INSTALLATION INSTRUCTIONS FOR *MEC80* & *CEC80 GAS FURNACE

(Type FSP CATEGORY I Direct
or Non Direct Vent Air Furnace)
(Type FSP CATÉGORIE I Direct
ou four á air soufflé non direct)

These furnaces comply with requirements embodied in the American National Standard / National Standard of Canada ANSI Z21.47·C-SA-2.3 Gas Fired Central Furnaces.

Installer:
Affix all manuals
adjacent to the unit.

As a professional installer you have an obligation to know the product better than the customer. This includes all safety precautions and related items.

Prior to actual installation, thoroughly familiarize yourself with this Instruction Manual. Pay special attention to all safety warnings. Often during installation or repair it is possible to place yourself in a position which is more hazardous than when the unit is in operation.

Remember, it is your responsibility to install the product safely and to know it well enough to be able to instruct a customer in its safe use.

Safety is a matter of common sense...a matter of thinking before acting. Most dealers have a list of specific good safety practices...follow them.

The precautions listed in this Installation Manual are intended as supplemental to existing practices. However, if there is a direct conflict between existing practices and the content of this manual, the precautions listed herein take precedence.

TABLE OF CONTENTS

⚠ WARNING

ONLY PERSONNEL THAT HAVE BEEN TRAINED TO INSTALL, ADJUST, SERVICE OR REPAIR (HEREINAFTER, "SERVICE") THE EQUIPMENT SPECIFIED IN THIS MANUAL SHOULD SERVICE THE EQUIPMENT. THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR ANY INJURY OR PROPERTY DAMAGE ARISING FROM IMPROPER SERVICE OR SERVICE PROCEDURES. IF YOU SERVICE THIS UNIT, YOU ASSUME RESPONSIBILITY FOR ANY INJURY OR PROPERTY DAMAGE WHICH MAY RESULT. IN ADDITION, IN JURISDICTIONS THAT REQUIRE ONE OR MORE LICENSES TO SERVICE THE EQUIPMENT SPECIFIED IN THIS MANUAL, ONLY LICENSED PERSONNEL SHOULD SERVICE THE EQUIPMENT. IMPROPER INSTALLATION, ADJUSTMENT, SERVICING OR REPAIR OF THE EQUIPMENT SPECIFIED IN THIS MANUAL, OR ATTEMPTING TO INSTALL, ADJUST, SERVICE OR REPAIR THE EQUIPMENT SPECIFIED IN THIS MANUAL WITHOUT PROPER TRAINING MAY RESULT IN PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

PROP 65 WARNING
FOR CALIFORNIA CONSUMERS

⚠ WARNING

Cancer and Reproductive Harm -
www.P65Warnings.ca.gov

0140M00517-A

⚠ RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION.

***NOTE:** Please contact your distributor or our website for the applicable Specification Sheet referred to in this manual.

IOG-2022
05/2019

5151 San Felipe Suite 500 • Houston, TX 77056
www.goodmanmfg.com • www.amana-hac.com

Safety Considerations

Adhere to the following warnings and cautions when installing, adjusting, altering, servicing, or operating the furnace. To ensure proper installation and operation, thoroughly read this manual for specifics pertaining to the installation and application of this product.

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow the safety warnings exactly could result in serious injury, death or property damage.

Never test for gas leaks with an open flame.
Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

AVERTISSEMENT

RISQUE D'INCENDIE OU D'EXPLOSION

Si les consignes de sécurité ne sont pas suivies à la lettre, cela peut entraîner la mort, de graves blessures ou des dommages matériels.

Ne jamais vérifier la présence de fuites de gaz au moyen d'une flamme nue. Vérifier tous les raccords en utilisant une solution savonneuse commerciale conçue spécialement pour la détection de fuites. Un incendie ou une explosion risque de se produire, ce qui peut entraîner la mort, des blessures ou des dommages matériels.

This furnace is manufactured for use with natural gas. It may be field converted to operate on L.P. gas by using the appropriate L.P. conversion kit listed in the **PROPANE GAS/ HIGH ALTITUDE INSTALLATIONS section** of this manual

Install this furnace only in a location and position as specified in **LOCATION REQUIREMENTS & CONSIDERATIONS section and INSTALLATION POSITIONS section** of this manual.

Provide adequate combustion and ventilation air to the furnace as specified in **COMBUSTION & VENTILATION AIR REQUIREMENTS section of this manual.**

Combustion products must be discharged to the outdoors. Connect this furnace to an approved vent system only, as specified in **Category 1 Venting** section of this manual.

Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections, as specified in **GAS SUPPLY AND PIPING** section of this manual.

Always install a furnace to operate within the furnace's intended temperature-rise range with a duct system which has external static pressure within the allowable range, as specified on the furnace rating plate and **OPERATIONAL CHECKS section** of these instructions.

When furnace duct(s) supply air outside the space containing the furnace, a return air duct must terminate in the same space as the supply duct and be sealed to the furnace casing.

A gas-fired furnace for installation in a residential garage must be installed as specified in the **LOCATION REQUIREMENTS AND CONSIDERATIONS section** of this manual.

This furnace may be used as a construction site heater only if certain conditions are met. These conditions are listed in the **PRODUCT APPLICATION section** of this manual.

WARNING

To prevent personal injury or death due to improper installation, adjustment, alteration, service or maintenance, refer to this manual. For additional assistance or information, consult a qualified installer, servicer agency or the gas supplier.

WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

— Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

— **WHAT TO DO IF YOU SMELL GAS:**

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

— Installation and service must be performed by a qualified installer, service agency or the gas supplier.

WARNING

This product contains or produces a chemical or chemicals which may cause serious illness or death and which are known to the State of California to cause cancer, birth defects or other reproductive harm.

DANGER

CARBON MONOXIDE POISONING HAZARD

Special Warning for Installation of Furnace or Air Handling Units in Enclosed Areas such as Garages, Utility Rooms or Parking Areas

Carbon monoxide producing devices (such as an automobile, space heater, gas water heater, etc.) should not be operated in enclosed areas such as unventilated garages, utility rooms or parking areas because of the danger of carbon monoxide (CO) poisoning resulting from the exhaust emissions. If a furnace or air handler is installed in an enclosed area such as a garage, utility room or parking area and a carbon monoxide producing device is operated therein, there must be adequate, direct outside ventilation.

This ventilation is necessary to avoid the danger of CO poisoning which can occur if a carbon monoxide producing device continues to operate in the enclosed area. Carbon monoxide emissions can be (re)circulated throughout the structure if the furnace or air handler is operating in any mode.

CO can cause serious illness including permanent brain damage or death.

B10259-216

DANGER
PELIGRO

RIESGO DE INTOXICACIÓN POR MONÓXIDO DE CARBONO

Advertencia especial para la instalación de calentadores ó manejadoras de aire en áreas cerradas como estacionamientos ó cuartos de servicio.

Los equipos ó aparatos que producen monóxido de carbono (tal como automóvil, calentador de gas, calentador de agua por medio de gas, etc) no deben ser operados en áreas cerradas debido al riesgo de envenenamiento por monóxido de carbono (CO) que resulta de las emisiones de gases de combustión. Si el equipo ó aparato se opera en dichas áreas, debe existir una adecuada ventilación directa al exterior.

Esta ventilación es necesaria para evitar el peligro de envenenamiento por CO, que puede ocurrir si un dispositivo que produce monóxido de carbono sigue operando en el lugar cerrado.

Las emisiones de monóxido de carbono pueden circular a través del aparato cuando se opera en cualquier modo.

El monóxido de carbono puede causar enfermedades severas como daño cerebral permanente ó muerte.

B10259-216

DANGER

RISQUE D'EMPOISONNEMENT AU MONOXYDE DE CARBONE

Advertencia especial para la instalación de calentadores ó manejadoras de aire en áreas cerradas como estacionamientos ó cuartos de servicio.

Avertissement special au sujet de l'installation d'appareils de hauffage ou de traitement d'air dans des endroits clos, tets les garages, les locaux d'entretien et les stationnements. Evitez de mettre en marche les appareils produisant du monoxyde de carbone (tels que les automobile, les appareils de chauffage autonome,etc.) dans des endroits non ventilés tels que les d'empoisonnement au monoxyde de carbone. Si vous devez faire fonctionner ces appareils dans un endroit clos, assures-vous qu'il y ait une ventilation directe provenant de l'exterier.

Cette ventilation est nécessaire pour éviter le danger d'intoxication au CO pouvant survenir si un appareil produisant du monoxyde de carbone continue de fonctionner au sein de la zone confinée.

Les émissions de monoxyde de carbone peuvent etre recircules dans les endroits clos, si l'appareil de chauffage ou de traitement d'air sont en marche.

Le monoxyde de carbone peut causer des maladies graves telles que des dommages permanents au cerveau et meme la mort.

B10259-216

WARNING

HEATING UNIT SHOULD NOT BE UTILIZED WITHOUT REASONABLE, ROUTINE, INSPECTION, MAINTENANCE AND SUPERVISION. IF THE BUILDING IN WHICH ANY SUCH DEVICE IS LOCATED WILL BE VACANT, CARE SHOULD BE TAKEN THAT SUCH DEVICE IS ROUTINELY INSPECTED, MAINTAINED AND MONITORED. IN THE EVENT THAT THE BUILDING MAYBE EXPOSED TO FREEZING TEMPERATURES AND WILL BE VACANT, ALL WATER-BEARING PIPES SHOULD BE DRAINED, THE BUILDING SHOULD BE PROPERLY WINTERIZED, AND THE WATER SOURCE CLOSED. IN THE EVENT THAT THE BUILDING MAY BE EXPOSED TO FREEZING TEMPERATURES AND WILL BE VACANT, ANY HYDRONIC COIL UNITS SHOULD BE DRAINED AS WELL AND, IN SUCH CASE, ALTERNATIVE HEAT SOURCES SHOULD BE UTILIZED.

WARNING

TO PREVENT POSSIBLE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH DUE TO ELECTRICAL SHOCK, THE FURNACE MUST BE LOCATED TO PROTECT THE ELECTRICAL COMPONENTS FROM WATER.

WARNING

SHOULD OVERHEATING OCCUR OR THE GAS SUPPLY FAIL TO SHUT OFF, TURN OFF THE MANUAL GAS SHUTOFF VALVE EXTERNAL TO THE FURNACE BEFORE TURNING OFF THE ELECTRICAL SUPPLY.

WARNING

POSSIBLE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH DUE TO FIRE, EXPLOSION, SMOKE, SOOT, CONDENSATION, ELECTRICAL SHOCK OR CARBON MONOXIDE MAY RESULT FROM IMPROPER INSTALLATION, REPAIR OPERATION, OR MAINTENANCE OF THIS PRODUCT.

WARNING

TO PREVENT PERSONAL INJURY OR DEATH DUE TO IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE, REFER TO THIS MANUAL. FOR ADDITIONAL ASSISTANCE OR INFORMATION, CONSULT A QUALIFIED INSTALLER, SERVICER AGENCY OR THE GAS SUPPLIER.

WARNING

TO PREVENT PERSONAL INJURY OR DEATH DUE TO ASPHYXIATION, THIS FURNACE MUST BE CATEGORY I VENTED. DO NOT VENT USING CATEGORY III VENTING.

PROVISIONS MUST BE MADE FOR VENTING COMBUSTION PRODUCTS OUTDOORS THROUGH A PROPER VENTING SYSTEM. THE LENGTH OF FLUE PIPE COULD BE A LIMITING FACTOR IN LOCATING THE FURNACE.

Additional Safety Considerations

- This furnace is approved for Category I Venting only.
- Provisions must be made for venting combustion products outdoors through a proper venting system. The length of flue pipe could be a limiting factor in locating the furnace.

Shipping Inspection

All units are securely packed in shipping containers tested according to International Safe Transit Association specifications. The carton must be checked upon arrival for external damage. If damage is found, a request for inspection by carrier's agent must be made in writing immediately.

The furnace must be carefully inspected on arrival for damage and bolts or screws which may have come loose in transit. In the event of damage the consignee should:

1. Make a notation on delivery receipt of any visible damage to shipment or container.
2. Notify carrier promptly and request an inspection.

3. With concealed damage, carrier must be notified as soon as possible - preferably within five days.
4. File the claim with the following support documents within a nine month statute of limitations.
   - Original or certified copy of the Bill of Lading, or indemnity bond.
   - Original paid freight bill or indemnity in lieu thereof.
   - Original or certified copy of the invoice, showing trade and other discounts or reductions.
   - Copy of the inspection report issued by carrier's representative at the time damage is reported to carrier.

The carrier is responsible for making prompt inspection of damage and for a thorough investigation of each claim. The distributor or manufacturer will not accept claims from dealers for transportation damage.

Keep this literature in a safe place for future reference.

Electrostatic Discharge (ESD) Precautions

NOTE: Discharge body's static electricity before touching unit. An electrostatic discharge can adversely affect electrical components.

Use the following precautions during furnace installation and servicing to protect the integrated control module from damage. By putting the furnace, the control, and the person at the same electrostatic potential, these steps will help avoid exposing the integrated control module to electrostatic discharge. This procedure is applicable to both installed and non-installed (ungrounded) furnaces.

1. Disconnect all power to the furnace. Do not touch the integrated control module or any wire connected to the control prior to discharging your body's electrostatic charge to ground.
2. Firmly touch a clean, unpainted, metal surface of the furnaces near the control. Any tools held in a person's hand during grounding will be discharged.
3. Service integrated control module or connecting wiring following the discharge process in step 2. Use caution not to recharge your body with static electricity; (i.e., do not move or shuffle your feet, do not touch ungrounded objects, etc.). If you come in contact with an ungrounded object, repeat step 2 before touching control or wires.
4. Discharge your body to ground before removing a new control from its container. Follow steps 1 through 3 if installing the control on a furnace. Return any old or new controls to their containers before touching any ungrounded object.

To The Installer

Before installing this unit, please read this manual thoroughly to familiarize yourself with specific items which must be adhered to, including but not limited to: unit maximum external static pressure, gas pressures, BTU input rating, proper electrical connections, circulating air temperature rise, minimum or maximum CFM, and motor speed connections, and venting. These furnaces are designed for Category I venting only.

⚠ WARNING

To prevent property damage, personal injury or death due to fire, do not install this furnace in a mobile home, trailer, or recreational vehicle.

Product Application

This furnace is primarily designed for residential home-heating applications. It is NOT designed or certified for use in mobile homes, trailers or recreational vehicles. Neither is it designed or certified for outdoor applications. The furnace **must** be installed indoors (i.e., attic space, crawl space, or garage area provided the garage area is enclosed with an operating door).

This furnace can be used in the following non-industrial commercial applications:

Schools, Office buildings, Churches, Retail stores, Nursing homes, Hotels/motels, Common or office areas

In such applications , the furnace must be installed with the following stipulations:

- It must be installed per the installation instructions provided and per local and national codes.
- It must be installed indoors in a building constructed on site.
- It must be part of a ducted system and not used in a free air delivery application.
- It must not be used as a "make-up" air unit.
- All other warranty exclusions and restrictions apply.

This furnace may be used as a construction site heater **ONLY** if all of the following conditions are met:

- The vent system is permanently installed per these installation instructions.
- A room thermostat is used to control the furnace. Fixed jumpers that provide continuous heating CANNOT be used and can cause long term equipment damage. Bi-metal thermostats, or any thermostat affected by vibration must not be used during construction.
- Return air ducts are provided and sealed to the furnace.
- A return air temperature range between 60ºF (16ºC) and 80ºF (27ºC) is maintained.
- Air filters are installed in the system and replaced daily during construction and upon completion of construction.
- The input rate and temperature rise are set per the furnace rating plate.
- 100% outside air must be used for combustion during construction. Temporary ducting may be used to supply outside air to the furnace for combustion – do not connect this duct directly to the furnace. Size this duct according to NFPA 54/ANSI Z223.1 section for

Combustion and Ventilation Air

- The furnace heat exchanger, components, duct system, air filters and evaporator coils are thoroughly cleaned following final construction clean up by a qualified person.
- All furnace operating conditions (including ignition, input rate, temperature rise and venting) are verified by a qualified person according to these installation instructions
- Furnace doors must be in place on the furnace while the furnace is operating in any mode
- Damage or repairs due to failure to comply with these requirements are not covered under the warranty.

NOTE: The Commonwealth of Massachusetts requires that the following additional requirements must also be met:

- Gas furnaces must be installed by a licensed plumber or gas fitter.
- A T-handle gas cock must be used.
- If the unit is to be installed in an attic, the passageway to and the service area around the unit must have flooring.

WARNING

TO PREVENT PROPERTY DAMAGE, PERSONAL INJURY OR DEATH DUE TO FIRE, DO NOT INSTALL THIS FURNACE IN A MOBILE HOME, TRAILER, OR RECREATIONAL VEHICLE.

To ensure proper furnace operation, install, operate and maintain the furnace in accordance with these installation and operation instructions, all local building codes and ordinances. In their absence, follow the latest edition of the National Fuel Gas Code (NFPA 54/ANSI Z223.1) and/or local plumbing or waste water codes, and other applicable codes.

A copy of the National Fuel Gas Code (NFPA 54/ANSI Z223.1) can be obtained from any of the following:

American National Standards Institute
25 West 43rd Street, 4th Floor
New York, NY 10036

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

CSA International
8501 East Pleasant Valley
Independence, OH 44131

The rated heating capacity of the furnace should be greater than or equal to the total heat loss of the area to be heated. The total heat loss should be calculated by an approved method or in accordance with “ASHRAE Guide” or “Manual J-Load Calculations” published by the Air Conditioning Contractors of America.

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

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

NOTE: Furnaces with NOx screens meet the California NOx emission standards and California seasonal efficiency standards. ANNUAL inspections of the furnace and its vent system is strongly recommended.

LOCATION REQUIREMENTS AND CONSIDERATIONS

Your unit model type determines which installation procedures must be used. For *MEC80 models, you must follow instructions for Horizontal Left, Horizontal Right or Upflow installations only. These furnaces are not approved for Downflow installations.
*CEC80 models may be installed in the Downflow position as well as Horizontal Left & Horizontal Right positions.

WARNING

TO PREVENT POSSIBLE EQUIPMENT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH, THE FOLLOWING BULLET POINTS MUST BE OBSERVED WHEN INSTALLING THIS UNIT.

Follow the instructions listed below when selecting a furnace location. Refer also to the guidelines provided in the *Combustion and Ventilation Air Requirements.*

- Centrally locate the furnace with respect to the proposed or existing air distribution system.
- Ensure the temperature of the return air entering the furnace is between 55°F and 100°F when the furnace is heating.
- Provisions must be made for venting combustion products outdoors through a proper venting system. The length of flue pipe could be a limiting factor in locating the furnace.
- Ensure adequate combustion air is available for the furnace. Improper or insufficient combustion air can expose building occupants to gas combustion products that could include carbon monoxide. Refer to *Combustion and Ventilation Air Requirements* section.
- The furnace must be level. If the furnace is to be set on a floor that may become wet or damp at times, the furnace should be supported above the floor on a concrete base sized approximately 1-1/2” larger than the base of the furnace.
- Ensure upflow or horizontal furnaces are not installed directly on carpeting, or any other combustible material. The only combustible material allowed is wood.

- Exposure to contaminated combustion air will result in safety and performance-related problems. Do not install the furnace where the combustion air is exposed to the following substances:

  chlorinated waxes or cleaners
  chlorine-based swimming pool chemicals
  water softening chemicals
  deicing salts or chemicals
  carbon tetrachloride
  halogen type refrigerants
  cleaning solutions (such as perchloroethylene)
  printing inks
  paint removers
  varnishes
  hydrochloric acid
  cements and glues
  antistatic fabric softeners for clothes dryers
  and masonry acid washing materials

- If the furnace is used in connection with a cooling unit, install the furnace upstream or in parallel with the cooling unit coil. Premature heat exchanger failure will result if the cooling unit coil is placed ahead of the furnace.
- For vertical applications, the minimum cooling coil width shall not be less than furnace width minus 1". Additionally, a coil installed above an upflow furnace or under a counterflow furnace may be the same width as the furnace or may be one size larger than the furnace. Example: a "C" width coil may be installed with a "B" width furnace.
- For upflow applications, the front of the coil and furnace must face the same direction.
- If the furnace is installed in a residential garage, position the furnace so that the burners and ignition source are located not less than 18 inches (457 mm) above the floor. Protect the furnace from physical damage by vehicles.
- If the furnace is installed horizontally, the furnace access doors must be vertical so that the burners fire horizontally into the heat exchanger. Do not install the unit with the access doors on the "up/top" or "down/bottom" side of the furnace.
- Do not connect this furnace to a chimney flue that serves a separate appliance designed to burn solid fuel.
- Counterflow installation over a noncombustible floor. Before setting the furnace over the plenum opening, ensure the surface around the opening is smooth and level. A tight seal should be made between the furnace base and floor by using a silicon rubber caulking compound or cement grout.
- Counterflow installation over a combustible floor. If installation over a combustible floor becomes necessary, use an accessory subbase (see Specification Sheet applicable to your model for details). A special accessory subbase must be used for upright counterflow unit installations over any combustible material including wood. Follow the instructions with the subbase for proper installations. Do not install the furnace directly on carpeting, tile, or other combustible material other than wood flooring. (**NOTE**: The subbase will not be required if an air conditioning coil is installed between the supply air opening on the furnace and the floor. The air conditioning coil must be downstream from the heat exchanger of the furnace.

