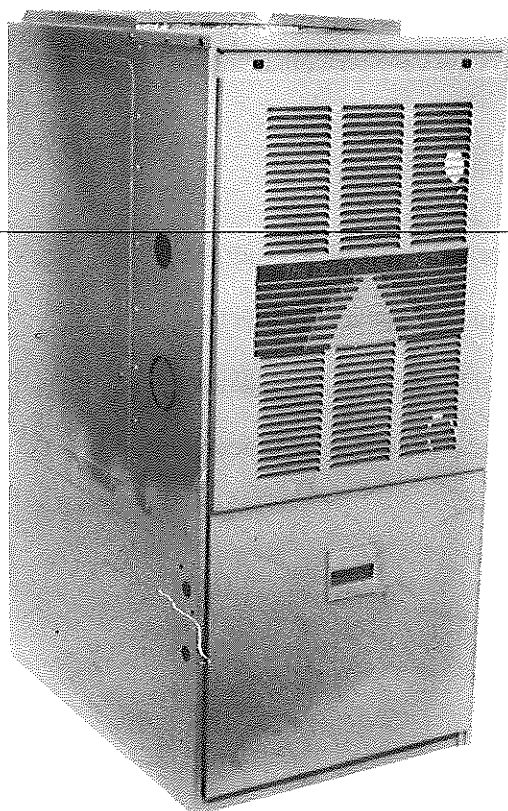
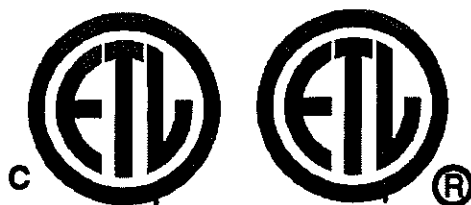


# INSTALLATION & OPERATING INSTRUCTIONS for GMPN MULTI-POSITION CONDENSING GAS FURNACE

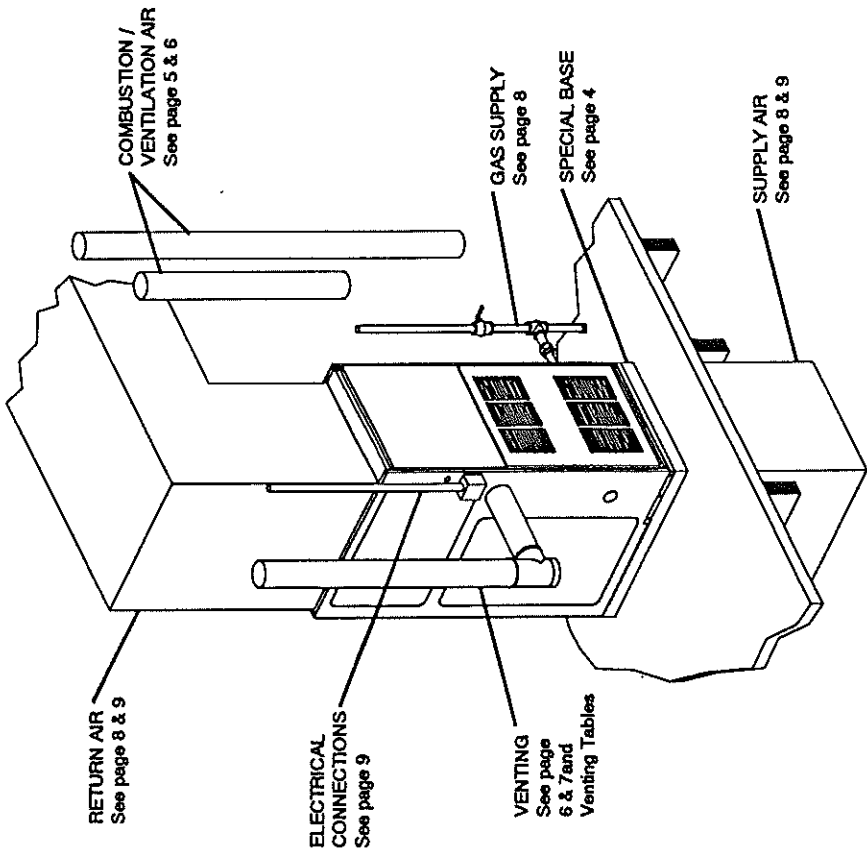
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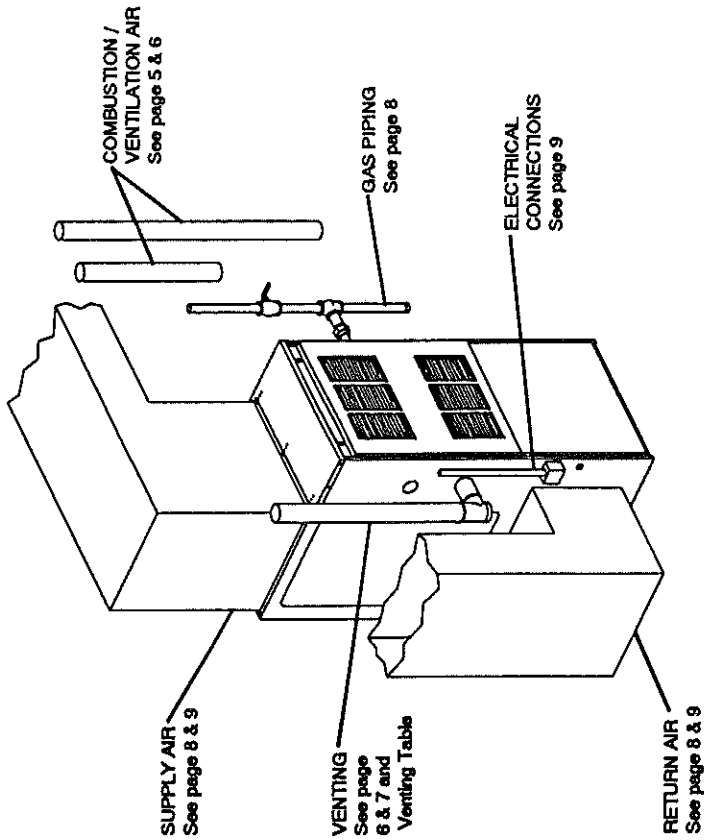
Goodman Manufacturing Company, L.P.  
1501 Seamist, Houston, Texas 77008

**INDEX**

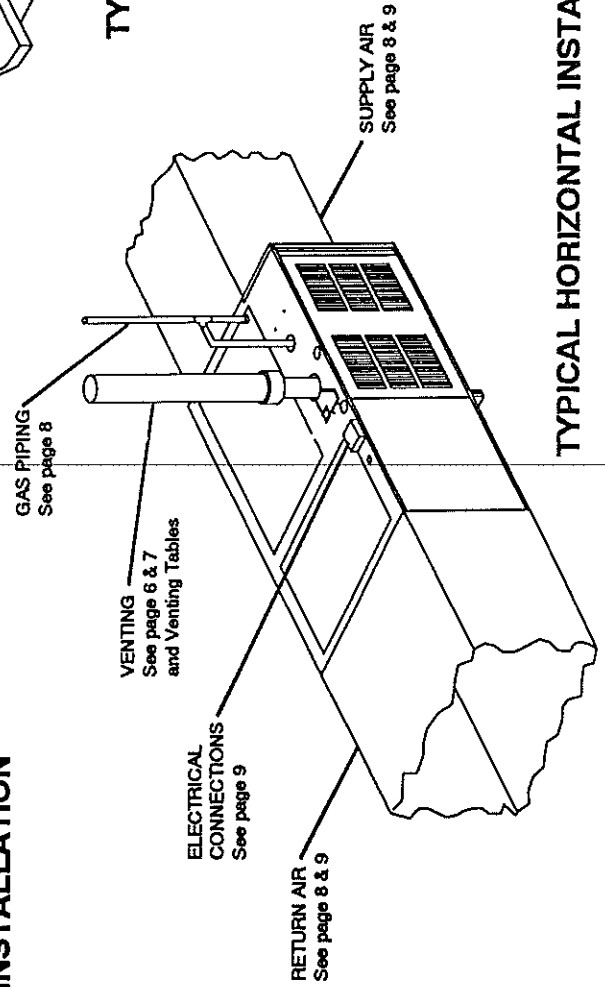
	<b>Page</b>
Typical Upflow/Downflow/Horizontal Installation	3
General Information	4
Clearances - Accessibility	4
Changing Orientation of Vent Blower	5
Converting Furnace To Downflow Configuration	5
Combustion/Ventilation Air Supply	5 - 6
Venting	6 - 7
Converting Furnace To Propane	8
Gas Supply and Piping	8
Circulating Supply Air and Return Air	8 - 9
Electrical Connection	9
Thermostat Location and Low Voltage Connections	9 - 10
To Rate Furnace	10
Main Burner Adjustment	11
<hr/>	
Safety Controls Functions & Check Out Procedures	11
Fan Control/Ignition Module & Circulating Air Filters	11
Temperature Rise & Motor Lubrication and Maintenance	12
System Operation Information and Primary\Secondary Heat Exchanger Cleaning	12
Lighting Instructions	13
Sequence of Operation	13
Normal Operation	14
Supplement	14
Wiring Diagram	15
Drain Kit Installation Instructions	16-22
Air Filter Rack Instructions	23



**TYPICAL DOWNFLOW INSTALLATION**



**TYPICAL UPFLOW INSTALLATION**



**TYPICAL HORIZONTAL INSTALLATION**

**CAUTION :** TO ENSURE PROPER INSTALLATION AND OPERATION OF THIS PRODUCT, COMPLETELY READ AND UNDERSTAND THESE INSTRUCTIONS PRIOR TO ATTEMPTING TO ASSEMBLE/INSTALL, MAINTAIN OR REPAIR.

**GENERAL INFORMATION**

**INSTALLATION :** In the USA this furnace should be installed in accordance with the latest edition of the American National Standard Z223.1 booklet entitled "National Fuel Gas Code" (NFPA 54), and the requirements or codes of the local utility or other authority having jurisdiction. In Canada this furnace must be installed in accordance with the current CAN/CGA-8149.1 & .2 Gas Installation Codes, local plumbing or waste water codes, and other applicable codes.

Additional helpful publication available from the "National Fire Association" are: NFPA 90A - Installation of Air Conditioning and Ventilating System, NFPA 90B - Warm Air Heating and Air Conditioning System.

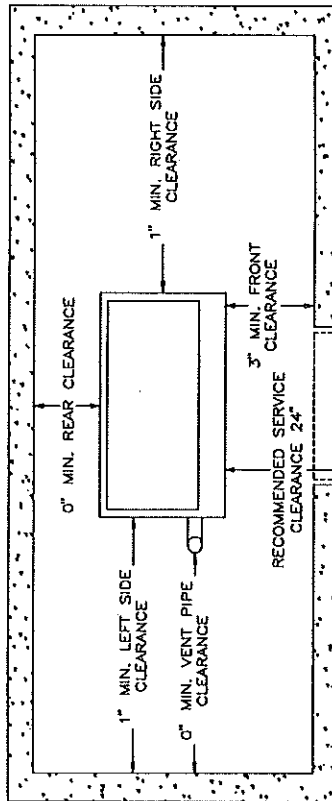
*These publications are available from:*

National Fire Protection Association, Inc.  
Batterymarch Park  
Quincy, MA 02269

**LOCATION :** Do not install this furnace in a mobile home. The furnace designed only for installation in buildings constructed on-site. This heating unit should be centralized with respect to the heat distribution system as much as possible. When installed in a utility room, the door should be wide enough to allow the largest part of the furnace to enter, or to permit the replacement of another appliance, such as a water heater. This furnace is designed to be installed indoors only. Do not install outdoors. This furnace shall be installed in a manner so that it is protected from water. Do not use as a construction heater.

**CLEARANCE - ACCESSIBILITY**

The furnaces covered in this manual are certified by ETL and WARNOCK HERSEY Laboratories for clearances to combustible materials (in inches) as shown below



It is recommended that a least 24" clearance be allowed in front of all furnaces for proper servicing.

**ACCESSIBILITY CLEARANCE, WHERE GREATER, SHOULD TAKE PRECEDENCE OVER MINIMUM FIRE PROTECTION CLEARANCE.**

A gas-fired furnace for installation in a residential garage must be installed so that the burner(s) and the ignition source are located not less than 18" above the floor and is located or protected to avoid physical damage by vehicles.

An upflow gas-fired furnace must not be installed directly on carpeting, tile or other combustible material other than wood flooring.

**WARNING:** COMBUSTIBLE MATERIAL MUST NOT BE PLACED ON OR AGAINST THE FURNACE JACKET. THE AREA AROUND THE FURNACE MUST BE KEPT CLEAR AND FREE OF ALL COMBUSTIBLE MATERIAL INCLUDING GASOLINE AND OTHER FLAMMABLE VAPORS AND LIQUIDS. THE USER SHOULD BE CAUTIONED THAT THE FURNACE AREA MUST NOT BE USED AS A BROOM CLOSET OR FOR ANY OTHER STORAGE PURPOSE.

**UPFLOW FURNACES ONLY**

**WARNING:** IMPORTANT NOTICE. A SOLID METAL BASE PLATE IS SUPPLIED WITH THIS FURNACE AND MUST BE IN PLACE WHEN THE FURNACE IS INSTALLED WITH SIDE AIR RETURN DUCTS. FAILURE TO LEAVE THIS BASE PLATE INSTALLED COULD CAUSE PRODUCTS OF COMBUSTION TO BE CIRCULATED INTO LIVING SPACE AND CREATE POTENTIALLY HAZARDOUS CONDITIONS, INCLUDING CARBON MONOXIDE POISONING. REFER TO SECTION ON "CIRCULATING AIR SUPPLY" FOR RETURN AIR DUCTWORK INSTRUCTIONS.

