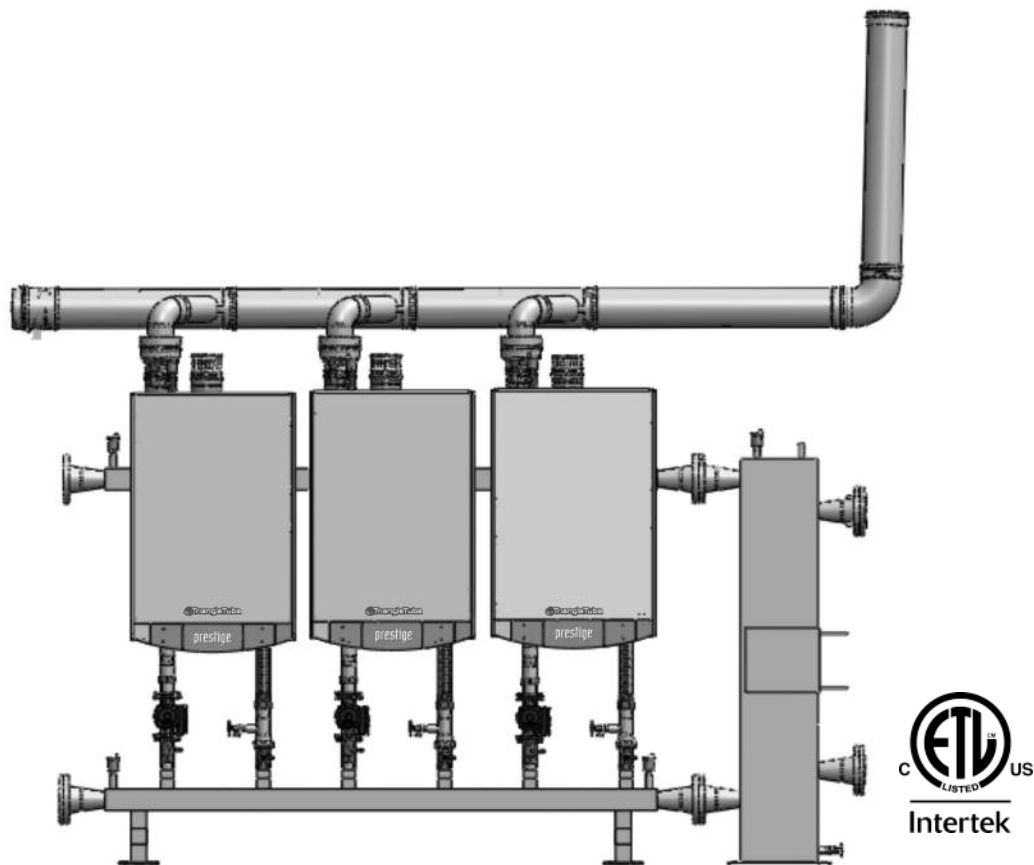


prestige

Cascade Common Vent Supplement



! WARNING

This document is intended to be used by a qualified heating contractor or service technician. Read all instructions within this document and within the PRESTIGE Boiler Installation and Maintenance Manual, before proceeding with the installation. It is recommended to follow the procedures in the steps given, skipping or missing procedural steps could result in severe personal injury, death or substantial property damage.

NOTICE

Installation of this boiler must comply with local requirements and codes and with the National Fuel Gas Code NFPA 54, ANSI Z223.1 for installations within the U.S. For installations in Canada the installation must comply with CSA B149.1 or B149.2

PRODUCT AND SAFETY INFORMATION

Definitions 1

SECTION I - PRE-INSTALLATION ITEMS

General Requirements 2
Vent System Kit Components 2
Assembled Vent System Kit Dimensions 3
Optional Vent System Components 4

SECTION II - VENT/AIR SYSTEM INSTALLATION

Vent System Clearance Requirements 5
Vent Equivalent Length 5
Determine Vent Termination Location 5
Vent System Joint Assembly 6
Vent Check Valve Assembly 6
Near Boiler Vent System Assembly 7
Termination Installation 7-8
Cutting Termination Fitting Internal Pipe to Length 8
Fire Stop Support Plate 8

SECTION III - INSTALLING CONDENSATE DRAIN

Installing Condensate Drain Assembly 9-10

SECTION IV - EXTERNAL WIRING

Installation Compliance 11
Pressure Switch Wiring 11
Pressure Switch Wiring Diagrams 12

SECTION V - MAINTENANCE PROCEDURES

Inspect Vent System 13

SECTION VI - MANIFOLD COMBUSTION AIR OPTION

Installation Guidelines 14

Definitions

The following terms are used throughout this manual to bring attention to the presence of potential hazards or to important information concerning the product.

 **WARNING**

Indicates a potentially hazardous situation which, if ignored, can result in death, serious injury or substantial property damage.

NOTICE

Indicates special instructions on installation, operation or maintenance, which are important to equipment but not related to personal injury hazards.

NOTICE

This supplement is intended for the installation of a Cascade Vent System with Prestige SOLO 399 Boilers. The Cascade Vent System is not intended for installation with any other Prestige Boiler.

NOTICE

This Vent/Air System is listed to ULCS636 as Type BH Class IIC Vent System with a 110°C (230°F) maximum flue temperature rating under Intertek/ETL Report number: 3122286

NOTICE

Triangle Tube reserves the right to modify the technical specifications and components of its products without prior notice.

SECTION I - Pre-Installation Items

General Requirements

Installation of the vent system must comply with local codes and requirements and with the National Fuel Gas Code NFPA 54, ANSI Z223.1 for installations in the U.S. For installations in Canada, the installation must comply with CSA B149.1 or B149.2.

The vent system must be fully constructed using ONLY the Prestige Cascade Vent System components from Triangle Tube. Do not mix other vent components or joining methods from other manufacturers.



Do not mix vent components or joining methods from any other vent manufacturer with Triangle Tube's Prestige Cascade Vent System. Failure to comply with this requirement could cause vent failure resulting in leakage of flue products into the living space of the building.

