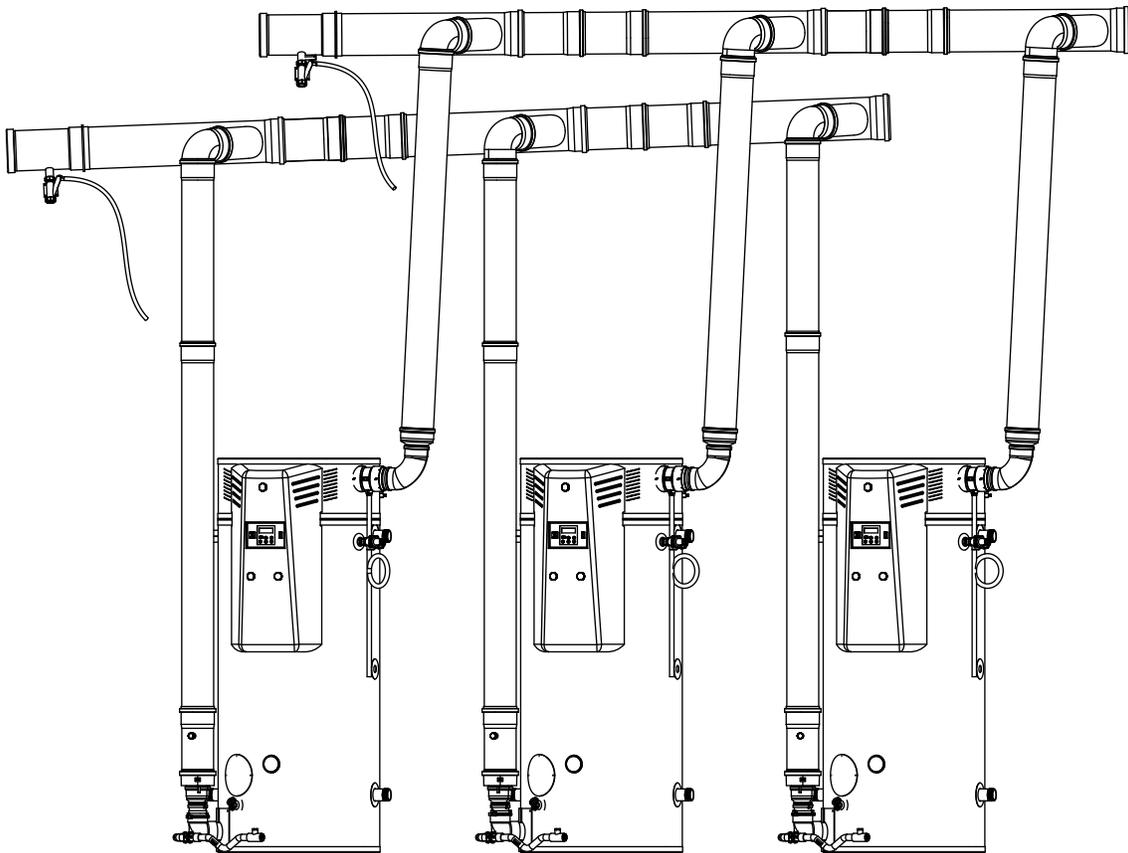


# Common Vent Kit Installation Manual for Commercial Models 120-400 & 120-500



## ⚠ WARNING

Read and understand the instruction manual and safety messages before installing, operating, or servicing the water heater.



As required by the state of California Proposition 65.

For your family's comfort, safety, and convenience we recommend this water heater be installed and serviced by a plumbing professional.

238-56699-00A REV 02/26

The proper installation, use and servicing of this water heater is very important to your safety and the safety of others.



This is the safety alert symbol. It is used to bring attention to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

**⚠ DANGER**

Indicates an immediately hazardous situation which, if not avoided, **WILL** result in death or injury.

**⚠ WARNING**

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

**⚠ CAUTION**

Indicates a potentially hazardous situation which, if not avoided, **COULD** result in moderate to minor injury.

**IMPORTANT**

Indicates a potentially hazardous situation which, if not avoided, **COULD** result in damage to property.

**⚠ DANGER**

Failure to properly install the vent and combustion air intake system, especially regarding proper installation of the Non-Return Valve, can result in unsafe operation of the water heater. To avoid the risk of fire, explosion, or asphyxiation from carbon monoxide, never operate this water heater unless it is properly vented and has adequate air supply for combustion. Be sure to inspect the system for proper installation at initial start-up; and at least annually thereafter. See the Maintenance section for more information.

**IMPORTANT**

**DO NOT** use this Common Vent Kit to combine the vents of water heaters outside of the model family 120-400 or 120-500. Using this Common Vent Kit to combine the vents of water heaters with a rated input greater than 500,000 BTU/Hr may result in excess pressures in the common vent.

**IMPORTANT**

**DO NOT** use this Common Vent Kit to combine the vents of more than three water heaters in the model family 120-400 or 120-500. Failure to comply with this requirement may result in excess pressures in the common vent.

**IMPORTANT**

**DO NOT** use this Common Vent Kit to combine the vents of water heaters which use different fuel types.

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# I. Introduction

The Common Vent Kit can be used to direct vent up to three appliances in the model category 120-400/500 provided they use the same fuel type and are not high-altitude versions. This document describes two heater and three heater direct vent kits.

These kits are intended to combine the intake and exhaust vents of two or three water heaters with the maximum input rates between 400,000 and 500,000 BTU/hr for the purpose of reducing the number of wall terminations required.

Combining heaters which have different input rates is permissible, but it is not permissible to combine fuel types in a common vent system. For example, it is permissible to combine the vents of an 120-400(N), and 120-500(N) because they all use the same fuel type, but it is not permissible to combine the vents of an 120-400(X), and 120-500(N) because they don't all share the same fuel type.

This manual was supplied with the Common Vent Kit in an adhesive backed sleeve. Once installation is complete, remove the paper adhesive cover and attach the sleeve with this manual inside to one of the water heaters underneath the standard installation manual sleeve.

# II. Supplemental Information

This installation manual supplements the standard installation manual provided with each water heater. The installation of a water heater with a Polypropylene Common Vent Kit must satisfy all the requirements in the standard installation manual and the requirements in this document. Additionally, installation of these kits shall comply with all local codes. In the absence of local codes, refer to the latest edition of NFPA 54/ANSI Z223.1 or CSA B149. It is permissible to switch to a different approved vent material after the manifold is constructed with the supplied polypropylene components given the installation complies with applicable codes.

# III. Overview

The Common Vent Kits include all necessary parts to properly connect the vents of two or three heaters and begin the common vent. These parts make up the vent sections called connectors and headers.

## Definitions

- **Common vent:** The section of intake/exhaust vent which carries combustion air/flue gasses of multiple water heaters from/to outside. This section does not include the Header section of the vent, is made up entirely of 8" vent pipes and fittings and is unique to each installation.
- **Header:** The horizontal section of intake/exhaust vent which distributes/collects combustion air/ flue gasses to/from the water heaters. This section is primarily made up of branch tees and optional spacers and is nominally 8" in diameter.
- **Connector:** The vertical section of intake/exhaust vent which connects a water heater to a header. This section is made up of several adapting fittings and a vertical section of 6" pipe which dictates how high the header is.
- **Manifold:** The section of intake/exhaust vent made up of the connectors and the header.

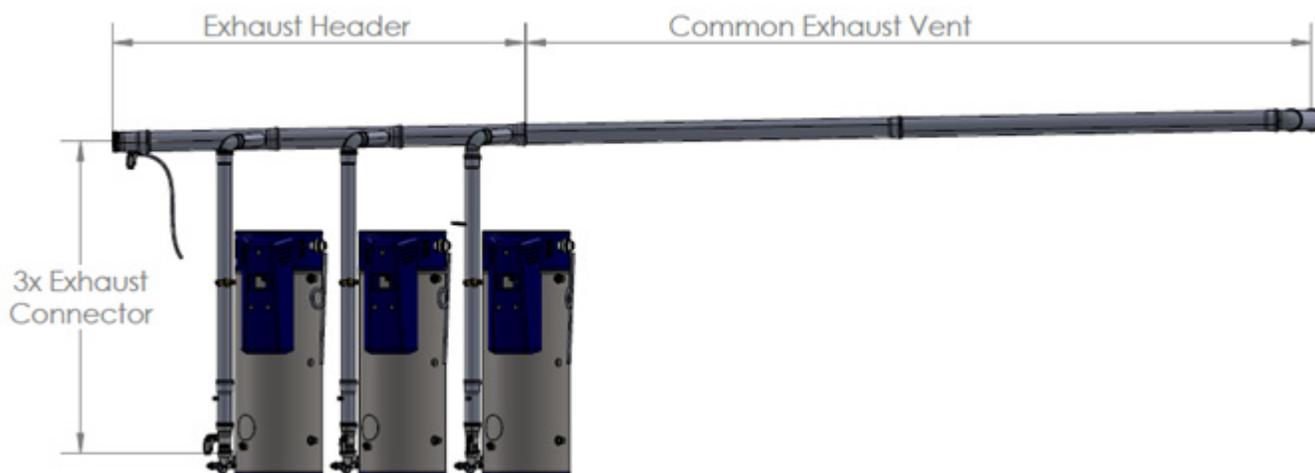


Fig. 1

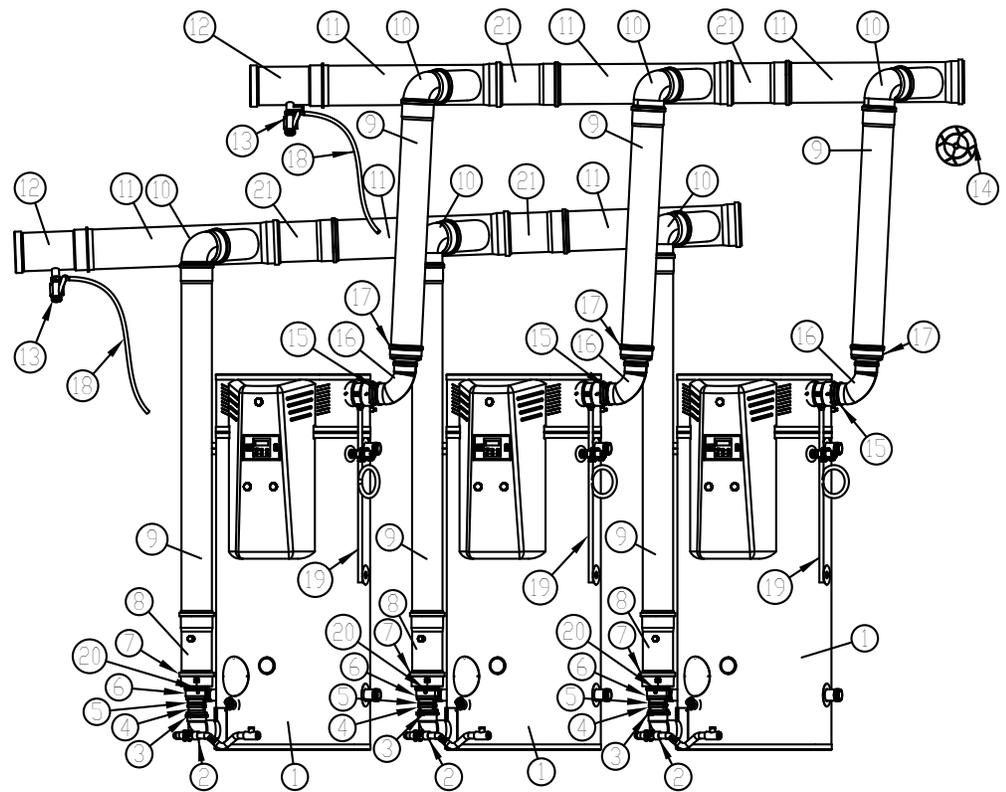
Connector, Header, Common Vent, Manifold Diagram

## Overview continued

### Configurations

There are two configurations for proper installation of the Common Vent Kit which allow you to configure two or three heaters. Standard heater spacing is 48" apart (center to center). If additional clearance is needed, an additional spacer piece must be purchased separately and inserted between the branch tees for each heater.

