,000	9,660,000
60	-	257,000	528,000	791,000	1,520,000	2,430,000	4,290,000	8,760,000
70	-	237,000	486,000	728,000	1,400,000	2,230,000	3,950,000	8,050,000
80	-	220,000	452,000	677,000	1,300,000	2,080,000	3,670,000	7,490,000
90	-	207,000	424,000	635,000	1,220,000	1,950,000	3,450,000	7,030,000
100	-	-	400,000	600,000	1,160,000	1,840,000	3,260,000	6,640,000
125	-	-	355,000	532,000	1,020,000	1,630,000	2,890,000	5,890,000
150	-	-	322,000	482,000	928,000	1,480,000	2,610,000	5,330,000
175	-	-	296,000	443,000	854,000	1,360,000	2,410,000	4,910,000
200	-	-	275,000	412,000	794,000	1,270,000	2,240,000	4,560,000
Note: BTU/h capacities are based on specific gravity of 0.6, pressure drop of 0.5" WC								

Pipe Sizes and BTU/h Capacity (Natural Gas). Use this table for static gas pressure greater than 5"									
Length Including fittings	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
10	404,000	949,000	1,787,000	3,669,000	5,497,000	10,588,000	16,875,000	29,832,000	43,678,000
20	286,000	652,000	1,228,000	2,522,000	3,778,000	7,277,000	11,598,000	20,503,000	30,020,000
30	233,000	524,000	986,000	2,025,000	3,034,000	5,844,000	9,314,000	16,465,000	24,107,000
40	202,000	448,000	844,000	1,733,000	2,597,000	5,001,000	7,971,000	14,092,000	20,632,000
50	-	397,000	748,000	1,536,000	2,302,000	4,433,000	7,065,000	12,489,000	18,286,000
60	-	360,000	678,000	1,392,000	2,085,000	4,016,000	6,401,000	11,316,000	16,569,000
70	-	331,000	624,000	1,280,000	1,919,000	3,695,000	5,889,000	10,411,000	15,243,000
80	-	308,000	580,000	1,191,000	1,785,000	3,437,000	5,479,000	9,685,000	14,181,000
90	-	289,000	544,000	1,118,000	1,675,000	3,225,000	5,140,000	9,087,000	13,305,000
100	-	273,000	514,000	1,056,000	1,582,000	3,046,000	4,856,000	8,584,000	12,568,000
125	-	242,000	456,000	936,000	1,402,000	2,700,000	4,303,000	7,608,000	11,139,000
150	-	219,000	413,000	848,000	1,270,000	2,446,000	3,899,000	6,893,000	10,093,000
175	-	202,000	380,000	780,000	1,169,000	2,251,000	3,587,000	6,342,000	9,285,000
200	-	-	353,000	726,000	1,087,000	2,094,000	3,337,000	5,900,000	8,638,000
Note: For 1/2" line BTU/h capacities are based on specific gravity of 0.6, pressure drop of 4.6" WC and 5.0" WC. For all other line sizes, capacities are based on specific gravity of 0.6, pressure drop of 3.0" WC									

Pipe sizes and BTU/h capacity (Propane). Use this table for static gas pressure greater than 5"									
Length Including fittings	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
10	409,000	608,000	1,150,000	2,350,000	3,520,000	6,790,000	10,800,000	19,100,000	39,000,000
20	289,000	418,000	787,000	1,620,000	2,420,000	4,660,000	7,430,000	13,100,000	26,800,000
30	236,000	336,000	632,000	1,300,000	1,940,000	3,750,000	5,970,000	10,600,000	21,500,000
40	204,000	287,000	541,000	1,110,000	1,660,000	3,210,000	5,110,000	9,030,000	18,400,000
50	-	255,000	480,000	985,000	1,480,000	2,840,000	4,530,000	8,000,000	16,300,000
60	-	231,000	434,000	892,000	1,340,000	2,570,000	4,100,000	7,250,000	14,800,000
80	-	212,000	400,000	821,000	1,230,000	2,370,000	3,770,000	6,670,000	13,600,000
100	-	-	372,000	763,000	1,140,000	2,200,000	3,510,000	6,210,000	12,700,000
125	-	-	349,000	716,000	1,070,000	2,070,000	3,290,000	5,820,000	11,900,000
150	-	-	330,000	677,000	1,010,000	1,950,000	3,110,000	5,500,000	11,200,000
175	-	-	292,000	600,000	899,000	1,730,000	2,760,000	4,880,000	9,950,000
200	-	-	265,000	543,000	814,000	1,570,000	2,500,000	4,420,000	9,010,000
Note: The line BTU/h capacities are based on specific gravity of 1.5, pressure drop of 0.5" WC.									

6.4 Gas Pressure Regulator

Depending on the gas inlet pressure at your location, it may be necessary to install a gas pressure regulator to lower gas pressures to an acceptable level. Please ensure that the gas pressure regulator has the same or higher minimum to maximum modulation range as the water heater model it is connected to.

Regulators should be mounted with a minimum of 12" of straight length pipe on either side.

6.5 Venting of Gas Supply Regulators

Below are the general guidelines for venting a gas regulator. The manufacturer recommends these guidelines be followed to ensure reliable and proper operation of the water heater. Local codes and the gas regulator manufacturer should also be consulted for additional installation information.

1. When venting the gas supply regulator, the vent pipe must be at least the same size as the regulator vent.
2. Vent lines must not be connected together or connected with any other appliance requiring external venting.
3. When selecting the size, the pipe diameter must be increased by one size for every 20 feet of pipe.
4. Each 90° elbow is equivalent to approximately:
4.5 feet for nominal pipe sizes of up to 1-1/2"
10.5 feet for nominal pipe sizes of up to 4"
5. Each 45° elbow is equivalent to approximately:
2 feet for nominal pipe sizes of up to 1-1/2"
5 feet for nominal pipe sizes of up to 4"

7. Venting and Materials

WARNING

Improper venting of the water heater can result in excessive levels of carbon monoxide, which can lead to severe personal injury or death. This water heater must be vented in accordance with the “Venting of Equipment” section of the latest edition of the ANSI Z223.1 / NFPA 54 (Natural Fuel Gas Code) in the USA, or in Canada refer to the “Venting Systems and Air Supply for Appliances” section in the latest version of CAN/CGA B149.1 (Natural Gas and Propane Installation Code), and all applicable local building codes. Vent installation should be performed only by a licensed professional.

7.1 Venting Guidelines

- This water heater must be properly vented to ensure there is a constant supply of clean intake air, and the exhaust is properly evacuated from the building. All seal connections should be airtight.
- The unit should be located as close to the vent termination, and the vents kept as short and straight as possible.
- Do not connect the water heater vent to a vent of any other non-water heater appliance.
- Combustion air may be drawn from the room where the unit is installed (single pipe/power vent) or directly from the outside (two pipe/direct vent).
- Ensure a sufficient supply of clean combustion air, free of any contaminants, such as dust, chemical fumes (i.e. aerosols, chlorine, paint), grass, or other airborne contaminants. If necessary, purchase and install the appropriate air screens, and follow a regular cleaning program to ensure an adequate supply of clean combustion air.
- Do not operate the unit in an area that is or will be under construction or renovation.
- The warranty does not cover damage caused by contaminants in the installation area. If you must install the water heater in an area with contaminated air, use direct venting to supply the air from the outside of the building.
- All horizontal runs should be sloped upwards towards the vent termination at a rate of 1/4" per foot.
- To avoid moisture and frost build-up to openings on adjacent homes, use 45° elbows, 90° elbows, or tees for the vent termination to direct the exhaust fumes away from the building.

7.2 Exhaust Vent Materials

The materials listed in the table below outline the acceptable exhaust vent materials:

United States Exhaust Vent Pipe Standards	
Material	Description*
Exhaust Vent Pipe	PVC Schedule 40
	CPVC Schedule 40, 80
	Approved Polypropylene
	AL294C Stainless Steel
Canadian Exhaust Vent Pipe Standards	
Material	Description (approved to ULC-S636)**
Exhaust Vent Pipe	Type BH Special Gas Vent Class IIA (PVC)
	Type BH Special Gas Vent Class IIB (CPVC)
	Type BH Special Gas Vent Class IIC (Polypropylene)
	Type BH Special Gas Vent Class I (AL294C Stainless Steel)

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

**Note: The components (pipe, fittings, primers, and glues) must be from a single manufacturer; do not interchange. Follow the vent manufacturer's certified instructions.

This water heater has a built-in exhaust vent temperature control that limits the exhaust temperature to a maximum of 149°F (65°C).

If the temperature approaches the upper limit, the burner will turn off automatically to protect the vent pipe. As a result, this water heater can be vented with PVC pipe. Once the exhaust temperature has dropped to a normal operating level, the unit will automatically restart.

If the inlet/return water temperature will exceed 150°F (66°C), do not use PVC venting. Refer to the Programming section for Flue Type Selection (PVC or CPVC) for additional information.

If the space temperature setpoint is greater than 150°F, use CPVC venting and set the unit to CPVC.

7.3 Air Intake Vent Materials

The air intake vent can be of any plastic or metal vent material available. ABS, PVC, Polypropylene, galvanized steel, and flexible corrugated ducting are all examples. If you are using a corrugated material, ensure there is no inadvertent crimping or blockage to the air intake pipe.

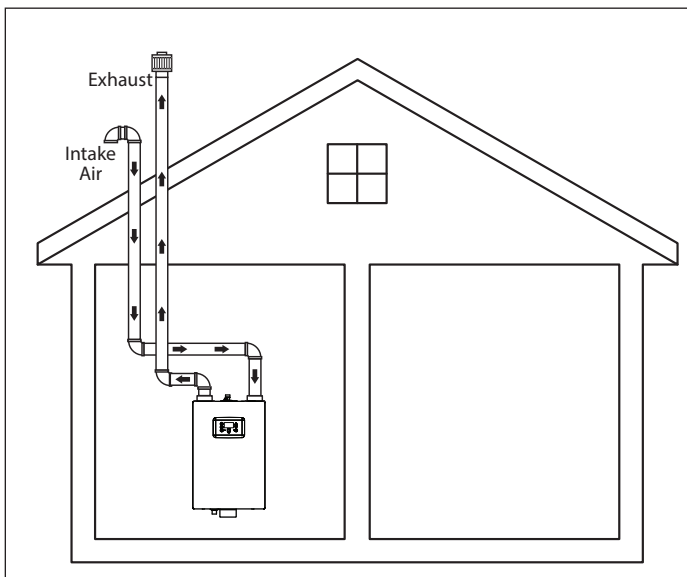
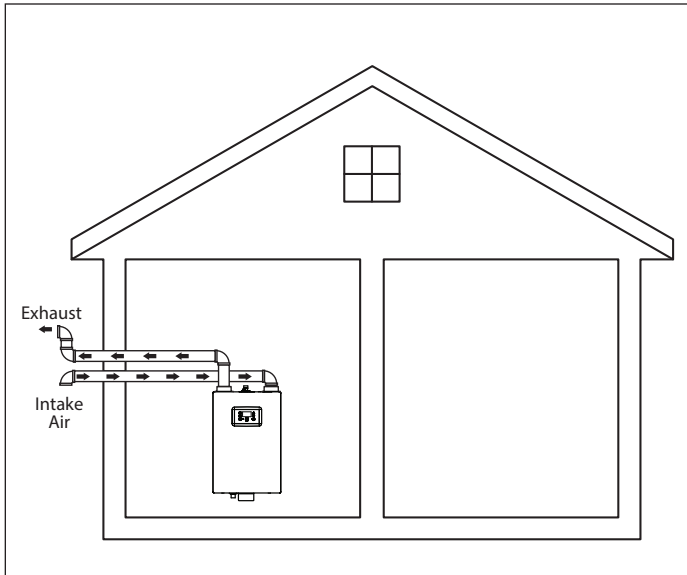
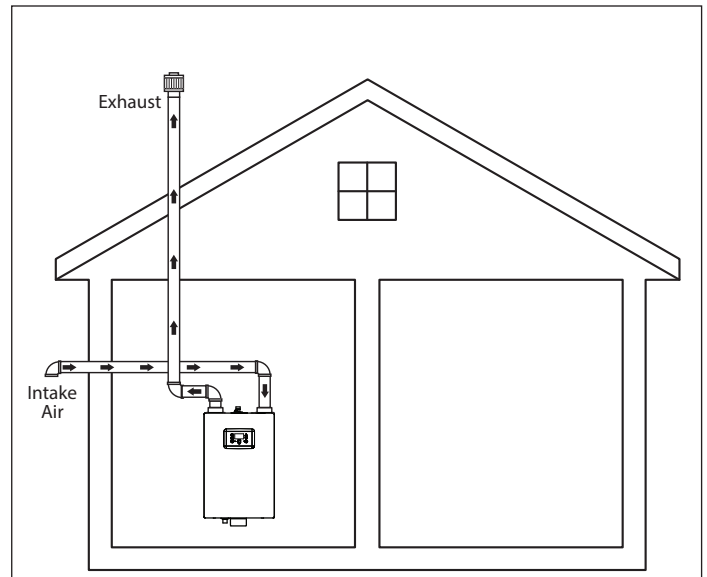
7.4 Venting Configurations

Water heaters may be installed with: two pipes (direct vent) configuration or with one pipe (power vent) configuration.

7.5 Two Pipe Vent System (Direct Vent)

The water heater can be direct vented without any modification using a 3 inch diameter pipe.

The following diagrams represent some typical direct venting configurations and are included to assist in designing the vent system. Possible configurations are not limited to the following diagrams.

