

INSTALLING YOUR FURNACE

Basic Tools Needed

- Hand drill or properly grounded electric drill
- 1/8 inch and 3/16 inch drill bit (metal)
- 6 foot folding ruler or tape measure
- Screwdriver (Phillips Head)
- Pliers (Wire Cutting)
- Hammer
- Stud locator or small finishing nails
- 8 inch adjustable wrench
- Keyhole saw or saber saw
- 2-10 inch or 12 inch pipe wrenches

Gloves and safety glasses

Basic Materials Needed

- Pipe joint compound resistant to propane gases.
- Electrical wiring supplied as needed for optional blower.
- Pipe and fittings to make connections to the heater.

Helpful Installation Information

THE FOLLOWING BOOKLETS WILL HELP YOU IN MAKING THE INSTALLATION:

ANSI/NFPA 70-1990 or current edition "National Electrical Code". In Canada: CSA C22.1 Canadian Electrical Code.

American National Standard NFPA54/ANSI Z223.1 1988 or current edition "National Fuel Gas Code".

Obtained from: American National Standards Institute, Inc., 1430 Broadway, New York, N Y 10018.

In Canada: CAN/CGA B149.

Optional Accessories

BLOWER

To increase circulation of warmed air within the heated space, you may use Blower Accessory Kit 2102, on all models except 2001622A and 2001621A.

THERMOSTAT P322016

FLOOR BOARD MODEL 4163 OR 4167

Available in black to match the heater.

VENT COLLAR MODEL 9102, 9104 OR 9106

Available in black to match the heater.

Unpacking Your Heater

Examine all packing material carefully. Look for loose parts before discarding. Store all parts where they cannot be lost or damaged before you need them.

NOTE: Check the burner rating plate, located in the burner compartment, to make sure your heater is equipped to operate on the type of gas available (either natural or propane gas). **DO NOT convert unit from natural gas to propane gas or from propane gas to natural gas without the proper manufacturer's gas conversion kit.**

Installing Your Heater

The following steps are needed for proper installation and safe operation of your heater. If you have any doubts as to any requirements, check with local authorities for local and state codes affecting the installation.

Obtain professional help where needed.

DO NOT install this heater in a travel trailer, recreational vehicle, or mobile home.

IMPORTANT

For satisfactory and trouble-free operation, be sure to:

1. Locate the heater properly within the space to be heated.
2. Provide for adequate combustion air, adequate air circulation around the cabinet inside the open room and a proper vent system.
3. Maintain all minimum clearances which apply to your heater.

Locating the Heater

! WARNING: Gas burning appliances require air for combustion and proper venting. Minimum fresh air opening of 1 square inch per 1,000 BTU/hr. input rating must be provided for ventilation.

EXAMPLE: A 30,000 BTU/hr. input unit requires the equivalent of a 30 inch wide window be open 1 inch for safe operation.

! WARNING: Danger of property damage, bodily injury or death. Even when a house meets requirements for unconfined space with adequate air infiltration, it is recommended that a fresh air intake be installed to lessen the possible dangers from any future changes on the home.

Consider the following points before attempting to install the heater:

1. In choosing the location for the heater, the following factors should be considered:
 - a. Convenience to the gas supply.

- b. Arrangement of the rooms or area to be heated.
 - c. Probable location of the furniture.
 - d. General appearance.
 - e. Safe clearance from anything that could catch fire.
 - f. Ability to properly vent the heater.
2. Locate the heater centrally in the area which it is to heat. The ideal location is at the source of cold air, which is an outside wall. If the heater is on an outside wall, the cold air will be warmed before it moves through the room.
 3. Place the heater where the air will circulate freely throughout the area to be heated. If one heater is intended to heat the entire house, it is advisable to consider the installation of grilles immediately below the ceilings to permit circulation of hot air from room to room. Return air grilles are also desirable.
 4. Be certain the heater is placed where the air is free to circulate around it. Never install the heater in a wall recess. The minimum clearance required to any wall or object can be found on the rating plate located inside the heater control door on the base plate. We recommend a 24-inch min. clearance from the burner access door for the ease of lighting and for observation of pilot and burner flames.
 5. The heater must be installed so that the draft hood is in the same pressure zone as the combustion air.
 6. The heater may be placed directly on wood floors. Heavy pile or shag rugs may restrict normal air flow. Some floor coverings discolor easily from even low heat. To assure safe operation, a metal or wood panel, extending the full depth and width of the appliance must be placed under the heater. Optional floor boards are available from Williams.
 7. Do not place the heater where curtains, draperies, or any other material may come into contact with any part of the heater.

GAS CONTROLS

1. All models are regulated on natural or propane gases. The regulator is built into the gas control valve.
2. All models are equipped with a 100% pilot safety shutoff and vent safety shutoff system.
3. **CAUTION:** Do not connect 115V electrical service line to gas control valve or wall thermostat.

GAS SUPPLY

For natural gas, the minimum inlet gas supply pressure for the purpose of input adjustment is 5" water column. The Maximum inlet gas supply pressure is 7" water column.

For propane gas, the minimum inlet gas supply pressure for the purpose of input adjustment is 11" water column. The maximum inlet gas supply pressure is 13" water column.

