REZNOR®

Revision: UBZ-UDZ-VENT (06-26) 1034632-D

Supersedes: UBZ-UDZ-VENTING (08-22) 1034632-C

VENTING INSTRUCTIONS FOR GAS-FIRED UNIT HEATERS

MODEL UBZ: SEPARATED-COMBUSTION BLOWER TYPE
MODEL UDZ: SEPARATED-COMBUSTION FAN TYPE

GENERAL INFORMATION

This manual applies only to venting instructions for models UBZ and UDZ and must be used with the installation manual. Both manuals are shipped with the heater. If either manual is missing, contact your distributor before beginning installation. When converting fuels, it is necessary to have the complete heater model. The identifying model number can be found on the heater rating plate. The rating plate identifies only original equipment, so also compare the label on the gas valve with the description listed.

Important Safety Information

Refer to the installation manual provided with the heater for important safety information. Pay attention to all dangers, warnings, cautions, and notes highlighted in this manual. Safety markings should not be ignored and are used frequently throughout to designate a degree or level of seriousness.

⚠ DANGER ⚠

- **Do not use an existing venting system. This heater requires installation of the combustion air/vent system ordered with the unit, either option CC6 for a horizontal system or option CC2 for a vertical system. Failure to comply could result in severe personal injury, death, and/or property damage.**
- **Heaters certified for residential use are intended for the heating of non-living spaces that are attached to or part of a structure that contains space for family living quarters. They are not intended to be the primary source of heat in residential applications or to be used in sleeping quarters.**
- **All gas conversion must be done by a qualified service person in accordance with these instructions and in compliance with all codes and requirements. In Canada, gas conversion shall be carried out in accordance with the requirements of the Provincial Authorities having jurisdiction and in accordance with the requirements of the CAN/CGA-B149.1 and CAN/CGA-B149.2 installation code.**
- **The gas burner in this gas-fired equipment is designed to provide safe complete combustion. However, if the installation does not permit the burner to receive the proper supply of combustion air, complete combustion may not occur. The result is incomplete combustion, which produces carbon monoxide, a poisonous gas that can cause death.**
- **Safe operation of indirect-fired gas burning equipment requires a properly-operating vent system that vents all flue products to the outside atmosphere. Failure to provide proper venting will result in a health hazard that could cause serious personal injury or death.**
- **For all heater installations, always comply with the combustion air requirements in the installation codes and instructions. Combustion air at the burner should be regulated only by manufacturer-provided equipment. Never restrict or otherwise alter the supply of combustion air to any heater. Maintain the vent or vent/combustion air system in structurally sound and proper operating condition.**
- **Improper installation, adjustment, alteration, service, or maintenance can cause property damage, injury, or death. Read the installation, operation, and maintenance instructions thoroughly before installing or servicing this equipment.**
- **Installation should be performed by a qualified agency in accordance with these instructions. The qualified service agency installing this unit is responsible for the installation.**

DO NOT DESTROY. PLEASE READ CAREFULLY. KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

Important Safety Information—Continued

⚠ WARNING ⚠

All separated-combustion units MUST BE equipped with both combustion air and exhaust piping to the outdoors.

⚠ CAUTION ⚠

- **These units should not be used in an application where the heated space temperature is below 40°F (4°C). Operating under low ambient conditions may cause condensate to form in the heat exchanger.**
- **When an existing appliance is removed or replaced in a venting system, verify that the venting system is properly sized to vent the new appliance. An improperly sized venting system may result in the formation of condensate, leakage, and/or spillage.**
- **Do not intermix different vent system parts from different manufacturers in the same venting system.**
- **Concentric horizontal and vertical vent/combustion air systems are the only venting/combustion air systems approved for these units.**

Unit Applicability

- Unit sizes 030–400 of model UBZ units and 150–400 of model UDZ units are certified only for commercial/industrial installations.
- Unit sizes 030–125 of model UDZ units are certified for both residential and commercial/industrial installations.

Hazards of Chlorine

The presence of chlorine vapors in the combustion air of gas-fired heating equipment presents a potential corrosion hazard. Chlorine—usually in the form of Freon or degreaser vapors—when exposed to flame will precipitate from the compound and go into solution with any condensation present in the heat exchanger or associated parts. The result is hydrochloric acid, which readily attacks all metals including 300 grade stainless steel. Care should be taken to separate these vapors from the combustion process. This may be done by the wise location of the combustion air terminal with regard to exhausters or prevailing wind directions. Chlorine is heavier than air. Keep these facts in mind when determining the installation location of the heater in relation to building exhaust systems.

Clearance to Combustibles

⚠ DANGER ⚠

Do not enclose the vent pipe or place it closer than 6 inches (152 mm) to combustible material.

Pipe Requirements

All pipe is field-supplied. Select the installation type that applies, Requirements are listed for both the vent pipe and the combustion air inlet pipe:

Type of Pipe for Residential Installations

- Single-wall vent pipe approved to UL standard 1738 for a category III appliance is required.
- The horizontal section of pipe in the vent terminal that extends through the box and runs concentric through the combustion air pipe must be one-piece with no joints.
- The vertical section of pipe in the vent terminal that extends through the box and runs concentric through the combustion air pipe must be one-piece with no joints.
- Sealed, single-wall galvanized pipe is recommended for the inlet air run and the terminal combustion air pipe.

Type of Pipe for Commercial/industrial Installations

- Single-wall vent pipe approved for a category III appliance or single-wall, 26-gauge or heavier galvanized or equivalent vent pipe is required between the heater and the concentric adapter box.
- The horizontal section of pipe in the vent terminal that extends through the box and runs concentric through the combustion air pipe must be one-piece with no joints.
- The vertical section of pipe in the vent terminal that extends through the box and runs concentric through the combustion air pipe must be one-piece with no joints. Double-wall (type B) vent pipe is required for the vertical vent terminal.
- Sealed, single-wall galvanized pipe is recommended for the inlet air run and terminal combustion air pipe.

Pipe Size Requirements

Pipe diameters of the outside (terminal) concentric pipes are listed in **Table 1**. Pipe diameter and length requirements listed in **Table 2** are for the indoor sections of pipe between the heater and the concentric adapter box.

Table 1. Concentric (Outdoor) Pipe Sizes

Pipe	Unit Size	
	030, 045, 060, 075, 100, 125	150, 175, 200, 225, 250, 300, 350, 400
	Pipe Diameter (Inches (mm))	
Inlet air	6 (152)	8 (203)
Vent	4 (102)	5 (127)

Table 2. Diameter and Length of Pipe (Indoor) from Heater to Concentric Adapter Box

Unit Size	Diameter (Inches (mm))		Length (Feet (Meters))			
	Vent Pipe	Inlet Air Pipe	Maximum	Equivalent Straight Length*		Minimum
				90-Degree Elbow	45-Degree Elbow	
030, 045	3 (76)		15 (4.6)	2 (0.6)	1 (0.3)	1 (0.3)
	4 (102)		10 (3)			
060	3 (76)		25 (7.6)	3 (0.9)	1.5 (0.5)	
	4 (102)		15 (4.6)	1.5 (0.5)	1 (0.3)	
075	4 (102)		25 (7.6)	3 (0.9)	1.5 (0.5)	
100, 125	4 (102)		35 (10.7)	4 (1.2)	2 (0.6)	
150	5 (127)	6 (152)	30 (9.1)	3 (0.9)	1.5 (0.5)	3 (0.9)
175	5 (127)	6 (152)	30 (9.1)	3 (0.9)	2 (0.6)	
200, 225, 250	5 (127)	6 (152)	40 (12.2)	4 (1.2)	2 (0.6)	
300	6 (152)		45 (13.7)	4 (1.2)	2 (0.6)	
350, 400	6 (152)		45 (13.7)	5 (1.5)	2.5 (0.8)	

*Add all straight sections and equivalent lengths for elbows—the total combined length must not exceed the maximum vent length.

