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**VENTING INSTRUCTIONS FOR INDOOR GAS-FIRED
UNIT HEATERS**

DISCONTINUED MODELS APD AND UDAP (STANDARD POWER VENT FAN TYPE), UDBP (STANDARD POWER VENT BLOWER TYPE), UDAS (SEPARATED-COMBUSTION FAN TYPE), AND UDBS (SEPARATED-COMBUSTION BLOWER TYPE)

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

Venting Requirements for Indoor, Power Vent

APPLIES TO:

Standard Power Vent, Fan Type Unit Heaters:

Model UDAP & Model APD

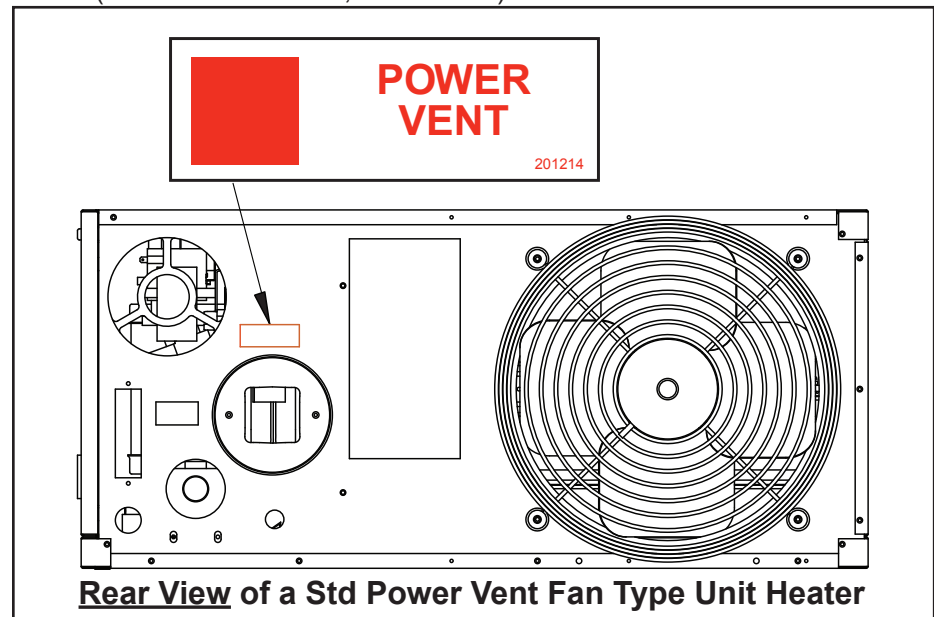
Standard Power Vent, Blower Type Unit Heaters:

Model UDBP

General

This manual applies only to venting instructions 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. The instructions in this manual apply to Standard Power Vent fan type and Standard Power Vent blower type unit heaters.

Verify that the label near the vent outlet on the heater matches the label illustrated below. (Label P/N is 201214; color is red.)



WARNING

Installation should be done by a qualified agency in accordance with these instructions. The qualified service agency installing this heater is responsible for the installation.

WARNING

Each heater requires its own individual vent pipe run and vent cap. Manifolding of vent runs can cause recirculation of combustion products into the building. Failure to comply could result in severe personal injury or death and/or property damage.

CAUTION: Standard Power Vent Fan & Blower type unit heaters should not be used in an application where the heated space temperature is below 50°F (10°C). Operating under low ambient conditions may cause condensate to form in the heat exchanger.

1.0 Venting Requirements

Standard Power Vent fan & blower type unit heaters are certified as Category III heaters.

Venting must be in accordance with local codes and the National Fuel Gas Code Z223.1 or CAN/CSA B149.1 and B149.2, Installation Code for Gas Burning Appliances and Equipment. Local requirements supersede national requirements.

These power-vented unit heaters are designed to operate safely and efficiently with either a horizontal or vertical vent. Comply with the specific requirements and instructions.

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 vent into an existing gravity vent or chimney.

Installation should be done by a qualified agency in accordance with these instructions. The qualified service agency installing this system is responsible for the installation.

Requirements and instructions vary depending on whether the installation is residential or commercial/industrial. Select and follow the venting instructions that apply to the installation only. All sizes of a Std Power Vent fan or blower type unit heaters are certified for commercial/industrial installation. A Std Power Vent fan type unit heater, sizes 30, 45, 60, 75, 100, and 125 are also certified for residential installation. Utility heaters certified for “residential use” are intended for 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.

Is the Installation Residential or Commercial/Industrial?

Select and follow the venting instructions that apply. **Do not mix** any instructions or requirements.

- Paragraph 2.0, Residential Installation Venting Requirements and Instructions
- Paragraph 3.0, Commercial/Industrial Installation Venting Requirements and Instructions

Residential Installation

Std Power Vent fan type unit heater - Sizes 30, 45, 60, 75, 100, 125

2.0 Venting Requirements and Instructions - Residential Installation

A Category III vent as defined by the National Fuel Gas Code Z223.1 or CAN/CSA B149.1 and B149.2 is required for a residential installation of a Std Power Vent fan type unit heater. Some venting requirements will vary, however, depending on whether the vent is horizontal or vertical.

Read and follow all of the requirements and instructions in Paragraphs 2.1 through 2.7.

2.1 Type of Vent Pipe Required for Vent Run

Type of Pipe for Standard Horizontal Vent (Category III)

- Vent pipe approved to UL Std 1738 for Category III appliance. **Do not intermix different vent system parts from different manufacturers in the same venting system.**

Type of Pipe for Standard Vertical Vent (Category III)

- Vent pipe approved to UL Std 1738 for Category III appliance. **Do not intermix different vent system parts from different manufacturers in the same venting system.**

• Diameter and Vent Length

2.2 Vent Pipe

Vent pipe diameters and maximum vent lengths are shown in **TABLE 1**. Minimum vent length is 3 feet (1M). Add all straight sections and equivalent lengths for elbows. The total must not exceed the Maximum Vent Length listed. Use only one diameter of vent pipe on an installation.

TABLE 1 - Vent Pipe Diameter and Maximum Vent Length for a Heater with either a Horizontal or Vertical Vent

Heater Size	Vent Pipe Diameter		Maximum Vent Length		Equivalent Straight Length for 90° Elbow		Equivalent Straight Length for 45° Elbow		Field-supplied taper type reducer required at the venter outlet
	inches	mm	feet	M	feet	M	feet	M	
30	3	76	20	6.1	3	0.9	1.5	0.5	4" to 3" (102mm to 76mm)
	4	102	10	3.0	2	0.6	1	0.3	None
45	3	76	20	6.1	3	0.9	1.5	0.5	4" to 3" (102mm to 76mm)
	4	102	10	3.0	2	0.6	1	0.3	None
60	3	76	30	9.1	4	1.2	2	0.6	4" to 3" (102mm to 76mm)
	4	102	15	4.6	2	0.6	1	0.3	None
75	4	102	30	9.1	4	1.2	2	0.6	None
100	4	102	40	12.2	5	1.5	2.5	0.8	None
125	4	102	40	12.2	5	1.5	2.5	0.8	None

2.3 Venter (Flue) Outlet Diameter

Depending on the size of vent pipe (either 3 or 4 inch) as determined in Paragraph 2.2, attach a 4" appliance adapter from Category III pipe manufacturer directly to the collar, then use a reducer if using 3" pipe.

TABLE 2 - Venter Outlet Diameter	Heater Size		30		45		60		75		100		125	
	Outlet Diameter		inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
			4	102	4	102	4	102	4	102	4	102	4	102

2.4 Vent System Sealing

Follow the Category III pipe manufacturer's instructions for joining pipe sections. When attaching Category III pipe to the venter outlet or the vent cap, make secure, sealed joints following a procedure that best suits the style of Category III pipe being used.

Residential Installation

Std Power Vent fan type unit heater - Sizes 30, 45, 60, 75, 100, 125

2.0 Venting Requirements and Instructions - Residential Installation (cont'd)

2.5 Vent System Support

Support horizontal runs every six feet (1.8M). Support vertical runs of Category III vent pipe in accordance with the requirements of the pipe manufacturer.

Do not rely on the heater for support of either horizontal or vertical pipes. Use non-combustible supports on vent pipe.

2.6 Condensation

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 with a tee, a drip leg, and a clean out 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" 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" per foot for condensate drainage. Slope applies to the entire length of the horizontal vent run. Failure to pitch the vent run properly may damage the heater due to condensate running back into the unit.

CAUTION: Exceeding the specified vent pipe diameter and length may result in condensate forming in the vent pipe.

The vent terminal pipe must be UL Std1738 approved Category III vent pipe. **Do not intermix different vent system parts from different manufacturers in the same venting system.**

2.7 Vent Terminal (Type of Pipe and Vent Cap)

Terminate the vent with a heater Option CC1, CC21 or Novavent #2NVTB4 vent cap. A different style vent cap could cause nuisance problems or unsafe conditions. The vent cap must be the same size as the vent pipe.

See **TABLE 3** and **FIGURE 1** for requirements of a horizontal vent terminal. See **FIGURE 2**, for requirements of vertical vent termination.

TABLE 3 - Horizontal Vent Terminal Clearances		Minimum Clearances for Vent Termination Location (all directions unless specified)
A Maintain a clearance of 6 inches (152mm) minimum from the wall to the vent terminal cap for stability under wind conditions. Products of combustion can cause discoloration of some building finishes and deterioration of masonry materials. Applying a clear silicone sealant that is normally used to protect concrete driveways can protect masonry materials. If discoloration is an esthetic problem, relocate the vent or install a vertical vent.	Structure	
	Forced air inlet within 10 ft (3.1M)	3 ft (0.9M) above
	Combustion air inlet of another appliance	6 ft (1.8M)
	Door, window, or gravity air inlet (any building opening)	4 ft (1.2M) horizontally
		4 ft (1.2M) below
		1 ft (305mm) above
	Electric meter, gas meter*, gas regulator*, and relief equipment	U.S. - 4 ft (1.2M) horizontally Canada - 6 ft (1.8M) horizontally
	Adjoining building or parapet	6 ft (1.8M)
	Adjacent public walkways or drive-ways	7 ft (2.1M) above
	Grade (ground level)	1 ft (305mm) above**
*Do not terminate the vent directly above a gas meter or service regulator. ** Consider local snow depth conditions. The vent must be at least 6" (152mm) higher than anticipated snow depth.		

Residential Installation

Std Power Vent fan type unit heater - Sizes 30, 45, 60, 75, 100, 125

FIGURE 1 - Horizontal Vent Terminal - Residential Installation

(NOTE: Read all measurements; drawing is not proportional.)

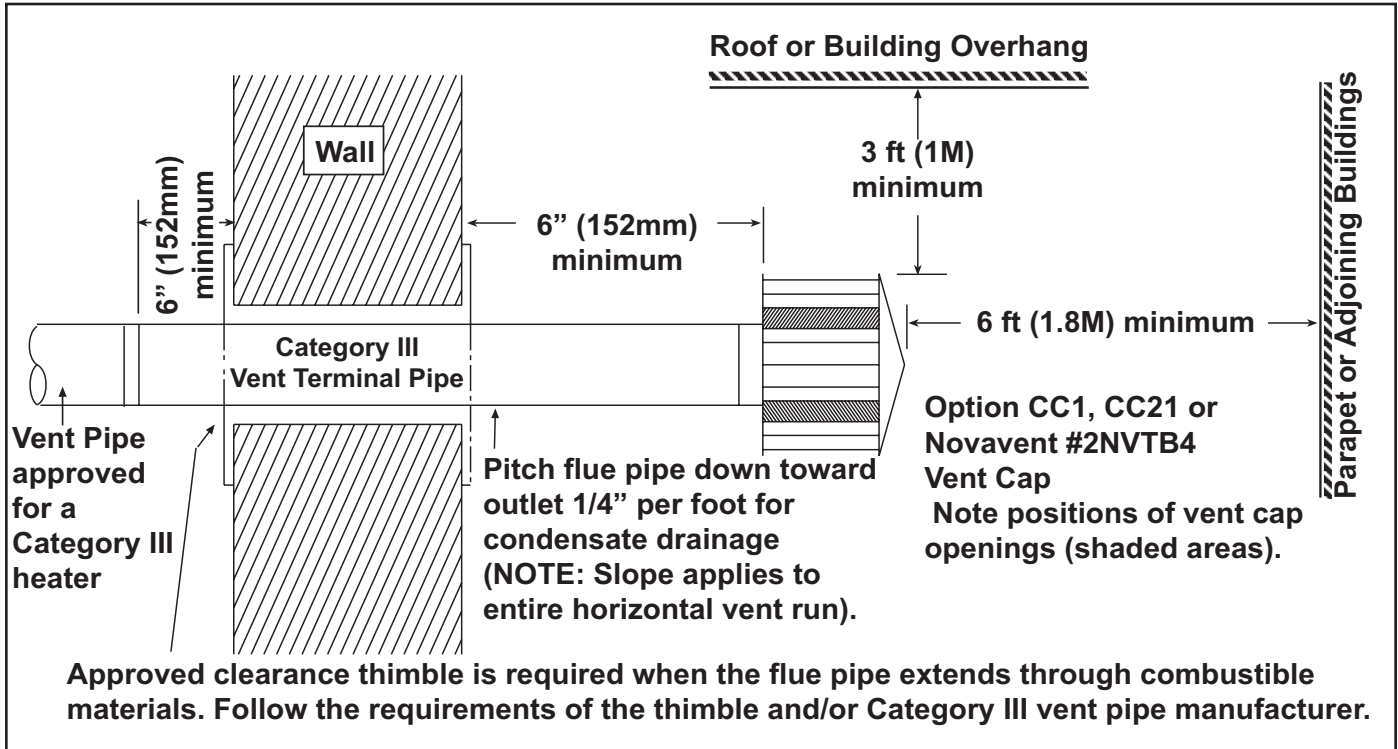
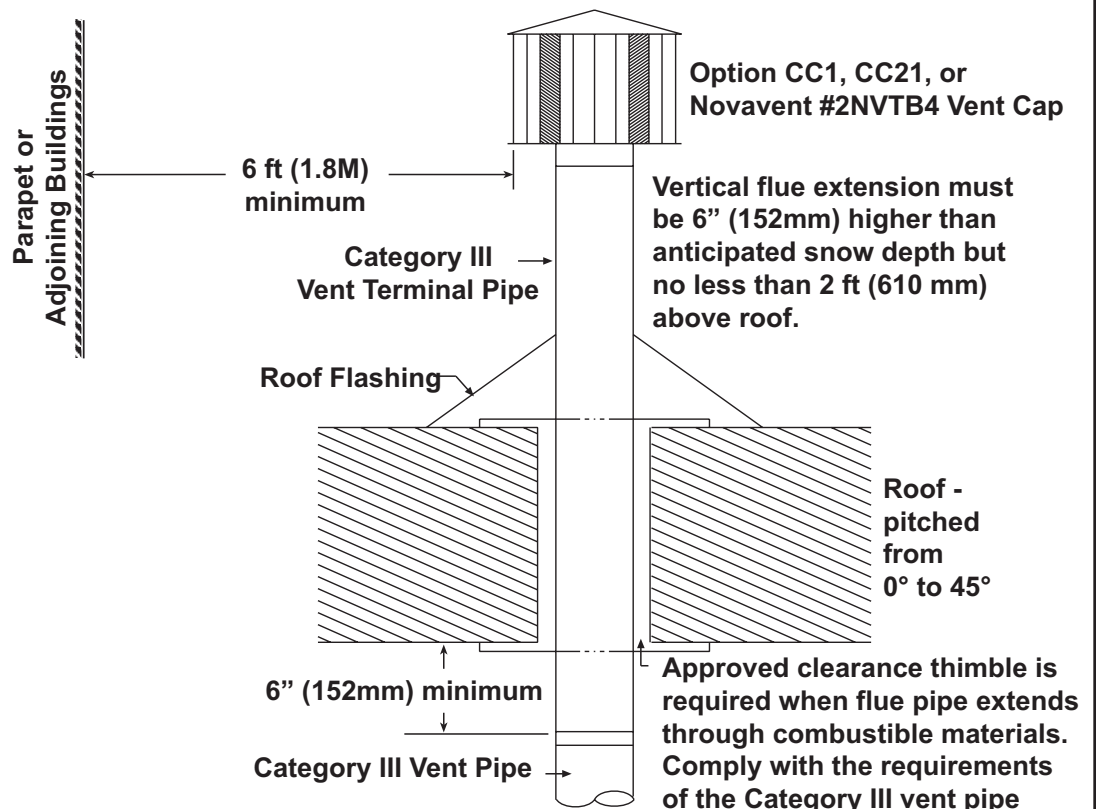


FIGURE 2 - Vertical Vent Terminal - Residential Installation

(NOTE: Read all measurements; drawing is not proportional.)



