

COMMON VENTING TANKLESS GAS WATER HEATERS



WARNING: 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.

	⚠ WARNING
	<p>Read and understand instruction manual and safety messages before installing, operating or servicing this water heater.</p> <p>Failure to follow instructions and safety messages could result in death or serious injury.</p> <p>Instruction manual must remain with water heater.</p>

• **For Your Safety** •
AN ODOURANT IS ADDED TO THE GAS USED BY THIS WATER HEATER.

ALL TECHNICAL AND WARRANTY QUESTIONS: SHOULD BE DIRECTED TO THE LOCAL DEALER FROM WHOM THE WATER HEATER WAS PURCHASED. IF YOU ARE UNSUCCESSFUL, PLEASE CONTACT THE COMPANY LISTED ON THE RATING PLATE ON THE WATER HEATER.

KEEP THIS MANUAL ON (OR NEAR) HEATER FOR FUTURE REFERENCE WHENEVER MAINTENANCE ADJUSTMENT OR SERVICE IS REQUIRED.

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INSTRUCTIONS

INTRODUCTION

The only heaters approved for common venting are the condensing heaters: 240 (T-H3J), 340 (T-H3S), and 540 (T-H3). When common vented, the heaters must be direct vented.

There are two possible configurations for common venting. One is for multiple heaters installed side-by-side (horizontal configuration), the other is a multi-level vertical configuration, like a multi-level apartment building.

WARNING! Each common vented heater must have a Non-Return Valve (NRV), p/n 100113130, installed in the heater's exhaust. See the instructions packaged with the NRV for proper installation.

A maximum of 8 heaters may be common vented in a side-by-side (horizontal) configuration. A maximum of 3 heaters may be common-vented in a multi-level vertical configuration.

When used in a common vent configuration, each condensing heater requires the installation of a polypropylene Non-Return Valve (NRV).

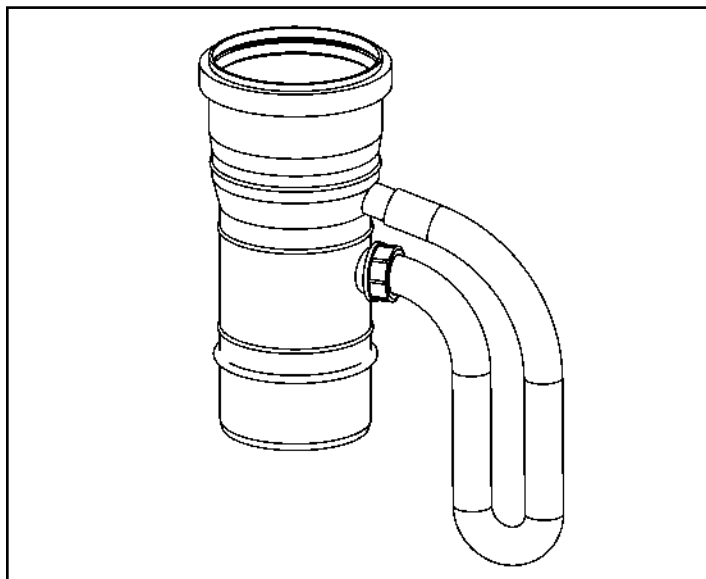


Figure 1. Non-Return Valve (p/n 100113130)

The maximum equivalent vent run is 100 feet. Each 90° elbow is equivalent to 5 feet of pipe. Each 45° elbow is equivalent to 2.5 feet of pipe. The common vent header should remain the same size from beginning to the termination. The termination can be through a sidewall or the roof.

VENT MATERIALS

The following venting materials are allowed to be used for the exhaust and air intake piping:

1. Schedule 40 PVC piping (Solid Core only).
2. PVC-DWV piping.
3. Schedule 40 CPVC piping (Solid Core only).
4. Schedule 40 ABS piping
5. InnoFlue® by Centrotherm (polypropylene vent system).

Item	Material	United States	Canada
Exhaust pipe and Fittings	Schedule 40 PVC	ANSI/ASTM D1785	ULC S636 Certified Materials Only
	PVC-DWV	ANSI/ASTM D2665	
	Schedule 40 CPVC	ANSI/ASTM F441	
	Schedule 40 ABS-DWV	ANSI/ASTM D2661	
	Polypropylene	UL-1738	
Pipe Cement/ Primer	PVC	ANSI/ASTM D2564	
	CPVC	ANSI/ASTM F493	
	ABS	ANSI/ASTM D2235	

Table 1. Allowable Vent Materials

A PVC Adaptor, p/n 100113129 (Figure 2), is required when using PVC piping for the exhaust. This PVC piping shall be installed in the NRV outlet and transition to 4" Schedule 40 PVC piping.

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

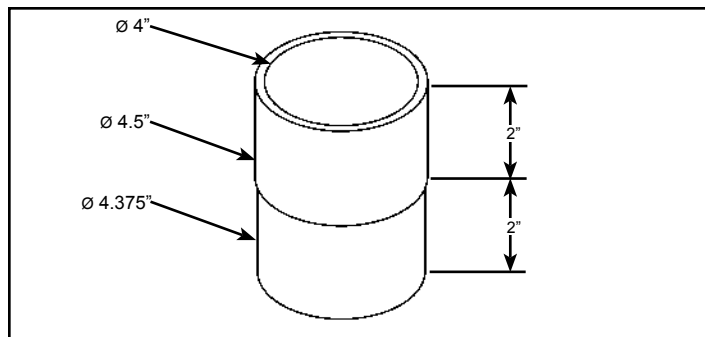


Figure 2. PVC Adaptor (p/n 100113129)

VENT & EXHAUST INSTALLATION

- All vent piping must be supported by hangers. DO NOT let the water heaters support the weight of the venting.
 - horizontal vent piping must be supported every 3 ft. (0.91m).
 - vertical vent piping must be supported every 5 ft. (1.5m).
- Horizontal vent runs require an upward slope of 1/4 in. per foot (21mm per metre).
- Each connection in the vent system must be air tight and tested before putting the heaters into operation.
- All common vented installations require a condensate drain in the exhaust vent run.
- The termination for side wall venting shall be a 45° elbow for the exhaust, and a 90° elbow for the intake. Install screens with minimum 3/4 in. (19mm) mesh spacing in each termination to prevent foreign material from entering the vent system.
- The terminations for the roof and air intake lines shall consist of one 90° elbow and one 45° elbow as shown in Figure 4 through Figure 11. The terminations may use two 90° elbows. Install screens with minimum 3/4 in. (19mm) mesh spacing in each termination to prevent foreign material from entering the vent system.
- Refer to the Installation Manual and Owner's Guide for further installation instructions.

CONDENSATE

This water heater is a high efficiency condensing water heater that produces condensate (acidic water). The venting must be installed such that the condensate will not drain through a heater. The contractor must install a condensate trap and pitch the exhaust venting towards the trap so it can be drained.

Common-venting system					
Vent Diameter* (D)	Max. No. of water heaters		Max. equivalent vent length** (L) Intake and Exhaust each	DIP switch settings	
	Horiz.	Vert.		240 Indoor (T-H3J-DV) 340 Indoor (T-H3S-DV)	540 Indoor (T-H3-DV) (Upper bank of DIPswitches)
4 in. (110mm)	2	2	25 ft. (7.6 m)	<p>ON 1 2 3 4 5 6 7 8 9 10</p> <p>OFF</p> <p>No.6: ON No.7: OFF</p>	<p>ON 1 2 3 4 5 6 7 8</p> <p>OFF</p> <p>No.3: ON No.4: OFF</p>
5 in. (125mm)	2	2	50 ft. (15.2 m)		
	3	3	20 ft. (6.1 m)		
6 in. (160mm)	2	2	100 ft. (30.5 m)		
	3	3	75 ft. (22.9 m)		
	4	N/A	50 ft. (15.2 m)		
	5	N/A	25 ft. (7.6 m)		
	6	N/A	20 ft. (6.1 m)		
8 in. (200mm)	3	3	100 ft. (30.5 m)		
	4	N/A	100 ft. (30.5 m)		
	5	N/A	85 ft. (25.9 m)		
	6	N/A	65 ft. (19.8 m)		
	7	N/A	50 ft. (15.2 m)		
	8	N/A	41 ft. (12.5 m)		

*Diameters of pipes are in accordance with Centrotherm's specifications.

**One elbow is equivalent to 5 ft (1.5 m) linear length. The maximum number of elbows allowed is 5. See calculations on page 8.

Figure 3. Vent Length Dimensioning

COMMON VENT TYPES

Horizontal (Side-By-Side)

A maximum of 8 condensing heaters may be common vented horizontally, in either an in-line or back-to-back configuration. The use of reducing wyes to join each heater's venting to the trunk line is preferred, however reducing tees are acceptable. The maximum length of the single exhaust vent line from the heater to the common vent header (trunk line) is 10 ft. (3 m), with only two elbows allowed. This vent size should be of 4 in. piping.

The exhaust piping should be sloped back to the heater 1/4 in. per foot (21mm per metre) or as per local code requirements.