All penetrations of the vent system through ceilings, floors or walls must be properly fire stopped. Check with local codes and requirements regarding fire stops and vent penetrations.

The vent system must not penetrate or be routed through any active vent system or chimney.

Vent/Air System Kit Components

Prior to installation of the vent system check to ensure all parts required for the completion of the system are present. See Figure 1 for a breakdown of Cascade Vent System kit parts for each common vent boiler assembly and Table 1 for a complete listing of kit parts and optional kit parts.

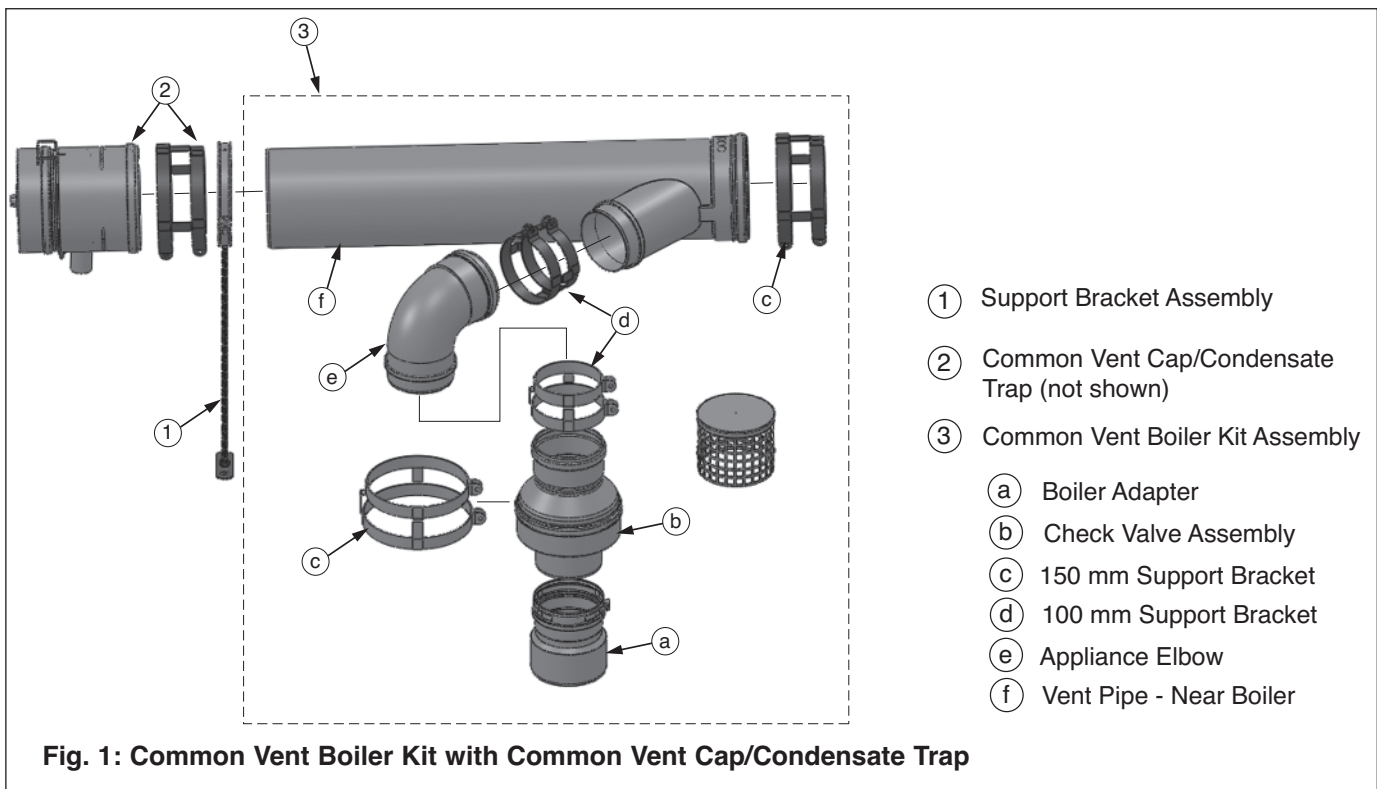


Fig. 1: Common Vent Boiler Kit with Common Vent Cap/Condensate Trap

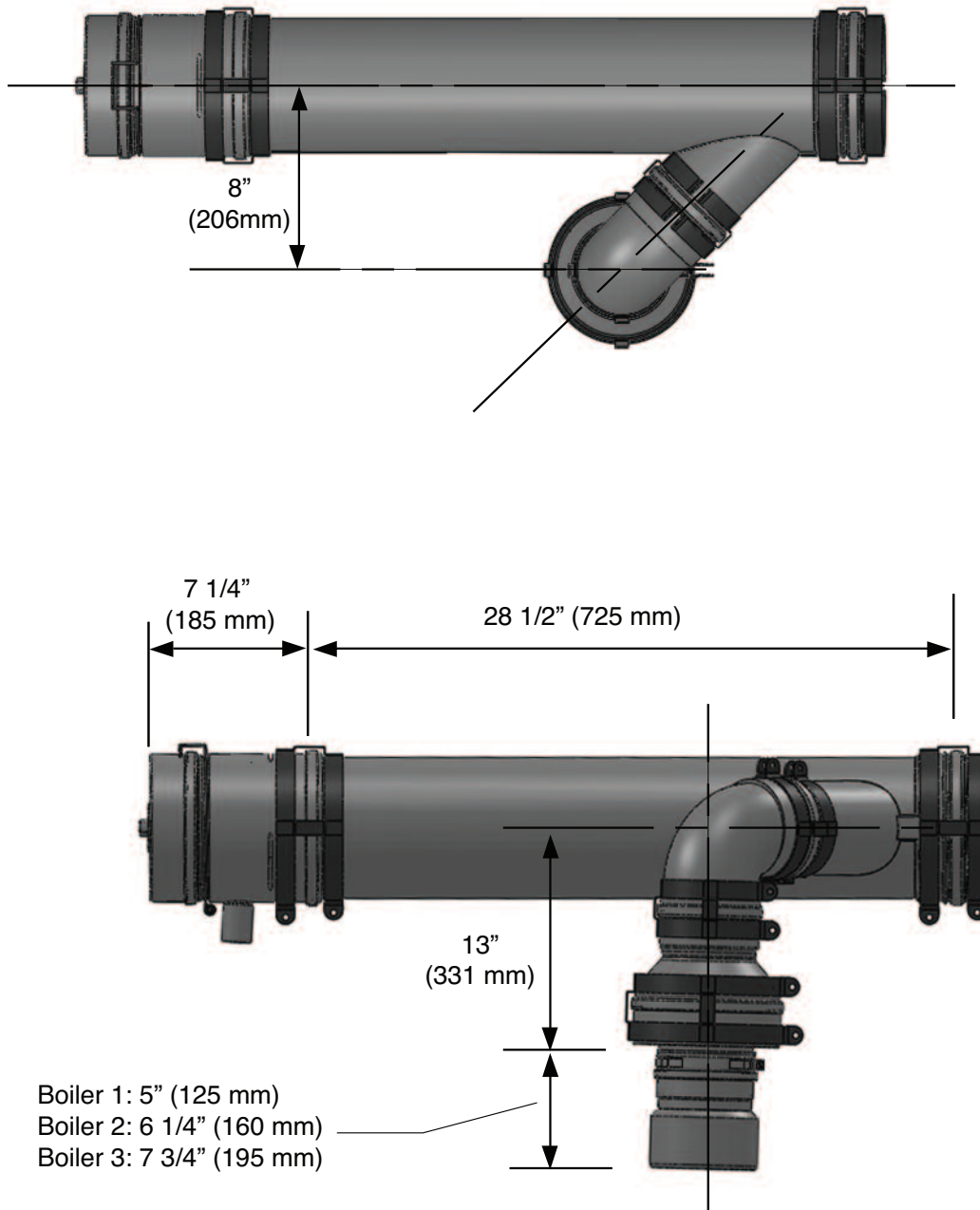


Fig. 2: Near Boiler Vent System Dimensions

Part #	Description	Qty	
PSVKIT04	2 Boiler Cascade Venting consisting of:	2	
	• Near Boiler Vent Assembly	1	
	• #1 Boiler Adapter	1	
	• #2 Boiler Adapter	1	
	• Common Vent Cap with Condensate Trap	2	
	• Support Brackets	1	
PSVKIT05	3 Boiler Cascade Venting consisting of:	3	
	• Near Boiler Vent Assembly	1	
	• #1 Boiler Adapter	1	
	• #2 Boiler Adapter	1	
	• #3 Boiler Adapter	1	
	• Common Vent Cap with Condensate Trap	3	
	• Support Brackets	1	
• Pressure Switch	1		

Part #	Description	Qty	
PSVPIP03	Common Vent Pipe – 39 Inches (990mm) Lgth	1	
