

INSTALLATION & OPERATING INSTRUCTIONS for GMPN CONDENSING GAS FURNACE

(CATEGORY IV)
(U.S. PAT. # 5,437,263)



WARNING

IF THIS FURNACE IS INSTALLED IN AN ENCLOSED AREA, SUCH AS A GARAGE OR UTILITY ROOM, EITHER ALONE OR WITH ANY OTHER CARBON MONOXIDE PRODUCING DEVICE (i.e. AUTOMOBILE, SPACE HEATER, WATER HEATER, ETC.) INSURE THAT THE ENCLOSED AREA IS PROPERLY VENTILATED.

WARNING

CARBON MONOXIDE (REFERRED TO AS CO) CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH.

WARNING

THIS FURNACE IS DESIGN CERTIFIED FOR INSTALLATION IN BUILDINGS CONSTRUCTED ON SITE ONLY.

Replacement parts for this appliance are available through your contractor or local distributor. For the location of your nearest distributor consult the white business pages, the yellow page section of the local telephone book or contact;

**SERVICE PARTS DEPARTMENT
GOODMAN MANUFACTURING CO., L.P.
1501 SEAMIST
HOUSTON, TEXAS 77008
(713) 861 - 2500**

The major parts groups are as follows;

BLOWER ASSEMBLY

Motor
Blower Housing
Blower wheel
Misc. sheetmetal items
Capacitor

HEAT EXCHANGER

Heat exchanger sections
Innerfront
Secondary coil

ELECTRICAL CONTROLS

Control board
Auxiliary / main limit switch
Roll-out switch
Transformer
Door interlock switch

Air pressure switch
Induced draft blower

BURNER ASSEMBLY

Burners
Manifold
Orifices
Gas Valve
Ignitor
Flame sensor

MISCELLANEOUS

Wrapper
Access doors
Chimney
Gaskets and seals
Wiring assemblies

In order to effectively process the parts requirement the distributor / contractor will need the entire model number and serial number found on the series and rating plate located inside the blower compartment.

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THIS FURNACE CONTAINS ELECTRONIC COMPONENTS WHICH REQUIRE A DEFINITE GROUND. PROVISIONS ARE MADE FOR CONNECTION OF THE GROUND. IF THIS PRODUCT IS NOT PERMANENTLY AND POSITIVELY GROUNDED NUMEROUS SERVICE CALLS MAY RESULT. A DEDICATED GROUND FROM THE MAIN POWER SUPPLY OR AN EARTH GROUND MUST BE PROVIDED.

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WARNING

WHILE **CARBON MONOXIDE** DETECTORS DO PROVIDE ADDITIONAL PROTECTION, CURRENT LIMITATIONS TO THEIR EFFECTIVENESS REQUIRES THAT YOU OTHERWISE CONTINUE TO FOLLOW APPROPRIATE INSTRUCTIONS LOCATED IN THE “INSTALLATION & OPERATING INSTRUCTIONS” AND “USERS INFORMATION” MANUALS RELATING TO PROTECTING PERSONS FROM THE RISKS OF **CARBON MONOXIDE**. REVIEW EACH CO DETECTORS MANUFACTURERS’ EXPLANATION OF THEIR UNIT’S CAPABILITIES AND FOLLOW THOSE INSTALLATION AND OPERATING MANUAL WHEN INSTALLING AND OPERATING THESE UNITS.

WARNING

THE CIRCULATING AIR DUCTS MUST BE COMPLETELY AND POSITIVELY SEALED TO PREVENT THE COMBUSTION PRODUCTS, INCLUDING **CARBON MONOXIDE**, FROM ENTERING THE LIVING SPACE.

WARNING

TO ENSURE PROPER INSTALLATION AND OPERATION OF THIS PRODUCT, COMPLETELY READ AND UNDERSTAND THESE INSTRUCTIONS PRIOR TO ATTEMPTING TO ASSEMBLE, INSTALL, MAINTAIN, OR REPAIR. IF THESE INSTRUCTIONS ARE NOT FOLLOWED PRECISELY THERE IS A POTENTIAL OF **CARBON MONOXIDE** POISONING, WHICH CAN RESULT IN SERIOUS ILLNESS OR DEATH.

WARNING

THIS FURNACE WAS EQUIPPED AT THE FACTORY FOR USE WITH NATURAL GAS ONLY. LIQUID PETROLEUM (LP) CONVERSION, IF REQUIRED, MUST BE PERFORMED BY A QUALIFIED TECHNICIAN FAMILIAR WITH PERFORMING THIS TYPE OF CONVERSION. IF LP CONVERSION IS REQUIRED, ALL INSTRUCTIONS INCLUDED WITH THE FACTORY AUTHORIZED KIT MUST BE FOLLOWED. THE ONLY KIT THAT MUST BE USED FOR THIS CONVERSION IS THE FACTORY AUTHORIZED **LPM-01**. FAILURE TO FOLLOW THOSE INSTRUCTIONS EXPLICITLY MAY CAUSE FIRE, EXPLOSION, OR PERSONAL AND PROPERTY DAMAGE.

WARNING

UNLESS ALLOWED BY LOCAL CODE, DO NOT INSTALL A LIQUID PETROLEUM GAS BURNING APPLIANCE IN A PIT, BASEMENT, OR SIMILAR LOCATION. LP, A HEAVIER THAN AIR GAS, CAN COLLECT IN LOW AREAS AND MAY NOT DISPERSE NATURALLY. APPLIANCES SO FUELED SHALL NOT BE INSTALLED IN AN ABOVE GRADE UNDER FLOOR SPACE OR BASEMENT UNLESS SUCH LOCATION IS PROVIDED WITH APPROVED MEANS FOR REMOVAL OF UNBURNED GAS.

GENERAL INFORMATION

These Installation and Operating Instructions are intended for use by fully qualified installation technicians. Some localities require the installer/sevicer to be licensed. If in doubt, check with local authorities.

INSTALLATION: In the USA this furnace **MUST** be installed in accordance with the latest edition of the ANSI 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-B149.1 & 2 Gas Installation Codes, local plumbing or waste water codes and other applicable codes.

Additional helpful publications are available from the NFPA are, NFPA 90A - Installation of Air Conditioning and Ventilating System and NFPA 90B - Warm Air Heating and Air Conditioning System.

ANNUAL inspections of the furnace and it's vent system is strongly recommended. It is the installer's responsibility to inform the user of this importance.

All venting shall be in accordance with PART 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1, or applicable local building and/or air conditioning codes.

These publications are available from:

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

The GMPN series of furnaces meet the California NOx emission standards and California seasonal efficiency standards.

LOCATION

DO NOT install this furnace in a mobile home. This furnace is designed only for installation in buildings constructed on site and connected to ductwork. When installed in a utility room or closet, 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 should be installed in such a manner so that it is protected from water. If any components should become wetted or submerged under water, replace those parts before returning the furnace to operation. **DO NOT** use as a construction heater. **DO NOT** use in an area where freezing may occur without properly protecting the vent and drain system. The drain may crack and leak if subjected to freezing temperatures. **DO NOT** install in a room used or designed to be used as a bedroom, bathroom or storage closet, or in any enclosed space with access only through such a room or space.

A return air filter grille or means of inserting a filter into the return air duct is recommended. The furnace and it's individual shut-off 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 (3.5kPa) The furnace must be isolated from the gas supply piping system by closing it's individual manual shut-off valve during any pressure testing of the gas supply piping system at pressures equal to or less than 1/2 psig (3.5 kPa).

MINIMUM CLEARANCES TO COMBUSTIBLE SURFACES
Unobstructed front clearance of 24" for servicing is recommended.

VENT - 0" FRONT - 3" RIGHT SIDE - 1"

LEFT SIDE - 1" REAR - 0" TOP OF PLENUM - 1"

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 ignition source and burners are located not less than eighteen inches (18") above the floor and is protected or located to prevent physical damage by vehicles.

A gas furnace must not be installed directly on carpeting, tile, or other combustible materials other than wood flooring.

WARNING

COMBUSTIBLE MATERIAL MUST NOT BE PLACED ON OR AGAINST THE FURNACE CABINET. 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.

