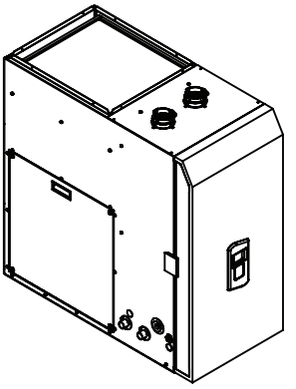
GF 200 Installation Manual

Combination gas-fired, condensing instantaneous hot water heater and space heating fan coil

* Lead Free

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

* The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight.



WARNING

This appliance (GF 200) is a combination gas-fired, condensing, instantaneous hot water heater and space heating fan coil. The water heater is a CSA-certified product in its own right and, as such, must be installed according to its installation and operation manuals (supplied).
This manual provides installation instructions for the GF 200, but defers to the water heater's manual(s) where appropriate. Throughout, in any conflict between instructions from this manual and those from the water heater's, the latter are assumed to be correct. When reading the water heater's manual, only sections pertaining to the NPE-240A model may apply.

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

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

What to do if you smell gas

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier. The installation must conform with local codes or, in the absence of local codes, the National Fuel Gas Code, ANSIZ223.1/NFPA 54 and/or CSA B149.1, Natural Gas and Propane Installation Code. When applicable, the installation must conform with the Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280 and/or CAN/CSA Z240 MH Series, Mobile Homes.

Contents

1. Important Information

This appliance (GF 200) is a combination gas-fired, condensing, instantaneous hot water heater and space heating fan coil. The water heater is a CSA-certified product in its own right and, as such, must be installed according to its installation and operation manuals (supplied).

This manual provides installation instructions for the GF 200, but defers to the water heater's manual(s) where appropriate. Throughout, in any conflict between instructions from this manual and those from the water heater's, the latter are assumed to be correct. When reading the water heater's manual, only sections pertaining to the NPE-240A model may apply.

As part of the GF 200's manufacturing process, certain portions of the water heater's installation have been completed. As such, some sections of this manual differ significantly from the corresponding instructions in the water heater manual(s). In these sections, it is intended that the installer follow the specific instructions as described for the GF 200, while following the general instructions in the water heater manual(s).

Installation and service must be performed by a qualified installer, service agency, or the gas supplier. Failure to follow these and other included instructions exactly could result in a fire or explosion, causing property damage, personal injury, or death.

1.1 Safety Information

The following safety symbols are used in this manual. Read and follow all safety instructions in this manual precisely to avoid unsafe operating conditions, fire, explosion, property damage, personal injury, or death.

DANGER

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

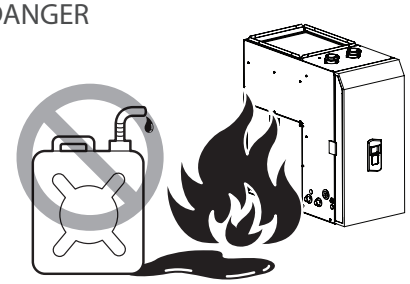
WARNING

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

CAUTION

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

DANGER



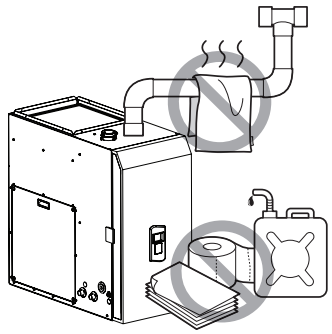
If you smell gas:

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

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

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

WARNING



- Do not store or use gasoline or other flammable liquids near this appliance.
  Doing so may result in fire or explosion.
- Do not place combustibles, such as newspapers or laundry, near the appliance or venting system.
  Doing so may result in a fire.
- Do not place or use hair sprays, spray paints, or any other compressed gases near the appliance or venting system, including the vent termination.
  Doing so may result in fire or explosion.
- Do not remove the front cover unless the power to the appliance is turned off or disconnected.
  Failure to do so may result in electric shock.
- Do not operate the appliance with the front cover opened.
  Doing so may result in fire or carbon monoxide (CO) poisoning, which may result in property damage, personal injury, or death.
- Do not operate this appliance without proper venting.
  Doing so may result in fire or carbon monoxide (CO) poisoning, which may result in property damage, personal injury, or death.
- Do not touch the internal components of the appliance with wet hands.
  Doing so may result in electric shock.

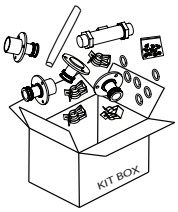
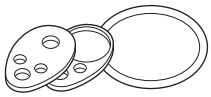
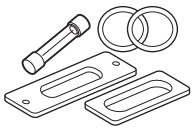
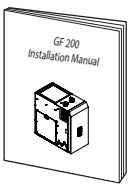
CAUTION

- Do not turn on the appliance unless the water and gas supplies are fully opened.
  Doing so may damage the appliance.
- Do not turn on the water if the cold water supply shut-off valve is closed.
  Doing so may damage the appliance.
- Do not use this appliance for anything other than its intended purpose, as described in this manual.
- When servicing the controls, label all wires prior to disconnecting them.
  Failure to do so may result in wiring errors, which can lead to improper or dangerous operation. Verify proper operation after servicing.
- Do not use unapproved replacement or accessory parts.
  Doing so may result in improper or dangerous operation and will void the manufacturer's warranty.
- Do not place anything in or around the vent terminals, such as a clothes line, that could obstruct the air flow in or out of the appliance.
- This appliance has been approved for use in the USA and Canada only.
  Using the appliance in any other country will void the manufacturer's warranty.

2. About the Appliance

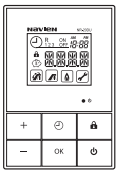
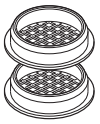
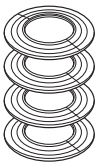
2.1 Items Included

When you open the box, you will find the following items with the appliance. Check the box for each of the following items before installing the appliance.

	
Water Heater Installation & Operation Manuals	Kit Box
	
Conversion Kit	Spare Parts
	
GF 200 Installation Manual	

2.2 Accessories

The following optional accessories are available for the appliance:

	
Remote Controller	3 in Vent Termination Caps
	
3 in Wall Flanges	

2.3 Specifications

The following table lists the specifications for the appliance. Additional specifications about water, gas, electric, and air supplies (venting) appear in the Installation section.

<table>
<tr><th colspan="2">Item</th><th colspan="2">GF 200</th></tr>
<tr><td rowspan="2">Heat Capacity (Input)</td><td>Natural Gas</td><td rowspan="2">Space Heating:
19,900 – 80,000 BTU/H</td><td rowspan="2">DHW Heating:
19,900 – 199,000 BTU/H</td></tr>
<tr><td>Propane Gas</td></tr>
<tr><td rowspan="2">Energy Factor</td><td>UEF (for NG & LP)</td><td colspan="2">0.96</td></tr>
<tr><td>EF (Canada) (for NG & LP)</td><td colspan="2">0.97</td></tr>
<tr><td rowspan="3">Flow Rate (DHW)</td><td>35 °F (19 °C) Temp Rise</td><td colspan="2">11.2 GPM (42 L/m)</td></tr>
<tr><td>45 °F (25 °C) Temp Rise</td><td colspan="2">8.7 GPM (33 L/m)</td></tr>
<tr><td>67 °F (36 °C) Temp Rise</td><td colspan="2">5.6 GPM (21 L/m)</td></tr>
<tr><td colspan="2">Dimensions</td><td colspan="2">17.75 in (W) x 38.0 in (H) x 40.0 in (D)</td></tr>
<tr><td colspan="2">Weight</td><td colspan="2">248 lbs</td></tr>
<tr><td colspan="2">Installation Type</td><td colspan="2">Indoor</td></tr>
<tr><td colspan="2">Venting Type</td><td colspan="2">Forced Draft Direct Vent</td></tr>
<tr><td colspan="2">Ignition</td><td colspan="2">Electronic Ignition</td></tr>
<tr><td colspan="2">Water Pressure</td><td colspan="2">15 – 150 PSI</td></tr>
<tr><td colspan="2">Natural Gas Supply Pressure (from source)</td><td colspan="2" rowspan="4">See Water Heater Installation Manual (Supplied)</td></tr>
<tr><td colspan="2">Propane Gas Supply Pressure (from source)</td></tr>
<tr><td colspan="2">Natural Gas Manifold Pressure (min-max)</td></tr>
<tr><td colspan="2">Propane Gas Manifold Pressure (min-max)</td></tr>
<tr><td colspan="2">Minimum Flow Rate*</td><td colspan="2">0.5 GPM (1.9 L/m), < 0.01 GPM (0.04 L/m) with optional recirculation mode.</td></tr>
<tr><td rowspan="3">Connection Sizes</td><td>Cold Water Inlet</td><td colspan="2">$^{3}/_{4}$ in sweat joint</td></tr>
<tr><td>Hot Water Outlet</td><td colspan="2">$^{3}/_{4}$ in sweat joint</td></tr>
<tr><td>Gas Inlet</td><td colspan="2">$^{3}/_{4}$ in NPT</td></tr>
<tr><td>Power Supply</td><td>Main Supply</td><td colspan="2">120 V AC, 60 Hz</td></tr>
<tr><td rowspan="2">Materials</td><td>Casing</td><td colspan="2">Cold Rolled Carbon Steel</td></tr>
<tr><td>Heat Exchangers</td><td colspan="2">Primary Heat Exchanger: Stainless Steel
Secondary Heat Exchanger: Stainless Steel</td></tr>
<tr><td rowspan="3">Venting</td><td>Exhaust**</td><td colspan="2" rowspan="3">See Water Heater Installation Manual (Supplied)</td></tr>
<tr><td>Intake</td></tr>
<tr><td>Vent Clearances</td></tr>
<tr><td>Safety Devices</td><td colspan="3">Flame Rod, APS, Ignition Operation Detector, Water Temperature High Limit Switch, Exhaust Temperature High Limit Sensor, Power Surge Fuse</td></tr>
</table>

*Energy consumption will increase when the system is configured for recirculation.
**High temperature venting material may be required. See section 3.5 Venting the appliance for details.

2.4 The Front Panel

The front panel allows you to adjust the water temperature and view the operating status or error codes.

a Error

A code will appear on the display

b Hot Water Recirculation

Recirculation Mode

c Diagnostics button

For installers only

d Information button

Shows basic information

e RESET Reset button

Resets the water heater (When an error occurs)