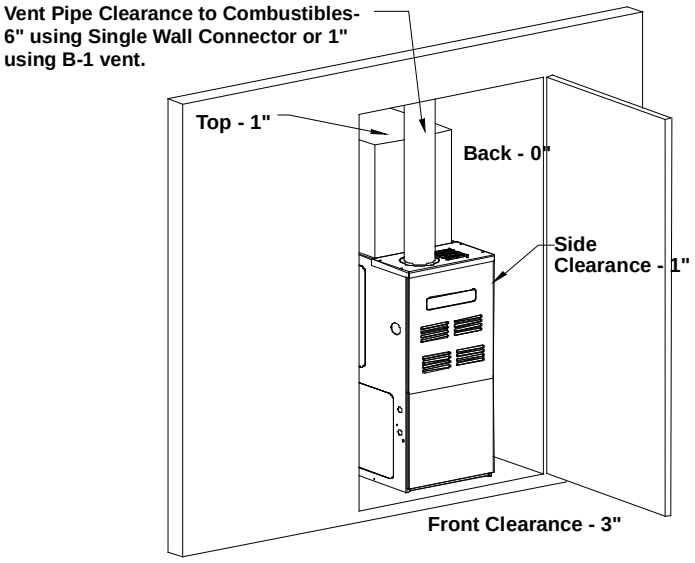


Figure 1

- Adequate combustion/ventilation air must be supplied to the closet.
- Furnace must be **completely** sealed to floor or base. Combustion/ ventilation air supply pipes must terminate 12" from top of closet and 12" from floor of closet. DO NOT remove solid base plate for side return.
- Return air ducts must be **completely** sealed to the furnace and terminate outside the enclosure surfaces.

Clearances and Accessibility

Unobstructed front clearance of 24" **for servicing** is recommended.

VENT		SIDES	FRONT	BACK	TOP
B1-VENT	SINGLE				(PLENUM)
1"	6"	1"	3"	0"	1"

Top clearance for horizontal configuration - 1"

Installation Positions

*MEC80 model furnaces may be installed vertically (upflow) or horizontally with left or right side down. *CEC80 model furnaces may be installed vertically (downflow) or horizontally with left or right side down. Do not install this furnace on its back. For vertically installed *upflow* furnaces, return air ductwork may be attached to the side panel(s) and/or basepan. For *horizontally* installed *upflow* furnaces, return air ductwork must be attached to the basepan. For *counterflow* furnaces, return ductwork must be attached to the the blower compartment end of the furnace.

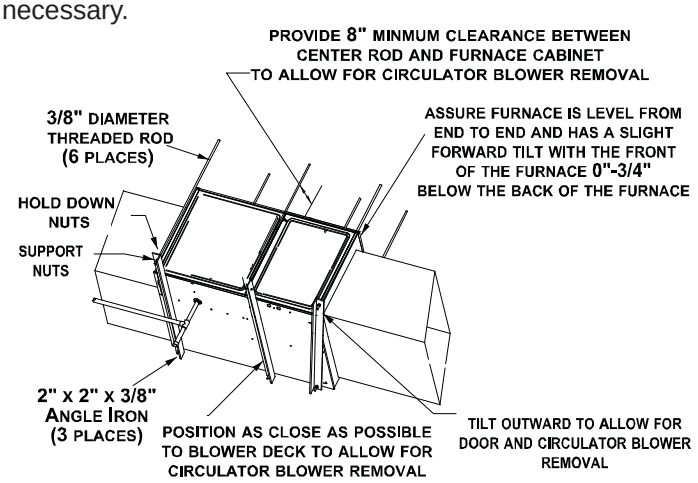
NOTE: Ductwork must never be attached to the back of the furnace.

Horizontal Installation

Line contact to framing is permitted when installed in the horizontal configuration. Line contact is defined as the portion of the cabinet that is formed by the intersection of the top and side. 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.

Furnace Suspension

If suspending the furnace from rafters or joist, use 3/8" threaded rod and 2"x2"x3/8" angle iron as shown below. The length of rod will depend on the application and the clearances necessary.



Suspended Furnace
Figure 2

Existing Furnace Removal

WARNING

CARBON MONOXIDE POISONING HAZARD

Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death.

The following steps shall be followed for each appliance connected to the venting system being placed into operation, while all other appliances connected to the venting system are not in operation:

1) Seal any unused openings in the venting system.
2) Inspect the venting system for proper size and horizontal pitch, as required in the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the Natural Gas and Propane Installation Code, CSA B149.1 and these instructions. Determine that there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
3) As 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 of the building.
4) Close fireplace dampers.
5) Turn on clothes dryers and any appliance not connected to the venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they are operating at maximum speed. Do not operate a summer exhaust fan.
6) Follow the lighting instructions. Place the appliance being inspected into operation. Adjust the thermostat so appliance is operating continuously.
7) Test for spillage from draft hood equipped appliances at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle.
8) If improper venting is observed during any of the above tests, the venting system must be corrected in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and/or Natural Gas and Propane Installation Code, CSA B149.1.
9) After it has been determined that each appliance connected to the venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas-fired burning appliance to their previous conditions of use.

⚠ AVERTISSEMENT

RISQUE D'INTOXICATION AU MONOXYDE DE CARBONE

Si les étapes décrites ci-dessous ne sont pas suivies pour chacun des appareils raccordés au système de ventilation au moment de sa mise en marche, cela peut entraîner une intoxication au monoxyde de carbone ou la mort. Les étapes suivantes doivent être suivies pour chacun des appareils raccordés au système de ventilation au moment de sa mise en marche, alors que tous les autres appareils raccordés au système de ventilation ne sont pas en marche:

1) Sceller toutes les ouvertures inutilisées du système de ventilation.
2) Inspecter le système de ventilation afin de vérifier si la taille et l'inclinaison par rapport à l'horizontale sont conformes aux exigences du National Fuel Gas Code, ANSI Z223.1/NFPA 54 ou du Code d'installation du gaz naturel et du propane, CSA B149.1 et à ces instructions. Vérifier qu'il n'y a pas d'obstruction ou de restriction, de fuite, de corrosion et d'autres problèmes qui pourraient entraîner une situation dangereuse.
3) Si possible, fermer toutes les portes et fenêtres du bâtiment ainsi que toutes les portes séparant l'endroit où se trouvent les appareils raccordés au système de ventilation et les autres zones du bâtiment.
4) Fermer le registre des foyers.
5) Mettre les sécheuses en marche ainsi que tous les autres appareils qui ne sont pas raccordés au système de ventilation. Mettre en marche tous les ventilateurs de tirage, comme celui des hottes de cuisine et des salles de bains, et les régler à la puissance maximale. Ne pas mettre en marche les ventilateurs d'été.
6) Suivre les instructions d'allumage. Mettre en marche l'appareil soumis à l'inspection. Régler le thermostat de manière à ce que l'appareil fonctionne en continu.
7) Vérifier la présence de fuite au niveau de l'ouverture du coupe-tirage des appareils qui en sont dotés après 5 minutes de fonctionnement du brûleur principal. Utiliser la flamme d'une allumette ou d'une bougie.
8) Si un problème de ventilation est observé pendant l'un des essais décrits ci-dessus, des correctifs doivent être apportés au système de ventilation conformément au National Fuel Gas Code, ANSI Z223.1/NFPA 54 et (ou) au Code d'installation du gaz naturel et du propane, CSA B149.1.
9) Une fois qu'il a été déterminé que chaque appareil raccordé au système de ventilation fonctionne correctement au moyen des essais décrits ci-dessus, les portes, les fenêtres, les ventilateurs, les registres de foyer et tous les autres appareils de combustion alimentés au gaz doivent être remis dans leur état initial.

Corrections must be in accordance with the latest edition of the National Fuel Gas Code NFPA 54/ANSI Z223.1 and/or CAN/CSA B149 Installation Codes.

If resizing is required on any portion of the venting system, use the appropriate table in the latest edition of the National Fuel Gas Code ANSI Z223.1.

Thermostat Location

In an area having good air circulation, locate the thermostat about five feet high on a vibration-free inside wall. Do not install the thermostat where it may be influenced by any of the following:

- Drafts, or dead spots behind doors, in corners, or under cabinets.
- Hot or cold air from registers.
- Radiant heat from the sun.
- Light fixtures or other appliances.
- Radiant heat from a fireplace.
- Concealed hot or cold water pipes, or chimneys.
- Unconditioned areas behind the thermostat, such as an outside wall.

Consult the instructions packaged with the thermostat for mounting instructions and further precautions.

Combustion and Ventilation Air Requirements

⚠ WARNING

To avoid property damage, personal injury or death, sufficient fresh air for proper combustion and ventilation of flue gases must be supplied. Most homes require outside air be supplied into the furnace area.

Improved construction and additional insulation in buildings have reduced heat loss by reducing air infiltration and escape around doors and windows. These changes have helped in reducing heating/cooling costs but have created a problem supplying combustion and ventilation air for gas fired and other fuel burning appliances. Appliances that pull air out of the house (clothes dryers, exhaust fans, fireplaces, etc.) increase the problem by starving appliances for air.

House depressurization can cause back drafting or improper combustion of gas-fired appliances, thereby exposing building occupants to gas combustion products that could include carbon monoxide.

If this furnace is to be installed in the same space with other gas appliances, such as a water heater, ensure there is an adequate supply of combustion and ventilation air for all appliances. Refer to the latest edition of the National Fuel Gas Code NFPA 54/ANSI Z223.1 or CAN/CSA B149 Installation Codes or applicable provisions of the local building codes for determining the combustion air requirements for the appliances.

This furnace must use indoor air for combustion. It cannot be installed as a direct vent (i.e., sealed combustion) furnace.

Most homes will require outside air be supplied to the furnace area by means of ventilation grilles or ducts connecting directly to the outdoors or spaces open to the outdoors such as attics or crawl spaces.

Category I Venting (Vertical Venting)

WARNING

To prevent possible personal injury or death due to asphyxiation, this furnace must be Category I vented. Do not vent using Category III venting.

Category I Venting is venting at a non-positive pressure. A furnace vented as Category I is considered a fan-assisted appliance and the vent system does not have to be "gas tight." **NOTE:** Gas furnaces with induced draft blowers draw products of combustion through a heat exchanger allowing, in some instances, common venting with natural draft appliances (i.e. water heaters). All installations must be vented in accordance with National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest edition.

NOTE: The vertical height of the Category I venting system must be at least as great as the horizontal length of the venting system.

WARNING

To prevent possible personal injury or death due to asphyxiation, common venting with other manufacturer's induced draft appliances is not allowed.

The minimum vent diameter for the Category I venting system is as shown:

MODEL	MINIMUM VENT	
	UPFLOW	COUNTERFLOW
060	4 inch	4 inch
080	4 inch	4 inch
100	5 inch	4 inch

Under some conditions, larger vents than those shown above may be required or allowed. *When an existing furnace is removed from a venting system serving other appliances*, the venting system may be too large to properly vent the remaining attached appliances.

Furnaces are shipped with the induced draft blower discharging from the top of the furnace. ("Top" is as viewed for an upflow installation.) The induced draft blower on *MEC80 models can be rotated 90 degrees for Category I venting. For furnaces installed vertically or horizontally, a four-inch single wall pipe can be used to extend the induced draft blower outlet 1/2" beyond the furnace cabinet. On *MEC80 furnaces installed upflow or horizontally with left side down, the draft inducer may be rotated to discharge from the right side of the cabinet. When rotating the inducer a chimney transition bottom kit (part # 0270F01119) is needed for proper alignment of the inducer outlet and the vent exit hole in the side of the cabinet. The inducer may NOT be rotated on *CEC80 model furnaces regardless of installation position.

THIS PRODUCT IS NOT DESIGNED FOR COUNTER-CLOCKWISE INDUCED DRAFT BLOWER ROTATION.

Vent the furnace in accordance with the National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest edition.

Venting

THIS FURNACE IS NOT DESIGN CERTIFIED TO BE HORIZONTALLY VENTED.

To rotate the induced draft blower clockwise, you will need to purchase one (0270F01119) chimney transition bottom kit.

1. Disconnect electrical power from the furnace.
2. Disconnect the induced draft blower power leads, flue pipe, and pressure switch tubing.
3. Remove the round cutout from the right side of the wrapper.
4. Remove and save the four screws that fasten the induced draft blower to the flue collector box.
5. Remove and save the three screws that hold the chimney assembly to the induced draft blower.
6. Remove and save the four screws that fasten the chimney top to the chimney bottom.
7. Remove the chimney transition bottom from the transition bottom kit.
8. Install the chimney top with the four screws retained from step 6 onto the new chimney transition bottom from the transition bottom kit.
9. Install chimney assembly with the three screws retained from step 5 onto the induced draft blower.
10. Reinstall the induced draft blower rotating it 90 degrees clockwise from the original upflow configuration using the four screws retained in step 3. Ensure the gasket located between the induced draft blower and the collector box is rotated accordingly.
11. Reconnect the induced draft blower power leads. NOTE: If the wires are not long enough, pull extra wire from the wire bundle in the blower compartment.
12. Reconnect the flue pipe, and the pressure switch tubing. Ensure that all wires and the pressure switch tubing is at least one inch from the flue pipe, or any other hot surface.
13. Restore power to furnace.

Counterflow units are shipped with the induced draft blower discharging from the top of the furnace. ("Top" as viewed for a counterflow installation.)

Vent the furnace in accordance with the National Fuel Gas Code NFPA54/ANSI Z223.1-latest edition.

WARNING

Never allow the products of combustion, including carbon monoxide, to enter the return ductwork or circulation air supply.

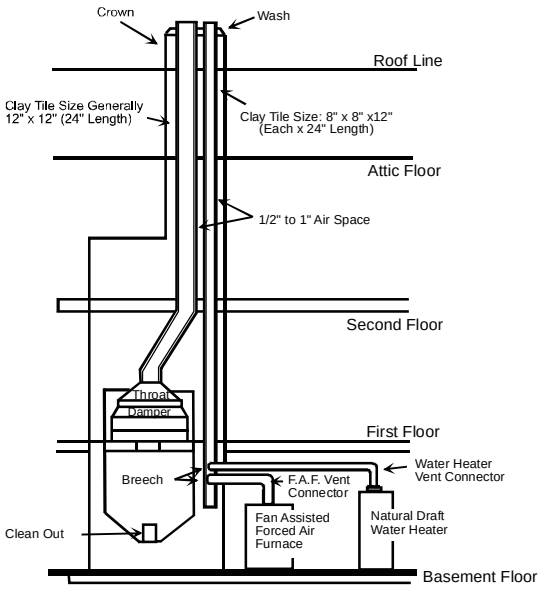
Exterior Masonry Chimneys

(Category I Furnaces Only)

An exterior masonry chimney is defined as a “Masonry” chimney exposed to the outdoors on one or more sides below the roof line.” The ability to use a clay lined masonry chimney depends on a parameter not associated with interior chimneys. This variable is the geographic location of the installation. Researchers have discovered that the winter design temperatures have a direct impact on the suitability of this type of venting. In most situations, the existing masonry chimneys will require a properly sized metallic liner.

WARNING

POSSIBILITY OF PROPERTY DAMAGE, PERSONAL INJURY OR DEATH DAMAGING CONDENSATION CAN OCCUR INSIDE MASONRY CHIMNEYS WHEN A SINGLE FAN-ASSISTED CATEGORY I APPLIANCE (80% AFUE FURNACE) IS VENTED WITHOUT ADEQUATE DILUTION AIR. DO NOT CONNECT AN 80% FURNACE TO A MASONRY CHIMNEY UNLESS THE FURNACE IS COMMON VENTED WITH A DRAFT HOOD EQUIPPED APPLIANCE OR THE CHIMNEY IS LINED WITH A METAL LINER OR TYPE B METAL VENT. ALL INSTALLATIONS USING MASONRY CHIMNEYS MUST BE SIZED IN ACCORDANCE WITH THE APPROPRIATE VENTING TABLES. IF AN 80% FURNACE IS COMMON VENTED WITH A DRAFT HOOD EQUIPPED APPLIANCE, THE POTENTIAL FOR CONDENSATION DAMAGE MAY STILL EXIST WITH EXTREMELY COLD CONDITIONS, LONG VENT CONNECTORS, EXTERIOR CHIMNEYS, OR ANY COMBINATION OF THESE CONDITIONS. THE RISK OF CONDENSATION DAMAGE IS BEST AVOIDED BY USING MASONRY CHIMNEY AS A PATHWAY FOR PROPERLY SIZED METAL LINER OR TYPE B METAL VENT.

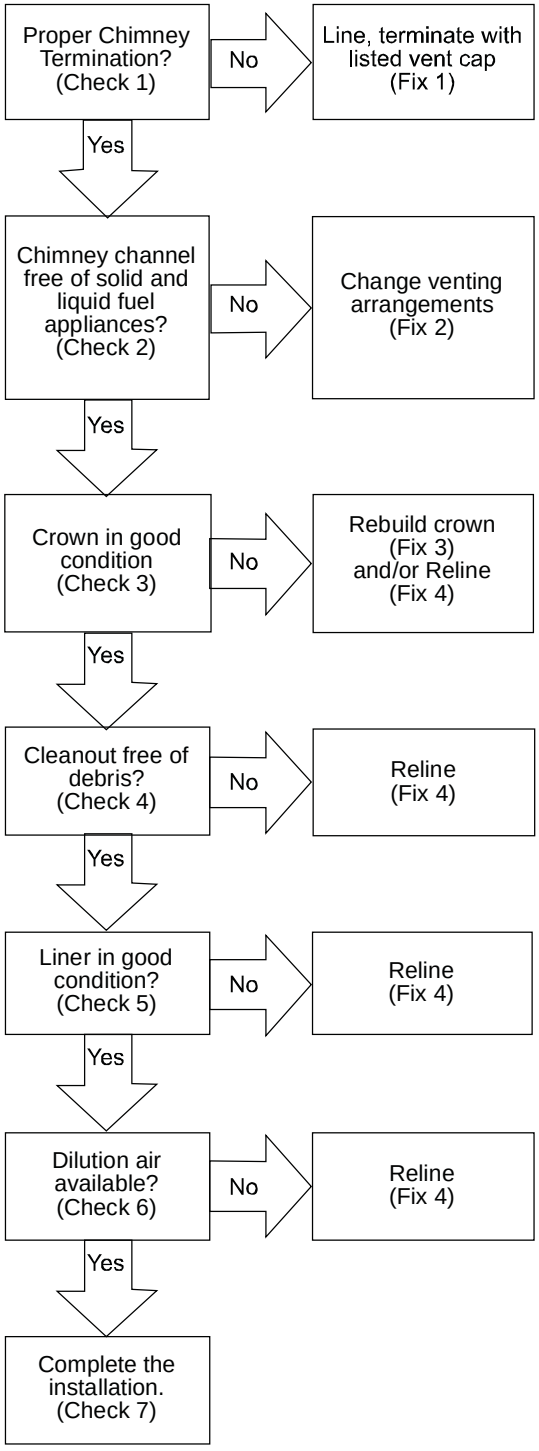


Typical Multiple Flue Clay Tile Chimney
Figure 3

Checklist Summary

This checklist serves as a summary of the items to be checked before venting an 80+ furnace into a masonry chimney. In addition, we recommend that a qualified serviceman use this checklist to perform a yearly inspection of the furnace venting system.

This checklist is only a summary. For detailed information on each of the procedures mentioned, see the paragraph referenced with each item.



Check 1 - Proper chimney termination.