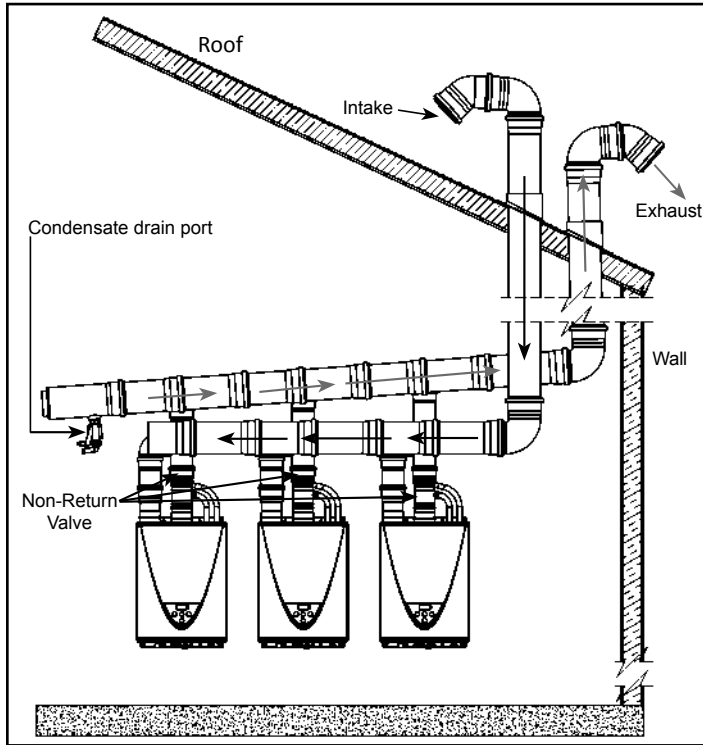


Figure 4. Typical Common-Vent Through The Roof Installation

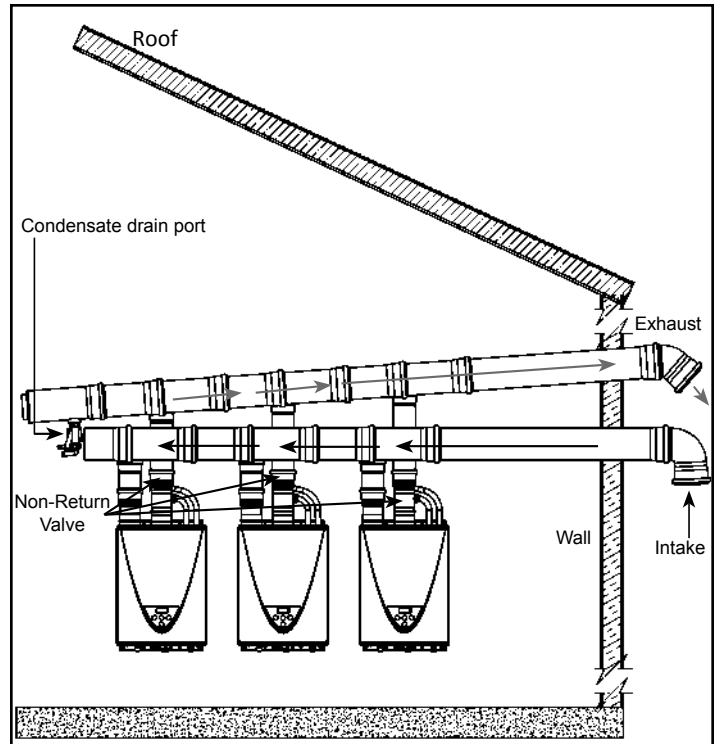


Figure 5. Typical Common-Vent Through The Wall Installation

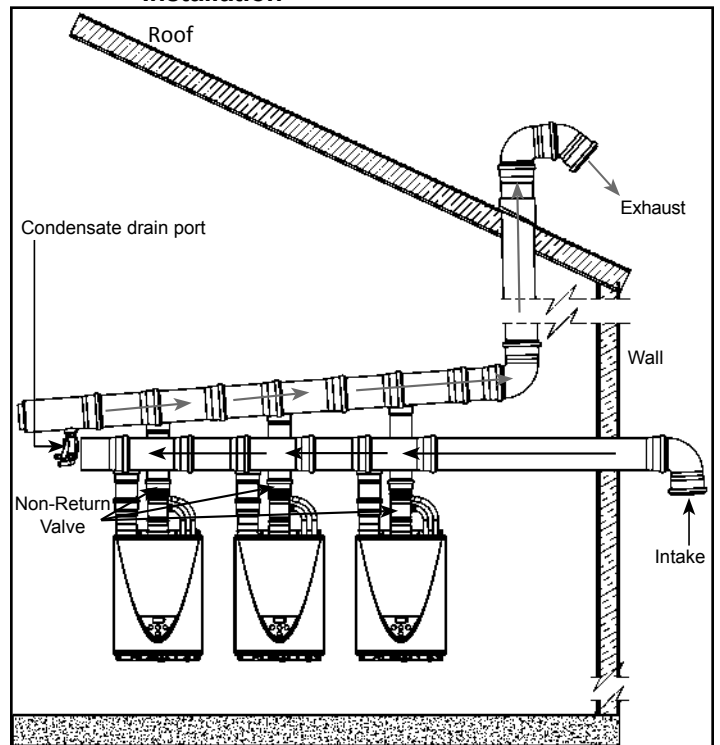


Figure 6. Typical Common-Vent Combination Wall / Roof Installation

Vertical (Multi-Level)

Condensing heaters may also be installed in a multi-level, vertical configuration. A maximum of 3 heaters may be common vented in a vertical configuration. The use of reducing wyes to join each heater's venting to the trunk line is preferred, however reducing tees are acceptable. The maximum vertical distance of the single exhaust vent line from the heater to the common vent header (trunk line) is 10 ft. (3m), with only two elbows allowed. This vent size should be of 4 in. piping.

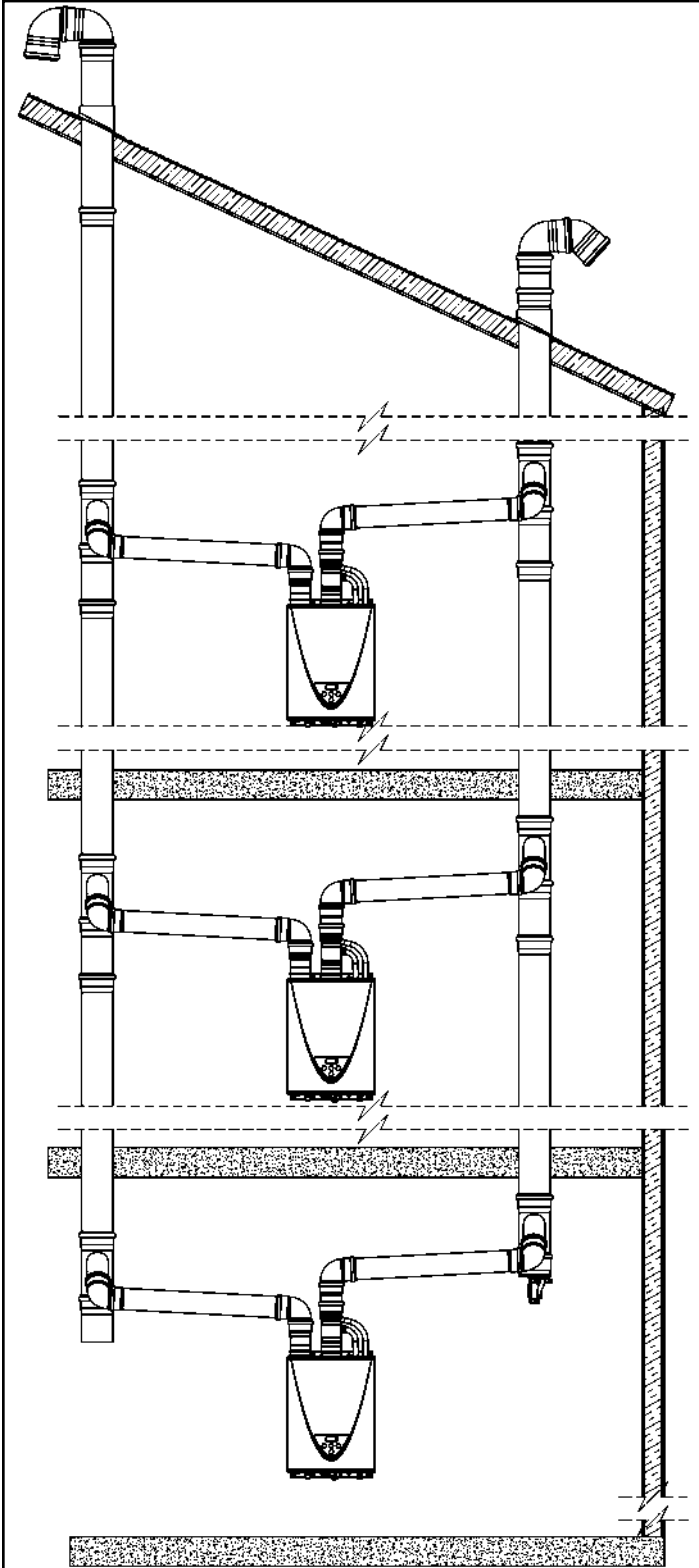


Figure 7. Vertical Through-The-Roof Venting
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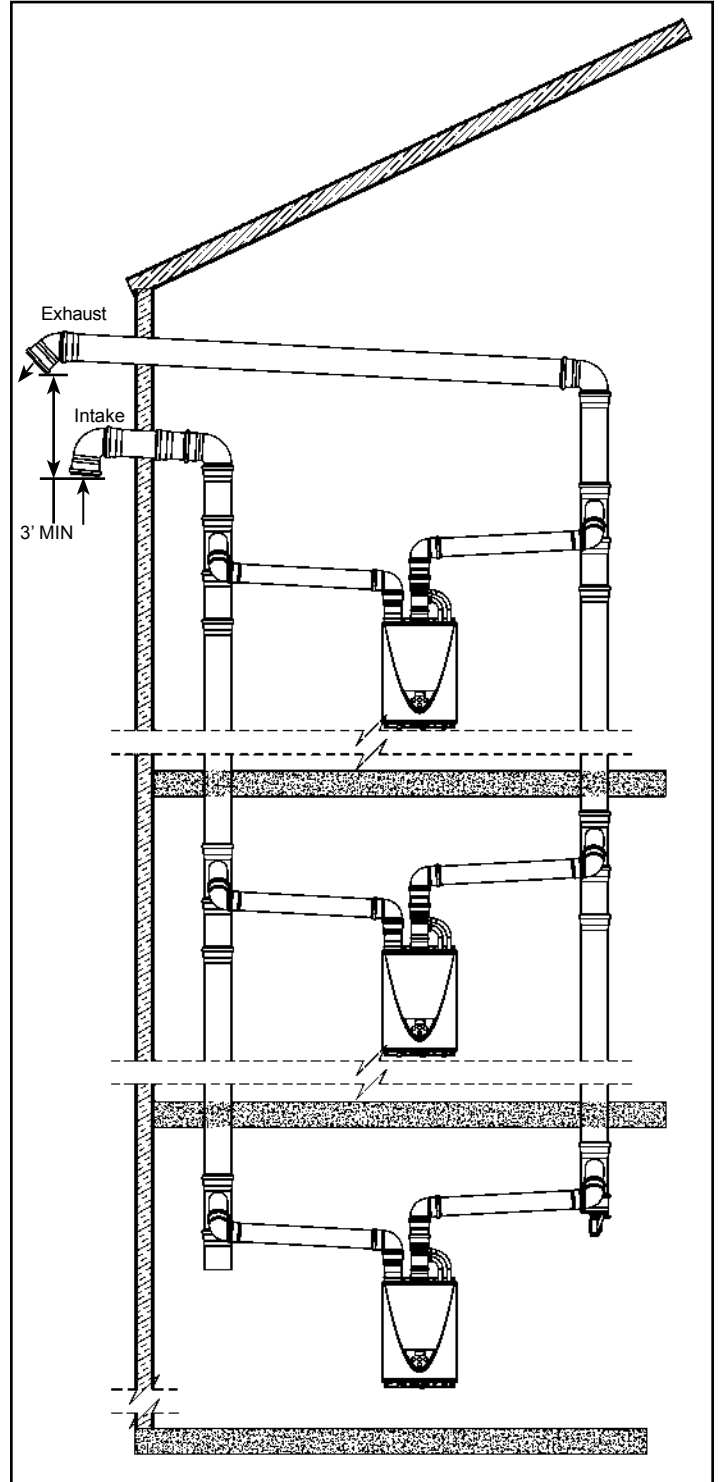


Figure 8. Vertical Through-The-Wall Venting

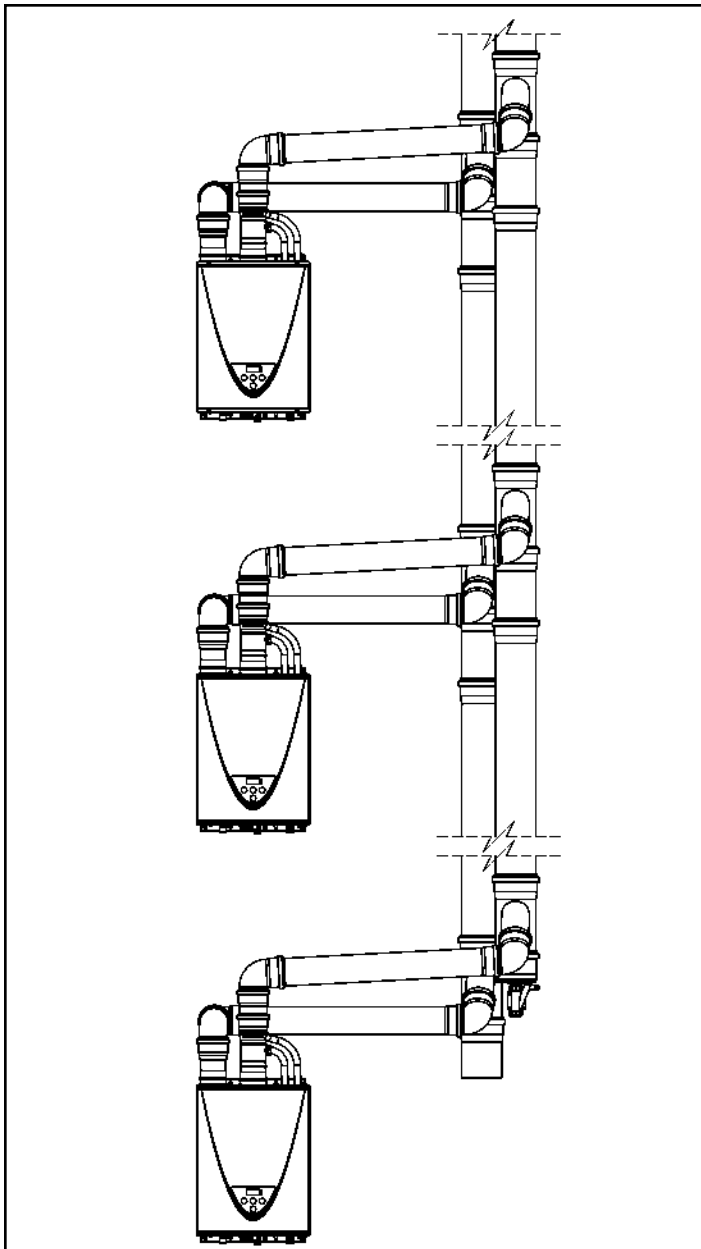


Figure 9. Vertical Venting In A Single Chase

DETERMINING THE COMMON VENT DIAMETER

Horizontal Configuration

In order to determine the vent trunk diameter (D), the total equivalent vent length and number of heaters must first be determined. The total equivalent vent length (L) is calculated by adding the horizontal length (W) and the vertical length (H), with each 90° elbow equaling 5 ft. (1.5m) of pipe.