Commercial / Industrial Installation

Std Power Vent fan type or blower type unit heater - All Sizes

3.0 Venting Requirements and Instructions - Commercial/Industrial Installation

3.1 Type of Vent Pipe Required for Vent Run

A commercial/industrial installation may have either a horizontal or a vertical vent run using one of the types of vent pipe listed. **Do not intermix different vent system parts from different manufacturers in the same venting system.**

<u>Horizontal Vent Run</u>	Vent pipe approved to UL Std 1738 for a Category III appliance, <u>OR</u> Appropriately sealed 26-gauge or heavier galvanized steel or equivalent single-wall pipe
<u>Vertical Vent Run</u>	Vent pipe approved to UL Std 1738 for a Category III appliance, <u>OR</u> Appropriately sealed 26-gauge or heavier galvanized steel or equivalent single-wall pipe, <u>OR</u> If at least 75% of the equivalent length of the vent run is vertical - Double-wall (Type B) vent pipe

3.2 Vent Pipe Diameter and Length

Vent pipe diameters and maximum vent lengths in **TABLE 4** apply to both **Horizontal** and **Vertical** vents. Add **all** straight sections and equivalent lengths for elbows. The total combined length must not exceed the **Maximum Vent Length**. Minimum vent length is 3 feet (1M). Use only one diameter of vent pipe on an installation.

TABLE 4 - Vent Pipe Diameter and Length for Horizontal and Vertical Vents

Heater Size	Vent Pipe Diameter		Maximum Vent Length		Equivalent Straight Length for 90° Elbow		Equivalent Straight Length for 45° Elbow		Field-supplied taper type connection required at the venter outlet
	inches	mm	feet	M	feet	M	feet	M	
30	3	76	20	6.1	3	0.9	1.5	0.5	4" to 3" (102mm to 76mm) reducer
	4	102	10	3	2	0.6	1	0.3	None
45	3	76	20	6.1	3	0.9	1.5	0.5	4" to 3" (102mm to 76mm) reducer
	4	102	10	3	2	0.6	1	0.3	None
60	3	76	30	9.1	4	1.2	2	0.6	4" to 3" (102mm to 76mm) reducer
	4	102	15	4.6	2	0.6	1	0.3	None
75	4	102	30	9.1	4	1.2	2	0.6	None
100	4	102	40	12.2	5	1.5	2.5	0.8	None
125	4	102	40	12.2	5	1.5	2.5	0.8	None
150	5	127	35	10.7	5	1.5	2.5	0.8	None
175	5	127	35	10.7	5	1.5	2.5	0.8	None
200	5	127	50	15.2	5	1.5	2.5	0.8	None
225	5	127	50	15.2	5	1.5	2.5	0.8	None
250	5	127	50	15.2	5	1.5	2.5	0.8	None
300	6	152	50	15.2	5	1.5	2.5	0.8	None
350	6	152	50	15.2	7	2.1	3.5	1.1	None
	7	178	50	15.2	4.5	1.4	2.25	0.7	6" to 7" (152 to 178mm) enlarger
400	6	152	50	15.2	8	2.4	4	1.2	None
	7	178	50	15.2	5	1.5	2.5	0.8	6" to 7" (152 to 178mm) enlarger

Commercial / Industrial Installation

Std Power Vent fan type or blower type unit heater - All Sizes

3.3 Venter (Flue) Outlet

Venter Outlet Attachment Requirements:

Depending on the size of vent pipe as determined in Paragraph 3.2, attach either the vent pipe directly to the collar or a taper-type connector. For Category III, attach a 4" appliance adapter from Category III pipe manufacturer directly to the collar, then use a reducer if using 3" pipe.

TABLE 5 - Venter Outlet Size	Heater Size		30	45	60	75	100	125	150	175	200	225	250	300	350	400
	Outlet Diameter	inches	4	4	4	4	4	4	5	5	5	5	5	6	6	6
		mm	102	102	102	102	102	102	127	127	127	127	127	152	152	152

NOTE: If attaching double-wall pipe to the heater, follow instructions in Addendum, Section A.

3.4 Vent System Sealing

Vent system joints depend on the type of pipe being used (See "Type of Vent Pipe", Paragraph 3.1).

- When using Category III vent pipe, follow the pipe manufacturer's instructions for joining pipe sections. When attaching Category III pipe to the venter outlet or the vent cap, make secure, sealed joints following a procedure that best suits the style of Category III pipe being used.
- If using single wall, 26-gauge or heavier galvanized pipe, secure slip-fit connections using sheetmetal screws or rivets. Seal all joints and seams of single-wall vent pipe inside the building with aluminum tape or silicone sealant.
- If using double-wall (Type B) vent pipe, follow the pipe manufacturer's instructions for joining pipe sections.

For joining double-wall pipe to heater collar, single-wall pipe, and vent cap, follow the illustrated instructions in Addendum Section A.

3.5 Vent System Support

Support horizontal runs every six feet (1.8M).

Support vertical runs of Type "B" double-wall or Category III vent pipe in accordance with the requirements of the pipe manufacturer.

Support vertical single-wall pipe in accordance with accepted industry practice.

Do not rely on the heater for support of either horizontal or vertical pipes. Use non-combustible supports on vent pipe.

CAUTION: Exceeding the specified vent pipe diameter and length may result in condensate forming in the vent pipe.

3.6 Condensation

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 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.

On all Model Sizes, 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" 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" per foot for condensate drainage. Slope applies to entire length of horizontal vent run. Failure to pitch vent run properly may damage the heater due to condensate running back into the unit.

3.7 Vent Terminal

The vent terminal pipe must be double-wall (Type B). Terminate the vent with a heater Option CC1, CC21, or Novavent #2NVTB4 vent cap. A different style vent cap could cause nuisance problems or unsafe conditions. The vent cap must be the same size as the vent pipe.

See **TABLE 6** and **FIGURE 3** for requirements of a horizontal vent terminal. See **FIGURE 4** for requirements of a vertical vent termination.

Commercial / Industrial Installation

Std Power Vent fan type or blower type unit heater - All Sizes

3.0 Venting Requirements and Instructions - Commercial/Industrial Installation (cont'd)

3.7 Vent Terminal (cont'd)

TABLE 6 - Horizontal Vent Terminal Clearances

Maintain a clearance of 6 to 12 inches (152-305mm) from the wall to the vent terminal cap for stability under wind conditions.

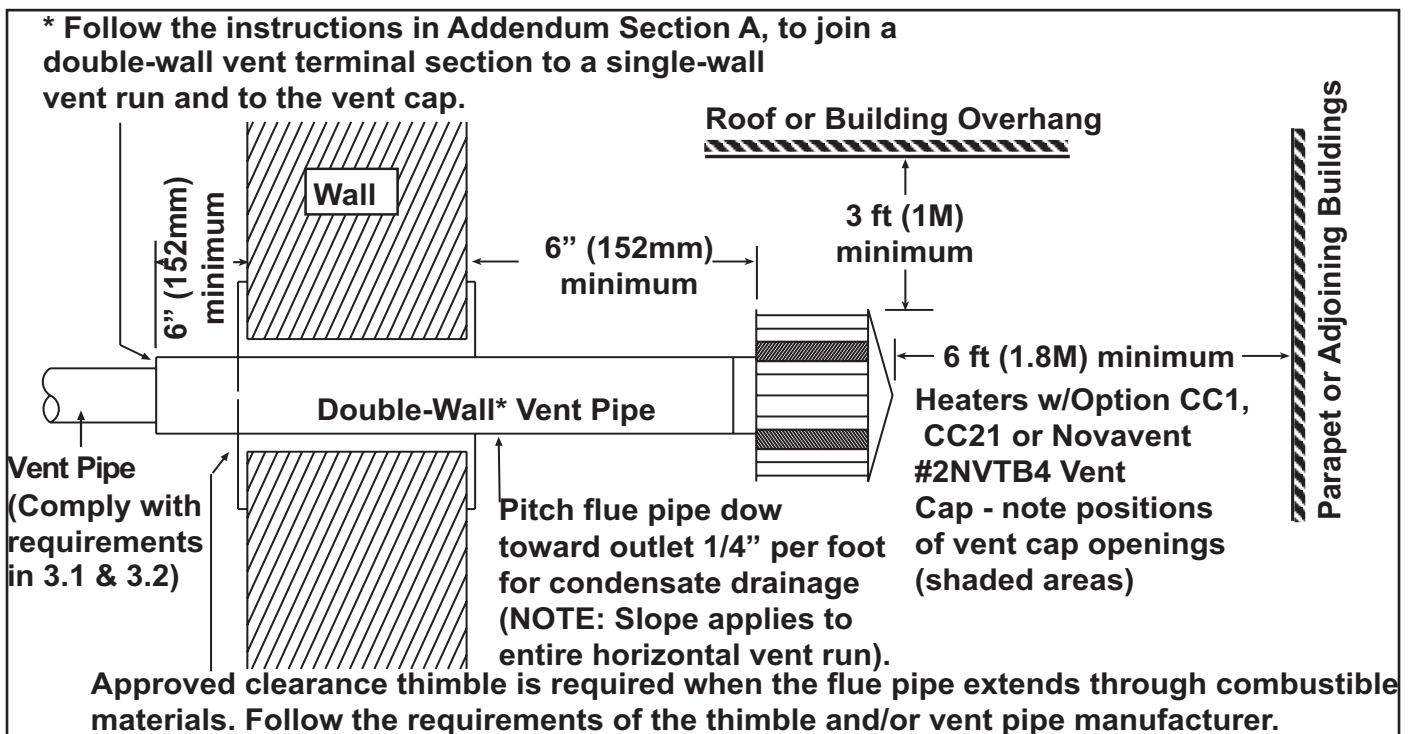
Products of combustion can cause discoloration of some building finishes and deterioration of masonry materials. Applying a clear silicone sealant that is normally used to protect concrete driveways can protect masonry materials. If discoloration is an esthetic problem, relocate the vent or install a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

Structure	Minimum Clearances for Vent Termination Location (all directions unless specified)
Forced air inlet within 10 ft (3.1M)	3 ft (0.9M) above
Combustion air inlet of another appliance	6 ft (1.8M)
Door, window, or gravity air inlet (any building opening)	4 ft (1.2M) horizontally
	4 ft (1.2M) below
	1 ft (305mm) above
Electric meter, gas meter*, gas regulator*,	U.S. - 4 ft (1.2M) horizontally
Gas regulator *	U.S. - 3 ft (0.9M)
Adjoining building or parapet	6 ft (1.8M)
Adjacent public walkways	7 ft (2.1M) above
Grade (ground level)	1 ft (305mm) above**

*Do not terminate the vent directly above a gas meter or service regulator.
 ** Consider local snow depth conditions. The vent must be at least 6" (152mm) higher than anticipated snow depth.

FIGURE 3 - Horizontal Vent Terminal - Commercial/Industrial Installation

(NOTE: Read all measurements; drawing is not proportional.)

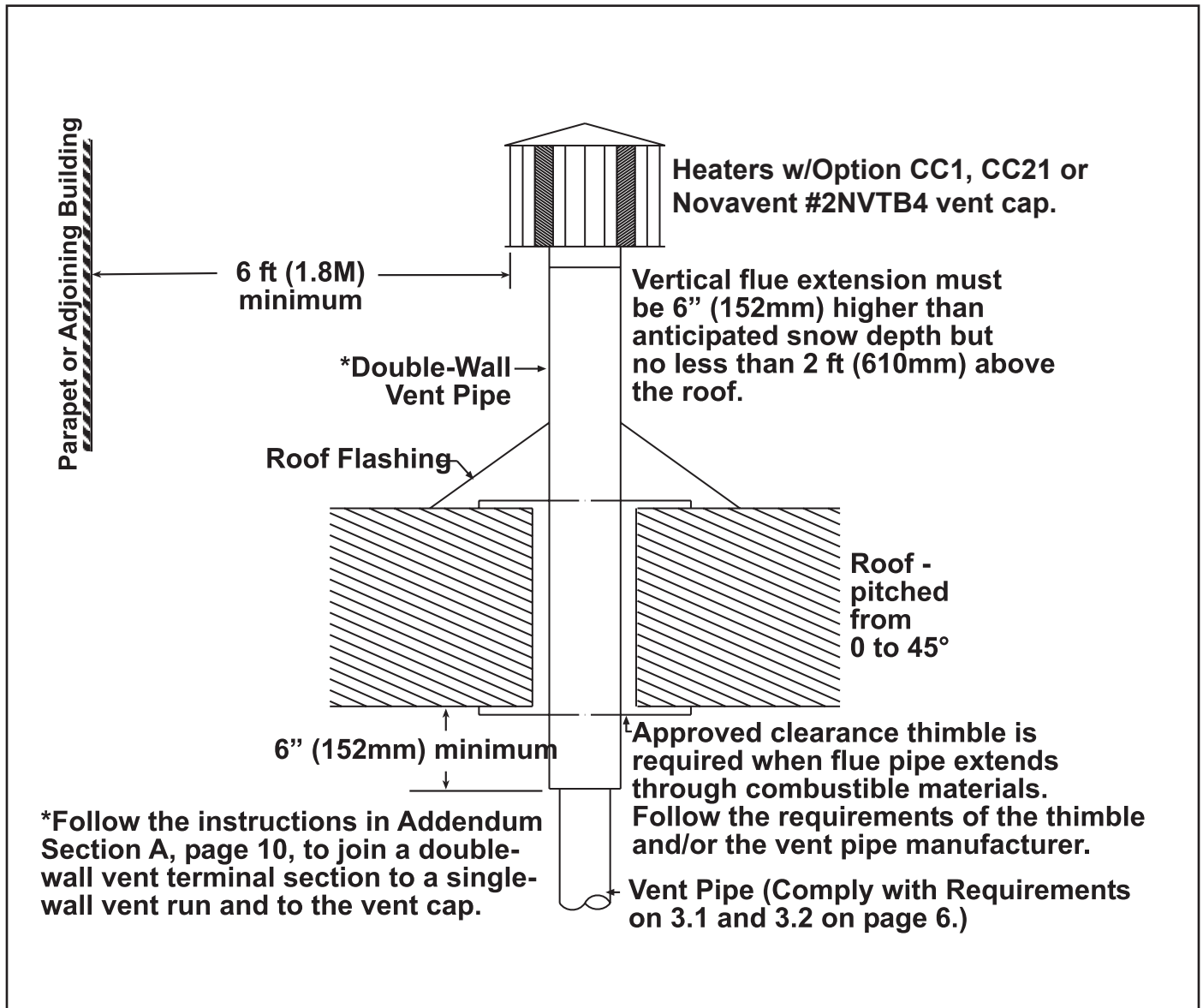


Commercial / Industrial Installation

Std Power Vent fan type or blower type unit heater - All Sizes

FIGURE 4 - Vertical Vent Terminal - Commercial/Industrial

(NOTE: Read all measurements; drawing is not proportional.)



Residential or Commercial / Industrial Installation

Vertical Category I, Std Power Vent fan type unit heater

Size 30, 45, 60

4.0 Venting Requirements & Instructions

On vent systems where at least 75% of the equivalent length of the vent run is vertical and the vent terminates at least 5 feet above the vent outlet of the heater. All vertically vented heaters that are Category I must be connected to a chimney or vent complying with a recognized standard or a lined masonry (or concrete) chimney with a material acceptable to the authority having jurisdiction. Venting into an unlined masonry chimney is not permitted.

4.1 Type of Vent Pipe Required for Vent Run

Type of Pipe for Standard Vertical (Category I)

Double wall vent pipe - **Recommended**.

Single wall vent pipe if requirements of the National Fuel Gas Code are followed.

All pipe must be UL listed for Category I appliances.

4.2 Vent Pipe Diameter and Vent Length

Vent pipe diameters and maximum vent lengths in **TABLE 7** apply to **Vertical** vents. Add **all** straight sections and equivalent lengths for elbows. The total length must not exceed the **Maximum Vent Length**. Use only one diameter of vent pipe on an installation.

TABLE 7 - Vent Pipe Diameter and Length for Vertical Vents

Heater Size	Vent Pipe Diameter		Maximum Vent Length		Equivalent Straight Length for 90° Elbow		Equivalent Straight Length for 45° Elbow		Field-supplied taper type connection required at the venter outlet
	inches	mm	feet	M	feet	M	feet	M	
30	3	76	20	6.1	3	0.9	1.5	0.5	4" to 3" (102mm to 76mm) reducer
	4	102	10	3	2	0.6	1	0.3	None
45	3	76	20	6.1	3	0.9	1.5	0.5	4" to 3" (102mm to 76mm) reducer
	4	102	10	3	2	0.6	1	0.3	None
60	3	76	30	9.1	4	1.2	2	0.6	4" to 3" (102mm to 76mm) reducer
	4	102	15	4.6	2	0.6	1	0.3	None

4.3 Venter (Flue) Outlet Diameter

Venter Outlet Attachment Requirements:

Depending on the size of vent pipe as determined in Paragraph 4.2 (Vent Pipe Diameter and Vent Length), attach either the vent pipe directly to the collar or a taper-type connector. For Category I, attach a 4" appliance adapter from Category I pipe manufacturer directly to the collar, then use a reducer if using 3" pipe.

4.4 Vent System Sealing

Vent system joints depend on the type of pipe being used (See, "Type of Vent Pipe Required for Vent Run", Paragraph 4.1).

- If using single wall, 26-gauge or heavier galvanized pipe, secure slip-fit connections using sheet metal screws or rivets. Seal all joints and seams of single-wall vent pipe inside the building with aluminum tape or silicone sealant.
- If using double-wall (Type B) vent pipe, follow the pipe manufacturer's instructions or joining pipe sections. For joining double-wall pipe to heater collar, single-wall pipe and vent cap, follow the illustrated instructions in Addendum Section A.

