

VENTING INSTRUCTIONS FOR UNIT HEATERS

MODEL UBX: STANDARD POWER VENT BLOWER TYPE MODEL UDX: STANDARD POWER VENT FAN TYPE

GENERAL INFORMATION

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.

Important Safety Information

Please read all information in this manual thoroughly and become familiar with the capabilities and use of your appliance before attempting to operate or maintain this unit. 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: A danger statement describes a potentially hazardous situation that if not avoided, will result in severe personal injury or death and/or property damage.

WARNING: A warning statement describes a potentially hazardous situation that if not avoided, can result in severe personal injury and/or property damage.

CAUTION: A caution statement describes a potentially hazardous situation that if not avoided, can result in minor or moderate personal injury and/or property damage.

NOTE: A note provides important information that should not be ignored.

⚠ CAUTION ⚠

These units 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.

⚠ DANGER ⚠

- 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, 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.
 - 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.
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Venting Requirements

- These unit heaters are certified as Category III heaters and are designed to operate safely and efficiently with either a horizontal or vertical vent. Comply with the specific requirements and instructions.
- These unit heaters are certified for commercial/industrial installation. Model UDX heaters in unit sizes 030, 045, 060, 075, 100, and 125 are also certified for residential 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.

GENERAL INFORMATION—CONTINUED

Venting Requirements—Continued

- Venting must be in accordance with local codes and with 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.

⚠ CAUTION ⚠

- **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.**
 - **Do not vent into an existing gravity vent or chimney.**
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Venter (Flue) Outlet Diameter

- Depending on the size of vent pipe, either attach the vent pipe directly to the collar or to a taper-type connector.
- For category I vent pipe, attach a 4-inch appliance adapter (available from the category I pipe manufacturer) directly to the collar and then use a reducer if using 3-inch pipe.
- For category III vent pipe, attach a 4-inch appliance adapter (available from the category III pipe manufacturer) directly to the collar and then use a reducer if using 3-inch pipe.
- Refer to [Table 1](#) for venter (flue) outlet diameters.

Vent System Sealing

Vent system joints depend on the type of pipe being used:

- **Category III pipe:** follow manufacturer's instructions for joining pipe sections—connect venter outlet or the vent cap using secure, sealed joints that follow a procedure best suited to the style of Category III pipe being used.
- **Single-wall galvanized pipe (26-gauge or heavier):** secure slip-fit connections using sheet metal screws or rivets—seal all joints and seams inside the building using aluminum tape or silicone sealant.
- **Double-wall type B vent pipe:** join pipe sections in accordance with the pipe manufacturer's requirement—refer to the illustrated instructions in [APPENDIX A](#) to connect double-wall pipe to the heater collar, single-wall pipe, and vent cap.

Table 1. Venter (Flue) Outlet Diameter

Unit Size		
030–125	150–250	300, 350, 400
Inches (mm)		
4 (102)	5 (127)	6 (152)

Vent System Support Requirements

- Support horizontal runs every six feet (1.8 meters).
- Support vertical runs—of type B double-wall, category I, or 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.**
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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.**
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Vent Terminal (Type of Pipe and Vent Cap) Requirements

⚠ DANGER ⚠

- **To prevent combustion products from entering the occupied space, all vent terminations 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.**
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⚠ WARNING ⚠

- **A different style vent cap could cause nuisance problems or unsafe conditions. The vent cap must be the same size as the vent pipe.**
 - **Do not locate a vent termination where it may cause hazardous frost or ice accumulations on adjacent property surfaces.**
 - **Maintain the required clearance from the wall to the vent terminal cap for stability under wind conditions and to protect the building.**
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- Refer to [Table 2](#) for horizontal vent terminals.
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NOTE: 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.

GENERAL INFORMATION—CONTINUED

Vent Terminal (Type of Pipe and Vent Cap) Requirements—Continued

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.	

- 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 a horizontal distance to any vertical wall or similar obstruction of 8 feet or greater, the vent must terminate above the roof in accordance with [Figure 1](#) and [Table 3](#).
 - For double wall vent pipe and a horizontal distance to any vertical wall or similar obstruction of less than 8 feet, the vent must terminate at least 2 feet above the highest point where it passes through a roof of a building and at least 2 feet higher than any portion of a building within a horizontal distance of 10 feet (refer to [Table 3](#)).