PSVPIP04	Common Vent Pipe – 79 inches (2007mm) Lgth	1	
PSVELB03	90° Elbow – 150mm Diameter	1	
PSVELB04	45° Elbow	1	
PSVTERM01	Vertical Termination Fitting with Support Plate	1	
PSVSUP02	Fire Stop Plate	1	
PSVSUP03	Support Bracket	1	
PSVFLA01	Exterior Roof Flashing – 0° / Flat	1	
PSVFLA02	Exterior Roof Flashing – 0° - 25° Pitch	1	
PSVFLA03	Exterior Roof Flashing – 25° - 45° Pitch	1	
PSSWI02	Pressure Switch with Terminals	1	
PSVGSK02	Seal Kit – 150mm	1	
PSVGSK01	Seal Kit – 100mm	1	

SECTION II - Vent System Installation

Vent System Clearance Requirements

The vent system must maintain a minimum 1/4" clearance to combustible & non-combustible materials.

Vent Equivalent Length

The maximum equivalent length of the Cascade Vent System should not exceed 70 feet (excluding the termination and common vent near boiler assembly, see Fig. 3). For each 90° elbow in the system, the equivalent length is reduced by 10 feet. For each 45° elbow in the system, the equivalent length is reduced by 5 feet.

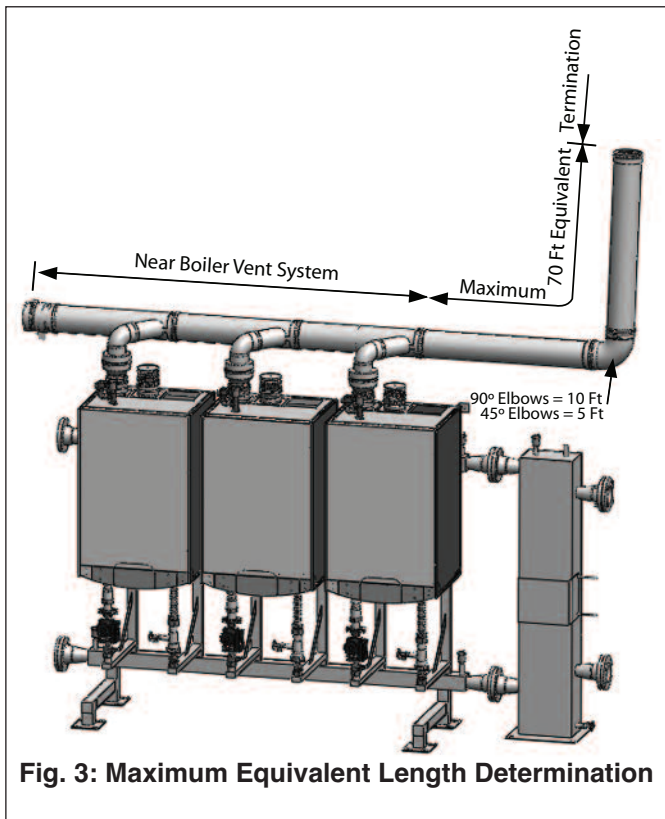


Fig. 3: Maximum Equivalent Length Determination

Determine Vent Termination Location

1. The installer must consider the following when determining the location of the vent system termination:
 - a. Locate the termination where flue vapors will not damage surrounding shrubs, plants

or air conditioning equipment or be otherwise objectionable.