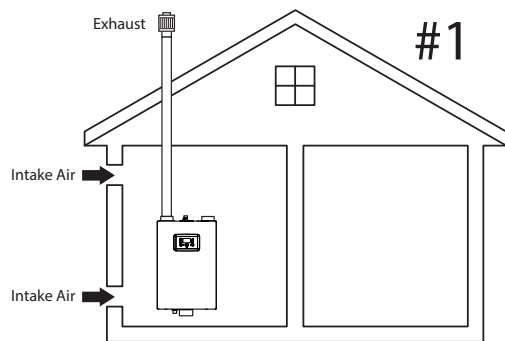


7.5.1 Single Pipe Venting System (Power Vent)

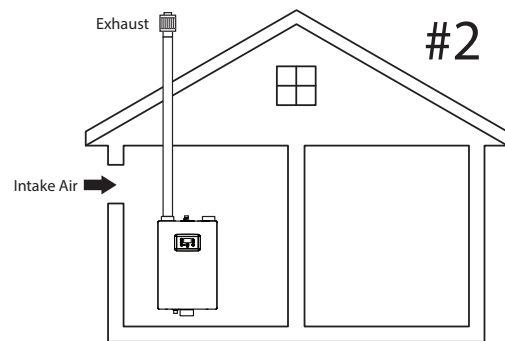
When using the single exhaust pipe/power vent method, the following table outlines the required opening sizes for the combustion and ventilation air coming into the room:

Required Combustion & Ventilation Air Opening Sizes (sq. in) Per Heater Per Room:					
Input BTU/hr	Air Type	Air is drawn directly from outside into the room			Example #4 Air is drawn from another interior space inside the building
		Example #1 through two openings*, direct or vertical	Example #2 through one opening**	Example #3 through two horizontal ducts***	
199,950	Combustion Air	50	67	100	67
	Ventilation Air	50		100	67
250,000	Combustion Air	63	84	125	84
	Ventilation Air	63		125	84

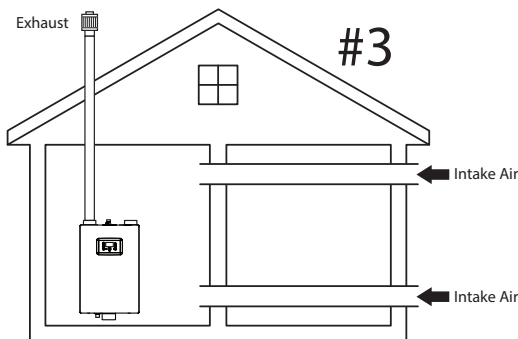
*Where two openings are used, one must be within 12" of the floor and the other opening must be within 12" of the ceiling.
 **Where one opening is required, it must be located within 12" of the ceiling. See illustration below.



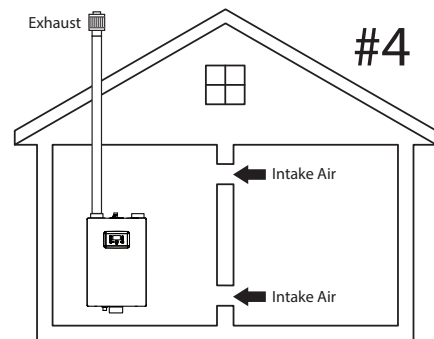
#1
Combustion Air Direct from Outside
2 Direct Openings or through Vertical Duct
1 sq. in. per 4000 btu/h



#2
Combustion Air Direct from Outside
1 Direct Opening
1 sq. in. per 3000 btu/h

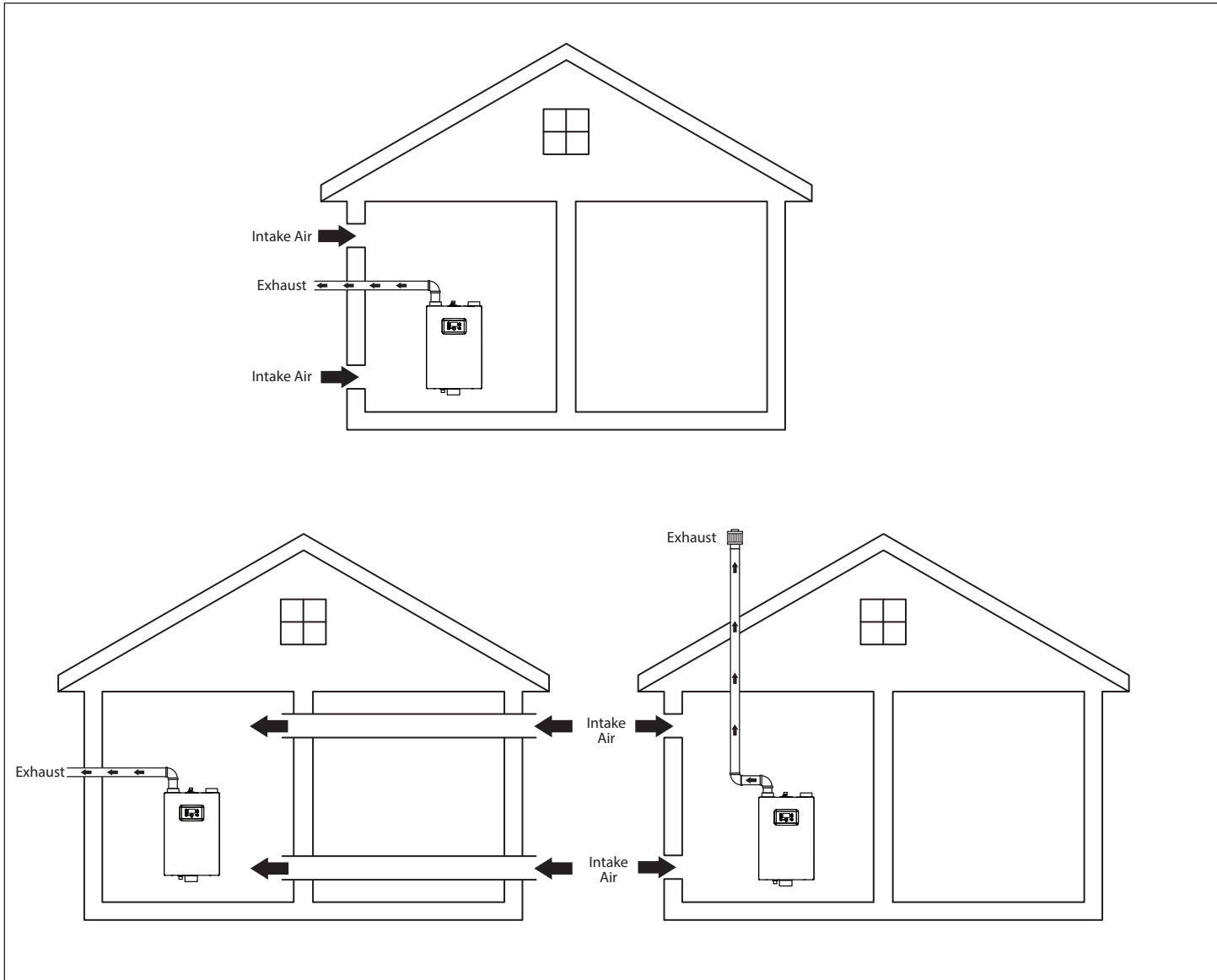


#3
Combustion Air Through Ducts
2 Openings through Horizontal Duct
1 sq. in. per 2000 btu/h



#4
Combustion Air from Interior Space
2 Direct Openings or through Vertical Duct
1 sq. in. per 1000 btu/h

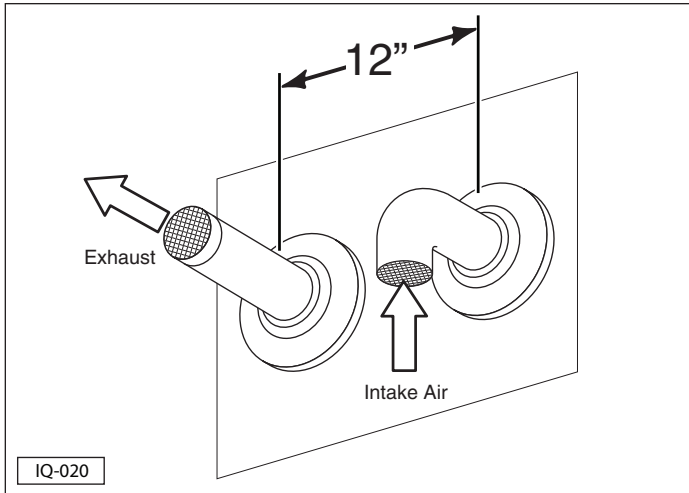
The following illustrations represent some typical power venting configurations and are included to assist in designing the vent system. Possible configurations are not limited to these designs.



7.6 Venting Termination

7.6.1 Side Wall Termination

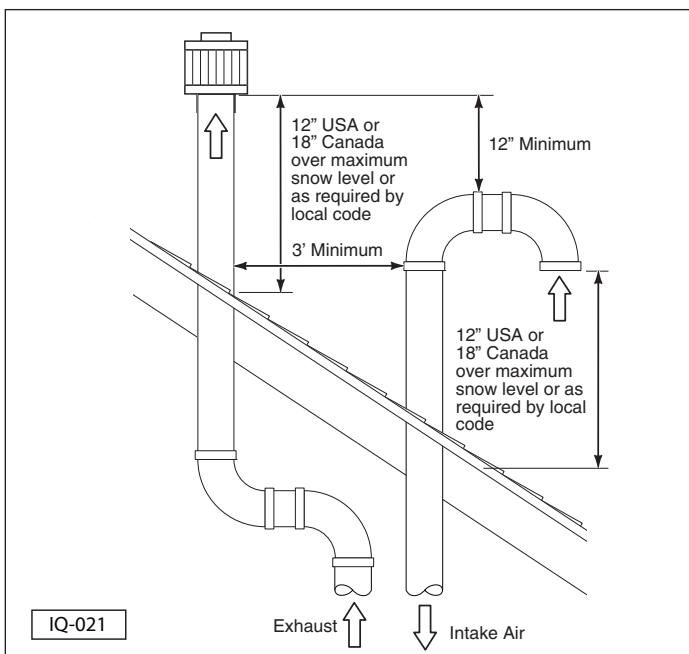
1. Terminate the air intake with a 90° elbow (angled down). Use a flange and PVC screen (not supplied).
2. Terminate the exhaust on the exterior wall at least 12" above ground and at least 12" away from the air intake, or as required by local building codes. In areas of high snow fall, protect the vent terminations from blockage. Use a flange and PVC guard.



7.6.2 Roof Termination

Venting the unit through the roof is also an option. With this installation method, the terminations must extend at least 12" over maximum potential snow levels, or as required by local building codes. In areas of high snow fall, protect the vent terminations from blockage.

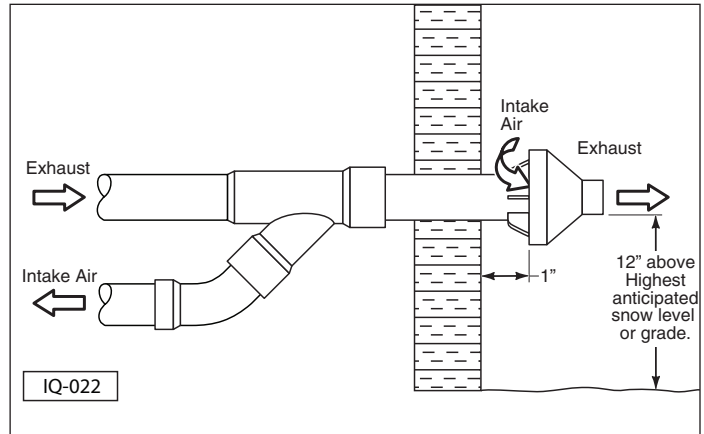
Terminate the air intake with a 90° elbow (angled down). A suitable roof flashing and vent cap (not supplied) should be installed.



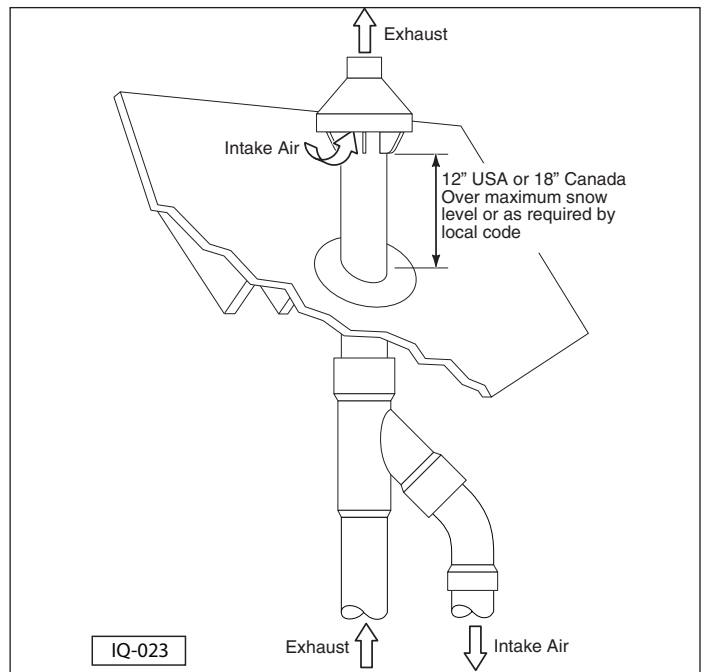
7.6.3 Concentric Venting Termination (Single Unit)

If desired, an optional concentric venting system, which uses one 5" opening through an exterior wall or roof, can be used, as opposed to cutting two 3" openings.

Follow all installation instructions included with the concentric vent kit when installing this type of vent system.

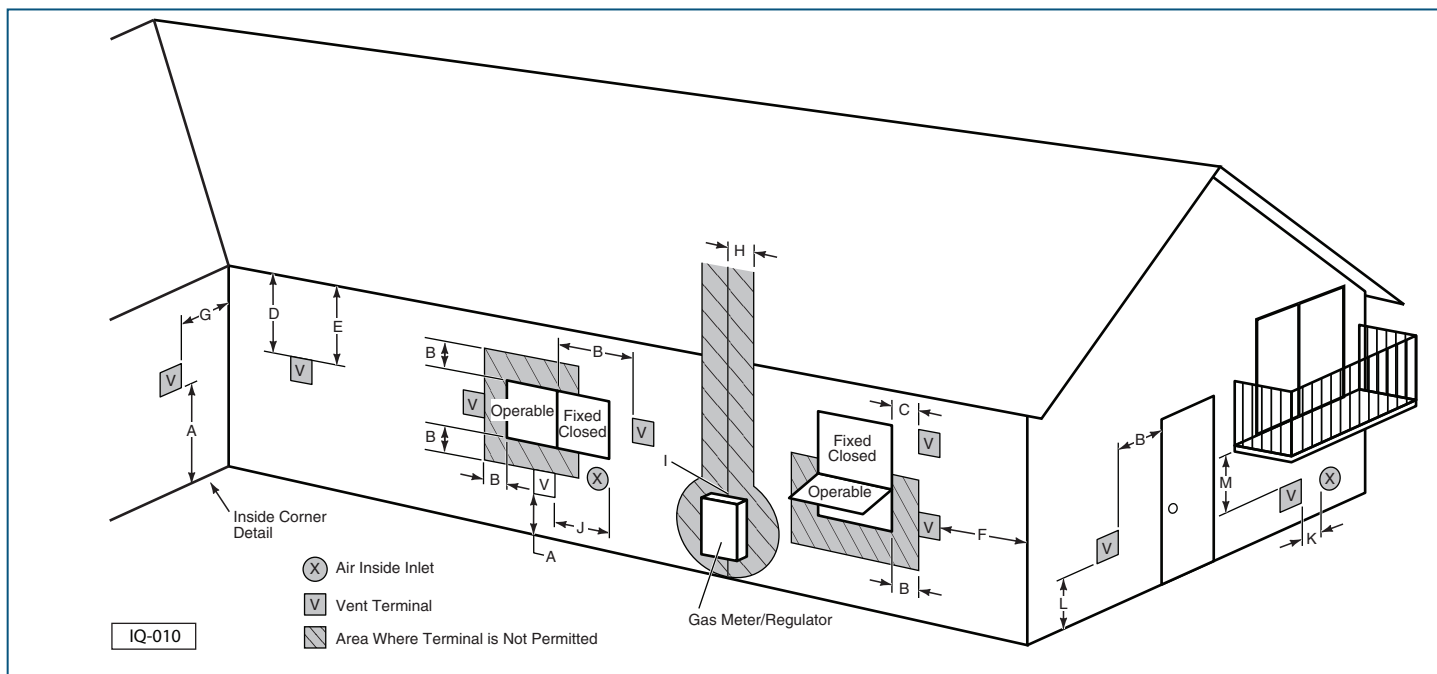


Concentric Venting System Through a Side Wall.