A masonry chimney used as a vent for gas fired equipment must extend at least three feet above the highest point where it passes through the roof. It must extend at least two feet higher than any portion of a building within a horizontal distance of 10 feet. In addition, the chimney must terminate at least 3 feet above any forced air inlet located within 10 feet. The chimney must extend at least five feet above the highest connected equipment draft hood outlet or flue collar.

If the chimney does not meet these termination requirements, but all other requirements in the checklist can be met, it may be possible for a mason to extend the chimney. If this will not be practical, see Fix 1.

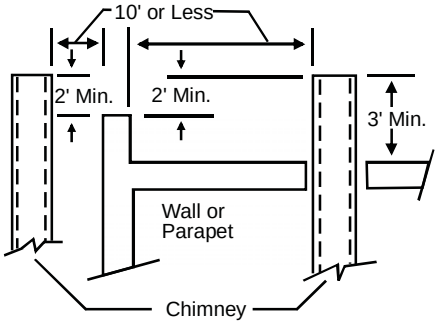
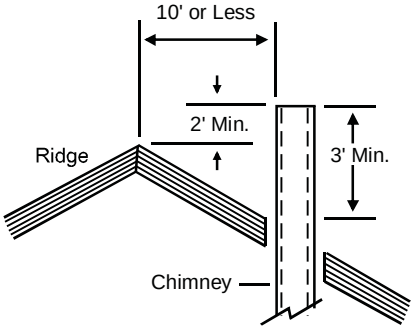


Figure 4



Termination 10 Feet Or Less From Ridge, Wall or Parapet
Figure 5

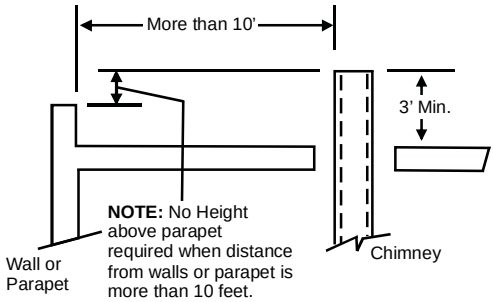
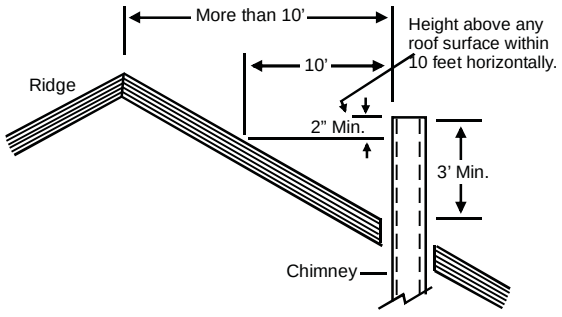


Figure 6



Termination More Than 10 Feet From Ridge, Wall or Parapet
Figure 7

Check 2 - Any Solid or Liquid Fuel Appliances Vented into this Chimney Channel

Solid fuel appliances include fireplaces, wood stoves, coal furnaces, and incinerators.

Liquid fuel appliances include oil furnaces, oil-fired boilers and oil-fired water heaters.

Appliances which burn propane (sometimes referred to as LP (liquefied petroleum)) gas are considered gas-fired appliances.

Check 3 - Chimney Crown Condition.

Damage from condensate usually shows up first in the crown. If any of the following trouble signs are present, the condition of the crown is not satisfactory:

a) Crown leaning
b) Bricks missing
c) Mortar missing
d) Tile liner cracked
e) No tile liner
f) Salt staining at mortar joints. (White stains, and mortar becomes sandy and/or erodes.)

For problems a, b, or c, see Fix 3. If problems d, e, or f are present, see Fix 4. IMPORTANT: It may be necessary to follow both Fix 3 and Fix 4.

Check 4 - Debris in Cleanout.

A cleanout (dropleg) must be present such that the upper edge of the cleanout cover is at least 12 inches below the lower edge of the lowest chimney inlet opening.

A chimney without a cleanout could become partially blocked by debris. If no cleanout is present, the chimney must be relined (Fix 4). Remove the cleanout cover, and examine the cleanout for debris. If significant amounts of any of the following are found:

- Fuel oil residue
- Bricks
- Mortar or sand
- Pieces of the tile liner
- Rusted pieces of the metallic liner - reline the chimney (Fix 4).

Check 5 - Liner Condition.

If a metal liner is present, it must be checked. It cannot be assumed that all existing metal liners are correctly installed and in good condition.

Remove the lowest existing vent connector, and examine the inside of the elbow or tee at the base of the liner. A small amount of soot may be considered acceptable, provided the installer vacuums it away. If rusted pieces of the liner have collected here, the metal liner must be removed and replaced (Fix 4).

Next, gently tap the inside of the liner with a Phillips screwdriver. If the screwdriver perforates the liner, or if the tapping does not sound like metal hitting metal, the liner must be removed and replaced (Fix 4).

Remember that all appliances must be vented inside the liner. Venting one appliance inside the liner and another appliance outside the liner is not acceptable.

Next, use a flashlight and small mirror to sight up the liner. B vent must be supported so as to not come into direct contact with the chimney walls or tile liner. If it is not, it can probably be rehung so as to be acceptable. A thimble or fire stop may be helpful here.

Flexible liners should be hung straight or nearly straight. If it is spiraled in the chimney and in good condition, it should be rehung. To do this, break the top seal; pull up and cut off the excess liner length, and refit the top seal. Use caution when doing this, as the cut edges of flexible liners may be sharp.

The surfaces of the liner must be physically sound. If gaps or holes are present, the metal liner must be removed and replaced (Fix 4). Finally, confirm that the metal liner is the correct size for the appliances to be installed. Use the GAMA tables and rules.

If a metal liner is not present, a clay tile liner must be present, or the chimney must be lined (Fix 4).

Use a flashlight and small mirror at the cleanout or vent connector to inspect the clay tile liner. If any of the following problems are present:

- Tile sections misaligned
- Tile sections missing
- Gaps between tile sections
- Signs of condensate drainage at the cleanout or vent connectors
- Mortar protruding from between tile sections
- Use of sewer pipe or drainage pipe rather than an approved fire clay tile reline the chimney (Fix 4).

Next, measure the size of the liner. It may be possible to do this from the cleanout. The liner must be at least as large as the minimum size established by the tables in National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest edition and in the National Standard of Canada, CAN/CSA B149.1 and CAN/CSA B149.2 - latest editions and amendments. If the liner is too small or too large, then the chimney must be relined (Fix 4).

Check 6 - Dilution Air.

If gas-fired appliances are to be vented into a clay tile liner, a source of dilution air is required.

Dilution air cannot be obtained through:

- Induced draft appliances
- Natural draft appliances with vent dampers

Sufficient dilution air can ordinarily be obtained through the draft hood of a natural draft appliance only if the appliance's vent connector does not include a vent damper. If dilution air will not be available, the chimney must be relined (Fix 4).

Check 7 - Complete the Installation.

If Checks 1 through 6 have been satisfactory, and the liner is an acceptable size as determined by the tables in National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest edition and in the National Standard of Canada, CAN/CSA B149.1 and CAN/CSA B149.2 - latest editions and amendments, then the clay tile liner can probably be used as a vent for the gas appliances. However, the installer must keep in mind the following factors which may render the tile liner unsuitable for use as a vent:

- Extremely cold weather
- Long vent connectors
- Masonry chimneys with no air gap between the liner and the bricks. (In practice, this can be difficult to detect.)
- Exterior chimneys (The tables in National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest edition and in the National Standard of Canada, CAN/CSA B149.1 and CAN/CSA B149.2 - latest editions and amendments assume interior chimneys.)

If, in the judgment of the local gas utility, installer, and/or local codes; one or more of the above factors is likely to present a problem, the chimney must be relined (Fix 4).

Fix 1 - Liner Termination

Any cap or roof assembly used with a liner must be approved by the liner manufacturer for such use. The liner and cap/roof assembly must then terminate above the roof in accordance with the manufacturer's instructions.

In some cases, a shorter extension above the roof may be possible with a liner than would be required with a masonry chimney.

For further information on relining, see Fix 4.

Fix 2 -Change Venting Arrangements

If the masonry chimney has more than one channel, it may be possible to vent the gas appliances into one channel and vent the solid or liquid fuel appliance(s) into another channel(s). Do not vent an 80+ Furnace inside of a metal liner with other appliances vented outside the liner.

Alternatively, the homeowner may agree to discontinue use of the fireplace (solid fuel appliance). If so, the tile liner must be cleaned to remove creosote buildup. The fireplace opening must then be permanently sealed.

If oil-fired appliance(s) are being replaced by gas-fired appliance(s), the tile liner must first be cleaned to remove the fuel oil residue.

If none of the above options is practical, the furnace may need to be vented vertically with a B Vent.

Under some conditions, a 90%+ furnace could be installed rather than an 80% furnace. The 90%+ furnace can be vented horizontally or vertically through PVC pipe.

Fix 3 - Rebuild the Crown

If the chimney crown is damaged, a qualified mason must repair it in accordance with nationally recognized building codes or standards. One such standard which may be referenced is the Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances, ANSI/NFPA 211.

Fix 4 - Relining

Relining options include B vent and flexible liners.

If the chimney has diagonal offsets, B vent probably cannot be used.

If B vent is to be used, it must be supported adequately. Supports (such as fire stops or thimbles) must be used to prevent the B vent from coming into direct contact with the tile liner or chimney walls. Direct contact would result in higher heat loss, with an increased possibility of poor venting system performance.

It is not acceptable to vent one appliance inside the B vent and other appliances outside. The excess space between the B vent and the chimney walls must be covered at the top of the chimney by a weatherproof, corrosion resistant flashing.

The B vent should then be topped with a listed vent cap. The listed vent cap will, when installed per the manufacturer's instructions, prevent problems due to rain, birds, or wind effects.

A B-vent installed as described in this section is considered to be an enclosed vent system, and the sizing tables in National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest edition and in the National Standard of Canada, CAN/CSA B149.1 and CAN/CSA B149.2 - latest editions and amendments may be used.

If a flexible liner is to be used, it must be made of the proper materials:

- For most residential applications, an aluminum liner should be acceptable.

  Flexible liners specifically intended and tested for gas applications are listed in the UL "Gas and Oil Equipment Directory". (UL Standard 1777).

For sizing of flexible liners, see the tables in the National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest edition and in the National Standard of Canada, CAN/CSA B149.1 and CAN/CSA B149.2 - latest editions and amendments.

To install the liner, read and follow the liner manufacturer's instructions and your local codes. Excess liner length should be pulled out of the chimney and cut off. Use caution when doing this, as the cut edges of flexible liners may be sharp. Do not spiral excess liner inside of the chimney. Support the liner as recommended by the liner manufacturer.

Some manufacturers of flexible liners offer an insulation sleeve designed to be added to the liner before it is installed in the chimney. (Poured insulation, either vermiculite or other materials, is no longer recommended.) Insulation will need to be added to the flexible liner if:

- It is required by the liner manufacturer's instructions.
- The previous liner was properly sized and installed, and suffered from condensation damage.
- It is required by your local building codes.

Even if none of those three conditions exist which require additional liner insulation, the installer may wish to consider it if:

- The local climate is very cold.
- The chimney is very tall.
- The vent connectors used are very long or have a large number of elbows.
- Local experience indicates that flexible liners installed without insulation are likely to have condensation problems.

Insulation must be selected and installed in accordance with the liner manufacturer's instructions.

Finally, cap the chimney and terminate the liner in accordance with the liner manufacturer's instructions.

Electrical Connections

WARNING

HIGH VOLTAGE !

To avoid the risk of electrical shock, wiring to the unit must be polarized and grounded.

WARNING

HIGH VOLTAGE !

To avoid personal injury or death due to electrical shock, disconnect electrical power before servicing or changing any electrical wiring.

CAUTION

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

WARNING

HIGH VOLTAGE !

To avoid the risk of injury, electrical shock or death, the furnace must be electrically grounded in accordance with local codes or in their absence, with the latest edition of the National Electric Code.

WARNING

Edges of sheet metal holes may be sharp. Use gloves as a precaution when removing hole plugs.

Wiring Harness

The wiring harness is an integral part of this furnace. Field alteration to comply with electrical codes should not be required. Wires are color coded for identification purposes. Refer to the wiring diagram for wire routings. If any of the original wire as supplied with the furnace must be replaced, it must be replaced with wiring material having a temperature rating of at least 105° C. Any replacement wiring must be a copper conductor.

115 Volt Line Connections

Before proceeding with electrical connections, ensure that the supply voltage, frequency, and phase correspond to that specified on the unit rating plate. Power supply to the furnace must be NEC Class 1, and must comply with all applicable codes. The furnace must be electrically grounded in accordance with local codes or, in their absence, with the latest edition of The National Electric Code, ANSI NFPA 70 and/or The Canadian Electric Code CSA C22.1.

Use a separate fused branch electrical circuit containing properly sized wire, and fuse or circuit breaker. The fuse or circuit breaker must be sized in accordance with the maximum overcurrent protection specified on the unit rating plate. An electrical disconnect must be provided at the furnace location.

Connect hot, neutral, and ground wires as shown in the wiring diagram located on the unit's blower door.

Line polarity must be observed when making field connections. Line voltage connections can be made through either the right or left side panel. The furnace is shipped configured for a right side electrical connection with the junction box located inside the burner compartment (blower compartment for downflows). To make electrical connections through the opposite side of the furnace, the junction box must be relocated to the other side of the burner (or blower) compartment prior to making electrical connections. To relocate the junction box, follow the steps shown below.

NOTE: Wire routing must not to interfere with circulator blower operation, filter removal, or routine maintenance.

Junction Box Relocation

⚠ WARNING

Edges of sheet metal holes may be sharp. Use gloves as a precaution when removing hole plugs.

⚠ WARNING

To prevent personal injury or death due to electric shock, disconnect electrical power before installing or servicing this unit.

1. Remove both doors from the furnace.
2. Remove and save the screws holding the junction box to the right side of the furnace.
3. Attach the junction box to the left side of the furnace, using the screws removed in step 2.
4. Check the location of the wiring. Confirm that it will not be damaged by heat from the burners or by the rotation of the fan. Also confirm that wiring location will not interfere with filter removal or other maintenance.

IMPORTANT NOTE: To avoid possible equipment malfunction, route the low voltage wires to avoid interference with filter removal or other maintenance.

⚠ WARNING

HIGH VOLTAGE !

To avoid the risk of injury, electrical shock or death, the furnace must be electrically grounded in accordance with local codes or in their absence, with the latest edition of the National Electric Code.

To ensure proper unit grounding, the ground wire should run from the furnace ground screw located inside the furnace junction box all the way back to the electrical panel. **NOTE:** Do not use gas piping as an electrical ground. To confirm proper unit grounding, turn off the electrical power and perform the following check.

1. Measure resistance between the neutral (white) connection and one of the burners.
2. Resistance should measure 10 ohms or less.

This furnace is equipped with a blower door interlock switch which interrupts unit voltage when the blower door is opened for servicing. Do not defeat this switch.

Gas Supply and Piping

The furnace rating plate includes the approved furnace gas input rating and gas types. The furnace must be equipped to operate on the type of gas applied. This includes any conversion kits required for alternate fuels and/or high altitude.

⚠ CAUTION

To prevent unreliable operation or equipment damage, the inlet gas supply pressure must be as specified on the unit rating plate with all other household gas fired appliances operating.

Inlet gas supply pressures must be maintained within the ranges specified in the following table. The supply pressure must be constant and available with all other household gas fired appliances operating. The minimum gas supply pressure must be maintained to prevent unreliable ignition. The maximum must not be exceeded to prevent unit overfiring.

NOTE: Do not remove the gas valve inlet plug before the gas line is installed. Replace if water or debris has been introduced.

INLET GAS SUPPLY PRESSURE		
Natural Gas	Minimum: 4.5" w.c.	Maximum: 10.0" w.c.
Propane Gas	Minimum: 11.0" w.c.	Maximum: 13.0" w.c.

NOTE: Adjusting the minimum supply pressure below the limits in the above table could lead to unreliable ignition. Gas input to the burners must not exceed the rated input shown on the rating plate. Overfiring of the furnace can result in premature heat exchanger failure. Gas pressures in excess of 13 inches water column can also cause permanent damage to the gas valve.

At all altitudes, the manifold pressure must be within 0.3 inches w.c. of that listed in the Specification Sheet applicable to your model for the fuel used. At all altitudes and with either fuel, the air temperature rise must be within the range listed on the furnace nameplate. Should this appliance be converted to LP, refer to the instructions included in the factory authorized LP conversion kit.

High Altitude Derate

High altitude installations may require both a pressure switch and an orifice change. These changes are necessary to compensate for the natural reduction in the density of both the gas fuel and the combustion air at higher altitude.

Clearance in accordance with local installation codes, the requirements of the gas supplier and the manufacturer's installation instructions.

Dégaugement conforme aux dodes d'installation locaux, aux exigences du fournisseur de gaz et aux instructions d'installation du fabricant.

Gas	Altitude	Kit	Orifice	Manifold Pressure		Pressure
				High Stage	Low Stage	Switch Change
Natural	0-7000	None	#45	3.5" w.c.	1.9" w.c.	None
Propane		LPM-06 H/W GAS VALVE	#55	10.0" w.c.	6.0" w.c.	None
Propane	0-7000	LPM-08 W-R VALVE	#55	10.0" w.c.	6.0" w.c.	None

NOTE: In Canada, gas furnaces are only certified to 4500 feet.

Consult the furnace Specification Sheet for appropriate manufacturer's kits for propane gas and/or high altitude installations. The indicated kits must be used to insure safe and proper furnace operation. All conversions must be performed by a qualified installer, or service agency.

Propane Gas Conversion

WARNING

POSSIBLE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH MAY OCCUR IF THE CORRECT CONVERSION KITS ARE NOT INSTALLED. THE APPROPRIATE KITS MUST BE APPLIED TO ENSURE SAFE AND PROPER FURNACE OPERATION. ALL CONVERSIONS MUST BE PERFORMED BY A QUALIFIED INSTALLER OR SERVICE AGENCY.

This unit is configured for natural gas. The appropriate manufacturer's propane gas conversion kit must be applied for propane gas installations.

If converting to LP gas, it is recommended that an LPLP0* kit also be installed. The use of this kit will prevent the furnace from firing when the LP gas supply pressure is too low to support proper combustion.

Gas Piping Connections

WARNING

TO AVOID POSSIBLE UNSATISFACTORY OPERATION OF EQUIPMENT DAMAGE DUE TO UNDERFIRING OR EQUIPMENT, USE THE PROPER SIZE OF NATURAL/PROPANE GAS PIPING NEEDED WHEN RUNNING PIPE FROM THE METER/TANK TO THE FURNACE.

When sizing gas lines, be sure to include all appliances which will operate simultaneously.

The gas piping supplying the furnace must be properly sized based on the gas flow required, specific gravity of the gas, and length of the run. The gas line installation must comply with local codes, or in their absence, with the latest edition of the National Fuel Gas Code, NFPA 54/ANSI Z223.1.

Natural Gas Capacity of Pipe
In Cubic Feet of Gas Per Hour (CFH)

Length of Pipe in Feet	Nominal Black Pipe Size				
	1/2"	3/4"	1"	1 1/4"	1 1/2"
10	132	278	520	1050	1600
20	92	190	350	730	1100
30	73	152	285	590	980
40	63	130	245	500	760
50	56	115	215	440	670
60	50	105	195	400	610
70	46	96	180	370	560
80	43	90	170	350	530
90	40	84	160	320	490
100	38	79	150	305	460

(Pressure 0.5 psig or less and pressure drop of 0.3" W.C.; Based on 0.60 Specific Gravity Gas)

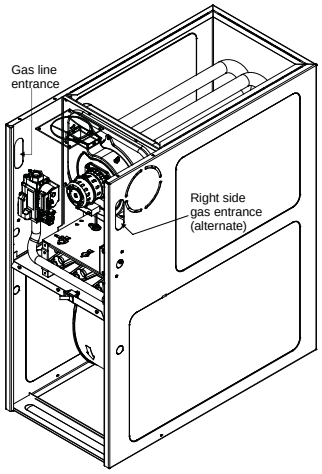
$$CFH = \frac{\text{BTUH Furnace Input}}{\text{Heating Value of Gas (BTU/Cubic Foot)}}$$

To connect the furnace to the building's gas piping, the installer must supply a ground joint union, drip leg, manual shutoff valve, and line and fittings to connect to gas valve. In some cases, the installer may also need to supply a transition piece from 1/2" pipe to a larger pipe size.

