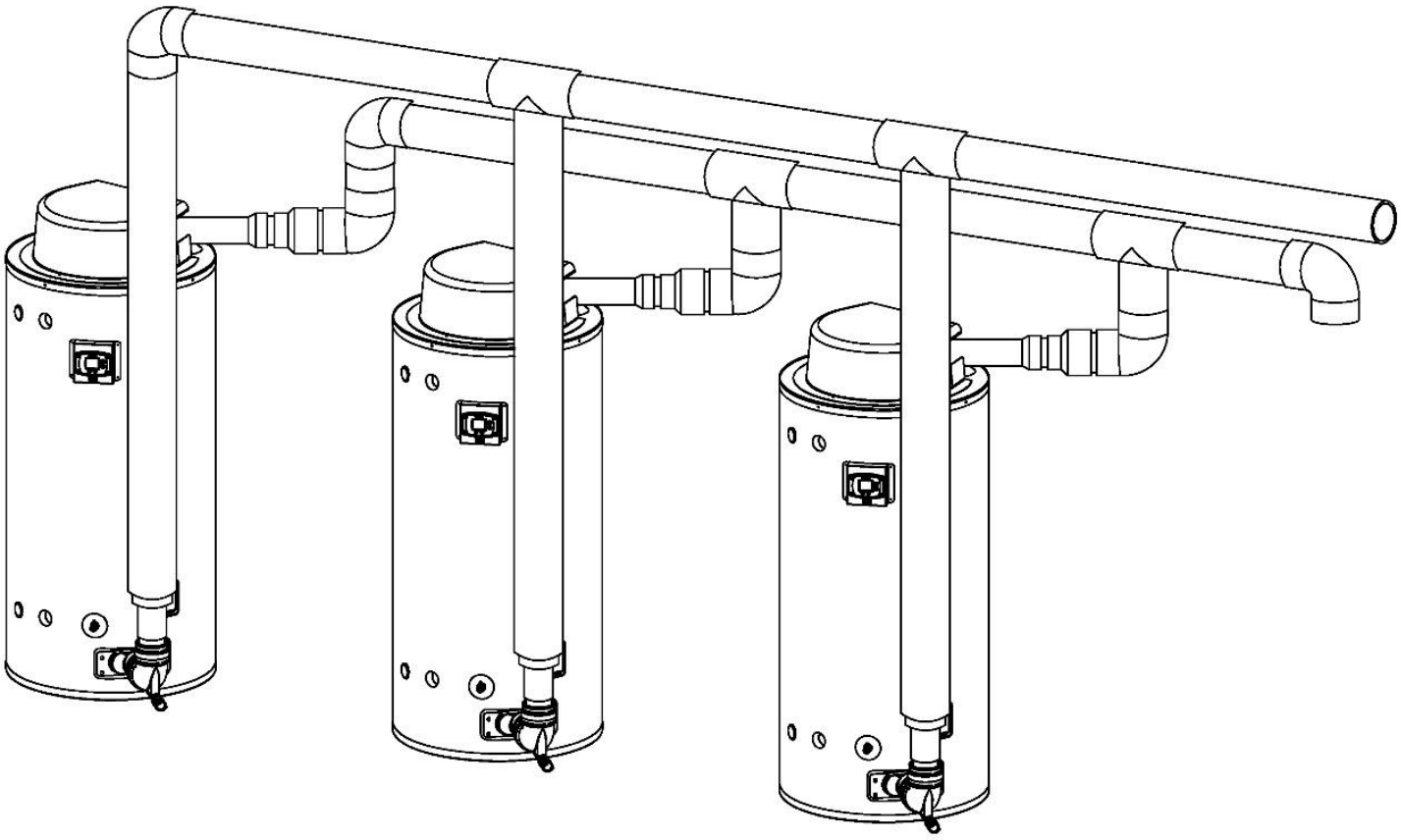
Common Exhaust Venting Kit Installation Instructions

Commercial Condensing Gas Water Heaters



WARNING
CANCER AND REPRODUCTIVE HARM
WWW.P65WARNINGS.CA.GOV

As required by the state of California Proposition 65.

238-54695-00A REV 01/23

TABLE OF CONTENTS

INTRODUCTION

These instructions instruct how to install common exhaust vent kits for the commercial condensing gas water heaters covered by Table 1 shown below. A maximum of 3 commercial condensing gas water heaters may be common vented. Any combination of the models in Group 1 shown by Table 1 can be common vented, or any combination of the models in Group 2 can be common vented. Commercial condensing gas models from Group 1 and Group 2 cannot be common vented together.

MODELS COVERED

These instructions cover how to install a common vent system using the models of water heaters shown in Table 1.

TABLE 1. GROUP 1 AND 2 MODELS COVERED BY THIS MANUAL

Group 1 (125 to 300 models)	Group 2 (400 to 500 models)
60 Gallon 60T-125E-3(N,X)(A) 60T-150E-3(N,X)(A) 60T-199E-3(N,X)(A) **100 Gallon** 100T-150E-3(N,X)(A) 100T-199E-3(N,X)(A) 100T-250E-3(N,X)(A) 100T-300E-3(N,X)(A)	**120 Gallon** 120T-400-3(N,X)(A) 120T-500-3(N,X)(A)

Models from different groups CANNOT be common vented together.

Example 1: 60T125, 100T199 and 100T300 may be common vented together since they belong to Group 1.

Example 2: 60T125, 100T199 and 120T500 may not be common vented together because 2 models are in Group 1 and 1 model is in Group 2.

NOTE: Each kit comes with components that connect one water heater to a common vent system for the exhaust only. One kit is needed for each heater.

ADDITIONAL VENTING INFORMATION

This common exhaust vent kit instruction is a supplement to the Instruction Manual that is supplied with the water heater. The multiple heater installation must satisfy all the requirements of the Instruction Manual as well as the requirements of this kit instruction. In the event of any conflict between the documents, these instructions take precedence.

⚠ WARNING

The vent system must be properly installed. Failure to properly install the vent system could result in property damage, personal injury, or death.

DO NOT install damaged venting system components. If damage is evident then please contact the supplier where the water heater was purchased, or the manufacturer listed on the rating plate for replacement parts.

Use only factory authorized terminals for venting this water heater

The water heater requires its own separate venting system. **DO NOT** connect the exhaust vent into an existing vent pipe or chimney.

All of the exhaust venting connections must be leak checked with a soap solution upon initial start-up of the water heater. Any leaks must be repaired before continuing operation of the water heater.

DO NOT terminate the venting where noise from the exhaust or intake will be objectionable. This includes locations close to or across from windows and doors. Avoid anchoring the vent and intake pipes directly to framed walls, floors, or ceilings unless rubber isolation pipe hangers are used. This prevents any vibrations from being transmitted into the living spaces.