Concentric Venting System Through the Roof.

7.7 Venting Clearance Specifications



Venting Clearance Specifications			
Item	Description	Clearance Distance	
		USA1	Canada2
A	Clearances above grade, veranda, porch, deck, or balcony	1 foot	1 foot
B	Clearances to window or door that may be opened	1 foot**	3 feet
C	Clearances to permanently closed window	*	*
D	Vertical clearance to a ventilated soffit, eaves, or overhang	*	*
E	Clearances to unventilated soffit, eaves, or overhang	*	*
F	Clearances to outside corner	*	*
G	Clearances to inside corner	*	*
H	Clearances to each side of centerline extended from meter/regulator	*	3 feet within a height 15 feet above meter/ regulator assembly
I	Clearances to gas meter regulator vent outlet	*	3 feet
J	Clearances to non-mechanical air supply inlet or combustion air inlet to any other appliance	1 foot**	3 feet
K	Clearances to mechanical air supply inlet	3 feet above if within 10 feet horizontally	6 feet
L	Clearances to above paved sidewalk or paved driveway on public property	*	7 feet
M	Clearances under veranda, porch, deck, or balcony	*	1 foot

*Per local/gas supplier codes. Use clearances in accordance with local building codes and local gas supplier.
 ** For single vent pipe/direct 4 feet (1.2 m) below or to the side of opening and 1 foot above opening.
¹ In accordance with Z223.1
² In accordance with CSA B149.1

8. Water Connections

8.1 Water Line Connection Guidelines

When making the water-side connections, please follow these guidelines:

- Since each installation is different, it is up to the installer to route the water lines in the most efficient manner.
- An isolation valve kit is recommended for easier service.
- Keep the hot water pipes as short as possible to deliver hot water to the fixtures quickly.
- Only materials (pipes, fittings, valves, solder, etc.) that are approved for use in potable water systems should be used.
- When tightening any fittings to the connections on the water heater, care should be exercised not to overtighten these joints and damage the unit.
- Unions and manual shut-off valves on the cold water inlet and hot water outlet are recommended.
- Isolation valve kits can be used if incoming water treatment is anticipated (such as a water softener) due to hardness levels or heavy usage of the unit.
- To conserve energy, insulate all hot water piping, except the condensate drain or pressure relief valve.
- When the water heater is installed in a closed loop recirculation system, and if the cold water supply line has a back flow preventer, then an expansion tank should be installed to allow for water expansion.
- After installation, test the water heater for proper flow and inspect for leaks.
- Run the hot water for a few minutes and then clean the inlet water strainer located on the cold water inlet fitting. This strainer must be cleaned periodically to maintain proper water flow.

8.2 Water Quality

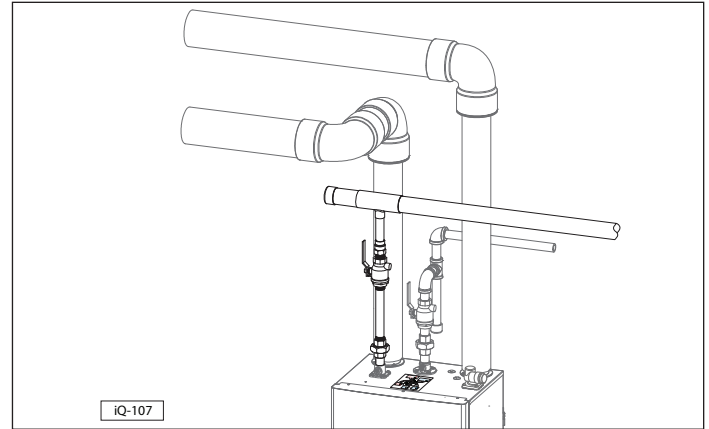
Proper maintenance of the water heater is required to ensure that your water meets EPA quality standards. The following table shows the maximum contaminant levels allowed, based on the EPA National Secondary Drinking Water Regulations (40 CFR Part 143.3). If you suspect that your water is contaminated in any way, discontinue use of the water heater and contact an authorized technician or licensed professional.

Contaminant	Maximum Allowable Level
Total Hardness	200 mg/l (12 grains/gallon)
Aluminum	0.05 to 0.2 mg/l
Chloride	250 mg/l
Copper	1.0 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
pH	6.5-8.5 mg/l
Sulfate	205 mg/l
Total Dissolved Solids (TDS)	500 mg/l
Zinc	205 mg/l

If the incoming water is known to have a high mineral content or “hardness” (see warranty section), treatment is recommended upstream from the water heater.

8.3 Hot Water Side Connection

8.3.1 Installation Instructions



1. Connect a 3/4" NPT coupler to the water heater's hot water connection.
2. Install a 3/4" union connection.
3. Following local building codes, install a 3/4" manual shut-off valve with 3/4" NPT fittings.

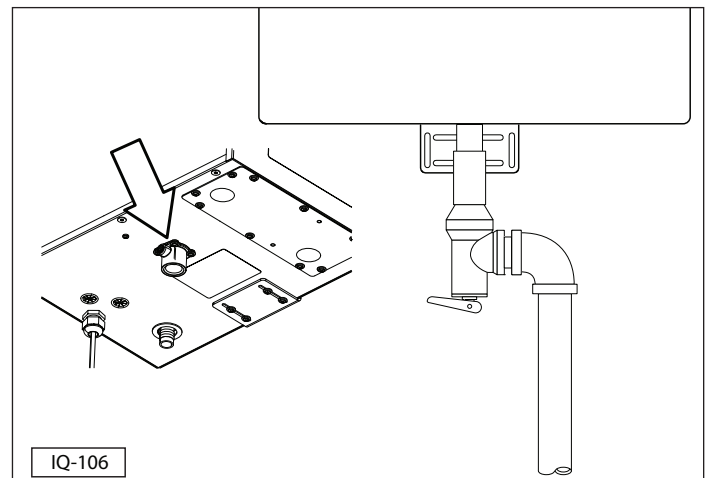
8.3.2 Pressure Relief Valve Installation

WARNING

To prevent serious personal injury, do not install any shut-off device between the water heater and the pressure relief valve. This valve is designed to release abnormally high pressure within the water heater in the event of a system problem.

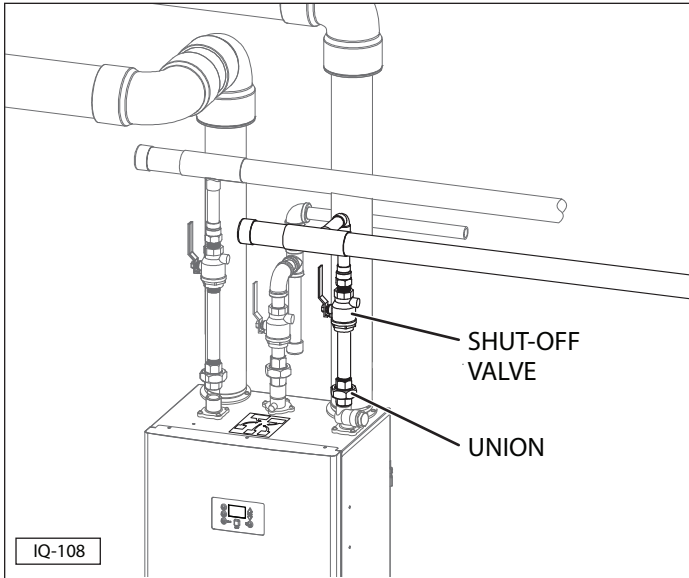
1. Install a customer-supplied 3/4" 150 psi maximum pressure relief valve on the outlet line (hot water side).
2. Install the pressure relief valve as close as possible to the outlet on the water heater.

Note: The water heater is designed with an internal high temperature shut-off switch and, therefore, only a pressure relief valve is required for these units.



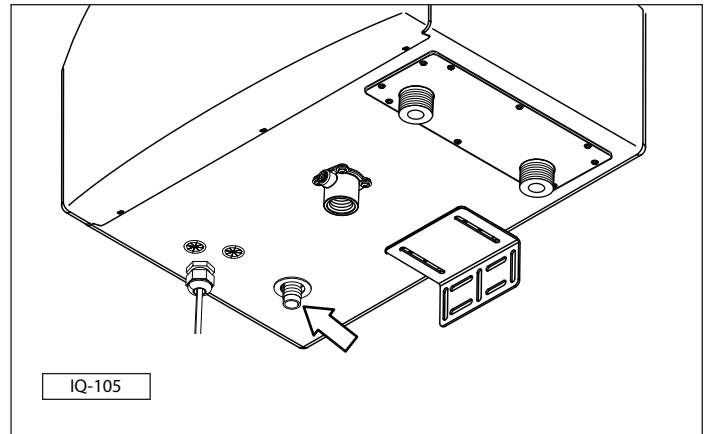
8.4 Cold Water Side Connection

Install and connect the cold water line.



1. Connect a 3/4" NPT coupler to the water heater's cold water connection.
2. Install a 3/4" union connection.
3. Following local building codes, install a 3/4" manual shut-off valve with 3/4" NPT fittings.
4. Connect the unit to the existing cold water lines. If the existing plumbing is 1/2" pipe, adapters may be used to transition from the 3/4" pipe.
5. Leak test the water piping before placing the unit in operation.

1. Attach and tighten the flex hose with the loop to the barb fitting located on the bottom of the unit.



2. Follow applicable local codes and if required, install in-line neutralizer (3) to treat the acidic condensate. Follow all the installation instructions included with the neutralizer.

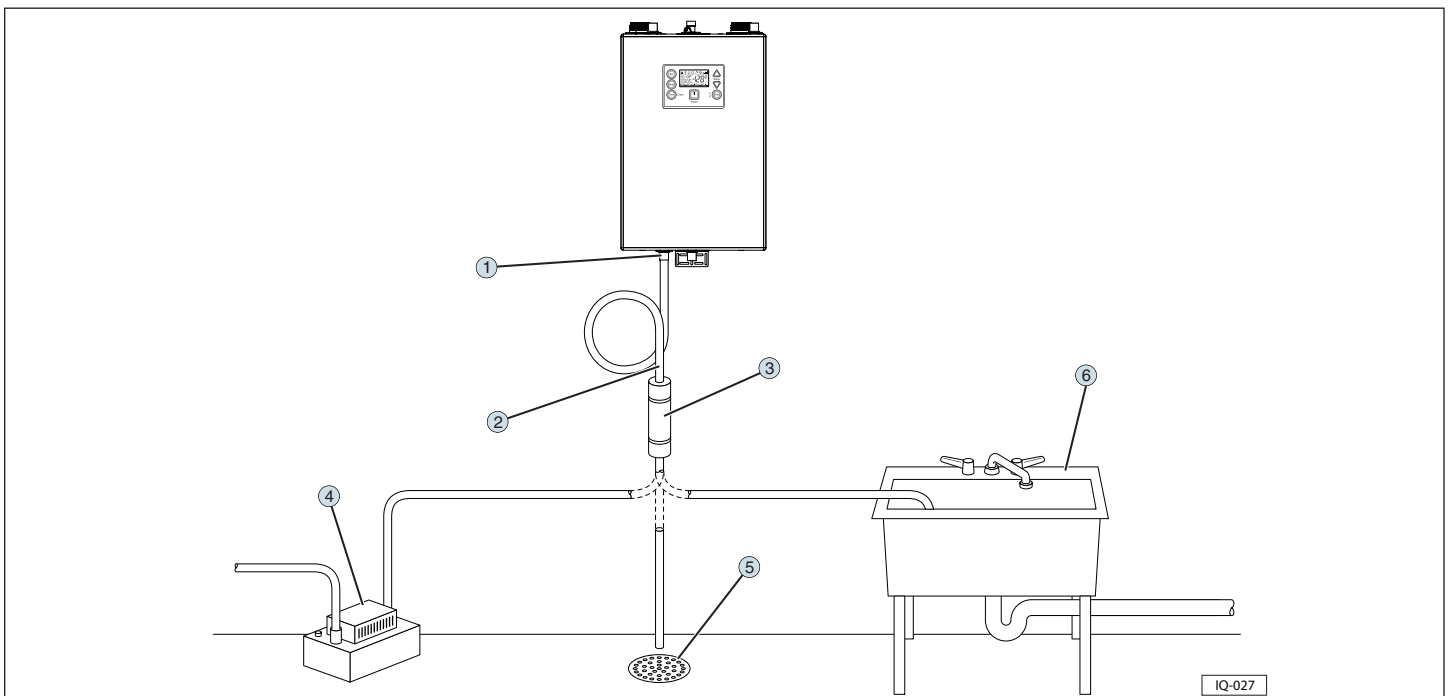
Note: Ensure that the flex tube is not pinched or kinked. The tube should freely drain. The tube termination should not be immersed in water.