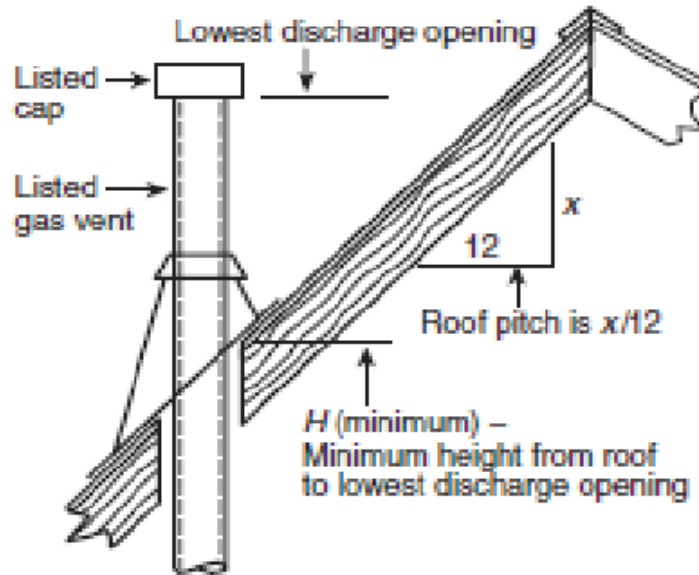


Figure 1. Roof Slope and Pitch

Roof Slope												
Flat to 6/12	Over 6/12–7/12	Over 7/12–8/12	Over 8/12–9/12	Over 9/12–10/12	Over 10/12–11/12	Over 11/12–12/12	Over 12/12–14/12	Over 14/12–16/12	Over 16/12–18/12	Over 18/12–20/12	Over 20/12–21/12	
Dimension H (Feet (Meters))*												
1.0 (0.30)	1.25 (0.38)	1.5 (0.46)	2.0 (0.61)	2.5 (0.76)	3.25 (0.99)	4.0 (1.22)	5.0 (1.52)	6.0 (1.83)	7.0 (2.13)	7.5 (2.27)	8.0 (2.44)	
*See Figure 1 . Termination locations for gas vents with listed caps 12" (300 mm) or less in size at least 8" (2.4 meters) from a vertical wall.												

INSTALLATION

Installation instructions vary depending on the installation type: commercial/industrial or residential. For commercial/industrial installations, refer to the [Instructions for Commercial/Industrial Installations \(Model UBX or UDX, All Unit Sizes\)](#) section. For residential installations, refer to the [Instructions for Residential Installations \(Model UDX, Unit Sizes 030, 045, 060, 075, 100, 125\)](#) section. For vertically-vented category I installations, refer to the [Instructions for Commercial/Industrial or Residential Installations \(Model UDX, Unit Sizes 030, 045, 060, 075, Vertical Category I\)](#) section.

Instructions for Commercial/Industrial Installations (Model UBX or UDX, All Unit Sizes)

A commercial/industrial installation may have either a horizontal or a vertical vent run. Install vent as follows:

1. Select vent pipe:
 - a. For either horizontal or vertical vent run, select vent pipe approved to UL standard 1738 for category III appliance or appropriately-sealed 26-gauge or heavier galvanized steel or equivalent single-wall pipe.
 - b. If at least 75% of equivalent length of the vent run is vertical, select double-wall type B vent pipe. If connecting double-wall pipe to heater, follow instructions in [APPENDIX A](#).
2. Determine vent pipe diameter and length:
 - a. Minimum vent length is 3 feet (1 meter).
 - b. Use only one diameter of vent pipe for installation (refer to [Table 4](#)).