The following stipulations apply when connecting gas piping.

- Gas piping must be supported external to the furnace cabinet so that the weight of the gas line does not distort the burner rack, manifold or gas valve.
- Use black iron or steel pipe and fittings for the building piping.
- Use pipe joint compound on male threads only. Pipe joint compound must be resistant to the action of the fuel used.
- Use ground joint unions.
- Install a drip leg to trap dirt and moisture before it can enter the gas valve. The drip leg must be a minimum of three inches long.
- Use two pipe wrenches when making connection to the gas valve to keep it from turning. The orientation of the gas valve on the manifold must be maintained as shipped from the factory.
- Install a manual shutoff valve between the gas meter and unit within six feet of the unit. If a union is installed, the union must be downstream of the manual shutoff valve, between the shutoff valve and the furnace.
- Tighten all joints securely.
- Connect the furnace to the building piping by one of the following methods:

- Rigid metallic pipe and fittings.
- Semi-rigid metallic tubing and metallic fittings. Aluminum alloy tubing must not be used in exterior locations.
- Use listed gas appliance connectors in accordance with their instructions. Connectors must be fully in the same room as the furnace.
- Protect connectors and semi-rigid tubing against physical and thermal damage when installed. Ensure aluminum-alloy tubing and connectors are coated to protect against external corrosion when in contact with masonry, plaster, or insulation, or subjected to repeated wetting by liquids such as water (except rain water), detergents, or sewage.



General Furnace Layout
Figure 8

Upflow Installations

When the gas piping enters through the side of the furnace, the installer must supply the following fittings (starting from the gas valve):

- Close nipple.
- 90 degree elbow.
- Straight pipe to reach the exterior of the furnace .

A ground joint union, drip leg, and manual shutoff valve must also be supplied by the installer. In some cases, the installer may also need to supply a transition piece from 1/2" to another pipe size.

When the gas piping enters through the left side of the furnace, the installer must supply the following fittings (starting from the gas valve):

- 90 degree elbow.
- Straight pipe to reach the exterior of the furnace.
- A ground joint union, drip leg, and manual shutoff valve must also be supplied by the installer. In some cases, the installer may also need to supply a transition piece from 1/2 inch to another pipe size.

Counterflow Installations

When the gas piping enters through the left side of the furnace, the installer must supply a straight pipe and a 90 degree elbow to reach the exterior of the furnace.

A ground joint union, drip leg and manual shutoff valve must also be supplied by the installer. In most cases, the installer may also need to supply a transition piece from ½" to another pipe size. When the gas piping enters through the right side of the furnace, the installer must supply the following fittings (starting at the gas valve):

- Close Nipple
- 90 Degree Elbow
- Straight Pipe to Reach Exterior of Furnace.

Gas Piping Checks

Before placing unit in operation, leak test the unit and gas connections.

⚠ WARNING

To avoid the possibility of explosion or fire, never use a match or open flame to test for leaks.

Check for leaks using an approved chloride-free soap and water solution, an electronic combustible gas detector, or other approved testing methods.

⚠ CAUTION

To prevent property damage or personal injury due to fire, the following instructions must be performed regarding gas connections, pressure testing, location of shutoff valve and installation of gas piping.

NOTE: Never exceed specified pressures for testing. Higher pressure may cause gas valve failure.

Disconnect this unit and shutoff valve from the gas supply piping system before pressure testing the supply piping system with pressures in excess of 1/2 psig (3.48 kPa).

This unit must be isolated from the gas supply system by closing its manual shutoff valve before pressure testing of gas supply piping system with test pressures equal to or less than 1/2 psig (3.48 kPa).

Propane Gas Tanks and Piping

A gas detecting warning system is the only reliable way to detect a propane gas leak. Rust can reduce the level of odorant in propane gas. Do not rely on your sense of smell. Contact a local propane gas supplier about installing a gas detecting warning system. If the presence of gas is suspected, follow the instructions on Page 3 of this manual.

All propane gas equipment must conform to the safety standards of the National Board of Fire Underwriters, NBFU

Manual 58.

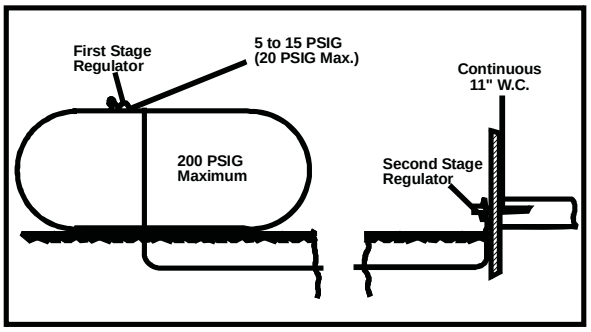
For satisfactory operation, propane gas pressure must be 10 inch WC at the furnace manifold with all gas appliances in operation. Maintaining proper gas pressure depends on three main factors:

1. Vaporization rate, depending on temperature of the liquid, and "wetted surface" area of the container or containers.
2. Proper pressure regulation. (Two-stage regulation is recommended for both cost and efficiency).
3. Pressure drop in lines between regulators, and between second stage regulator and the appliance. Pipe size will depend on length of pipe run and total load of all appliances.

Complete information regarding tank sizing for vaporization, recommended regulator settings, and pipe sizing is available from most regulator manufacturers and propane gas suppliers.

Use a pipe thread compound that is approved for natural gas and LP Gas.

Refer to the following illustration for typical propane gas installations and piping.



Propane Gas Installation (Typ.)

Figure 9

Propane Gas Piping Charts

Sizing Between First and Second Stage Regulator*
Maximum Propane Capacities listed are based on 2 psig pressure drop at 10 psig setting.
Capacities in 1,000 BTU/hour.

Pipe or Tubing Length, Feet	Tubing Size, O.D. Type L					Nominal Pipe Size Schedule 40	
	3/8"	1/2"	5/8"	3/4"	7/8"	1/2"	3/4"
10	730	1,700	3,200	5,300	8,300	3,200	7,500
20	500	1,100	2,200	3,700	5,800	2,200	4,200
30	400	920	2,000	2,900	4,700	1,800	4,000
40	370	850	1,700	2,700	4,100	1,600	3,700
50	330	770	1,500	2,400	3,700	1,500	3,400
60	300	700	1,300	2,200	3,300	1,300	3,100
80	260	610	1,200	1,900	2,900	1,200	2,600
100	220	540	1,000	1,700	2,600	1,000	2,300
125	200	490	900	1,400	2,300	900	2,100
150	190	430	830	1,300	2,100	830	1,900
175	170	400	780	1,200	1,900	770	1,700
200	160	380	730	1,100	1,800	720	1,500

Sizing Between Second Stage and Appliance Regulator*
Maximum Propane Capacities listed are based on 2 psig pressure drop at 10 psig setting.
Capacities in 1,000 BTU/hour.

Pipe or Tubing Length, Feet	Tubing Size, O.D. Type L						Nominal Pipe Size Schedule 40				
	3/8"	1/2"	5/8"	3/4"	7/8"	1-1/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"
10	39	92	199	329	501	935	275	567	1,071	2,205	3,307
20	26	62	131	216	346	630	189	393	732	1,496	2,299
30	21	50	107	181	277	500	152	315	590	1,212	1,858
40	19	41	90	145	233	427	129	267	504	1,039	1,559
50	18	37	79	131	198	376	114	237	448	910	1,417
60	16	35	72	121	187	340	103	217	409	834	1,275
80	13	29	62	104	155	289	89	185	346	724	1,066
100	11	26	55	90	138	255	78	162	307	630	976
125	10	24	48	81	122	224	69	146	275	567	866
150	9	21	43	72	109	202	63	132	252	511	787
200	8	19	39	66	100	187	54	112	209	439	665
250	8	17	36	60	93	172	48	100	185	390	590

Circulating Air

WARNING

NEVER ALLOW THE PRODUCTS OF COMBUSTION, INCLUDING CARBON MONOXIDE, TO ENTER THE RETURN DUCT WORK OR CIRCULATION AIR SUPPLY.

Duct systems and register sizes must be properly designed for the CFM and external static pressure rating of the furnace. Ductwork should be designed in accordance with the recommended methods of "Air Conditioning Contractors of America" Manual D.

A duct system must be installed in accordance with Standards of the National Board of Fire Underwriters for the Installation of Air Conditioning, Warm Air Heating and Ventilating Systems. Pamphlets No. 90A and 90B.

A closed return duct system must be used, with the return duct connected to the furnace. **NOTE:** Ductwork must never be attached to the back of the furnace. For installations requiring more than 1800 CFM, use a bottom return or two sided return. Supply and return connections to the furnace may be made with flexible joints to reduce noise transmission. To prevent the blower from interfering with combustion air or draft when a central return is used, a connecting duct must be installed between the unit and the utility room wall. A room, closet, or alcove must not be used as a return air chamber.

When the furnace is used in connection with a cooling unit, the furnace should be installed in parallel with or on the upstream side of the cooling unit to avoid condensation in the heating element. With a parallel flow arrangement, the dampers 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 either unit unless the damper is in the full heat or cool position.

When the furnace is installed without a cooling coil, it is recommended that a removable access panel be provided in the outlet air duct. This opening shall be accessible when the furnace is installed and shall be of such a size that the heat exchanger can be viewed for visual light inspection or such that a sampling probe can be inserted into the airstream. The access panel must be made to prevent air leaks when the furnace is in operation.

When furnace duct(s) supply air outside the space containing the furnace, a return air duct must terminate in the same space as the supply duct and be sealed to the furnace casing.

When the furnace is heating, the temperature of the return air entering the furnace must be between 55°F and 100°F.

Checking Duct Static

Refer to your furnace rating plate for the maximum ESP (external duct static) rating.

Total external static refers to static pressure created by all components external to the furnace cabinet. Cooling coils, filters, ducts, grilles, registers must all be considered when reading your total external static pressure. The supply duct pressure must be read between the furnace and the cooling coil. This reading is usually taken by removing the “A” shaped block off plate from the end on the coil; drilling a test hole in it and reinstalling the block off plate. Take a duct static reading at the test hole. Tape up the test hole after your test is complete. The negative pressure must be read between the filter and the furnace blower.

Too much external static pressure will result in insufficient air that can cause excessive temperature rise. This can cause limit switch tripping and heat exchanger failure.

To determine total external duct static pressure, proceed as follows;

1. With clean filters in the furnace, use a draft gauge (inclined manometer) to measure the static pressure of the return duct at the inlet of the furnace. (Negative Pressure)
2. Measure the static pressure of the supply duct. (Positive Pressure)
3. The difference between the two numbers is .4” w.c.

Example:

static reading from return duct = -.1” w.c.

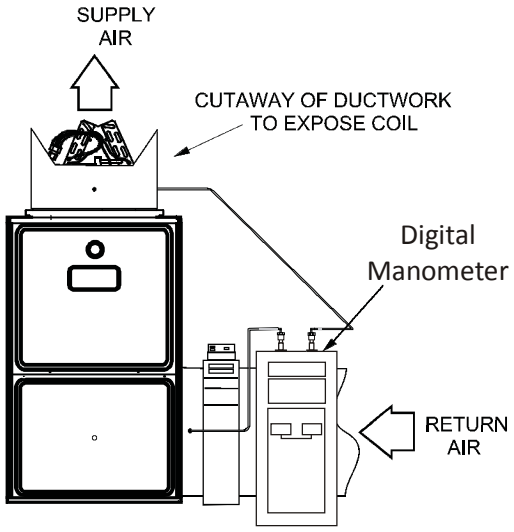
static reading from supply duct = .3” w.c.

total external static pressure on this system = .4” w.c.

NOTE: Both readings may be taken simultaneously and read directly on the manometer if so desired. If an air conditioner coil or Electronic Air Cleaner is used in conjunction with the furnace, the readings must also include these components, as shown in the following drawing.

4. Consult proper tables for the quantity of air.

If the total external static pressure exceeds the maximum listed on the furnace rating plate, check for closed dampers, registers, undersized or poorly laid out duct work.



Checking Static Pressure
Figure 10

Filters - Read This Section Before Installing The Return Air Ductwork

Filters must be used with this furnace. Discuss filter maintenance with the building owner. Filters do not ship with this furnace, but must be provided by the installer. Filters must comply with UL900 or CAN/ULCS111 standards.Damage or repairs due to the installation of the furnace without filters is not covered under the warranty.

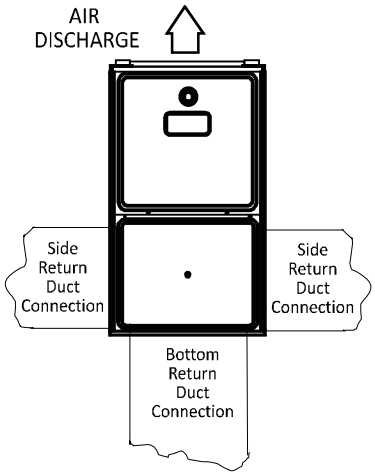
Upright Installations

Depending on the installation and/or customer preference, differing filter arrangements can be applied. Filters can be installed in the central return register or a side panel external filter rack kit (upflows), or the ductwork above a downflow furnace. As an alternative, a media air filter or electronic air cleaner can be used as the primary filter.

Horizontal Installations

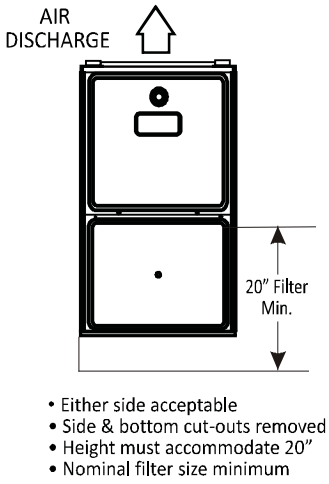
Filters must be installed in either the central return register or in the return air duct work.

Circulation Air Filters



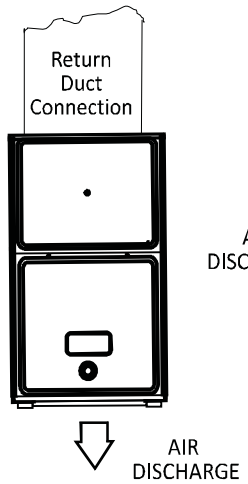
UPFLOW UPRIGHT

Figure 11



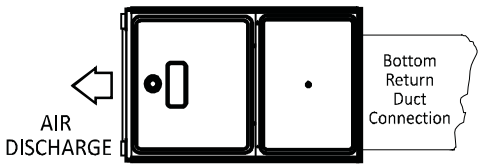
SIDE/BOTTOM
RETURN DUCT OPTION

Figure 12



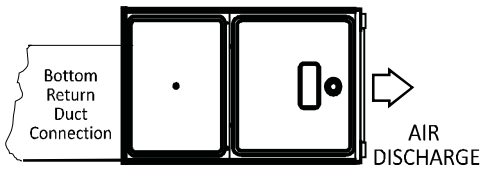
COUNTERFLOW

Figure 13



UPFLOW HORIZONTAL
LEFT AIR DISCHARGE

Figure 14



UPFLOW HORIZONTAL
RIGHT AIR DISCHARGE

Figure 15

One of the most common causes of a problem in a forced air heating system is a blocked or dirty filter. 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.

Upflow / Horizontal Models	Minimum Recommended Filter Size^
MEC80403B	1 - 16 X 25 Side or 1 - 14 X 24 Bottom Return
MEC80603B	1 - 16 X 25 Side or 1 - 14 X 24 Bottom Return
MEC80604B	1 - 16 X 25 Side or 14 X 24 Bottom Return
MEC80803B	1 - 16 X 25 Side or Bottom Return
MEC80804C	1 - 16 X 25 Side or Bottom Return
MEC80805C[1]	1 - 16 X 25 Side or Bottom Return[1]
MEC80805D[1]	1 - 16 X 25 Side or Bottom Return[1]
MEC81005C	2 - 16 X 25 Side or 1 - 20 X 25 Bottom Return
MEC81005C	2 - 16 X 25 Side or 1 - 20 X 25 Bottom Return
Downflow / Horizontal Models	
CEC80403B	2 - 10 X 20 or 1 - 14 X 25 Top Return
CEC80603B	2 - 10 X 20 or 1 - 14 X 25 Top Return
CEC80805C	2 - 14 X 20 or 1 - 16 X 25 Top Return
CEC81005C	2 - 14 X 20 or 1 - 20 X 25 Top Return

^ Larger filters may be used, filters may also be centrally located

[1] = use 2 - 16 X 25 filters and two side returns or 20 X 25 filter on bottom return if furnace is connected to a cooling unit over 4 tons nominal capacity

Electrical

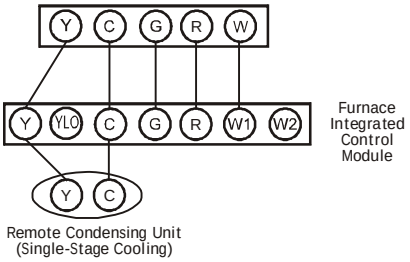
24 Volt Thermostat Wiring

IMPORTANT NOTE

Wire routing must not interfere with circulator blower operation, filter removal or routine maintenance.

Low voltage connections can be made through either the right or left side panel. Thermostat wiring entrance holes are located in the blower compartment. The following figure shows connections for a "heat/cool system".

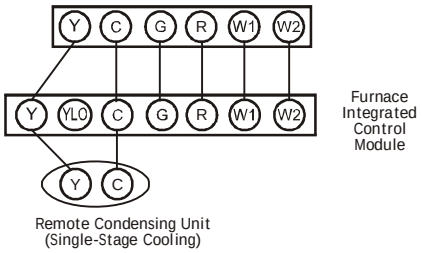
This furnace is equipped with a 40 VA transformer to facilitate use with most cooling equipment. Consult the wiring diagram, located on the blower compartment door, for further details of 115 Volt and 24 Volt wiring.



Thermostat - Single -Stage Heating with Single-Stage Cooling

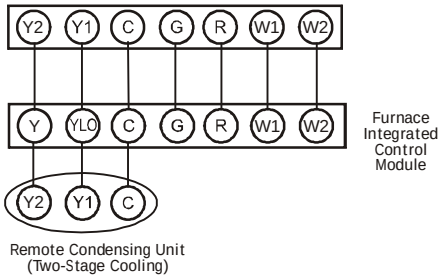
NOTE: **To apply a single-stage Heating Thermostat, the thermostat selector switch on the Integrated Control Module *must* be set on single-stage.**

Figure 16



Thermostat - Two-Stage Heating with Single-Stage Cooling

Figure 17



Thermostat - Two-Stage Heating with Two-Stage Cooling

Thermostat Wiring Diagrams

Figure 18

Single-Stage Heating Thermostat Application

A single-stage thermostat with only one heating stage may be used to control this furnace. The application of a single-stage thermostat offers a *timed* transition from low to high fire. The furnace will run on low stage for a fixed period of time before stepping up to high stage to satisfy the thermostat's call for heat. The delay period prior to stepping up can be set at either a fixed 10 or 20 minute time delay or a load based variable time between 1 and 12 minutes (AUTO mode). If the AUTO mode is selected, the control averages the cycle times of the previous three cycles and uses the average to determine the time to transition from low stage to high stage.

PCBBF139 CONTROL BOARD

Purpose	Switch Group	Function	Dip Switch			
			1	2	3	4
Thermostat Setup	S3	2 Stage Stat	OFF	OFF		
		1 Stg Stat 10 min delay	ON	OFF		
		1 Stg Stat 20 min delay	ON	ON		
		Auto	OFF*	ON*		
Heating Fan Off Delay	S3	90			OFF	OFF
		120			OFF	ON
		150			ON*	OFF*
		180			ON	ON

* FACTORY SETTING

Fossil Fuel Applications

This furnace can be used in conjunction with a heat pump in a fossil fuel application. A fossil fuel application refers to a combined gas furnace and heat pump installation which uses an outdoor temperature sensor to determine the most cost efficient means of heating (heat pump or gas furnace).

A heat pump thermostat with *three stages of heat* is required to properly use a two-stage furnace in conjunction with a heat pump. Refer to the fossil fuel kit installation instructions for additional thermostat requirements.

