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 P/N 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 & UDBS

1.1 Type of Pipe ........................................... 3
1.2 Venter Outlet and Combustion Air Inlet ...... 3
1.3 Pipe Diameter and Length ......................... 4
1.4 Joints and Sealing .................................. 4
1.5 Support .................................................. 5
1.6 Clearance .............................................. 5
1.7 Condensation ........................................ 6
1.8 Concentric Adapter Box ............................. 6

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?

The requirements in Venting Requirement 1.1, Type of Vent Pipe, are not the same for Residential and Commercial/Industrial installations. Other venting requirements (1.2 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 30, 45, 60, 75, 100, and 125 are certified for residential use.

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Horizontal or Vertical Vent Pipe Run</strong></td>
<td>Vent pipe approved to UL Std 1738 for a Category III appliance is required. The horizontal section of pipe in the vent terminal that extends through the box and runs concentric through the combustion air pipe must be one-piece with no joints.</td>
</tr>
<tr>
<td><strong>Horizontal Vent Terminal (using Option CC6 Kit)</strong></td>
<td>Double-wall vent pipe approved to UL Std 1738 for a Category III appliance is required. 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.</td>
</tr>
<tr>
<td><strong>Vertical Vent Terminal (using Option CC2 Kit)</strong></td>
<td>Sealed, single-wall galvanized pipe is recommended for inlet air run and terminal combustion air pipe.</td>
</tr>
</tbody>
</table>

### 1.1.2 Commercial/Industrial Installation - Pipe Requirements

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Horizontal or Vertical Vent Pipe Run</strong></td>
<td>Vent pipe approved for a Category III appliance OR single-wall, 26-gauge or heavier galvanized or equivalent vent pipe is required between the heater and the concentric adapter box. The horizontal section of pipe in the vent terminal that extends through the box and runs concentric through the combustion air pipe must be one-piece with no joints.</td>
</tr>
<tr>
<td><strong>Horizontal Vent Terminal (using Option CC6 Kit)</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Vertical Vent Terminal (using Option CC2 Kit)</strong></td>
<td>Sealed, single-wall galvanized pipe is recommended for inlet air run and terminal combustion air pipe.</td>
</tr>
</tbody>
</table>

#### FIGURE 1 - Rear of Heater showing Location of Inlet and Outlet Connections

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

<table>
<thead>
<tr>
<th>TABLE 1 - Heater Connections (diameter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UDAS and UDBS</td>
</tr>
<tr>
<td>Venter Outlet</td>
</tr>
<tr>
<td>Inlet Air Collar</td>
</tr>
</tbody>
</table>

#### Special Requirements at the Heater Connections

- Sizes 30, 45, and 60 - When using 3” diameter pipe, a 4” to 3” (102 to 76mm) 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 30, 45, and 60 - When using 3” diameter pipe, a 3” to 4” (76 to 102mm) 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 30, 45, 60, 75, 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 Maximum Length from Heater to Concentric Adapter Box