Venter Outlet and Combustion Air Inlet Connection Requirements

- **Venter outlet connection on unit sizes 030, 045, and 060:** when using 3-inch diameter pipe, a 4- to 3-inch (102- to 76-mm) taper-type reducer is required at the venter outlet—for category III, attach a 4-inch appliance adapter from a category III pipe manufacturer directly to the collar and then use a reducer if using 3-inch pipe.
- **Combustion air inlet connection on unit sizes 030, 045, and 060:** when using 3-inch diameter pipe, a 3- to 4-inch (76- to 102-mm) taper-type increaser is required at the inlet air collar.
- **Both heater connections on unit sizes 200, 225, 250, 300, 350, and 400:** require a minimum of 12 inches (305 mm) of straight pipe at both heater connections.
- Connections are shown in **Figure 1**. Connection sizes are listed in **Table 1**.

Venter Outlet and Combustion Air Inlet Connection Requirements—Continued

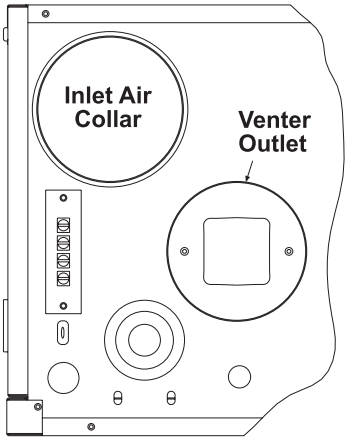


Figure 1. Typical Combustion Air Inlet and Venter Outlet Connections

Table 3. Combustion Air Inlet and Venter Outlet Connection Sizes

Connection	Unit Size		
	030, 045, 060, 075, 100, 125	150, 175, 200, 225, 250	300, 350, 400
	Connection Diameter (Inches (mm))		
Venter outlet	4 (102)	5 (127)	6 (152)
Combustion air inlet collar		6 (152)	

Joint Connection and Sealing Requirements

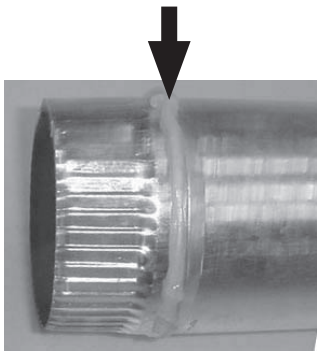
- **Category III pipe:** follow the pipe manufacturer's instructions for joining and sealing.
- **Single-wall pipe (vent pipe or combustion air pipe):** secure slip-fit pipe connections using sheet metal screws or rivets. Seal all joints with aluminum tape or silicone sealant.

NOTE: When connecting double-wall Type B vent pipe to single-wall pipe, work quickly to assemble components before sealant dries.

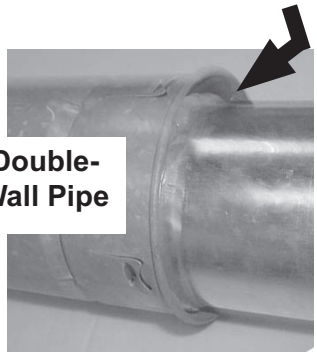
- **Terminal section of double-wall vent pipe (vertical vent terminal option CC2 only) to vent cap:** connect in accordance with **Figure 2.**
- **Terminal section of double-wall vent pipe to single-wall vent pipe:** connect in accordance with **Figure 2**.
- **When joining two sections of double-wall vent pipe:** follow the pipe manufacturer's instructions for joining and sealing vent pipe sections.

NOTE: Joints connecting double-wall pipe apply only to commercial/industrial installations with a vertical vent terminal (option CC2).

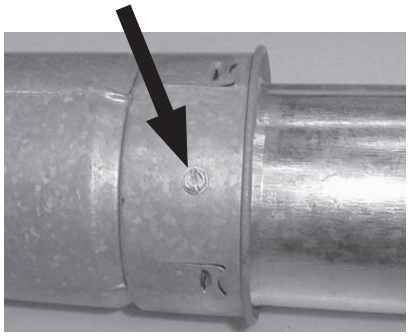
STEP 1: Place continual 1/4-inch bead of silicone sealant around circumference of single-wall pipe.



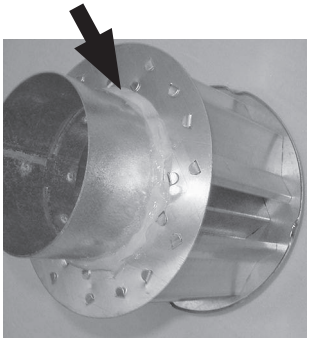
STEP 2: Before sealant can dry, insert single-wall pipe into inner pipe of double-wall pipe until bead of sealant contacts inner pipe to create sealed joint.



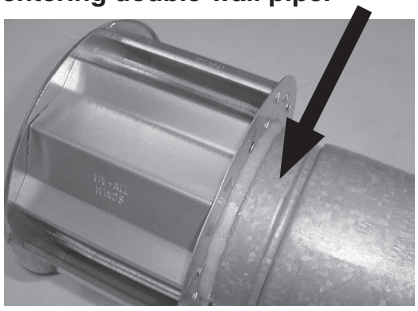
STEP 3: Drill three small holes spaced equally around double-wall pipe below sealant ring. Secure joint using 3/4-inch-long sheet metal screws. Do not overtighten screws.



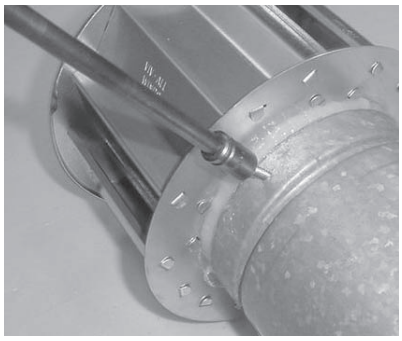
STEP 4: Place continual 3/8-inch bead of silicone sealant around he circumference of vent cap collar to prevent any water inside vent cap from running down double-wall pipe.



STEP 5: Before sealant can dry, insert collar on vent cap as far as possible inside inner wall of double-wall pipe. Apply silicone sealant to fully close any gaps between vent cap and double-wall pipe to prevent water from entering double-wall pipe.



STEP 6: Drill small hole through vent cap and double-wall pipe. Secure joint using 3/4-inch-long sheet metal screw. Do not overtighten screw.



STEP 7: Place continual 1/4-inch bead of silicone sealant around circumference of venter outlet collar.



STEP 8: Before sealant can dry, slide double-wall pipe over collar so that collar is inside inner pipe. Push double-wall pipe tight to heater cabinet. Drill three small holes through the pipe and into collar spaced equally around pipe below sealant ring. Secure joint using 3/4-inch-long sheet metal screws. Do not overtighten screws.

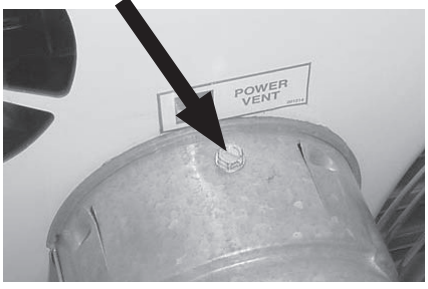


Figure 2. Instructions for Attaching Double-Wall Type B Vent Pipe to Single-Wall Pipe

Vent System Support Requirements

- Support horizontal runs every six feet (1.8 meters).
- Support vertical runs category III vent pipe in accordance with the pipe manufacturer's requirements.
- Support vertical single-wall pipe in accordance with accepted industry practice.

⚠ CAUTION ⚠

- **Do not rely on the heater to support either horizontal or vertical vent pipe.**
- **Use non-combustible supports on vent pipe.**

NOTE: The vertical vent terminal pipe does not attach to the concentric adapter box and must be supported during installation.

INSTALLATION

⚠ CAUTION ⚠

Do NOT make actual connections until after reading the instructions and length requirements for installing the vent/combustion air kit (refer to Pipe Requirements section).

