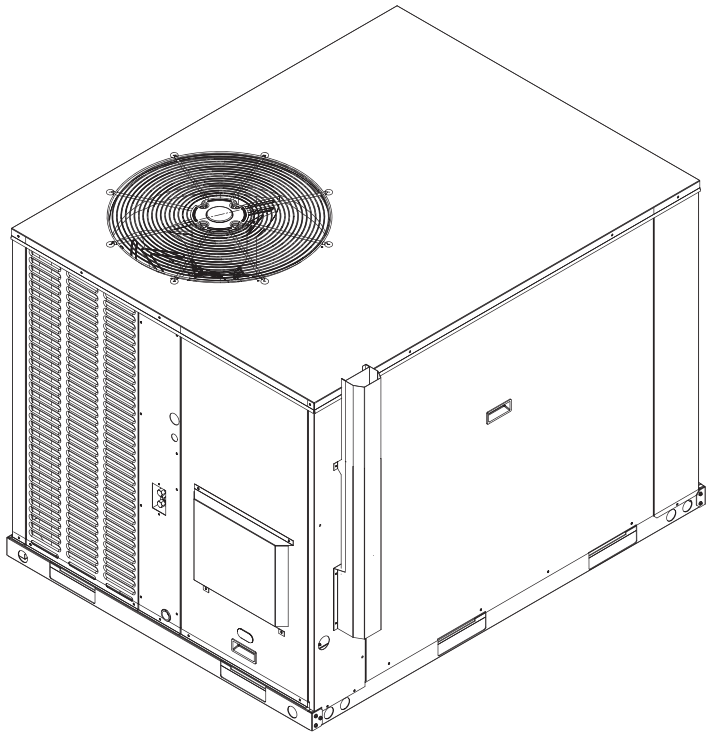
Ameristar™
HEATING & COOLING

INSTALLATION INSTRUCTIONS

PACKAGE GAS ELECTRIC UNITS

FEATURING R-410A

14 SEER SERIES - (2-5Tons)



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CERTIFIED TO CSA STD. C22.2 NO. 236

CENTRAL FURNACE CONFORMS TO ANSI STD Z21.47-2012, CERTIFIED TO CSA STD 2.3-2012

RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION

WARNING:

FIRE OR EXPLOSION HAZARD

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

WARNING

— Do not store or use gasoline or other flammable vapors and liquids, or other combustible materials 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.
- Do not return to your home until authorized by the gas supplier or fire department.

— Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or death. Refer to this manual, installation and service must be performed by a qualified installer, service agency or the gas supplier. In the commonwealth of Massachusetts, installation must be performed by a licensed plumber or gas fitter for appropriate fuel.

NOTE: Do not use this furnace if any part has been under water. A flood-damaged furnace is extremely dangerous. Attempts to use the furnace can result in fire or explosion. A qualified service agency should be contacted to inspect the furnace and to replace all gas controls, control system parts, electrical parts that have been wet or the furnace if deemed necessary.

DO NOT DESTROY THIS MANUAL
Please read carefully and keep in a safe place for future reference by a serviceman.

Installation Start-up，Operating and Service and Maintenance Instructions

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This document is customer property and is to remain with this unit.
These instructions do not cover all the different variations of systems nor does it provide for every possible contingency to be met in connection with installation.
All phases of this installation must comply with NATION, STATE AND LOCAL CODES. If additional information is required please contact your local distributor.

1.0 SAFETY

When you see the symbols below on labels or in the manual, be alert to the potential or immediate hazards of personal injury, property and/or product damage. It is the owner's or installer's responsibility to comply with all safety instructions and information accompanying these symbols.

⚠ WARNING: This is a safety alert symbol indicating a potential hazardous situation, which could result in personal injury, property and/or product damage or death.

⚠ CAUTION: This is a safety alert symbol indicating a potential hazardous situation, which could result in moderate personal injury, and/or property and product damage.

⚠ WARNING

These instructions are intended as an aid to qualified, licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.

⚠ WARNING

The manufacturer's warranty does not cover any damage or defect to the gas/electric unit caused by the attachment or use of any components, accessories or devices (other than those authorized by the manufacturer) into, onto or in conjunction with the gas/electric unit. You should be aware that the use of unauthorized components, accessories or devices may adversely affect the operation of the gas/electric unit and may also endanger life and property. The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized components, accessories or devices.

⚠ WARNING

Do not, under any circumstances, connect return ductwork to any other heat producing device such as a fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, Carbon Monoxide poisoning, explosion, property damage, severe personal injury or death.

⚠ WARNING

This unit is designed certified for outdoor installation only. Installation inside any part of a structure can result in inadequate unit performance as well as property damage. Installation inside can also cause recirculation of flue products into the conditioned space resulting in personal injury or death.

⚠ WARNING

The spark ignitor and ignition lead from the ignition control are high voltage. Keep hands or tools away to prevent electrical shock. Shut off electrical power before servicing any of the controls. Failure to adhere to this warning can result in personal injury or death.

⚠ WARNING

Proposition 65: This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to the state of California to cause cancer. Exhaust gas from this appliance contains chemicals, including carbon monoxide, known to the state of california to cause birth defects of other reproductive harm.

⚠ WARNING

Never allow products of combustion or the flue products to enter the return air ductwork, or the circulating air supply. All return ductwork must be adequately sealed and secured to the furnace with sheet metal screws, and joints taped. All other duct joints must be secured with approved connections and sealed airtight. Failure to prevent products of combustion from being circulated into the living space can create potentially hazardous conditions, including Carbon Monoxide poisoning that could result in personal injury or death.

⚠ WARNING

Holes in the exhaust transition or heat exchanger can cause toxic fumes to enter the home. The exhaust transition or heat exchanger must be replaced if they have holes or cracks in them. Failure to do so can cause Carbon Monoxide poisoning resulting in personal injury or death.

⚠ WARNING

Do not attempt to manually light this furnace with a match or any open flame. Attempting to do so can cause fire or explosion resulting in property damage, personal injury or death.

⚠ WARNING

Should overheating occur or the gas supply fail to shut off. Shut off the Manual Gas valve to the appliance before shutting off the supply. Failure to do so can result in an explosion or fire causing property damage, severe personal injury or death.

⚠ WARNING

Disconnect all power to the unit before starting maintenance. Failure to do so can result in severe electrical shock or death. Regular maintenance will reduce the buildup of contaminants and help to protect the unit's finish.

⚠ WARNING

Turn off the main electrical power at the branch circuit disconnect closest to the unit before attempting any wiring. Failure to do so can cause electrical shock resulting in personal injury or death.

⚠ WARNING

DO NOT JUMPER THIS DEVICE! Do not reset the overtemperature control without taking corrective action to assure that an adequate supply of combustion air is maintained under all conditions of operation. Failure to do so can result in Carbon Monoxide poisoning or death. Replace this control only with the identical replacement part.

⚠ WARNING

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation resulting in fire ,electrical shock, property damage, personal injury or death.

⚠ WARNING

This unit is equipped at the factory for use on Natural Gas only. Conversion to LP Gas requires a special kit enclosed instructions with. DO NOT BURN ANY LIQUID FUEL OR SOLID FUEL IN THIS UNIT. Burning any unapproved fuel will result in damage to this unit heat exchanger, which could result in fire, Carbon Monoxide poisoning, explosion, personal injury, property damage or death.

⚠ WARNING

Install this unit only in a location and position as specified in the location requirements and considerations section of these instructions. Provide adequate combustion and ventilation air to the unit space as specified in the venting section of these instructions.

⚠ WARNING

Do not use this unit during construction if air laden corrosive compounds are present such as chlorine and fluorine. Otherwise, provisions must be taken to provide clean, uncontaminated combustion and ventilation air to the unit, combustion and ventilation air contaminated with these compounds forms acids during combustion which corrodes the heat exchanger and component parts, some of these contaminates are found in, but not limited to, paneling, dry wall, adhesives, paints, stains, varnishes, sealers, and masonry cleaning materials.

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK, AND CARBON MONOXIDE POISONING HAZARD

Failure to follow this warning could result in dangerous operation, serious injury, death or property damage. Improper installation，adjustment，alteration，service，maintenance or use could cause carbon monoxide poisoning，explosion，fire，electrical shock or other conditions which may cause personal injury or property damage. Consult a qualified service agency，local gas supplier or your distributor or branch for information or assistance. The qualified service agency must use only factory-authorized and listed kits or accessories when modifying this product.

⚠ WARNING

Always install unit to operate within the unit's intended temperature-rise range with a duct system which has an external static pressure within the allowable range, as specified in ducting section of these instructions, see also unit rating plate.

⚠ CAUTION

FURNACE RELIABILITY HAZARD

Improper installation or misapplication of furnace may require excessive servicing or cause premature component failure. Application of this furnace should be outdoors with special attention given to vent sizing and material, gas input rate, air temperature rise, unit leveling, and unit sizing.

⚠ CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury. Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing furnaces.