- b. The flue products will form a noticeable plume as they condense in colder air. Avoid terminating in areas where the plume could obstruct window views.
 - c. Prevailing winds could cause freezing of flue condensation and a buildup of water/ice on surrounding plants, building surfaces or combustion air inlet.
 - d. Avoid locations of possible accidental contact of flue vapors with persons or pets.
 - e. Avoid locations where prevailing winds could affect the performance of the unit or cause recirculation of the flue gases, such as inside corners of buildings or near adjacent buildings or vertical surfaces, window wells, stairwells, alcoves, courtyards, or other recessed areas.
 - f. Do not terminate above any doors or windows; flue condensate could freeze causing ice formations.
 - g. Locate or guard the termination to prevent possible condensate damage to exterior finishes.
2. Maintain the following clearances to the termination:
 - a. At least 3 feet from adjacent walls
 - b. No closer than 3 feet below roof overhangs
 - c. At least 7 feet above any public walkways
 - d. At least 3 feet above any forced air intake within 10 feet.
 - e. The termination must be at least 4 feet from any electric meters, gas meters, gas meter-regulators, relief valves or other equipment. Never terminate above or below any of these items within 4 feet horizontally.
 - f. No closer than 4 feet below or horizontally from any door or window or gravity air inlet.
 3. Horizontal or vertical runs of the vent system must be supported at every joint. The installer should use the support bracket assembly or perforated metal strap hangers or equivalent to support the piping.

5. The vent system must terminate vertically using vertical termination assembly with one of the optional roof flashing kits.
6. Any horizontal runs of the vent system must be pitched back to the boilers a minimum of 5/8 inch per foot of run.

Vent System Joint Assembly

1. When installing the vent system, the female end of the pipe or fitting should face up or away from the boilers and from the common vent cap/condensate trap.
2. Prior to assembly of any piping or fittings inspect and ensure the inner pipe gasket seal is present, undamaged and properly seated in the groove of the pipe.

WARNING

Prior to assembly of piping or fittings it is extremely important to ensure the gaskets are present, undamaged and properly seated. Failure to do so can result in flue gas leakage and/or vent failure.

3. Insert and rotate the male end of the inner pipe into the female end of the previous pipe section. It is recommend to moisten the gasket seal with clean water prior to assembly.

NOTICE

To aid in the assembly of the pipes and fittings use only clean water to moisten the gasket and the mating end of the pipe. Use a twisting motion as the pipe ends are pressed together.

4. Secure the two components together by placing a clamp over the connection and secure the clamp with 2 bolts and nuts provided. The edge of the clamp should be installed adjacent to the gasket groove of the female pipe end as shown in Fig. 3

WARNING

It is very important that the clamp be properly installed. Failure to properly connect the vent components could lead to vent failure and can result in death, serious injury or substantial property damage.

Vent Check Valve Assembly

1. Ensure the vent check valve is installed on each boiler vent outlet.
2. Ensure the vent check valve is installed on a vertical run of vent, keeping the valve's internal plate horizontal.
3. Ensure clamp is may tightened and secures the vent check valve assembly. It be necessary to adjust the height of the valve assembly to properly install the clamp.

WARNING

Failure to install or properly install the vent check valve assembly could result in flue gas recirculation through a non-operating boiler and can result in death, serious injury or substantial property damage.

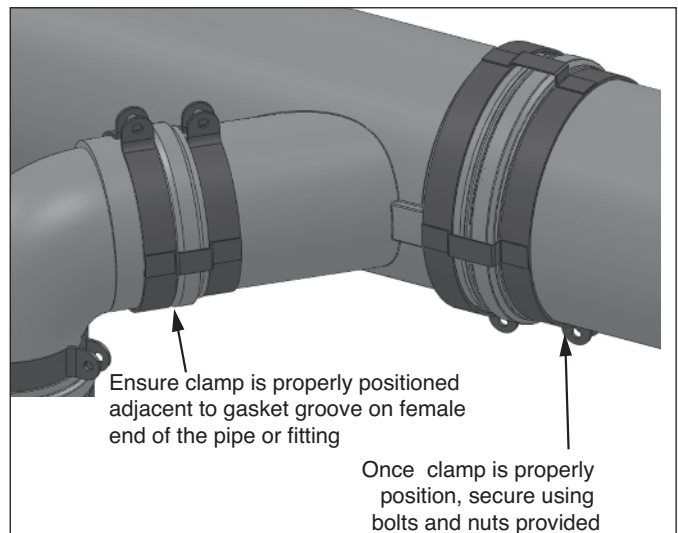


Fig. 4: Installation of Pipe Clamps

Near Boiler Vent System Assembly

1. Install the boiler adapter into the vent outlet adapter of the boiler. Tighten the vent outlet adapter banding strap securing the boiler adapter in place.
2. Install the vent check valve assembly into the boiler adapter tighten the boiler adapter banding strap securing the check valve assembly.
3. Insert the appliance elbow into the check valve assembly. Place the pipe clamp onto the joint of the appliance elbow and check valve.

NOTICE

Do not fully tighten the pipe clamp at the joint of the appliance elbow and vent pipe until all near boiler vent assembly is complete. This will allow adjustments during assembly.

4. Install the near boiler vent pipe onto the appliance elbow. Place the pipe clamp onto the joint of the appliance elbow and vent pipe.

NOTICE

Do not fully tighten the pipe clamp at the joint of the appliance elbow and vent pipe until all near boiler vent assembly is complete. This will allow adjustments during assembly.

5. Ensure the near boiler vent assemblies are installed in the proper configuration that the vent system slopes towards the common vent cap with condensate trap.

NOTICE

Ensure Vent System Adapters are properly oriented to provide the proper pitch of the common vent system from the common vent cap/condensate trap to the first boiler in the system.

5. Continue the slope of the near boiler vent assembly throughout any horizontal runs of vent. Horizontal runs should be pitched towards the common vent cap at a minimum 5/8" per foot of run.