ITEM	DESCRIPTION	QTY.
1	120-(400,500)	3
2	Condensate Assembly running trap.	3
3	3" Flue Clamp PVC to PP	3
4	PVC-PP Adapter 3"	3
5	3" Locking Clamp Ring	3
6	3"-4" Polypropylene Centric Increaser	3
7	NRV PP, 4in-6in internal condensate drain	3
8	6" Test Port-Polypropylene	3
9	6" Vent Length Polypropylene 6ft Long	6
10	Elbow, 87 degree, polypropylene	6
11	Branch Tee 8inX6inX36in	6
12	Horizontal Drain Fitting 8in	2
13	John Ball Valve Condensate Trap	2
14	Bird screen for 8" Polypropylene Termination	1
15	Adapter, Pvc to PP, 4in	3
16	4" X 90° Elbow-Polypropylene	3
17	Increaser, PP, 4in to 6in	3
18	Common Vent Drain Line (Field Supplied)	2
19	Intake Drain Line (Field Supplied)	3
20	4" Locking Clamp Ring	3
21	Polypropylene Vent Pipe, 8" Dia x 1' Length	4



Item (14) only required for polypropylene intake terminations. Intake terminations must be field supplied for PVC common vents.

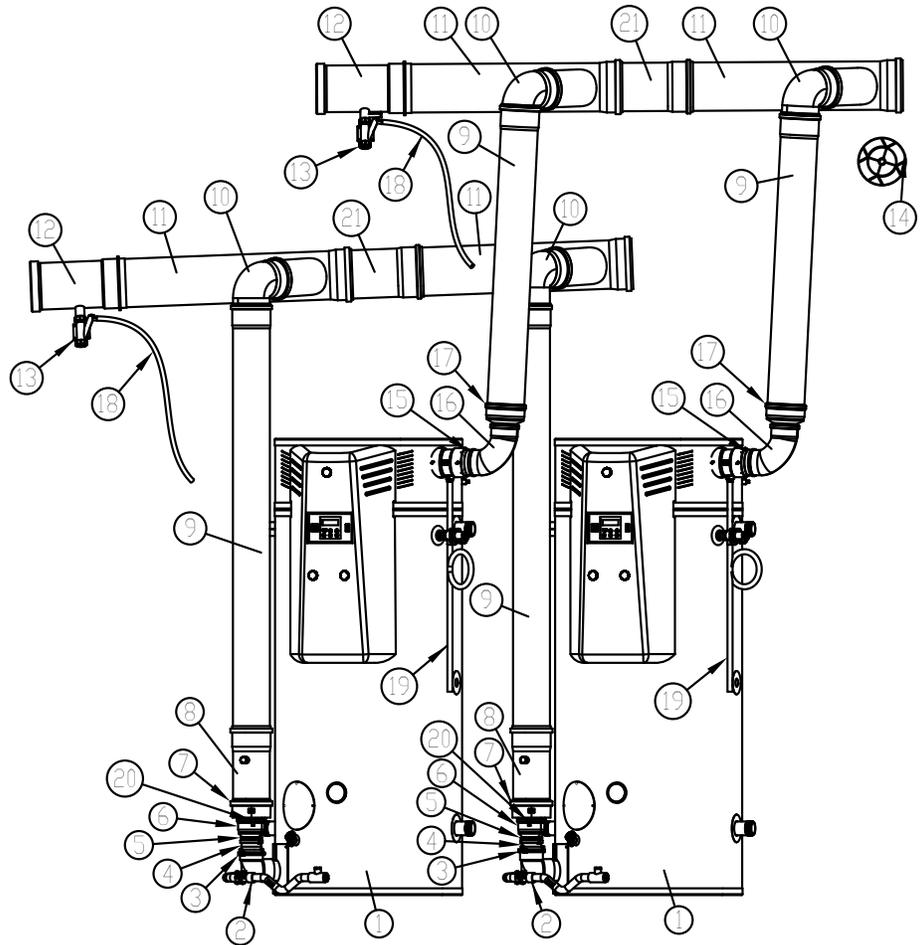
**Fig. 2**

### Common Vent Kit Assembly, 3 Heater Configuration

## Overview continued

ITEM	DESCRIPTION	QTY.
1	120-(400,500)	2
2	Condensate Assembly running trap.	2
3	3" Flue Clamp PVC to PP	2
4	PVC-PP Adapter 3"	2
5	3" Locking Clamp Ring	2
6	3"-4" Polypropylene Centric Increaser	2
7	NRV PP, 4in-6in internal condensate drain	2
8	6" Test Port-Polypropylene	2
9	6" Vent Length Polypropylene 6ft Long	4
10	Elbow, 87 degree, polypropylene	4
11	Branch Tee 8inX6inX36in	4
12	Horizontal Drain Fitting 8in	2
13	John Ball Valve Condensate Trap	2
14	Bird screen for 8" Polypropylene Termination	1
15	Adapter, Pvc to PP, 4in	2
16	4" X 90° Elbow-Polypropylene	2
17	Increaser, PP, 4in to 6in	2
18	Common Vent Drain Line (Field Supplied)	2
19	Intake Drain Line (Field Supplied)	2
20	4" Locking Clamp Ring	2
21	Polypropylene Vent Pipe, 8" Dia x 1' Length	2

Item (14) only required for polpropylene intake terminations. Intake terminations must be field supplied for PVC common vents.



**Fig. 3**

### Common Vent Kit Assembly, 2 Heater Configuration

## Common Vent Kit – Parts List

The parts list below includes all the polypropylene vent parts necessary to connect two or three heaters to the common vent. These parts are necessary for the headers and connectors. Some non-polypropylene parts are also necessary for proper installation. These are either shipped with the heater or are field supplied. In some situations, additional polypropylene parts may be necessary to complete the manifold. Further polypropylene parts will be necessary to complete the common vent after the intake and exhaust manifolds have been constructed if a polypropylene common vent will be used.

Table 1 references the overall installation figures.

<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>Two heater direct vent - 48" spacing</b>	<b>Three heater direct vent - 48" spacing</b>
3	3" Flue Clamp PVC to PP	2	3
4	PVC-PP Adapter 3"	2	3
5	3" Locking Clamp Ring	2	3
6	3"-4" Polypropylene centric increaser	2	3
7	NRV PP, 4in-6in internal condensate drain	2	3
8	6" Test Port- Polypropylene	2	3
9	6" Vent Length Polypropylene - 6 ft Long	4	6
10	6" X 87° Elbow - Polypropylene	4	6
11	Branch Tee, 8" X 36", 6" feeder	4	6
12	Horizontal Drain Fitting - 8"	2	3
13	John Ball Valve Condensate Trap	2	3
14	8" bird screen for polypropylene pipe	1	1
15	4" PVC to 4" PP Adapter	2	3
16	4" X 87° Elbow - Polypropylene	2	3
17	Increaser 4" PP to 6" PP	2	3
20	4" Locking Clamp Ring	2	3
21	Polypropylene Vent Pipe, 8" Dia x 1 ft Length	2	3

## Optional Connector and Header Parts:

In some cases, additional parts may be necessary to properly create the connectors and headers based on your application.

- If the heaters must be spaced farther than 49" apart, an additional 8" X 1' polypropylene piece (PN: 24328) will be needed to accommodate the increased distance. See the part identified as "spacer" in Figure 4.
- If the exhaust header must be taller than the standard 8', you may add up to one section of 6" x 3' PP pipe (PN: 24330) to increase the height to a maximum of 11'. See the part identified as "Connector Extension." Intake headers may not be raised in this fashion.