The gas pressure and input to the burners must not exceed the rated input and pressure shown on the rating

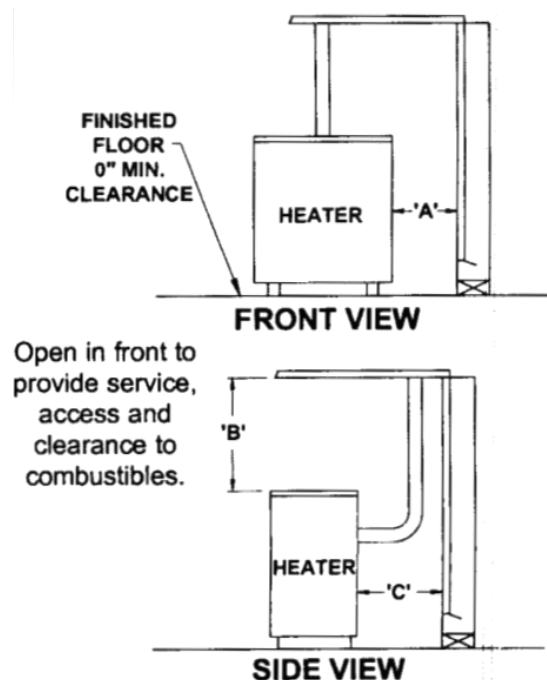
plate. On natural gas, the manifold pressure should be 4 inches water column. The manifold pressure should be 10 inches water column for propane gas.

Orifice changes may be required to suit the gas supplied.

For heaters located at elevations between sea level and 2,000 feet, the measured input must not be greater than the input shown on the rating plate of the heater. For elevations above 2,000 feet, the measured input must not exceed the input of the rating plate reduced by 4 percent for each 1,000 feet that the heater is above sea level.

MINIMUM REQUIRED CLEARANCES			
MODEL	"A" SIDE	"B" CEILING	"C" REAR
200 SERIES	2"	36"	3"
350 SERIES	6"	57"	6"
500 SERIES	6"	57"	6"
650 SERIES	6"	57"	6"
24" MIN. CLEARANCE IS RECOMMENDED ON SIDE WITH BURNER ACCESS DOOR OR EASE OF LIGHTING AND FOR OBSERVATION OF PILOT AND BURNER FLAMES.			

FIGURE 1 - MINIMUM REQUIRED CLEARANCES



INSTALLING YOUR FURNACE

NOTE: Minimum fresh air opening is 1 square inch per 1,000 BTU/hr.

GAS PIPING

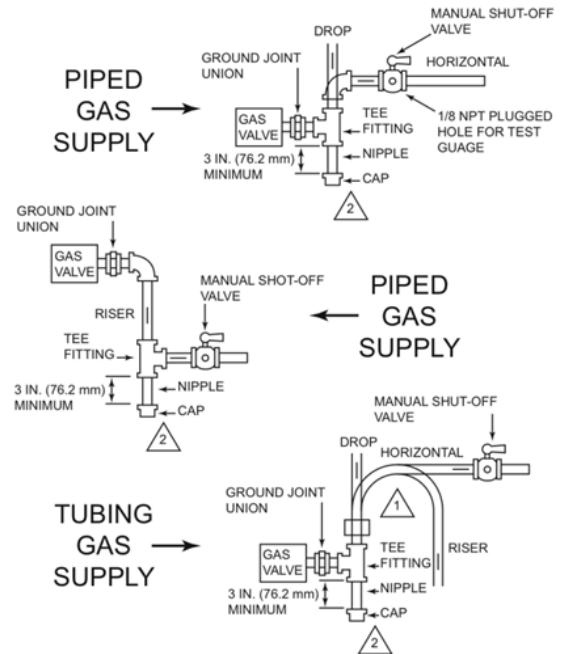
State and local authorities have established codes regulating the installation of gas burning equipment. Consult your gas supplier or gas company for complete information. In the absence of local codes, all aspects of the installation must comply with the National Fuel Gas Code ANSI Z223.1. In Canada: Follow the CAN/CGA-B149.1(2) Canadian Standard.

1. Use ½-inch pipe or semi-rigid tubing for natural and Liquefied Petroleum Gases. **DO NOT USE FLEXIBLE HOSE.** Appliance connectors of corrugated metal tubing and fittings that are listed by a nationally recognized testing agency may be used if accepted by the local code authorities. **FOLLOW THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.** This type of connection may only be installed in the room where the heater is located.
2. A manual shutoff valve and union must be installed in the gas supply line just ahead of the connection to the heater. The manual valve must include a 1/8-inch NPT plugged tapping accessible for connection of a test gauge.
3. Unions in the gas supply lines should be of the ground joint type. Compounds used on threaded pipe joints must be resistant to the action of liquefied petroleum gases.

⚠ WARNING: When connecting field piping, use a second wrench to keep the heater valve from turning. Support field piping properly, stress and over tightening could damage the gas valve and result in dangerous gas leaks which can cause dangerous conditions including property damage, bodily injury, and even death.

4. A drip leg **Figure 2** should be installed to constitute a trap to catch any condensate that may be in the gas. The drip leg should be readily accessible for cleaning.
5. The heater must be disconnected from the gas supply system and from the heaters individual shutoff valve when the system is tested at a pressure in excess of 1/2 PSI.
6. Check all factory and field pipe joints for gas leaks before and after lighting the heater. Use a soap solution. Never use a match or open flame. Correct any leak(s), no matter how small.
7. Piping supply shall be supported to prevent sagging damage to the controls and hazardous gas leaks. To prevent freezing where the supply pipe is exposed to cold air, wrap the pipe or run it underground.