DO NOT exceed the venting distances or the number of elbows listed in this manual. Exceeding the maximum venting distances may cause the water heater to malfunction or cause an unsafe condition.

DO NOT operate this water heater until the venting installation is complete and the piping completed. Failure to complete installation before operation can result in property damage, personal injury, or death.

⚠ WARNING

Risk of carbon monoxide poisoning or fire due to joint separation or pipe breakage.

This water heater must be properly vented and connected to an approved vent system in good condition. **DO NOT** operate water heater with the absence of an approved vent system. A clean and unobstructed vent system is necessary to allow noxious fumes that could cause injury or loss of life to vent safely and will contribute toward maintaining the water heater's efficiency. The acceptance of the venting system is dependent upon full compliance with these installation instructions.

For installations in Canada, the venting system must **NOT** pass-through rated fire separations.

The venting system must be free to expand and contract. This venting system must be supported in accordance with these instructions.

NOTICE

For installations in Canada, field supplied vent piping must comply with CAN/CGA B149.1 (latest edition) and be certified to the Standard for Type BH, Class II, 65°C, Gas Venting Systems, ULC S636. Components of this listed system shall not be interchanged with other vent systems or unlisted pipe/fittings. All components and specified primers and cements of the certified vent system must be from a single system manufacturer and not intermixed with other system manufacturer's vent system parts. The supplied vent connector and vent termination are certified under ULC S636 and are also certified as part of the water heater. Refer to the following tables for approved venting materials, primers, and cements. All approved primers and cements are to be used within their marked time limitations.

NOTICE

Use of cellular core PVC (ASTM F891), cellular core CPVC, or Radel® (polyphenosulfone) in non-metallic venting systems is prohibited and covering non-metallic venting with thermal insulation is prohibited.

NOTICE

Before beginning installation of any vent pipe, read the vent pipe manufacturer's installation instructions.

DO NOT install the water heater in any location where the ambient temperature may fall below freezing. Water heater **must** be protected from freezing downdrafts during shutdown periods.

Provide protection of the building materials from degradation by flue gases from the exhaust vent terminal.

⚠ CAUTION

Check to make sure flue gases **DO NOT** recirculate into the air intake terminal when using direct venting. If the water heater is having service issues, flue recirculation may be a contributing factor. Even when the minimum vent terminal separation distances 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 sensor or igniter shield. Correction to flue recirculation may involve angling the intake away from the exhaust terminal, increasing the distance between them, relocating the air intake to another side of the building, or using inside air for combustion. Check to be sure the intake and exhaust terminals are not obstructed, especially during periods of below freezing weather.

⚠ CAUTION

All intake and exhaust venting components **must** have the same diameter size. **DO NOT** use a different size on the intake and exhaust venting. All intake and exhaust venting components must have the same diameter size. DO NOT use a different size on the intake and exhaust venting.

Be sure the condensate runs freely to a drain and does **NOT** accumulate inside the water heater. In cold climates, precautions may need to be taken to ensure that the condensate drain does not freeze. Make sure the condensate trap or drain loop is installed to prevent flue gases from being discharged into the room.

High levels of dust and debris such as road and construction dust, insects, and tree pollen may clog the burner resulting in poor performance and damage to the water heater. Avoid air intake locations where debris can be created such as exhaust ventilation hoods, gravel parking lots, and near outdoor spotlights that attract bugs. For these installations, an air intake filter kit (p/n 239-47330-00) is available as an accessory service part from the installer of this water heater. The air intake filter kit is **NOT** designed to filter out airborne contaminants or chemicals that may damage the water heater.

⚠ CAUTION

The vent shall terminate a minimum of 12 in *(30 cm)* above expected snowfall level to prevent blockage of vent termination.

The horizontal centerline of the exhaust vent terminal (if applicable) **must NOT** be located lower than the horizontal centerline of the air intake terminal if vented through the same wall.

A service drain loop must be installed in the drain tubing to serve as a condensate trap to prevent flue gases from escaping into the room.

DO NOT position the air intake above the exhaust terminal.

NEVER locate the air intake where exhaust gases can be introduced.

Approved Venting Materials for Common Venting

For installations in the US only	**For installations in CANADA**
• PVC DWV (ASTM D-2665) • PVC Sch. 40 (ASTM-D1785) • CPVC Sch. 40 (ASTM-F441, ASTM-D2846) • PVC and CPVC (UL 1738, ULC S636) • ABS Sch. 40 DWV (ASTM-D2661) • Polypropylene (UL 1738, ULC S636)	• ULC S636 approved PVC for flue gas venting rated Class II, 65°C • ULC S636 approved CPVC for flue gas venting rated Class II, 65°C • ULC S636 approved Polypropylene for flue gas venting rated Class II, 65°C

Approved Primers and Cements

For installations in the US only	**For installations in CANADA**
• PVC and CPVC Primer (ASTM-F656) • PVC Cement (ASTM D-2564) • CPVC Cement (ASTM F493) • ABS Primer and Cement (ASTM D-2235)	• ULC S636 approved Primer and Cement for flue gas venting rated Class II, 65°C

PHYSICAL LAYOUT - GENERAL

NOTE: Do not use these parts to combine the commercial condensing gas water heaters with any other heater or gas appliance.

The system layout must be planned to minimize the linear length and number of fittings in the system. Consult the water heater's installation instructions in the I&O Manual for proper clearances for service which can be found under Section IV: INSTALLATION INSTRUCTIONS for Group 1 and 2. **The common vent sections are defined as the shaded sections of venting shown in Figure 1. All sections that are not shaded in Figure 1 are considered non-common vent sections.**

VENT LENGTH INFORMATION

There are a total of 6 **shaded sections** shown in Figure 1, known as common vent sections. Each **individual** common vent section has the following equivalent vent length requirements:

- **Minimum Equivalent Length: 3 feet**
- **Maximum Equivalent Length: 50 feet**

- A maximum of **4 tees** can be used when constructing the common vent system with **3 water heaters**.
- a maximum of **2 tees** can be used when constructing the common vent system with **2 water heaters**. (All tees permitted in the construction of a 3-water heater common vent system are shown in Figure 1.)
- When adding up each common vent section equivalent length count each 90° elbow as 5 feet and each 45° elbow as 2 ½ feet if any elbows are used. **None are used in the configuration shown in Figure 1.**
- Any Tee or 90° elbow connecting non-common vent sections to common vent sections DO NOT count toward the length of either common or non-common vent sections. ANY additional 45° or 90° elbows DO count toward either the common vent section length, which CANNOT exceed 50 ft, or the non-common vent section length, which CANNOT exceed 12 ft.
- The air intake terminal, labeled in Figure 1, is not counted when adding up the length of the 3rd common section on the intake side of the system, see Figure 1.