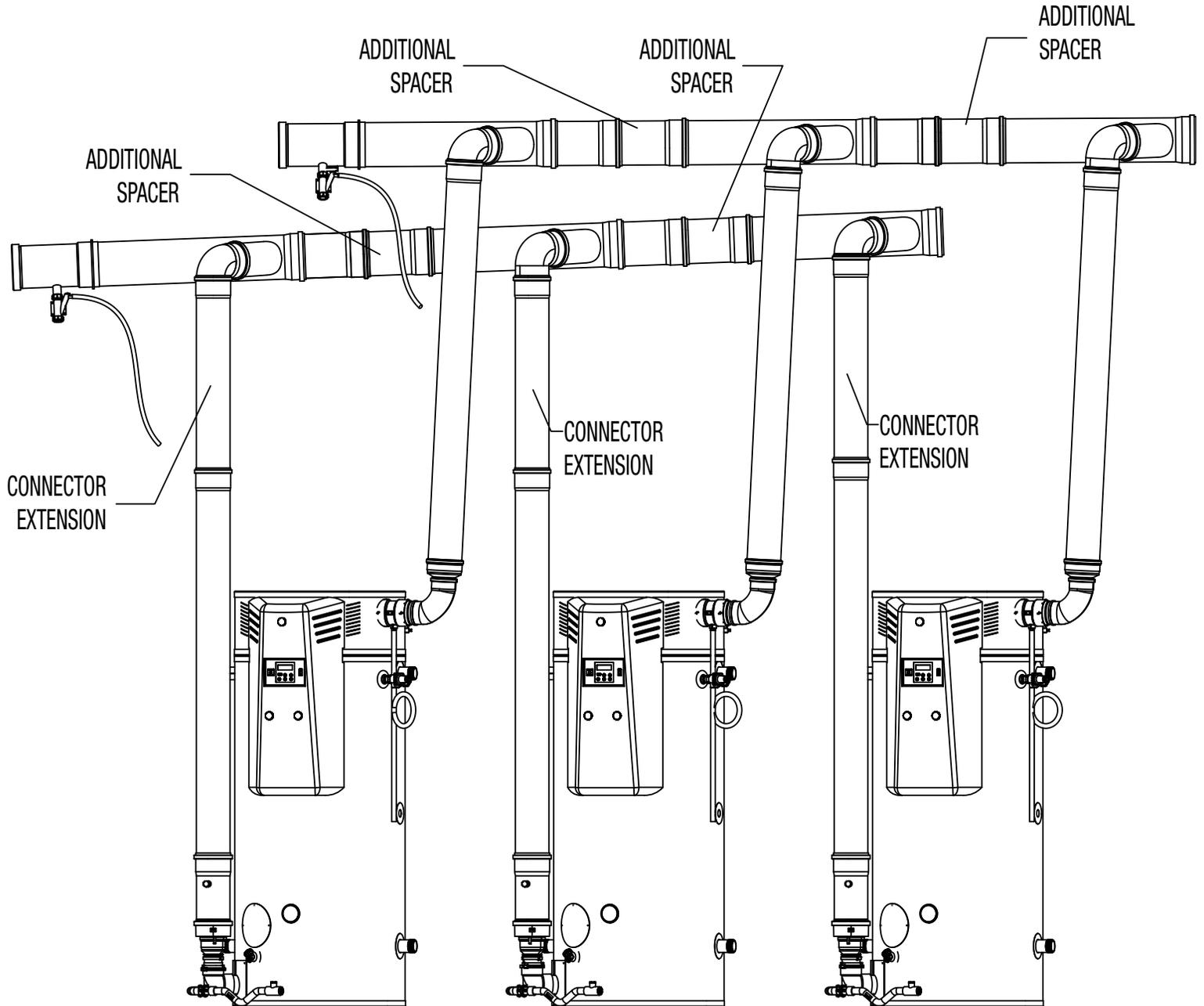


Fig. 4

Optional manifold components

## Common Vent Parts

Additional parts will be required to properly create the common vent out of polypropylene. All pipes and fittings in the common vent shall be 8" diameter pieces. If using polypropylene, Table 2 shows several parts that may be used. If using a different approved vent material, pipes and fittings must be field supplied. The 8" PP-PVC termination adapter shall be used to convert to PVC if necessary.

Part Description	Equivalent Length (ft)
8" PP (6')	6
8" PP (3')	3
8" PP (2')	2
8" PP (1')	1
90° PP Elbow 8" diameter	5
45° PP Elbow 8" diameter	2.5
30° PP Elbow 8" diameter	1.67
15° PP Elbow 8" diameter	1
8" PP-PVC termination adapter	1
PP 8" Bird Screen	0
Centrocerin Lubricant	N/A

## IV. Installation Instructions

### Pre-Installation

The following describes the steps required for proper installation of the Common Vent Kit. The components of this kit are made of polypropylene and seal with gaskets which do not require any adhesive.

All water heaters that will be a part of the common vent system must be next to each other and facing the same direction. The water heaters must be installed in a line with equal spacing between them. They should each be located between 48" and 60" apart from one another (measured on-center). Installing the heaters in this way allows them to have their exhaust and intake vents combined. If heaters are more than 49" apart from one another it will be necessary to add a spacer piece (PN: 24328) between the branch tees. The spacer piece must be purchased separately. Failing to add this spacer piece will add stress to the joints, could adversely affect condensate drainage, prevent proper connections, or allow the connections to fail.

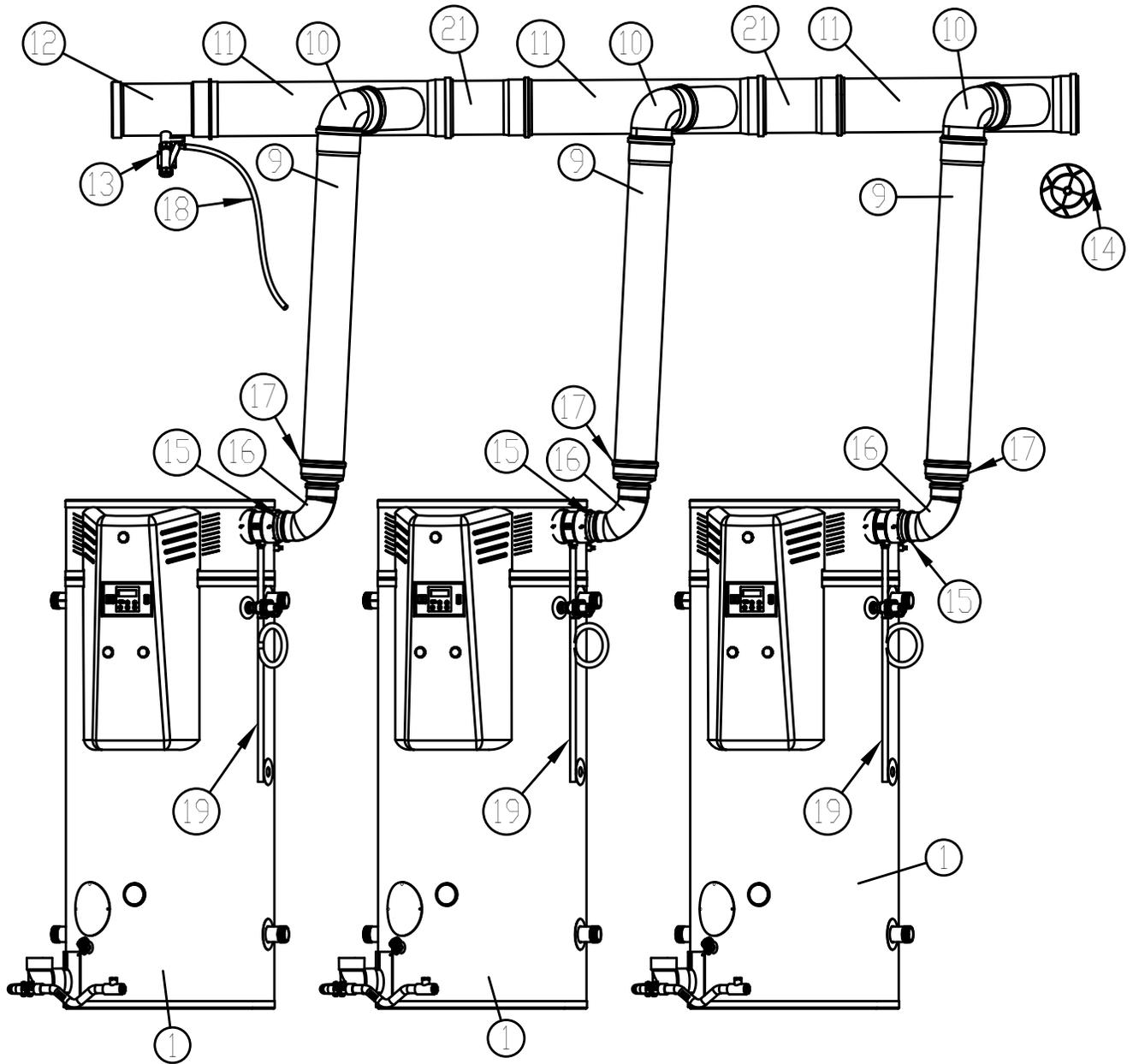
The common vents should be planned to minimize the length and number of fittings required to terminate both vents outside and should be properly located to prevent cross contamination. The maximum equivalent length of each of the common vents is 60 feet (not including the headers and connectors). See Table 3 for the equivalent lengths of several parts which may be required to properly vent the heaters.

Kit Size	Vent Section	Fuel Type	Diameter (in)	Minimum Equivalent Length (ft)	Maximum Equivalent Length (ft)
Two Heater, Three Heater	Intake Common Vent	NAT or LP	8	20	60
	Exhaust Common Vent	NAT or LP	8	20	60

**CAUTION**

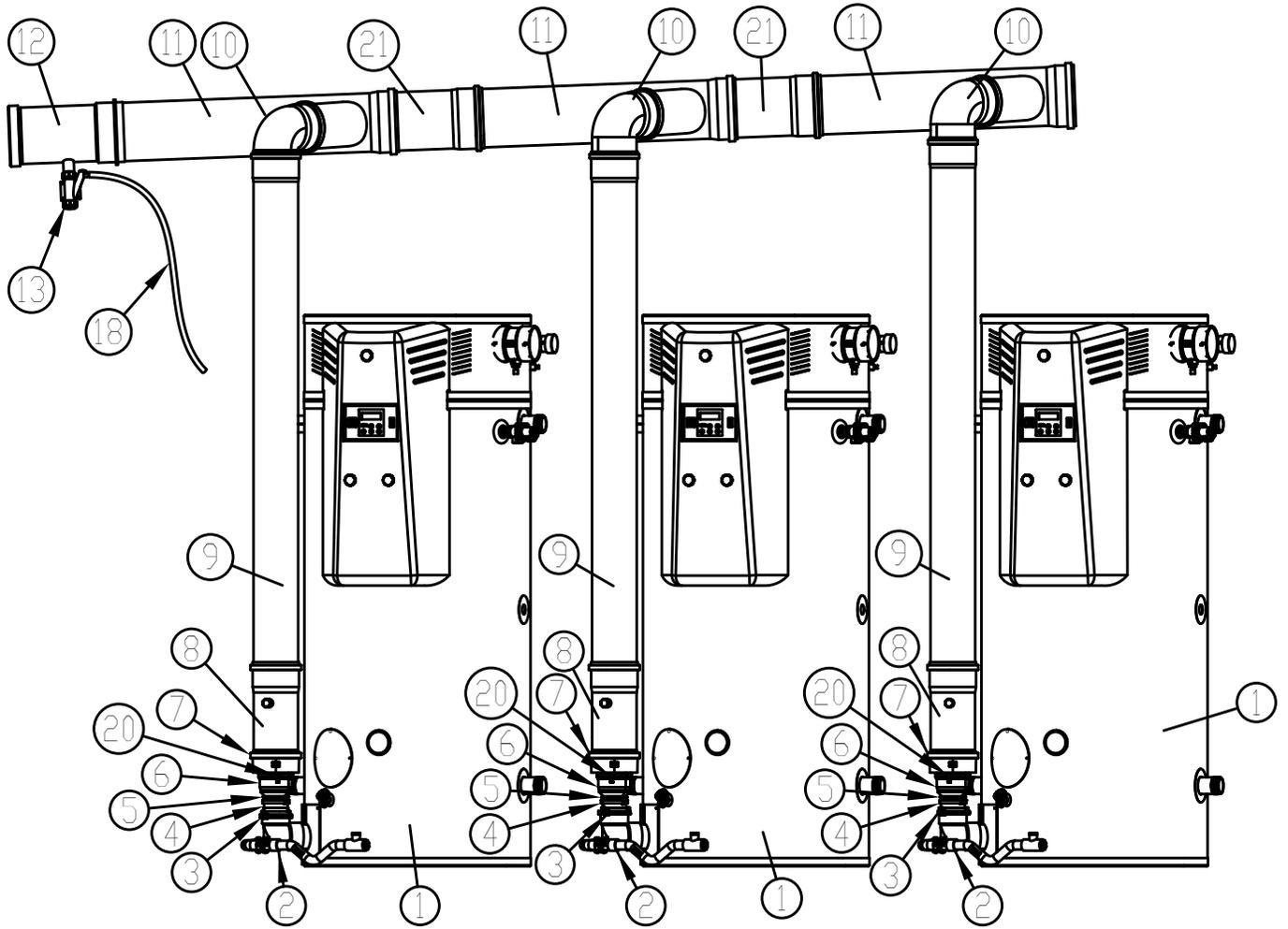
Venting a common vent system is only permissible in a Direct Vent configuration where both intake and exhaust vents terminate outside. Venting a common vent system under a Power Vent configuration (using room air for combustion) can result in exhaust gasses, which may contain carbon monoxide, entering the room.