Table 4. Vent (Horizontal or Vertical) Pipe Diameters and Lengths

Unit Size	Vent Pipe Diameter (Inches (mm))	Feet (Meters)			Venter Outlet Connection**
		Maximum Vent Length	Equivalent Straight Length*		
			90-Degree Elbow	45-Degree Elbow	
030	3 (76)	20 (6.1)	3 (0.9)	1.5 (0.5)	4- to 3-inch (102- to 76-mm) reducer***
	4 (102)	10 (3)	2 (0.6)	1 (0.3)	—
045	3 (76)	20 (6.1)	3 (0.9)	1.5 (0.5)	4- to 3-inch (102- to 76-mm) reducer***
	4 (102)	10 (3)	2 (0.6)	1 (0.3)	—
060	3 (76)	30 (9.1)	4 (1.2)	2 (0.6)	4- to 3-inch (102- to 76-mm) reducer***
	4 (102)	15 (4.6)	2 (0.6)	1 (0.3)	—
075	4 (102)	30 (9.1)	4 (1.2)	2 (0.6)	—
100	4 (102)	40 (12.2)	5 (1.5)	2.5 (0.8)	—
125	4 (102)	40 (12.2)	5 (1.5)	2.5 (0.8)	—
150	5 (127)	35 (10.7)	5 (1.5)	2.5 (0.8)	—
175	5 (127)	35 (10.7)	5 (1.5)	2.5 (0.8)	—
200	5 (127)	50 (15.2)	5 (1.5)	2.5 (0.8)	—
225	5 (127)	50 (15.2)	5 (1.5)	2.5 (0.8)	—
250	5 (127)	50 (15.2)	5 (1.5)	2.5 (0.8)	—
300	6 (152)	50 (15.2)	5 (1.5)	2.5 (0.8)	—
350	6 (152)	50 (15.2)	7 (2.1)	3.5 (1.1)	—
	7 (178)	50 (15.2)	4.5 (1.4)	2.25 (0.7)	6- to 7-inch (152- to 178-mm) enlarger
400	6 (152)	50 (15.2)	8 (2.4)	4 (1.2)	—
	7 (178)	50 (15.2)	5 (1.5)	2.5 (0.8)	6- to 7-inch (152- to 178-mm) enlarger

*Add all straight sections and equivalent lengths for elbows—the total combined length must not exceed the maximum vent length.
 **Field-supplied taper-type connection required at the venter outlet.
 ***Refer to [APPENDIX B](#).

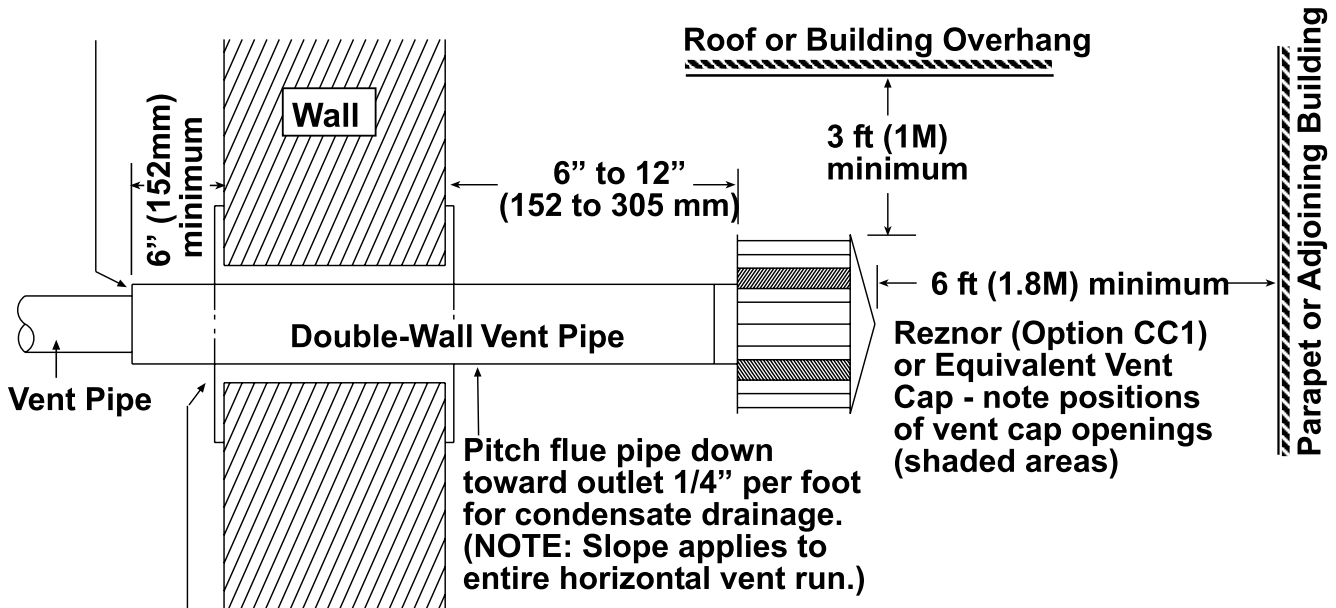
3. Determine venter (flue) outlet diameter (refer to [Venter \(Flue\) Outlet Diameter](#) section).
4. Make all vent pipe joint connections in accordance with [Vent System Sealing](#) section.
5. Support all vent pipe runs in accordance with [Vent System Support Requirements](#) section.
6. Take appropriate steps to mitigate condensation in accordance with [Condensation Mitigation](#) section.

NOTE: Ensure that terminal vent pipe is double-wall type B pipe.