3. Route the drain line to nearby laundry tub (6), floor drain (5), or condensate pump (4).

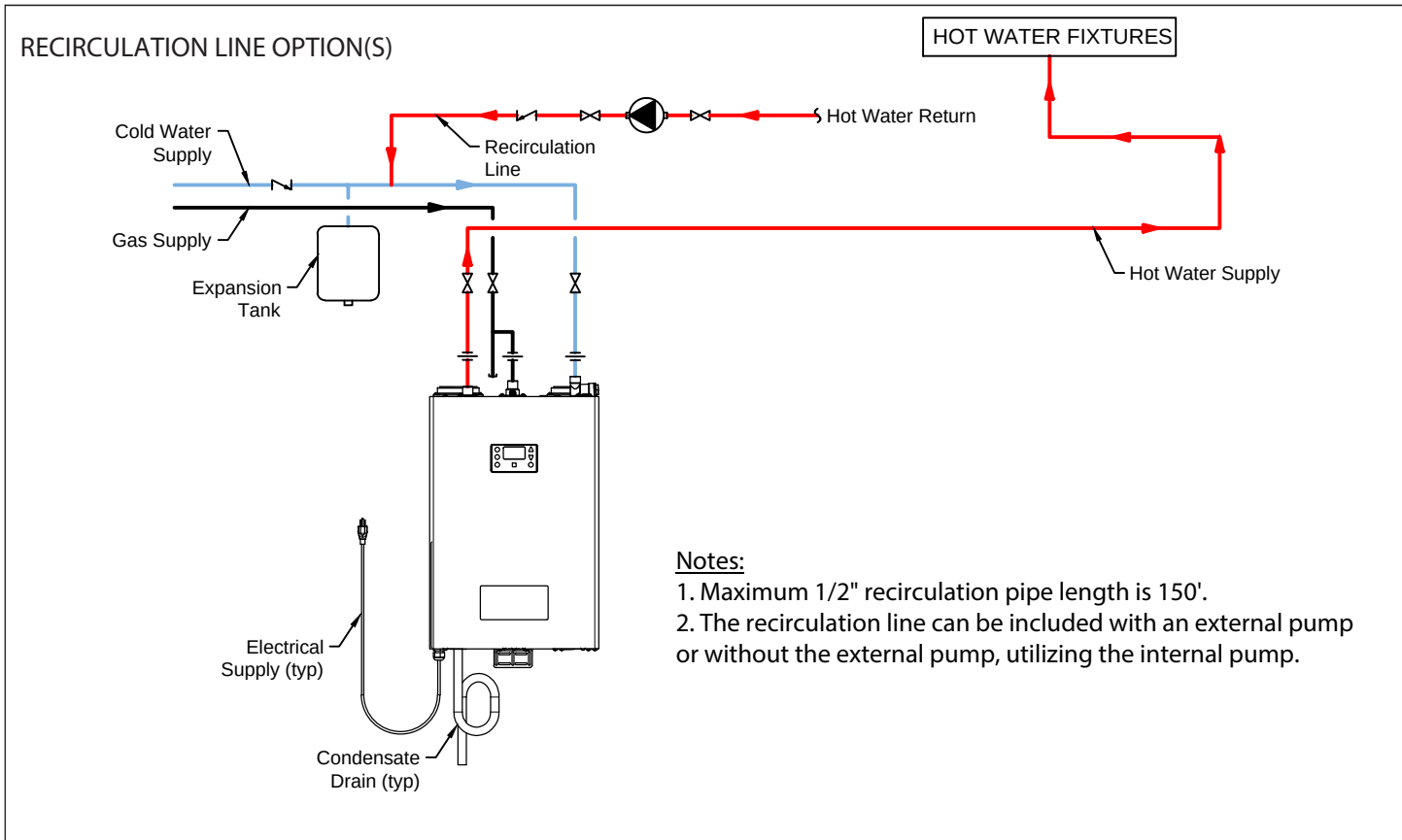
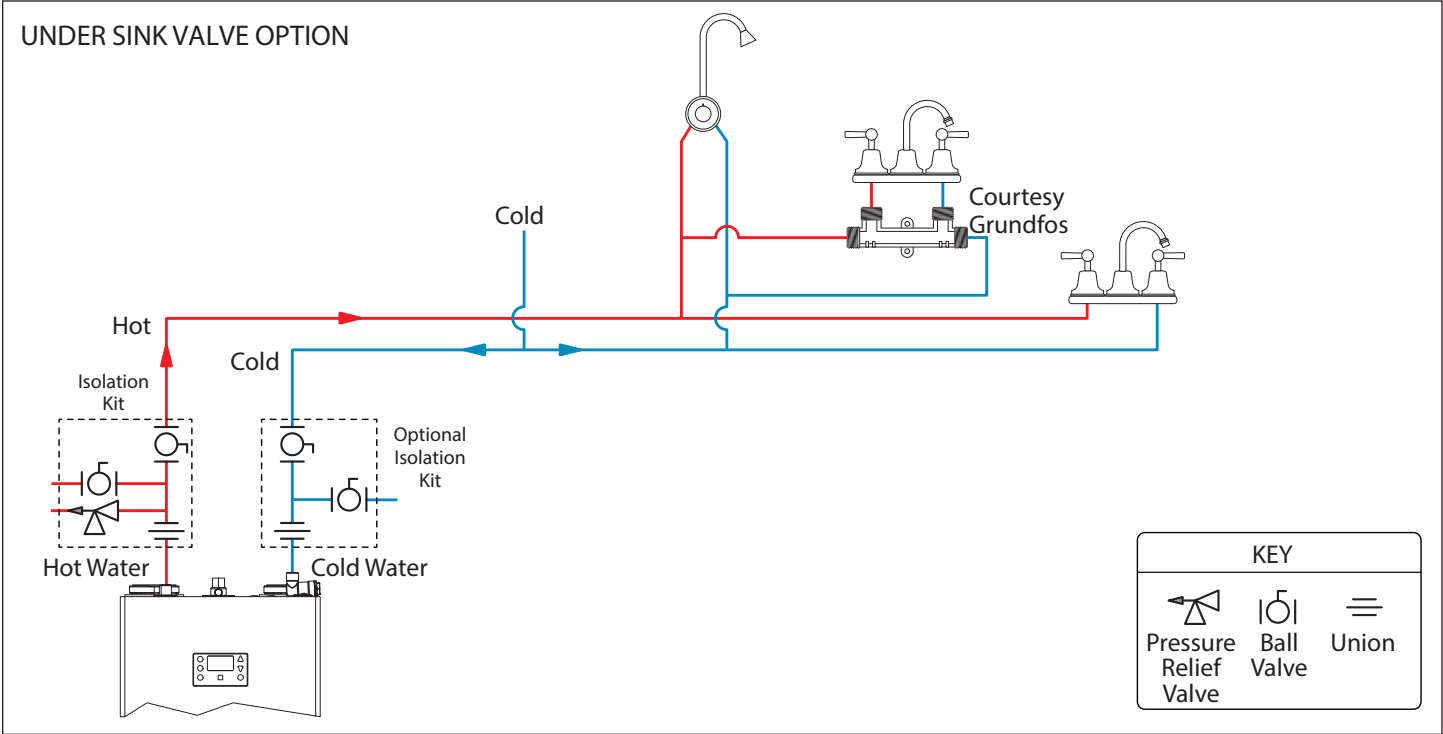
⚠ WARNING

The drain line is shipped from the factory with a loop held together with plastic ties. Do not remove the ties and/or straighten the loop. This loop forms an air block (trap) which prevents carbon monoxide from exiting the water heater through the drain line. Improper installation of the drain line can result in carbon monoxide build, which can lead to severe personal injury or death.

8.5 Condensate Line Installation



The following illustrations provide possible external recirculation options (Domestic shown only).



9. Electrical

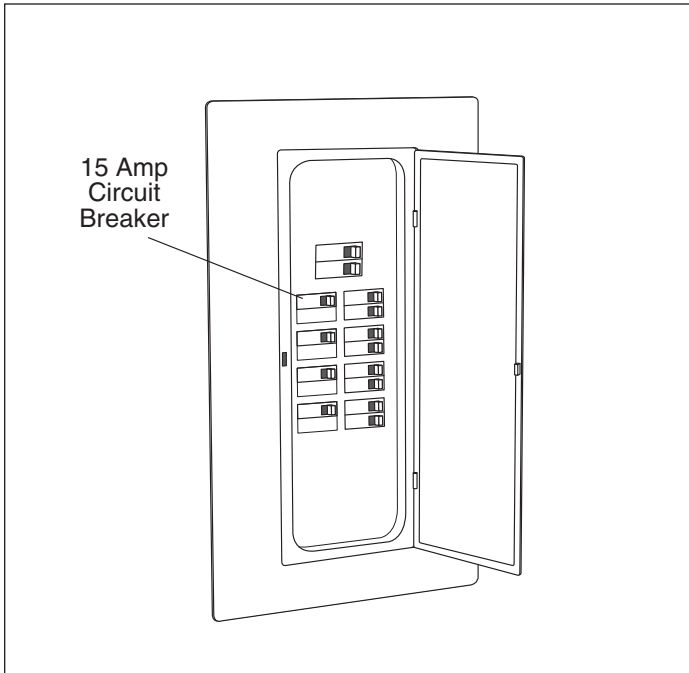
⚠ WARNING

To avoid serious injury or even death, follow all applicable local, state, and national regulations, mandates, and building codes for guidelines to install the electrical power supply.

9.1 Electrical Code Requirements

Electrical code requirements are different in the USA and Canada. Refer to and follow the local building codes, the latest edition of the National Electrical Code (NFPA 70) in the USA, or the CGA C22.1 Canadian Electrical Code - Part 1.

The circuit breaker should be at least 15 amps.



Use 15 Amp Breakers For Single Units.

Note: For an electrical wiring schematic, refer to the Wiring Diagram section in this manual for additional information.

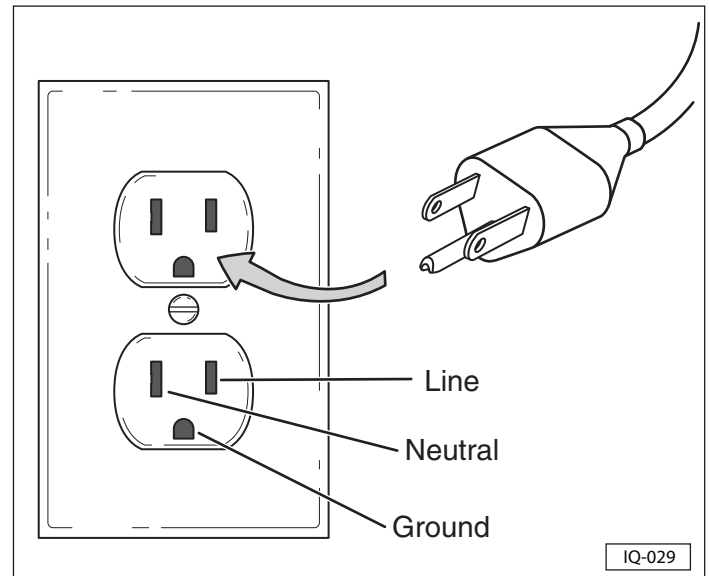
9.2 Electrical Connection and Polarity

NOTICE

POLARITY

The plug provided with the unit is polarity sensitive. Ensure that the line and neutral are at the correct locations in the wall socket. If the polarity is reversed, it will cause the unit to malfunction and turn off every 15 seconds.

Make sure the electrical outlet being used is wired with at least 12 gauge wire and grounded. Only one water heater should be plugged into an outlet with the 12 gauge wire. It should also be connected to at least a 15 Amp circuit breaker. The electrical power required for the water heater is 120V AC at 60 Hz.



SAFETY INSTRUCTIONS

If desired, the water heater can be wired into the electrical system by removing the power cord and replacing it with electrical cable. If this method is used, a separate ON/OFF switch must be installed to remove power from the unit.

10. Propane (LPG) Conversion

SAFETY INSTRUCTIONS

A qualified service technician **MUST** make the required changes to convert the water heater from Natural Gas to LP Gas.

10.1 General Information

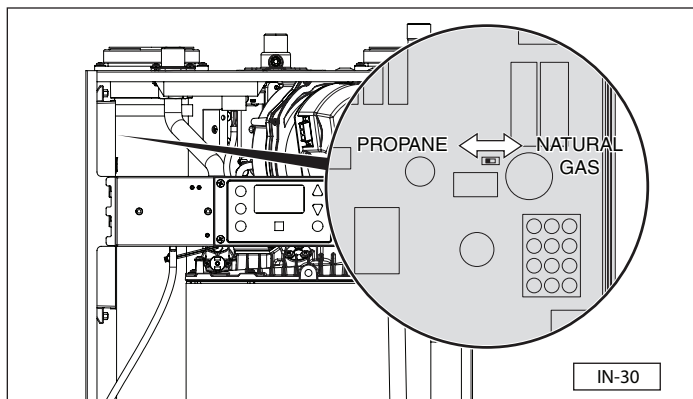
Before beginning the conversion, make sure the LP gas inlet pressure is between 8.0" and 13.0" W.C. Record the gas pressure here.

STATIC LP GAS PRESSURE _____ W.C.

DATE _____

10.2 Procedure

1. Make sure all hot water faucets are OFF. If required, press the control panel Power button to turn the water heater OFF. Disconnect the power.
2. Shut OFF the gas supply inlet valve closest to the unit, if connected.
3. Remove the front cover and locate the main circuit board.
4. Locate DIP Switch 1 and change it to the PROPANE position.



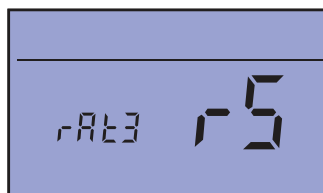
DIP Switch Settings (Réglages des commutateurs DIP)

SW1	ON Propane	ON Natural Gas (Gaz naturel)
-----	-------------	----------------------------------

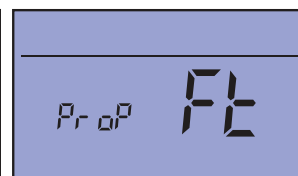
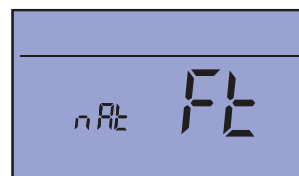
5. Reconnect the power and wait for main screen to appear.



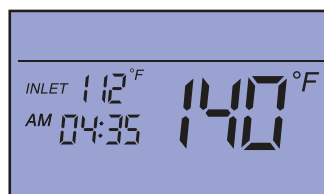
6. Press and hold the Mode button until the rS screen appears on the display.



Press the Mode button multiple times until the Ft screen appears on the display. The current Fuel Type setting will appear. Either nAt or Prop will be displayed to indicate the position of the DIP switch.



7. Press and hold the Enter button to return to the main display.



8. Refer to Adjusting the CO₂ Level section in this manual for instructions on connecting a calibrated CO₂ analyzer to the gas valve.

11. Adjusting CO₂ Level

11.1 General Information

This procedure is required only during installation in a high altitude location or when changing the unit from natural gas to propane, or when experiencing combustion problems. This procedure should only be done by a qualified technician.