The following images depict the manifolds which are constructed from the Common Vent Kits. Figure 5 shows the intake manifold and Figure 6 shows the exhaust manifold. Both are required for proper installation of a common vent. After installation of the headers, the common vent can be connected. The common vent sections shall have a maximum equivalent vent length of 60 feet for a total maximum equivalent vent length of 120 feet (not including the required header sections).



**Fig. 5**

**Intake manifold (see Table 4 for part number list)**



**Fig. 6**

**Exhaust manifold (see Table 4 for part number list)**

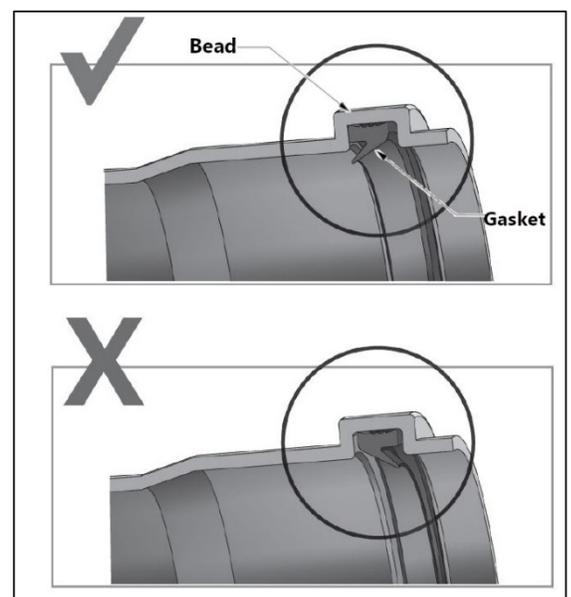
## Installation continued

<b>Table 4: Manifold parts, two and three heater configurations.</b>			
<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>QTY 2 HEATERS</b>	<b>QTY 3 HEATERS</b>
1	120-(400,500)	2	3
2	Condensate Assembly running trap	2	3
3	3" Flue Clamp PVC to PP	2	3
4	PVC-PP Adapter 3"	2	3
5	3" Locking Clamp Ring	2	3
6	3"-4" Polypropylene Centric Increaser	2	3
7	NRV PP, 4in-6in internal condensate drain	2	3
8	6" Test Port- Polypropylene	2	3
9	6" Vent Length Polypropylene - 6 ft Long	4	6
10	Elbow, 87 degree, polypropylene	4	6
11	Branch Tee 8inX6inX36in	4	6
12	Horizontal Drain Fitting 8in	2	2
13	John Ball Valve Condensate Trap	2	2
14	Bird screen for 8" Polypropylene Termination	1	1
15	Adapter, Pvc to PP, 4in	2	3
16	4" X 90° Elbow- Polypropylene	2	3
17	Increaser, PP, 4in to 6in	2	3
18	Common Vent Drain Line (Field Supplied)	2	2
19	Intake Drain Line (Field Supplied)	2	3
20	4" Locking Clamp Ring	2	3
21	Polypropylene Vent Pipe, 8" Dia x 1 ft Length	2	4

## Polypropylene Pipe Connections

### Gasket Placement

- Gaskets are factory installed in all components
- If a gasket is missing or damaged, it must be replaced by the correctly sized gasket. Contact Customer Service.
- If a gasket must be replaced, ensure both the gasket bead and the gasket itself is clean, then insert the new gasket according to the drawing.



**Fig. 7**

**Gasket Placement**

## Installation continued

### Field Cutting Polypropylene Vent Lengths

Occasionally, the standard lengths of polypropylene pipes are insufficient for proper installation of a common vent system. In these cases, cut the pipes to a new length by removing the excess length from the male end.

- Use commonly available tools like hand saws or reciprocating saws to make a perpendicular, clean cut.
- Deburr the cut to avoid damage to the gasket on the mating piece.
- Clean out all debris from the inside of the pipe prior to assembly.
- Female sockets are approximately 4" deep. When cutting components to length, ensure the 4" of overlap is accounted for.

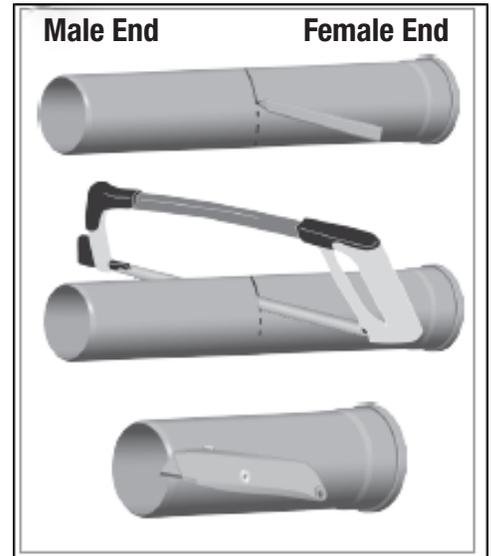


Fig. 8

Cutting vent lengths

### Joint Connections

The female end of each polypropylene vent and fitting includes a factory installed gasket. Before making a polypropylene-to-polypropylene connection ensure the gaskets are correctly in place. Measure the depth of the female socket and mark the male end of each component at that distance to allow a reference. Rub a thin layer of Centrocerin, a water-based lubricant, or rub water onto the male end of Component 2 to assist with assembly. Slip a Connector Ring (only required for 3" and 4" connections) over the male end of Component 2 so that it can grip the gasket bead of Component 1. Push and twist the male end until properly seated in Component 1, aligning the mark with the top of the female end. Clip the Connector Ring onto the gasket bead to secure the two components to each other.

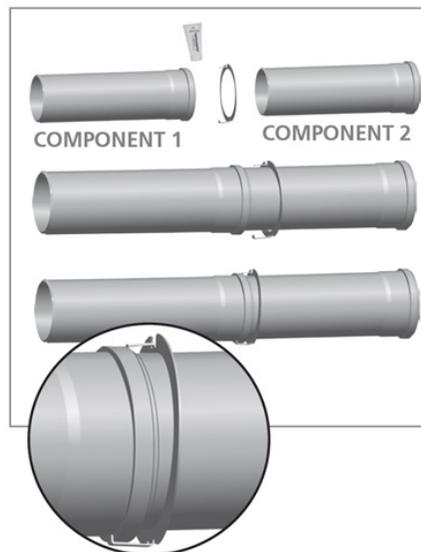


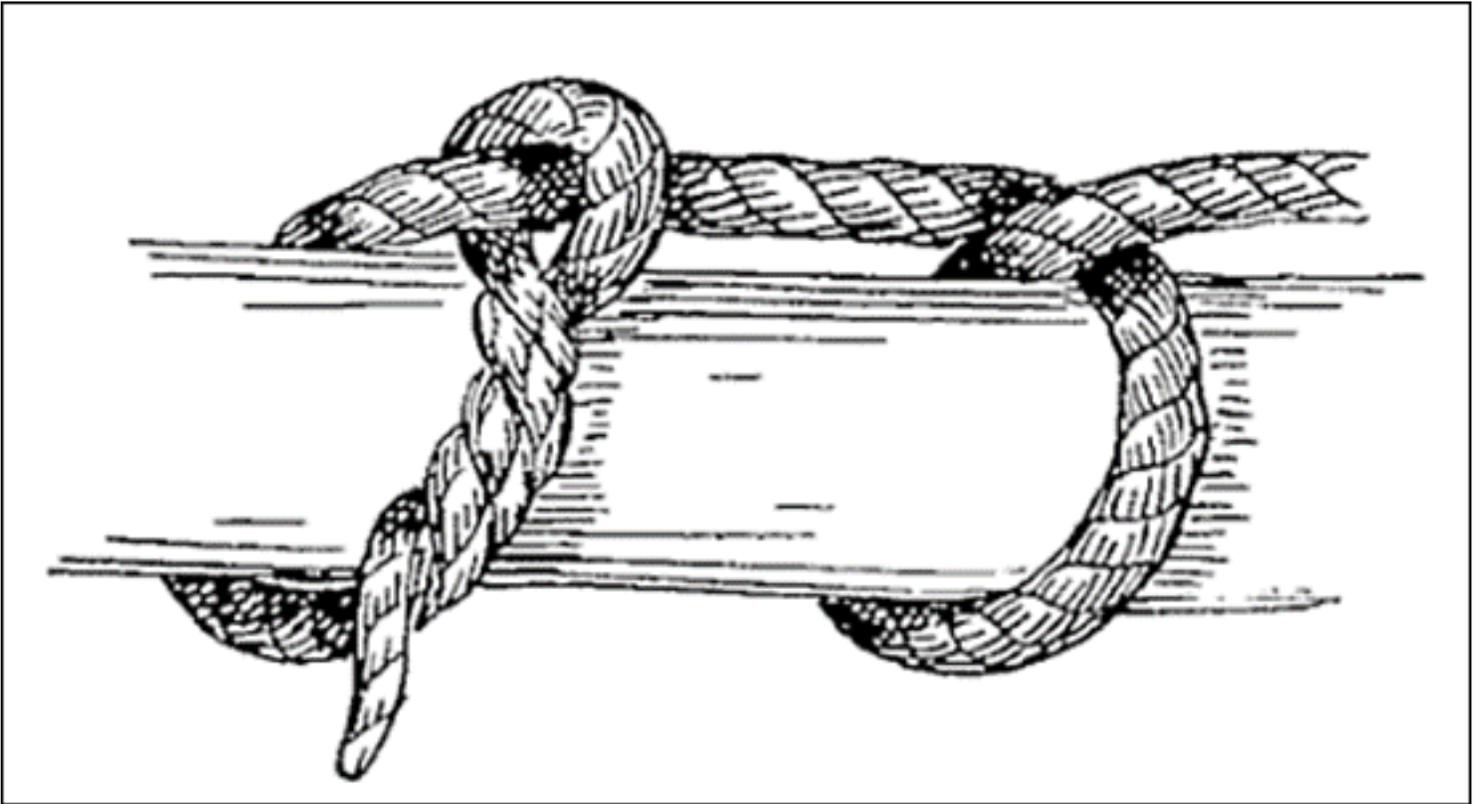
Fig. 9

Mechanical Connection & Clamp Ring

## Installation continued

Connecting pipes larger than 4" can be difficult even with properly lubricated joints. When connecting large joints without a second person it can be helpful to use a standard 2" wide ratchet strap.