6. The near boiler vent assembly should be supported at every joint. The supports may be affixed to the boiler jacket, wall or ceiling.
7. All horizontal and vertical runs shall be supported at every joint. Any change in direction of vent run shall be provided with a support.

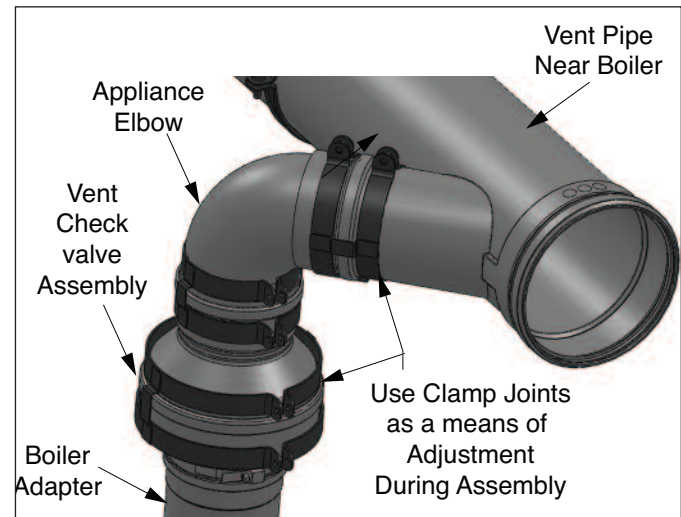


Fig. 5: Assembly of Near Boiler Vent

Termination Installation

1. Determine the termination location using the guidelines listed on page 5 and drill or cut a 6 1/2 inch hole.
2. Install an exterior flashing plate on the outside of the roof using the screws provide in the kit.
3. Mount the termination fitting through the exterior flashing plate from the exterior side of the roof.

NOTICE

To determine the appropriate pipe length of the termination fitting, mount the exterior flashing plate prior to the installation of the interior support plate(s). Insert the termination fitting from the interior side of the roof through the exterior flashing plate. The termination fitting has a formed bead that limits the distance of penetration through the exterior flashing plate. The interior pipe of the termination fitting should be measured and cut to length prior to mounting the support plates. For information on measuring and cutting common vent pipe, reference page 7.

- The termination fitting is secured to the exterior flashing plate using an interior support plate as shown in Fig. 6.
- The gaps between the outer pipe of the termination fitting and the exterior flashing plate must be sealed with a high quality silicone caulk. Also apply the silicone caulk along the outer edge of the exterior flashing plate sealing the plates to the roof and along the adjustment flashing roof.

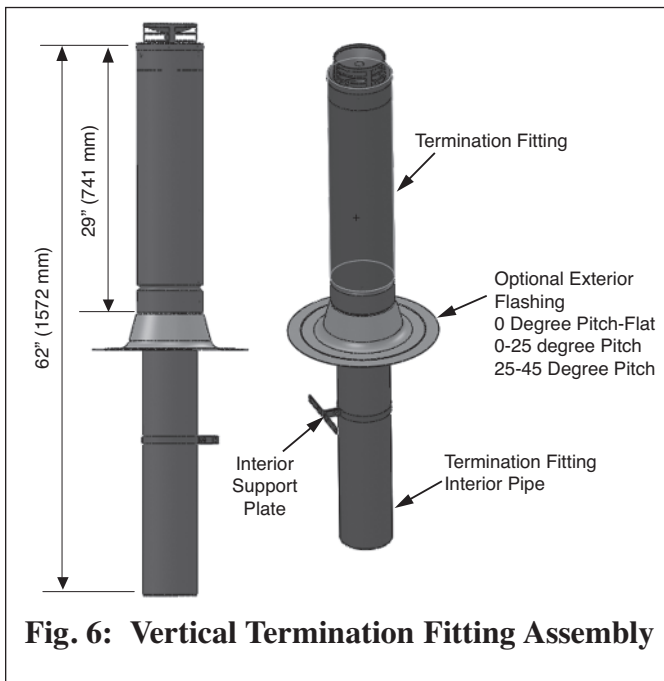


Fig. 6: Vertical Termination Fitting Assembly

Cutting Termination Fitting Internal Pipe to Length

- Only the termination fitting internal pipe can be cut to length if required.
- Add 3/4" to the required length and mark the end of the outer pipe.

NOTICE

Measure twice, cut once! Make sure to add 3/4" to the overall required length when cutting the pipe.

- Cut the pipes using an abrasive cutoff saw or hacksaw (minimum 32 teeth per inch).
- File off any burrs or rough edges on both pipes. Clean off any dust or dirt.


WARNING

To prevent dislodging or damaging the gasket seal of the mating vent pipe the end of the cut pipe must be deburred and chamfered.

Fire Stop Support Plate

The Fire Stop Support Plate must be used when the vent system piping passes through any floors, ceilings, enclosed chase or exterior walls. This plate can be used for vertical or horizontal penetrations.

- Prepare a minimum 6 1/2-inch round or square opening. Remove any insulation from the opening.
- Secure the plate at the corners using the screws provided.
- Install the vent pipe through the plate. Use a support bracket assembly to secure the vent pipe and to prevent movement through the fire stop.

SECTION III - Installing Condensate Drain

Installing Condensate Drain Assembly

1. Locate the condensate drain assembly and install as shown in Fig. 7 page 10 .

NOTICE

The installer may want to fill the condensate trap with water prior to assembling on the unit.

2. Remove the retaining nut and rubber seal from the condensate drain assembly and slide over the common vent cap condensate drain nipple. Connect the condensate drain assembly to the retaining nut and tighten. **Hand tight only!**

WARNING

Ensure the condensate drain assembly contains the plastic seated ball. Do not install the condensate drain assembly if the ball is lost or missing, replace the entire assembly.

3. Remove the compression nut and rubber seal from the drain outlet.
4. Using 3/4" x 2' flexible PVC tube provided, slide the compression nut and rubber seal over the pipe.

NOTICE

The use of 3/4" PVC or CPVC pipe is also acceptable. If 3/4" pipe is used deburr and chamfer pipe to allow mating onto the drain assembly.