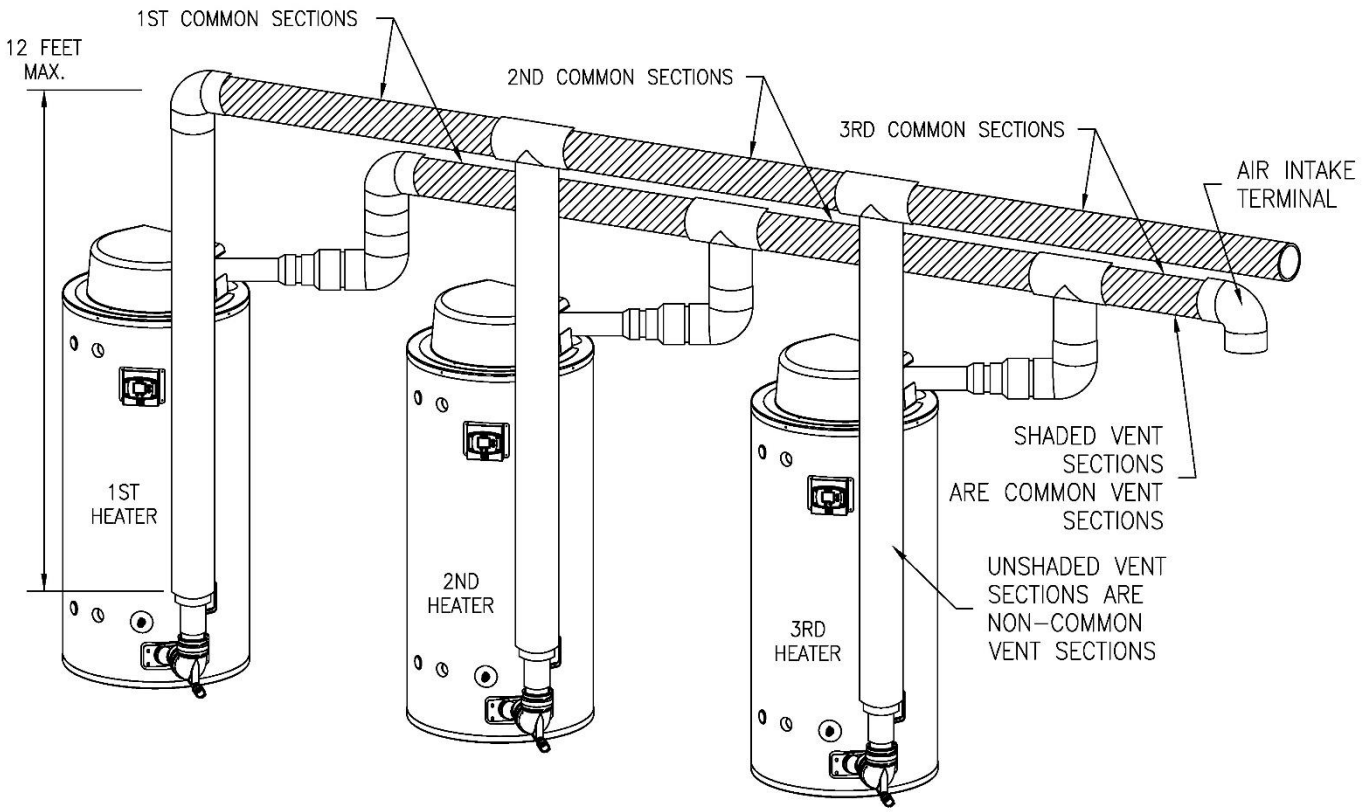


FIGURE 1. DEFINITION OF COMMON vs. NON-COMMON VENT SECTIONS – PVC/CPVC AND POLYPROPYLENE.

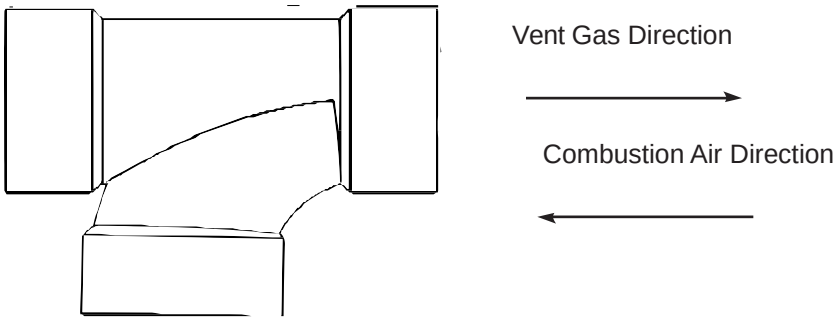


FIGURE 2. SANITARY TEE

as an acceptable substitute, provided they are arranged so that the flows are in the directions indicated in Figure 2.

VENTING SUPPORTS

DO NOT SUPPORT WEIGHT OF VENT SYSTEM ON THE HEATER. Supports must be installed every 3 feet of horizontal run and 5 feet of vertical run for both the intake and exhaust venting. Supports may be made of field supplied metal strapping or equivalent. The common vent exhaust venting must be sloped upwards toward the vent terminal at least 1/4" per foot.

TERMINATIONS

The terminations can be direct vented through the same wall (Figure 4), roof (Figures 5-6), or opposing walls. A direct vent configuration with the exhaust going through the roof and the intake going horizontally through a wall is also permitted. These are all the allowed direct vent termination configurations.

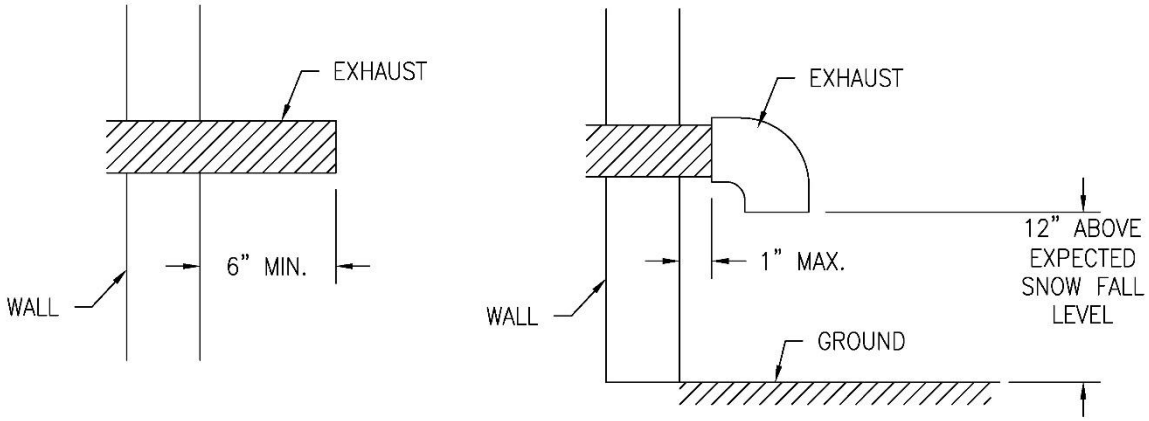


FIGURE 3. Recommended Horizontal Direct Vent System Wall-Vent Separation (Intake and Exhaust Terminals may be on different outside walls.)