4.5 Vent System Support

Support horizontal runs every six feet (1.8M). Support vertical runs of Category I vent pipe in accordance with the requirements of the pipe manufacturer. Do not rely on the heater for support of either horizontal or vertical pipes. Use non-combustible supports on vent pipe.

4.6 Condensation

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 with a tee, a drip leg and a clean out 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 vent pipe exposed to cold air or run through an unheated area or an area with an ambient temperature of 50° or less, **must be insulated along its entire length** with a minimum of 1/2" foil-faced fiberglass, 1-1/2# density insulation. Inspect for leakage prior to insulating and use insulation that is noncombustible with a rating not less than 400°F. Install a tee fitting at the low point of the vent system and provide a drip leg with a clean out cap. On horizontal vent runs, the flue pipe **must be pitched down toward the terminal end** 1/4" per foot for condensate drainage. Slope applies to the entire length of the horizontal run. Failure to pitch the vent run properly may damage the heater due to condensate running back into the unit.

CAUTION: Exceeding the specified vent pipe diameter and length may result in condensate forming in the vent pipe.

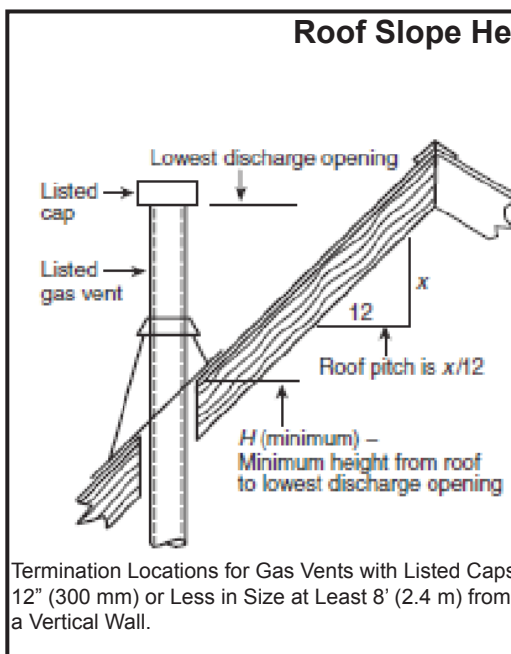
4.7 Vent Terminal (Type of Pipe and Vent Cap)

The vent terminal pipe must be UL listed Category I vent pipe. Terminate the vent with a heater Option CC1, CC21 or Novavent #2NVTB4 vent cap. A different style vent cap could cause nuisance problems or unsafe conditions. The vent cap must be the same size as the vent pipe. See Figure 4 for requirements of vertical vent termination.

Vertical vents must terminate a minimum horizontal and vertical distance from roof lines and adjacent walls or obstructions. These minimum distances are outlined as follows (based on National Fuel Gas Code requirements for vents with diameters less than 12"):

- For **double wall** vent pipe and **8' or greater** horizontal distance to any vertical wall or similar obstruction, the vent must terminate above the roof in accordance with Figure X and Roof Slope Heights Table.
- For **double wall** vent pipe and **less than 8'** horizontal distance to any vertical wall or similar obstruction, the vent must terminate at least 2' above the highest point where it passes through a roof of a building and at least 2' higher than any portion of a building within a horizontal distance of 10' (see Roof Slope Heights Table shown below).

Roof Slope Heights Table		
Roof Slope	H (minimum)	
	ft	m
Flat to 6/12	1.0	0.30
Over 6/12 to 7/12	1.25	0.38
Over 7/12 to 8/12	1.5	0.46
Over 8/12 to 9/12	2.0	0.61
Over 9/12 to 10/12	2.5	0.76
Over 10/12 to 11/12	3.25	0.99
Over 11/12 to 12/12	4.0	1.22
Over 12/12 to 14/12	5.0	1.52
Over 14/12 to 16/12	6.0	1.83
Over 16/12 to 18/12	7.0	2.13
Over 18/12 to 20/12	7.5	2.27
Over 20/12 to 21/12	8.0	2.44



ADDENDUM

Section A - Instructions for Attaching Double- Wall Vent Pipe (Type-B)

**FIGURE 5 - Attaching
Double-Wall (Type B)
Pipe to Single-Wall
Pipe**

Figure 5 - STEP 1

On the single-wall pipe, where illustrated, place a continual 1/4 inch bead of silicone sealant around the circumference. Do STEP 2 immediately following STEP 1.

Single-
Wall
Vent
Pipe

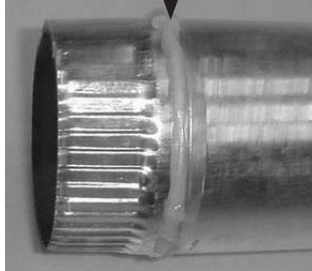
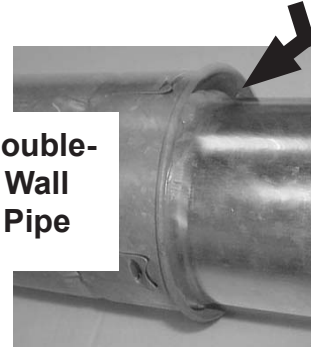


Figure 5 - STEP 2

Insert the single-wall pipe into the inner pipe of the double-wall pipe until the bead of sealant contacts the inner pipe creating a sealed joint.

Double-
Wall
Pipe



Single-
Wall
Vent
Pipe
with
Sealant

Figure 5 - STEP 3

Spaced equally around the double-wall pipe, drill three small holes below the sealant ring. Insert 3/4 inch long sheetmetal screws to secure the joint. Do not over tighten screws.

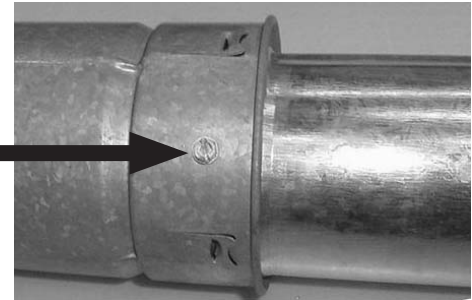


FIGURE 6 - Attaching Double-Wall (Type B) Pipe to a Vent Cap

Figure 6 - STEP 1

Place a continual 3/8" bead of silicone sealant around the circumference of the vent cap collar. This will prevent any water inside the vent cap from running down the double-wall pipe. Do STEP 2 immediately following STEP 1.

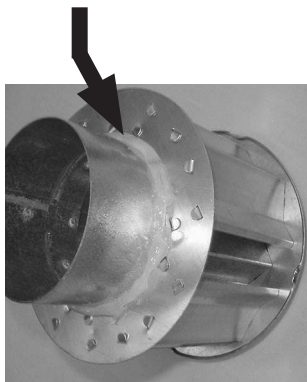


Figure 6 - STEP 2

Insert the collar on the vent cap inside the inner wall of the double-wall pipe. Insert as far as possible. Add additional silicone sealant to fully close any gaps between the vent cap and the double wall pipe. This is necessary to prevent water from entering the double wall pipe.



Figure 6 - STEP 3

Secure the vent cap to the double wall pipe by drilling and inserting a 3/4" long sheetmetal screw into the vent cap collar. Do not over tighten screw.

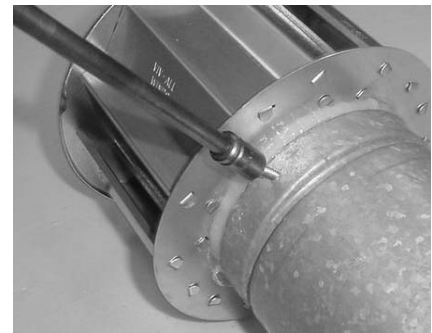


**FIGURE 7 -
Attaching Double-
Wall (Type-B) Vent
Pipe to the Heater**

Figure 7 - STEP 1

Place a continual 1/4" bead of silicone sealant around the circumference of the venter outlet collar. Do STEP 2 immediately after STEP 1.

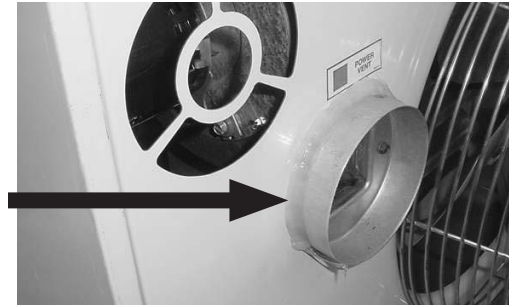
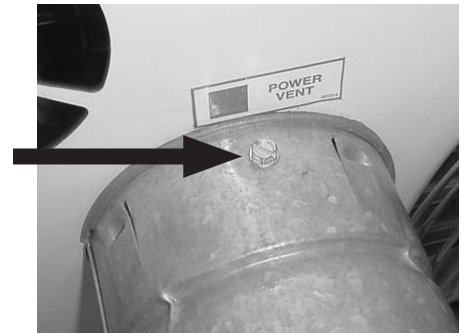


Figure 7 - STEP 2

Slide the double-wall pipe over the collar so that the collar is inside the inner pipe. Push the double-wall pipe tight to the heater cabinet. To secure the connection, spaced equal distance around the pipe, drill and insert three 3/4" long sheetmetal screws through the pipe and into the collar. Do not over tighten the screws.

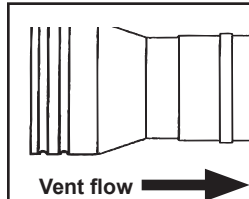


ADDENDUM

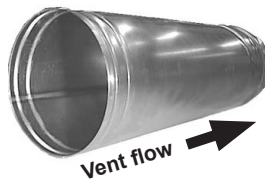
Section B - Instructions for Installing Flex-L brand Category III Vent Pipe on a Std Power Vent fan or blower type unit heater

**FIGURE 8 - Flex-L
brand Vent Pipe
Adapters**

SUPPLIER NOTE: The adapters for Flex-L vent pipe illustrated in FIGURE 8 is not available from the heater manufacturer; the adapters are available from a Flex-L brand vent pipe distributor. These instructions are designed to assist the contractor who has selected to use Flex-L brand Category III vent pipe to install a power vented heater with a 4" (102mm) venter outlet.



4" to 3" (102 to 76mm) diameter, 6-3/4" long Adapter Reducer, Flex-L #SRARZA43, specially designed for attaching Flex-L brand Category III vent pipe to a Std Power Vent fan or blower type unit heater, sizes 30, 45, and 60 for 3" (76mm) diameter vent pipe.

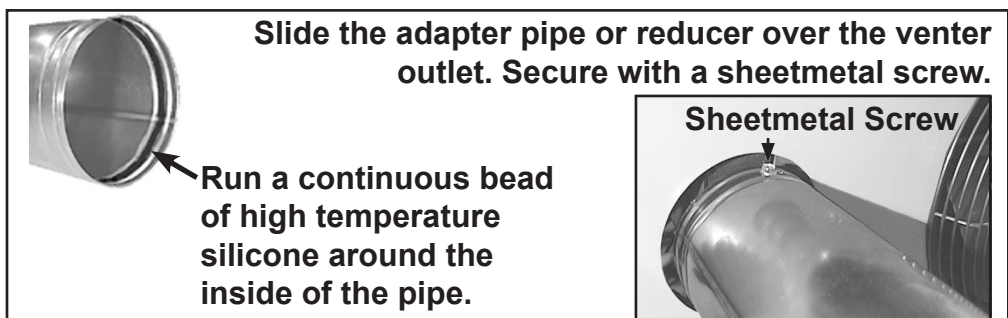


4" (102mm) diameter, 12" long Adapter Pipe, Flex-L® #SRARZA4, specially designed for attaching Flex-L brand Category III vent pipe to a Std Power Vent fan or blower type unit heater, sizes 30, 45, 60, 75, 100, and 125 for 4" (102mm) diameter vent pipe.

1. Attach the Adapter Pipe or Reducer to the Venter Collar

- a) On the end of the adapter or reducer that attaches to the venter collar (the end of the adapter with the double emboss without the locking ring hole), run a continuous bead of high temperature silicone around the inside of the pipe. See FIGURE 9.

**FIGURE 9 - Attach to
Venter Outlet**

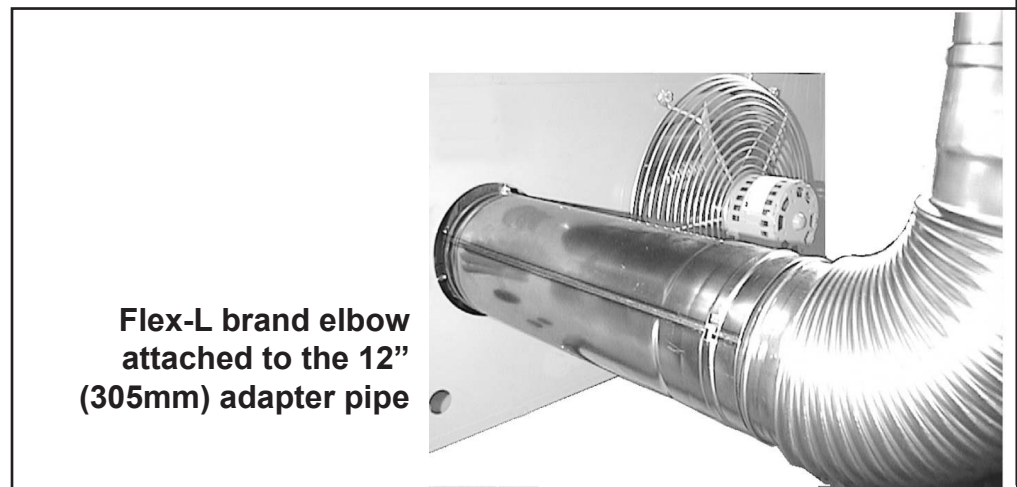


ADDENDUM,
Section B
(cont'd)

**Instructions for
Installing Flex-L
brand Category III
Vent Pipe (cont'd)**

**FIGURE 10 - Extend
vent in any direction
above horizontal**

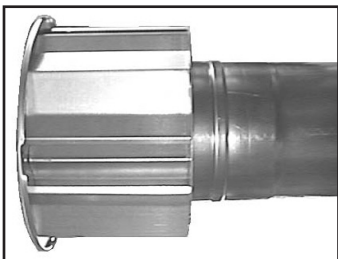
- b) Push the adapter pipe or reducer over the flue collar.
 - c) On the top of the overlap, drill a 1/8" hole and insert a sheetmetal screw to secure the connection.
- 2. Run the Vent Pipe**
- a) Refer to either the residential or commercial/industrial venting instructions in this manual for vent length requirements.
 - b) **If using a 4" to 3" (102 to 76mm) reducer** - Following the vent pipe manufacturer's instructions, attach a straight piece of 3" diameter horizontal pipe or an elbow in any direction above horizontal.



If using a 4" (102mm) diameter, 12" (305mm) long adapter pipe - Following the vent pipe manufacturer's instructions, attach one of the following:

- an elbow in any direction above horizontal, or
 - a straight horizontal pipe
- c) Follow the pipe manufacturer's instructions to connect the vent pipe sections and install the vent pipe run. The length of vent must not exceed the maximum allowed for the heater being installed.
 - d) Extend the vent pipe through the wall or roof to the outdoors. An approved clearance thimble is required when flue pipe extends through combustible materials. Follow the requirements of the pipe and thimble manufacturer. Be sure to comply with local and national codes when selecting the vent terminal location. The vent pipe installer is responsible for following the manufacturer's instructions and complying with all applicable codes.

**FIGURE 11 - Attach
Vent Cap**



3. Attach the Vent Cap (FIGURE 11)

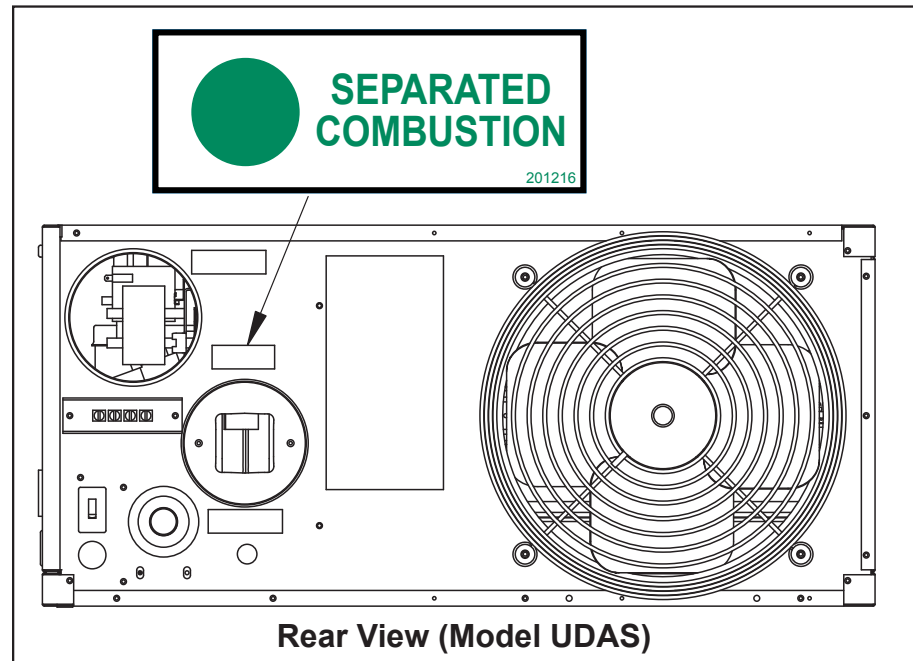
- a) Use a heater Option CC1, CC21, or Novavent #2NVTB4 vent cap.
- b) Slide the vent cap collar into the vent pipe.
- c) Around the end of the vent pipe, drill three evenly spaced 1/8" holes through the vent pipe and vent cap. Insert sheetmetal screws to secure the vent cap to the vent pipe.