5. Thread the rubber seal into the compression nut to ease installation of the pipe to the drain assembly.
6. Seat the pipe onto the drain assembly and tighten the compression nut. **Hand tight only!**

NOTICE

The installer may opt to using 13/16" ID tubing in lieu of rigid piping.

NOTICE

The drain line materials must be an approved material by the authority having jurisdiction. In absence of such authority, PVC and CPVC piping must comply with ASTM D1785 or D2845. The cement and primer used on the piping must comply with ASME D2564 or F493. For installations in Canada, use CSA or ULC certified PVC or CPVC pipe, fittings and cement/primer.

7. Continue the pipe from the drain assembly to a floor drain or condensate pump.

NOTICE

When selecting and installing a condensate pump, ensure the pump is approved for use with condensing boilers and furnaces. The pump should be equipped with an overflow switch to prevent property damage from potential condensate spillage.

8. The PRESTIGE Boiler will typically produce a condensate that is considered slightly acidic with a pH content below 3.0. Install a neutralizing filter if required by authority having jurisdiction.

CAUTION

The condensate drain must remain filled and unobstructed and allow unrestricted flow of condensate. The condensate should not be subject to conditions where freezing could occur. If the condensate is subjected to freezing or becomes obstructed , it can leak, resulting in potential water damage to the boiler and surrounding area.

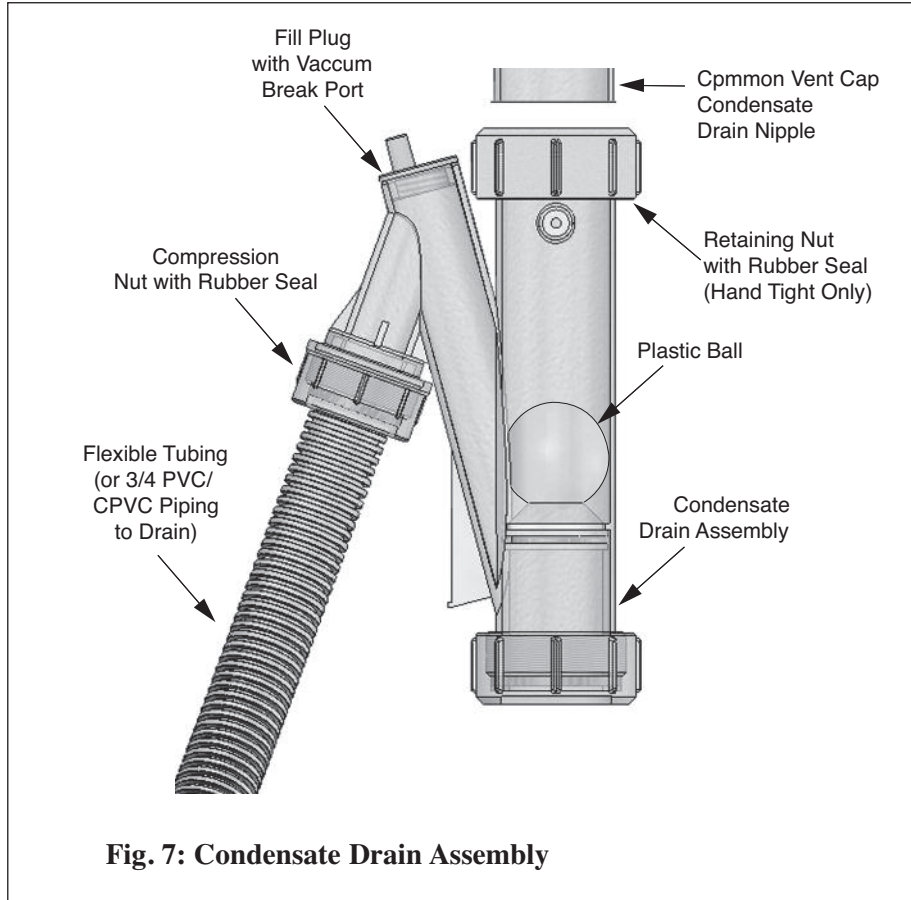


Fig. 7: Condensate Drain Assembly

SECTION IV - External Wiring

Installation Compliance

All field wiring made during installation must comply with:

- National Electrical Code NFPA 70 any other National, State, Provincial or local codes or requirements.
- In Canada, CSA C22.1 Canadian ELECTRICAL Code Part I and any other local codes.

Pressure Switch Wiring



The common vent cap is provided with a block vent pressure switch that must be either wired to each individual boiler vented into the common vent system or wired to the SCC4 Multiple Boiler Control. Failure to comply can cause severe personal injury or death.

1. Crimp low voltage wiring (provided by others) to the insulate terminals provided with the pressure switch.
2. Wiring to individual prestige boilers.
 - Route the wiring to the 24V terminal strip on the wiring panel below the control module of the Prestige boiler. Use terminals 13 and 14 to provide a “hard” lockout which requires a manual reset of the boilers.
 - When wiring the individual Prestige boilers the pressure switch must be wired in parallel as shown in Fig.: 8 page 12 .
3. Wiring to the SCC4 multiple boiler control.
 - Route the wiring to the SCC4 terminal strips.
 - Use terminals 29 and 30 on the SCC4 terminals as shown in Fig. 9, page 12.
 - Reference the SCC4 Boiler Control Manual for information on programming and setting the controller for “prove” feature.