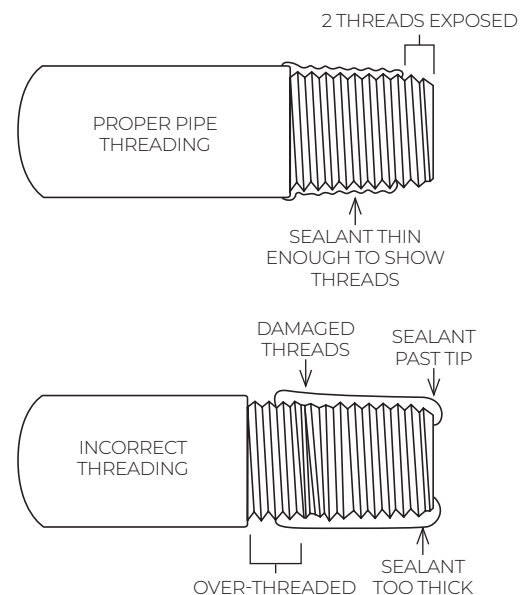
FIGURE 2 - LEFT SIDE GAS INLET



1. ALL BENDS IN METTALIC TUBING SHOULD BE SMOOTH.
2. CAUTION: SHUT OFF THE MAIN GAS SUPPLY BEFORE REMOVING END CAP TO PREVENT GAS FROM FILLING THE WORK AREA. TEST FOR GAS LEAKAGE WHEN INSTALLATION IS COMPLETE.

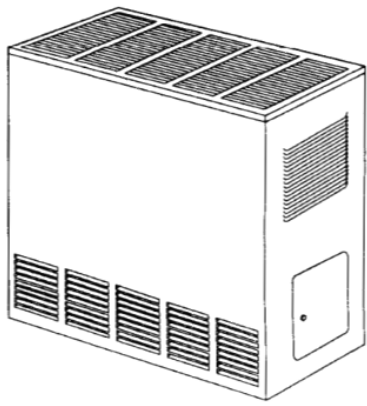
*Left side gas inlet shown. Models vary. Check to be sure.

FIGURE 3 – PROPER PIPING PRACTICE



IMPORTANT: All piping must comply with local codes and ordinances or with the National Fuel Gas Code (ANSI Z223.1 NFPA No. 54), whichever applies. (In Canada: CAN/CGA B149).

FIGURE 4 - ENCLOSED MODEL



FRONT VIEW ENCLOSED MODEL SHOWN

FIGURE 5 - GAS PIPE SIZES

NATURAL GAS PIPE CAPACITY - BTU/hr. (INCLUDES FITTINGS PIPE SIZE)			
LENGTH OF PIPE FEET	PIPE SIZE		
	1/2"	3/4"	1"
20	92,000	190,000	350,000
40	63,000	130,000	245,000
60	50,000	105,000	195,000

PROPANE GAS PIPE CAPACITY - BTU/hr. (INCLUDES FITTINGS PIPE SIZE)			
LENGTH OF PIPE FEET	PIPE SIZE		
	1/2"	3/4"	1"
20	189,000	393,000	732,000
40	129,000	267,000	504,000
60	103,000	217,000	409,000

Combustion & Ventilation Air

**WARNING:** Danger of property damage, bodily injury or loss of life. The furnace and any other fuel-burning appliances must be provided with enough fresh air for proper combustion and ventilation of flue gases. Most homes will require that outside air be supplied into the heated area.

The high cost of energy for home heating has brought about new materials and methods used to construct or remodel most current homes. The improved construction and additional insulation has reduced the heat loss and made these homes much tighter around windows and doors so that infiltrated air is minimal. This creates a problem to supply combustion and ventilation air for gas-fired or other

fuel burning appliances. Any use of appliances that pull air out of the house (clothes dryers, exhaust fans, fireplaces, etc.) increases this problem and appliances could be starving for air.

In addition, these energy measures mean that your home will retain more water vapor or a higher relative humidity.

High humidity, especially during cold weather, may be damaging to buildings because condensation forms on windows and inside walls.

The combination of a tight energy efficient home with the use of exhaust fans, fireplaces, clothes dryers, and gas appliances result in more and more air being drawn from the house until fresh air may be sucked back into the house down a furnace flue or fireplace chimney. Carbon monoxide can be the result. Carbon monoxide (CO) is a colorless, odorless gas produced when fuel is not burned completely or when the flame does not receive sufficient oxygen. Automobiles, charcoal, wood fires and improperly vented or air-starved coal, oil and gas furnaces or other appliances can produce carbon monoxide.

BE AWARE OF THESE AIR-STARVATION SIGNALS:

1. Headaches, nausea, dizziness.
2. Excessive humidity shown by heavily frosted windows or a moist "clammy" sensation.
3. Fireplace smoke fills the room or will not draw.
4. Furnace flue backs up.

AIR REQUIREMENTS

The requirements for providing air for combustion and ventilation are listed in the National Fuel Gas Code NFPA 54/ANSI Z223.1 (in Canada: CAN/CGA B149). Most homes will require that outside air be supplied to the heated area by means of ventilation grilles or ducts connecting directly to the outside or spaces open to the outdoors such as attic or crawl space. The only exception is when the furnace area meets the requirements and definitions for an unconfined space with adequate air infiltration.

**WARNING:** Danger of property damage, bodily injury or loss of life. The furnace and any other fuel-burning appliances must be provided with enough fresh air for proper combustion and ventilation of flue gases. Most homes will require that outside air be supplied into the heated area.