f Combusting

When the gas burner is on

g N/A

h 120F Display

i + Up button

Increases the temperature

j − Down button

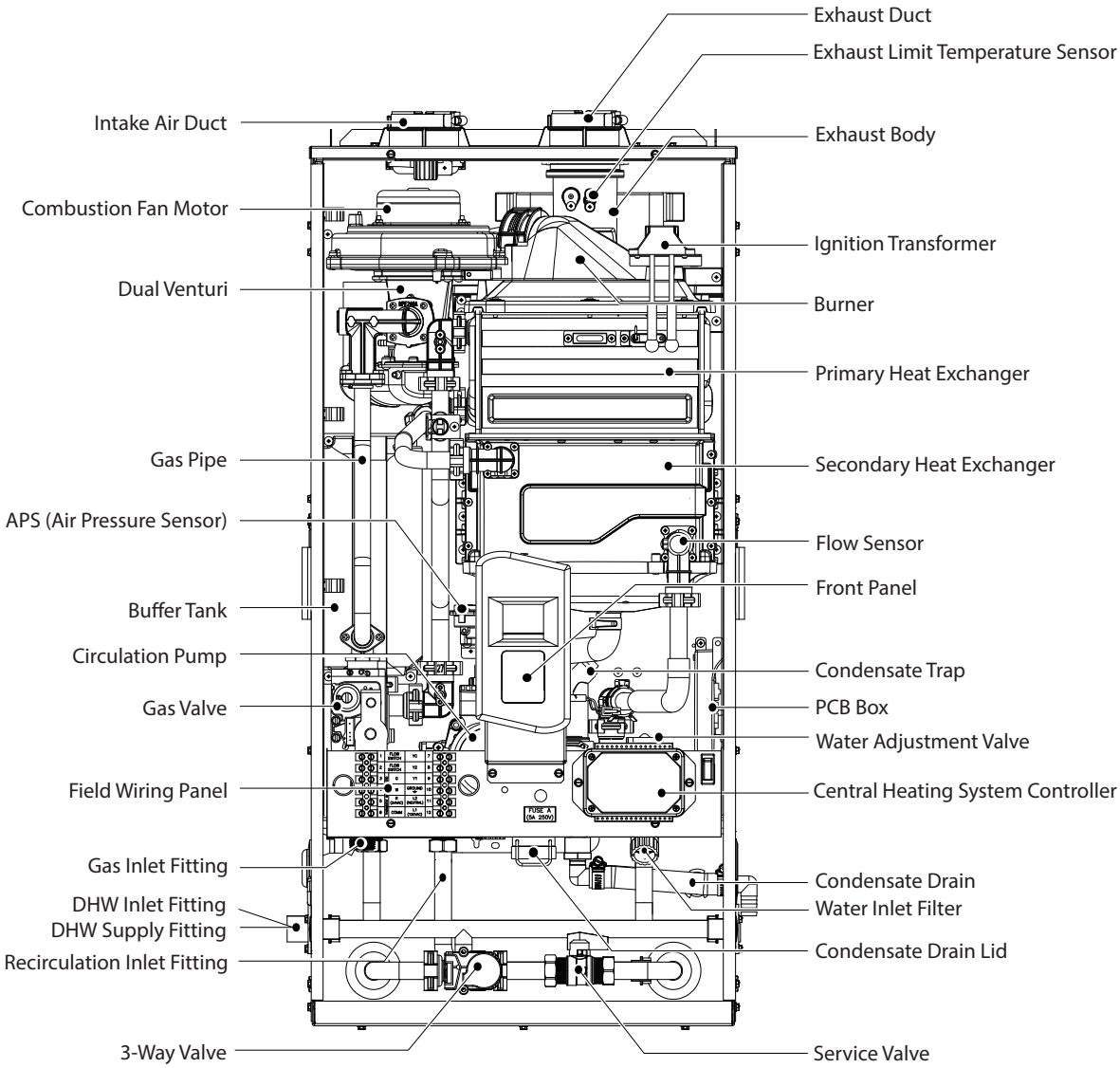
Decreases the temperature

k Power button

Turns the water heater on or off

2.5 Components

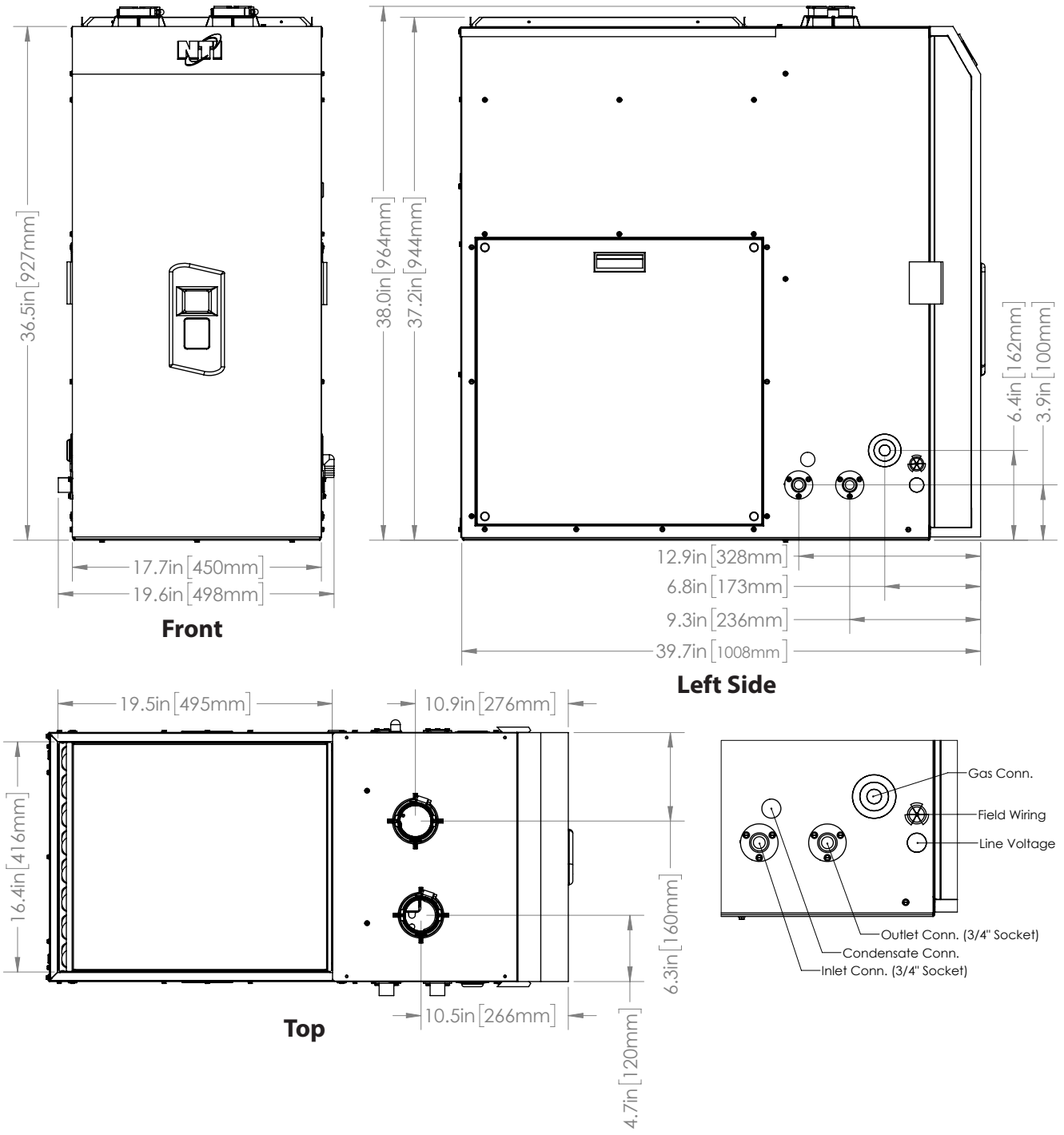
The following diagram shows the key components of the appliance. Component assembly diagrams and particular parts lists are included in the Appendixes.



GF 200

2.6 Dimensions

The following diagrams show the dimensions of the appliance and the connections.



**Inlet Connection is furthest to the back from the front of the appliance. Plumbing connections are possible from left or right side of cabinet. See Plumbing Section for details.

2.7 Rating Plate

This appliance comes from the factory configured for use with Natural Gas (NG). Before starting the installation, check the rating plate located on the side of the appliance to ensure that it matches the gas type, gas pressure, water pressure, and electrical supply available in the installation location. If the appliance does not match each of these ratings, do not install the appliance. If conversion to Propane Gas is required, the included gas conversion kit must be used. Refer to water heater installation manual for details.

Part # 85477

#####	#####	#####	#####	#####

Certified by
Certifie par

Made in Canada
Fabriqués au Canada

GF 200

COMBINATION GAS WATER HEATER / CENTRAL AIR HEATING
COMBINAISON CHAUFFEE-EAU INSTANTANE / GENERATEUR D'AIR CHAUD

NY Thermal Inc. 30 Stonegate Dr., Saint John, NB, E2H 0A4, Canada

Serial Number: #####

Model [Modèle]	**Fuel** [Gaz]	**Altitude, ft** [Altitude, pi]	**Input, MBH** [Entrée, kW]		**Space Heating Capacity, MBH** [Capacité de Chauffage, kW]
			Min	Max	
GF 200	Nat.	0 - 4500*	19.9 [5.83]	200 [58.6]	80 [23.5]
	LP				

* Refer to water heater rating plate on the opposite side of this cabinet.

FACTORY SET FOR NATURAL GAS
Field converted to Propane Gas
☐ Date:_____

CONFIGURÉE À L'USINE POUR GAZ NATUREL
Convertie au propane sur place
☐ Date:_____

- Orifices necessary for LP conversion are provided.
- Failure to use the correct gas can cause problems which can result in death, serious injury or property damage.

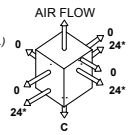
- Les injectures nécessaires à la conversion au GPL sont fournis.
- Le fait de ne pas utiliser le bon gaz peut causer des problèmes qui peuvent mener à la mort, causer des blessures graves ou endommager la propriété.

Gas Pressure [Pression du Gaz]	**Natural** [Naturel]	**Propane**
Maximum Inlet Gas Pressure [Pression maximale d'entrée du gaz]	10.5" WC	13" WC
Minimum Inlet Gas Pressure [Pression minimum d'entrée du gaz]	3.5" WC	8" WC
Manifold Pressure [Pression d'admission]	-0.58" WC	-0.02 / -0.78" WC

Clearances [Dégagements]

This appliance is approved for upflow installation.
Cette fournaise est approvée pour l'installation et circulation d'air ascendente.
Min. clearance to combustible construction: (in.) see diagram.
Dégagements minimum entre l'appareil et des constructions combustibles (PO.)
Vent clearance to combustible construction (in.): 0
Dégagement de vent constructions combustibles (PO.): 0
* **Min service clearance**
* *Dégagement min. pour fins d'entretien pour les installations*

C: COMBUSTIBLE FLOORS
**Refer to Installation Manual for service clearance details*



Electrical Rating / *Caractéristique Électrique*

VOLTS	FREQ.	PHASE	RATED AMPS	MCA	MAX. CKT. BRK.	INDOOR BLOWER MOTOR	
						RATED AMPS	HP
120	**60 Hz**	**1**	**12 A**	**15 A**	**20 A**	**9.6 A**	**3/4**

Important Information [Rensignesments Importants]

- Use for Natural or LP Gas only.
- Maximum Water Pressure = 150 psi
- Maximum Static Pressure = 0.8 IN. W.C.
- Maximum Inlet Water Temperature = 180°F
- This appliance must be installed in accordance with local codes, if any; if not, follow ANSI Z223.1/NFPA 54 or CAN/CSA B149.1, Natural Gas and Propane Installation Code, as applicable.

- Utilisez des gaz Naturel ou LP seulement.
- Pression d'eau max. = 150 lb/po²
- Pression statique max. = 0.8 PO. D'EAU
- Temp. maximale d'eau d'entrée = 180°F
- Cet appareil doit être installé conformément aux codes locaux, le cas échéant ; sinon, suivez ANSI Z223.1 / NFPA 54 ou CAN / CSA B149.1, gaz naturel et propane Code d'installation, le cas échéant.

FOR YOUR SAFETY
Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

POUR VOTRE SÉCURITÉ
Ne pas entreposer ou utiliser d'essence ou d'autres vapeurs et liquides inflammables à proximité de cet appareil ou de tout autre appareil.

Standard ANSI Z21.10.3 / CSA 4.3
Gas Water Heaters, Volume III Storage Water Heaters, with Input Ratings Above 75,000 BTU per Hour, Circulating and Instantaneous

CSA C22.2 No. 236 / UL 1995
Heating and Cooling Equipment

Water heater rating plate located on opposite side of cabinet.