Venting Requirements for
Model UDAS and Model UDBS
and Instructions for Combustion Air
Inlet/Vent Terminal Options CC6 and CC2

General

This manual applies only to venting and combustion air inlet instructions and **must be used with the installation manual that was shipped with the heater**. If either manual is missing, contact your distributor before beginning installation.

Verify that the label near the vent outlet on the heater matches the label illustrated below (label PN is 201216, color is green).



WARNING

Installation should be done by a qualified agency in accordance with these instructions. The qualified service agency installing this separated-combustion system is responsible for the installation.

WARNING

Do not use an existing venting system. This heater requires installation of the combustion air/vent system ordered with the unit, either option CC6 or CC14 for a horizontal system or option CC2 for a vertical system. Failure to comply could result in severe personal injury or death and/or property damage.

CAUTION: Model UDAS and UDBS unit heaters should not be used in an application where the heated space temperature is below 50°F (10°C). Operating under low ambient conditions may cause condensate to form in the heat exchanger.

1.0 Venting and Combustion Air Requirements for Separated-Combustion Models (UDAS and UDBS)

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

When an existing appliance is removed or replaced in a venting system, the venting system may not be properly sized to vent the attached appliances. An improperly sized venting system may result in the formation of condensate, leakage, and/or spillage.

Concentric horizontal and vertical vent/combustion air systems are the only venting/combustion air systems approved for Model UDAS and Model UDBS separated-combustion unit heaters.

Model UDAS 030, 045, 060, 075, 100, and 125 are certified for both residential and commercial/industrial installations. Utility heaters certified for “residential use” are intended for 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.

Model UDAS 150, 175, 200, 225, 250, 300, 350, and 400 and Model UDBS 030, 045, 060, 075, 100, 125, 150, 175, 200, 225, 250, 300, 350, and 400 are certified only for 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 found 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 that is 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 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 installation location of the heater in relation to building exhaust systems.

Is the Installation Residential or Commercial/Industrial?

Venting requirements in Paragraphs 1.1 (*Type of Pipe*) and 1.4 (*Joints and Sealing*) are not the same for Residential and Commercial/Industrial installations. Venting requirements in Paragraphs 1.2, 1.3, and 1.5 through 1.8 are the same for both.

The installation instructions in Paragraphs 2 and 3 apply to both Residential and Commercial/Industrial installations.

The testing requirement in Paragraph 4 applies to a Residential installation.

Read the headings and comply with the requirements that apply to the type of installation.

1.1 Type of Pipe

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

1.1.1 Residential Installation—Pipe Requirements

NOTE: Only UDAS 030, 045, 060, 075, 100, and 125 are certified for residential use.

Horizontal or Vertical Vent Pipe Run	Single-wall vent pipe approved to UL Std 1738 for a Category III appliance is required. Do not intermix different vent system parts from different manufacturers in the same venting system.
Horizontal Vent Terminal (using option CC6 kit)	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.
Vertical Vent Terminal (using option CC2 kit)	Single-wall vent pipe approved to UL Std 1738 for a Category III appliance is required. Do not intermix different vent system parts from different manufacturers in the same venting system. The 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.
Combustion Air Inlet Pipe (options CC2 and CC6)	Sealed, single-wall galvanized pipe is recommended for inlet air run and terminal combustion air pipe.

1.1.2 Commercial/Industrial Installation—Pipe Requirements

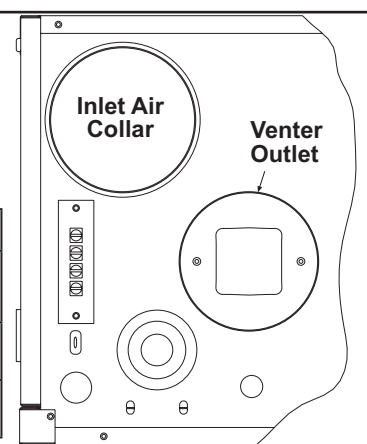
Horizontal or Vertical Vent Pipe Run	Single-wall vent pipe approved for a Category III appliance OR single-wall, 26-gauge or heavier galvanized or equivalent vent pipe is required between the heater and the concentric adapter box.
Horizontal Vent Terminal (using option CC6 kit)	The horizontal section 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.
Vertical Vent Terminal (using option CC2 kit)	Double-wall (Type B) vent pipe is required for the vertical vent terminal. The 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.
Combustion Air Inlet Pipe (options CC2 and CC6)	Sealed, single-wall galvanized pipe is recommended for inlet air run and terminal combustion air pipe.

1.2 Venter Outlet and Combustion Air Inlet

FIGURE 1: Rear of Heater Showing Location of Inlet and Outlet Connections

Note: Small unit is illustrated. Larger units have slightly different orientation.

TABLE 1: Heater Connections (Diameter)			
UDAS and UDBS	030, 045, 060, 075, 100, 125	150, 175, 200, 225, 250	300, 350, 400
Venter Outlet	4" (102 mm)	5" (127 mm)	6" (152 mm)
Inlet Air Collar	4" (102 mm)	6" (152 mm)	6" (152 mm)



Special Requirements at the Heater Connections

- **Sizes 030, 045, and 060:** When using 3" diameter pipe, a 4" to 3" (102 to 76 mm) taper-type reducer is required at the venter outlet. For Category III, attach a 4" appliance adapter from Category III pipe manufacturer directly to the collar, then use a reducer if using 3" pipe.
- **Sizes 030, 045, and 060:** When using 3" diameter pipe, a 3" to 4" (76 to 102 mm) taper-type increaser is required at the inlet air collar.
- **Sizes 200, 225, 250, 300, 350, and 400:** Require a minimum of 12" (305 mm) of straight pipe at both heater connections.

Applies to: Residential or Commercial/Industrial Installation

NOTE: Only UDAS 030, 045, 060, 075, 100, and 125 are certified for residential use.

1.0 Venting and Combustion Air Requirements (cont'd)

1.3 Pipe Diameter and Length

Pipe diameter and length requirements listed in **TABLE 2** are for the **indoor** sections of pipe between the heater and the concentric adapter box.

Pipe diameters and maximum indoor vent lengths in **TABLE 2** apply to both **horizontal** and **vertical** vent/combustion air systems. Add **all** straight sections and equivalent lengths for elbows. **The total length of the straight sections and elbows must not exceed the Maximum Length.**

TABLE 2: Pipe Diameter and Length from Heater to Concentric Adapter Box

- **Minimum length** between the heater and the concentric adapter box is 1 foot (305 mm) for Sizes 030–125 and 3 feet (914 mm) for Sizes 150–400.

Pipe Diameter and Maximum Length from Heater to Concentric Adapter Box										
UDAS and UDBS	Pipe Diameter				Maximum Length		Equivalent Straight Length for a			
	Vent Pipe		Inlet Air Pipe				90° Elbow		45° Elbow	
	inches	mm	inches	mm	feet	M	feet	M	feet	M
030	3	76	3	76	15	4.6	2	0.6	1	0.3
	4	102	4	102	10	3.0	2	0.6	1	0.3
045	3	76	3	76	15	4.6	2	0.6	1	0.3
	4	102	4	102	10	3.0	2	0.6	1	0.3
060	3	76	3	76	25	7.6	3	0.9	1.5	0.5
	4	102	4	102	15	4.6	1.5	0.5	1	0.3
075	4	102	4	102	25	7.6	3	0.9	1.5	0.5
100	4	102	4	102	35	10.7	4	1.2	2	0.6
125	4	102	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
175	5	127	6	152	30	9.1	3	0.9	2	0.5
200	5	127	6	152	40	12.2	4	1.2	2	0.6
225	5	127	6	152	40	12.2	4	1.2	2	0.6
250	5	127	6	152	40	12.2	4	1.2	2	0.6
300	6	152	6	152	45	13.7	4	1.2	2	0.6
350	6	152	6	152	45	13.7	5	1.5	2.5	0.8
400	6	152	6	152	45	13.7	5	1.5	2.5	0.8

TABLE 3: Diameters of Concentric (outdoor) Pipes

Diameters of the **outside** (terminal) concentric pipes are listed in **TABLE 3**.

UDAS and UDBS	030, 045, 060, 075, 100, 125	150, 175, 200, 225, 250, 300, 350, 400
Inlet Air Pipe Diameter	6" (152 mm)	8" (203 mm)
Vent Pipe Diameter	4" (102 mm)	5" (127 mm)

The outdoor pipe lengths depend on the installation; requirements are listed in the installation instructions for the horizontal (option CC6) and vertical (option CC2) vent/combustion air kits.

1.4 Joints and Sealing

NOTE: Joints connecting double-wall pipe apply only to Commercial/Industrial installations with a vertical vent terminal (option CC2: vertical vent/combustion air kit). See Type of Pipe requirement.

Provide pipes as specified in **Requirement No. 1.1** and seal joints as follows:

- **To join sections of Category III pipe**, follow the pipe manufacturer's instructions for joining and sealing.
- **To join sections of 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.
- **For Commercial/Industrial installations:**
 - When joining the terminal section of double-wall vent pipe (vertical vent terminal option CC2 only) to the vent cap**, follow the illustrated step-by-step instructions in **FIGURE 2**.

When joining a terminal section of double-wall vent pipe to a single-wall a vent pipe run, follow the illustrated step-by-step instructions in **FIGURE 3**.

When joining two sections of double-wall vent pipe, follow the pipe manufacturer's instructions for joining and sealing vent pipe sections.

Applies to: Residential or Commercial/Industrial Installation

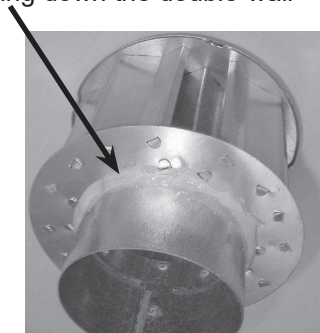
NOTE: Only UDAS 030, 045, 060, 075, 100, and 125 are certified for residential use.

FIGURE 2: STEPS (for Commercial/Industrial Installations) to Join Double-Wall (Type B) Pipe and Vent Terminal Cap—Applies Only to Vertical Vent/Combustion Air Kit (Option CC2)

STEP 1

Place a continual 3/8" bead of silicone sealant around the circumference of the vent cap collar. This will prevent any water inside the vent cap from running down the double-wall pipe.

Do STEP 2 immediately following STEP 1.



STEP 2

Insert the collar on the vent cap inside the inner wall of the double-wall pipe. Insert as far as possible. Add additional silicone sealant to fully close any gaps between the vent cap and the double wall pipe. This is necessary to prevent water from entering the double-wall pipe.

STEP 3

Secure the vent cap to the double-wall pipe by drilling and inserting a 3/4" (19 mm) long sheet metal screw into the vent cap collar. Do not overtighten screw.

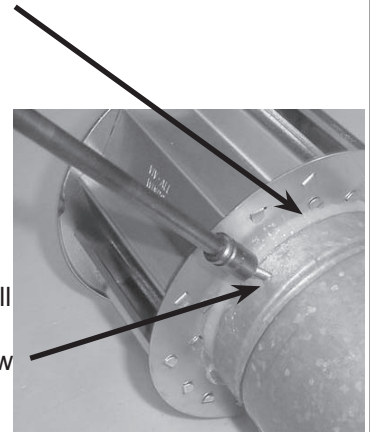


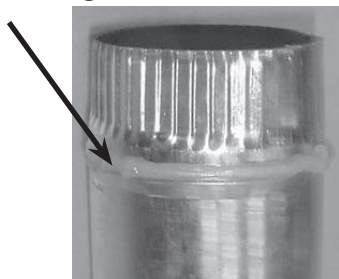
FIGURE 3: STEPS (for Commercial/Industrial Installations) to Join Double-Wall (Type B) Pipe to Single-Wall Vent Pipe Run

NOTE: Comply with pipe requirements.

STEP 1

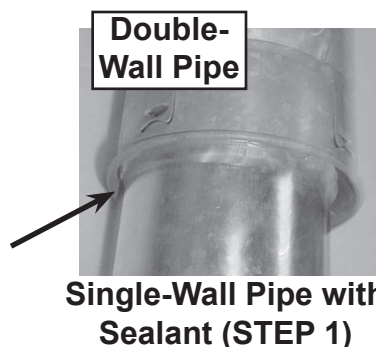
On the single-wall pipe or taper-type connector, place a continual 1/4" bead of silicone sealant around the circumference.

Do STEP 2 immediately following STEP 1.



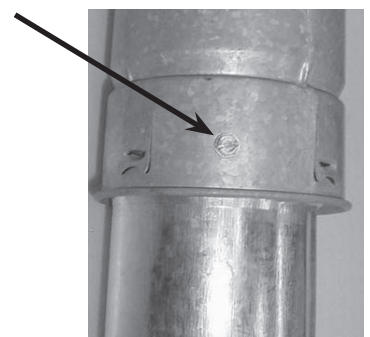
STEP 2

Insert the pipe prepared with sealant into the inner pipe of the double-wall pipe until the bead of sealant contacts the inner pipe creating a sealed joint.



STEP 3

Spaced equally around the double-wall pipe, drill three small holes below the sealant ring. Insert 3/4 inch (19 mm) long sheet metal screws to secure the joint. Do not overtighten screws.



1.5 Support

Support horizontal run every 6 feet (1.8 meters).

Support vertical run of Category III vent pipe in accordance with the requirements of the pipe manufacturer.

Support vertical single-wall pipe in accordance with accepted industry practices.

Do not rely on the heater or the adapter box for support of either horizontal or vertical pipes. 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.

1.6 Clearance

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

Applies to: Residential or Commercial/Industrial Installation

NOTE: Only UDAS 030, 045, 060, 075, 100, and 125 are certified for residential use.

1.0 Venting and Combustion Air Requirements (cont'd)

1.7 Condensation

CAUTION:
Exceeding the specified vent pipe diameter and length may result in condensate forming in the vent pipe.

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 with a tee, a drip leg, and a clean out 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.

On all Model Sizes, 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" foil-faced fiberglass, 1-1/2# density insulation.

On horizontal vent runs, the flue pipe **must be pitched down toward the outlet** 1/4" per foot for condensate drainage. Slope applies to entire length of horizontal vent run. Failure to pitch vent run properly may damage unit due to condensate running back into the unit.

1.8 Concentric Adapter Box

All UDAS and UDBS installations **require** a concentric adapter box designed to allow both combustion air and venting with only one building penetration. 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).

The illustrations below apply to the concentric adapter box in both the horizontal terminal vent/combustion air kit (option CC6) and the vertical terminal vent/combustion air kit (option CC2). All dimensions are the same except for the opening for the vent pipe (see **NOTE** in **FIGURE 6**).

NOTE: A Model UDAS or UDBS 030, 045, 060, or 075 with a horizontal vent may use option CC14 instead of option CC6. Option CC14 is a more aesthetic concentric vent terminal/combustion air kit that terminates flush with the wall. If installing option CC14, follow the instructions in the option package (Form I-UDAS/UDBS/UEAS-ASC).

FIGURE 4: Concentric Adapter Box Is Required Part of All Model UDAS and UDBS Installations

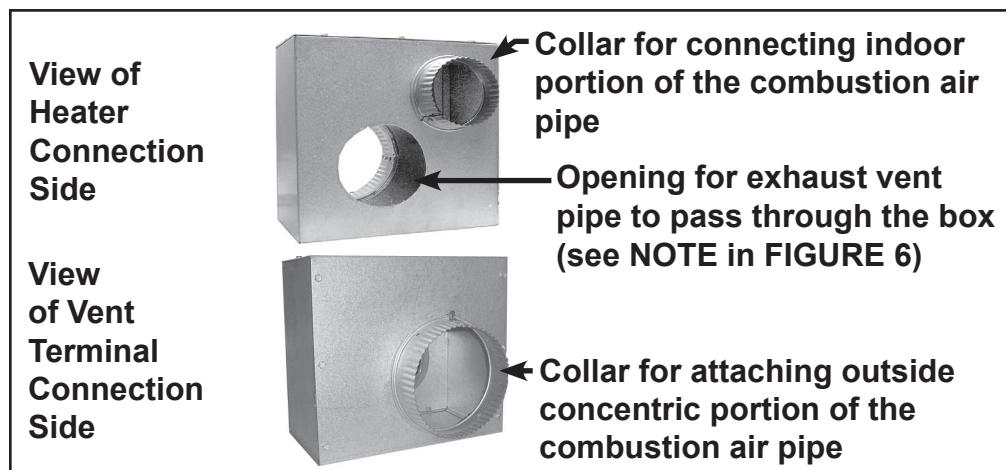
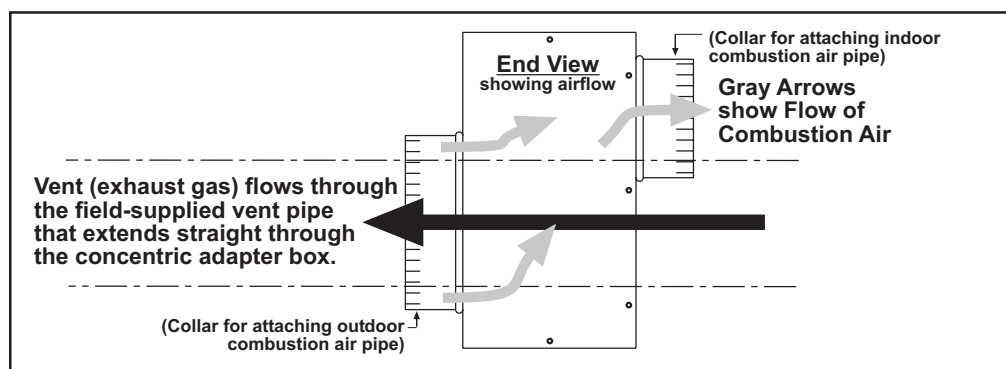


FIGURE 5: Concentric Adapter Box Airflow



Applies to: Residential or Commercial/Industrial Installation

NOTE: Only UDAS 030, 045, 060, 075, 100, and 125 are certified for residential use.

