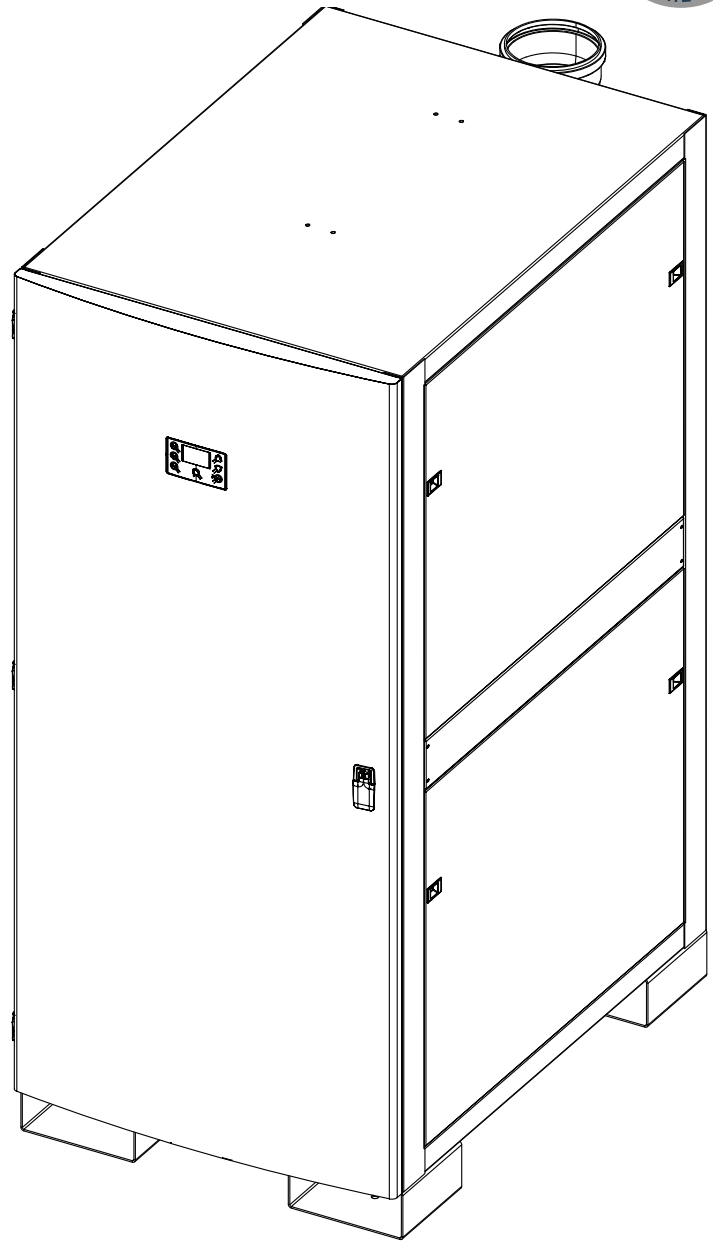




Operation and Installation Manual

Model: iQ751
iQ1001
iQ1501

This product complies with ANSI Z21.10.3 (2011) / CSA 4.3 Gas Water Heater. For use as a potable water heater.



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.

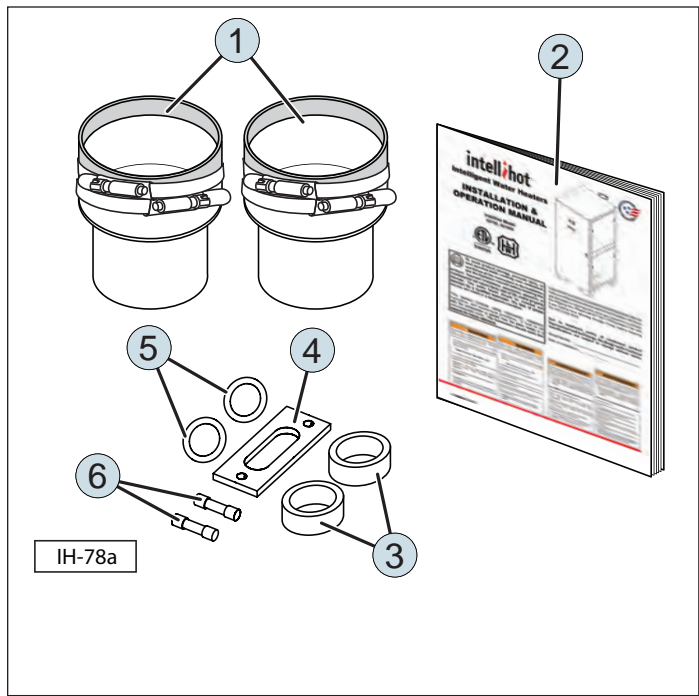
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1. General Information

1.1 Items Shipped With Water Heater

The following items are shipped with the water heater; Polypropylene to PVC adapters (1), manual (2), flat gaskets (3), electrode seal (4), set of O-rings (5), and bus fuses (6).



1.3 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.



Dealer Contact Information

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

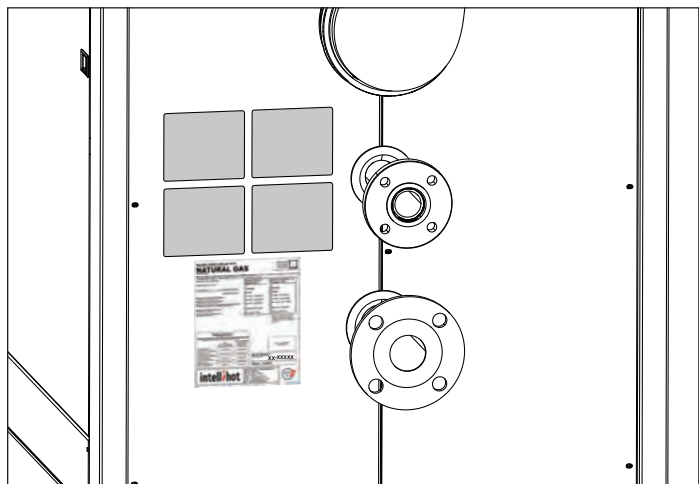
Serial Number: _____

Date of Installation: ____ / ____ / ____

1.2 Serial Number Plate Locations

Each heat exchanger module has its own ASME certification plate located on the heat exchanger itself.

A rating plate below the ASME certification plates has the serial number for the unit. Please provide this serial number 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.

3. Technical Specifications

3.1 Specifications Chart

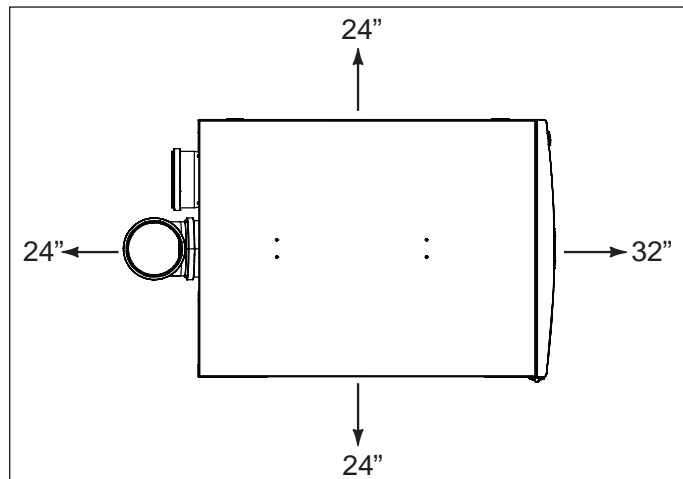
Specifications	Models		
	iQ751	iQ1001	iQ1501
Type	Indoor/Outdoor, Floor Mounted		Indoor/Outdoor, Floor Mounted,
Fuel	Preset for NG / LP convertible without additional parts		
Minimum Input (Btu/h)	30,000		
Maximum Input (Btu/h)	751,000	1,001,000	1,501,000
Maximum Output (Btu/h)	705,940	940,940	1,380,920
Thermal Efficiency	94%	94%	92%
Turn Down Ratio (TDR)	25:1	33:1	50:1
Water Inlet / Outlet Connections	2" Headers with 6" OD Flange		
Gas Inlet Connection	1-1/4" Gas Inlet with 4-5/8" OD Flange		
Condensate Drain Connection	3/4" PVC		
Maximum Condensate Flow Rate (GPH)	5.4	7.2	10.8
Dimensions H X W X D (inches)	64 X 30 X 43.3 (48 cu. ft)		64 X 30 X 59.6 (66 cu. Ft)
Service Clearances	Recommend 24" on all sides		
Weight (lbs)	525	590	650
Venting Type	Direct Vent (2 pipe - intake & exhaust), Power vent (1 pipe - exhaust only)		
Venting Materials (USA)	Sch. 40 PVC, Sch. 40 CPVC, Polypropylene, Stainless Steel		
Venting Materials (Canada)	Type BH Gas Vent Classes: II A (PVC), II B (CPVC), II C (Polypropylene), I (AL294C SS)		
Vent Size (Diameter)	6" Ø		
Max 6" Vent Length - Single Pipe / Power Vent	220 ft.*	130 ft.*	110 ft*
Max 6" Vent Length - Two pipe / Direct Vent	120 ft.*	65 ft.*	55 ft*
* Venting Note: From the maximum lengths above, deduct 5 ft. per 90° elbow and 2 ft. per 45° elbow			
Ignition	Electronic Spark Ignition		
Temperature Range	100°F – 190°F		
Temperature Stability	+/- 4°F		
Installation Location Ambient Temperature	40°F – 130°F		
Safety	Flame Rod, Thermal Fuse, Overheat Prevention Device, Fan Speed Monitor, Flue Temperature Monitor, Blocked Vent Detector, Dual Flame Sensing		
Water Pressure Min / Max (PSIG)	30 / 160		
NG/LP- Min. Dynamic Gas Pressure (Full Fire)	2.5" (non-corrugated, black iron)		
NG/LP - Maximum Static Gas Pressure	14"		
Gas Pressure for Adjustments	8" for NG, 11" for LP		
Electrical	120V AC, 60 Hz		
Power Consumption	Max 16 Amps, 24W (Standby)	Max 20 Amps, 32W (Standby)	Max 29 Amps, 48W (Standby)
Internal Water Volume (gallons)	3	4	6
Features and Approvals	iQ751	iQ1001	iQ1501
4 unit Cascaded High Turn Down	100:1	133:1	200:1
Built-In Redundancy	Multiple Heat Exchangers w/ Individual Control		
Cascading	Masterless, 4 units, Automatic rotation		
Common Venting	Yes, Up to 4 units		
Heat exchanger	Expandable, Stainless 316L		
Appliance Certification to ANSI Z21.10.3	ETL		
SCAQMD	Ultra Low Nox (under 20 PPM)		
ASME	HLW		
Performance GPM	iQ751	iQ1001	iQ1501
Hot Water Capacity, 45F Rise	31.4	41.6	62.4
Hot Water Capacity, 70F Rise	20.2	26.7	40.1
Hot Water Capacity, 90F Rise	15.7	20.8	31.2
Hot Water Capacity, 100F Rise	14.1	18.7	28.1
Hot Water Capacity, 140F Rise	10.1	13.4	20.1
Warranty	Heat Exchanger coil – 10 years, All Other Parts – 2 years		
Note: Due to Intellihot's Policy of continuous product improvements, design and technical specifications are subject to change without notice			

3.1.1 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.

3.2 Clearance Requirements

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



Service Clearances. If multiple units are installed, the side clearance can be shared between the two units.

Required Clearances			
Location	From Combustibles	From Non-Combustibles	Service Clearance ¹
Top	6" (15.2 cm)	2" (50.8 cm)	18" (46 cm)
Back	5/8" (15.8 mm)	5/8" (15.8 mm)	24" (61 cm)
Sides	1" (25.4 mm)	1/2" (12.7 mm)	24" (61 cm)
Front	2" (5.1 cm)	2" (5.1 cm)	32" (81 cm)
Bottom	0" (0 mm)	0" (0 mm)	0" (0 mm)

¹ Service clearances are suggested dimensions to allow for normal service of the unit.

3.3 Connection Specifications

Connections	
Description	Specification ²
Gas Supply Inlet Connection	1-1/4" NPT Flange Connection
Water Supply Inlet Connection	2" Copper Flange Connection
Heated Water Outlet Connection	2" Copper Flange Connection
Exhaust Gas Vent ¹	6" Polypropylene
Fresh Air Intake ¹	6" Polypropylene
Condensate Drain Connection	3/4" Flexible Plastic Hose
Power Supply	120V, 20 Amp AC Power

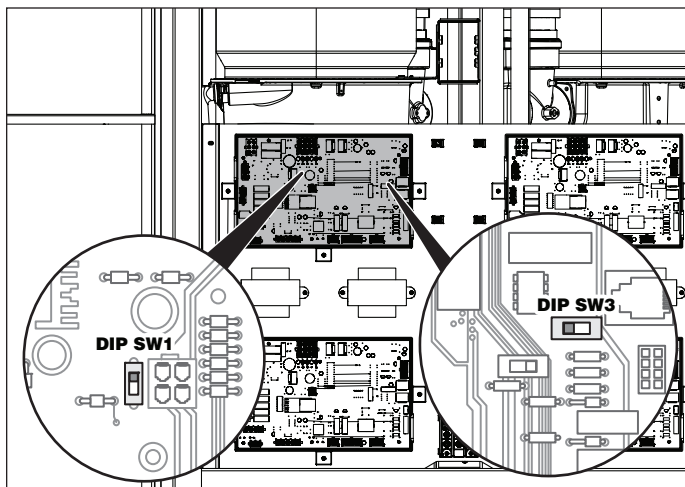
¹ Requires a 6" adapter when using PVC or CPVC pipe.

² Using sizes other than specified can cause damage to the water heater and will void the warranty.

3.4 Exhaust Gas Standards

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

3.5 DIP Switch Locations and Settings

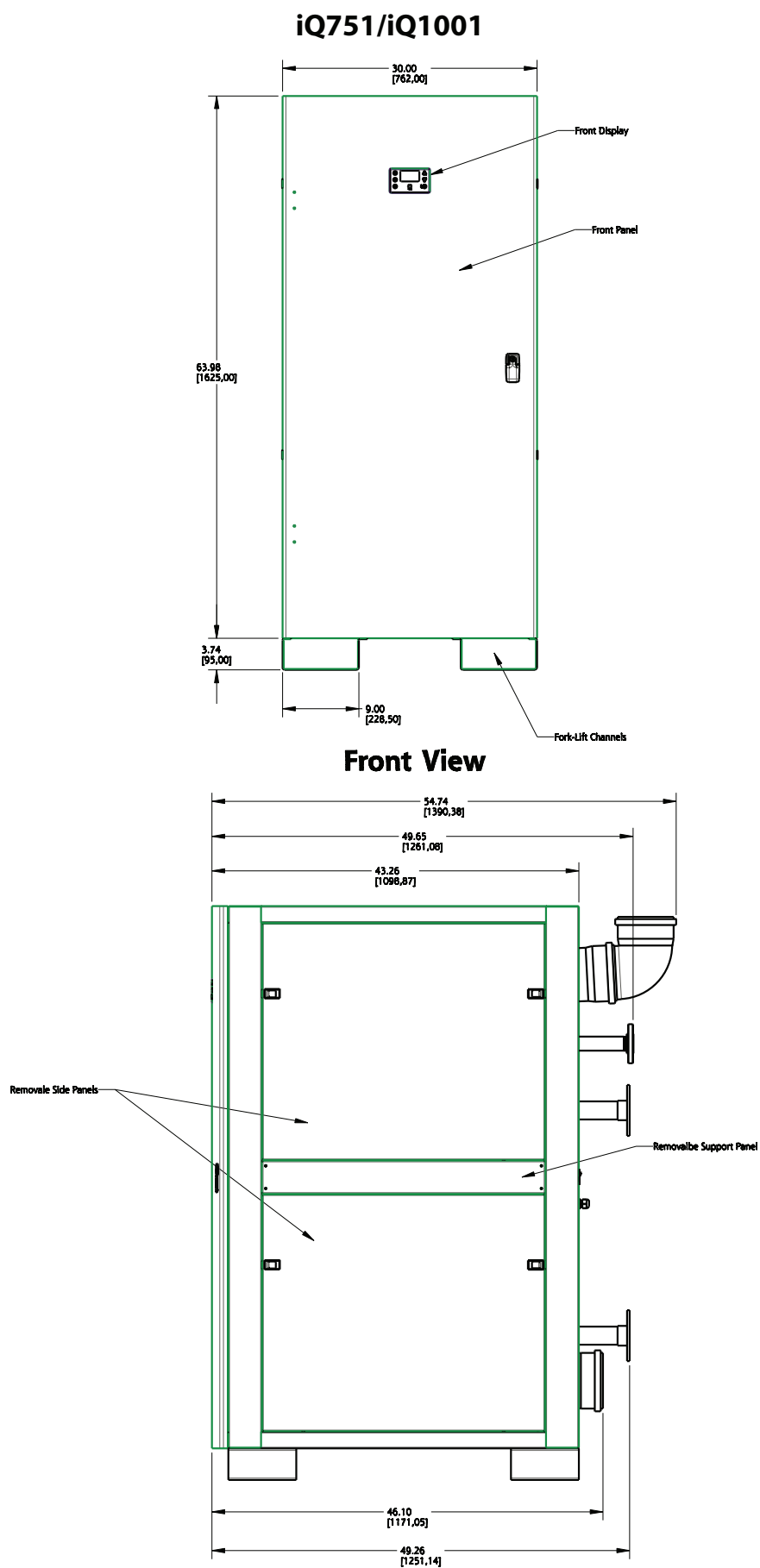


DIP Switch Settings (Réglages des commutateurs DIP)		
SW1	<input type="checkbox"/> ↑ Natural Gas (Gaz naturel)	<input type="checkbox"/> ↓ Propane
SW3	→ Cascading OFF <input type="checkbox"/> (Cascade HORS FONCTION)	← Cascading ON <input type="checkbox"/> (Cascade EN FONCTION)

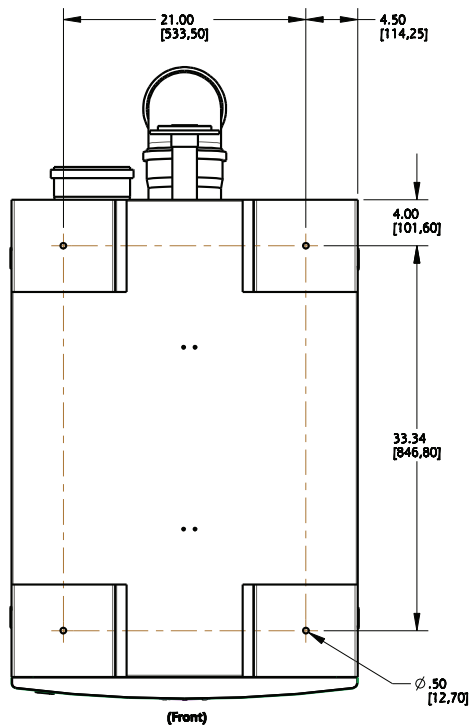
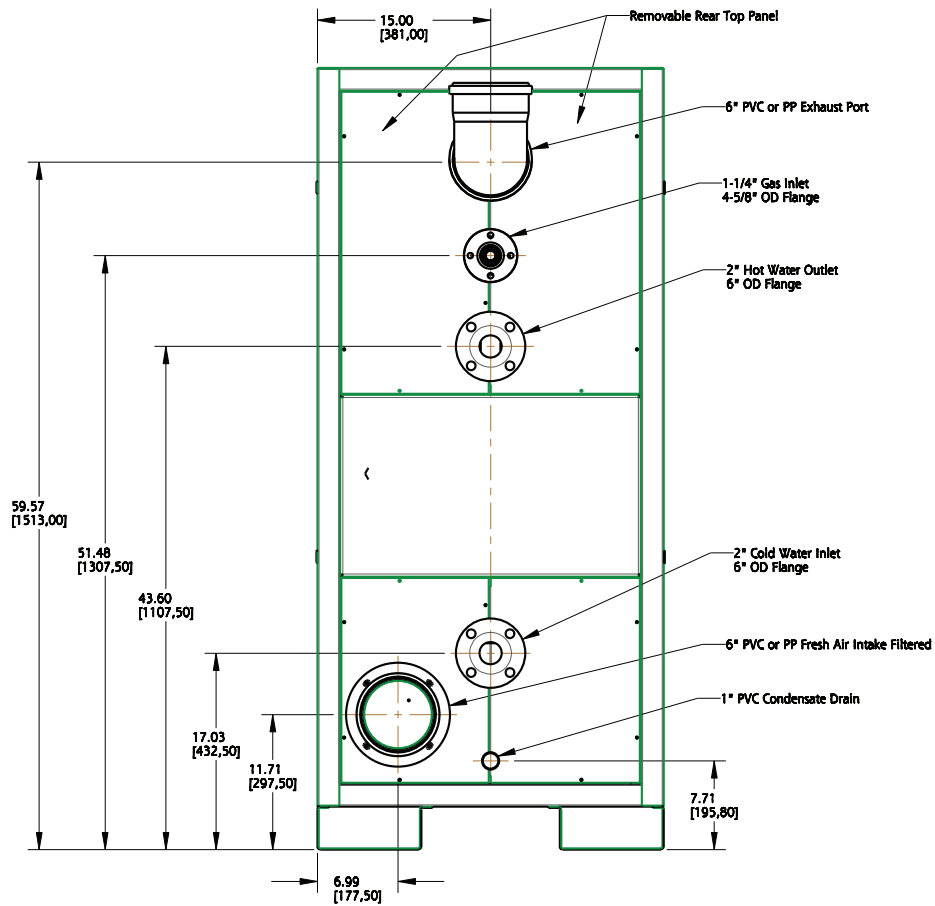
Cascade Termination DIP Switch 3 Setting (Single Unit)						
Model	Board 1	Board 2	Board 3	Board 4	Board 5	Board 6
iQ751	ON	OFF	ON	N/A	N/A	N/A
iQ1001	ON	OFF	OFF	ON	N/A	N/A
iQ1501	ON	OFF	OFF	OFF	OFF	ON

Cascade Termination DIP Switch 3 Setting (Multiple Units)						
Model	Board 1	Board 2	Board 3	Board 4	Board 5	Board 6
iQ751 Unit 1	ON	OFF	OFF	N/A	N/A	N/A
iQ751 Unit 2 or last unit	OFF	OFF	ON	N/A	N/A	N/A
iQ1001 Unit 1	ON	OFF	OFF	OFF	N/A	N/A
iQ1001 Unit 2 or last unit	OFF	OFF	OFF	ON	N/A	N/A
iQ1501 Unit 1	ON	OFF	OFF	OFF	OFF	OFF
iQ1501 Unit 2 or last unit	OFF	OFF	OFF	OFF	OFF	ON

