

# INSTALLATION AND SERVICE MANUAL

## HORIZONTAL COMBUSTION AIR INLET KITS

### CATEGORY III VENTING FOR SEPARATED COMBUSTION TUBULAR GAS FIRED UNIT HEATERS

**USE 5 INCH KIT FOR UNITS WITH CAPACITIES 100,000 TO 250,000 BTU/HR**  
**USE 6 INCH KIT FOR UNITS WITH CAPACITIES 300,000 TO 400,000 BTU/HR**  
 Supplement to unit installation instructions – STPIM or STBII

**▲ WARNING** Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read this supplement and the unit heater installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.



This Combustion Air Inlet Kit utilizes one 5 or 6 inch termination in which both the discharge flue gas and the combustion air inlet pass.

The location of the vent terminal must be in accordance with the National Fuel Code ANSI Z223.1 (NFPA 54) in the U.S. or the Natural Gas Installation Code CSA-B149.1 or the Propane Gas Installation Code CSA-B149.2 in Canada. Minimum clearances are shown in Table 1 and Figure 3.

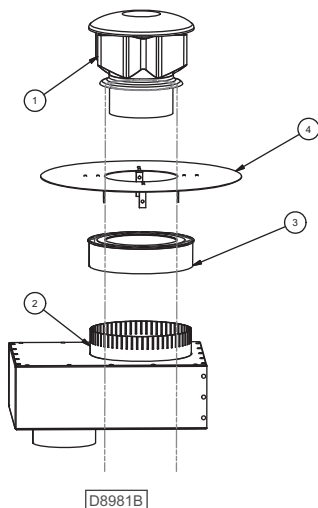
#### KIT CONTENTS:

##### Figure 1a – 5 Inch Combustion Air Inlet Kit

- #1 – Part No. 11J37R02222-002  
(1) Flue Vent Terminal
- #2 – Part No. 11507R08560  
(1) Combustion Air Inlet Box Assembly (see Figure 2a for dimensional data)
- #3 – Part No. 11J37R08572  
(1) Air Inlet Screen
- #4 – Part No. 11507R08569  
(1) Deflector Disk

##### Also Included:

- (1) Part No. J30-09025  
Installation Instructions
- (1) Part No. 11H03R03612-002  
Tube of High Temp Silicone Sealant

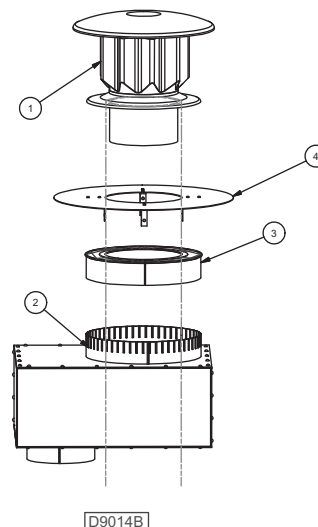


##### Figure 1b – 6 Inch Combustion Air Inlet Kit

- #1 – Part No. 11J37R02222-003  
(1) Flue Vent Terminal
- #2 – Part No. 11507R08951  
(1) Combustion Air Inlet Box Assembly (see Figure 2b for dimensional data)
- #3 – Part No. 11J37R08957  
(1) Air Inlet Screen
- #4 – Part No. 11507R09012  
(1) Deflector Disk

##### Also Included:

- (1) Part No. J30-09025  
Installation Instructions
- (1) Part No. 11H03R03612-002  
Tube of High Temp Silicone Sealant