** The Water Heater rating plate is located on the right side of the cabinet.

Rating Plate, *Plaque Signalétique

Direct Vent Automatic Instantaneous Water Heater **Chauffe-eau instantané automatique à évent direct*
For Indoor, Outdoor or Manufactured Home (Mobile Home) Installation **Pour installation dans une maison préfabriquée (mobile)*

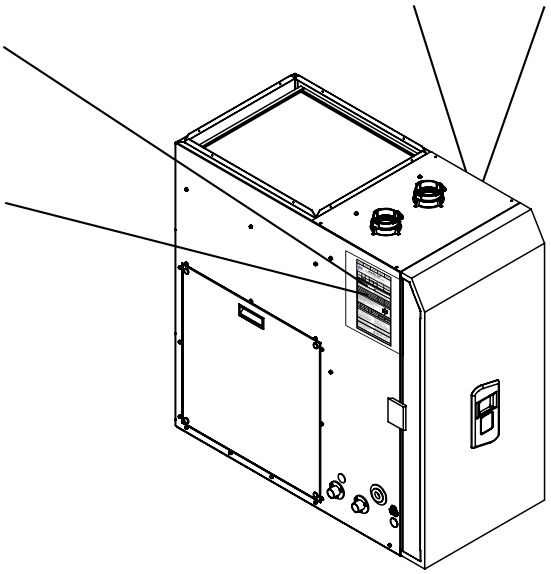
Navien, Inc.
20 Goodyear, Irvine, CA 92618
Tel: 1-800-519-8794

Model No. **Numéro de modèle*
NPE-210A
Max. Input Rating, **Entrée GPL max.*
180,000 Btu/h
Recovery Rating, **Calibre de recouvrement*
Max. Inlet Gas Pressure, **Pression max. de gaz d'entrée*
Min. Inlet Gas Pressure, **Pression min. de gaz d'entrée*
Manifold Pressure, **Pression d'admission*
Electrical Rating, **Régime nominal électrique*
Max. Water Pressure, **Pression d'eau max.*

Type of Gas. **Type de gaz*
NG
Min. Input Rating, **Débit calorifique max.*
19,900 Btu/h
265 Gallons/Hour, **gallons/heures*
10.5 Inches W.C. **pouces W.C.*
3.5 Inches W.C. **pouces W.C.*
-0.36 Inches W.C. **pouces W.C.*
AC **c.a.* **120 Volts 60Hz, less than 2 amperes,** **Utilise moins de 2A*
160 psi **lb/po2* **ANSI Z21.10.3 · CSA 4.3-2011**

Orifices necessary for LP conversion are provided. **Les injectures nécessaires à la conversion au GPL sont fournis.*
Failure to use the correct gas can cause problems which can result in death, serious injury or property damage. **Le fait de ne pas utiliser le bon gaz peut causer des problèmes qui peuvent mener à la mort, causer des blessures graves ou endommager la propriété.*
Consult your installation manual for more information. **Consultez votre manuel d'installation pour plus d'information.*
Suitable for combination water (potable) heating and space heating and not suitable for space heating applications only.
**Convient au chauffage combiné de l'eau (potable) et des locaux, mais non au chauffage des locaux seulement.*
This appliance is certified for use at altitudes up to 4,500 ft (1,370 m) in accordance to the latest CAN/CGA 2.17-High Altitude Installation procedures at normal manifold pressure. For installation instructions at altitudes higher than 4,500 ft, please contact Navien. **Cet appareil est certifié pour une utilisation à des altitudes de 0 à 4,500 pieds (1,370 m) conformément aux toutes les procédures d'installation à haute altitude CAN/CGA 2.17 à une pression normale. Pour les installations à élévations en haut de 4,500 pieds, appeler le bureau de Navien.*
This appliance must be installed in accordance with local codes, or in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the CSA B149.1, Natural Gas and Propane Installation Code. **Cet appareil doit être installé selon les règlements locaux, ou en l'absence de tels règlements, selon le National Fuel Gas Code, ANSI Z223.1/NFPA 54, ou les, Code d'installation du gaz natural et du propane, CSA-B149.1.*

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



WARNING

- Be sure the gas type and electricity voltage match the rating plate. Using a different gas type will cause abnormal combustion and appliance malfunction.
- Using abnormally high or low AC voltage may cause abnormal operation, and may reduce the life expectancy of this product.

3. Installing the appliance

3.1 Choosing an installation location

This appliance must be installed indoors, in a dry location free of dust and debris.

When choosing an installation location, you must ensure that the location provides adequate clearance for the appliance (inculding ductwork), adequate venting and drainage options, and sufficient access to gas, water, and electrical supplies. Carefully consider the following factors when choosing an installation location:

Water quality

Proper maintenance of the appliance 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	Up to 200 mg/l (12 grains/gallon)
Aluminum	0.05 to 0.2 mg/l
Chloride	Up to 250 mg/l
Copper	Up to 1.0 mg/l
Iron	Up to 0.3 mg/l
Manganese	Up to 0.05 mg/l
pH	6.5 to 8.5
Sulfate	Up to 205 mg/l
Total Dissolved Solids (TDS)	Up to 500 mg/l
Zinc	Up to 5 mg/l
Chlorine	Up to 4 mg/l

Access to utilities

- Water – the installation location should be near where the domestic water supply enters the building.
- Gas – the installation location should be near where the gas supply enters the building.
- Electricity – the installation location should be near where the electrical supply enters the building.

Adequate drainage

This appliance produces a significant amount of condensate

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

Proximity to fixtures and other appliances

Install the appliance near fixtures that deliver or use hot water, such as bathroom, kitchen, and laundry room faucets. Select a location that minimizes the water piping required between major fixtures. If the distances are long or the user requires "instant" hot water, we recommend running a recirculation line back to the appliance from the furthest fixture. Insulate as much of the hot water supply and recirculation lines as possible. For more information about the water supply, refer to "3.4 Connecting the Water Supply."

Additionally, take care to locate the appliance such that the supply and return ductwork can be installed efficiently, to limit noise and power consumption.

Clean, debris and chemical-free combustion air

- Do not install the appliance in areas where dust and debris may accumulate or where hair sprays, spray detergents, chlorine, or similar chemicals are used.
- Do not install the appliance in areas where gasoline or other flammables are used or stored.
- Ensure that combustible materials are stored away from the appliance and that hanging laundry or similar items do not obstruct access to the appliance or its venting.
- In commercial locations, do not install the appliance in areas with greasy fumes or heavy amounts of steam or take measures to prevent fumes and steam from entering the appliance.

3.2 Installation clearances

Install the appliance in an area that allows for service and maintenance access to utility connections, piping, filters, and traps. Based on the installation location, ensure the following clearances are maintained:

Clearance from:	Minimum clearance
Top	9 in
Back	Nil (if not return)
Front	4 in*
Side (No connections)	3 in
Fan access side	24 in (457 mm)
Side (Connections)	12 in
Bottom	Nil

* 4 inch clearance to front of unit if obstruction is removable (such as a door). 12 inch clearance if obstruction is permanent.

When locating the appliance prior to completing the ductwork, it is essential that sufficient space be allotted for ductwork installation and maintenance (such as replacement or cleaning of the air filter), as well as fan access.

Return ducting

Return air may be ducted into the appliance via:

1. side access door opening
2. rear panel (cut out guide holes provided)
3. floor panel (leave minimum 1" along sides, rear, and spine, taking care not to excise formed feet at the rear corners).

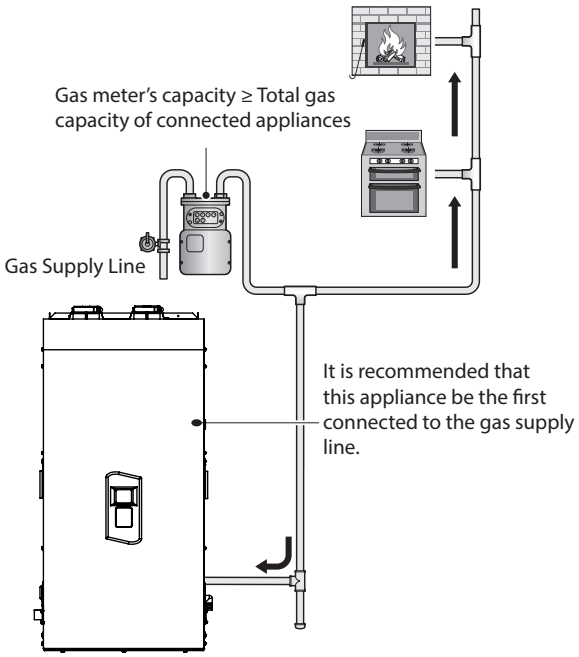
REFER TO DUCTING SECTION FOR DETAILED INSTRUCTIONS

3.3 Connecting the Gas Supply

WARNING

- Before connecting the gas supply, determine the gas type and pressure for the appliance by referring to the rating plate. Use only the same gas type indicated on the rating plate. Using a different gas type will result in abnormal combustion and malfunction of the appliance. Gas supplies should be connected by a licensed professional only.
- The appliance and its gas connection must be leak tested before placing it in operation.
- This appliance cannot be converted from natural gas to propane or vice versa without a gas conversion kit. Do not attempt a field conversion of this appliance without a gas conversion kit. Doing so will result in dangerous operating conditions and will void the warranty.
- For gas conversion instructions, refer to relevant sections of the water heater installation manual (supplied).

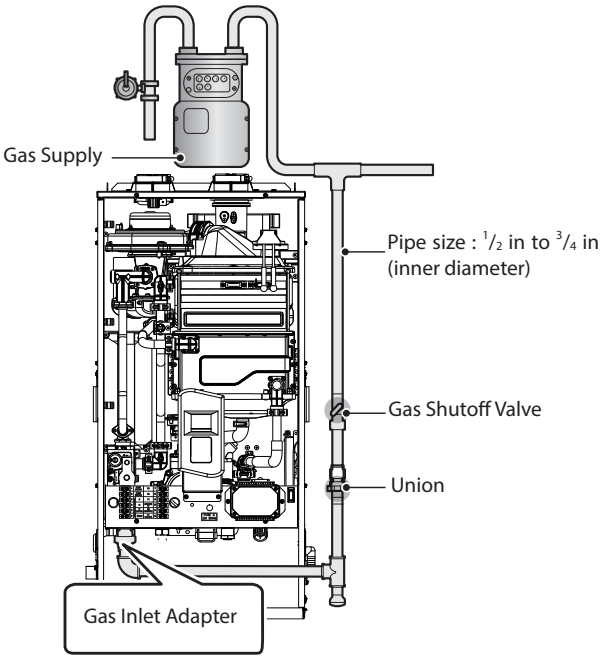
It is recommended that this appliance be connected as the first one downstream of the gas meter, to ensure a sufficient gas supply.



*Gas connection can be made on the left or right side of the cabinet.

To connect the gas supply:

1. Determine the gas type and pressure for the appliance by referring to the rating plate.
2. Perform a pressure test on the main gas supply line.
3. Purge the gas line of any debris.
4. Determine the proper size and type for the gas line. Refer to the tables that follow.
5. Install full port valves on the gas supply line and appliance.
6. Connect the gas supply line.
7. Test the supply line, all connection points, and the appliance for gas leaks.

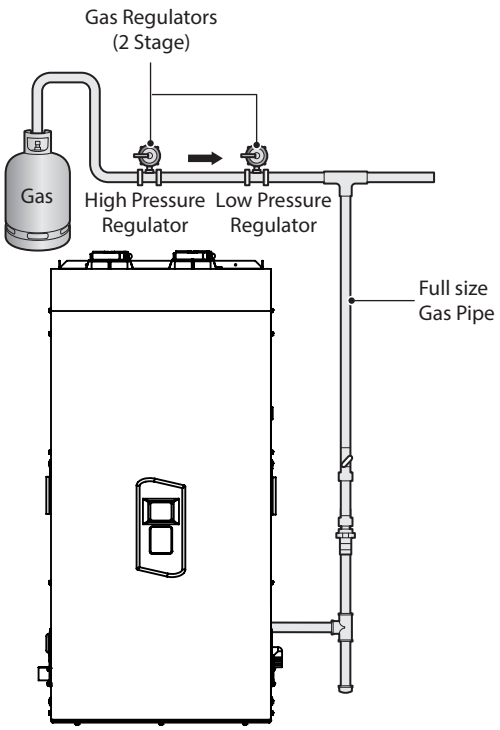


Note

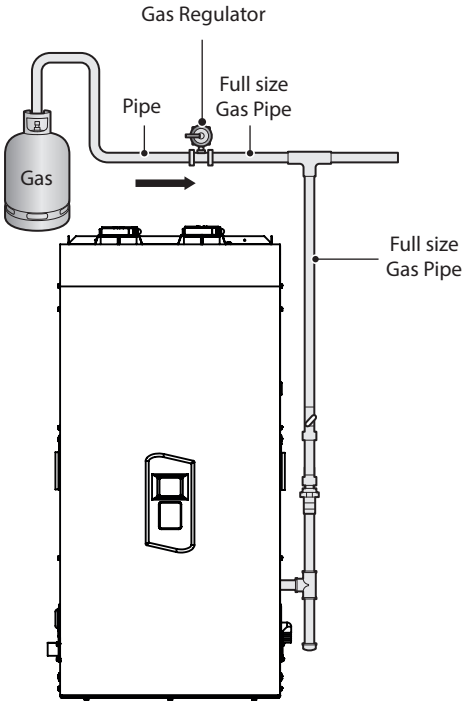
- Tighten the appliance connection valves with care to avoid damage.
- Refer to the sizing tables on the following pages for limitations.
- It is recommended that a union be installed on the gas supply line close to the appliance, to facilitate any future maintenance or service.

Typical LP Gas piping examples:

2 Stage System with Multiple Regulators (Recommended)



Single Regulator System



3.3.1 Gas Pipe Sizing Tables (Referenced from 2012 National Fuel Gas Code)

These tables are for reference only. Please consult the gas pipe manufacturer for actual pipe capacities.