DANGER

A concentration of carbon monoxide as small as 0.04% (400 parts per million) in the air can be fatal. When making high fire and/or low fire adjustments, CO levels must be monitored using a flue gas analyzer so that the level of no more than 400 ppm of CO is exceeded at any time during the operation.

Adjusting the “low fire screw “ or the “high fire screw” in small increments can result in a significant increase in CO concentration. To avoid serious injury or death, **DO NOT** make any adjustments to the gas valve without monitoring the exhaust gases with a fully functional and calibrated flue gas analyzer.

CO ₂ and CO Standards		
Description	CO ₂ Range (%)	Max. CO Level (ppm)
Natural Gas		
High Fire	9.1% to 9.3%	< 200 ppm
Low Fire	9.1% to 9.3%	< 60 ppm
LP Gas		
High Fire	10.1% to 10.5%	< 200 ppm
Low Fire	10.1% to 10.5%	< 60 ppm

NOTICE

The values listed in the table are for nominal conditions. Variables such as gas pressure, heating value of the gas, and the humidity and temperature of combustion air can all impact CO and CO₂ values. Changes in these variables can result in different CO and CO₂ values on the same water heater.

A qualified service technician must use a calibrated CO₂ analyzer to adjust the gas valve to achieve the desired CO₂ and CO values.

It is recommended that before any adjustments are made, the gas pressure to the unit be as follows:

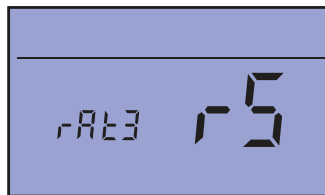
NG - 8" W.C.

LP - 11" W.C.

The service technician must confirm Static gas pressures before setting High Fire and Low Fire CO₂ and CO values.

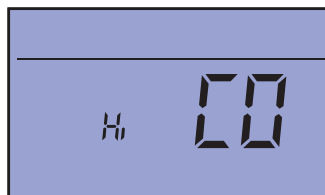
11.2 Procedure

1. Locate the gas valve.
2. Use a CO₂ analyzer to measure the exhaust vent gas at the bottom of the condensate trap.
3. Press and hold the Mode button for five seconds to access the r5 screen on the display.

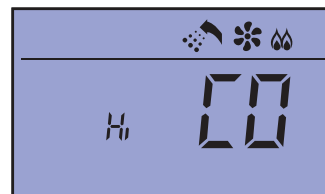


4. Press and release the Mode button multiple times until the CO screen appears on the display.

Hi will be displayed indicating the unit will fire at its highest firing rate when a hot water faucet is opened.



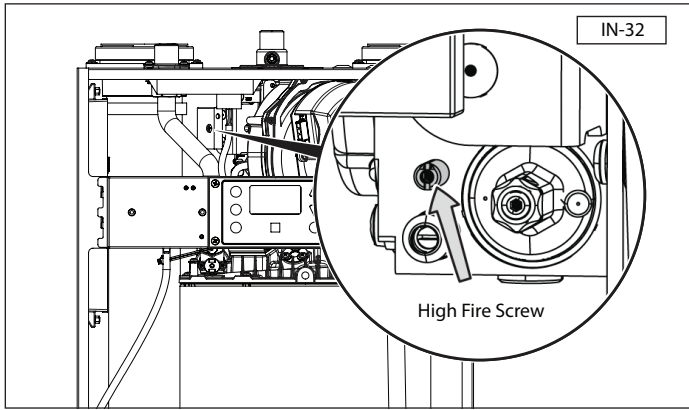
5. Open several hot water faucets to allow at least 5 gpm of water flow.
6. When the unit is operating at high firing – the shower, blower, and flame icons will be displayed.



7. Record values in table column 1, 'Hi'. If the CO₂ values are within the appropriate range, proceed to step 9, otherwise continue with Step 8.

8. Use a flat blade screwdriver to adjust the gas valve high fire screw to achieve the desired CO₂ values.

Note: Turn clockwise to decrease CO₂ and counterclockwise to increase CO₂. Make adjustments by making 1/4 turn increments. Wait three minutes for reading to stabilize and then record the combustion analyzer values for CO₂ and CO.



9. Once the desired values are achieved, record the new HIGH FIRE CO₂ values in table column 2, 'Adjusted Hi'.

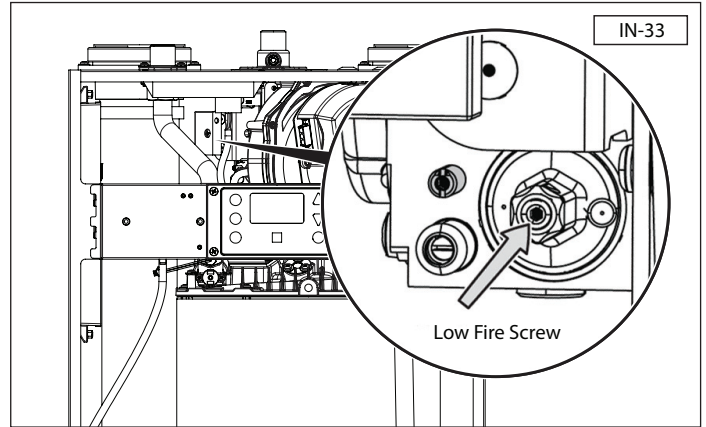
CO ₂ and CO Recorded Values				
	Hi	Adjusted Hi	Lo	Adjusted Lo
CO ₂ Value %				
Max CO ppm				
Date				

10. Press the Down arrow key to let the unit fire at low fire.



11. Record values in table column 3, 'Lo'. If the CO₂ values are within the appropriate range, proceed to Step 14, otherwise continue with Step 12.

12. Adjust the Low Fire screw while the burner operates at low fire using a 2 mm hex wrench. Turn clockwise to increase CO₂ and counterclockwise to decrease CO₂.



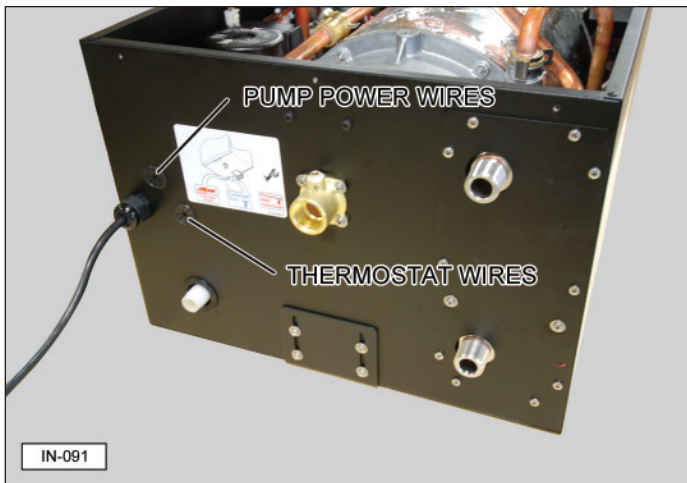
13. Once the desired values are achieved, record the LOW FIRE CO₂ values in table column 4, 'Adjusted Lo'.
14. Remove the combustion analyzer.
15. Turn off water flow
16. Press and hold the **Enter** button to return to home screen to resume operation.

12. Space Heating

12.1 Space Heating System Pump Wiring

1. Connect the rest of the heating circuit based on the example drawings shown on pages
2. Route the three wires from the heating system pump to the water heater via the front wire grommets located on the bottom of the water heater.

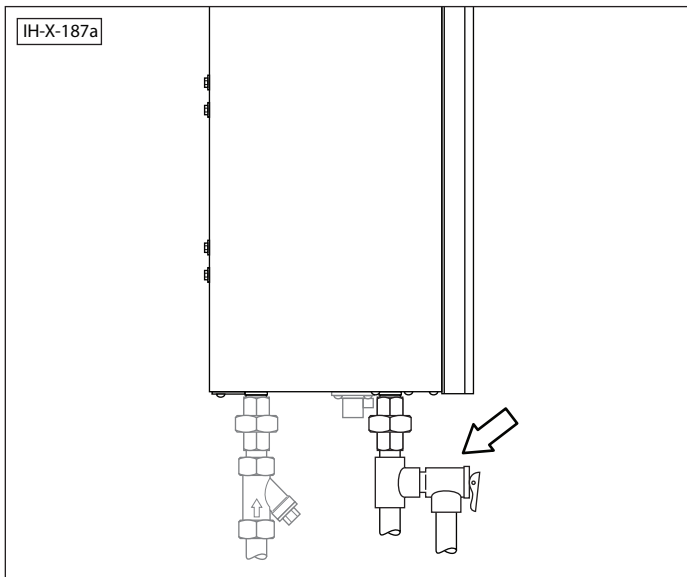
Please see the following piping schematics for various heating configurations



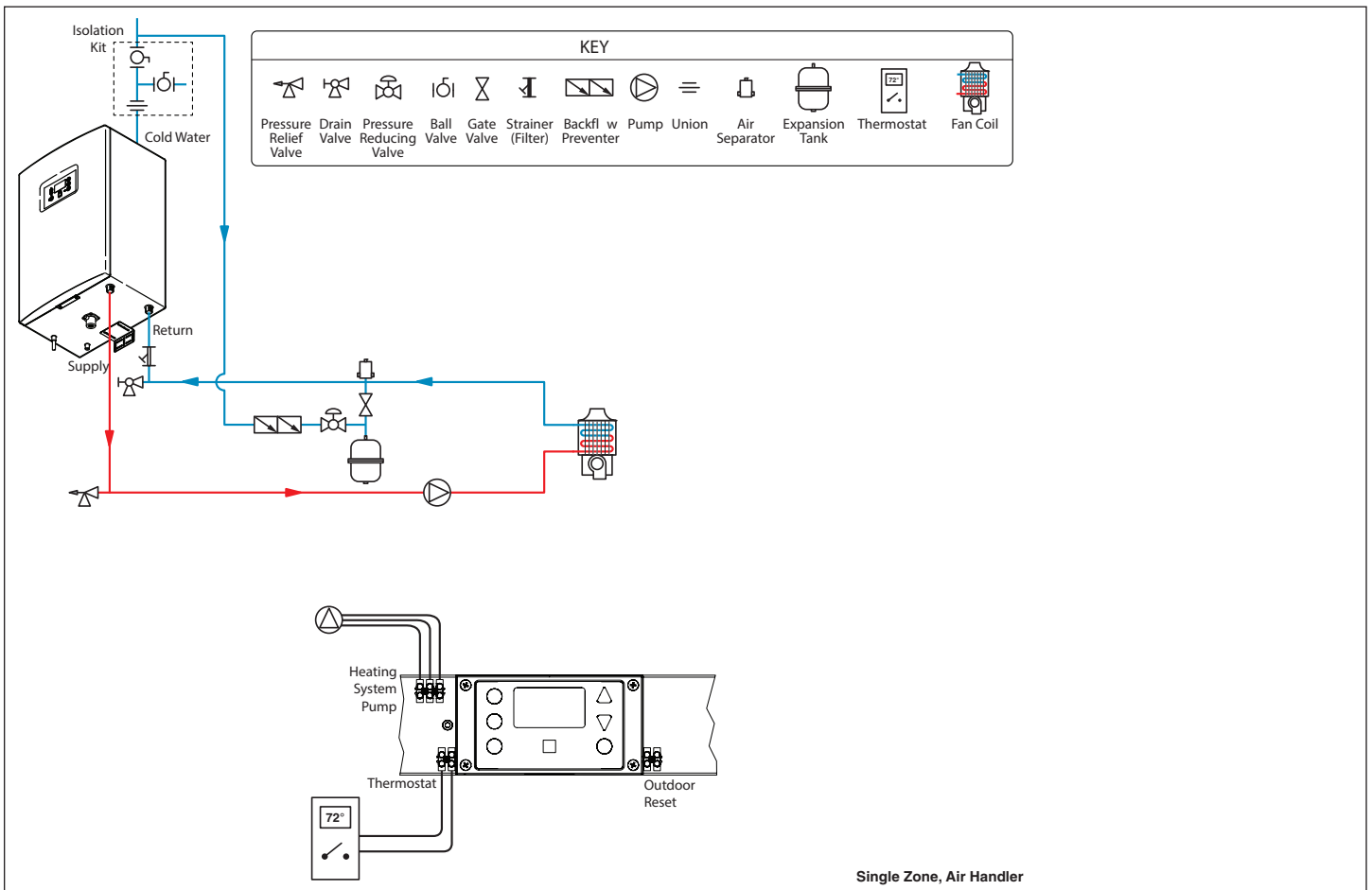
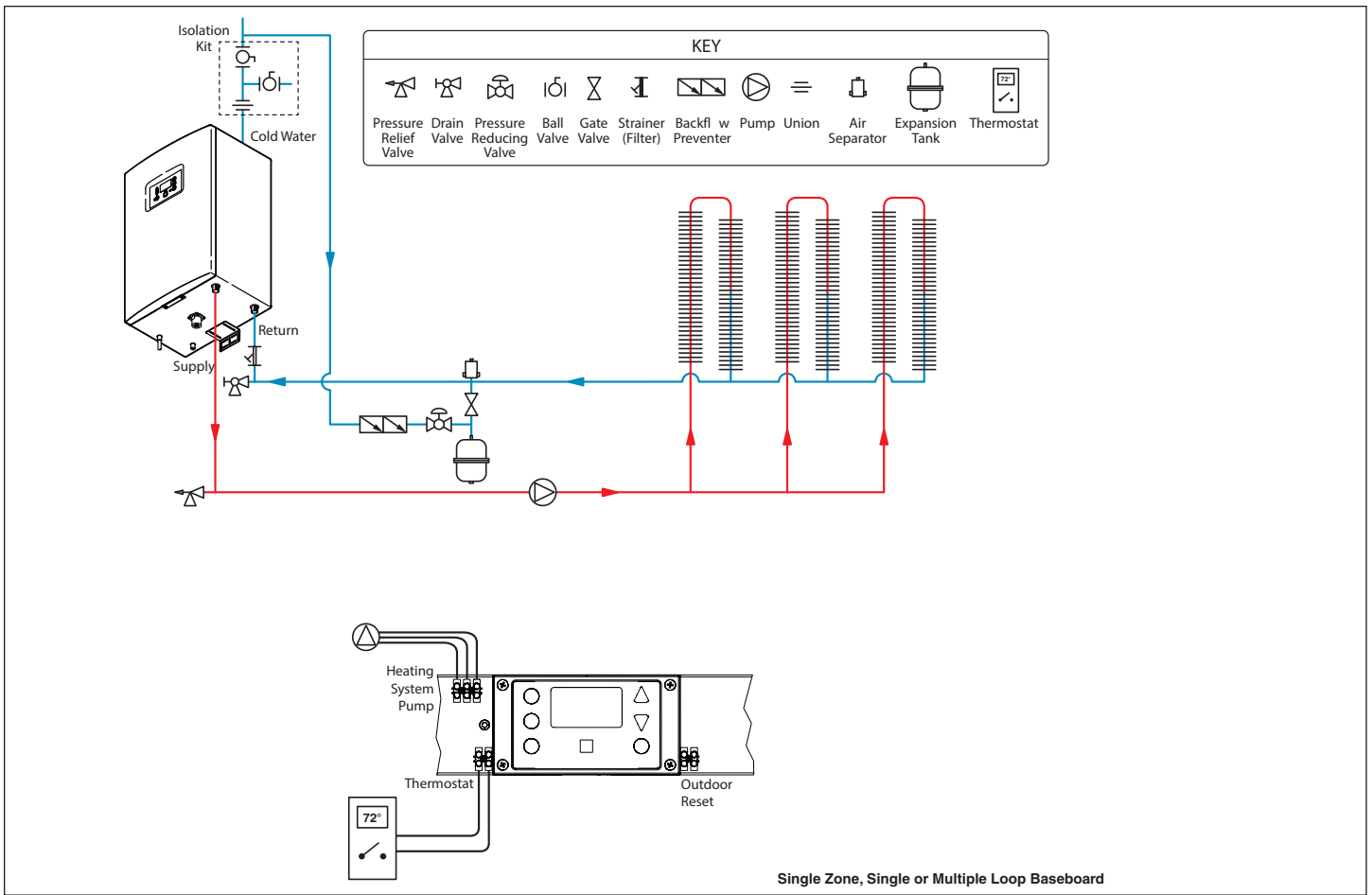
12.2 Piping