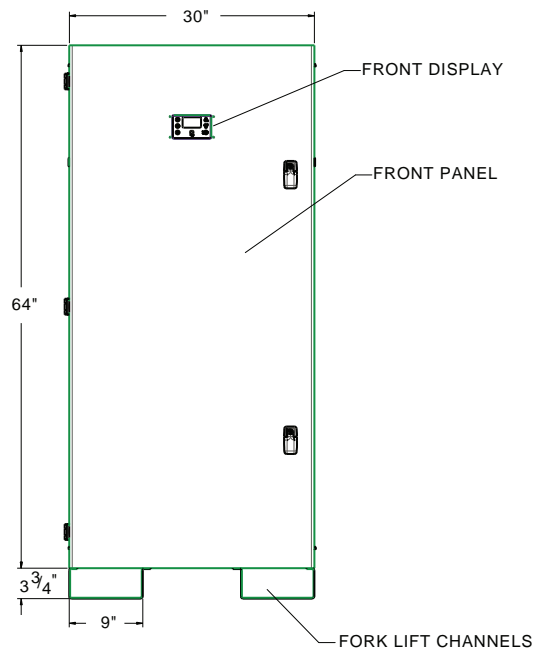
3.6 Overall Dimensions



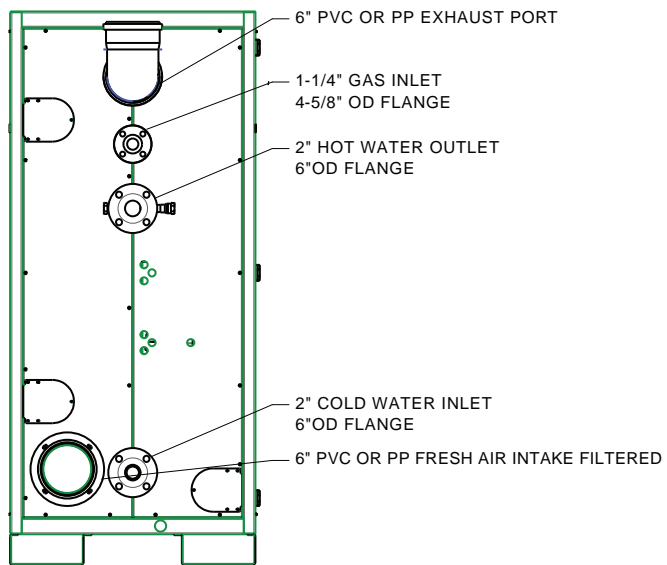
iQ751/iQ1001



iQ1501

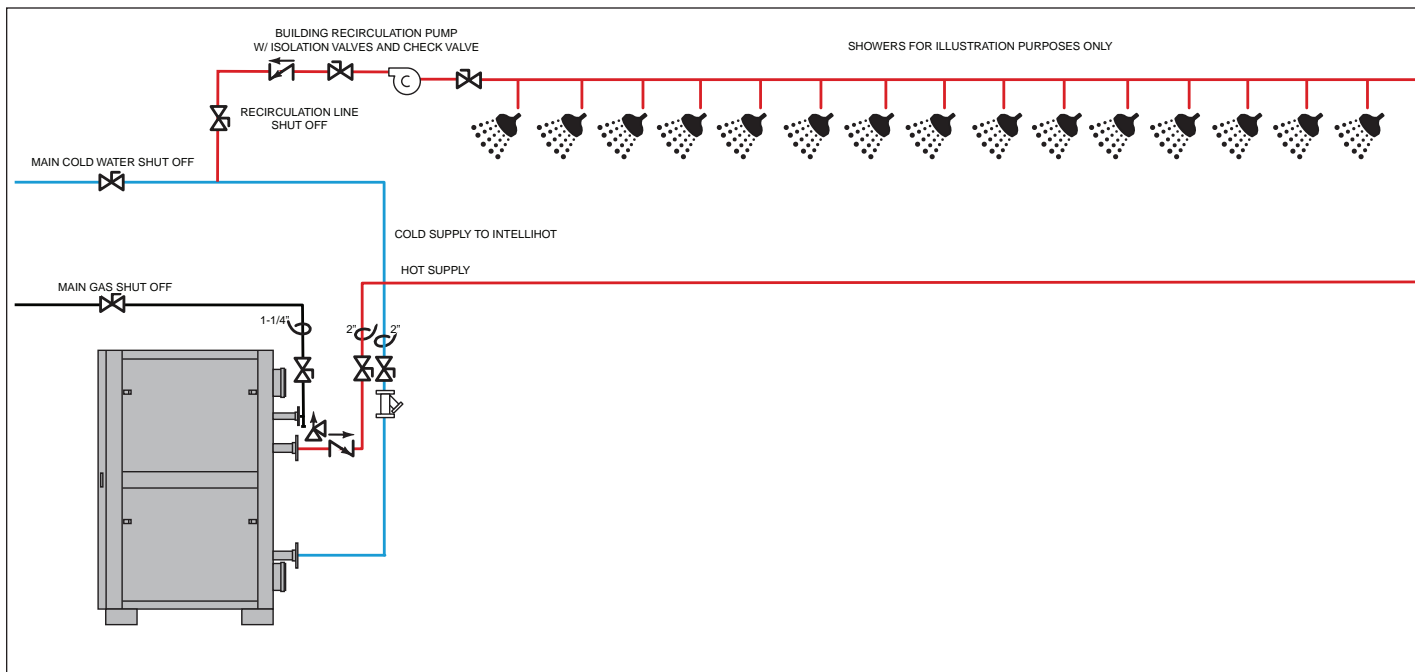


FRONT VIEW

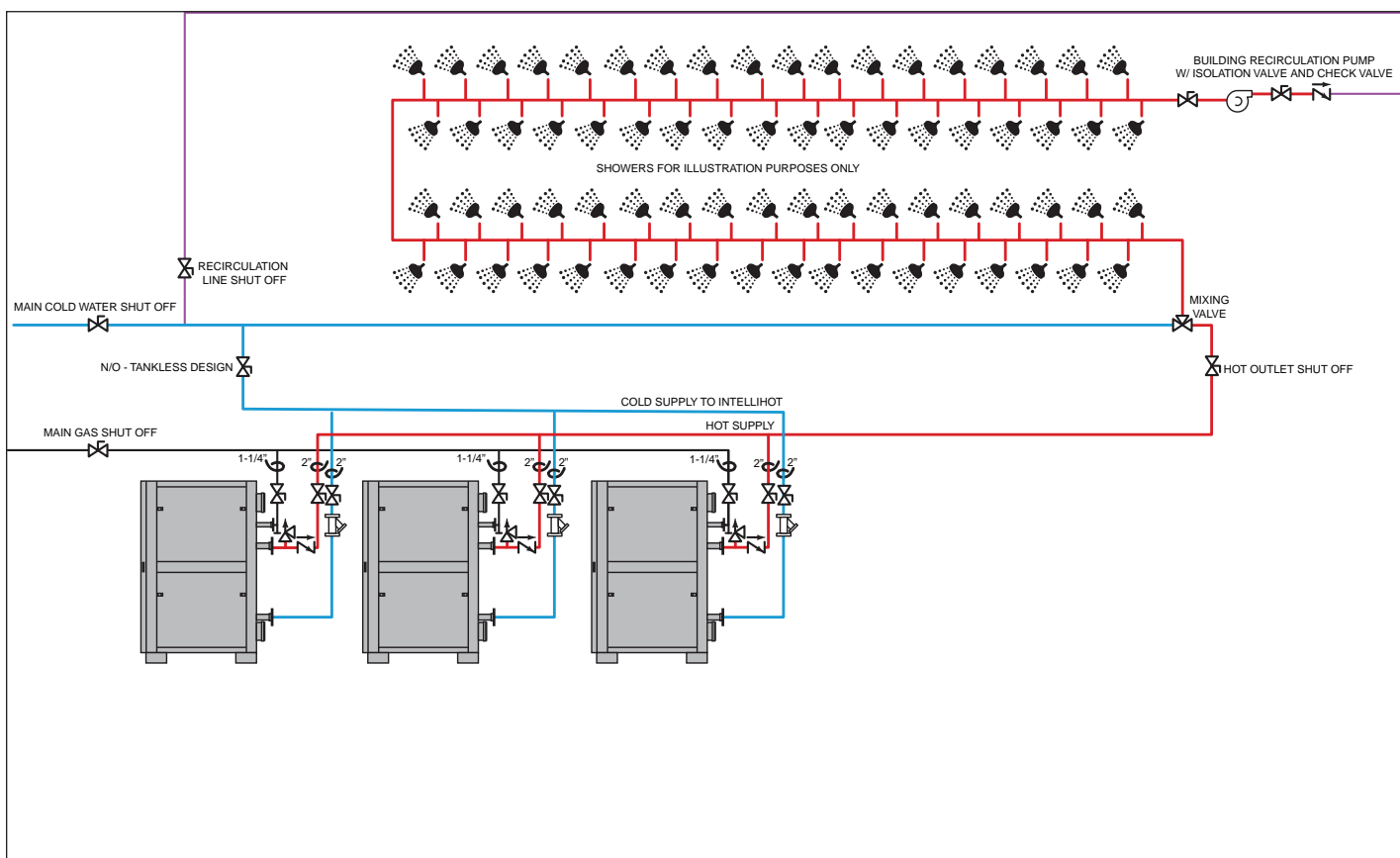


REAR VIEW

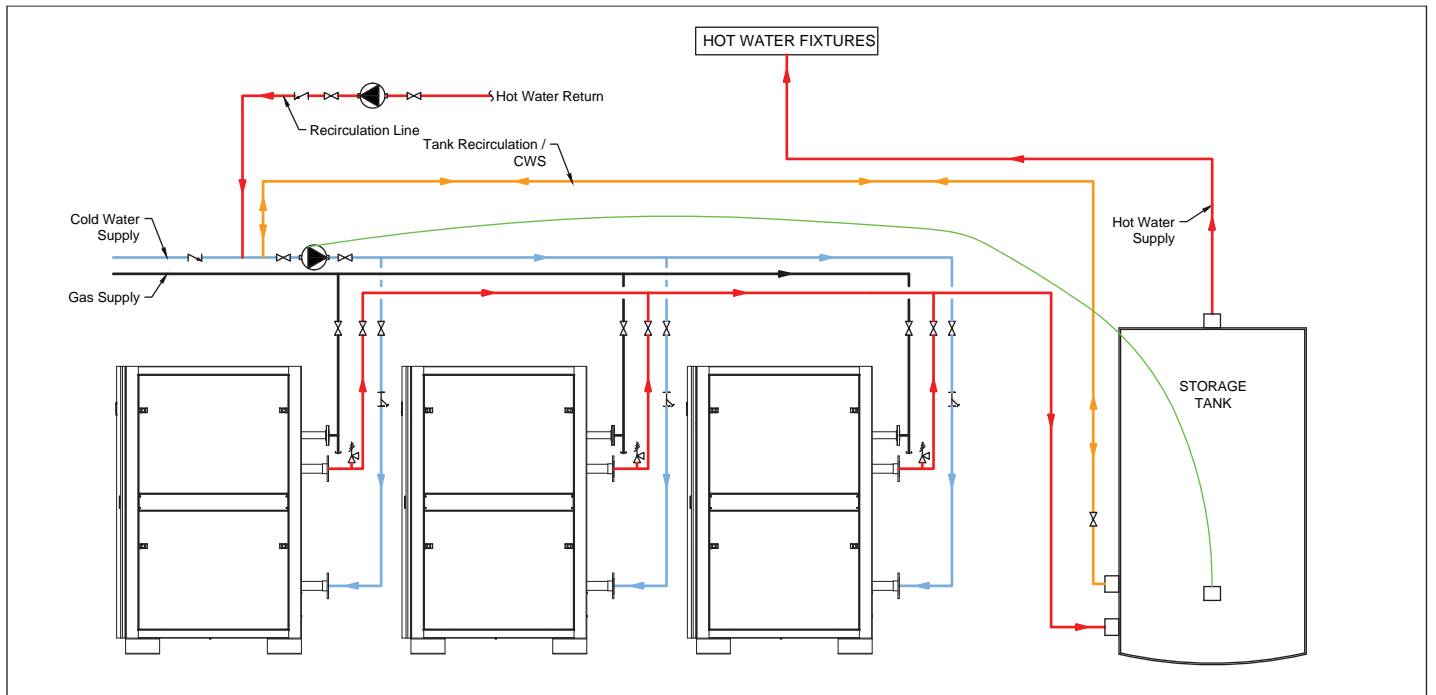
3.7 Configuration Options



System with no storage tank and without mixing valve



Multiple unit system with mixing valve but no storage tank.



Multiple unit system with storage tank.

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.
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. Gas Connection

5.1 Gas Pressure Requirements

iQ series models are designed to operate at gas pressures as low as 2.5" WC (at maximum firing rate). Gas inlet pressures to each unit should not exceed 14" WC under any condition (when unit is firing or not firing).

5.2 Gas Pressure Regulator

Depending on the gas inlet pressure at your facility, 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 iQ model it is connected to. For example, a gas pressure regulator connected to an iQ1000 should have a modulation range of 30,000 BTU/h to 1,000,000 BTU/h. In the case of multiple units it is recommended to use a dedicated gas pressure regulator for each unit.

5.3 Connection Recommendations

WARNING

FIRE AND/OR EXPLOSION HAZARD

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.

Always match the water heater with the type of gas supplied to the unit (natural gas or LP gas). 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 water heater will use natural gas (factory preset) or LP (propane) gas.
 - a. To convert the unit to propane, refer to the Propane (LPG) Conversion section in this manual.
 - b. Make sure your gas supply matches the rating decal located on the side of the water heater.
2. Make sure the gas pressure meets the requirements for the unit, as shown in the tables.

Parameters	
NG/LP- Minimum Static Gas Pressure	2.5" (non-corrugated, black iron)
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 minimum. Only gas approved fittings, valves, or pipe should be utilized.
 - b. Standard industry practice for gas piping is Schedule 40 iron pipe and fittings. All high and low gas pressure piping systems must comply with local utility and building codes.
 - c. Assembled piping should be clean of all scale, debris, metal particles, or foreign material.
 - d. The piping must be supported from the floor, ceiling, or walls and by the water heater itself.
4. Make sure the supply line (diameter) is correctly sized for the maximum output of the water heater(s) being installed.

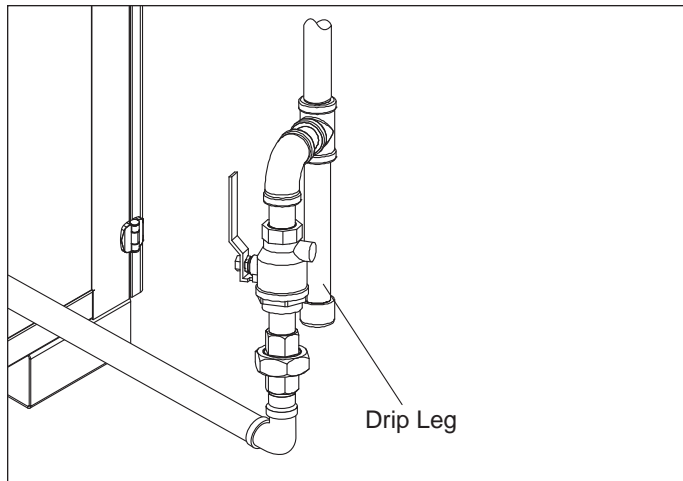
The water heater should be the first appliance to be connected to the gas supply line.

 - a. Determine the gas requirement of the water heater(s) and other appliances requiring gas. The supply line must be sized according to the COMBINED total maximum BTUH volume for all the appliances as if they were all operating at the same time.

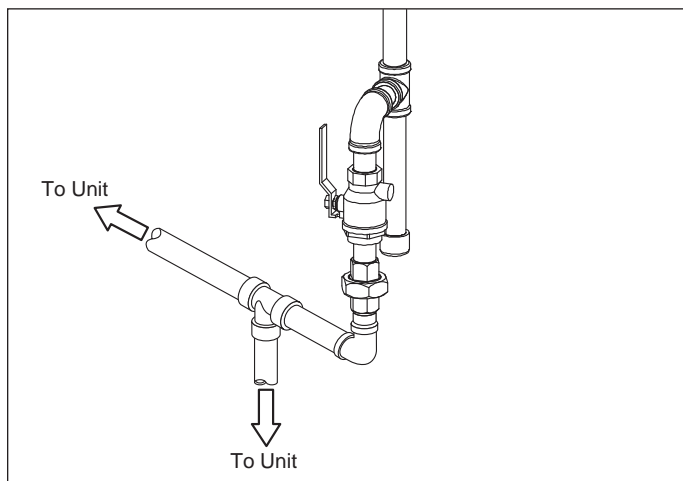
Header Sizing for Multiple iQ Units				
Number of Heaters	1	2	3	4
Sch 40 Iron Pipe	2"	2"	3"	3"

- b. Gas pipe sizing, for either a single or multiple unit installation, must be sized for a maximum pressure drop of 0.3" W.C., from the source to the final water heater.
- c. 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, (approximately 1,030 BTU per cubic foot for natural gas or 2,520 BTU per cubic foot for propane).
- d. The fuel supplier or utility 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.

5. Make sure the supply line (length) is correctly sized.
 - a. Measure the length of the gas supply line from the gas meter to the water heater or other appliances requiring gas. The diameter of the pipe must be in relation to the length.
 - b. The total length of gas piping, as well as fitting pressure drop, must be considered when sizing the gas piping. Total equivalent length should be calculated from the meter or source location to the last heater connected.
 - c. Gas pipe size should be selected on the total equivalent length. The gas volume for cfm flow will be the input divided by the calorific value of the fuel to be supplied.
 - d. Use the Gas Pipe Sizing tables in this manual or refer to the gas line manufacturers sizing information to determine the correct diameter for the supply pipe.
 - e. The diameter of the gas lines, shown in the illustration, will vary according to the specific installation requirements.
6. Install a drip leg on the gas piping.

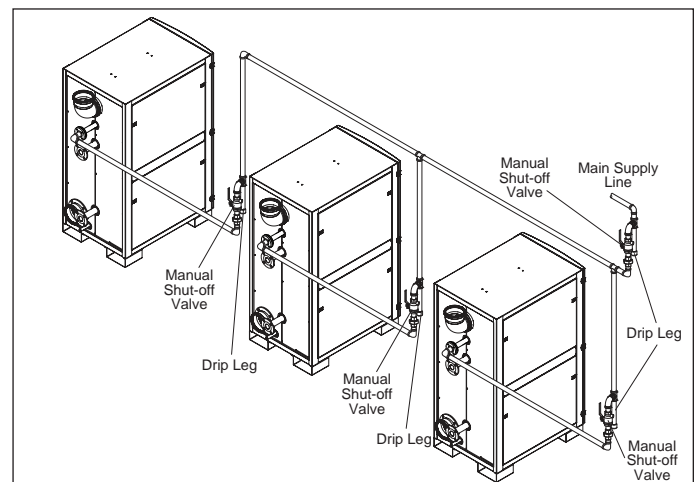
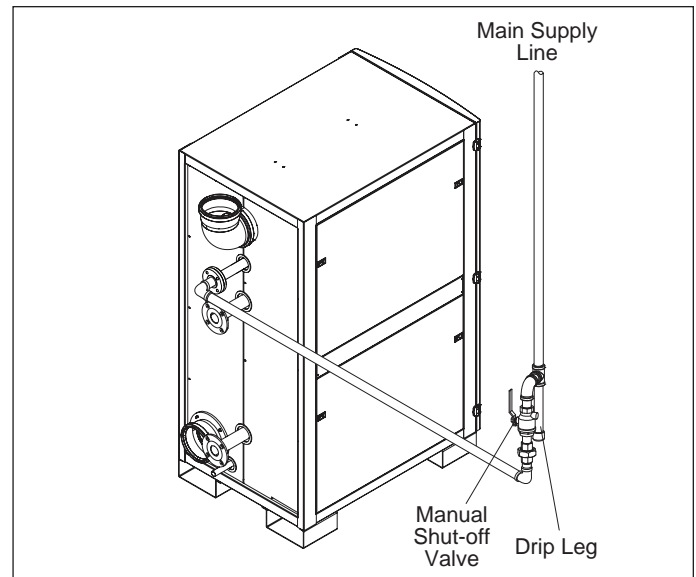


- a. Drip legs are typically required at the gas supply of each heater to prevent any dirt, condensation, or debris from entering the gas inlet.
- b. When multiple heaters are installed, some utilities and local codes require a full size drip leg on the main gas supply line in addition to the drip leg at each unit.



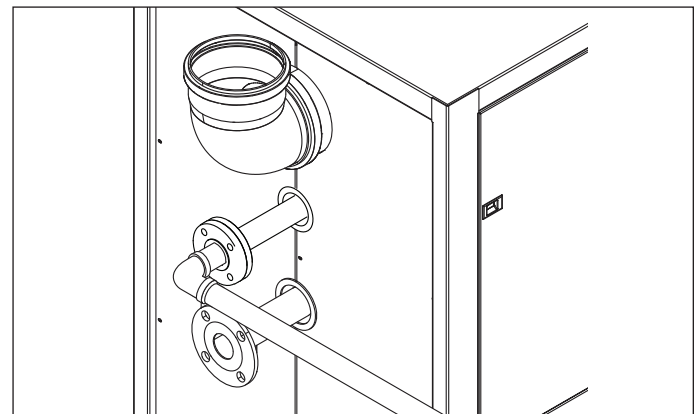
- c. The bottom of the gas drip leg should be removable without disassembling any gas piping.
- d. The weight of the gas pipe should not be supported from the bottom of the drip leg or to support any of the gas piping.

5.4 Connecting the Gas Line

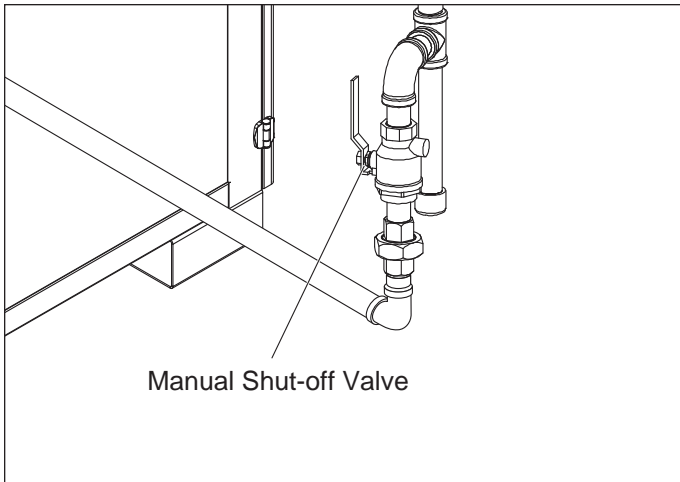


Note: Always clean the inside of the gas line of any dirt or debris before connecting the piping to the unit.

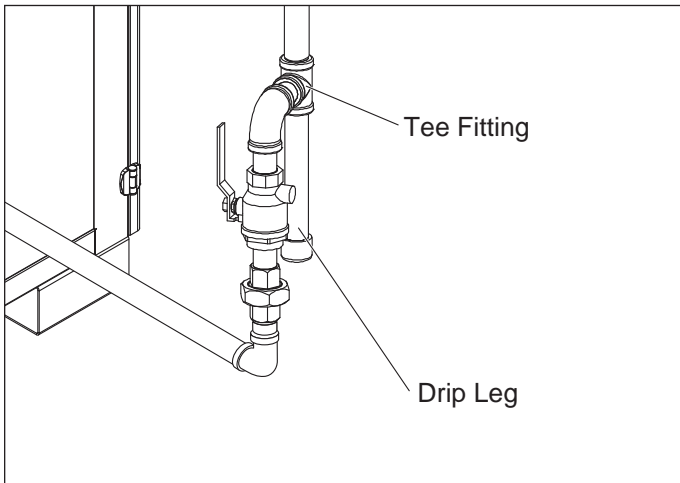
1. Install a 4-5/8" OD flanged steel coupling and gasket with a short piece of 1-1/4" NPT black pipe.



- Following local building codes, install a manual shut-off valve.



- Using a tee fitting, install a drip leg and continue the piping to the gas supply connection.



- All the gas pipe connections should be tested as prescribed in NFPA 54. In multiple water heater applications, each unit should be isolated before testing any piping system over the allowable pressure. DO NOT EXCEED 14.0" W.C. on the inlet side of the water heater at any time.

NOTICE

IMPORTANT

Do not fire (operate) the water heater until all connections have been completed and the heat exchanger is filled with water.

5.5 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.

- When venting the gas supply regulator, the vent pipe must be at least the same size as the regulator vent.
- When multiple units are connected, each regulator must have a separate vent line.
- Vent lines must not be connected together or connected with any other appliance requiring external venting.
- When selecting the size, the pipe diameter must be increased by one size for every 20 feet of pipe.
- 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"
- 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"

5.6 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.									

5.7 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. In the case of multiple units, it is recommended to use a dedicated gas pressure regulator for each unit.

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

5.8 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. When multiple units are connected, each regulator must have a separate vent line.
3. Vent lines must not be connected together or connected with any other appliance requiring external venting.
4. When selecting the size, the pipe diameter must be increased by one size for every 20 feet of pipe.
5. 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"
6. 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"

6. 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.

6.1 Venting Guidelines

- This appliance is a Category IV appliance.
- 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.

6.2 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.

All units come factory installed with 6 inch polypropylene (PP) venting. A polypropylene to PVC adapter is included with each unit to enable the use of PVC exhaust vent. The maximum allowable venting distances are the same regardless of vent material selected.

6.3 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.

6.4 Combustion Air Requirements

The iQ water heaters have the following combustion air volume requirements per heater:

Model	Required CFM
iQ751	135
iQ1001	180
iQ1501	270

Do not operate the unit in an area that will draw in outside air contaminated with high levels of dust, sawdust, aerosols such as paint, or other airborne contaminants.

If necessary, purchase and install appropriate air screens and follow a regular cleaning program to ensure an adequate supply of clean, outside combustion air.

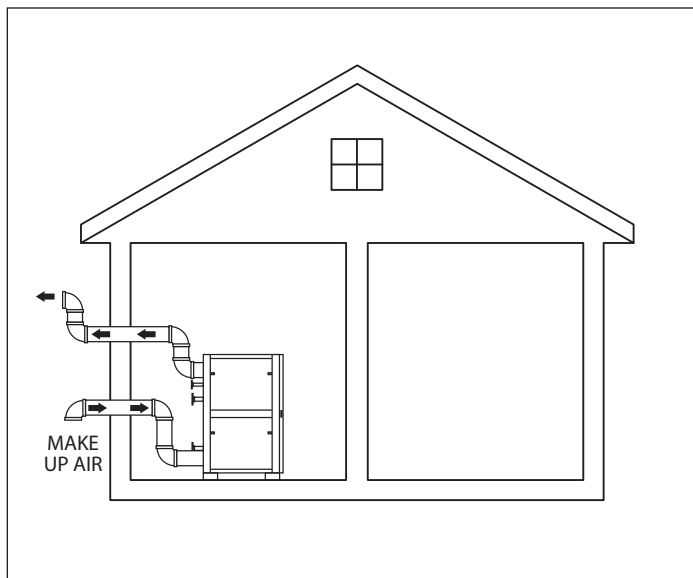
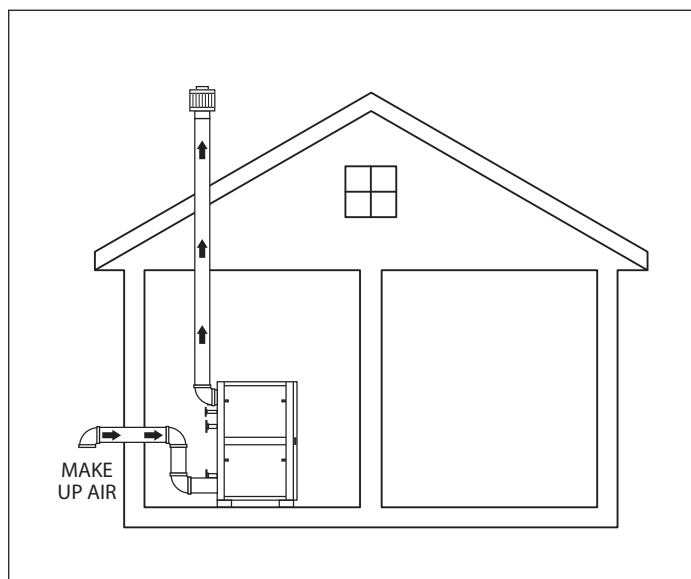
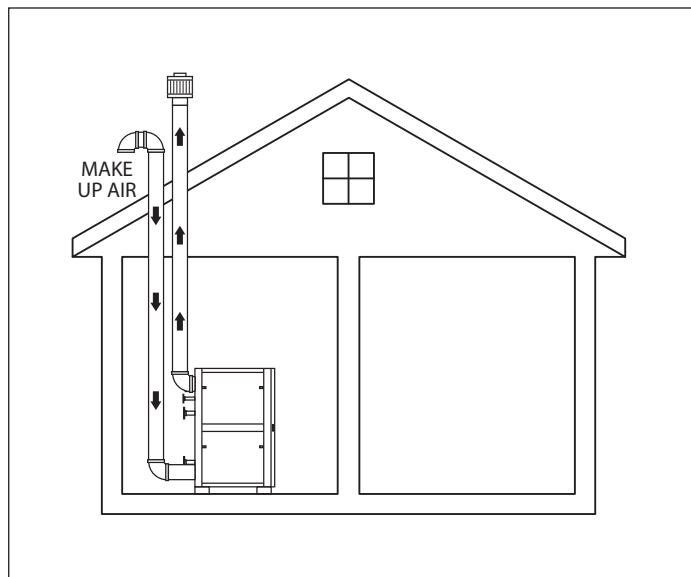
6.5 Venting Configurations

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

6.6 Two Pipe Vent System (Direct Vent)

The water heater can be direct vented without any modification using a 6 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.



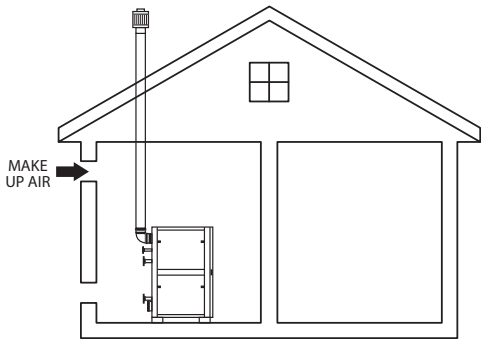
6.6.1 Single Pipe Venting System (Power Vent)

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:

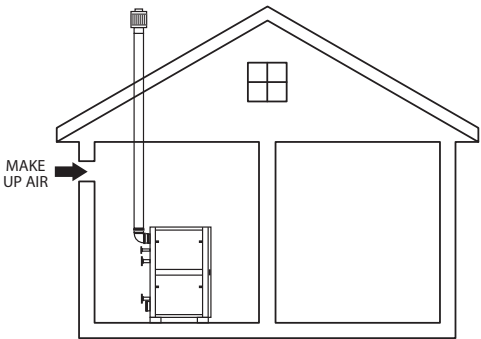
Required Combustion & Ventilation Air Opening Sizes (sq. in) Per Heater Per Boiler Room:						
Model	Input	Air Type	Air is drawn directly from outside into the mechanical room			Air is drawn from another interior space inside the building
			through two openings*, direct or vertical	through one opening**	through two horizontal ducts	
iQ751	751,000	Combustion Air	188	250	375	751
		Ventilation Air	188		375	751
iQ1001	1,001,000	Combustion Air	250	333	500	1001
		Ventilation Air	250		500	1001
iQ1501	1,501,000	Combustion Air	375	500	750	1501
		Ventilation Air	375		750	1501

*Where two openings are used, one must be within 12 inches of the floor and the other opening must be within 12 inches of the ceiling of the mechanical room.

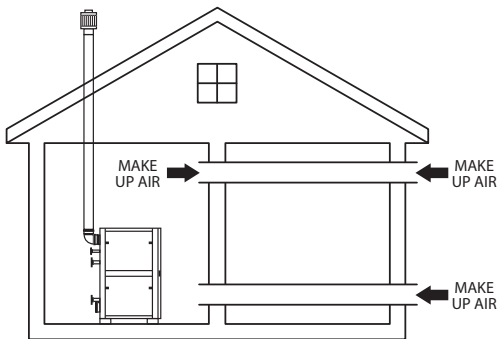
**Where one opening is required, it must be located within 12 inches of the ceiling. See figures below.