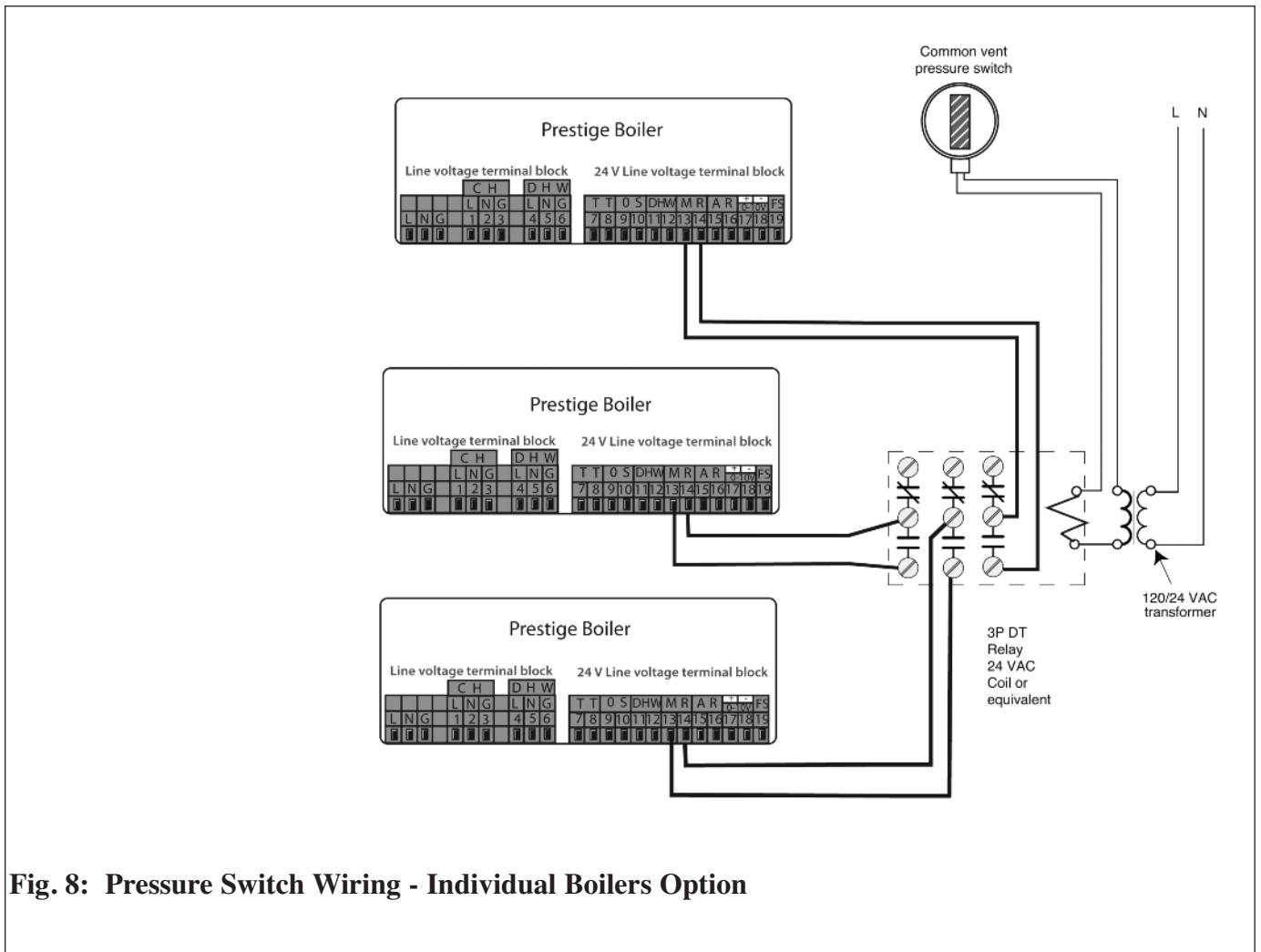


Fig. 8: Pressure Switch Wiring - Individual Boilers Option

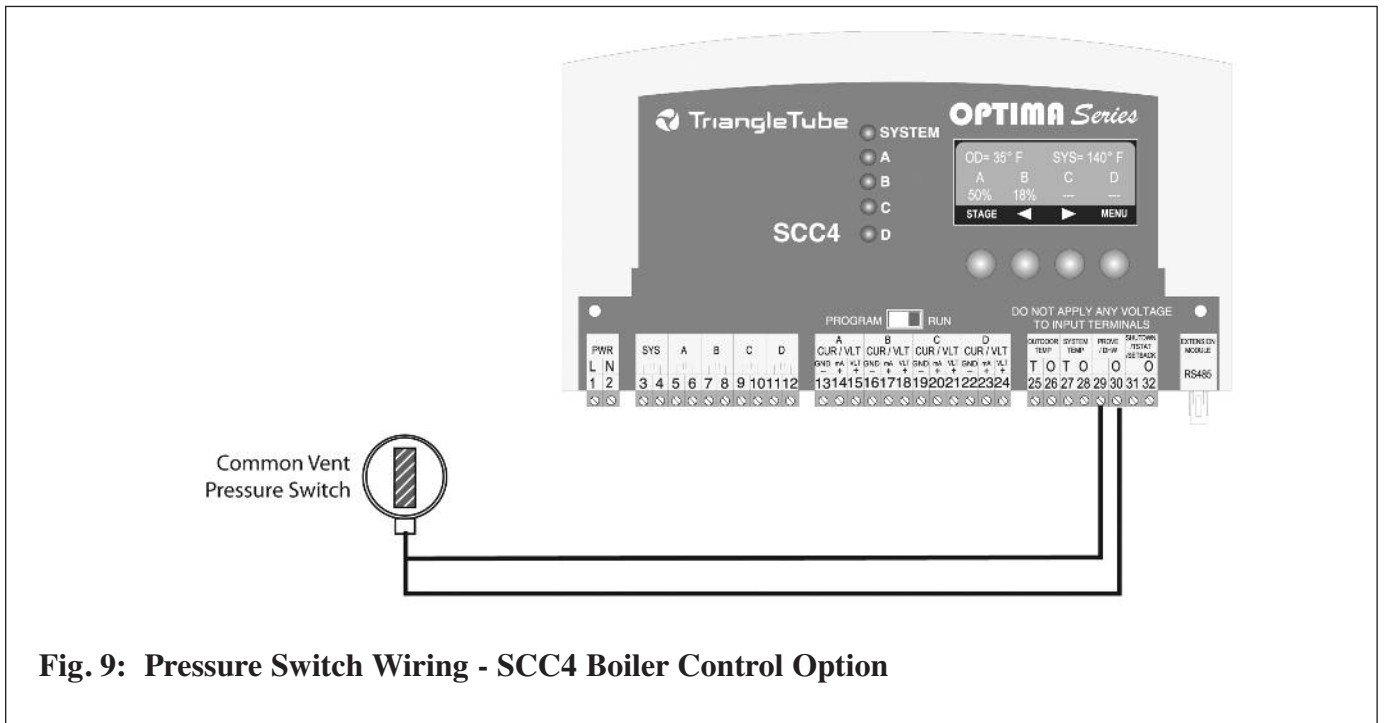


Fig. 9: Pressure Switch Wiring - SCC4 Boiler Control Option

SECTION V - Maintenance Procedures

Inspect Vent System

Visually inspect the vent system annually for blockage, deterioration or leakage. Immediately repair any joints that show signs of deterioration or leakage with the boiler turned off.