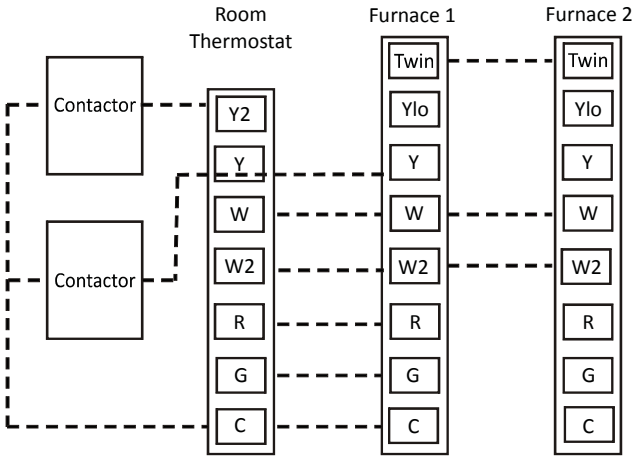
Strictly follow the wiring guidelines in the fossil fuel kit installation instructions. All furnace connections must be made to the furnace two-stage integrated control module and the "FURNACE" terminal strip on the fossil fuel control board.

Twinning

Using the "TWIN" terminals and proper wiring enables two *MEC96 furnaces of the same model and size to be twinned. Twinning allows simultaneous operation of two furnaces and forces the indoor blower motors of each furnace to operate synchronously into a common duct system. Using the twinning function will require only field installed wiring with no external kits or parts.

- The staging DIP switches and speed tap DIP switches must be set the same on both furnaces.

  NOTE: Each furnace must be connected to it's own 115 VAC power supply. The L1 connection to each furnace must be in phase (connected to circuit breakers on the same 115 VAC service panel phase leg). To verify that the furnaces are in phase, check from L1 to L1 on each furnace with a voltmeter. If the furnaces are in phase, the voltage between both furnaces will be ZERO.



115 Volt Line Connection of Accessories (Humidifier and Electronic Air Cleaner)

The furnace integrated control module is equipped with line voltage accessory terminals for controlling power to an optional field-supplied humidifier and/or electronic air cleaner.

The accessory load specifications are noted in the chart below:

Humidifier	1.0 Amp maximum at 120 VAC
Electronic Air Cleaner	1.0 Amp maximum at 120 VAC

Turn OFF power to the furnace before installing any accessories. Follow the humidifier or air cleaner manufacturers' instructions for locating, mounting, grounding, and controlling these accessories. Accessory wiring connections are to be made through the 1/4" quick connect terminals provided on the furnace integrated control module. The humidifier and electronic air cleaner hot terminals are identified as HUM and EAC. The humidifier and electronic

air cleaner neutral terminals are identified as NEUTRAL. All field wiring must conform to applicable codes. Connections should be made as shown.

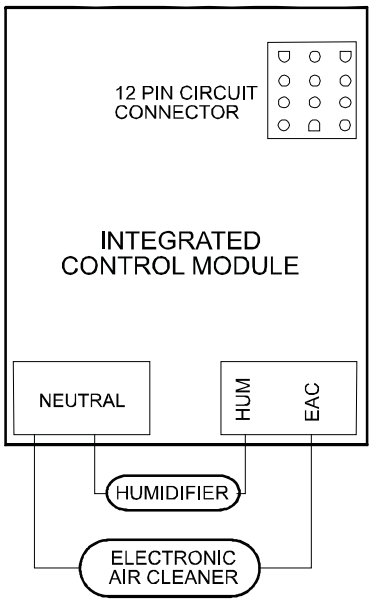
If it is necessary for the installer to supply additional line voltage wiring to the inside of the furnace, the wiring must conform to all local codes, and have a minimum temperature rating of 105°C. All line voltage wire splices must be made inside the furnace junction box.

The integrated control module humidifier terminal (HUM) is energized with 115 volts whenever the induced draft blower is energized. The integrated control module electronic air cleaner terminal (EAC) is energized with 115 volts whenever the circulator blower is energized. This terminal can also be used to provide 115 volt power to a humidifier transformer. The remaining primary transformer wire would be connected to the Line N on the control board.

WARNING

HIGH VOLTAGE !

TO AVOID PERSONAL INJURY OR DEATH DUE TO ELECTRICAL SHOCK, DISCONNECT ELECTRICAL POWER BEFORE SERVICING OR CHANGING ANY ELECTRICAL WIRING.



Accessories - Accessories Wiring

Figure 19

Gas Supply and Piping

WARNING

TO AVOID POSSIBLE UNSATISFACTORY OPERATION OF EQUIPMENT DAMAGE DUE TO UNDERFIRING OR EQUIPMENT, USE THE PROPER SIZE OF NATURAL/PROPANE GAS PIPING NEEDED WHEN RUNNING PIPE FROM THE METER/TANK TO THE FURNACE.

INLET GAS SUPPLY PRESSURE		
Natural Gas	Minimum: 4.5" w.c.	Maximum: 10.0" w.c.
Propane Gas	Minimum: 11.0" w.c.	Maximum: 13.0" w.c.

The furnace rating plate includes the approved furnace gas input rating and gas types. The furnace must be equipped to operate on the type of gas applied. This includes any conversion kits required for alternate fuels and/or high altitude.

Inlet gas supply pressures must be maintained within the ranges specified in the adjacent table. The supply pressure must be constant and available with all other household gas fired appliances operating. The minimum gas supply pressure must be maintained to prevent unreliable ignition. The maximum must not be exceeded to prevent unit overfiring.

High Altitude Derate

When this furnace is installed at high altitude, the appropriate High Altitude orifice kit must be applied. This is required due to the natural reduction in the density of both the gas fuel and combustion air as altitude increases. The kit will provide the proper design certified input rate within the specified altitude range.

High altitude kits are purchased according to the installation altitude and usage of either natural or propane gas. Consult the furnace Specification Sheet for appropriate kits.

Do **not** derate the furnace by adjusting the manifold pressure to a lower pressure than specified on the furnace rating plate. The combination of the lower air density and a lower manifold pressure will prohibit the burner orifice from drawing the proper amount of air into the burner. This may cause incomplete combustion, flashback, and possible yellow tipping.

In some areas the gas supplier may artificially derate the gas in an effort to compensate for the effects of altitude. If the gas is artificially derated, the appropriate orifice size must be determined based upon the BTU/ft^3 content of the derated gas and the altitude. Refer to the National Fuel Gas Code, NFPA 54/ANSI Z223.1, and information provided by the gas supplier to determine the proper orifice size.

A different pressure switch may be required at high altitude regardless of the BTU/ft^3 content of the fuel used. Consult the furnace Specification Sheet for pressure switch.

WARNING

POSSIBLE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH MAY OCCUR IF THE CORRECT CONVERSION KITS ARE NOT INSTALLED. THE APPROPRIATE KITS MUST BE APPLIED TO ENSURE SAFE AND PROPER FURNACE OPERATION. ALL CONVERSIONS MUST BE PERFORMED BY A QUALIFIED INSTALLER OR SERVICE AGENCY.

Propane Gas Conversion

This unit is configured for natural gas, but may be converted for use with L.P. gas. Refer to the section on PROPANE GAS/ HIGH ALTITUDE INSTALLATIONS for L.P. kit selection.

Consult the furnace Specification Sheet for a listing of appropriate kits. The indicated kits must be used to insure safe and

proper furnace operation. All conversions must be performed by a qualified installer, or service agency.

CAUTION

TO PREVENT UNRELIABLE OPERATION OR EQUIPMENT DAMAGE, THE INLET GAS SUPPLY PRESSURE MUST BE AS SPECIFIED ON THE UNIT RATING PLATE WITH ALL OTHER HOUSEHOLD GAS FIRED APPLIANCES OPERATING.

GAS VALVE

This unit is equipped with a 24 volt gas valve controlled during furnace operation by the integrated control module. As shipped, the valve is configured for natural gas. The valve is field convertible for use with propane gas by replacing the regulator spring with a propane gas spring from an appropriate manufacturer's propane gas conversion kit. Taps for measuring the gas supply pressure and manifold pressure are provided on the valve.

The gas valve has a manual ON/OFF control located on the valve itself. This control may be set only to the "ON" or "OFF" position. Refer to the lighting instructions label or *Startup Procedure & Adjustment* for use of this control during start up and shut down periods.

GAS PIPING CONNECTIONS

The gas piping supplying the furnace must be properly sized based on the gas flow required, specific gravity of the gas, and length of the run. The gas line installation must comply with local codes, or in their absence, with the latest edition of the National Fuel Gas Code, NFPA 54/ANSI Z223.1.

Natural Gas Capacity of Pipe
In Cubic Feet of Gas Per Hour (CFH)

Length of	Nominal Black Pipe Size				
Pipe in Feet	1/2"	3/4"	1"	1 1/4"	1 1/2"
10	132	278	520	1050	1600
20	92	190	350	730	1100
30	73	152	285	590	980
40	63	130	245	500	760
50	56	115	215	440	670
60	50	105	195	400	610
70	46	96	180	370	560
80	43	90	170	350	530
90	40	84	160	320	490
100	38	79	150	305	460

(Pressure 0.5 psig or less and pressure drop of 0.3" W.C.; Based on 0.60 Specific Gravity Gas)

$$CFH = \frac{\text{BTUH Furnace Input}}{\text{Heating Value of Gas (BTU/Cubic Foot)}}$$

To connect the furnace to the building's gas piping, the installer must supply a ground joint union, drip leg, manual shutoff valve, and line and fittings to connect to gas valve. In some cases, the installer may also need to supply a transition piece from 1/2" pipe to a larger pipe size.

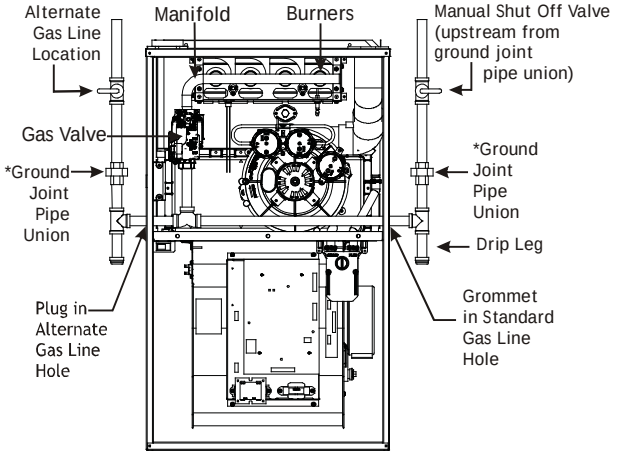
The following stipulations apply when connecting gas piping. Refer to *Gas Piping Connections* figure for typical gas line connections to the furnace.

- Gas piping must be supported external to the furnace cabinet so that the weight of the gas line does not distort the burner rack, manifold or gas valve.
- Use black iron or steel pipe and fittings for building piping. Where possible, use new pipe that is properly chamfered, reamed, and free of burrs and chips. If old pipe is used, be sure it is clean and free of rust, scale, burrs, chips, and old pipe joint compound.
- Use pipe joint compound on male threads ONLY. Always use pipe joint compound (pipe dope) that is APPROVED FOR ALL GASSES. DO NOT apply compound to the first two threads.
- Use ground joint unions.
- Install a drip leg to trap dirt and moisture before it can enter the gas valve. The drip leg must be a minimum of three inches long.
- Install a 1/8" NPT pipe plug fitting, accessible for test gage connection, immediately upstream of the gas supply connection to the furnace.
- Always use a back-up wrench when making the connection to the gas valve to keep it from turning. The orientation of the gas valve on the manifold must be maintained as shipped from the factory. Maximum torque for the gas valve connection is 375 in-lbs; excessive over-tightening may damage the gas valve.
- Install a manual shutoff valve between the gas meter and unit within six feet of the unit. If a union is installed, the union must be downstream of the manual shutoff valve, between the shutoff valve and the furnace.
- Tighten all joints securely.
- Connect the furnace to the building piping by one of the following methods:
  - Rigid metallic pipe and fittings.
  - Semi-rigid metallic tubing and metallic fittings. Aluminum alloy tubing must not be used in exterior locations. In order to seal the grommet cabinet penetration, rigid pipe must be used to reach the outside of the cabinet. A semi-rigid connector to the gas piping may be used from there.
- Use listed gas appliance connectors in accordance with their instructions. Connectors must be fully in the same room as the furnace.
- Protect connectors and semirigid tubing against physical and thermal damage when installed. Ensure aluminum-alloy tubing and connectors are coated to protect against external corrosion when in contact with masonry, plaster, or insulation, or subjected to repeated wetting by liquids such as water (except rain water), detergents, or sewage.

The gas piping may enter the left or right side of the furnace cabinet. The installer must supply rigid pipe long enough to reach the outside of the cabinet to seal the grommet cabinet penetration. A semi-rigid connector to the gas piping can be used outside the cabinet per local codes. 1/2" NPT pipe and fittings are required. For models with an "L" shaped manifold, a 4 1/2" long nipple is required. For models with a hook shaped manifold, a 2"

long nipple is required.

A semi-rigid connector to the gas piping can be used outside the cabinet per local codes. From the elbow, the length of pipe and the fittings required will vary by the side chosen, location of union and cabinet width. The union may be placed inside or outside of the cabinet.



**NOTE: Union may be inside furnace cabinet where allowed by local codes.*

UPFLOW
Figure 20
Gas Connections

WARNING

TO AVOID THE POSSIBILITY OF EXPLOSION OR FIRE, NEVER USE A MATCH OR OPEN FLAME TO TEST FOR LEAKS.

GAS PIPING CHECKS

Before placing unit in operation, leak test the unit and gas connections.

Check for leaks using an approved chloride-free soap and water solution, an electronic combustible gas detector, or other approved testing methods.

NOTE: Never exceed specified pressures for testing. Higher pressure may damage the gas valve and cause subsequent overfiring, resulting in heat exchanger failure.

Disconnect this unit and shutoff valve from the gas supply piping system before pressure testing the supply piping system with pressures in excess of 1/2 psig (3.48 kPa).

Isolate this unit from the gas supply piping system by closing its external manual gas shutoff valve before pressure testing supply piping system with test pressures equal to or less than 1/2 psig (3.48 kPA).

PROPANE GAS TANKS AND PIPING

WARNING

IF THE GAS FURNACE IS INSTALLED IN A BASEMENT, AN EXCAVATED AREA OR CONFINED SPACE, IT IS STRONGLY RECOMMENDED TO CONTACT A PROPANE SUPPLIER TO INSTALL A GAS DETECTING WARNING DEVICE IN CASE OF A GAS LEAK.

- **SINCE PROPANE GAS IS HEAVIER THAN AIR, ANY LEAKING GAS CAN SETTLE IN ANY LOW AREAS OR CONFINED SPACES.**
- **PROPANE GAS ODORANT MAY FADE, MAKING THE GAS UNDETECTABLE EXCEPT WITH A WARNING DEVICE.**

A gas detecting warning system is the only reliable way to detect a propane gas leak. Rust can reduce the level of odorant in propane gas. Do not rely on your sense of smell. Contact a local propane gas supplier about installing a gas detecting warning system. If the presence of gas is suspected, follow the instructions listed in the *Safety Considerations* section of this manual.

All propane gas equipment must conform to the safety standards of the National Board of Fire Underwriters, NBFU Manual 58.

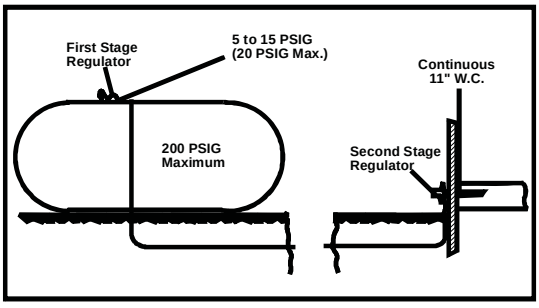
For satisfactory operation, propane gas pressure must be 10" WC at the furnace manifold with all gas appliances in operation. Maintaining proper gas pressure depends on three main factors:

1. Vaporization rate, depending on temperature of the liquid, and "wetted surface" area of the container or containers.
2. Proper pressure regulation. (Two-stage regulation is recommended for both cost and efficiency).
3. Pressure drop in lines between regulators, and between second stage regulator and the appliance. Pipe size will depend on length of pipe run and total load of all appliances.

Complete information regarding tank sizing for vaporization, recommended regulator settings, and pipe sizing is available from most regulator manufacturers and propane gas suppliers.

Since propane gas will quickly dissolve white lead and most standard commercial compounds, special pipe dope must be used. Always use a pipe thread sealant approved for all gases.

Refer to the this illustration for typical propane gas installations and piping.



Propane Gas Installation (Typ.)
Figure 21

Circulating Air & Filters

Duct work - Air Flow

Duct systems and register sizes must be properly designed for the CFM and external static pressure rating of the furnace. Design the ductwork in accordance with the recommended methods of "Air Conditioning Contractors of America" Manual D.

Install the duct system in accordance with Standards of the National Board of Fire Underwriters for the Installation of Air Conditioning, Warm Air Heating and Ventilating Systems. Pamphlets No. 90A and 90B.

A closed return duct system must be used, with the return duct connected to the furnace. **NOTE:** Ductwork must never be attached to the back of the furnace. For upflow installations requiring 1800 CFM or more, use either two side returns or bottom return or a combination of side /bottom. Flexible joints may be used for supply and return connections to reduce noise transmission. To prevent the blower from interfering with combustion air or draft when a central return is used, a connecting duct must be installed between the unit and the utility room wall. Never use a room, closet, or alcove as a return air chamber.

Checking Duct Static

Refer to your furnace rating plate for the maximum ESP (external duct static) rating.

⚠ WARNING

Never allow the products of combustion, including carbon monoxide, to enter the return duct work or circulation air supply.

Total external static refers to everything external to the furnace cabinet. Cooling coils, filters, ducts, grilles, registers must all be considered when reading your total external static pressure. The supply duct pressure must be read between the furnace and the cooling coil.

This reading is usually taken by removing the "A" shaped block off plate from the end on the coil; drilling a test hole in it and reinstalling the block off plate. Take a duct static reading at the test hole. Tape up the test hole after your test is complete. The negative pressure must be read between the filter and the furnace blower.

Too much external static pressure will result in insufficient air that can cause excessive temperature rise. This can cause limit switch tripping and heat exchanger failure.

To determine total external duct static pressure, proceed as follows;

1. With clean filters in the furnace, use a draft gauge (inclined manometer) to measure the static pressure of the return duct at the inlet of the furnace. (Negative Pressure)
2. Measure the static pressure of the supply duct. (Positive Pressure)
3. The difference between the two numbers is .4" w.c. Example:

   static reading from return duct = -.1" w.c.

   static reading from supply duct = .3" w.c.

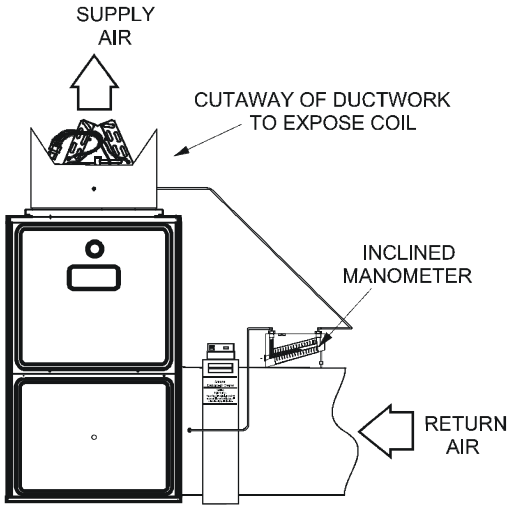
   total external static pressure on this system = .4" w.c.

NOTE: Both readings may be taken simultaneously and read directly on the manometer if so desired. If an air conditioner coil or Electronic Air Cleaner is used in conjunction with the furnace, the readings must also include theses components, as shown in the following drawing.

4. Consult proper tables for the quantity of air.

If the total external static pressure exceeds the maximum listed on the furnace rating plate, check for closed dampers, registers, undersized and/or oversized poorly laid out duct work.

The temperature rise of the furnace must be within the temperature rise range listed on the furnace rating plate.



Checking Static Pressure
Figure 22

Air Cleaner Installation Location	Maximum Heating Airflow	Filter (Media) Dimensions	Part Number	Air Cleaner Family
Side or bottom return	1200 CFM	16 in X 20 in x 5¼"	AM11-1620-5	AM11-5
Side or bottom return	1600 CFM	16 in X 25 in x 5¼"	AM11-1625-5	
Side or bottom return	1600 CFM	20 in X 20 in x 5¼"	AM11-2020-5	
Side or bottom return	2000 CFM	20 in X 25 in x 5¼"	AM11-2025-5	
Side return (for 2 separate returns)	2 X 1600 CFM	2, 16 in X 25 in x 5¼"	AM11-3225-5	AM11-3225
Side return (Right angle)	2000 CFM	20 in X 25 in x 5¼"	AM11-2025-5RA	AM11-5RA
Bottom return (platform)	2000 CFM	20 in X 25 in x 5¼"	AM11-2832-5PP	AM11-5PP
Bottom return (platform)	2000 CFM	20 in X 25 in x 5¼"	AM11-2843-5PP	

AM11-5 Family	AM11-5RA Family	AM11-5PP Family
		

Furnace Startup

1. Close the manual gas shutoff valve external to the furnace.
2. Turn off the electrical power to the furnace.
3. Set the room thermostat to the lowest possible setting.
4. Remove the burner compartment door.