<table>
<thead>
<tr>
<th>UDAS and UDBS</th>
<th>Pipe Diameter</th>
<th>Maximum Length</th>
<th>Equivalent Straight Length for a 90° Elbow</th>
<th>Equivalent Straight Length for a 45° Elbow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vent Pipe</td>
<td>Inlet Air Pipe</td>
<td>feet M</td>
<td>feet M</td>
</tr>
<tr>
<td>30</td>
<td>3</td>
<td>76</td>
<td>15 4.6</td>
<td>2 0.6</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>102</td>
<td>10 3.0</td>
<td>2 0.6</td>
</tr>
<tr>
<td>45</td>
<td>3</td>
<td>76</td>
<td>15 4.6</td>
<td>2 0.6</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>102</td>
<td>10 3.0</td>
<td>2 0.6</td>
</tr>
<tr>
<td>60</td>
<td>3</td>
<td>76</td>
<td>25 7.6</td>
<td>3 0.9</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>102</td>
<td>10 15 4.6</td>
<td>3.0</td>
</tr>
<tr>
<td>75</td>
<td>4</td>
<td>102</td>
<td>10 15 4.6</td>
<td>3.0</td>
</tr>
<tr>
<td>100</td>
<td>4</td>
<td>102</td>
<td>35 10.7</td>
<td>4 1.2</td>
</tr>
<tr>
<td>125</td>
<td>4</td>
<td>102</td>
<td>35 10.7</td>
<td>4 1.2</td>
</tr>
<tr>
<td>150</td>
<td>5</td>
<td>127</td>
<td>152 30 9.1</td>
<td>4 1.2</td>
</tr>
<tr>
<td>175</td>
<td>5</td>
<td>127</td>
<td>152 30 9.1</td>
<td>4 1.2</td>
</tr>
<tr>
<td>200</td>
<td>5</td>
<td>127</td>
<td>152 40 12.2</td>
<td>4 1.2</td>
</tr>
<tr>
<td>225</td>
<td>5</td>
<td>127</td>
<td>152 40 12.2</td>
<td>4 1.2</td>
</tr>
<tr>
<td>250</td>
<td>5</td>
<td>127</td>
<td>152 40 12.2</td>
<td>4 1.2</td>
</tr>
<tr>
<td>300</td>
<td>6</td>
<td>152</td>
<td>152 45 13.7</td>
<td>5 1.5</td>
</tr>
<tr>
<td>350</td>
<td>6</td>
<td>152</td>
<td>152 45 13.7</td>
<td>5 1.5</td>
</tr>
<tr>
<td>400</td>
<td>6</td>
<td>152</td>
<td>152 45 13.7</td>
<td>5 1.5</td>
</tr>
</tbody>
</table>

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.

Table 3 - Diameters of Concentric (outdoor) Pipes

<table>
<thead>
<tr>
<th>UDAS and UDBS</th>
<th>30, 45, 60, 75, 100, 125</th>
<th>150, 175, 200, 225, 250, 300, 350, 400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet Air Pipe Diameter</td>
<td>6” (152mm)</td>
<td>8” (203mm)</td>
</tr>
<tr>
<td>Vent Pipe Diameter</td>
<td>4” (102mm)</td>
<td>5” (127mm)</td>
</tr>
</tbody>
</table>

1.4 Joints and Sealing

NOTE: Joints connecting double-wall pipe apply only to a vertical vent terminal (Option CC2 Vertical Vent/Combustion Air Kit). See Type of Pipe requirement on page 3.

Provide pipes as specified in Requirement No. 1.1, page 3, 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 sheetmetal screws or rivets. Seal all joints with aluminum tape or silicone sealant.

- 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 30, 45, 60, 75, 100, and 125 are certified for residential use.

**FIGURE 2 - Follow STEPS to join Double-Wall (Type B) Pipe and the Vent Terminal Cap**
(appplies only to vertical vent/combustion air kit Option CC2)

<table>
<thead>
<tr>
<th><strong>FIGURE 2 - STEP 1</strong></th>
<th><strong>FIGURE 2 - STEP 2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>

Do **STEP 2 immediately following STEP 1.**

**FIGURE 2 - STEP 3**
Secure the vent cap to the double-wall pipe by drilling and inserting a 3/4” (19mm) long sheetmetal screw into the vent cap collar. Do not overtighten screw.

---

**FIGURE 3 - Follow STEPS to join Double-Wall (Type B) Pipe to a Single-Wall Vent Pipe Run**
(NOTE: Comply with pipe requirements on page 3.)