1. Hang the new piece to be installed in its approximate location and so that it is completely supported but can still slide along its axis.
2. Separate the strap into its two parts.
3. Starting with the long end of the strap, and the male end of the piece to be installed, use the hook end of the strap to make a loop plus half hitch onto the pipe about 2 feet from the end so that the hitch self-tightens when pulled towards the male end. See Figure 10 for an example of how the knot should look.
4. With the ratchet end tie a similar hitch on the female end of the other pipe.
5. Adjust the knots so that the standing ends are on the same sides of the pipe and re-connect the ratchet strap.
6. Ensure that the gasket is properly lubricated.
7. Slowly tighten the ratchet strap while firmly pressing on the side of the joint opposite the strap to keep the joint from binding during tightening.



**Fig. 10**

### **Timber hitch with a half hitch**

PVC to polypropylene connections that are 3" in diameter shall be mechanically secured with the use of a 3" flue clamp. This flue clamp operates similarly to a regular hose clamp. Figure 11 shows the appliance outlet, adapter, and flue clamp. Tighten the worm gear on the flue clamp to secure it to the outside of the 3" PVC appliance outlet and line up the retaining brackets with the ledge on the adapter so the adapter is properly secured.

## Installation continued

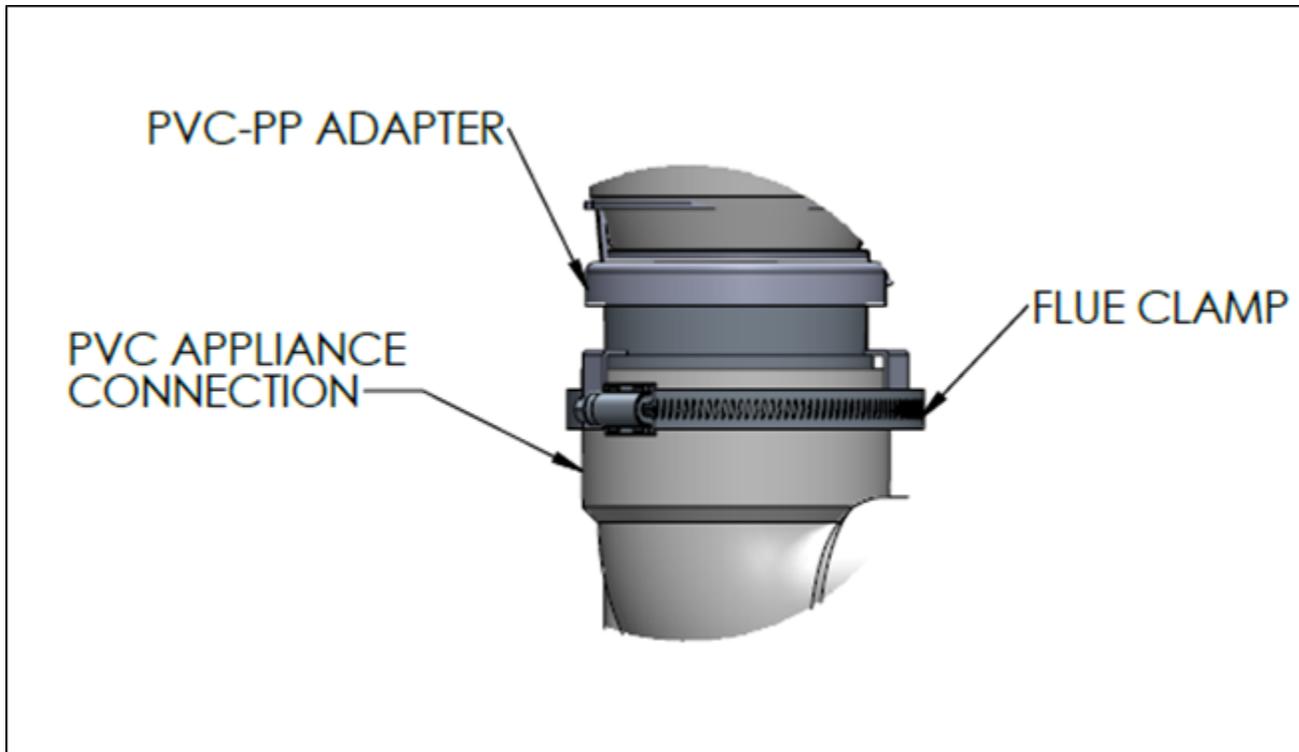


Fig. 11

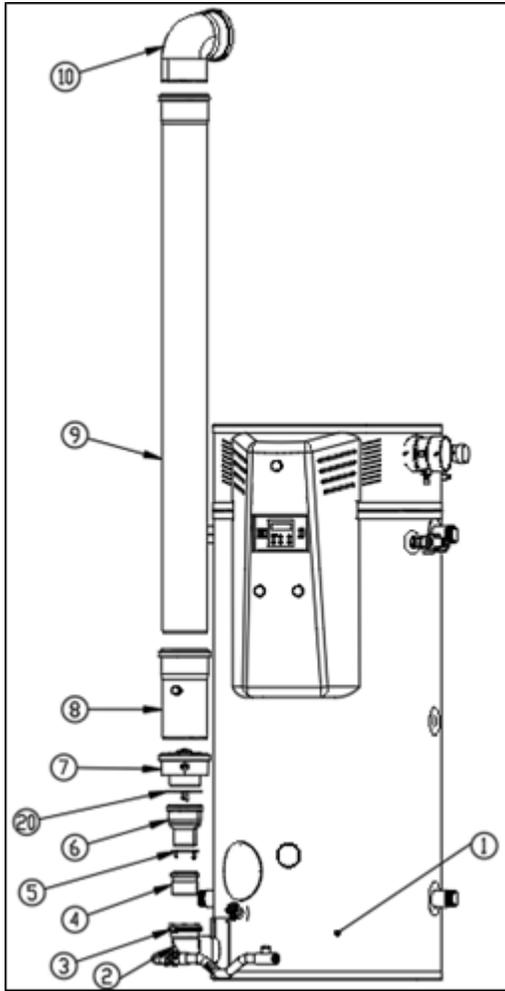
### Flue Clamp Installation

## Exhaust Connectors and Header

Complete the following steps for each water heater to construct the exhaust connectors.

- Install the standard condensate drain assembly (Item 2).
- Insert a PVC-PP adapter (Item 4) into the outlet of each drain assembly. Lock with a flue clamp (Item 3).
- Install 3" to 4" increaser (Item 6), lock in place with a locking clamp ring (Item 5).
- Insert a polypropylene non-return valve (Item 7) into the adapter.
  - ◊ **This piece shall be fully primed with water before continuing.** Fill the valve with water until it starts draining out of the bottom. Failure to properly prime the NRV will result in back feeding exhaust gas into the heaters creating improper combustion, nuisance lockouts, and potential air quality hazards.
- Insert a 6" test port (Item 8) into the outlet of the non-return valve.
- Insert a 6" X 6' polypropylene vent length (Item 9) into the test port.
- Optional: Extend the vertical pipe with an additional 6" pipe up to 3' in length (PN: 24330).
- Insert a 6" X 87° polypropylene elbow (Item 10) into the top of the vertical pipe.

## Installation continued



**Fig. 12**

### Exhaust connector components

**Table 5: Exhaust Connector components**

ITEM NO.	PART NUMBER	DESCRIPTION
1	25605,25615	120-400, 120-500
2	19986	Condensate Assembly running trap
3	24250	3" Flue Clamp PVC to PP
4	24246	PVC-PP Adapter 3"
5	24252	3" Locking Clamp Ring
6	24256	3"-4" Polypropylene Centric Increaser
7	24310	NRV PP, 4in-6in internal condensate drain
8	24312	6" Test Port- Polypropylene
9	24314	6" Vent Length Polypropylene - 6 ft Long
10	24316	Elbow, 6" x 87 degree, polypropylene

Complete the following steps to construct the exhaust Header, refer to Figure 13 for an overall view of the header and components.

**NOTE:** It may be easier to measure the center-center heater space by measuring from two equal points on each heater provided they are pointing in the same direction. For example, after installing the standard condensate elbow, measuring between the outlets will provide the correct center-center distance.

- **When heaters are spaced farther than 49" apart (not to exceed 60" apart):** Use a spacer piece (purchased separately, PN 24328) to extend the branch tees (Item 11) to match center-to-center heater spacing. Remove excess material from the male end of the branch tee (Item 11) to account for the extra distance between heaters.  
Excess Material (EM) is defined below.

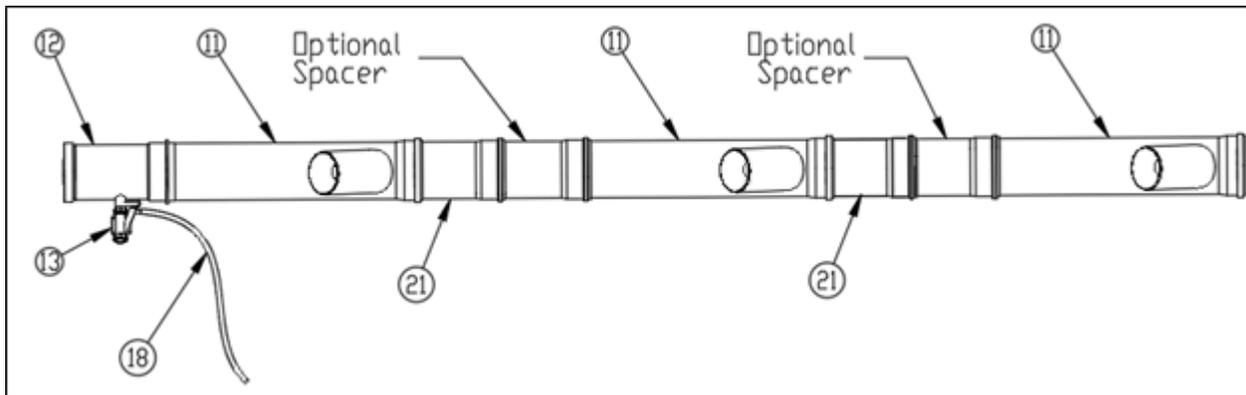
$$EM = 12" - [(Actual Heater Spacing^*) - 48]$$

\* Center-to-center distance between heaters

- Example: when heaters are spaced 55" apart, remove 5" from the male end of the branch tee.

