

**City of Portland, Maine - Building or Use Permit Application**

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 10-0839	Issue Date:	CBL: 082 B012001
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Location of Construction: 119 Noyes St	Owner Name: Redfern Homes Llc	Owner Address: Po Box 8816	Phone:
Business Name:	Contractor Name: CM McCormick & Sons	Contractor Address: 6 East River Road PO Box 71 White F	Phone: 2075497535
Lessee/Buyer's Name	Phone:	Permit Type: HVAC	Zone: R-5

Past Use: Single Family	Proposed Use: Single Family / Install natural gas 105 Lockiwar Night heating system in the basement.	Permit Fee: \$220.00	Cost of Work: \$20,000.00	CEO District: 3
Proposed Project Description: Install natural gas 105 Lockiwar Night heating system in the basement.		FIRE DEPT: <input type="checkbox"/> Approved <input type="checkbox"/> Denied	INSPECTION: Use Group: R-3 Type: HVAC	
		Signature: JMB 7/19/10		
PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)				
Action: <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied				
Signature: _____ Date: _____				

Permit Taken By: gg	Date Applied For: 07/16/2010	<b>Zoning Approval</b>		
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- This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
- Building permits do not include plumbing, septic or electrical work.
- Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..

<b>Special Zone or Reviews</b> <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetland <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan Maj <input type="checkbox"/> Minor <input type="checkbox"/> MM <input type="checkbox"/> Date: 7/16/10	<b>Zoning Appeal</b> <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied Date:	<b>Historic Preservation</b> <input checked="" type="checkbox"/> Not in District or Landmark <input type="checkbox"/> Does Not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Date:
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**PERMIT ISSUED**  
 JUL 19 2010  
 City of Portland

**CERTIFICATION**

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT \_\_\_\_\_ ADDRESS \_\_\_\_\_ DATE \_\_\_\_\_ PHONE \_\_\_\_\_

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE \_\_\_\_\_ DATE \_\_\_\_\_ PHONE \_\_\_\_\_



100839

FILL IN AND SIGN WITH INK

PERMIT ISSUED

JUL 19 2010

# APPLICATION FOR PERMIT HEATING OR POWER EQUIPMENT

082 B. O. 10 City of Portland

To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL 119 Noyse ST Use of Building SFH Date 16 July 2010

Name and address of owner of appliance Jonathan Colley

Installer's name and address CM McCormick + Sons (Sons of) White Field Me  
6 East River Rd PO Box 71 04353 Telephone 207-549-7535

### Location of appliance:

- Basement
- Floor
- Attic
- Roof

### Type of Fuel:

- Gas
- Oil
- Solid

Appliance Name: Lockwood Night 105

U.L. Approved  Yes  No

Will appliance be installed in accordance with the manufacturer's installation instructions?  Yes  No

IF NO Explain: \_\_\_\_\_

### The Type of License of Installer:

- Master Plumber # 6923
- Solid Fuel # \_\_\_\_\_
- Oil # \_\_\_\_\_
- Gas # PNT 3311
- Other \_\_\_\_\_

### Type of Chimney:

Masonry Lined  
Factory built PVC

Metal  
Factory Built U.L. Listing # \_\_\_\_\_

Direct Vent  
Type \_\_\_\_\_ UL# \_\_\_\_\_

### Type of Fuel Tank

- Oil NA
- Gas 2

Size of Tank 105

Number of Tanks \_\_\_\_\_

Distance from Tank to Center of Flame \_\_\_\_\_ feet.

Cost of Work: \$ 20,000

Permit Fee: \$ 220.00

RECEIVED  
JUL 16 2010  
Dept. of Building Inspections  
City of Portland Maine

### Approved

Fire: \_\_\_\_\_  
Ele.: \_\_\_\_\_  
Bldg.: \_\_\_\_\_

### Approved with Conditions

- See attached letter or requirement

Signature of Installer

Inspector's Signature

Date Approved

White - Inspection

Yellow - File

Pink - Applicant's

Gold - Assessor's Copy

**City of Portland, Maine - Building or Use Permit**

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

<b>Permit No:</b> 10-0839	<b>Date Applied For:</b> 07/16/2010	<b>CBL:</b> 082 B012001
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<b>Location of Construction:</b> 119 Noyes St	<b>Owner Name:</b> Redfern Homes Llc	<b>Owner Address:</b> Po Box 8816	<b>Phone:</b>
<b>Business Name:</b>	<b>Contractor Name:</b> CM McCormick & Sons	<b>Contractor Address:</b> 6 East River Road PO Box 71 White F	<b>Phone</b> (207) 549-7535
<b>Lessee/Buyer's Name</b>	<b>Phone:</b>	<b>Permit Type:</b> HVAC	

<b>Proposed Use:</b> Single Family / Install natural gas 105 Lockiwvar Night heating system in the basement.	<b>Proposed Project Description:</b> Install natural gas 105 Lockiwvar Night heating system in the basement.
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**Dept:** Zoning      **Status:** Approved      **Reviewer:** Marge Schmuckal      **Approval Date:** 07/16/2010  
**Note:**      **Ok to Issue:**

**Dept:** Building      **Status:** Approved with Conditions      **Reviewer:** Jeanine Bourke      **Approval Date:** 07/19/2010  
**Note:**      **Ok to Issue:**

- 1) The appliance and venting shall be installed in accordance with the UL listing and the manufacturers specifications.
- 2) The installation must comply with the State of Maine Gas Regulations.
- 3) Application approval based upon information provided by applicant. Any deviation from approved plans requires separate review and approval prior to work.