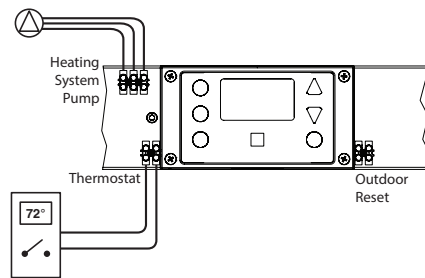
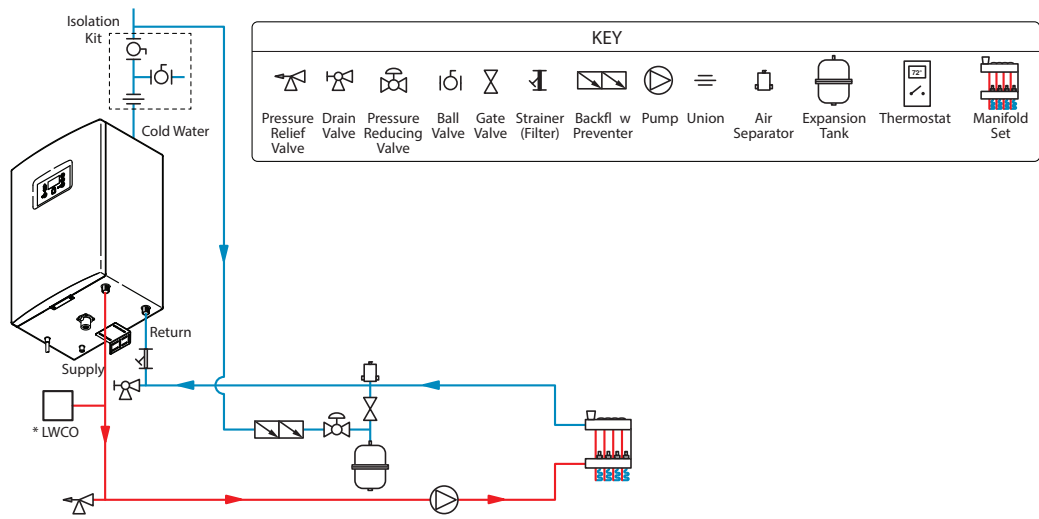
Install and connect the hydronic piping. The connections are at the bottom of the unit marked supply and return.

1. Install a 1" NPT union to the Heating Return IN connection.
2. Install an in-line wye strainer on the Heating Return IN line.

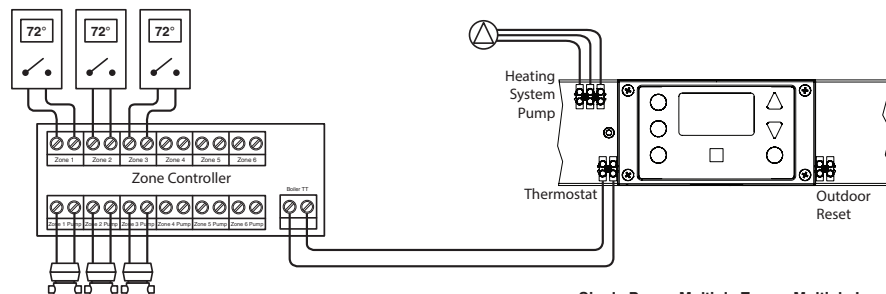
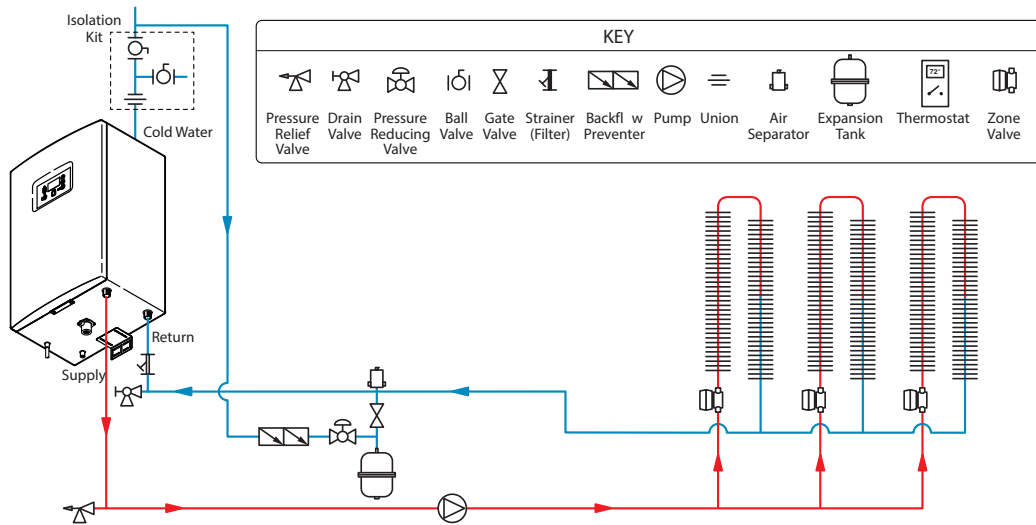


3. Connect a 1" NPT union to the Heating Supply OUT connection.
4. Install a 1" x 1" x 3/4" tee fitting to the Heating Supply OUT line.
5. Install a 30 psig safety relief valve, provided with the unit, into the tee fitting.

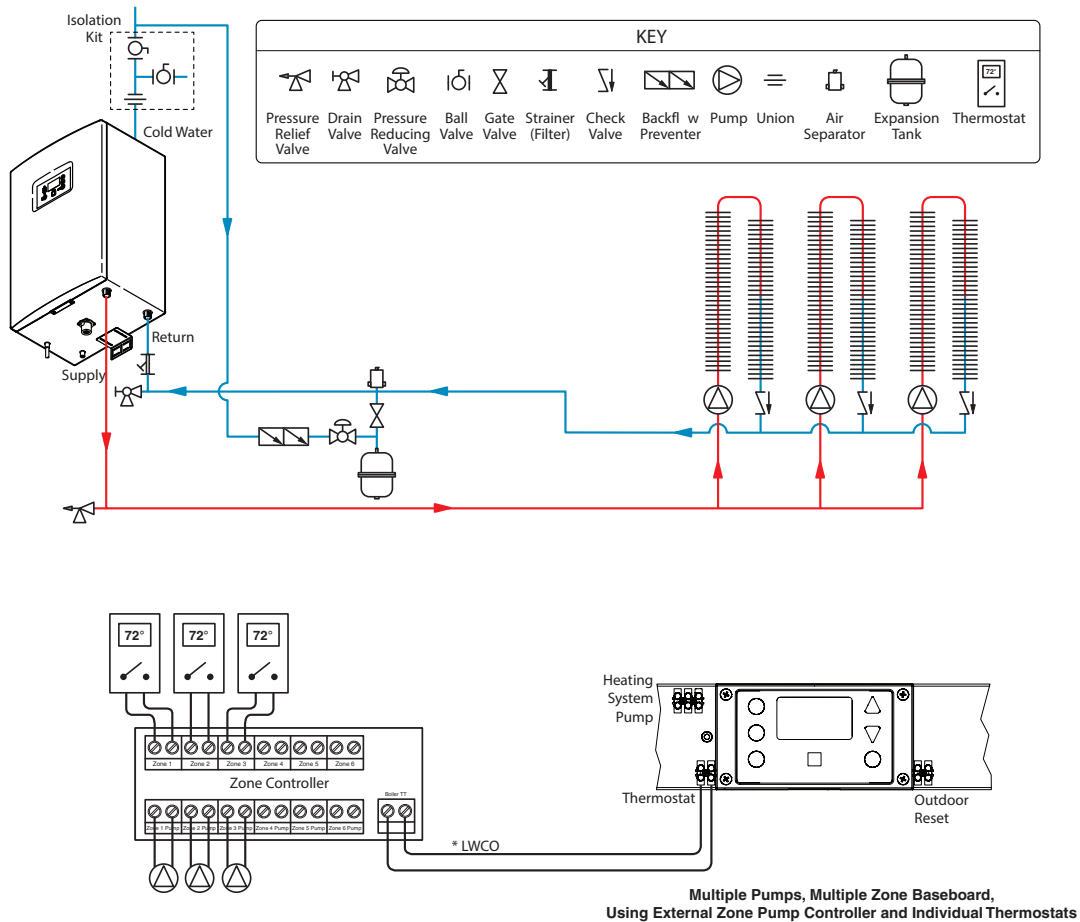
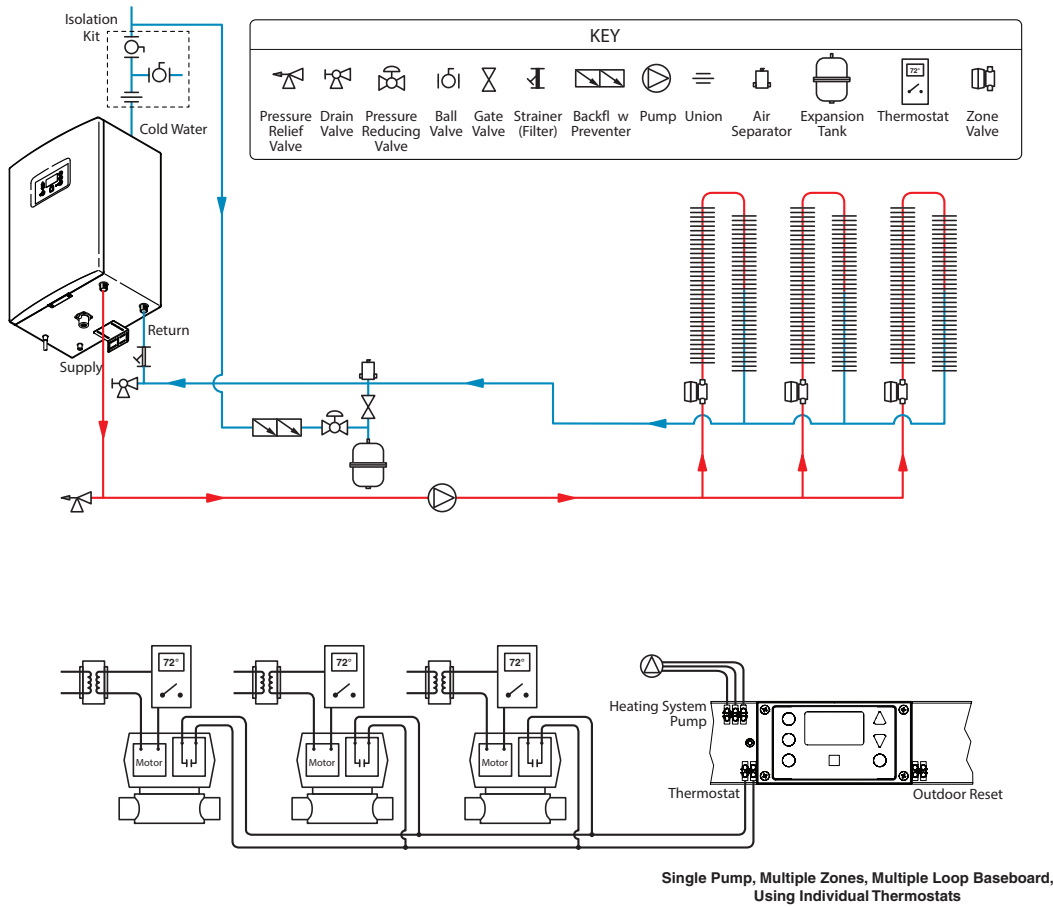