Condensation Mitigation

- On units with long vent runs—over 50% of maximum vent length allowed—or installed in low ambient conditions (below 50°F), it is recommended that vent pipes be fitted at the low point of the vent system with a tee, a drip leg, and a cleanout cap to prevent any moisture in the vent pipe from entering the unit. The drip leg should be inspected and cleaned out periodically during the heating season.
- Any length of single-wall vent pipe exposed to cold air or run through an unheated area or an area with an ambient temperature of 50°F or less, must be insulated along its entire length with a minimum of 1/2-inch foil-faced fiberglass, 1-1/2# density insulation.
- On horizontal vent runs, the flue pipe must be pitched down toward the terminal end—1/4-inch per foot for condensate drainage—for the entire length of the horizontal vent run.

⚠ CAUTION ⚠

- **Failure to pitch the vent run properly may damage the heater due to condensate running back into the unit.**
- **Exceeding vent pipe diameter and length requirements may result in condensate forming in the vent pipe.**

Concentric Adapter Box Connections

NOTES:

- **All UBZ and UDZ installations require a concentric adapter box designed to allow both combustion air and venting. The unique concentric adapter assembly required with this heater allows for both combustion air and exhaust piping with only one horizontal or vertical penetration hole in the building.**
- **The concentric adapter box is included in the vent/combustion air terminal kit. Components and instructions depend on whether the vent terminal is horizontal (option CC6) or vertical (option CC2).**
- **Horizontal and vertical kits do not use the same adapter box. The only difference is the diameter of the opening in the box for the vent pipe. On commercial/industrial installations, a vertical vent requires double-wall pipe and a slightly larger opening through the box.**

- **Figure 3** shows a typical concentric adapter box and its airflow.

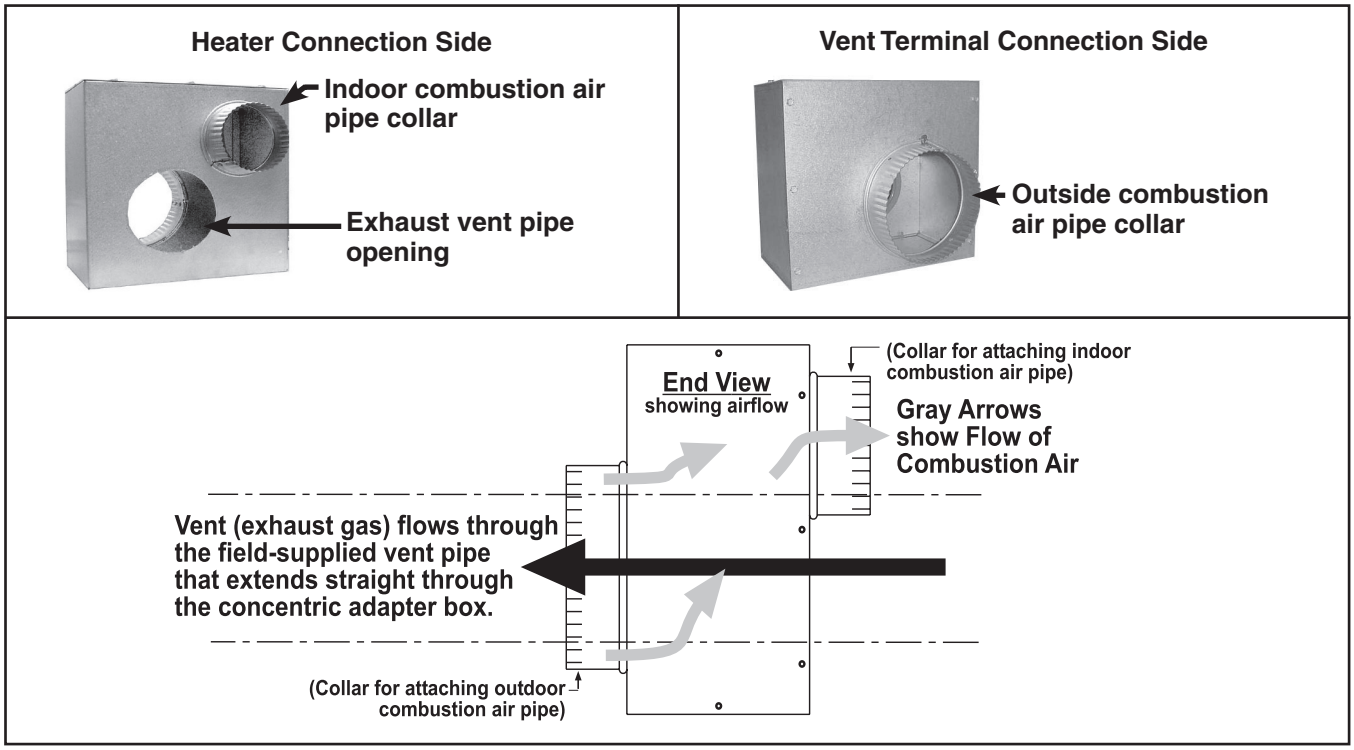


Figure 3. Concentric Adapter Box

Concentric Adapter Box Connections—Continued

- See **Figure 4** for concentric adapter box dimensions.
- When pipe diameters differ, depending on the direction of airflow, join the pipes with either a taper-type reducer or increaser. Requirements vary depending on the unit size. The connection requirements are the same for both vertical and horizontal systems, but the length of pipe required varies by installation.
- **Table 4** lists vent pipe opening diameters shown in **Figure 4**.
- **Figure 5** shows concentric adapter box connections.

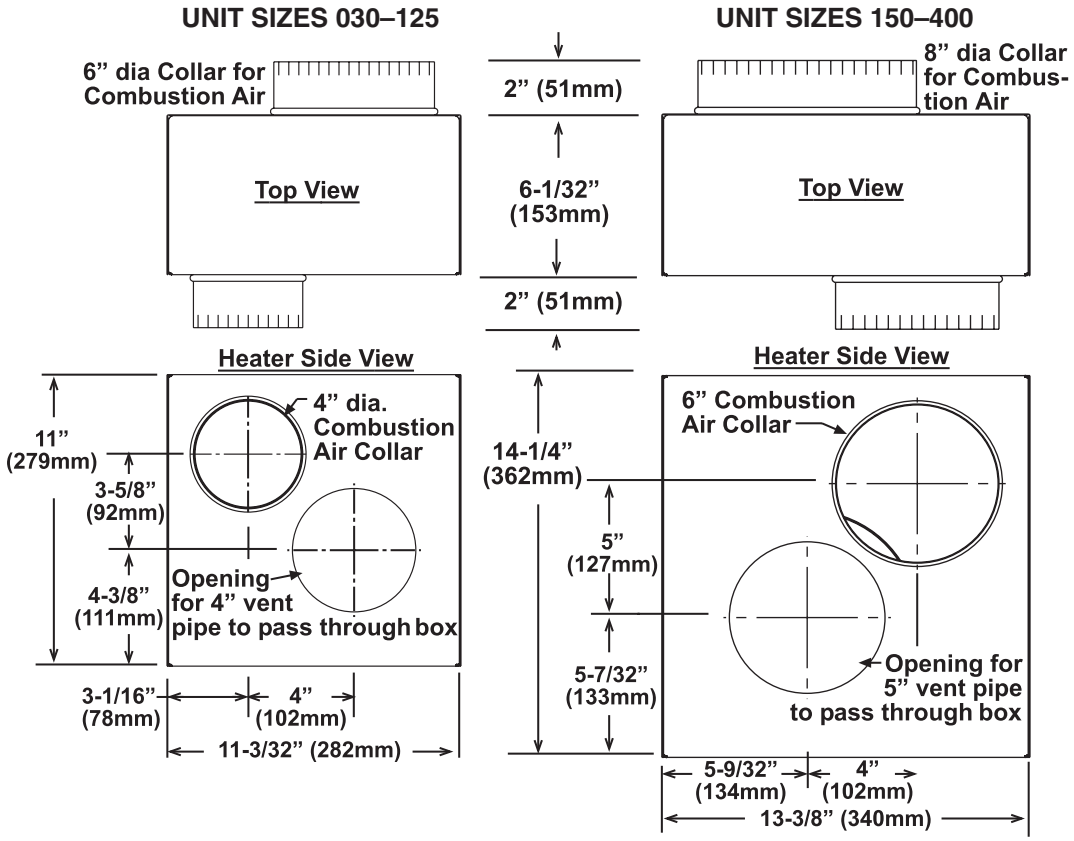


Figure 4. Concentric Adapter Box Dimensions (Refer to Table 4)