NOTE: This furnace is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.

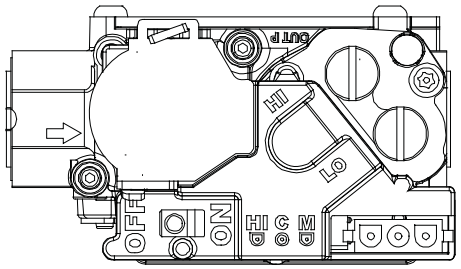
5. Move the furnace gas valve manual control to the OFF position.
6. Wait five minutes then smell for gas. Be sure check near the floor as some types of gas are heavier than air.
7. If you smell gas after five minutes, immediately follow the safety instructions in the *Safety Considerations* on page 3 of this manual. If you do not smell gas after five minutes, move the furnace gas valve manual control to the ON position.
8. Replace the burner compartment door.
9. Open the manual gas shutoff valve external to the furnace.
10. Turn on the electrical power to the furnace.
11. Adjust the thermostat to a setting above room temperature.
12. After the burners are lit, set the thermostat to desired temperature.

Furnace Shutdown

1. Set the thermostat to the lowest setting.

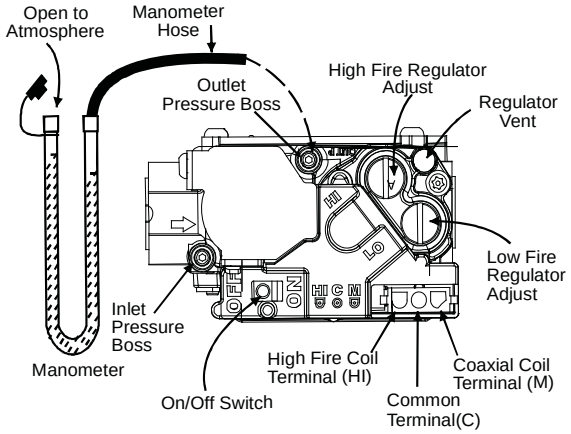
   The integrated control will close the gas valve and extinguish flame. Following a 15 second delay, the induced draft blower will be de-energized. After the blower off delay time expires, the blower de-energizes.
2. Remove the burner compartment door and move the furnace gas valve manual control to the OFF position.
3. Close the manual gas shutoff valve external to the furnace.
4. Replace the burner compartment door.

Gas Supply Pressure Measurement



White-Rodgers Model 36J54 (Two-Stage)

Figure 23A



White-Rodgers Model 36J54 Connected to Manometer

Figure 23B

INLET GAS SUPPLY PRESSURE		
Natural Gas	Minimum: 4.5" w.c.	Maximum: 10.0" w.c.
Propane Gas	Minimum: 11.0" w.c.	Maximum: 13.0" w.c.

CAUTION

To prevent unreliable operation or equipment damage, the inlet gas supply pressure must be as specified on the unit rating plate with all other household gas fired appliances operating.

The line pressure supplied to the gas valve must be within the range specified below. The supply pressure can be measured at the gas valve inlet pressure tap or at a hose fitting installed in the gas piping drip leg. The supply pressure must be measured with the burners operating. To measure the gas supply pressure, use the following procedure.

1. Turn OFF gas to furnace at the manual gas shutoff valve external to the furnace.
2. Connect a calibrated water manometer (or appropriate gas pressure gauge) at either the gas valve inlet pressure tap or the gas piping drip leg. See White-Rodgers 36J54 gas valve (Figure 43B) fto locate the inlet pressure tap.

NOTE: If using the inlet pressure tap on the White-Rodgers 36J54 gas valve, then use the 36G/J Valve Pressure Check Kit, Part No. 0151K00000S.

3. Turn ON the gas supply and operate the furnace and all other gas consuming appliances on the same gas supply line.
4. Measure furnace gas supply pressure with burners firing. Supply pressure must be within the range specified in the *Inlet Gas Supply Pressure* table.

If supply pressure differs from table, make the necessary adjustments to pressure regulator, gas piping size, etc., and/or consult with local gas utility.

5. Turn OFF gas to furnace at the manual shutoff valve and disconnect manometer. Reinstall plug before turning on gas to furnace.
6. Turn OFF any unnecessary gas appliances stated in step three.

Gas Manifold Pressure Measurement and Adjustment

CAUTION

To prevent unreliable operation or equipment damage, the gas manifold pressure must be as specified on the unit rating plate. Only minor adjustments should be made by adjusting the gas valve pressure regulator.

Only small variations in gas pressure should be made by adjusting the gas valve pressure regulator. The manifold pressure must be measured with the burners operating. To measure and adjust the manifold pressure, use the following procedure.

1. Turn OFF gas to furnace at the manual gas shutoff valve external to the furnace.
2. Turn off all electrical power to the system.
3. Outlet pressure tap connections:

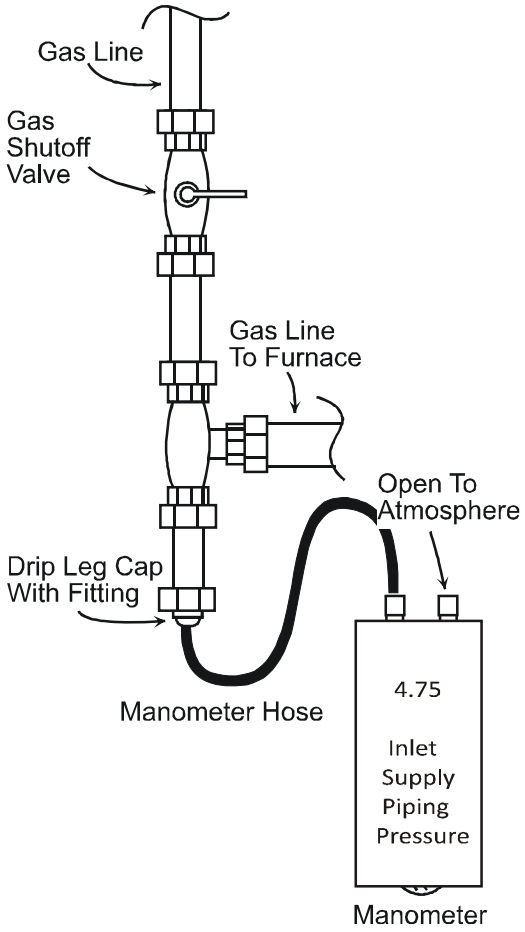
   White-Rodgers 36J54 valve: Back outlet pressure test screw (inlet/outlet pressure tap) out one turn (counterclockwise, not more than one turn).
4. Attach a hose and manometer to outlet pressure tap .
5. Turn ON the gas supply.

NOTE: Follow this procedure to test the gas valve pressure at 100% firing rate.

Run High Fire

NOTE: the Cool Cloud phone application be used to assist with all functional tests. *See the quick start guide section for details.*

The furnace should be inspected by a qualified installer, or service agency at least once per year. This check should be performed at the beginning of the heating season. This will ensure that all furnace components are in proper working order and that the heating system functions appropriately. Pay particular attention to the following items. Repair or service as necessary.



Measuring Inlet Gas Pressure (Alt. Method)
Figure 24

NOTE: When converting from natural gas to L.P. consult your distributor for proper conversion kit.

Manifold Gas Pressure			
Gas		**Range**	**Nominal**
Natural	Low Stage	1.6 - 2.2" w.c.	1.9" w.c.
	High Stage	3.2 - 3.8" w.c.	3.5" w.c.
Propane	Low Stage	5.7 - 6.3" w.c.	6.0" w.c.
	High Stage	9.7 - 10.3" w.c.	10.0" w.c.

PCBBF139	*CEC800403A* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	785	754	736	690	650	604	565	527
	Y	1348	1294	1261	1250	1229	1233	1205	1182
ON OFF OFF	Ylo	663	647	597	551	501	458	408	355
	Y	785	754	736	690	650	604	565	527
ON ON OFF	Ylo	663	647	597	551	501	458	408	355
	Y	1348	1294	1261	1250	1229	1233	1205	1182
OFF ON OFF	Ylo	785	754	736	690	650	604	565	527
	Y	591	568	518	463	411	355	300	243
OFF OFF ON	Ylo	785	754	736	690	650	604	565	527
	Y	1104	1058	1020	1022	1013	981	952	918
OFF ON ON	Ylo	663	647	597	551	501	458	408	355
	Y	591	568	518	463	411	355	300	243
ON OFF ON	Ylo	1104	1058	1020	1022	1013	981	952	918
	Y	1348	1294	1261	1250	1229	1233	1205	1182
ON ON ON	Ylo	1104	1058	1020	1022	1013	981	952	918
	Y	663	647	597	551	501	458	408	355

PCBBF139	*CEC800403A* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	591	568	518	463	411	355	300	243
ON OFF OFF	G	1104	1058	1020	1022	1013	981	952	918
ON ON OFF	G	663	647	597	551	501	458	408	355
OFF ON OFF	G	785	754	736	690	650	604	565	527
OFF OFF ON	G	1348	1294	1261	1250	1229	1233	1205	1182
OFF ON ON	G	591	568	518	463	411	355	300	243
ON OFF ON	G	591	568	518	463	411	355	300	243
ON ON ON	G	591	568	518	463	411	355	300	243

PCBBF139	*CEC800403A* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	591	35	568	37	518	40	463	45	411	N/A	355	300	243
	W2	1104	27	1058	28	1020	29	1022	29	1013	29	981	952	918
ON OFF	W1	663	31	647	32	597	35	551	38	501	41	458	408	355
	W2	1104	27	1058	28	1020	29	1022	29	1013	29	981	952	918
ON ON	W1	663	31	647	32	597	35	551	38	501	41	458	408	355
	W2	785	38	754	39	736	40	690	43	650	N/A	604	565	527
OFF ON	W1	785	26	754	28	736	28	690	30	650	32	604	565	527
	W2	1348	22	1294	23	1261	23	1250	24	1229	24	1233	1205	1182

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*CEC800603A*- COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1160	1102	1055	1017	970	930	891	847
	Y	1411	1356	1313	1272	1235	1198	1162	1127
ON OFF OFF	Ylo	656	589	532	465	402	348	271	219
	Y	1160	1102	1055	1017	970	930	891	847
ON ON OFF	Ylo	656	589	532	465	402	348	271	219
	Y	1411	1356	1313	1272	1235	1198	1162	1127
OFF ON OFF	Ylo	1160	1102	1055	1017	970	930	891	847
	Y	716	647	592	541	478	420	368	296
OFF OFF ON	Ylo	1160	1102	1055	1017	970	930	891	847
	Y	1054	1002	951	906	861	820	797	754
OFF ON ON	Ylo	656	589	532	465	402	348	271	219
	Y	716	647	592	541	478	420	368	296
ON OFF ON	Ylo	1054	1002	951	906	861	820	797	754
	Y	1411	1356	1313	1272	1235	1198	1162	1127
ON ON ON	Ylo	1054	1002	951	906	861	820	797	754
	Y	656	589	532	465	402	348	271	219

PCBBF139	*CEC800603A* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	716	647	592	541	478	420	368	296
ON OFF OFF	G	1054	1002	951	906	861	820	797	754
ON ON OFF	G	656	589	532	465	402	348	271	219
OFF ON OFF	G	1160	1102	1055	1017	970	930	891	847
OFF OFF ON	G	1411	1356	1313	1272	1235	1198	1162	1127
OFF ON ON	G	716	647	592	541	478	420	368	296
ON OFF ON	G	716	647	592	541	478	420	368	296
ON ON ON	G	716	647	592	541	478	420	368	296

PCBBF139	*CEC800603A* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	716	43	647	48	592	53	541	58	478	N/A	420	368	296
	W2	1054	42	1002	44	951	47	906	49	861	52	820	797	754
ON OFF	W1	656	47	589	53	532	58	465	N/A	402	N/A	348	271	219
	W2	1054	42	1002	44	951	47	906	49	861	52	820	797	754
ON ON	W1	656	47	589	53	532	58	465	N/A	402	N/A	348	271	219
	W2	1160	38	1102	40	1055	42	1017	44	970	46	930	891	847
OFF ON**	W1	1160	N/A	1102	N/A	1055	N/A	1017	N/A	970	N/A	930	891	847
	W2	1411	N/A	1356	N/A	1313	N/A	1272	N/A	1235	N/A	1198	1162	1127

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*CEC800603B* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1223	1144	1081	995	918	839	798	738
	Y	1395	1332	1272	1207	1136	1074	1007	948
ON OFF OFF	Ylo	1032	800	578	487	387	301	235	151
	Y	1223	1144	1081	995	918	839	798	738
ON ON OFF	Ylo	1032	800	578	487	387	301	235	151
	Y	1395	1332	1272	1207	1136	1074	1007	948
OFF ON OFF	Ylo	1223	1144	1081	995	918	839	798	738
	Y	1025	850	754	670	594	520	443	366
OFF OFF ON	Ylo	1223	1144	1081	995	918	839	798	738
	Y	1258	1179	1115	1030	954	885	814	776
OFF ON ON	Ylo	1032	800	578	487	387	301	235	151
	Y	1025	850	754	670	594	520	443	366
ON OFF ON	Ylo	1258	1179	1115	1030	954	885	814	776
	Y	1395	1332	1272	1207	1136	1074	1007	948
ON ON ON	Ylo	1258	1179	1115	1030	954	885	814	776
	Y	1032	800	578	487	387	301	235	151

PCBBF139	*CEC800603B* - CONTINOUS FAN							
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1025	850	754	670	594	520	443	366
ON OFF OFF	G	1258	1179	1115	1030	954	885	814	776
ON ON OFF	G	1032	800	578	487	387	301	235	151
OFF ON OFF	G	1223	1144	1081	995	918	839	798	738
OFF OFF ON	G	1395	1332	1272	1207	1136	1074	1007	948
OFF ON ON	G	1025	850	754	670	594	520	443	366
ON OFF ON	G	1025	850	754	670	594	520	443	366
ON ON ON	G	1025	850	754	670	594	520	443	366

PCBBF139	*CEC800603B* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1025	30	850	37	754	41	670	46	594	52	520	443	366
	W2	1258	35	1179	38	1115	40	1030	43	954	47	885	814	776
ON OFF	W1	1032	30	800	39	578	54	487	N/A	387	N/A	301	235	151
	W2	1258	35	1179	38	1115	40	1030	43	954	47	885	814	776
ON ON	W1	1032	30	800	39	578	54	487	N/A	387	N/A	301	235	151
	W2	1223	36	1144	39	1081	41	995	45	918	48	839	798	738
OFF ON**	W1	1223	N/A	1144	N/A	1081	N/A	995	N/A	918	N/A	839	798	738
	W2	1395	N/A	1332	N/A	1272	N/A	1207	N/A	1136	N/A	1074	1007	948

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*CEC800804B* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1596	1553	1512	1491	1450	1411	1388	1347
	Y	1757	1713	1691	1664	1625	1588	1552	1522
ON OFF OFF	Ylo	784	716	645	583	516	405	334	282
	Y	1596	1553	1512	1491	1450	1411	1388	1347
ON ON OFF	Ylo	784	716	645	583	516	405	334	282
	Y	1757	1713	1691	1664	1625	1588	1552	1522
OFF ON OFF	Ylo	1596	1553	1512	1491	1450	1411	1388	1347
	Y	1040	973	936	918	859	805	770	720
OFF OFF ON	Ylo	1596	1553	1512	1491	1450	1411	1388	1347
	Y	1401	1366	1320	1278	1236	1194	1153	1112
OFF ON ON	Ylo	784	716	645	583	516	405	334	282
	Y	1040	973	936	918	859	805	770	720
ON OFF ON	Ylo	1401	1366	1320	1278	1236	1194	1153	1112
	Y	1757	1713	1691	1664	1625	1588	1552	1522
ON ON ON	Ylo	1401	1366	1320	1278	1236	1194	1153	1112
	Y	784	716	645	583	516	405	334	282

PCBBF139	*CEC800804B* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1040	973	936	918	859	805	770	720
ON OFF OFF	G	1401	1366	1320	1278	1236	1194	1153	1112
ON ON OFF	G	784	716	645	583	516	405	334	282
OFF ON OFF	G	1596	1553	1512	1491	1450	1411	1388	1347
OFF OFF ON	G	1757	1713	1691	1664	1625	1588	1552	1522
OFF ON ON	G	1040	973	936	918	859	805	770	720
ON OFF ON	G	1040	973	936	918	859	805	770	720
ON ON ON	G	1040	973	936	918	859	805	770	720

PCBBF139	*CEC800804B* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1040	40	973	43	936	44	918	45	859	48	805	770	720
	W2	1401	42	1366	43	1320	45	1278	46	1236	48	1194	1153	1112
ON OFF	W1	784	53	716	58	645	N/A	583	N/A	516	N/A	405	334	282
	W2	1401	42	1366	43	1320	45	1278	46	1236	48	1194	1153	1112
ON ON	W1	784	53	716	58	645	N/A	583	N/A	516	N/A	405	334	282
	W2	1596	37	1553	38	1512	39	1491	40	1450	41	1411	1388	1347
OFF ON**	W1	1596	N/A	1553	N/A	1512	N/A	1491	N/A	1450	N/A	1411	1388	1347
	W2	1757	N/A	1713	N/A	1691	N/A	1664	N/A	1625	N/A	1588	1552	1522

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*CEC800805C* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1782	1744	1715	1700	1660	1619	1579	1510
	Y	2145	2089	2058	2036	2020	2000	1971	1935
ON OFF OFF	Ylo	1171	884	667	576	495	399	338	302
	Y	1782	1744	1715	1700	1660	1619	1579	1510
ON ON OFF	Ylo	1171	884	667	576	495	399	338	302
	Y	2145	2089	2058	2036	2020	2000	1971	1935
OFF ON OFF	Ylo	1782	1744	1715	1700	1660	1619	1579	1510
	Y	1175	1098	1024	947	883	823	764	703
OFF OFF ON	Ylo	1782	1744	1715	1700	1660	1619	1579	1510
	Y	1547	1506	1474	1442	1390	1332	1273	1222
OFF ON ON	Ylo	1171	884	667	576	495	399	338	302
	Y	1175	1098	1024	947	883	823	764	703
ON OFF ON	Ylo	1547	1506	1474	1442	1390	1332	1273	1222
	Y	2145	2089	2058	2036	2020	2000	1971	1935
ON ON ON	Ylo	1547	1506	1474	1442	1390	1332	1273	1222
	Y	1171	884	667	576	495	399	338	302

PCBBF139	*CEC800805C* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1175	1098	1024	947	883	823	764	703
ON OFF OFF	G	1547	1506	1474	1442	1390	1332	1273	1222
ON ON OFF	G	1171	884	667	576	495	399	338	302
OFF ON OFF	G	1782	1744	1715	1700	1660	1619	1579	1510
OFF OFF ON	G	2145	2089	2058	2036	2020	2000	1971	1935
OFF ON ON	G	1175	1098	1024	947	883	823	764	703
ON OFF ON	G	1175	1098	1024	947	883	823	764	703
ON ON ON	G	1175	1098	1024	947	883	823	764	703

PCBBF139	*CEC800805C* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1175	35	1098	38	1024	41	947	44	883	47	823	764	703
	W2	1547	38	1506	39	1474	40	1442	41	1390	43	1332	1273	1222
ON OFF	W1	1171	35	884	47	667	N/A	576	N/A	495	N/A	399	338	302
	W2	1547	38	1506	39	1474	40	1442	41	1390	43	1332	1273	1222
ON ON**	W1	1171	N/A	884	N/A	667	N/A	576	N/A	495	N/A	399	338	302
	W2	1782	N/A	1744	N/A	1715	N/A	1700	N/A	1660	N/A	1619	1579	1510
OFF ON**	W1	1782	N/A	1744	N/A	1715	N/A	1700	N/A	1660	N/A	1619	1579	1510
	W2	2145	N/A	2089	N/A	2058	N/A	2036	N/A	2020	N/A	2000	1971	1935