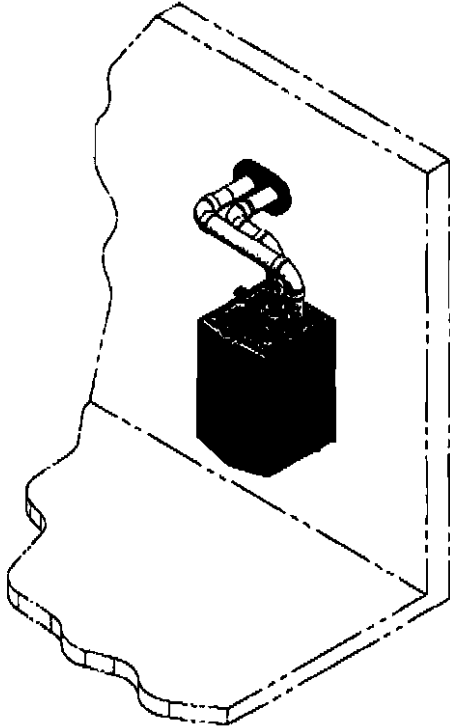
PERMIT ISSUED

JUL 19 2010

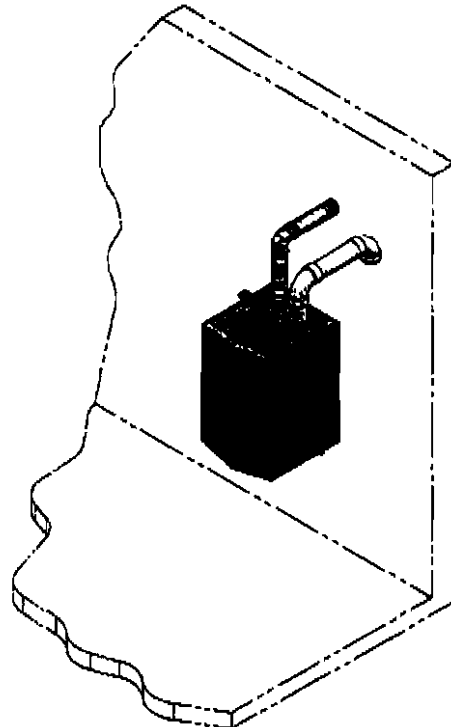
City of Portland

### 3 General venting

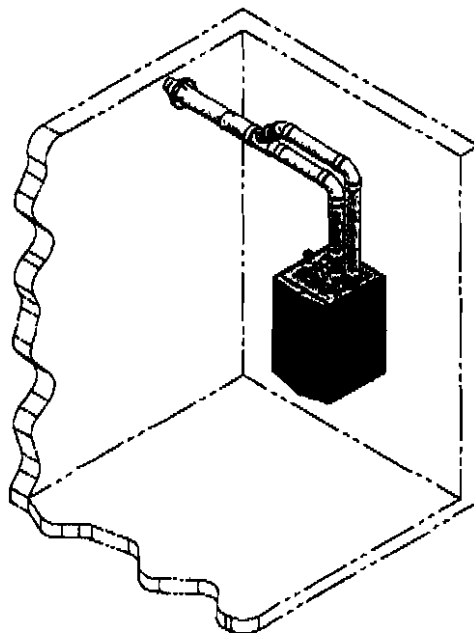
#### Direct venting options - Sidewall Vent



**Figure 3-1** PVC/CPVC Two-Pipe Sidewall Termination - See page 21 for more details



**Figure 3-2** Stainless Steel Two-Pipe Sidewall Termination - See page 22 for more details



**Figure 3-3** PVC/CPVC Concentric Sidewall Termination - See page 24 for more details



### 3 General venting (continued)

#### Direct venting options - Vertical Vent

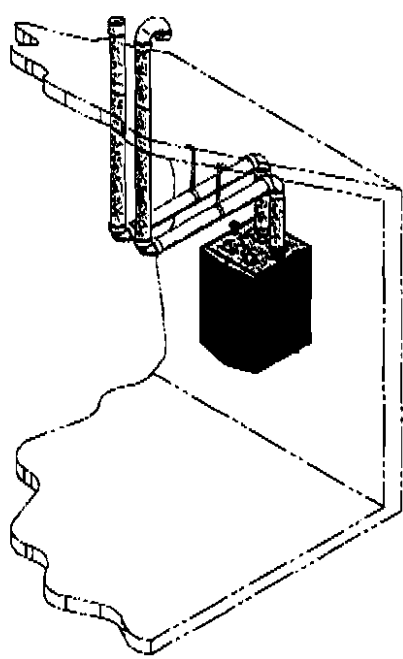


Figure 3-4 PVC/CPVC Two-Pipe Vertical Termination - See page 27 for more details

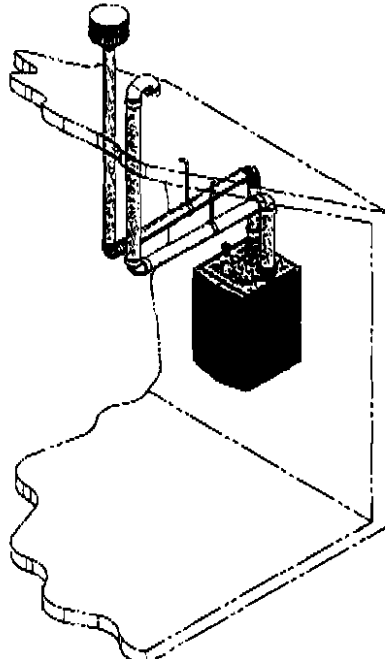


Figure 3-5 Stainless Steel Two-Pipe Vertical Termination - See page 27 for more details

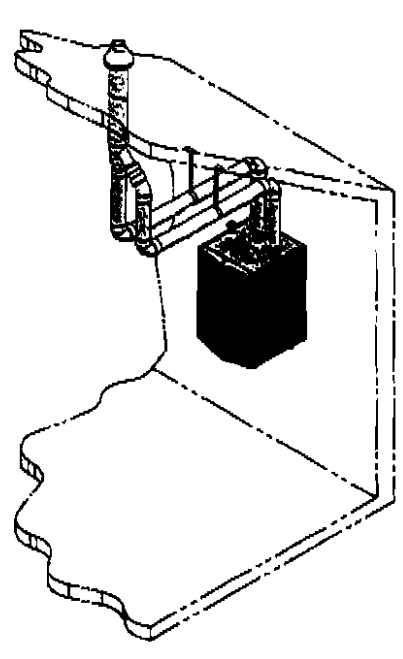


Figure 3-6 PVC/CPVC Concentric Vertical Termination - See page 29 for more details

#### Direct venting options - Vertical Vent, Sidewall Air

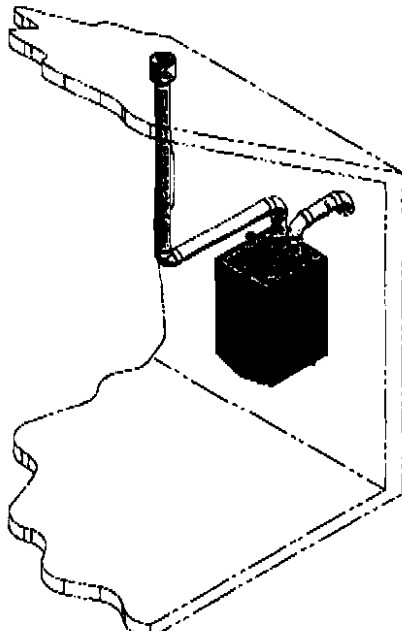


Figure 3-7 PVC/CPVC Vertical Vent, Sidewall Air

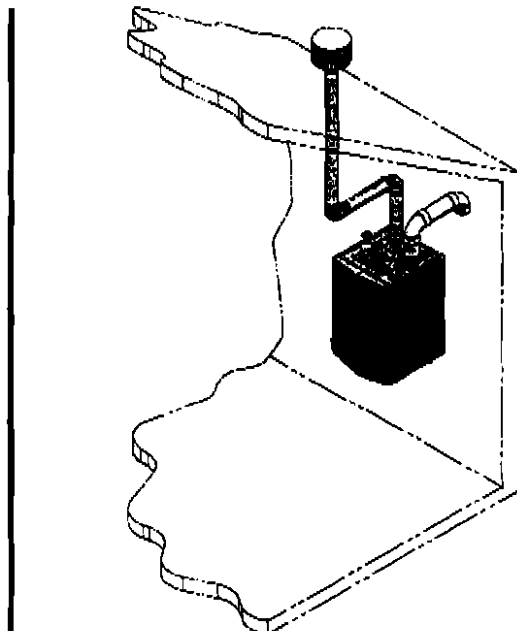
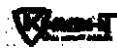


Figure 3-8 Stainless Steel Vertical Vent, Sidewall Air

**NOTICE**

Stainless steel vent/air design and terminations will vary slightly by manufacturer.