**DOWNFLOW FURNACES ONLY**

Downflow furnaces are not certified for use on combustible flooring unless a special combustible floor base is installed. See table below for details:

Furnace Width	Special Base Part Number
14"	SBM-14
17 1/2"	SBM-17
21"	SBM-21
24 1/2"	SBM-24

Before proceeding with the remaining installation, check the following:

- 1.) Correct clearances from combustible material
- 2.) Adequate accessibility for servicing
- 3.) Flooring is not carpet, tile or any other combustible material (except wood)
- 4.) In a garage, the furnace has been adequately elevated
- 5.) Furnace area is free of flammable materials and vapors such as gasoline
- 6.) The metal base plate used on upflow furnaces with side air returns is in position.
- 7.) A special base has been installed on downflow furnaces if they are installed on combustible flooring.

## CHANGING ORIENTATION OF VENT BLOWER

This furnace is shipped from the factory in the upflow configuration with the vent connection on the left side. It can be easily converted to right side venting following the instructions below :

Electrical and Gas Supply must be "OFF" before attempting any service.

- Step 1** Disconnect the Power Supply.
- Step 2** Rotate the quarter turn fasteners (item 1) 90 degrees to release the Control Access Panel (item 2)
- Step 3** Disconnect the Power wires to Vent Blower, Stack Overtemp wires, and Pressure Switch tube leading to Vent Blower.

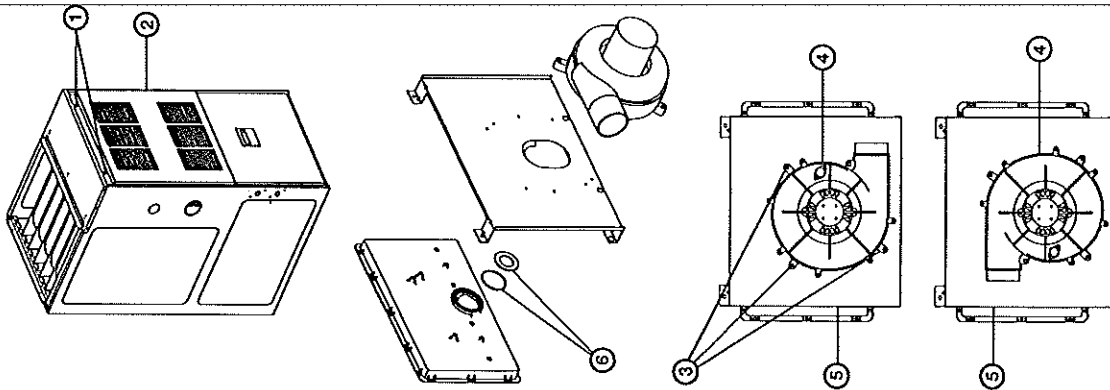
**Step 4** Remove the three screws (item 3) which secure the Vent Blower (item 4) to the Heat Shield (item 5) on illustration.

**Step 5** Rotate Vent Blower 180 degrees counter clockwise. (WARNING) Make sure that the O-Ring, and Restrictor Plate (if used), (items 6) are located properly.

**Step 6** Make sure the Vent Blower is properly seated against the O-Ring and Vent Blower legs are aligned with the holes in Heat Shield.

**Step 7** Tighten the three screws (item 3), reconnect wiring to Vent Blower and Stack Overtemp Switch. Reconnect tube from Pressure Switch to Vent Blower.

**Step 8** Replace Control Access Panel and reconnect Power Supply.



## CONVERTING FURNACE TO DOWNFLOW CONFIGURATION

### Step 1

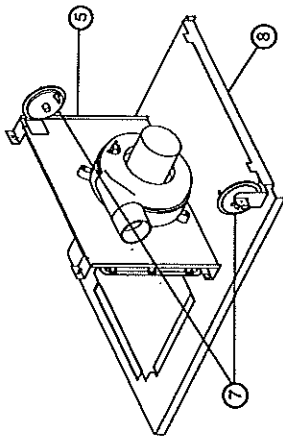
Disconnect the Power Supply

### Step 2

Rotate the quarter turn fasteners (item 7), from Heat Shield (item 5) to Blower Deck (item 8) for Downflow conversion.

### Step 3

Relocate Pressure Switch (item 7), from Heat Shield (item 5) to Blower Deck (item 8) for Downflow conversion.

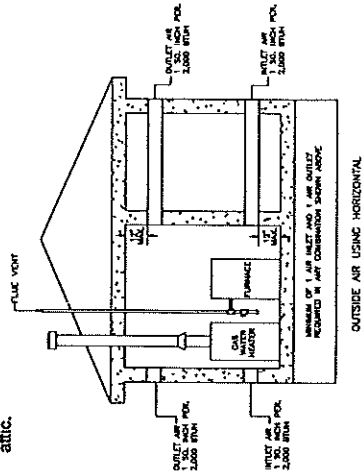
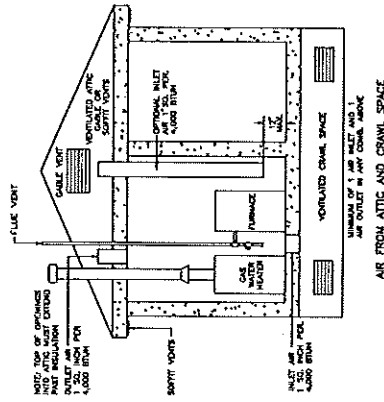
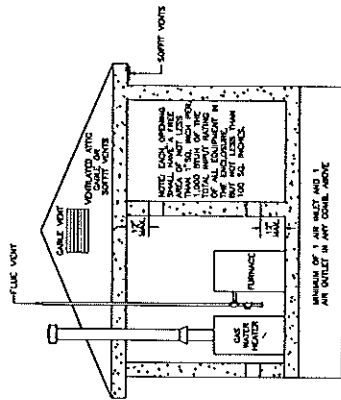


## COMBUSTION / VENTILATION AIR SUPPLY

A leading cause of unsatisfactory or dangerous performance is due to inadequate provisions for combustion and ventilation air. The following sketches outline the minimum combustion/ventilation air this furnace and any additional gas fired equipment require when installed in a confined area. It is important that provisions be made for adequate combustion and ventilation air (in accordance with section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1, or applicable local building codes.) In Canada use the current CAN/CGA-B149.1 & 2 Gas Installation Codes.

It is important that the following be observed when installing the combustion/ventilation air supplies for your system.

- 1.) The passageways that supply combustion/ventilation air must not be obstructed to prevent flow of air to the mechanical room. Extra care is to be used to prevent blockage of the ducts due to insulation, as may occur in an attic.



2.) The size of the combustion and ventilation air ducts depend upon where the source of the air is located. It is important to note that all sizes are to be regarded as "free area" and any obstruction such as an inlet or outlet grille must be made up for in the size of the openings. No screen may be used at the outlet or inlet of these ducts which are smaller than 1/4" mesh. Any grille used must be non-moveable fixed grilles. The user should be informed not to block or in any manner restrict these openings.

Air taken from the living area must be from two (2) permanent openings with each opening having a minimum of 1 square inch per 1000 BTUH of total gas burning equipment. With a minimum of 100 square inches, one opening must be located within 12 inches from the top of the enclosure, and the other opening is to be located within 12 inches of the bottom of the enclosure.

Note : The openings must not originate in a bedroom, bathroom or any room which may be commonly closed.

Combustion/ventilation air supplied to the mechanical room from the outside via horizontal ducts are to be a minimum of 1 square inch per 2000 BTUH of total gas burning equipment.

Combustion/ventilation air originating in a ventilated attic or crawl space requires a minimum of 1 square inch per 4000 BTUH of total gas burning equipment contained in the enclosure.

3.) The combustion and ventilation free air openings must be of equal size and sized appropriately. Use the table below as a guide:

TOTAL APPLIANCE INPUT	1000 BTUH / SQ. INCH		2000 BTUH / SQ. INCH		4000 BTUH / SQ. INCH	
	RD. PIPE	RECT. DUCT	RD. PIPE	RECT. DUCT	RD. PIPE	RECT. DUCT
60,000	11" DIA.	100 SQ. IN.	7" DIA.	30 SQ. IN.	5" DIA.	15 SQ. IN.
80,000	11" DIA.	100 SQ. IN.	8" DIA.	40 SQ. IN.	5" DIA.	20 SQ. IN.
100,000	11" DIA.	100 SQ. IN.	8" DIA.	50 SQ. IN.	6" DIA.	25 SQ. IN.
120,000	13" DIA.	120 SQ. IN.	9" DIA.	60 SQ. IN.	7" DIA.	30 SQ. IN.

The preceding table shows the combustion/ventilation air openings based upon the furnace only. If additional gas fired equipment is installed in the mechanical room use the following work sheet to determine the combustion/ventilation air duct size requirements :

Total Appliance Input (Furnace + all other gas fired equipment) = \_\_\_\_\_  
 BTUH per square inch requirement - 1000, 2000 or 4000 (see figures 1 through 3) = \_\_\_\_\_  
 Rectangular duct size = Total Appliance Input / BTUH per square inch requirement = \_\_\_\_\_

4.) When the installation is in an unconfined space in buildings of conventional frame, brick, or stone construction, normal infiltration found in these types of construction, should be adequate to provide the necessary air for combustion and ventilation. If the unconfined space is within a building of unusually tight construction, provisions for combustion and outlet air must be provided.

5.) No dimension of a rectangular duct used to carry combustion or ventilation air shall be less than 3".

6.) If unit is installed near an exhaust fan, sufficient combustion and ventilation must be provided to prevent the exhaust fan from creating a negative pressure in the room.

7.) Combustion Air must not be obtained from a bedroom or bathroom.

**CONSULT LOCAL CODES FOR SPECIAL OR ADDITIONAL REQUIREMENTS.**

**VENTING**

**GENERAL INSTRUCTIONS :**

The following instructions are intended for use by fully qualified installation or service technicians. Education of the user as to the importance of venting inspection and annual maintenance by a qualified service technicians should be stressed by the heating contractor at the earliest practical time.

All Venting shall be in accordance with Part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1, or applicable provisions of the local building codes.

**PROPER VENT PIPE INSTALLATION IS CRITICAL TO THE SAFE OPERATION OF THE FURNACE. THEREFORE CAREFULLY READ AND FOLLOW ALL THE INSTRUCTIONS GIVEN IN THIS SECTION. EACH VENT MUST SERVE ONLY ONE APPLIANCE. DO NOT CONNECT TO AN EXISTING VENT OR CHIMNEY.**

**MATERIAL :**

This furnace must be vented to the outdoors using 2 or 3 inch PVC schedule 40 vent pipe, DWV, or equivalent. Substitutes are permitted only when approved by local codes, and are equal to or better than PVC. Vent diameter must not be reduced. Elbows used to change from a vertical run to a horizontal run should be type DWV (long radius) to provide the correct slope in horizontal run. If other types are used, then (2) 45 degree elbows should be used in place of one 90 degree, with elbows slightly misaligned to provide slope in the horizontal runs. Materials and procedures must conform to American Society for Testing and Materials Standard (ASTM).

Pipe and fittings - ASTM 1785, D2466 & D2665  
 PVC Primer and Solvent Cement - ASTM D2564  
 Procedure for Cementing Joints Ref ASTM D2855

**INSTALLATION :**

May be vertically or horizontally vented. **ALL HORIZONTAL VENT INSTALLATIONS MUST BE IN ACCORDANCE WITH THESE INSTRUCTIONS AND ADDITIONAL REQUIREMENTS UNDER SECTION FOR HORIZONTAL VENT.**

- a.) DO NOT install the vent pipe in the same chase with a vent from another gas or other fuel burning appliance. Except with another GIMN.
- b.) DO NOT install the vent pipe within 6 inches from another gas or fuel burning appliance.
- c.) Drain trap must be easily accessible for checking and cleaning, and must be installed within 4 feet of the furnace. DO NOT install trap higher than the vent blower outlet.

### PROTECTION FROM FREEZING

The vent pipe must be properly insulated if there is any chance of condensate freezing inside the pipe, particularly when the pipe passes through an UNCONDITIONED SPACE or is exposed to the exterior. For exterior use, a minimum of 1 inch thick closed cell foam insulation is recommended. For interior piping, fiber glass with a vapor barrier having "R" value of R-7 or better may be used.

### SUPPORTING AND PITCHING

All horizontal runs must be supported at least every 3 ft. and at joints with straps or hangers. No sags or dips are permitted. Maintain 1/4 inch per foot minimum pitch upward on all horizontal piping from the drain trap to the vent terminal. Horizontal pipe run from the unit to the trap must be pitched upward a minimum of 1/4 inch per foot of run away from the drain trap assembly so the condensate will flow into drain trap. Vertical runs must be supported every 6 ft.

### JOINING PIPE AND FITTINGS

- Clean pipe joint area and fitting socket of all grease, dirt and moisture. Check pipe and socket for proper fit.
- Wipe socket and pipe with cleaner-primer. Apply a generous coat of primer to contacting areas.  
**DO NOT ALLOW PRIMER TO DRY BEFORE APPLYING CEMENT.**
- Apply a thin coat of cement in the socket. Quickly apply a heavy coat of cement to the pipe end and insert pipe into fitting.
- Hold the pipe in the fitting for 30 seconds.
- Wipe all excess cement from the joint and allow 15 minutes before handling.  
**DO NOT CEMENT VENT PIPE TO VENT BLOWER OUTLET.**

### CAUTION :

- For proper installation
- DO NOT use solvent cement that has become curdled, lumpy or thickened.
- DO NOT thin. Observe shelf precautions printed on containers.
- For application below 32 degrees F use only low temperature type solvent cement.

**WARNING :** DANGER OF FIRE OR BODILY INJURY FROM PVC SOLVENT CEMENTS AND PRIMERS ARE HIGHLY FLAMMABLE. PROVIDE ADEQUATE VENTILATION. DO NOT ASSEMBLE NEAR HEAT SOURCE OR OPEN FLAME. DO NOT SMOKE. AVOID SKIN OR EYE CONTACT. OBSERVE ALL CAUTIONS AND WARNING PRINTED ON MATERIAL CONTAINERS.