**MESTEK, INC.**

260 NORTH ELM ST., WESTFIELD, MA 01085  
 TEL: (413) 568-9571 FAX: (413) 562-8437  
 www.mestek.com

## DIMENSIONAL DATA

Figure 2a – 5 Inch Combustion Air Inlet Box Assembly

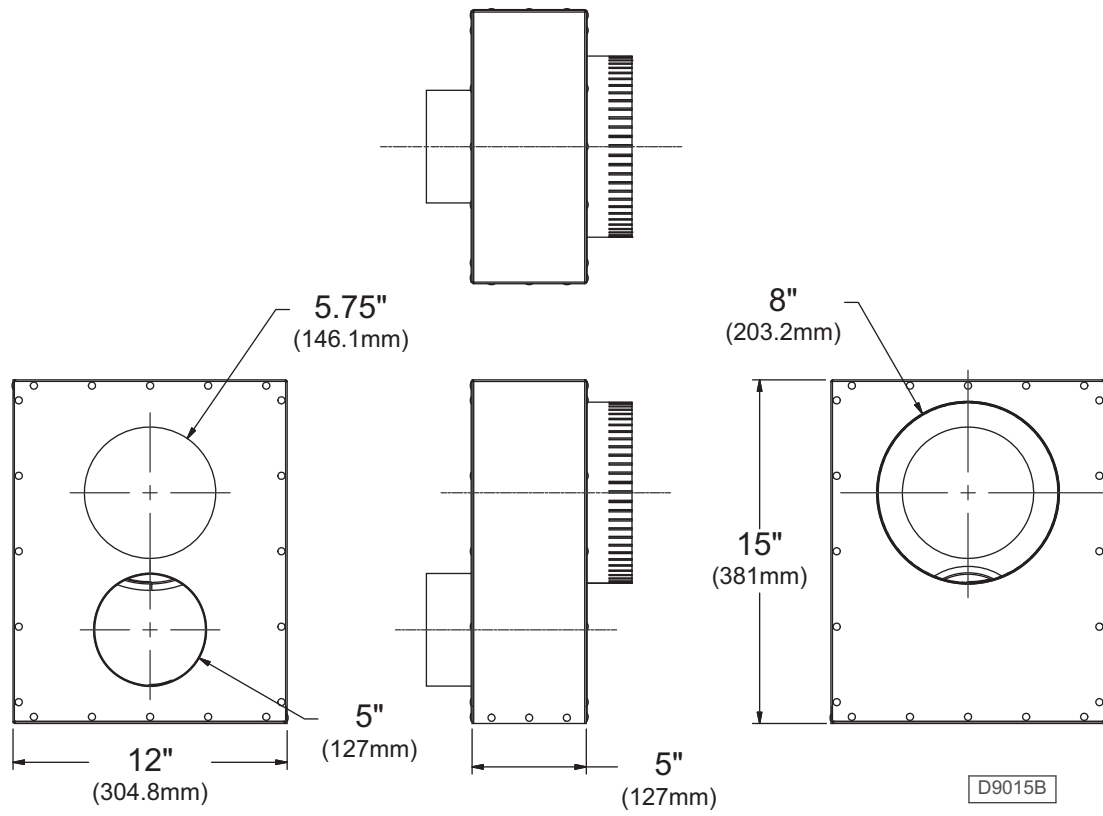
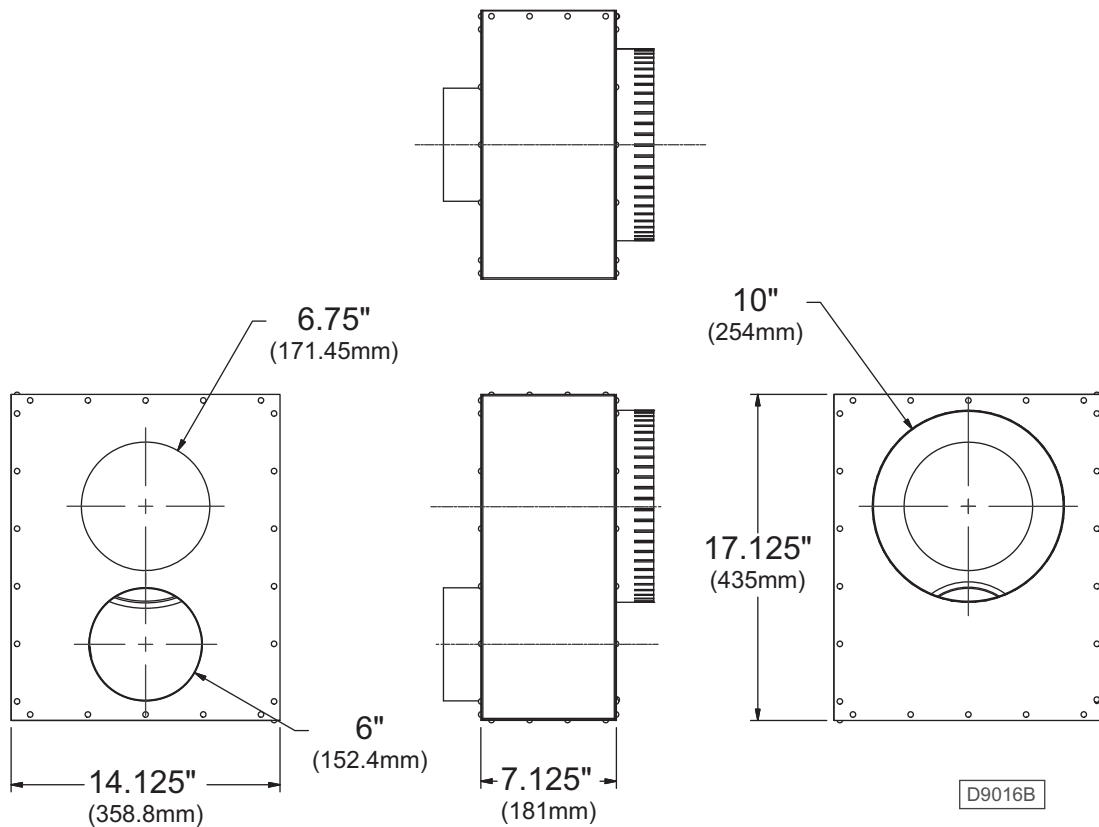