INSTALLATION—CONTINUED

Instructions for Commercial/Industrial Installations (Model UBX or UDX, All Unit Sizes)—Continued

7. Terminate vent as follows:
 - a. Install double-wall type B terminal vent pipe (connect in accordance with [APPENDIX A](#)) and terminate vent with option CC1 or CC21 vent cap or Novavent #2NVTB4 vent cap.
 - b. Refer to instructions shown in [Figure 2](#) to install horizontal vent terminal.



Approved clearance thimble is required when flue pipe extends through combustible materials. Follow the requirements of the thimble and/or the vent pipe manufacturer.

Figure 2. Horizontal Vent Terminal (Commercial/Industrial Installations)

- c. Refer to instructions shown in [Figure 3](#) to install vertical vent terminal.
- d. Ensure that vent terminal is installed in accordance with [Vent Terminal \(Type of Pipe and Vent Cap\) Requirements](#) section.

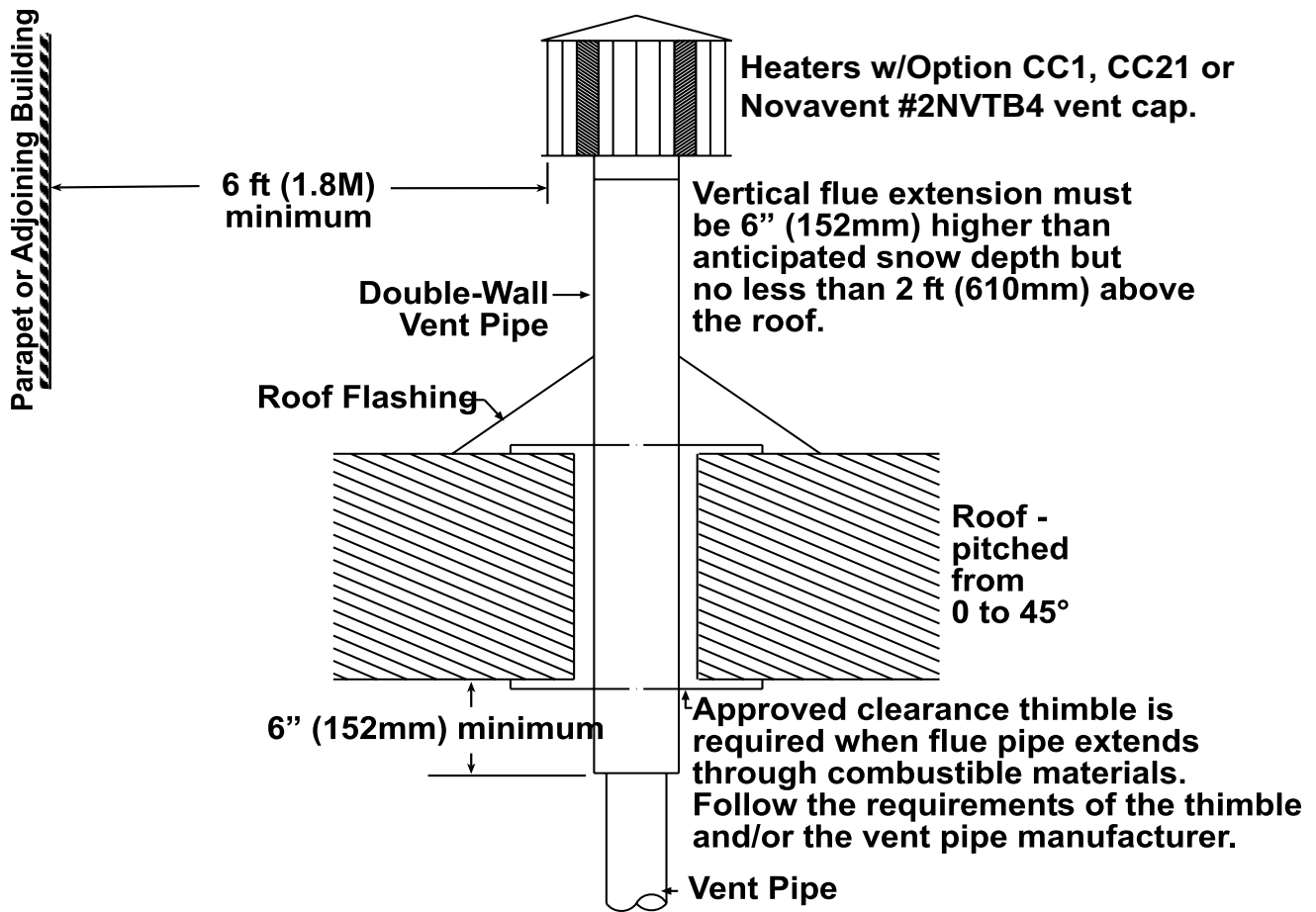


Figure 3. Vertical Vent Terminal (Commercial/Industrial Installations)