## Installation continued

- **When heaters are spaced farther than 49" apart (not to exceed 60" apart):** Connect two 8" x 6" x 36" branch tees (Item 11), two 8" x 1 foot pipe sections, and two spacers. Point the 6" branches in the same direction. Refer to Figure 12.
- **When heaters are spaced 48" ±1" apart:** Connect two 8" x 6" x 36" branch tees (Item 11) and two 8" x 1 foot pipe sections. Point the 6" branches in the same direction. Refer to Figure 12 and ignore the optional spacers.
- Now that the two branch tees are connected, lift them to the top of the connectors and connect the 6" branches to the 87° elbows (Item 10). Point the male end of the branch tees opposite the direction that the common vent will run. Install a horizontal vent support on this piece as required. Pitch this section ¼" per foot back towards the heaters.
- **For three heater kits:** Install the third branch tee (Item 11) and 8" x 1 foot pipe section in a similar manner. Include a spacer piece if necessary. Continue the ¼" per foot pitch.
- Install horizontal vent supports according to the vent support requirements of this document.
- Install a horizontal drain tee (Item 12) onto the male end of the header. Point the drain down.
- Install a ball valve siphon (Item 13) and drain line (Item 18) onto the 11/16" barb outlet of the drain. A loop trap is not necessary on this drain line because the ball valve traps moisture.



**Fig. 13**

### Exhaust Header Components

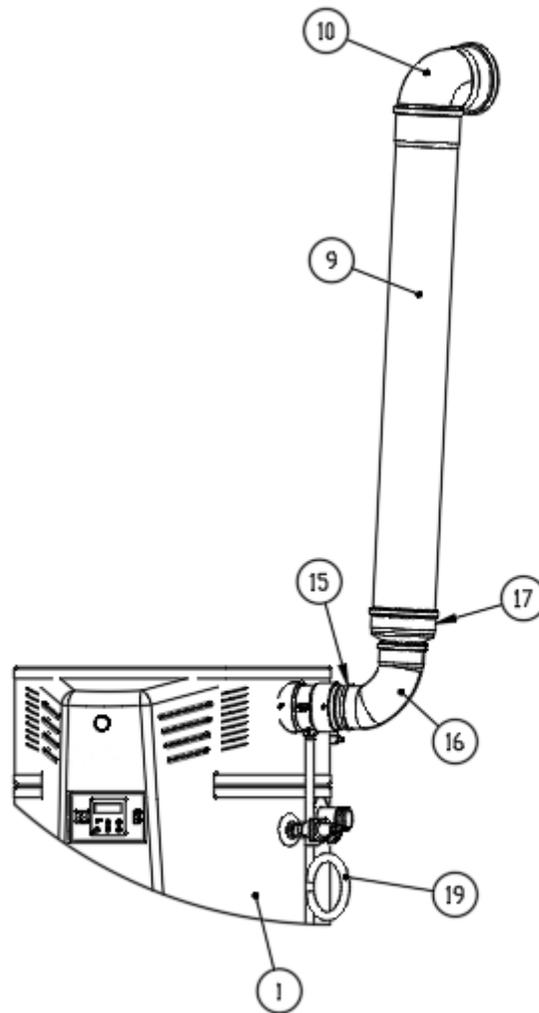
Table 6: Exhaust header components.	
ITEM NO.	DESCRIPTION
11	Branch Tee 8in x 6in x 36in
12	Horizontal Drain Fitting 8in
13	John Ball Valve Condensate Trap
18	Common Vent Drain Line (Field Supplied)
21	Polypropylene Vent Pipe, 8" Dia x 1 foot Length

## Intake Connectors and Header

The intake vent will be established in a similar way to the exhaust vent. Follow these steps for each heater to construct the intake connectors.

- Install a 4" PVC to Polypropylene adapter (Item 15) into the intake assembly.
- Install a 4" polypropylene elbow (Item 16).
- Connect a drain line (Item 19) to the intake drain elbow (1/4" barb). Create a loop trap in the line.
- Insert a 4" to 6" polypropylene increaser (Item 17) into the 4" polypropylene elbow.
- Insert a 6" X 6" polypropylene pipe (Item 9) into the polypropylene increaser (Item 17). This vertical 6" pipe may be reduced in length to meet the requirements of your circumstances, but may not be extended with an additional piece of pipe.
- Insert a polypropylene elbow (6" X 87°) (Item 10) into the top of the vertical pipe (Item 9).

## Installation continued



**Fig. 14**

### Intake connector components

<b>Table 7: Intake connector components</b>	
<b>ITEM NO.</b>	<b>DESCRIPTION</b>
1	120-400, 20-500
9	6" Polypropylene Vent, 6 feet long
10	Elbow, 87 deg, polypropylene
15	Adapter, PVC to PP, 4"
16	4" X 87° Elbow - Polypropylene
17	Increaser, PP, 4" to 6"
19	Intake Drain Line (Field Supplied)

## Installation continued

Complete the following steps to construct the intake Header, refer to Figure 15 for an overall view of the header and components:

**NOTE:** It may be easier to measure the center-center heater space by measuring from two equal points on each heater provided they are pointing in the same direction. For example, after installing the standard condensate elbow, measuring between the outlets will provide the correct center-center distance.

- **When heaters are spaced farther than 49" apart (not to exceed 60" apart):** Use a spacer piece (purchased separately, PN 24328) to extend the branch tees (Item 11) to match center-to-center heater spacing. Remove excess material from the male end of the branch tee (Item 11) to account for the extra distance between heaters. Excess Material (EM) is defined below.

$$EM = 12" - [(Actual Heater Spacing^*) - 48]$$

\* Center-to-center distance between heaters

- Example: when heaters are spaced 55" apart, remove 5" from the male end of the branch tee.
- **When heaters are spaced farther than 49" apart (not to exceed 60" apart):** Connect two 8" x 6" x 36" branch tees (Item 11), two 8" x 1 foot pipe sections, and two spacers. Point the 6" branches in the same direction. Refer to Figure 12.
- **When heaters are spaced 48" ±1" apart:** Connect two 8" x 6" x 36" branch tees (Item 11) and two 8" x 1 foot pipe sections. Point the 6" branches in the same direction. Refer to Figure 12 and ignore the optional spacers.
- Now that the two branch tees are connected, lift them to the top of the connectors and connect the 6" branches to the 87° elbows (Item 10). Point the male end of the branch tees opposite the direction that the common vent will run. Install a horizontal vent support on this piece as required. Pitch this section ¼" per foot back towards the heaters.
- **For three heater kits:** Install the third branch tee (Item 11) and 8" x 1 foot pipe section in a similar manner. Include a spacer piece if necessary. Continue the ¼" per foot pitch.
- Install horizontal vent supports according to the vent support requirements of this document.
- Install a horizontal drain tee (Item 12) onto the male end of the header. Point the drain down.
- Install a ball valve siphon (Item 13) and drain line (Item 18) onto the 11/16" barb outlet of the drain. A loop trap is not necessary on this drain line because the ball valve traps moisture.

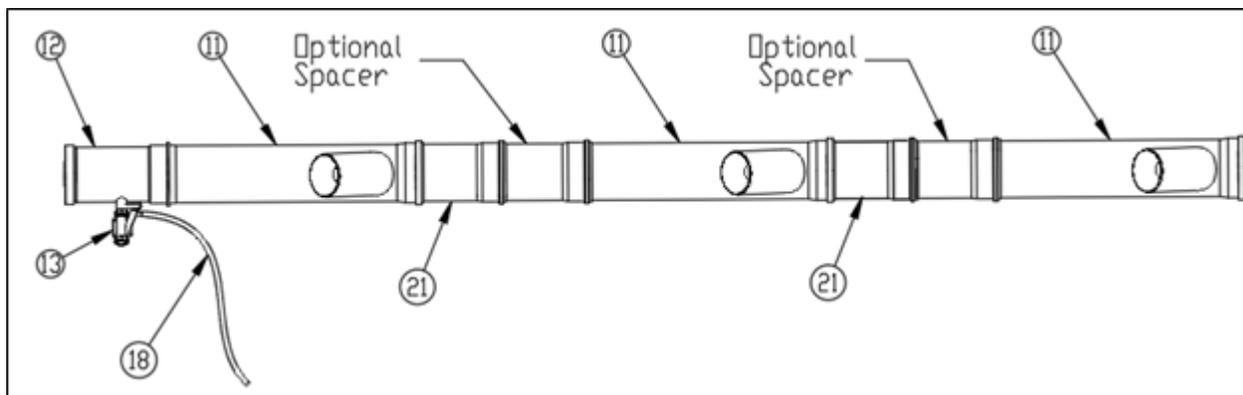


Fig. 15

### Intake Header Components

## Installation continued

Table 8: Intake header components	
ITEM NO.	DESCRIPTION
11	Branch Tee 8in x 6in x 36in
12	Horizontal Drain Fitting 8in
13	John Ball Valve Condensate Trap
18	Common Vent Drain Line
21	Polypropylene Vent Pipe, 8" Dia x 1 foot Length

## Condensation Management

The water heater is supplied with a pre-assembled PVC condensate assembly that must be installed to the exhaust pipe prior to construction of the manifold. See the water heater manual for detailed instructions on how to install this condensate assembly.

The Common Vent Kit also has several locations for condensation management. Both vent headers are capped on the male end with a horizontal drain tee. After installation, the drain shall point down and have an exhaust trap installed. The included ball drain valve siphon (Item 13) shall serve this purpose (see Figure 16 for installation).

The drain valve siphon (Item 13) seals against the drain tee with an O-ring. Before installing, check to ensure this O-ring is in place and in good condition. Without this O-ring it will not be possible to properly install the drain. On the outlet of the drain valve siphon, install an independent condensate drain line. The horizontal drain tee includes a removeable clean out cap. Unscrew this cap to clean out any debris that may accumulate over time.