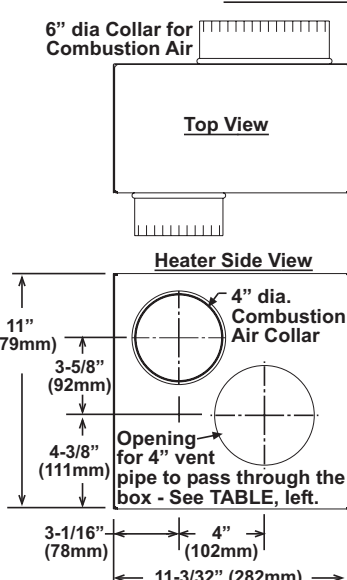
FIGURE 6: Concentric Adapter Box Dimensions

NOTE: 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. See **TABLE 4** below.

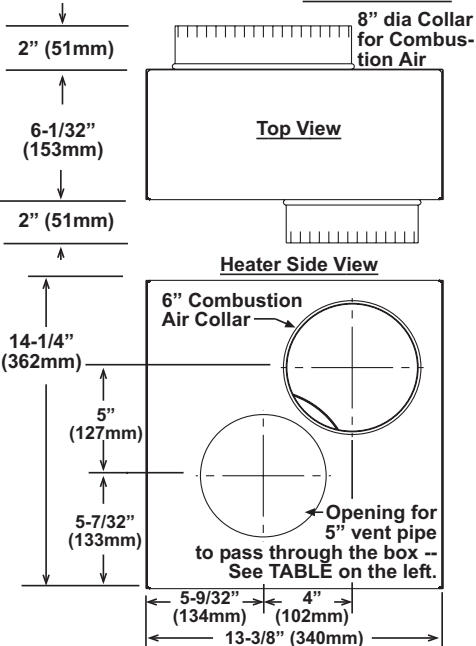
TABLE 4: Diameter of Opening in Box for Vent Pipe to Pass Through

Vent Terminal Configuration	Unit Size			
	030-125		150-400	
	inches	mm	inches	mm
Horizontal (option CC6)	4-1/16	103	5-1/16	129
Vertical (option CC2)	4-21/32	118	5-21/32	144

Concentric Adapter Box in Kits for UDAS/UDBS Sizes 30-125



Concentric Adapter Box in Kits for UDAS/UDBS Sizes 150-400

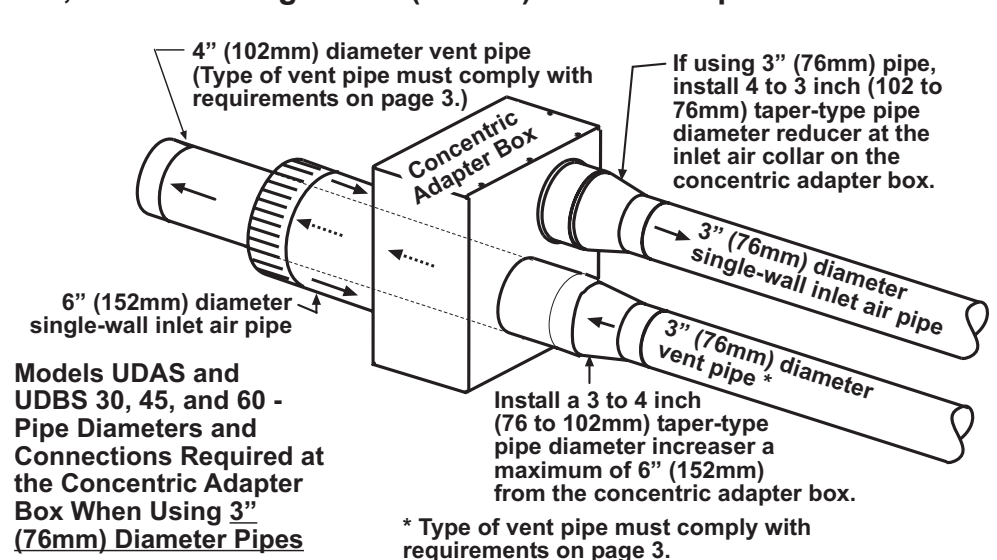


Pipe Connections at the Concentric Adapter Box

- If using 3" (76 mm) diameter pipes, Sizes 030, 045, and 060 require a 3" to 4" (76 to 102 mm) taper-type reducer in the vent pipe.
- If using 3" (76 mm) diameter pipes, Sizes 030, 045, and 060 require a 4" to 3" (102 to 76 mm) taper-type reducer on the combustion air pipe collar.

When pipe diameters differ, depending on direction of airflow, join the pipes with either a taper-type reducer or increaser. Requirements vary depending on the size of the heater (see **FIGURE 7, 8, or 9** to determine whether or not pipe diameters differ). Do **NOT** make actual connections until after reading the instructions and length requirements for installing the vent/combustion air kit (Paragraph 2.0 or 3.0). **The connection requirements are the same for both vertical and horizontal systems, but the length of pipe required varies by installation.**

FIGURE 7: Concentric Adapter Box Connections for Sizes 030, 045, and 060 Using 3-Inch (76 mm) Diameter Pipes



Applies to: Residential or Commercial/Industrial Installation

NOTE: Only UDAS 030, 045, 060, 075, 100, and 125 are certified for residential use.

1.0 Venting and Combustion Air Requirements (cont'd)

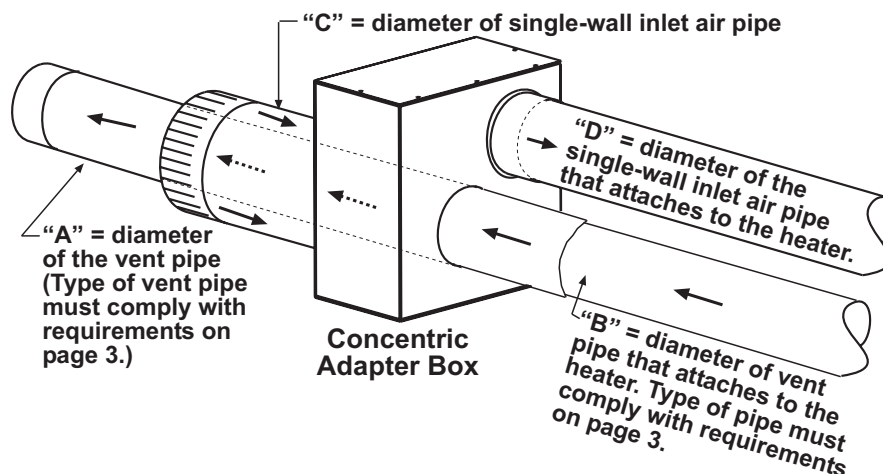
1.8 Concentric Adapter Box (cont'd)

FIGURE 8: Concentric Adapter Box Connections for Sizes 030, 045, and 060 Using 4-Inch (102 mm) Diameter Pipes and for all Sizes 075, 100, 125, 150, 175, 200, 225, and 250

Models UDAS and UDBS 30, 45, and 60 - Pipe Diameters and Connections Required at the Concentric Adapter Box When Using 4" (102mm) Diameter Pipes from the Heater to the Concentric Adapter

AND

Models UDAS and UDBS 75, 100, 125, 150, 175, 200, 225, and 250 - Pipe Diameters and Connections Required at the Concentric Adapter Box



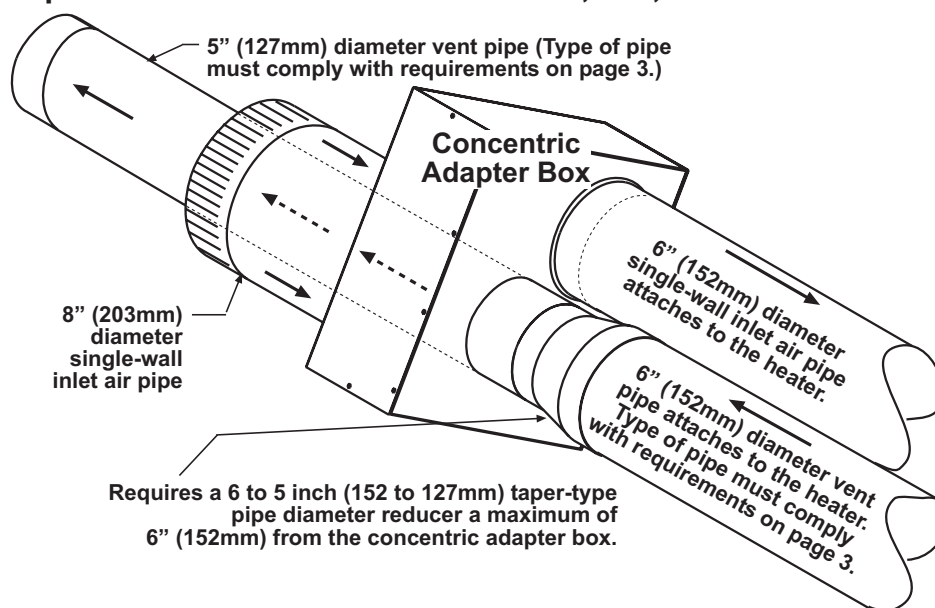
- Pipe diameters do not differ.

Model UDAS and UDBS Sizes		A	B	C	D
030, 045, 060 with 4" vent and combustion air runs from heater to concentric adapter box	inches	4	4	6	4
	mm	102	102	152	102
075, 100, 125	inches	4	4	6	4
	mm	102	102	152	102
150, 175, 200, 225, 250	inches	5	5	8	6
	mm	127	127	203	152

FIGURE 9: Concentric Adapter Box Connections for Sizes 300, 350, and 400

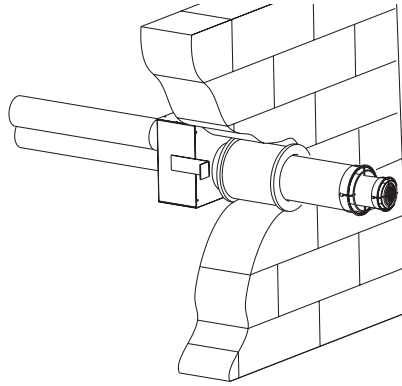
Models UDAS and UDBS 300, 350, and 400 - Pipe Diameters and Connections Required at the Concentric Adapter Box

- Sizes 300, 350, and 400 **always** require a 6" to 5" (152 to 127 mm) taper-type reducer in the vent pipe.

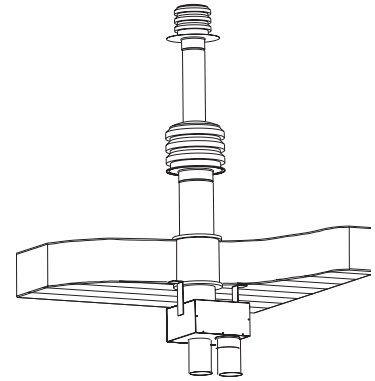


HORIZONTAL OR VERTICAL VENT TERMINAL?

FIGURE 10:
Is Separated-Combustion Vent/
Combustion Air
System Horizontal or
Vertical?



**Horizontal,
option CC6**



**Vertical,
option CC2**

Vent Terminal Instructions apply to both a Residential and a Commercial/Industrial Type of Installation

NOTE: Only UDAS 030, 045, 060, 075, 100, and 125 are certified for residential use.

2.0 Horizontal Vent Instructions (Option CC6)

2.1 Components Required—Factory and Field

**TABLE 4: Parts in
Horizontal Vent/
Combustion Air
Terminal Package
(Option CC6)**

Qty	Sizes	PN	Description
1	030–125	211762	Complete Horizontal Vent/Combustion Air Terminal Kit (same as option CC6)
	150–400	211763	
1	030–125	211789	Concentric Adapter Box (see FIGURE 6 and verify diameter of vent pipe opening)
	150–400	211790	
1	030–125	211791	Exhaust Grill 
	150–400	211792	
1	030–125	151755	Inlet Guard 
	150–400	124940	
8	030–400	37661	#10-16 × 1/2" long Screws to attach the exhaust grill and the inlet guard
2	030–400	207232	Brackets for attaching Concentric Adapter Box (see FIGURE 11)
1	030–400	53335	Tube of High Temperature (450°F) Silicone Sealant

Field-supplied requirements:

- Vent pipes (see type requirements)
- Combustion air pipes (see type requirements)
- Taper-type vent pipe diameter reducers and/or increasers as required
- Thimble (a thimble is not required if wall is of non-combustible construction)
- Flashing
- Sheet metal screws, tape, and sealant as required

2.0 Horizontal Vent Instructions (Option CC6) (cont'd)

2.2 Installation Instructions for Horizontal Vent/ Combustion Air Kit (Option CC6)

Before beginning, verify that the kit is at the site and that all components are correct for the installation. Be sure all required field-supplied parts are available.

- 1) Determine the location on the outside wall for the vent terminal. Location must comply with vent length requirements, Requirement No. 1.3. In most applications, the terminal would be on a level with the heater mounting height. Allow 1/4" per foot (6 mm per 305 mm) downward pitch for condensate drain.

Minimum clearances for the horizontal vent terminal are shown in **TABLE 5**. Also, select a location that complies with adjoining building clearances as shown in **FIGURE 12**.

Products of combustion can cause discoloring of some building finishes and deterioration of masonry materials. Applying a clear silicone sealant that is normally used to protect concrete driveways can protect masonry materials. If discoloration is an esthetic problem, re-locate the vent or install a vertical vent.

WARNING

All vent terminals must be positioned or located away from fresh air intakes, doors and windows to preclude combustion products from entering occupied space. Failure to comply could result in severe personal injury or death and/or property damage.

**TABLE 5:
Clearances to
Horizontal Vent
Terminal**

Structure	Minimum Clearances for Vent Terminal Location, All Directions Unless Specified (Feet (Meters))	
	United States	Canada
Forced air inlet within 10 feet (3.1 meters)*	3 (0.9) above	
Combustion air inlet of another appliance	3 (0.9)	
Door, window, or gravity air inlet (any building opening)	4 (1.2) horizontal	
	4 (1.2) below	
	1 (0.305) above (305 mm)	
Electric meter, gas meter, and relief equipment**	4 (1.2) horizontal	6 (1.8) horizontal
Gas regulator**	3 (0.9) horizontal	6 (1.8) horizontal)
Adjoining building or parapet	6 (1.8)	
Adjacent public walkways	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.		
***Consider local snow depth conditions. Vent must be at least 6" (152 mm) higher than anticipated snow depth.		

2) Install Vent Pipe and Combustion Air Pipe Runs:

Use the type of pipe specified in Requirement No. 1.1. Comply with requirements in Requirement No. 1.2 when attaching pipes to the heater. Length must comply with Requirement 1.3. Seal all joints. Due to the high temperature, do not enclose the vent (exhaust) pipe or place pipe closer than 6" (152 mm) to combustible material. Extend the runs close to the wall location selected in Step 1). Support pipes as required in Requirement No. 1.5. Comply with requirements concerning condensation in Paragraph 1.7.

- 3) Prepare a clearance hole through the outside wall for the combustion air pipe—6" (152 mm) diameter pipe for Sizes 030–125 or an 8" (203 mm) diameter pipe for Sizes 150–400. Outside wall construction thickness should be 1" (25 mm) minimum and 48" (1219 maximum). The larger diameter combustion air pipe serves as clearance for the vent pipe on non-

combustible construction. A thimble may be required depending on wall construction and/or local codes.

4) Prepare the Concentric Adapter Box

- a. Attach the brackets to the box. Follow the instructions in **FIGURE 11**.