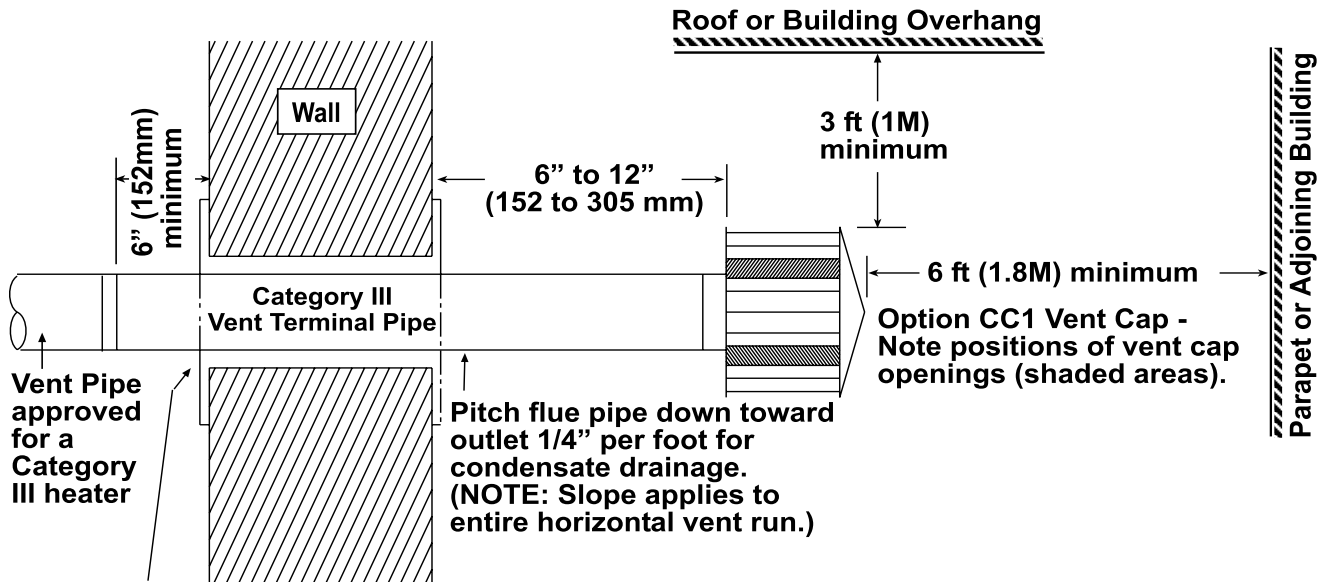
Instructions for Residential Installations (Model UDX, Unit Sizes 030, 045, 060, 075, 100, 125)

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 model UDX units. Some venting requirements will vary, however, depending on whether the vent is horizontal or vertical. Install vent as follows:

1. Select vent pipe approved to UL standard 1738 for category III appliance for either horizontal or vertical vent run.
2. Determine vent pipe diameter and length:
 - a. Minimum vent length is 3 feet (1 meter).
 - b. Use only one diameter of vent pipe for installation (refer to [Table 4](#)).
3. Determine venter (flue) outlet diameter (refer to [Venter \(Flue\) Outlet Diameter](#) section).
4. Make all vent pipe joint connections in accordance with [Vent System Sealing](#) section.
5. Support all vent pipe runs in accordance with [Vent System Support Requirements](#) section.
6. Take appropriate steps to mitigate condensation in accordance with [Condensation Mitigation](#) section.
7. Terminate vent as follows:
 - a. Install UL standard 1738 approved category III vent pipe and terminate vent with option CC1 or CC21 vent cap or Novavent #2NVTB4 vent cap.
 - b. Refer to instructions shown in [Figure 4](#) and to [Table 2](#) to install horizontal vent terminal.

INSTALLATION—CONTINUED

Instructions for Residential Installations (Model UDX,
Unit Sizes 030, 045, 060, 075, 100, 125)—Continued



Approved clearance thimble is required when the flue pipe extends through combustible materials. Follow the requirements of the thimble and/or Category III vent pipe manufacturer.

Figure 4. Horizontal Vent Terminal (Residential Installations)

- c. Refer to instructions shown in [Figure 5](#) to install vertical vent terminal.
- d. Ensure that vent terminal is installed in accordance with [Vent Terminal \(Type of Pipe and Vent Cap\) Requirements](#) section.