Maximum Natural Gas Delivery Capacity

in Cubic Feet (ft^3) per Hour (0.60 Specific Gravity; 0.5 in WC Pressure Drop). Contact your gas supplier for BTU/ft3 ratings. Use 1,000 BTU/ft3 for simplified calculations. This table is recommended for supply pressures less than 6 in WC.

Pipe Size	Length (including fittings)										
	10 ft (3 m)	20 ft (6 m)	30 ft (9 m)	40 ft (12 m)	50 ft (15 m)	60 ft (18 m)	70 ft (21 m)	80 ft (24 m)	90 ft (27 m)	100 ft (30 m)	125 ft (38 m)
3/4 in	360	247	199	170	151	137	126	117	110	104	92
1 in	678	466	374	320	284	257	237	220	207	195	173
1 1/4 in	1,390	957	768	657	583	528	486	452	424	400	355
1 1/2 in	2,090	1,430	1,150	985	873	791	728	677	635	600	532
2 in	4,020	2,760	2,220	1,900	1,680	1,520	1,400	1,300	1,220	1,160	1,020
2 1/2 in	6,400	4,400	3,530	3,020	2,680	2,430	2,230	2,080	1,950	1,840	1,630
3 in	11,300	7,780	6,250	5,350	4,740	4,290	3,950	3,670	3,450	3,260	2,890
4 in	23,100	15,900	12,700	10,900	9,660	8,760	8,050	7,490	7,030	6,640	5,890

in Cubic Feet (ft^3) per Hour (0.60 Specific Gravity; 3.0 in WC Pressure Drop). Contact your gas supplier for BTU/ft3 ratings. Use 1,000 BTU/ft3 for simplified calculations. This table is recommended for supply pressures of 6 in WC or greater.

Pipe Size	Length (including fittings)										
	10 ft (3 m)	20 ft (6 m)	30 ft (9 m)	40 ft (12 m)	50 ft (15 m)	60 ft (18 m)	70 ft (21 m)	80 ft (24 m)	90 ft (27 m)	100 ft (30 m)	125 ft (38 m)
1/2 in	454	312	250	214	190	172	158	147	138	131	116
3/4 in	949	652	524	448	397	360	331	308	289	273	242
1 in	1,787	1,228	986	844	748	678	624	580	544	514	456
1 1/4 in	3,669	2,522	2,025	1,733	1,536	1,392	1,280	1,191	1,118	1,056	936
1 1/2 in	5,497	3,778	3,034	2,597	2,302	2,085	1,919	1,785	1,675	1,582	1,402
2 in	10,588	7,277	5,844	5,001	4,433	4,016	3,695	3,437	3,225	3,046	2,700
2 1/2 in	16,875	11,598	9,314	7,971	7,065	6,401	5,889	5,479	5,140	4,856	4,303
3 in	29,832	20,503	16,465	14,092	12,489	11,316	10,411	9,685	9,087	8,584	7,608
4 in	43,678	30,020	24,107	20,632	18,286	16,569	15,243	14,181	13,305	12,568	11,139

Maximum Liquefied Propane Delivery Capacity

in Thousands of BTU/H (0.5 in WC Pressure Drop)

Pipe Size	Length (including fittings)												
	10 ft (3 m)	20 ft (6 m)	30 ft (9 m)	40 ft (12 m)	50 ft (15 m)	60 ft (18 m)	80 ft (24 m)	100 ft (30 m)	125 ft (38 m)	150 ft (45 m)	175 ft (53 m)	200 ft (60 m)	250 ft (76 m)
1/2 in	291	200	160	137	122	110	101	94	89	84	74	67	62
3/4 in	608	418	336	287	255	231	212	197	185	175	155	140	129
1 in	1,150	787	632	541	480	434	400	372	349	330	292	265	243
1 1/4 in	2,350	1,620	1,300	1,110	985	892	821	763	716	677	600	543	500
1 1/2 in	3,520	2,420	1,940	1,660	1,480	1,340	1,230	1,140	1,070	1,010	899	814	749
2 in	6,790	4,660	3,750	3,210	2,840	2,570	2,370	2,200	2,070	1,950	1,730	1,570	1,440

3.3.2 Measuring the Inlet Gas Pressure

For detailed instrustions to measure the inlet gas pressure, see relevant section in the water heater installation manual (supplied).

3.4 Connecting the Water Supply

When connecting the water supply, follow these guidelines:

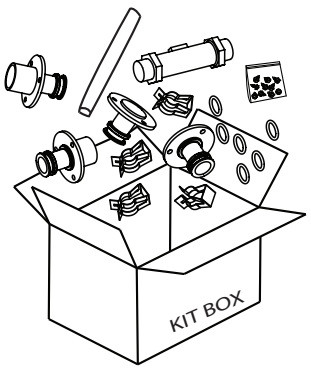
- Use only pipes, fittings, valves, and other components, such as solder, that are approved for use in potable water systems.
- Tighten the appliance connection valves and/or fittings with care to avoid damage.
- We recommend using unions and manual shut-off valves on the cold water inlet and DHW outlet.
- Strive to make the hot water piping system as short as possible, to deliver hot water to the fixtures more quickly.
- To conserve water and energy, insulate all water piping. Never cover the drain or pressure relief valve. If the appliance is installed in a closed water supply system, such as one having a backflow preventer in the cold water supply line, means shall be provided to control thermal expansion. Contact the water supplier or local plumbing inspector for information about how to control this situation.
- After installing the appliance, clean the inlet water filter that is located inside the cold water inlet, and then test the appliance for proper flow and inspect for leaks. Instruct the appliance owner that the filter must be cleaned periodically to maintain proper water flow.

3.4.1 Installing the plumbing connections

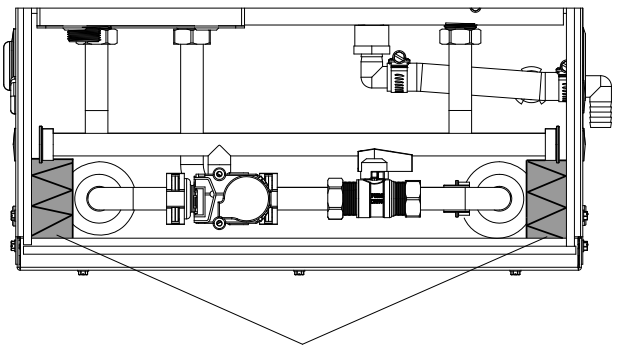
1. A kit box containing the necessary plumbing connections is shipped inside the cabinet. Remove the kit box before installation.

Kit box includes:

Item	Part Number	Quantity
Open Brass Connection Adapter	85372	2
Plug Brass Connection Adapter	85523	2
Pipe Clips	85371	4
Flow Switch	85582	1
Vinyl Tubing (10.5")	83044	1
O-Rings	85369	6
Screws	82998	14
2" Vent Termination Caps	85590	2
2" Wall Flanges	85591	4



2. This appliance is shipped with cardboard inserts on the inside to support the plumbing during shipping. Remove cardboard prior to installation.

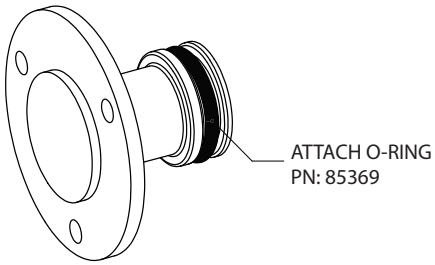


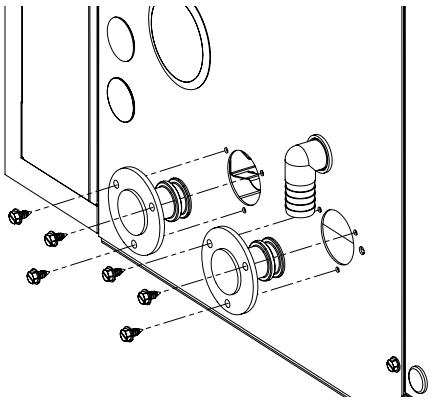
3. Determine which side of the appliance the inlet and outlet water connections will be made on.

A) Left side connections
B) Right side connections
C) Both - One on each side

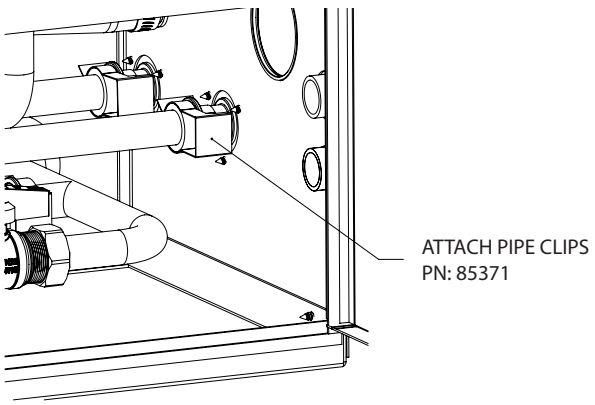
NOTE: Typically both water connections are installed on the opposite side of the return air duct to allow for air filter & maintenence clearances.

4. Install the plug adapters opposite the inlet and outlet connections.



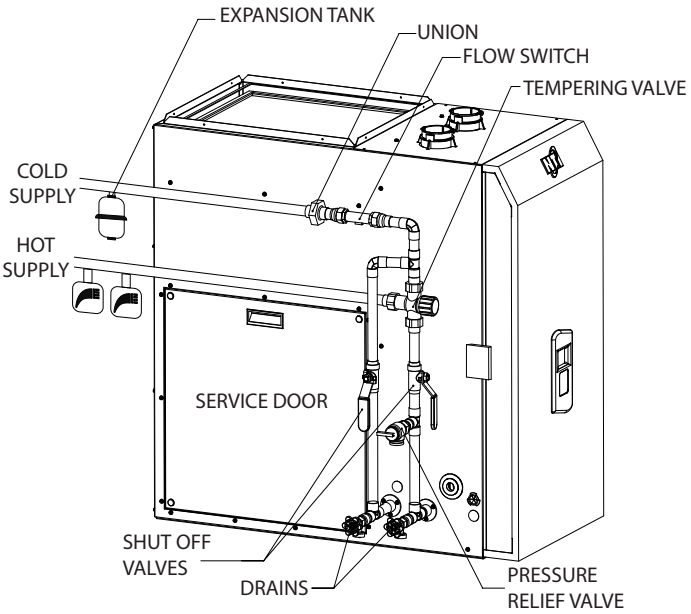


Slide each plug through the hole in the cabinet and into the corresponding pipe; secure with (3) screws (PN: 82998) and (1) pipe clip (PN: 85371).
MUST ATTACH O-RING BEFORE SECURING.

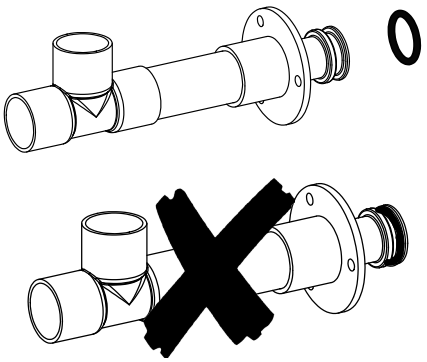


The following is a typical near-appliance plumbing layout for connections on the same side.

NOTE: Do not block service door



5. Solder pipe and pipe fittings onto the open brass connection adapter (PN: 85372) prior to securing to the cabinet and internal plumbing.



IMPORTANT: Do not solder to brass adapter with O-ring installed.

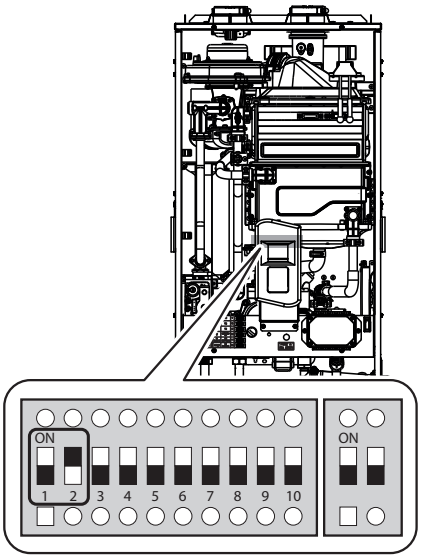
6. Install the flow switch on the inlet piping upstream of the tempering valve as shown above. Connect the flow switch cable to terminals 1 and 2 "FLOW SWITCH" on the field wiring barrier strip.

