⚠ WARNING

1. Gas fired heating equipment must be vented - do not operate unvented.
2. A built-in power exhauster is provided - additional external power exhausters are not required or permitted.
3. If an existing heater is being replaced, it may be necessary to resize the venting systems. Improperly sized venting systems can result in vent gas leakage or the formation of condensate. Refer to the National Fuel Gas Code ANSI Z223.1 (NFPA 54) or CSA-B149.1 Installation Code - latest edition. Failure to follow these instructions can result in serious injury or death.
4. Under no circumstances should two sections of double wall vent pipe be joined together within one horizontal vent system due to the inability to verify complete seal of inner pipes.

⚠ CAUTION

Installation must conform with local building codes or in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) - latest edition. In Canada, installation must be in accordance with CSA B149.1.

Model HD/HDB unit heaters must be vented with the proper passageway as described in these instructions to convey flue gases from the unit or the vent connector to the outside atmosphere.

The venting instructions are organized in sections, based on installation type. The sections are identified as follows:

Instructions Section	Applicable Installation Instructions by Vent System Type
A	General instructions for **ALL** installations
B	**VERTICAL Category I** vent systems ①
C	**HORIZONTAL Category III** vent systems ①

① The difference between Vertical Category I and Horizontal Category III will be identified in "Section A - General Instructions - All Units".

Section A – General Instructions – All Units

A1. If the unit heater being installed is replacing existing equipment and using the existing vent system from that equipment, inspect the venting system for proper size and horizontal pitch, as required in the National Fuel Gas Code ANSI Z223.1 (NFPA 54) or CSA-B149.1 Installation Code-latest edition and these instructions. Determine that there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.

A2. The vent pipe should be galvanized steel or other suitable corrosion resistant material (except for Horizontal Category III vent systems, which will be covered in “Section C – Horizontal, Category III Vent System Installation”). Follow the National Fuel Gas Code for minimum thickness of vent material. The minimum thickness for connectors varies depending on the pipe diameter. Do not vent unit with PVC or other forms of plastic venting material.

A3. All heaters come with a factory installed vent adapter for attaching the vent pipe to the heater. Attach the vent pipe to the adapter with 3 non-corrosive screws. (Drill pilot holes through the vent pipe and adapter prior to screwing in place).

A4. Refer to Table 6.1 for total equivalent vent pipe lengths, making the vent system as straight as possible. The equivalent length of a 3" elbow is 1' and for a 4" elbow is 5'.

Table 6.1 - Vent Pipe Diameters and Total Equivalent Vent Pipe Lengths For Horizontal Venting Systems

Model Size	Vent Pipe Diameter	Minimum Eqv. Length	Maximum Eqv. Length
30-75	3"	3'	30'
100-125	4"	3'	30'

A5. A minimum of 12" straight pipe is recommended from the flue outlet before turns in the vent pipe.

A6. Horizontal sections of vent pipe are to be installed with a minimum downward slope from the appliance of 1/4 inch per foot and suspended securely from overhead structures at points not greater than 3' apart.

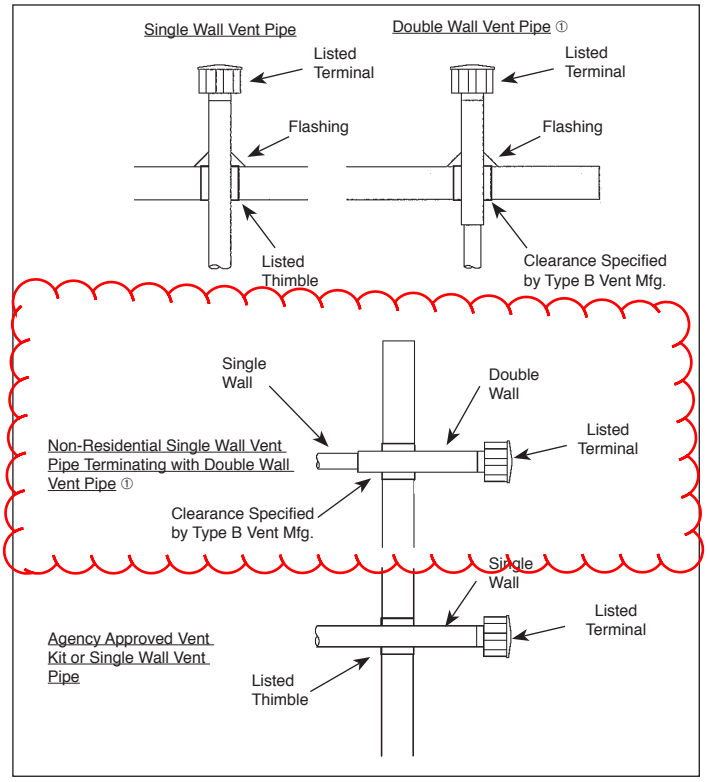
A7. Fasten individual lengths of vent together with at least 3 corrosion-resistant sheet metal screws.

A8. Keep single wall vent pipe at least 6" from combustible materials. For double wall vent pipe, follow the vent pipe manufacturer’s clearances to combustibles. The minimum distance from combustible materials is based on the combustible material surface not exceeding 160°F. Clearance from the vent pipe (or the top of the unit) may be required to be greater than 6" if heat damage other than fire could result (such as material distortion or discoloration).

A9. Avoid venting through unheated space when possible. When venting does pass through an unheated space or if the unit is installed in an environment that promotes condensation, insulate runs greater than 5' to minimize condensation. Inspect for leakage prior to insulating and use insulation that is noncombustible with a rating of not less than 400°F. Install a tee fitting at the low point of the vent system and provide a drip leg with a clean out cap as shown in Figure 8.1.

A10. When the vent passes through a combustible INTERIOR wall or floor, a metal thimble 4" greater than the vent

Figure 6.1 - Venting Through Combustible Roof or Wall



① See Instruction A10 for attaching single wall pipe to double wall pipe

diameter is necessary. If there is 6' or more of vent pipe in the open space between the appliance and where the vent pipe passes through the wall or floor, the thimble need only be 2" greater than the diameter of the vent pipe. If a thimble is not used, all combustible material must be cut away to provide 6" of clearance. Where authorities have jurisdiction, type B vent may be used for the last section of vent pipe to maintain clearance to combustibles while passing through wall or floor (see Figure 6.1). Any material used to close the opening must be noncombustible.

A11. The following are general instructions for double wall (type B) terminal pipe installation:

How to attach a single wall vent terminal to double wall (type B) vent pipe:

1. Look for the “flow” arrow on the vent pipe.
2. Slide the vent terminal inside the exhaust end of the double wall vent pipe.
3. Drill 3 holes through the pipe and the vent terminal. Using 3/4" long sheet metal screws, attach the cap to the pipe. Do not over tighten.

How to connect a single wall vent system to double wall (type B) vent pipe:

1. Slide the single wall pipe inside the inner wall of the double wall pipe.
2. Drill 3 holes through both walls of the single and double wall vent pipes. Using 3/4" sheet metal screws, attach the two pieces of pipe. Do not over tighten.
3. The gap between the single and double wall pipe must be sealed, but it is not necessary to fill the full volume of the annular area. To seal, run a large bead of 400°F silastic around the gap.

A12. Vent termination clearances must be maintained:

Table 7.1 - Vent Termination Clearances

Structure	Minimum Clearances for Vent Terminal Location
Forced air inlet within 10 feet	3 feet above
Combustion air inlet of another appliance	6 feet all directions
Door, window, gravity air inlet, or any building opening	4 feet horizontal and below 1 foot above
Electric meter, gas meter, gas regulator, and relief equipment ① Gas regulator ①	4 feet horizontal (U.S.) 6 feet horizontal (Canada) 3 feet horizontal (U.S.) 6 feet horizontal (Canada)
Adjoining building or parapet wall	6 feet all directions
Adjacent public walkways	7 feet all directions
Grade (ground level)	3 feet above

① Do not terminate the vent directly above a gas meter or regulator.

A13. Do NOT use dampers or other devices in the vent or combustion air pipes.

A14. Precautions must be taken to prevent degradation of building materials by flue products.

A15. Single wall vent pipe must not pass through any unoccupied attic, inside wall, concealed space, or floor.

A16. Uninsulated single wall vent pipe must not be used outdoors for venting appliances in regions where the 99% winter design temperature is below 32°F.

A17. The vent terminal must be:

Table 7.2 - Vent Terminals

Model Size	Modine PN	Other Listed Terminals
~~30-75~~	~~5H0722850005~~	~~Gary Steel 1092~~
100-125	5H0722850001	Gary Steel 1092

A18. In addition to following these general instructions, specific instructions for Vertical Category I or Horizontal Category III vent systems must also be followed. Table 7.3 outlines the differences:

Table 7.3 - ANSI Unit Heater Venting Requirements

Category	Description	Venting Requirements
I	Negative vent pressure Non-condensing	Follow standard venting requirements.
II	Negative vent pressure Condensing	Condensate must be drained.
III	Positive vent pressure Non-condensing	Vent must be gas tight.
IV	Positive vent pressure Condensing	Vent must be liquid and gastight. Condensate must be drained.

Note: Vent connectors serving Category I appliances shall not be connected into any portion of mechanical draft systems operating under positive pressure.

Vertical Category I Vent System Determination

- Vertical vent systems terminate vertically (up).
- The horizontal portion of the vent run cannot exceed 75% of the vertical rise (Example: If the vent height is 10', the horizontal portion of the vent system cannot exceed 7.5').
- The vent terminates a minimum of 5’ above the vent connector on the unit.
- If the vent system to be installed meets ALL these criteria (an example is shown in Figure 9.1), proceed to “Section B – Vertical Vent System Installation”. For all other cases, proceed to the next section for Horizontal Category III Vent System Determination:

Horizontal Category III Vent System Determination

- Horizontal vent systems terminate horizontally (sideways).
- A vent system that terminates vertically but has a horizontal run that exceeds 75% of the vertical rise is considered horizontal.

Horizontal vent configurations are Category III. For residential installations, this requires the use of an agency approved (UL1738) Category III vent system. Additional requirements, including those for commercial and industrial installations are covered in “Section C – Horizontal, Category III Vent System Installation”.