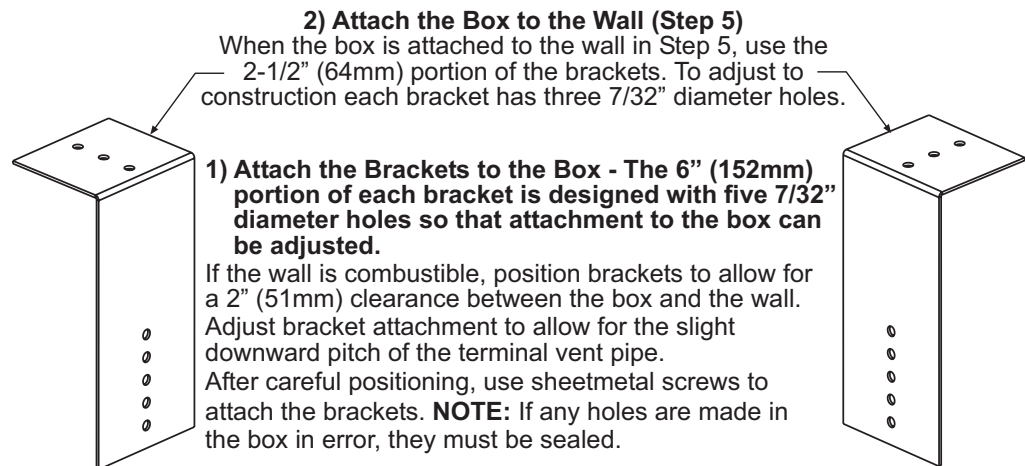
- b. **Attach the outside portion of the combustion air pipe to the box.** Determine the length by measuring the bracket length from box to wall, plus the wall thickness, plus 4–16" (102–406 mm) beyond the wall. (The inlet air pipe should extend beyond the outside wall a minimum of 4" (102 mm) to a maximum of 16" (406 mm).

Attach the inlet air pipe to the collar of the concentric adapter with sheet metal screws and seal.

5) Attach the concentric adapter box to the wall.

Insert the combustion air pipe out through the wall. Attach the brackets (see **FIGURE 11**) to the wall. On the outside, caulk or flash the inlet air pipe. Flashing is field-supplied.

**FIGURE 11:
Brackets for
Attaching
Concentric
Adapter Box
to Wall**



6) On the outside, position the inlet air guard over the end of the combustion air pipe (see **FIGURE 12**). Attach the guard to the inlet air pipe with the four 1/2" long screws provided.

7) Determine length and install the "terminal-end" vent pipe.

a. Determine length of pipe. The length of the continuous piece of terminal-end vent pipe is determined by the installation within the maximum and minimum requirements. See **FIGURE 12** to determine lengths of each segment and calculate the total length required. The "terminal-end" vent pipe extending through the box and concentric through the inlet air pipe **must be one piece of vent pipe without joints**. The connection to the vent pipe run, must be a maximum of 6" (152 mm) from the heater side of the box.

b. Install terminal-end vent pipe. Being sure the vent pipe is in the proper flow direction, slide the end through the box. Position the vent pipe so that it will extend between 3" (76 mm) and 6" (152 mm) past the end of the combustion air pipe and no more than 6" (152 mm) out of the box toward the heater.

No more than 6" (152 mm) from the box, connect the terminal-end vent pipe to the vent pipe run from the heater.

8) Position the exhaust grill over the end of the vent pipe (see FIGURE 12, Top View). Attach the grill to the end of the vent pipe with the four 1/2" long screws in the kit.

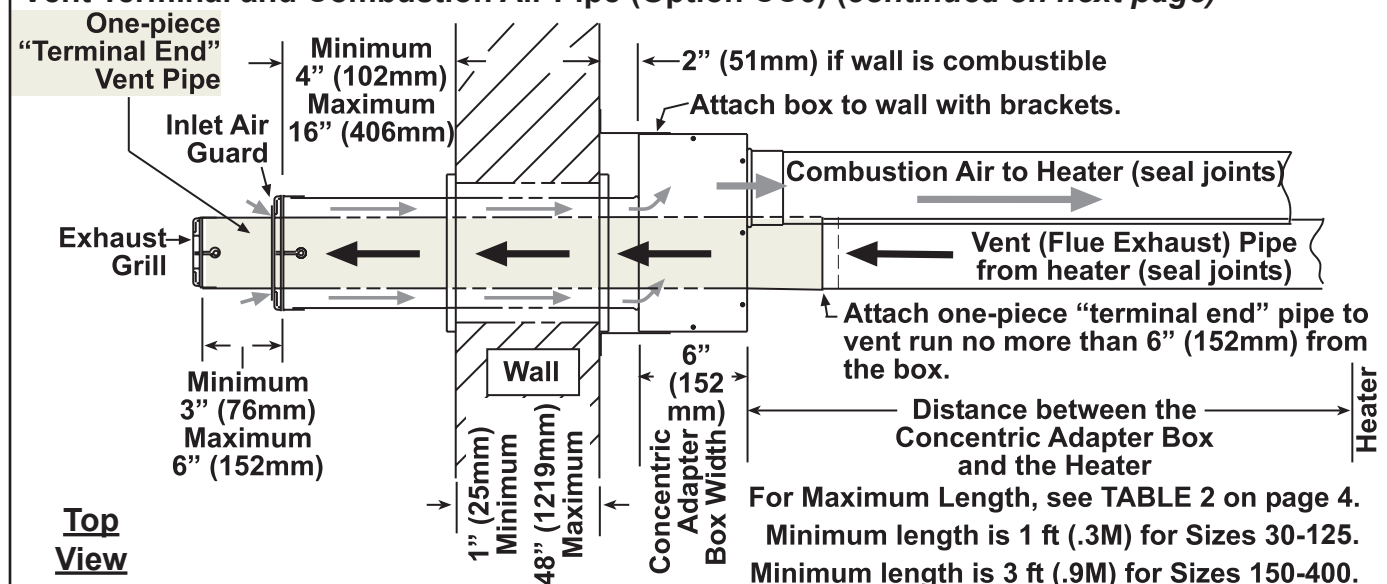
9) Seal the vent pipe to the concentric adapter box. Verify that the terminal-end section of vent pipe has a slight downward drop (1/4" per foot/6 mm per 305 mm) toward the outside. Use silicone sealant and seal the circumference of the pipe and the opening of the box. Seal the area around the pipe completely.

10) Attach the indoor combustion air pipe. Use sheet metal screws to attach the single-wall combustion air pipe run to the collar on the concentric adapter box. Seal with tape or sealant.

NOTE: If using 3" combustion air pipe on Size 030, 045, or 060, install a taper-type reducer as illustrated in **FIGURE 7**.

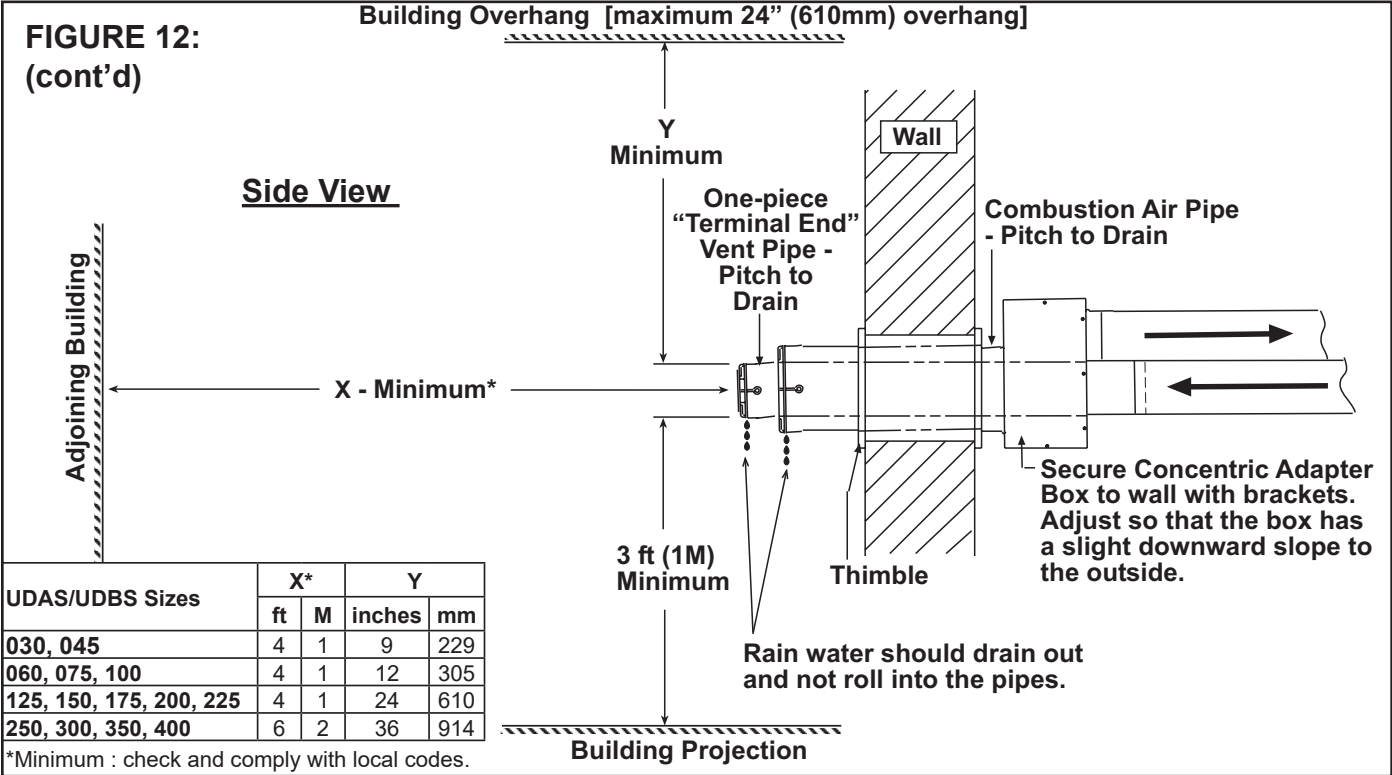
Review Paragraph 1.7 concerning condensation; comply with all requirements that apply.

FIGURE 12: Installation of Typical Separated-Combustion Unit with Horizontal Vent Terminal and Combustion Air Pipe (Option CC6) (continued on next page)



2.0 Horizontal Vent Instructions (Option CC6) (cont'd)

2.2 Installation Instructions—Horizontal Vent/Combustion Air Kit (Option CC6) (cont'd)



Installation of the horizontal vent and combustion air system on your separated-combustion unit is complete. Verify compliance with all venting installation requirements and FIGURE 12.

3.0 Vertical Vent Instructions (Option CC2)

3.1 Components
Required—Factory
and Field

TABLE 6: Parts
in Vertical Vent
Terminal/Combustion
Air Package
(Option CC2)

Qty	Size	PN	Description
1	030–125	205895	Complete Vertical Vent Kit (same as option CC2)
	150–400	205896	
1	030–125	205884	Concentric Adapter Box (see FIGURE 6 and verify diameter of vent pipe opening)
	150–400	205885	
1	030–125	110051	Exhaust (Vent) Terminal Assembly 
	150–400	110052	
1	030–125	155635	Combustion Air Inlet Assembly 
	150–400	53330	
2	030–400	207232	Brackets for attaching Concentric Adapter Box (see FIGURE 13)
1	030–400	53335	Tube of High Temperature Silicone Sealant

Field-supplied
requirements:

- Vent pipes (see type requirements)
- Combustion air pipes (see type requirements)
- Taper-type pipe diameter reducers and/or increasers as required
- Thimble (a thimble is not required if wall is of non-combustible construction)
- Flashing
- Sheet metal screws, tape, and sealant as required

Before beginning, verify that the kit is at the site and that all components are correct for the installation. Be sure all required field-supplied parts are available.

3.2 Installation Instructions for Vertical Vent/Combustion Air Kit (Option CC2)

1) Determine the location of the vent terminal.

WARNING

All vent terminals must be positioned or located away from fresh air intakes, doors and windows to preclude combustion products from entering occupied space. Failure to comply could result in severe personal injury or death and/or property damage.

Select a location away from fresh air intakes, allowing space for the concentric adapter box inside. Vent terminal must be located from adjacent buildings as shown in **FIGURE 17**.

If more than one vertical concentric vent/combustion air terminal (option CC2) is being installed, the minimum spacing between vent center lines is determined by the minimum outdoor design temperature (most extreme outdoor condition at the installation site).

Minimum Outdoor Design Temperature		Minimum Spacing between Center Lines of Vent Pipes in Vertical Combustion Air/Vent Terminals	
°F	°C	inches	mm
31 or warmer	0 or warmer	36	914
-10 to 30	-23 to -1	60	1524
< -10	< -23	84	2134

2) Install Vent Pipe and Combustion Air Pipe Run: Use the type of pipe specified (Requirement No. 1) and comply with the attachment requirements in Requirement No. 1.2. Length must comply with Requirement No. 1.3.

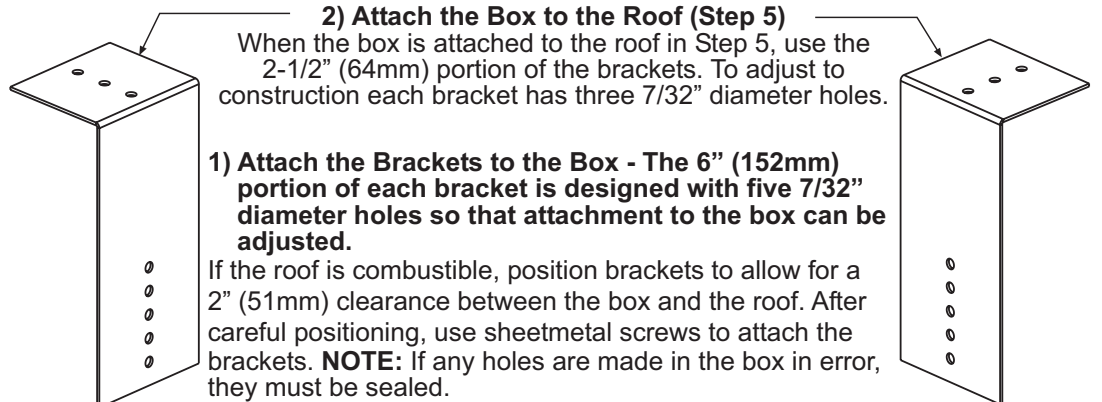
Seal all joints. Due to the high temperature, **do not** enclose the exhaust pipe or place pipe closer than 6" (152 mm) to combustible material. Provide supports for the pipes. Extend the runs to close to the roof at the location selected in Step 1.

3) Prepare a clearance hole through the roof for the combustion air pipe—6" (152 mm) diameter pipe for Sizes 030–125 or an 8" (203 mm) diameter pipe for Sizes 150–400. A thimble may or may not be required depending on building construction and/or local codes. The larger diameter combustion air pipe serves as clearance for the vent pipe on non-combustible construction.

4) Prepare the Concentric Adapter Box

a. Attach the brackets to the box (see **FIGURE 13**).

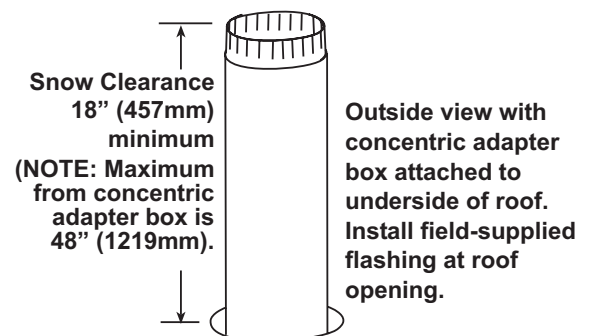
FIGURE 13: Brackets for Attaching Concentric Adapter Box to Roof



b. Attach the outside portion of the combustion air pipe to the box. Determine the length of the combustion air pipe so that dimension "X" in **FIGURE 14** is equal to the bracket length, plus the roof thickness, plus anticipated snow depth, but does not exceed 48" (1219 mm) or have less than 18" (457 mm) of pipe above the roof. Attach the inlet air pipe to the collar of the concentric adapter box with sheet metal screws.

5) Attach the concentric adapter box to the roof. On the inside, insert the combustion air pipe up through the opening and attach brackets to the roof (see **FIGURES 13, 14, and 15**). On the outside, flash the combustion air pipe to the roof. Flashing is field-supplied.