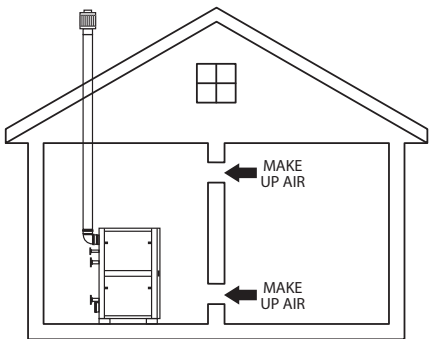
Combustion Air Direct from Outside
2 Direct Openings or through Vertical Duct
1 sq. in. per 4000 btu/h



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

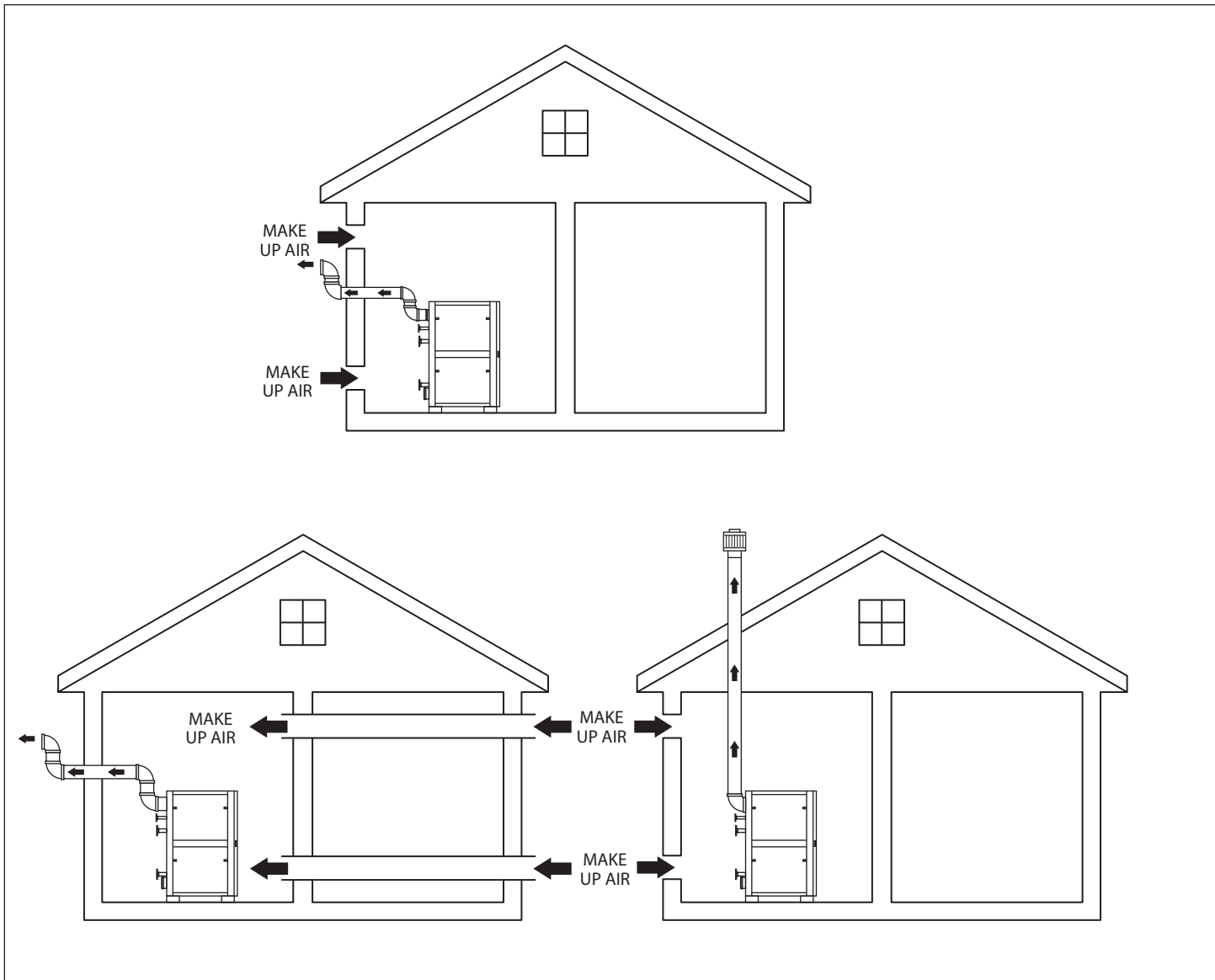


Combustion Air Through Ducts
2 Openings through Horizontal Duct
1 sq. in. per 2000 btu/h



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

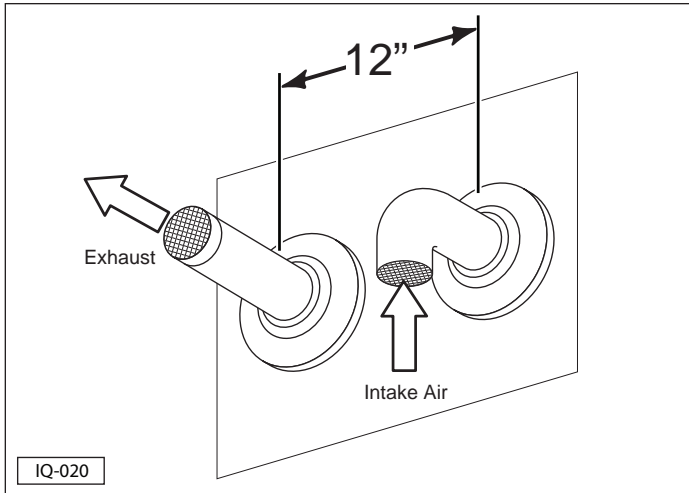
The following illustrations represent some typical power venting configurations and are included to assist in designing the vent system. Possible configurations are not limited to these designs.



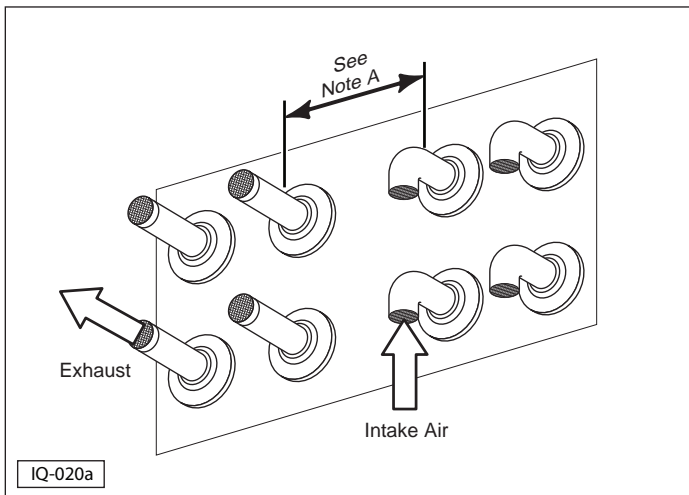
6.7 Venting Termination

6.7.1 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.



Single unit.



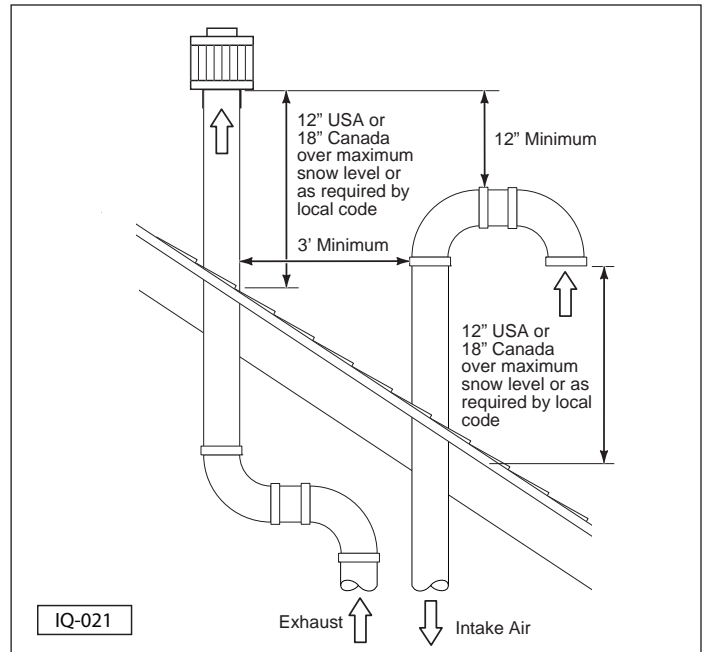
Multiple units.

Note A: The distance between any exhaust outlet and air intake should be between 18 and 36 inches or greater than 72 inches.

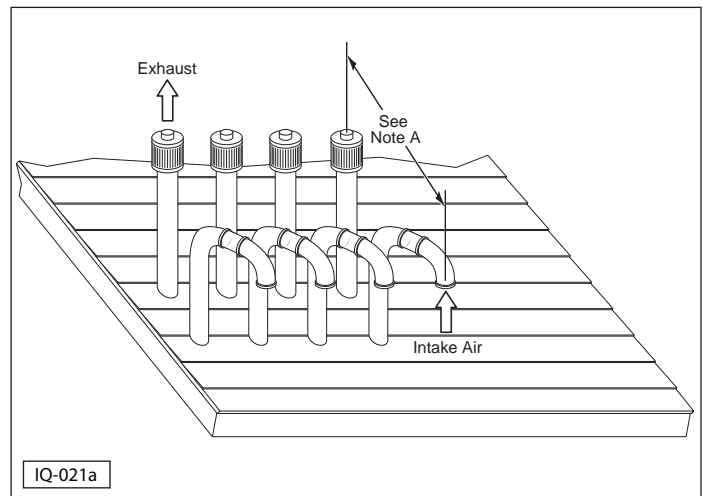
6.7.2 Roof Termination

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.



Single unit.



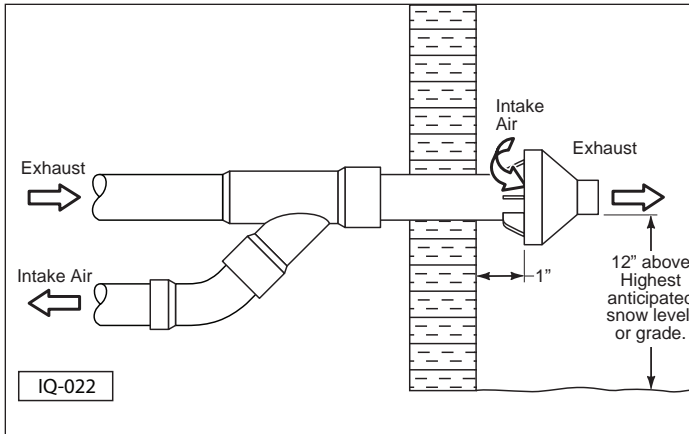
Multiple units.

Note A: The distance between any exhaust outlet and air intake should be between 18 and 36 inches or greater than 72 inches.

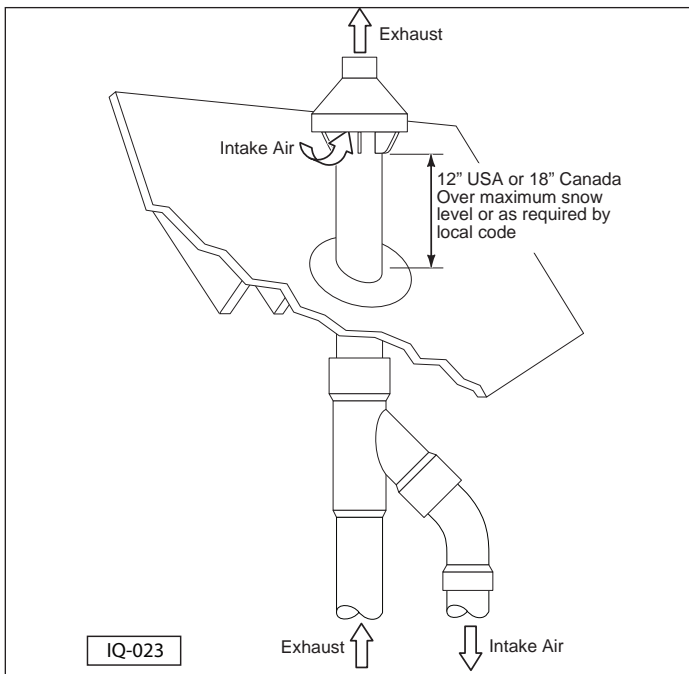
6.7.3 Concentric Venting Termination (Single Unit)

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.

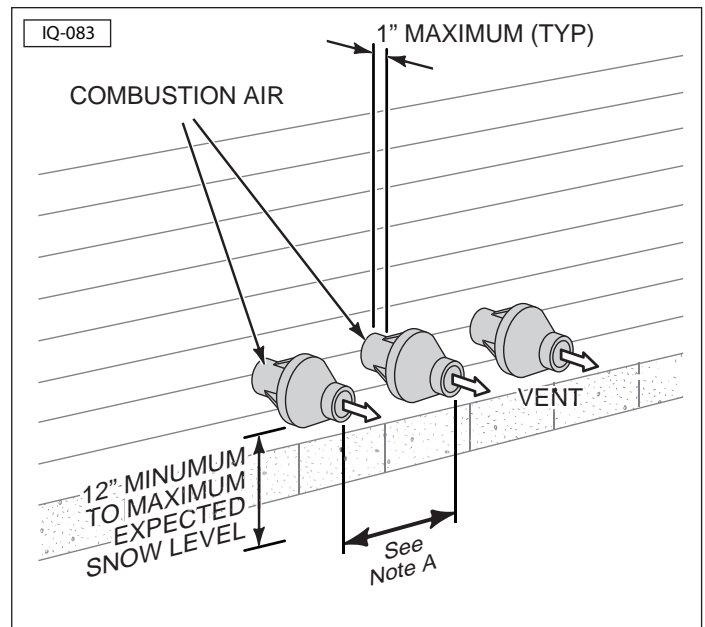


Concentric Venting System Through the Roof.

6.7.4 Concentric Venting Termination (Multiple Units)

In order to conform to some national codes, when two or more water heaters are installed they must be individually vented. When two or more units are vented near each other, each vent termination must be installed, as shown, to avoid recirculation of flue gases. A minimum distance of 18 inches must be maintained between each vent termination.

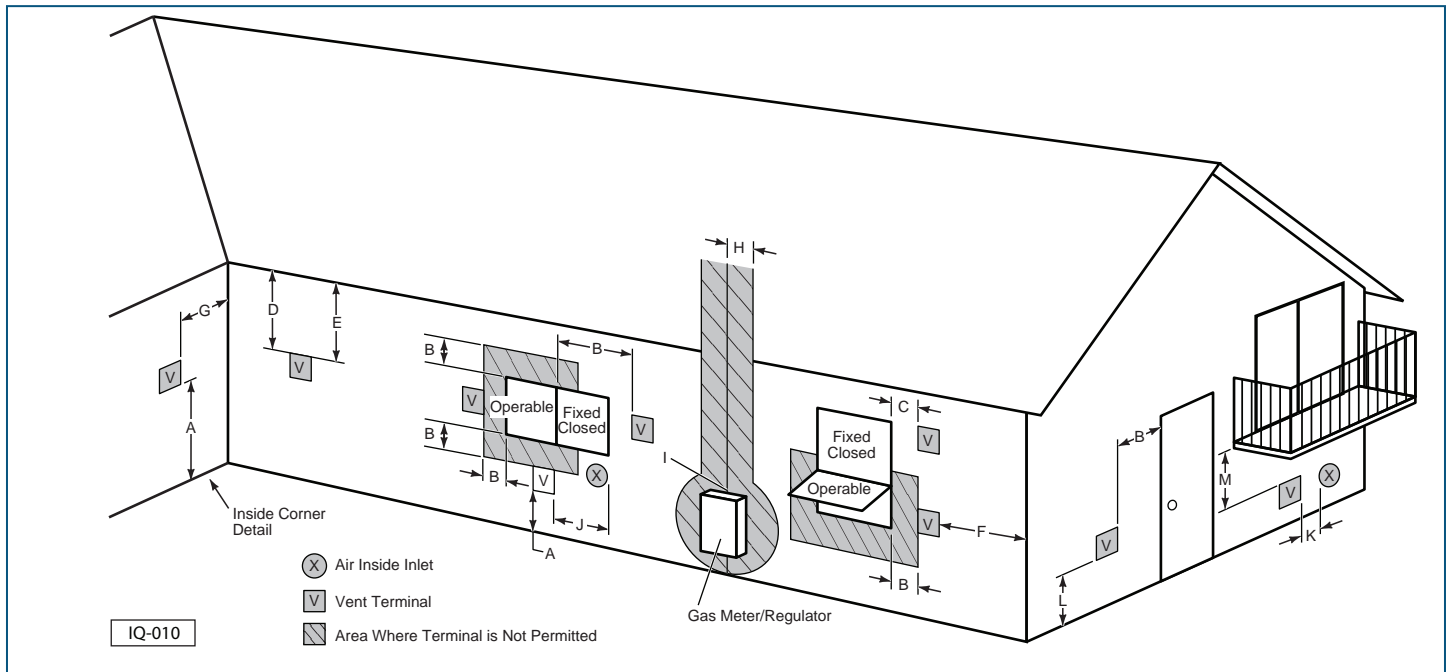
Follow all installation instructions included with the concentric vent kit when installing this type of vent system.



Multiple concentric units.

Note A: The distance between any exhaust outlet and air intake should be between 18 and 36 inches or greater than 72 inches.

6.8 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

NOTE:

The vent for this appliance shall not terminate:

1. Over public walkways; or
2. Near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property damage; or
3. Where condensate vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.

6.9 Common Venting for Multiple Units

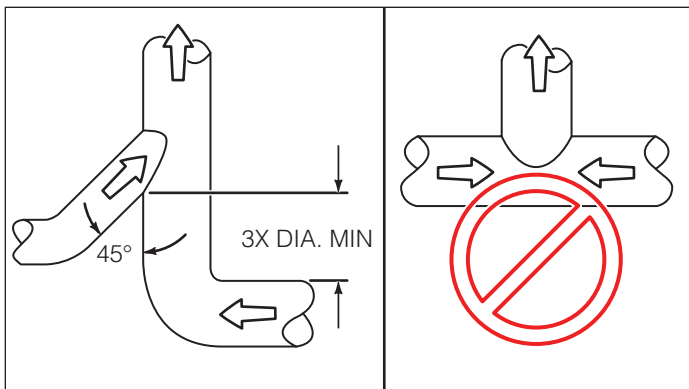
Connecting multiple units together requires proper sizing of the intake and exhaust pipes. Up to four water heaters can be connected (cascading) together.

6.9.1 Vent Diameter Sizing and Lengths

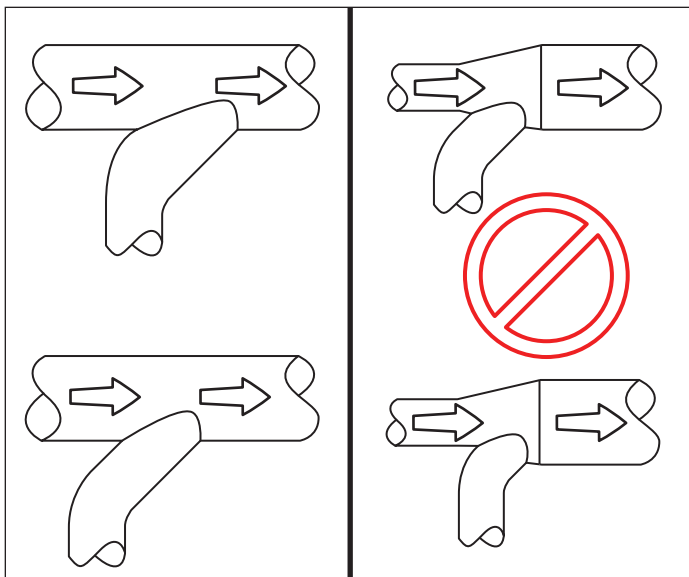
The iQ751, iQ1001, and iQ1501 come factory installed with 6 inch polypropylene (PP) venting. The following chart outlines the maximum length of venting allowable for each model. A vent system's length is calculated by adding the length of all straight pieces used (both horizontal and vertical) and then adding the equivalent lengths of each fitting used in the system. A vent system's length shall not exceed the maximum length outlined in the chart below:

Maximum Vent Length (in ft.) for Various Venting Designs for iQ751, iQ1001 and iQ1501													
Number of Units	Venting Type	Duct Size and Model											
		6"			8"			10"			12"		
		iQ751	iQ1001	iQ1501	iQ751	iQ1001	iQ1501	iQ751	iQ1001	iQ1501	iQ751	iQ1001	iQ1501
1	1 pipe - PV	220	130	65	500	500	270						
	2 pipe - DV	110	65	35	250	250	135						
2	1 pipe - PV		36		252	150	70	500	440	220			
	2 pipe - DV		18		127	75	35	250	220	110			
3	1 pipe - PV				120	70		360	212	110	500	500	250
	2 pipe - DV				60	35		180	110	55	250	250	125
4	1 pipe - PV				70	42		212	124	60	500	250	150
	2 pipe - DV				35	21		106	62	35	250	124	75
PV = Power Vent DV = Direct Vent 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.													

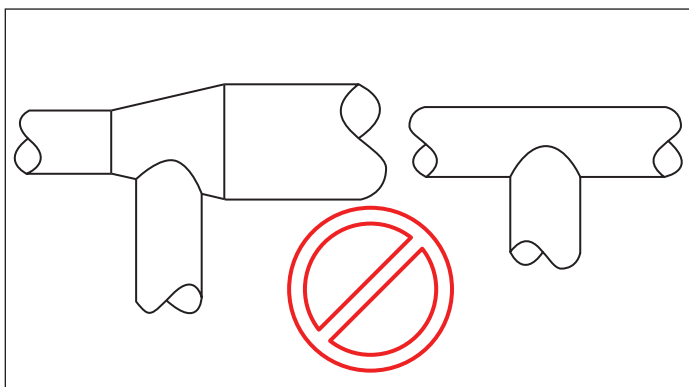
6.9.2 Recommended Exhaust Pipe Transitions



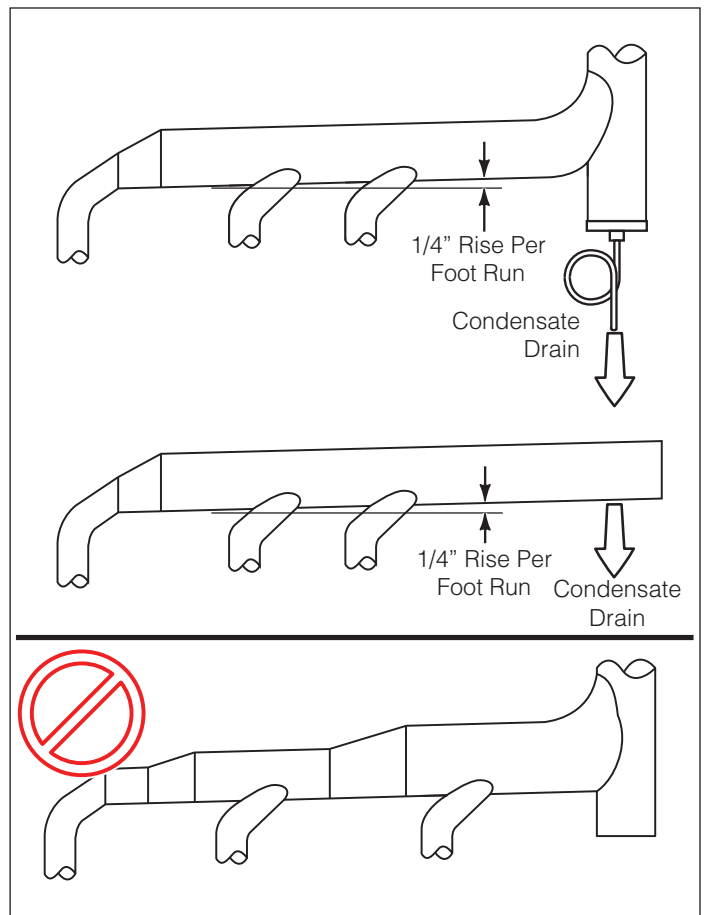
Do not direct gas exhaust from opposite directions. Use a 45 degree transition, as shown.



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.

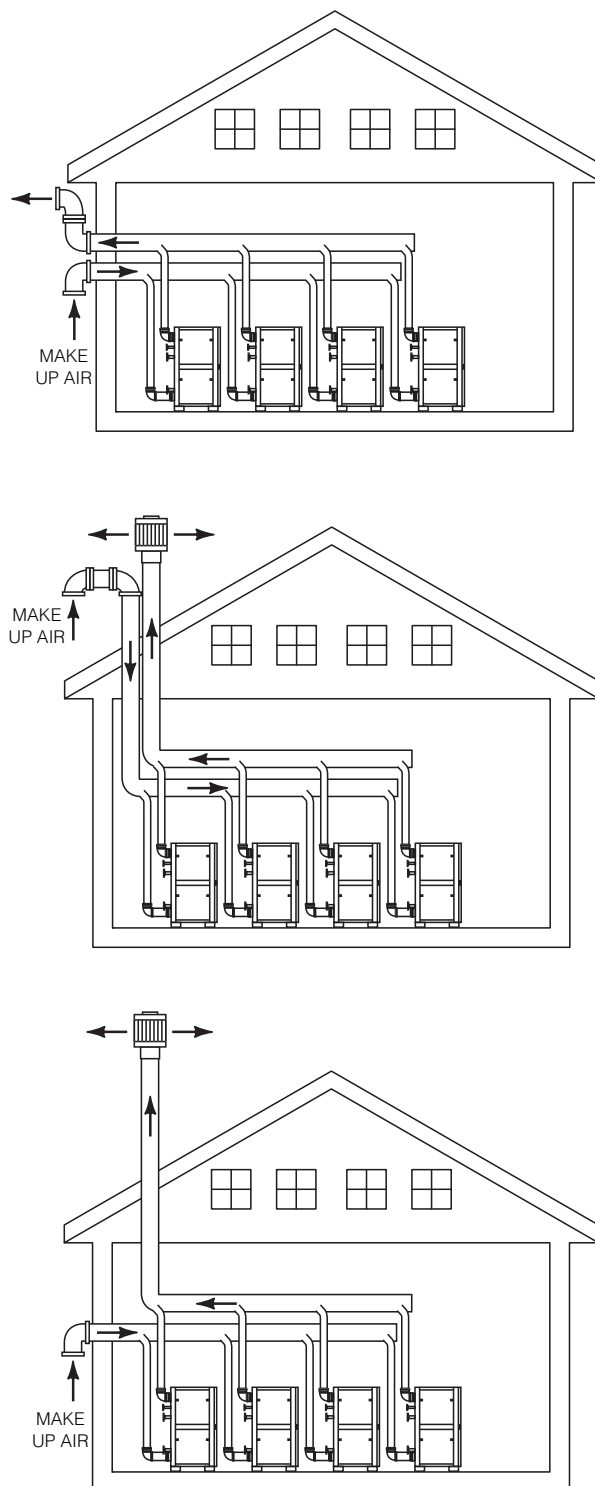


Do not use reducers in a straight run of pipe.

6.9.3 Two Pipe Vent System (Direct Vent)

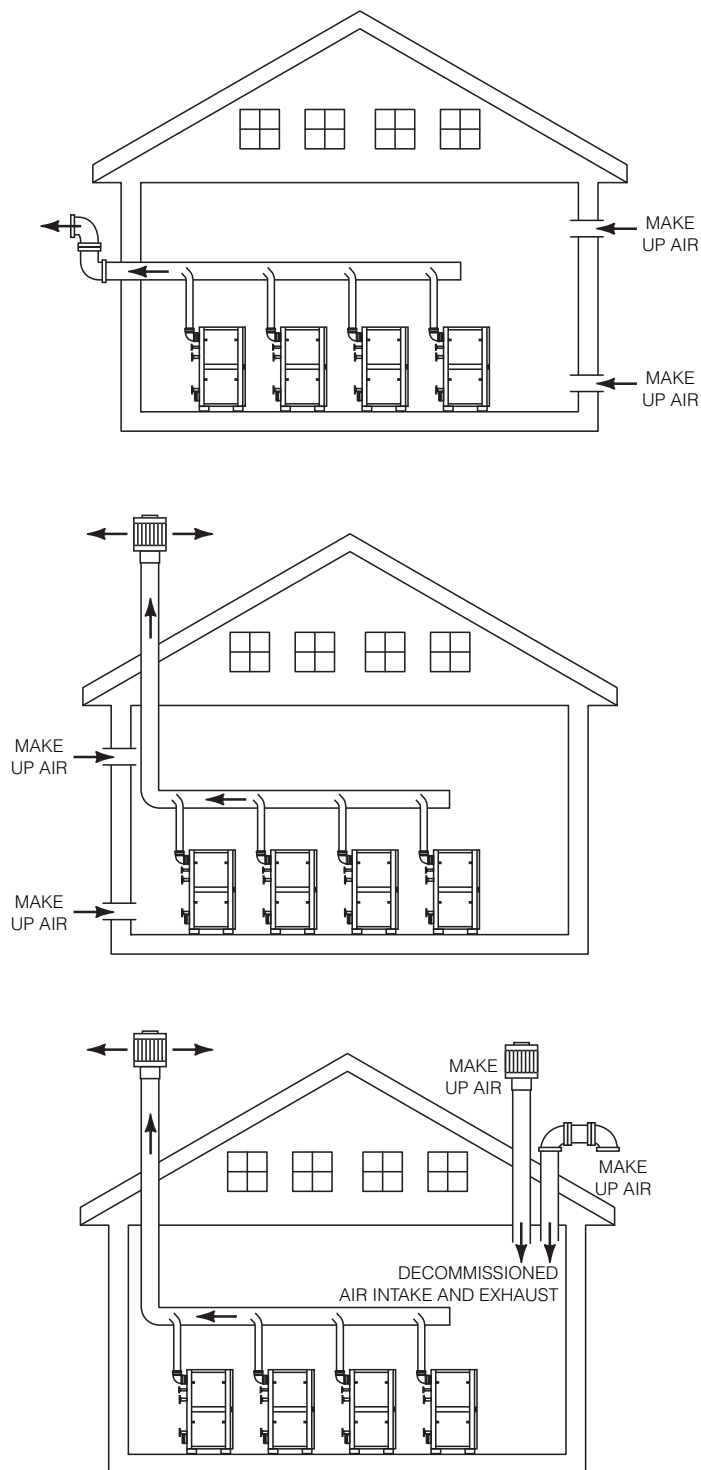
The water heater can be direct vented without any modification using a 6 inch diameter pipe when installing single units. When more than one unit is installed, refer to "6.9.1 Vent Diameter Sizing and Lengths" on page 28.