⚠ CAUTION

R410A systems operate at higher pressures than R22 systems. Do not use R22 service equipment or components on R410A equipment.

⚠ WARNING

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage. Improper servicing could result in dangerous operation, serious injury, death or property damage.

- Before servicing, disconnect all electrical power to furnace.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing.

Improper installation, adjustment, alteration, service, Maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions include in literature and attached to the unit. Consult local building codes，the current editions of the National Fuel Gas Code (NFGC) NFPA 54/ANSI Z223.1 and the National Electrical Code (NEC) NFPA 70.

In Canada, refer to the current editions of the National Standards of Canada CAN/CSA-BI49.1 and .2 Natural Gas and Propane Installation Codes, and Canadian Electrical Code CSA C22.1

Recognize safety information. This is the safety-alert symbol⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol.

DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies hazards which could result in personal injury or death. CAUTION is used to identify unsafe practices which may result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which will result in enhanced Installation, reliability, or operation.

- Use only with type of gas approved for this unit. Refer to the unit rating plate.
- Install this unit only in a location and position as specified in the "Installation" section of these instructions.
- Provide adequate combustion and ventilation air to the unit space as specified in "Safety" section.
- 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 the "Gas Supply, Condensate drain and Piping" section.
- Always install unit to operate within the furnace's intended temperature-rise range with a duct system which has an external static pressure within the allowable range, as specified in the "Safety" section. See also unit rating plate.

- When unit is installed so that supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall also be handled by duct(s) sealed to the furnace casing and terminating outside the space containing the furnace. See “Ductwork” and "Return Air" section.

- The unit may be used for construction heat provided that the furnace installation and operation complies with the CAUTION and WARING instructions in this manual.

- The unit is design-certified for use with natural and propane gases (see unit rating plate) and for installation in outside only. The unit is factory-shipped for use with natural gas. A listed accessory gas conversion kit is required to convert unit for use with propane gas. The LP conversion kit is included with the unit.

- The unit must be kept free and clear of insulating materials. Inspect surrounding area to ensure insulation material is in safe distance when installing furnaces or adding insulation materials. Insulation materials may be combustible.
  See Table 3-1 for required clearances to combustible construction.

- Before heating season begins, exam the unit to determine that:
  a. All flue gas carrying areas external to the unit (i.e. chimney, vent connector) are clear and free of obstructions.
  b. The vent connector is in place, slopes upward and is physically sound without holes or excessive corrosion.
  c. The return-air duct connection(s) is physically sound, is sealed to the furnace casing, and terminates outside the space containing the furnace.
  d. The physical support of the unit is sound without sagging, cracks, gaps, etc around the base so as to provide a seal between the support and the base.
  e. There are no obvious sign of deterioration of the unit.
  f. The burner flames are in good adjustment (by comparison with pictorial sketches of the main burner flame.

- Furnace operation needs air for combustion and ventilation. Do not block or obstruct air openings on furnace or spacing around furnace required for supplying sufficient combustion air and ventilation.

1.1 INSPECTION

As soon as unit is received, it should be inspected and noted for possible shipping damage during transportation. It is shipper’s responsibility to cover the cost of shipping damage. Manufacturer or distributor will not accept the claims from dealer for any transportation damage.

1.2 LIMITATIONS

Refer to *Fig. 2-2, 2-3* for unit physical data and to *Table 7-1* for electrical data. If components are to be added to a unit they must meet local codes, they are to be installed at the dealer’s and /or the customer’s expense. Size of unit for proposed installation should be based on heat loss / heat gain calculations made in accordance with industry recognized procedures identified by the Air conditioning contractors of America.

Note: Rating plate must be left visible for future reference.

FOR YOUR SAFETY READ BEFORE OPERATING

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

A. This appliance does not have a pilot. it is equipped with an ignition device which automatically lights the burner. **Do not** try to light the burner by hand.

B. **BEFORE OPERATING** smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

FOR YOUR SAFETY
WHAT TO DO IF YOU SMELL GAS

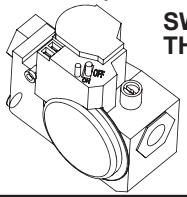
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbors’ phone. Follow the gas suppliers Instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to turn the gas control switch. Never use tools. If the switch will not turn by hand, don’t try to repair it; call a qualified service technician. Force or attempted repair may result in a fire or explosion.

D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.



SWITCH SHOWN IN THE “OFF” POSITION

5. Remove control access panel.
6. Wait five (5) minutes to clear out any gas. if you then smell gas, STOP! Follow “B” in the safety information above on this label. If you don’t smell gas, go to the next step.
7. Push gas control switch to “ON”.
   NOTE: Do not force.
8. Replace control access panel.
9. Turn on all electric power to the appliance.
10. Set thermostat to desired setting
11. If the appliance will not operate, follow instructions “To Turn Off Gas To Appliance” and call your service technician or gas supplier.

TO TURN OFF GAS TO APPLIANCE

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

See Fig: Instruction of lighting/ shutdown operation. Should the gas supply fail to shut off or if overheating occurs, shut off the gas valve to the furnace before shutting of the electrical supply.

2. INTRODUCTION

A Package Gas Electric Unit is a fully self-contained, combination gas heating/electric cooling unit designed for outdoor installation. All unit sizes have return and discharge openings for both horizontal and downflow configurations, and are factory shipped with all downflow duct openings covered. Units may be installed either on a rooftop or on a cement slab.

In gas heating mode, this unit is designed for a minimum continuous return-air temperature and a maximum continuous return-air temperature. Failure to follow these return-air temperature limits may affect reliability of heat exchangers, motors, and other components.

This booklet contains the installation and operating instructions for your Package Gas Electric Unit. There are some precautions that should be taken to derive maximum satisfaction from it. Improper installation can result in unsatisfactory operation or dangerous conditions. Read this booklet and any instructions packaged with separate equipment required to make up the system prior to installation. Give this booklet to the owner and explain its provisions. The owner should retain this booklet for future reference.

A Package Gas Electric Unit includes a hermetically-sealed refrigerating system consisting of a compressor, condenser coil, evaporator coil with thermal expansion valve (TXV) or throttle valve, a circulation air blower, a condenser fan, a heat exchanger assembly, gas burner and control assembly, combustion air motor and fan, and all necessary internal electrical wiring. The cooling system of these units is factory-evacuated, charged and performance tested. All units are factory charged with Refrigerant R410A.