### 3 General venting

#### Install vent and combustion air piping

##### ⚠ DANGER

The Knight wall mount boiler must be vented and supplied with combustion and ventilation air as described in this section. Ensure the vent and air piping and the combustion air supply comply with these instructions regarding vent system, air system, and combustion air quality. See also Section 1 of this manual.

Inspect finished vent and air piping thoroughly to ensure all are airtight and comply with the instructions provided and with all requirements of applicable codes.

Failure to provide a properly installed vent and air system will cause severe personal injury or death.

#### PVC/CPVC Vent piping materials



Use only the materials listed in Table 3A for vent pipe, and fittings. Failure to comply could result in severe personal injury, death, or substantial property damage.

##### NOTICE

Installation must comply with local requirements and with the National Fuel Gas Code, ANSI Z223.1 for U.S. installations or CSA B149.1 for Canadian installations.



For closet and alcove installations, CPVC or stainless steel material **MUST BE** used in a closet/alcove structure. Failure to follow this warning could result in fire, personal injury, or death.

##### NOTICE

All PVC vent pipes must be glued, properly supported, and the exhaust must be pitched a minimum of a 1/4 inch per foot back to the boiler (to allow drainage of condensate).



This appliance requires a special venting system. The vent connection to the appliance must be made with the starter CPVC pipe section provided with the appliance if PVC/CPVC vent is to be used. For stainless steel venting use an adapter from Table 3B (page 18) that corresponds with the intended vent manufacturer to be used and discard the CPVC starter piece. The field provided vent fittings must be cemented to the CPVC pipe section using an "All Purpose Cement" suitable for PVC and CPVC pipe. Use only the vent materials, primer, and cement specified in this manual to make the vent connections. Failure to follow this warning could result in fire, personal injury, or death.



Insulation should not be used on PVC or CPVC venting materials. The use of insulation will cause increased vent wall temperatures, which could result in vent pipe failure.



For models 50 - 105 when transitioning from 2 to 3 inch vent diameter, a 2" pipe section and 2" to 3" increaser are required to be CPVC when PVC/CPVC vent is used.

For installations using 2" vent, the first seven (7) equivalent feet of vent must be CPVC (field supplied). See examples below.

- Examples:
1. Seven (7) feet vertical
  2. Connector + 90° elbow + 2 feet horizontal
  3. One (1) foot vertical + 90° elbow + 1 foot horizontal

#### Requirements for installation in Canada

1. Installations must be made with a vent pipe system certified to ULC-S636.  
IPEX is an approved vent manufacturer in Canada supplying vent material listed to ULC-S636.
2. The first three (3) feet of plastic vent pipe from the appliance flue outlet must be readily accessible for visual inspection.
3. The components of the certified vent system must not be interchanged with other vent systems or unlisted pipe/fittings.
4. The 2" and 3" Concentric Vent Kits available from Lochinvar (see Section 4 - *Sidewall Termination - Optional Concentric Vent*) and the 2" and 3" Concentric Vent Kits available from IPEX are approved for use on the Knight wall mount boiler. Both kits are listed to the ULC-S636 standard for use in Canada.



Improper installation of PVC or CPVC systems may result in injury or death.

#### Installing vent and air piping

##### NOTICE

Use only cleaners, primers, and solvents that are approved for the materials which are joined together.

1. Work from the boiler to vent or air termination. Do not exceed the lengths given in this manual for the air or vent piping.
2. Cut pipe to the required lengths and deburr the inside and outside of the pipe ends.
3. Chamfer outside of each pipe end to ensure even cement distribution when joining.
4. Clean all pipe ends and fittings using a clean dry rag. (Moisture will retard curing and dirt or grease will prevent adhesion.)



### 3 General venting *(continued)*

5. Dry fit vent or air piping to ensure proper fit up before assembling any joint. The pipe should go a third to two-thirds into the fitting to ensure proper sealing after cement is applied.
6. Priming and Cementing:
  - a. Handle fittings and pipes carefully to prevent contamination of surfaces.
  - b. Apply a liberal even coat of primer to the fitting socket.
  - c. Apply a liberal even coat of primer to the pipe end to approximately 1/2" beyond the socket depth.
  - d. Apply a second primer coat to the fitting socket.
  - e. While primer is still wet, apply an even coat of approved cement to the pipe equal to the depth of the fitting socket.
  - f. While primer is still wet, apply an even coat of approved cement to the fitting socket.
  - g. Apply a second coat of cement to the pipe.
  - h. While the cement is still wet, insert the pipe into the fitting, if possible twist the pipe a 1/4 turn as you insert it. **NOTE:** If voids are present, sufficient cement was not applied and joint could be defective.
  - i. Wipe excess cement from the joint removing ring or beads as it will needlessly soften the pipe.

**Table 3A Vent Pipe, and Fittings**

All vent pipe materials and fittings must comply with the following:			
Item	Material	Standards for installation in:	
		United States	Canada
Vent pipe and fittings	PVC schedule 40	ANSI/ASTM D1785	CPVC and PVC venting must be ULC-S636 Certified. IPEX is an approved manufacturer in Canada supplying vent material listed to ULC-S636.
	PVC-DWV	ANSI/ASTM D2685	
	CPVC schedule 40/80	ANSI/ASTM F441	
	AL29-4C	UL1738	
Pipe cement/primer	PVC	ANSI/ASTM D2684	IPEX System 636 Cements & Primers
	CPVC	ANSI/ASTM F493	
<b>NOTICE: DO NOT USE CELLULAR (FOAM) CORE PIPE</b>			
<b>Approved Stainless Steel Vent Manufacturers</b>			
<b>Make</b>		<b>Model</b>	
ProTech Systems (Simpson Dura-Vent Co.)		FasNSeal Vent / FasNSeal Flex® Vent	
Z-Flex (Nova Flex Group)		Z-Vent	
Heat Fab (Selkirk Corporation)		Saf-T Vent	

\*Use of FasNSeal Flex smooth inner wall vent is to be used in vertical or near vertical sections only, taking precaution to ensure no sagging occurs of the vent system. Connect to the FasNSeal rigid vent using specially designed adapters and sealing method, see manufacturer's instructions.

#### PVC/CPVC air intake/vent connections

1. **Combustion Air Intake Connector** (FIG. 3-9) - Used to provide combustion air directly to the unit from outdoors. A fitting is provided on the unit for final connection. Combustion air piping must be supported per guidelines listed in the National Mechanical Code, Section 305, Table 305.4 or as local codes dictate.
2. **Vent Connector** (FIG. 3-9) - Used to provide a passageway for conveying combustion gases to the outside. A transition fitting is provided on the unit for final connection. Vent piping must be supported per the National Building Code, Section 305, Table 305.4 or as local codes dictate.

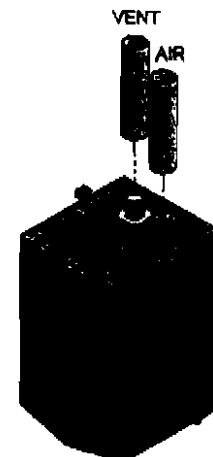
#### Air inlet pipe materials:

The air inlet pipe(s) must be sealed. Choose acceptable combustion air inlet pipe materials from the following list:

- PVC, CPVC or ABS
- Dryer Vent or Sealed Flexible Duct (not recommended for rooftop air inlet)
- Galvanized steel vent pipe with joints and seams sealed as specified in this section.
- "Type "B" double-wall vent with joints and seams sealed as specified in this section.
- AL29-4C, stainless steel material to be sealed to specification of its manufacturer.