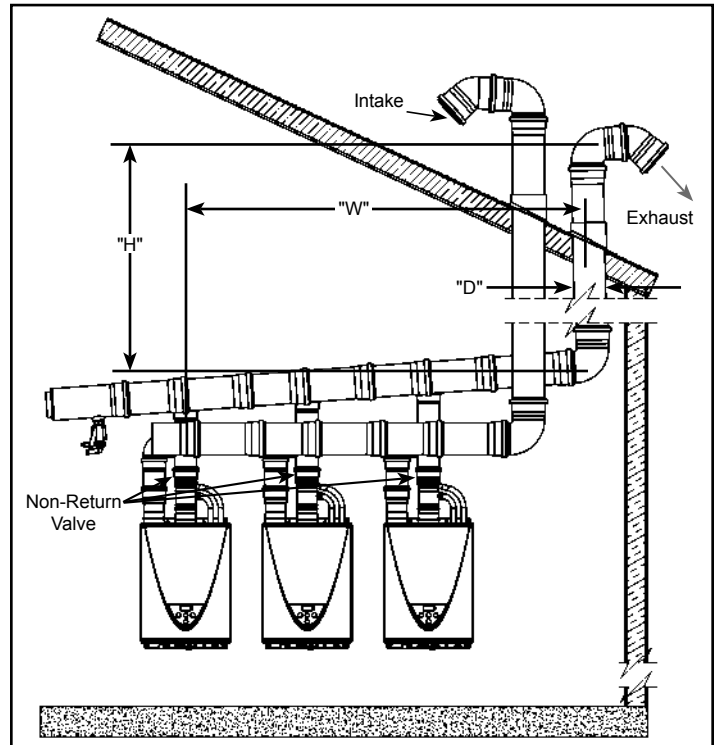


Figure 10. Vent Dimensioning

Notes:

- Total vent length (L) = H + W + (Number of Elbows x 5)
- Vent diameter="D"
- For the clearances between the exhaust termination and the intake termination refer to the heater Installation and Owner's Guide.
- Once you have determined L, see Figure 3 to determine the common vent header size. The common vent header is dependent on the number of heaters connected to the vent. For example, if you have 4 heaters vented together with L = 60 ft. (18m) your minimum common vent diameter is 8 in.
- The air intake sizing follows this same criteria.
- Install screens in each termination to prevent foreign material from entering the vent system. The mesh spacing of the screen should be no less than 3/4 in. (19mm).

Vertical Configuration

Maximum number of 3 heaters may be common vented in a vertical configuration. The maximum equivalent length of the common vent chimney is 100 ft. (30m) using 8 in. pipe and the trunk line should be a constant size.

Restrictions for vertical common venting (intake and exhaust) are as follows (see Figure 11):

- $L_1 + L_2 \leq 10 \text{ ft.} + 2 \text{ elbows, max.}$
- $\text{Total vent length} = L_1 + L_2 + H_t$

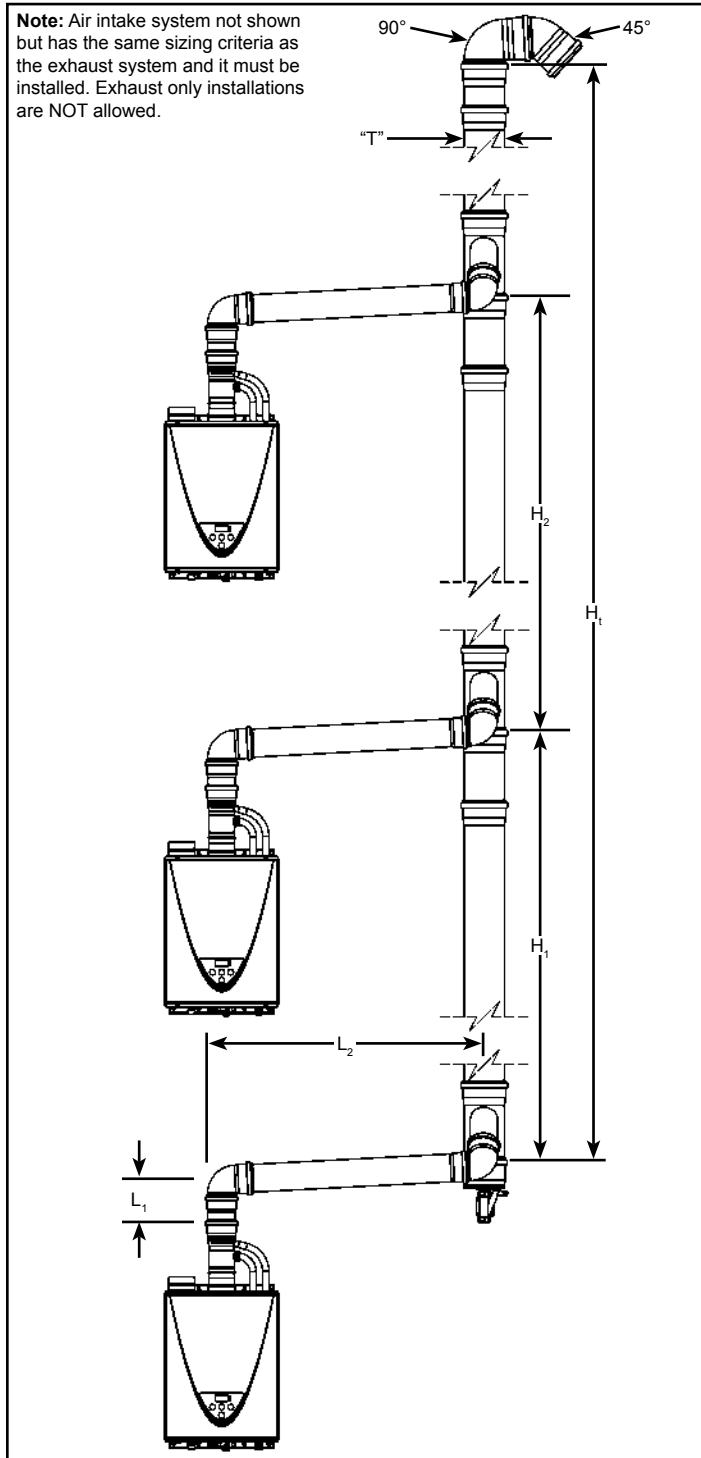


Figure 11. Vent Dimensioning

CLEARANCES

NOTICE: Follow all local and national codes in regards to proper termination clearances. In the absence of such codes, the clearances below can be used as guidelines. Local codes supersede these guidelines.

Sidewall Terminations

For multiple sidewall exhaust terminations, an exhaust termination must be at least 1 ft. (305mm) away from another exhaust termination. An exhaust termination must also be at least 2 ft. (610mm) away from an inside corner. (If the adjacent wall is less than 2 ft. (610mm) of length, the minimum required distance away from the inside corner will be equal to the length of that adjacent wall.)

For direct-vent sidewall terminations that use two separate penetrations for the intake and exhaust, maintain the termination clearances shown in the diagrams in the Installation Manual and Owner's Guide.

Exhaust and/or direct-vent sidewall terminations should be at least 2 ft. (610mm) away from an opposite surface/wall. Do not place the termination directly in front of an opening into a building.

Rooftop Terminations

Exhaust terminations must be at least 1 ft. (305mm) away from any obstructions.

1. Clearances for multiple exhausts and intakes – sidewall & roof: maintain the termination clearances shown in the diagrams in the Installation Manual and Owner's Guide.

VENTING COMPONENTS

The following pages show exploded vent fitting diagrams for each configuration (horizontal or vertical) for PVC and polypropylene piping. Each configuration will have a table showing the number of fittings needed corresponding to the number of heaters being common vented.

HORIZONTAL CONFIGURATIONS - (SCHEDULE 40 PVC PIPING)

Back-To-Back

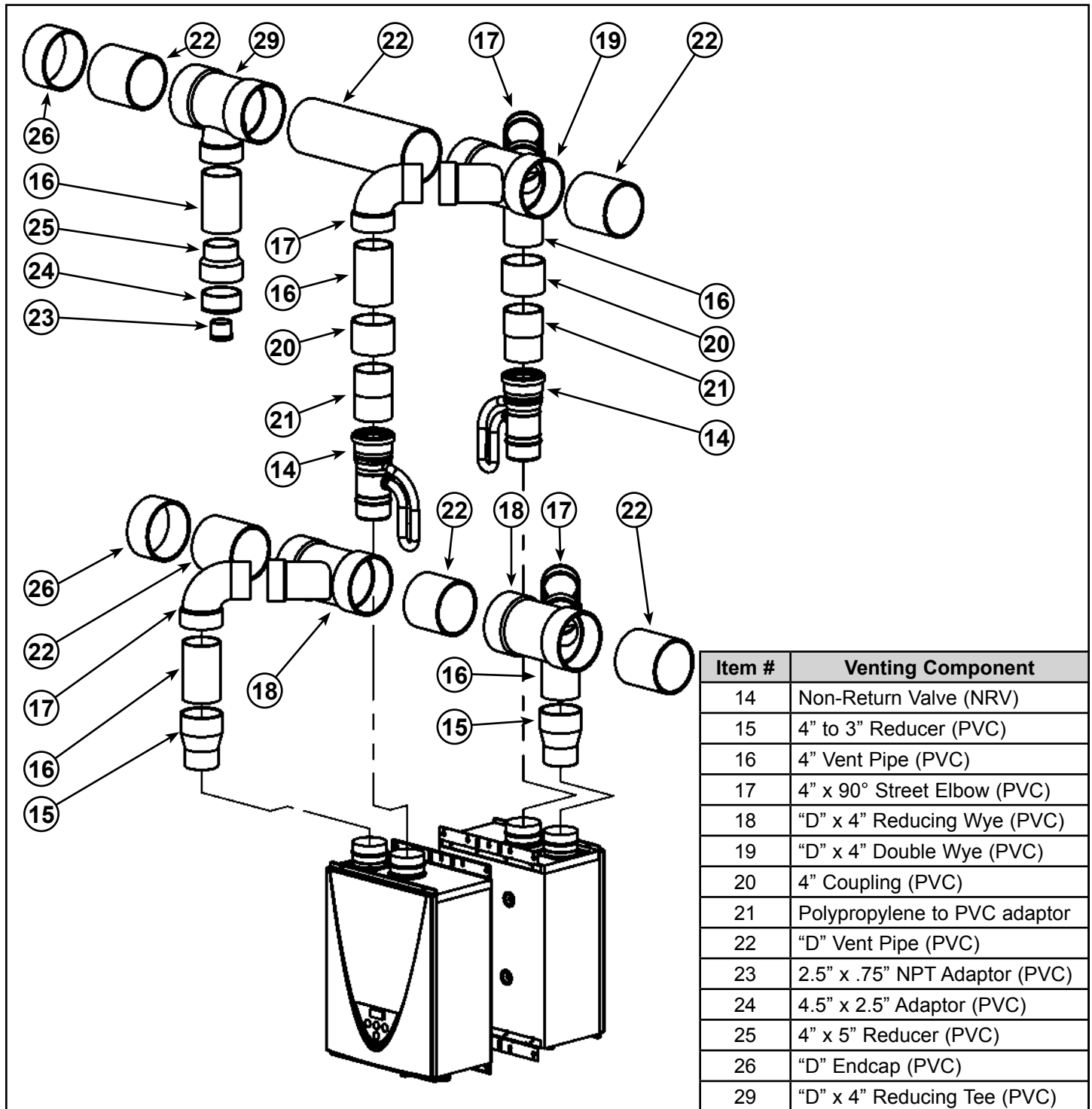


Figure 12. Venting Components Horizontal Configuration (Back-to-Back)

Venting Component		Number of Back-to-Back Common Vented Heaters						
		2	3	4	5	6	7	8
Air Intake	4" to 3" Reducer (PVC) (Item #15)	2	3	4	5	6	7	8
	4" x 90° Street Elbow (PVC) (Item #17)	2	3	4	5	6	7	8
	"D" x 4" Reducing Wye (PVC) (Item #18)	2	3	4	5	6	7	8
Exhaust	Non-Return Valve (NRV) (Item #14)	2	3	4	5	6	7	8
	4" x 90° Street Elbow (PVC) (Item #17)	2	3	4	5	6	7	8
	"D" x 4" Reducing Wye (PVC) (Item #18)	0	1	0	1	0	1	0
	"D" x 4" Double Wye (PVC) (Item #19)	1	1	2	2	3	3	4
	4" Coupling (PVC) (Item #20)	2	3	4	5	6	7	8
	Polypropylene to PVC adaptor (Item #21)	2	3	4	5	6	7	8

* All PVC fittings and pipe shall be schedule 40.
"D" = Main Trunk Diameter.
Contractor to obtain proper pipe hangers for the venting and air intake.

