

These units are certified for residential applications. For installation in a residential garage, these units must be installed so that burners and ignition source are located no less than 18" (457mm) above floor. Heater must be located or protected to avoid physical damage by vehicles. Refer to CSA B149.1, Natural Gas and Propane Installation Code current edition.

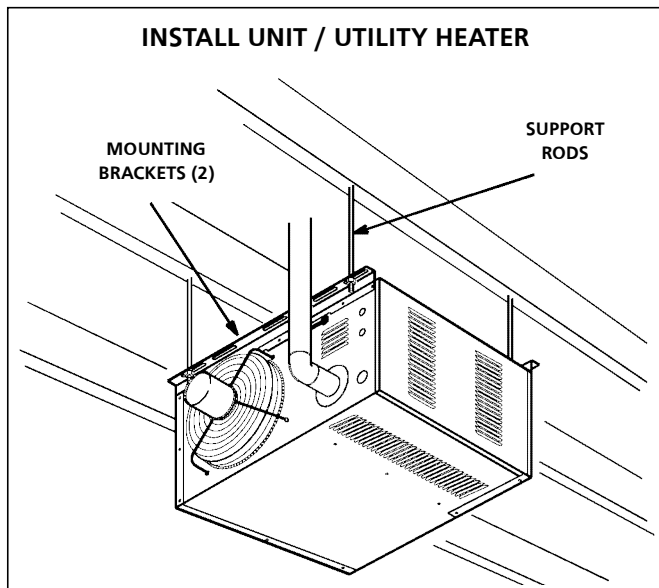
IN CANADA: In a confined area, the heater must be installed in accordance with the CSA B149.1, Natural Gas and Propane Installation Code. Be sure to check with local codes and ordinances for additional requirements.

UNIT HEATER INSTALLATION

Unit is shipped ready for installation. Unit may be installed as shown in **figure 1** or inverted 180° depending on desired location as governed by clearances, vent connection, air direction, gas supply, electrical supply and service accessibility.

1. If installing unit in an inverted position: Remove and retain screws securing door and rotate door 180°. Secure with retained screws. Rotate louvers directing airflow as desired.
2. Choose location for mounting brackets.
3. Remove and retain three screws along top edge (bottom edge when inverted) of front of unit.
4. Align screw holes on mounting bracket with holes along top edge (either upright or inverted) of unit. Secure one mounting bracket to front of unit with retained screws. Secure other mounting bracket to back of unit with screws retained on the back of unit.
5. To support unit, secure mounting bracket to ceiling joist or truss. Unit may also hang on rods as shown in **figure 1**.

FIGURE 1



COMBUSTION AND VENTILATION AIR

Adequate facilities for supplying air for combustion and ventilation must be provided in accordance with the latest edition of section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1, in the U.S.A., CSA B149.1 Natural Gas and Propane Installation Code, or applicable provisions of local building codes.

All gas fired appliances require air to be used for the combustion process. In many buildings today, there is a negative indoor air pressure caused by exhaust fans, etc. If sufficient quantities of combustion air are not available, the heater or another appliance will operate in an inefficient manner, resulting in incomplete combustion which can result in the production of excessive carbon monoxide.

CAUTION: Insufficient combustion air can cause headaches, nausea, dizziness, asphyxiation or death.

If indoor air is to be used for combustion, it must be free of the following substances or the life of the heat exchanger will be adversely affected: chlorine, carbon tetrachloride, cleaning solvent, halogen refrigerants, acids, cements and glues, printing inks, fluorides, paint removers, varnishes, or any other corrosives.

VENTING

A – GENERAL RECOMMENDATIONS AND REQUIREMENTS

NOTE: The vent is a passageway, vertical or nearly so, used to convey flue gases from an appliance, or its vent connector, to the outside atmosphere. The vent connector is the pipe or duct that connects a fuel-gas burning appliance to a vent or chimney.

Unit heaters must be vented in compliance with all local codes or requirements of the local utility, the current standards of the (American) National Fuel Gas Code, ANSI Z223.1 or (Canada) CSA B149.1 Natural Gas and Propane Installation Code, and the following instructions.

A metal stamped/extruded transition is supplied with this certified unit. It must not be modified or altered and must be installed on the outlet of the induced draft blower assembly prior to the installation of the vent or vent connector. Failure to comply with this requirement will void the certification of the unit by the approval agencies. All joints shall be secured with at least two corrosion resistant screws. All joints must be checked for gas tightness after installation.

B – VERTICAL VENTS USING METAL VENT PIPE – COMMERCIAL AND RESIDENTIAL INSTALLATIONS

MHU compact unit heaters are listed as Category I appliances for vertical vent installations.

1. MHU unit heaters are to be used with NFPA- or ANSI-approved chimneys, U.L. listed type B-1 gas vents, single wall metal pipe, or listed chimney lining system for gas venting where applicable, as well as the modifications and limitations listed in **figure 2**. Seal single wall vent material according to the section **A - General Recommendations and Requirements**.
2. The vent diameter shall be 3" (76mm) or 4" (102mm) for the 50k unit and 4" (102mm) only for the 80k and 125k units. In all cases, a flue transition piece (supplied) is required to fit over the outlet of the induced draft assembly on the appliance.
3. Keep the vent connector runs as short as possible with a minimum number of elbows. Refer to the (American) National Fuel Gas Code ANSI Z223.1 or (Canada) CSA B149.1 Natural Gas and Propane Installation Code for maximum vent and vent connector lengths. Horizontal run of the vent connector from the induced draft blower to the chimney/vent

cannot exceed the values in **table 2**.

4. When the length of a single wall vent, including elbows, exceeds 5 feet (1.5m), the vent shall be insulated along its entire length with a minimum of 1/2" thick foil faced fiberglass 1-1/2# density insulation. If a single wall vent is used in an unheated area it shall be insulated. Failure to do so will result in condensation of flue gases.
5. The unit may be vented vertically as a single appliance or as a common vent with other gas-fired appliances. In common venting situations, vent connectors for other appliances must maintain a 4" (100mm) vertical separation between the vent connectors. Refer to common venting tables in the (American) National Fuel Gas Code ANSI Z223.1 or (Canada) CSA B149.1 Natural Gas and Propane Installation Code for proper vent size.
6. Clearance to combustible material is 6" (152mm) for single wall vent material except where a listed clearance thimble is used. Clearance to combustible material for type B-1 vent or factory-built chimney is per manufacturer's instructions.
7. The vent connector shall be supported without any dips or sags. Vertical vents shall be supported in accordance with their listing and manufacturers' instructions. All horizontal vent connector runs shall have a slope up to the vertical vent of at least 1/4" per foot (1mm per 50mm).
8. All vertical type B-1 vents, single wall vents, or listed chimney lining system must be terminated with a listed vent cap or listed roof assembly.
9. The vent must extend at least 3' (1m) above the highest point where it passes through a roof of a building and at least 2' (0.6m) higher than any part of a building within a horizontal distance of 10' (3.05m) unless otherwise specified by the (American) National Fuel Gas Code, ANSI Z223.1 or (Canada) CAN/CGA-B149 Installation Code. The vent must extend at least 5' (1.6m) above the highest connected equipment flue collar.

**TABLE 2
MAXIMUM HORIZONTAL VENT
LENGTHS**

No. of Elbows	Feet	m
1	25	7.6
2	20	6.1
3	15	4.6
4	10	3.0
5	5	1.5
Maximum length of vent connector not to exceed 30 ft. (9.1m).		

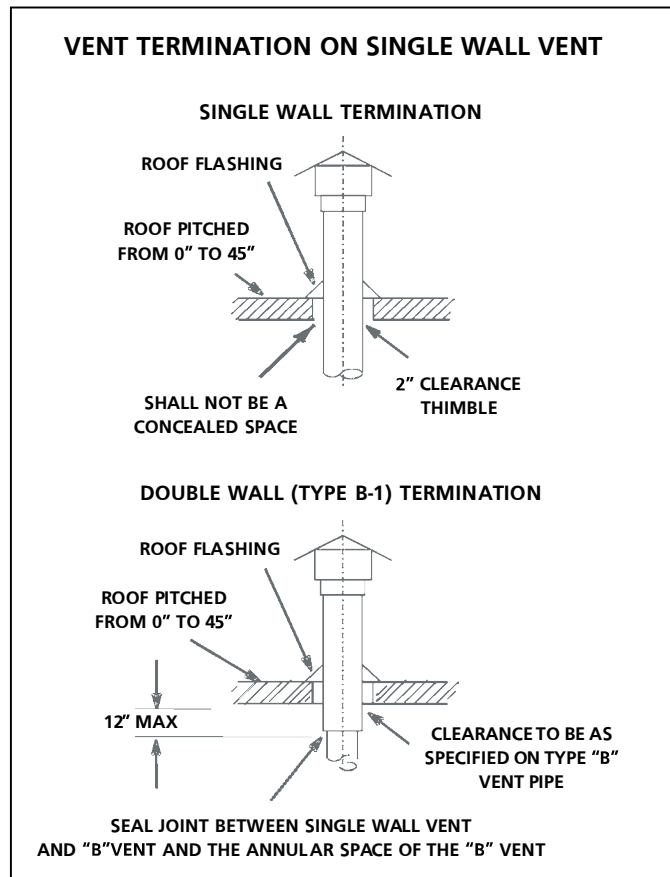


FIGURE 2

C – HORIZONTAL VENTING – GENERAL

Due to changes to Z83-8 2009 CSA2.6-2009, the use of single wall B-Vent is no longer permitted as an acceptable material when venting horizontally, this change covers both residential and commercial installations. All horizontally vented units manufactured after July of 2011 must be vented as a Category III Unit/Utility Heater in compliance with UL 1738 & ULS636. Common venting is not allowed when horizontally venting the unit heater.

The minimum horizontal vent length is 5 feet (914mm).

1. If possible, do not terminate the horizontal vent through a wall that is exposed to prevailing wind. Exposure to excessive winds can affect unit performance.
2. Vent termination must be free from obstructions and at least 12" (306mm) above grade level and maximum snow height.
3. Do not terminate vent directly below roof eaves or above a walkway, or any other area where condensate dripping may be troublesome and may cause some staining. Avoid windows where steam may cause fogging or ice buildup.
4. When horizontally vented, minimum clearance for termination from any door, window, gravity air inlet, gas or electric meter, regulators, and relief equipment is 4 ft. (1.2m) for U.S. installations. Refer to NFPA 54/ANSI Z223.1 in the U.S.A. and CSA B149.1 Natural Gas and Propane Installation Code and .2 in Canada or with authorities having local jurisdiction. In Canada, vent termination must have a minimum 6 ft. (1.8 m) horizontal clearance from gas and electric meters and relief devices as specified in the Canadian B149.1, Natural Gas Installation Code.

- Vent termination must be a minimum of 4' (1.2m) below or 4' (1.2m) horizontally from any soffit vent or under-eave vent.
- Vent must be a minimum of 6' from an inside corner formed by two exterior walls. If possible, leave a 10' clearance.
- Vent termination must be a minimum of 10' (3m) from any forced air inlet (includes fresh air inlet for other appliances, such as a dryer).
- When termination is routed through an exterior combustible wall the vent must be supported using a listed clearance thimble. Seal the connection between the single wall and double wall pipes and the annular space of the double wall pipe as shown in figure 2. Inside edge of vent termination tee must be at least 12 inches from outside wall as shown in figure 3.
- For horizontal venting, the vent pipe shall be supported with hangers no more than 3ft. (1m) apart to prevent movement after installation.

D – HORIZONTAL VENTING – COMMERCIAL

- Horizontal commercial installations are for buildings which are not attached to living spaces. The vent may be single wall vent material installed according to the sections

Venting A - General Recommendations and Requirements and **C - Horizontal Venting General** and **D - Horizontal Venting - Commercial**. Refer to figure 3.

- The vent pipe diameter for horizontal commercial installations shall be 4" (76mm) on 50 units. Because of this a transition piece has been supplied and is already attached to your heater. Refer to figure 4
- Select a wall termination point that will maintain 1/4" rise per foot slope of horizontal run of vent pipe.
- For upward sloped vent a condensate tee and drain must be installed within the first 5' (1.5m) from the unit heater to protect the appliance. If a flexible condensate drain line is used, the drain line must include a loop entering the

structure. If the unit is shut down for an extended period of time and will be exposed to sub-freezing temperatures, the condensate may freeze.

E – HORIZONTAL VENTING – RESIDENTIAL

- For horizontal residential installations these units are certified as Category III appliances. **Venting A - General Recommendations and Requirements** and **C - Horizontal Venting General** and **E - Horizontal Venting - Residential**. Refer to figure 6.
- The vent pipe diameter for horizontal residential installations shall be 4" on all units. A standard vent transition is required at unit in addition to the transition supplied with the unit.
- The maximum vent length is 25' (7.6m) plus one 90-degree elbow. The minimum length is 5' (1.5m).
- The vent must maintain a 1/4 " rise per foot of slope upwards toward the termination.

F – VENTING USING A MASONRY CHIMNEY

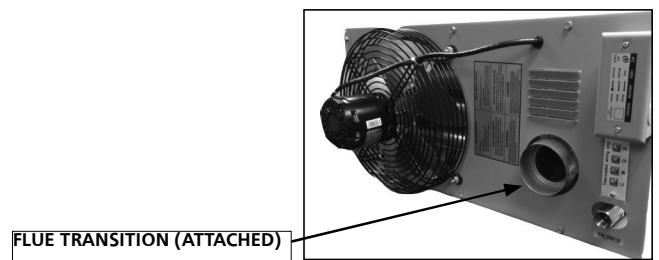


FIGURE 4

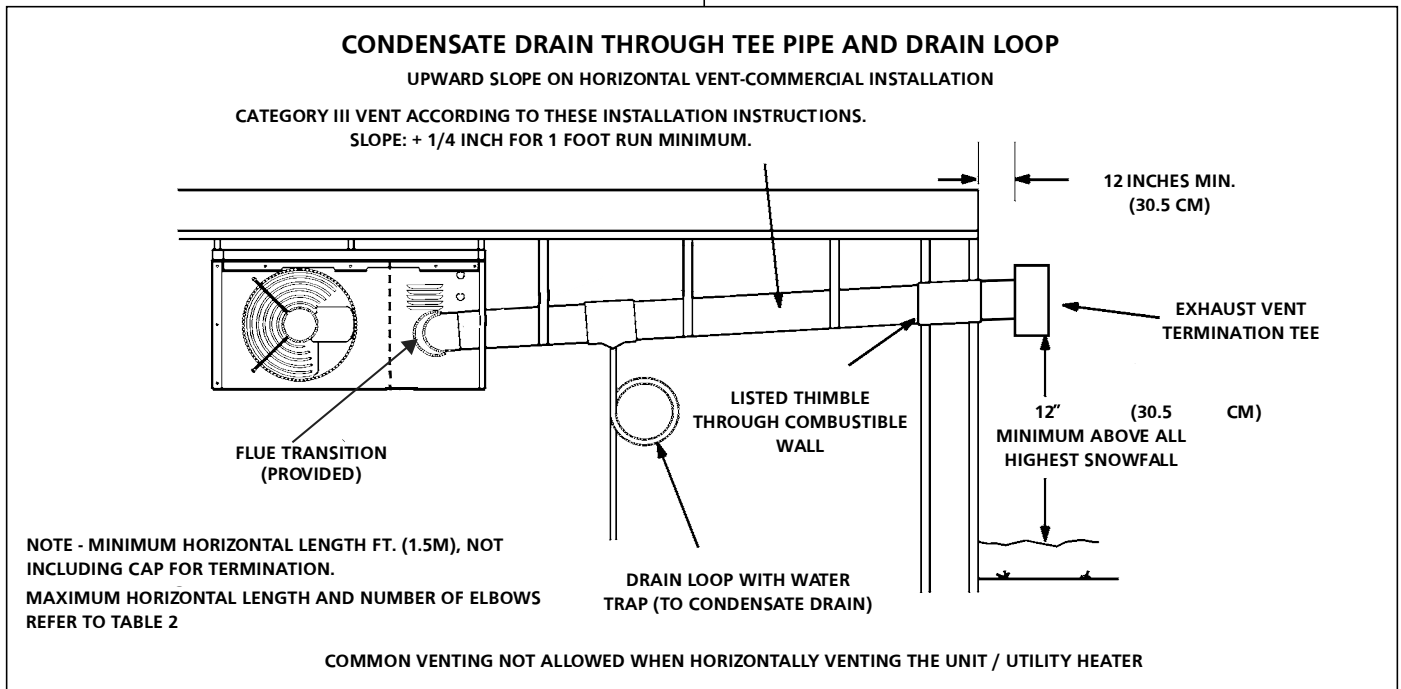


FIGURE 3

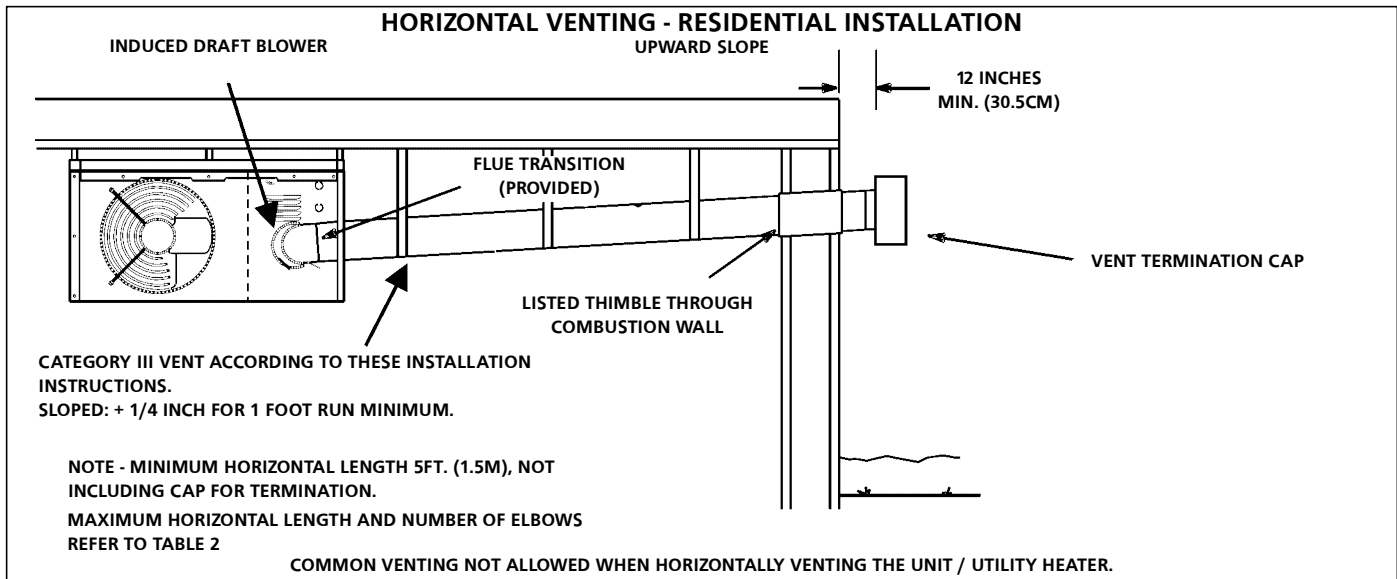


FIGURE 6

The following additional requirements apply when a lined masonry chimney is being used to vent the compact unit / utility heater.

1. Masonry chimneys used to vent Category I units heaters must be either tile-lined or lined with a listed metal lining system or dedicated gas vent. Unlined masonry chimneys are prohibited. A category I appliance must never be connected to a chimney that is servicing a solid fuel appliance. If a fireplace chimney flue is used to vent this appliance, the fireplace opening must be permanently sealed.
2. A fan assisted unit heater may be commonly vented into an existing lined masonry chimney provided:
 - The chimney is currently serving at least one draft-hood equipped appliance.
 - The vent connector and chimney are sized in accordance with venting tables in the (American) National Fuel Gas Code ANSI Z223.1 or (Canada) CSA B149.1 Natural Gas and Propane Installation Code.

IMPORTANT Single appliance venting of a fan assisted unit heater into a tile lined masonry chimney (interior or outside wall) is prohibited. The chimney must first be lined with either type B-1 vent or an insulated single wall flexible vent lining system, sized in accordance with venting tables in the (American) National Fuel Gas Code ANSI Z223.1 or (Canada) CSA B149.1 Natural Gas and Propane Installation Code.

3. A type B-1 vent or masonry chimney liner shall terminate above the roof surface with a listed cap or a listed roof assembly in accordance with the terms of their respective listings and the vent manufacturer's instructions.
4. Do not install a manual damper, barometric draft regulator, or flue restrictor between the unit heater and the chimney.
5. If type B-1 double-wall vent is used inside a chimney, no other appliance can be vented into the chimney. Outer wall of type B-1 vent pipe must not be exposed to flue products.
6. Insulation for the flexible vent pipe must be an encapsulated fiberglass sleeve recommended by the flexible vent pipe manufacturer.
7. The space between liner and chimney wall should NOT be insulated with puffed mica or any other loose granular

insulating material.

8. If type B-1 vent or an insulated flexible vent pipe cannot be used as liners, the chimney must be rebuilt to accommodate one of these methods or some alternate approved method must be found to vent the appliance. When inspection reveals that an existing chimney is not safe for the intended purpose, it shall be rebuilt to conform to nationally recognized standards, lined or relined with suitable materials or replaced with a gas vent or chimney suitable for venting unit heaters. The chimney passageway must be checked periodically to ensure that it is clear and free of obstructions.

G –REMOVAL OF UNIT FROM COMMON VENT

In the event that an existing unit heater is removed from a venting system commonly run with separate gas appliances, the venting system is likely to be too large to properly vent the remaining attached appliances. The following test should be conducted while each appliance is in operation and the other appliances are not in operation, yet remain connected to the common venting system. If the venting system has been installed improperly, the system must be corrected.

1. Seal any unused openings in the common venting system.
2. Visually inspect the venting system for proper size and horizontal pitch. Determine there is no blockage or restriction, leakage, corrosion, or other deficiencies which could cause an unsafe condition.
3. If practical close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliances not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
4. Follow the lighting instructions. Place the appliance being inspected in operation. Adjust thermostat so appliance will operate continuously.
5. Test for spillage at the draft hood relief opening after five minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar, or pipe.

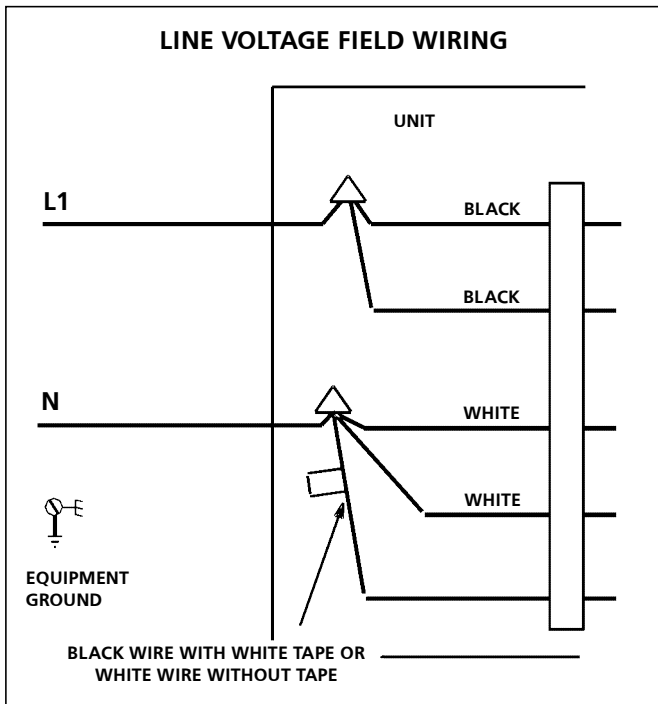


FIGURE 7

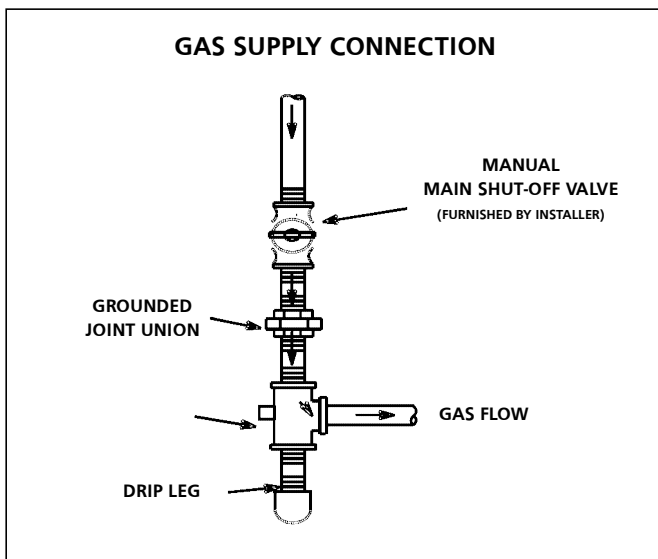


FIGURE 8

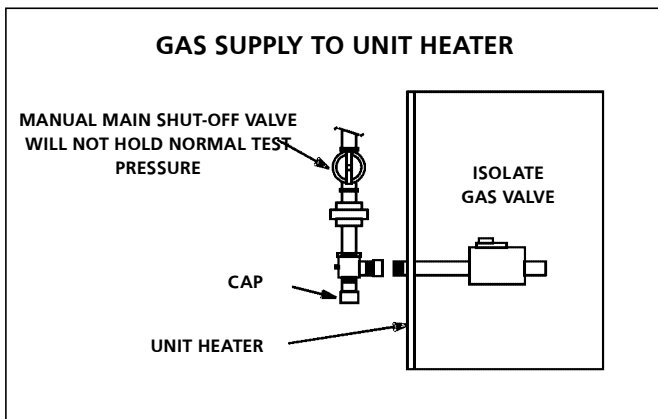


FIGURE 9

6. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas-burning appliance to their previous condition of use.
7. If improper venting is observed during any of the above tests, the common venting system must be corrected. The common venting system should be re-sized to approach the minimum size as determined by using the appropriate tables

ELECTRICAL CONNECTIONS

NOTE: The MHU series unit/utility heaters use a direct spark ignition system. There is no pilot necessary as the spark lights the main burner as the gas valve is turned on. The direct spark ignition control board emits radio noise during burner ignition. The level of energy may be enough to disturb a logic circuit in a microprocessor controlled thermostat. It is recommended that an isolation relay be used when connecting the unit heater to a microprocessor controlled thermostat. Select circuit protection and wire size according to the unit rating plate. Install a separate disconnect switch (protected by either fuse or circuit breaker) near the unit so that power can be turned off for servicing. Remove electrical junction box cover and connect wiring through knockout on the junction box located on the side of the heater. Refer to heater wiring diagram for connection information. Use 18 gauge wire or larger for line power connections. Make sure to connect line power to wires located in the external electrical junction box behind junction box cover. **DO NOT CONNECT LINE POWER TO THERMOSTAT TERMINAL STRIP ON OUTSIDE OF HEATER.**

Electrically ground the unit in accordance with local codes or in the absence of local codes, in accordance with the current National Electrical Code (ANSI/NFPA No. 70) in the USA, and in Canada with the current Canadian Electrical Code, Part 1 CSA C22.1

NOTE: Un-insulated ground wire must be wrapped in electrical tape to avoid damage to the electrical system.

Make line voltage connections as shown in figure 7. Connect field wiring as shown on wiring diagram on unit. Also, refer to typical diagram in this manual.

To use the blower for air circulation only, your thermostat must have a "fan only" or fan selection setting. In case your thermostat has this option, an additional wire should be run to the "G" terminal on the thermostat connection block. See wiring schematic on page 13.