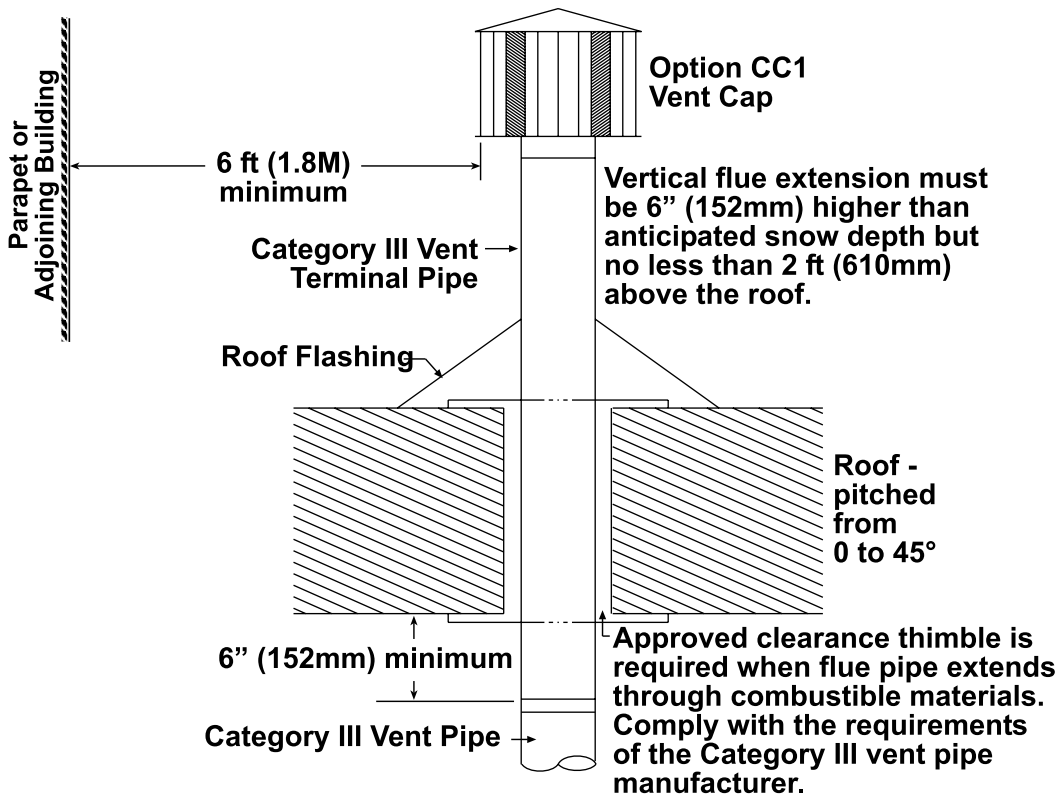


Figure 5. Vertical Vent Terminal (Residential Installations)

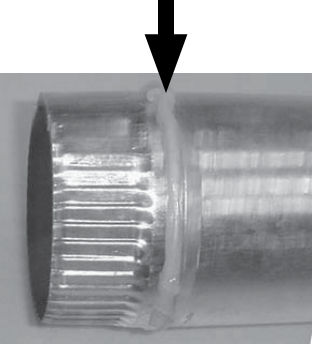
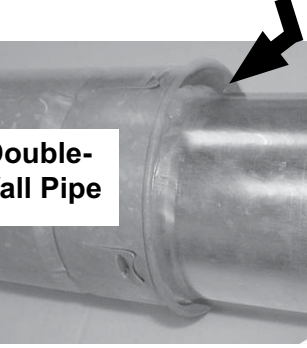
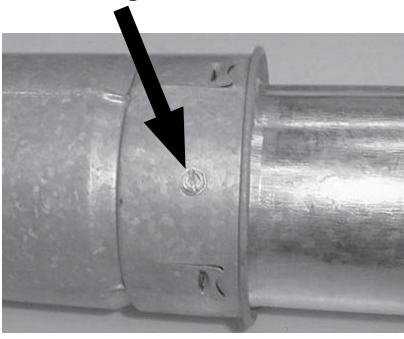
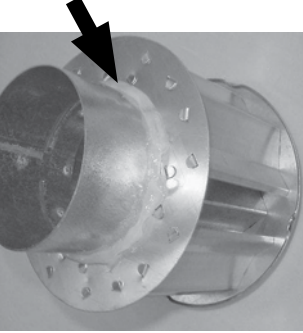
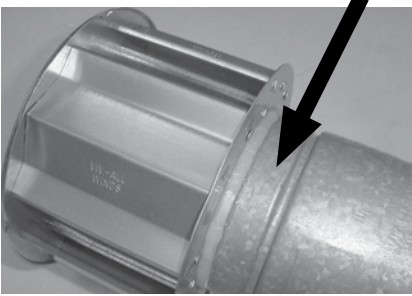