All air openings and connecting ducts must comply with the following:

If the furnace is installed in an area with another gas appliance(s), the total input rating of all appliances must be considered when determining the free area requirements for combustion and ventilation air openings.

Ducts must have the same cross-sectional area as the free area of the openings to which they connect. The minimum dimension of rectangular air ducts must not be less than 3-inches in length or height.

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LOUVERS / GRILLES AND SCREENS COVERING FREE AREA OPENINGS

If a screen is used to cover the opening(s), it must not be smaller than 1/4-inch mesh. Use the free area of a louver or grille to determine the size opening required to provide the free area specified. If the free area is not known, assume a 20% free area for wood and a 60% free area for metal louvers or grilles.

EXAMPLE 1

FURNACE LOCATED IN UNCONFINED SPACE.*

*An unconfined space must have a volume of a minimum 50 cubic feet per 1000 BTU/hr. of total of all appliances in area. Adjoining rooms may be included only if there are no doors between the rooms, or if special provisions are made such as ventilation grilles installed between connecting rooms.

Page 11, Figure 8 shows the minimum area in square feet' based on 8 foot ceiling heights, required for different BTU/hr. input ratings.

- A. If your furnace is in an open area (unconfined space*) the air that leaks through the cracks around doors and windows may be enough for combustion and ventilation air. The doors should not fit tight. The cracks around windows should not be caulked or weather stripped.

To determine if infiltration air is adequate, perform following checks:

1. Close all doors and windows. If you have a fireplace, start a fire and wait until flames are burning vigorously.
2. Turn on all exhausting devices, such as: kitchen and bathroom exhaust fans, dryers (gas and electric)
3. Turn on all vented gas appliances, such as: heating equipment (includes any room heaters), water heater
4. Wait ten (10) minutes for drafts to stabilize.
5. Check for draft hood spillage at each appliance. Hold a lighted match 2 inches from draft opening.

See Figure 6

- B. No Spillage

If the match flame pulls toward draft hood - this indicates sufficient infiltration air:

1. Return exhausting devices and appliances to the condition you found them.

- C. Draft Hood Spills

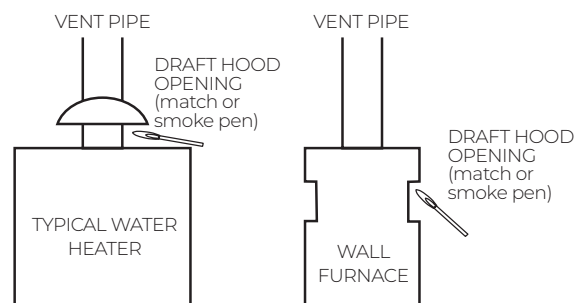
If there is spillage at a draft hood (match goes out or flame wavers away from draft hood):

1. Check for plugged flue connectors and chimneys. Check and repair, stoppage and test again.
2. If you have a fireplace, open a window or door near the fireplace and then check for spillage.
 - a) If spillage stops, do not use the fireplace without a nearby window or door open until you can supply fresh air by a permanent duct.

3. If you have kitchen and bathroom exhaust fans, turn them off and check for spillage.
 - a) If spillage stops, do not use exhaust fans until you can supply fresh air by a permanent duct.

! WARNING: Danger of property damage, bodily injury or loss of life. Draft hood spillage, with unobstructed vents, indicates that additional air must be brought into the structure from outside. Keep a window open (minimum 2 inches) near the appliance until a permanent air duct is installed.

FIGURE 6 - DRAFT HOOD SPILLAGE



4. Spillage means air starvation and a fresh air duct or air intakes must be installed to provide air directly to the furnace or other gas appliance.
- D. If spillage exists or when the furnace is in a building of tight construction where the windows and doors are weather-stripped, air for combustion and ventilation must be obtained from outdoors or space open to the outdoors.

Provide an opening(s) having a total free area of 1-square inch per 4,000 BTU/hr. for the total of all appliances. The required area is shown on **page 12, Figure 11**.

Figure 7 shows a typical duct going into ventilated crawl space or attic.

1. Duct must terminate at a point not more than 1 foot above the floor.
2. Duct size must be at least 1 inch of free area for each 4000 BTU/hr. of input of all appliances in area.

EXAMPLE 2

FURNACE LOCATED IN CONFINED SPACE

If furnace is installed in a confined space, it must be provided with free air for proper combustion and ventilation of flue gases by one of the following methods.

A. ALL AIR FROM INSIDE BUILDING:

If the confined space adjoins an unconfined, provide two permanent openings, one within 12 inches of the top and one within 12 inches of the bottom of the room connecting directly to unconfined space. Each opening must have a free area of at least 100 square inches or 1 square inch per 1,000 BTU/hr. combined input of appliances in one room if combined input exceeds 100,000 BTU/hr.

⚠ WARNING: Danger of property damage, bodily injury or loss of life. The adjoining unconfined space must have adequate air infiltration as defined in example 1.

FOR EXAMPLE: Your furnace is rated at 50,000 BTU/hr. The water heater is rated at 30,000 Btu/hr. The total is 80,000 BTU/hr. You need two grilles, each with 100 square inches of free opening. Metal grilles have about 60% free area, so you need two metal grilles each with 160 square inches of louvered area.