7. A tempering valve must be installed on the hot water outlet to prevent scalding. See drawing above.

RECIRCULATION MODE

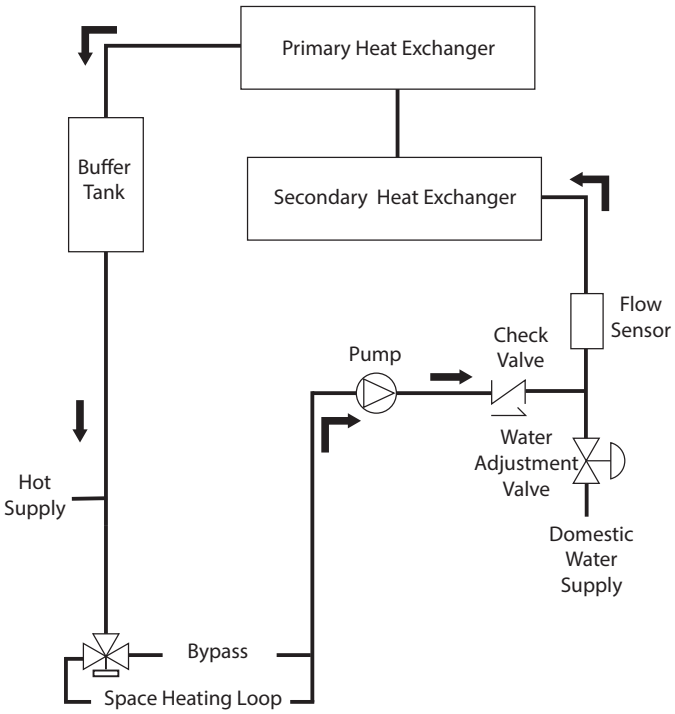
This appliance comes factory set for pre-heat recirculation.

1. The Front Panel DIP switches (set of ten) are factory set to: 1—OFF; 2—ON.



2. To disable pre-heat recirculation, set DIP switch #2 to the off (down) position.

The following diagram shows the recirculation flow for pre-heating:



3.4.2 Connecting a Pressure Relief Valve

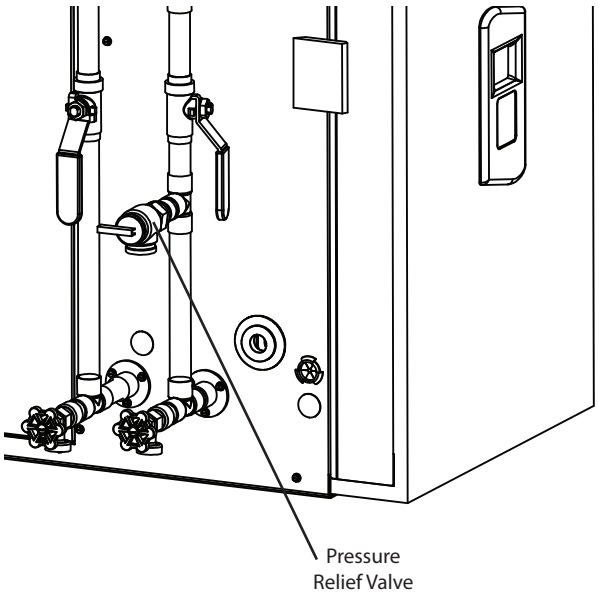
WARNING

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

To complete the installation of the appliance, you must install an approved $^{3}/_{4}$ in, maximum 150 PSI pressure relief valve on the hot water outlet. The appliance's water heater has a built-in high temperature shut off switch, so install a "pressure only" relief valve. This valve is not supplied, but is required. The following examples are approved for use with the appliance:

- Wilkins P-1000A (Zurn Industries)
- Conbraco 17-402-04
- Watts Industries 3L(M7)
- Cash Acme FWL-2, $^{3}/_{4}$ in

The pressure relief valve should be placed as close to the hot water outlet as possible. No other valve should be placed between the pressure relief valve and the appliance.



When installing the valve, follow these guidelines:

- Ensure that the discharge capacity of the pressure relief valve is equal to or greater than the maximum pressure rating of the appliance.
- Ensure that the maximum BTU/H rating on the pressure relief valve is equal to or greater than the maximum input BTU/H rating of the appliance's water heater.
- Direct the discharge piping of the pressure relief valve so that hot water will not splash on anyone or any nearby equipment.
- Attach the discharge line to the pressure relief valve and run the end of the line to within 6-12 in (150-300 mm) of the floor.
- Ensure that the discharge line will allow free and complete drainage without restriction. Do not install a reducing coupling or other restriction on the discharge line.
- If the relief valve discharges periodically, this may be due to thermal expansion in a closed water supply system. Contact the water supplier or local plumbing inspector on how to correct this situation. Do not plug the relief valve.

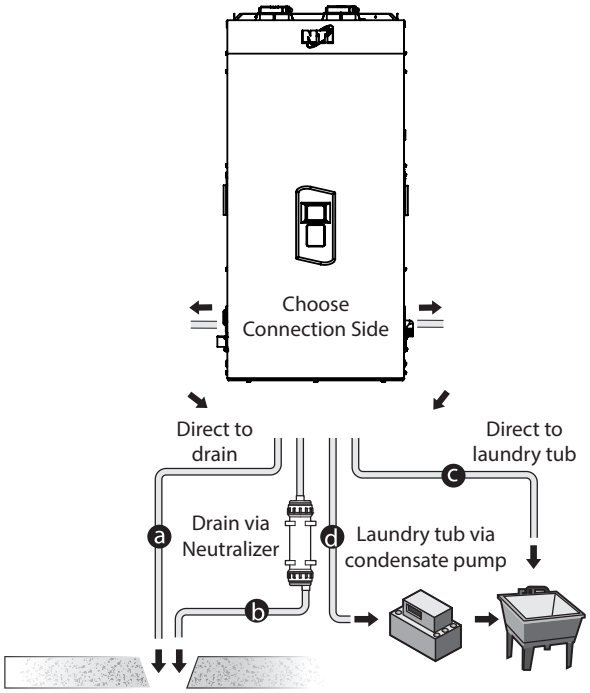
3.5 Connecting the Condensate Drain

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

CAUTION

- Do not cap or plug the integrated condensate line. If prevented from draining, condensate can damage the appliance.
- The condensate line must have a negative slope to drain properly.

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



a. From the appliance directly into an external drain.

b. From the appliance, through a neutralizing agent, and then into an external drain.

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

c. From the appliance into a laundry tub.

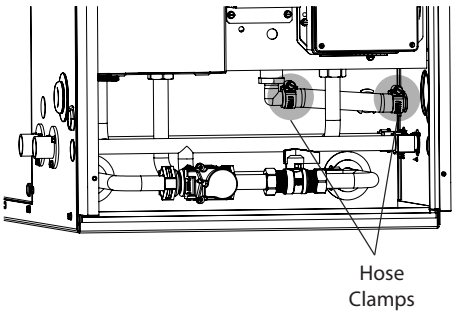
Note The condensate outlet must be higher than the top of the laundry tub to use this option. The condensate line must have a negative slope to drain properly.

d. From the appliance into a condensate pump, and then into a laundry tub.

Note A pump can be used when there is a long distance between the appliance and the laundry tub or when the condensate outlet is lower than the top of the laundry tub.

The appliance is shipped from the factory with a condensate drain pre-installed on the right side. To switch the drain to the left side:

1. Loosen the two (2) metal hose clamps on each end of the tubing inside the cabinet.
2. Remove the 90° barbed fitting and protective ring grommet from the panel cutout.
3. Remove the tubing from the barbed end of the condensate drain adapter and rotate the adapter anti-clockwise such that the free end points to the left.
4. Install the supplied tubing (10.5 in) onto the adapter, making sure to orient the hose clamps conveniently, and adjust it such that the free end of the tubing aligns with the panel cutout on the left side of the appliance.
5. Install the protective grommet into the panel cutout, and insert the 90° barbed fitting through into the tubing.
6. Tighten the hose clamps to ensure a leak-free installation.



To connect the condensate drain:

1. Connect a drain line to the $^{5}/_{8}$ in barbed fitting at the side of the appliance. Secure with hose clamp. Use only corrosion-resistant material for the drain line, such as PVC or CPVC. Do not reduce the size of this fitting or the drain line to less than $^{1}/_{2}$ in.
2. Place the free end of the drain line into an appropriate drain.
3. If you are using a condensate pump, ensure that the pump allows for up to 2 GPH of drainage
   If you are not using a condensate pump, ensure that the drain line is pitched downward at a minimum slope of $^{1}/_{4}$ in per foot.

3.6 Venting the Appliance

For detailed instrustions on venting the appliance, see relevant section in the water heater installation manual (supplied).

> **CAUTION**
>
> - This appliance uses temperature settings above 150°F (66°C), which could result in exhaust temperatures in excess of 149°F (65°C). As a result, high-temperature vent pipe materials may be required at the exhaust outlet of the appliance as instructed in the water heater installation manual.

To adjust the water heater settings to limit the maximum space heating setpoint follow these steps:

1. Remove the front cover from the appliance

2. Connect the appliance to mains power and flip the main power switch ON

3. Using the soft-touch button on the Front Panel, turn the water heater OFF

4. Enter the 'R&D information menu' by pressing the Up (+) button three (3) times, the Down (-) button three (3) times, and then the Up (+) button four (4) more times.

5. In the 'R&D information menu', use the Up (+) or Down (-) buttons to move to '2.PAR', and then press the 'Info' button (middle left) to enter the 'Parameter' menu.

6. If necessary: to return to the previous menu, press the 'Reset' button once.

7. In the Parameter menu, use the Up (+) or Down (-) buttons to proceed to Parameter 10 ('P.10'), and then press the 'Info' button to enter the 'Heating MAX set point' mode (default: 180°F)

8. Use the Up (+) or Down (-) buttons to set this maximum heating set point to 149°F, and then press the 'Info' button to confirm the value.

9. Press the Reset button to return to the Parameter menu, and proceed as above to Parameter 7 ('P.07'), and then press the 'Info' button to enter the 'Outdoor low temperature set point' mode (default: 14°F)

10. Use the Up (+) or Down (-) buttons to set this effective low temperature set point to 36°F, and then press the 'Info' button to confirm the value.

11. Press the 'Reset' button 3 times to exit back to the main menu.

Once this adjustment is made, Standard vent pipe materials may be used throughout. The following table shows the parameters of the heating profile with and without high-temperature venting. Note the setpoint in stages 8-10, as well as the reduced heating output.

Stage	Air flow	High temp. venting		Standard venting	
		Set point	Output	Set point	Output
(#)	(cfm)	(°F)	(MBH)	(°F)	(MBH)
1	500	112	21	112	21
2	600	116	26	116	26
3	720	118	31	118	31
4	780	125	37	125	37
5	840	134	45	134	45
6	930	140	52	140	52
7	1020	145	59	145	59
8	1080	154	68	**149**	**64**
9	1140	159	74	**149**	**66**
10	1200	163	79	**149**	**67**

3.7 Connecting the Power Supply

WARNING

Improperly connecting the power supply can result in electrical shock and electrocution. Follow all applicable electrical codes of the local authority having jurisdiction. In the absence of such requirements, follow the latest edition of the National Electrical Code (NFPA 70) in the USA or the latest edition of CSA C22.1 Canadian Electrical Code Part 1 in Canada. Connecting the power supply should be performed only by a licensed professional.

When connecting the power supply, follow these guidelines:

- Do not connect the electric supply until all plumbing and gas piping is complete and the appliance has been filled with water.
- Do not connect the appliance to a 220-240 V AC power supply. Doing so will damage the appliance and void the warranty.
- This appliance must be wired directly. It is recommended that a power switch be installed between the breaker and the appliance to facilitate end-user maintenance and servicing.
- Connect the appliance to a 110-120 V AC circuit at 60 Hz, with a minimum circuit ampacity (MCA) of 15 A, and a maximum circuit breaker size of 20 A, as per the rating plate.
- Ensure that the appliance is electrically grounded via the GND circuit on the barrier strip. Do not attach the ground wire to either the gas or the water piping as plastic pipe or dielectric unions may prevent proper grounding.
- If there is a power failure in cold weather areas, the freeze prevention system in the appliance will not operate and may result in freezing of the heat exchanger and or coil. In cold weather areas where power failures are common, you must completely drain the appliance to prevent damage if the power will be off for any extended period of time. A battery back-up (available at most computer retailers) may be used to supply hot water during periods of power outages. Damage caused by freezing is not covered under warranty.