Figure 2b – 6 Inch Combustion Air Inlet Box Assembly



## VENTING – GENERAL GUIDELINES

**All unit heaters must be vented!** All Venting installations shall be in accordance with the latest edition of Part 7, Venting of Equipment of the National Fuel Gas Code, ANSI Z223.1 (NFPA 54), or applicable provisions of local building codes. Refer to notes\* below for Canadian installations.

**▲ WARNING CARBON MONOXIDE!** Your venting system must not be blocked by any snow, snow drifts, or any foreign matter. Inspect your venting system to ensure adequate ventilation exists at all times! Failure to heed these warnings could result in Carbon Monoxide Poisoning (symptoms include grogginess, lethargy, inappropriate tiredness, or flu-like symptoms).

When an existing heater is removed or replaced in venting system, the venting system may not be properly sized to vent the attached appliances. An improperly sized vent system can cause formulation of condensate or leakage or spillage of flue gases.

The following steps shall be followed with each appliance connected to the venting system placed in operation, while any other appliances connected to the venting system are not in operation:

1. Seal any unused openings in the venting system.
2. Inspect the venting system for proper size and horizontal pitch, as required in the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) and these instructions. Determine that there is no blockage or restriction, leakage, corrosion and other deficiencies, which could cause an unsafe condition.
3. In so far as practical, close all building doors and windows and all doors between the space in which the appliance(s) connected to the venting system are located and other spaces of the building. Turn on clothes dryers and any exhaust fans, such as range hoods and bathroom exhausts, so they shall operate at maximum speed. Do not operate

- a summer exhaust fan. Close fireplace damper.
4. Follow the lighting instructions. Place the appliance being inspected in operation. Adjust thermostat so that the appliance will operate continuously.
5. After it has been determined that each appliance connected to the venting system properly vents when tested as outline above, return doors, windows, exhaust fans, fireplace dampers, and any other gas-burning appliance to their previous condition of use.
6. If improper venting is observed during any of the above tests, the venting system must be corrected immediately so that the system conforms with the National Fuel Gas Code, ANSI Z223.1 (NFPA 54). When resizing any portion of the venting system, the venting system should be resized to approach the minimum size as determined using the appropriate tables in Appendix G of the National Fuel Gas Code, ANSI Z223.1 (NFPA 54).

The unit heater shall be connected to a factory built chimney or vent complying with a recognized standard, or a masonry or concrete chimney lined with a lining material acceptable to the authority having jurisdiction.

**Venting into an unlined masonry chimney is prohibited.**

## ADDITIONAL REQUIREMENTS FOR CANADIAN INSTALLATIONS

\*The following instructions apply to Canadian installations in addition to installation and operating instructions.

1. Installation must conform with local building codes, or in the absence of local codes, with current CSA-B149.1, Installation Codes for Natural Gas Burning Appliances and Equipment, or CSA-B149.2, Installation Codes for Propane Gas Burning Appliances and Equipment.
2. Any reference to U.S. standards or codes in these instructions are to be ignored and the applicable Canadian standards or codes applied.

## VENTING – GENERAL GUIDELINES (continued)

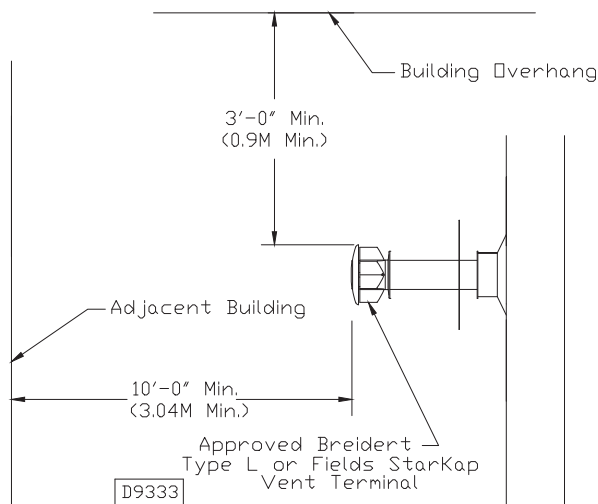
Do not damper or add heat recovery devices to the flue piping. Failure to open such a damper prior to operating the gas unit heater will result in the spillage of flue gas into the occupied space.

Avoid installing units in areas under negative pressure. When required, a flue vent fan should be installed in accordance with the instructions included with the fan.

Vent connectors serving Category I and Category II heaters shall not be connected into any portion of mechanical draft systems operating under positive vent pressure.

Maintain 1-inch (25.4mm) clearance between the vent pipe and combustible materials.

**Figure 3 – Side View Horizontal Vent**



ANSI now organizes vented appliances into four categories:

### Venting Categories

	Non Condensing	Condensing
Negative Vent Pressure	I	II
Positive Vent Pressure	III	IV

#### **Category I**

Includes non-condensing appliances with negative vent pressure, like the traditional atmospheric unit heater.

#### **Category II**

Groups condensing appliances with negative vent pressure.

#### **Category III**

Appliances are non-condensing and operate with a positive vent pressure.

#### **Category IV**

Covers condensing appliances with positive vent pressure.

**NOTICE: Category II and IV do not apply to equipment specified within this manual.**

**Table 1**

### Vent Systems Termination Clearance Requirements

Structure/Object	Minimum Clearances for Termination Locations	
	USA	CANADA
Door, window or gravity vent inlet or combustion air inlet for other appliances	4 ft. below 4 ft. horizontally 1 ft. above	1 ft. (0.3m) for 100,000 BTUH input or less. 3 ft. (0.9m) for input exceeding 100,000 BTUH
Forced air inlet within 10 ft.	3 ft. above	6 ft. (1.8m)
Adjoining building or parapet	10 ft.	10 ft. (3.04m)
Adjacent public walkways	7 ft. above grade	7 ft. (2.1m) above grade
Electric, gas meters & regulators	4 ft. horizontal	3 ft. (0.9m) horizontally from meter/regulator assembly. 6 ft. (1.8m), any direction, from a gas service regulator vent outlet
Above grade level*	1 ft.	1 ft. (0.3m)

4 \* Minimum above maximum snow depth, or per local code, whichever is greatest.

## INSTALLATION

### HORIZONTAL TERMINATION, 5 INCH KIT FOR USE WITH 100-250 MBH UNITS ONLY

Select a location on outside wall for vent terminal. In most applications, the terminal should be on level with the flue outlet of the unit, less a 1/4 inch per foot (21mm/m) pitch for condensate drainage toward the outside of the building. See Table 1 and Figures 3 and 4.

Cut hole through wall for 8 inch (203mm) combustion air pipe. Install thimble if required by local codes or type of wall construction.

Combustion air inlet box may be fastened directly to wall or spaced away from wall using suitable brackets (field supplied). Cut length of 8 inch UL 1738 listed pipe so that it will protrude 4 inches (102mm) through the wall when the box is mounted in position. Fasten pipe to box with sheet metal screws, using at least 3 screws per joint. Seal joint with high temperature silicone sealant.

**▲ WARNING** Never use pipe other than 5 inch diameter. Never use PVC, ABS or any other non-metallic pipe for venting! To do so may result in serious damage to the unit and or severe personal injury or death!

Insert pipe through wall and fasten adaptor box in place so that the pipe pitches downward 1/4 inch per foot (21mm/m) toward the outside. Flash and/or caulk 8 inch pipe on outside wall. Install inlet air screen assembly and fasten to 8 inch pipe with screws. Insert a continuous length of 5 inch UL 1738 listed vent pipe through the 5-3/4 inch opening with the "UP" arrow pointing toward the outside. Position the pipe to extend a minimum of 12 inches (305mm) beyond the inlet air screen. Seal the space between the UL 1738 listed vent pipe and 5-3/4 inch opening of the combustion air inlet box using high temperature silicone sealant. Install deflector disk on UL 1738 listed vent pipe 2-1/2 inches (63.5mm) from inlet air screen and fasten with screws.

Install vent terminal on end of UL 1738 listed vent pipe, fasten with screws and seal joint (see Figure 4).

Connect flue pipe and combustion air pipe from combustion air inlet box to unit following Combustion Air and Exhaust Venting instructions on pages 7 and 8. Joint between UL 1738 listed vent pipe and single wall vent pipe must be sealed with high temperature silicone sealant (see Figure 4).

Collars on unit and on combustion air inlet box are sized so that crimped ends of combustion air pipes go toward the unit and crimped ends of flue pipes go away from the unit.

### HORIZONTAL TERMINATION, 6 INCH KIT FOR USE WITH 300-400 MBH UNITS ONLY

Select a location on outside wall for vent terminal. In most applications, the terminal should be on level with the flue outlet of the unit, less a 1/4 inch per foot (21mm/m) pitch for condensate drainage toward the outside of the building. See Table 1 and Figures 3 and 4.

Cut hole through wall for 10 inch (254mm) combustion air pipe. Install thimble if required by local codes or type of wall construction.

Combustion air inlet box may be fastened directly to wall or spaced away from wall using suitable brackets (field supplied). Cut length of 10 inch UL 1738 listed pipe so that it will protrude 4 inches (102mm) through the wall when the box is mounted in position. Fasten pipe to box with sheet metal screws, using at least 3 screws per joint. Seal joint with high temperature silicone sealant.

**▲ WARNING** Never use pipe other than 6 inch diameter. Never use PVC, ABS or any other non-metallic pipe for venting! To do so may result in serious damage to the unit and or severe personal injury or death!

Insert pipe through wall and fasten adaptor box in place so that the pipe pitches downward 1/4 inch per foot (21mm/m) toward the outside. Flash and/or caulk 10 inch pipe on outside wall. Install inlet air screen assembly and fasten to 10 inch pipe with screws. Insert a continuous length of 6 inch UL 1738 listed vent pipe through the 6-3/4 inch opening with the "UP" arrow pointing toward the outside. Position the pipe to extend a minimum of 12 inches (305mm) beyond the inlet air screen. Seal the space between the UL 1738 listed vent pipe and 6-3/4 inch opening of the combustion air inlet box using high temperature silicone sealant. Install deflector disk on UL 1738 listed vent pipe 2-1/2 inches (63.5mm) from inlet air screen and fasten with screws.

Install vent terminal on end of UL 1738 listed vent pipe, fasten with screws and seal joint (see Figure 4).

Connect flue pipe and combustion air pipe from combustion air inlet box to unit following Combustion Air and Exhaust Venting instructions on pages 7 and 8. Joint between UL 1738 listed vent pipe and single wall vent pipe must be sealed with high temperature silicone sealant (see Figure 4).

Collars on unit and on combustion air inlet box are sized so that crimped ends of combustion air pipes go toward the unit and crimped ends of flue pipes go away from the unit.

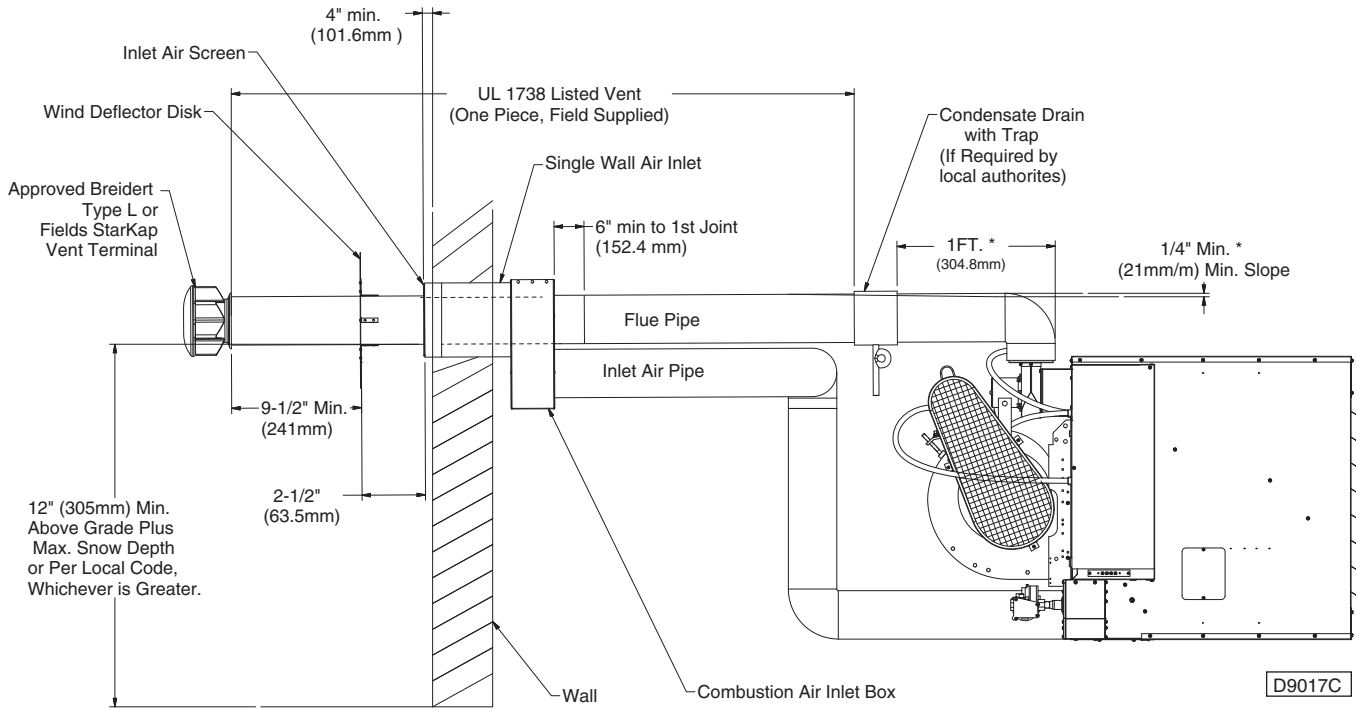
## INSTALLATION (continued)

**Figure 4 – Horizontal Combustion Air Inlet Kit Installation**

Note: Separated Combustion Blower Type Unit Shown

\*\*Seal All Joints!

\*Secure with a minimum of 3 corrosion resistant screws!



## INSTALLATION (continued)

### COMBUSTION AIR VENTING

**▲ WARNING** Never operate unit heaters without combustion air and flue gas piping in place or severe personal injury or death may occur!

**▲ WARNING** **CARBON MONOXIDE!**

Your venting system must not be blocked by any snow, snow drifts, or any foreign matter. Inspect your venting system to ensure adequate ventilation exists at all times! Failure to heed these warnings could result in Carbon Monoxide Poisoning (symptoms include grogginess, lethargy, inappropriate tiredness, or flu-like symptoms).

1. The combustion air system installation must be in accordance with the current edition of the National Fuel Gas Code-NFPA 54 or ANSI Z223.1 National Fuel Gas Code. In Canada, installation must be in accordance with CSA-B149.1 "Installation Code for Natural Gas Burning Appliances and Equipment" and CSA-B149.2 "Installation Code for Propane Burning Appliances and Equipment."
2. The combustion air inlet box, inlet air screen, deflector disk, and vent terminal provided with the unit heater must be installed at the termination point of the combustion air/vent system. See Figures 1a/1b, 2a/2b and 4.
3. Each unit heater MUST have its own combustion air system. It MUST NOT be connected to other air intake systems.
4. Use UL 1738 listed single wall pipe for the vent system. For installations in Canada, use corrosion resistant and gas-tight, listed vent pipe conforming with local building codes, or in the absence of local building codes, with current CSA-B149.1, Installation Codes for Natural Gas Burning Appliances and Equipment or CSA-B149.2, Installation Codes for Propane Gas Burning Appliances and Equipment. For residential installations in the United States, vent pipe approved for Category III appliances must be used between the appliance and the combustion air inlet box.

**▲ WARNING** Never use pipe other than 5 or 6 inch diameter with respective Combustion Air Inlet Kits. Never use PVC, ABS or any other nonmetallic pipe for venting! To do so may result in serious damage to the unit and or severe personal injury or death!

5. Long runs of single wall combustion air piping passing through an unheated space may require insulating if condensation becomes noticeable.
6. The combustion air system must be installed to prevent collection of condensate. Pitch horizontal pipes downward 1/4 inch per foot (21 mm/m) toward the inlet cap to facilitate drainage.
7. The equivalent length of the combustion air system must not be less than 5 feet (1.5m) and must not exceed 50 feet (15.2m). Equivalent length equals the total length of straight pipe plus 10 feet (3.05m) for each 90° elbow and 4 feet (1.22m) for each 45° elbow.

**NOTICE:** For optimum performance keep the combustion air system as straight as possible.

8. Each joint must be secured with at least three corrosion resistant screws. Two full turns of 3M #425 Aluminum Foil Tape or its equivalent must then be used to seal each joint. General Electric RTV-108, Dow-Corning RTV-732 or an equivalent silicone sealant with a temperature rating of 500°F may be used instead of the tape.
9. For horizontal combustion air systems longer than 5 feet (1.5m), the system must be supported from overhead building structures at 4 foot (1.2m) intervals in the U.S. and at 3 foot (0.91m) intervals in Canada.



## INSTALLATION (continued)

### EXHAUST VENTING

**▲ WARNING** Never operate unit heaters without combustion air and flue gas piping in place or severe personal injury or death may occur!

1. Vent system installation must be in accordance with the current National Fuel Gas Code-NFPA 54 or ANSI Z223.1 National Fuel Gas Code. In Canada installation must be in accordance with CSA-B149.1 "Installation Code for Natural Gas Burning Appliances and Equipment" and CSA-B149.2. "Installation Code for Propane Burning Appliances and Equipment".
2. A factory supplied Combustion Air Inlet Kit (which includes a combustion air inlet box, air inlet screen, deflector disk, vent terminal and inlet air collar) MUST be installed at the termination point of the combustion air/vent system. See Figures 1a/1b, 2a/2b, and 4.
3. Each unit heater MUST have its own vent system. It MUST NOT be connected to other vent systems or to a chimney.
4. Use UL 1738 listed single wall pipe for the vent system. For installations in Canada, use corrosion resistant and gas-tight, listed vent pipe conforming with local building codes, or in the absence of local building codes, with current CSA-B149.1, Installation Codes for Natural Gas Burning Appliances and Equipment or CSA-B149.2, Installation Codes for Propane Gas Burning Appliances and Equipment. For residential installations in the United States, vent pipe approved for Category III appliances must be used between the appliance and the combustion air inlet box.
5. Any run of single wall vent pipe passing through an unheated space must be insulated with insulation suitable to 550°F.
6. The vent system must be installed to prevent collection of condensate. Pitch horizontal pipes downward 1/4 inch per foot (21mm per meter) toward the vent cap to facilitate drainage.
7. The equivalent length of the vent system must not be less than 5 feet (1.5m) and must not exceed 50 feet (15.2m). The equivalent length equals the total length of straight pipe plus 10 feet (3.05m) for each 90° elbow and 4 feet (1.22m) for each 45° elbow.
8. Each joint must be secured with at least three corrosion resistant screws. Two full turns of 3M #425 Aluminum Foil tape or its equivalent must then be used to seal each joint. High temperature silicone sealant may be used instead of the tape. Silicone sealant must be used to seal the joint between the double wall vent pipe and the single wall pipe.
9. For horizontal vent systems longer than 5 feet (1.5m), the system must be supported from overhead building structures at 4 foot (1.2m) intervals in the U.S. and at 3 foot (0.91m) intervals in Canada.
10. The exhaust vent system must remain at a minimum distance of 1 inch (25mm) from all combustible materials. Any part of the vent system that passes through a combustible material must be properly insulated.

**NOTICE: Increasing the clearance distances may be necessary if there is a possibility of distortion or discoloration of adjacent materials.**