*DEFAULT
**NOT RECOMMENDED

PCBBF139	**EC801005C* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1820	1769	1726	1685	1642	1603	1557	1521
	Y	2235	2185	2139	2108	2076	2032	2000	1964
ON OFF OFF	Ylo	803	719	631	540	471	337	298	265
	Y	1820	1769	1726	1685	1642	1603	1557	1521
ON ON OFF	Ylo	803	719	631	540	471	337	298	265
	Y	2235	2185	2139	2108	2076	2032	2000	1964
OFF ON OFF	Ylo	1820	1769	1726	1685	1642	1603	1557	1521
	Y	1626	1574	1524	1479	1433	1410	1400	1358
OFF OFF ON	Ylo	1820	1769	1726	1685	1642	1603	1557	1521
	Y	2169	2116	2070	2038	2003	1970	1933	1897
OFF ON ON	Ylo	803	719	631	540	471	337	298	265
	Y	1626	1574	1524	1479	1433	1410	1400	1358
ON OFF ON	Ylo	2169	2116	2070	2038	2003	1970	1933	1897
	Y	2235	2185	2139	2108	2076	2032	2000	1964
ON ON ON	Ylo	2169	2116	2070	2038	2003	1970	1933	1897
	Y	803	719	631	540	471	337	298	265

PCBBF139	**EC801005C* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1626	1574	1524	1479	1433	1410	1400	1358
ON OFF OFF	G	2169	2116	2070	2038	2003	1970	1933	1897
ON ON OFF	G	803	719	631	540	471	337	298	265
OFF ON OFF	G	1820	1769	1726	1685	1642	1603	1557	1521
OFF OFF ON	G	2235	2185	2139	2108	2076	2032	2000	1964
OFF ON ON	G	1626	1574	1524	1479	1433	1410	1400	1358
ON OFF ON	G	1626	1574	1524	1479	1433	1410	1400	1358
ON ON ON	G	1626	1574	1524	1479	1433	1410	1400	1358

PCBBF139	**EC801005C* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1626	32	1574	33	1524	34	1479	35	1433	36	1410	1400	1358
	W2	2169	34	2116	35	2070	36	2038	36	2003	37	1970	1933	1897
ON OFF	W1	803	N/A	719	N/A	631	N/A	540	N/A	471	N/A	337	298	265
	W2	2169	34	2116	35	2070	36	2038	36	2003	37	1970	1933	1897
ON ON	W1	803	N/A	719	N/A	631	N/A	540	N/A	471	N/A	337	298	265
	W2	1820	41	1769	42	1726	43	1685	44	1642	45	1603	1557	1521
OFF ON**	W1	1820	N/A	1769	N/A	1726	N/A	1685	N/A	1642	N/A	1603	1557	1521
	W2	2235	N/A	2185	N/A	2139	N/A	2108	N/A	2076	N/A	2032	2000	1964

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*CEC800403A* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	785	754	736	690	650	604	565	527
	Y	1348	1294	1261	1250	1229	1233	1205	1182
ON OFF OFF	Ylo	663	647	597	551	501	458	408	355
	Y	785	754	736	690	650	604	565	527
ON ON OFF	Ylo	663	647	597	551	501	458	408	355
	Y	1348	1294	1261	1250	1229	1233	1205	1182
OFF ON OFF	Ylo	785	754	736	690	650	604	565	527
	Y	591	568	518	463	411	355	300	243
OFF OFF ON	Ylo	785	754	736	690	650	604	565	527
	Y	1104	1058	1020	1022	1013	981	952	918
OFF ON ON	Ylo	663	647	597	551	501	458	408	355
	Y	591	568	518	463	411	355	300	243
ON OFF ON	Ylo	1104	1058	1020	1022	1013	981	952	918
	Y	1348	1294	1261	1250	1229	1233	1205	1182
ON ON ON	Ylo	1104	1058	1020	1022	1013	981	952	918
	Y	663	647	597	551	501	458	408	355

PCBBF139	*CEC800403A* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	591	568	518	463	411	355	300	243
ON OFF OFF	G	1104	1058	1020	1022	1013	981	952	918
ON ON OFF	G	663	647	597	551	501	458	408	355
OFF ON OFF	G	785	754	736	690	650	604	565	527
OFF OFF ON	G	1348	1294	1261	1250	1229	1233	1205	1182
OFF ON ON	G	591	568	518	463	411	355	300	243
ON OFF ON	G	591	568	518	463	411	355	300	243
ON ON ON	G	591	568	518	463	411	355	300	243

PCBBF139	*CEC800403A* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	591	35	568	37	518	40	463	45	411	N/A	355	300	243
	W2	1104	27	1058	28	1020	29	1022	29	1013	29	981	952	918
ON OFF	W1	663	31	647	32	597	35	551	38	501	41	458	408	355
	W2	1104	27	1058	28	1020	29	1022	29	1013	29	981	952	918
ON ON	W1	663	31	647	32	597	35	551	38	501	41	458	408	355
	W2	785	38	754	39	736	40	690	43	650	N/A	604	565	527
OFF ON	W1	785	26	754	28	736	28	690	30	650	32	604	565	527
	W2	1348	22	1294	23	1261	23	1250	24	1229	24	1233	1205	1182

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*MEC800403A* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1138	1093	1057	1016	981	945	912	876
	Y	1367	1321	1286	1255	1223	1190	1160	1133
ON OFF OFF	Ylo	923	865	824	802	759	715	674	631
	Y	1138	1093	1057	1016	981	945	912	876
ON ON OFF	Ylo	923	865	824	802	759	715	674	631
	Y	1367	1321	1286	1255	1223	1190	1160	1133
OFF ON OFF	Ylo	1138	1093	1057	1016	981	945	912	876
	Y	553	496	436	372	308	252	198	N/A
OFF OFF ON	Ylo	1138	1093	1057	1016	981	945	912	876
	Y	750	703	651	600	553	504	456	409
OFF ON ON	Ylo	923	865	824	802	759	715	674	631
	Y	553	496	436	372	308	252	198	N/A
ON OFF ON	Ylo	750	703	651	600	553	504	456	409
	Y	1367	1321	1286	1255	1223	1190	1160	1133
ON ON ON	Ylo	750	703	651	600	553	504	456	409
	Y	923	865	824	802	759	715	674	631

PCBBF139	*MEC800403A* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	553	496	436	372	308	252	198	N/A
ON OFF OFF	G	750	703	651	600	553	504	456	409
ON ON OFF	G	923	865	824	802	759	715	674	631
OFF ON OFF	G	1138	1093	1057	1016	981	945	912	876
OFF OFF ON	G	1367	1321	1286	1255	1223	1190	1160	1133
OFF ON ON	G	553	496	436	372	308	252	198	N/A
ON OFF ON	G	553	496	436	372	308	252	198	N/A
ON ON ON	G	553	496	436	372	308	252	198	N/A

PCBBF139	*MEC800403A* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	553	38	496	42	436	N/A	372	N/A	308	N/A	252	198	N/A
	W2	750	40	703	42	651	N/A	600	N/A	553	N/A	504	456	409
ON OFF	W1	923	22	865	24	824	25	802	26	759	27	715	674	631
	W2	750	40	703	42	651	N/A	600	N/A	553	N/A	504	456	409
ON ON	W1	923	22	865	24	824	25	802	26	759	27	715	674	631
	W2	1138	26	1093	27	1057	28	1016	29	981	30	945	912	876
OFF ON**	W1	1138	N/A	1093	N/A	1057	N/A	1016	N/A	981	N/A	945	912	876
	W2	1367	N/A	1321	N/A	1286	N/A	1255	N/A	1223	N/A	1190	1160	1133

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*MEC800603A* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1151	1091	1050	1007	964	926	885	850
	Y	1389	1341	1295	1258	1221	1176	1140	1105
ON OFF OFF	Ylo	681	617	566	511	458	405	358	311
	Y	1151	1091	1050	1007	964	926	885	850
ON ON OFF	Ylo	681	617	566	511	458	405	358	311
	Y	1389	1341	1295	1258	1221	1176	1140	1105
OFF ON OFF	Ylo	1151	1091	1050	1007	964	926	885	850
	Y	1079	1019	975	934	890	850	808	791
OFF OFF ON	Ylo	1151	1091	1050	1007	964	926	885	850
	Y	1328	1274	1231	1191	1155	1114	1081	1047
OFF ON ON	Ylo	681	617	566	511	458	405	358	311
	Y	1079	1019	975	934	890	850	808	791
ON OFF ON	Ylo	1328	1274	1231	1191	1155	1114	1081	1047
	Y	1389	1341	1295	1258	1221	1176	1140	1105
ON ON ON	Ylo	1328	1274	1231	1191	1155	1114	1081	1047
	Y	681	617	566	511	458	405	358	311

PCBBF139	*MEC800603A* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1079	1019	975	934	890	850	808	791
ON OFF OFF	G	1328	1274	1231	1191	1155	1114	1081	1047
ON ON OFF	G	681	617	566	511	458	405	358	311
OFF ON OFF	G	1151	1091	1050	1007	964	926	885	850
OFF OFF ON	G	1389	1341	1295	1258	1221	1176	1140	1105
OFF ON ON	G	1079	1019	975	934	890	850	808	791
ON OFF ON	G	1079	1019	975	934	890	850	808	791
ON ON ON	G	1079	1019	975	934	890	850	808	791

PCBBF139	*MEC800603A* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1079	29	1019	31	975	32	934	33	890	35	850	808	791
	W2	1328	33	1274	35	1231	36	1191	37	1155	38	1114	1081	1047
ON OFF	W1	681	46	617	50	566	N/A	511	N/A	458	N/A	405	358	311
	W2	1328	33	1274	35	1231	36	1191	37	1155	38	1114	1081	1047
ON ON	W1	681	46	617	50	566	N/A	511	N/A	458	N/A	405	358	311
	W2	1151	39	1091	41	1050	42	1007	44	964	46	926	885	850
OFF ON	W1	1151	27	1091	29	1050	30	1007	31	964	32	926	885	850
	W2	1389	32	1341	33	1295	34	1258	35	1221	36	1176	1140	1105

***DEFAULT**
****NOT RECOMMENDED**

PCBBF139	*MEC800603B* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1330	1280	1229	1187	1146	1103	1061	1018
	Y	1465	1416	1382	1340	1299	1278	1257	1219
ON OFF OFF	Ylo	737	661	589	531	456	384	313	252
	Y	1330	1280	1229	1187	1146	1103	1061	1018
ON ON OFF	Ylo	737	661	589	531	456	384	313	252
	Y	1465	1416	1382	1340	1299	1278	1257	1219
OFF ON OFF	Ylo	1330	1280	1229	1187	1146	1103	1061	1018
	Y	1155	1100	1048	1002	952	907	861	816
OFF OFF ON	Ylo	1330	1280	1229	1187	1146	1103	1061	1018
	Y	1418	1376	1333	1288	1248	1206	1163	1124
OFF ON ON	Ylo	737	661	589	531	456	384	313	252
	Y	1155	1100	1048	1002	952	907	861	816
ON OFF ON	Ylo	1418	1376	1333	1288	1248	1206	1163	1124
	Y	1465	1416	1382	1340	1299	1278	1257	1219
ON ON ON	Ylo	1418	1376	1333	1288	1248	1206	1163	1124
	Y	737	661	589	531	456	384	313	252

PCBBF139	*MEC800603B* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1155	1100	1048	1002	952	907	861	816
ON OFF OFF	G	1418	1376	1333	1288	1248	1206	1163	1124
ON ON OFF	G	737	661	589	531	456	384	313	252
OFF ON OFF	G	1330	1280	1229	1187	1146	1103	1061	1018
OFF OFF ON	G	1465	1416	1382	1340	1299	1278	1257	1219
OFF ON ON	G	1155	1100	1048	1002	952	907	861	816
ON OFF ON	G	1155	1100	1048	1002	952	907	861	816
ON ON ON	G	1155	1100	1048	1002	952	907	861	816

PCBBF139	*MEC800603B* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1155	27	1100	28	1048	30	1002	31	952	33	907	861	816
	W2	1418	31	1376	32	1333	33	1288	35	1248	36	1206	1163	1124
ON OFF	W1	737	42	661	N/A	589	N/A	531	N/A	456	N/A	384	313	252
	W2	1418	31	1376	32	1333	33	1288	35	1248	36	1206	1163	1124
ON ON	W1	737	42	661	N/A	589	N/A	531	N/A	456	N/A	384	313	252
	W2	1330	33	1280	35	1229	36	1187	37	1146	39	1103	1061	1018
OFF ON**	W1	1330	N/A	1280	N/A	1229	N/A	1187	N/A	1146	N/A	1103	1061	1018
	W2	1465	N/A	1416	N/A	1382	N/A	1340	N/A	1299	N/A	1278	1257	1219

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*MEC800803B* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1160	1107	1060	1011	965	920	868	818
	Y	1231	1185	1136	1093	1049	1004	956	908
ON OFF OFF	Ylo	706	631	563	486	404	338	280	232
	Y	1160	1107	1060	1011	965	920	868	818
ON ON OFF	Ylo	706	631	563	486	404	338	280	232
	Y	1231	1185	1136	1093	1049	1004	956	908
OFF ON OFF	Ylo	1160	1107	1060	1011	965	920	868	818
	Y	1133	1009	956	903	856	804	774	722
OFF OFF ON	Ylo	1160	1107	1060	1011	965	920	868	818
	Y	1402	1358	1317	1274	1234	1195	1154	1113
OFF ON ON	Ylo	706	631	563	486	404	338	280	232
	Y	1133	1009	956	903	856	804	774	722
ON OFF ON	Ylo	1402	1358	1317	1274	1234	1195	1154	1113
	Y	1231	1185	1136	1093	1049	1004	956	908
ON ON ON	Ylo	1402	1358	1317	1274	1234	1195	1154	1113
	Y	706	631	563	486	404	338	280	232

PCBBF139	*MEC800803B* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1133	1009	956	903	856	804	774	722
ON OFF OFF	G	1402	1358	1317	1274	1234	1195	1154	1113
ON ON OFF	G	706	631	563	486	404	338	280	232
OFF ON OFF	G	1160	1107	1060	1011	965	920	868	818
OFF OFF ON	G	1231	1185	1136	1093	1049	1004	956	908
OFF ON ON	G	1133	1009	956	903	856	804	774	722
ON OFF ON	G	1133	1009	956	903	856	804	774	722
ON ON ON	G	1133	1009	956	903	856	804	774	722

PCBBF139	*MEC800803B* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1133	37	1009	41	956	43	903	46	856	48	804	774	722
	W2	1402	42	1358	44	1317	45	1274	47	1234	48	1195	1154	1113
ON OFF**	W1	706	N/A	631	N/A	563	N/A	486	N/A	404	N/A	338	280	232
	W2	1402	N/A	1358	N/A	1317	N/A	1274	N/A	1234	N/A	1195	1154	1113
ON ON**	W1	706	N/A	631	N/A	563	N/A	486	N/A	404	N/A	338	280	232
	W2	1160	N/A	1107	N/A	1060	N/A	1011	N/A	965	N/A	920	868	818
OFF ON	W1	1160	36	1107	37	1060	39	1011	41	965	43	920	868	818
	W2	1231	48	1185	50	1136	52	1093	54	1049	56	1004	956	908

***DEFAULT**
****NOT RECOMMENDED**

PCBBF139	*MEC800804B* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1574	1521	1481	1439	1398	1374	1335	1295
	Y	1782	1726	1684	1645	1610	1574	1542	1506
ON OFF OFF	Ylo	743	668	599	522	432	366	312	258
	Y	1574	1521	1481	1439	1398	1374	1335	1295
ON ON OFF	Ylo	743	668	599	522	432	366	312	258
	Y	1782	1726	1684	1645	1610	1574	1542	1506
OFF ON OFF	Ylo	1574	1521	1481	1439	1398	1374	1335	1295
	Y	1130	1071	1027	973	922	870	817	787
OFF OFF ON	Ylo	1574	1521	1481	1439	1398	1374	1335	1295
	Y	1408	1369	1319	1282	1242	1193	1150	1109
OFF ON ON	Ylo	743	668	599	522	432	366	312	258
	Y	1130	1071	1027	973	922	870	817	787
ON OFF ON	Ylo	1408	1369	1319	1282	1242	1193	1150	1109
	Y	1782	1726	1684	1645	1610	1574	1542	1506
ON ON ON	Ylo	1408	1369	1319	1282	1242	1193	1150	1109
	Y	743	668	599	522	432	366	312	258

PCBBF139	*MEC800804B* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1130	1071	1027	973	922	870	817	787
ON OFF OFF	G	1408	1369	1319	1282	1242	1193	1150	1109
ON ON OFF	G	743	668	599	522	432	366	312	258
OFF ON OFF	G	1574	1521	1481	1439	1398	1374	1335	1295
OFF OFF ON	G	1782	1726	1684	1645	1610	1574	1542	1506
OFF ON ON	G	1130	1071	1027	973	922	870	817	787
ON OFF ON	G	1130	1071	1027	973	922	870	817	787
ON ON ON	G	1130	1071	1027	973	922	870	817	787

PCBBF139	*MEC800804B* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1130	37	1071	39	1027	40	973	43	922	45	870	817	787
	W2	1408	42	1369	43	1319	45	1282	46	1242	48	1193	1150	1109
ON OFF	W1	743	56	668	N/A	599	N/A	522	N/A	432	N/A	366	312	258
	W2	1408	42	1369	43	1319	45	1282	46	1242	48	1193	1150	1109
ON ON**	W1	743	N/A	668	N/A	599	N/A	522	N/A	432	N/A	366	312	258
	W2	1574	N/A	1521	N/A	1481	N/A	1439	N/A	1398	N/A	1374	1335	1295
OFF ON	W1	1574	26	1521	27	1481	28	1439	29	1398	30	1374	1335	1295
	W2	1782	33	1726	34	1684	35	1645	36	1610	37	1574	1542	1506

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*MEC800804C* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1466	1399	1347	1290	1230	1170	1112	1054
	Y	1904	1832	1777	1727	1678	1630	1579	1523
ON OFF OFF	Ylo	822	754	652	566	499	428	346	294
	Y	1466	1399	1347	1290	1230	1170	1112	1054
ON ON OFF	Ylo	822	754	652	566	499	428	346	294
	Y	1904	1832	1777	1727	1678	1630	1579	1523
OFF ON OFF	Ylo	1466	1399	1347	1290	1230	1170	1112	1054
	Y	1352	1281	1218	1152	1076	1026	964	901
OFF OFF ON	Ylo	1466	1399	1347	1290	1230	1170	1112	1054
	Y	1669	1595	1527	1463	1407	1363	1336	1289
OFF ON ON	Ylo	822	754	652	566	499	428	346	294
	Y	1352	1281	1218	1152	1076	1026	964	901
ON OFF ON	Ylo	1669	1595	1527	1463	1407	1363	1336	1289
	Y	1904	1832	1777	1727	1678	1630	1579	1523
ON ON ON	Ylo	1669	1595	1527	1463	1407	1363	1336	1289
	Y	822	754	652	566	499	428	346	294

PCBBF139	*MEC800804C* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1352	1281	1218	1152	1076	1026	964	901
ON OFF OFF	G	1669	1595	1527	1463	1407	1363	1336	1289
ON ON OFF	G	822	754	652	566	499	428	346	294
OFF ON OFF	G	1466	1399	1347	1290	1230	1170	1112	1054
OFF OFF ON	G	1904	1832	1777	1727	1678	1630	1579	1523
OFF ON ON	G	1352	1281	1218	1152	1076	1026	964	901
ON OFF ON	G	1352	1281	1218	1152	1076	1026	964	901
ON ON ON	G	1352	1281	1218	1152	1076	1026	964	901

PCBBF139	*MEC800804C* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1352	31	1281	32	1218	34	1152	36	1076	39	1026	964	901
	W2	1669	36	1595	37	1527	39	1463	41	1407	42	1363	1336	1289
ON OFF	W1	822	50	754	55	652	N/A	566	N/A	499	N/A	428	346	294
	W2	1669	36	1595	37	1527	39	1463	41	1407	42	1363	1336	1289
ON ON	W1	822	50	754	55	652	N/A	566	N/A	499	N/A	428	346	294
	W2	1466	40	1399	42	1347	44	1290	46	1230	48	1170	1112	1054
OFF ON	W1	1466	28	1399	30	1347	31	1290	32	1230	34	1170	1112	1054
	W2	1904	31	1832	32	1777	33	1727	34	1678	35	1630	1579	1523