3.8 Setting the DIP Switches

The appliance has two installer-serviceable DIP switch locations: on the front panel, and on the interface board, mounted on the frame of the PCB.

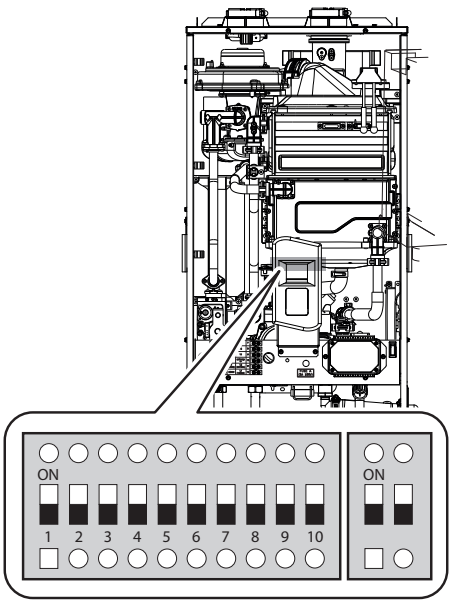
3.8.1 Interface Board DIP Switches (H2Air)

The four DIP switches on the interface board configure the settings governing central heating operation. These configurations are set at the factory (OFF ON OFF OFF) and should not be changed.

However, should absolute DHW priority be desired, such that *any* DHW demand disables *any* central heating operation for the duration of the demand, DIP switch #2 may be set to OFF. This operational mode is not recommended.

3.8.2 Front Panel DIP Switches

The two sets of DIP switches on the front panel configure the appliance pump & recirculation, display, well pump, storage tank & solar system, lime alarm, high altitude, cascade venting and gas type settings. Some of these configurations are set at the factory and should not be changed. The following tables describe the functions of the DIP switches and their settings:



- **10-switch Panel:**

Switch	Function	Setting		Remark
1-3	Recirculation Mode	No Recirculation	1-OFF; 2-OFF; 3-OFF	*Intelligent Preheating: Learns the user's hot water usage patterns and starts preheating prior to an anticipated draw. • Preheating starts when remote controller is not connected. • When remote controller is connected, preheating starts and operates based on the timer. • Set the timer on the remote controller to use hot water at the time of your choice. • Intelligent preheating does not function in Cascade Mode (Preheating OFF). • Freeze protection is still available with preheating OFF. ***Lime Alarm: Displays a "760" error when the set time period has been reached to indicate a flush or service is necessary. ****High Altitude Above 2,000 ft (610 m), the appliance will de-rate by 4% for each 1,000 ft (305 m) of altitude gain.
		External Recirculation	1-OFF; 2-ON; 3-OFF	
		Intelligent Preheating*	1-ON; 2-ON; 3-OFF	
4	Display Temperature Unit	Celsius	4-ON	
		Fahrenheit	4-OFF	
5	Well Pump	Well Pump Operation	5-ON	
		Do Not Use Well Pump	5-OFF	
6	DHW Storage Tank/ Solar System	Storage Tank/Solar System Operation	6-ON	
		Do Not Use Storage Tank/Solar System	6-OFF	
7 & 8	Lime Alarm***	6 Months Alert	7-ON; 8-OFF	
		12 Months Alert	7-OFF; 8-ON	
		24 Months Alert	7-ON; 8-ON	
9 & 10	High Altitude ****	0–1,999 ft (0–609 m)	9-OFF, 10-OFF	
		2,000–5,399 ft (610–1,645 m)	9-ON, 10-OFF	
		5,400–7,699 ft (1,646–2,346 m)	9-OFF, 10-ON	
		7,700–10,100 ft (2,347–3,078 m)	9-ON, 10-ON	

Note This appliance may be installed at elevations up to 10,100 ft (3,078 m) for use with Natural Gas and 4,500 ft (1,370 m) for use with Propane. To use the appliance at a specific altitude, the DIP switches should be set as described above.

- **2-switch Panel:**

Switch	Function	Setting	
1	Cascade Vent	Common Vent	1-OFF
		Individual Vent	1-ON
2	Gas Type	Natural Gas	OFF
		Propane Gas	ON

3.9 Ducting the appliance

3.9.1 Supply ducting

The appliance provides a standard-size flanged supply air outlet for easy installation of a cooling coil or supply plenum. Take care not to damage the heating coil when installing ductwork to the supply air outlet by using screws no longer than ¾" (0.75 in.).

3.9.2 Return ducting

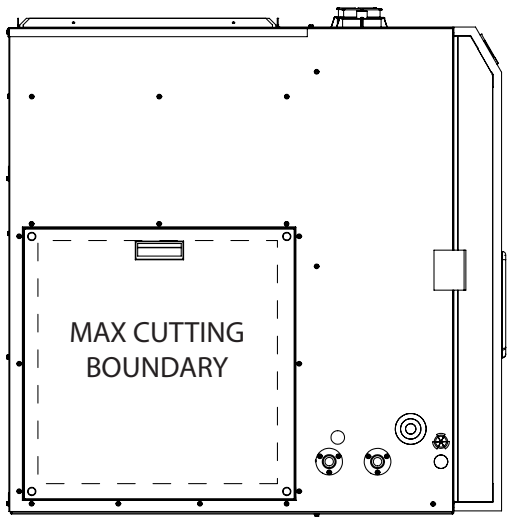
The return air may be delivered to the appliance via: a) either side; b) the back; c) the bottom; or any combination thereof, provided that access to one of the two side doors remains clear (24" min.) for fan access and maintenance.

Should spatial restrictions preclude such a clearance in a side-return installation, it is recommended that a joint be made in the return ducting such that the portion immediately adjacent to the cabinet be removable to allow for fan access.

a) Side return:

When routing return air into the side of the unit, an opening may be cut into the central area of the side door, taking care not to excise the screw holes.

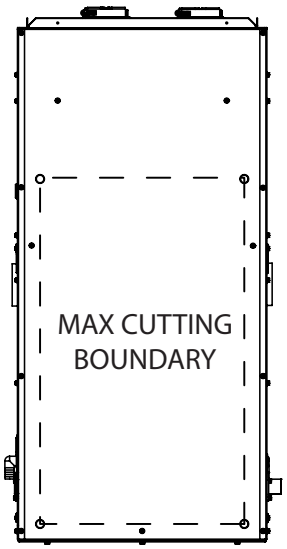
If installing a cabinet-mounted filter rack, it may be fastened to both the remaining door material and the cabinet, such that it overlaps the door frame. However, DO NOT drill holes or cut away any material from the cabinet sides themselves.



Sides

b) Rear return:

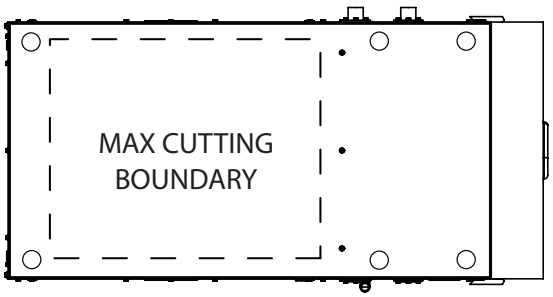
When routing return air into the back of the unit, an opening may be cut within the confines of the provided holes, taking care not to damage the interior sheet metal when using longer tools.



Rear

c) Bottom return:

When routing return air into the bottom of the unit, an opening may be cut into the floor, leaving a minimum of 1" clearance from the sides and the rear feet, and 2" from the spine, taking care not to damage the piping and blower when using longer tools.



Bottom

3.9.3 Air filtration system

In all installations, an appropriate air filtration system is recommended and must meet test requirements in UL 900. Failure to install one could lead to damage to and/or premature failure of the space heating components.

3.10 Configuring the appliance

The appliance is designed to operate with second-stage (Y2) cooling air flow rates between 700 and 1450 CFM. First-stage (Y1) cooling and circulation air flow rates are set to 70% and 50% of second-stage (Y2) rates, respectively. Depending on cooling capacity, climatic conditions, and owner preference, one may choose any Y2 value between 700 and 1450, in increments of 50 CFM (see table below). Once a value is selected (by following the steps in 3.10.1), it will remain in solid-state memory. The default setting is 'maximum' (all 4 LEDs illuminated).

The following rates apply at all operating points within the proscribed external static pressure range: 0 - 0.8" w.c.

Air flow settings						
LEDs				Stage 2	Stage 1	Circulation
1	2	3	4	(Y2)	(Y1)	(G)
On: ¤ | Off: ○				(cfm)	(cfm)	(cfm)
○	○	○	○	700	490	350
○	○	○	¤	750	525	375
○	○	¤	○	800	560	400
○	○	¤	¤	850	595	425
○	¤	○	○	900	630	450
○	¤	○	¤	950	665	475
○	¤	¤	○	1000	700	500
○	¤	¤	¤	1050	735	525
¤	○	○	○	1100	770	550
¤	○	○	¤	1150	805	575
¤	○	¤	○	1200	840	600
¤	○	¤	¤	1250	875	625
¤	¤	○	○	1300	910	650
¤	¤	○	¤	1350	945	675
¤	¤	¤	○	1400	980	700
¤	¤	¤	¤	1450	1015	725

3.10.1 Setting air flow rates:

1. Remove the front cover from the appliance

2. Connect the appliance to mains power and flip the main power switch ON

3. Using the soft-touch button on the Front Panel, turn the water heater OFF

4. Remove the protective cover from the controller enclosure (4 Phillips head screws).

5. Locate the push-button in the lower left corner of the controller enclosure (see figure below).

6. Locate the 4 numbered LEDs (boxed below) that will indicate the air flow programming setting.

   a. Note the 3 unlabeled LEDs (circled below) which will remain lit or flashing throughout this process. These 3 are not part of the programming procedure.

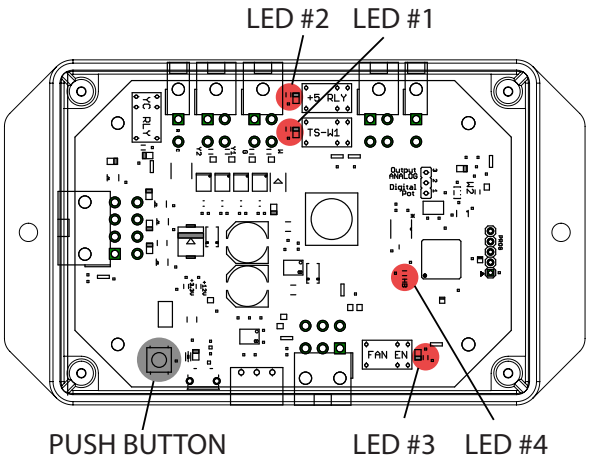
   b. LED #4 (HB) will flash steadily during normal operation.

7. Press and hold the Bootloader button for 3 seconds (LED #4 will stop flashing for these seconds) then release it. This activates programming mode, where the numbered LEDs will identify which mode is currently programmed.

8. Each subsequent press increases the second-stage (Y2) cooling air flow rate by 50 CFM, as per the table above. Once all 4 LEDs are lit (Y2 = 1450 cfm), the next press will loop back to the beginning (Y2 = 700 cfm).

9. Confirm the setting using the 4 LEDs (shown in the figure below and the table above).

10. Once the desired setting is selected, wait 10 seconds. The LEDs will return to their former state, and the values will be saved as the controller exits programming mode.



3.10.2 Connecting the field wiring:

All field wiring is intended to be passed through the 1" slit grommet below the gas line panel hole on either side of the cabinet (swap grommet for caplug accordingly):

Flow switch:

The two wires in the flow switch cable must be connected to the labeled terminals in the barrier strip. Failure to install and connect the flow switch correctly could result in high-temperature water being sent to the thermostatic mixing valve, increasing the potential for injurious burns.