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.



6.9.4 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 “6.9.1 Vent Diameter Sizing and Lengths” on page 28.



6.10 Combustion (Fresh) Air Inlet Exhaust Outlet Connections

6.10.1 Recommendations

SAFETY INSTRUCTIONS

For information on combustion air, either from inside the building or from the outside, refer to the Venting section in this manual.

Select an approved material for the combustion air inlet. Refer to the table below for a list of approved materials. Also select the appropriate diameter of pipe based on length and number of units being installed, as shown in the tables in the Technical Specifications section.

United States Vent Pipe Standards	
Material	Description
Vent Pipe	PVC Schedule 40
	CPVC Schedule 80
	Approved Polypropylene

Canadian Vent Pipe Standards	
Material	Description
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)

NOTE: Consult the following chart or the most recent edition of ANSI Z223.1/NFPA 54 or CAN/CGA B149.1, as well as all applicable local codes and regulations when selecting vent pipe materials.

For installation in Canada, installer-supplied plastic vent piping must comply with CAN/CGA B149.1 and be certified to the Standard For Type BH Gas Venting Systems, ULC-S636. Components of this listed system must not be interchanged with other vent systems or unlisted pipes or fittings. All plastic components and specified primers and glues must be from a single system manufacturer and must not be intermixed with another system manufacturer's products.

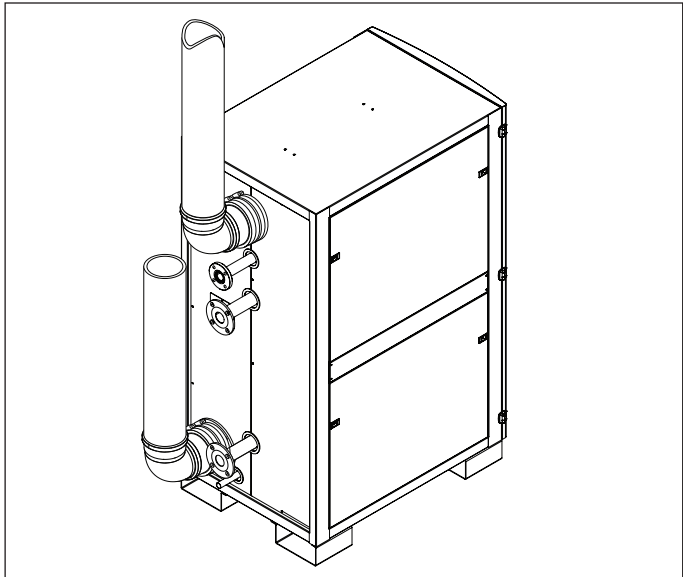
SAFETY INSTRUCTIONS

Do not use cellular foam core pipe to vent exhaust gases.

IMPORTANT
On multiple unit installations, the piping from the water heater must be connected into the properly-sized piping. Use the table in the Specification section to determine the diameter of the common connecting piping between each individual water heater.

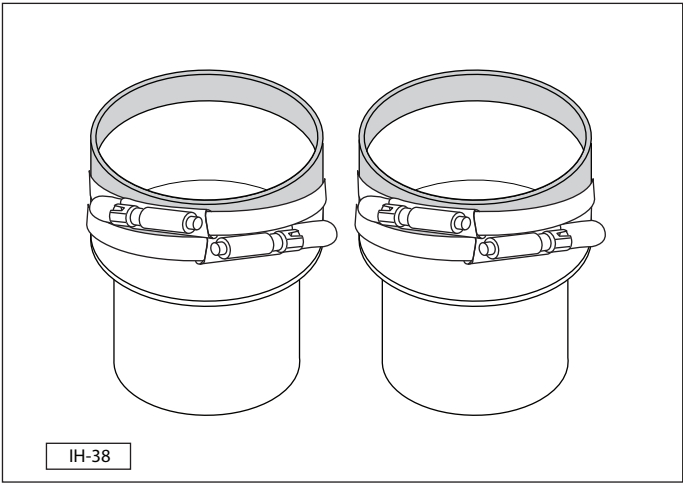
6.10.2 Installation Instructions

- 1. Install the desired configuration of pipe for the combustion air inlet.



A power vent system is shown with a short length of intake pipe.

NOTE: If PVC pipe is being used, the polypropylene-to-PVC adapters must be installed.

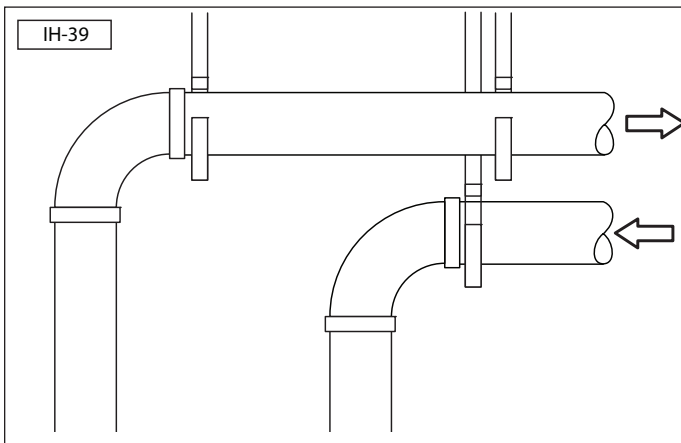


- 2. Continue the routing of the combustion air inlet.
 - a. For termination of the pipe to the outside, continue installing the required pipe to a suitable outside location. Glue all connections, making sure the joints are sealed airtight.
 - b. To configure the unit for power vent, insert a 3' section of 6" pipe.

3. Continue the routing of the exhaust gas outlet to a suitable outside location.
 - a. Glue all connections, making sure the joints are sealed airtight.
 - b. Install all horizontal exhaust gas vents with a minimum 2 degree (1/4" per foot) slope back toward the water heater. This allows any condensate that accumulates in the exhaust outlet to properly drain back into the unit.
4. Install suitable pipe support hangers every 4 to 5 feet, or as local building codes require.

SAFETY INSTRUCTIONS

Do not connect any other appliance vents to the water heater inlet or outlet pipes.



5. If multiple units are installed, make sure the diameter of the connecting exhaust outlet is properly sized for the number of units being installed.

CAUTION

This water heater has a built-in control to limit the exhaust temperature to 149°F (65°C) when the PVC is selected in the "Flue Type" programming section. As a result, the water heater can be vented with Schedule 40 PVC. If the incoming (or recirculation return) water temperature does not exceed 150°F (66°C), the exhaust temperature will not exceed 149°F (65°C).

However, if you set the water heater at a temperature above 150°F (66°C) and you are also incorporating either an external recirculation loop or a combination heating system, the exhaust temperature can exceed 149°F (65°C). In that case, you must use Schedule 80 CPVC or Approved Polypropylene in the USA or Type BH Special Gas Vent Class IIB (CPCV) or Class IC (Polypropylene) that conforms to ULC-S636 in Canada.

WARNING

When the unit is set for CPVC (polypropylene pipe), flue temperatures can reach 190°F (88°C). PVC pipe will melt at temperatures above 149°F (65°C) and could therefore result in a fire. Make sure the setting and the type of material being used for the flue are compatible.

7. Water Connections

7.1 Water Line Connection Guidelines

Note: For flow rate changes faster than 10 gpm in one second, a water hammer arrester must be installed to prevent damage to the water heater.

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.
- 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.

7.2 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	See Warranty Section
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

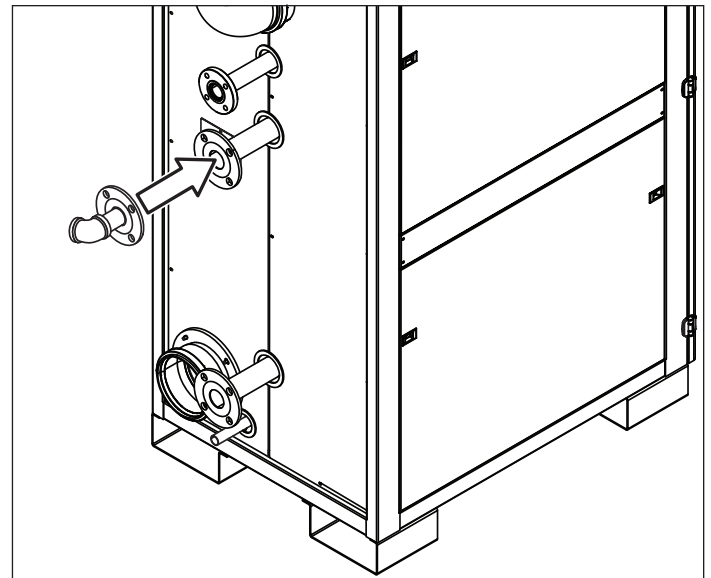
If the incoming water is known to have a high mineral content or “hardness” (see warranty section), treatment is recommended upstream from the water heater.

7.3 Hot Water Connection

Install and connect the hot water lines. If an optional hot water storage tank is required, connect the hot water lines to this tank also.

Since each installation is different, it is up to the installer to route the water lines using the most efficient routing. The drawings shown here are only suggestions indicating the items needed for the installation.

1. Connect a short section of 2" copper water line to the water heater's hot water connection.
 - a. The incoming flange, flange gasket, and stainless steel flange bolts must be supplied by the installer.
 - b. The flange connection uses a 6" OD, four-bolt brass flanged assembly.
 - c. The gasket material specs are an EPDM material with a minimum rating of 210°F continuous service or higher.
 - d. The flange bolts are a 3/8" diameter stainless steel. Also install stainless steel washers on both sides of the flange.



⚠ WARNING

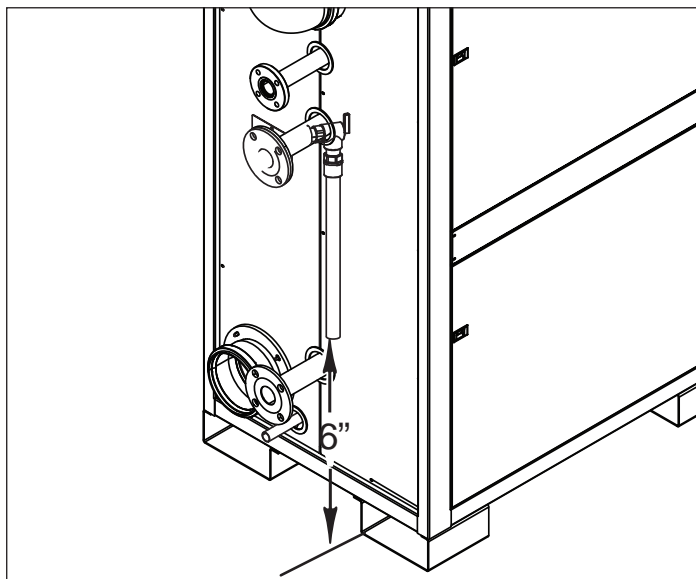
To prevent serious personal injury, do not install any shut-off device between the water heater and the pressure relief valve. This valve is designed to release abnormally high pressure within the water heater in the event of a system problem.

2. Install either a pressure relief valve or a temperature and pressure relief valve, as required by your local code into the port on the outlet piping of the unit.

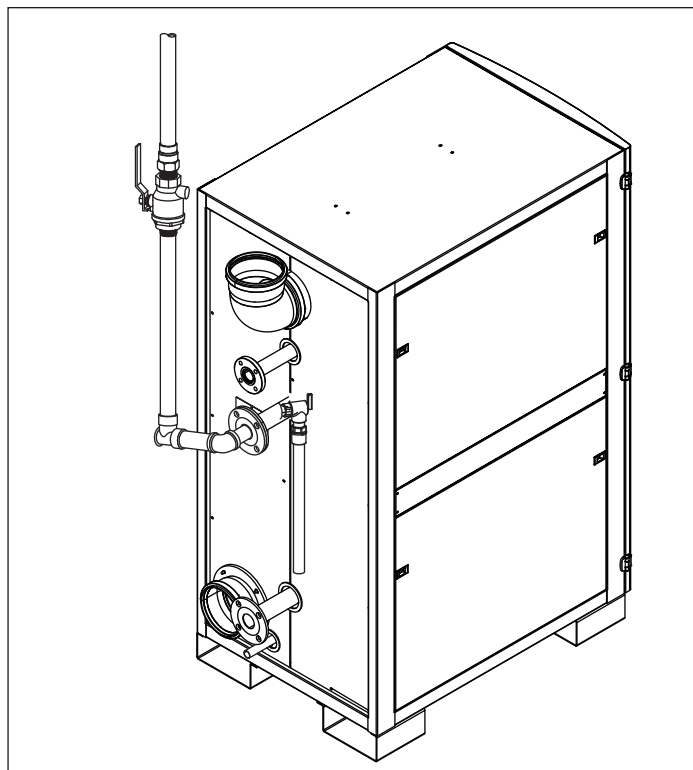
NOTICE

The pressure relief valve must be rated at 150 psi, the maximum btu/h input of the unit, and comply with all local building codes and standards. Do not install any restrictions or other valves in the pressure relief line.

- a. Route the relief valve to within 6 inches of the floor to prevent injury in the event of a discharge.
 - b. The diameter of the pipe from the relief valve must be equal to the outlet size of the relief valve.
 - c. Do not use reducers in the outlet piping.
 - d. Do not install any valves, restrictions, or other blockages in the outlet piping.
 - e. For multiple unit installations, the outlet piping must not be connected together. Each line must be separately routed to a suitable drain.
3. Install and route a discharge pipe from pressure relief valve to within 6 inches of the floor and directed away from walkways or other appliances.



4. Following local building codes, install a manual shut-off valve.



5. Connect the unit to the building's hot water lines. If multiple water heaters are being installed, the diameter of both the main cold water lines and the main hot water lines need to be sized appropriately.
6. With the unit OFF, open a nearby hot water faucet and allow the water to run through the unit until all the air is exhausted from the water lines and from the water heater.
7. Leak test the water piping. Repair any leaks immediately.

Note: For energy conservation, the hot water pipes should be insulated. Also insulate any recirculation water lines.

7.3.1 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.

Install the manufacturer-supplied 3/4" 150 psi maximum pressure relief valve with the appropriate BTU/HR rating into the 3/4" female NPT port on the back of the unit.

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.

7.4 Cold Water Connection

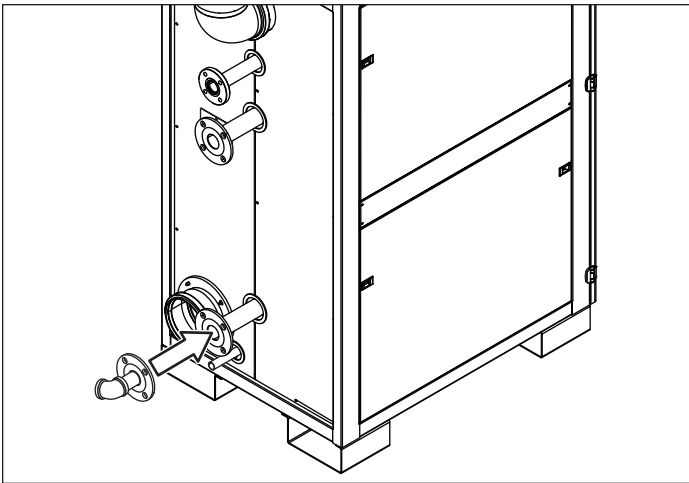
Install and connect the cold water lines.

Note 1: 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.

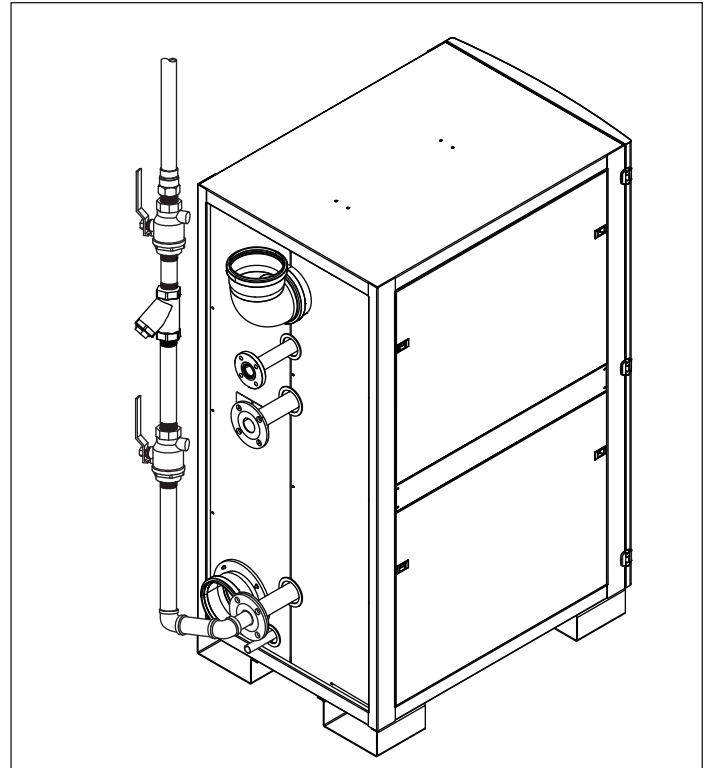
Note 2: A water inlet strainer must be installed prior to use. This strainer must be inspected and cleaned after initial operation of 3 hours. Subsequently inspect the strainer at least every 3 months to establish a cleaning schedule.

Since each installation is different, it is up to the installer to route the water lines using the most efficient routing. The drawings shown here are only suggestions indicating the items needed for the installation.

1. Connect a short section of 2" copper water line to the water heater's cold water connection.
 - a. The incoming flange, flange gasket, and stainless steel flange bolts must be supplied by the installer.
 - b. The flange connection uses a 6" OD, four-bolt brass flanged assembly.
 - c. The gasket material specs are an EPDM material with a minimum rating of 210°F continuous service or higher.
 - d. The flange bolts are a 3/8" diameter stainless steel. Also install stainless steel washers on both sides of the flange.



2. Following local building codes, install a manual shut-off valve.



3. Connect the unit to the building's cold water lines. If multiple water heaters are being installed, the diameter of the main cold water line needs to be sized appropriately.
4. With the unit OFF, open a nearby hot water faucet and allow the water to run through the unit until all the air is exhausted from the water lines and from the water heater.
5. Leak test the water lines. Repair any leaks immediately.

7.5 Condensate Line Installation

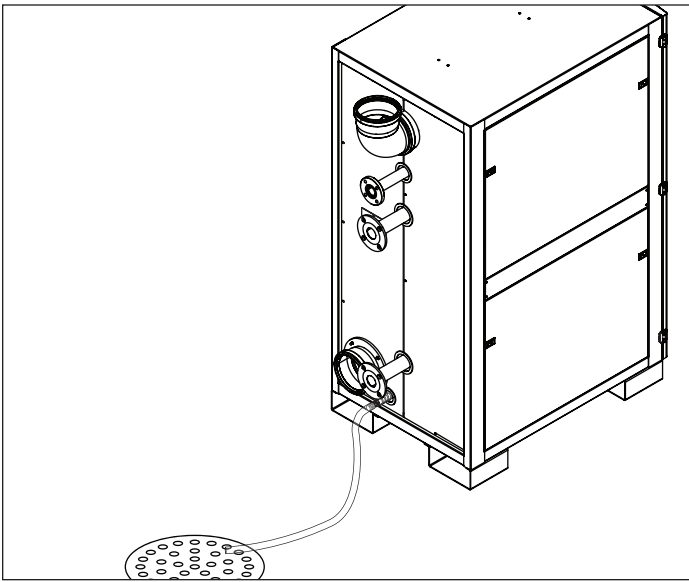
7.5.1 Connection Recommendations

Due to its efficient design, the Intellihot water heater produces condensate (water) as a normal by-product of heating the water.

1. This condensate is acidic, with a pH level between 3 and 4. Local building codes may require an in-line neutralizer to be installed (not included) to treat this water.
2. The maximum condensate flow rate is 20 GPH.
3. The condensate drain trap, associated fittings, and drain line must be removable for routine maintenance.
4. The drain line must be higher than the condensate pump of the floor drain connection to drain properly.
5. The condensate pump must be supported by the floor or other means; it cannot be supported by the connecting pipes.
6. The drain line should contain a union to facilitate servicing the unit or cleaning the drain line.

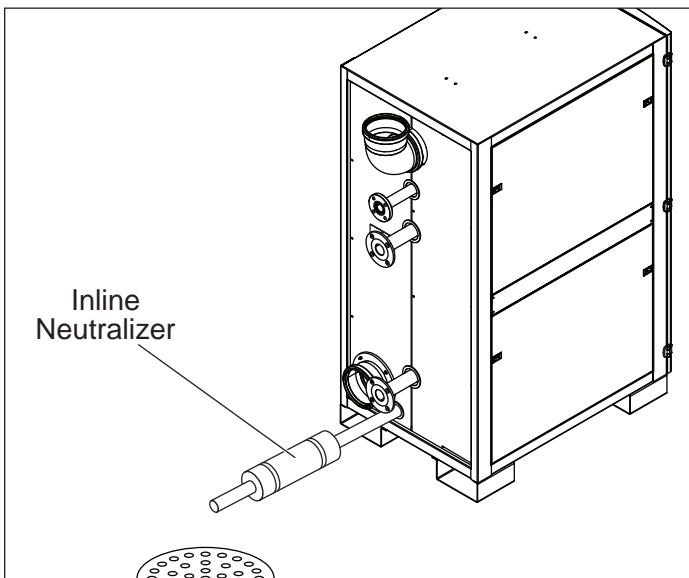
7.5.2 Drain Line Installation

1. Install a 3/4" flexible hose to the hose connection on the water heater.

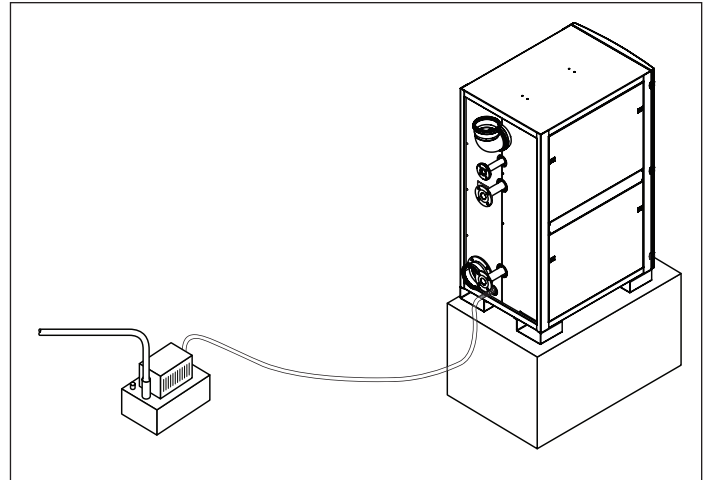


Note: If a floor drain is used to remove the discharge, route the drain pipe over or into the drain. If a condensate pump is being used, the water heater may need to be raised off the floor to accommodate the height of the pump.

2. If required, install an inline neutralizer to treat the acidic condensate. Follow all the installation instructions included with the neutralizer.



3. If a floor drain is not available, a condensate pump can be used to pump the condensate to the drain.



4. Route the hose on the trap outlet to a nearby floor drain or drain pipe.

8. Electrical Power

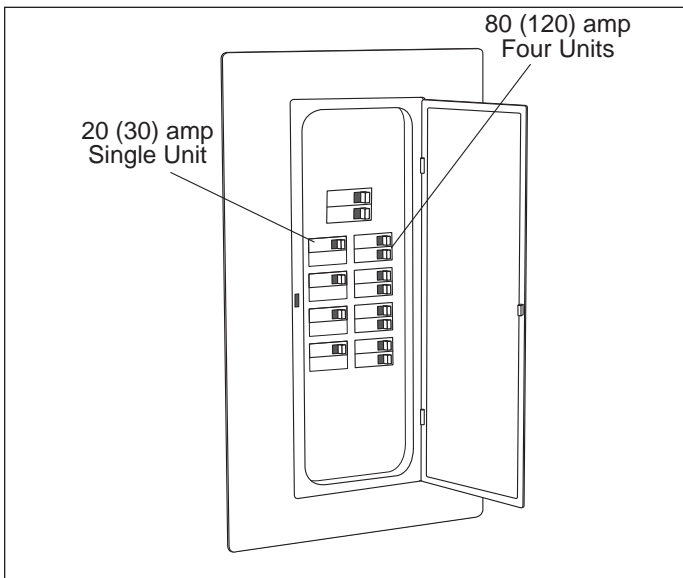
8.1 Electrical Recommendations

⚠ 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.

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.

Depending on the number of water heaters being installed, the circuit breaker(s) should be at least 20 amps (30 Amps for iQ1501) for each unit. If one unit is installed, a dedicated 20 amp (30 Amp for iQ1501) circuit is required. If four units are installed, then an 80 amp (120 Amp for iQ1501) circuit breaker is required, or four separate 20 amp (30 Amp for iQ1501) circuits.



Use 20 Amp (30 Amp for iQ1501) Breakers For Single Units Or Larger Breakers (80 Amp) (120 Amp for iQ1501) For Multiple Units.

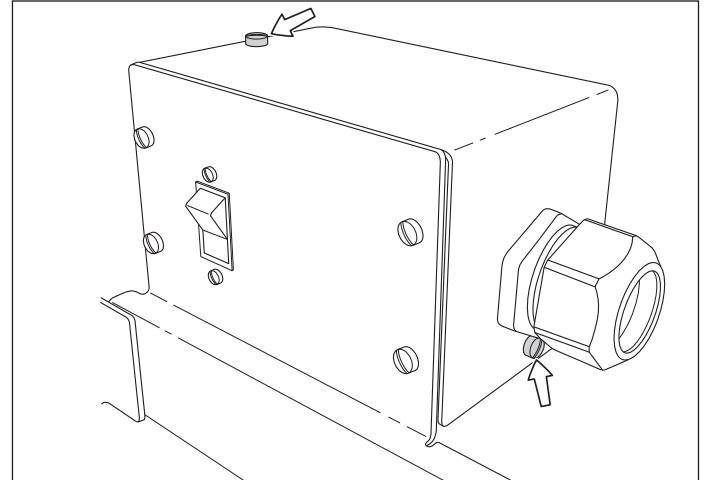
Note: For an electrical wiring schematic, refer to the Wiring Diagram section in this manual for additional information.

NOTICE

The electrical connections for the water heaters are polarity sensitive. Before connecting the water heater to the power source, test the polarity of the electrical circuit.

8.2 Connection Instructions

1. On single unit installations, make sure the electrical outlet being used is wired with at least 12 gauge wire and grounded with an appropriately sized circuit breaker. The electrical power required for the water heater is 120V AC at 60 Hz.
2. Remove the cover screws and open the cover.