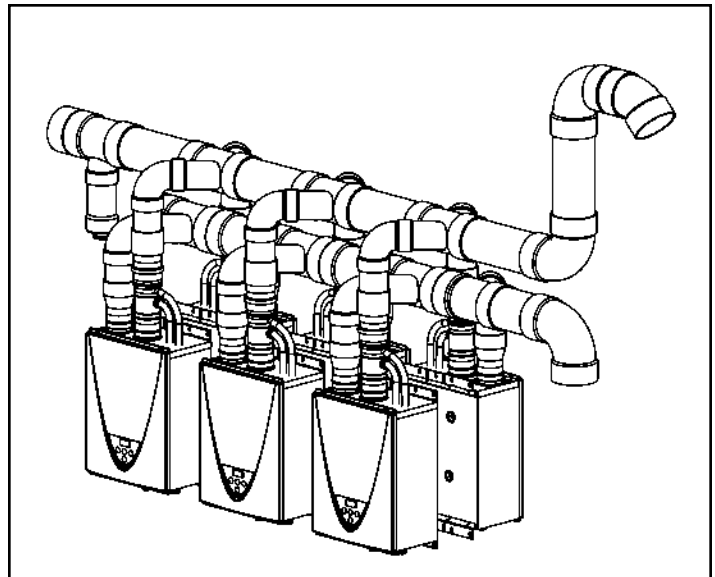


Figure 13. Horizontal Configuration (Back-to-Back)

Table 2. List of Venting Components Horizontal Configuration (Back-to-Back)

In-Line

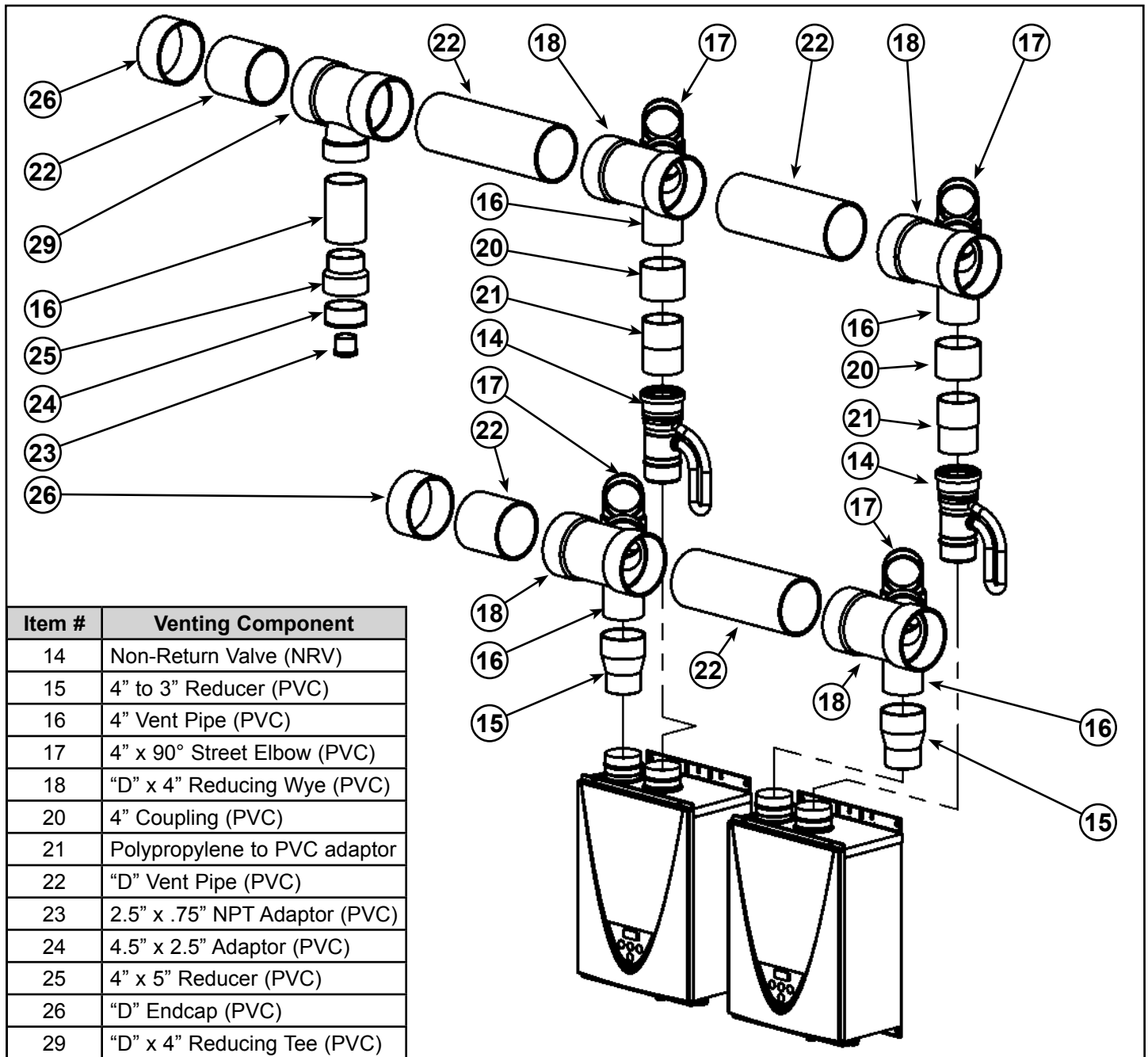


Figure 14. Venting Components Horizontal Configuration (In-Line)

Venting Component		Number of In-Line Common Vented Heaters						
		2	3	4	5	6	7	8
Air Intake	4" to 3" Reducer (PVC) (Item #15)	2	3	4	5	6	7	8
	4" x 90° Street Elbow (PVC) (Item #17)	2	3	4	5	6	7	8
	"D" x 4" Reducing Wye (PVC) (Item #18)	2	3	4	5	6	7	8
Exhaust	Non-Return Valve (NRV) (Item #14)	2	3	4	5	6	7	8
	4" x 90° Street Elbow (PVC) (Item #17)	2	3	4	5	6	7	8
	"D" x 4" Reducing Wye (PVC) (Item #18)	2	3	4	5	6	7	8
	4" Coupling (PVC) (Item #20)	2	3	4	5	6	7	8
	Polypropylene to PVC adaptor (Item #21)	2	3	4	5	6	7	8

* All PVC fittings and pipe shall be schedule 40.
 "D" = Main Trunk Diameter.
 Contractor to obtain proper pipe hangers for the venting and air intake.

Table 3. List of Venting Components Horizontal Configuration (In-Line)

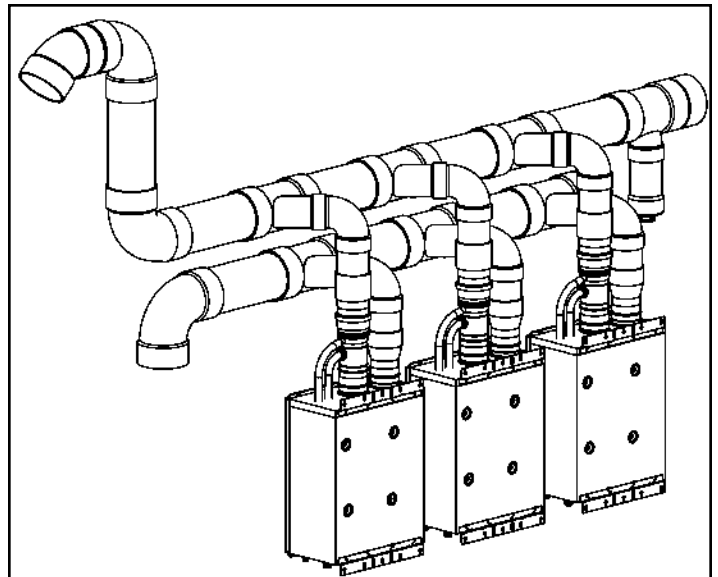


Figure 15. Horizontal Configuration (In-Line)

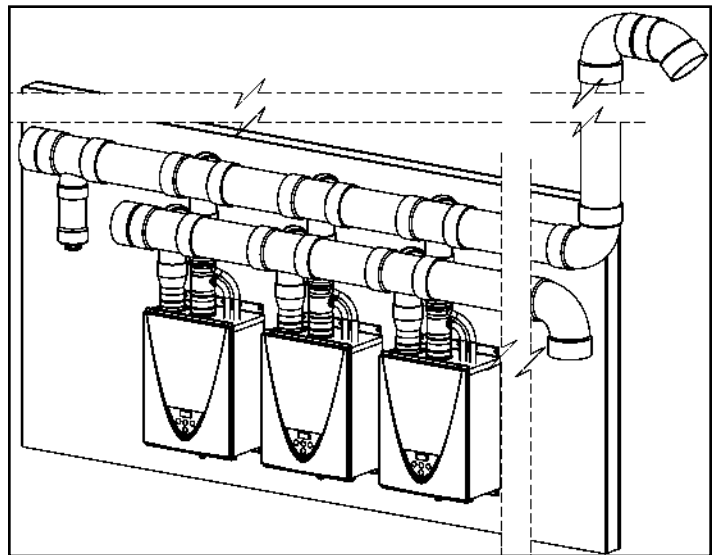


Figure 16. Horizontal Configuration (In-Line on Wall)

HORIZONTAL CONFIGURATIONS - (POLYPROPYLENE PIPING)