Thermostat:

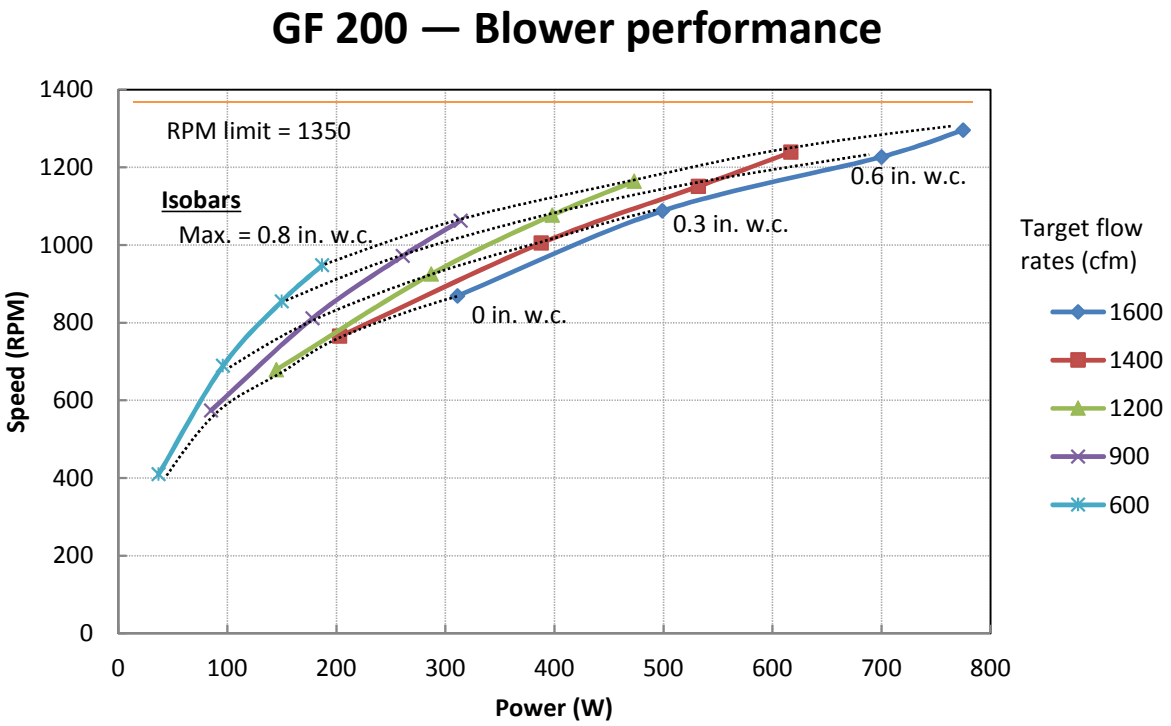
The GF 200's Green Furnace Technology modulates automatically through 10 heating stages to match its output to the load. As such, it accepts only one 'W' input. Connect your thermostat wires accordingly.

The G, Y1, and Y2 inputs, if used, must be wired directly from the thermostat (or in such a way that is electrically indistinguishable).

The GF 200 protects itself from damage by only allowing the outdoor A/C compressor to run when the circulating fan is within its normal operating envelope (see Appendices). As such, when wiring the outdoor A/C unit, it is imperative that the return leg of the signal wire from the outdoor unit be wired to the 'Yc' terminal on the barrier strip. Failure to do so correctly will void the warranty and could cause significant property damage.

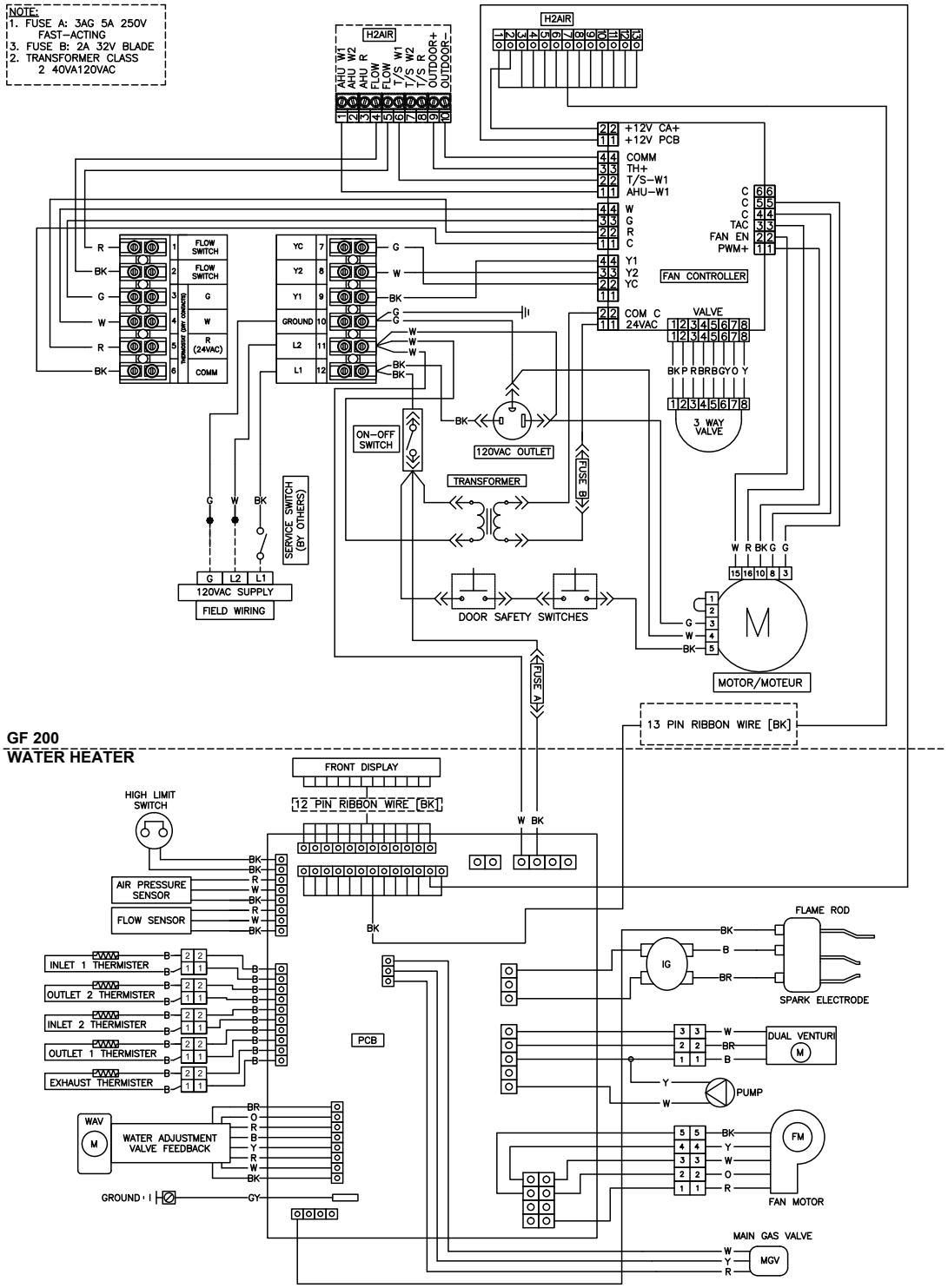
4. Appendices

4.1 Blower Performance

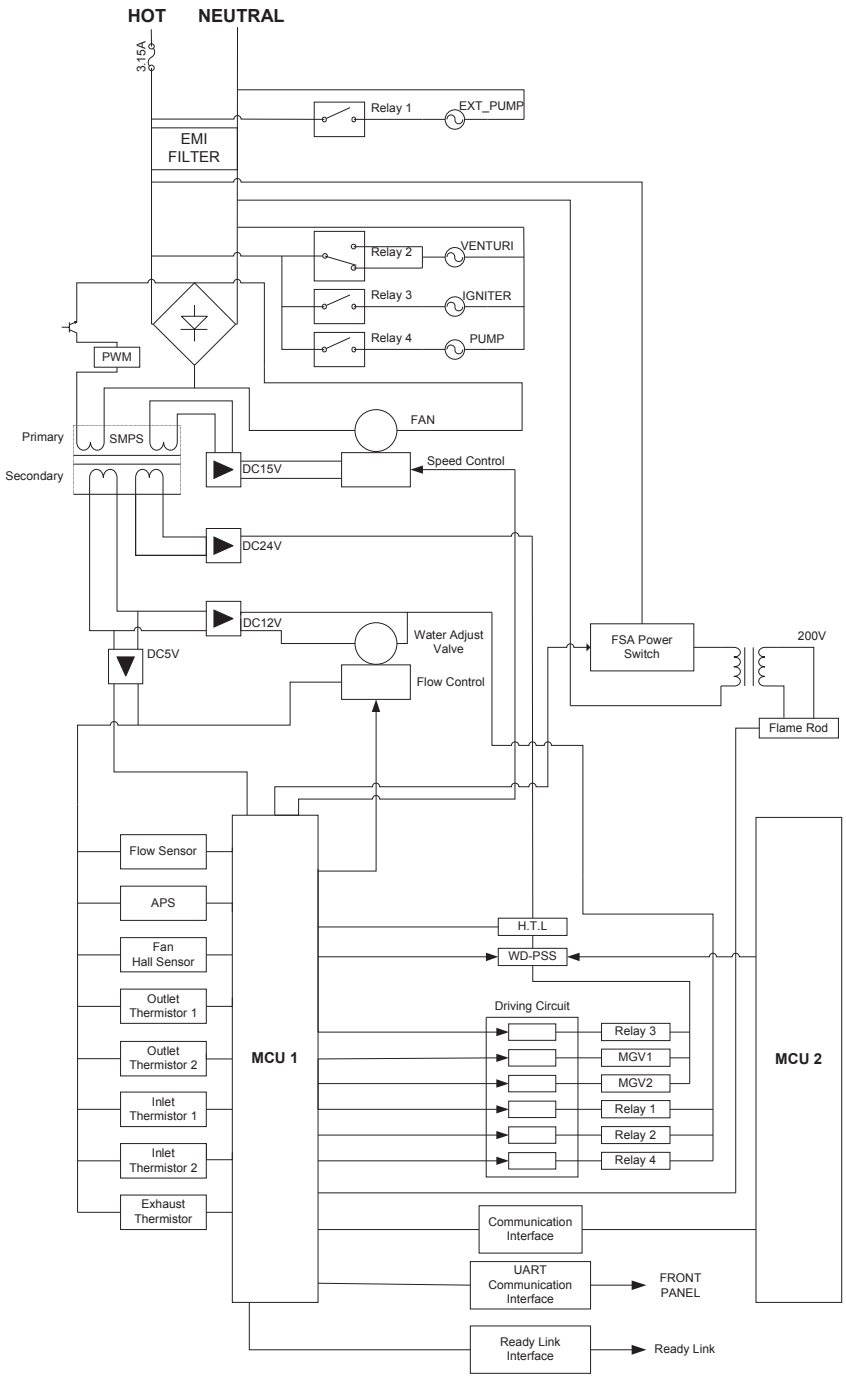


GF 200 -- Air flow settings								
LEDs				Stage 2	Yc Cut-off		Stage 1	Yc Cut-off		Circulation
1	2	3	4	(Y2)	Y2 Start	Y2 Max	(Y1)	Y1 Start	Y1 Max	(G)
On: ¤ | Off: ○				(cfm)	(RPM)	(RPM)	(cfm)	(RPM)	(RPM)	(cfm)
○	○	○	○	700	664	1258	490	458	1241	350
○	○	○	¤	750	683	1263	525	473	1244	375
○	○	¤	○	800	702	1267	560	489	1247	400
○	○	¤	¤	850	721	1271	595	504	1250	425
○	¤	○	○	900	740	1275	630	520	1253	450
○	¤	○	¤	950	759	1279	665	536	1255	475
○	¤	¤	○	1000	778	1283	700	551	1258	500
○	¤	¤	¤	1050	797	1288	735	567	1261	525
¤	○	○	○	1100	816	1292	770	582	1264	550
¤	○	○	¤	1150	834	1296	805	598	1267	575
¤	○	¤	○	1200	853	1300	840	613	1270	600
¤	○	¤	¤	1250	872	1304	875	629	1273	625
¤	¤	○	○	1300	891	1308	910	644	1276	650
¤	¤	○	¤	1350	910	1313	945	660	1279	675
¤	¤	¤	○	1400	929	1317	980	676	1282	700
¤	¤	¤	¤	1450	948	1321	1015	691	1285	725

4.2 Wiring Diagram (GF 200 + NPE-240A)



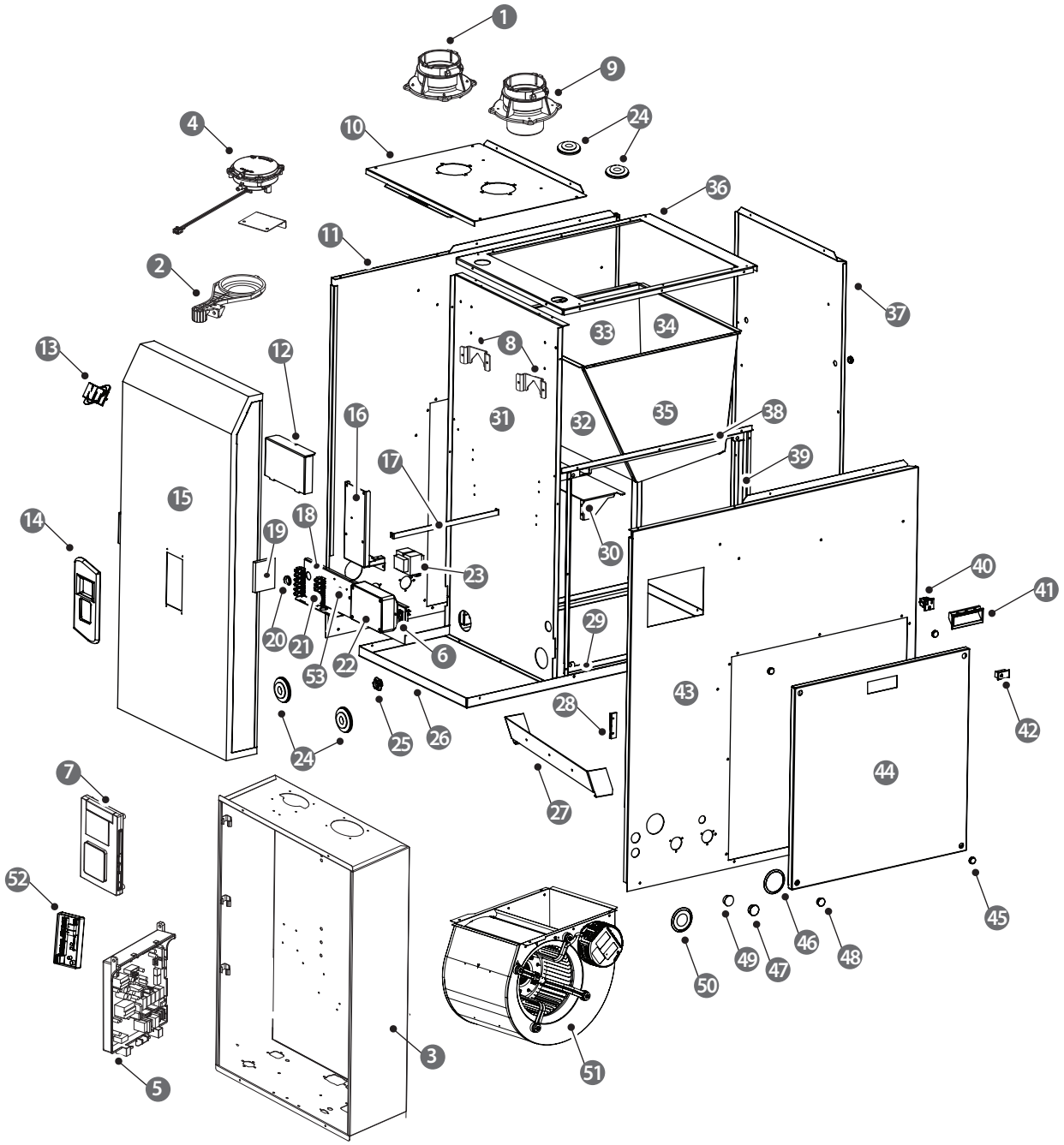
4.3 Ladder Diagram



GF 200

4.4 Component Assembly Diagrams and Parts Lists

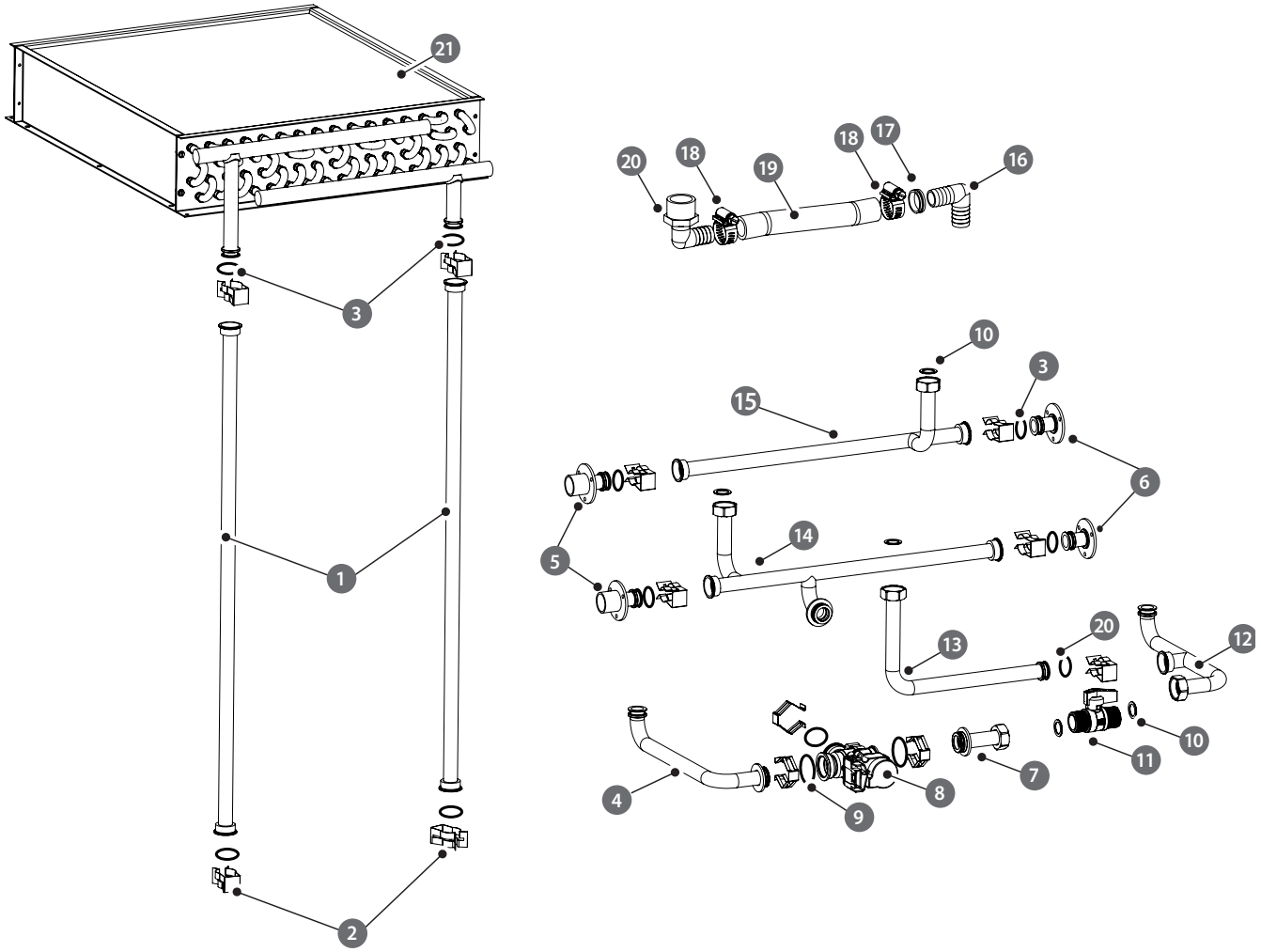
4.4.1 Case Assembly



#	Description	Part #
1	Intake Air Duct Assembly	30008662B
2	Intake Air Filter	20007667A
3	Case	20019078C
4	Air Pressure Sensor	30010346A
5	PCB	30011969A
6	Power Switch	30009482A
7	Front Panel	30008333A
8	Case Bracket	20007609A
9	Exhaust Pipe Assembly	30008673A
10	Top Panel	TBD
11	Left Side	TBD
12	Electrical Cover	TBD
13	Logo	81613
14	Display Bezel	85565
15	Front Cover	TBD
16	Screen Mount	TBD
17	Screen Support Bracket	TBD
18	Electrical Panel	TBD
19	Door Latch	TBD
20	Grommet, Ring	85205
21	Barrier Strip	85556
22	Fan Controller	85566
23	Transformer	83190
24	Grommet, 0.75" ID	85559
25	Grommet, 1.25"OD Slit	85254
26	Bottom	TBD
27	Blower Mount Bracket	TBD
28	Door Latch Keeper	TBD

#	Description	Part #
29	Bottom Door Rail	TBD
30	Blower Shelf	TBD
31	Spine	TBD
32	Hopper, Front	TBD
33	Hopper, Left	TBD
34	Hopper, Back	TBD
35	Hopper, Right	TBD
36	Coil Mount	TBD
37	Back	TBD
38	Top Door Rail Right	TBD
	Top Door Rail Left	TBD
39	Side Door Rail	TBD
40	Receptacle, 120V	84423
41	Handle	81622
42	Door Safety Switch	83208
43	Right Side	TBD
44	Side Door	TBD
45	Grommet, Diaphragm 0.5"	84214
46	Cap, 2"	85564
47	Cap, 1"	85563
48	Cap, 0.75"	85562
49	Plug, 0.875"	84095
50	Grommet, 1"ID	83923
51	Fan	85546
52	H2Air Controller	85535
53	Fuse Holder	84192

4.4.2 Waterway Assembly



#	Description	Part #
1	AHU Extension, 18mm	85246
2	Pipe Clip, 18mm	85371
3	O-Ring, 18mm	85369
4	AHU Inlet, 18mm	85244
5	Brass Conn. Adapter	85372
6	Brass Plug Adapter	85523
7	Pipe, Valve to Valve, 18mm	85524
8	3-Way Valve, 18mm	85376
9	3-Way Valve O-Ring	85374
10	Compression Gasket	82368
11	Ball Valve, Brass	85541
12	Bypass Loop, 18mm	85373
13	Bypass Inlet. 18mm	85249
14	Dual Outlet, 18mm	85248
15	Dual Inlet, 18mm	85247
16	Barb Elbow, 90, 5/8"	85561
17	Ring Grommet, 3/4"	85205
18	Hose Clamp	83135
19	Vinyl Tubing, 5/8"	83044
20	1/2" Thread - 5/8" Barb Elbow, 90	85560
21	Coil	85388

4.5 Installation Check list

After installing the appliance, review the following checklist. You should be able to answer "Yes" to all of the items in the checklist. If not, review the appropriate sections to complete the installation. If you have additional questions or need assistance with installation, contact Technical Support at 1-800-688-2575.

Water Heater Checklist	Yes	No
Have you completed the Installation Checklist in the Water Heater Installation Manual?		

The following check list is intended to supplement those found in the water heater manual, and focuses on installation details specific to the overall appliance.

Venting the Water Heater	Yes	No
Have you vented the water heater using the correct temperature rated materials for the maximum space heating setpoint?		

Connecting the Power Supply	Yes	No
Is the supplied voltage 110-120 V AC?		
Have you installed a power switch to facilitate end-user maintenance?		
Have you checked the polarity of the electrical connection?		

Setting the DIP Switches	Yes	No
Have you verified the positions of all DIP switches on the interface board?		
Have you verified the positions of all DIP switches on the front panel?		

Ducting the Appliance	Yes	No
Have you set the appropriate cooling flow rate for the installation?		
Have you installed a return air filtration system?		

Operating the Appliance	Yes	No
Have you given both Installation Manuals and the water heater Operations Manual to the owner for future reference?		
Have you shown the owner how to clean/replace the return air filter?		

Plumbing the Appliance	Yes	No
Have you installed a thermostatic mixing valve on the appliance hot water outlet?		

NOTES

NOTES

NOTES

Installation Manual
GF 200

Getting Service

If your appliance requires service, you have several options for getting service:

- Contact Technical Support at 1-800-688-2575 or on the website: www.NTIBoilers.com.
- For warranty service, always contact Technical Support first.
- Contact the technician or professional who installed your water heater.
- Contact a licensed professional for the affected system (for example, a plumber or electrician).

When you contact Technical Support, please have the following information at hand:

- Model number
- Serial number
- Date purchased
- Installation location and type
- Error code, if any appears on the front panel display

NTI Boilers
1-800-688-2575 www.NTIBoilers.com
30 Stonegate Drive, Saint John, NB, E2H 0A4

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