When direct venting through a wall, the separation between exhaust vent outlet and wall is recommended to be a minimum of 6" (see Figure 3). The separation between the air intake terminal (see Figures 1 and 3) and wall is recommended to be a maximum of 1". It is also recommended that the air intake terminal outlet be 12" above expected snow fall levels in the place of installation, see Figure 3.

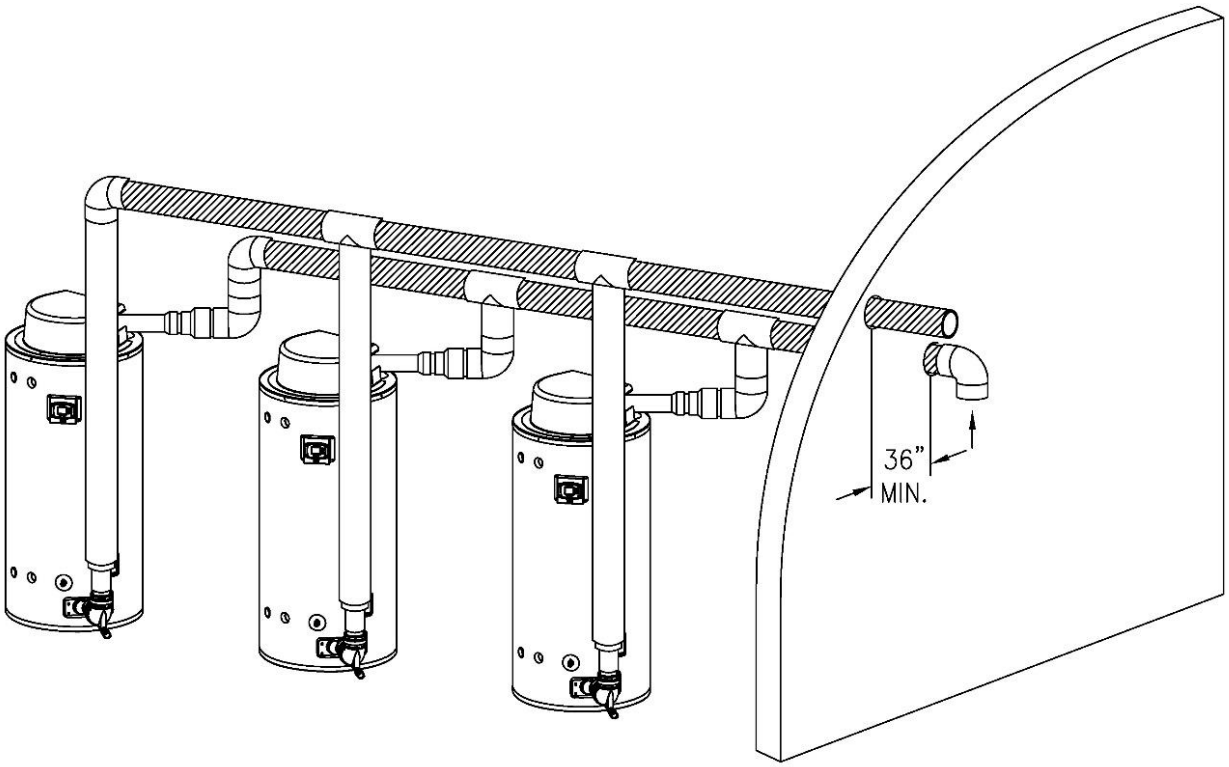


FIGURE 4. Recommended Horizontal Direct Vent System Installation. (Intake and Exhaust Terminals may be on different outside walls.)

The air intake terminal is a 90° elbow pointing down and the exhaust terminal is the end of a straight pipe section when venting through a wall, see Figure 4. The minimum recommended vent separation distance between the intake and exhaust terminals is 36", see Figure 4, when power direct venting through the same wall.

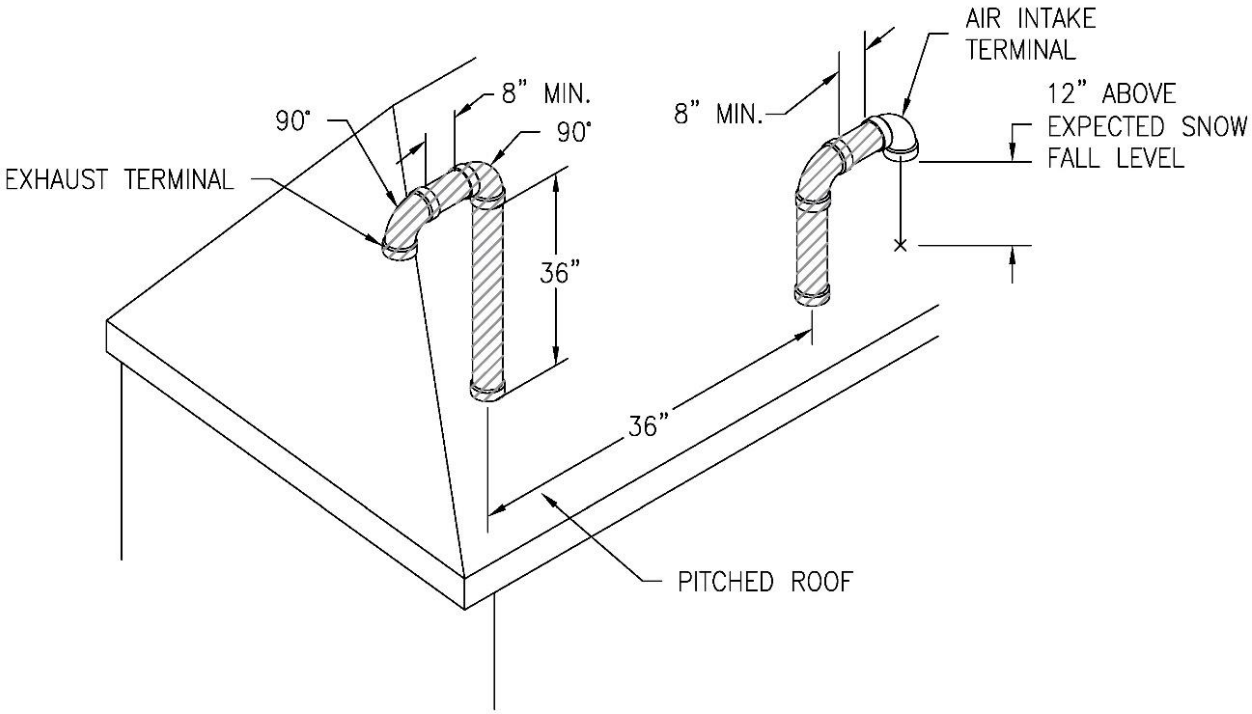


FIGURE 5. Recommended Vertical Direct Vent System Installation for Pitched Roof.