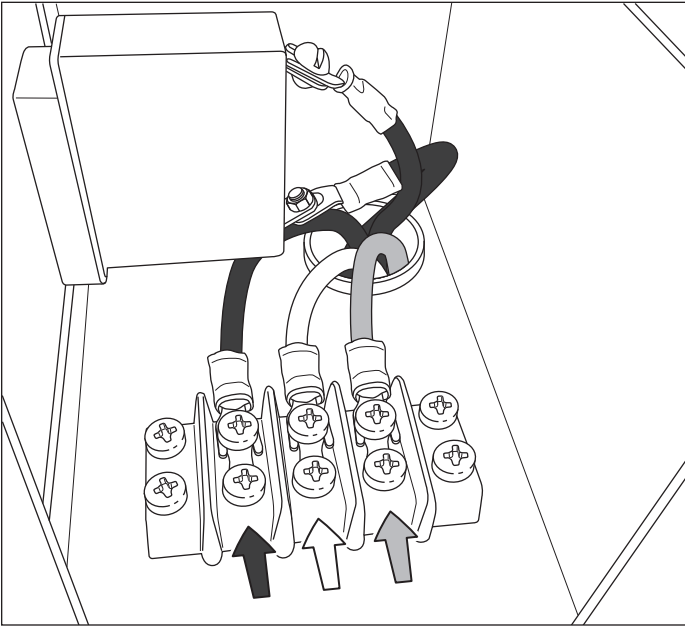
3. Install the electrical wiring in a manner that is safe and efficient for the overall use of the water heater.

⚠ WARNING

To avoid serious injury or even death from electrical hazards, an ON/OFF switch should be installed near the water heater. The switch will allow power to be removed from the water heater prior to service or in the case of an emergency.

4. Route a customer-supplied 12 gauge wire with ground from an electrical junction box with an ON/OFF switch through the back panel and into the water heater. Route the wire through the provided grommet on the cover of the terminal housing in the front of the unit.

5. On the opposite side of the block from the factory installed wiring, connect the white wire to the white terminal, the black wire to the black terminal, and the green ground wire to the green terminal.



Note: It is recommended that a separate ON/OFF switch or breaker box be installed near the water heater to remove power from the unit when servicing the water heater or in case of an emergency.

6. If multiple units are being installed, refer to the Multiple Units section of the manual for additional information.

9. 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.

9.1 General Information

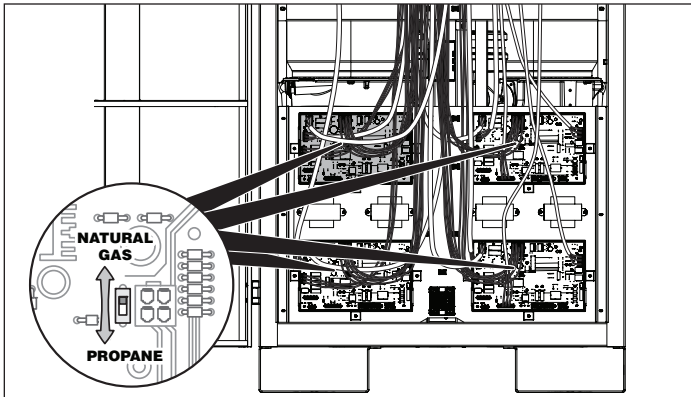
Before beginning the conversion, make sure the LP gas inlet pressure is between 8.0" and 13.0" W.C. Record the gas pressure here.

STATIC LP GAS PRESSURE _____ W.C.

DATE _____

9.2 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)

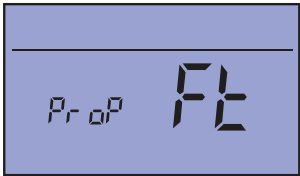
- 5. Reconnect the power and wait for main screen to appear.



- 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.

10. Adjusting CO₂ Level

10.1 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:

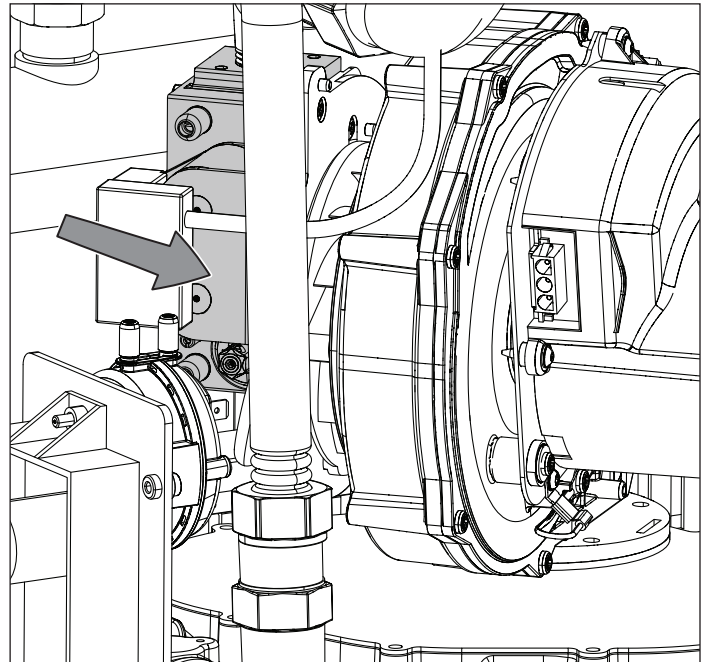
NG - 8" W.C.

LP - 11" W.C.

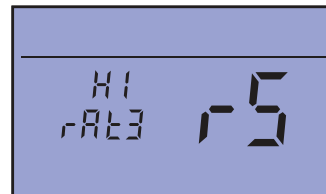
The service technician must confirm Static gas pressures before setting High Fire and Low Fire CO₂ and CO values.

10.2 Procedure

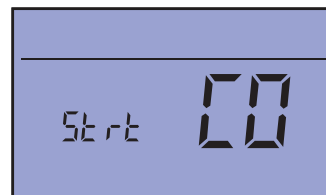
1. Locate the gas valve.



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.



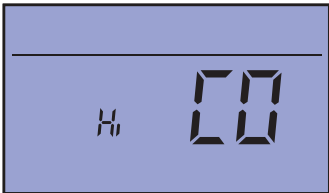
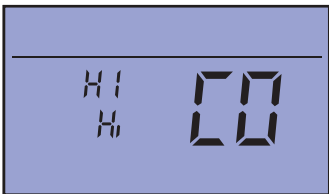
4. Press and release the Mode button multiple times until the CO screen appears on the display.



5. Press and release the **ENTER** button. Lo will be displayed indicating the unit will fire at its lowest firing rate when a hot water faucet is opened.



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

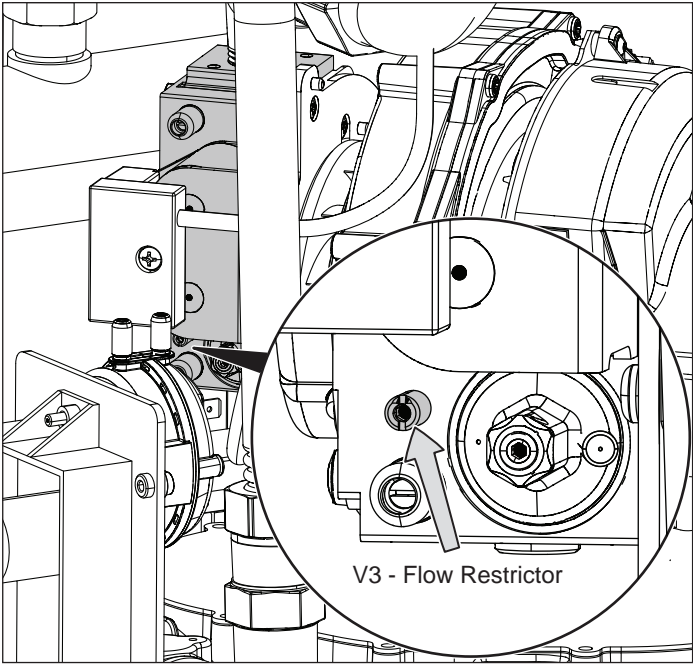


7. Open several hot water faucets to allow at least 5 gpm of water flow.
8. When the unit is operating at high firing – the shower, blower, and flame icons will be displayed.



9. Record values in table column 1, 'Hi'. If the CO₂ values are within the appropriate range, proceed to step 11, otherwise continue with Step 10.
10. 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.



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

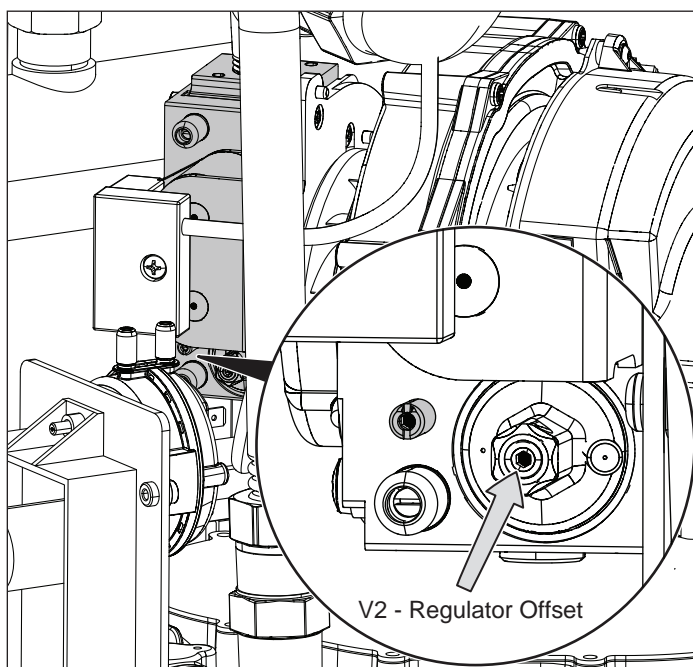
	Hi	Adjusted Hi	Lo	Adjusted Lo
CO ₂ Value %				
Max CO ppm				
Date				

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

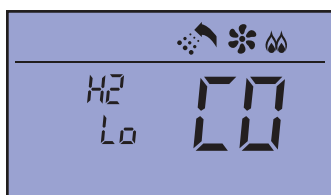


13. Record values in table column 3, 'Lo'. If the CO₂ values are within the appropriate range, proceed to Step 15, otherwise continue with Step 14.

14. 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.

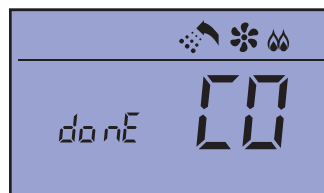


15. Once the desired values are achieved, record the LOW FIRE CO₂ values in table column 4, 'Adjusted Lo'.
16. Press and release the **Enter** button to advance to the H₂ display Screen.



17. Repeat steps 9-15 until all the modules are set to the desired CO₂ levels.

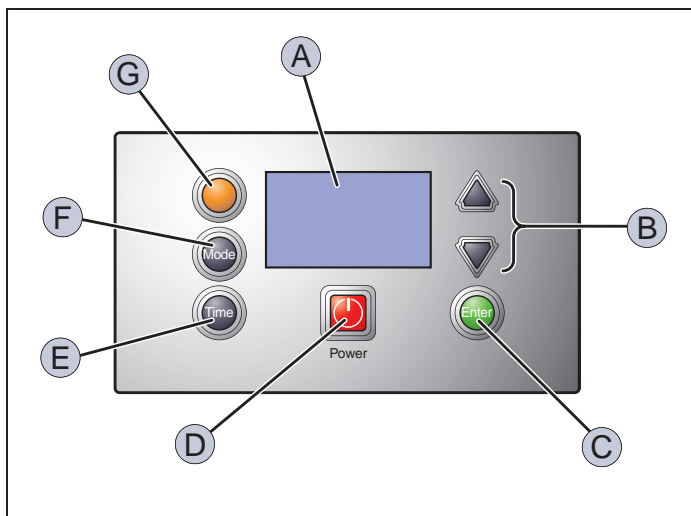
18. Press and release the **Enter** button to repeat or press and hold the **Enter** button to return to home screen



19. Close all open water faucets.
20. Turn off water flow
21. Remove the combustion analyzer.
22. Plug access port.
23. Press and hold the **Enter** button to return to home screen to resume operation.
24. Leak test the gas valve before placing the unit in operation. Only use approved leak detector liquid solutions to check for leaks.
25. Install any removed side panel covers and close the front door panel.

11. Operation

11.1 Control Panel



A) LCD screen

The LCD display screen shows all information about the operating functions of the water heater.

B) Arrow keys

Press the UP or DOWN arrows to adjust the value of the selected feature, such as time or water temperature.

C) Enter button

To return to the Main or Home screen.

D) Power button

When the water heater is initially connected to an electrical power supply, the unit will automatically turn ON and the display panel should light up. To turn the unit OFF, press and hold the Power button and the water heater will go through a shutdown process. The unit can then be turned ON again, once the blower finishes its purge cycle (10 seconds) by pressing the Power button.

E) Time button

Press this button to set the hours and minutes on the clock.

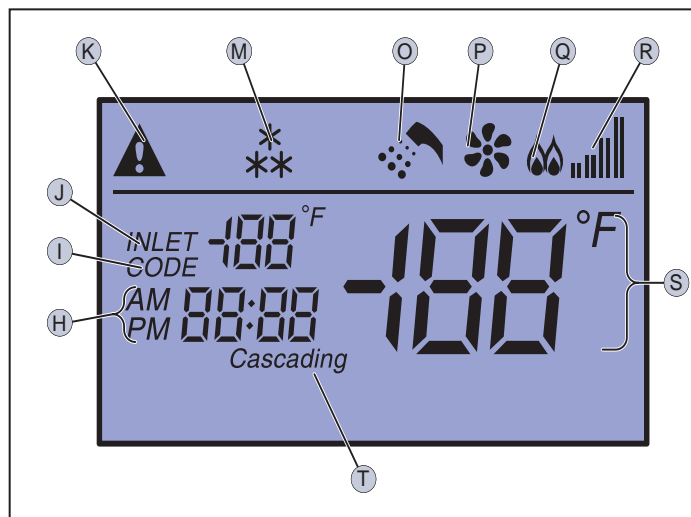
F) Mode button

Press this button to access various Modes of Operation.

G) Orange button

Used to view real time flow and temperature readings.

11.2 Display Icons



H) Displays the current time in AM or PM.

I) Displays the CODE icon and the most recent digital error code.

J) Displays the INLET icon and the actual inlet water temperature.

K) Indicates an error has been detected and a trouble code may be shown next to the CODE icon.

L) Not Used.

M) Warns of freezing conditions within the water heater. The water heater is designed to turn ON to prevent freezing of the internal water pipes.

N) Not Used.

O) Indicates water flow (open faucet).

P) Indicates blower is ON.

Q) Indicates burner is ON.

R) Indicates the level of energy usage. There are four "bar" indicators and each represent 25% of gas usage.

S) Indicates outlet water temperature.

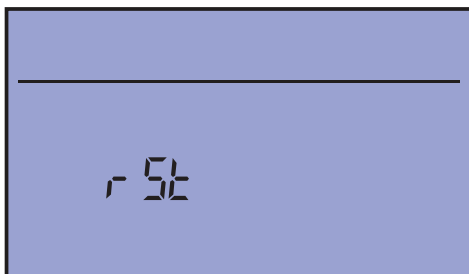
T) Indicates multiple units are daisy chained and programmed. When flashing, indicates an error in communication

11.3 Turning Water Heater ON and OFF

1. To turn the water heater ON press the Power button. The home screen will automatically display when the unit is ready to use.
2. To turn the water heater OFF, press and hold the Power button for three seconds and the display will show the Idle screen, and then go blank.



3. To turn the unit back on, press the Power button. The display will show the rSt screen for 10 seconds, then the main screen.



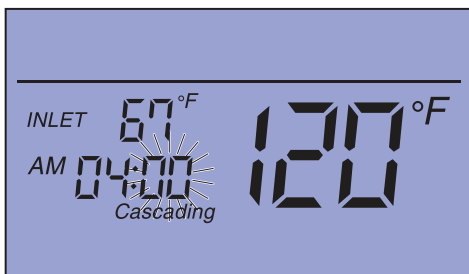
11.4 Resetting (Clear) Error Codes

1. To reset the water heater and clear all error codes, press and release Power button.

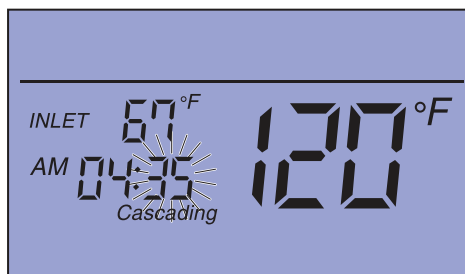
11.5 Setting the Time

1. Press and release the Time button.

The minute section of the time display will flash.

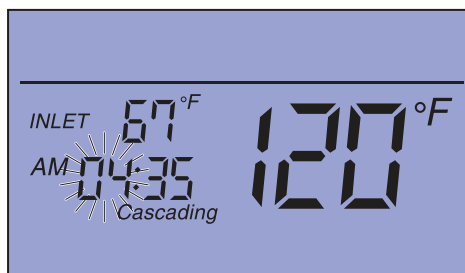


2. Press the Up/Down arrows to set the correct minute.

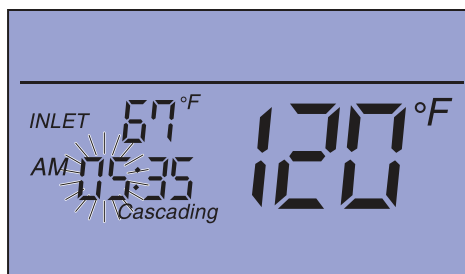


3. Press and release the Time button again.

The hour section of the time display will flash.

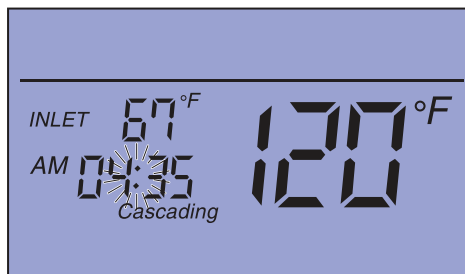


4. Press the Up/Down arrows to set the correct hour. When setting the hour, make sure you have correctly advanced the time to either the AM or PM hour setting.



5. Press and release the Time button again.

The colon (:) between the hours and minutes should now be flashing, indicating the time has been properly set.



11.6 Adjusting the Water Temperature

11.6.1 General Information

These commercial water heaters are capable of heating water to 190°F.

Note: The outlet water temperature is factory preset to 120°F.

WARNING

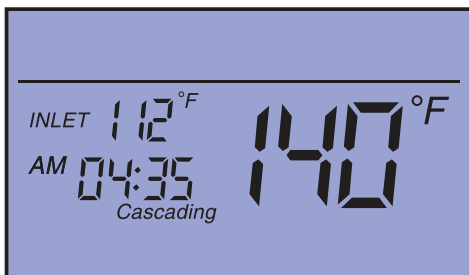


DANGER Hot water temperature over 125°F (52°C) can cause severe burns instantly or death from scalding. Children, the disabled, and the elderly are at the highest risk of being scalded. Do not leave children or the infirm unsupervised. Check temperature of hot water before taking a shower or bath. To control water temperature to a particular faucet, temperature limiting valves can be installed by your service professional.

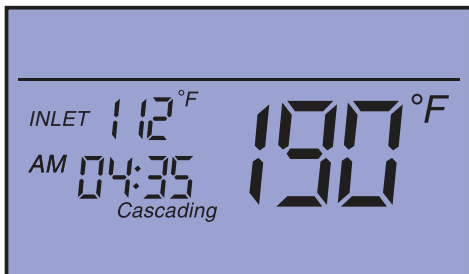
All water faucets must be closed before changing the temperature setting. The unit must not be operating (burner icon not on).

11.6.2 Adjustment Procedure

Press the Up/Down arrows to set the desired temperature range from 100 to 140°F in one degree increments.



For setting the temperature above 140°F, press and continue to hold the Orange button while pressing the Up arrow. Continue pressing the Up button until the desired temperature range is reached.



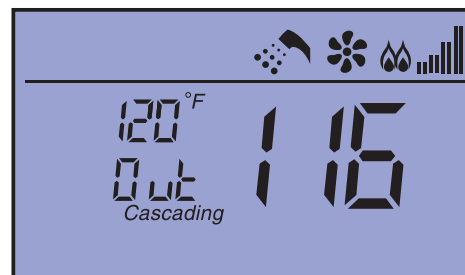
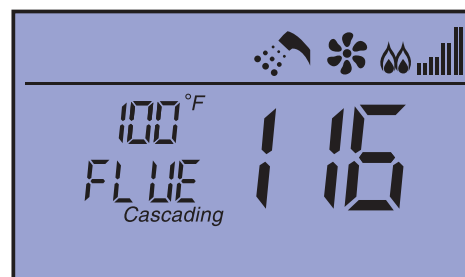
Once the desired temperature is selected, the unit will heat water up to that temperature.

When the Orange button is released, the Home screen will appear.

11.7 Real Time Temperature and Flow of the System

Press and hold the Orange button. On the left hand side the screen will toggle between Flow, then show the flow rate in gallons per minute, after which the words "Flue" along with the flue temperature will appear, followed by the word Out (water outlet temperature). These three screens will continue to cycle as long as the set key is held down.

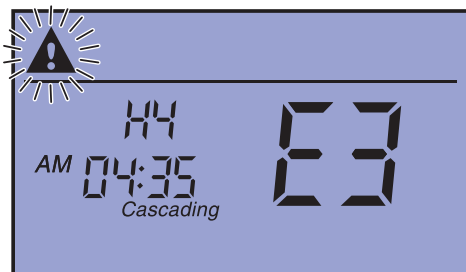
The flow screen Flow indicates gallons per minute (gpm). This screen alternates between Flow and the actual gallons per minute. The first two digits are gallons and the second two digits are a portion of one gallon. For example 3:05 is 3.05 gallons per minute.



Release the Orange button to return to the home screen.

11.8 Error Screen

If an error occurs, the display will indicate an error code; E1, E3, E7, etc. The flashing triangle will also appear in the upper left corner of the display to indicate a potential problem with the unit.



This screen will toggle with the main screen. The flashing triangle will also appear on the main screen.

Refer to the Troubleshooting section for additional information on the resolution of error codes.

Press and release the Power button to re-set.

11.9 Heat Exchanger Parameters

The FLO screen shows the flow rate in gallons per minute of the heat exchangers.

Note: The last digit represents tenths of a gallon. The unit does not display the decimal point. The image below shows 7.5 gallons per minute.

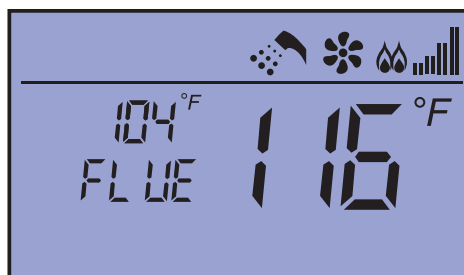


The Out screen shows the outlet temperature.

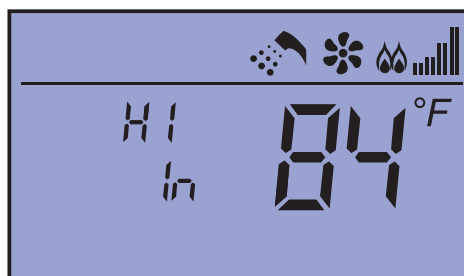


11.10 Flue Temperature

The FLUE screen shows the maximum flue temperature of the heat exchangers.



The In screen shows the inlet temperature.

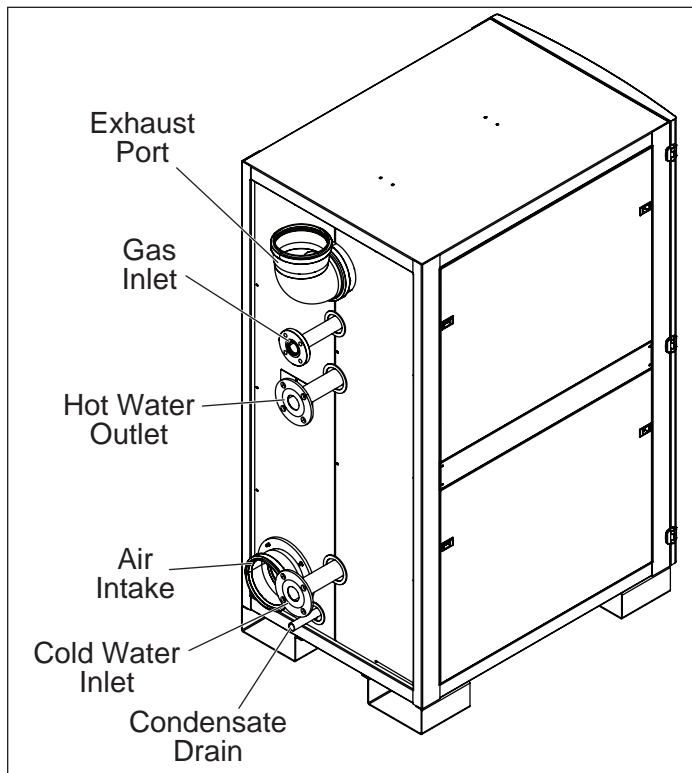


Press and release the **ENTER** button. The display will scroll through flow, outlet temperature, flue temperature and inlet temperature of heat exchanger H1. The flame and blower status of H1 is shown on the display icons. Press and release the **ENTER** button to view the parameters for the next heat exchanger. After the last heat exchanger (H4 for iQ1000, H3 for iQ750) is shown, pressing **ENTER** returns the display to the main screen.

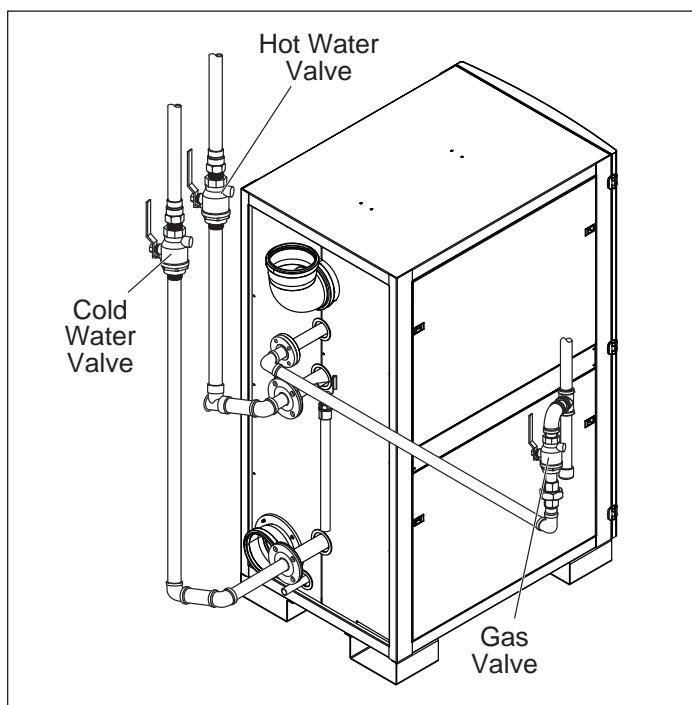
12. INITIAL STARTUP

12.1 Instructions

1. Recheck the hot and cold water lines, the gas line, condensate and drain line, the combustion (fresh) air inlet, and gas exhaust outlet to make sure they are properly connected.



2. Before connecting the water heater to the power, open the gas supply valve, cold water valve, and hot water valve.



3. With the unit OFF, open a nearby hot water faucet and allow the water to run through the unit until all the air is exhausted from the water lines and from the water heater.
4. If multiple units are being installed, follow the installation guidelines in the Multiple Units section of the manual.
5. Turn ON the power switch at the electrical junction box and turn ON the ON/OFF switch on the inside of the water heater cabinet. The water heater's display panel should turn ON. DO NOT disconnect the power supply while the unit is operating (heating water).

NOTE: For additional electrical protection, the use of a surge protection device is recommended. Damage caused by power surges is not covered by the warranty.

NOTICE

If the water heater display does not come ON, first check the plug. Also check the electrical panel circuit breaker and reset it if necessary. If the circuit breaker trips again, do not reset. Disconnect the plug and have a qualified technician diagnose the problem.

13. Programming

13.1 Modes of Operation

The Modes of Operation screens provide set up screens and additional information on the water heater. There are five Mode of Operation screens which are used by the technician during installation or maintenance of the water heater.