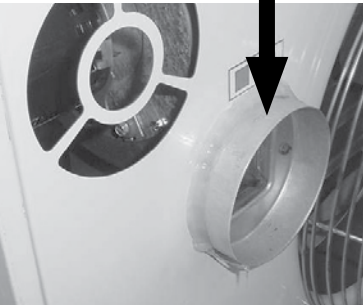
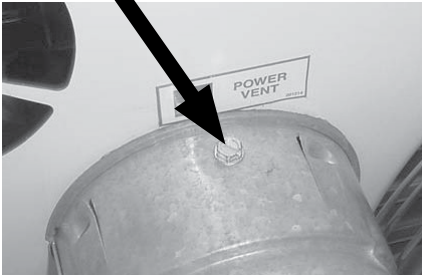
Instructions for Commercial/Industrial or Residential Installations (Model UDX, Unit Sizes 030, 045, 060, 075, Vertical Category I)

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. Install vent as follows:

1. Select type of pipe for standard vertical (category I) vent. Double-wall vent pipe is recommended. Use single-wall vent pipe if requirements of the National Fuel Gas Code are followed. All pipe must be UL listed for category I appliances.
2. Determine vent pipe diameter and length for vertical vent. Use only one diameter of vent pipe for installation (refer to [Table 4](#)).
3. Determine venter (flue) outlet diameter (refer to [Venter \(Flue\) Outlet Diameter](#) section).
4. Make all vent pipe joint connections in accordance with [Vent System Sealing](#) section.
5. Support all vent pipe runs in accordance with [Vent System Support Requirements](#) section.
6. Take appropriate steps to mitigate condensation in accordance with [Condensation Mitigation](#) section.
7. Terminate vent as follows:
 - a. Install UL listed category I terminal vent pipe and terminate vent with option CC1 or CC21 vent cap or Novavent #2NVTB4 vent cap.
 - b. Refer to instructions shown in [Figure 4](#) to install vertical vent terminal.
 - c. Ensure that vent terminal is installed in accordance with [Vent Terminal \(Type of Pipe and Vent Cap\) Requirements](#) section.

APPENDIX A: INSTRUCTIONS FOR ATTACHING DOUBLE-WALL TYPE B VENT PIPE TO SINGLE-WALL PIPE

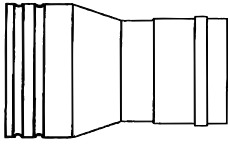

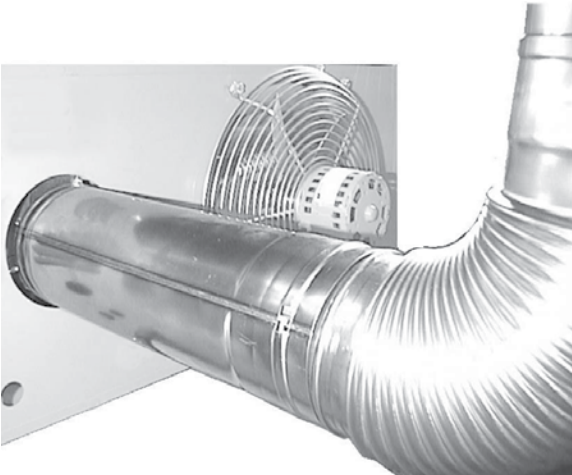
NOTE: Work quickly to assemble components before sealant dries.

<p>STEP 1: Place continual 1/4-inch bead of silicone sealant around circumference of single-wall pipe.</p> 	<p>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.</p> 	<p>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.</p> 
<p>STEP 4: Place continual 3/8-inch bead of silicone sealant around the circumference of vent cap collar to prevent any water inside vent cap from running down double-wall pipe.</p> 	<p>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.</p> 	<p>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.</p> 
<p>STEP 7: Place continual 1/4-inch bead of silicone sealant around circumference of venter outlet collar.</p> 	<p>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.</p> 	

APPENDIX B: INSTRUCTIONS FOR INSTALLING FLEX-L BRAND CATEGORY III VENT PIPE

NOTES:

- **SUPPLIER NOTE:** The adapters for Flex-L vent pipe, which are not available from the heater manufacturer, 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-inch (102-mm) venter outlet.
- Work quickly to assemble components before sealant dries.