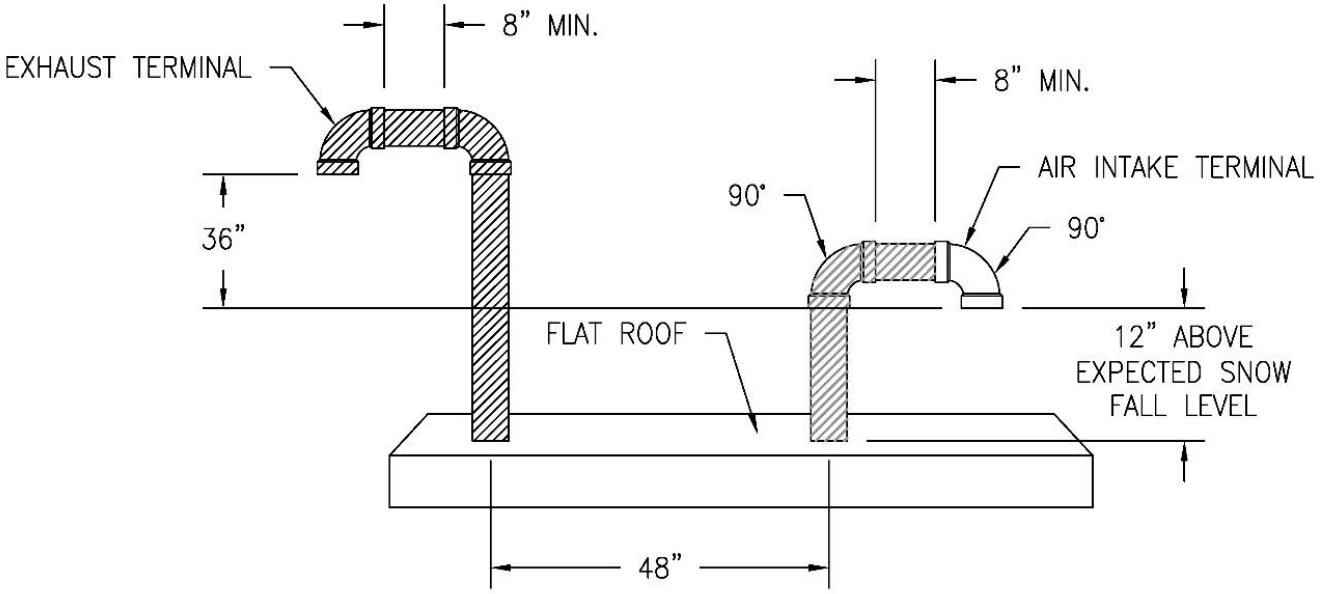


Figure 6. Recommended Vertical Direct Vent System Installation for Flat Roof.

Figure 5 shows the recommended vertical direct vent system installation for a pitched roof, Figure 6 shows an installation for a flat roof. For both configurations it is recommended that the exhaust and intake are terminated as shown. The intake and exhaust are recommended to be facing opposite directions, see Figures 5 and 6, and be terminated with a 90º-8" MIN. Section-90º to prevent rain or snow from easily entering the system. For both configurations it is recommended that the inlet of the air intake terminal and exhaust terminal outlet have a **vertical** separation of 36". It is recommended that the air intake terminal inlet be 12" above expected snow fall levels.

For a pitched roof installation, it is recommended that the intake and exhaust straight sections have a **horizontal** separation of 36", for flat roof 48", see Figures 5 and 6.

The shaded intake and exhaust vent components shown in Figures 5 and 6 are parts of the 3RD Common Section shown in Figure 1 and all components are to be counted when adding up common section equivalent lengths, except the unshaded air intake terminal, see VENT LENGTH INFORMATION section of this manual.

Group 1 and 2 units are sold with 3" or 4" termination fittings, respectively. These fittings cannot be used. The common vent system must be constructed with 6" venting making the termination components unusable. **DO NOT reduce the terminations down to 3" or 4" venting to fit the supplied termination fittings that are supplied with the heater.**

PVC/CPVC AND POLYPROPYLENE (PP) COMMON VENT REQUIREMENTS

The requirements for the layout of the Polypropylene common vent system, required lengths and terminal locations are the same as for the PVC/CPVC vent. Consult the above instructions and the water heater's I&O manual for exact layout requirements.

CONDENSATE DRAIN

Each water heater must have a separate condensate drain line running to an open drain. Follow the directions in the water heater's instruction manual. Do not use a common condensate drain line for multiple heaters. See the I&O manuals that comes with the water heaters for condensate drain instructions.

COMMON VENT KIT INSTRUCTIONS

PVC/CPVC COMMON VENT PARTS LIST

Each kit contains the adapters needed to connect the PVC/CPVC exhaust to one heater. See Figures 7 and 8 along with Tables 2 and 3. Additional parts are needed for the air intakes. See Figure 9 and Tables 4 and 5.

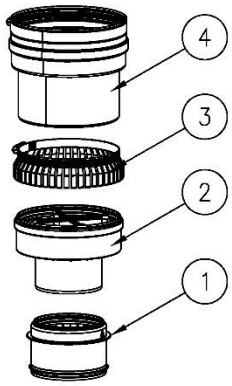


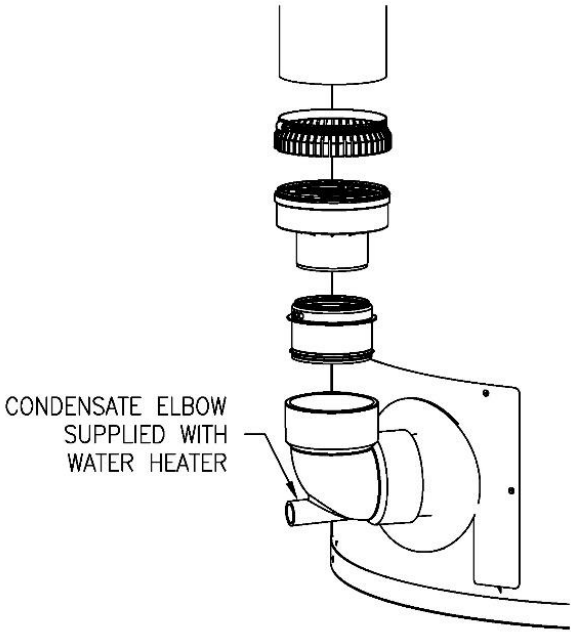
FIGURE 7. PVC/CPVC COMMON VENT KIT (GROUP 1 AND 2 MODELS).