WARNING

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

Before proceeding with this installation check the following;

- Correct clearance from combustible materials
- Adequate accessibility for servicing
- Flooring is not carpet or any other combustible material, except wood
- Adequate combustion / ventilation air is supplied
- Metal base plate is in place when using side(s) for return air
- In a garage, the furnace has been adequately elevated and protected from vehicle damage
- Furnace area is free of flammable materials and vapors such as gasoline

VENTING

PROPER INSTALLATION OF THE VENTING SYSTEM IS CRITICAL TO SAFE OPERATION OF THIS PRODUCT. CAREFULLY READ AND UNDERSTAND THE INSTRUCTIONS IN THIS SECTION. DO NOT CONNECT TO AN EXISTING VENT OR CHIMNEY.

THE FOLLOWING TABLE SHOWS THE MAXIMUM VENT LENGTH WITH VARIOUS QUANTITY OF ELBOWS. ELBOWS MUST BE LONG RADIUS TYPE (QUARTER BENDS OR DWV).

MODEL	VENT DIA.	0 ELL	1 ELL	2 ELL	3 ELL	4 ELL
GMPN040	2"	100'	100'	100'	100'	100'
GMPN060	3"	100'	100'	100'	100'	100'
GMPN060	2"	75'	67.5'	60'	52.5'	45'
GMPN080	3"	100'	100'	100'	100'	100'

GMPN080	2"	75'	67.5'	60'	52.5'	45'
GMPN100	3"	100'	100'	100'	100'	100'
GMPN120	3"	100'	100'	100'	100'	100'

Should more elbows be required, subtract 7.5' from the vent length for each elbow used (over 4 as noted above). A maximum of 6 elbows is acceptable. The use of two 45° over one 90° is preferred. Do not count the termination as an elbow.

Minimum vent lengths are 5 ft. for vertical runs and 3ft. for horizontal runs.
A pitch of 1/4" per foot toward the drain assembly is necessary for proper drainage.

The GMPN series of gas furnace is a condensing type appliance. The products of combustion are recirculated through a secondary coil. During this process the flue products are brought to a temperature below dew point. Thus the moisture present in the flue products condense, leaving a liquid by-product. This by-product must be removed from the furnace and it's collection system. In addition, the vent temperatures are also considerably lower than conventional furnaces. This allows the use of low temperature plastic as the vent system. The recommended material is schedule 40 PVC, DWV, ABS (or equivalent if allowed by local code). See previous chart for proper sizing. The drain trap and related parts must be installed as shown in the illustrations located elsewhere in these instructions. Failure to follow these instructions can cause products of combustion including **Carbon Monoxide** to enter the building. This appliance may be horizontally vented through an exterior wall. See the illustrations located elsewhere in this manual.

IF THIS FURNACE IS INSTALLED IN AN ATTIC OR SIMILAR AREA WHERE CONDENSATE OVERFLOW MAY BE A PROBLEM AN AUXILIARY DRAIN PAN MUST BE INSTALLED UNDER THE FURNACE WITH THE AUXILIARY DRAIN LINES ROUTED TO THE OUTDOORS TO PREVENT WATER DAMAGE CAUSED BY LEAKS.

The vent pipes must be inspected annually.

Visually check the vent terminal screen and clean if necessary.

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.

This appliance may be vertically or horizontally vented. Horizontal venting requires a 90° long sweep elbow be installed as the vent terminal. This elbow is to be installed discharging downward and the factory supplied termination screen is to be attached. To prevent damage to the vent pipe and its terminal the distance from the terminal to the exiting wall is to be the minimum practical distance (within 12" would be acceptable). Vertical venting does not require any terminal. If desired, the vent may be faced downward to prevent water or other foreign objects from entering the vent pipe. In that case two long radius elbows may be employed, facing downward and terminating no less than one foot (1') from the roof surface.

PROTECTION FROM FREEZING

The vent pipe and drain assembly must be properly protected from freezing particularly if it is installed in an UNHEATED SPACE. Low wattage tape heaters should be employed on the drain system. The vent pipe should be insulated using a one (1) inch thick closed foam insulation if exposed to the outdoors. For pipes located indoors or protected from the elements such as a garage, basement, etc. fiberglass with an R value of 7 or greater is acceptable.

CAUTION

DO NOT install the vent pipe in the same chase with the vent from another fuel burning appliance, except with a GMN, GMPN, GSUS, or GSU furnace manufactured by GOODMAN.
DO NOT install the vent pipe within six (6) inches of another fuel burning appliance. The drain trap must be easily accessible for checking and / or cleaning. It must be mounted as shown elsewhere in this I&O.
DO NOT install the trap higher than the venter blower outlet.
DO NOT install this appliance in any area where freezing may occur without properly protecting the drain assembly.
DO NOT terminate the vent under a deck or overhang or where a positive pressure or the recirculation of vent products may occur.

CONSULT LOCAL CODES FOR SPECIAL ADDITIONAL REQUIREMENTS.

THE COMBUSTION PRODUCTS AND MOISTURE IN THE FLUE GASES WILL CONDENSE. THE CONDENSATE MAY FREEZE ON THE EXTERIOR WALL AND SURROUNDING SURFACES. SOME DISCOLORATION OR ETCHING IS TO BE EXPECTED.

When selecting which exterior wall to penetrate the following items should be taken into consideration:

Layout the vent system to avoid the possibility of interference with beams, poles, posts, electrical wiring, plumbing , etc.

When possible the vent termination should not be subjected to prevailing winds.

The vent termination must be located at least twelve (12) inches above grade or expected snow depth. Consideration should be given to past unusual snow falls.

- **DO NOT** locate the terminal less than seven (7) feet above public walkways or where it could cause a nuisance or hazard. This also applies to steps and stairwells.
- **DO NOT** locate the termination where condensate may present a problem such as flower beds, patios, etc.
- **DO NOT** locate within four (4) feet of a gas or electric meter or gas regulator.
- **DO NOT** locate the vent terminal within four (4) feet between buildings.
- **DO NOT** locate the vent terminal less than twelve (12) inches above a door or an operable window.
- **DO NOT** locate the vent terminal less than four (4) feet below OR four (4) feet horizontally from, any door, window, or gravity air inlet into any building.
- **DO NOT** locate the vent terminal within three (3) feet of an inside corner of a building or structure. A minor inside corner formed by a masonry chimney is an exception to this requirement.

To protect the exterior surface from staining due to the condensate an aluminum plate or similar material may be installed surrounding the termination. This plate should extend approximately two (2) feet from the penetration.

CAUTION

The area surrounding the vent pipe must be kept free of snow, trash, bushes or any other obstacle which may cause a blockage. A blockage can cause **CARBON MONOXIDE** to enter the building.

SUPPORTING AND PITCHING THE VENT

All horizontal runs must be supported at least every five (5) feet and at joints with straps or hangers. No sags or dips are permitted. The pipe must be saddle supported only. Do not secure the hangers or straps tightly to the pipes, allow for expansion and contraction of the vent pipe material. Maintain a 1/4 " per foot minimum pitch upward on the horizontal vent pipe from the

drain to the terminal. This will allow the condensate to flow backwards into the drain system and not out the terminal. When penetrating the structure to the outdoors install a sleeve to allow for expansion and contraction. Vertical runs must be supported a minimum of every six (6) feet. **DO NOT** rigidly support the vent pipe, always allow for expansion and contraction.

JOINING PIPE AND FITTINGS

Observe all cautions stated on the cement label.
DO NOT CEMENT THE PIPE OR FITTINGS DIRECTLY TO THE VENTER. A RUBBER BOOT AND HOSE CLAMPS ARE PROVIDED FOR THIS PURPOSE.

CONDENSATE DRAIN

This furnace is designed to remove both sensible and latent heat from the combustion flue gas. As a result water vapor is condensed in the secondary heat exchanger. This condensate must be drained either to the outdoors or, where local code permits, to a sewage system. In areas where floor level drains are not available a condensate pump may be employed. This condensate pump must be constructed of corrosion resistant materials. It must also have an auxiliary switch which will shut down the furnace in the event of pump failure or drain tube blockage.

DO NOT run the condensate drain to an outdoor drain or to an unheated area where the possibility of freezing may occur. If installed above a ceiling or other areas where condensate overflow may cause damage, due to drain freezing or blockage, an auxiliary drain pan draining to the outdoors is required.

Note: Some local codes require this condensate to be neutralized prior to disposal. See illustrations elsewhere in this I&O for proper drain connections.