<table>
<thead>
<tr>
<th><strong>FIGURE 3 - STEP 1</strong></th>
<th><strong>FIGURE 3 - STEP 2</strong></th>
<th><strong>FIGURE 3 - STEP 3</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>On the single-wall pipe or taper-type connector, place a continual 1/4” bead of silicone sealant around the circumference.</td>
<td>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.</td>
<td>Spaced equally around the double-wall pipe, drill three small holes below the sealant ring. Insert 3/4 inch (19mm) long sheetmetal screws to secure the joint. Do not overtighten screws.</td>
</tr>
</tbody>
</table>

Do **STEP 2 immediately following STEP 1.**

---

### 1.5 Support
Support horizontal run every six feet (1.8M).
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” (152mm) to combustible material.
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 30, 45, 60, or 75 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).
Applies to: Residential or Commercial/Industrial Installation
NOTE: Only UDAS 30, 45, 60, 75, 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. A vertical vent requires double-wall pipe and a slightly larger opening through the box. See TABLE 4 below and P/N list on page 9 or page 12.

| Table 4 - Diameter of Opening in the Box for Vent Pipe to Pass Through |
|-----------------|------------------|------------------|
| Vent Terminal Configuration | Sizes 30-125 inches | Sizes 150-400 inches |
| Horizontal (Option CC6)       | 4-1/16 103      | 5-1/16 129       |
| Vertical (Option CC2)         | 4-21/32 118     | 5-21/32 144      |

Pipe Connections at the Concentric Adapter Box

- If using 3” (76mm) diameter pipes, Sizes 30, 45, and 60 require a 3” to 4” (76 to 102mm) taper-type increaser in the vent pipe.

- If using 3” (76mm) diameter pipes, Sizes 30, 45, and 60 require a 4” to 3” (102 to 76mm) 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; refer to 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 30, 45, and 60 using 3” (76mm) diameter pipes

When using 3” (76mm) diameter pipes, Models UDAS and UDBS 30, 45, and 60 - Pipe diameters and connections required at the concentric adapter box when using 3” (76mm) diameter pipes.

{Image of concentric adapter box connections for sizes 30, 45, and 60 using 3” (76mm) diameter pipes

* Type of vent pipe must comply with requirements on page 3.
1.0 Venting and Combustion Air Requirements (cont’d)
1.8 Concentric Adapter Box (cont’d)

**FIGURE 8 - Concentric Adapter Box Connections for Sizes 30, 45, and 60 using 4” (102mm) diameter pipes and for all Sizes 75, 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.

<table>
<thead>
<tr>
<th>Model UDAS and UDBS Sizes</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>30, 45, 60 with 4” vent and combustion air runs from heater to concentric adapter box</td>
<td>inches 4</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>102</td>
<td>102</td>
<td>152</td>
</tr>
<tr>
<td>75, 100, 125</td>
<td>inches 4</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>102</td>
<td>102</td>
<td>152</td>
</tr>
<tr>
<td>150, 175, 200, 225, 250</td>
<td>inches 5</td>
<td>5</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>127</td>
<td>127</td>
<td>203</td>
</tr>
</tbody>
</table>

**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.

5” (127mm) diameter vent pipe (Type of pipe must comply with requirements on page 3.)

8” (203mm) diameter single-wall inlet air pipe

Requires a 6 to 5 inch (152 to 127mm) taper-type pipe diameter reducer a maximum of 6” (152mm) from the concentric adapter box.
HORIZONTAL OR VERTICAL VENT TERMINAL?

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

Horizontal, Option CC6, instructions begin below.

Vertical, Option CC2, instructions begin on page 12.