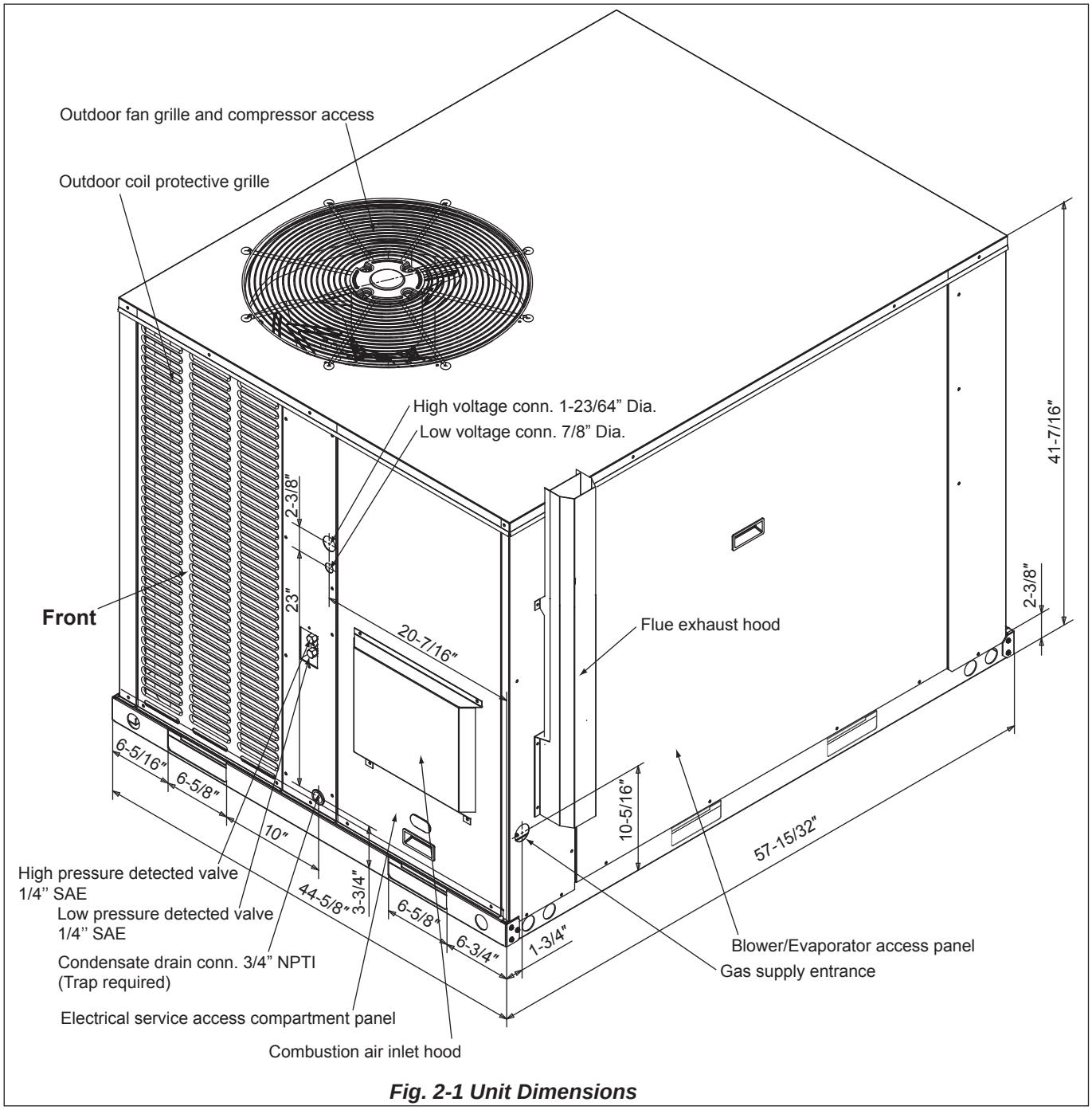


Fig. 2-1 Unit Dimensions

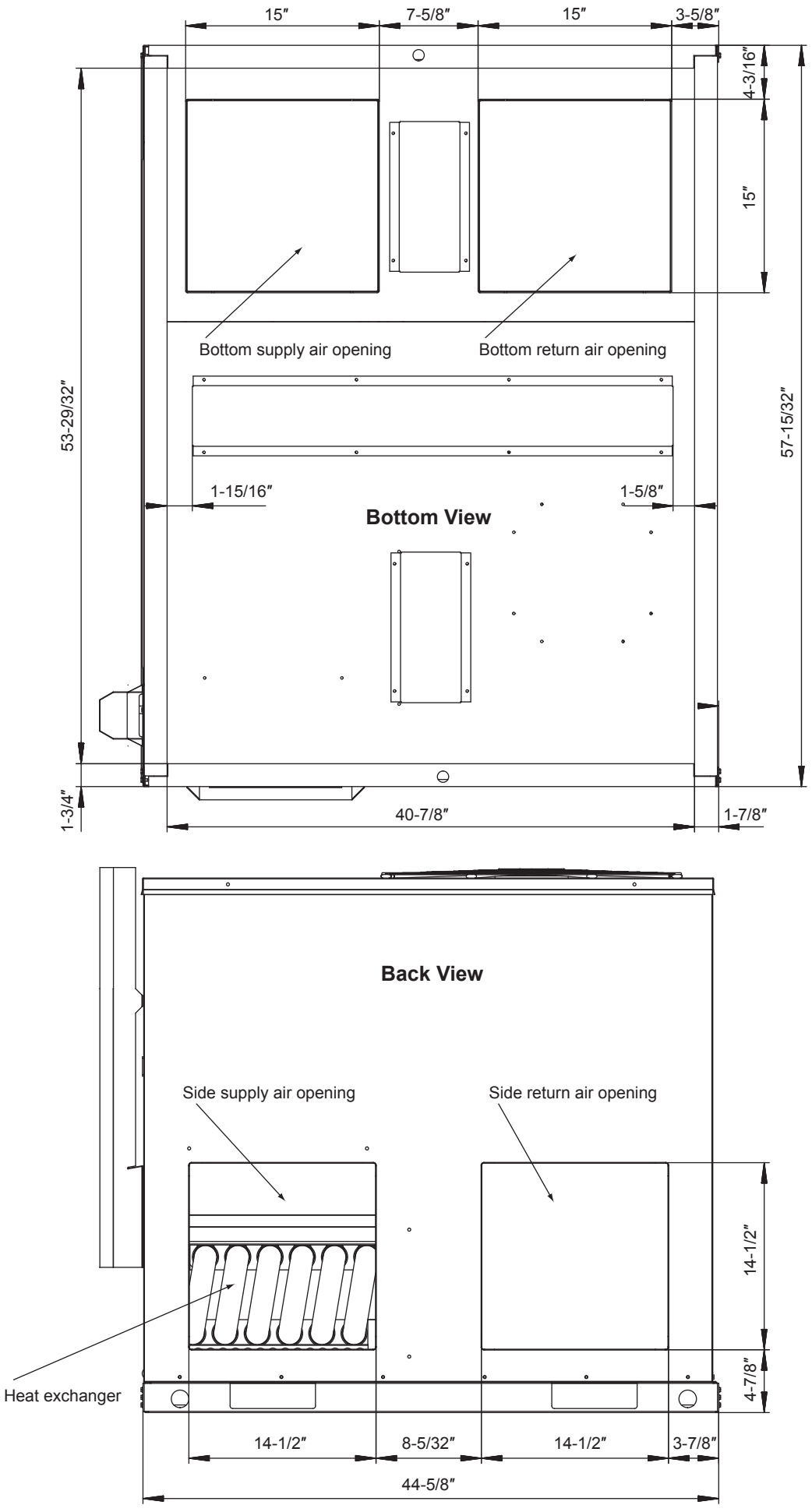


Fig. 2-2 Dimensions Back and Bottom

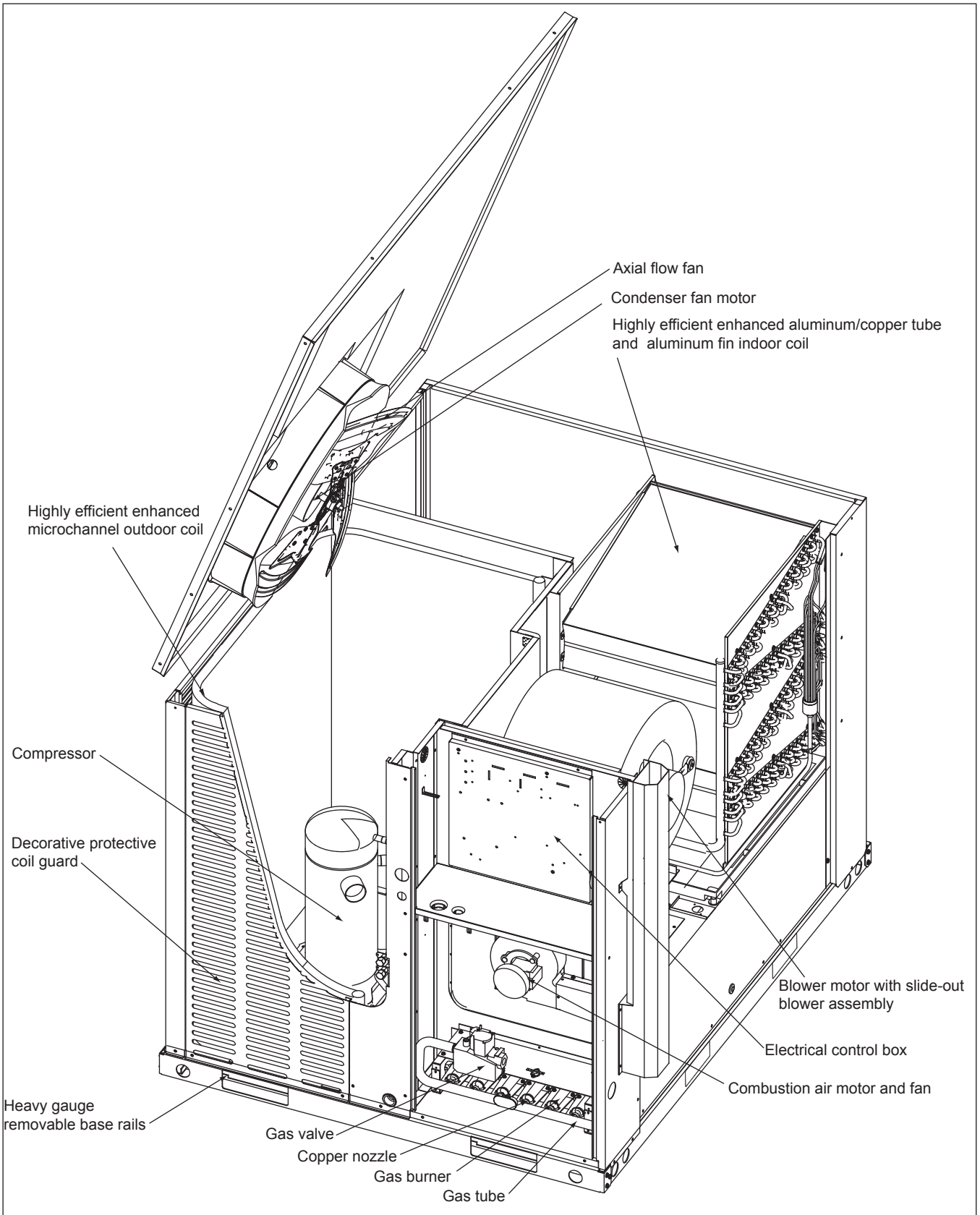


Fig. 2-3 Component Location

3.0 INSTALLATION

Install the unit in accordance with The American National Standard Z223.1-latest edition booklet entitled “National Fuel Gas Code”, and the requirements or codes of the local utility or other authority having jurisdiction.
Unit should be installed in accordance with national and local safety codes, including but not limit to ANSI/NFPS No. 70 or Canadian Electrical Code Part 1, C22.1, local plumbing and wastewater codes and any other applicable codes.
Additional helpful publications available from the “National Fire Protection Association” are: NFPA-90A - installation of Air Conditioning and Ventilating Systems 1985 or latest edition. NFPA-90B - Warm Air Heating and Air Conditioning Systems 1984.