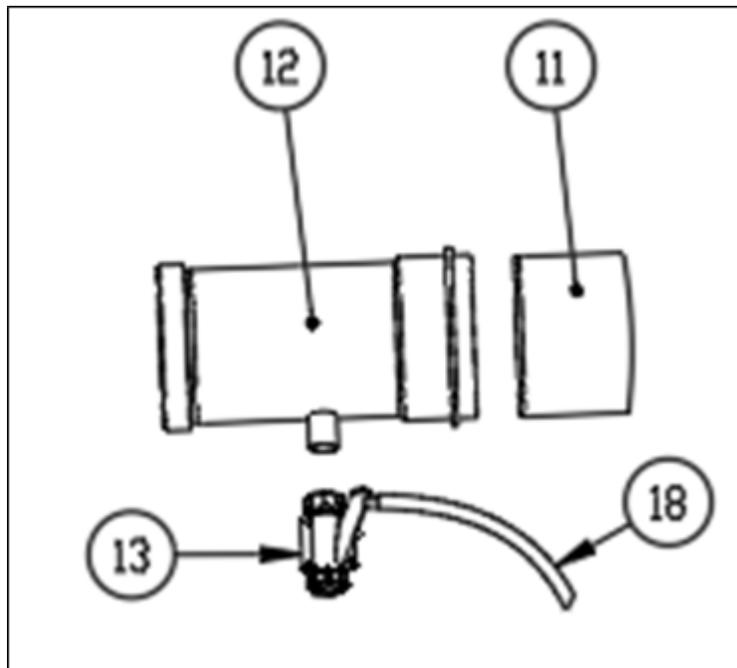


Fig. 16

### Common Vent Drain

## Installation continued

Condensation can form in the intake common vent during periods of standby and it must drain properly. In addition to the common vent drain shown in Figure 15, the water heater contains a factory installed drain tee on the intake.

Horizontal sections of the exhaust vent shall slope upward away from the water heater a minimum of 1/4" per foot. This will allow the condensate in the vent to run back to the condensate drains on the water heaters, and in the common vent header. In some instances, condensate may form in the intake piping during periods following burner operation. Horizontal sections of air intake piping shall slope downward away from the water heater a minimum of 1/4" per foot.

## Common Vent

The common vent is the section of venting that carries the vent gas or intake air between the water heaters and the outside. Each pipe shall extend from the completed exhaust or intake manifold to the outside wall. Vertical or horizontal vent configurations may be used. The common vent equivalent length measurements specified in this manual are in addition to the pre-assembled piping and supplied assemblies and fittings. Common vent equivalent pipe lengths shall not be greater than 60 feet per side.

The common vents shall be comprised of pipe and fittings with a nominal inside diameter of 8". The polypropylene components in Table 2 are recommended because of their approval to UL 1738 and ULC-S636, but any of the following materials are approved for use as the common vent and common combustion air intake piping.

- PVC (DWV, ASTM-D2665 or CSA B181.2)
- PVC (Schedule 40, ASTM-D1785 or CSA B137.3)
- PVC (SDR Series, ASTM-D2241 or CSA B137.3)
- CPVC (Schedule 40, ASTM-F441 or CSA B137.3)
- CPVC (SDR Series, ASTM-F442)
- PVC IPEX 1738 (UL 1738, ASTM D2665)

**In Canada, check local codes to ensure that SDR series is approved for use. SDR is not approved for all installations in Canada.**

The following materials are approved for use for the fittings in the common vent and combustion air intake systems:

- • PVC (Schedule 40 DWV, ASTM D2665)
- • CPVC (Schedule 40, ASTM F438)
- • PVC IPEX 1738 (UL1738, ASTM D2665)

The use of cellular core PVC (ASTM F891), cellular core CPVC, or RadelR (polyphenylsulfone) in non-metallic vent pipe and systems is prohibited. Covering non-metallic vent pipe and fittings with thermal insulation is prohibited.

If an approved vent material other than polypropylene is going to be used for the common vent there must be an adaptation from the polypropylene header sections to the other approved vent material. The manufacturer can supply an approved polypropylene to PVC termination adapter (PN 24280). Both schedule 40 PVC and SDR Series CPVC are compatible with this termination adapter. Other vent adapters have not been tested and are not approved for use in the common intake or exhaust vent.

### IMPORTANT

Installations in Canada must conform to the requirements of CSA B149 code. Plastic vent systems must be assembled with pipe, fittings, cements, and primers listed to ULC S636. Components of this listed system shall not be interchanged with other vent systems or unlisted pipe/fittings. In Canada, the primer and cement must be of the same manufacturer as the vent system; do not mix primers and cements from one manufacturer with a vent system from a different manufacturer. The supplied plastic pipe/fittings are certified as part of the water heater.

The vent and combustion air intake systems must be sufficiently supported along vertical and horizontal sections. At minimum, it is recommended that a support is placed along the vent or air intake piping every 39 inches of horizontal run and every 78" of vertical run. For horizontal systems, the first support shall be located immediately adjacent to the first 90-deg. elbow following the vertical section connected to the water heater. The support method should act to isolate the vent and combustion air intake piping from floor joists or other structural members to reduce transmission of noise and vibration.

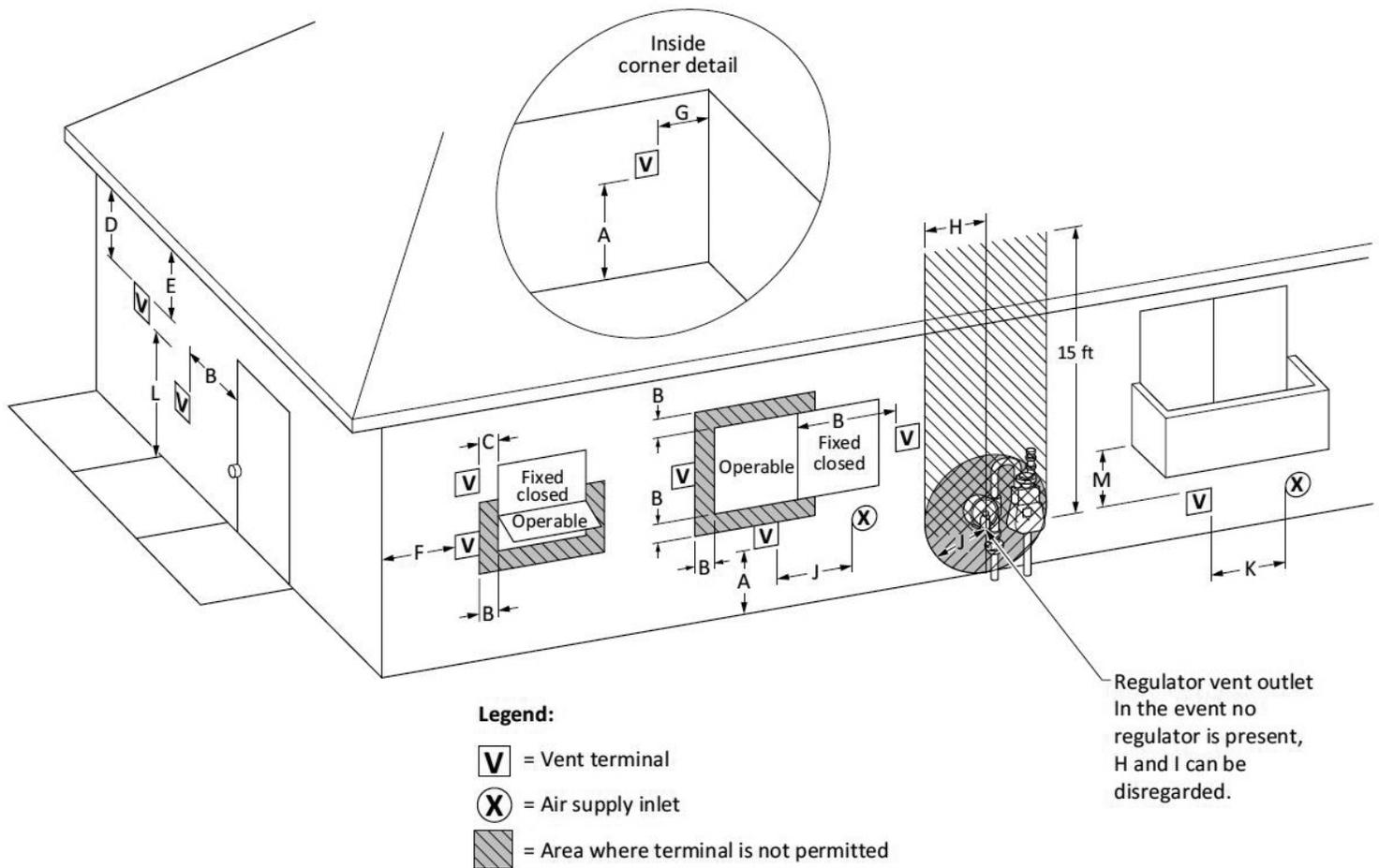
**NOTE:** Do not support, pin, or secure the vent and combustion air intake pipe in a way that restricts the normal thermal expansion and contraction of the venting material.

## Installation continued

### Terminations

This kit shall be used to common vent water heaters with a two-pipe termination. Two holes through an exterior wall are required for the vent and combustion air intake pipes. Minimum clearances between the terminals must be met as specified in Figure 18. All clearances must comply with local codes or the latest edition of NFPA 54/ANSI Z223.1 or CSA B149. See Figure 17 and Table 9 for terminal clearances.

Check to make sure flue gases **DO NOT** recirculate into the air intake terminal. If the water heaters are having service issues, flue recirculation may be a contributing factor. Even when the minimum vent terminal separation distances in Figure 18 are followed, recirculation may still occur depending upon the location outside the building, the distance from other buildings, proximity to corners, weather conditions, wind patterns, and snow depth. Periodically check to make sure that flue recirculation is not occurring. Signs of flue gas recirculation include frosted or frozen intake terminals, condensate in the intake terminal and venting system, oxidation or white chalk material on the flame rod or hot surface igniter. Correction to flue recirculation may involve angling the intake away from the exhaust terminal or increasing the distance between them. Check to be sure the intake and exhaust terminals are not obstructed, especially during periods of below freezing weather. All intake and exhaust venting components must have the same diameter size. **DO NOT** use a different size on the intake and exhaust venting.