GAS PIPING & GAS PIPE CAPACITY TABLE

Check the rating plate to make certain that the gas supplied is compatible with the unit requirements. Care should be taken after the installation of this appliance that the gas control valve is not subjected to high gas supply line pressure.

In making connections, avoid strains as they may cause noise and damage the controls. Always use a back-up wrench when tightening the gas supply pipe to the gas control valve. Check for leaks in the gas supply using soap bubbles or other approved methods.

NEVER USE AN OPEN FLAME TO CHECK FOR GAS LEAKS. THIS PRACTICE MAY CAUSE A FIRE, EXPLOSION, BODILY HARM OR PROPERTY DAMAGE.

Pipe joint compound must be resistant to the action of LP gas. When connecting the gas service to the 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 near the manual valve for the purpose of making pressure measurement must also be installed. The valve should be readily accessible for turning on or off. A capped sediment trap, sometimes called a drip leg, must be installed in the gas supply pipe as close to the furnace as possible. The sediment trap must incorporate a change of gas flow direction.

Refer to local codes or the above mentioned publications for proper location and size of the manual shutoff and sediment trap lengths.

The gas pipe must be sized to eliminate undue pressure drop. See pipe capacity table or consult your local utility.

Both the supply and manifold pressure must be measured with the furnace running using the field supplied pressure tap near the manual shut-off valve and the pressure adjusted if necessary.

All gas piping must conform to local codes, or in the absence of local codes, to the National Fuel Gas Code ANSI Z223.1 and / or CAN/CGA B149 Installation Codes.

NOTE: COPPER TUBING MUST NOT BE USED FOR NATURAL GAS INSTALLATIONS WHERE MORE THAN .3 GRAINS OF HYDROGEN SULFIDE PER 100 STANDARD CUBIC FEET OF GAS IS PRESENT.

FOR INSTALLATIONS IN THE COMMONWEALTH OF MASSACHUSETTS SEE FUEL GAS AND PLUMBING CODE 248 CMR: APPENDIX C.

Capacity of gas pipe of different diameters and length in ft³/hr. with a pressure drop of 0.3” W.C. and a specific gravity of 0.60 (natural gas).

PIPE SIZE*	LENGTH OF PIPE IN 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

* Nominal size of Iron Pipe in inches.

After the length of pipe has been determined, select the pipe size which will provide the minimum cubic feet per hour of gas flow for the required input of the appliance. In the case where more than one appliance utilizes the same supply pipe be sure to consider the sum of all appliances. The cubic feet of gas required for the appliances should be determined using the following formula;

$$\text{Cubic feet of gas required} = \text{Gas input of appliance (Btu/hr)} / \text{heating value of gas(Btu/hr)}$$

The gas input of the appliance is marked on the specification plate. The heating value of the gas may be determined by contacting the gas utility or gas supplier.

CAUTION

If the local utility permits the use of a flexible gas connector *ALWAYS USE A NEW FLEXIBLE CONNECTOR. DO NOT USE FLEXIBLE GAS LINES WHICH HAVE SERVICED ANOTHER APPLIANCE. AFTER A PERIOD OF TIME THESE LINES MAY BECOME BRITTLE AND WITH THE DISCONNECTION AND RECONNECTION CAN DEVELOP LEAKS.*

CIRCULATING AIR SUPPLY AND RETURN AIR

WARNING

NEVER LAY THIS FURNACE ON IT'S FRONT OR REAR

The circulating air supply may be taken from; 1) Outside the building, 2) return ducts from several rooms, 3) central return, 4) any combination of the above.

When a cooling coil is not installed it is recommended that the supply duct have an access panel so the heat exchanger can be viewed. This panel shall be of sufficient size to permit the entrance of a light or probe to assist in the observation of the heat exchanger integrity or sampling the air stream. It should be sealed to prevent air leakage during normal operation.

CAUTION

DO NOT take return air from bathrooms, kitchens, furnace rooms, garages, utility/laundry rooms or cold areas. If outside air is utilized it should not be taken from within 10 feet of an appliance vent outlet, a vent opening or a plumbing drainage system, or the discharge from an exhaust system unless the outlet is three (3) feet above the outside air inlet. **DO NOT** take return air from areas where it can pick-up objectionable odors, fumes or flammable vapors.

Note: When a combination of outdoor and indoor air is utilized the system should be designed and adjusted such that the temperature reaching the appliance will not drop below 50° F during heating operation. This will minimize the possibility of condensate forming inside the heat exchanger. When this type of system is utilized the volume of air must not be reduced.

Plenum chambers and air ducts must be installed in accordance with the Standard for the Installation of Air Conditioning and Ventilating Systems, NFPA #90A, or the Standard for the Installation of Warm Air Heating and Air Conditioning Systems, NFPA # 90B.

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.

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. *IT IS RECOMMENDED THAT WINDOWS AND DOORS BE OPENED UPON INITIAL START-UP TO VENT THIS NON-TOXIC SMOKE.*

CAUTION

One of the most common causes of problems, including premature heat exchanger failure, in a forced air heating system is insufficient return air. The return air connections to the furnace should be approximately equal to the area of warm air discharge. Consult local codes for specific requirements. The blower speed should be adjusted to maintain the temperature rise range shown on the rating plate.

The total static pressure should not exceed 0.50" W.C.

WARNING

NEVER ALLOW THE PRODUCTS OF COMBUSTION TO ENTER THE RETURN DUCTWORK OR CIRCULATING AIR SUPPLY. ALL RETURN DUCTS MUST BE ADEQUATELY SECURED TO THE FURNACE AND COMPLETELY SEALED. ALL OTHER DUCTWORK MUST BE SECURED WITH APPROVED CONNECTIONS AND SEALED AIRTIGHT. THE VENT AND COMBUSTION AIR SUPPLY PIPES MUST BE PROPERLY INSTALLED AND SUPPORTED TO PREVENT LEAKAGE AS NOTED ELSEWHERE IN THESE INSTRUCTIONS. WHEN A FURNACE IS MOUNTED ON A PLATFORM IT MUST BE SEALED AIRTIGHT BETWEEN THE

FURNACE AND RETURN DUCTWORK. THE FLOOR OR PLATFORM MUST PROVIDE SOUND PHYSICAL SUPPORT FOR THE FURNACE WITHOUT CRACKING, GAPS, SAGGING ETC. AROUND THE BASE AS TO PROVIDE A SEAL BETWEEN THE SUPPORT AND THE BASE.
FAILURE TO PREVENT PRODUCTS OF COMBUSTION FROM ENTERING THE RETURN AIR SUPPLY MAY CAUSE SEVERE ILLNESS OR DEATH FROM **CARBON MONOXIDE** POISONING.

Install the return air to terminate through the base under the furnace. For installations where return air ducts cannot be run under the floor, the return air supply may be taken from the side(s).

WHERE THE MAXIMUM REQUIRED AIR FLOW IS 1800 CFM OR GREATER THE BOTTOM OR BOTH SIDES MUST BE UTILIZED FOR RETURN AIR SUPPLY. NEVER USE THE REAR OF THE FURNACE FOR THE RETURN CONNECTION.

WARNING

A SOLID METAL BASEPLATE IS SUPPLIED WITH THIS FURNACE. THIS BASEPLATE MUST BE IN PLACE WHEN THE FURNACE IS INSTALLED WITH SIDE(S) RETURN AIR DUCTS. FAILURE TO DO SO MAY PERMIT COMBUSTION PRODUCTS TO ENTER THE LIVING SPACE. THIS MAY CREATE POTENTIALLY HAZARDOUS CONDITIONS SUCH AS **CARBON MONOXIDE** POISONING OR DEATH. FULL SIZE RETURN AIR DUCT OPENINGS MUST BE UTILIZED. EMBOSES ARE PROVIDED FOR THIS PURPOSE.

ELECTRICAL SUPPLY CONNECTIONS

The electrical requirements are listed on the series and rating plate on the furnace. A separate supply line with a current overload device and a manual switch, where required, must be installed. Type "T" wire or equivalent with a minimum rating of 95°F (35°C) temperature rise must be run directly from the main power supply to the junction box in the furnace. Copper conductors are required.