TABLE 2. PVC/CPVC COMMON VENT KIT EXHAUST PARTS LIST (GROUP 1)			
Item No.	**Kit No.**	**Description**	**Quantity**
1	415-54696-00	Appliance Adapter, 3”	1
2		3” – 6” Back Flow Valve	1
3		6” Locking Clamp	1
4		6” PP to 6” PVC/CPVC Adapter	1

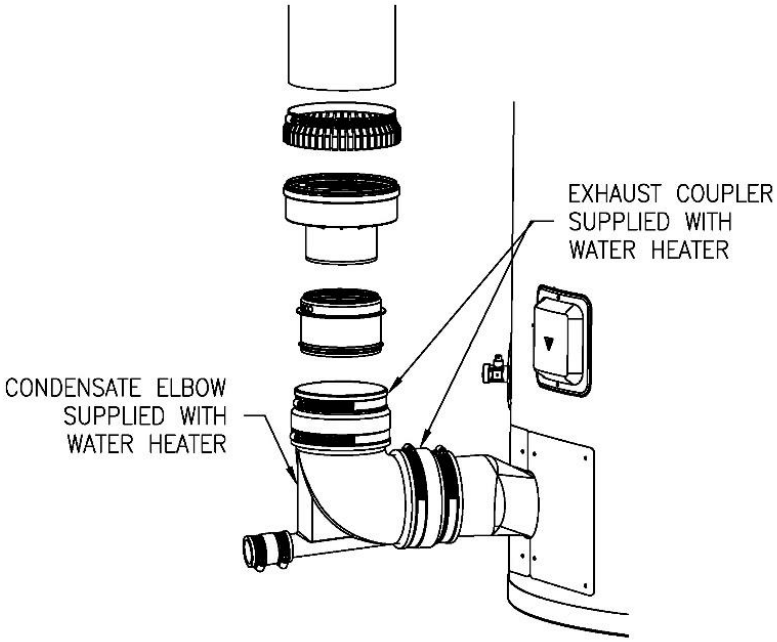
TABLE 3. PVC/CPVC COMMON VENT KIT EXHAUST PARTS LIST (GROUP 2)			
Item No.	**Kit No.**	**Description**	**Quantity**
1	415-54698-00	Appliance Adapter, 4”	1
2		4” – 6” Back Flow Valve	1
3		6” Locking Clamp	1
4		6“ PP to 6” PVC/CPVC Adapter	1

PVC/CPVC EXHAUST ASSEMBLY

For assembly of the common vent kit see Figure 8 below. The remainder of the exhaust vent side of the common system, past what is shown in Figure 8, is composed of field-supplied ***Schedule-40*** PVC/CPVC pipe and fittings.



Group 1: 3”-6” PVC/CPVC Exhaust Connection

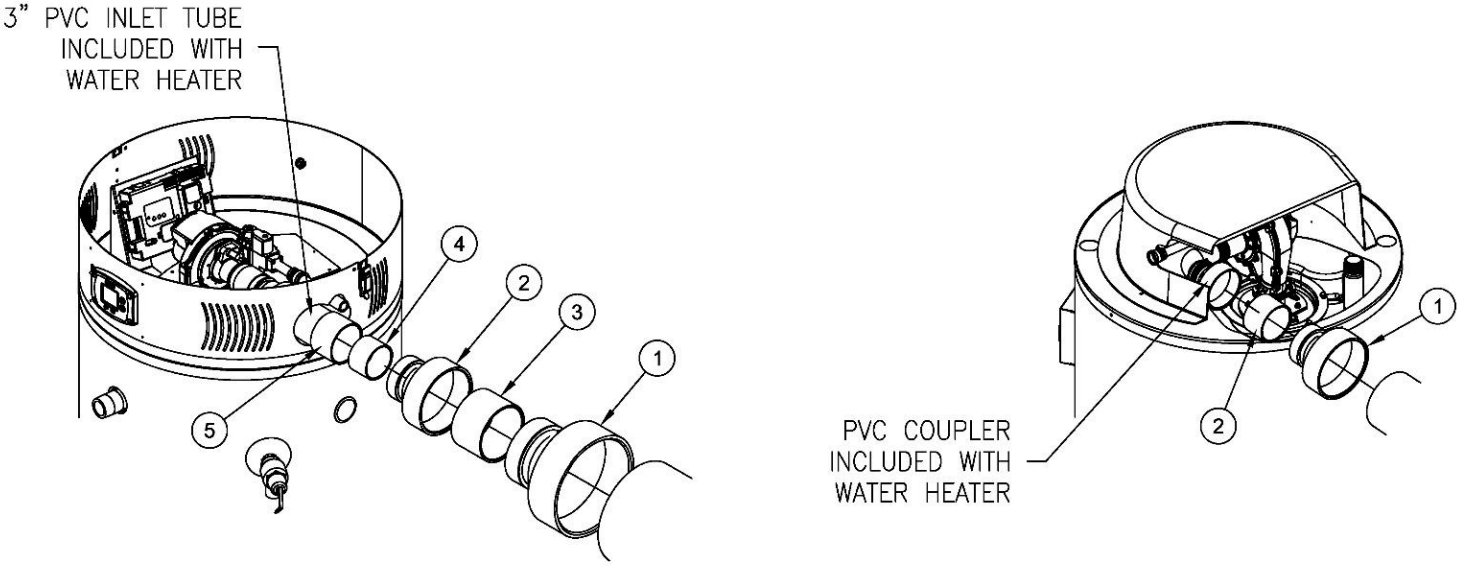


Group 2: 4”-6” PVC/CPVC Exhaust Connection

FIGURE 8: EXHAUST CONNECTIONS FOR PVC/CPVC FOR GROUPS 1 AND 2.

PVC/CPVC INTAKE ASSEMBLY

The water heater's air intake is either a 3" or 4" PVC/CPVC fitting. For assembly of Group 1 and 2 PVC/CPVC intake connections see Figure 9 along with Tables 4 and 5. The remainder of the intake vent side of the common system is composed of field-supplied ***Schedule-40*** PVC/CPVC pipe and fittings.