FIGURE 7 - FRESH AIR DUCT

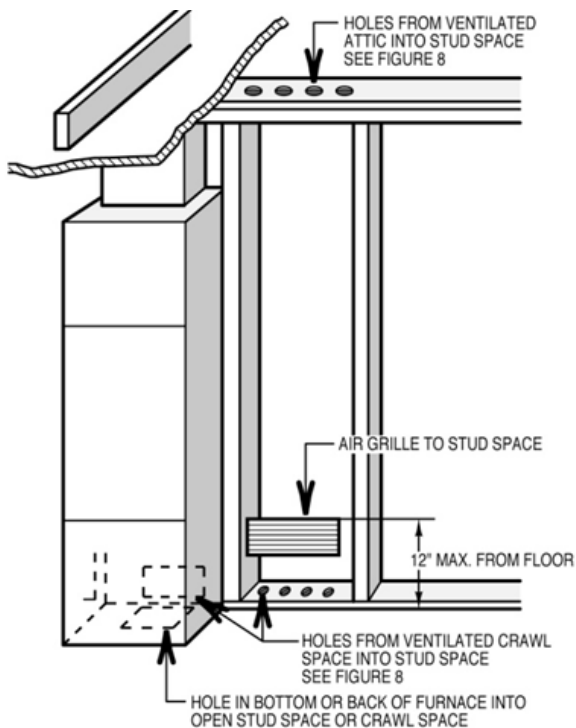


FIGURE 8 - MINIMUM AREA IN SQUARE FEET

4,000 BTU/hr. PER SQUARE INCH OPENING		MAX BTU/hr. INPUT	*UNCONFINED SPACE MIN. AREA IN SQ. FT. 8' CEILING HEIGHT
ROUND DUCT	RECTANGULAR DUCT		
4" DIA	3" X 3" SQ.	30,000	188
4" DIA	3" X 3" SQ.	35,000	219
4" DIA	3" X 4" SQ.	40,000	250
4" DIA	3" X 4" SQ.	45,000	281
4" DIA	3" X 5" SQ.	50,000	312
4 1/2" DIA	3" X 5" SQ.	60,000	375

* CAN BE TWO OR MORE ROOMS JOINED BY VENTILATION GRILLES.

Refer to figure as shown on **page 11, Figure. 9**, which shows grille installation. Using the previous example, the two connecting rooms plus the closet must equal at least 500 sq. feet to handle the combined input 50,000 plus 30,000.

B. ALL AIR FROM OUTDOORS:

If confined space doesn't adjoin an unconfined space then air must be provided from outdoors or spaces open to outdoors such as attic or crawl space.

Provide two permanent openings, one within 12 inches of top, one within 12 inches of bottom of room connecting directly, or by using ducts, with the outdoors or areas open to outdoors.

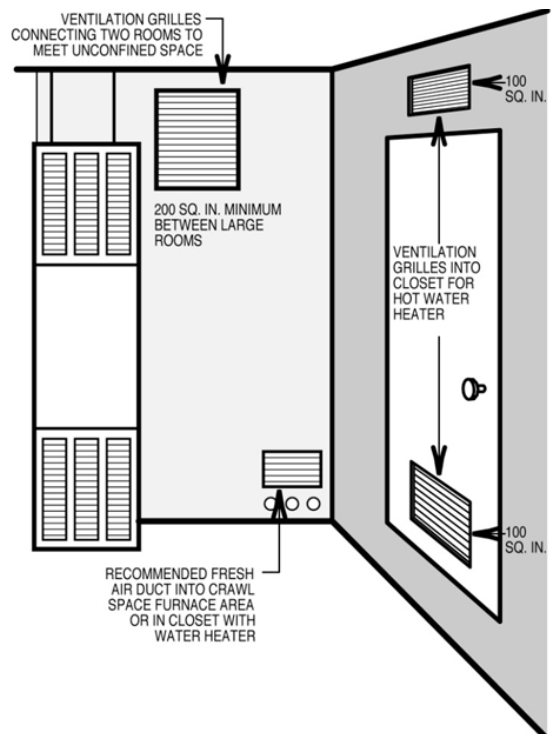
If opening connects directly to, or within vertical ducts, the free area of each opening must be at least 1 square inch per 4,000 BTU/hr. combined input of appliances in area.

If horizontal ducts are used, the free area of each opening must be at least 1 square inch per 2,000 BTU/hr. combined input of appliances in area.

FOR EXAMPLE: Your furnace is rated at 50000 BTU/hr. The water heater is rated at 30,000 BTU/hr. The total is 80,000 BTU/hr. You need two grilles, each with 20-square inches of free opening, unless connected by horizontal ducts which would require each grille or opening to have a free area of 40 square inches.

Openings for inlet or outlet air should not be made into attic area if attic is equipped with a thermostat controlled power vent.