Installation of the electrical supply must be in accordance with local codes. In the absence of local codes refer to the National Electrical Code ANSI/NFPA No. 70 (latest edition), which can be obtained from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269. In Canada refer to the latest edition of the Canadian Electrical Code C22.1 Part I.

WARNING

THE GAS SUPPLY PIPE MUST NEVER BE USED FOR GROUNDING PURPOSES.

CONTROL VOLTAGE CONNECTIONS

THERMOSTAT INSTALLATION:

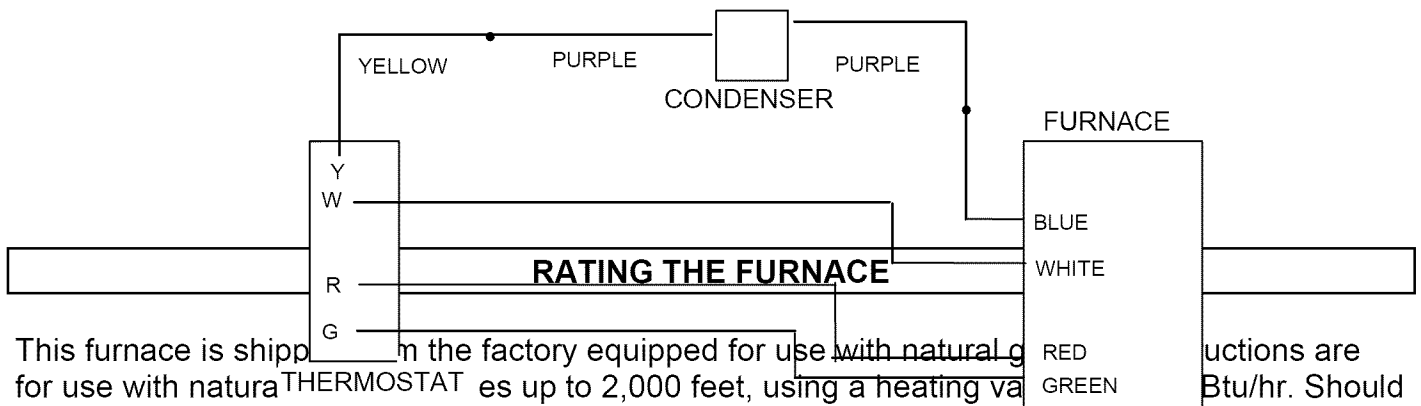
Install the thermostat in accordance with the instructions accompanying the thermostat. Run the thermostat wires into the control compartment of the furnace. Connect the thermostat wiring as shown on the wiring diagram. The thermostat wiring should be a minimum of 18 gauge. Adhere to recommended color code to facilitate future troubleshooting.

The thermostat should be located near the return air grille or opening. It should be approximately 5 feet from the floor level. Never locate the thermostat where it will be influenced by heat generated by hot water pipes, lamps, televisions, direct sunlight, supply air registers, etc.

Interconnecting wiring must be secured and protected from damage or disconnection. The use of solderless connectors or equivalent is recommended. The low voltage control wiring exiting the furnace is labeled "thermostat wiring".

SETTING THE HEAT ANTICIPATOR

The following method should be used in measuring the amp draw of the control circuit to assure proper adjustment of the thermostat heat anticipator



This furnace is shipped from the factory equipped for use with natural gas. Instructions are for use with natural gas up to 2,000 feet, using a heating value of 100,000 Btu/hr. Should this appliance be converted to LP, refer to the instructions included in the factory authorized LP Conversion Kit (**LPM-01**). If for use at altitudes in excess of 2,000 feet refer to the instructions included in the factory authorized High Altitude Kit (**HA-02**).

It is important to wrap the "R" leg around a clip-on amp meter 10 times. Energize the furnace in the heat mode. Record the reading. Divide this reading by 10. Set the heat anticipator on the thermostat to match this reading.

EXAMPLE:
If the reading on the amp meter is "4", divide this by 10. The anticipator setting will be .4 amps.

the input rate of the furnace to prevent an overfiring situation. at exchanger failure. The input is controlled by the supply pressure and heating (calorific) value of the gas. The input is measured with an orifice and all other gas burning appliances must be adjusted to the pressure range stated in the table below. The furnace derate is 4% for each 1,000 feet above 2,000 feet.

NAT. GAS ORIFICE SIZE	
0 - 5,000	#45
5,000 - 10,000	#47
10,000 - 15,000	#47
15,000 - 20,000	#47

6,000	#48
7,000	#48

The input to the furnace must be checked AFTER reorificing.

For altitudes above 7,000 feet refer to appropriate section of the National Fuel Gas Code, ANSI Z223.1. To calculate the input of the furnace for installations in altitudes over 2,000 feet, use the following formula;

CORRECTED INPUT = SERIES & RATING PLATE INPUT - (ALTITUDE X .04) X SERIES & RATING PLATE INPUT / 1000

EXAMPLE:

Corrected input for a 100,000 Btu/hr. appliance installed at an altitude of 6,000 ft. utilizing natural gas with a heating value of 1,000 Btu/ft³ is determined by-

$$\text{Corrected Input} = 100,000 - (6,000 \times .04) \times (100,000 / 1,000)$$

$$\text{Corrected Input} = 100,000 - (240 \times 100)$$

$$\text{Corrected Input} = 100,000 - 24,000$$

$$\text{Corrected Input} = 76,000$$

Using the orifices sized as shown in the table for 6,000 feet (#48), a meter time of 48.0 seconds is measured. The actual firing rate of the furnace is

$$\text{Input} = 1,000 \text{ (heating value of the gas)} \times 3600 \text{ (constant)} / 48.0 \text{ (meter time for } 1 \text{ ft}^3 \text{ of gas)}$$

$$\text{Input} = 3,600,000 / 48.0$$

$$\text{Input} = 76,000 \text{ Btu/hr}$$

In Canada, the series and rating plate input for the furnace apply to installations up to 2,000 feet (610m) above sea level. Kit HA-02 for natural and LP gases is required to convert furnaces from elevations of 2,000 to 4,500 feet (610m to 1,370m). Canadian certification applies to the installations of up to 4,500 feet above sea level. Installations above 4,500 feet is subject to acceptance by the local authorities having jurisdiction.

WARNING

BEFORE ATTEMPTING ANY SERVICE OR ADJUSTMENTS - INSURE THAT THE GAS AND ELECTRICAL SUPPLIES ARE "OFF".

TIMING THE GAS METER

Use the following method to determine the firing rate of the furnace. The supply pressure tap should be located on the field installed piping or gas shut-off valve. The manifold pressure tap is located on the combination gas valve in the furnace and labeled "OUTLET PRESSURE TAP".

- Install a manometer graduated in tenths of an inch of water column on the supply pressure tap of the gas supply pipe.
- Remove plug at the "Manifold" pressure tap on the gas valve and install a second manometer.
- Determine the size of gas meter used.
- Shut off all other gas fired appliances with the exception of the pilots.
- Place furnace in operation.
- Check the supply pressure as shown the on series and rating plate.
- After 15 minutes of operation, time the meter with a stop watch for 2 revolutions & divide by 2.
- Use the appropriate column to determine the furnace input.

- If necessary, adjust the manifold pressure at the gas valve by removing the regulator cap and turning the adjustment screw clockwise to raise the pressure and counterclockwise to reduce the pressure. The manifold pressure must be between 3.2" W.C. and 3.8" W.C. for natural gas and 9.5"W.C. and 10.5" W.C. for LP (a field conversion is necessary for LP). The inability to maintain the proper pressure range will require reorificing. After replacing the orifices, repeat the above steps to insure that the furnace input is adjusted properly.
- Turn off gas and electrical supply, remove manometers and replace any plugs which were removed. Use a pipe joint compound which is suitable for use with LP gas.
- Restore any other appliances affected to their normal operating mode.

METER TIME IN MINUTES AND SECONDS FOR NORMAL INPUT RATING OF FURNACES EQUIPPED FOR USE WITH NATURAL GAS AT 0 - 2,000 FEET ALTITUDE.