FIGURE 14: Slide Attached Combustion Air Pipe up Through Roof



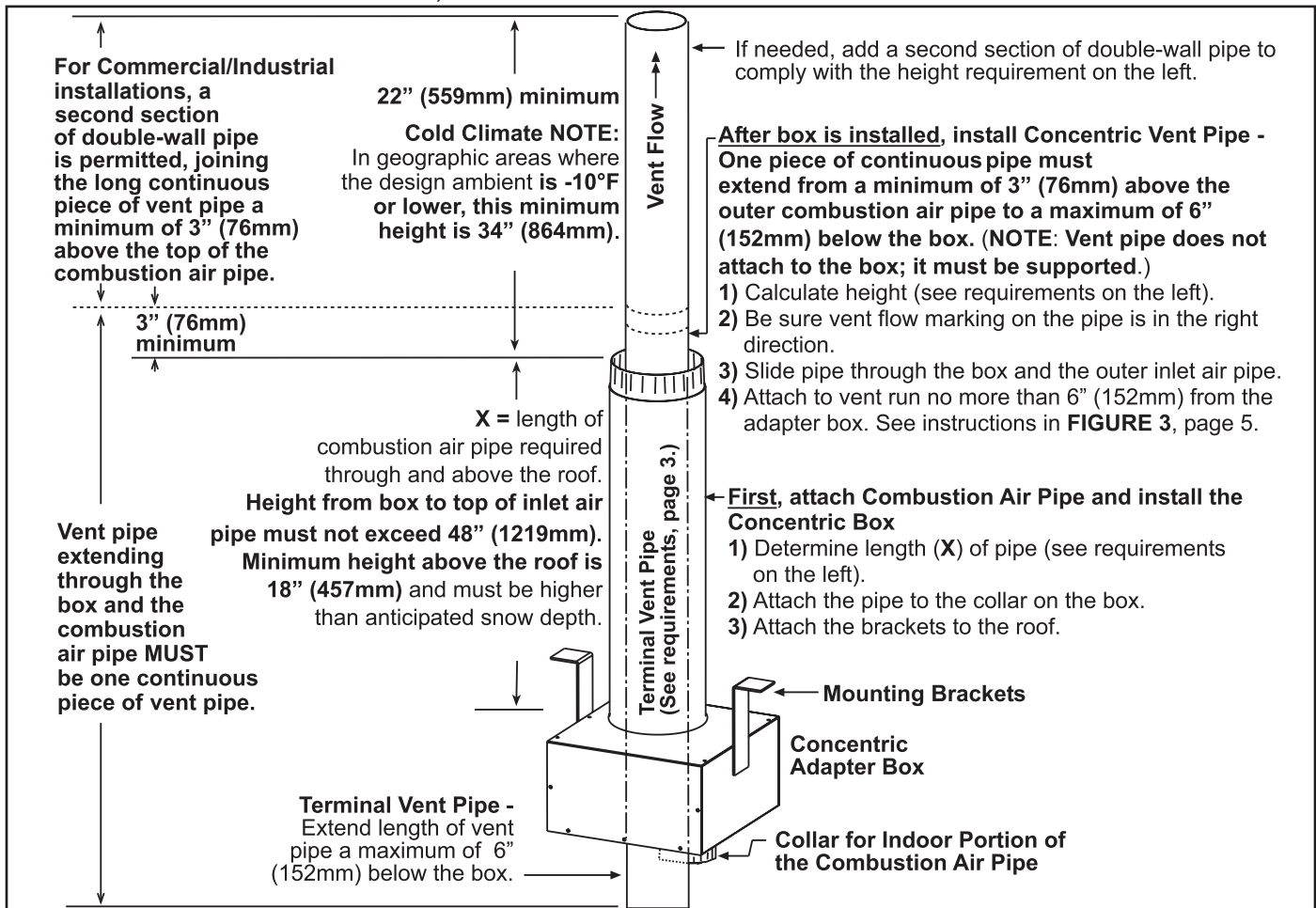
3.2 Installation Instructions for Vertical Vent/Combustion Air Kit (Option CC2) (cont'd)

**FIGURE 15:
Concentric Adapter
Box, Outdoor
Combustion Air Pipe,
and Concentric Vent
Pipe**

6) Determine the length and install the vent pipe.

- a. **Determine minimum length of the continuous section of vent pipe:** single-wall Category III for Residential or double-wall Type B for Commercial/Industrial installations (see **FIGURE 15**). The vent pipe extending through the box and the inlet air pipe **must be one piece of vent pipe without joints**.

Determine the minimum length by adding the requirements. Starting at the bottom, the maximum the vent pipe can extend below the box is 6" (152 mm); **plus** 6" (152 mm) through the box; **plus** length of bracket extending above the box; **plus** the width of the roof; **plus** the height of the outside combustion air pipe above the roof; **plus** a minimum of 3" (76 mm) beyond the top of the inlet air pipe. Total is the minimum length of the vent pipe section. If the actual piece of vent pipe is longer, extend it further above the combustion air pipe. Do not extend it more than 6" (152 mm) below the box.



b. Install the vent terminal pipe.

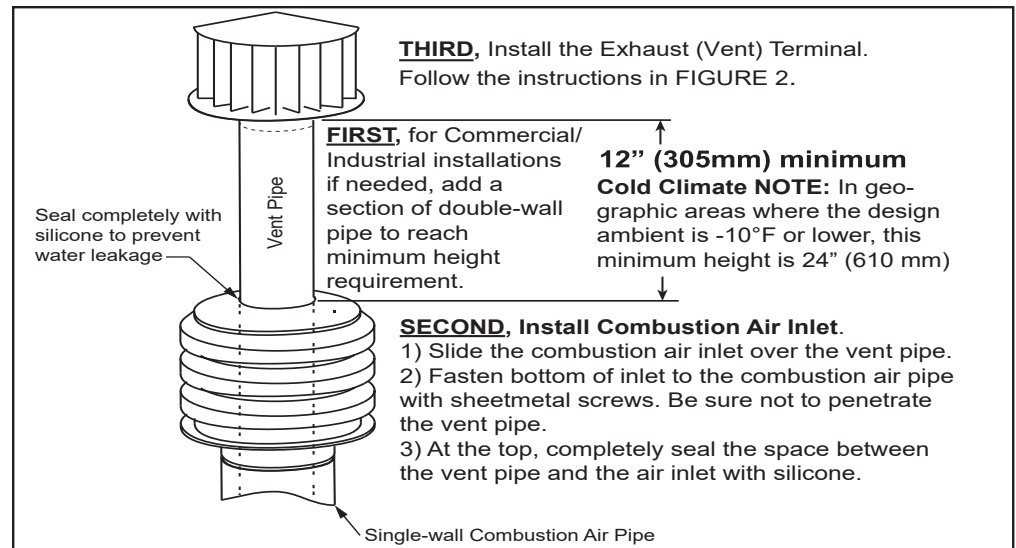
Being sure the pipe is in the proper flow direction, slide the end into the box and out through the combustion air pipe. Position the vent pipe so that the end is no more than 6" (152 mm) below the box. The upper end should extend at least 3" (76 mm) above the combustion air pipe. **NOTE: The vent pipe does not attach to the box. The installer must provide support.**

For Commercial/Industrial installations, follow the instructions in **FIGURE 3** for connecting a double-wall pipe to a single-wall pipe or taper-type connector.

Seal the circumference of the pipe and the opening of the box with silicone sealant. Seal the area around the pipe completely.

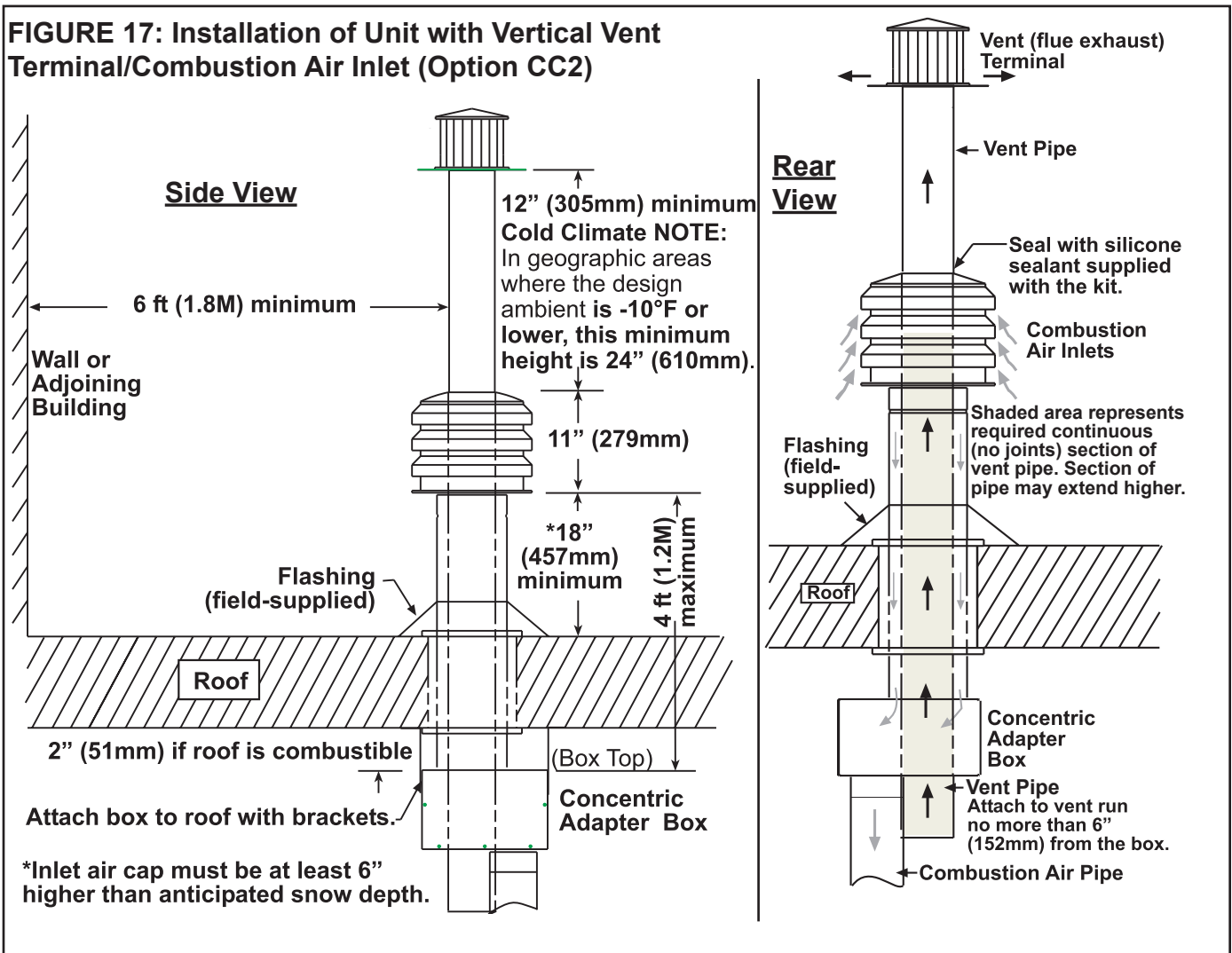
- 7) **On the outside**, if an additional section of vent pipe is needed (see **FIGURE 16**), add it. Make joint according to the pipe manufacturer's requirements. When vent pipe is the required height, **slide the combustion air inlet** over the vent pipe and fasten the collar to the combustion air pipe with sheet metal screws (see **FIGURE 16**). Seal the opening at the top between the vent pipe and the combustion air inlet with silicone sealant to prevent water leakage.
- 8) **Attach the exhaust (vent) cap.** Follow the illustrated instructions in **FIGURE 2**.

FIGURE 16: Install Combustion Air Inlet and Vent Terminal



9) Attach the indoor combustion air pipe. Use sheet metal screws to attach the single-wall combustion air pipe run to the collar on the concentric adapter box. Seal with tape or sealant. If using 3" combustion air pipe on Sizes 030, 045, and 060, install a taper-type reducer as illustrated in **FIGURE 7**. Review Paragraph 1.7 concerning condensation; comply with all requirements that apply.

FIGURE 17: Installation of Unit with Vertical Vent Terminal/Combustion Air Inlet (Option CC2)



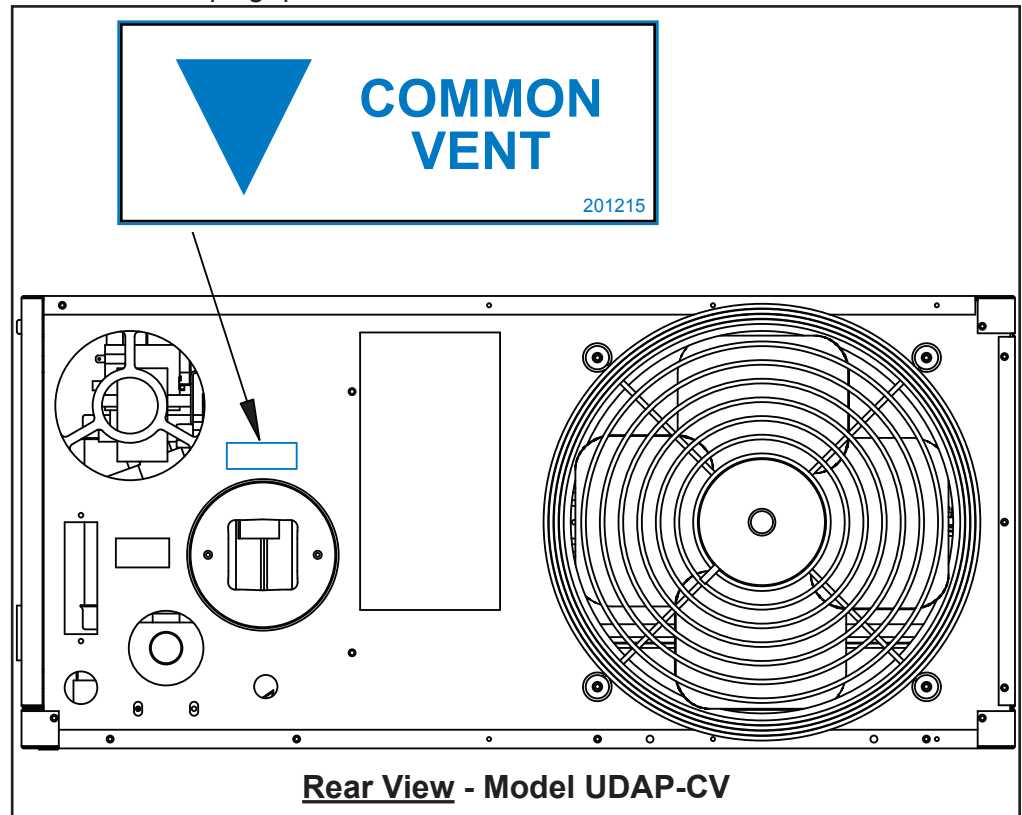
Installation of the vertical vent and combustion air system on your separated-combustion unit is complete. **Verify compliance with all venting installation requirements and FIGURE 17.**

Installation Instructions for Category I Single or Common Vent - Applies only to Indoor Fan Assisted Unit Heater Model UDAP-CV

Applies to: **Model UDAP-CV**
 (Model UDAP
 with Option AV6)

General

This manual applies only to venting instructions 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. The instructions in this manual apply **only** to indoor fan assisted Model UDAP-CV. Models UDAP-CV 30, 45, 60, 75, and 100 are certified as Category I heaters for residential or industrial/commercial installation. Utility heaters certified for “residential use” are intended for 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.



DANGER:

Check the Model No. on the rating plate. These instructions apply only to a Reznor Model UDAP with a suffix -CV, which is a Model UDAP heater with common vent Option AV6. If the Model No. does not have a suffix -CV, do NOT use these instructions. Failure to comply will result in severe personal injury or death and/or property damage.

1.0 Venting Requirements for Model UDAP-CV

Venting must be in accordance with these instructions, the National Fuel Gas Code Z223.1 or CSA B149.1 and B149.2, Installation Code for Gas Burning Appliances and Equipment, and all local codes. Local requirements supersede national requirements.

When an existing appliance is removed or replaced in a venting system, the venting system may not be properly sized to vent the attached appliances. An improperly sized venting system may result in the formation of condensate, leakage, and/or spillage.

Model UDAP-CV heaters require a vertical vent. Common vertical venting is permitted when installed according to the instructions in SECTION 2. Venting instructions are divided into two sections. Select and follow the instructions in SECTION 1 or 2.

SECTION 1 Venting a Model UDAP-CV heater with a **dedicated vent** systems a single Category I appliance

SECTION 2 Venting a Model UDAP-CV heater in a **common vent** with other Category I appliance(s)

WARNING: Use only the venting instruction section that applies to the installation. Do not combine any requirements. Use these venting instructions only with Model UDAP heaters with -CV in the Model No. Failure to comply could result in severe personal injury of death and/or property damage.

WARNING: Installation should be done by a qualified agency in accordance with these instructions. The qualified service agency installing this heater is responsible for the installation.

2.0 SECTION 1 - Requirements and Instructions for Venting a Single Category I Model UDAP-CV

Comply with these requirements to vent a Model UDAP-CV as a Category I appliance into a dedicated vertical vent.

2.1 SECTION 1 - Type of Pipe

Vertical Vent Pipe - Use Type B double-wall pipe for all installations.

Horizontal Vent Connector Pipe - Sizes 30 and 45 require Type B double-wall pipe for all installations.

Depending on the installation (Refer to **TABLE 1A** or **1B**), Sizes 60, 75, and 100 may use either Type B double-wall vent pipe or 26-gauge or heavier galvanized single-wall vent pipe.

2.2 SECTION 1 - Vent Diameter and Length

Vent diameter for Sizes 30, 45 60, and 75 is 4 inches (102mm).

Vent diameter for Size 100 is 5 inches (127mm).

Vent length requirements vary depending on size of heater and the type of pipe used in the vent connector. If using a double-wall vent connector, refer to **FIGURE 1A** and comply with vent lengths in **TABLE 1A**. If using a single-wall vent connector (Sizes 60, 75, 100 only), refer to **FIGURE 1B** and comply with vent lengths in **TABLE 1B**.