Table 4. Vent Pipe Opening Diameter

Vent Terminal Configuration	Option	Unit Size (See Figure 4)	
		030–125 (5-Inch Vent Pipe)	150–400 (5-Inch Vent Pipe)
		Diameter (Feet (Meters))	
Vertical	CC2	4-21/32 (118)	5-21/32 (144)
Horizontal	CC6	4-1/16 (103)	5-1/16 (129)

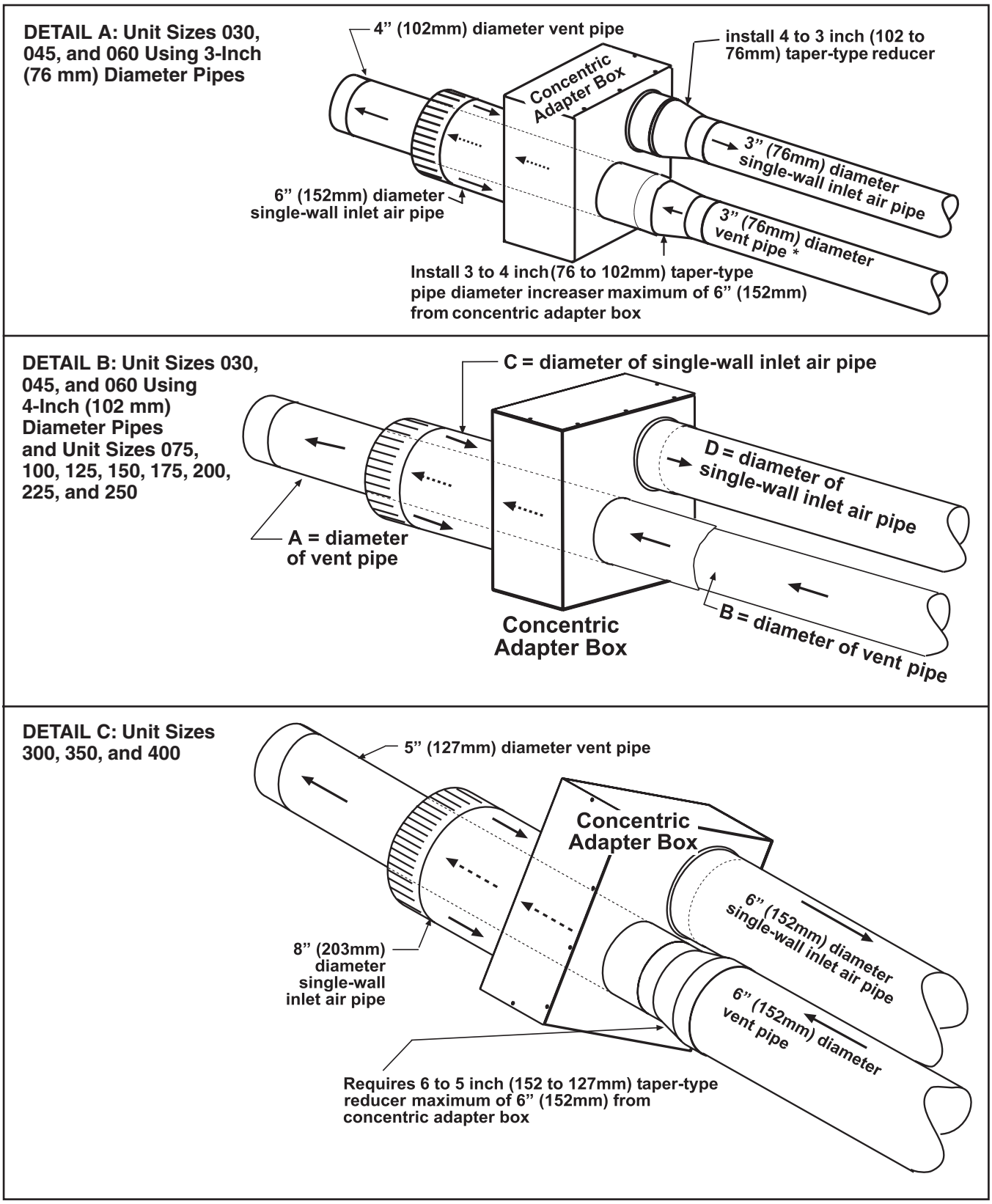


Figure 5. Concentric Adapter Box Connections (Refer to Table 4)

Concentric Adapter Box Connections—Continued

- **Table 5** lists connection dimensions shown in **Figure 5**, DETAIL B.
- Unit sizes 300, 350, and 400 shown in **Figure 5**, DETAIL C always require a 6- to 5-inch (152- to 127-mm) taper-type reducer in the vent pipe.

Table 5. Concentric Adapter Box Vent Pipe Sizes

Unit Size	Dimension (See Figure 5)			
	A	B	C	D
	Diameter (Inches (mm))			
030, 045, 060*	4 (102)		6 (152)	4 (102)
075, 100, 125	4 (102)		6 (152)	4 (102)
150, 175, 200, 225, 250	5 (127)		8 (203)	6 (152)

*Uses 4-inch vent pipe for combustion air runs from heater to concentric adapter box.

Vent Terminal Connections

Vent terminal options CC2 (vertical vent configuration) and CC6 (horizontal vent configuration) are shown in **Figure 6**. Both options are applicable to residential and commercial/industrial installations

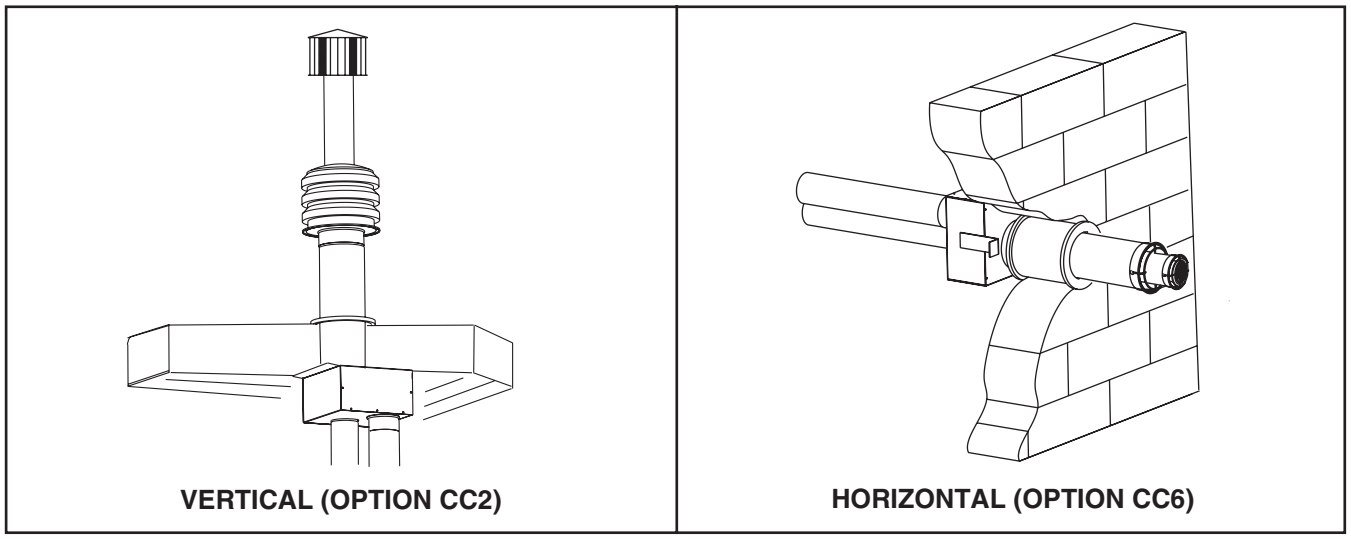


Figure 6. Vent Terminal Options

Vertical Vent Terminal (Option CC2) Installation

- Field-supplied components required for installation of the vertical vent kit are as follows:
  a. Vent and combustion air piping in accordance with **Table 2**
  b. Tapered vent pipe diameter reducers and/or increasers, as required
  c. Thimble (not required if wall is of non-combustible construction)
  d. Flashing
  e. Sheet metal screws, tape, and sealant, as required
- Factory-supplied components for installation of the vertical vent kit are listed in **Table 6**.