13.1.1 Standard Modes



1. Press and release the Mode button until the desired screen shows on the display.
dC - Daisy Chain
FC - Flow Control
PH - Performance History
dE - Diagnostic Error
2. Follow the instructions in the specific section to enter the desired settings.

13.1.2 Advanced Modes



1. Press and hold the Mode button for five seconds until the rS screen appears. Now press and release the Mode button multiple times until the desired screen shows on the display.
rS - Burner Rate Ramp Setting
Ft - Fuel Type
CO - Adjust CO₂ Level
CE - Common Exhaust
FP - Flue Pipe Type
Id - Heat Exchanger Identifier
Fb - Flow Boost
2. Follow the instructions in the specific section to enter the desired settings.

13.2 Viewing and Setting Modes of Operation

13.2.1 Daisy Chain



Refer to "Multiple Units" for more information.

13.2.2 Flow Control Selection



Press the Mode button multiple times until the FC screen appears on the display.

The current setting will be shown on the display.



The water control valve is set to ON for temperature priority and OFF for maximum flow.

Press the Up/Down arrows to select either ON or OFF.



Press and hold the Enter button for three seconds to save the settings and return to the home screen.

Note: If the Enter button is not pressed within 30 seconds of inactivity, the display will return to the home screen.

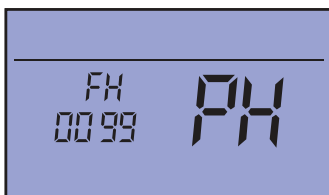
13.2.3 Performance History



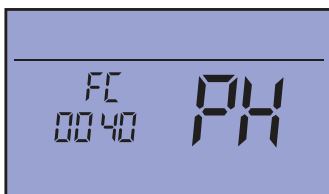
The Performance History mode allows the technician to view ignition cycles, number of ON times, and cumulative water flow. The displayed results are for all the water heater modules combined within the unit.

Press the Mode button multiple times until the PH screen appears.

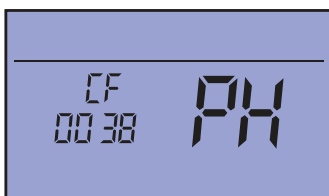
The Flow-On Hours FH, Firing Counts FC, and Cumulative Flow CF, will now begin to display for 1.5 seconds each. The display will continue to cycle for 30 seconds and then return to the home screen. Some examples are shown below.



Diagnostic Code FH (Flow-on hours) shows one hour of flame. (To obtain the total hours, multiply the number by 10).



Diagnostic Code FC (Firing Count) shows a flame count of 40,000. (To obtain the total number, multiply the number by 1,000).



Diagnostic Code CF (Cumulative Flow) shows 38,000 gallons of water. (To obtain the usage in gallons, multiply the number by 1,000).

Press and hold the Enter button for three seconds to return to the home screen.

Note: If the Enter button is not pressed within 30 seconds of inactivity, the display will return to the home screen.

13.2.4 Diagnostic Code and Error Log Selection



This screen provides the technician with Diagnostic Codes and Errors recorded as the water heater operates. These codes are used in conjunction with the Performance History Codes.

Error Code	Description of Error Code
E1	Blower Speed Fault
E3	Blocked Flue Fault
E7	Ignition Failure
E9	Temperature Sensor Shorted
EA	Temperature Sensor Open Circuit
EC	Flue Temperature Exceeded Set Limit
Ed	Heat Exchanger Outlet Temperature Exceeded Set Limit
Flashing Warning Icon	Error Code and Unit Locked Out
Flashing Cascading Icon	Loss of Communication Between Units

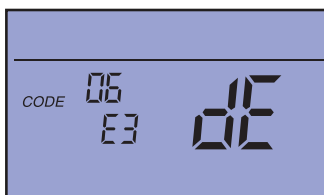
* If Eb is displayed, please call the factory for service instructions.

Press and release the Mode button multiple times until the dE screen appears.

The 01:E1 screen is the most recent code, while the 10:E3 is the last viewable screen. Refer to the examples below for further clarification.



Example of latest diagnostic code Fan Speed Error Code E1



Example of the last viewable code Blocked Flue Fault Code 03

Press and hold the Enter button for three seconds to return to the home screen.

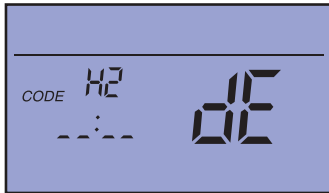
Note: If the Enter button is not pressed within 30 seconds of inactivity, the display will return to the home screen.

The H1, H2, H3, H4, H5 and H6 codes refer to a specific water heater module. The iQ751 will not have an H4, H5, or H6. The iQ1001 will not have an H5 or H6.

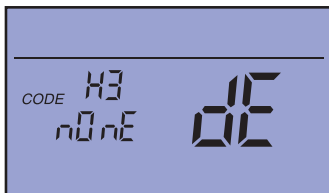
With the 1:E1 type codes, the first number is the sequence in which the error code occurred and the second number is the error code. Refer to the examples below for further clarification.



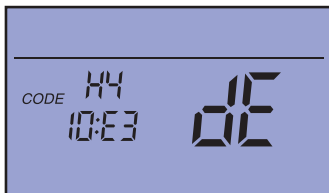
Example of diagnostic code Fan Speed Error Code E1 in water heater module H1.



Example of switching between water heater modules displays four _ _ _ _ underline characters for two seconds. This is an example of the display switching from water heater module H2 to H3.



Example of water heater module H3 with no error codes (none).



Example of water heater module H4 with an E3 Blocked Flue error code. This is the oldest recorded (number 10).

13.2.5 Blower Ramp Selection



When exhaust harmonics are observed, i.e. resonance at low fire, adjust the water heater using the blower ramp setting (default is rat3). Increase the rate number until the resonance is no longer observed.

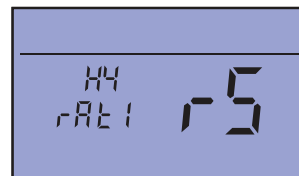
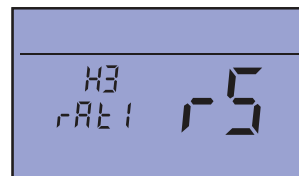
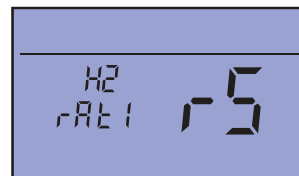
The Blower Ramp Selection has five different settings (rat1 - rat5):

Press and hold the Mode button for five seconds to access the r5 screen on the display. The current setting will be displayed.

Press the Up/Down arrows to select the Blower Ramp Selection from five different settings (rat1 - rat5). Select a ramp rate at which the harmonics disappears during operation.



Press the Enter button to advance to the next heat exchanger, H2 for example. Continue to press the **Enter** button until all the units have been set up.



Press and hold the Enter button for three seconds to save the settings and return to the home screen.

Note: If the Enter button is not pressed within 30 seconds of inactivity, the display will return to the home screen.

13.2.6 Fuel Type Verification

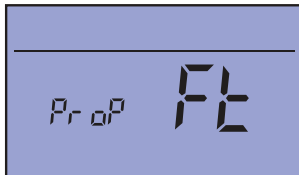


The Fuel Type mode screen shows the selected fuel type; natural gas (factory preset) or Propane. Operation with natural gas is factory preset. Refer to the Propane (LPG) Conversion section in this manual for additional set up information.

Press and hold the Mode button for five seconds to access the r5 screen on the display.



Press and release the Mode button until the Ft screen appears on the display. The current Fuel Type setting will appear (nAt or PrOP) to indicate the position of DIP switch 3 on the circuit boards. Fuel type cannot be changed from the screen.



To change fuel type from factory set natural gas to propane, follow the Propane Conversion procedure in this manual.

Press and hold the Enter button for three seconds to return to the home screen.

Note: If the Enter button is not pressed within 30 seconds of inactivity, the display will return to the home screen.


13.2.7 Adjusting CO₂ Levels Selection



Refer to the Adjusting the CO₂ Level section in this manual.

13.2.8 Common Exhaust Venting



Changing this setting can only be done when the Flame ON  icon is not displayed.

This mode is applicable when multiple units are connected together. Turning the CE mode ON allows multiple units to be vented into a common vent. Refer to the Venting for Commercial Application section for information on common venting guidelines.

Press and hold the Mode button until the r5 screen appears.

Press and release the Mode button multiple times until the CE screen appears. The current setting will be displayed.

The default setting for this mode is ON.



Press the Up/Down arrows to select either ON or OFF.




Press the Enter button to save the changes and return to the main display.

Note: If the Enter button is not pressed within 30 seconds of inactivity, the display will return to the home screen.

13.2.9 Flue Pipe Selection (PVC or CPVC)



Changing this setting can only be done when the Flame ON  icon is not displayed.

WARNING

 When the unit is set for CPVC or polypropylene pipe, flue temperatures can reach 190°F. PVC pipe will lose integrity at temperatures above 149°F. Make sure FP setting and the type of material being used for the flue are compatible.

Press and hold the Mode button until the r5 screen appears.

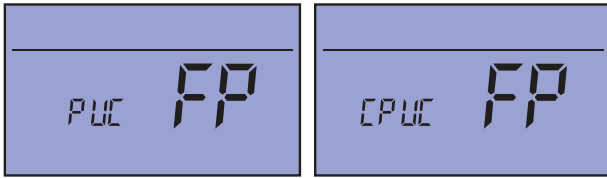
Press the Mode button multiple times until the FP screen appears. The current setting will be displayed.

The default setting for this mode is PVC.



Press the Up/Down arrows to select the desired setting of either PUC or CPUC.

Note: The flue temperature for PVC material must not exceed 149°F. The flue temperature for CPVC or Polypropylene material must not exceed 190°F.



Press the Enter button to save the changes and return to the main screen.

Note: If the Enter button is not pressed within 30 seconds of inactivity, the display will return to the home screen.

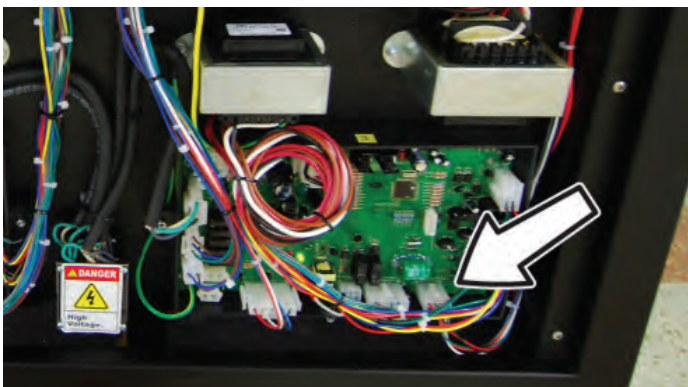
13.2.10 Heat Exchanger Identifier



The ID or identification mode is used to program an identifier in each of the control boards. This procedure is not necessary unless a controller is being replaced during service and should be carried

out by a trained service contractor. Incorrect programming can result in communication problems and cause the unit to malfunction. Please follow appropriate safety procedures when replacing a control board including turning off gas, water, and power to the unit.

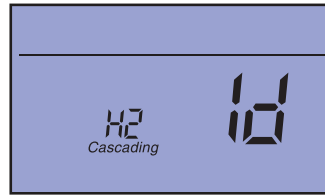
Plug the display harness into the controller that is being replaced.



Turn power on.

Press and hold the Mode button for more than 5 seconds till the rS screen is shown.

Press the Mode button multiple time until Id is displayed.



Use the Up/Down arrows to set the appropriate ID. For example if controller #2 is being replaced, then the replacement controller should be set with an ID of "H2".

Press and hold the Enter button for three seconds to save the setting and return to the home screen.

13.2.11 Flow Boost Mode



This mode may be used to increase the overall system recirculation flow by enabling all the water valves in a mulitple units (or multiple heat exchangers) installation to be open.

Press and hold the Mode button until the rS screen appears.

Press and release the Mode button multiple times until the Fb screen appears.

The current setting will be display. The default setting for this mode is OFF.

Press the up/down arrows to select either ON or OFF.

Press and hold the Enter button for three seconds to save the setting and return to the home screen.

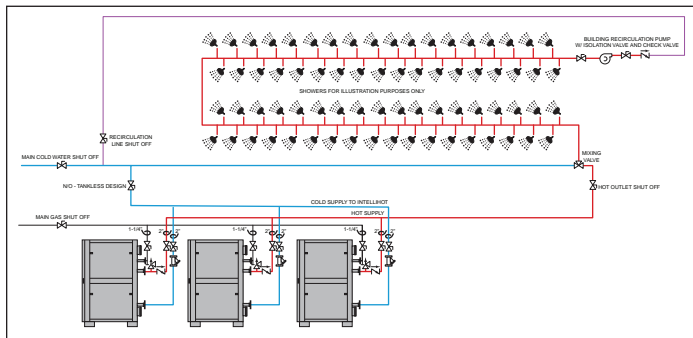
14. Multiple Units

14.1 General Information

Water heaters are designed to connect multiple units together. Multiple units increase the volume of hot water and also ensures that hot water is always available, even if one unit is shut down due to maintenance.

Connecting several units together requires proper sizing of water and gas piping, as well as increased size in the intake and exhaust pipes.

Up to four water heaters can be connected (cascaded) together. Use the steps in this section along with the basic installation procedure for installing a single unit.



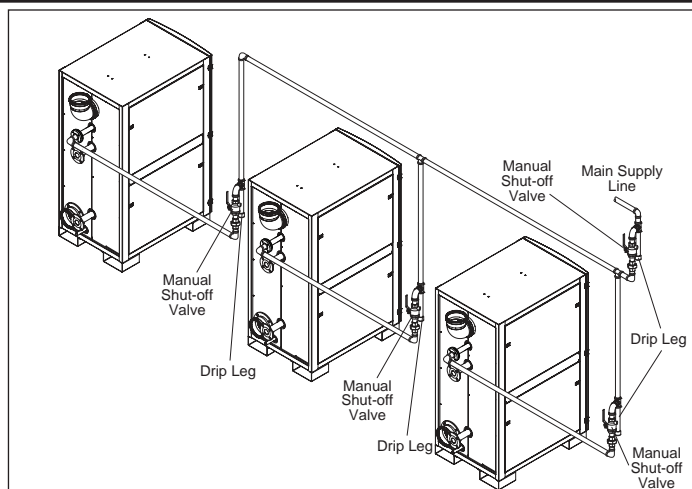
The water heaters will communicate through a cable connection between each water heater. The benefits of connecting the units are as follows.

- When demand for hot water is low, fewer units will operate.
- If one unit has an error code, the others will continue to operate.
- Changing the settings (temperature, time, etc.) on one unit changes settings on all the units.
- It allows possible the shut down of one unit for maintenance while the others continue to operate.

14.2 Installation Procedure

1. Connect all the units to a gas supply pipe. Make sure the pipe is properly sized in accordance with the BTU draw and number of units being operated.
2. Connect all the units to the power supply.

Note: When installing multiple units, the electrical power supply must be sized accordingly. Plug each water heater into a separate outlet. Using a separate circuit for each unit allows one circuit breaker to trip while the other units can continue to operate.



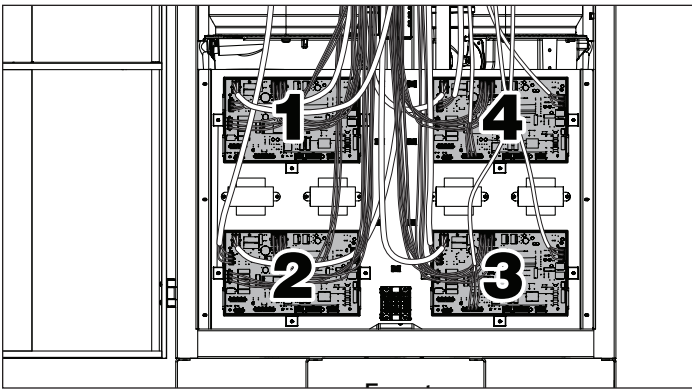
3. Install the combustion (fresh) air intake and exhaust outlet pipes. Make sure the pipes are properly sized in accordance with the number of units being operated. Refer to the sizing table in this manual.
 - a. Connect the 6" air inlet from the unit to a properly sized (large) common trunk line using suitable adapters, wye fittings, and elbows.
 - b. Connect the 6" exhaust outlet from the unit to a properly sized (large) common trunk line using suitable adapters, wye fittings, and elbows.
4. Install and connect the hot water lines. If an optional hot water storage tank is required, connect the hot water lines to this tank. Make sure the water pipe is properly sized in accordance with the number of units being operated.
5. Install and connect the cold water lines. Make sure the water line is properly sized in accordance with the number of units being operated.
6. Connect and route the condensate drain lines to a suitable discharge location.
7. Do **NOT** connect communication cables yet. Power up all the heaters. Set dC Mode to unique number. (e.g. if 3 heaters, set unique heater to 1,2,3) Repeat for each unit.
8. Wait for 30 seconds.

WARNING

Before making any adjustments or connections inside the water heater cabinet, make sure the power is disconnected. Unplug the water and/or turn the circuit breaker OFF.

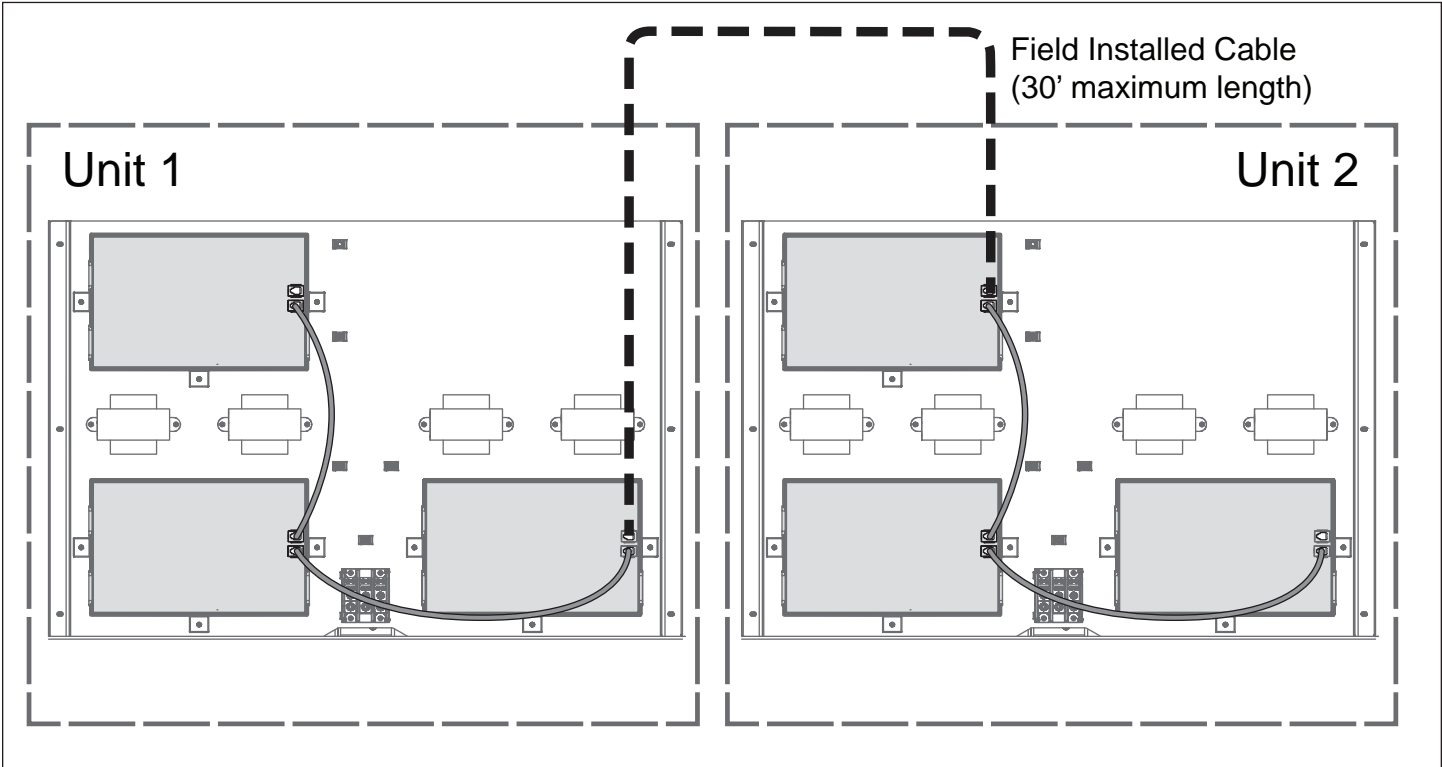
9. If necessary, press the **Power** button to turn OFF each water heater in the system.
10. Disconnect power from all the units in the system.

11. Open the front cover and locate the main circuit boards.

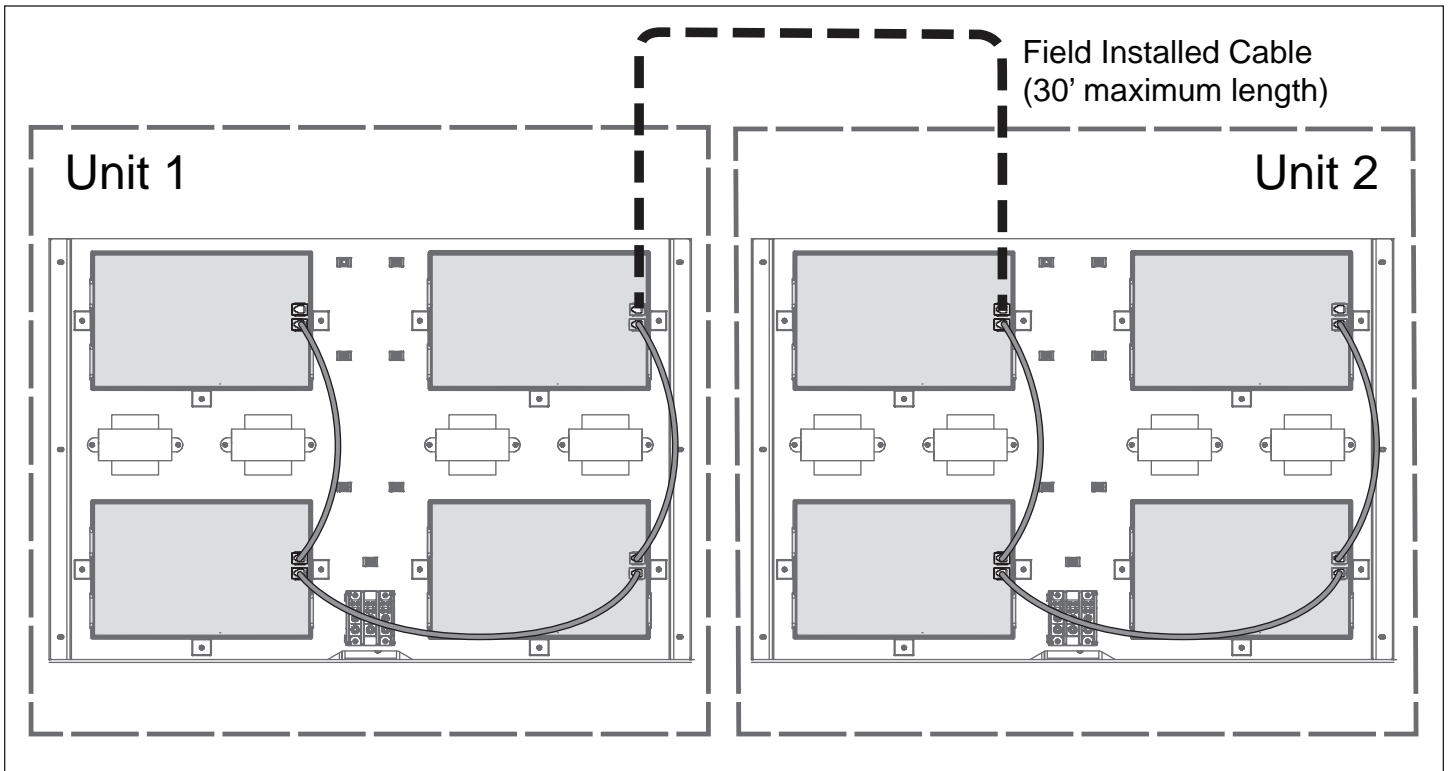


iQ1001 Shown (Four Circuit Boards). iQ751 Has Three Circuit Boards.
iQ1501 has Six Circuit Boards.