Back-To-Back

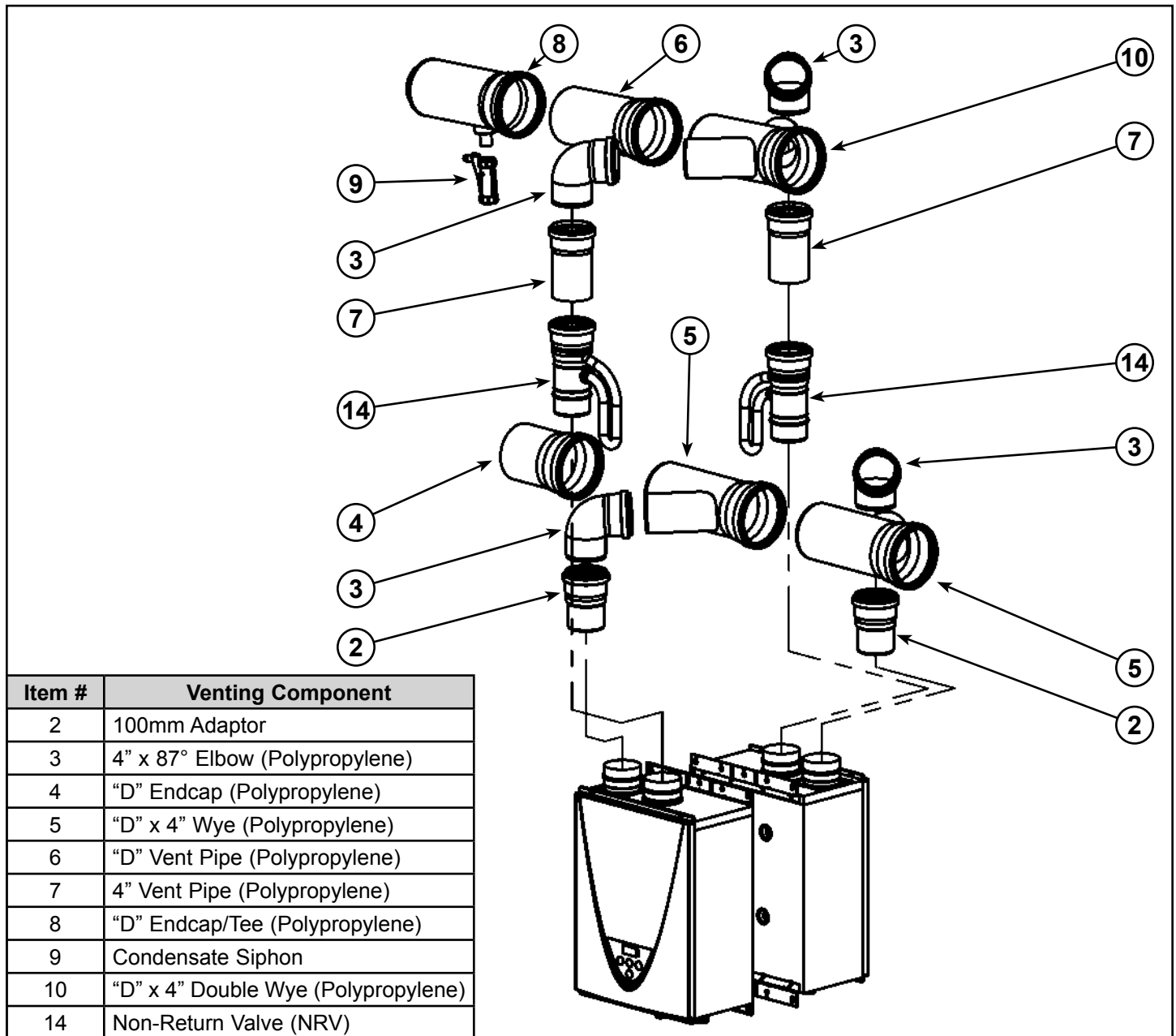


Figure 17. Venting Components Horizontal Configuration (Back-to-Back)

Venting Component		Number of Back-to-Back Common Vented Heaters						
		2	3	4	5	6	7	8
Air Intake	100mm Adaptor (Item #2)	2	3	4	5	6	7	8
	4" x 87° Elbow (Polypropylene) (Item #3)	2	3	4	5	6	7	8
	"D" x 4" Wye (Polypropylene) (Item #5)	2	3	4	5	6	7	8
Exhaust	4" x 87° Elbow (Polypropylene) (Item #3)	2	3	4	5	6	7	8
	"D" x 4" Wye (Polypropylene) (Item #5)	0	1	0	1	0	1	0
	"D" x 4" Double Wye (Polypropylene) (Item #10)	1	1	2	2	3	3	4
	Non-Return Valve (NRV) (Item #14)	2	3	4	5	6	7	8
"D" = Main Trunk Diameter. Contractor to obtain proper pipe hangers for the venting and air intake.								

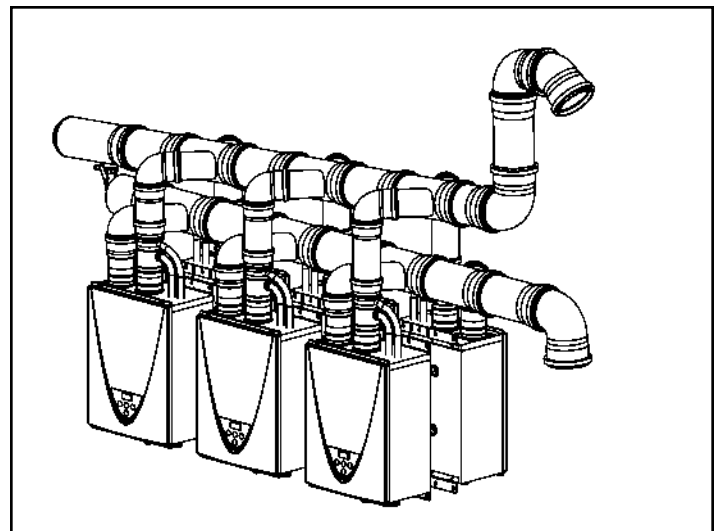


Figure 18. Horizontal Configuration (Back-to-Back)

Table 4. List of Venting Components Horizontal Configuration (Back-to-Back)

In-Line

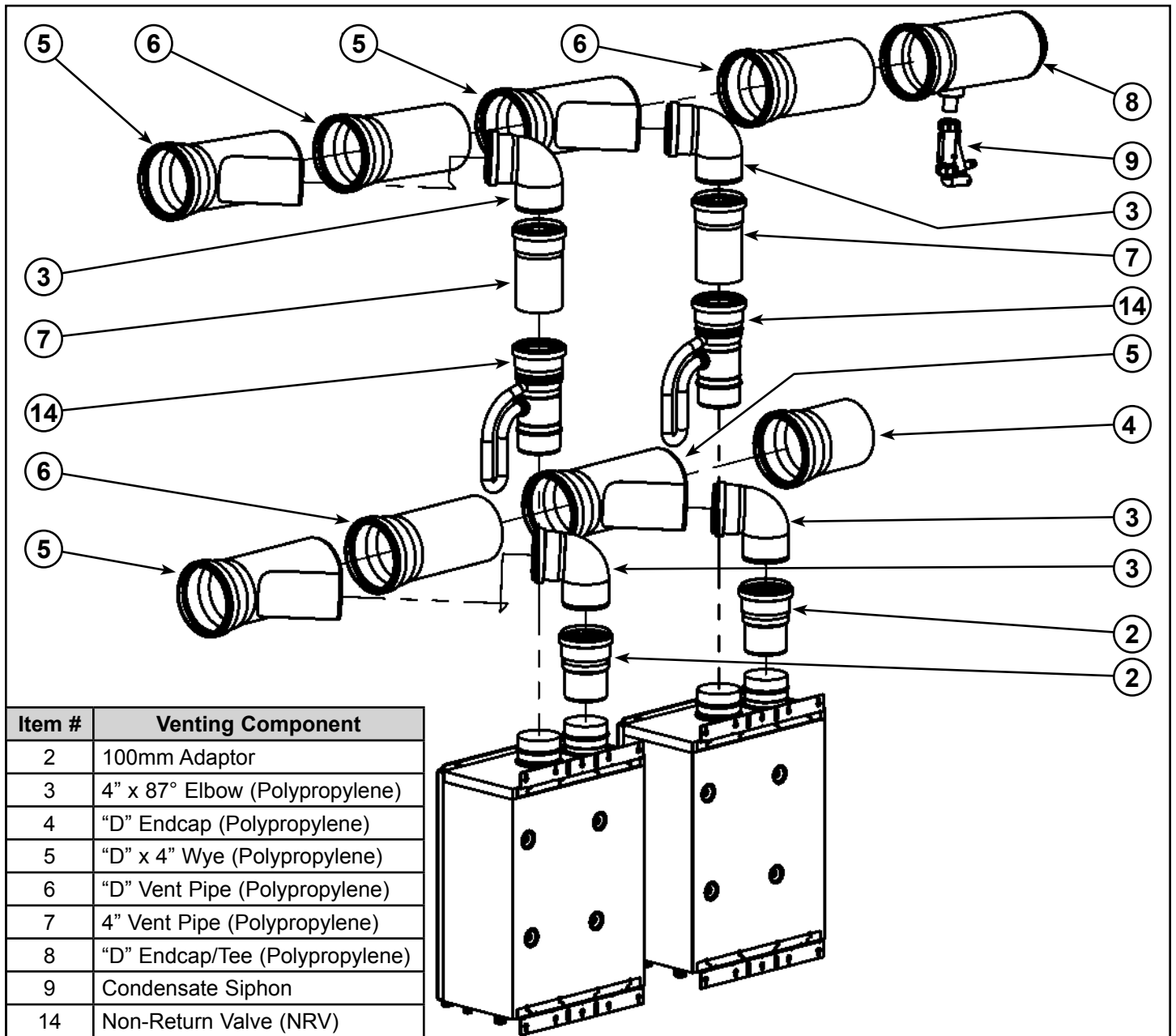


Figure 19. Venting Components Horizontal Configuration (In-Line)

Venting Component		Number of In-Line Common Vented Heaters						
		2	3	4	5	6	7	8
Air Intake	100mm Adaptor (Item #2)	2	3	4	5	6	7	8
	4" x 87° Elbow (Polypropylene) (Item #3)	2	3	4	5	6	7	8
	"D" x 4" Wye (Polypropylene) (Item #5)	2	3	4	5	6	7	8
Exhaust	4" x 87° Elbow (Polypropylene) (Item #3)	2	3	4	5	6	7	8
	"D" x 4" Wye (Polypropylene) (Item #5)	2	3	4	5	6	7	8
	Non-Return Valve (NRV) (Item #14)	2	3	4	5	6	7	8

"D" = Main Trunk Diameter.
Contractor to obtain proper pipe hangers for the venting and air intake.

Table 5. List of Venting Components Horizontal Configuration (In-Line)

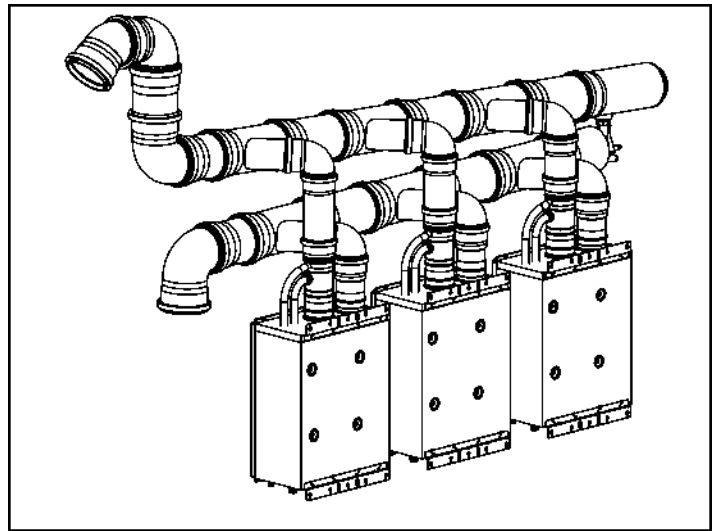


Figure 20. Horizontal Configuration (In-Line)

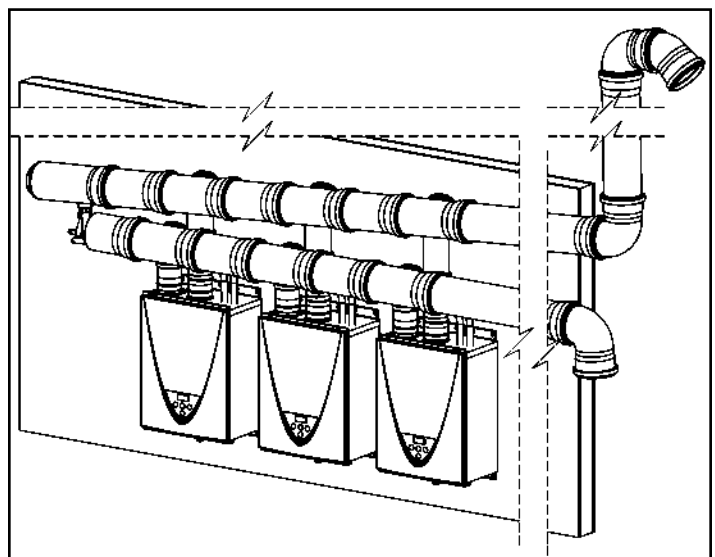


Figure 21. Horizontal Configuration (In-Line on Wall)