### CONDENSATE DRAIN

This furnace is designed to remove both sensible and latent heat from the combustion flue gas. As a result, condensed water vapor is formed in the secondary heat exchanger and drains to the drain trap outside the unit.

**DO NOT RUN CONDENSATE DRAIN TO AN OUTDOOR DRAIN OR WHERE THE POTENTIAL FOR FREEZING CAN OCCUR.**

If an indoor drain is not readily available, a condensate pump or sump pump must be used. The condensate pump must be constructed of acid resistant materials. The condensate pump must have an auxiliary safety switch to prevent operation of the furnace, resulting in overflow of condensate, in the event of pump failure.

### HORIZONTAL THROUGH THE WALL VENTING INSTRUCTIONS

The furnace may be vented horizontally through an exterior wall, using all applicable instructions under "Venting" together with these additional requirements. See illustration below.

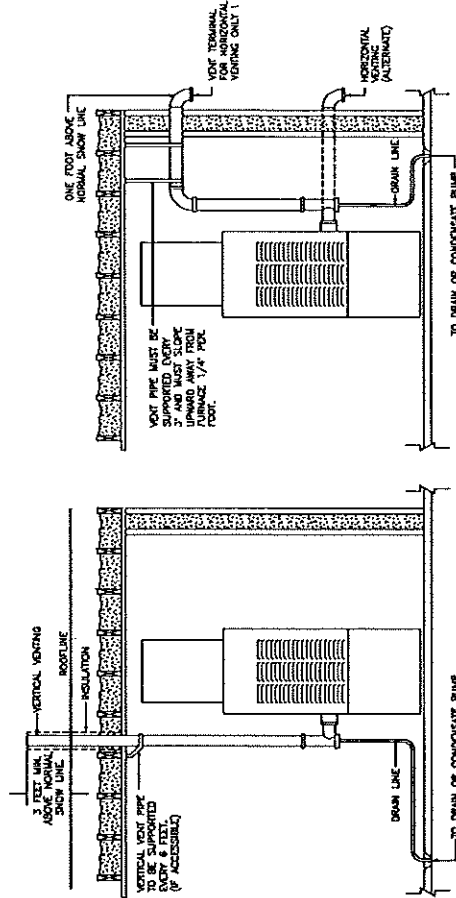
**ALL HORIZONTAL VENT INSTALLATION MUST BE MADE IN ACCORDANCE WITH THESE INSTRUCTIONS.**

**WARNING :** THE COMBUSTION PRODUCTS AND MOISTURE IN THE FLUE GAS WILL CONDENSE. THE CONDENSATE MAY FREEZE ON THE EXTERIOR WALL AND SURROUNDING SURFACES. SOME DISCOLORATION TO THE EXTERIOR OF THE BUILDING IS TO BE EXPECTED.

When selecting the external wall which the vent is to penetrate, the following items are to be taken into consideration:

- When possible the vent termination is not to be exposed to the prevailing winds.
- The vent termination must be a minimum of 12 inches above grade level, or expected snow level.
- If adjacent to a public walkway, the vent termination must be a minimum of 7 feet above the walkway.
- Avoid areas where condensate drainage may be a problem such as, flower beds, patios etc.
- Do not locate the termination within 4 feet of an electric meter, gas meter, or gas regulator.
- Do not locate the termination within 4 feet of an adjacent building.
- Do not locate the termination within 4 feet of an operable window.
- Do not locate the termination within 10 feet vertical and 3 feet horizontal from a forced air inlet.
- Do not locate the termination within 3 feet of an inside corner to a building.
- The vent gases exiting from the termination may create staining or discoloration of the exterior wall. To protect against this action it is desirable to protect this surface for a distance of approximately 2 feet surrounding the termination with an aluminum plate, or similar non-corrosive material.

Instruct the user to keep the area around the termination free of snow, dirt and other obstacles which could prevent normal venting operation of the appliance.



**CONVERTING FURNACE TO PROPANE**

**WARNING:** This furnace was equipped at the factory for use with NATURAL GAS. Propane conversion, if required, must be performed by a qualified service technician experienced in performing this type of conversion. If conversion to Propane is required, all instructions included with the factory authorized conversion kit must be followed.

**GAS SUPPLY AND PIPING**

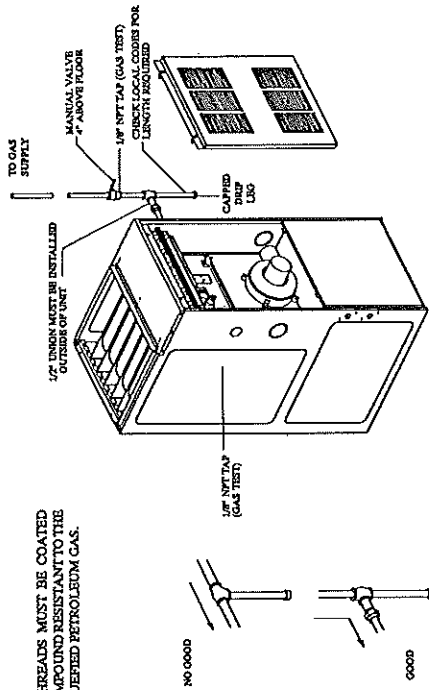
Check rating plate to make certain unit is equipped to burn the type of gas supplied. Care should be taken after installation of this equipment that gas control valve not be subjected to high gas supply line pressure.

**THE FURNACE AND ITS INDIVIDUAL SHUT OFF VALVE MUST BE DISCONNECTED FROM THE GAS SUPPLY PIPING SYSTEM DURING ANY PRESSURE TESTING OF THAT SYSTEM AT TEST PRESSURES IN EXCESS OF 1/2 PSIG (3.48 KPA). THE FURNACE MUST BE ISOLATED FROM THE GAS SUPPLY PIPING SYSTEM BY CLOSING ITS INDIVIDUAL MANUAL SHUT OFF VALVE DURING ANY PRESSURE TESTING OF THE GAS SUPPLY PIPING SYSTEM AT TEST PRESSURE EQUAL TO OR LESS THAN 1/2 PSIG (3.48 KPA).**

In making gas connections, avoid strains as they may cause noise and may damage controls. **IT IS IMPORTANT TO USE A BACK-UP WRENCH WHEN MAKING GAS CONNECTIONS. IGNORING THIS PRACTICE MAY RESULT IN A FIRE HAZARD CAUSING PROPERTY DAMAGE OR DEATH.**

To check for leaks in piping use a soap and water solution or other approved method. **DO NOT USE AN OPEN FLAME.**

**NOTE :** ALL THREADS MUST BE COATED WITH A FIRE COMPOUND RESISTANT TO THE ACTION OF LIQUEFIED PETROLEUM GAS.



**GAS PIPE CAPACITY TABLE (CU. FT./HR)**

Capacity of gas pipe of different diameters and length in cu. ft. per hr. with pressure drop of 0.3 in. and specific gravity of 0.60 (natural gas). **NOTE : COPPER TUBING MUST NOT BE USED FOR NATURAL GAS INSTALLATIONS.**

Nominal Iron Pipe Size, Inches	Length of Pipe, Feet							
	10	20	30	40	50	60	70	80
1/2	132	92	73	63	56	50	46	43
3/4	278	190	152	130	115	105	96	90
1	520	350	285	245	215	195	180	170
1 1/4	1050	730	590	500	440	400	370	350
1 1/2	1600	1100	890	760	670	610	560	530

After the length of pipe has been determined, select the pipe size which will provide the minimum cubic feet per hour required for the gas input rating of the furnace using the formula :

$$\text{Cu. Ft. Per Hr. Required} = \frac{\text{Gas Input of Furnace (BTU/HR)}}{\text{Heating Value of Gas (BTU/HR)}}$$

The gas input of the furnace is marked on the furnace rating plate. The heating calorific value of the gas (BTU/FF) may be determined by consulting the local natural gas utility or the L.P. gas supplier.

If your local utility/building codes permit the use of a flexible gas line ALWAYS USE A NEW LINE. DO NOT USE FLEXIBLE GAS LINES WHICH HAVE PREVIOUSLY SERVICED ANOTHER APPLIANCE.

**CIRCULATING SUPPLY AIR AND RETURN AIR.**

The circulating air return may be taken from: (1) outside the building (2) return ducts from several rooms (3) central return (4) any combination of the above.

**Note:** When outside air is utilized, the system should be designed and adjusted such that the temperature of the air supply to the furnace will not drop to below 50°F during the heating season.

When a combination of indoor and outside air is used (in conjunction with a mixing or diverting damper) the volume of air must not be reduced.

Plenum chambers and air ducts must be installed in accordance with Standard for the Installation of Air Conditioning and Ventilating Systems, NFPA No. 90A, or the Standard for the Installation of Warm Air Heating and Air Conditioning Systems, NFPA No. 90B.

When the ducts are installed so that the supply ducts carry air circulated by the furnace to area outside the space containing the furnace, the return air shall be handled by a duct or ducts sealed to the furnace casing and terminated outside the space containing the furnace. If there is no complete return air duct system, the return air connection must be sealed to the furnace casing and run full size to a location outside the utility room or space housing the furnace. The furnace must be installed in a level and plumb position.

If installed in parallel with a cooling unit, the damper or other means used to control the flow of air must be adequate to prevent chilled air from entering the furnace, and if manually operated must be equipped with means to prevent operation of the other unit unless the damper is in the full heat or cool position.

**CONNECT GAS SERVICE FROM SUPPLY TO FURNACE. A GROUND-JOINT UNION AND MANUAL SHUTOFF MUST BE INSTALLED, EXTERIOR TO THE FURNACE CABINET, SO THE CONTROL ASSEMBLY MAY BE EASILY REMOVED.** A 1/8" NPT plug on the supply pipe at the valve for the purpose of making measurements of the inlet gas pressure must also be installed. A manual shut-off valve must be installed in the gas line outside of the furnace casing. The valve should be readily accessible for turning on or off. A capped drip leg must be installed in the gas supply line as close to the furnace as possible. A PIPE COMPOUND RESISTANT TO THE ACTION OF LIQUEFIED PETROLEUM GASES MUST BE USED AT ALL THREADED PIPE CONNECTIONS.

The drip leg must incorporate a change of direction of gas flow (see illustration). Gas piping should be installed in accordance with local codes and regulations of the utility company. Consult local gas company for location of manual main valve. The gas line should be of adequate size to prevent undue pressure drop. It is recommended that the size of pipe selected be in accordance with "GAS PIPE CAPACITY TABLE" for the length of pipe required and connected to the furnace as illustrated. Check both manifold pressure (using the 1/8" NPT tap located on the gas valve) and service pressure (using the 1/8" NPT tap as shown in the drawing above).



**CAUTION:** ONE OF THE MOST COMMON CAUSES OF TROUBLE IN FORCED AIR HEATING SYSTEMS IS DUE TO INSUFFICIENT RETURN AIR TO THE FURNACE. THE RETURN AIR SYSTEM SHOULD BE APPROXIMATELY EQUAL TO OR GREATER THAN THE AREA OF THE WARM AIR DISCHARGE. CONSULT LOCAL CODES FOR SPECIAL REQUIREMENTS. BLOWER SPEED SHOULD BE ADJUSTED TO MAINTAIN THE TEMPERATURE RISE RANGE SHOWN ON THE RATING PLATE.

**NOTE:** Upon initial start-up, some smoke or an odor may be present. This is normal and should disappear in a short amount of time.

**WARNING:** IMPORTANT NOTICE - NEVER ALLOW THE PRODUCTS OF COMBUSTION OR THE FLUE PRODUCTS TO ENTER THE RETURN DUCTWORK, OR THE CIRCULATING AIR SUPPLY. ALL RETURN DUCTWORK MUST BE ADEQUATELY SEALED AND SECURED TO THE FURNACE AND JOINTS MUST BE COMPLETELY SEALED. ALL OTHER DUCT JOINTS MUST BE SECURED WITH APPROVED CONNECTIONS AND SEALED AIRTIGHT. THE VENT AND THE COMBUSTION AIR SUPPLY PIPES MUST BE PROPERLY INSTALLED TO PREVENT LEAKAGE, AS NOTED ELSEWHERE IN THESE INSTRUCTIONS. WHEN A FURNACE IS MOUNTED ON A PLATFORM, WITH RETURN THROUGH THE BOTTOM, IT MUST BE SEALED AIRTIGHT BETWEEN THE FURNACE AND THE RETURN AIR PLENUM. THE FLOOR OR PLATFORM MUST PROVIDE SOUND PHYSICAL SUPPORT OF THE FURNACE WITHOUT SAGGING, CRACKS, GAPS, ETC. AROUND THE BASE AS TO PROVIDE A SEAL BETWEEN THE SUPPORT AND THE BASE. WHEN INSTALLED IN A CLOSET OR OTHER SIMILAR ENCLOSURE THE VENT AIR OPENINGS IN THE CLOSET DOOR AND THE CIRCULATING AIR OPENINGS MUST BE SEPARATED AN ADEQUATE DISTANCE TO PREVENT THE CIRCULATING AIR FROM INTERFERING WITH THE NATURAL FLOW OF VENTILATION AIR.

FAILURE TO PREVENT PRODUCTS OF COMBUSTION FROM BEING CIRCULATED INTO THE LIVING SPACE CAN CREATE POTENTIALLY HAZARDOUS CONDITIONS, INCLUDING CARBON MONOXIDE POISONING THAT COULD RESULT IN PERSONAL INJURY OR DEATH.

DO NOT, UNDER ANY CIRCUMSTANCES, CONNECT RETURN DUCTWORK TO ANY OTHER HEAT PRODUCING DEVICE SUCH AS A FIREPLACE INSERT, STOVE, ETC. DOING SO MAY RESULT IN FIRE, CARBON MONOXIDE POISONING, EXPLOSION, PERSONAL INJURY OR PROPERTY DAMAGE.