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

NOTE: Only UDAS 30, 45, 60, 75, 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 the Horizontal Vent/Combustion Air Terminal Package (Option CC6)

<table>
<thead>
<tr>
<th>Qty</th>
<th>Sizes</th>
<th>P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30-125</td>
<td>211762</td>
<td>Complete Horizontal Vent/Combustion Air Terminal Kit (Same as Option CC6)</td>
</tr>
<tr>
<td>1</td>
<td>150-400</td>
<td>211763</td>
<td>Concentric Adapter Box (NOTE: Refer to FIGURE 6, page 7, and verify diameter of vent pipe opening.)</td>
</tr>
<tr>
<td>1</td>
<td>30-125</td>
<td>211789</td>
<td>Exhaust Grill</td>
</tr>
<tr>
<td>1</td>
<td>150-400</td>
<td>211790</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>30-125</td>
<td>151755</td>
<td>Inlet Guard</td>
</tr>
<tr>
<td>1</td>
<td>150-400</td>
<td>124940</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>30-400</td>
<td>37661</td>
<td>#10-16 x 1/2&quot; long Screws to attach the exhaust grill and the inlet guard</td>
</tr>
<tr>
<td>2</td>
<td>30-400</td>
<td>207232</td>
<td>Brackets for attaching Concentric Adapter Box (See FIGURE 11, page 11.)</td>
</tr>
<tr>
<td>1</td>
<td>30-400</td>
<td>53335</td>
<td>Tube of High Temperature (450°F) Silicone Sealant</td>
</tr>
</tbody>
</table>

Field-supplied requirements:

- Vent pipes - see type requirements, page 3
- Combustion air pipes - see type requirements, page 3
- 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
- Sheetmetal 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
(in compliance with requirements on pages 3-8)

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 on page 4. In most applications, the terminal would be on a level with the heater mounting height. Allow 1/4” per foot (6mm per 305mm) 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, pages 11-12.

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.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Minimum Clearances for Vent Terminal Location (all directions unless specified)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forced air inlet within 10 ft (3.1M)*</td>
<td>3 ft (0.9M) above</td>
</tr>
<tr>
<td>Combustion air inlet of another appliance</td>
<td>6 ft (1.8M)</td>
</tr>
<tr>
<td>Door, window, or gravity air inlet</td>
<td>4 ft (1.2M) horizontally</td>
</tr>
<tr>
<td>Electric meter, gas meter ** and relief equipment</td>
<td>U.S. - 4 ft (1.2M) horizontally</td>
</tr>
<tr>
<td>Gas regulator **</td>
<td>Canada - 6 ft (1.8M)</td>
</tr>
<tr>
<td>Adjoining building or parapet</td>
<td>3 ft (0.9M) horizontally</td>
</tr>
<tr>
<td>Adjacent public walkways</td>
<td>6 ft (1.8M)</td>
</tr>
<tr>
<td>Grade (ground level)</td>
<td>7 ft (2.1M) above</td>
</tr>
</tbody>
</table>
| *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. The vent must be at least 6” (152mm) higher than anticipated snow depth.

2) Install the Vent Pipe and Combustion Air Pipe Runs
- 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, page 5. Comply with requirements concerning condensation in Paragraph 1.7.

3) Prepare a clearance hole through the outside wall for the combustion air pipe -- a 6” (152mm) diameter pipe for Sizes 30-125 or an 8” (203mm) diameter pipe for Sizes 150-400. Outside wall construction thickness should be 1” (25mm) 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” (102mm) to a maximum or 16” (406mm).

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

5) Attach the concentric adapter box to the wall.

Insert the combustion air pipe out through the wall. Attach the brackets (FIGURE 11) to the wall. On the outside, caulk or flash the inlet air pipe. Flashing is field-supplied.
6) On the outside, position the inlet air guard over the end of the combustion air pipe. See FIGURE 12, below and next page. 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” (152mm) 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” (76mm) and 6” (152mm) past the end of the combustion air pipe and no more than 6” (152mm) out of the box toward 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/6mm per 305mm) 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 sheetmetal 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 30, 45, or 60, install a taper-type reducer as illustrated in FIGURE 7, page 7.

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

FIGURE 12 - Installation of a Typical Separated-Combustion Unit with Horizontal Vent Terminal and Combustion Air Pipe (Option CC6) - continued on page 12
2.0 HORIZONTAL VENT INSTRUCTIONS - Option CC6 (cont’d)

2.2 Installation Instructions - Horizontal Vent/Combustion Air Kit Opt 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, pages 3-8, and FIGURE 12.