3.1 PRE-INSTALLATION CHECK-POINTS

Before installation, carefully check the following:
1. For rooftop installation, be sure the structure has enough strength to support the weight of unit.
2. Clearances and provision for servicing.
3. Power supply and wiring.
4. Gas supply and piping.
5. Air duct connections and sizing.
6. Drain facilities and connections.
7. Location for minimum noise and vibration.

3.2 LOCATION CONSIDERATIONS

The metal parts of the unit may be subject to rust or deterioration in adverse environmental conditions. This oxidation could shorten the equipment’s useful life. Salt spray, fog or mist in seacoast areas, sulphur or chlorine from lawn watering systems, and various chemical contaminants from industries such as paper mills and petroleum refineries are especially corrosive.

If the unit is to be installed in an area where contaminants are likely to be a problem, give special attention to the equipment location and exposure:
1. Avoid having lawn sprinkler heads spray directly on the unit cabinet.
2. In coastal areas locate the unit on the side of the building away from the waterfront.

⚠ WARNING

Disconnect all power to the unit before starting maintenance. Failure to do so can cause electrical shock resulting in personal injury or death.

3. Shielding by a fence or shrubs may give some protection.
4. Elevate the unit off its slab or base enough to allow air circulation and avoid holding water against the base pan.
5. Frequent washing of the cabinet, fan blade and coil with fresh water will remove most of the salt or other contaminants that build up on the unit.
6. Regular cleaning and waxing of the cabinet with a good automobile polish will provide some protection.
7. Use a good liquid cleaner several times a year to remove matter that will not wash off with water.

Several different types of protective coatings are offered in some areas. These coatings may provide some benefit, but the effectiveness of such coating materials cannot be verified by the equipment manufacturer. The best protection is frequent cleaning, maintenance and minimal exposure to contaminants.

3.3 OUTSIDE INSTALLATION

⚠ WARNING

This unit is designed certified for outdoor installation only. Installation inside any part of a structure can result in inadequate unit performance as well as property damage. Installation inside can also cause recirculation of flue products into the conditioned space resulting in personal injury or death.

Typical outdoor installation in shown in Figure 3-2:
1. Select a location where external water drainage cannot collect around unit.
2. Locate unit where operating sounds will not disturb owner or neighbors.
3. The location of the unit should allow proper access for inspection and servicing.
4. Locate unit so roof runoff water does not pour directly on the unit. Provide gutter or other shielding at roof level. Do not locate unit in an area where excessive snow drifting may occur or accumulate.
5. Provide a concrete slab extending 3″ beyond all four sides of the unit. The slab should be sufficiently high enough above grade to prevent surface water from entering the unit. The slab should be isolated from the foundation wall.
6. Pitch the slab approximately 1/2″ so that the unit will be pitched toward the drain. See Figure 3-3.
7. It is essential that the unit be elevated above the base pad to allow for defrost water runoff, condensate drainage, and possible refreezing or condensate. Route condensation off the base pad to an area that will not become slippery and result in personal injury.
   Important: Do not interfere with opening in bottom of unit.
8. Where snowfall is anticipated, the height of the unit above the ground level must be considered. Mount unit high enough to be above average area snowfall to prevent snow from blocking the outdoor coil, to allow condensate runoff, and to allow combustion air to enter the combustion air inlet.

3.4 ATTACHING EXHAUST AND COMBUSTiON AIR INLET HOODS

IMPOPTANT: Do not operate this unit without the exhaust and combustion air inlet hood property installed. These hoods are shipped in a carton in the return air compartment inside the unit and must be attached the unit is installed. See Fig. 2-1.
To attach exhaust and combustion air inlet hood:
1. Remove 3 screws securing filter access panel and remove filter access panel. For location of filter access panel, see Fig.3-4.
2. Remove both exhaust and combustion air inlet hoods from their carton, located inside the return air compartment.
3. Attach filter access panel.
4, Attach the combustion air inlet hood and the exhaust hood with 4 and 6 screws as shown in Fig. 2-1. Screws are in parts bag shipped in the burner compartment.
5. Vent the unit using the flue exhaust hood, as supplied from the factory, without alteration addition. The only exception is with factory approved additions. Consult your local unity or other authority having jurisdiction for accepted venting techniques.

3.5 COVER PANEL INSTAILATiON / CONVERSION POCEDURE

All unit sizes have return and discharge openings for both horizontal and downflow configurations, and are factory shipped with all downflow duct openings covered, **HORIZONTAL** is factory shipped.

HORIZONTAL TO DOWNFLOW
1. Remove screws and covers from the supply and return bottom section.
2. Install gasket (supplied with parts bag) around perimeter of cover on the insulate side.
3. Secure covers to the side of the unit using existing screws and those supplied in the parts bag. See Fig. 3-4.
4. Seal duct covers with silicone caulk.

DOWNFLOW TO HORIZONTAL
1. Remove screws and covers from the supply and return bottom section.
2. Install gasket (factory shipped) around perimeter of cover on the insulate side.
3. Secure covers to the bottom of the unit using existing screws and those supplied in the parts bag. See Fig. 3-5.

⚠ WARNING

This unit must not be installed directly on wood flooring, Class A, Class B or Class C roof covering materials, or any other combustion structure except as specified in Fig.3-1. Failure to adhere to this warning can cause a fire or explosion resulting in property damage, personal injury or death.

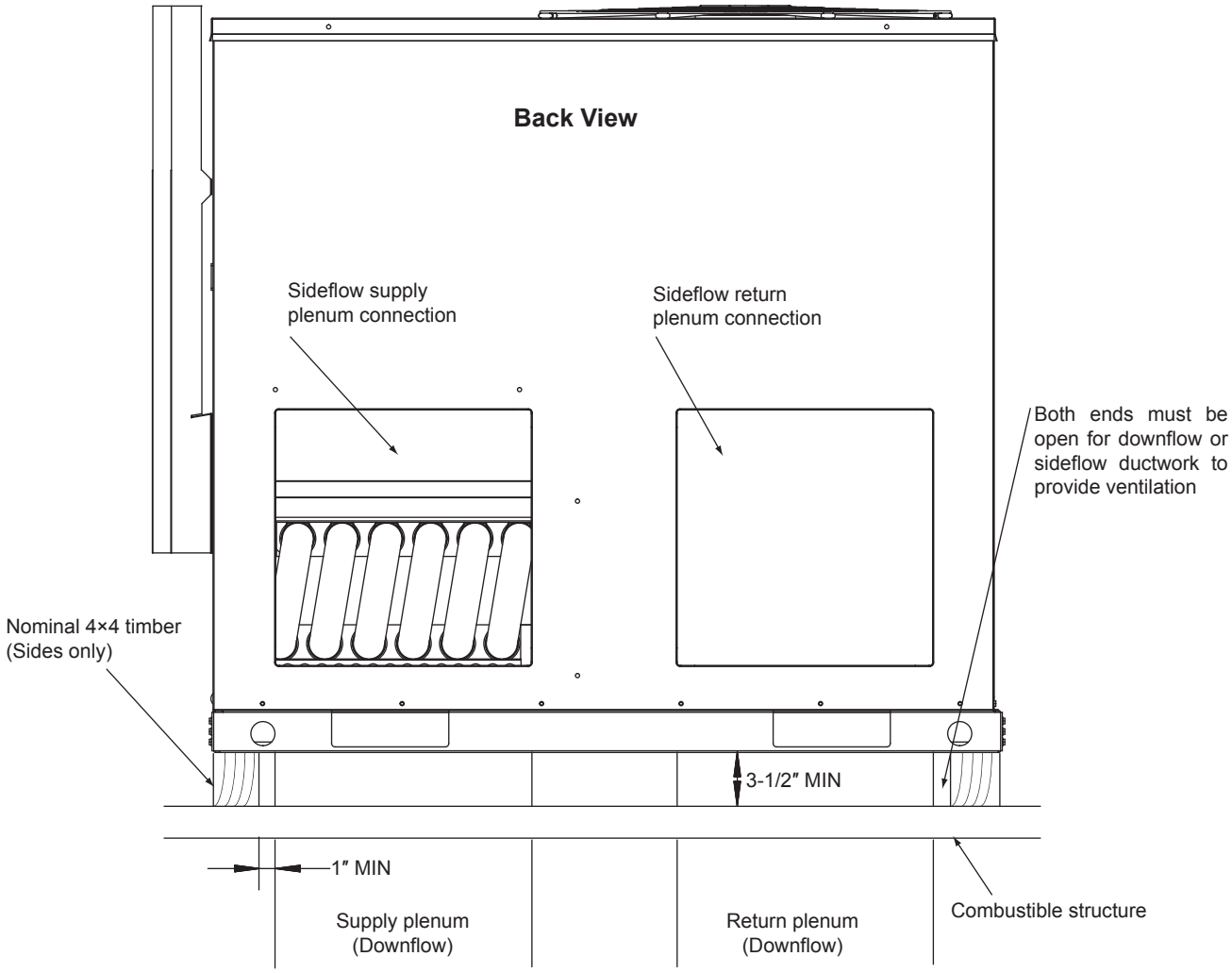


Fig. 3-1 Exception to non-combustible flooring requirement

3.6 CLEARANCE

All units require certain clearance for proper operation and service. Refer to Table 3-1 for the minimum clearances required for construction, servicing and proper unit operation.