Install the air return to terminate through the floor under the furnace. For installations where return air ducts cannot be run under the floor, return air may be taken from the side(s). When side air return is used, determine the size opening required, and scribe a line between the knockout squares and cut out the opening along these lines.

WHERE MAXIMUM AIRFLOW IS 1800 C.F.M. OR MORE, BOTH SIDES OR THE BOTTOM MUST BE USED FOR RETURN AIR.

**WARNING:** IMPORTANT NOTICE-UPFLOW FURNACES - A SOLID METAL BASE PLATE IS SUPPLIED WITH THIS FURNACE AND IT MUST BE IN PLACE WHEN THE FURNACE IS INSTALLED WITH SIDE AIR RETURN DUCTS. FAILURE TO LEAVE THIS BASE PLATE IN PLACE COULD CAUSE PRODUCTS OF COMBUSTION TO BE CIRCULATED INTO THE LIVING SPACE AND CREATE POTENTIALLY HAZARDOUS CONDITIONS, INCLUDING, BUT NOT LIMITED TO, CARBON MONOXIDE POISONING. REFER TO SECTION ON "CIRCULATING AIR SUPPLY" FOR RETURN AIR DUCTWORK INSTRUCTIONS.

**ELECTRICAL CONNECTION**

**POWER SUPPLY**

The electrical supply requirements are listed on the furnace rating plate. A separate supply line with a current overload device and manual switch using type T wire or equivalent, with minimum rating of 63 degree F (35 degree C) temperature rise, should be run directly from the main switch box to the junction box located inside the furnace. Copper conductors are preferred.

**WARNING:** Cabinet must be permanently grounded. Provisions are made for this purpose. THE GAS SUPPLY PIPE MUST NEVER BE USED AS A GROUND OR GROUND CONNECTION. A DEDICATED GROUND FROM THE DISCONNECT MUST BE PROVIDED.

Installation of the electric supply should be in accordance with local codes. In the absence of local codes refer to the National Electrical Code ANSI/NFPA No. 70 and local building codes, which can be obtained from: National Fire Protection Association, Batterymarch, Quincy, MA 02269. In Canada; refer to the Canadian Electrical Code C22.1 Part 1 the latest edition.

This equipment is polarity sensitive. The neutral lead must be connected to the equipment white power connector and a positive ground to the unit ground wire.. Failure to observe this practice will result in no flame sensing ability.

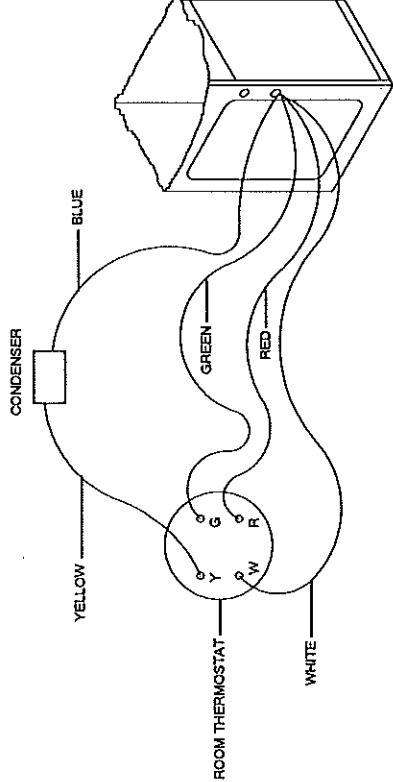
**THERMOSTAT LOCATION AND LOW VOLTAGE CONNECTIONS**

**THERMOSTAT LOCATION**

Install the room thermostat in accordance with the instruction sheet accompanying the thermostat. Run the thermostat lead wires inside the control compartment. Connect the thermostat as shown on the wiring diagram. Never install a thermostat on an outside wall or where it will be influenced by drafts, concealed hot or cold water pipes, ducts, lighting fixtures, radiation from a fireplace, rays of the sun, lamps, televisions, radios or air streams from warm air registers.

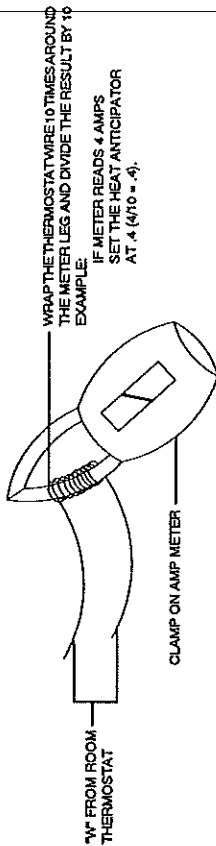
**LOW VOLTAGE ELECTRICAL CONNECTIONS**

To facilitate the thermostat connections to the appliance, low voltage wiring extends through the furnace cabinet and is wrapped with a label titled "Thermostat Wiring". Connect the field supplied low voltage wiring to the appliance wiring using solderless connectors. Color coding should be adhered to in order to facilitate future troubleshooting.



**SETTING THE THERMOSTAT HEAT ANTICIPATOR**

The method shown below should be used in measuring the amp draw of the low voltage circuit to assure proper adjustment of the thermostat heat anticipator.



**HOW TO RATE FURNACE**

**GENERAL**  
The meter time and orifice sizes indicated in these instructions are for equipment to be installed using Natural Gas. If Propane Gas is used refer to instructions supplied with the conversion kit. High Altitude application requires the conversion kit HAO2.

It is important to check the furnace input to prevent over firing beyond the design-rated input. NEVER SET INPUT ABOVE THAT SHOWN ON THE RATING PLATE. Furnace firing rate is controlled by inlet pressure, manifold pressure, burner orifices, heating value of the gas. This furnace is equipped with the correct burner orifices for installations between 0 to 2000 feet and normally do not have to be changed. Applications over 2000 feet require factory equipped orifices to be replaced by burner orifices selected from the table below resulting in the furnace input being reduced at a rate of 4% for each 1000 feet above sea-level (U.S. only).

ALTITUDE	BURNER ORIFICE NATURAL GAS
0-2000	45
3000	47
4000	47
5000	47
6000	48
7000	48

For altitudes above 7000 feet refer to appropriate section of the National Fuel Gas Code, ANSI Z223.1. If re-orificing is required this must be performed prior to timing the gas meter. THE GAS AND ELECTRIC SUPPLY MUST BE OFF BEFORE INSTALLING NEW BURNER ORIFICES. To calculate the furnace input of a furnace installed over 2000 feet you must use the following formula and not the table supplied.

**CORRECTED INPUT (BTUH) = NAMEPLATE INPUT - (ALTITUDE x .04) x (NAMEPLATE INPUT / 1000)**

*Input BTUH/HR = Heating Value of Gas (BTU/FT<sup>3</sup>) x 3600  
Time in Second (for 1 cu.ft.) of Gas*

**HIGH ALTITUDE CONVERSIONS FOR CANADIAN INSTALLATIONS :**

In Canada the name plate input rating for the furnaces apply to installations up to 2,000 feet (610 m) above sea level. Kit No. HAO2 for Natural Gas and for Propane Gas is required to convert the furnaces to elevations from 2,000 to 4,500 feet (610 to 1,370 m) above sea level. Canadian Certification applies to the installations of furnaces up to 4,500 feet (1,370 m) above sea level. Installations above 4,500 feet (1,370 m) above sea level is subject to acceptance by the local authorities having jurisdiction.

**EXAMPLE :**

Corrected input for a GMPN100-4 installed at an elevation of 6,000 feet using Natural Gas with a heating value of 1000 (BTUH) is =

$Corrected\ Input\ (BTUH) = 100,000 - (6,000 \times .04) \times (100,000 / 1,000)$   
 $Corrected\ Input\ (BTUH) = 100,000 - (240 \times 100)$   
 $Corrected\ Input\ (BTUH) = 100,000 - 24,000$   
 $Corrected\ Input\ (BTUH) = 76,000$

Using the orifices shown in the table for 6000 feet elevation (#48). A meter time of 48.0 seconds is measured.

The actual firing rate of the furnace =

$Input\ BTUH = 1,000 \cdot (Heating\ Value\ of\ Gas) \times 3,600$   
 $48.0\ Meter\ time\ for\ 1\ cubic\ foot\ of\ gas$   
 $Input\ BTUH = 3,600,000 / 48.0$   
 $Input\ BTUH = 75,000\ BTUH$

**TIMING THE GAS METER**

Use the following method to time determine the firing rate of the furnace. Location of inlet and manifold pressure taps are shown in the "GAS SUPPLY AND PIPING" section of these instructions.

Before attempting any service or adjustments - Insure that Gas & Electrical Supplies are "OFF".

- 1.) Install a manometer graduated in tenths of an inch of water column on the inlet pressure tap.
- 2.) Remove plug at the "Manifold Pressure Tap" on the gas valve and install second manometer.
- 3.) Determine the size of the gas meter being used.
- 4.) Shut off all other gas appliances with the exception of pilot burners.
- 5.) Place the furnace into operation.
- 6.) Adjust inlet pressure to obtain the pressure shown on the rating plate.
- 7.) After 15 minutes of furnace operation, time meter with an accurate stop watch for 2 revolutions.
- 8.) Divide time obtained in step 7 by 2.
- 9.) Use the appropriate table or formula to determine firing input.
- 10.) If necessary, adjust manifold pressure at the gas valve by removing the regulator cap and turn adjustment screw clockwise to obtain a higher pressure or counterclockwise to reduce manifold pressure. Manifold pressure must be within a range of 3.2" to 3.8" W.C. Inability to obtain the correct firing rate will result in the need to re-orifice. If manifold pressure or re-orificing is necessary repeat steps 4 through 10 after the furnace has been allowed to cool down for approximately 10 - 15 minutes.
- 11.) Turn off gas and electric supply, remove manometers and replace any plug removed in steps 1 and 2, using a joint compound resistant to L.P. Gas.

**METER TIME IN MINUTES AND SECOND FOR NORMAL INPUT RATING OF FURNACES EQUIPPED FOR NATURAL GAS. 0-2000 FEET ALITUDE**

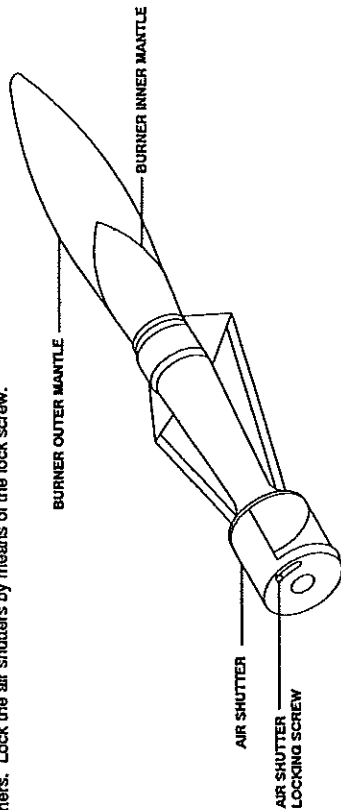
Nameplate Input BTU/HR.	Meter Size Cu.Ft.	Heating Value of Gas, BTU per Cu.Ft.					
		900		1000		1100	
		Min.	Sec.	Min.	Sec.	Min.	Sec.
60,000	1	0	54	1	00	1	03
	10	9	00	10	00	10	24
80,000	1	0	41	0	45	0	47
	10	6	45	7	30	7	48
100,000	1	0	32	0	36	0	37
	10	5	24	6	00	6	14
120,000	1	0	27	0	30	0	31
	10	4	30	5	00	5	12

*Input BTUH/HR = Heating Value of Gas (BTU/FT<sup>3</sup>) x 3600  
Time in Second (for 1 cu.ft.) of Gas*

## MAIN BURNER ADJUSTMENT

### MAIN BURNER

After furnace has been in operation for approximately five minutes, close the air shutters until yellow tips appear on the flames. Now open the air shutter until yellow tips just disappear and the flames have soft blue cones. Repeat this procedure on all burners. Lock the air shutters by means of the lock screw.



## SAFETY CONTROLS FUNCTIONS AND CHECKOUT PROCEDURE

### GENERAL

In most cases all safety switches used on this furnace are wired in series through the furnace "V" leg. It is important never to bypass, alter or tamper with any safety control on this furnace. Safety features of this furnace must be checked at time of installation to assure proper operation of the furnace.

### MAIN LIMIT SWITCH

High limit switch used is a 1/2" dia. disk switch, designed to shut off the gas to the burners if the outlet air exceeds the max. design outlet temperature. High limit cut-off is non-adjustable. To check the control operation, block the air flow through the unit temporarily. The limit switch should function to turn off the automatic gas valve within a few minutes. Remove blockage immediately after switch operates.

### VENT PRESSURE SWITCH

This furnace uses a vent pressure switch to prevent the furnace from operating if the vent blower should fail to operate or a restriction in the venting system occurs. DO NOT tamper with or bypass this switch. For more details of the venting installation see the section titled "VENTING". To check this switch remove the hose from the vent motor with the burners ignited. The switch should function and turn off the burners immediately. Reinstall the rubber hose and the burners should ignite.

### FLAME ROLL-OUT SWITCH

This furnace is equipped with flame roll-out switches. These 1/2" dia., manual reset switches are located in the burner vestibule. These switches are designed to shut down the burners in event presence of flame is detected outside the heat exchanger. To reset the switch you must depress the button on the top of the switch. With the furnace in operation place an open flame (candle, match, cigarette lighter etc.) under this switch with the flame touching the sensing element. The switch should function in a short time and the burners should extinguish. Reset the switch.