INPUT Btu/hr	METER SIZE FT ³	HEAT VALUE 900		HEAT VALUE 1,000		HEAT VALUE 1040		HEAT VALUE 1,100	
		MIN.	SEC.	MIN.	SEC.	MIN.	SEC.	MIN.	SEC.
40,000	1	1	21	1	30	1	33	1	39
	10	13	30	15	00	15	36	16	30
60,000	1	0	54	1	00	1	03	1	06
	10	9	00	10	10	10	24	11	00
80,000	1	0	41	0	45	0	47	0	50
	10	6	45	7	30	7	48	8	15
100,000	1	0	32	0	36	0	37	0	40
	10	5	24	6	00	6	14	6	36
120,000	1	0	27	0	30	0	31	0	33
	10	4	30	5	00	5	12	5	30

MAIN BURNER ADJUSTMENT

The main burners should not need adjustment in most instances. However, air shutters are provided should adjustment be necessary.

After the furnace has been in operation for at least five (5) minutes loosen the shutter locking screw and close the shutter until yellow tipped flames appear. Now slowly open the shutters until the yellow disappears. Retighten the locking screw.

SAFETY CONTROL FUNCTIONS AND CHECK-OUT PROCEDURE

GENERAL

In most cases the safety controls are wired in series with the "W" leg. It is imperative that these switches remain in the circuit. Never jumper, relocate (unless as noted on the furnace) or bypass any control. The safety controls must be checked for proper operation at the time of start-up of the furnace.

WARNING

SHOULD ANY SAFETY CONTROL BE ALTERED, JUMPERED OR BYPASSED, A HAZARDOUS CONDITION SUCH AS FIRE OR THE POSSIBILITY OF **CARBON MONOXIDE** ENTERING THE BUILDING MAY OCCUR.

MAIN LIMIT SWITCH

The main limit switch is a 1/2" disc designed to shut off the burner gas should the outlet (bonnet) temperature exceed the maximum design outlet air temperature. This switch is not adjustable. To check the operation, block the return air flow through the unit temporarily. The limit switch should function and shut the burner gas off within a few minutes. Remove the blockage and allow the switch to cool sufficiently before reestablishing burner flames.

VENT PRESSURE SWITCH

This furnace utilizes a vent pressure switch which prevents the furnace from operating should any portion of the vent system become restricted or a venter failure occur. To check this switch, place the furnace in operation and remove the hose from the switch. The gas burners will extinguish. Replacing the hose will allow the furnace to operate normally.

FLAME ROLL-OUT SWITCH

This furnace is equipped with four (4) flame roll-out switches. These manually resettable switches are 1/2" disc type and are non-adjustable. They are designed to shut down the burner gas in the event that flames are detected outside the heat exchanger. **Should a switch function, contact a qualified service person to determine the cause of function before resetting.** To reset this switch press the button on top of the switch after the furnace has cooled. To test the operation of the switch with the furnace in operation, place an open flame on the disc portion of the switch. The switch should function to shut down the burner gas. **Wait until the furnace has cooled sufficiently before resetting the switch.**

FLAME SENSOR

The ignition is provided by electronic means. The burner flames should be extinguished if the flame sensor fails to detect the presence of burner flame. To test, disconnect the flame sensor wire before placing the furnace in operation. The electronic ignition should ignite the burners. However the burners should shut off after a few seconds of operation. Disconnect the electrical supply to the furnace, reinstall the disconnected sensor wire and reset the power supply to restore the furnace to its normal operation.

BLOWER DOOR INTERLOCK SWITCH

The purpose of the switch is to disconnect electrical power to the furnace should the blower door become dislodged, removed, or not properly reinstalled such as performing a filter change. **ALLOWING THE FURNACE TO OPERATE WITHOUT THE BLOWER DOOR BEING SECURELY IN PLACE CAN CAUSE COMBUSTION PRODUCTS TO BECOME CIRCULATED THROUGHOUT THE LIVING AREA WHICH CAN CAUSE SERIOUS ILLNESS OR CARBON MONOXIDE POISONING.** To test the operation of this switch, place the furnace in operation and remove the blower access door. The burner flames will extinguish and the venter and circulating air blowers should both stop. To restore the unit to normal operation, shut off the electrical power to the unit, replace the blower access door and restore the electrical power.

STACK OVER-TEMPERATURE SWITCH

Located on the venter blower housing, this switch is designed to shut down the burners should the circulating air blower fail or the secondary coil become blocked. To test this switch, bypass the main limit switch, disconnect the circulating air blower, and place the furnace in operation. After a short period of time this switch should function shutting down the burners. **IT IS VERY IMPORTANT TO REMOVE THE BYPASS FROM THE MAIN LIMIT SWITCH AND REPLACE THE WIRES WHICH WERE DISCONNECTED FOR THIS TEST PRIOR TO RETURNING THE FURNACE IN NORMAL OPERATION.**

INTEGRATED FAN / IGNITION CONTROL

This furnace is equipped with a combination ignition module and fan control. An electronic device ignites the burners upon a call for heat. It also controls the venter blower and the various speed selections of the circulating air blower. This control is located in the circulating air blower compartment. Upon a demand for heat the venter is energized. After a short purge, the electronic ignition device is energized. The burners are ignited after a short delay and the burner flame is proven. The circulating air blower is energized approximately thirty (30) seconds after the burners are ignited. The circulating air blower off time is field selectable. THIS CONTROL IS NOT FIELD SERVICEABLE.

CIRCULATING AIR FILTERS

One of the most common causes of problems in a forced air heating system is blocked or dirty filters. Circulating air filters must be inspected monthly for dirt accumulation and replaced if necessary. Failure to maintain clean filters can cause premature heat exchanger failure. A new home may require more frequent replacement until all construction dust and dirt is removed. Circulating air filters are to be installed external to the furnace cabinet.

CAUTION

Before performing any service on this furnace, including checking or replacing circulating air filters - disconnect main power.

DO NOT operate the furnace for extended periods of time without filters in place. Dust and dirt in the air will restrict the air movement over the secondary coil causing nuisance cycling of safety controls which may result in a "no heat condition."

MINIMUM FILTER SIZES

INPUT BTUH	FILTER SIZE	TYPE
40,000	320 / 160 IN. ²	DISPOS. / PERMAN.
60,000	480 / 240 IN. ²	DISPOS. / PERMAN.
80,000	640 / 320 IN. ²	DISPOS. / PERMAN.
100,000	727 / 363 IN. ²	DISPOS. / PERMAN.
120,000	960 / 480 IN. ²	DISPOS. / PERMAN.

TEMPERATURE RISE

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

- Prior to starting the furnace visually inspect all joints and seams in the supply and return air ducts for leaks. Repair them if necessary.
- Adjust the room thermostat to obtain constant operation.
- Allow the furnace to operate for at least fifteen (15) minutes.
- With an accurate thermometer measure the temperature at the return air grille. If a combination indoor / outdoor system is used, the temperature must be measured downstream of the connection.

- Measure the outlet air temperature at a point approximately twelve to eighteen (12 -18) inches from the supply air duct opening of the furnace. It may be necessary to measure the outlet air at several places to obtain an accurate average. NOTE: IF AN AIR CONDITIONING COIL IS INSTALLED TAKE CARE SO AS NOT TO DAMAGE THAT COIL.
- Adjust the temperature by changing circulating air blower speed tap.

MOTOR LUBRICATION AND MAINTENANCE

The circulating air blower is equipped with sleeve bearings which are permanently lubricated by the motor manufacturer and require no lubrication. At the time of the monthly filter inspection clean the exterior of the circulating air motor, especially around the perimeter air holes to prevent the possibility of overheating due to an accumulation of dust or dirt on the windings and motor casing. As suggested elsewhere in these instructions, the air filters are to be kept clean. Dirty filters will restrict the air flow over the motor windings and possibly cause an overheating condition. The venter motor has bearings which are prelubricated by the motor manufacturer and require no attention.

SERVICE INSTRUCTIONS

- **DO** keep the circulating air filters clean. The heating system will operate more efficiently and economically.
- **DO** arrange drapes and furniture so that the supply air registers and return air grilles are unobstructed.
- **DO** close doors and windows. This will reduce the heat load on the system.
- **DO** avoid excessive use of bathroom and kitchen exhaust fans.
- **DO NOT** let heat generated by televisions, lamps, direct sunlight, etc. influence the thermostat operation.
- Exclusive of the mounting platform, keep all combustible materials at least three (3) feet from the furnace.
- **DO NOT** use the furnace room as a storage area.
- **DO NOT** store gasoline or other flammable liquids or vapors in the vicinity of the furnace.