 <p>Vent flow →</p>	<ul style="list-style-type: none">• Adapter reducer, Flex-L #SRARZA43, for 3-inch (76-mm) diameter vent pipe• 4- to 3-inch (102- to 76-mm) diameter, 6-3/4 inches long• Specially-designed for attaching Flex-L brand category III vent pipe to unit• For unit sizes 030, 045, and 060
 <p>Vent flow →</p>	<ul style="list-style-type: none">• Adapter pipe, Flex-L #SRARZA4, for 4-inch (102-mm) diameter vent pipe• 4-inch (102-mm) diameter, 12-inch-long• Specially-designed for attaching Flex-L brand category III vent pipe to unit• For unit sizes 030, 045, 060, 075, 100, and 125
	<ul style="list-style-type: none">• Flex-L brand elbow• Attached to 12-inch (305-mm) adapter pipe• Extend vent in any direction above horizontal

1. Attach adapter pipe or reducer to venter collar:

- a. Place continual bead (see [Figure B1](#), DETAIL A) of high-temperature silicone around inside of pipe on end of adapter or reducer that attaches to venter collar (end of adapter with double emboss without locking ring hole).
- b. Push adapter pipe or reducer over flue collar.
- c. Drill 1/8-inch hole on top of overlap and secure joint using sheet metal screw (see [Figure B1](#), DETAIL B).

APPENDIX B: INSTRUCTIONS FOR INSTALLING FLEX-L BRAND CATEGORY III VENT PIPE—CONTINUED

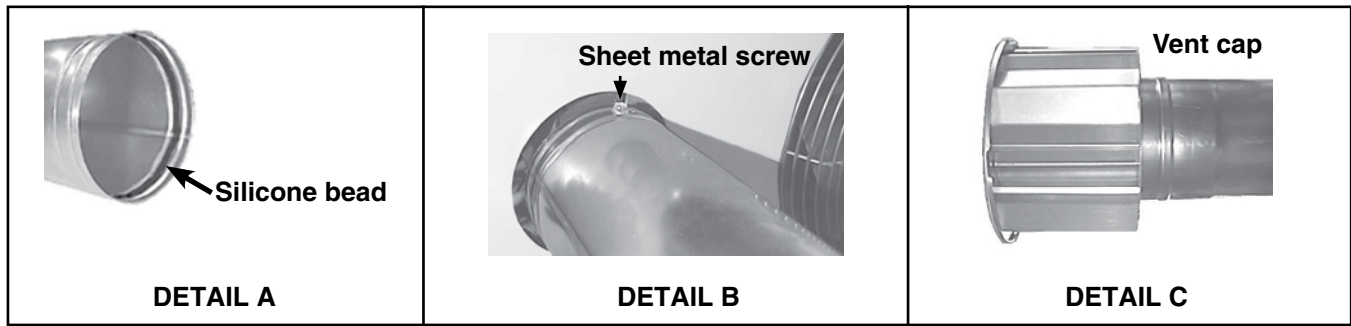


Figure B1. Reducer and Vent Cap

2. Run vent pipe:

- Determine vent length in accordance with residential or commercial/industrial vent length requirements in [Installation](#) section.
- If using 4- to 3-inch (102- to 76-mm) reducer, follow vent pipe manufacturer's instructions to attach straight piece of 3-inch diameter horizontal pipe or elbow in any direction above horizontal. If using 4-inch (102-mm) diameter 12-inch (305-mm) long adapter pipe, follow vent pipe manufacturer's instructions to attach elbow in any direction above horizontal or straight horizontal pipe.
- Follow pipe manufacturer's instructions to connect vent pipe sections and install vent pipe run—length of vent must not exceed maximum allowed for heater being installed.
- Extend vent pipe through wall or roof to outdoors. Approved clearance thimble is required when flue pipe extends through combustible materials. Follow requirements of pipe and thimble manufacturer. Be sure to comply with local and national codes when selecting vent terminal location. Vent pipe installer is responsible for following manufacturer's instructions and complying with all applicable codes.

3. Attach vent cap (see [Figure B1](#), [DETAIL C](#)):

- Use option CC1 or CC21 vent cap or Novavent #2NVTB4 vent cap.
- Slide vent cap collar into vent pipe.
- Drill three evenly-spaced 1/8-inch holes around end of vent pipe through pipe and vent cap and secure joint using sheet metal screws.