Group 1: 3"-6" PVC/CPVC Intake Connections. Group 2: 4"-6" PVC/CPVC Intake Connections.

FIGURE 9: PVC/CPVC INTAKE VENT CONNECTIONS. LEFT IMAGE: TABLE 4. RIGHT IMAGE: TABLE 5.

TABLE 4. PVC/CPVC FIELD SUPPLIED INTAKE PARTS LIST (GROUP 1)		
Item No.	**Description**	**Quantity**
1	6"-4" PVC/CPVC Reducer	1
2	4"-3" PVC/CPVC Reducer	1
3	4" PVC/CPVC Section, Length: 4"	1
4	3" PVC/CPVC Section, Length: 4"	1
5	3" PVC/CPVC Coupler	1

TABLE 5. PVC/CPVC FIELD SUPPLIED INTAKE PARTS LIST (GROUP 2)		
Item No.	**Description**	**Quantity**
1	6"-4" PVC/CPVC Reducer	1
2	4" PVC/CPVC Section, Length: 4"	1

POLYPROPYLENE COMMON VENT PARTS LIST

Each kit contains the adapters needed to connect the exhaust to one heater as shown in Figure 10 and listed in Table 6 and 7. Additional parts are needed for the air intake as shown by Figure 13 and 14 with a parts list given in Table 9 and 10. A list of additional recommended parts is included below for your convenience in Table 8.

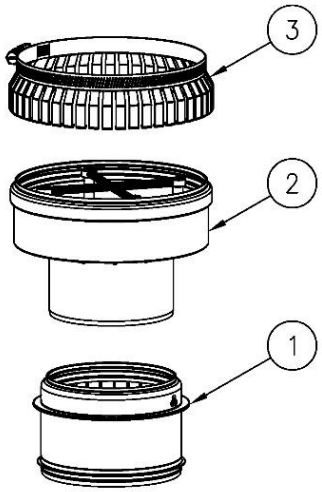


FIGURE 10. POLYPROPYLENE COMMON VENT KIT (GROUP 1 AND GROUP 2 MODELS)

TABLE 6. POLYPROPYLENE COMMON VENT KIT EXHAUST PARTS LIST (GROUP 1)			
Item No.	**Part No.**	**Description**	**Quantity**
1	415-54697-00	3” Appliance Adapter	1
2		3” – 6” Back Flow Valve	1
3		6” Locking Clamp	1

TABLE 7. POLYPROPYLENE COMMON VENT KIT EXHAUST PARTS LIST (GROUP 2)			
Item No.	**Part No.**	**Description**	**Quantity**
1	415-54706-00	4” Appliance Adapter	1
2		4” – 6” Back Flow Valve	1
3		6” Locking Clamp	1

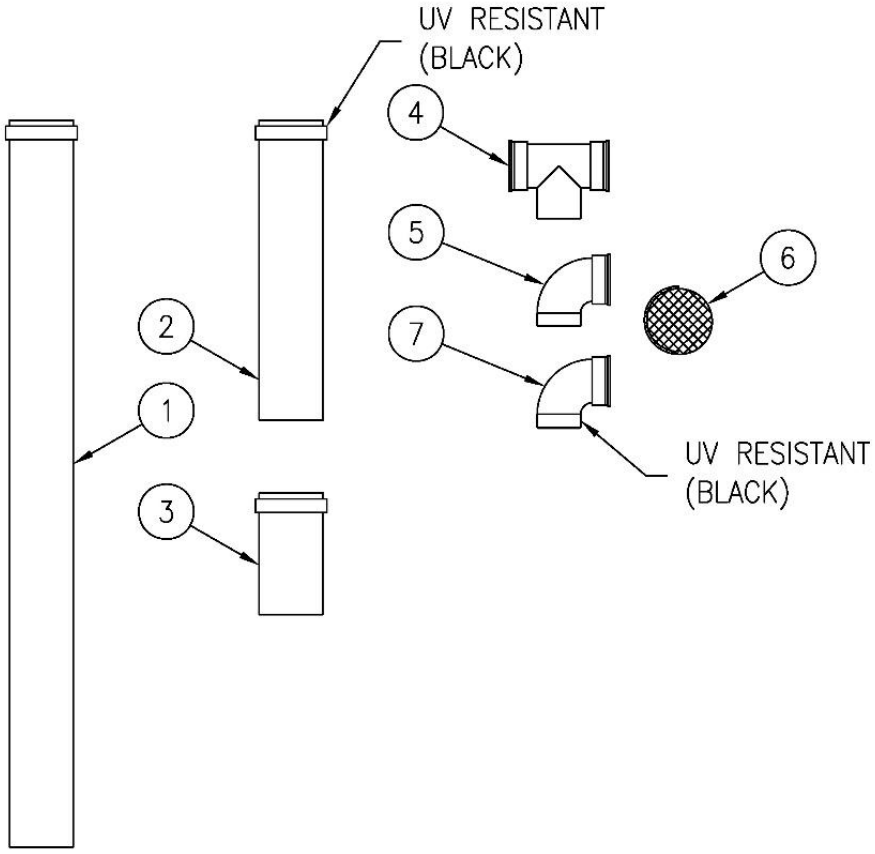
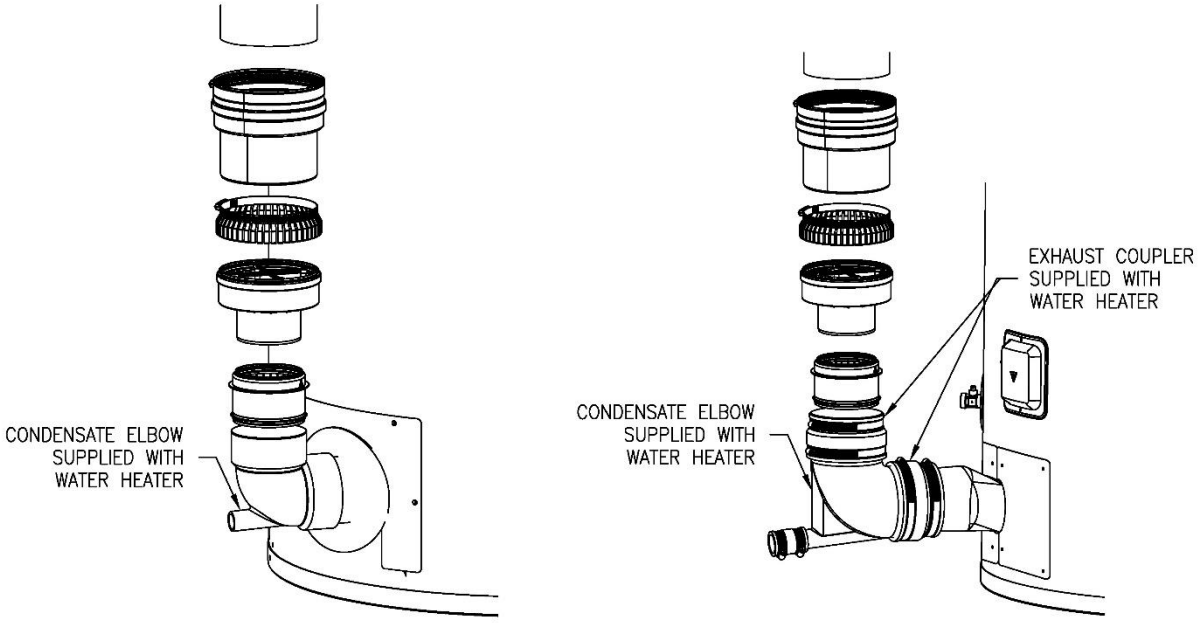