Table 3-1: Unit Clearance

Direction	Distance (in.)	Direction	Distance (in.)
Top[1]	60	Right	24
Front	48	Left	12 [4]
Rear	18 [2]	Bottom[3]	0

Duct clearance: 1 inch clearance for all sides of air supply duct.

1. Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet.
2. The minimum clearance without economizer/fresh air damper. For distance with Economizer/fresh air damper, please refer to the relevant Install requirement.
3. Units may be installed on combustible floors made from wood or class A, B or C roof covering materials.
4. If Economizer/fresh air damper is used, a 24″ minimum clearance is required on left side of unit.

NOTE

For units applied with a roof curb, the minimum clearance may be reduced from 1 inch to 1/2 inch between combustible roof curb material and this supply air duct.

3.7 RIGGING AND HANDING

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation. Rig the unit by attaching chain or cable slings to the lifting holes provided in the base rails. Spreader bars, whose length exceeds the largest dimension across the unit, MUST be used across the top of the unit.

CAUTION

Before lifting, make sure the unit weight is distributed equally on the rigging cables so it will lift evenly.

Units may be moved or lifted with a forklift. Slotted openings in the base rails are provided for this purpose.

CAUTION

All panels must be secured in place when the unit is lifted. The condenser coils should be protected from rigging cable damage with plywood or other suitable material.