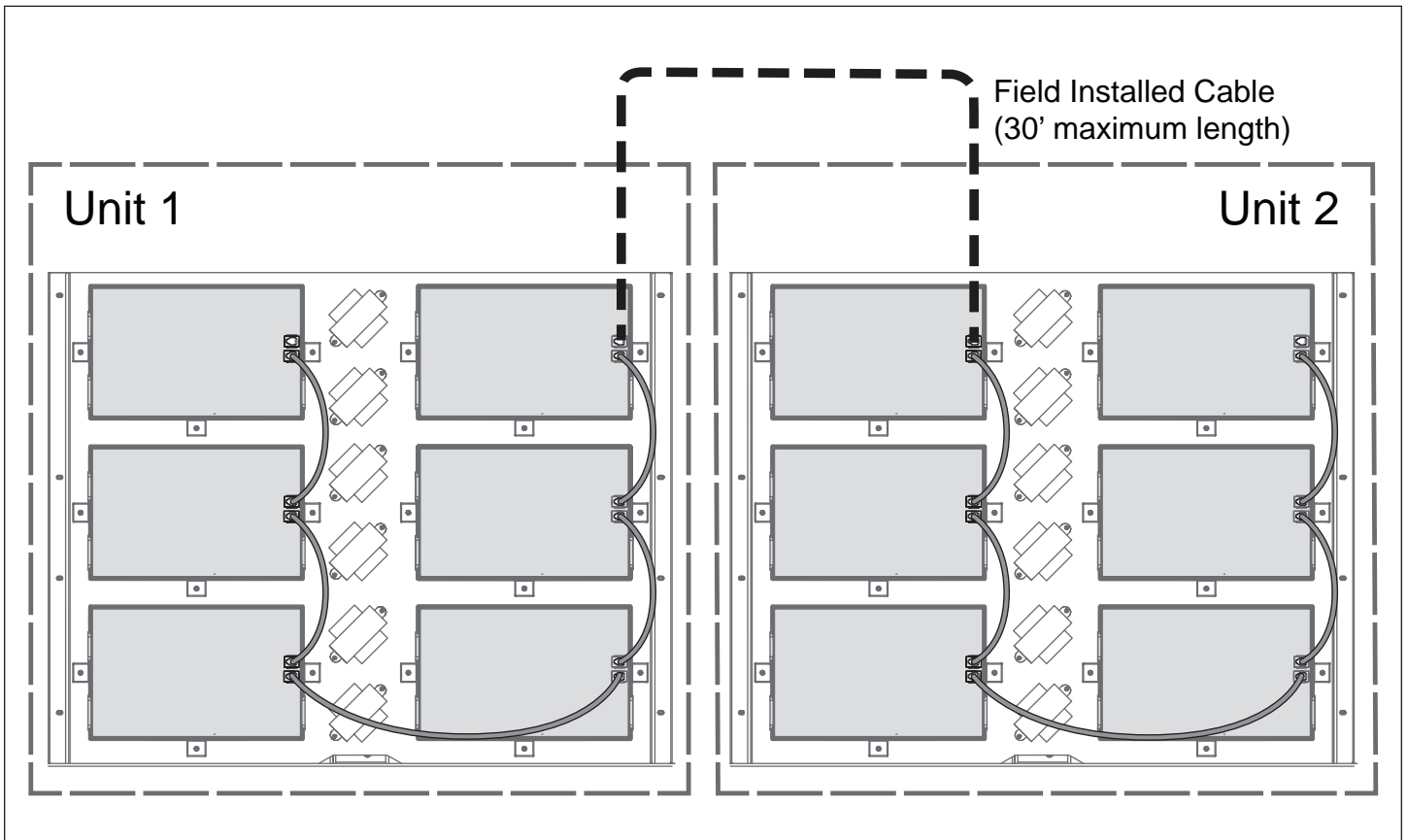
12. Connect a communication cable from the upper port on circuit board 3 (iQ751), 4 (iQ1001), or 6 (iQ1501) of the first water heater to the upper port of circuit board 1 of the second water heater. Repeat this step as required by the number of water heaters being installed.



iQ751



iQ1001

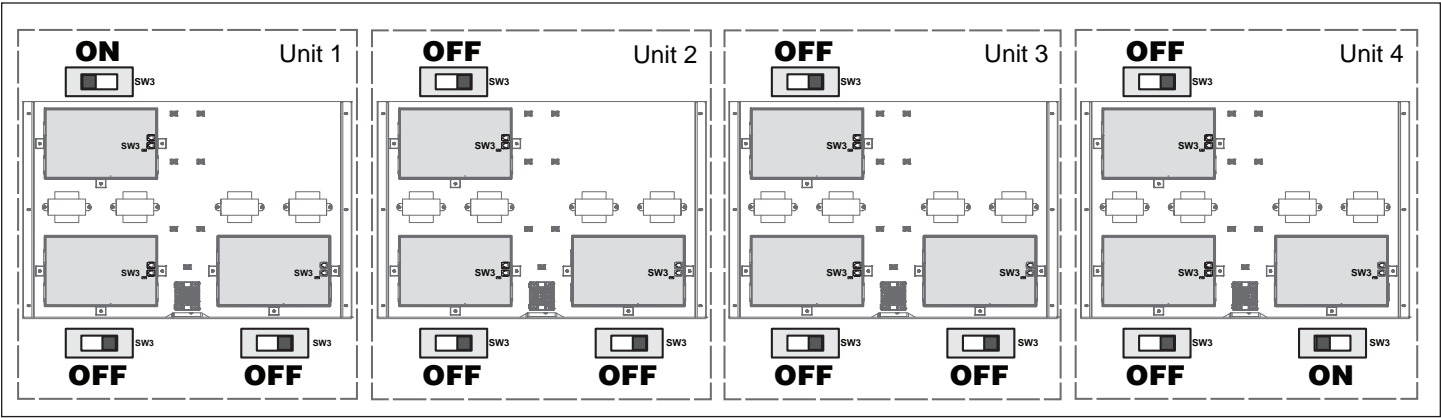


iQ1501

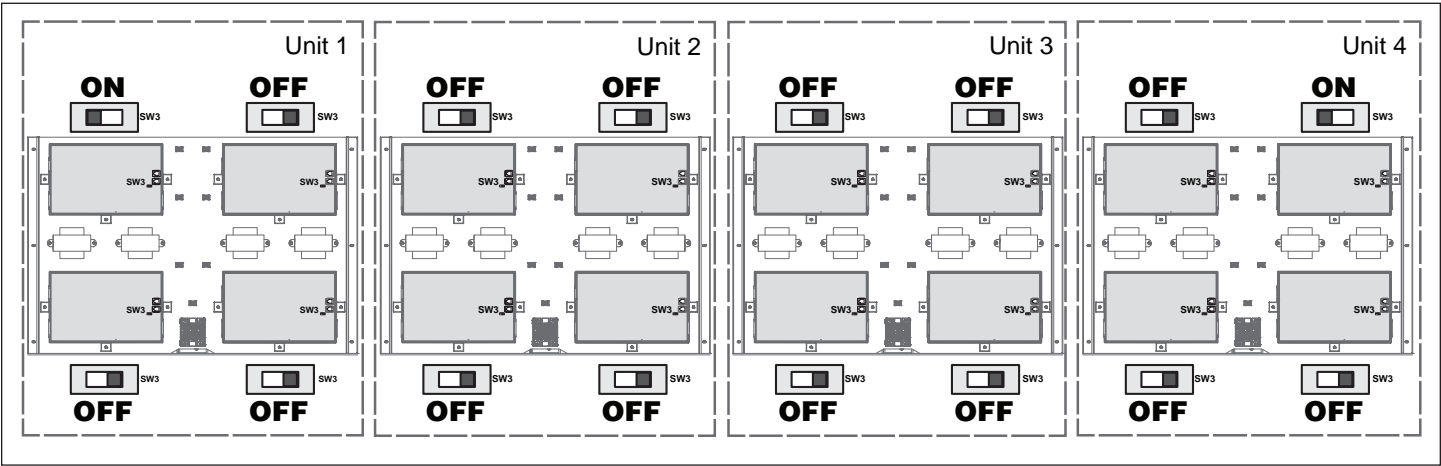
13. On the first water heater, locate DIP Switch 3 on circuit board 1. Position the switch in the ON position (left). Refer to the illustrations for additional clarification.
14. Position the switches on the other two, three, or five circuit boards in the OFF position (right). There are two additional switches on Model iQ751, three additional switches on Model iQ1001, and five additional switches on Model iQ1501.
15. On any water heater unit between the first and last unit, Unit 2 and/or Unit 3, position all DIP SW3 switches in the OFF position (left).
16. On the last water heater, locate DIP Switch 3 on circuit board 3, 4 or 6, depending on the model, and position the switch in the ON position (right). All the other switches should be in the OFF position.
17. Once the communication cables are routed and connected and the DIP switches are correctly positioned, close and lock the front cover.
18. The water heaters, should now be ready to communicate with each other and operate as a single system.

Note: Whenever a change is made to one water heater, all the other units in the system will be automatically updated to the new settings.

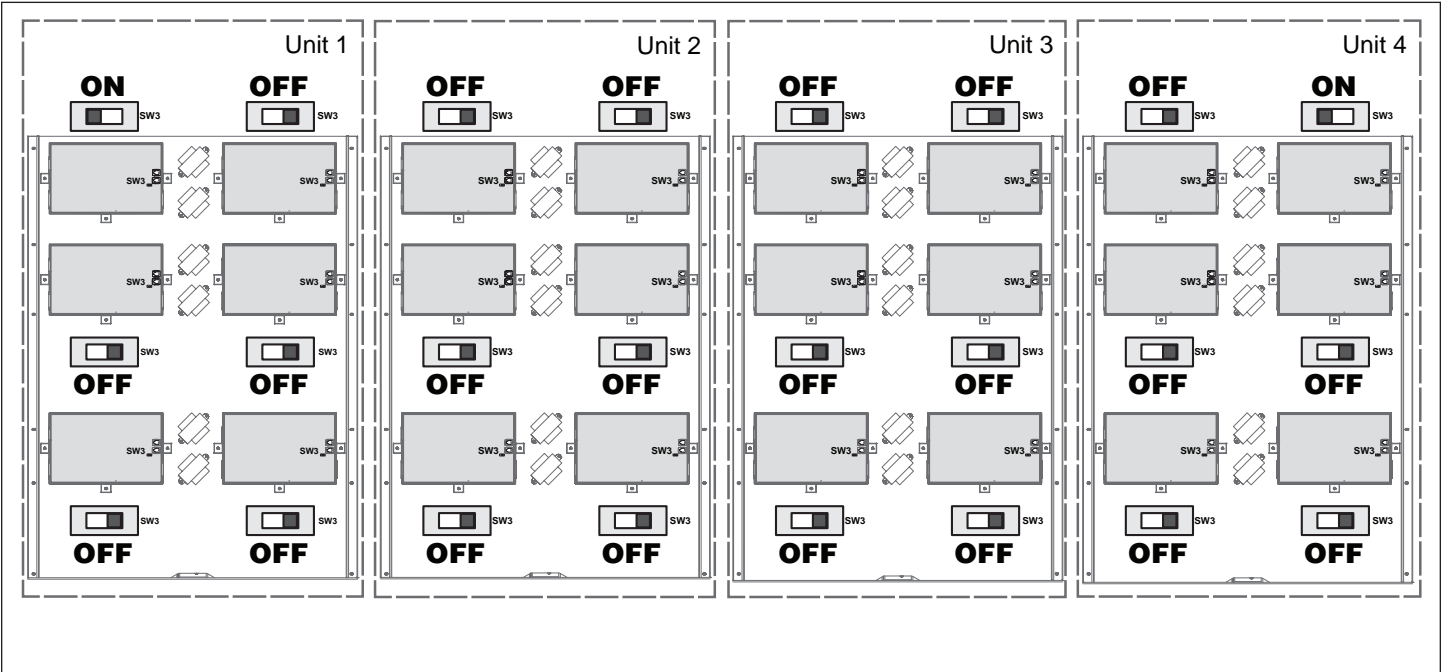
14.3 DIP Switch Configuration Drawings



iQ751



iQ1001



iQ1501

15. Maintenance

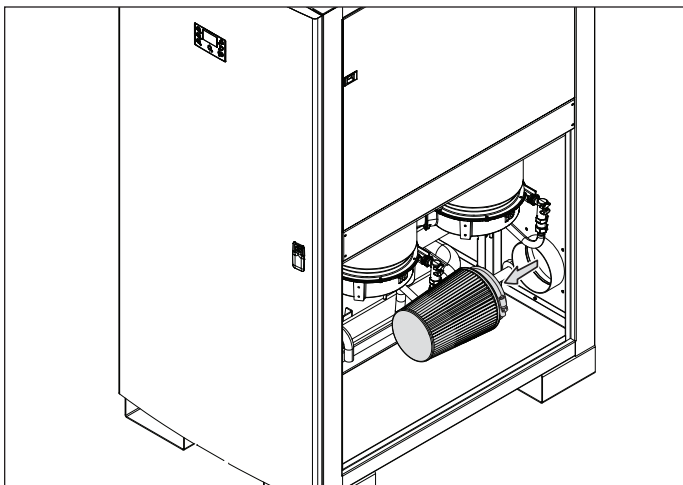
15.1 Air Filter

15.1.1 Inspection

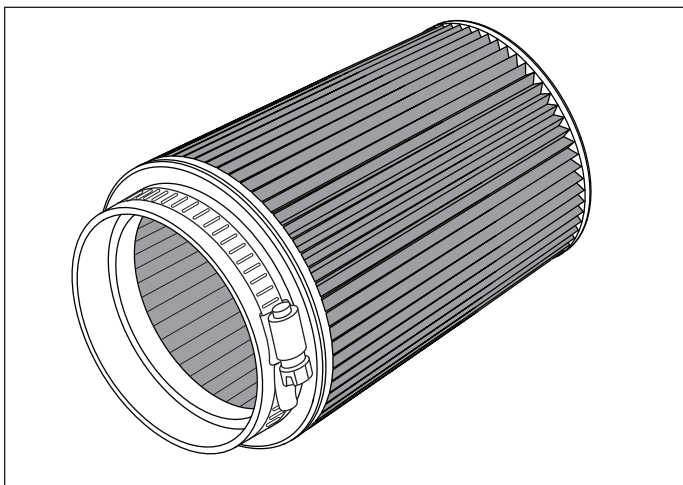
Check the filter every six months for dirt and duct build-up. Clean and re-oil the filter annually. If the filter is dirty, follow the cleaning procedure.

Note: The air filter is manufactured by K&N. Contact K&N at 800-858-3333 or online at www.knfilters.com for the necessary supplies to clean the filter.

1. Loosen the band clamp and remove the air filter.



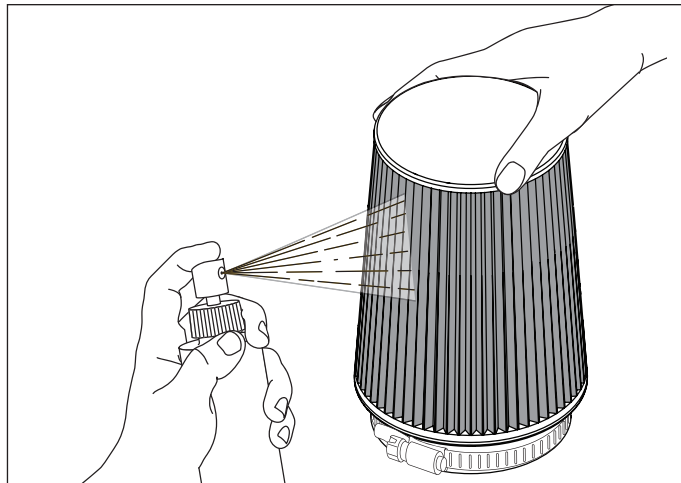
2. Inspect the inside of the filter for dirt and dust build-up. Clean the filter, if needed.



3. After inspection and/or cleaning, replace the air filter and snugly tighten the band clamp.

15.1.2 Cleaning Procedure

1. Liberally spray K&N Air Filter Cleaner and Degreaser (99-0606) onto both sides of filter and allow to soak for 10 minutes to loosen the dirt. Do not allow cleaner to dry on air filter.



NOTICE

K&N Air Filter Cleaner is the only cleaner formulated to safely clean K&N air filters with cotton media. The use of any other cleaning solution could damage the cotton material.

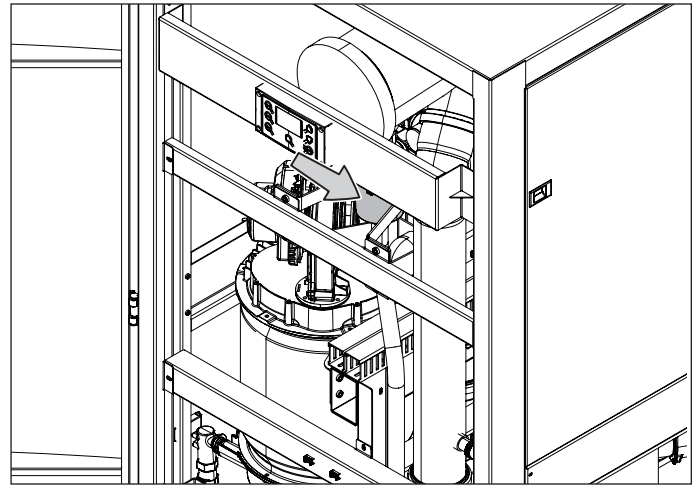
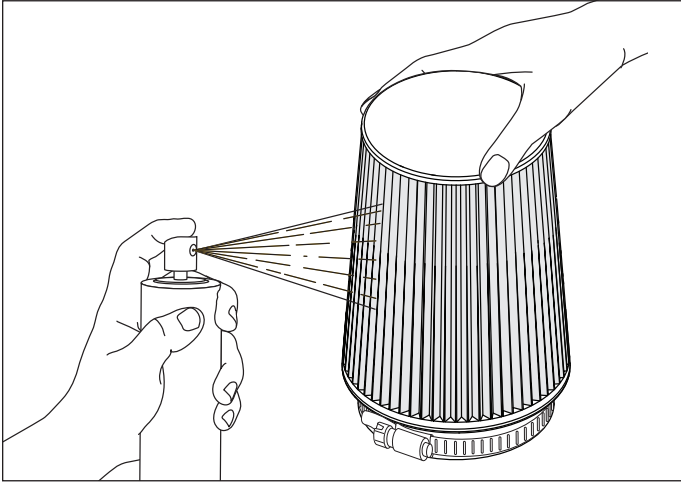
2. Rinse the air filter with cool low-pressure water applied from the outside in in order to flush the dirt out of the filter. Continue to rinse the filter until all traces of cleaner are gone. It may be necessary to repeat Steps 1 and 2

3. After rinsing, gently shake off the excess water and air dry the filter.

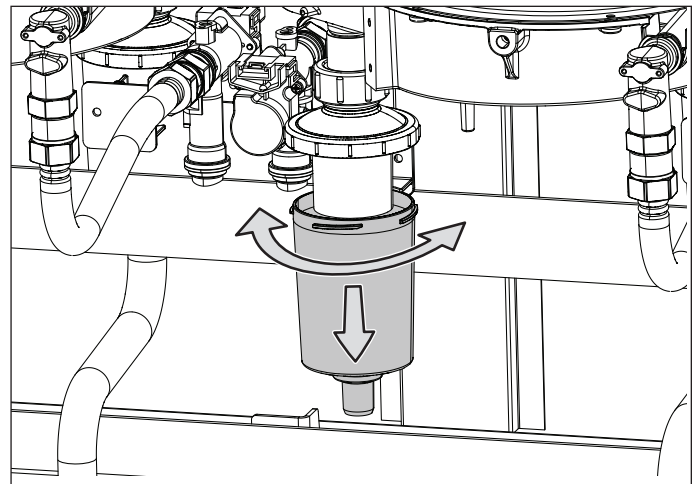
NOTICE

Do not use compressed air to dry the filter. Do not apply oil to the filter until it is completely dry.

4. Spray K&N Aerosol Air Filter Oil (99-0504) evenly along the crown of each pleat holding nozzle about 3" away. Allow oil to wick for approximately 20 minutes. Touch up any light areas on either side of the filter until there is a uniform red color at all areas.

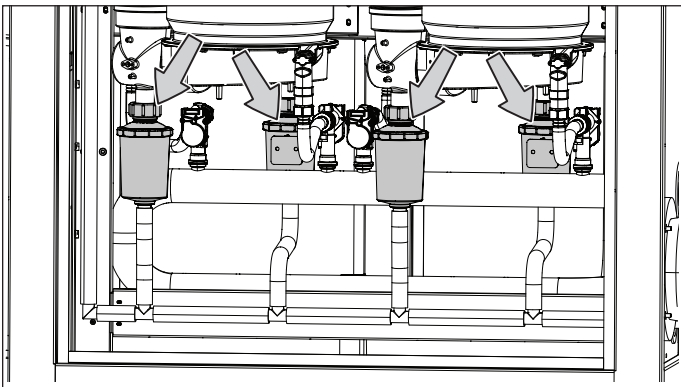


1. Twist the bottom of the sediment cup to release the locking clips.

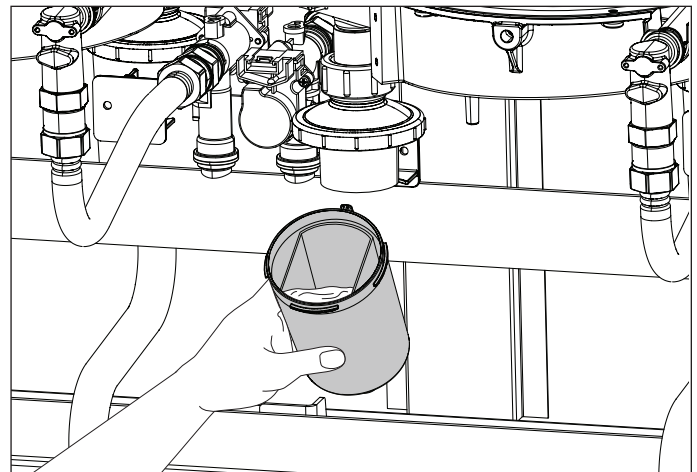


15.2 Condensate Sediment Cup Cleaning

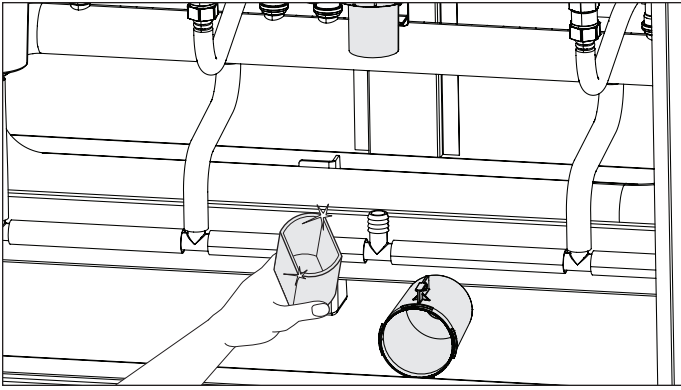
There are four (iQ751), or five (iQ1001) sediment cups located inside the water heater cabinet. These cups should be removed and cleaned annually. The iQ1501 has one sediment cup.



2. Pull down on the sediment cup and pull it away from the upper portion of the unit. The sediment cup will normally be full of condensate. Carefully, pour the condensate into a container and properly dispose of it.



3. Remove the sediment cup from inside the lower portion of the unit.



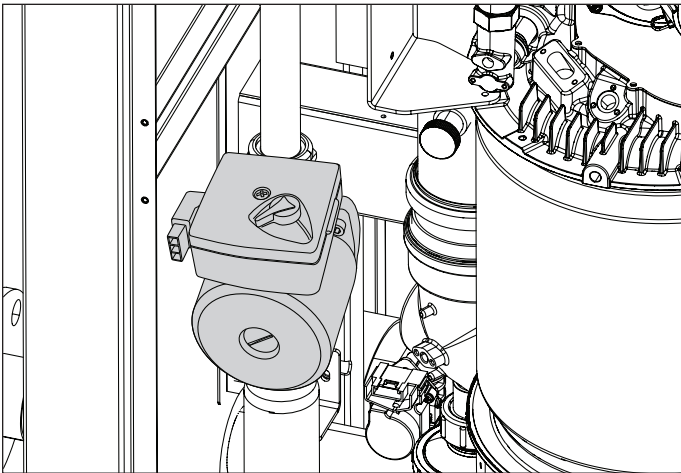
4. Remove any dirt and debris build-up using soap and warm water.
5. Replace the sediment cup in the lower portion of the unit and reattach it to the upper portion.

⚠ 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.

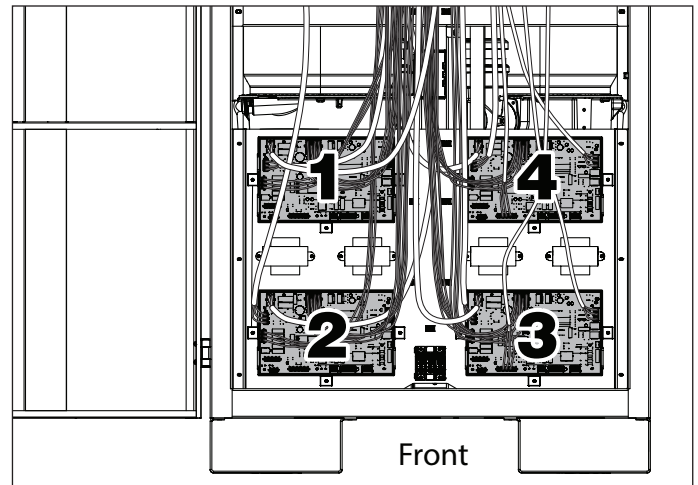
15.3 Maintenance-Free Circulation Pump

The circulation pump is maintenance-free and therefore does not require any servicing. The only adjustment is the speed setting, which must be set to Speed 3 (III).

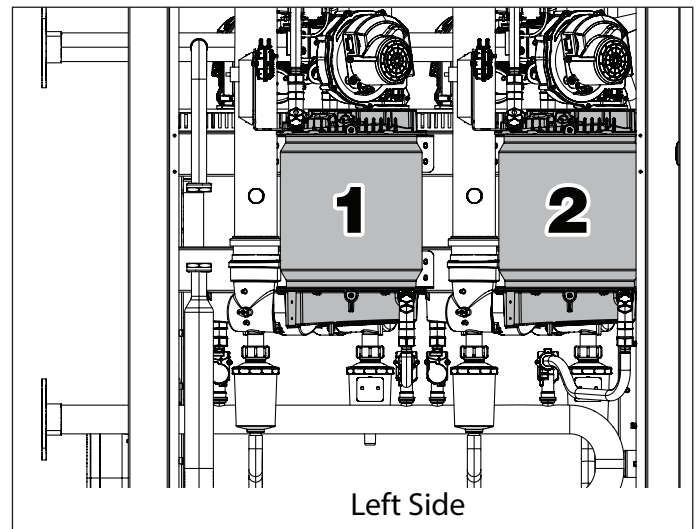
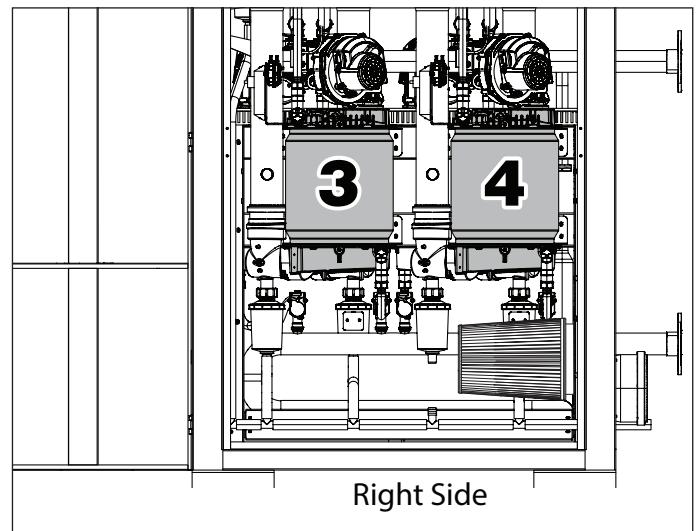


15.4 Water Heater Control Boards

Each water heater heat exchanger is controlled by a separate control board. Whenever making a setting for a specific water heater heat exchanger, use the following diagram to identify which control board controls which heat exchanger module. The control boards and heat exchanger modules should also have corresponding numbers attached to them.



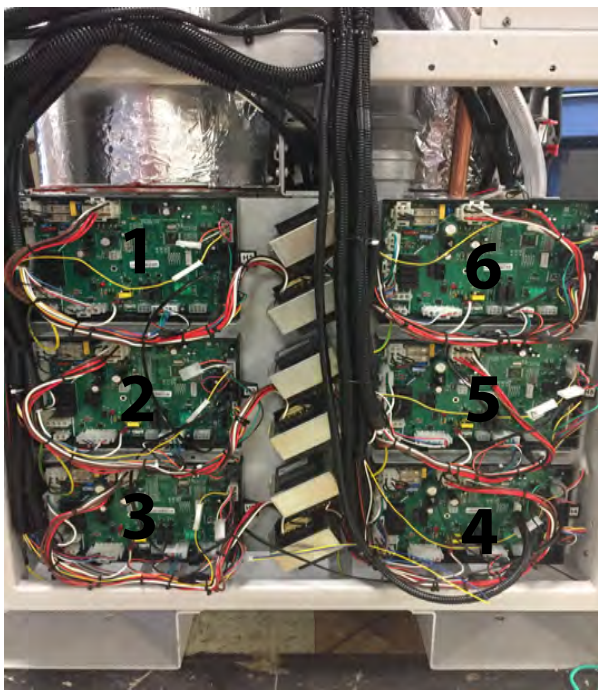
The iQ751 will not have board #4.



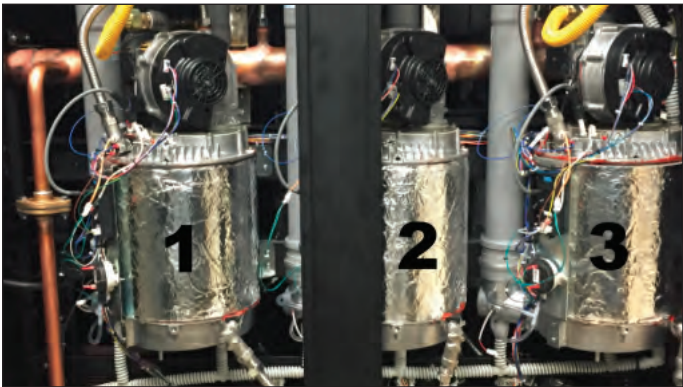
The iQ751 will not have heat exchanger #4.

See next page for layout of iQ1501.