### FLAME SENSOR

Main burner ignition is provided by a Hot Surface Ignition system. The main burners should extinguish if the flame sensor fails to detect burner flame. Disconnect the sensor lead to the module. Place the furnace into operation. The ignitor should glow, the burners ignite; however the burners should shut off after a few seconds of operation. Reconnect the sensor lead and follow the lighting instructions to restore the furnace to its operational condition.

## BLOWER DOOR INTERLOCK SWITCH

The purpose of this device is to disconnect all power to the furnace in event the blower door should become dislodged or is not installed. Operation of this furnace with the blower door being out of position will allow toxic combustion fumes to be transmitted into the living area via the circulating air blower. With the furnace in operation remove the blower door, the blower and burners should stop. Replace blower door.

## STACK OVERTEMP SWITCH

Mounted on the Vent blower housing, this switch is designed to shut down the burners if the main blower should fail to operate. To test this switch disconnect the main blower, bypass the main limit, and place the furnace into operation. After a period of time this switch should function and the burners extinguish. IT IS IMPORTANT TO REMOVE THE JUMPER FROM THE MAIN LIMIT AND RECONNECT THE BLOWER prior to returning this furnace into operation.

## FAN CONTROL / IGNITION MODULE

This appliance is equipped with an integrated hot surface ignition module / fan control. The function of this device is to ignite the burners and to control the blower and venter functions.

Upon a call for heat by the room thermostat the control activates the vent blower relay. After a short pre-purge the hot surface ignitor is energized. The main valve is opened after the ignitor has been glowing for about 17 seconds. If main burner flame is detected by the flame sensor (see flame sensor section) the burners will continue operation.

Unlike the traditional thermal fan control this device activates the blower at a predetermined time (nominal 30 seconds) after the main valve is energized, not after the burner has achieved a certain temperature. This control is located in the blower compartment. The blower motor is deactivated approximately 2 1/2 minutes after the burners are extinguished.

## CIRCULATING AIR FILTERS

**CAUTION: DISCONNECT THE MAIN POWER TO THE UNIT BEFORE ATTEMPTING ANY MAINTENANCE.**

- 1.) Keep the air filters clean.
- 2.) Inspect filters monthly and replace when necessary. A new home may require more frequent attention to the filters until dust from construction is removed.
- 3.) Permanent filters may be cleaned by using a vacuum cleaner and washing with detergent and water. Air dry thoroughly and reinstall. Disposable filters cannot be cleaned.

**CAUTION: DO NOT OPERATE YOUR SYSTEM FOR EXTENDED PERIODS WITHOUT FILTERS. DUST IN THE AIR WILL RESTRICT THE AIR MOVEMENT OVER THE SECONDARY (CONDENSING) COIL CAUSING NUISANCE CYCLING OF SAFETY CONTROL AND CAUSE A "NO HEAT" CONDITION.**

## MINIMUM FILTER SIZES

Furnace Width	Filter Size	Type
14"	14 x 25 x 1	Perm.
17-1/2"	16 x 25 x 1	Perm.
21"	20 x 25 x 1	Perm.
24-1/2"	24 x 25 x 1	Perm.

### TEMPERATURE RISE

The difference between the temperature of the outlet air and the inlet air is known as the furnace temperature rise. This furnace is designed to operate within the rise range displayed on the furnace series and rating plate. To ensure satisfactory performance, the temperature rise of the furnace must be measured. Use the following procedure to measure and adjust the furnace temperature rise:

- 1.) Prior to starting the furnace visually check the supply and return air ducts for restrictions or leaks. Make all necessary repair to the ductwork prior to continuing.
- 2.) Adjust the room thermostat to obtain a continuous burner operation. Allow the furnace to operate for 15 minutes before proceeding to the next step.
- 3.) With an accurate thermometer measure the air temperature at the return air grille. If a combination of indoor / outdoor air is used for return air, the temperature must be obtained from a point in the return air ductwork close to the connecting point with the furnace.
- 4.) Measure the outlet air temperature of the furnace with a thermometer inserted into the supply duct approximately 12" to 18" above the furnace outlet. It may be necessary to measure the outlet air in several places in the supply plenum in order to obtain an accurate average.
- 5.) Subtract the inlet air temperature from the outlet air temperature to obtain the furnace temperature rise.
- 6.) Compare the temperature rise measured with that indicated on the furnace series and rating plate. If the measured rise is above the tolerance shown on the series and rating plate the blower speed must be increased (a higher speed). If the measured rise is below the furnace design rise range the blower speed must be decreased (a lower motor speed). Prior to making any motor speed changes allow the furnace adequate time to cool down, and turn off electric supply to the appliance. Repeat steps 2 thru 5 until satisfactory performance is achieved.
- 7.) Repair any holes which may have been made in the ductwork prior to putting the furnace into operation.

### MOTOR LUBRICATION AND MAINTENANCE

Circulating air blower motor has sleeve bearings which are prelubricated by the motor manufacturer. There is no provision for additional oiling. Clean the motor periodically to prevent the possibility of overheating due to an accumulation of dust and dirt on the windings or on the motor exterior. As suggested elsewhere in these instructions, the air filters should be kept clean. Dirty filters will restrict the airflow the blower motor requires and possibly overheat the motor.

The Vent Blower motor has bearings which are prelubricated by the motor manufacturer. There is no provision for additional oiling.

### SERVICE INSTRUCTIONS

#### GENERAL GUIDELINES FOR MAXIMUM PERFORMANCE

- 1.) Keep the air filters clean. Your heating system will operate more efficiently and economically.
- 2.) Arrange your furniture and drapes so that the supply air registers and the return air grilles are unobstructed.
- 3.) Close doors and windows. This will reduce the heating load on your system.
- 4.) Avoid excessive use of kitchen and bathroom exhaust fans.
- 5.) Do not permit the heat generated by television, lamps, radios, etc. to influence the thermostat operation.
- 6.) Exclusive of the mounting platform, keep all combustible articles three feet from the furnace jacket.
- 7.) **CAUTION:** Replace all blower doors and compartment covers after servicing the furnace. Do not operate the unit without all panels and doors securely in place.

This unit is manufactured with a door switch. Do not attempt to jumper or tamper with this switch in any way.

- 8.) If you desire to operate your system with constant air circulation, please seek advice from your servicing contractor.

### CLEANING AND INSPECTING THE HEAT EXCHANGER

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

It is the duty of the installer to advise the user to have the furnace inspected and cleaned annually. To clean the heat exchanger perform the following:

- 1.) Adjust the room thermostat to its lowest setting.
- 2.) Turn off the gas and electric supply to the furnace.
- 3.) Remove the control access door.
- 4.) Open the gas supply union.
- 5.) Disconnect the gas supply line attached to the gas valve.
- 6.) Remove the wires attached to the gas valve.
- 7.) Remove the gas valve/manifold assembly from the burner box assembly.
- 8.) Disconnect the sensor wire and hot surface ignitor plug.
- 9.) Remove the burner box assembly. **CAUTION!** Care must be exercised to avoid damage to the hot surface ignitor during the exercise.
- 10.) Remove the vent from the furnace vent blower assembly.
- 11.) Remove the vent blower, heat shield, and flue collector box.
- 12.) With a stiff wire brush on a flexible handle remove any loose scale from the heat exchanger (both flue opening and burner opening). Use a 1/2" diameter round wire brush to remove any deposits in coil tubes.
- 13.) With a vacuum remove any scale dislodged in step 12 and any additional scale which is obtainable from within the heat exchanger.
- 14.) With a bright flashlight, visually inspect each cell for cracks.
- 15.) If any failures within the heat exchanger are detected it is important to notify the user and ensure that the furnace remains inoperable until repairs are implemented.
- 16.) Reassemble furnace by reversing steps 3 through 11. **SERVICEMAN:** No extra screws or wires are provided with this product. You must reassemble all components to avoid an unsafe condition.
- 17.) Restore the gas and electrical supply to the appliance.
- 18.) Follow the lighting instructions and restore the furnace into operational mode.

**NOTE:** It is important to use a pipe thread compound (resistant to the effects of LP gas) on the threads of any gas piping removed. Check the appliance piping for leaks with a soap solution. If a flexible gas line is used - examine it for cracks or weakness and replace if necessary.

### VENTING SYSTEM

The venting system should be inspected annually.

- 1.) Visually check the vent pipe and vent terminal screen. Clean if necessary.
- 2.) Visually check for blockage of the condensate disposal system. Hoses may be disconnected to determine that proper flow is maintained. Should an obstruction be observed, it can be dislodged by forcing a stream of water through it using a device such as a garden hose.

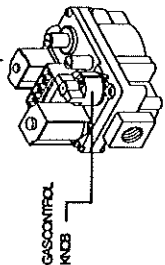
**LIGHTING INSTRUCTIONS**

**FOR YOUR SAFETY READ BEFORE OPERATING**

**WARNING:** If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life

- A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
- B. BEFORE OPERATING smell around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
- WHAT TO DO IF YOU SMELL GAS
  - Do not try to light any appliance;
  - Do not touch any electric switch; do not use any telephone in your building;
  - Extinguish any open flame;
  - Immediately call your supplier from a neighbor's phone. Follow the gas suppliers instructions.
- C. Use only your hand to turn the gas knob. Never use tools. If the knob will not turn, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

**OPERATING INSTRUCTIONS**

1. STOP! Read the safety information above on this label.
  2. Set the thermostat to lowest setting.
  3. Turn off all electric power to the appliance.
  4. This appliance is equipped with an automatic ignition system which automatically lights the burner. Do not try to light the burner by hand.
  5. Remove control access panel.
- 
6. Turn gas control knob clockwise to "OFF".
  7. Wait five (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
  8. Turn gas control knob counterclockwise to "ON".
  9. Replace control access panel.
  10. Turn on all electric power to the appliance.
  11. Set the thermostat to the desired setting.
  12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

**TO TURN OFF GAS TO APPLIANCE**

1. Set the thermostat to its lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control access panel.
4. Turn gas control knob clockwise to "OFF". Do not force
5. Replace control access panel.

**SEQUENCE OF OPERATION**

This appliance communicates with room thermostat through the low voltage connections described in "Thermostat location and low voltage connections" section of this manual. It is the obligation of the installer to instruct the user how to use the room thermostat and what the normal sequence of operation is in both the heating and cooling modes. It is important that any troubleshooting and or repair to this appliance be performed by a qualified technician, not by a user.

**HEATING MODE**

- 1.) The room thermostat demands heat.
- 2.) The furnace control checks for an open limit. If an open limit (main limit and auxiliary limit) is detected the appliance will remain inoperable until the limit closes. During an open limit condition the main circulating air blower will be energized. The status indicator light on the furnace control will blink 4 times.
- 3.) The furnace control checks to ensure the vent pressure switch is open. If the vent pressure switch is closed the furnace control will blink 2 times and not permit the furnace to be operational until this condition is remedied.
- 4.) The vent blower is energized.
- 5.) The vent pressure switch will close when it detects a pressure in excess of its setting. If the pressure switch should fail to close the status light on the furnace control will flash 3 times. Until the vent pressure switch closes the ignition sequence cannot begin.
- 6.) The flame rollout switches are checked to ensure that they are in the closed position.
- 7.) After a venter pre-purge of about 15 seconds the appliance hot surface ignitor will be energized.
- 8.) After a 17 second "ignitor warm-up" period the main valve will open.
- 9.) The burners will light and the flame sensor will detect the presence of burner flame. The ignitor will de-energize about 7 to 9 seconds. If the flame sensor does not detect the presence of main burner flame, the gas valve will close and steps 6 through 9 will be repeated for a maximum of 3 attempts. If after 3 attempts the flame sensor remains "open" the furnace will go into a lock-out condition. The furnace will remain in a lock-out condition for 1 hour unless the room thermostat is reset.
- 10.) 30 seconds after the main valve is energized the heating speed of the circulating air blower is activated.
- 11.) The furnace will remain in operation until the room thermostat is satisfied.
- 12.) The gas valve will then be closed.
- 13.) The vent blower will turn off.
- 14.) The circulating air blower will turn off after approximately 2 1/2 minutes.

The furnace will remain dormant until the next demand for heat is received by the room thermostat. If an abnormality is observed during the steps outlined above use the trouble-shooting guide enclosed with this furnace to assist in diagnosing the problem.

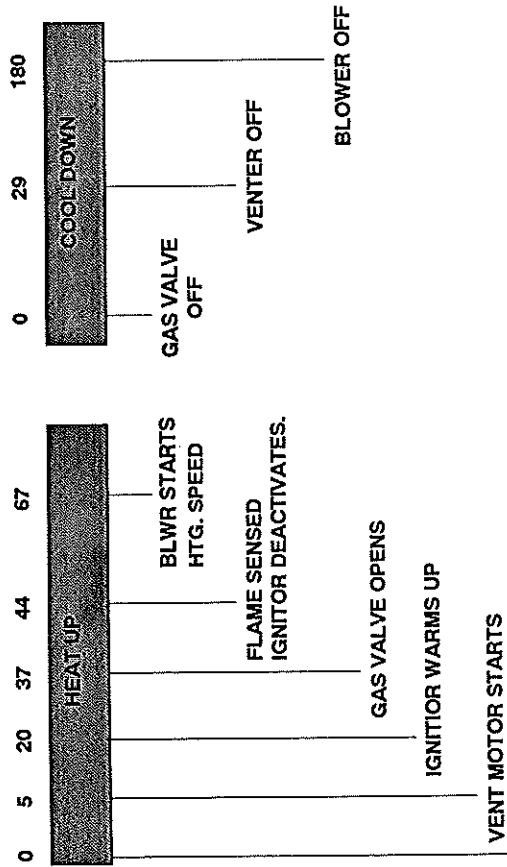
**COOLING MODE**

- 1.) A demand for cooling is received by the room thermostat.
- 2.) The furnace control checks for an open limit. If an open limit (main limit and auxiliary limit) is detected the appliance will remain inoperable until the limit closes. During an open limit condition the main circulating air blower will be energized. The status indicator light on the furnace control will blink 4 times.
- 3.) The condenser contactor will close.
- 4.) After about 7 seconds the circulating air blower will start on cooling speed.
- 5.) The furnace will remain in operation until the room thermostat is satisfied.
- 6.) The condenser contactor will then open.
- 7.) The circulating air blower will turn off after 60 seconds.