**Fig. 17**

### Terminal Clearances

## Installation continued

**Table 9. Vent Terminal Clearances**

		<b>Canadian Installation</b>	<b>US Installation</b>
A	Clearance above grade, veranda, porch, deck, or Balcony	12 in (30 cm)	12 in (30 cm)
B	Clearance to window or door that may be opened	6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 12 in(30 cm) for appliances > 10,000Btuh (3 kW) and ≤ 100,000 Btuh(30 kW), 36 in (91 cm) for appliances >100,000 Btuh (30 kW)	6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 9 in(23 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 50,000 Btuh (15 kW), 12 in(30 cm) for appliances > 50,000 Btuh (15 kW)
C	Clearance to permanently closed window	12 in (30 cm)*	12 in (30 cm)*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 ft (61 cm) from the center line of the terminal.	12 in (30 cm)*	12 in (30 cm)*
E	Clearance to unventilated soffit	12 in (30 cm)*	12 in (30 cm)*
F	Clearance to outside corner	2 ft (60 cm)*	2 ft (60 cm)*
G	Clearance to inside corner	18 in (45 cm)*	18 in (45 cm)*
H	Clearance to each side of center line extended above meter/regulator assembly	3 ft (91 cm) within a height of 15 ft (4.6 m)	Clearance in accordance with local installation codes and the requirements of the gas supplier.
I	Clearance to service regulator vent outlet	3 ft (91 cm)	Clearance in accordance with local installation codes and the requirements of the gas supplier.
J	Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	<ul style="list-style-type: none"> <li>• 6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW).</li> <li>• 12 in (30 cm) for appliances &gt; 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW)</li> <li>• 36 in (91 cm) for appliances &gt; 100,000 Btuh (30 kW)"</li> </ul>	<ul style="list-style-type: none"> <li>• 6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW),</li> <li>• 9 in (23 cm) for appliances &gt; 10,000 Btuh (3 kW) and ≤ 50,000 Btuh (15 kW),</li> <li>• 12 in (30 cm) for appliances &gt; 50,000 Btuh (15 kW)"</li> </ul>
K	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	3 ft (91 cm) above if within 10 ft (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2,13 m) †	Cannot be located above public walkways or other areas where condensate or vapor can cause a nuisance or hazard.
M	Clearance under veranda, porch deck, or balcony	12 in (30 cm) ‡	12 in (30 cm) ‡

1 In accordance with with the current CSA B149.1 Natural Gas and Propane Installation Code.

2 In accordance with the current ANSI Z223.1 / NFPA 54 National Fuel Gas Code.

3 If locally adopted installation codes specify clearances different than those illustrated, then the most stringent clearance shall prevail.

†A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

‡Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

\* Manufacturer's recommendation. Must be in accordance with local installation codes and requirements of the gas supplier.

## Installation continued

The common intake vent shall terminate outside with an 8" elbow including an appropriately sized vent screen. A straight termination on the common exhaust vent is recommended. The Common Vent Kit includes an appropriate 8" vent screen (PN 24286) for use with a polypropylene elbow. If your common intake and exhaust vents are comprised of an approved vent material other than polypropylene, an appropriate 8" vent screen must be field supplied. Whatever screen is used it must not significantly restrict airflow. A screen that significantly restricts airflow will reduce the performance of the water heater and could cause nuisance control lockouts.

In addition to the clearances specified, the following items shall be accounted for during installation:

- The minimum distance from adjacent public walkways, adjacent buildings, openable windows, and building openings shall not be less than those values specified in the National Fuel Gas Code, ANSI Z22.3.1/NFPA 54, and/or the National Gas and Propane Installation Code, CSA B149.1.
- Do not terminate near soffit vents or crawl space or other areas where condensate or vapor could create a nuisance hazard or cause property damage.
- Do not locate the exhaust vent terminal where condensate or vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.
- Do not locate the exhaust vent terminal over public areas, near soffit vents, or crawl space vents, or over walkways where condensate or vapor can cause nuisance or hazard.
- Do not locate the exhaust vent terminal where condensate vapor could cause damage or be detrimental to the operation of regulators, relief valve, or other equipment.
- Do not locate the vent terminal in proximity to plants/shrubs.
- The vent and air intake shall terminate a minimum of 12" (30.5 cm) above expected snowfall level to prevent blockage.
- It is best practice to locate the intake and exhaust terminations on a common plane.

### **▲ CAUTION**

**Never install air intake terminal above vent (exhaust) terminal.**

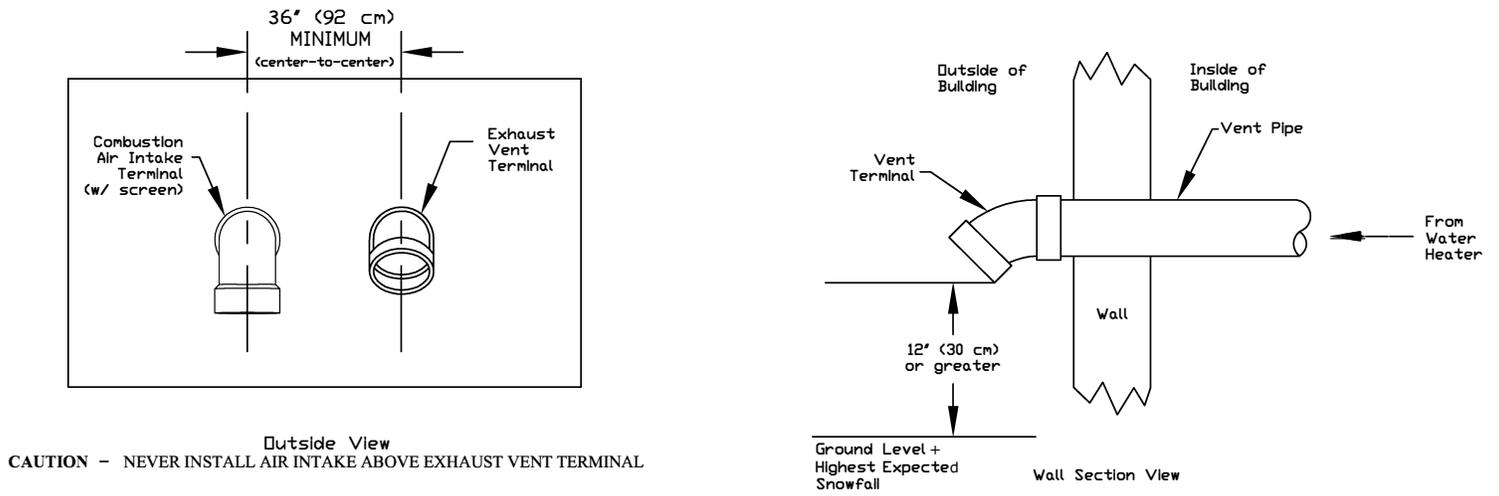
Install piping through the wall as shown in Figure 18. Adequate length of pipe must protrude beyond the exterior wall for attachment of the termination fitting. The recommended distance between the terminal fitting and the exterior wall is 1 in. (2.5 cm). A single 90° elbow should be used for the termination fitting on the air intake. This elbow and other fittings which might be required must be purchased separately. The Common Vent Kit contains a protective screen (for 8" polypropylene pipes) to block foreign debris or small animals from entering the intake pipe. When a screen at the exhaust termination, or a different intake screen is preferred it must have a low resistance to air flow and be field supplied. Refer to the type of screen used in the supplied elbow. A screen that significantly restricts airflow will reduce the performance of the water heater and could cause nuisance control lockouts. Horizontal sections of the exhaust vent shall slope upward away from the water heater a minimum of 1/4" per foot (10 mm per meter). This will allow the condensate in the vent to run back to the condensate drain on the water heater. Horizontal sections of air intake piping shall slope downward away from the water heater a minimum of 1/4" per foot.

**NOTE:** If the air intake and exhaust vent terminations will be located on a side of the building that is frequently subjected to high winds, it is recommended that the air intake termination is located 24" (center-to-center) below the exhaust vent termination.

### **▲ CAUTION**

**Annular spaces around vent pipe wall penetrations shall be permanently sealed using approved materials to prevent entry of combustion products into the building.**

## Installation continued



**Fig. 18**

### Horizontal Venting minimum spacing

**NOTE:** See the water heater installation manual for complete information on intake and exhaust termination spacing (Section IV).

# V. Maintenance

## IMPORTANT

If you are having a mechanical problem with your water heater or vent, contact your service company or installer.

The required maintenance schedule for this Common Vent Kit is shown in Table 10. Further detail is given in this section for each component.

**Table 10: Periodic maintenance intervals**

Component	Operation	Interval	Required
Condensate Traps	Inspect	6 months	Remove Sediment
Vent System	Inspect	Annually	Terminations are clear; joints are sealed; proper support
Non-Return Valve	Inspect	Annually	Valve properly actuates with blower.
Combustion System	Measurements	Annually	Check inlet gas pressure; take combustion readings (O <sub>2</sub> % & CO ppm)

### Condensate Traps

Each water heater has several condensation traps. Where applicable, follow the maintenance instructions in the standard installation manual. The additional condensation drains/traps to common vent systems should be maintained on the same schedule. Ball valve siphons, found on the end of the headers, can be cleaned by removing the top and bottom caps and running water through body of the valve.

Drain lines with loop traps can be cleaned by removing the loop and line and running water through.

### Inspect the venting system

The vent and combustion air intake system should be checked at least once a year for damage and blockage. Make sure all joints are secure and that the system is properly supported. Inspect the outdoor terminals to make sure they are free of obstructions. Open the cap on the end of the intake/exhaust header and clean out any debris that has accumulated.

### Non-Return Valve

The Non-Return Valve is the most critical piece of the manifold. If it fails it can produce nuisance lockouts or allow combustion air to leak into the room. Check for proper operation of this valve annually by individually cycling power to each water heater and listening for the “clack” that the valve makes when opening and closing. The valve only opens when the blower is on. Therefore, wait until the water heater is in Hot Water Demand to do this inspection. If the Non-Return Valve is not operating properly it may need to be cleaned or replaced. Turn off power to all water heaters connected to the common vent and remove the Non-Return Valve from the connector. Clean with soap and water so the valve easily actuates before re-installing into the connector. Check that the gaskets are in good condition before re-installing. Replace the Non-Return Valve if necessary.

### Combustion System

The combustion system can be maintained according to the maintenance section in the standard installation manual. The Common Vent Kits include a test port for each water heater connector which shall be installed into the non-return valve. When taking a combustion reading, remove the thumb screw in the test port to insert the combustion analyzer. Do not lose the O-Ring -it is loosely attached to the thumb screw threads.

# VI. Troubleshooting

General troubleshooting for the heaters in the common vent system will be the same. See the standard installation manual for detailed troubleshooting information. The below table includes problems that may arise and are unique to a common vent system.

<b>Problem</b>	<b>Possible Cause</b>	<b>Recommended Action</b>
Repeated Blocked Vent Errors A36, E36	Non-Return Valve Stuck Closed	See Non-Return Valve Maintenance
	Excessive Condensate	Remove and clean all condensate drains and horizontal drain tees.
Repeated Flame Failures A24	Non-Return Valve Stuck Open	See Non-Return Valve Maintenance
	One unit significantly oversized and vent is partially blocked	Increase water flow to problem unit. Clear vent blockage.



## United States

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**Sales** 1-800-523-2931  
**Technical Support** 1-888-443-4394  
**Email** [techsupport@bradfordwhite.com](mailto:techsupport@bradfordwhite.com)  
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