Table 6. Vertical Vent Terminal/Combustion Air Package (Option CC2) Components			
Unit Size		Description	Qty
030–125	150–400		
PN			
205895	205896	Kit package	1
205884	205885	Concentric adapter box (see **Figure 3**, **Figure 4,** and **Figure 5**)	1
110051	110052	Exhaust vent terminal assembly (see **Figure 7**)	1
155635	53330	Combustion air inlet assembly (see **Figure 7**)	1
207232		Concentric adapter box bracket	2
53335		High-temperature silicone sealant, tube	1



EXHAUST VENT TERMINAL ASSEMBLY



COMBUSTION AIR INLET ASSEMBLY

Figure 7. Option CC2 Components

⚠ DANGER ⚠

- **To prevent combustion products from entering the occupied space, all vent terminals must be positioned or located away from fresh air intakes, doors, and windows. Failure to comply could result in severe personal injury or death and/or property damage.**
- **Consider local snow depth conditions. The vent must be at least 6 inches (152 mm) above the anticipated snow depth.**

1. Determine vent terminal location on roof:
   a. If more than one vertical vent terminal is being installed, minimum spacing between vent center lines is determined by minimum outdoor design temperature (coldest outdoor condition at installation site). Refer to **Table 7** to ensure that location complies with minimum outdoor design temperature requirements.
   b. Select location away from fresh air intakes, allowing space for concentric adapter box inside. Vent terminal must be located away from adjacent buildings as shown in **Figure 8**.

Table 7. Minimum Spacing Between Center Lines of Vertical Vent Pipes	
Minimum Outdoor Design Temperature	Minimum Spacing Between Center Lines of Vertical Vent Pipes (Inches (mm))
≥31°F (≥0°C)	36 (914)
−10 to 30°F (−23 to −1°C)	60 (1524)
< −10°F (< −23°C)	84 (2134)

Vent Terminal Connections—Continued

Vertical Vent Terminal (Option CC2) Installation—Continued

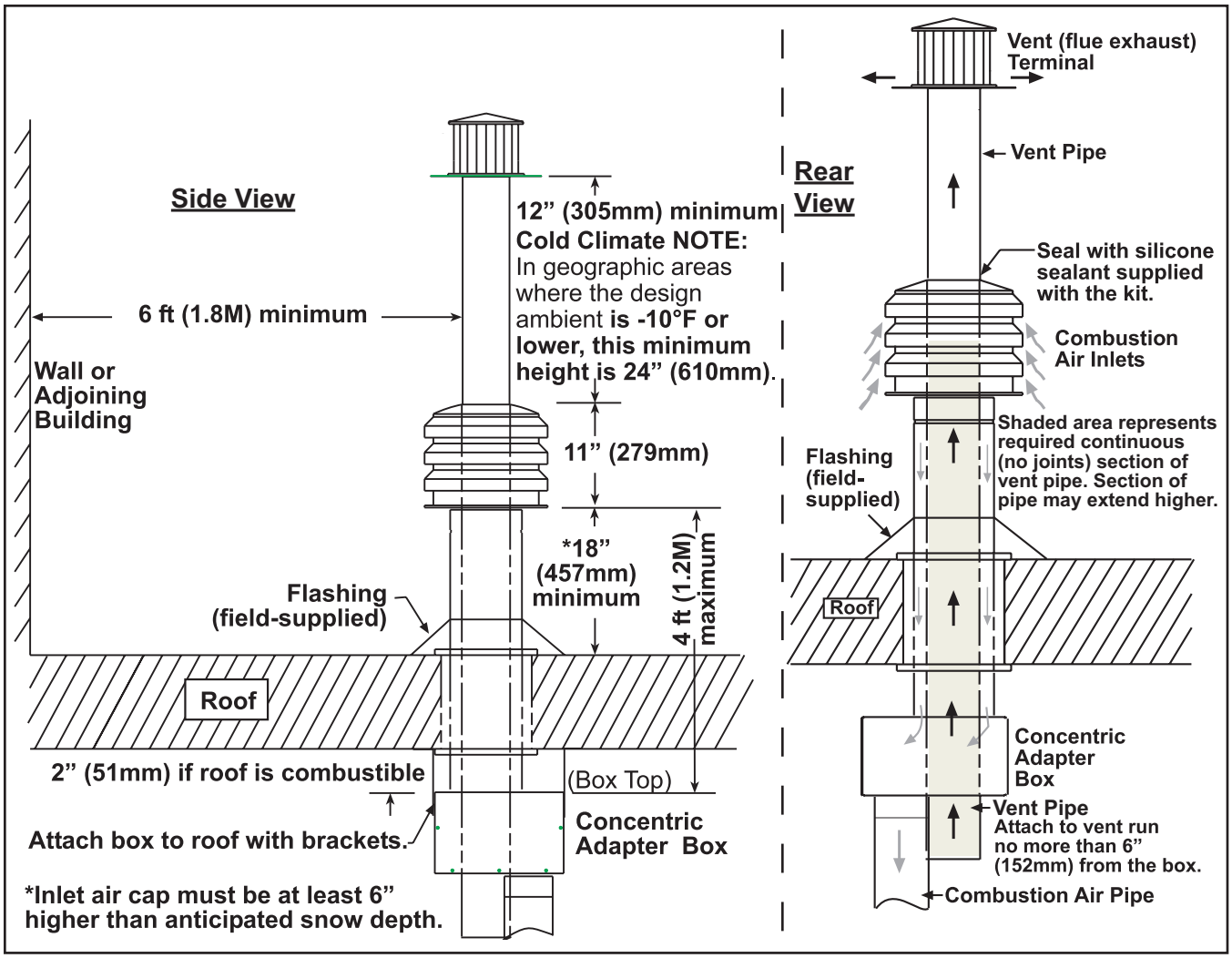


Figure 8. Option CC2 Installation

2. Install vent pipe and combustion air pipe runs:
   a. Connect piping to heater in accordance with specifications listed in **Pipe Requirements** section.
   b. Seal all joints in accordance with specifications listed in **Joint Connection and Sealing Requirements** section. Due to high temperature considerations, do not enclose exhaust pipe or place pipe closer than 6 inches (152 mm) to combustible material.
   c. Extend piping runs close to roof at location selected in step 1 and support piping in accordance with specifications listed in **Vent System Support Requirements** section.

NOTE: The vent pipe will extend through the roof after the concentric adapter box is installed. The indoor combustion air pipe will end at the box.

3. Cut hole through roof for combustion air pipe.
   a. Ensure that location and orientation of concentric adapter box are correct and mark and cut hole.
   b. Ensure that hole accommodates 6-inch (152 mm) combustion air pipe for unit sizes 030–125 or 8-inch (203-mm) combustion air pipe for unit sizes 150–400. Thimble may or may not be required depending on building construction and/or local codes. Larger diameter combustion air pipe serves as clearance for vent pipe on non-combustible construction.

NOTE: The longer angle of the concentric adapter box bracket has five 7/32-inch holes that allow the position of the bracket on the box to be adjusted. The shorter angle has three 7/32-inch holes that allow adjustment to construction.

4. Secure longer angles on concentric adapter box brackets (see **Figure 9**) to concentric adapter box.

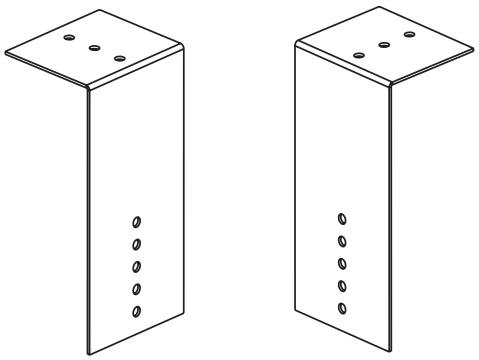


Figure 9. Concentric Adapter Box Brackets

5. Connect outside section of combustion air pipe to concentric adapter box (see **Figure 10**):
   a. Determine length of combustion air pipe so that dimension X in **Figure 10** is equal to bracket length, plus roof thickness, plus anticipated snow depth. Ensure that length of combustion air pipe does not exceed 48 inches (1,219 mm) or does not extend **less than** 18 inches (457 mm) above roof.
   b. Secure inlet air pipe to collar of concentric adapter box using sheet metal screws. Seal joint and seam using tape or sealant.