The furnace will remain dormant until the demand for cooling is received by the room thermostat. If an abnormality is observed during the steps outlined above use the trouble-shooting guide enclosed with this furnace to assist in diagnosing the problem.

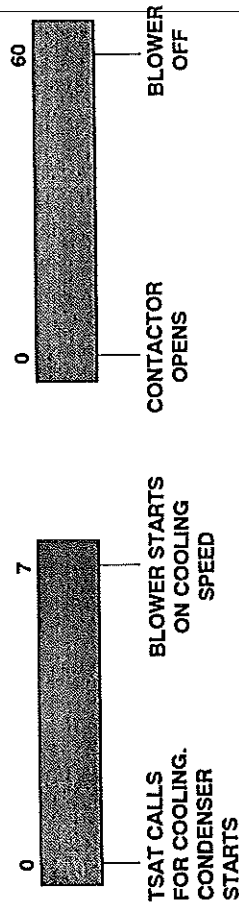
**NORMAL OPERATION**

**HEATING MODE**



THERMOSTAT CALL FOR HEAT

**COOLING MODE**



**SUPPLEMENT**

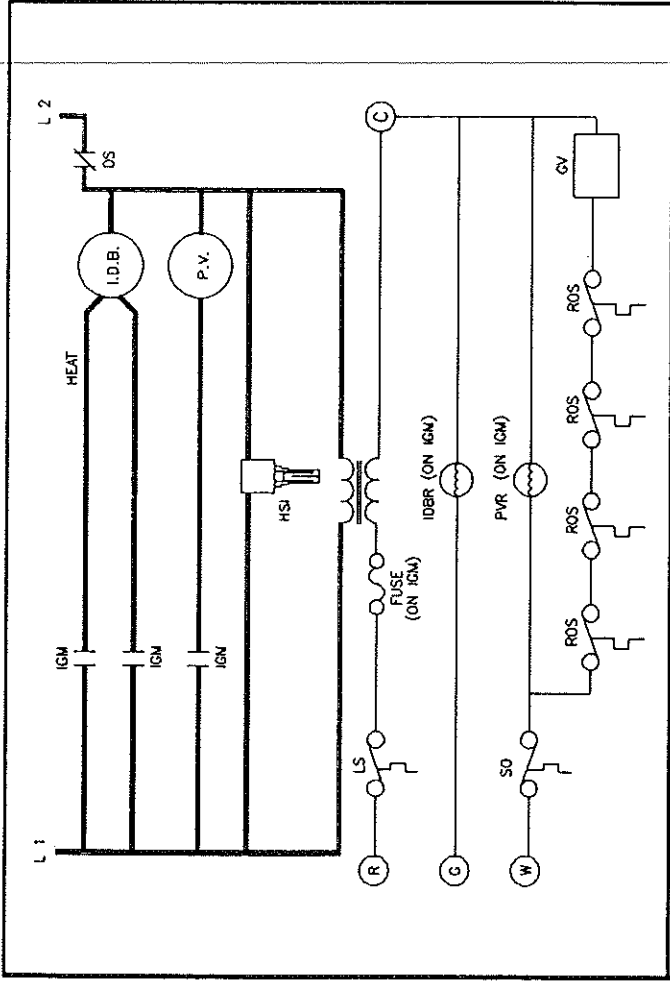
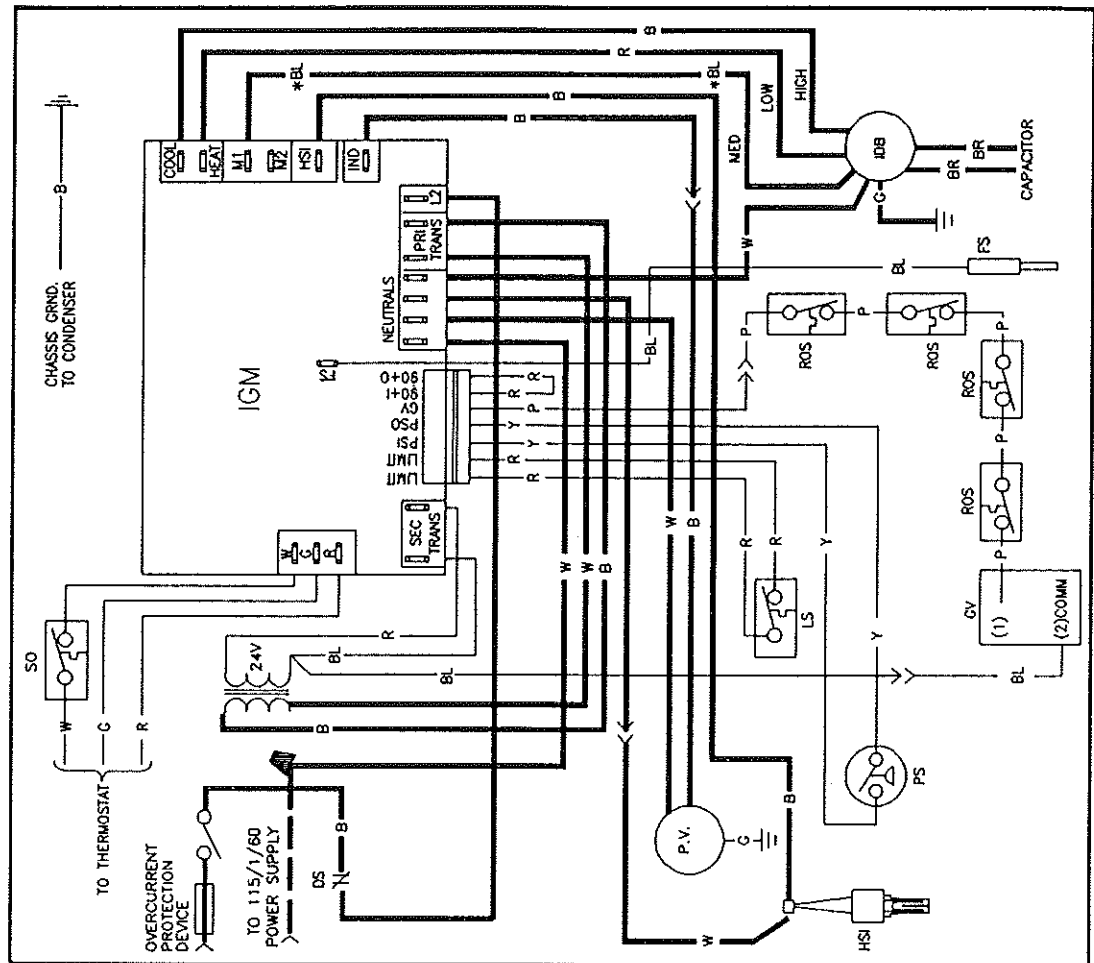
The recommended source of combustion air is to use the outdoor air supply. However, the use of indoor air in most applications is acceptable except as follows:

1. If the furnace is installed in a confined space it is recommended that the necessary combustion air come from the outdoors by way of attic, crawl space, combustion ventilation, air duct or direct opening.
2. If outdoor combustion air is used, there must be no exposure to the installations or substances listed in #3 below.
3. The following types of installation may require OUTDOOR AIR for combustion, due to chemical exposures:
  - Commercial buildings
  - Buildings with indoor pools
  - Furnaces installed in laundry rooms
  - Furnaces installed in hobby or craft rooms
  - Furnaces installed near chemical storage areas

Exposure to the following substances in the combustion air supply may also require OUTDOOR AIR for combustion:

- Permanent wave solutions
- Chlorinated waxes and cleaners
- Chlorine based swimming pool chemicals
- Water softening chemicals
- De-icing salts or chemicals
- Carbon tetrachloride
- Halogen type refrigerants
- Cleaning solvents (such as perchloroethylene)
- Printing inks, paint removers, varnishes, etc.
- Hydrochloric acid
- Cements and glues
- Artistic fabric softeners for clothes dryers
- Masonry acid washing materials

# WIRING DIAGRAM



- IDBR - INDOOR BLOWER RELAY
  - IDB - INDOOR BLOWER
  - IGM - IGNITION MODULE
  - LS - LIMIT SWITCH
  - DS - DOOR SWITCH
  - PVR - POWER VENT RELAY
  - ROS - ROLLOUT SWITCH
  - GV - GAS VALVE
  - HSI - HOT SURFACE IGNITOR
  - PV - POWER VENTOR
  - FS - FLAME SENSOR
  - SO - STACK OVERTEMP
  - PS - PRESSURE SWITCH
- B - BLACK  
BL - BLUE  
BR - BROWN  
G - GREEN  
O - ORANGE  
P - PURPLE  
R - RED  
W - WHITE  
Y - YELLOW

**FACTORY WIRING :**  
HIGH VOL.T. ———  
LOW VOL.T. ———

**FIELD WIRING :**  
HIGH VOL.T. ———  
LOW VOL.T. ———

**NOTES :**

1. REPLACEMENT WIRE MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105C).
2. WARNING! CABINET MUST BE PERMANENTLY GROUNDED TO CONFORM TO N.E.C. & LOCAL CODES.
3. THE LEADS FROM THE MOTOR MAY BE CHANGED TO THE REQUIRED SPEED.  
\* MED-HIGH - YELLOW  
MED-LOW - ORANGE

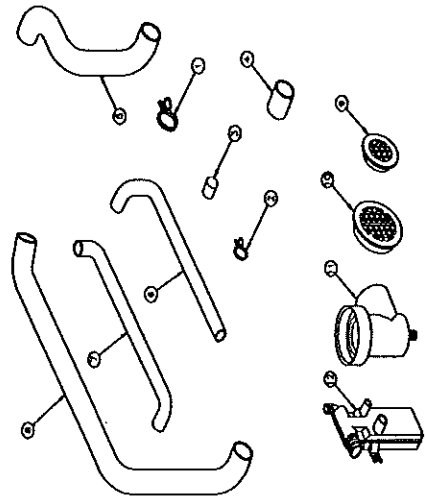
## Drain Kit Installation Instructions (GMPN & GMPNV Condensing Furnace)

These instructions must be followed to correctly drain the GMPN(V) furnace. Failure to follow these instructions explicitly may result in condensate leakage or the passage of flue gases into the building. The Installation and Operating Instructions accompanying the furnace must be adhered to. Installation must be done by a qualified contractor.

Follow the Installation & Operating Instructions and labels located on the unit for proper vent diameter and length. A termination elbow or tee is not supplied, however a termination screen is included. The terminal and all other elbows should be of the long radius type (D.W.V. is recommended). **NOTE: To facilitate the installment of hoses, apply liquid soap to the fitting.**

The parts list shows the components necessary to complete this installation. Check to be assured that all components needed for the particular position are available. Do not proceed with this installation if necessary components are not contained in this package.

QTY.	PART NO.	DESCRIPTION	ITEM
1	1	B28108-11 DRAIN TRAP ASM.	12
1	1	B28108-15 DRAIN TEE	11
1	1	B28108-14 3" MESH INSERT	10
1	1	B28108-16 2" MESH INSERT	9
1	1	B28108-10 24" RIGHTSIDE TUBE .75"	
1	1	B28108-09 21" RIGHTSIDE TUBE .75"	8
1	1	B28108-08 17" RIGHTSIDE TUBE .75"	
1	1	B28108-07 14" RIGHTSIDE TUBE .75"	
1	1	B28108-06 24" LEFTSIDE TUBE .5"	
1	1	B28108-05 21" LEFTSIDE TUBE .5"	7
1	1	B28108-04 17" LEFTSIDE TUBE .5"	
1	1	B28108-03 14" LEFTSIDE TUBE .5"	
1	1	B28108-02 MULTI-PURPOSE TUBE .5"	6
1	1	B28108-01 LEFTSIDE TUBE .75"	5
1	1	B28108-00 HORIZONTAL BOOT .75"	4
2	2	B18100-01 RUBBER CAP F/S	3
2	2	B18100-06 HOSE CLAMP F/S	2
1	1	B18100-07 HOSE CLAMP F/.75"	1



**Figure #1**  
Upflow Right Side Venting

Remove knockouts as shown.

With right side venting it is not necessary to drain the vent blower, therefore, the caps on the vent drain fittings should not be removed. The hoses should be installed on the collector box as shown. The clamps must be applied to avoid leakage.

Install the drain tee and secure with the proper type of PVC cement. The vent system should be supported to avoid any undue strain on the vent / drain assembly.

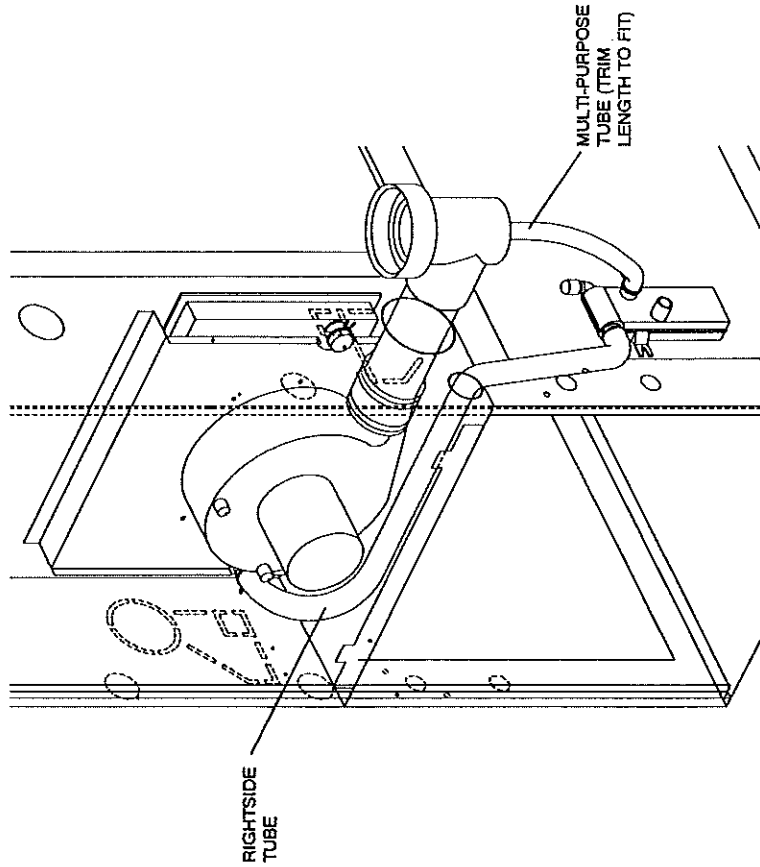
Mount drain trap on the exterior of the casing as shown.