FIGURE 9 - GRILLES CONNETING ROOMS TO MAKE UNCONFINED SPACE



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FIGURE 10 – AIR FROM OUTDOORS OR CRAWL SPACE

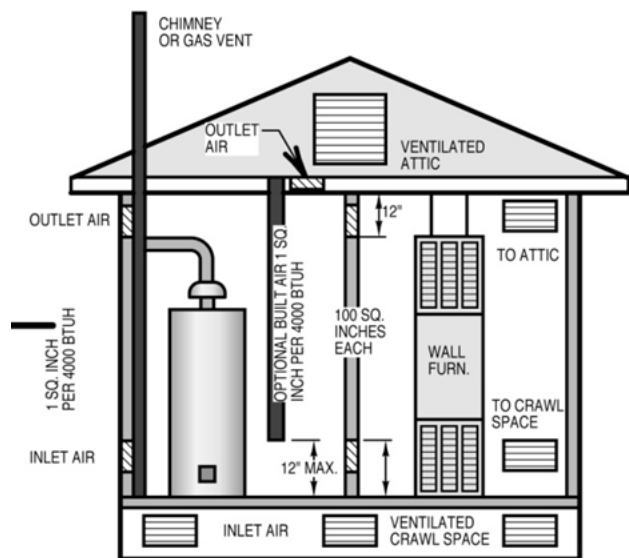


FIGURE 11 – FREE AREA

FURNACE BTU/hr. / INPUT	SQ. OF OPENING	REQUIRED NUMBER OF HOLES SILL OR HEADER PLATES		
		1 1/2"	2"	3"
30,000	7.5	7	4	2
35,000	8.75	8	5	2
40,000	10.0	9	5	3
45,000	11.25	10	6	3
50,000	12.5	11	6	3
60,000	15.0	13	8	4

Shown in square inches - each opening (furnace only).
Based on one square inch per 4,000 BTU/hr.

Thermostat Installation *(Sold Separately)*

Williams' heaters are operated by a millivolt type thermostat. Current to the thermostat is supplied by the pilot generator. Do not connect to electricity. Anticipator settings are not required.

1. If an old thermostat is being replaced and is in a satisfactory location and the wiring appears to be in good condition, use existing wiring. If in doubt, use new wire.
2. If a new location is chosen or if this is a new installation, thermostat cable must first be run to the location selected. All wiring must agree with local codes and ordinances. These instructions cover bringing the wire down from the attic but it can be run from a basement or crawl space using similar methods.

3. Before drilling a hole in the wall at the selected location, drive a small finishing nail through the ceiling in the corner of the wall and ceiling above the thermostat location. Pull the nail out and push a small stiff wire through the hole so it can be found in the attic. Drill a 1/2-inch hole through the ceiling wall plate.
4. Probe for obstructions in the partition. Then drill a 1/2-inch hole through the wall at the selected location for thermostat.
5. From the attic, feed the thermostat cable or a stiff wire through the wall until even with the thermostat location.
6. Snag the thermostat cable through the hole and pull the cable through the hole in the wall so that 6 inches of the cable protrudes.
7. Route the cable to the wall heater.
8. Never use nails or staples across the thermostat wires.

CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

Refer to installation instructions packed in the thermostat carton if you have any doubt about the above procedures. Use Williams thermostat P322016 or any millivolt thermostat.

WALL-MOUNTED THERMOSTAT INSTALLATION

1. To remove the thermostat cover, squeeze both sides and lift.
2. Connect the thermostat wires to the terminal screws on the thermostat base. Make sure the wiring does not interfere with thermostat operation.
3. Push any excess wire back through the hole in the wall and plug the hole with insulation to prevent drafts from affecting thermostat operation.
4. Being sure to level the thermostat for best appearance, fasten the thermostat base to the wall through the mounting holes with screws provided.
5. Replace the thermostat cover.
6. Do not run wire in any location where it might be damaged. Avoid splicing thermostat wires unless the spliced wires are properly cleaned, soldered and taped.
7. Use #18 gauge wire as supplied for a maximum length of 20 feet. If longer length is needed, use #16 gauge wire for a maximum length of 25 feet.
8. Connect the thermostat wires to the control valve as shown in **Figure 12**.

CABINET-MOUNTED THERMOSTAT INSTALLATION

1. Locate the knockout on the right side of the heater to mount the thermostat. Remove the knockout by

taping lightly with a screwdriver. It will also be necessary to cut the inside panel insulation about a ½-inch in diameter for clearance to the knockout.

2. Cut the thermostat wire to the desired length.
3. Connect the thermostat wires to the terminal screws on the back of the thermostat base.
4. Feed the thermostat wires through the knockout and route through the metal clip to the gas valve. Models, 2001621A and 2001622A do not have a metal clip.
5. Mount the thermostat to the side of the cabinet with screws provided.
6. Replace the thermostat cover.
7. Connect the thermostat wires to the control valve as shown in **Figure 12**.

IMPORTANT: KEEP THE THERMOSTAT WIRE AWAY FROM THE COMBUSTION CHAMBER.

FIGURE 12 - THERMOSTAT WIRING

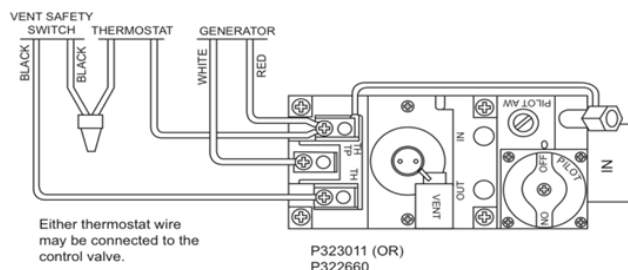
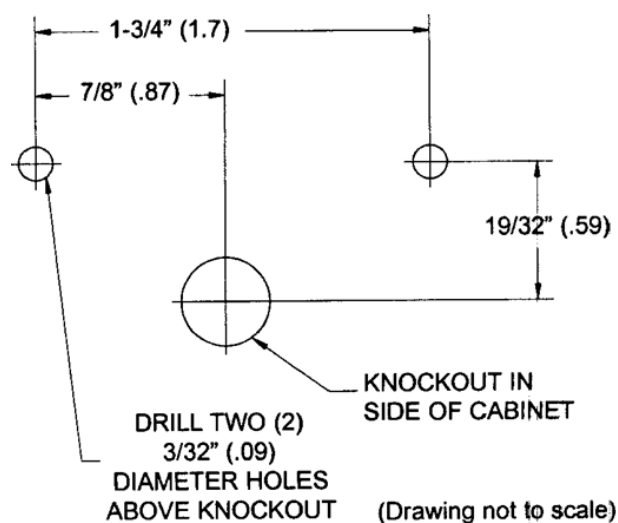