SEQUENCE OF OPERATION

This appliance is controlled by the thermostat. Within this section, the term lockout is referenced. This lockout is a “soft” lockout which will reset after one hour. It is the obligation of the installer to educate the user on the proper use of the thermostat and the sequence of operation in both the heating and cooling modes. It is also important that any repair or service be performed by a QUALIFIED service person, not by the user.

HEATING MODE

- The furnace control checks for an open main limit (this limit is in the normally closed). If the limit is open, the furnace will remain inoperable until the limit is closed. During an open limit the circulating air blower will be energized. The status light will blink four (4) times.
- The room thermostat reacts to a demand for heat.
- The control will then check to insure that the vent pressure switch is open. If, at this point, the vent pressure switch is closed the control will blink two (2) times and will remain inoperable until this situation is corrected.
- The venter blower is energized.

- The vent pressure switch will close when it detects a pressure in excess of it's setting. If the pressure switch fails to close the status light will flash three (3) times. The sequence cannot continue until the pressure switch closes.
- The flame rollout switches are then checked to assure that they are in the closed position.
- After a pre-purge of about fifteen (15) seconds the electronic ignition device will be energized.
- After a slight delay the gas valve will open if the flame rollout switches are closed.
- The burners will ignite and the flame sensor will detect the presence of flame. The ignition device will deenergize. If the sensor does not detect the burner flame, the gas valve will close and the ignition cycle will be repeated for a total of three attempts. If, after the third attempt, the presence of flame is not detected, the furnace will go into a lockout condition for one (1) hour. It will then repeat the ignition cycle. This one (1) hour lockout and retry will occur indefinitely.
- Thirty (30) seconds after the main valve is energized the circulating air blower will be activated.
- The furnace will remain in operation until the demand for heat is satisfied.
- Once the demand is satisfied the venter will shut off, and the circulating air blower will shut off after the field selectable time off is attained.
- The furnace will remain dormant until the next demand for heat.

COOLING MODE

- A demand for cooling is initiated.
- The control checks for an open limit. If an open limit is detected the furnace will remain inoperable until the condition is corrected. During an open limit condition the circulating air blower will be energized. The status light will blink four (4) times.
- The condenser contactor will close.
- After approximately five (5) seconds the circulating air blower will start on the cooling speed.
- After the room thermostat is satisfied the condenser contactor will open.
- The circulating air blower will remain in operation for approximately sixty (60) seconds.

REMOVING AN EXISTING APPLIANCE

When replacing an existing appliance, the resulting installation must comply with all local codes, or in the absence of local codes, to the National Fuel Gas Codes ANSI Z223.1 and/or CAN/CGA B149 Installation Codes as well as these installation instructions.

If the installation of this GMPN furnace requires that an existing appliance be removed from a venting system which still serves another gas fired appliance this may require that the existing vent be re-sized. The following steps shall be performed with each appliance connected to the venting system placed in operation while any other appliance connected to the venting system are not in operation;

- a) Seal any unused openings in the venting system;
- b) Inspect the venting system for proper size and horizontal pitch, as required in the National Fuel Gas Code, ANSI Z223.1 or the CAN/CGA B149 Installation Codes and these instructions. Determine that there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition;
- c) In so far as practical close all building doors and windows and all doors between the space in which the appliance(s) connected to the venting system are located and other spaces in the

building. Turn on clothes dryers and any other appliance not connected to the venting system. Turn on any exhaust fans such as range hoods and bathroom exhausts, so they shall operate at their maximum speed. DO NOT operate a summer exhaust fan (whole house fan). Close fireplace dampers;

d) Follow lighting instructions. Place the appliance being inspected in operation. Adjust the thermostat so the appliance shall operate continuously;

e) Test for draft hood equipped appliance spillage at the relief opening after five (5) minutes of burner operation. Use the flame of a match or candle;

f) After it has been determined that each appliance connected to the venting system properly vents when tested as outlined above, return all doors, windows, exhaust fans, fireplace dampers and any other gas-burning appliance back to their previous condition of use;

g) If improper venting is observed during any of the above tests, the venting system must be corrected.

If resizing of the existing vent is required this shall be sized in accordance with Appendix G of the National Fuel Gas Code, ANSI Z223.1 or CAN/CGA B149 Installation Codes.

INSPECTING & CLEANING 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 obligation of the installer to advise the user to have the furnace inspected and cleaned annually. To clean the heat exchanger perform the following:

- Adjust the room thermostat to its lowest setting.
- Turn off the gas and electric supply to the furnace.
- Remove the control access door.
- Open the gas supply union.
- Disconnect the gas supply line attached to the gas valve.
- Remove the wires connected to the gas valve.
- Remove the burner box assembly. Care must be exercised to avoid damage to the igniter.
- Inshot burners should not require cleaning. However, if they exhibit signs of corrosion they can be cleaned by brushing with a stiff wire brush.
- Remove the vent from the furnace venter blower.
- Remove the venter blower and collector box.
- With a stiff wire brush on a flexible handle, remove any loose scale from the heat exchanger at both the flue and burner openings.
- Use a 1/2" diameter brush to remove any deposits in the secondary heat exchanger.
- With a vacuum remove any loose scale dislodged and any additional debris found in the heat exchanger.
- Visually inspect the heat exchanger cells for any cracks or openings using a bright light.
- **If any failures are discovered it is important to disable the furnace and notify the user to ensure that it remains inoperable until repairs are implemented.**

- Reassemble the furnace in the reverse order. Note: No additional screws or wires are supplied with this product. All components must be reassembled to avoid an unsafe condition.
- Reconnect gas supply and check for leaks using a soap solution. If a flexible gas line is used examine it for cracks or weakness. Replace if necessary.
- Restore electrical power.
- Follow the lighting instructions to place the furnace into operation.

Note - It is important to use a pipe joint compound that is resistant to the effects of LP gas.

SOURCE OF COMBUSTION AIR

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 come from outdoors by way of the attic, crawl space, or direct opening to the outside.
2. If indoor combustion is used, there must be no exposure to the substances listed in #3 below.
3. The following installations may require OUTDOOR AIR for combustion, due to chemical exposures;

- | | |
|---------------------------------------|--|
| • Commercial buildings | • Furnaces installed in hobby or craft rooms |
| • Buildings with indoor pools | • Furnaces installed near chemical storage areas |
| • Furnaces installed in laundry rooms | |

Exposures to the following substances in the combustion air supply may also require OUTDOOR AIR for combustion;

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

BLOWER OFF DELAY

In the heating mode, the time period between the extinguishing of the burners and the circulating blower turning off, is known as the “Blower Off Delay.” This time is factory preset at 150 seconds. The 150 second delay can be changed to 120 or 90 seconds by changing the position of a jumper on the Ignition Control.

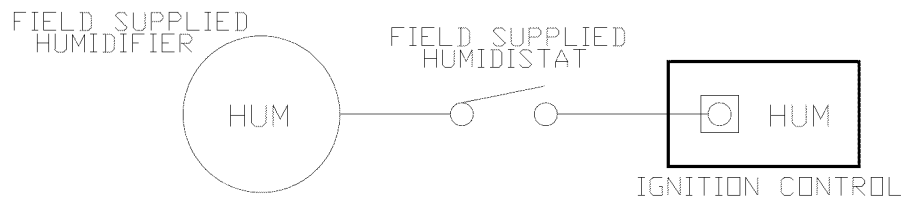


ELECTRONIC AIR CLEANER CONTROL

The red-capped terminal on the ignition control marked "EAC" is to supply 115 VAC to an Electronic Air Cleaner. This terminal is powered in both the heating and air conditioning modes when the circulating blower is operating.