Do Not Remove The Unused Vinyl Caps.

Apply the rubber cap to the unused hose connection on the drain trap.

Place the drain tube on the drain tee as shown.

**DO NOT CEMENT THE PIPE TO THE VENTER HOUSING. USE THE BOOT AND CLAMPS PROVIDED.**

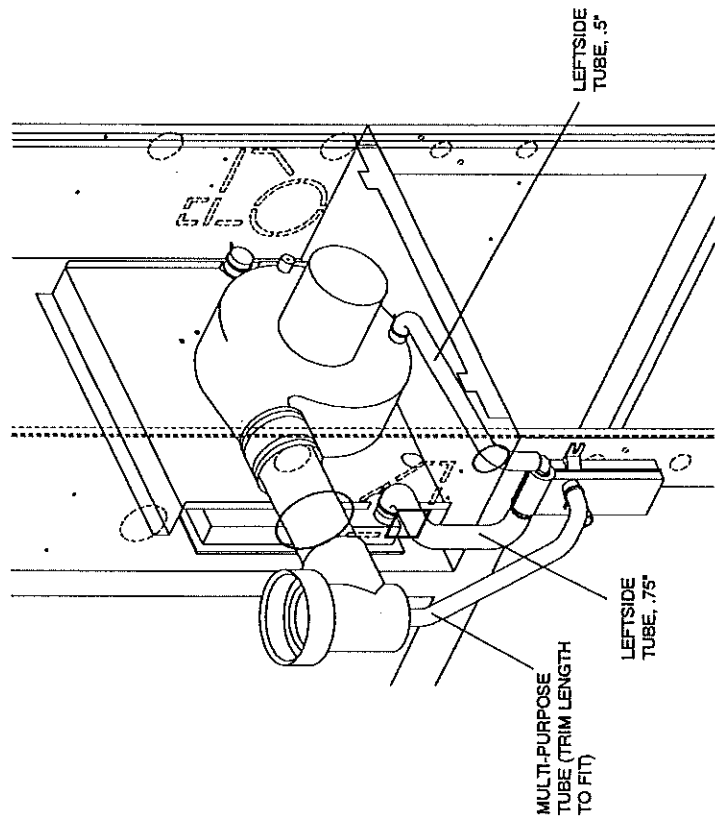




**Figure #2**  
Upflow Left Side Venting

Rotate the venter assembly following the directions located in the Installation and Operating Instructions.  
 Remove knockouts shown.  
 Install the drain tee and secure with the proper type of PVC cement. The vent should be supported to avoid any undue strain on the vent / drain assembly.  
 This set-up requires applying a drain hose to the venter blower bottom connection and the lower left connection on the collector box. Remove the caps as shown and install the hoses in their respective place.

Route the hoses to the drain trap and secure with a clamp  
 Mount drain trap on the exterior of the casing as shown.  
 Do Not Remove The Unused Vinyl Caps.  
 Place the drain tube on the drain tee as shown.  
**DO NOT CEMENT THE PIPE TO THE VENTER HOUSING. USE THE BOOT AND CLAMPS PROVIDED.**

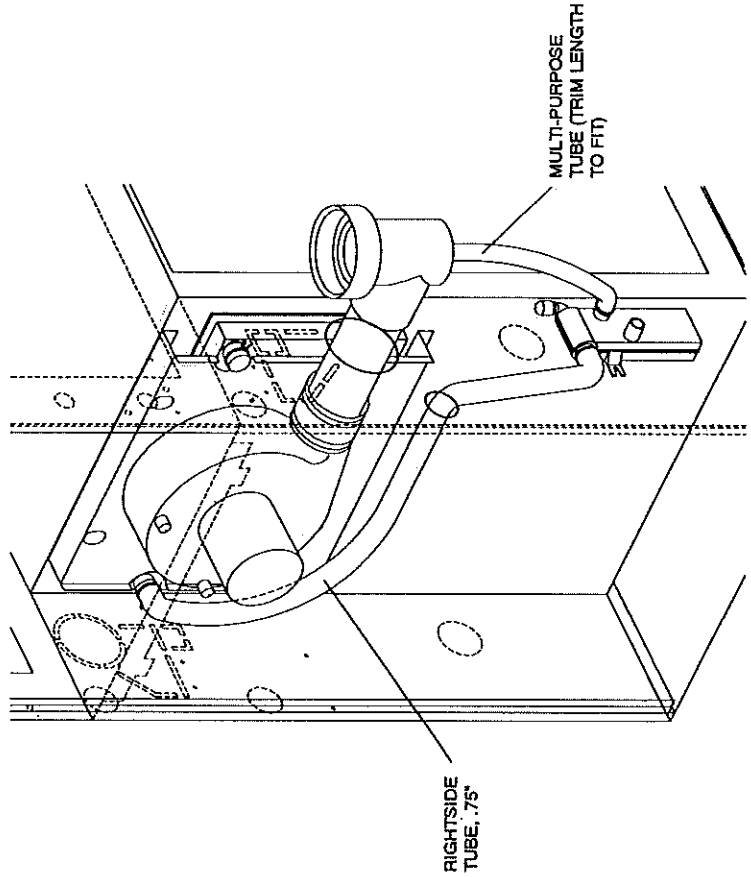


**Figure #3**  
Downflow (Counterflow) Right Side Venting

Rotate the venter assembly following the directions located in the Installation and Operating Instructions.

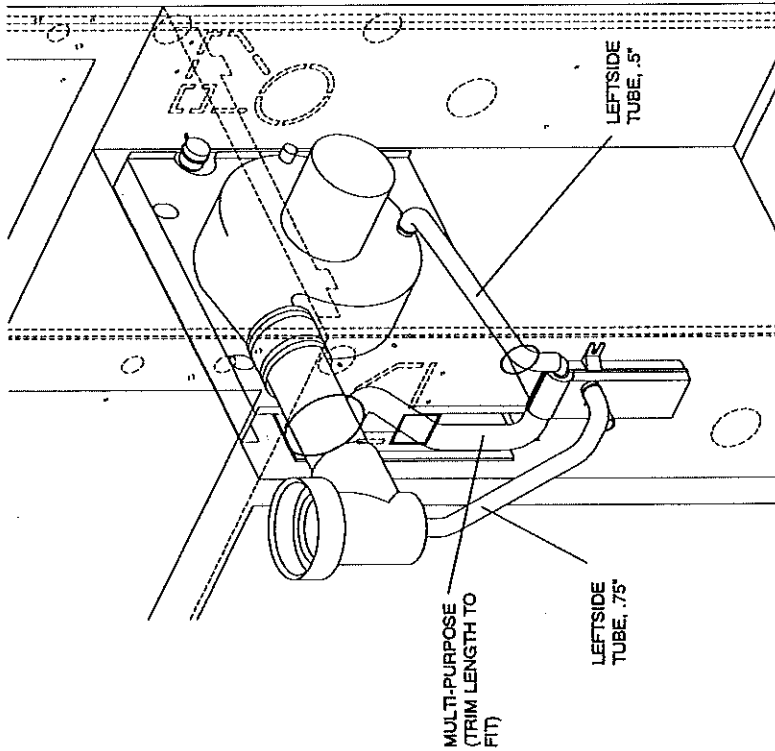
Remove knockouts shown.  
 Does not require drain hoses to be applied to the venter.  
 Place the supplied rubber cap to the unused hose connection on the drain trap.  
 With the unit in its proper configuration, remove the vinyl cap from the upper left side of the collector box and replace with the correct hose as shown.

Mount drain trap on the exterior of the case and route the hose from the drain tee to the trap.  
 Install the drain tee and secure with the proper type of PVC cement. The vent should be supported to avoid any undue strain on the vent / drain assembly.  
 Do Not Remove The Unused Vinyl Caps.  
**DO NOT CEMENT THE PIPE TO THE VENTER HOUSING. USE THE BOOT AND CLAMPS PROVIDED.**



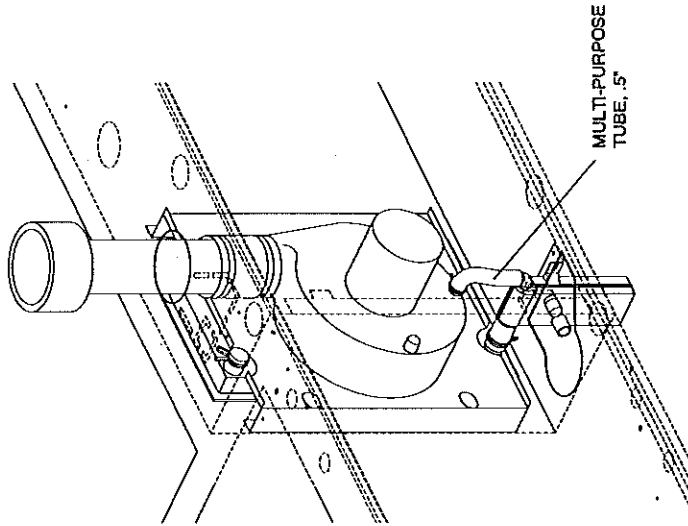
**Figure #4**  
Downflow (Counterflow) Left Side Venting

Remove knockouts shown.  
This set-up requires applying the drain hoses to the left side of the collector box and the lower connection on the venter assembly.  
Route the hoses as shown. Use clamps to prevent leakage.  
Mount drain trap as shown.  
Place the drain tube on the drain tee.  
The vent system must be supported to prevent any undue strain on the vent / drain assembly.  
Do Not Remove The Unused Vinyl Caps.  
**DO NOT CEMENT THE PIPE TO THE VENTER HOUSING. USE THE BOOT AND CLAMPS PROVIDED.**



**Figure #5**  
Horizontal Right Side Supply Air Discharge

It is recommended that the furnace be elevated or suspended to maintain a five (5) inch clearance under the unit to aid in drainage.  
Remove knockouts shown.  
The drain tee should not be used in this configuration.  
Mount drain trap on mounting bracket as shown.  
Install the mounting bracket & drain trap on the exterior of the casing in the mounting holes provided.  
Install the drain hoses on the bottom of the collector box and venter assembly. The hose clamps must be applied to prevent leakage.  
**On 100 mbtu & 120 mbtu units a field supplied 2" x 3" bushing must be used.**  
Route the hoses as shown.  
Place the cap on the drain trap upper right port of the drain trap.  
The vent system must be supported to prevent any undue strain on the vent / drain assembly.  
Do Not Remove The Unused Vinyl Caps.  
**DO NOT CEMENT THE PIPE TO THE VENTER HOUSING. USE THE BOOT AND CLAMPS PROVIDED.**



**Figure #6**  
Horizontal Left Side Supply Air Discharge.

It is recommended that the furnace be elevated or suspended to maintain a five (5) inch clearance under the unit to aid in drainage.

Remove knockouts shown.

The drain tee should not be used in this configuration.

Mount drain trap on mounting bracket as shown.

Install the mounting bracket & drain trap on the interior of the casing in the mounting holes provided.

Install the drain hoses on the bottom of the collector box and venter assembly. The hose clamps must be applied to prevent leakage.

On 100 mbtu & 120 mbtu units a field supplied 2" x 3" bushing must be used.

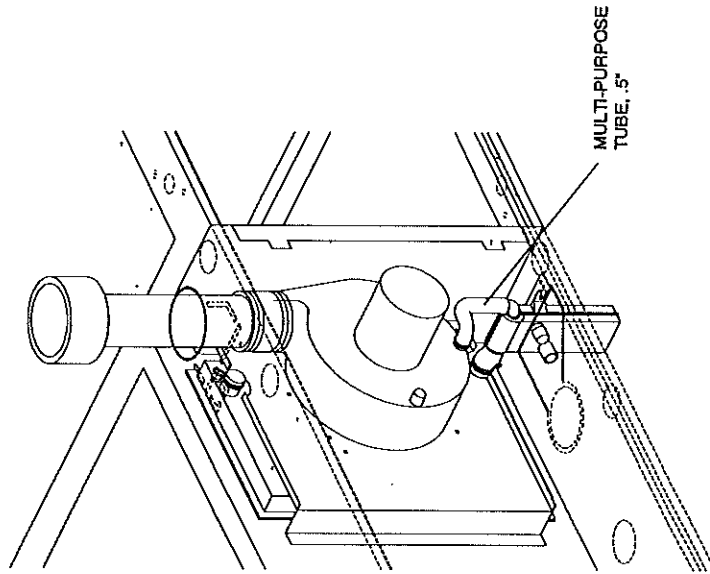
Route the hoses as shown.

Place the cap on the drain trap upper right port of the drain trap.

The vent system must be supported to prevent any undue strain on the vent / drain assembly.

Do Not Remove The Unused Vinyl Caps.

**DO NOT CEMENT THE PIPE TO THE VENTER HOUSING. USE THE BOOT AND CLAMPS PROVIDED.**



**SPECIAL INSTRUCTIONS FOR  
AIR FILTER RACK INSTALLATION**

When installing an upflow gas furnace and utilizing the furnace side or bottom for return air, follow the instructions below.