### TABLE 6 - Parts in the Vertical Vent Terminal/Combustion Air Package (Option CC2)

<table>
<thead>
<tr>
<th>UDAS/UDBS Sizes</th>
<th>X*</th>
<th>Y</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30, 45, 60, 75, 100</td>
<td>41</td>
<td>18</td>
<td>457</td>
</tr>
<tr>
<td>125, 150, 175, 200, 225</td>
<td>41</td>
<td>24</td>
<td>610</td>
</tr>
<tr>
<td>250, 300, 350, 400</td>
<td>62</td>
<td>36</td>
<td>914</td>
</tr>
</tbody>
</table>

*Minimum - Check & comply with local Codes.

Installation of the horizontal vent and combustion air system on your separated-combustion unit is complete. Verify compliance with all venting installation requirements, pages 3-8, and FIGURE 12.

### 3.0 VERTICAL VENT INSTRUCTIONS - Option CC2

#### 3.1 Components Required - Factory and Field

<table>
<thead>
<tr>
<th>Qty</th>
<th>Size</th>
<th>P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30-125</td>
<td>205895</td>
<td>Complete Vertical Vent Kit (Same as Option CC2)</td>
</tr>
<tr>
<td></td>
<td>150-400</td>
<td>205896</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>30-125</td>
<td>205884</td>
<td>Concentric Adapter Box (NOTE: Refer to FIGURE 6, page 7, and verify diameter of vent pipe opening.)</td>
</tr>
<tr>
<td></td>
<td>150-400</td>
<td>205885</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>30-125</td>
<td>110051</td>
<td>Exhaust (Vent) Terminal Assembly</td>
</tr>
<tr>
<td></td>
<td>150-400</td>
<td>110052</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>30-125</td>
<td>155635</td>
<td>Combustion Air Inlet Assembly</td>
</tr>
<tr>
<td></td>
<td>150-400</td>
<td>53330</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>30-400</td>
<td>207232</td>
<td>Brackets for attaching Concentric Adapter Box (See FIGURE 13, page 13.)</td>
</tr>
<tr>
<td>1</td>
<td>30-400</td>
<td>53335</td>
<td>Tube of High Temperature Silicone Sealant</td>
</tr>
</tbody>
</table>

Field-supplied requirements:

- Vent pipes - see type requirements, page 3
- Combustion air pipes - see type requirements, page 3
- Taper-type pipe diameter reducers and/or increasers as required
- Thimble (a thimble is not required if wall is of non-combustible construction)
- Flashing
- Sheetmetal 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

(in compliance with requirements on pages 3-8)

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, page 15.

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

<table>
<thead>
<tr>
<th>Minimum Outdoor Design Temperature</th>
<th>Minimum Spacing between Centerlines of Vent Pipes in Vertical Combustion Air/Vent Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>°F</td>
<td>°C</td>
</tr>
<tr>
<td>31 or warmer</td>
<td>0 or warmer</td>
</tr>
<tr>
<td>-10 to 30</td>
<td>-23 to -1</td>
</tr>
<tr>
<td>less than -10</td>
<td>less than -23</td>
</tr>
</tbody>
</table>

2) Install the Vent Pipe and Combustion Air Pipe Run

- Use the type of pipe specified (Requirement No. 1), page 3, and comply with the attachment requirements in Requirement No. 1.2, page 3. Length must comply with Requirement No. 1.3, page 4.

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 -- a 6" (152mm) diameter pipe for Sizes 30-125 or an 8" (203mm) 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.

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" (1219mm) or have less than 18" (457mm) of pipe above the roof. Attach the inlet air pipe to the collar of the concentric adapter box with sheetmetal 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 13 - Brackets for Attaching the Concentric Adapter Box to the Roof

2) Attach the Box to the Roof (Step 5)

When the box is attached to the roof in Step 5, use the 2-1/2" (64mm) portion of the brackets. To adjust to construction each bracket has three 7/32" diameter holes.