FIGURE 11. ADDITIONAL RECOMMENDED PARTS – POLYPROPYLENE

TABLE 8. ADDITIONAL RECOMMENDED PARTS	
Item No.	**Description**
1	6” VENT PIPE, 72”, PP, DURAVENT
2	6” VENT PIPE, 36”, PP, UV, DURAVENT
3	6” VENT PIPE, 12”, PP, DURAVENT
4	VENT TEE W/CAP, 6”, PP, DURAVENT
5	90° ELBOW, 6”, PP, UV, DURAVENT
6	BIRD SCREEN, 6”, DURAVENT
7	90° ELBOW, 6”, PP, DURAVENT

POLYPROPYLENE EXHAUST ASSEMBLY

For assembly of the common vent kit see Figure 12 below. The remainder of the exhaust vent side of the common system is composed of field supplied polypropylene pipes and fittings, see Table 8 and Figure 11.



Group 1: 3”-6” Polypropylene exhaust connection. Group 2: 4”-6” Polypropylene exhaust connection.

FIGURE 12. EXHAUST CONNECTIONS FOR POLYPROPYLENE FOR GROUPS 1 AND 2.

POLYPROPYLENE INTAKE ASSEMBLY

The water heater's air intake is either a 3" or 4" PVC/CPVC fitting. For assembly of Group 1 and 2 Polypropylene intake connections see Figure 13 and 14 along with Tables 9 and 10. The remainder of the intake vent side of the common system is composed of field supplied polypropylene pipes and fittings. See Table 8 above for a list of recommended field-supplied parts.

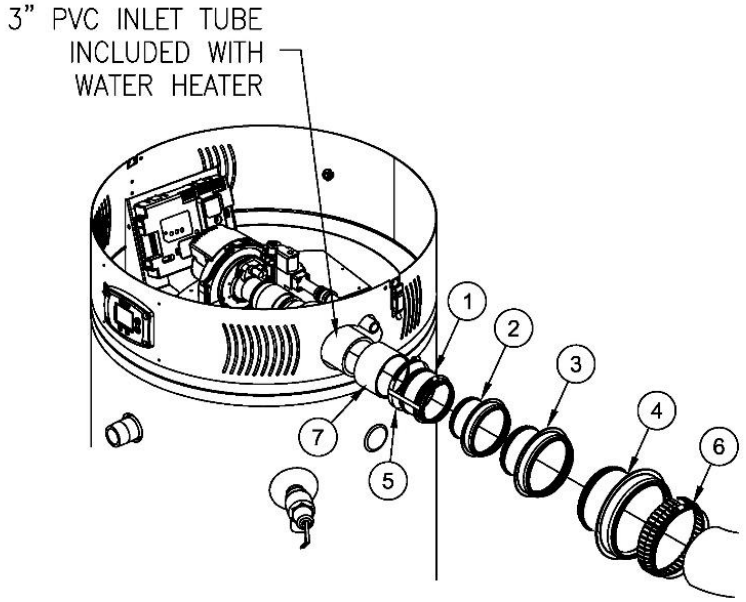


FIGURE 13. GROUP 1 POLYPROPYLENE INTAKE VENT CONNECTIONS. See Table 9.

TABLE 9. POLYPROPYLENE FIELD SUPPLIED INTAKE PARTS LIST	
Item No.	**Description**
1	3" Appliance Adapter for PVC Coupler
2	3"-4" Increaser
3	4"-5" Increaser
4	5"-6" Increaser
5	2-4" Adapter Connector
6	6" Locking Clamp
7	3" PVC/CPVC Coupler

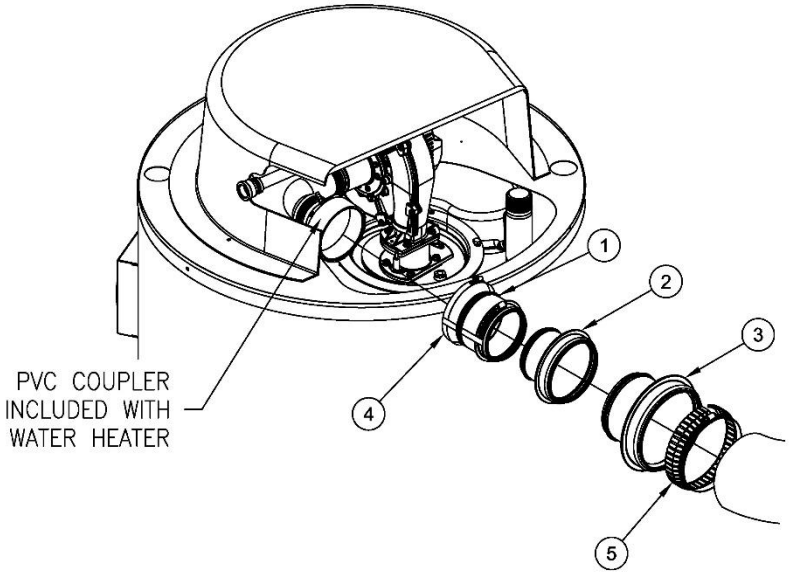


FIGURE 14. GROUP 2 POLYPROPYLENE INTAKE VENT CONNECTIONS. See Table 10.

TABLE 10. POLYPROPYLENE FIELD SUPPLIED INTAKE PARTS LIST	
Item No.	**Description**
1	4” Appliance Adapter for PVC Coupler
2	4”-5” Increaser
3	5”-6” Increaser
4	2”-4” Adapter Connector
5	6” Locking Clamp

NOTES

NOTES