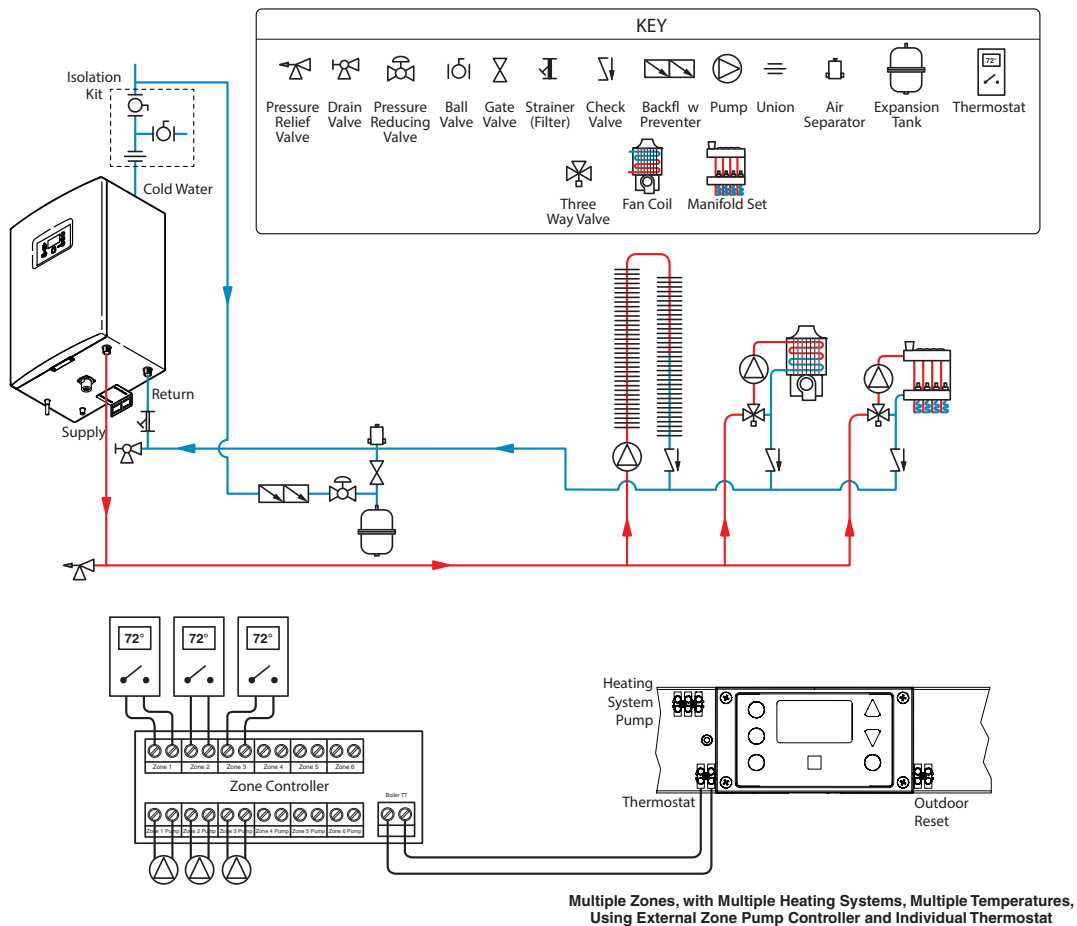
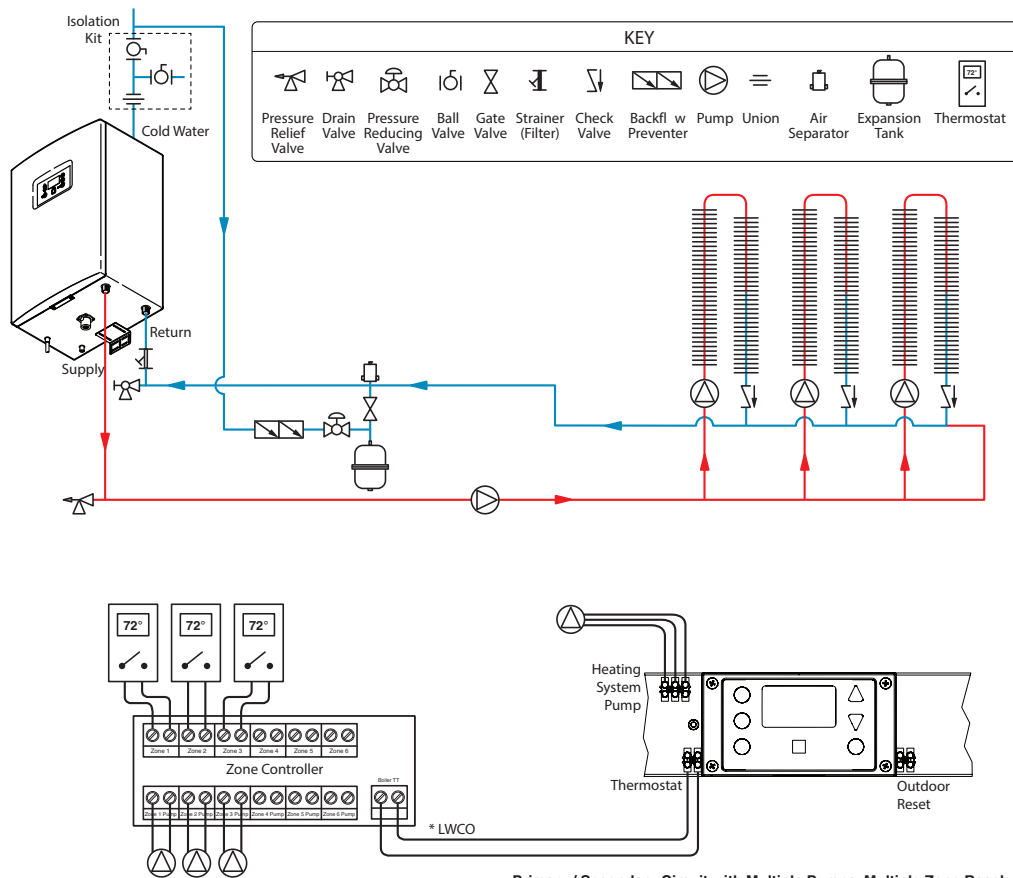


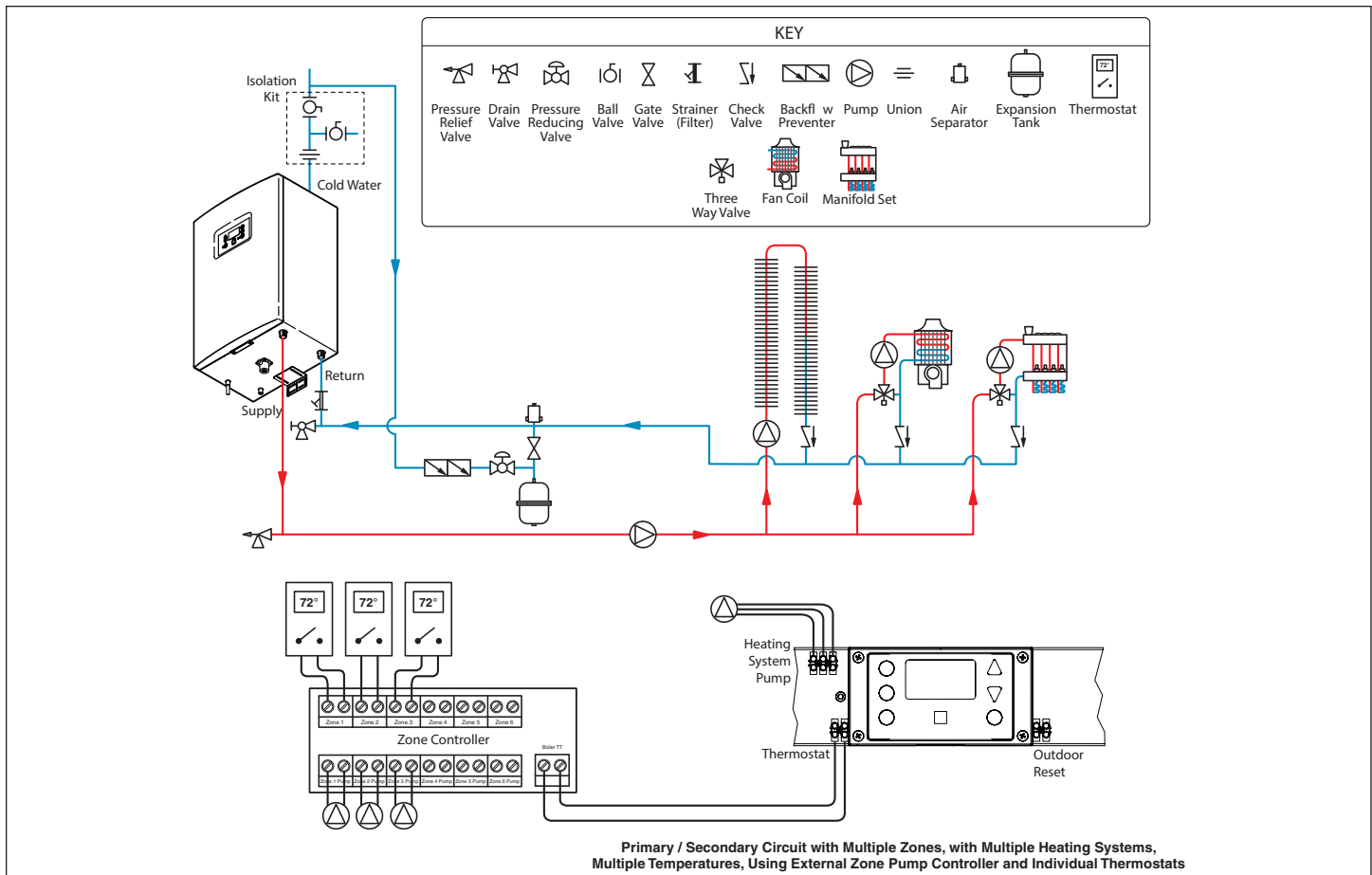
Single Zone, Multiple Loop Radiant



Single Pump, Multiple Zones, Multiple Loop Baseboard, Using External Zone Valve Controller





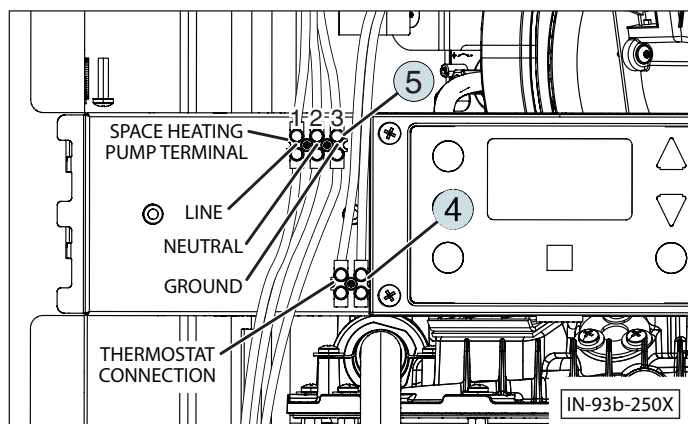


12.3 Wiring Connections - Heating System Pump and Thermostat

1. Route the two thermostat wires via the separate grommet in bottom of the unit and connect to block 4.
2. Route the three heating system pump wires (if equipped) via a separate grommet in bottom of the unit and connect to block 5.
3. Route the two outdoor reset (if equipped) wires via the grommet in the bottom of the unit and connect to block 6.

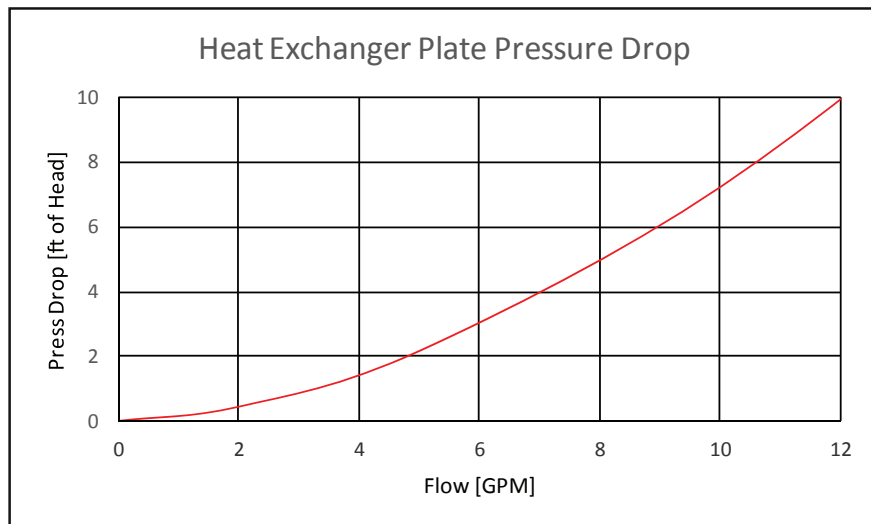
NOTICE

Do not run high and low voltage via the same grommet.



12.4 Space Heating System Design

Please use the chart below to select the pump to provide adequate heat delivery.



12.4.1 Space Heating System Performance

Model ¹	Space Heating input(MBH)		Heating Capacity ² (MBH)	AFUE (%)	DHW Capacity @ 77°F (GPM)
	Min	Max			
i200X	30	142	125	90.2	5.0
i250X	30	142	125	90.2	6.0

¹ Ratings are the same for Natural Gas converted to Propane.

² Capacity based on U.S. Department of Energy (DOE) test procedure 10CFR Section 430.23(n)

13. Multiple Units

13.1 Common Venting for Multiple Units

Connecting several units together requires proper sizing of the intake and exhaust pipes. Up to five water heaters (similar model numbers) can be connected (cascading) together.