1) Attach the Brackets to the Box - The 6" (152mm) portion of each bracket is designed with five 7/32" diameter holes so that attachment to the box can be adjusted.

If the roof is combustable, position brackets to allow for a 2" (51mm) clearance between the box and the roof. After careful positioning, use sheetmetal screws to attach the brackets. NOTE: If any holes are made in the box in error, they must be sealed.

FIGURE 14 - Slide attached Combustion Air Pipe up through the Roof

Snow Clearance 18" (457mm) minimum

NOTE: Maximum from concentric adapter box is 48" (1219mm).

Outside view with concentric adapter box attached to underside of roof. Install field-supplied flashing at roof opening.
6. Determine the length and install the double-wall vent pipe.
   a. Determine minimum length of the continuous section of double-wall vent pipe. See FIGURE 15. The vent pipe extending through the box and the inlet air pipe must be one piece of double-wall vent pipe without joints.

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

   If needed, add a second section of double-wall pipe to comply with the height requirement on the left.

   After box is installed, install Concentric Vent Pipe - One piece of continuous double-wall pipe must extend from a minimum of 3" (76mm) above the outer combustion air pipe to a maximum of 6" (152mm) below the box. (NOTE: Vent pipe does not attach to the box; it must be supported.)
   1) Calculate height (see requirements on the left).
   2) Be sure vent flow marking on the pipe is in the right direction.
   3) Slide pipe through the box and the outer inlet air pipe.
   4) Attach to vent run no more than 6" (152mm) from the adapter box. See instructions in FIGURE 3, page 5.

   First, attach Combustion Air Pipe and install the Concentric Box
   1) Determine length (X) of pipe (see requirements on the left).
   2) Attach the pipe to the collar on the box.
   3) Attach the brackets to the roof.

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" (152mm) below the box. The upper end should extend at least 3" (76mm) above the combustion air pipe. NOTE: The vent pipe does not attach to the box. The installer must provide support.

   Follow the instructions in FIGURE 3, page 5, 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 sheetmetal 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, page 5.
Installation of the vertical vent and combustion air system on your separated-combustion unit is complete. Verify compliance with all venting installation requirements, pages 3-8, and FIGURE 17.
INDEX

B
Brackets for Attaching the Concentric Adapter Box to the Roof 13
Brackets for Attaching the Concentric Adapter Box to the Wall 11

C
Hazards of Chlorine 2
Clearance 5, 6
Clearances to Horizontal Vent Terminal 10
Combustion Air Inlet 15
Components 9, 12
Condensation 6
Pipe Connections at the Concentric Adapter Box 7

D
Diameters of Concentric (outdoor) Pipes 3, 4
Concentric Adapter Box Dimensions 7

H
HORIZONTAL VENT INSTRUCTIONS - Option CC6 9
Horizontal Vent Terminal 11

I
Increaser 7
Inlet air guard 11
Installation Instructions for Vertical Vent Kit 13, 14

J
Joints 4

L
Length from Heater to Concentric Adapter Box 4

P
Parts in the Horizontal Vent/Combustion Air Terminal Package (Option CC6) 9
Parts in the Vertical Vent Terminal/Combustion Air Package (Option CC2) 12
Pipe Diameter 4
Pipe Diameter and Maximum Pipe Length from Heater to Concentric Adapter Box 4
Commercial/Industrial Installation - Pipe Requirements 3
Residential Installation - Pipe Requirements 3

R
Reducer 7, 8

S
Support 5

T
Terminal-end vent pipe 11
Type of Pipe 3

V
Venting and Combustion Air Requirements 2
VENT TERMINAL 9
Vent Terminal 15
VERTICAL VENT INSTRUCTIONS - Option CC2 12, 14