FIGURE 13 - CABINET-MOUNTED CLEARANCE



Vent Installation

This heater must be properly connected to a venting system. This heater is equipped with a vent safety shutoff system to protect against improper venting of combustion products. Tampering with or removal of this control will void the limited warranty and can result in carbon monoxide (CO) poisoning and possible death.

WARNING: Operation of this heater, when not connected to a properly installed and maintained venting system or tampering with the vent safety shutoff system, can result in carbon monoxide (CO) poisoning and possible death.

This appliance needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air. This room heater is equipped with a vent safety switch. The vent safety switch will cause gas flow to the main burner to shutoff due to improper venting or a blocked flue. If the vent safety switch continues to shut off the gas flow, a qualified service person must be contacted to inspect for improper venting, blockage in the vent pipe or the vent safety switch for being defective.

WARNING: Do not bypass the vent safety shutoff switch. To do so could expose the consumer to property damage, personal injury or possible death.

WARNING: Danger of illness, bodily injury or death. This heater and any other fuel burning appliance must be provided with enough fresh air for proper combustion and ventilation of flue gases. Most homes will require that outside air be supplied into the heater area.

1. An effective flue is necessary to carry off water vapor, carbon monoxide (CO), carbon dioxide (CO₂), and other products of combustion. For proper venting, follow the following basic rules for gravity venting, which are:
 - a. Keep the flue gases hot.
 - b. Follow the vent manufacturer's installation instructions.
 - c. Select the proper vent size.
 - d. Provide constant fresh air replacement.
2. For new installation, it is recommended that a Type "B" vent in accordance with its' listing be used. A Type "B" vent is one made of non-combustible, corrosion resistant material of sufficient thickness, cross sectional area and heat insulating quality to avoid excess temperatures on adjacent combustible material and certified by a nationally recognized testing agency. Existing brick flues should be lined to provide an effective vent. Brick chimneys, even in good repair, may be too large and will not provide sufficient draft to effectively vent a heater.

INSTALLING YOUR HEATER

3. Use vent pipe of the same size as the outlet on back of heater. In no case should a different size vent be used. Single wall vent pipe may be attached directly to the draft hood of the room heater when a clearance of 3 inches (76.2 mm) is maintained between the single wall vent pipe and the combustible wall of the room in which the room heater is located. Use double wall vent pipe for clearances less than 3 inches (76.2 mm) to combustibles.
4. Avoid a horizontal run to the vent pipe whenever possible. When a horizontal run is necessary, the pipe must pitch upward at least 1/4 inch per foot. It must be supported securely and joints fastened by sheet metal screws or rivets. Under no circumstances should the vent run downhill.
5. Never put a damper or barometric draft control in a gas vent pipe.
6. Never end a vent in an open attic or run a vent through a wall to the outside without extending it upward above the roof.
7. Always terminate the vent with an approved vent cap.
8. ALWAYS SECURE THE VENT PIPE TO THE OUTLET ON THE BACK OF THE HEATER WITH A SHEET METAL SCREW.
9. The flue pipe should extend through the wall of a chimney to be flush with the inner wall.
10. The flue pipe must be adequately supported by metal strips.
11. For the flue pipe running through walls and roofs, use B type (1 inch (25mm) clearance to combustibles) vent pipe.
12. Vents should extend at least 2 feet (.6m) above the roof and above any object or nearby building within 10 feet (3m).
13. Open tees should not be used in the flue pipe.
14. The heater must not be connected to a chimney flue that is servicing a separate solid-fuel burning appliance.
15. Run flue pipe as direct as possible with not more than two elbows. Use 45 degree elbows if possible.
16. The use of more than one appliance per vent system may cause the vent safety shutoff device to shut off the heater due to the cooling of vent temperatures through the draft diverter of the second appliance.
17. The vent safety shutoff may shut down the heater if a too large or an unlined, masonry chimney is used. The vent may not warm quickly enough to get adequate vent action in a chimney before the shutoff device will shut down the heater. If this is the case, it is recommended lining the chimney with proper size type "B" vent pipe or type "B" chimney liner.
18. Single-wall metal pipe should not be used outdoors in cold climates or venting gas equipment. If the vent is installed directly outside, the cold pipe may delay the venting and cause the heater to shut-off by the vent safety switch. To prevent this problem, as well as condensation of flue products, an insulated

enclosure is recommended. Use type B, vent pipe and maintain at least a one inch clearance to combustibles. Use a metal thimble to protect vent pipe as it passes through combustibles.

IMPORTANT: Inspect venting system prior to each heating season.