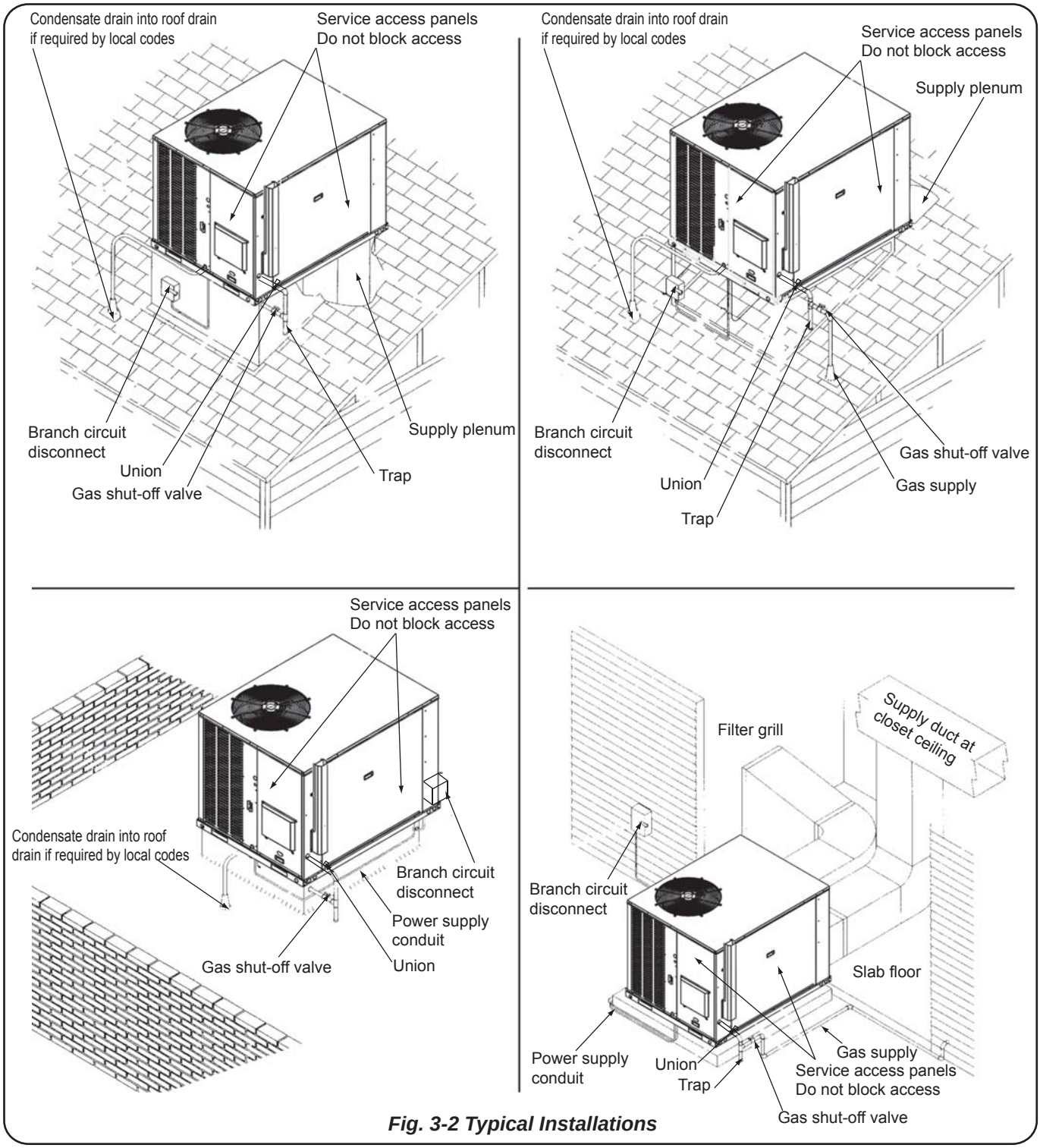


Fig. 3-2 Typical Installations

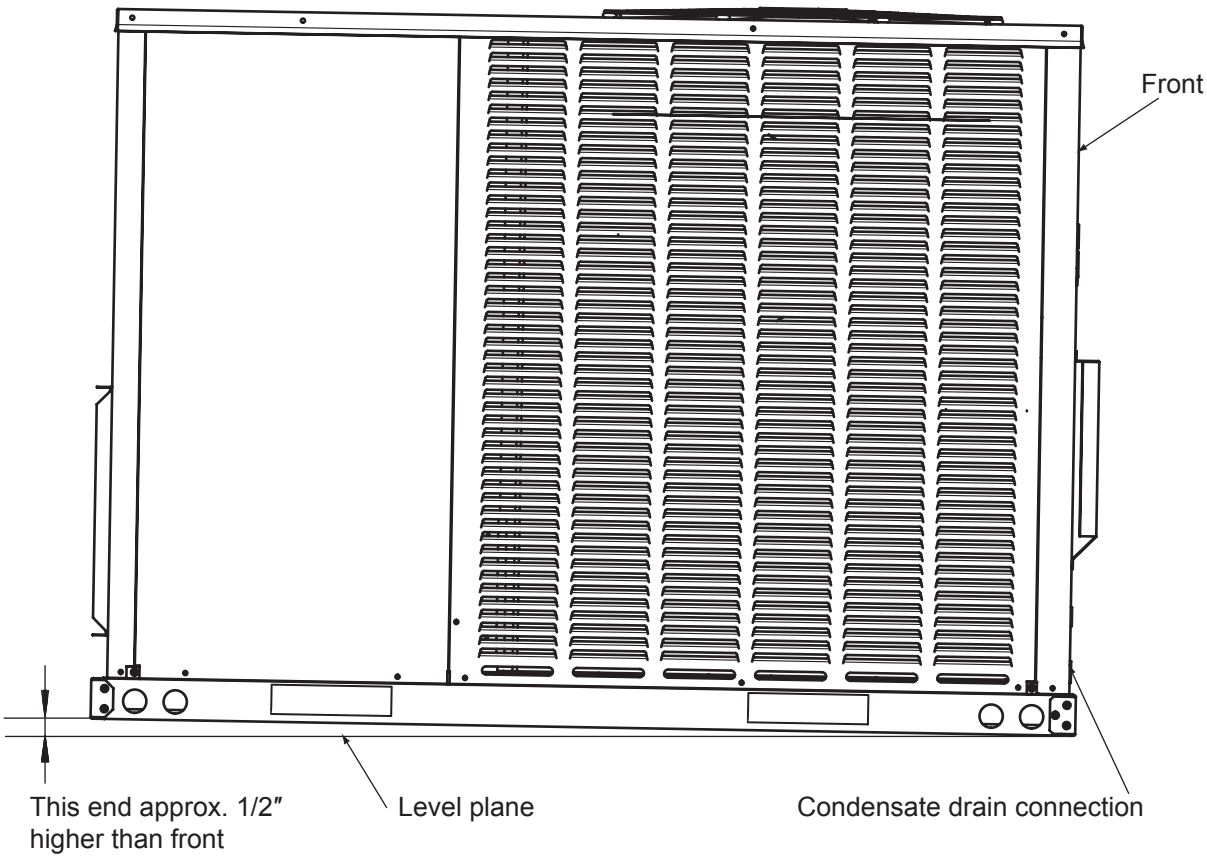


Fig. 3-3 Slab installation

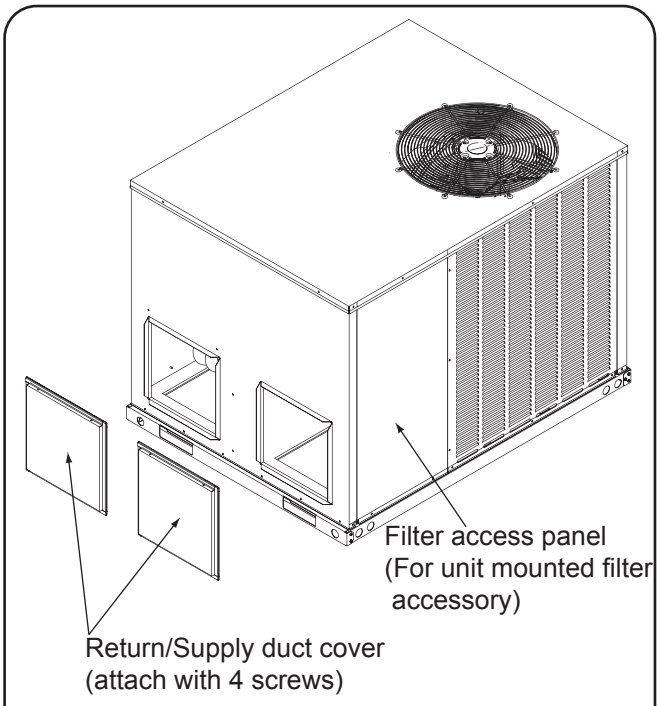


Fig. 3-4 Duct cover installation side mounting

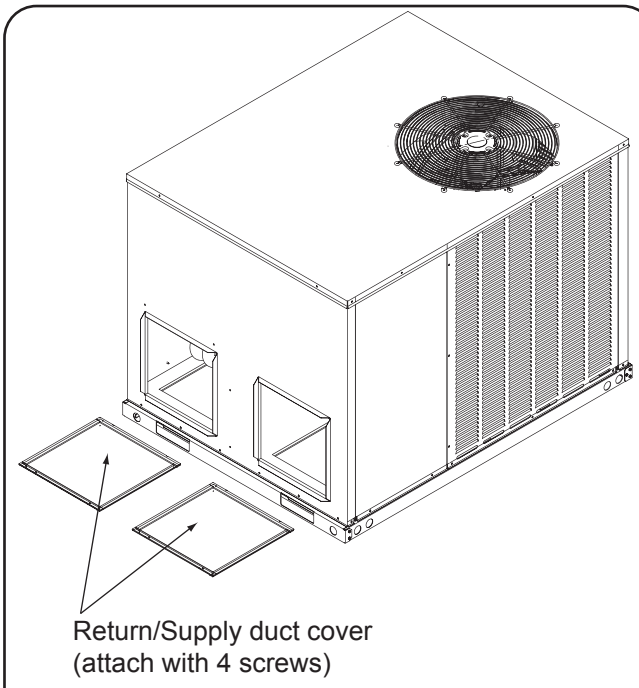
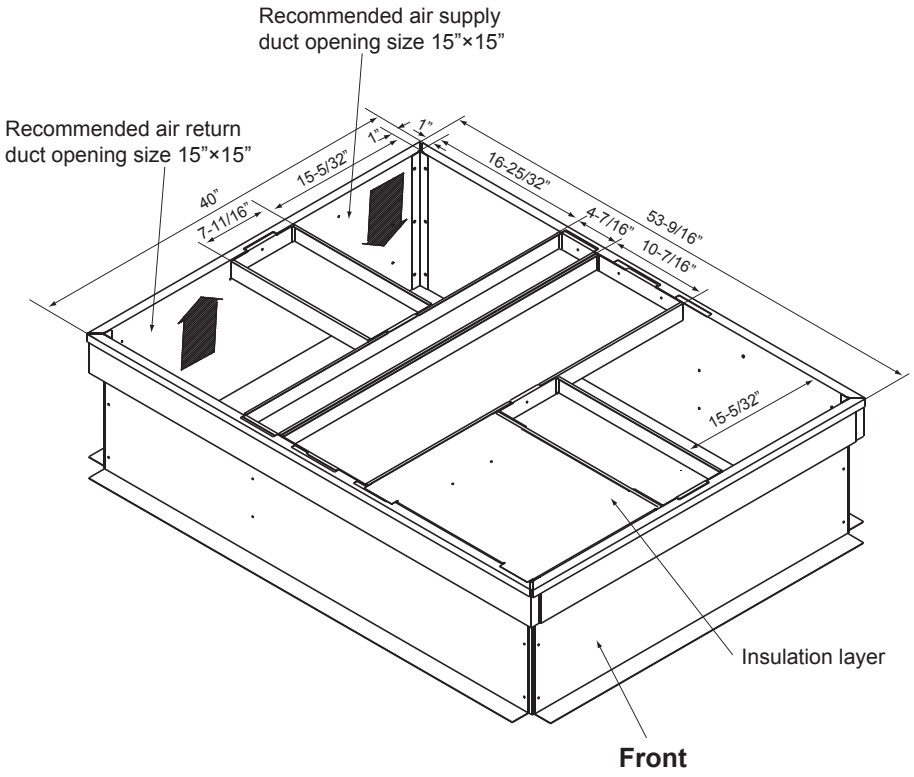


Fig. 3-5 Duct cover installation base pan mounting



Supply and return air (including duct support rails) shown are typical for bottom duct applications.
For location of horizontal duct applications (on back of unit), refer to unit dimension details.

Fig. 3-6 Roof Curb Dimension

* The above figures for reference purpose only.

NOTE

Be sure to note supply and return openings.
Refer to *Fig.3-6, 3-7* for information concerning rear and bottom supply and return air duct openings.

ROOF CURB

On applications when a roof curb is used, the unit must be positioned on the curb so the front of the unit is tight against the curb. (See *Fig. 3-6 ROOF CURB DIMENSION*)