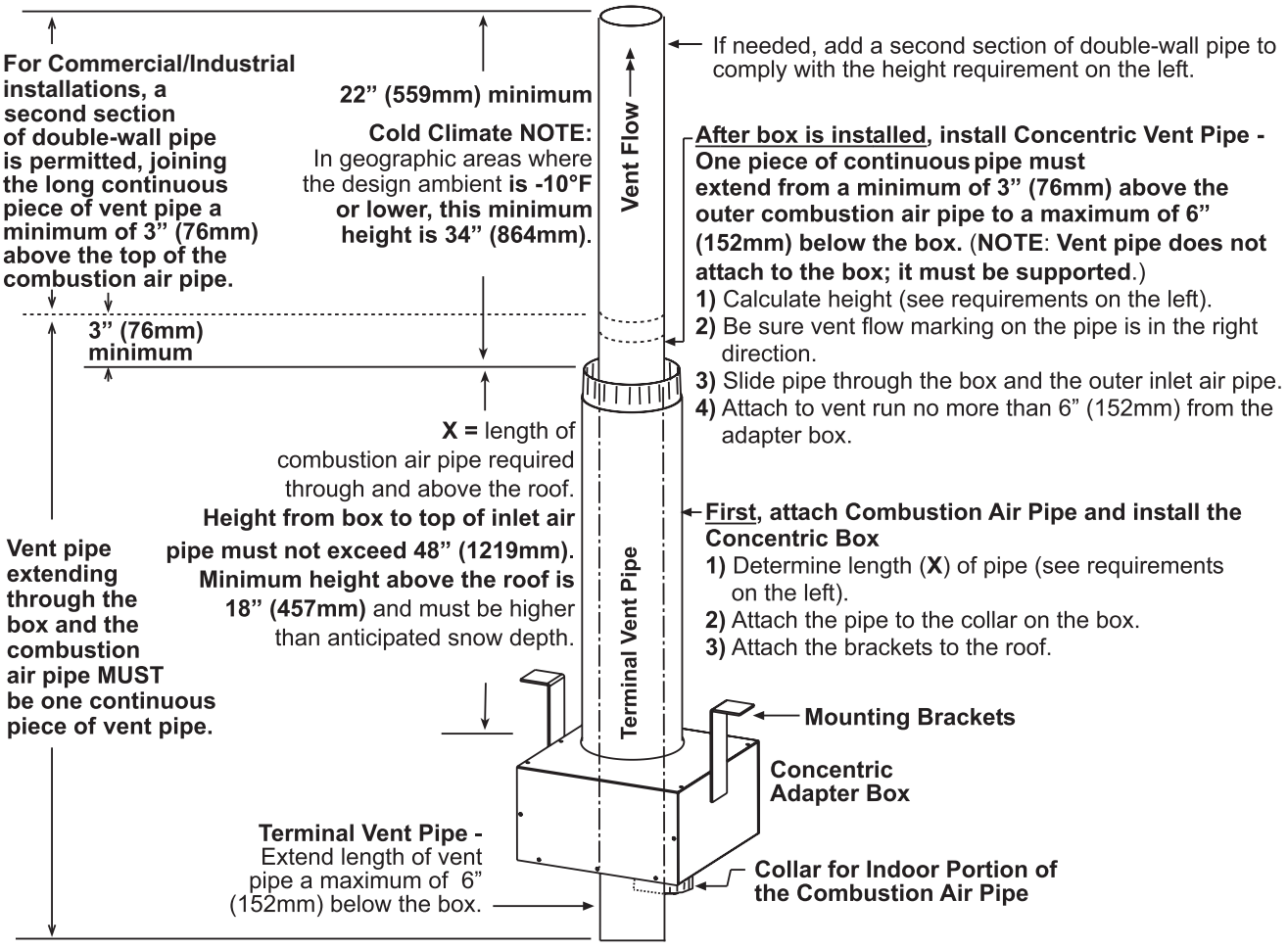


Figure 10. Combustion Air Pipe Installation

Vent Terminal Connections—Continued

Vertical Vent Terminal (Option CC2) Installation—Continued

6. Secure concentric adapter box to underside of roof (see **Figure 10**):

⚠ CAUTION ⚠

- **If the roof is combustible, ensure that brackets are positioned to allow a 2-inch (51 mm) clearance between the concentric adapter box and the roof.**
- **If any holes are made in the concentric adapter box in error, ensure that they are sealed.**

a. Insert combustion air pipe through roof as shown in **Figure 11**.

b. Position concentric adapter box to match pipe runs and secure short angles of concentric adapter brackets (see **Figure 9**) to underside of roof using field-supplied hardware.

c. Install field-supplied flashing around combustion air pipe on roof outside.

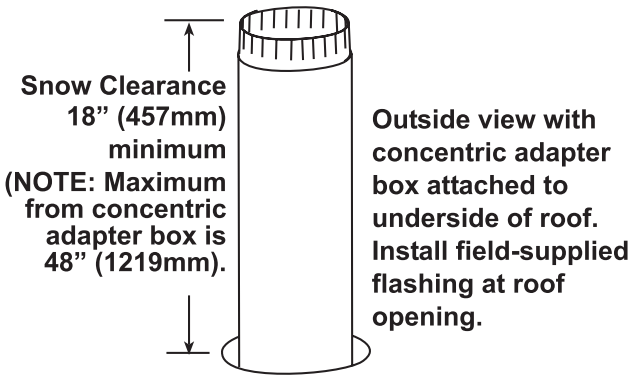


Figure 11. Combustion Air Pipe Through Roof

7. Install double-wall terminal vent pipe

NOTE: The length of the vent pipe is determined by the installation within maximum and minimum requirements. The vent pipe extending through the concentric adapter box, through the combustion air inlet pipe, and above the combustion air inlet air pipe must be one piece without joints.

a. Refer to **Figure 10** to determine required length of continuous section of vent pipe. Determine length as follows:

(1) Start with no more than 6 inches (152 mm) below concentric adapter box

(2) Plus 6 inches (152 mm) through box

(3) Plus length of bracket extending above box

(4) Plus width of roof

(5) Plus height of combustion air pipe above roof

(6) Plus minimum of 3 inches (76 mm) beyond top of combustion air pipe

(7) Total is minimum length of vent pipe section—if actual piece of vent pipe is longer, extend it further above combustion air pipe—do not extend it more than 6 inches (152 mm) below box

b. Ensure that vent pipe is in proper flow direction and slide end of pipe into box and out through combustion air pipe. Position vent pipe to lengths determined above.

NOTE: The double-wall vent pipe does not attach to the box. The installer must provide support.

c. Connect double-wall pipe to single-wall pipe or taper-type connector in accordance with **Figure 2**.

d. Seal completely around circumference of pipe and opening of box using silicone sealant.

8. Install combustion air inlet (see **Figure 12**):
   a. Install additional section of vent pipe if needed on outside and make joint in accordance with pipe manufacturer's requirements.
   b. When vent pipe is required height, slide combustion air inlet over vent pipe and fasten collar to combustion air pipe using sheet metal screws.
   c. Seal opening at top between vent pipe and combustion air inlet to prevent water leakage using silicone sealant.