Failure to inspect the vent system and have any conditions repaired can result in severe personal injury or death.

SECTION VI - Manifolded Combustion Air Option

1. The Prestige Cascade System can use a common combustion air manifold.
2. The combustion air manifold must be constructed of round PVC pipe with the following diameter:
 - Cascade 800 (2 boilers) - 6 inch
 - Cascade 1200 (3 boilers) - 8 inch
 - Cascade 1600 (4 boilers) - 8 inch
 - Cascade 2000 (5 boilers) - 10 inch
3. The combustion air manifold must terminate vertically in a configuration as shown in Fig. 10.
4. Maintain 12 inch clearance, horizontally, from the vent termination.
5. The combustion air manifold must terminate a minimal 12 inches below the vent termination and a minimum 12 inches above the highest anticipated snow line.

6. The maximum equivalent length of the combustion air manifold is 70 feet. The equivalent length does not include any near boiler piping or the elbows where the manifold originates.
7. The near boiler piping shall be of 4 inch with a transition to the appropriate manifold size. Keep fittings required for the transition to a minimum.
8. All 90° elbows in the manifold are considered as 10 feet equivalent and 45° elbows are considered 5 feet equivalent.
9. Use perforated metal strap hangers or equivalent pipe hangers suitable for plastic pipe to support the pipe. The hangers must be spaced at maximum of every 5 feet of horizontal and vertical run of piping. A support must be placed near the boiler and every change in direction vertical or horizontal (i.e elbow).

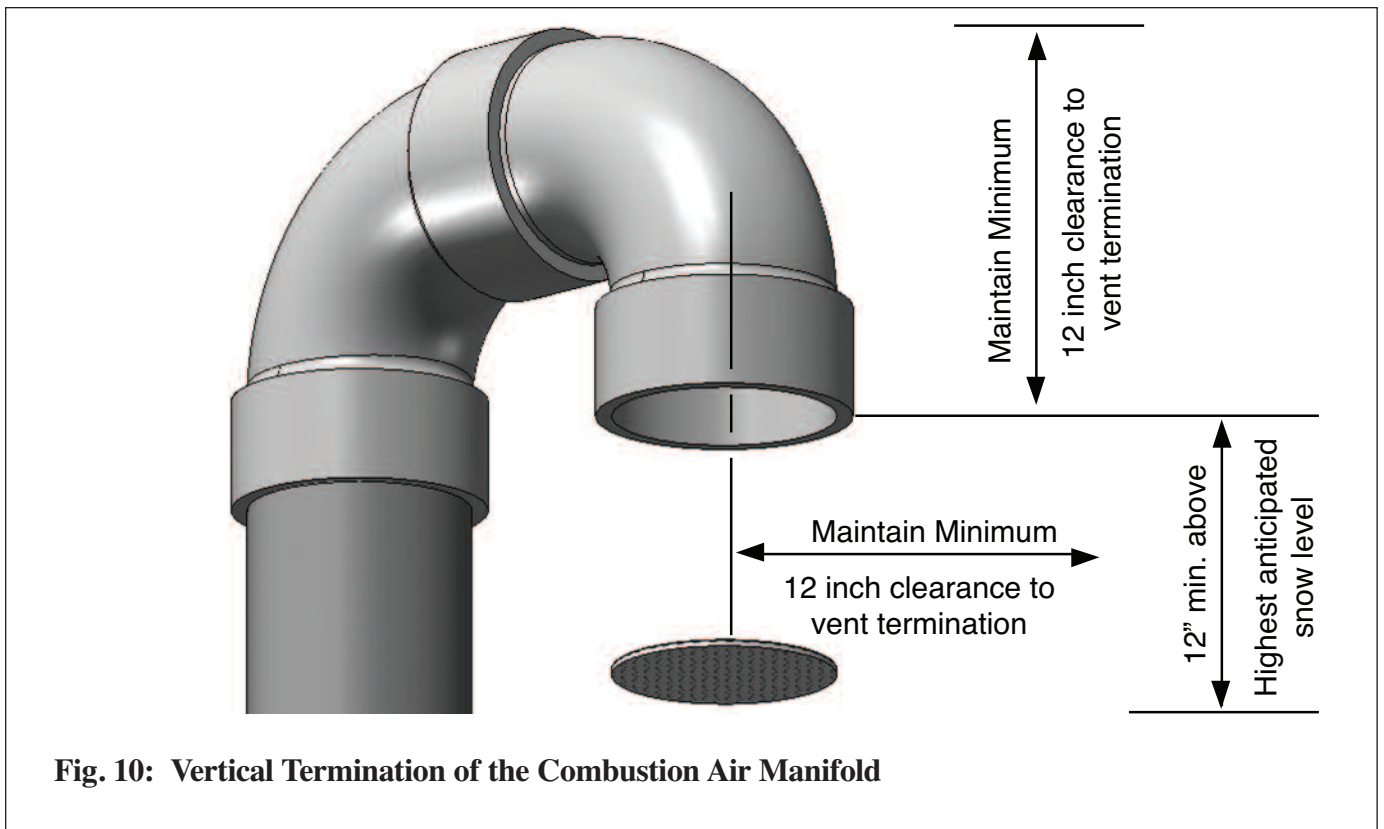


Fig. 10: Vertical Termination of the Combustion Air Manifold

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