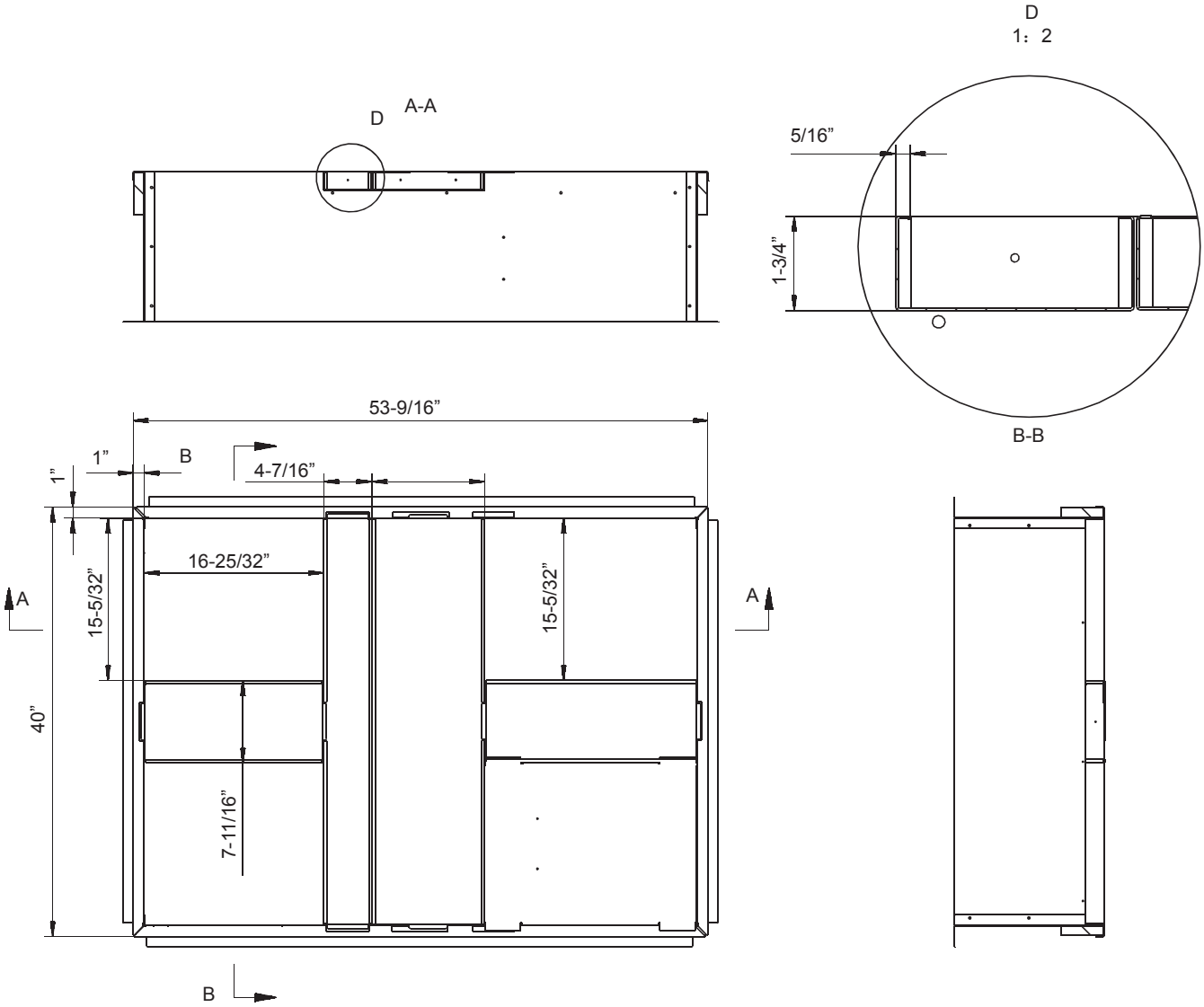


Fig.3-7 Roof Curb Details

3.8 DUCTWORK

Ductwork should be made and sized by installer and in accordance with Air Manual from Conditioning Contractors of America and local codes.

NOTE

On ductwork exposed to outside air conditioning space, use at least 2" of insulation and a vapor barrier. Flexible joint may be used to reduce noise.

These units are adaptable to horizontal use as well as rear supply and return air duct openings. To convert to downflow, use the steps is shown in 3.5.

A closed return duct system shall be used. This shall not preclude use of economizers or ventilation air intake. Flexible joints may be used in the supply and return duct work to minimize the transmission of noise.

CAUTION

When fastening duct work to the side duct flanges on the unit, insert the screws through the duct flanges only. DO NOT insert the screws through the casing. Outdoor duct work must be insulation and waterproofed.

NOTE

Be sure to note supply and return openings. Refer to Fig. 3 and 4 for information concerning rear and bottom supply and return air duct openings.

3.9 RETURN AIR

WARNING

Never allow products of combustion to the flue products to enter the return air ductwork, or the circulating air supply. All return ductwork must be adequately sealed and secured to the furnace with sheet metal screws, and joints taped. All other duct joints must be secured with approved connections and sealed airtight.
Failure to prevent products of combustion from being circulated into the living space can create potentially hazardous conditions, including carbon monoxide poisoning that could result in personal injury or death.

3.10 FILTERS

The installer must install field supplied filters in the return air duct. A field installed filter grille is recommended for easy and convenient access to the filters for periodic inspection and cleaning. Filters must have adequate face area for the rated air quantity of the unit. See air delivery tables for recommended filter size.

4.0 GAS SUPPLY, CONDENSATE DRAIN AND PIPING

4.1 GAS CONNECTION

IMPORTANT: Connect this unit only to gas supplied by a commercial utility.

1. Install gas piping in accordance with local codes and regulations of the local utility company. In the absence of local codes, the installation must conform to the specifications of the National Fuel Gas Code, ANSI Z223.1 - latest edition.
   NOTE: The use of flexible gas connectors is not permitted. If local codes allow the use of a corrugated stainless steel flexible gas appliance connector, always use a new listed connector. Do not use a connector which has previously serviced another gas appliance.
   NOTE: The Commonwealth of Massachusetts requires the gas shut-off valve to be a T-handle gas cock.
2. Connect the gas line to the gas pipe inlet opening provided into the 1/2″ inlet valve. See Fig. 4-1 for typical piping.
3. Size the gas line to the furnace adequate enough to prevent undue pressure drop and never less than 1/2″ nominal pipe size.
4. Install a drip leg or sediment trap in the gas supply line as close to the unit as possible.
5. Install an outside ground joint union to connect the gas supply to the control assembly at the burner tray, Unions may not be installed inside the unit.
6. Gas valves have been factory installed. Install a manual gas valve where local codes specify a shut-off valve outside the unit casting.
7. Make sure piping is tight. A pipe compound resistant to the action of liquefied petroleum gases must be used at all threaded pipe connections.
8. IMPORTANT: Any additions, changes or conversions required for the furnace to satisfactorily meet the application should be made by a qualified installer, service agency or the gas supplier, using factory-specified or approved parts. In the commonwealth of Massachusetts, installation must be performed by a licensed plumber or gas fitter for appropriate fuel.

IMPORTANT: Disconnect the furnace and its individual shutoff valve the gas supply piping during any pressure testing of that system at test pressures in excess of 1/2 psig or isolate the system from the gas supply piping system by closing its individual manual shutoff valve during any pressures equal to or less than 1/2 psig.

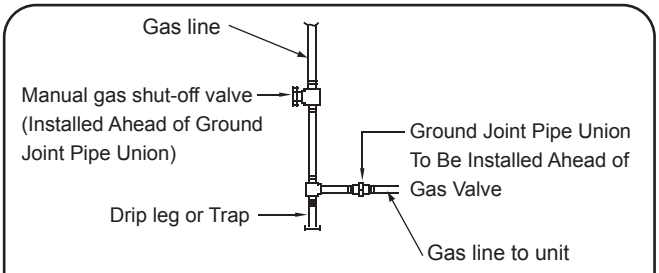


Fig. 4-1 Typical Gas Pipe Arrangement

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow the safety warnings exactly could result in serious injury, death of 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.

TO CHECK FOR GAS LEAKS, USE A SOAP AND WATER SOLUTION OR OTHER APPROVED METHOD. DO NOT USE AN OPEN FLAME.

IMPORTANT: Check the rating plate to make certain the appliance is equipped to burn the type of gas supplied. Care should be taken after installation of this equipment that the gas control valve not be subjected to high gas supply the pressure.
In making gas connections, avoid strains as they may cause noise and damage the controls. A backup wrench is required to be used on the valve to avoid damage.

The capacity of gas pipe of different diameters and lengths in CFH with pressure drop of 0.5 in. and specific gravity of 0.60 (natural gas) are shown in Table 4-1.

Table 4-1: Natural gas pipe capacity table (CFH - Cubic Feet of Gas Per Hour)

Nominal iron pipe size (in.)	Equivalent length of pipe (ft.)							
	10	20	30	40	50	60	70	80
1/2	132	92	73	63	56	50	46	43
3/4	278	190	152	130	115	105	96	90
1	520	350	285	245	215	195	180	170
1-1/4	1050	730	590	500	440	400	370	350
1-1/2	1600	1100	890	760	670	610	560	530

After determining the pipe length, select the pipe size which will provide the minimum cubic feet per hour required for the gas input rating of the furnace. By formula:

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

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

4.2 LP CONVERSION

WARNING

This unit is equipped at the factory for use on Natural Gas only. Conversion to LP Gas requires a special kit which is included with the unit. DO NOT BURN ANY LIQUID FUEL OR SOLID FUEL IN THIS UNIT. Burning any unapproved fuel will result in damage to this unit heat exchanger, which could result in fire, Carbon Monoxide poisoning, explosion, personal injury, property damage or death.

Convert the valve to use liquefied petroleum (LP) gas by replacing the pressure regulator spring with the conversion kit spring. This LP kit spring allows the regulator to maintain the proper manifold pressure for LP gas. The correct burner LP orifices are included in the kit.
NOTE: The LP conversion kit is included with the unit. **See Conversion Kit Index shipped with unit for proper LP kit number. Furnace conversion to LP gas must be performed by a qualified technician.**

Table 4-2: LP gas pipe capacity table (CFH - Cubic Feet of Gas Per Hour)

Nominal iron pipe size (in.)	Equivalent length of pipe (ft.)											
	10	20	30	40	50	60	70	80	90	100	125	150
1/2	275	189	152	129	114	103	96	89	83	78	69	63
3/4	567	393	315	267	237	217	196	182	173	162	146	132
1	1071	732	590	504	448	409	378	346	322	307	275	252
1-1/4	2205	1496	1212	1039	913	834	771	724	677	630	567	511
1-1/2	3307	2299	1858	1559	1417	1275	1181	1086	1023	976	866	787
2	6221	4331	3465	2992	2646	2394	2205	2047	1921	1811	1606	1496

Example (LP): Input BTU requirement of unit, 150000
Equivalent length of pipe, 60 ft. =3/4″ IPS r