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*MEC800805D* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1698	1621	1553	1497	1437	1393	1328	1270
	Y	2266	2202	2143	2090	2040	1995	1945	1896
ON OFF OFF	Ylo	1088	999	899	772	667	561	490	418
	Y	1698	1621	1553	1497	1437	1393	1328	1270
ON ON OFF	Ylo	1088	999	899	772	667	561	490	418
	Y	2266	2202	2143	2090	2040	1995	1945	1896
OFF ON OFF	Ylo	1698	1621	1553	1497	1437	1393	1328	1270
	Y	1450	1382	1314	1243	1181	1115	1047	973
OFF OFF ON	Ylo	1698	1621	1553	1497	1437	1393	1328	1270
	Y	1886	1822	1758	1701	1646	1591	1535	1482
OFF ON ON	Ylo	1088	999	899	772	667	561	490	418
	Y	1450	1382	1314	1243	1181	1115	1047	973
ON OFF ON	Ylo	1886	1822	1758	1701	1646	1591	1535	1482
	Y	2266	2202	2143	2090	2040	1995	1945	1896
ON ON ON	Ylo	1886	1822	1758	1701	1646	1591	1535	1482
	Y	1088	999	899	772	667	561	490	418

PCBBF139	*MEC800805D* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1450	1382	1314	1243	1181	1115	1047	973
ON OFF OFF	G	1886	1822	1758	1701	1646	1591	1535	1482
ON ON OFF	G	1088	999	899	772	667	561	490	418
OFF ON OFF	G	1698	1621	1553	1497	1437	1393	1328	1270
OFF OFF ON	G	2266	2202	2143	2090	2040	1995	1945	1896
OFF ON ON	G	1450	1382	1314	1243	1181	1115	1047	973
ON OFF ON	G	1450	1382	1314	1243	1181	1115	1047	973
ON ON ON	G	1450	1382	1314	1243	1181	1115	1047	973

PCBBF139	*MEC800805D* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1450	29	1382	30	1314	32	1243	33	1181	35	1115	1047	973
	W2	1886	31	1822	33	1758	34	1701	35	1646	36	1591	1535	1482
ON OFF	W1	1088	38	999	42	899	46	772	N/A	667	N/A	561	490	418
	W2	1886	31	1822	33	1758	34	1701	35	1646	36	1591	1535	1482
ON ON	W1	1088	38	999	42	899	46	772	N/A	667	N/A	561	490	418
	W2	1698	35	1621	37	1553	38	1497	40	1437	41	1393	1328	1270
OFF ON	W1	1698	24	1621	26	1553	27	1497	28	1437	29	1393	1328	1270
	W2	2266	26	2202	27	2143	28	2090	28	2040	29	1995	1945	1896

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*MEC800805C* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1583	1536	1515	1478	1434	1383	1317	1265
	Y	2145	2089	2058	2036	2020	2000	1971	1935
ON OFF OFF	Ylo	1171	884	667	576	495	399	338	302
	Y	1583	1536	1515	1478	1434	1383	1317	1265
ON ON OFF	Ylo	1171	884	667	576	495	399	338	302
	Y	2145	2089	2058	2036	2020	2000	1971	1935
OFF ON OFF	Ylo	1583	1536	1515	1478	1434	1383	1317	1265
	Y	1436	1402	1362	1313	1244	1182	1132	1079
OFF OFF ON	Ylo	1583	1536	1515	1478	1434	1383	1317	1265
	Y	1782	1744	1715	1700	1660	1619	1579	1510
OFF ON ON	Ylo	1171	884	667	576	495	399	338	302
	Y	1436	1402	1362	1313	1244	1182	1132	1079
ON OFF ON	Ylo	1782	1744	1715	1700	1660	1619	1579	1510
	Y	2145	2089	2058	2036	2020	2000	1971	1935
ON ON ON	Ylo	1782	1744	1715	1700	1660	1619	1579	1510
	Y	1171	884	667	576	495	399	338	302

PCBBF139	*MEC800805C* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1436	1402	1362	1313	1244	1182	1132	1079
ON OFF OFF	G	1782	1744	1715	1700	1660	1619	1579	1510
ON ON OFF	G	1171	884	667	576	495	399	338	302
OFF ON OFF	G	1583	1536	1515	1478	1434	1383	1317	1265
OFF OFF ON	G	2145	2089	2058	2036	2020	2000	1971	1935
OFF ON ON	G	1436	1402	1362	1313	1244	1182	1132	1079
ON OFF ON	G	1436	1402	1362	1313	1244	1182	1132	1079
ON ON ON	G	1436	1402	1362	1313	1244	1182	1132	1079

PCBBF139	*MEC800805C* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1436	29	1402	30	1362	30	1313	32	1244	33	1182	1132	1079
	W2	1782	33	1744	34	1715	35	1700	35	1660	36	1619	1579	1510
ON OFF	W1	1171	35	884	47	667	N/A	576	N/A	495	N/A	399	338	302
	W2	1782	33	1744	34	1715	35	1700	35	1660	36	1619	1579	1510
ON ON	W1	1171	35	884	47	667	N/A	576	N/A	495	N/A	399	338	302
	W2	1583	37	1536	39	1515	39	1478	40	1434	41	1383	1317	1265
OFF ON**	W1	1583	N/A	1536	N/A	1515	N/A	1478	N/A	1434	N/A	1383	1317	1265
	W2	2145	N/A	2089	N/A	2058	N/A	2036	N/A	2020	N/A	2000	1971	1935

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*MEC801004C* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1265	1204	1146	1091	1034	973	918	870
	Y	1598	1547	1509	1464	1417	1387	1340	1295
ON OFF OFF	Ylo	789	719	637	545	458	378	324	273
	Y	1265	1204	1146	1091	1034	973	918	870
ON ON OFF	Ylo	789	719	637	545	458	378	324	273
	Y	1598	1547	1509	1464	1417	1387	1340	1295
OFF ON OFF	Ylo	1265	1204	1146	1091	1034	973	918	870
	Y	1424	1378	1330	1274	1226	1172	1119	1071
OFF OFF ON	Ylo	1265	1204	1146	1091	1034	973	918	870
	Y	1810	1764	1718	1682	1633	1596	1549	1510
OFF ON ON	Ylo	789	719	637	545	458	378	324	273
	Y	1424	1378	1330	1274	1226	1172	1119	1071
ON OFF ON	Ylo	1810	1764	1718	1682	1633	1596	1549	1510
	Y	1598	1547	1509	1464	1417	1387	1340	1295
ON ON ON	Ylo	1810	1764	1718	1682	1633	1596	1549	1510
	Y	789	719	637	545	458	378	324	273

PCBBF139	*MEC801004C* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1424	1378	1330	1274	1226	1172	1119	1071
ON OFF OFF	G	1810	1764	1718	1682	1633	1596	1549	1510
ON ON OFF	G	789	719	637	545	458	378	324	273
OFF ON OFF	G	1265	1204	1146	1091	1034	973	918	870
OFF OFF ON	G	1598	1547	1509	1464	1417	1387	1340	1295
OFF ON ON	G	1424	1378	1330	1274	1226	1172	1119	1071
ON OFF ON	G	1424	1378	1330	1274	1226	1172	1119	1071
ON ON ON	G	1424	1378	1330	1274	1226	1172	1119	1071

PCBBF139	*MEC801004C* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1424	36	1378	38	1330	39	1274	41	1226	42	1172	1119	1071
	W2	1810	41	1764	42	1718	43	1682	44	1633	45	1596	1549	1510
ON OFF**	W1	789	N/A	719	N/A	637	N/A	545	N/A	458	N/A	378	324	273
	W2	1810	N/A	1764	N/A	1718	N/A	1682	N/A	1633	N/A	1596	1549	1510
ON ON**	W1	789	N/A	719	N/A	637	N/A	545	N/A	458	N/A	378	324	273
	W2	1265	N/A	1204	N/A	1146	N/A	1091	N/A	1034	N/A	973	918	870
OFF ON	W1	1265	41	1204	43	1146	45	1091	48	1034	50	973	918	870
	W2	1598	46	1547	48	1509	49	1464	51	1417	52	1387	1340	1295

*DEFAULT
**NOT RECOMMENDED

PCBBF139	*MEC801205D* - COOLING								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S1-1 S1-2 S1-3	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF*	Ylo	1627	1566	1520	1470	1420	1398	1391	1343
	Y	2226	2165	2126	2083	2048	2011	1983	1945
ON OFF OFF	Ylo	815	742	662	590	503	422	362	299
	Y	1627	1566	1520	1470	1420	1398	1391	1343
ON ON OFF	Ylo	815	742	662	590	503	422	362	299
	Y	2226	2165	2126	2083	2048	2011	1983	1945
OFF ON OFF	Ylo	1627	1566	1520	1470	1420	1398	1391	1343
	Y	1381	1324	1274	1220	1164	1137	1109	1049
OFF OFF ON	Ylo	1627	1566	1520	1470	1420	1398	1391	1343
	Y	1831	1770	1723	1677	1630	1590	1547	1506
OFF ON ON	Ylo	815	742	662	590	503	422	362	299
	Y	1381	1324	1274	1220	1164	1137	1109	1049
ON OFF ON	Ylo	1831	1770	1723	1677	1630	1590	1547	1506
	Y	2226	2165	2126	2083	2048	2011	1983	1945
ON ON ON	Ylo	1831	1770	1723	1677	1630	1590	1547	1506
	Y	815	742	662	590	503	422	362	299

PCBBF139	*MEC801205D* - CONTINOUS FAN								
DIP Switches	STATIC	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
S2-2 S2-3 S2-4	T STAT CALL	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
OFF OFF OFF	G	1381	1324	1274	1220	1164	1137	1109	1049
ON OFF OFF	G	1831	1770	1723	1677	1630	1590	1547	1506
ON ON OFF	G	815	742	662	590	503	422	362	299
OFF ON OFF	G	1627	1566	1520	1470	1420	1398	1391	1343
OFF OFF ON	G	2226	2165	2126	2083	2048	2011	1983	1945
OFF ON ON	G	1381	1324	1274	1220	1164	1137	1109	1049
ON OFF ON	G	1381	1324	1274	1220	1164	1137	1109	1049
ON ON ON	G	1381	1324	1274	1220	1164	1137	1109	1049

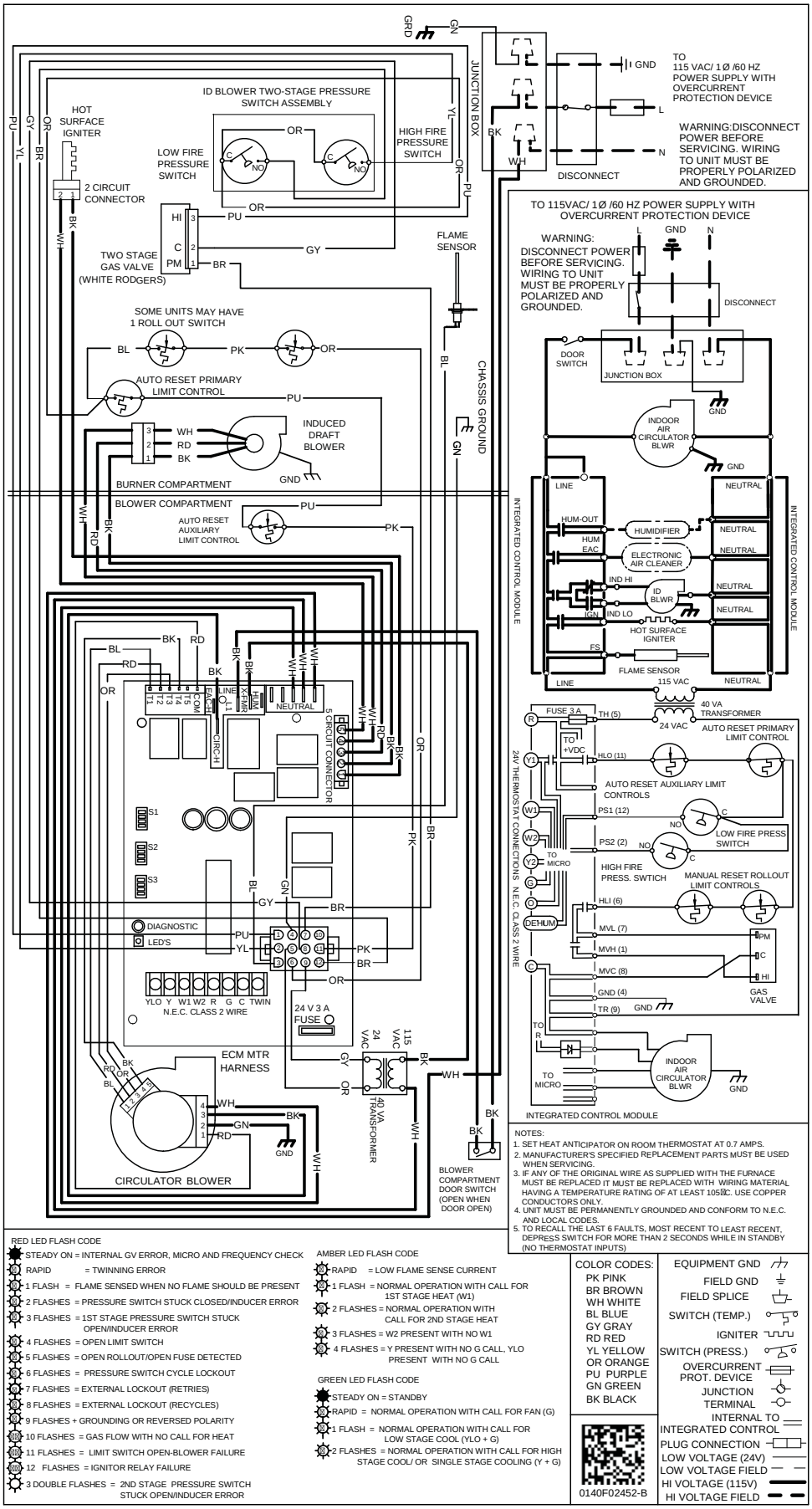
PCBBF139	*MEC801205D* - HEATING													
DIP Switches	STATIC	0.1		0.2		0.3		0.4		0.5		0.6	0.7	0.8
S1-4 S2-1	T STAT CALL	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	RISE	CFM	CFM	CFM
OFF OFF*	W1	1381	45	1324	47	1274	49	1220	51	1164	53	1137	1109	1049
	W2	1831	49	1770	50	1723	52	1677	53	1630	55	1590	1547	1506
ON OFF**	W1	815	N/A	742	N/A	662	N/A	590	N/A	503	N/A	422	362	299
	W2	1831	N/A	1770	N/A	1723	N/A	1677	N/A	1630	N/A	1590	1547	1506
ON ON**	W1	815	N/A	742	N/A	662	N/A	590	N/A	503	N/A	422	362	299
	W2	1627	N/A	1566	N/A	1520	N/A	1470	N/A	1420	N/A	1398	1391	1343
OFF ON	W1	1627	38	1566	40	1520	41	1470	42	1420	44	1398	1391	1343
	W2	2226	40	2165	41	2126	42	2083	43	2048	43	2011	1983	1945

*DEFAULT
**NOT RECOMMENDED

WIRING DIAGRAM

WARNING

HIGH VOLTAGE!
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.

Maintenance

WARNING

To avoid electrical shock, injury or death, disconnect electrical power before performing any maintenance. If you must handle the igniter, handle with care. Touching the igniter element with bare fingers, rough handling or vibration could damage the igniter resulting in premature failure. Only a qualified servicer should ever handle the igniter.

Annual Inspection

The furnace should be inspected by a qualified installer, or service agency at least once per year. This check should be performed at the beginning of the heating season. This will ensure that all furnace components are in proper working order and that the heating system functions appropriately. Pay particular attention to the following items. Repair or service as necessary.

- Flue pipe system. Check for blockage and/or leakage. Check the outside termination and the connections at and internal to the furnace.
- Heat exchanger. Check for corrosion and/or buildup within the heat exchanger passageways.
- Burners. Check for proper ignition, burner flame, and flame signal.
- Wiring. Check electrical connections for tightness and/or corrosion. Check wires for damage.
- Filters.

Filters

CAUTION

To ensure proper unit performance, adhere to the filter sizes given in the recommended Minimum Filter Size Table or Specification Sheet applicable to your model.

Filter Maintenance

Improper filter maintenance is the most common cause of inadequate heating or cooling performance. Filters should be cleaned (permanent) or replaced (disposable) as required.

Filter Removal

Depending on the installation, differing filter arrangements can be applied. Filters can be installed in either the central return register or a side panel external filter rack (upflow only). A media air filter or electronic air cleaner can be used as an alternate filter. Follow the filter sizes given in the Recommended Minimum Filter size table to ensure proper unit performance.

To remove filters from an external filter rack in an upright upflow installation, follow the directions provided with external filter rack kit.

Horizontal Unit Filter Removal

Filters in horizontal installations are located in the central return register or the ductwork near the furnace.

To remove:

1. Turn OFF electrical power to furnace.
2. Remove filter(s) from the central return register or ductwork.
3. Replace filter(s) by reversing the procedure for removal.
4. Turn ON electrical power to furnace.

Media Air Filter or Electronic Air Cleaner Removal

Follow the manufacturer's directions for service.

Burners

Visually inspect the burner flames periodically during the heating season. Turn on the furnace at the thermostat and allow several minutes for flames to stabilize, since any dislodged dust will alter the flames normal appearance. Flames should be stable, quiet, soft, and blue (dust may cause orange tips but they must not be yellow). They should extend directly outward from the burners without curling, floating, or lifting off. Flames must not impinge on the sides of the heat exchanger firing tubes.

Induced Draft and Circulator Blowers

The bearings in the induced draft blower and circulator blower motors are permanently lubricated by the manufacturer. No further lubrication is required. Check motor windings for accumulation of dust which may cause overheating. Clean as necessary.

Flame Sensor (Qualified Servicer Only)

Under some conditions, the fuel or air supply can create a nearly invisible coating on the flame sensor. This coating acts as an insulator causing a drop in the flame sense signal. If the flame sense signal drops too low the furnace will not sense flame and will lock out. The flame sensor should be carefully cleaned by a qualified servicer using steel wool. Following cleaning, the flame sense signal should be as indicated in the Specifications Sheet.

Flue Passages (Qualified Servicer Only)

The heat exchanger flue passageways should be inspected at the beginning of each heating season.

Before Leaving an Installation

- Cycle the furnace with the thermostat at least three times. Verify cooling and fan only operation.
- Review the Owner's Manual with the homeowner and discuss proper furnace operation and maintenance.
- Leave literature packet near furnace.

Repair and Replacement Parts

- When ordering any of the listed functional parts, be sure to provide the furnace model, manufacturing, and serial numbers with the order.
- Although only functional parts are shown in the parts list, all sheet metal parts, doors, etc. may be ordered by description.
- Parts are available from your distributor.

Functional Parts List

Gas Valve
Gas Manifold
Natural Gas Orifice
Propane Gas Orifice
Igniter
Flame Sensor
Rollout Limit Switch
Primary Limit Switch
Pressure Switch
Induced Draft Blower
Door Switch
Blower Motor
Blower Wheel
Blower Mounting Bracket
Blower Cutoff
Blower Housing
Inductor
Heat Exchanger
Auxiliary Limit Switch
Integrated Control Module
Transformer

CUSTOMER FEEDBACK

We are very interested in all product comments.
Please fill out the feedback on one of the following links:
Goodman® Brand Products: (http://www.goodmanmfg.com/about/contact-us).
Amana® Brand Products: (http://www.amana-hac.com/about-us/contact-us).
You can also scan the QR code on the right for the product brand you purchased to be direced to the feedback page.

GOODMAN® BRAND AMANA® BRAND

Product Registration

Thank you for your recent purchase. Though not required to get the protection of the standard waranty, registering your product is a relatively short process, and entitles you to additional warranty protection, except that failure by California ad Quebec residents to register their product does not diminsh their warranty rights.

GOODMAN® BRAND AMANA® BRAND

For Product Registration please register by following this link:
Goodman® Brand Products: (https://www.goodmanmfg.com/product-registration).
Amana® Brand Products: (http://www.amana-hac.com/product-registration).
You can also scan the QR code on the right to be directed to the Product Registration Page.

5151 San Felipe Suite 500 • Houston, TX 77056
www.goodmanmfg.com • www.amana-hac.com