VERTICAL CONFIGURATION (SCHEDULE 40 PVC PIPING)

Dual Chase

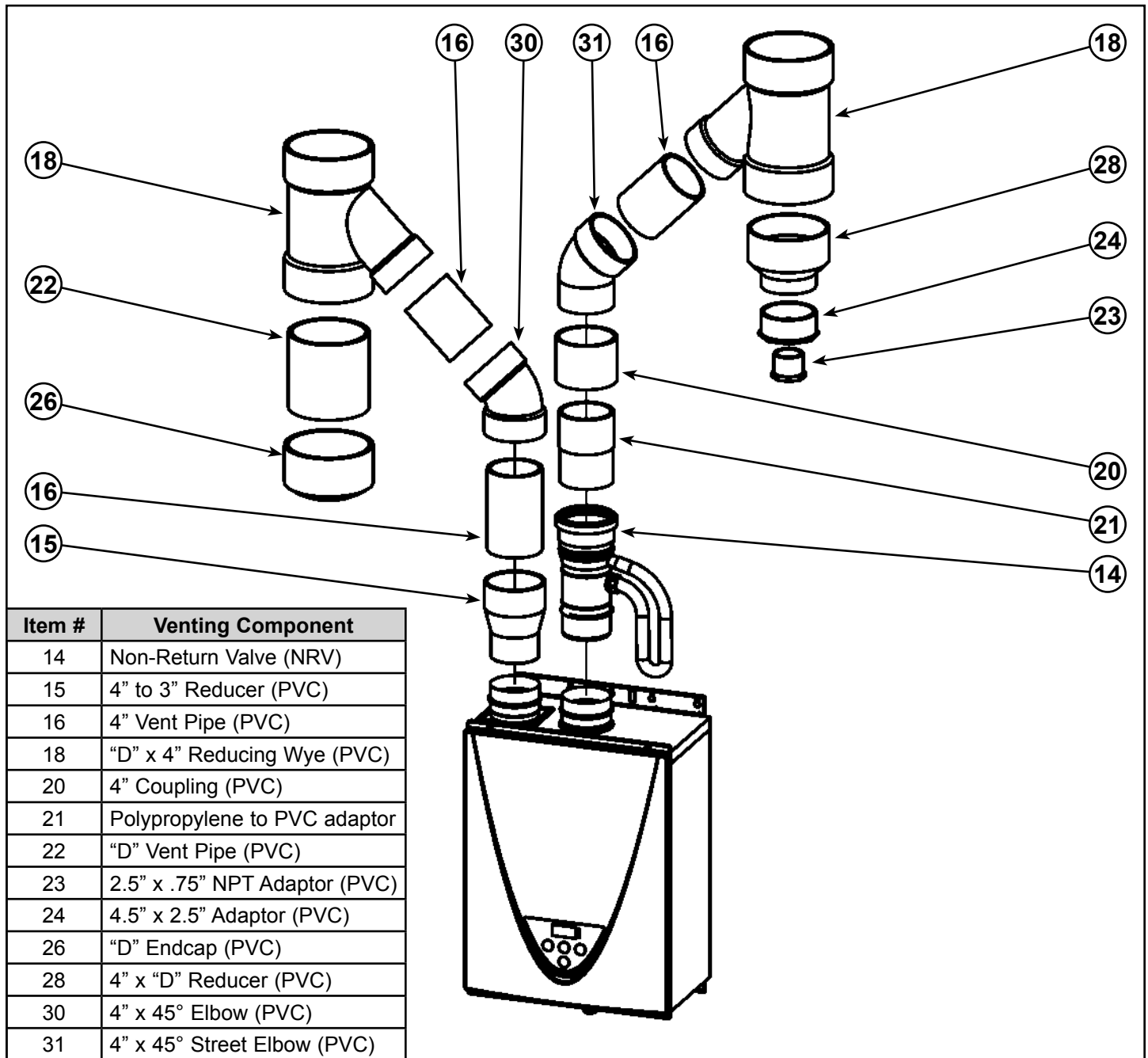


Figure 22. Venting Components Vertical Configuration (Dual Chase)

Venting Component		Number of Common Vented Heaters	
		2	3
Air Intake	4" to 3" Reducer (PVC) (Item #15)	2	3
	"D" x 4" Reducing Wye (PVC) (Item #18)	2	3
	4" x 45° Elbow (PVC) (Item #30)	2	3
Exhaust	Non-Return Valve (NRV) (Item #14)	2	3
	"D" x 4" Reducing Wye (PVC) (Item #18)	2	3
	4" Coupling (PVC) (Item #20)	2	3
	Polypropylene to PVC adaptor (Item #21)	2	3
	4" x 45° Street Elbow (PVC) (Item #31)	2	3
<p>* All PVC fittings and pipe shall be schedule 40. "D" = Main Trunk Diameter. Contractor to obtain proper pipe hangers for the venting and air intake.</p>			

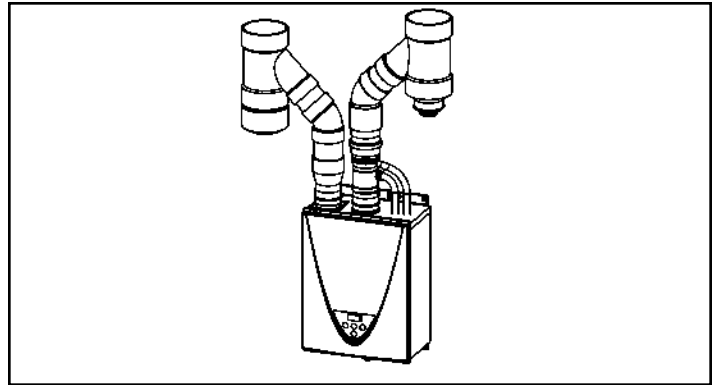


Figure 23. Vertical Configuration (Dual Chase)

Table 6. List of Venting Components Vertical Configuration (Dual Chase)

Single Chase

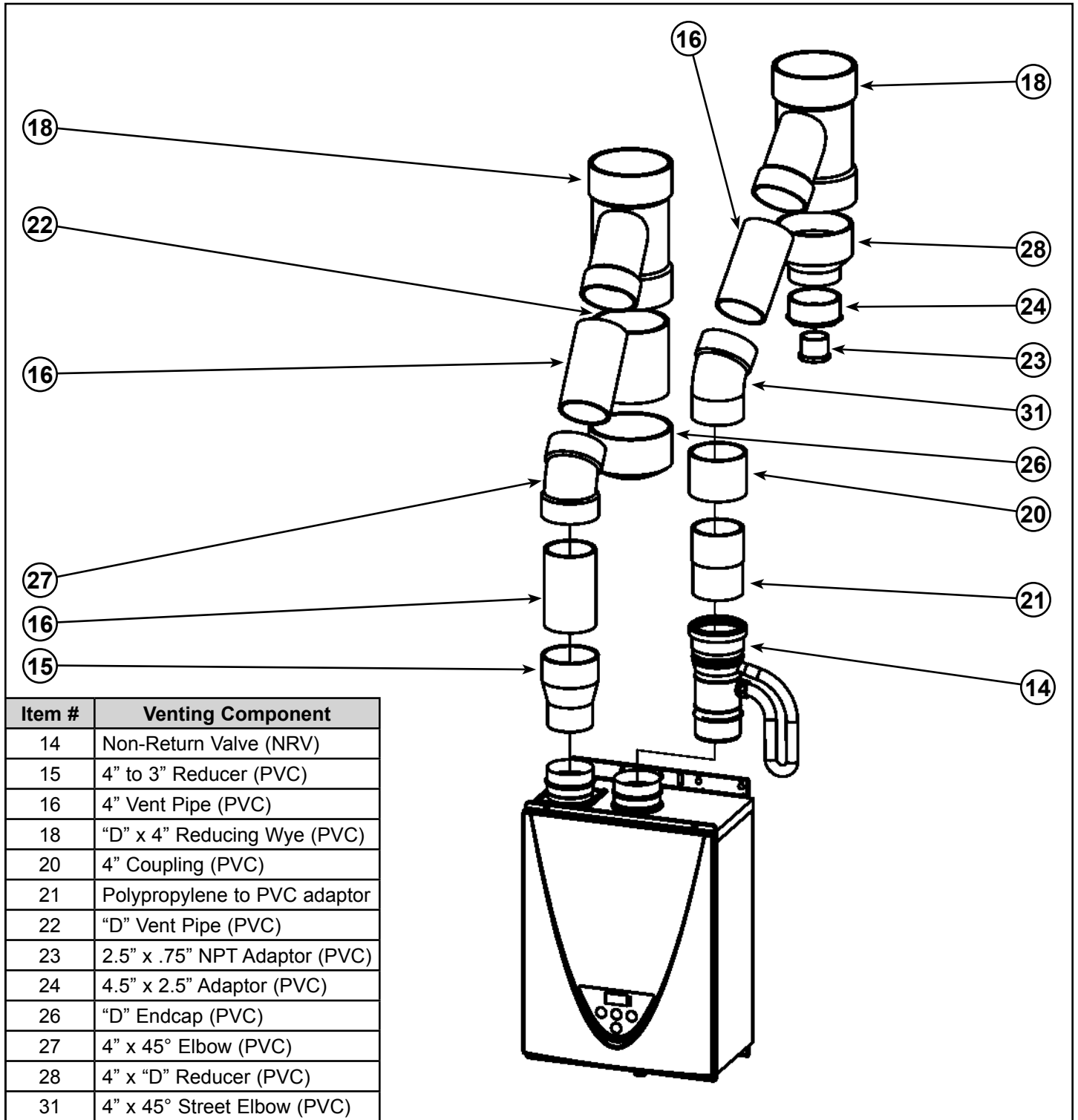


Figure 24. Venting Components Vertical Configuration (Single Chase)

Venting Component		Number of Common Vented Heaters	
		2	3
Air Intake	4" to 3" Reducer (PVC) (Item #15)	2	3
	"D" x 4" Reducing Wye (PVC) (Item #18)	2	3
	4" x 45° Elbow (PVC) (Item #27)	2	3
	4" x 45° Street Elbow (PVC) (Item #31)	2	3
Exhaust	Non-Return Valve (NRV) (Item #14)	2	3
	"D" x 4" Reducing Wye (PVC) (Item #18)	2	3
	4" Coupling (PVC) (Item #20)	2	3
	Polypropylene to PVC adaptor (Item #21)	2	3
	4" x 45° Street Elbow (PVC) (Item #31)	2	3
<p>* All PVC fittings and pipe shall be schedule 40. "D" = Main Trunk Diameter. Contractor to obtain proper pipe hangers for the venting and air intake.</p>			

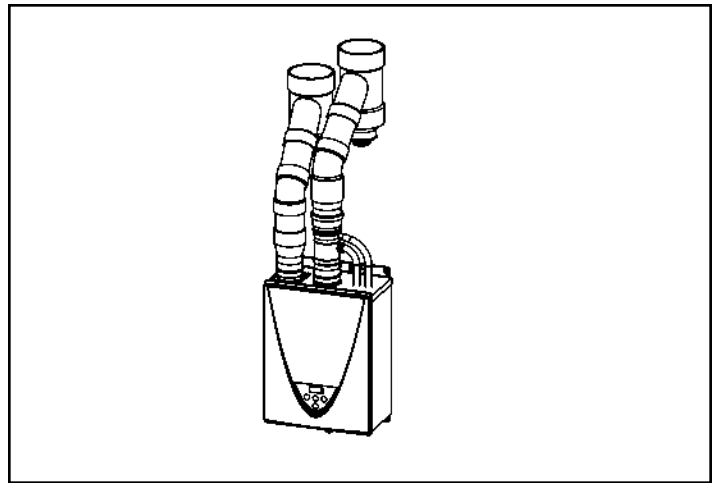


Figure 25. Vertical Configuration (Single Chase)

Table 7. List of Venting Components Vertical Configuration (Single Chase)