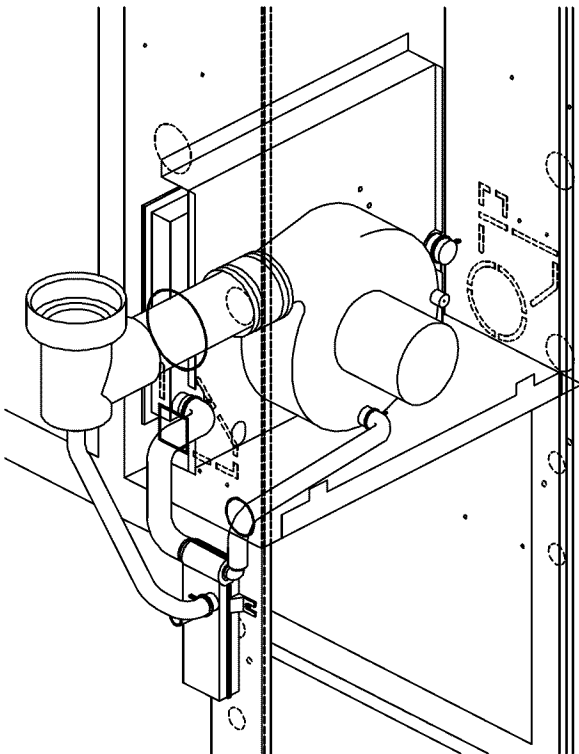
HUMIDIFIER CONTROL

The screw terminal on the ignition control called "HUM" is designed to give a 24 VAC signal to a humidistat in the heating mode. DO NOT USE ON HUMIDIFIERS WHICH USE 115 VAC.

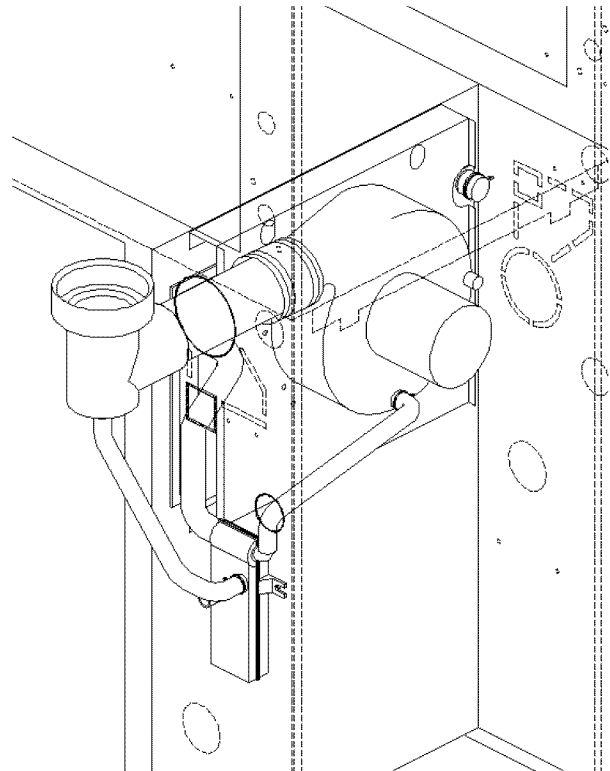


DRAIN CONNECTIONS

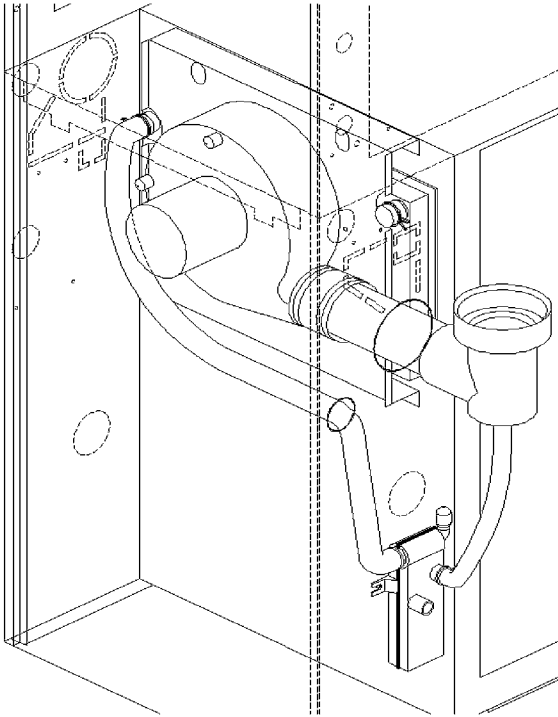
UPFLOW LEFT SIDE



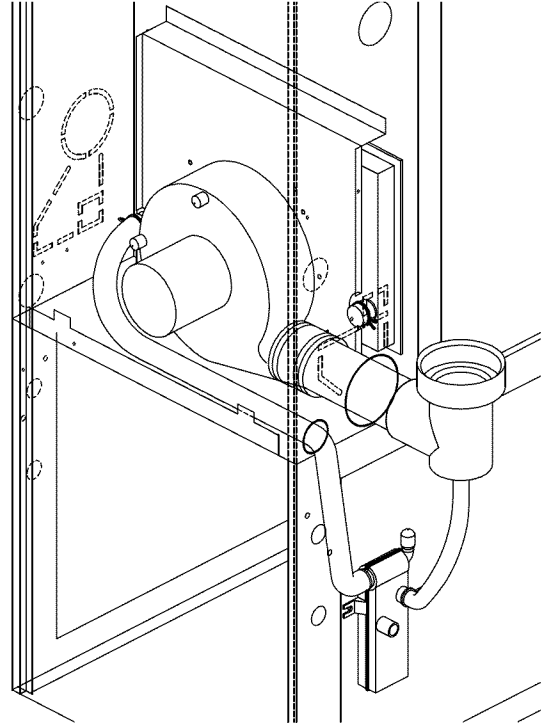
DOWNFLOW LEFT SIDE



DOWNFLOW RIGHT SIDE

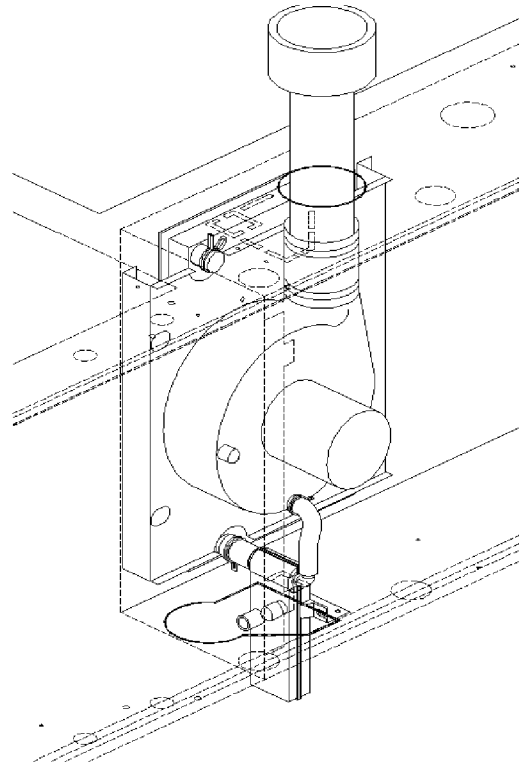
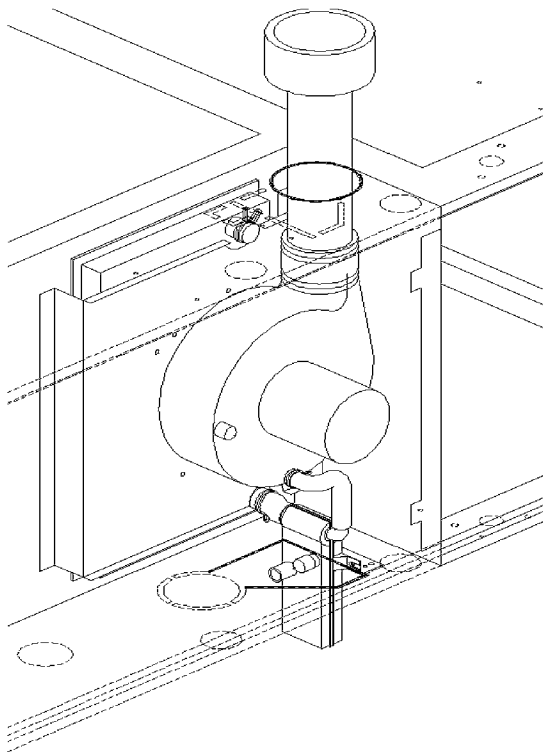


UPFLOW RIGHT SIDE



HORIZONTAL LEFT

HORIZONTAL RIGHT



LIGHTING INSTRUCTIONS

These instructions are also on the furnace

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 burners. Do not try to light the burners 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.
- Immediately call your supplier from a neighbor's phone. Follow the gas suppliers instructions.

- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to move the gas control switch or knob. Never use tools. If the gas control switch or knob will not operate, 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.

WARNING: Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to the user's information manual provided with this furnace. For assistance or additional information consult a qualified installer, service agency or the gas supplier.

This furnace must be installed in accordance with the manufacturers instructions and local codes. In the absence of local codes follow the National Fuel Gas Code, ANSI Z223.1.

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 burners. Do not try to light the burners by hand.

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.

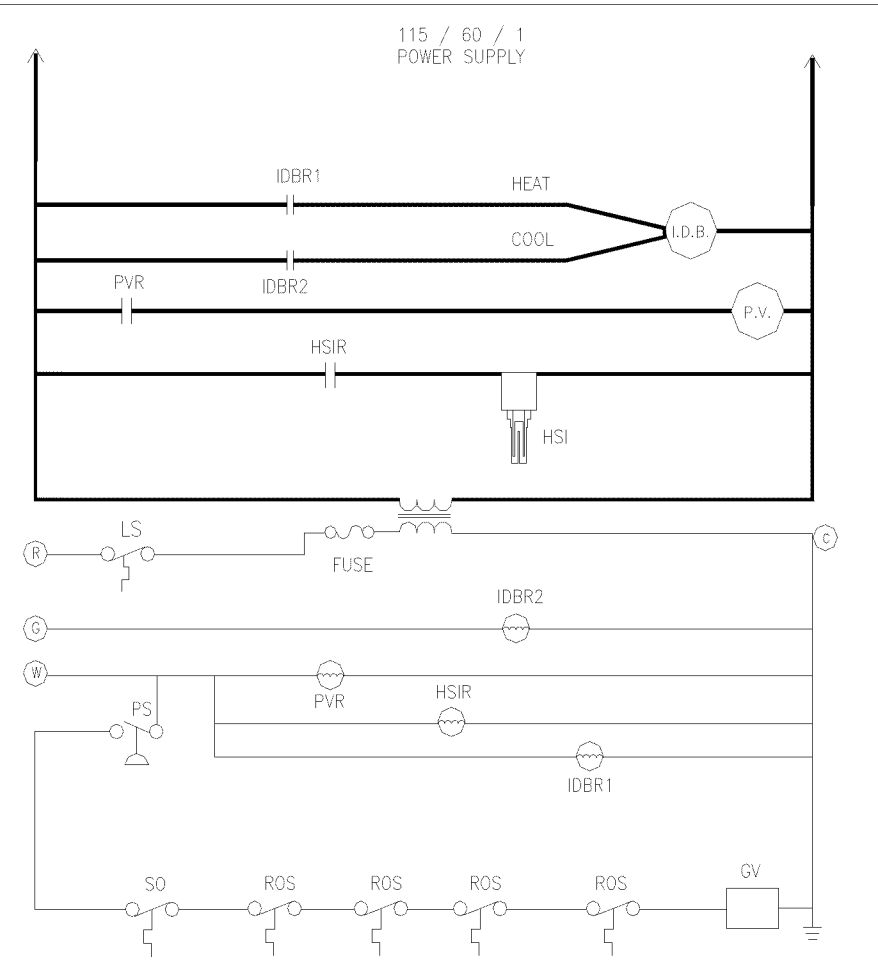
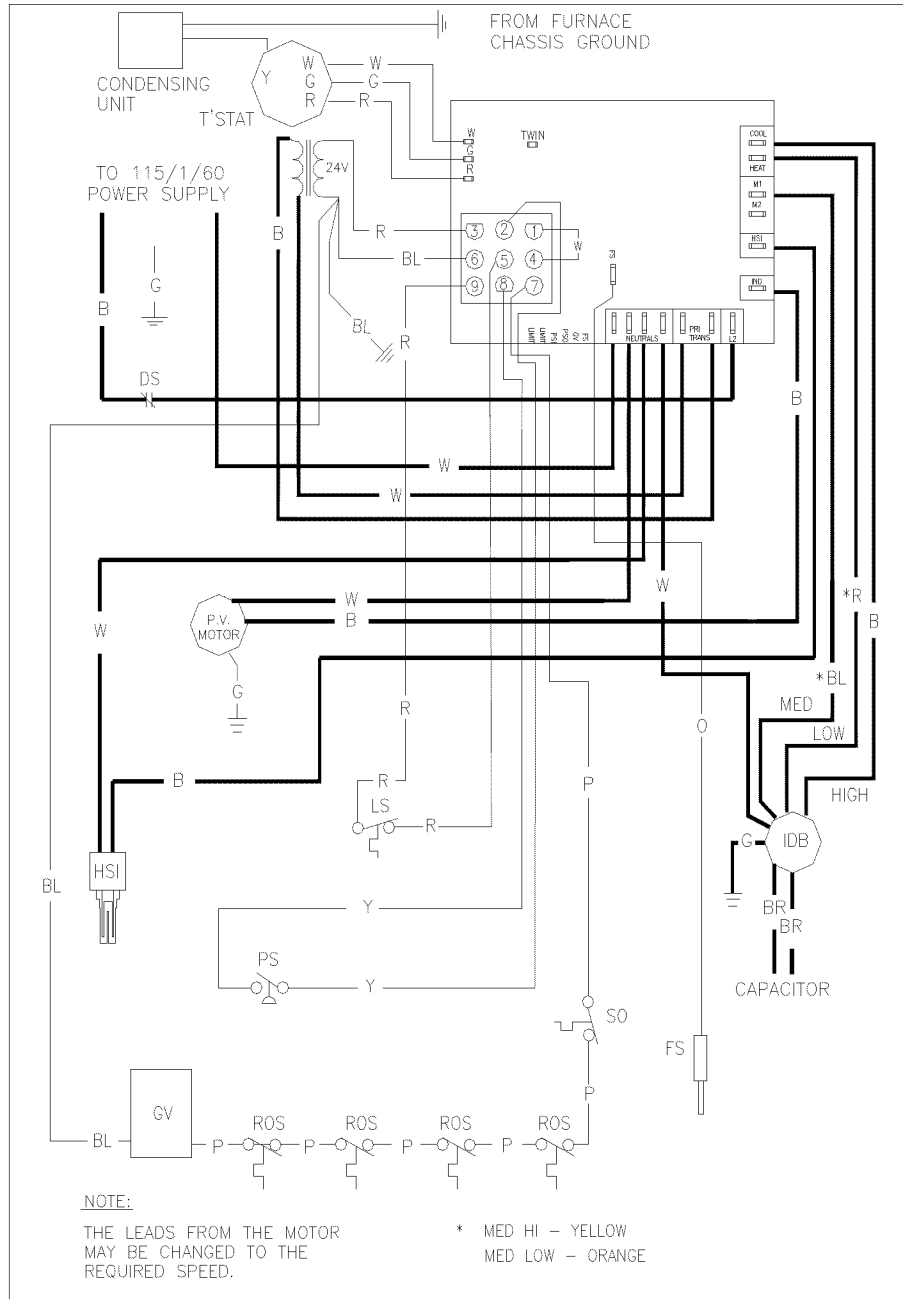
8. Move the gas control switch or knob to "ON".

9. Replace control access panel.

10. Turn on all electric power to the

For indoor installation.

PGB & PGJ
For outdoor installation only.



- DS - DOOR SWITCH
- FS - FLAME SENSOR
- GV - GAS VALVE
- HSI - HOT SURFACE IGNITOR
- HSIR - HOT SURFACE IGNITION RELAY
- IDB - INDOOR BLOWER
- IDBR - INDOOR BLOWER RELAY
- LS - LIMIT SWITCH
- PS - PRESSURE SWITCH
- PV - POWER VENTOR
- PVR - POWER VENT RELAY
- ROS - ROLLOUT SWITCH
- S.O. - STACK OVERTEMP SWITCH

WIRING CODE
FACTORY WIRING
HIGH VOLTAGE **————**
LOW VOLTAGE **————**

WIRE COLOR CODE

B — BLACK (1)	PK — PINK (9)
BL — BLUE (4)	P — PURPLE (5)
BR — BROWN (7)	W — WHITE (0)
G — GREEN (8)	Y — YELLOW (3)
O — ORANGE (6)	R — RED (2)

- NOTES:
1. REPLACEMENT WIRE MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105°C)
 2. WARNING CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO N.E.C. & LOCAL CODES.