\*Plastic pipe may require an adapter (not provided) to transition between the air inlet connection on the appliance and the plastic air inlet pipe.

**Figure 3-9 Near Boiler PVC/CPVC Venting**



### 3 General venting

**WARNING** Using vent or air intake materials other than those specified, failure to properly seal all seams and joints or failure to follow vent pipe manufacturer's instructions can result in personal injury, death or property damage. Mixing of venting materials will void the warranty and certification of the appliance.

**NOTICE** The use of double-wall vent or insulated material for the combustion air inlet pipe is recommended in cold climates to prevent the condensation of airborne moisture in the incoming combustion air.

Sealing of Type "B" double-wall vent material or galvanized vent pipe material used for air inlet piping on a sidewall or vertical rooftop Combustion Air Supply System:

- Seal all joints and seams of the air inlet pipe using either Aluminum Foil Duct Tape meeting UL Standard 723 or 181A-P or a high quality UL Listed silicone sealant such as those manufactured by Dow Corning or General Electric.
- Do not install seams of vent pipe on the bottom of horizontal runs.
- Secure all joints with a minimum of three sheet metal screws or pop rivets. Apply Aluminum Foil Duct Tape or silicone sealant to all screws or rivets installed in the vent pipe.
- Ensure that the air inlet pipes are properly supported.

The PVC, CPVC, or ABS air inlet pipe should be cleaned and sealed with the pipe manufacturer's recommended solvents and standard commercial pipe cement for the material used. The PVC, CPVC, ABS, Dryer Vent or Flex Duct air inlet pipe should use a silicone sealant to ensure a proper seal at the appliance connection and the air inlet cap connection. Dryer vent or flex duct should use a screw type clamp to seal the vent to the appliance air inlet and the air inlet cap. Proper sealing of the air inlet pipe ensures that combustion air will be free of contaminants and supplied in proper volume.

When a sidewall or vertical rooftop combustion air supply system is disconnected for any reason, the air inlet pipe must be resealed to ensure that combustion air will be free of contaminants and supplied in proper volume.

**DANGER** Failure to properly seal all joints and seams as required in the air inlet piping may result in flue gas recirculation, spillage of flue products and carbon monoxide emissions causing severe personal injury or death.

#### Stainless steel vent

This product has been approved for use with stainless steel using the manufacturers listed in Table 3A.

**WARNING** Use only the materials, vent systems, and terminations listed in Table 3B. DO NOT mix vent systems of different types or manufacturers, unless listed in this manual. Failure to comply could result in severe personal injury, death, or substantial property damage.

**NOTICE** Installations must comply with applicable national, state, and local codes. Stainless steel vent systems must be listed as a UL-1738 approved system for the United States and a U.L.C.-S636 approved system for Canada.

**NOTICE** Installation of a stainless steel vent system should adhere to the stainless steel vent manufacturer's installation instructions supplied with the vent system.

**NOTICE** The installer must use a specific vent starter adapter at the flue collar connection, supplied by the vent manufacturer to adapt to its vent system. See Table 3B for approved vent adapters. Discard CPVC starter piece.

Table 3B Approved Stainless Steel Terminations and Adapters

Model	ProTech			Heat Fab				Z Flex		
	FasNSeal			Saf-T Vent				Z-Vent		
	**Boiler Adapter	Flue Termination	Intake Air Termination	**Boiler Adapter	Intermediate Adapter	Flue Termination	Intake Air Termination	**Boiler Adapter	Flue Termination	Intake Air Termination
51 - 211	300716 (Vent) 300715 (Intake Air)	FSBS3 FSRC3(R.C)	303889	WB50210 (Vent) KB80210 (Intake Air)	9353BUREZ-1*	9392 5300CI	9314TERM	2SVSLPVC3 (Vent) 2SVSLA03 (Intake Air)	2SVSTP03 2SVSRCX03	2SVSTEX0380

\* = This adapter must be used in addition to the boiler adapter for Saf-T vent pipe as shown in FIG. 3-10, unless approved vent other than standard diameter is used. Consult a Heat Fab representative for questions.

\*\*The stainless steel venting option is only available in 3" vent diameters.

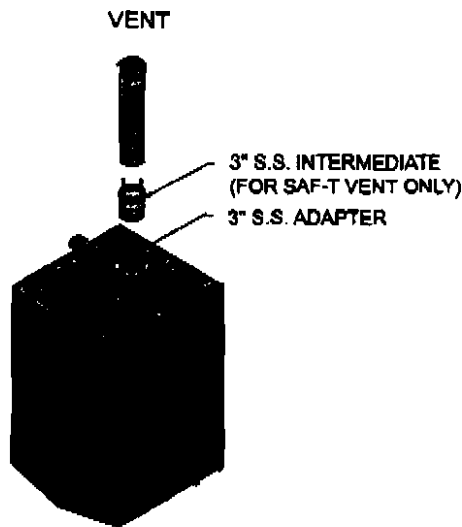


### 3 General venting *(continued)*

#### Stainless steel air intake/vent connections

1. **Combustion Air Intake Connector** (FIG. 3-10) - Used to provide combustion air directly to the unit from outdoors. A fitting is provided on the unit for final connection. Combustion air piping must be supported per guidelines listed in the National Mechanical Code, Section 305, Table 305.4 or as local codes dictate.
2. **Vent Connector** (FIG. 3-10) - Used to provide a passageway for conveying combustion gases to the outside. A transition fitting is provided on the unit for final connection. Vent piping must be supported per the National Building Code, Section 305, Table 305.4 or as local codes dictate.

Figure 3-10 Near Boiler Stainless Steel Venting



The Knight wall mount boiler uses model specific combustion air intake and vent piping sizes as detailed in Table 3C below.

**NOTICE** Increasing or decreasing the size of the combustion air or vent piping beyond the sizes listed in Table 3C is not authorized.

#### Maximum allowable combustion air and vent piping lengths are as follows:

Table 3C Maximum Combustion Air and Vent Piping Lengths

Model	2" Max Vent/Air	3" Max Vent/Air
51	40 feet	100 feet
81	40 feet	100 feet
106	40 feet	100 feet
151	N/A	100 feet
211	N/A	100 feet

**NOTICE** For 2" vent / air lengths greater than 40 feet, consult the factory.

**Note:** The minimum combustion air and vent piping length is 12 equivalent feet.

When determining equivalent combustion air and vent length, add 5 feet for each 90° elbow, 3 feet for each 45° elbow, and 3 feet for the concentric vent kit, see example below.

**EXAMPLE:** 20 feet of PVC pipe + (4) 90° elbows + (2) 45° elbows + (1) concentric vent kit = 49 equivalent feet of piping.

#### Removing from existing vent

Follow the instructions in Section 1, page 11 of this manual when removing a boiler from an existing vent system.

#### Vent and air piping

##### Vent and air system:

**NOTICE** Installation must comply with local requirements and with the National Fuel Gas Code, ANSI Z223.1 for U.S. installations or CSA B149.1 for Canadian installations.