VERTICAL CONFIGURATION (POLYPROPYLENE PIPING)

Dual Chase

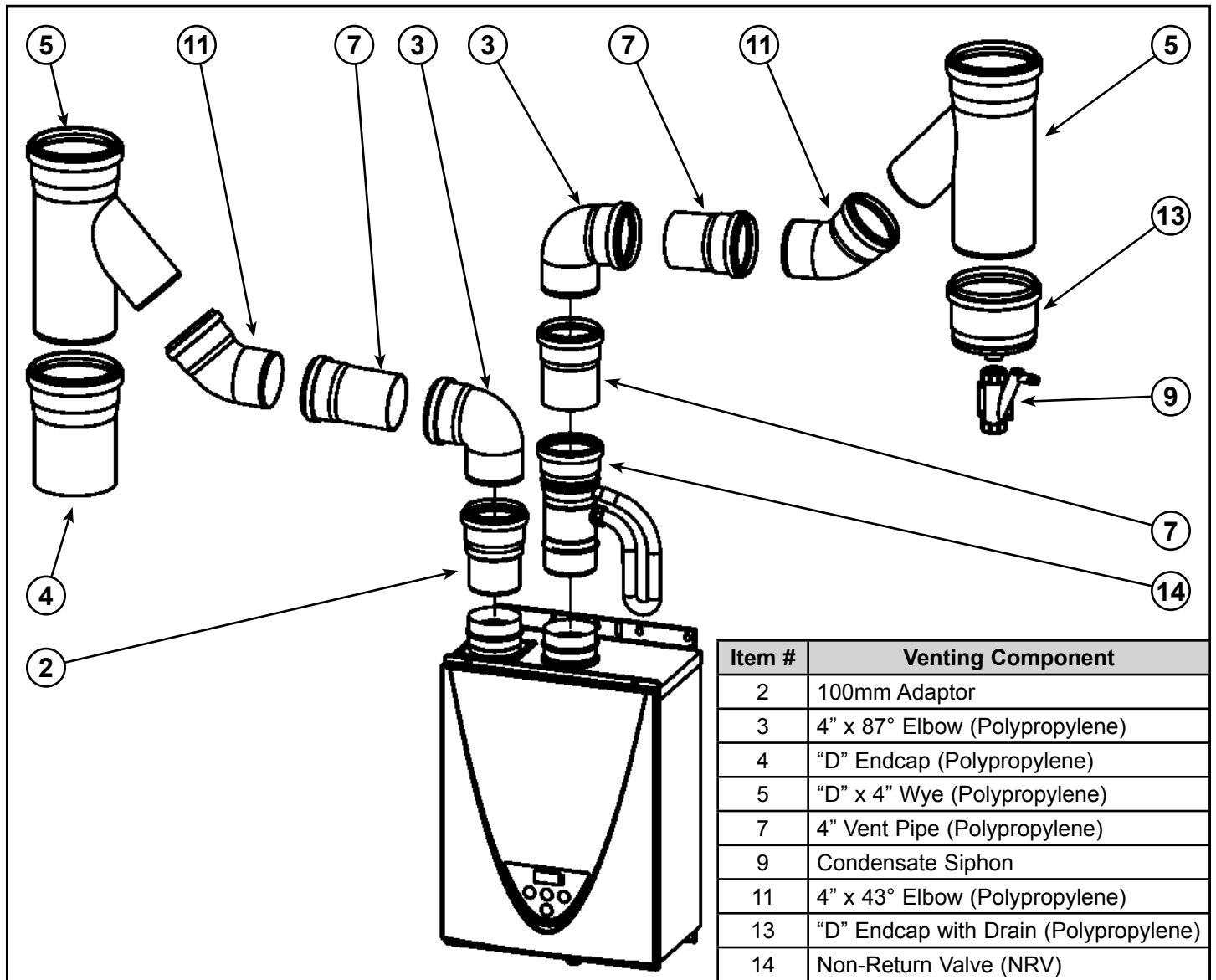


Figure 26. Venting Components Vertical Configuration (Dual Chase)

Venting Component		Number of Common Vented Heaters	
		2	3
Air Intake	100mm Adaptor (Item #2)	2	3
	4" x 87° Elbow (Polypropylene) (Item #3)	2	3
	"D" x 4" Wye (Polypropylene) (Item #5)	2	3
	4" x 43° Elbow (Polypropylene) (Item #11)	2	3
Exhaust	4" x 87° Elbow (Polypropylene) (Item #3)	2	3
	"D" x 4" Wye (Polypropylene) (Item #5)	2	3
	4" x 43° Elbow (Polypropylene) (Item #11)	2	3
	Non-Return Valve (NRV) (Item #14)	2	3
"D" = Main Trunk Diameter. Contractor to obtain proper pipe hangers for the venting and air intake.			

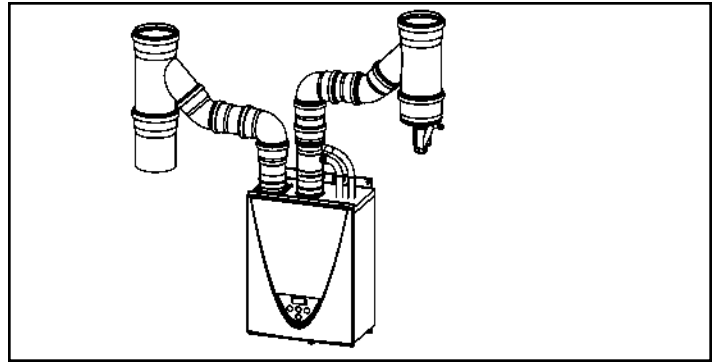


Figure 27. Vertical Configuration (Dual Chase)

Table 8. List of Venting Components Vertical Configuration - Wyes (Dual Chase)

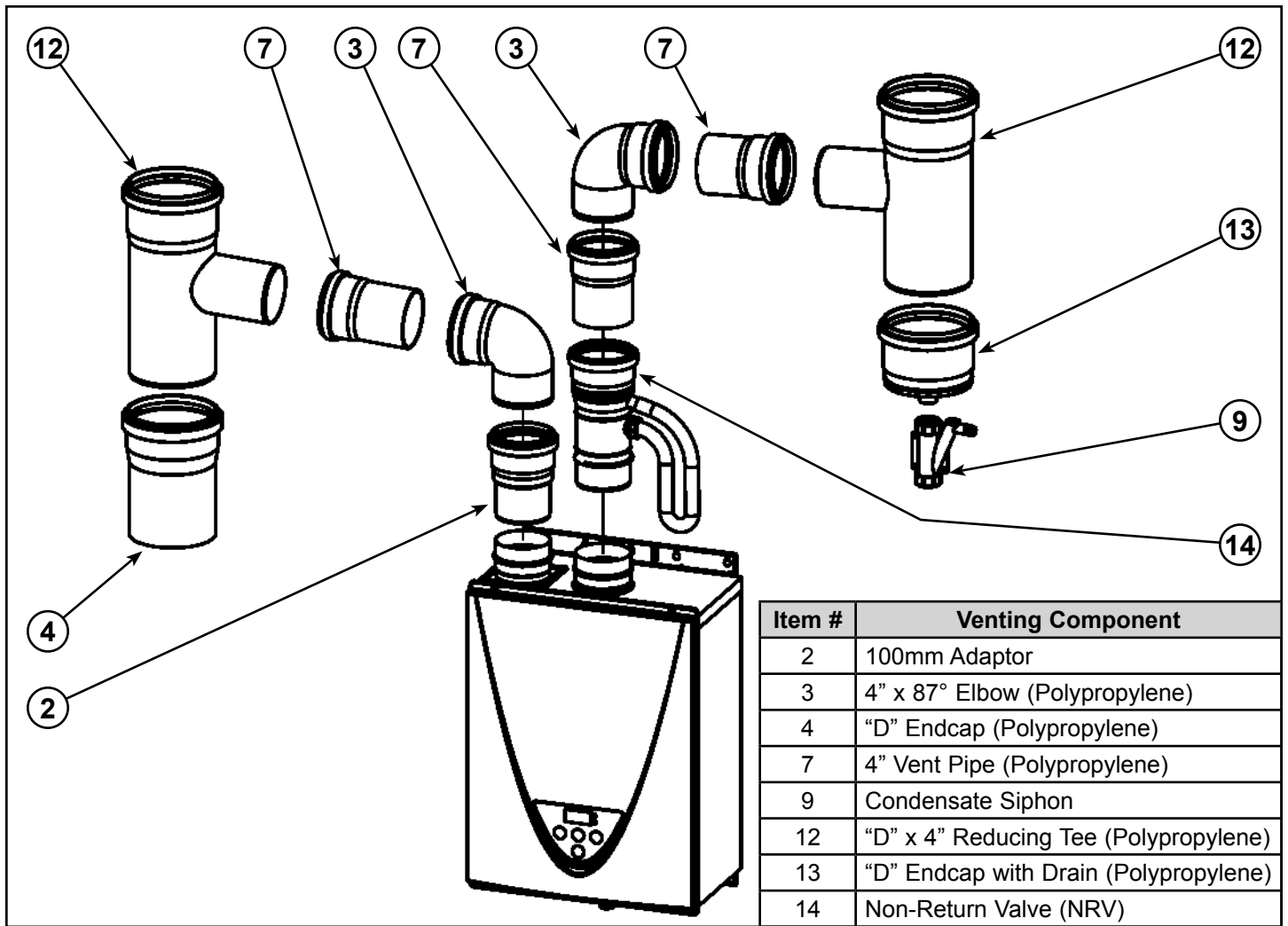


Figure 28. Venting Components Vertical Configuration - Tees (Dual Chase)

Venting Component		Number of Common Vented Heaters	
		2	3
Air Intake	100mm Adaptor (Item #2)	2	3
	4" x 87° Elbow (Polypropylene) (Item #3)	2	3
	"D" x 4" Reducing Tee (Polypropylene) (Item #12)	2	3
Exhaust	4" x 87° Elbow (Polypropylene) (Item #3)	2	3
	Non-Return Valve (NRV) (Item #14)	2	3
	"D" x 4" Reducing Tee (Polypropylene) (Item #12)	2	3
"D" = Main Trunk Diameter. Contractor to obtain proper pipe hangers for the venting and air intake.			

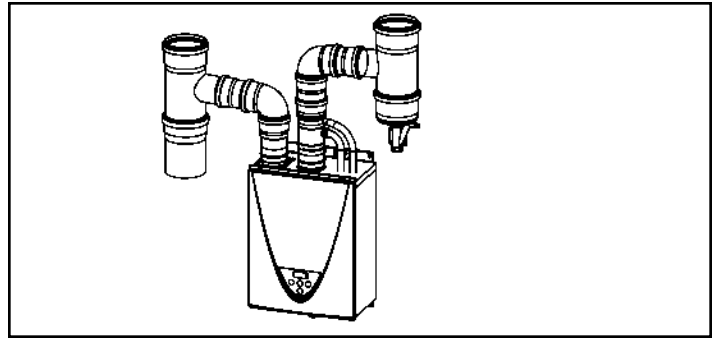


Figure 29. Vertical Configuration - Tees (Dual Chase)

Table 9. List of Venting Components Vertical Configuration - Tees (Dual Chase)