FIGURE 1A and TABLE 1A - Vent Lengths for Model UDAP-CV with a Category I Vent using all Type B Double-Wall Vent Pipe

FIGURE 1A

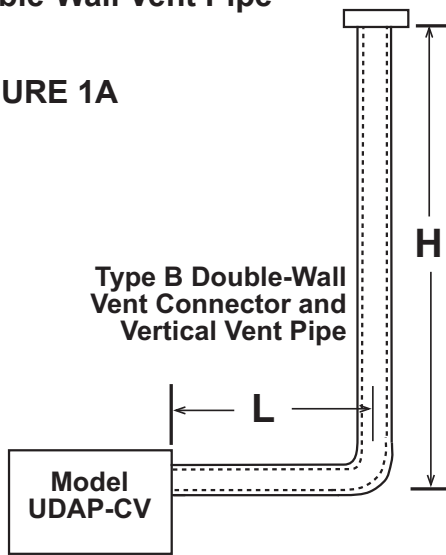


TABLE 1A - Vent Lengths of Category I Vent for Model UDAP-CV Using All Double-Wall Vent Pipe

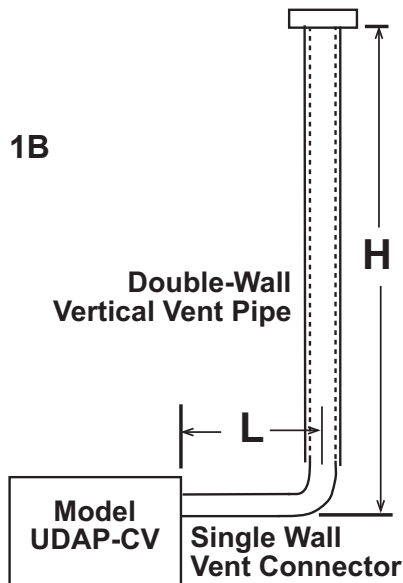
Model UDAP-CV Size	Vent Diameter		H		L	
	inches	mm	ft	M	ft	M
30	4	102	6	1.8	4	1.2
45, 60, 75			6	1.8	6	1.8
			8	2.4	8	1.5
30	4	102	10	3.0	2	0.6
45			10	3.0	5	1.5
60, 75			10	3.0	10	3.0
30, 45	4	102	15	4.6	5	1.5
60, 75			15	4.6	15	4.6
30, 45	4	102	20	6.1	5	1.5
60, 75			20	6.1	20	6.1
100	5	127	6	1.8	6	1.8
			8	2.4	8	2.4
			10	3.0	10	3.0
			15	4.6	15	4.6
			20	6.1	20	6.1
			30	9.1	30	9.1

H = Vertical Height of Double-Wall Vent

L = Maximum Horizontal Double-Wall Vent Connector Length

FIGURE 1B and TABLE 1B - Vent Lengths for Model UDAP-CV 60, 75, or 100 with a Category I Vent with a Single-Wall Vent Connector and a Type B Double-Wall Vertical Vent Pipe

FIGURE 1B



H = Vertical Height of Double-Wall Vent

L = Maximum Horizontal Single-Wall Vent Connector Length

TABLE 1B - Vent Lengths of Category I Vent with Single-Wall Connector to Double-Wall Vent for Model UDAP-CV 60, 75, or 100

Model UDAP-CV Size	Vent Diameter		H		L	
	inches	mm	ft	M	ft	M
60	4	102	6	1.8	2	0.6
			8	2.4	2	0.6
			10	3	2	0.6
			15	4.6	2	0.6
			20	6.1	2	0.6
75	4	102	6	1.8	2	0.6
			8	2.4	4	1.2
			10	3.0	4	1.2
			15	4.6	5	1.5
			20	6.1	5	1.5
100	5	127	6	1.8	4	1.2
			8	2.4	4	1.2
			10	3.0	5	1.5
			15	4.6	5	1.5
			20	6.1	5	1.5

2.0 SECTION 1 - Requirements and Instructions for Venting a Single Category I Model UDAP-CV (cont'd)

2.4 SECTION 1 - Condensation

2.5 SECTION 1 - Vent System Support

2.6 SECTION 1 - Vent Terminal

2.7 SECTION 1 - Clearance to Combustibles

2.3 SECTION 1 - Vent System Joints/Sealing

Vent system joints depend on the type of pipe:

- **Single-wall pipe**, 26-gauge or heavier galvanized, secure each slip-fit connection with three sheetmetal screws or rivets. When connecting the single-wall pipe to the Type B double-wall pipe, use an adapter made by the Type B double-wall pipe manufacturer for connection of their Type B double-wall pipe to single-wall pipe. Follow the Type B double-wall pipe manufacturer's instructions.
- **Type B double-wall pipe**, follow the pipe manufacturer's instructions for joining and securing the pipe sections. If Type B double-wall pipe is connected to the vent collar on the Model UDAP-CV, use an adapter made by the Type B double-wall pipe manufacturer for that purpose. Follow the Type B double-wall pipe manufacturer's instructions.

CAUTION: Exceeding the specified vent pipe diameter and length may result in condensate forming in the vent pipe.

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 the vent pipe be fitted with a tee, a drip leg, and a cleanout cap to prevent moisture in the vent pipe from entering the unit. The drip leg should be inspected and cleaned out periodically during the heating season.

A single-wall vent pipe run 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" foil-faced fiberglass, 1-1/2# density insulation.

The horizontal vent run **must be pitched down toward the terminal end** 1/4" per foot for condensate drainage. The slope applies to the entire length of the horizontal vent run. Failure to pitch the vent run properly may damage the heater due to condensate running back into the unit.

Use non-combustible supports on vent pipe. Support lateral runs every six feet (1.8M). Support vertical runs of Type B double-wall vent pipe in accordance with the requirements of the pipe manufacturer. Support lateral single-wall pipe in accordance with accepted industry practices. Do not rely on the heater for support of either horizontal or vertical vent pipe.

The vent terminal should be a minimum of six feet (1.8M) from adjoining buildings. The vent terminal should be six inches (152mm) higher than the anticipated snow depth but no less than two feet (610mm) above the roof. Where the vent extends through the roof, a clearance thimble is required when the flue pipe extends through combustible materials; follow the requirements of the double-wall pipe manufacturer.

Terminate with a Reznor Option CC1 vent cap.

Maintain 6 inches (152 mm) clearance between a single-wall vent pipe and combustibles.

For Type B double-wall vent pipe, follow the pipe manufacturer's recommendations for clearance to combustibles.

3.0 SECTION 2 - Requirements and Instructions for Category I Common Venting of a Model UDAP-CV

Comply with these requirements to common vent a Model UDAP-CV as a Category I appliance with other Category I appliance(s).

DANGER: A Model UDAP-CV heater is designed for a Category I common venting application. Common venting is when two or more Category I appliances are vented into a single vertical vent. The installer must comply with the venting requirements listed in this section, instructions provided with other appliances that are to be commonly vented with the Model UDAP-CV, and local codes. Verify that any appliances being commonly vented with the Model UDAP-CV are designed for Category I common venting. Failure to comply will result in severe personal injury or death and/or property damage.

3.1 SECTION 2 - Category I Common Vent General Definitions

Common Vent: The vertical portion of the venting system that conveys the vent gas streams from all the appliances connected in common. (See examples in FIGURES 2A and 2B.)

Vent Connector: The individual horizontal length of vent pipe from each appliance to the vertical common vent is the vent connector. (See FIGURES 2A and 2B.)

Vent Connector Rise: The vent connector rise is the vertical distance measurement from the appliance outlet to the centerline where the vent gas streams come together. The maximum rise permitted is three feet (.9M). (See FIGURES 2A and 2B.)

FIGURE 2A - Typical Common Vent Application of a Model UDAP-CV and another Category I appliance using a Type B Double-Wall Common Vent

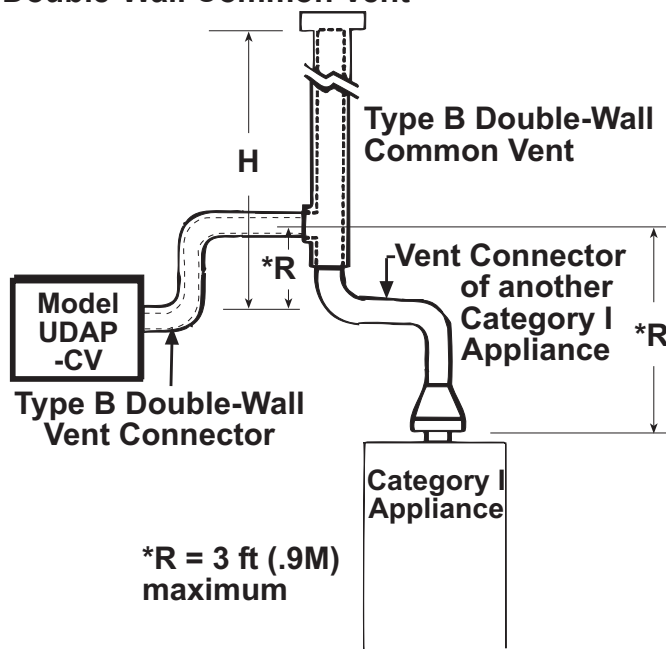
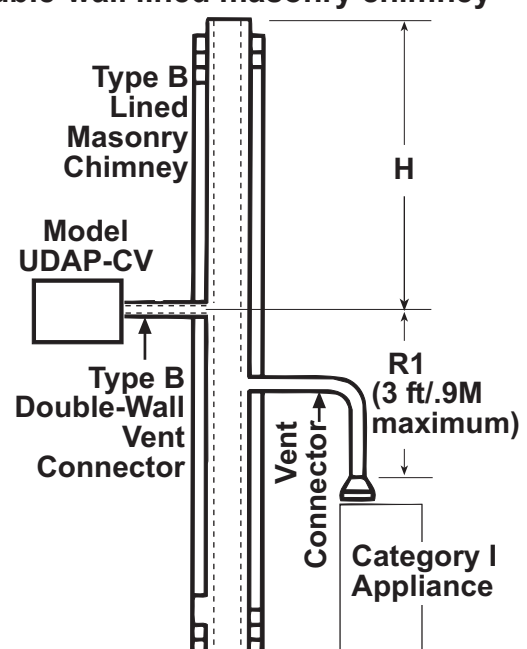


FIGURE 2B - Typical Common Vent Application of a Model UDAP-CV and another Category I appliance venting into a Type B double-wall lined masonry chimney



H = Common Vent Height

Definition - The common vent height is the vertical distance measurement from the highest draft hood outlet or flue collar to the vent cap or chimney outlet of the common vent.

R = Vent Connector Rise (3ft/.9M maximum)

Definition - The vent connector rise is the vertical distance measurement from each heater or appliance outlet to the centerline where the vent gas streams come together.

3.0 SECTION 2 - Requirements and Instructions for Category I Common Venting of a Model UDAP-CV (cont'd)

3.1 SECTION 2 - Model UDAP-CV Category I Common Venting Instructions

These instructions apply to the proper installation of a Model UDAP-CV in a common vent application. The information provided is based on material published in the National Fuel Gas Code and engineering calculations. The Model UDAP-CV is a fan assisted (FAN) Category I heater. Instructions for the proper installation of other appliances connected in common with the Model UDAP-CV unit heater should be obtained from the manufacturer's instructions or the National Fuel Gas Code. In the case of conflicting instructions the most conservative instruction must be applied.

The vertical portion of the common vent must be Type B double-wall or a masonry chimney lined with Type B double-wall pipe. Refer to **TABLE 4A** to determine the vent diameter required for the combined BTU/H input capacities of all appliances to be connected and the height of the common vent portion of the venting system. In **TABLE 4A**, "FAN" refers to fan assisted appliances and "NAT" refers to appliances that rely solely on the natural buoyancy of the vent gases for venting.

TABLE 4A - Common Vent Capacity when a Category I Model UDAP-CV is Installed with other Category I Appliance(s)*

Vertical Height of Vent		Type B Double-Wall Common Vertical Vent ¹ Diameter					
		5 inches		6 inches		7 inches	
		Maximum Combined Input Rating of the Appliances (mbh)					
ft	M	FAN + FAN	FAN + NAT	FAN + FAN	FAN + NAT	FAN + FAN	FAN + NAT
6	1.8	NA	102	180	142	274	220
7	2.1	NA	108	188	149	286	231
8	2.4	147	113	196	156	298	242
10	3.0	170	123	213	170	321	263
15	4.6	187	143	248	199	374	309
20	6.1	212	159	275	222	417	345
30	9.1	241	182	315	257	480	401

* If a conflict in capacity occurs with other instructions, the more conservative capacity must be chosen.

¹ This table may also be used for Type B double-wall lined masonry chimneys.

If single-wall pipe is used in the horizontal vent connector, refer to **TABLE 4B** to determine the maximum horizontal vent connector length permitted.

If double-wall pipe is used in the horizontal vent connector, refer to **TABLE 4C** to determine the maximum horizontal vent connector length permitted. Two elbows may be used in the horizontal vent connection with a maximum rise of three feet (.9M).

NOTE: When two or more vent connectors enter a common vent, the smaller connector shall enter at the highest level consistent with available headroom or clearances to combustible material.

TABLE 4B - Maximum Horizontal Length of Single-Wall Connector Pipe for Model UDAP-CV* (Category I Common Vent)

Vertical Height of Vent		UDAP-CV Model Size				
		30	45	60	75	100
		Diameter of Vent Connector (inches)				
ft	M	4	4	4	4	5
6	1.8	0	0	2	3	3
7	2.1	2	2	2	3	3
8	2.4	3	3	3	3	3
10	3.0	3	4	4	4	4
15	4.6	3	4	5	5	6
20	6.1	3	4	5	5	6
30	9.1	3	4	5	5	6

* For the proper vent connector length and diameter of other appliances connected in common with the Model UDAP-CV unit heater, refer to the appliance manufacturer's instructions or the National Fuel Gas Code.

TABLE 4C - Maximum Horizontal Length of Type B Double-Wall Connector Pipe for Model UDAP-CV* (Category I Common Vent)

Vertical Height of Vent		UDAP-CV Model Size				
		30	45	60	75	100
		Diameter of Vent Connector (inches)				
ft	M	4	4	4	4	5
6	1.8	2	2	2	2	3
7	2.1	3	3	3	3	4
8	2.4	4	4	4	4	5
10	3.0	5	5	5	5	6
15	4.6	5	5	6	6	7.5
20	6.1	5	6	6	6	7.5
30	9.1	5	6	6	6	7.5

* For the proper vent connector length and diameter of other appliances connected in common with the Model UDAP-CV unit heater, refer to the appliance manufacturer's instructions or the National Fuel Gas Code.

3.2 SECTION 2 - Vent System Joints/Sealing

Vent system joints depend on the type of pipe:

- **Single-wall pipe**, 26-gauge or heavier galvanized, secure each slip-fit connection with three sheetmetal screws or rivets. When connecting the single-wall pipe to the Type B double-wall pipe, use an adapter made by the Type B double-wall pipe manufacturer for connection of their Type B double-wall pipe to single-wall pipe. Follow the Type B double-wall pipe manufacturer's instructions.
- **Type B double-wall pipe**, follow the pipe manufacturer's instructions for joining and securing the pipe sections. If Type B double-wall pipe is connected to the vent collar on the Model UDAP-CV, use an adapter made by the Type B double-wall pipe manufacturer for that purpose. Follow the Type B double-wall pipe manufacturer's instructions.

3.3 SECTION 2 - Condensation

CAUTION: Exceeding the specified vent pipe diameter and length may result in condensate forming in the vent pipe.

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 the vent pipe be fitted with a tee, a drip leg, and a cleanout cap to prevent moisture in the vent pipe from entering the unit. The drip leg should be inspected and cleaned out periodically during the heating season.

A single-wall vent pipe run 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" foil-faced fiberglass, 1-1/2# density insulation.

The horizontal vent run **must be pitched down toward the terminal end** 1/4" per foot for condensate drainage. The slope applies to the entire length of the horizontal vent run. Failure to pitch the vent run properly may damage the heater due to condensate running back into the unit.

3.4 SECTION 2 - Vent System Support

Use non-combustible supports on vent pipe. Support lateral runs every six feet (1.8M). Support vertical runs of Type B double-wall vent pipe in accordance with the requirements of the pipe manufacturer. Support lateral single-wall pipe in accordance with accepted industry practices. Do not rely on the heater for support of either horizontal or vertical vent pipe.

3.0 SECTION 2 - Requirements and Instructions for Category I Common Venting of a Model UDAP- CV (cont'd)

3.5 SECTION 2 - Vent Terminal

The vent terminal should be a minimum of six feet (1.8M) from adjoining buildings. The vent terminal should be six inches (152mm) higher than the anticipated snow depth but no less than two feet (610mm) above the roof. Where the vent extends through the roof, a clearance thimble is required when the flue pipe extends through combustible materials; follow the requirements of the double-wall pipe manufacturer.

Terminate with a Reznor Option CC1 vent cap.

3.6 SECTION 2 - Clearance to Combustibles

Maintain 6 inches (152 mm) clearance between a single-wall vent pipe and combustibles.

For Type B double-wall vent pipe, follow the pipe manufacturer's recommendations for clearance to combustibles.