You must also install air piping from outside to the boiler air intake adapter. The resultant installation is direct vent (sealed combustion).

You may use any of the vent/air piping methods covered in this manual. Do not attempt to install the Knight wall mount boiler using any other means.

**WARNING** DO NOT mix components from different systems. The vent system could fail, causing leakage of flue products into the living space. Use only approved stainless steel, PVC or CPVC pipe and fittings. For PVC/CPVC use with primer and cement specifically designed for the material used.

#### Vent, air piping and termination:

The Knight wall mount boiler vent and air piping can be installed through the roof or through a sidewall. Follow the procedures in this manual for the method chosen. Refer to the information in this manual to determine acceptable vent and air piping length.



## 3 General venting

### Optional room air

#### NOTICE

Optional room air is intended for commercial applications. Combustion air piping to the outside is recommended for residential applications.

Commercial applications utilizing the Knight wall mount boiler may be installed with a single pipe carrying the flue products to the outside while using combustion air from the equipment room. In order to use the room air venting option the following conditions and considerations must be followed.

- The unit **MUST** be installed with the appropriate room air kit (Table 3D).
- The equipment room **MUST** be provided with properly sized openings to assure adequate combustion air. Please refer to instructions provided with the room air kit.
- There will be a noticeable increase in the noise level during normal operation from the inlet air opening.
- Using the room air kit makes the unit vulnerable to combustion air contamination from within the building. Please review Section 1, Prevent Combustion Air Contamination, to ensure proper installation.
- Vent system and terminations must comply with the standard venting instructions set forth in this manual.



When utilizing the single pipe method, provisions for combustion and ventilation air must be in accordance with Air for Combustion and Ventilation, of the latest edition of the National Fuel Gas Code, ANSI Z223.1, in Canada, the latest edition of CGA Standard B149 Installation Code for Gas Burning Appliances and Equipment, or applicable provisions of the local building codes.

**Table 3D** Optional Room Air Kit

Model	Kit Number
51 - 211	KIT30051

#### Air contamination

Pool and laundry products and common household and hobby products often contain fluorine or chlorine compounds. When these chemicals pass through the boiler, they can form strong acids. The acid can eat through the boiler wall, causing serious damage and presenting a possible threat of flue gas spillage or boiler water leakage into the building.

Please read the information given in Table 1A, page 10, listing contaminants and areas likely to contain them. If contaminating chemicals will be present near the location of the boiler combustion air inlet, have your installer pipe the boiler combustion air and vent to another location, per this manual.



If the boiler combustion air inlet is located in a laundry room or pool facility, for example, these areas will always contain hazardous contaminants.



To prevent the potential of severe personal injury or death, check for areas and products listed in Table 1A, page 10 before installing the boiler or air inlet piping.

If contaminants are found, you **MUST**:

- Remove contaminants permanently.

—OR—

- Relocate air inlet and vent terminations to other areas.



# 4 Sidewall direct venting

## Vent/air termination - sidewall



Follow instructions below when determining vent location to avoid possibility of severe personal injury, death, or substantial property damage.



A gas vent extending through an exterior wall shall not terminate adjacent to a wall or below building extensions such as eaves, parapets, balconies, or docks. Failure to comply could result in severe personal injury, death, or substantial property damage.



Do not connect any other appliance to the vent pipe or multiple boilers to a common vent pipe. Failure to comply could result in severe personal injury, death, or substantial property damage.



Installation must comply with local requirements and with the National Fuel Gas Code, ANSI Z223.1 for U.S. installations or CSA B149.1 for Canadian installations.

### Determine location

Locate the vent/air terminations using the following guidelines:

1. The total length of piping for vent or air must not exceed the limits given in the General Venting Section on page 19 of this manual.
2. You must consider the surroundings when terminating the vent and air:
  - a. Position the vent termination where vapors will not damage nearby shrubs, plants or air conditioning equipment or be objectionable.
  - b. The flue products will form a noticeable plume as they condense in cold air. Avoid areas where the plume could obstruct window views.
  - c. Prevailing winds could cause freezing of condensate and water/ice buildup where flue products impinge on building surfaces or plants.
  - d. Avoid possibility of accidental contact of flue products with people or pets.
  - e. Do not locate the terminations where wind eddies could affect performance or cause recirculation, such as inside building corners, near adjacent buildings or surfaces, window wells, stairwells, alcoves, courtyards, or other recessed areas.

Figure 4-1A PVC/CPVC Sidewall Termination of Air and Vent

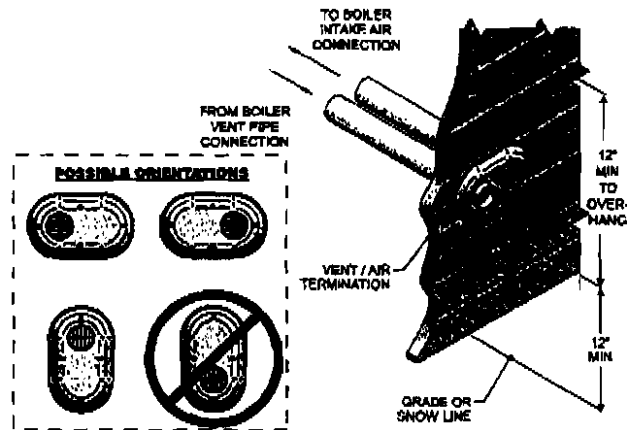


Table 4A Sidewall Vent Kit

Model	Kit Number	Vent Size
51 - 106	KIT30044	2 inch vent
151 - 211	KIT30045	3 inch vent

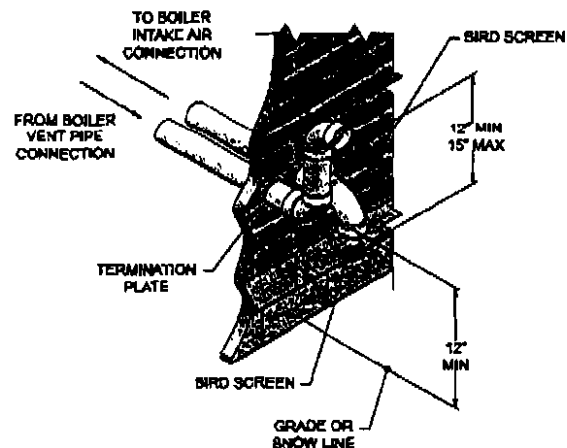
### If using the alternate sidewall termination:

3. The air piping must terminate in a down-turned elbow as shown in FIG. 4-1B. This arrangement avoids recirculation of flue products into the combustion air stream.
4. The vent piping must terminate in an elbow pointed outward or away from the air inlet, as shown in FIG. 4-1B.



Do not exceed the maximum lengths of the outside vent piping shown in FIG. 4-1B. Excessive length exposed to the outside could cause freezing of condensate in the vent pipe, resulting in potential boiler shutdown.

Figure 4-1B Alternate PVC/CPVC Sidewall Termination of Air and Vent w/Field Supplied Fittings

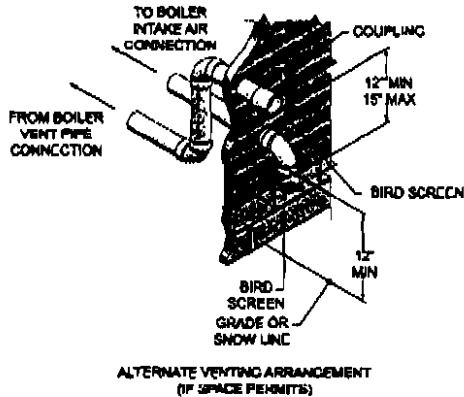




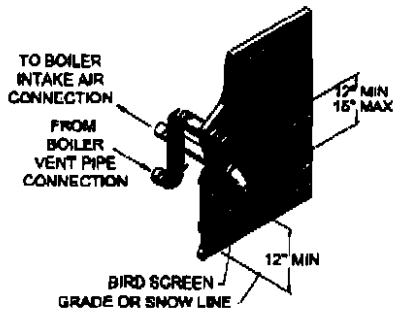
# 4 Sidewall direct venting

## Vent/air termination – sidewall

**Figure 4-1C Alternate Venting Arrangement (if Space Allows) w/Field Supplied Fittings**

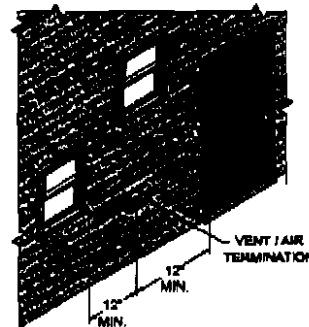


**Figure 4-1D Alternate Venting Arrangement - Typical Stainless Steel Sidewall Termination of Air and Vent w/Field Supplied Fittings**

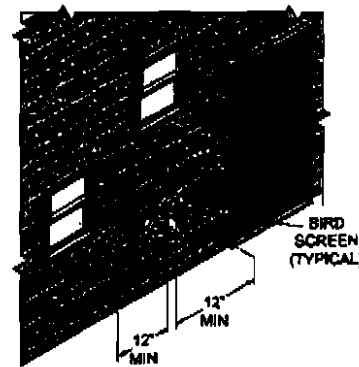


5. Maintain clearances as shown in FIG's 4-1A thru 4-3B, pages 21 and 22. Also maintain the following:
  - a. Vent must terminate:
    - At least 6 feet from adjacent walls.
    - No closer than 12 inches below roof overhang.
    - At least 7 feet above any public walkway.
    - At least 3 feet above any forced air intake within 10 feet.
    - No closer than 12 inches below or horizontally from any door or window or any other gravity air inlet.
  - b. Air inlet must terminate at least 12 inches above grade or snow line; at least 12 inches below the vent termination (FIG. 4-1B); and the vent pipe must not extend more than 24 inches vertically outside the building.
  - c. Do not terminate closer than 4 feet horizontally from any electric meter, gas meter, regulator, relief valve, or other equipment. Never terminate above or below any of these within 4 feet horizontally.
6. Locate terminations so they are not likely to be damaged by foreign objects, such as stones or balls, or subject to buildup of leaves or sediment.

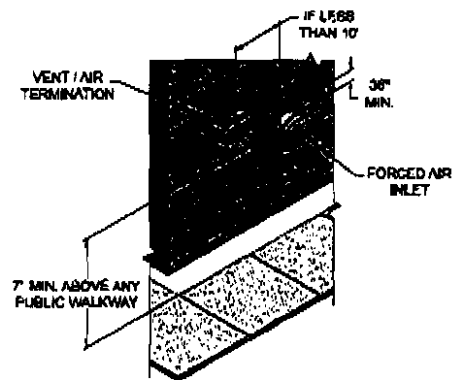
**Figure 4-2A Clearance to Gravity Air Inlets**



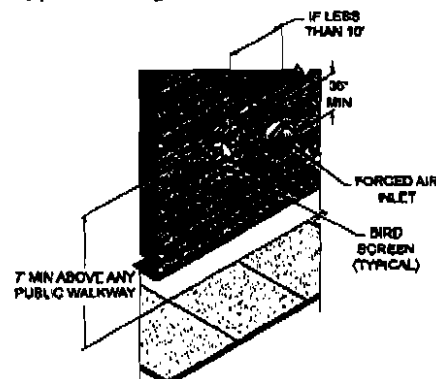
**Figure 4-2B Alternate Clearance to Gravity Air Inlets w/Field Supplied Fittings**



**Figure 4-3A Clearance to Forced Air Inlets**



**Figure 4-3B Alternate Clearance to Forced Air Inlets w/Field Supplied Fittings**





## 4 Sidewall direct venting *(continued)*

### Prepare wall penetrations

1. Use the factory supplied wall plate as a template to locate the vent and air intake holes and mounting holes.

#### Air pipe penetration:

- a. Cut a hole for the air pipe. Size the air pipe hole as close as desired to the air pipe outside diameter.

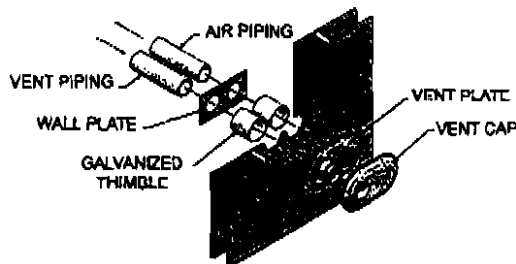
#### Vent pipe penetration:

- a. Cut a hole for the vent pipe. For either combustible or noncombustible construction, size the vent pipe hole with at least a 1/2 inch clearance around the vent pipe outer diameter:
  - 3 1/2 inch hole for 2 inch vent pipe
  - 4 1/2 inch hole for 3 inch vent pipe

Drill 3/16" diameter holes for inserting the plastic anchors into the wall.

2. Install the vent and air intake piping through the wall into the vent plate openings. Seal all gaps between the pipes and wall. Use RTV silicone sealant to seal the air pipe. Use the cement/primer listed in Table 3A on page 17 to seal the vent pipe.
3. Mount and secure the vent plate to the wall using stainless steel screws. Seal around the plate to the wall assuring no air gaps.
4. Assemble the vent cap to the vent plate (see FIG. 4-4A). Insert the stainless steel screws into the vent cap screw hole openings and securely attach the vent cap to the vent plate.
5. Seal all wall cavities.

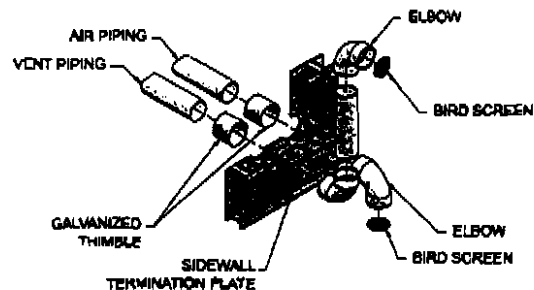
**Figure 4-4A Sidewall Termination Assembly**



### Prepare wall penetrations (Alternate - Field Supplied Option)

1. Air pipe penetration:
  - a. Cut a hole for the air pipe. Size the air pipe hole as close as desired to the air pipe outside diameter.
2. Vent pipe penetration:
  - a. Cut a hole for the vent pipe. For either combustible or noncombustible construction, size the vent pipe hole with at least a 1/2 inch clearance around the vent pipe outer diameter:
    - 3 1/2 inch hole for 2 inch vent pipe
    - 4 1/2 inch hole for 3 inch vent pipe
  - h. Insert a galvanized metal thimble in the vent pipe hole as shown in FIG. 4-4B.
3. Use a sidewall termination plate as a template for correct location of hole centers.
4. Follow all local codes for isolation of vent pipe when passing through floors or walls.
5. Seal exterior openings thoroughly with exterior caulk.

**Figure 4-4B Alternate Sidewall Termination Assembly w/Field Supplied Fittings**



### Termination and fittings

1. The air termination coupling must be oriented at least 12 inches above grade or snow line as shown in FIG. 4-1A, page 21.
2. Maintain the required dimensions of the finished termination piping as shown in FIG. 4-1A, page 21.
3. If using the alternate sidewall termination do not extend exposed vent pipe outside of building more than shown in this document. Condensate could freeze and block vent pipe.
4. PVC/CPVC terminations are designed to accommodate any wall thickness of standard constructions per the directions found in this manual.

### Multiple vent/air terminations

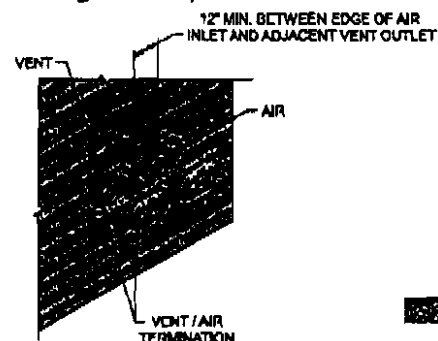
1. When terminating multiple Knight wall mount boilers terminate each vent/air connection as described in this manual (FIG. 4-5A).



All vent pipes and air inlets must terminate at the same height to avoid possibility of severe personal injury, death, or substantial property damage.

2. Place wall penetrations to obtain minimum clearance of 12 inches between edge of air inlet and adjacent vent outlet, as shown in FIG. 4-5A for U.S. installations. For Canadian installations, provide clearances required by CSA B149.1 Installation Code.
3. The air inlet of a Knight wall mount boiler is part of a direct vent connection. It is not classified as a forced air intake with regard to spacing from adjacent boiler vents.

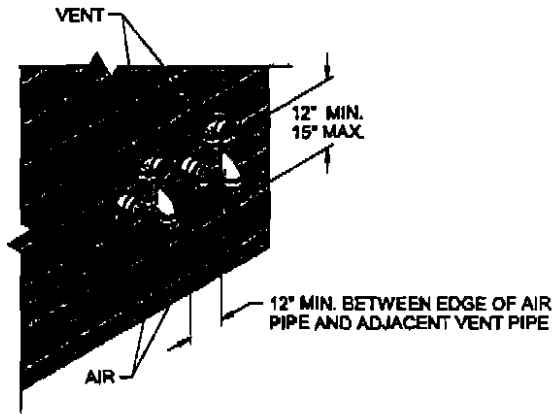
**Figure 4-5A Multiple Vent Terminations (must also comply with Figure 4-1A)**





## 4 Sidewall direct venting

**Figure 4-5B Alternate Multiple Vent Terminations w/Field Supplied Fittings (must also comply with Figure 4-1B)**



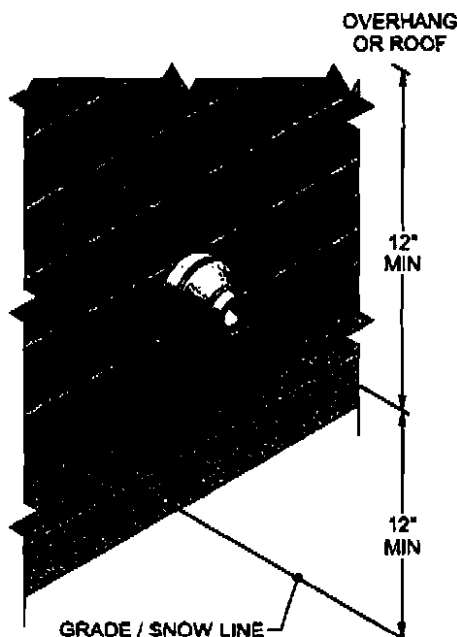
### Sidewall termination - optional concentric vent

#### Description and usage

Lochinvar offers optional concentric combustion air and vent pipe termination kits (Factory Kit #CVK3003 - 3" or #CVK3008 - 2"). Both combustion air and vent pipes must attach to the termination kit. The termination kit must terminate outside the structure and must be installed as shown below in FIG. 4-6.

The required combustion vent pipe and fittings are listed in Table 3A, on page 17 of this manual.

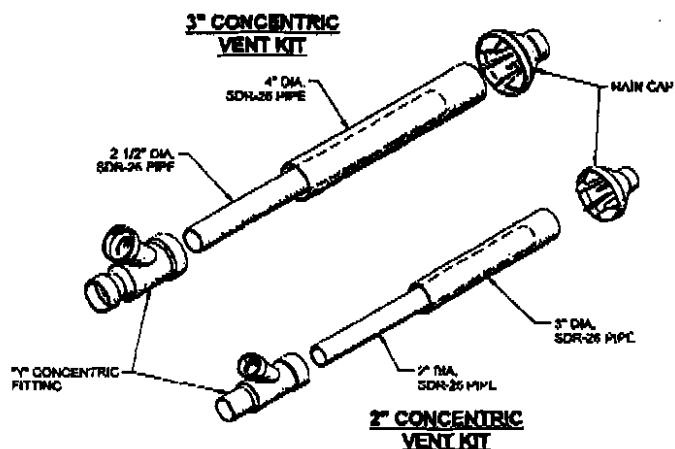
**Figure 4-6 Concentric Sidewall Termination**



#### Sidewall termination installation

- Determine the best location for the termination kit (see FIG. 4-6).
- The total length of piping for vent or air must not exceed the limits given in the General Venting Section on page 19 of this manual.
- You must consider the surroundings when terminating the vent and air:
  - Position the vent termination where vapors will not damage nearby shrubs, plants or air conditioning equipment or be objectionable.
  - The flue products will form a noticeable plume as they condense in cold air. Avoid areas where the plume could obstruct window views.
  - Prevailing winds could cause freezing of condensate and water/ice buildup where flue products impinge on building surfaces or plants.
  - Avoid possibility of accidental contact of flue products with people or pets.
  - Do not terminate above any door or window. Condensate can freeze, causing ice formations.
  - Locate or guard vent to prevent condensate damage to exterior finishes.
- Cut one (1) hole (5 inch diameter for #CVK3003 installations or 4 inch diameter for #CVK3008 installations) into the structure to install the termination kit.
- Partially assemble the concentric vent termination kit. Clean and cement using the procedures found in these instructions.
  - Cement the Y concentric fitting to the larger kit pipe (FIG. 4-7).
  - Cement the rain cap to the smaller diameter kit pipe (FIG. 4-7).

**Figure 4-7 Kit Contents**

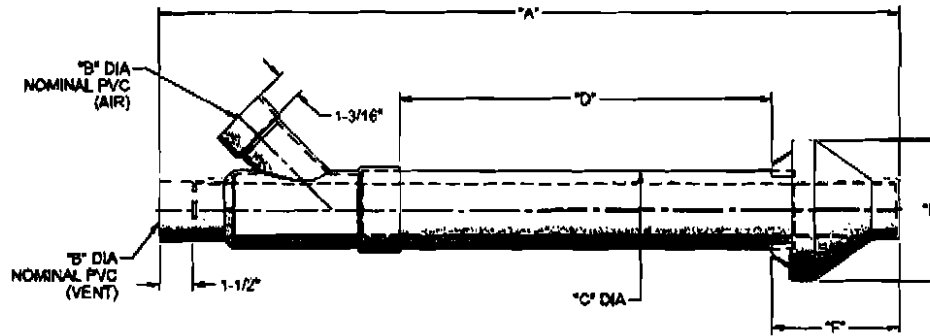




## 4 Sidewall direct venting *(continued)*

### Sidewall termination – optional concentric vent models

Figure 4-8 Concentric Vent Dimensional Drawing



	"A"	"B"	"C"	"D"	"E"	"F"
2" VENT KIT	33-3/8"	2"	3-1/2"	16-5/8"	6-1/4"	5-3/4"
3" VENT KIT	38-7/8"	3"	4-1/2"	21-1/8"	7-3/8"	6-1/2"

**NOTICE**

Instead of cementing the smaller pipe to the rain cap, a field-supplied stainless steel screw may be used to secure the two (2) components together when field disassembly is desired for cleaning (see FIG. 4-9).

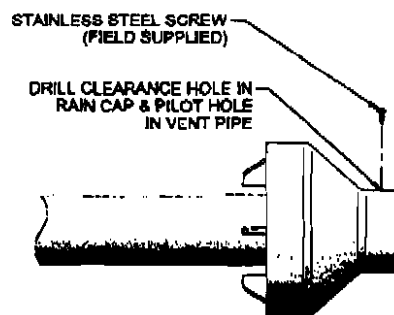


When using the alternate screw assembly method, drill a clearance hole in the rain cap and a pilot hole in the vent pipe for the screw size being used. Failure to drill adequate holes may cause cracking of PVC components, allowing combustion products to be recirculated. Failure to follow this warning could result in personal injury or death.



Do not operate the appliance with the rain cap removed or recirculation of combustion products may occur. Water may also collect inside the larger combustion air pipe and flow to the burner enclosure. Failure to follow this warning could result in product damage or improper operation, personal injury, or death.

Figure 4-9 Rain Cap to Vent Pipe Alternate Assembly



6. Install the Y concentric fitting and pipe assembly through the structure's hole.

**NOTICE**

Do not allow insulation or other materials to accumulate inside the pipe assembly when installing through the hole.

7. Install the rain cap and small diameter pipe assembly into the Y concentric fitting and large pipe assembly. Ensure small diameter pipe is bottomed and cemented in the Y concentric fitting.
8. Secure the assembly to the structure as shown in FIG. 4-10 using field-supplied metal strapping or equivalent support material.

**NOTICE**

Ensure termination location clearance dimensions are as shown in FIG. 4-6.

**NOTICE**

If assembly needs to be extended to allow sidewall thickness requirement, the two (2) pipes supplied in the kit may be replaced by using the same diameter, field-supplied SDR-26 PVC (D2241) pipe. Do not extend dimension D more than 60 inches (see FIG. 4-8).

**NOTICE**

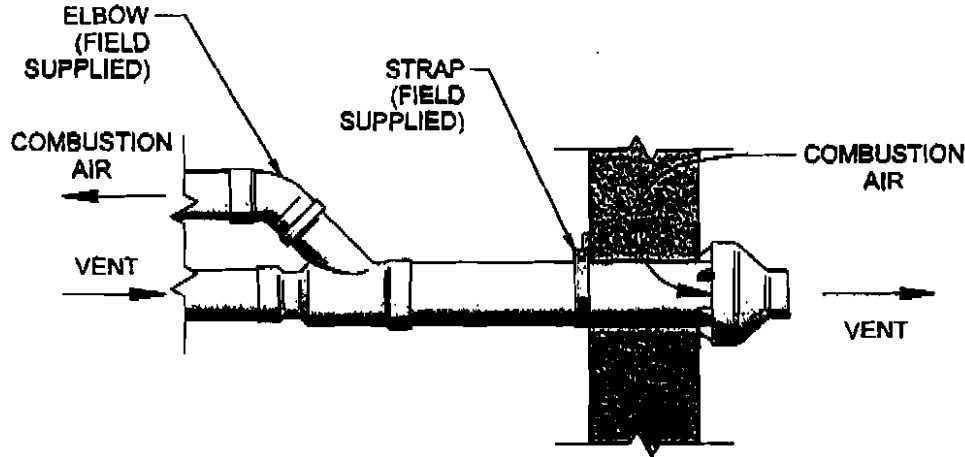
If assembly needs to be reduced, dimension D can be as short as possible.



# 4 Sidewall direct venting

## Sidewall termination – optional concentric vent

Figure 4-10 Concentric Vent Sidewall Attachment



**CAUTION** DO NOT use field-supplied couplings to extend pipes. Airflow restriction will occur and may cause intermittent operation.

9. Cement appliance combustion air and vent pipes to the concentric vent termination assembly. See FIG. 4-10 for proper pipe attachment.
10. Operate the appliance one (1) heat cycle to ensure combustion air and vent pipes are properly connected to the concentric vent termination connections.

### Multiventing sidewall terminations

When two (2) or more direct vent appliances are vented near each other, each appliance must be individually vented (see FIG. 4-11). NEVER common vent or breach vent this appliance. When two (2) or more direct vent appliances are vented near each other, two (2) vent terminations may be installed as shown in FIG. 4-11. It is important that vent terminations be made as shown to avoid recirculation of flue gases.

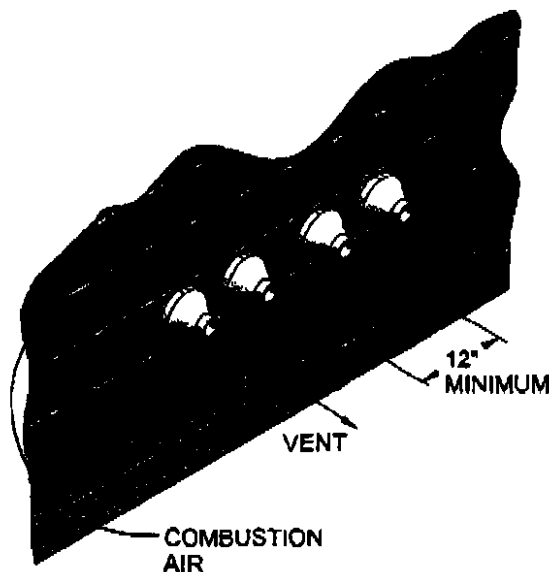


Figure 4-11 Concentric Vent and Combustion Air Termination



**Nelson & Small, Inc.** 212 Canco Road, P.O. Box 1420, Portland, Maine 04103-1420  
TEL (207) 775-5666  
FAX (207) 775-3212



**To: Lannie Dobson**

**Fax No.** 874-8716

**RE: Bill Gabriel**

**From: Nora Jordan**

**Date: July 16, 2010**

**No. of Pgs. 15 total**

**Re: Lochinvar Venting Instructions**

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Attached please find documentation requested regarding the Lochinvar Boiler unit.