Single Chase

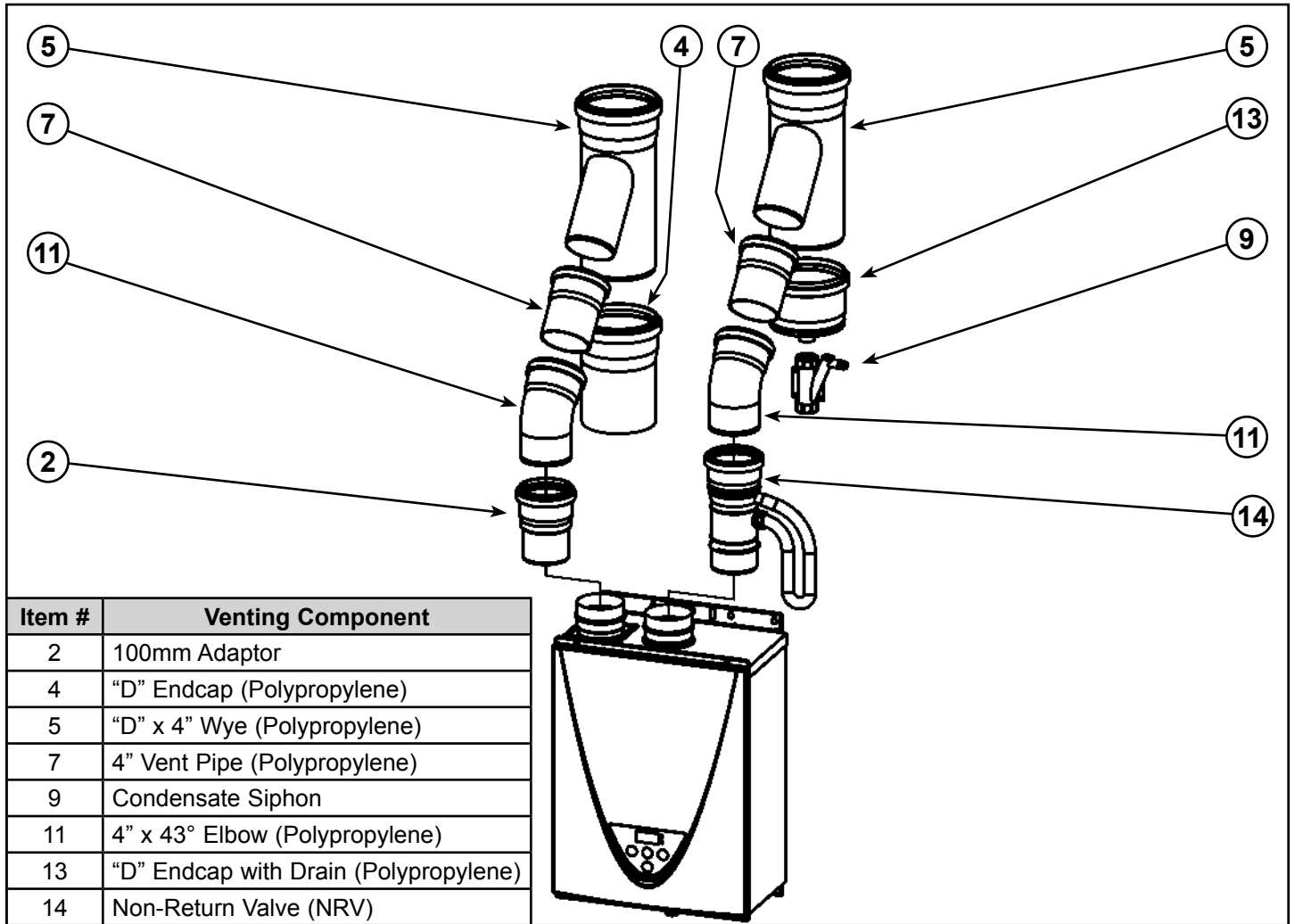


Figure 30. Venting Components Vertical Configuration - Wyes (Single Chase)

Venting Component		Number of Common Vented Heaters	
		2	3
Air Intake	100mm Adaptor (Item #2)	2	3
	"D" Endcap (Polypropylene) (Item #4)	2	3
	4" x 43° Elbow (Polypropylene) (Item #11)	4	6
Exhaust	"D" x 4" Wye (Polypropylene) (Item #5)	2	3
	4" x 43° Elbow (Polypropylene) (Item #11)	2	3
	Non-Return Valve (NRV) (Item #14)	2	3
<p>"D" = Main Trunk Diameter. Contractor to obtain proper pipe hangers for the venting and air intake.</p>			

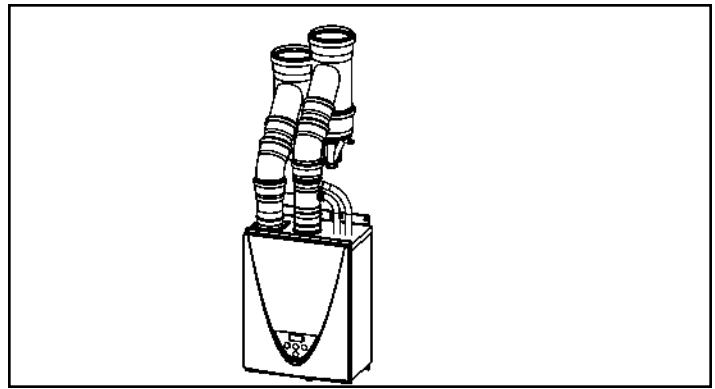


Figure 31. Vertical Configuration - Wyes (Single Chase)

Table 10. List of Venting Components Vertical Configuration - Wyes (Single Chase)

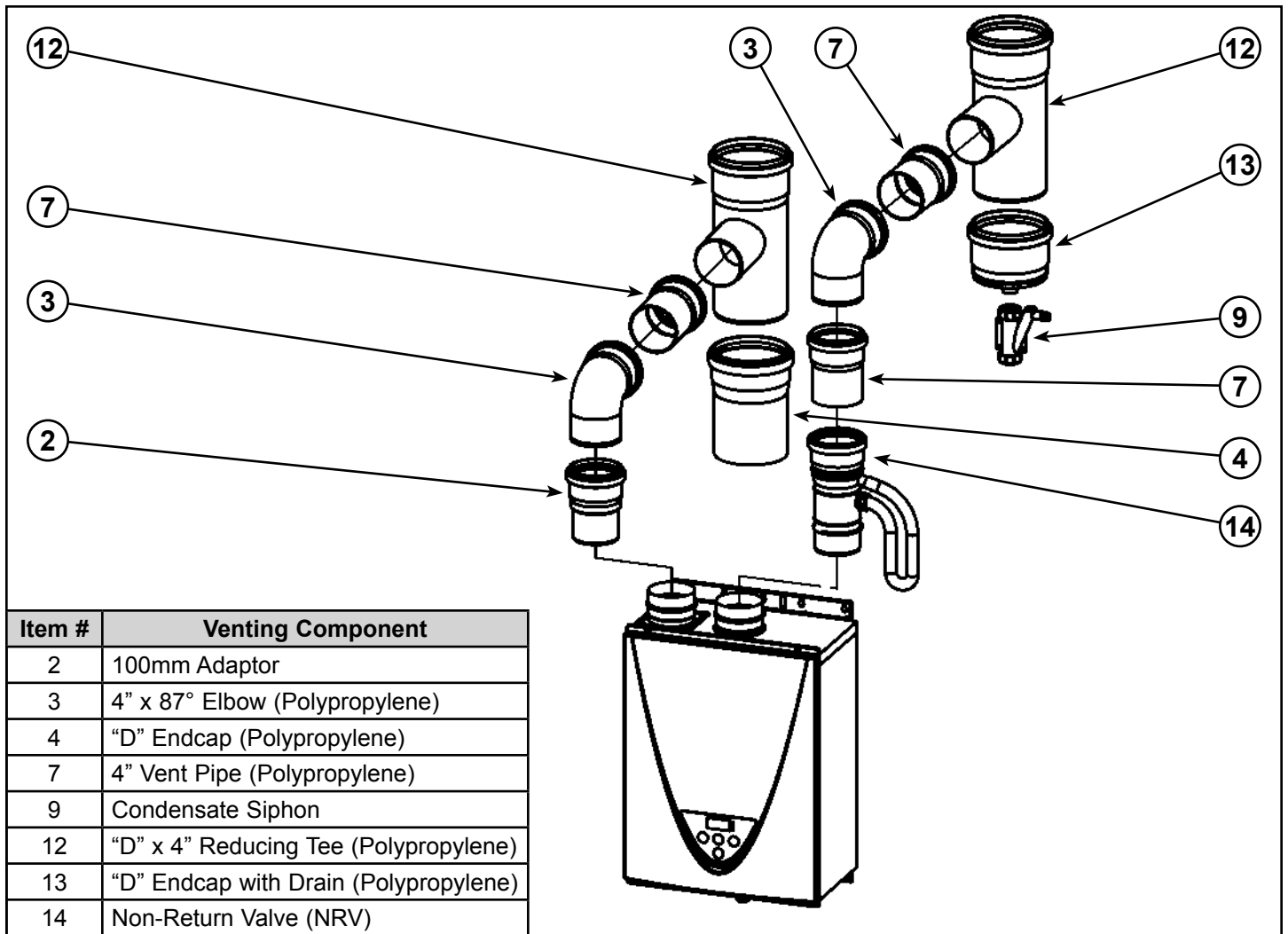


Figure 32. Venting Components Vertical Configuration - Tees (Single Chase)

Venting Component		Number of Common Vented Heaters	
		2	3
Air Intake	100mm Adaptor (Item #2)	2	3
	4" x 87° Elbow (Polypropylene) (Item #3)	2	3
	4" x 43° Elbow (Polypropylene) (Item #11)	2	3
	"D" x 4" Reducing Tee (Polypropylene) (Item #12)	2	3
Exhaust	4" x 87° Elbow (Polypropylene) (Item #3)	2	3
	"D" x 4" Reducing Tee (Polypropylene) (Item #12)	2	3
	Non-Return Valve (NRV) (Item #14)	2	3
"D" = Main Trunk Diameter. Contractor to obtain proper pipe hangers for the venting and air intake.			

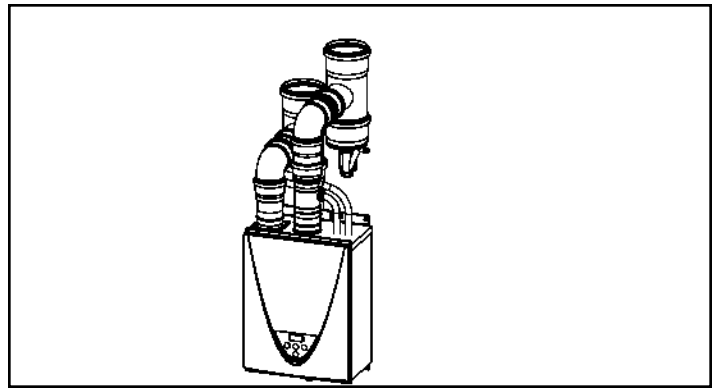


Figure 33. Vertical Configuration - Tees (Single Chase)

Table 11. List of Venting Components Vertical Configuration - Tees (Single Chase)

ITEM LIST

1	Heater	
2	100mm Adaptor	
3	4" x 87° Elbow (Polypropylene)	
4	"D" Endcap (Polypropylene)	
5	"D" x 4" Wye (Polypropylene)	
6	"D" Vent Pipe (Polypropylene)	
7	4" Vent Pipe (Polypropylene)	
8	"D" Endcap/Tee (Polypropylene)	
9	Condensate Siphon	
10	"D" x 4" Double Wye (Polypropylene)	
11	4" x 43° Elbow (Polypropylene)	
12	"D" x 4" Reducing Tee (Polypropylene)	
13	"D" Endcap with Drain (Polypropylene)	
14	Non-Return Valve (NRV)	(100113130)
15	4" to 3" Reducer (PVC)	
16	4" Vent Pipe (PVC)	
17	4" x 90° Street Elbow (PVC)	
18	"D" x 4" Reducing Wye (PVC)	
19	"D" x 4" Double Wye (PVC)	
20	4" Coupling (PVC)	
21	Polypropylene to PVC adaptor	(100113129)
22	"D" Vent Pipe (PVC)	
23	2.5" x .75" NPT Adaptor (PVC)	
24	4.5" x 2.5" Adaptor (PVC)	
25	4" x 5" Reducer (PVC)	
26	"D" Endcap (PVC)	
27	4" x 45° Elbow (PVC)	
28	4" x "D" Reducer (PVC)	
29	"D" x 4" Reducing Tee (PVC)	
30	4" x 45° Elbow (PVC)	
31	4" x 45° Street Elbow (PVC)	
"D" = Main Trunk Diameter.		

FINAL CHECKLIST

- Non-Return Valve (NRV) installed on each heater.
- PVC Adaptor installed on each heater with PVC venting.
- Venting properly supported.
- Venting properly sloped.
- Venting condensate drain installed.