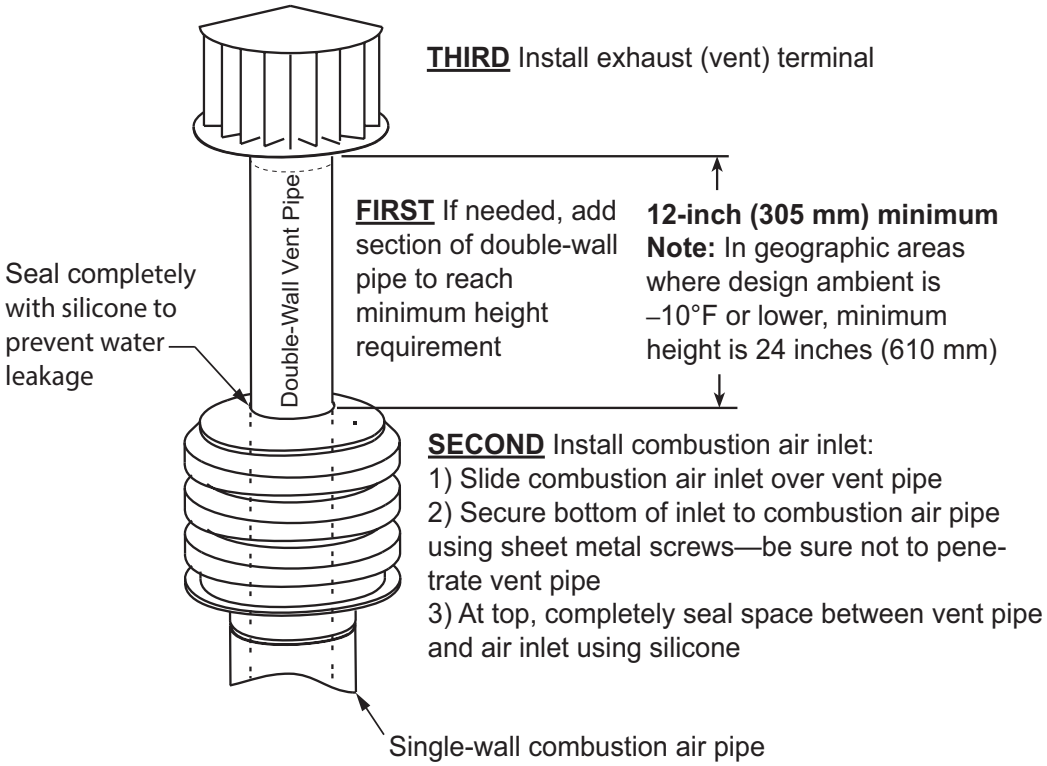


Figure 12. Combustion Air Inlet and Vent Terminal Installation

9. Install exhaust (vent) terminal cap (see **Figure 12**) in accordance with **Figure 2**.
10. Install indoor combustion air pipe:
    a. Secure single-wall combustion air pipe run to collar on concentric adapter box using field-supplied sheet metal screws.
    b. Seal pipe joint using tape or sealant.
11. Verify compliance with **Figure 8** and with all specifications and requirements listed in this manual.

Horizontal Vent Terminal (Option CC6) Installation

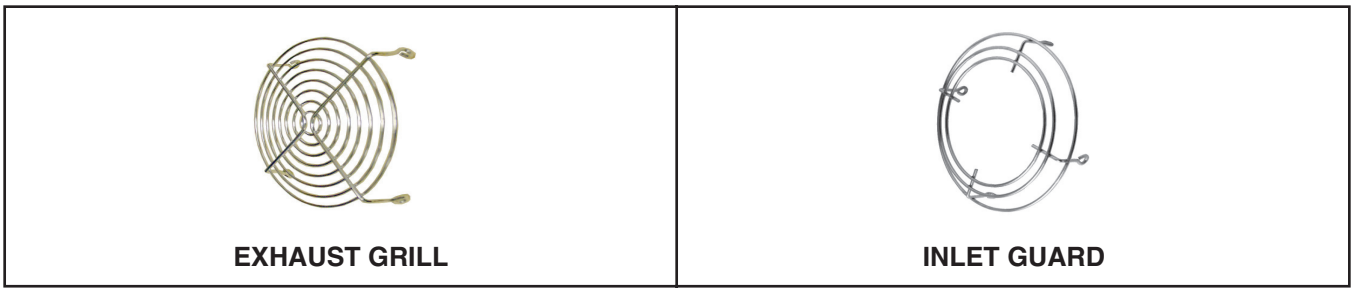
- Field-supplied components required for installation of the horizontal vent kit are as follows:
  a. Vent and combustion air piping in accordance with **Table 2**
  b. Tapered vent pipe diameter reducers and/or increasers, as required
  c. Thimble (not required if wall is of non-combustible construction)
  d. Flashing
  e. Sheet metal screws, tape, and sealant, as required
- Factory-supplied components for installation of the horizontal vent kit are listed in **Table 8**.

Vent Terminal Connections—Continued

Horizontal Vent Terminal (Option CC6) Installation—Continued

Table 8. Horizontal Vent Terminal/Combustion Air Package (Option CC6) Components

Unit Size		Description	Qty
030–125	150–400		
PN			
211762	211763	Kit package	1
211789	211790	Concentric adapter box (see **Figure 3**, **Figure 4,** and **Figure 5**)	1
211791	211792	Exhaust grill (see **Figure 13**)	1
151755	124940	Inlet guard (see **Figure 13**)	1
207232		Concentric adapter box bracket	2
37661		Screw, sheet metal, #10-16 × 1/2	8
53335		High-temperature silicone sealant, tube	1



EXHAUST GRILL

INLET GUARD

Figure 13. Option CC6 Components

⚠ DANGER ⚠

- **To prevent combustion products from entering the occupied space, all vent terminals must be positioned or located away from fresh air intakes, doors, and windows. Failure to comply could result in severe personal injury or death and/or property damage.**
- **In climates with below freezing temperatures, condensate may form icicles on the vent terminal. Locate the terminal where falling icicles do not present a hazard.**
- **Consider local snow depth conditions. The vent must be at least 6 inches (152 mm) above the anticipated snow depth.**

1. Determine vent/combustion air terminal location on outside wall:
   a. Refer to **Table 2** to ensure that location complies with vent length requirements.
   b. For most applications, ensure that vent terminal is level with heater mounting height.
   c. Allow downward pitch of 1/4-inch per foot (6 mm per 305 mm) for condensate drain.

NOTE: Local codes supersede all provisions in these instructions and in *National Fuel Gas Code* Z223.1.

   d. Ensure that distance of vent terminal from adjacent public walkways and buildings and window and building openings complies with local codes. Absent any local codes, distance must comply with *National Fuel Gas Code* Z223.1.

⚠ WARNING ⚠

Avoid positioning the vent terminal above a walkway as there may be a small amount of condensate that drips from the end of the vent/combustion air terminal. In cold climates, the condensate may form ice.

⚠ CAUTION ⚠

Products of combustion can cause discoloration of some building finishes and deterioration of masonry materials. A clear silicone sealant normally used to protect concrete driveways may be used to protect masonry materials from discoloration and deterioration. If discoloration is an esthetic problem relocate the vent or install a vertical vent.

e. Refer to **Table 9** to ensure that location complies with minimum clearance requirements.

Table 9. Minimum Clearance Requirements for Horizontal Vent Termination Location

Component/Structure	Minimum Clearance, All Directions Unless Specified (Feet (Meters))
Forced air inlet within 10 feet (3.1 meters)*	3 (0.9) above
Combustion air inlet of another appliance	6 (1.8)
Mechanical air supply inlet to any building	Canada: 6 (1.8)
Any building opening (door, window, or gravity air inlet)	4 (1.2) horizontal and below
	1 (0.3) above
Gas meter,** electric meter, and relief equipment	US: 4 (1.2) horizontal
	Canada: 6 (1.8) horizontal
Gas regulator**	US: 3 (0.9) horizontal
	Canada: 6 (1.8) horizontal
Adjoining building or parapet	6 (1.8)
Adjacent public walkway	7 (2.1) above
Grade (ground level)	3 (0.9) above
*Does not apply to the inlet of a direct vent appliance.	
**Do not terminate the vent directly above a gas meter or service regulator.	