13.1.1 Vent Diameter Sizing and Lengths

The water heaters are designed for 3 inch air intake and gas exhaust vents. The following chart outlines the maximum length of venting allowable for each model. A vent system's length is calculated by adding the length of all straight pieces used (both horizontal and vertical) and then adding the equivalent lengths of each fitting used in the system. A vent system's length must not exceed the maximum length outlined in the chart below:

i200X Maximum Vent Length (in feet) for Power Vent (1 pipe)					
Number of Units common vented together	Duct Size				
	2"	3"	4"	6"	8"
1	26	200	200		
2			200		
3			100	200	
4				200	
5				200	

Note: Reduce the maximum equivalent length above by 5 feet per 90° elbow used and by 2 feet per 45° elbow used. Do not exceed the above set limits.

i200X Maximum Vent Length (in feet) for Direct Vent (2 pipe)					
Number of Units common vented together	Duct Size				
	2"	3"	4"	6"	8"
1	21	100	100		
2			100		
3			50	100	
4				100	
5				100	

Note: Reduce the maximum equivalent length above by 5 feet per 90° elbow used and by 2 feet per 45° elbow used. Do not exceed the above set limits.

i250X Maximum Vent Length (in feet) for Power Vent (1 pipe)				
Number of Units common vented together	Duct Size			
	3"	4"	6"	8"
1	130	130		
2		130		
3		30	130	
4			130	
5			130	

Note: Reduce the maximum equivalent length above by 5 feet per 90° elbow used and by 2 feet per 45° elbow used. Do not exceed the above set limits.

i250X Maximum Vent Length (in feet) for Direct Vent (2 pipe)				
Number of Units common vented together	Duct Size			
	3"	4"	6"	8"
1	65	65		
2		65		
3		30	65	
4			65	
5			65	

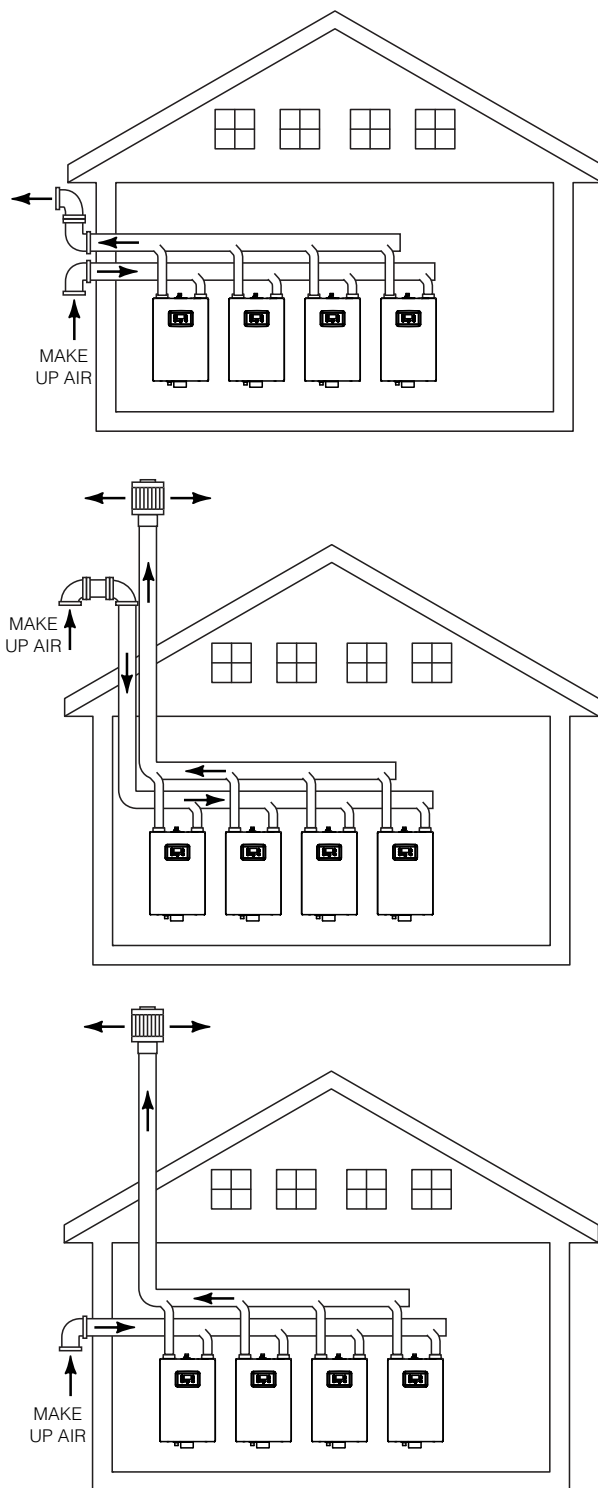
Note: Reduce the maximum equivalent length above by 5 feet per 90° elbow used and by 2 feet per 45° elbow used. Do not exceed the above set limits.

NOTE: ONLY UNITS OF THE SAME MODEL NUMBER TO BE CASCADED TOGETHER

13.1.2 Two Pipe Vent System (Direct Vent)

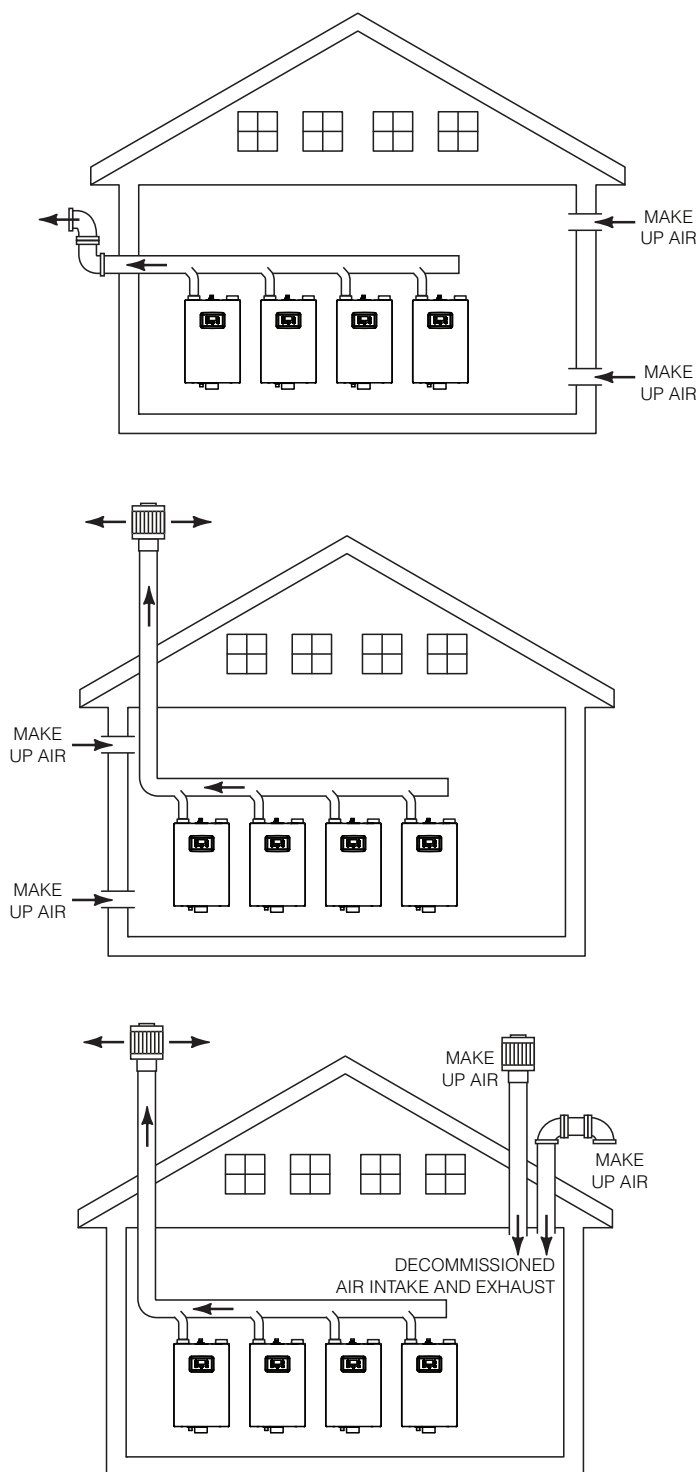
The water heater can be direct vented without any modification using a 3 inch diameter pipe when installing single units. When more than one unit is installed, refer to "13.1.1 Vent Diameter Sizing and Lengths" on page 35.

The following diagrams represent some typical direct venting configurations and are included to assist in designing the vent system. Possible configurations are not limited to the following diagrams.

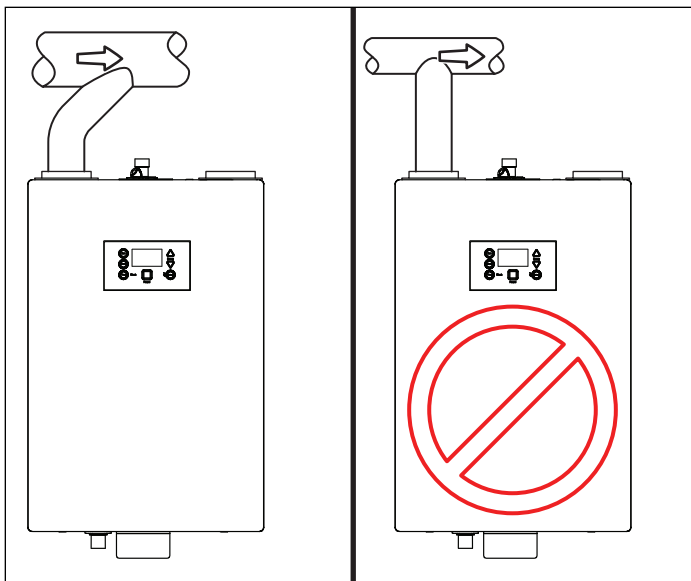


13.1.3 Single Pipe Venting System (Power Vent)

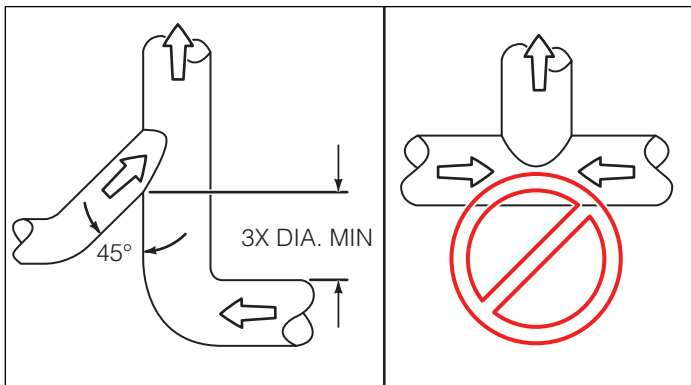
When using the single exhaust pipe/power vent method, the following table outlines the required opening sizes for the combustion and ventilation air coming into the room: When installing multiple units, refer to “13.1.1 Vent Diameter Sizing and Lengths” on page 35.



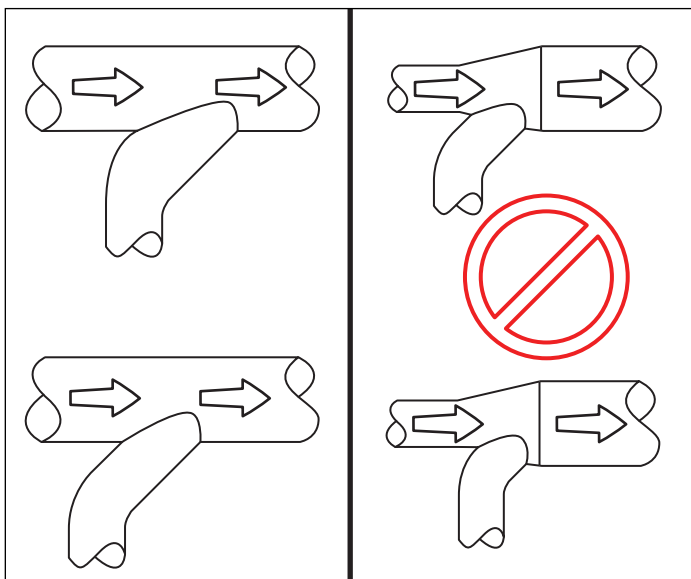
13.1.4 Recommended Exhaust Pipe Transitions



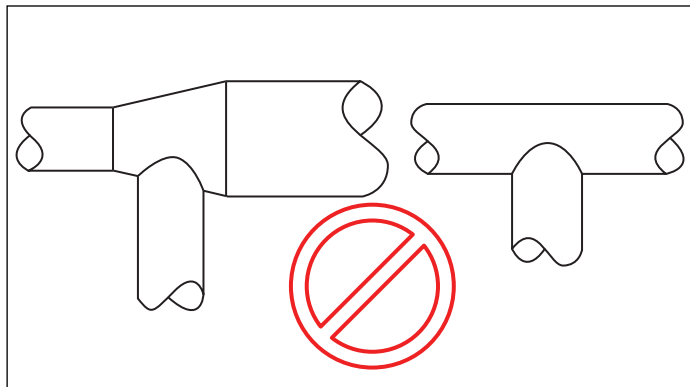
Do not use a 90 degree t-fitting for the gas exhaust.



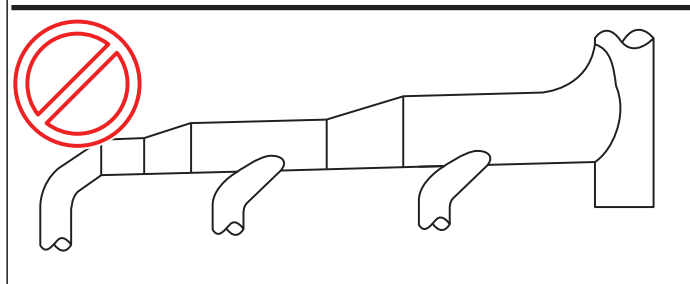
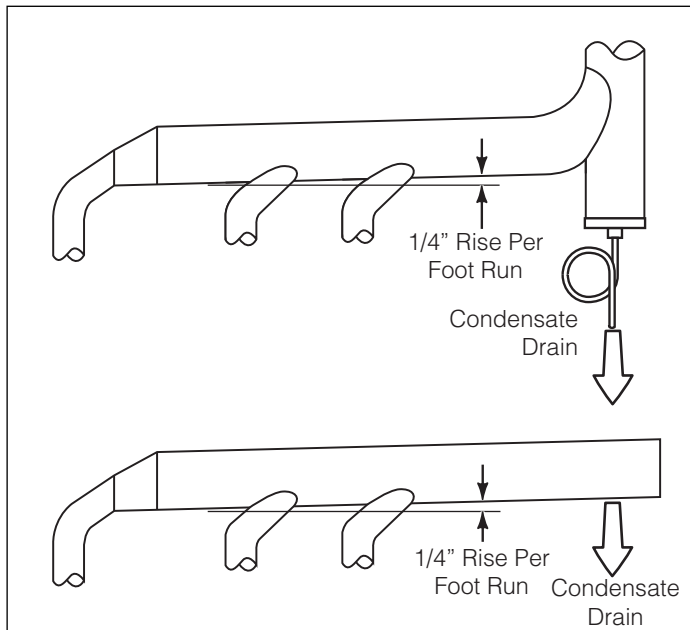
Do not direct gas exhaust from opposite directions. Use a 45 degree transition, as shown.



Do not transition into a reducer or use a t-fitting. Transitions should always be directed into a straight run of pipe.



Do not use 90 degree transition into a reducer or a straight pipe.



Do not use reducers in a straight run of pipe.

14. Requirements for State of Massachusetts

Notice Before Installation

This appliance must be installed by a licensed plumber or gas fitter in accordance with the Massachusetts Plumbing and Fuel Gas Code 248 CMR Sections 2.00 and 5.00.

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

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

1. INSTALLATION OF CARBON MONOXIDE DETECTORS.

At the time of installation of the side wall horizontal vented gas fueled equipment, the installing plumber or gasfitter shall observe that a hard wired carbon monoxide detector with an alarm and battery backup is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gasfitter shall observe that a battery operated or hard wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, building, or structure served by the side wall horizontal vented gas fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard wired carbon monoxide detectors.

- a. In the event that the side wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.
- b. In the event that the requirements of this subdivision cannot be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements; provided, however, that during said thirty (30) day period, a battery operated carbon monoxide detector with an alarm shall be installed.

2. APPROVED CARBON MONOXIDE DETECTORS.

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

3. SIGNAGE.

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

4. INSPECTION.

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



Dealer / Installer Contact Information: