AIR FOR COMBUSTION AND VENTILATION
Vent-Free Gas Fireplace and Log Heaters

⚠ WARNING: This heater shall not be installed in a room or space unless the required volume of indoor combustion air is provided by the method described in the National Fuel Gas Code, ANSI Z223.1/NFPA 54, the International Fuel Gas Code, or applicable local codes. Read the following instructions to ensure proper fresh air for this and other fuel-burning appliances in your home.

Today's homes are built more energy efficient than ever. New materials, increased insulation and new construction methods help reduce heat loss in homes. Homeowners apply weather strip and caulk around windows and doors to keep the cold air out and the warm air in. During heating months, homeowners want their homes as airtight as possible.

While it is good to make your home energy efficient, your home needs to breathe. Fresh air must enter your home. All fuel-burning appliances need fresh air for proper combustion and ventilation.

Exhaust fans, some fireplaces, clothes dryers and some fuel-burning appliances draw air from the house to operate. You must provide adequate fresh air for these appliances. This will ensure proper venting of vented fuel-burning appliances.

PROVIDING ADEQUATE VENTILATION

The following are excerpts from *National Fuel Gas Code, ANSI Z223.1/NFPA 54, Air for Combustion and Ventilation.*

All spaces in homes fall into one of the three following ventilation classifications:

1. Unusually Tight Construction
2. Unconfined Space
3. Confined Space

The information on ***Pages 6-7*** will help you classify your space and provide adequate ventilation.

Unusually Tight Construction

The air that leaks around doors and windows may provide enough fresh air for combustion and ventilation. However, in buildings of unusually tight construction, you must provide additional fresh air.

Unusually tight construction is defined as construction where:

a. walls and ceilings exposed to the outside atmosphere have a continuous water vapor retarder with a rating of one perm (6 x 10^{-11} kg per pa-sec-m^2) or less with openings gasketed or sealed and

b. weather stripping has been added on openable windows and doors and

c. caulking or sealants are applied to areas such as joints around window and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines and at other openings.

If your home meets all three criteria above, you must provide additional fresh air. See *Ventilation Air From Outdoors*, *Page 7*.

If your home does not meet all three criteria above, proceed to Determining *Fresh-Air Flow For Heater Location*.

Confined and Unconfined Space

The National Fuel Gas Code, ANSI Z223.1/ NFPA54 allows two methods for determining whether the space in which the heater is being installed is confined or unconfined space. The standard method defines a confined space as a space whose volume is less than 50 cubic feet per 1,000 BTU/hr (4.8 m^3 per kw) of the aggregate input rating of all appliances installed in that space and an unconfined space as a space whose volume is not less than 50 cubic feet per 1,000 BTU/hr (4.8 m^3 per kw) of the aggregate input rating of all appliances installed in that space. Rooms communicating directly with the space in which the appliances are installed*, through openings not furnished with doors, are considered a part of the unconfined space. Where the air infiltration rate of a structure is known, the Known Air Infiltration Rate Method may be used. Follow The National Fuel Gas Code, ANSI Z223.1/NFPA 54 to use this method to determine if the space is confined or unconfined.

* Adjoining rooms are communicating only if there are doorless passageways or ventilation grills between them.

DETERMINING FRESH-AIR FLOW FOR HEATER LOCATION

Determining if You Have a Confined or Unconfined Space Using the Standard Method

Use this work sheet to determine if you have a confined or unconfined space.

Space: Includes the room in which you will install fireplace plus any adjoining rooms with doorless passageways or ventilation grills between the rooms.

1. Determine the volume of the space (length x width x height).
   Length x Width x Height =_____cu. ft. (volume of space)
   Example: Space size 20 ft. (length) x 16 ft. (width) x 8 ft. (ceiling height) = 2560 cu. ft. (volume of space)
   If additional ventilation to adjoining room is supplied with grills or openings, add the volume of these rooms to the total volume of the space.
2. Multiply the space volume by 20 to determine the maximum BTU/Hr the space can support.
   _____ (volume of space) x 20 = (Maximum BTU/Hr the space can support)
   Example: 2560 cu. ft. (volume of space) x 20 = 51,200 (maximum BTU/Hr the space can support)

3. Add the BTU/Hr of all fuel burning appliances in the space.

Vent-free fireplace	_____	BTU/Hr
Gas water heater*	_____	BTU/Hr
Gas furnace	_____	BTU/Hr
Vented gas heater	_____	BTU/Hr
Gas fireplace logs	_____	BTU/Hr
Other gas appliances*	_____ +	BTU/Hr
Total	0 =	BTU/Hr

* Do not include direct-vent gas appliances. Direct-vent draws combustion air from the outdoors and vents to the outdoors.

Example:

Gas water heater	40,000	BTU/Hr
Vent-free fireplace	+ 33,000	BTU/Hr
Total	= 73,000	BTU/Hr

4. Compare the maximum BTU/Hr the space can support with the actual amount of BTU/Hr used.

(maximum can support)	_____	BTU/Hr
(actual amount used	_____	BTU/Hr

Example: 51,200 BTU/Hr (maximum the space can support)
73,000 BTU/Hr (actual amount of BTU/Hr used)

The space in the above example is a confined space because the actual BTU/Hr used is more than the maximum BTU/Hr the space can support. You must provide additional fresh air. Your options are as follows:

A. Rework worksheet, adding the space of an adjoining room. If the extra space provides an unconfined space, remove door to adjoining room or add ventilation grills between rooms. See *Ventilation Air From Inside Building*.

B. Vent room directly to the outdoors. See *Ventilation Air From Outdoors*.

C. Install a lower BTU/Hr fireplace, if lower BTU/Hr size makes room unconfined.

If the actual BTU/Hr used is less than the maximum BTU/Hr the space can support, the space is an unconfined space. You will need no additional fresh air ventilation.

⚠ WARNING: If the area in which the heater may be operated does not meet the required volume for indoor combustion air, combustion and ventilation air shall be provided by one of the methods described in the *National Fuel Gas Code, ANSI Z223.1/NFPA 54,* the *International Fuel Gas Code,* or applicable local codes.

VENTILATION AIR

Ventilation Air From Inside Building

This fresh air would come from an adjoining unconfined space. When ventilating to an adjoining unconfined space, you must provide two permanent openings: one within 12" of the ceiling and one within 12" of the floor on the wall connecting the two spaces *(see options 1 and 2, **Figure 2**)*. You can also remove door into adjoining room *(see option 3, **Figure 2**)*. Follow the *National Fuel Gas Code, ANSI Z223.1/NFPA 54, Air for Combustion and Ventilation* for required size of ventilation grills or ducts.

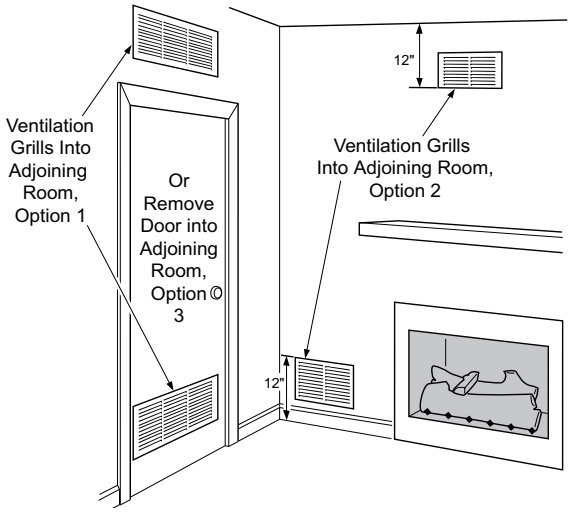

Figure 2 - Ventilation Air from Inside Building

Ventilation Air From Outdoors

Provide extra fresh air by using ventilation grills or ducts. You must provide two permanent openings: one within 12" of the ceiling and one within 12" of the floor. Connect these items directly to the outdoors or spaces open to the outdoors. These spaces include attics and crawl spaces. Follow the *National Fuel Gas Code, ANSI Z223.1/NFPA 54, Air for Combustion and Ventilation* for required size of ventilation grills or ducts.

IMPORTANT: Do not provide openings for inlet or outlet air into attic if attic has a thermostat-controlled power vent. Heated air entering the attic will activate the power vent.

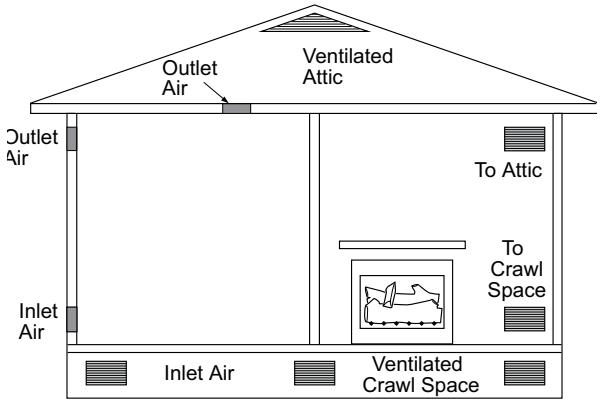

Figure 3 - Ventilation Air from Outdoors