**A. FOR SIDE RETURN**

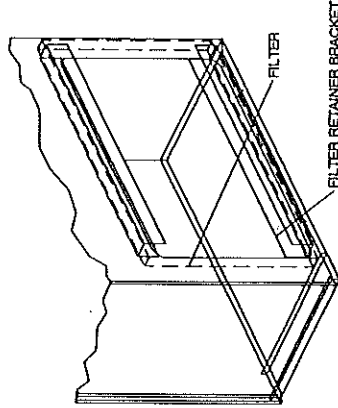
1. Lay furnace on solid flat surface and using tin snips or similar tools cut along emboss on lower portion of cabinet. Caution should be exercised not to damage any wiring contained in the blower compartment.
2. Install filter retainer brackets & filter as shown in side filter installation example.
3. The solid metal base plate should not be removed when using side return.

FURNACE WIDTH      SOLID BASE PLATE PART NUMBER

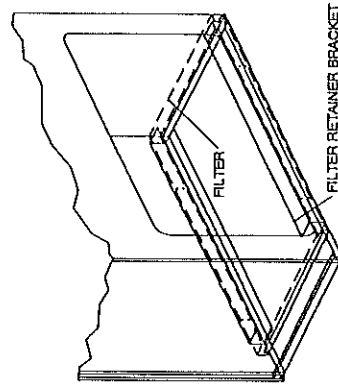
14"	18214-00
17-1/2"	18214-01
21"	18214-02
24-1/2"	18214-03

**B. FOR BOTTOM RETURN**

1. Remove bottom access door.
2. Using existing holes & screws for solid bottom, install the (2) filter retainer brackets & filter as shown in bottom filter installation example.
3. Reinstall blower access door.



**SIDE FILTER INSTALLATION**

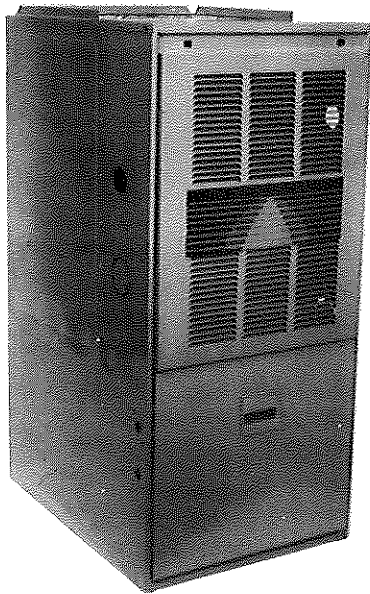


**BOTTOM FILTER INSTALLATION**

( )

( )

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## Multi-Position Condensing Gas Furnace GMPN Series

(PATENT PENDING)



### Description / Application

- All models design certified by ETL and ETL Canada Testing Laboratories in compliance with Unified Standard
- Completely assembled, factory tested furnace for heating or combination heating/cooling application.
- For utility room, closet, alcove or basement application.
- Vertical or horizontal venting with 2" diameter PVC for 60k, 80k and 3" diameter for 100k, 120k.
- Capable of multiple position installation - upflow, downflow, or horizontal.

### Construction

- Heavy gauge, reinforced, wrap-around insulated, steel cabinet with durable baked enamel finish.
- Aluminized steel heat exchanger cells featuring the "weld free" manufacturing process.
- Left, right side or bottom inlet air return.
- Aluminized steel in-shot burners.
- Convenient right & left hand connection for gas and electric service.
- Removable Solid bottom blockoff.

### Optional Equipment

- L. P. conversion kit (L.P. kit model LPM-01)
- Combustible floor base for downflow application.

### Standard Equipment

- Electronic hot surface ignition system with diagnostics.
- Corrosion resistant stainless steel secondary heat exchanger which extracts the maximum amount of energy from the gas and converts it to usable heat.
- Energy saving PSC multispeed direct drive blower motors.
- Blower door safety switch.
- Outlet air temperature limit control.
- Pressure switch for proof of combustion air.
- Combination redundant gas valve and regulator.
- Corrosion resistant induced draft motor/blower assembly.
- 40 VA transformer for heating and cooling operation.
- Temperature limit control at vent blower outlet, guards against excessive exhaust gas temperatures.
- Flame roll-out switches.
- Drain kit includes vent screens, drain trap assembly, hoses & clamps.

### Performance Data

GMPN Model No.	Input*	Output	DOE**	Temp. Rise
	Nat. & L.P. BTUH	BTUH	AFUE	Range
GMPN060-3	60,000	54,000	92.0	35-65
GMPN080-4	80,000	72,000	92.0	35-65
GMPN100-4	100,000	90,000	92.0	40-70
GMPN120-5	120,000	108,000	92.0	35-65

\* For altitudes above 2,000 ft. reduce ratings 4% for each 1,000 ft above sea level

\*\*DOE AFUE based upon Isolated Combustion System (ICS)

BEFORE PURCHASING THIS APPLIANCE, READ IMPORTANT ENERGY COST AND EFFICIENCY INFORMATION AVAILABLE FROM YOUR RETAILER

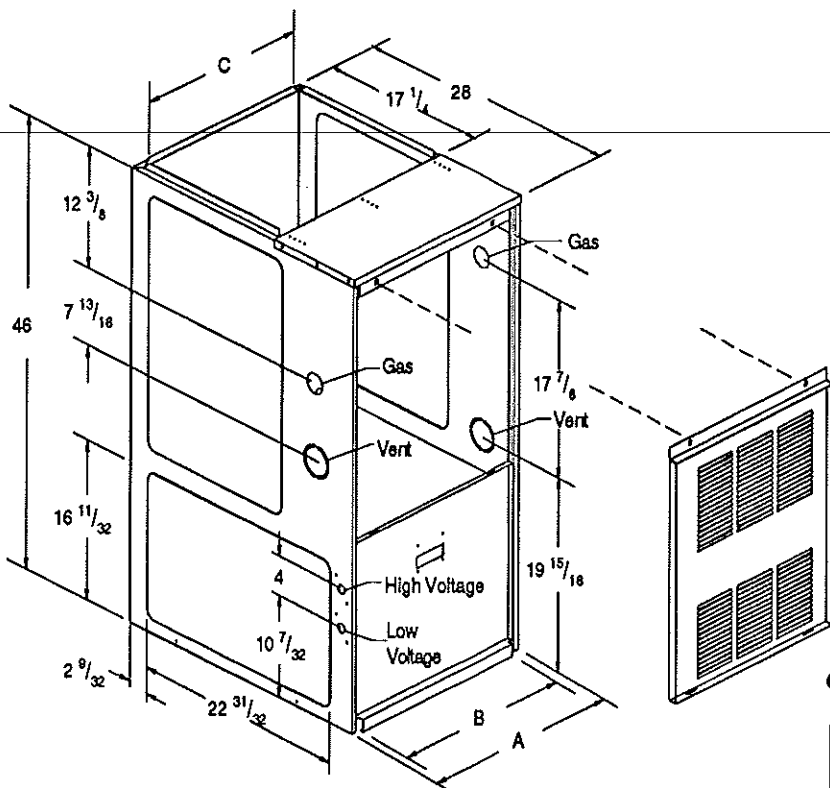
### Specification Data

GMPN Model No.	Blower				Vent* Dia. In.	Filter** Size In.	Electrical		Ship Wt.
	Motor H.P.	Speeds	Dia	Width			Fla	Max. Fuse	
GMPN060-3	1/3	4	10	6	2	14 x 25	5.2	15	180
GMPN080-4	1/2	3	10	8	2	16 x 25	7.8	15	205
GMPN100-4	1/2	3	10	10	3	20 x 25	7.8	15	225
GMPN120-5	3/4	3	10	6(2)	3	24 x 25	9.6	15	265

\* Schedule 40 PVC pipe, DWV

\*\* Filter dimensions for bottom application. All models require 18" x 25" filter(s) for air side air installations. Permanent air filters recommended.

Where max. air flow is 1800 CFM or greater, both sides or the bottom must be used for return air.



### Dimensions

GMPN Model No.	A	B	C
GMPN060-3	14	12 1/2	12 1/2
GMPN080-4	17 1/2	16	16
GMPN100-4	21	19 1/2	19 1/2
GMPN120-5	24 1/2	23	23

COMBUSTIBLE FLOOR BASE FOR DOWNFLOW APPLICATION	
GMPN060-3	SBM14
GMPN080-4	SBM17
GMPN100-4	SBM21
GMPN120-5	SBM24

### Clearances from Combustible Materials (all models)

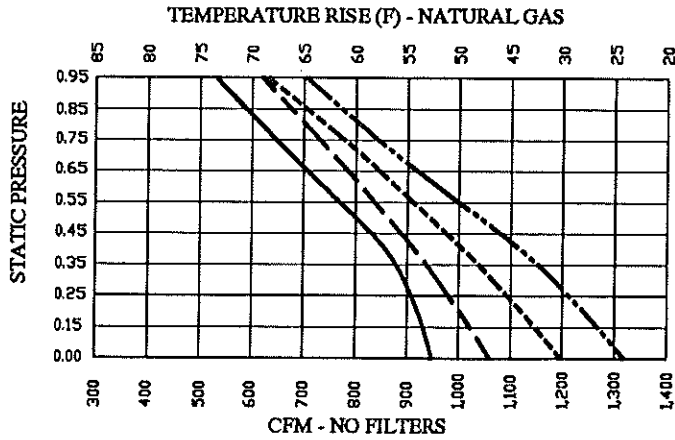
Sides	Rear	Top	Front*	Vent	Horiz Top
1"	0"	1"	3"	0"	8"

\* Accessibility clearance shall take precedence where greater

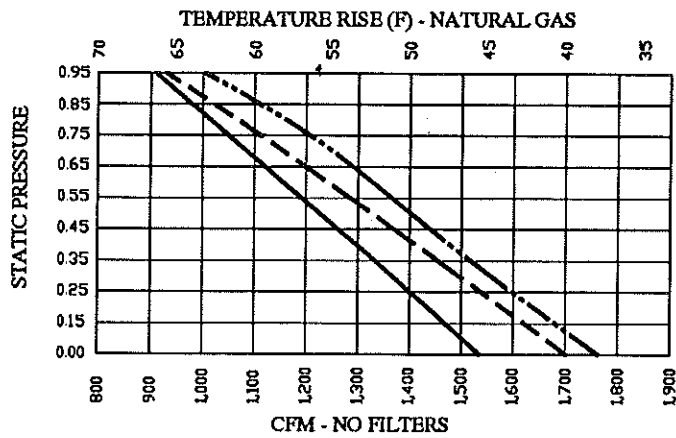
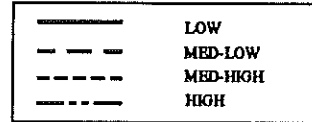
### Model Identification

G	M	P	N	060	3
Gas Furnace	Multi	Position	Condensing+	Input(MBTU) (Nom)	Tons Cooling (Nom)

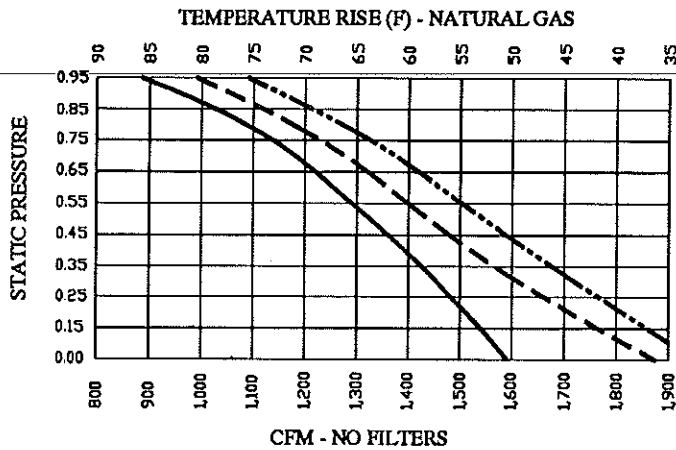
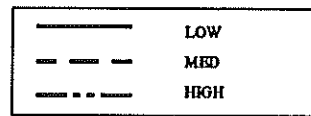
# AIRFLOW DATA



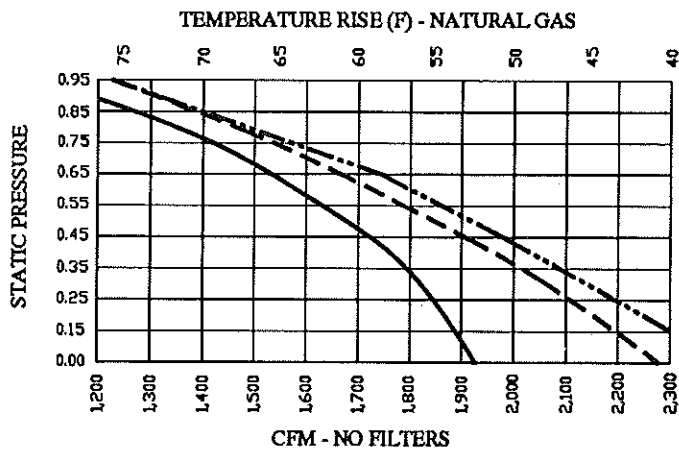
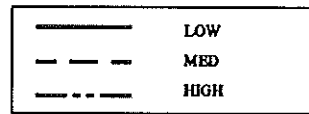
MODEL : GMPN060-3  
 MOTOR H.P.: 1/3 HP  
 BLOWER : 10 X 6



MODEL : GMPN080-4  
 MOTOR H.P.: 1/2 HP  
 BLOWER : 10 X 8



MODEL : GMPN100-4  
 MOTOR H.P.: 1/2 HP  
 BLOWER : 10 X 10



MODEL : GMPN120-5  
 MOTOR H.P.: 3/4 HP  
 BLOWER : (2) 10 X 6