2. Install vent pipe and combustion air pipe runs:
   a. Connect piping to heater in accordance with specifications listed in **Pipe Requirements** section.
   b. Seal all joints in accordance with specifications listed in **Joint Connection and Sealing Requirements** section. Due to high temperature considerations, do not enclose exhaust pipe or place pipe closer than 6 inches (152 mm) to combustible material.
   c. Extend piping runs close to roof at location selected in step 1 and support piping in accordance with specifications listed in **Vent System Support Requirements** section.
3. Cut hole through outside wall for combustion air pipe.
   a. Ensure that outside wall construction thickness is between 1 inch (25 mm) minimum and 48 inches (1,219 mm) maximum.
   b. Ensure that hole accommodates 6-inch (152 mm) combustion air pipe for unit sizes 030–125 or 8-inch (203-mm) combustion air pipe for unit sizes 150–400. Thimble may or may not be required depending on building construction and/or local codes. Larger diameter combustion air pipe serves as clearance for vent pipe on non-combustible construction.
4. Secure longer angles on concentric adapter box brackets (see **Figure 9**) to concentric adapter box.

NOTE: The longer angle of the concentric adapter box bracket has five 7/32-inch holes that allow the position of the bracket on the box to be adjusted. The shorter angle has three 7/32-inch holes that allow adjustment to construction.

5. Connect outside section of combustion air pipe to concentric adapter box (see **Figure 14**):
   a. Determine length of combustion air pipe as follows:
      (1) Bracket length from box to wall
      (2) Plus wall thickness
      (3) Plus 4–16 inches (102–406 mm) beyond wall
   b. Secure inlet air pipe to collar of concentric adapter box using sheet metal screws. Seal joint and seam using tape or sealant.

Vent Terminal Connections—Continued

Horizontal Vent Terminal (Option CC6) Installation—Continued

6. Secure concentric adapter box to wall (see **Figure 14**):

⚠ CAUTION ⚠

- **If the wall is combustible, ensure that brackets are positioned to allow a 2-inch (51 mm) clearance between the concentric adapter box and the wall.**
- **If any holes are made in the concentric adapter box in error, ensure that they are sealed.**

   a. Insert combustion air pipe out through wall.
   b. Secure short angles of concentric adapter box brackets (see **Figure 9**) to wall.
   c. Seal or flash inlet air pipe on outside using sealant and/or field-supplied flashing.

7. Install inlet guard:
   a. Position inlet guard over end of combustion air pipe in accordance with **Figure 14**.
   b. Secure inlet guard to inlet air pipe using four 1/2-inch-long screws provided.

8. Install terminal-end vent pipe:

NOTE: The length of the terminal-end vent pipe is determined by the installation within maximum and minimum requirements. The vent pipe extending through the concentric adapter box, through the combustion air inlet pipe, and above the combustion air inlet air pipe must be one piece without joints. The connection to the vent pipe run must be a maximum of 6 inches (152 mm) from the heater side of the box.

   a. Refer to **Figure 14** to determine lengths of each pipe segment and to calculate total length required.
   b. Ensure that terminal-end vent pipe is in proper flow direction and slide end of pipe through box.
   c. Position vent pipe so that it extends 3–6 inches (76–152 mm) past end of combustion air pipe and no more than 6 inches (152 mm) out of box toward heater.
   d. Connect terminal-end vent pipe to vent pipe run no more than 6 inches (152 mm) from heater.

9. Install exhaust grill:
   a. Position exhaust grill over end of vent pipe in accordance with **Figure 14**.
   b. Secure exhaust grill to end of vent pipe using four 1/2-inch-long screws provided.
   c. Seal vent pipe to concentric adapter box.
   d. Ensure that terminal-end section of vent pipe has slight downward pitch of 1/4-inch (6-mm) per foot (305 mm) toward outside.
   e. Seal completely around circumference of pipe and opening of box using silicone sealant.

10. Install indoor section of combustion air pipe:
   a. Secure single-wall combustion air pipe run to collar on concentric adapter box using sheet metal screws.
   b. Seal pipe joint using tape or sealant.

11. Verify compliance with **Figure 14** and with all specifications and requirements listed in this manual.

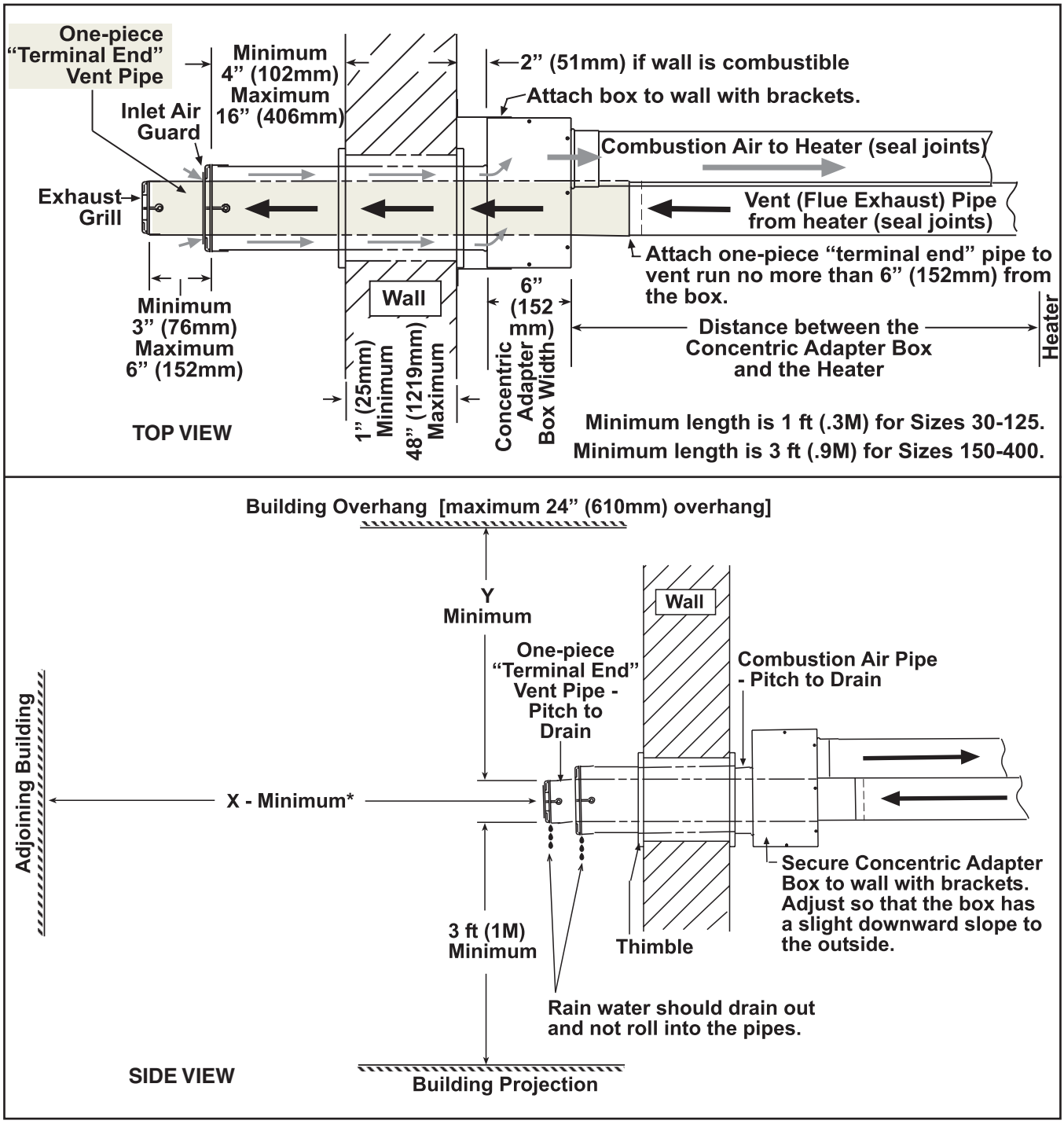


Figure 14. Option CC6 Installation (Refer to Table 10)

Table 10. Horizontal Vent Dimensions

Unit Size	Dimension (See Figure 14)	
	X (Feet (Meters))*	Y (Inches (mm))
030, 045	4 (1)	9 (229)
060, 075, 100		12 (305)
125–225		24 (610)
250–400	6 (2)	36 (914)

*Minimum—check and comply with local codes.

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