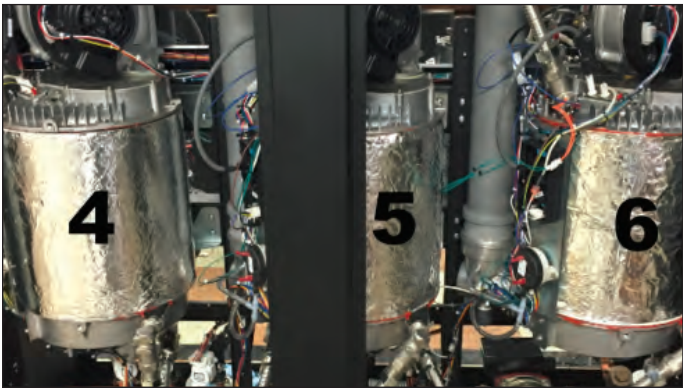
iQ1501 Control Boards



Front














Left Side








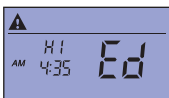

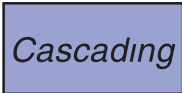


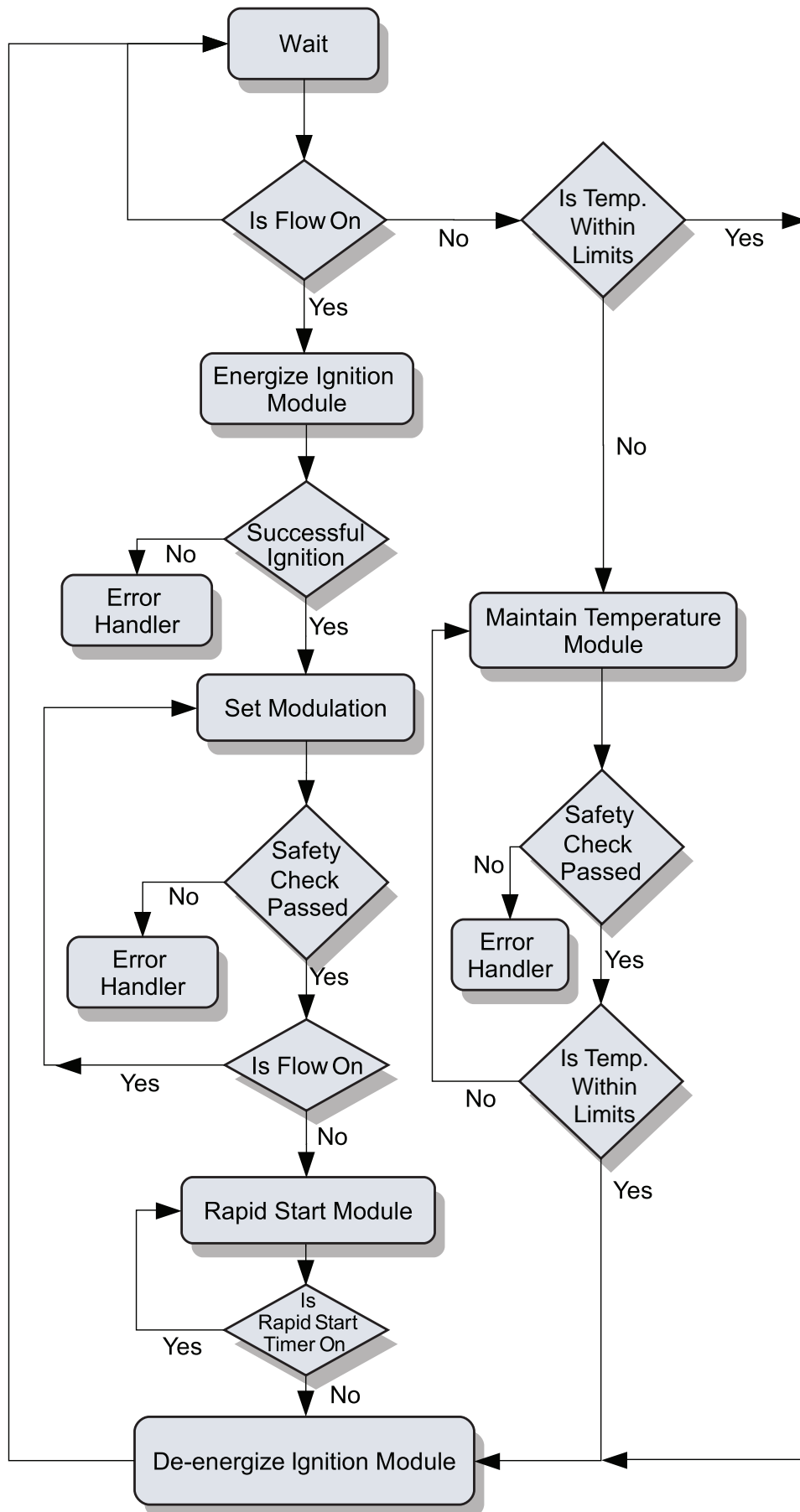
Right Side

16. Troubleshooting

16.1 Error Code Chart

ERROR CODE	DESCRIPTION	POSSIBLE CAUSE	REMEDY
	Blower Speed Fault 	<ul style="list-style-type: none"> • Blower noisy / impeller jammed. • Disconnected signal wire. • Wiring faulty. 	<ul style="list-style-type: none"> • Inspect blower / impeller. Clean and remove any obstructions. • Check PWN signal. Check for loose wires / pins, and repair. • Check PWN signal. Check for loose wires / pins, and repair. <p>If the problem persists, turn control panel OFF, shut gas valve, unplug unit, and contact an authorized service technician.</p>
	Blocked Flue Fault 	<ul style="list-style-type: none"> • Exhaust blocked (bird, etc). • Backed up condensate. • Wiring loose (switch open). 	<ul style="list-style-type: none"> • Check exhaust termination. Check exhaust connection at water heater. Install screens. • Check slope of drain. Check for double loops, air locks, or debris in loop. • Check wiring.
	Ignition Failure 	<ul style="list-style-type: none"> • Water over-heat switch tripped. • Faulty DSI, faulty igniter wire, faulty ignition connection, faulty PCB, bad igniter. • Low gas pressure. 	<ul style="list-style-type: none"> • Check pump, check cross over solenoid. Electrical noise (DSI). • Replace part. • Adjust gas pressure at regulator, check / upsize gas line, check for gas line blockage. • If the problem persists, turn control panel OFF, shut gas valve, unplug unit, and contact an authorized service technician.
	Water Valve Fault	<ul style="list-style-type: none"> • Faulty Water Valve Wiring • Water valve clogged or damaged 	<ul style="list-style-type: none"> • Check for nicked or broken wiring or connectors. Also check for corroded or wet connectors. • Check and clean the water valve • Check and clean the external Wye strainer • Replace the Water valve
	Temperature Sensor Shorted   	<ul style="list-style-type: none"> • Faulty sensor wiring • Faulty sensor • In - inlet water temperature sensor. • Flue - Flue temperature sensor. • Out - heat exchanger water outlet temperature sensor. • Faulty controller 	<ul style="list-style-type: none"> • Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors. • Measure resistance of sensor at connector (18 Kohm at 50°F, 10 Kohm at 77°F, 3 Kohm at 140°F) • Replace controller

ERROR CODE	DESCRIPTION	POSSIBLE CAUSE	REMEDY
	Temperature Sensor Open Circuit   	<ul style="list-style-type: none"> • Unplugged connectors • Faulty sensor wiring • Faulty sensor • OUT- heat exchanger water outlet temperature sensor. • FL - Flue temperature sensor. • IN - inlet water temperature sensor. • Faulty Controller 	<ul style="list-style-type: none"> • Check connectors and ensure they are securely connected • Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors • Measure resistance of sensor at connector (18 Kohm at 50°F, 10 Kohm at 77°F, 3 Kohm at 140°F) • Replace controller
	Flue Temperature Exceeded Set Limit 	<ul style="list-style-type: none"> • Incorrect vent set up • High inlet temperature • Faulty sensor wiring • Faulty sensor • Faulty Controller 	<ul style="list-style-type: none"> • If vent pipe material is CPVC or Polypropylene, ensure that CPVC is selected in the FP (Flue Pipe) mode. • Ensure inlet temperature is lower than 150°F if vent pipe material is PVC or lower than 190°F if vent pipe material is CPVC or Polypropylene. • Check for nicked or broken sensor wiring & connectors. Also check for corroded or wet connectors • Measure resistance of sensor at connector (18 Kohm at 50°F, 10 Kohm at 77°F, 3 Kohm at 140°F) • Replace controller
	Heat Exchanger outlet temperature exceeded set limit 	<ul style="list-style-type: none"> • Flow rate changes excessive • Faulty sensor wiring • Faulty sensor • Faulty Controller 	<ul style="list-style-type: none"> • Ensure the water flow rate does not change faster than 2 GPM every 5 seconds • Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors • Measure resistance of sensor at connector (18 Kohm at 50°F, 10 Kohm at 77°F, 3 Kohm at 140°F) • Replace controller
	Flashing Icon	<ul style="list-style-type: none"> • Indicates an error code and unit locked out 	<ul style="list-style-type: none"> • Refer to the indicated error code (E1, E2, etc) for resolution
	Flashing Cascade Icon	<ul style="list-style-type: none"> • Loss of communication between units 	<ul style="list-style-type: none"> • Check for broken or nicked communication cable or loose connector • Ensure that the communication cable is not bundled or tied to any high voltage lines • Ensure dip switch (SW3) is ON in first and last units and OFF in all other units • Ensure each unit numbering is unique under the dC mode



One moduleshown

Wiring Table:

Wire Color	Wire Size	Terminal	Component
Black	75 18AWG	CON12-1A	SW1
White	75 18AWG	CON12-1B	SW1
Green	18AWG	CON14-1	Green Earth
White	18AWG	CON14-2	White-Line
Black	18AWG	CON14-3	Black-Neutral
Blue	18AWG	CON15-1	Blue-Neutral
Brown	18AWG	CON15-2	Brown-Line
Blue	18AWG	CON16-1	Blue-Neutral
Brown	18AWG	CON16-2	Brown-Line
Blue	18AWG	CON17-1	Blue-Neutral
Brown	18AWG	CON17-2	Brown-Line
Blue	18AWG	CON18-1	Blue-Neutral
Brown	18AWG	CON18-2	Brown-Line
Blue	18AWG	CON19-1	Blue-Neutral
Brown	18AWG	CON19-2	Brown-Line
Blue	18AWG	CON20-1	Blue-Neutral
Brown	18AWG	CON20-2	Brown-Line
Blue	18AWG	CON21-1	Blue-Neutral
Brown	18AWG	CON21-2	Brown-Line
Blue	18AWG	CON22-1	Blue-Neutral
Brown	18AWG	CON22-2	Brown-Line
Blue	18AWG	CON23-1	Blue-Neutral
Brown	18AWG	CON23-2	Brown-Line
Blue	18AWG	CON24-1	Blue-Neutral
Brown	18AWG	CON24-2	Brown-Line
Blue	18AWG	CON25-1	Blue-Neutral
Brown	18AWG	CON25-2	Brown-Line
Blue	18AWG	CON26-1	Blue-Neutral
Brown	18AWG	CON26-2	Brown-Line
Blue	18AWG	CON27-1	Blue-Neutral
Brown	18AWG	CON27-2	Brown-Line
Blue	18AWG	CON28-1	Blue-Neutral
Brown	18AWG	CON28-2	Brown-Line
Blue	18AWG	CON29-1	Blue-Neutral
Brown	18AWG	CON29-2	Brown-Line
Blue	18AWG	CON30-1	Blue-Neutral
Brown	18AWG	CON30-2	Brown-Line
Blue	18AWG	CON31-1	Blue-Neutral
Brown	18AWG	CON31-2	Brown-Line
Blue	18AWG	CON32-1	Blue-Neutral
Brown	18AWG	CON32-2	Brown-Line
Blue	18AWG	CON33-1	Blue-Neutral
Brown	18AWG	CON33-2	Brown-Line
Blue	18AWG	CON34-1	Blue-Neutral
Brown	18AWG	CON34-2	Brown-Line
Blue	18AWG	CON35-1	Blue-Neutral
Brown	18AWG	CON35-2	Brown-Line
Blue	18AWG	CON36-1	Blue-Neutral
Brown	18AWG	CON36-2	Brown-Line
Blue	18AWG	CON37-1	Blue-Neutral
Brown	18AWG	CON37-2	Brown-Line
Blue	18AWG	CON38-1	Blue-Neutral
Brown	18AWG	CON38-2	Brown-Line
Blue	18AWG	CON39-1	Blue-Neutral
Brown	18AWG	CON39-2	Brown-Line
Blue	18AWG	CON40-1	Blue-Neutral
Brown	18AWG	CON40-2	Brown-Line
Blue	18AWG	CON41-1	Blue-Neutral
Brown	18AWG	CON41-2	Brown-Line
Blue	18AWG	CON42-1	Blue-Neutral
Brown	18AWG	CON42-2	Brown-Line
Blue	18AWG	CON43-1	Blue-Neutral
Brown	18AWG	CON43-2	Brown-Line
Blue	18AWG	CON44-1	Blue-Neutral
Brown	18AWG	CON44-2	Brown-Line
Blue	18AWG	CON45-1	Blue-Neutral
Brown	18AWG	CON45-2	Brown-Line
Blue	18AWG	CON46-1	Blue-Neutral
Brown	18AWG	CON46-2	Brown-Line
Blue	18AWG	CON47-1	Blue-Neutral
Brown	18AWG	CON47-2	Brown-Line
Blue	18AWG	CON48-1	Blue-Neutral
Brown	18AWG	CON48-2	Brown-Line
Blue	18AWG	CON49-1	Blue-Neutral
Brown	18AWG	CON49-2	Brown-Line
Blue	18AWG	CON50-1	Blue-Neutral
Brown	18AWG	CON50-2	Brown-Line
Blue	18AWG	CON51-1	Blue-Neutral
Brown	18AWG	CON51-2	Brown-Line
Blue	18AWG	CON52-1	Blue-Neutral
Brown	18AWG	CON52-2	Brown-Line
Blue	18AWG	CON53-1	Blue-Neutral
Brown	18AWG	CON53-2	Brown-Line
Blue	18AWG	CON54-1	Blue-Neutral
Brown	18AWG	CON54-2	Brown-Line
Blue	18AWG	CON55-1	Blue-Neutral
Brown	18AWG	CON55-2	Brown-Line
Blue	18AWG	CON56-1	Blue-Neutral
Brown	18AWG	CON56-2	Brown-Line
Blue	18AWG	CON57-1	

IntelliHot Water Heater

Wiring Diagram

Model: iQ751/iQ1001/iQ1501
IGT-LBL0022

Neutral Line

5

4

3

2

1

Brown 200 18AWG

Yell/Gm 300 18AWG

HV Ignition Cable 310

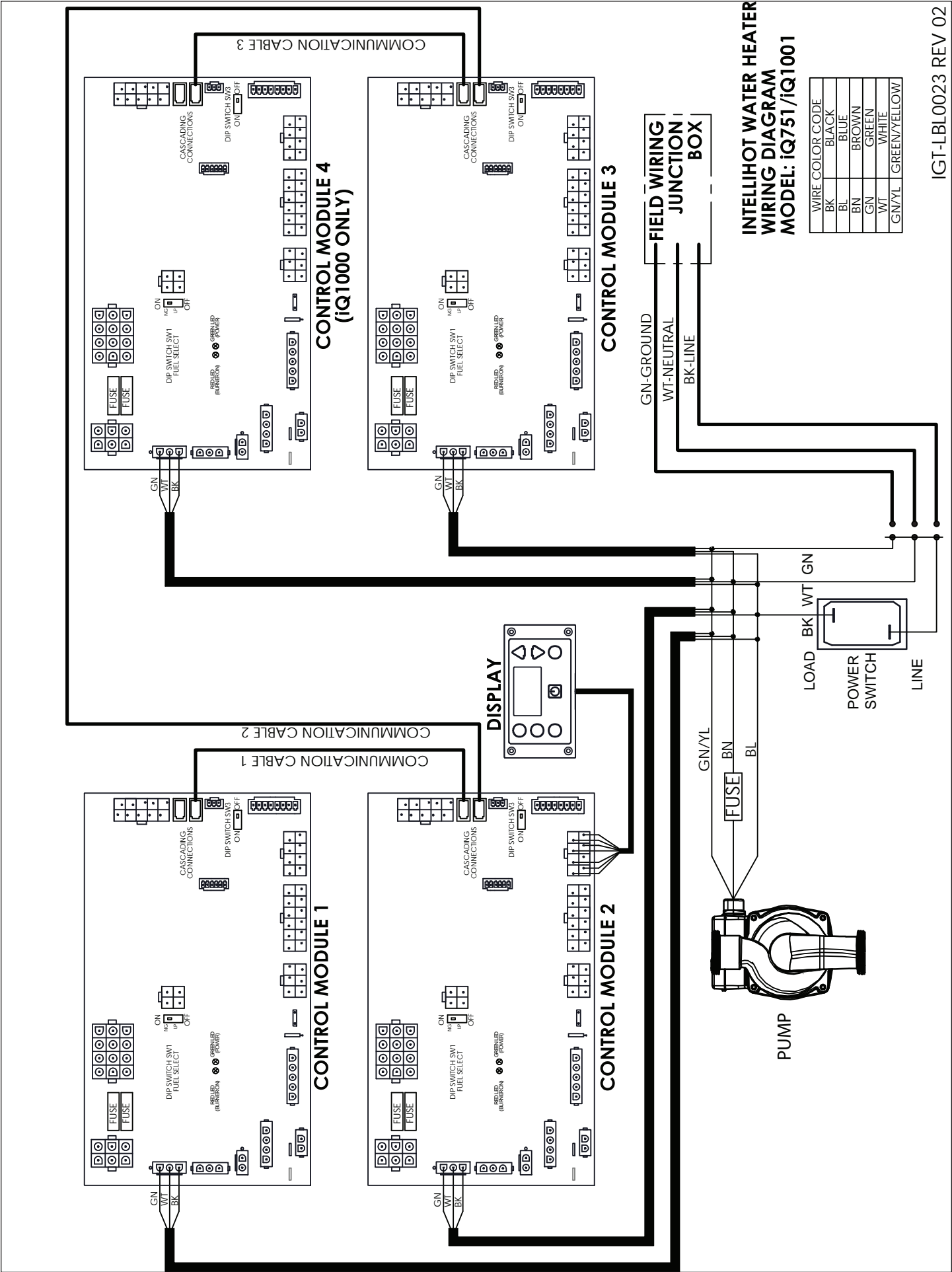
Rajah Terminal

Electrode

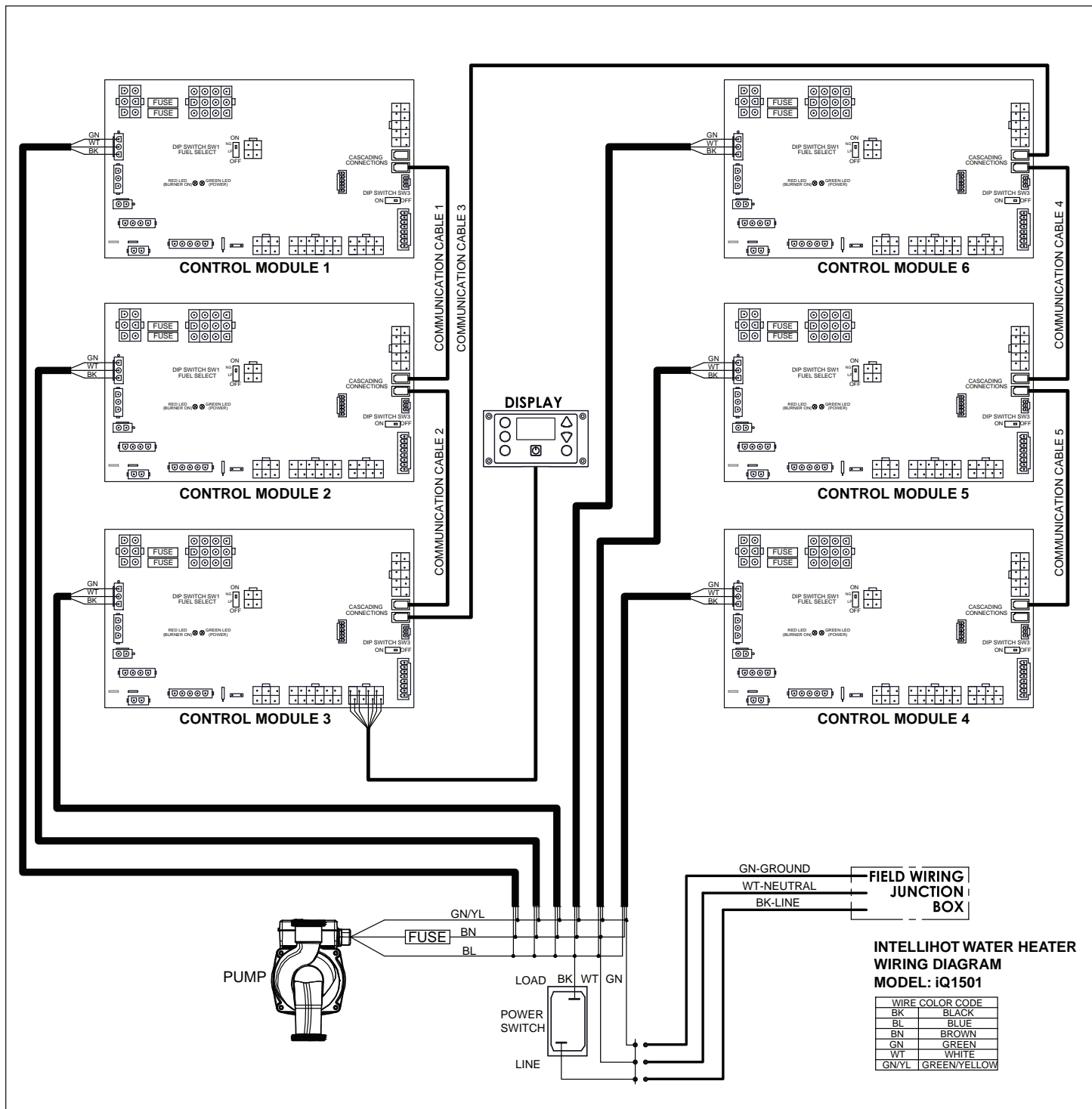
6.3Q.C.

#4 ground plate with black shrink tube

MX3.96



16.4 iQ1501 Complete System



17. 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.

18. Warranty

General

This unit is warranted by Intellihot Inc. (Intellihot), and covers defects in materials and workmanship, subject to the applicable time periods and terms below. The warranty effective start date begins on the date of commissioning.

This warranty is extended to the original purchaser and any subsequent owner at the original install location, and applies only when properly installed by a licensed contractor and operated in accordance with the instruction manuals. This warranty is limited to repairs or replacement of parts, at Intellihot's option that are proven to be defective under normal use and connected only to potable water systems.

Warranty Period

Commercial Domestic Hot Water (DHW) Warranty: Heat Exchanger coil - 10 years, Other Parts - 2 year

Heat Exchanger Coil

The warranty period for a heat exchanger coil failure, when installed in a Commercial DHW application is ten (10) years from the effective start date.

All other Parts and Components

The warranty period for any original parts (excluding the heat exchanger coil) against failure, is two (2) year from the effective start date. A replacement part will be warranted for the unexpired term of the original warranty. Defective parts submitted may not be returned. No returns will be accepted without prior authorization from Intellihot.

Definition of Potable water

Potable water is defined as drinkable water supplied from utility or well water in compliance with EPA secondary maximum contaminant levels (40 CFR part 143.3) as shown in the table.

Shipping Costs

If a replacement part is supplied under the terms of this warranty, Intellihot will provide ground service delivery for the part free of charge. Any expedited shipping expense will be paid by the customer.

Contaminant	Level
Aluminum	0.05 to 0.2 mg/l
Chloride	250 mg/l
Color	15 color units
Copper	1.0 mg/l
Corrosivity	Non-corrosive
Fluoride	2.0 mg/l
Foaming Agents	0.5 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Odor	3 threshold odor number
pH	6.5-8.5 mg/l
Silver	0.1 mg/l
Sulfate	250 mg/l
Total dissolved solids (TDS)	500 mg/l
Zinc	5 mg/l

Water Hardness Criteria

This warranty applies only when the water quality and supply meets the parameters outlined in the table below.

To use the table, locate the desired unit setpoint temperature on the left side of the table. Then locate the incoming water pressure across the top. The corresponding value in the table is the maximum allowable hardness in grains per gallon (gpg).

Maximum Allowable Hardness (grains per gallon, gpg)						
Unit Setpoint (°F)	Incoming Water Pressure (psi)					
	30	40	50	60	80	100
100-120	8	15	20	25	30	30
120-140	5	11	15	20	27	30
140-160	4	5	11	13	18	20
160-190	3	4	10	12	15	17

Not Covered by this Warranty

This warranty does not cover failures or problems due to:

- Failure to install in accordance applicable building codes, ordinances, normal plumbing and electrical trade practices.
- Improper installation, improper use, improper maintenance, improperly made replacements or repairs, accidents or abuse.
- Sediment deposits, fire, flood, lightning, freezing, and acts of God, or any causes other than defects in materials and workmanship.

This warranty will be void and have no effect if:

- The unit is modified or altered in any way.
- Appliance(s) or equipment attached to the unit that have not been approved by Intellihot.
- If the unit is used exclusively as a booster heater for a commercial dishwasher, or if the water from a reverse osmosis or deionized process is run directly through the unit.
- The serial number is altered, defaced, or discarded.

Warranty Limitations

This warranty applies only when the unit is used in the United States or Canada. Except for the limited warranties provided above, Intellihot disclaims any and all other warranties, including but not limited to warranties of merchantability and fitness for a particular purpose; provided however, that implied warranties of merchantability and fit-ness for a particular purpose are not disclaimed during the 1-year period from the effective date. Intellihot shall not be liable for indirect, special, incidental, consequential, or other similar damages, including lost profits, arising from or relating to the unit. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

How to Make a Claim

Please Call (877) 835-1705. Proof of purchase in the form of a dated sales receipt or warranty registration should be included with your claim. The product owner should submit the warranty claim directly to Intellihot at the following address:

Intellihot Inc.
Attn: Warranty Claims
2900 W Main St
Galesburg, IL 61401

All parts claimed to be defective may be requested to be returned to Intellihot for examination prior to full claim settlement. Please include the following information on your warranty claim:

- Model number and serial number of the unit
- Date of original purchase
- Owner's name and address
- A description of the problem with the part and unit.

19. Product Warranty Card

To activate your warranty, please fill out the information in the form below and mail to the following address:

Warranty Registration
Intellihot Inc.
2900 W. Main Street
Galesburg, IL 61401

Model: _____

Serial Numbers (up to 4):

Owner Information:

Name: _____

Address: _____

City, State, Postal Code _____

Phone Number _____

Dealer Information:

Sold By: _____

Address: _____

City, State, Postal Code _____

Phone Number _____

20. Preparation Before Outdoor Installation

20.1 Selecting an Outdoor 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 a location for the installation. Each installation is unique; therefore, take the time to find the best location for the water heater.
 - a. Select a location that minimizes the length of the water pipe.
 - b. 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.
 - c. Insulate the hot and cold water supply and recirculation lines.
 - d. Select a location away from foot traffic and away from areas where dust, debris, chemical agents, or other combustible materials could accumulate.
 - e. Allow sufficient space for service and maintenance access to all gas, water, and drain connections.
 - f. Make sure the location meets all building code requirements.
 - g. Contaminated or dirty air drawn into the intake pipe can damage the water heater. The warranty does not cover damage caused by airborne contaminants.
 - h. Ensure that the air intake is free (and remains free) from grass clippings, wood, landscaping and other debris. It must be higher than the code defined snow line.
 - i. Install Intellihot outdoor kit IGT-SPR0064. For installation instructions & details, see manual IGT-MNL0020.
 - j. Units should be installed on a minimum 4" concrete pad that is 4" clear around the exterior of the unit.

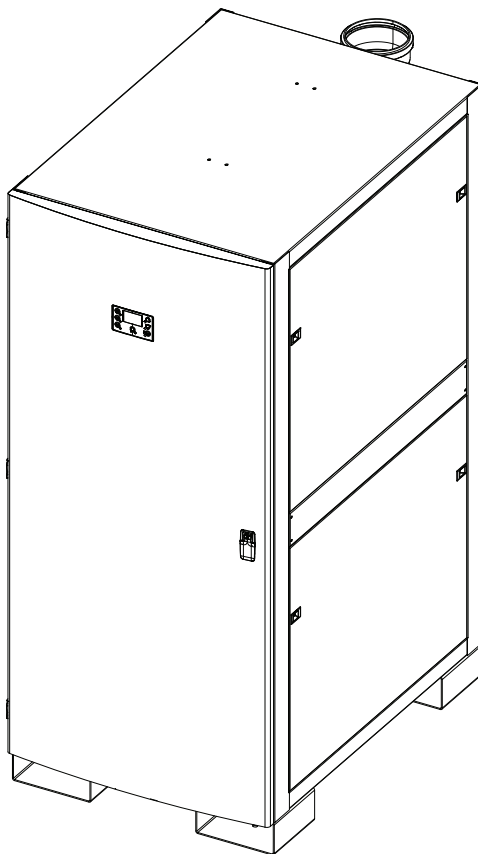
2. Locate the unit close to a drain and near gas and water connections.

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. If installing on a roof, 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.

3. Locate the water heater and all the water pipes in an area where they can be properly insulated.
 - 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

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.



Dealer / Installer Contact Information: