

STEP 1 - BEFORE INSTALLING

**Read both the GF200 and NPE-240A Installation manuals before installing.**

This product must be installed and serviced by a licensed plumber, a licensed gas fitter, or a professional service technician. NTI is not liable for any damages or defects resulting from improper installation.

When applicable, the installation must conform with Manufactured Home Construction and Safety Standards, Title 24 CFR, Part 3280 and/or CAN/CSA Z240 MH Series, Mobile Homes.

**WARNING**

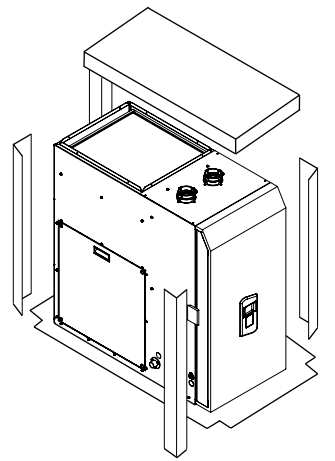
Follow all local codes and/or the most recent edition of the National Fuel Gas Code (ANSI Z223.1/NFPA 54) in the USA, or the Natural Gas and Propane Installation Code in Canada (CAN/CGA B149.1).

**Safety**

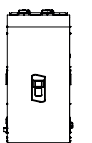


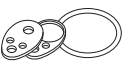

DO NOT install in areas with excessively high humidity or poor air quality (dust, particulate matter, etc.)

STEP 2 - INSTALLING

1 Unpacking



When you unpack the GF200, you will find the following items inside the appliance. Check for each of the following items before installing the appliance.

 <b>GF200</b>	 <b>Spare Parts Kit</b> Located on interior right side of cabinet (near heat exchanger).
 <b>Installation Kit Box</b> See sub-step: <b>6 Plumbing</b>	 <b>LP Conversion Kit</b> Located on interior left side of cabinet (near buffer tank).
 <b>Manual Packet</b>	

2 Location Requirements

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

Minimum clearance:	Clearance to combustibles	Recommended service clearances
Top	9 in	as required
Back	0	0
Front	0*	0 (or as required)*
Side (w/o connections)	0	as required
Side (w/ connections)	0	as required
Side (Blower access)	0	24 in
Bottom	0	0

\* No clearance required to front of unit if obstruction is removable (such as a door or access panel). 24 inch clearance if obstruction is permanent.

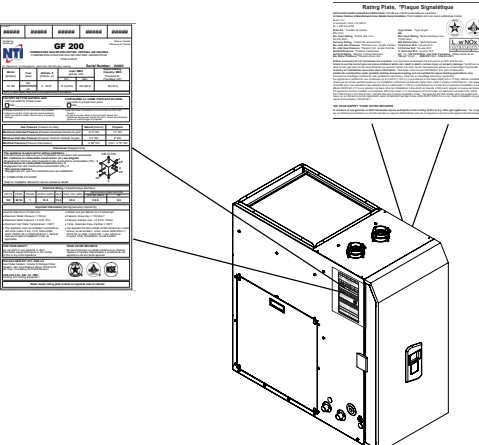
NOTE: The service clearances are recommendations.

If you are unable to maintain those specific clearances, be sure you have an alternative plan as to how you are going to service the unit.

When locating the appliance prior to completing the ductwork and plumbing, it is essential that sufficient space be allotted for the installation and maintenance of components such as:

- Flow switch
- Thermostatic Mixing Valve (TMV)
- Pressure Relief Valve (PRV)
- Shut off and drain valves
- Expansion tank (optional)
- Condensate drain (and optional pump)
- Return air filter
- Circulating blower

3 Checking the Rating Plate



**WARNING**

The GF200 is configured for Natural Gas from the factory. If conversion to Propane Gas is required, the conversion kit supplied with the water heater must be used.

**WARNING**

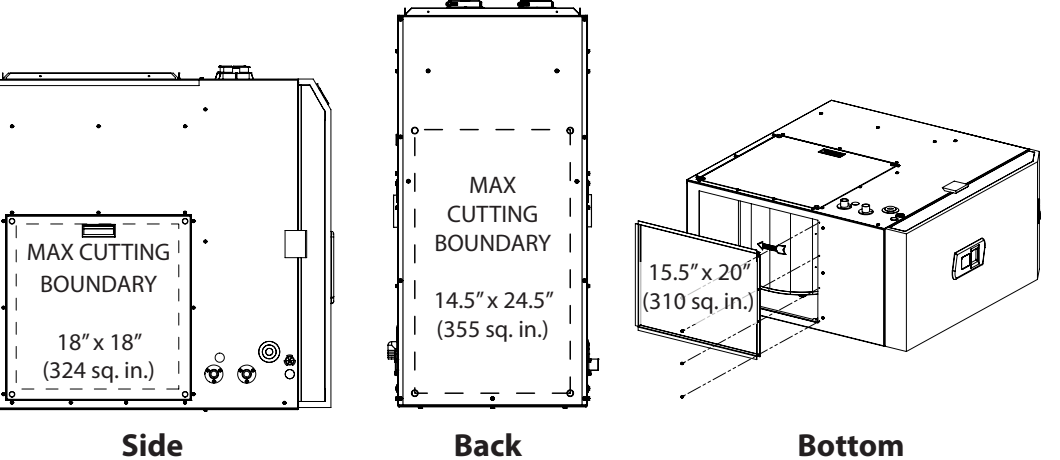
- Before connecting the gas supply, determine the gas type and pressure for the water heater by referring to the rating plate. Use only the same gas type indicated on the rating plate. Using a different gas type will result in abnormal combustion and malfunction of the water heater. Gas supplies should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

NTI is not liable for any property damage and/or personal injury resulting from improper conversions.

4 Return Air Ducting

The return air may be delivered to the appliance via:

- a) either side;
- b) the back;
- c) the bottom; or
- d) any combination thereof, provided, in all cases, that access to at least one side door remains clear (24" min.) for blower access and maintenance.



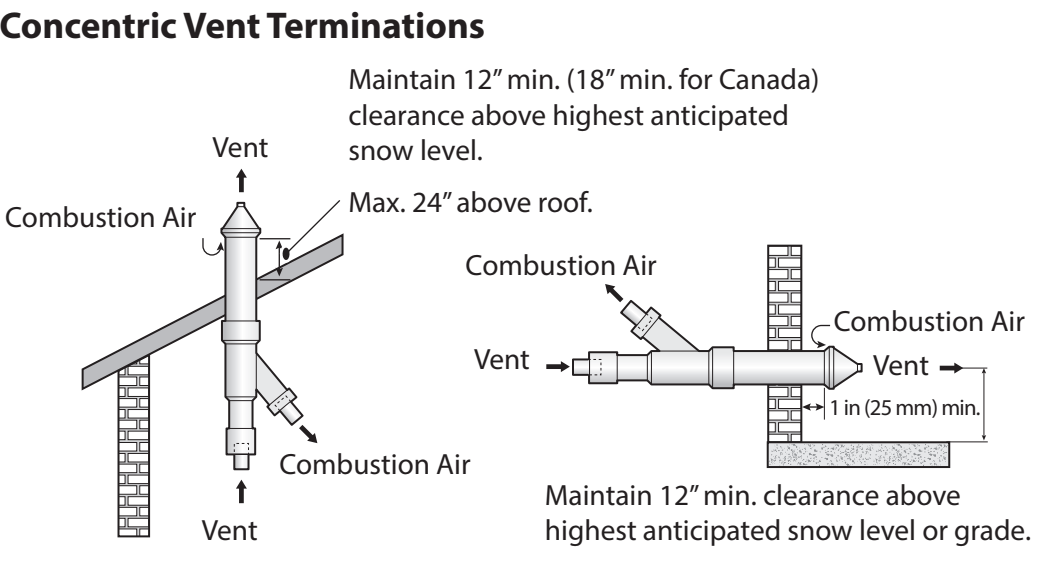
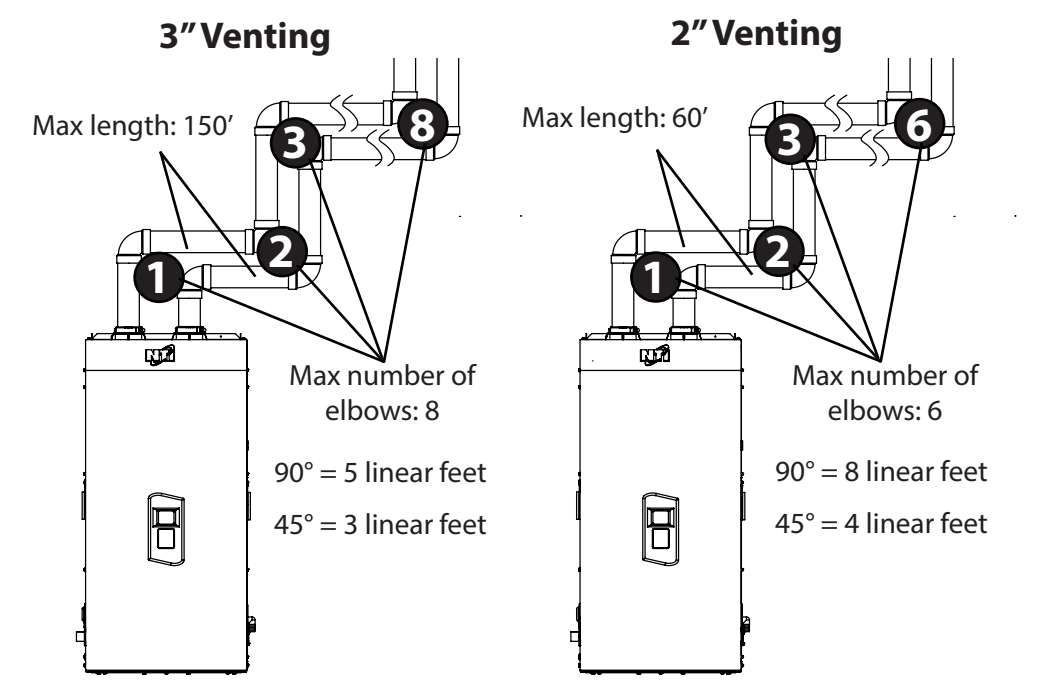
NOTE: For details and recommendations on side, back or bottom return ducting see GF200 Installation Manual.

**WARNING**

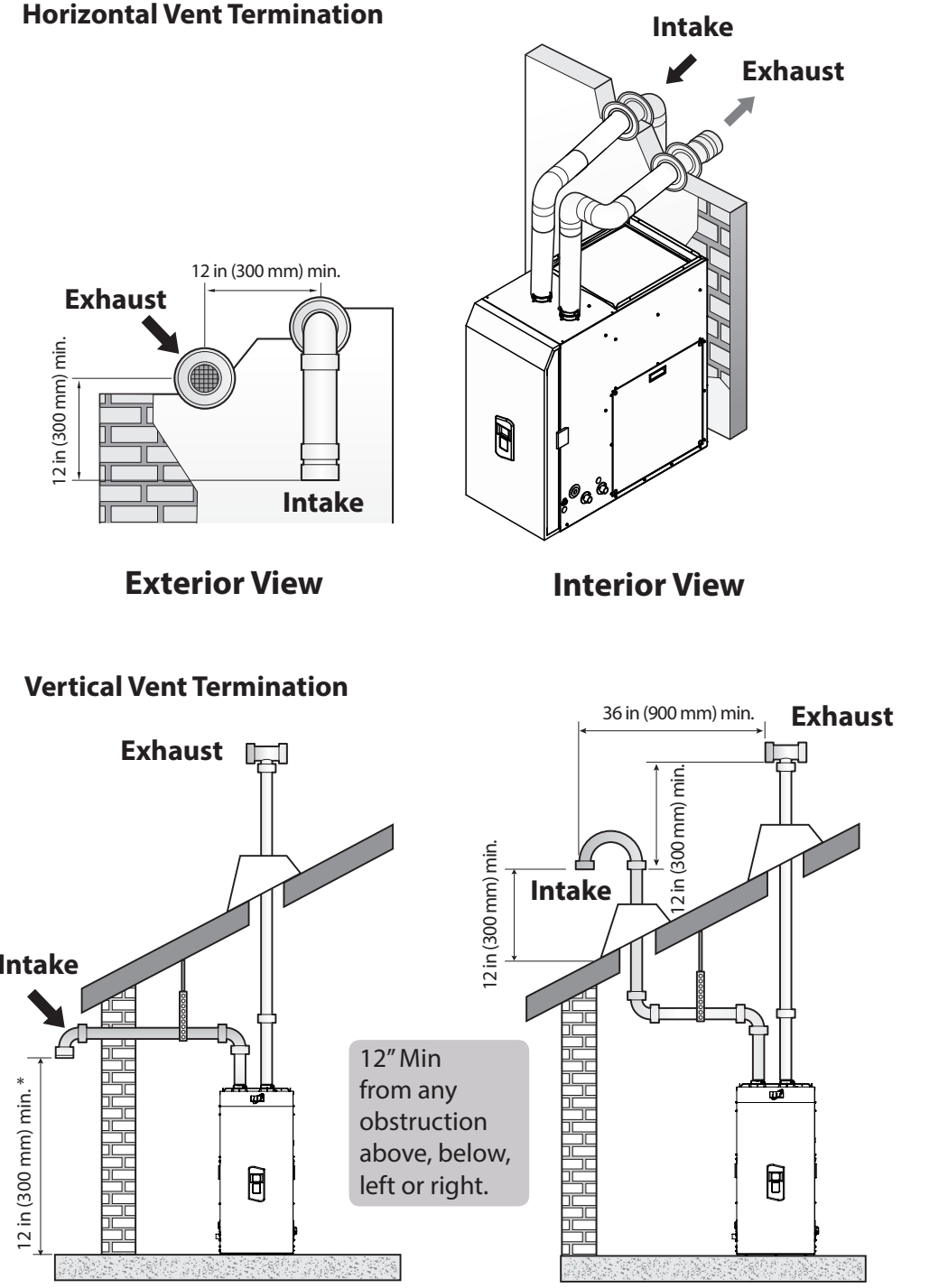
In all installations, an appropriate air filtration system is recommended and must meet test requirements in UL 900. Failure to install and properly maintain such a system could lead to damage to and/or premature failure of the space heating components.

In all cases, care must be taken to ensure that return ducting is sealed against the inlet, such that the entire air stream is directed through the air filter. Failure to do so could cause damage to the air moving equipment and clogging of the heating and/or cooling coils.

5 Venting



Vent Termination Options



**Exhaust Vent Materials**

From factory, the GF200 operates at water temperatures exceeding 150°F, resulting in the potential for exhaust temperatures to exceed 149°F.

As such, high-temperature vent pipe material (CPVC or polypropylene; see table below) **must** be used for the first 3 feet (2" venting) or 0.5 feet (3" venting).

If such materials are unavailable, see the Venting section of the GF200 manual for instructions on how to limit the maximum water temperature set point.

Venting requirements differ in the US and Canada. Consult the following chart or the most recent edition of ANSI Z223.1/NFPA 54 or CAN/CGA B149.1, as well as all applicable local codes and regulations when selecting vent pipe materials. Do not use cellular core PVC (ASTM F891), cellular core CPVC, or Radel® (polyphenolsulfone) for the exhaust vent.

Locale	Recommended Vent Materials
USA	• PVC Schedule 40 (Solid core) • CPVC Schedule 40 or 80 (Solid core) • Approved Polypropylene*
Canada**	• Type BH Special Gas Vent Class IIA (PVC) • Type BH Special Gas Vent Class IIB (CPVC) • Type BH Special Gas Class IIC (Polypropylene)

\* Approved polypropylene systems include: Duravent Polypro (Single Wall): 2PPS-xxx (2in), 3PPS-xxx (3 in) / Centrotherm InnoFlue SW: ISxx02xx (2 in), ISxx03xx (3 in) / Centrotherm InnoFlue Flex: IFVL02XXX (2 in). Refer to the manufacturer's literature for detailed information.

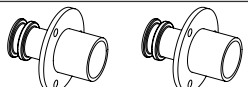

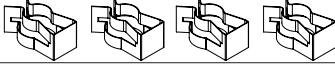


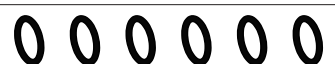




\*\* For installation in Canada, field-supplied plastic vent piping must comply with CAN/CGA B149.1 (latest edition) and be certified to the Standard. For Type BH Gas Venting Systems, ULC-S636. Components of this listed system must not be interchanged with other vent systems or unlisted pipes or fittings. All plastic components and specified primers and glues of the certified vent system must be from a single system manufacturer and must not be intermixed with another system manufacturer's parts. The supplied vent connector and vent termination are certified as part of the water heater.

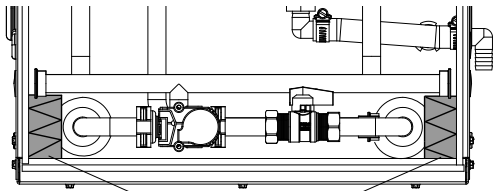


### 6 Plumbing

A kit box containing the necessary plumbing connections is shipped inside the front cover.

- 1
- Remove the kit box before installation.

	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
	Jumper	85742	1



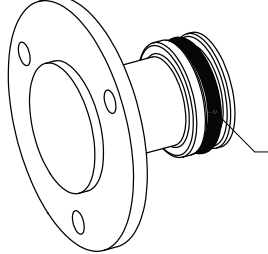
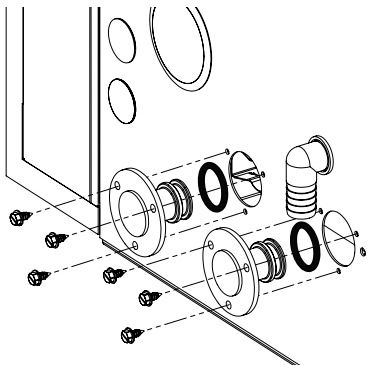
This appliance is shipped with cardboard inserts on the inside to support the plumbing during shipping. Remove cardboard prior to installation.

2

- 3
- Determine which side of the appliance the gas, inlet water, and outlet water connections will be made on.  
A) Left side connections  
B) Right side connections  
C) Both - One (or more) on each side

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

- 4
- Install the plug adapters in the unused inlet and outlet connections.

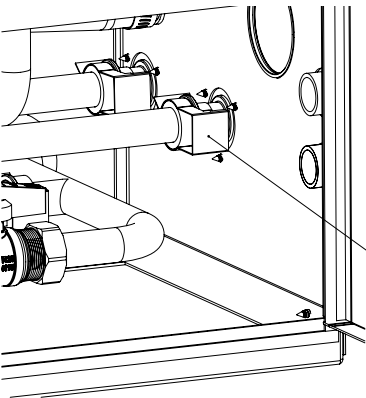


ATTACH O-RING  
PN: 85369

**NOTE:** wet the outer surface of the O-ring for easier insertion.

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).

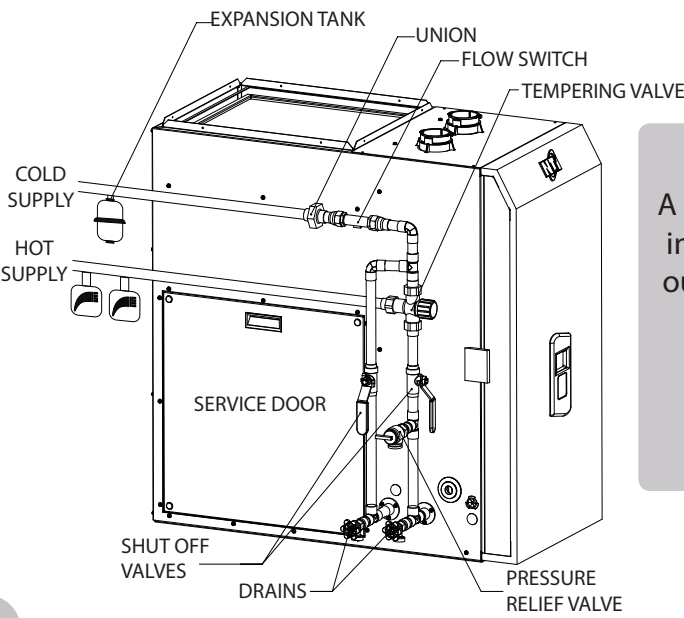
**REMEMBER TO ATTACH O-RING BEFORE SECURING.**



ATTACH PIPE CLIPS  
PN: 85371

5

### Typical near-appliance plumbing layout



A tempering valve must be installed on the hot water outlet to prevent scalding.

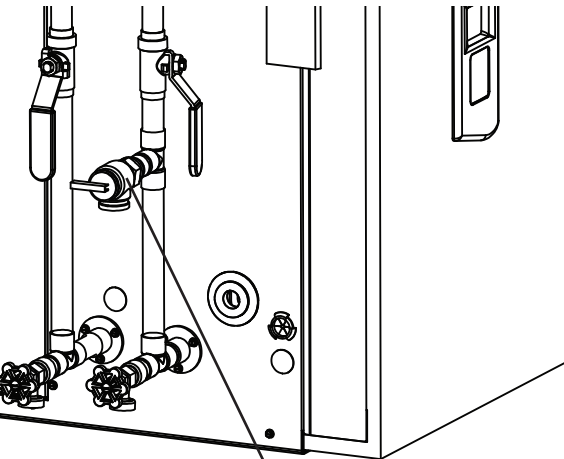
Do not block service door

6

Dry-fit the open brass connections (w/ O-rings removed, but w/ screws and clips in place) and solder nearby connections. Install the O-rings and re-insert the fittings, fastening with clips and screws (x 3).

Take care not to damage the O-rings with excessive heat.

**DO NOT** install O-ring before soldering



**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.

7

To complete the installation of the appliance, you must install an approved <sup>3</sup>/<sub>4</sub> in, maximum 150 PSI pressure relief valve (PRV) on the hot water outlet.

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

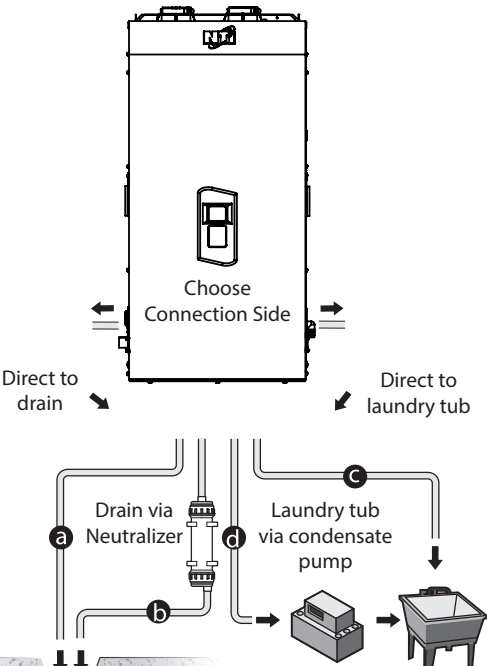
### 7 Connection the condensate drain

This appliance is shipped from factory with a condensate drain pre-installed on the right side. To switch sides, refer to the GF200 Installation Manual.

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

- a.
- Direct to drain
- b.
- Drain via neutralizer
- c.
- Direct to laundry tub
- d.
- Laundry tub via condensate pump

Do not use metal pipe for draining condensate



### To connect the condensate drain:

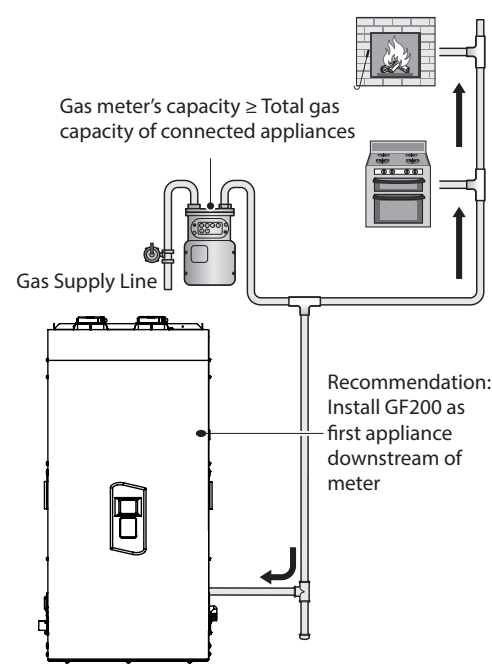
1.
- Connect a drain line to the <sup>5</sup>/<sub>8</sub> in barbed fitting at the side of the appliance. Secure with hose clamp. Use only corrosion-resistant material for the drain line, such as PVC or CPVC. Do not reduce the size of this fitting or the drain line to less than <sup>1</sup>/<sub>2</sub> 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 <sup>1</sup>/<sub>4</sub> in per foot.

### 8 Gas Connection

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

#### NOTE:

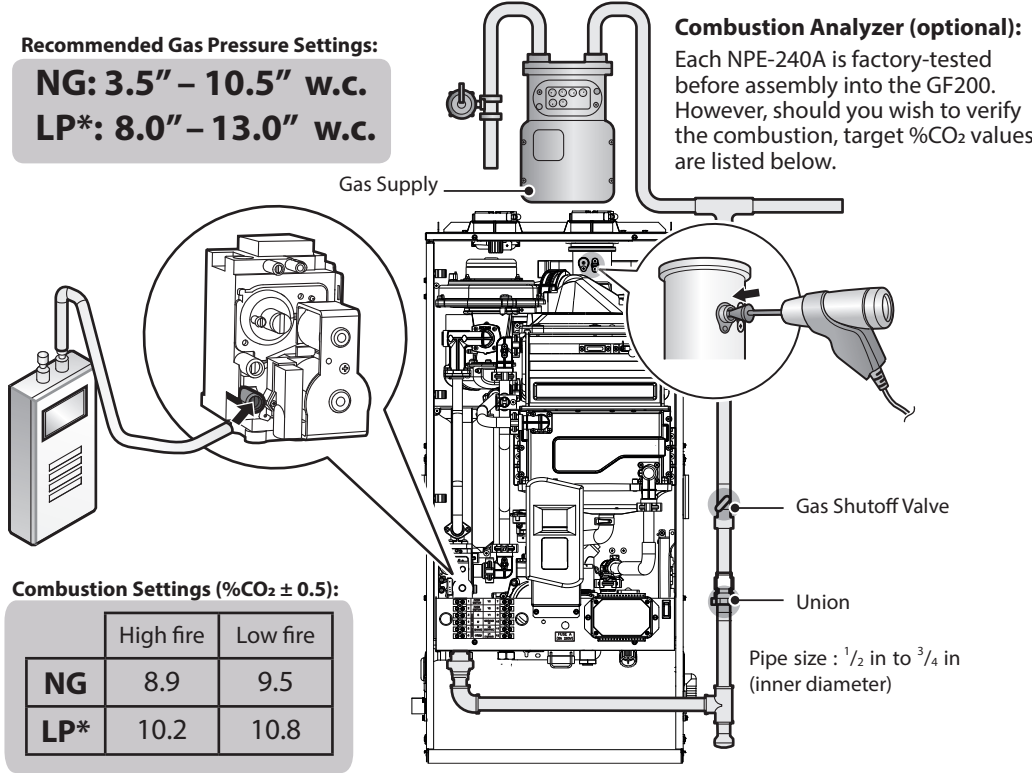
- Tighten the appliance connection valves with care to avoid damage.
- It is recommended that a union be installed on the gas supply line close to the appliance, to facilitate any future maintenance or service.
- Gas connection is possible from both sides. A union inside the cabinet will help improve access to plumbing and filters when routing gas line from right side.



### 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. For detailed instructions to measure the inlet gas pressure, see relevant section in the water heater installation manual (supplied).
3.
- Determine the proper size and type for the gas line. Purge the gas line of any debris.
4.
- Install full port valves on the gas supply line and appliance.
5.
- Connect the gas supply line. Test it, all connection points, and the GF200 for gas leaks.
6.
- Shut off manual gas valve and run a hot water faucet (until the water heater shuts off due to lack of fuel) to purge the gas line.
7.
- Re-open the manual gas valve and open several high flow rate fixtures to ramp the water heater up to its maximum firing rate.
8.
- Check the inlet gas pressure reading on the manometer as shown below.
9.
- If readings are out of range: adjust the inlet gas pressure regulator.

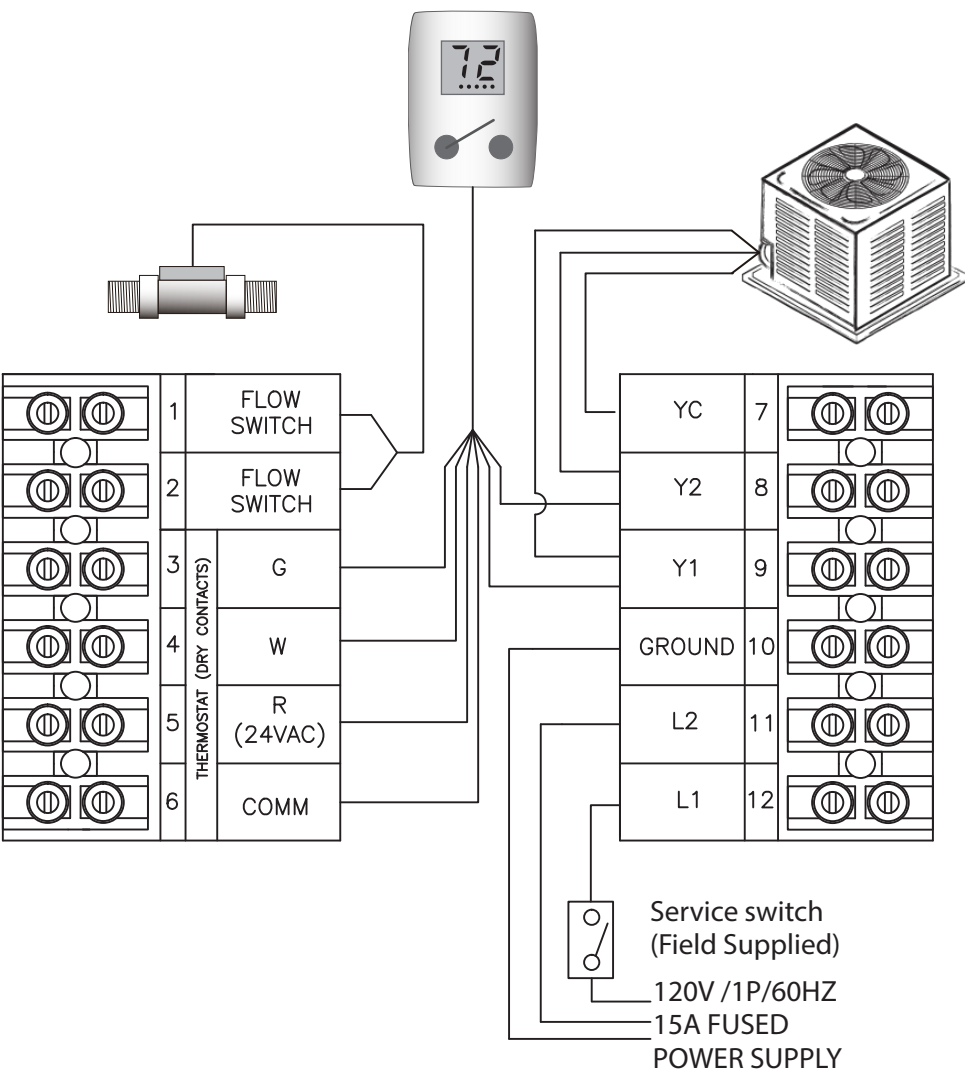
**Recommended Gas Pressure Settings:**  
**NG: 3.5" – 10.5" w.c.**  
**LP\*: 8.0" – 13.0" w.c.**



	High fire	Low fire
NG	8.9	9.5
LP*	10.2	10.8

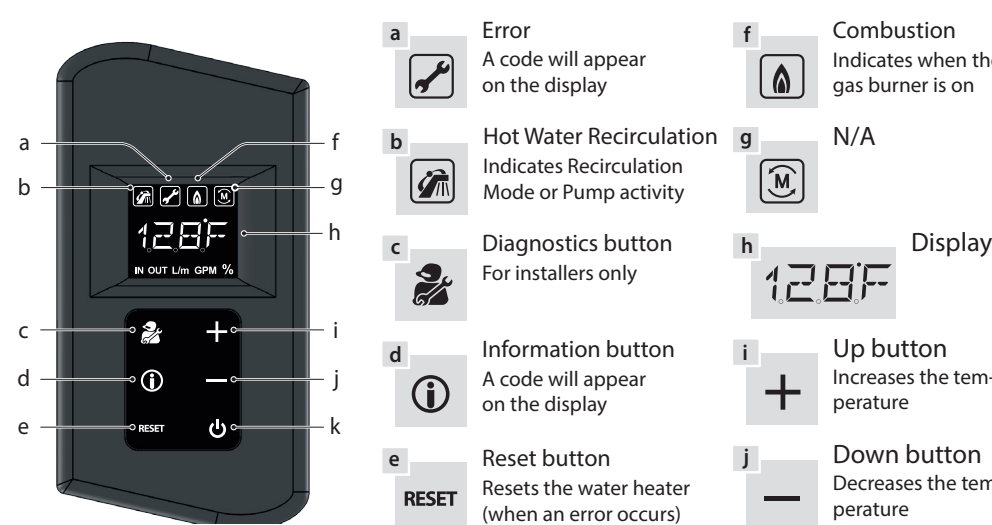
**\*WARNING:** If the GF200 is connected to Liquefied Propane Gas (LP), it **MUST** be converted using the LP Conversion Kit located inside the cabinet. Failure to do so could cause severe injury or death.

### 9 Wiring



Input	Description
FLOW SWITCH	FLOW SWITCH: Connect the two leads from the external flow switch here (one per terminal). Note: The 'hot' lead only becomes energized (from the H <sub>2</sub> Air board) when Central Heating mode (W) is active. Switch closes at approx. 0.5 US gpm.
W	HEAT: Connect heating wire from thermostat here.
G	VENTILATION: Connect continuous ventilation / circulation wire from thermostat here.
R	24 V AC OUTPUT: Connect power input wire from thermostat here.
C	COMMON: Connect common wire from thermostat here.
YC	COMPRESSOR COMMON: Connect common wire from Outdoor A/C Unit control here. This is the GF200 FREEZE PROTECTION – it <b>must</b> be connected.
Y2	COOLING (2 <sup>nd</sup> Stage): Connect second stage cooling wire from thermostat here (see Appendix 4.1 for cfm table).
Y1	COOLING (1 <sup>st</sup> Stage): Connect first stage cooling wire from thermostat here (see Appendix 4.1 for cfm table).
GROUND	GROUND: Connect earth ground wire here.
L2	NEUTRAL: Connect the neutral wire for the power supply here
L1	LINE: Connect the line voltage wire for the power supply here

### 10 Front Panel



**NOTE:** Master power switch located behind the front cover on right-hand side of wiring panel it must be ON to operate NPE-240A.