Typical Methods of Safely Venting Your Heater

1. Any horizontal run of vent pipe must slope upward a minimum of 1/4" per foot. Secure all joints of the vent with sheet metal screws.
2. Where the vent passes through the ceiling or wall, a thimble is required to keep the ceiling from catching fire. Use only a thimble designed for use with Type "B" gas vent, certified by a nationally recognized testing agency.
3. The vertical (straight up and down) part of the vent must end 2 feet above any part of the roof within 10 feet of the vent. This is to make sure the "draw" of the vent is not obstructed in any way.
4. A vent cap, approved by a nationally recognized testing agency, must be installed on top of the vent to keep out rain and snow and to prevent obstructions of the vent. The vent cap will also prevent excessive downdraft that can cause carbon monoxide to enter into the home. Do not use a homemade vent cap. They are dangerous and can restrict the draft of the vent.
5. Safe clearances are shown below. To prevent a fire, make sure the heater is installed no closer than the distances shown in the figures that apply to your type of venting.
6. If you are venting into a masonry chimney, it must be lined, in good repair and must not serve a wood or coal burning appliance. The flue must be at least as large in diameter as the vent connector. The top of the chimney must be two (2) feet higher above any part of the roof within ten (10) feet horizontally of the chimney and must be three (3) feet higher than the point where it passes through the roof line. If installed in front of a fireplace, the pipe must pass through a sheet metal cover on the fireplace that fits tightly.

VENTED ROOM HEATERS VENT SIZE (INCHES)		
NATURAL GAS	PROPANE GAS	VENT SIZE (INCHES)
2001622A	2001621A	3
3501522A	3501521A	4
5001522A	5001521A	4
6501522A	6501521A	5
3501922A	3501921A	4
5001922A	5001921A	4
6501922A	6501921A	5
3502522A	3502521A	4
5002522A	5002521A	4
6502522A	6502521A	5
3502921A	3502922A	4
5002921A	5002922A	4
6502921A	6502922A	5

FIGURE 14 - VENTING INTO A MASONRY CHIMNEY

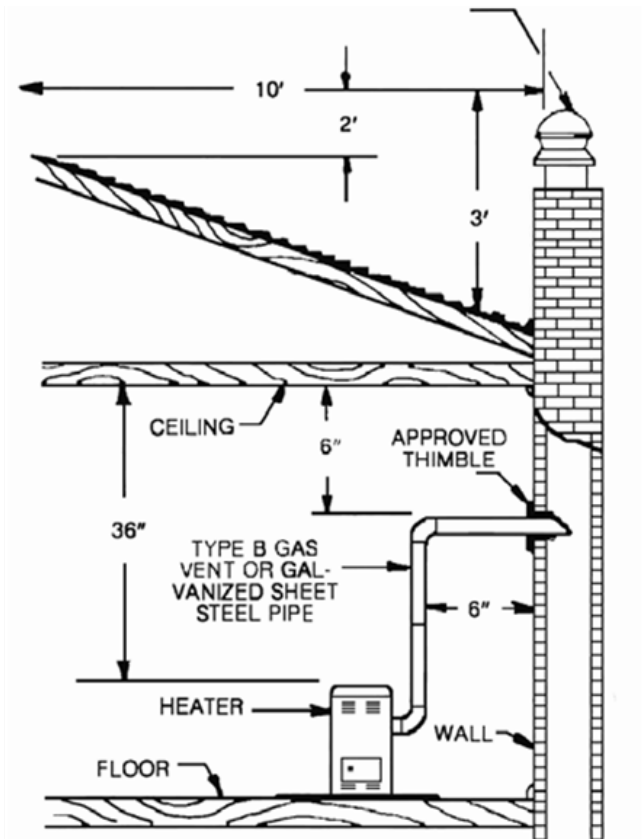


FIGURE 15 - STRAIGHT UP VENTING WITH TYPE "B" GAS VENT

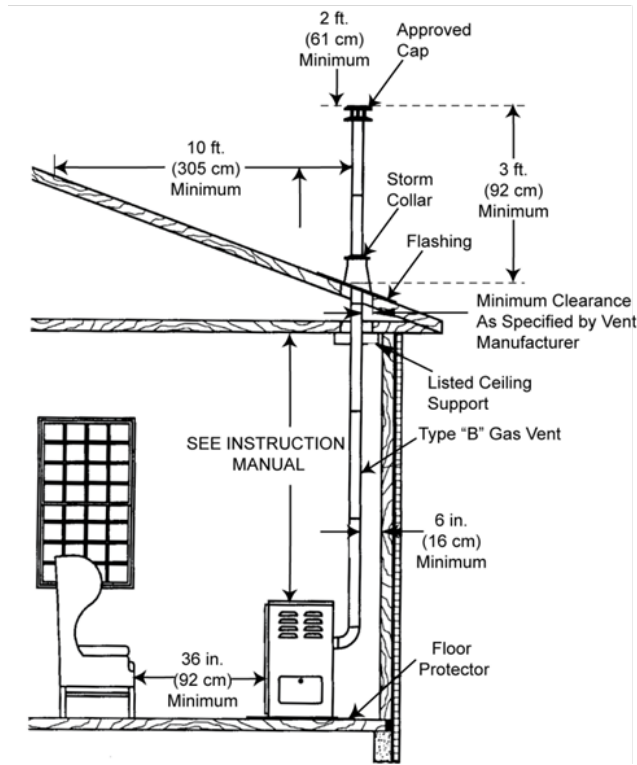


FIGURE 16 - VENTING INTO AN OUTSIDE TYPE "B" GAS VENT