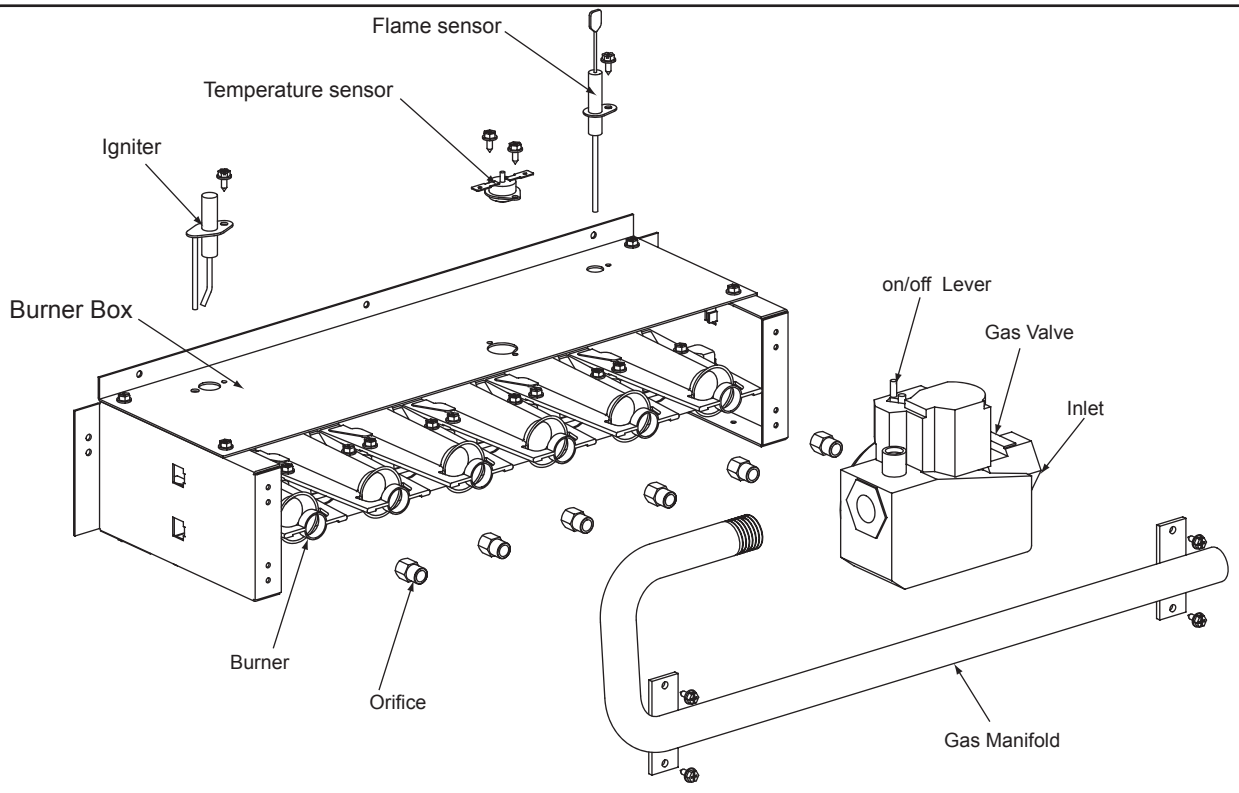


Fig. 4-2 Burner and Gas Valve Arrangement

4.3 ADJUSTING OR CHECKING FURNACE INPUT

- Natural Gas Inlet Pressure 5″ -10.5″ W.C.
- LP Gas Inlet Pressure 11″ -13″ W.C.
- Natural Gas Outlet Pressure 3.5″ W.C.
- LP Gas Outlet Pressure 10″ W.C.

Supply and manifold pressure taps are located on the gas valve body 1/8″ N.P.T.
Use a properly calibrated manometer gauge for accurate gas pressure readings.
Only small variations in the gas flow should be made by means of the pressure regulator adjustment. Furnaces functioning on LP gas must be set by means of the tank or branch supply regulators. The furnace outlet pressure should be set at 10″ W.C. at the gas control valve.
To adjust the pressure regulator, remove the regulator cap and turn the adjustment screw clockwise to increase pressure or counter-clockwise to decrease pressure. Then replace the regulator cap securely.
Any necessary major changes in the gas flow rate should be made by changing the size of the burner orifices. To change orifice spuds, shut off the manual main gas valve and remove the gas manifold.
For elevations up to 2000 feet, rating plate input rating apply. For high altitudes (elevations over 2000 feet), see conversion kit index for derating and orifice spud sizes.
Check of input is important to prevent over-firing of the furnace beyond its designated input, NEVER SET INPUT ABOVE THAT SHOWN ON THE RATING PLATE. Use the following formula to determine input rate.

$$\text{C.F.H. Required} = \frac{\text{Heating value of gas (BTU/Cubic Ft)} \times 3600}{\text{Time of Seconds (for 1 Cubic Ft.) of gas}}$$

Start the furnace and measure the time required to burn on cubic foot of gas. Prior to checking the furnace input, make certain that all other gas appliances are shut off, with the exception of pilot burners. Time the meter with only the furnace in operation.
IMPORTANT NOTE FOR ALL ALTITUDES ABOVE 2000 FEET: The main burner orifices in your furnace and in these kits are sized for the nameplate input and intended for installations at elevations up to 2000 feet in the USA or Canada, or for elevations of 2000-4500 feet in Canada if the unit has been derated at the factory. For elevations above 2000 feet **IN THE USA ONLY** (see ANSI-Z223.1), the burner orifices must be sized to reduce the input 4% for each 1000 feet above sea level.
NOTICE: Derating of the heating input for high altitude in the field is unlawful in Canada (refer to CAN/CGA 2.17). Units installed in altitudes greater than 2000 feet must be shipped from the factory or from a factory authorized conversion station with the heating input derated by 10% so as to operate properly in altitudes from 2000-4500 feet.

4.4 CONDENSATE DRAIN

The evaporator coil condensate drain ends with a threaded 3/4″ nominal PVC stub. A trap is built in for proper condensate drainage and to prevent debris from being drawn into the unit. Do not connect the drain to a closed sewer line. It is recommended that a PVC cement not be used so that the drain line can be easily cleaned in the future.
IMPORTANT: Do not install an external trap. Doing so can cause improper drainage of the condensate and result in flooding within the unit.

5.0 WIRING

5.1 POWER SUPPLY

⚠ WARNING

Turn off the main electrical power at the branch circuit disconnect closest to the unit before attempting any wiring. Failure to do so can cause electrical shock resulting in personal injury or death.

1. All wiring should be made in accordance with the National Electrical Code. Consult the local power company to determine the availability of sufficient power to operate the unit. Check the voltage at power supply to make sure it corresponds to the unit's rated voltage requirement. Install a branch circuit disconnect near the rooftop, in accordance with the N.E.C., C.E.C. or local codes.
2. It is important that proper electrical power is available at the unit. Voltage should not vary more than 10% from that stamped on the unit nameplate. On three phase units, phases must be balanced within 3%.
3. For branch circuit wiring (main power supply to unit disconnect), the minimum wire size for the length of run can be determined from Table 5-1 using the circuit ampacity found on the unit rating plate. Use the smallest wire size allowable in Table 5-1 from the disconnect to unit. The disconnect must be in sight and readily accessible of the unit.

Table 5-1: Branch circuit copper wire size (in.)

		Branch circuit ampacity							
		15	20	25	30	35	40	45	50
Supply wire length (Ft.)	200	6	4	4	4	3	3	2	2
	150	8	6	6	4	4	4	3	3
	100	10	8	8	6	6	6	4	4
	50	14	12	10	10	8	8	6	6

NOTES:
1. Wire size based on 60°C rated wire insulation and 30°C Ambient Temp.
2. For more than 3 conductors in a raceway or cable, see the N.E.C. for derating the ampacity of each conductor. When installed, the unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, **ANSI/NFPA 70**, if an external electrical source is utilized.

IMPORTANT: This unit is approved for use with copper conductors only connected to unit contactor. Warranty may be jeopardized if aluminum wire is connected to unit contactor.
Special instructions apply for power wiring aluminum conductors: Warranty is void if connections are not made per instructions.
Attach a length (6″ or more) of recommended size copper wire to the unit contactor terminals L1 and L3 for single phase.

Select the equivalent aluminum wire size from the tabulation below: Splice copper wire pigtails to aluminum wire with U.L. recognized connectors for copper-aluminum splices. Please exercise the follow ing instructions very carefully to obtain a positive and lasting connection:
1. Strip insulation from aluminum conductor.
2. Coat the stripped end of the aluminum wire with the recommended inhibitor, and wire brush the aluminum surface through inhibitor. INHIBITORS: Brundy-Pentex "A"; Alcoa-No. 2EJC; T & B-KPOR Shield.
3. Clean and recoat aluminum conductor with inhibitor.
4. Make the splice using the below listed wire nuts or split bolt connectors.
5. Coat the entire connection with inhibitor and wrap with electrical insulating tape.

AWG Copper Wire Size	AWG Aluminum Wire Size	Connector Type and Size (or equivalent)
#12	#10	T & B Wire Nut PT2
#10	#8	T & B Wire Nut PT3
#8	#6	Sherman Split Bolt TSP6
#6	#4	Sherman Split Bolt TSP4
#4	#2	Sherman Split Bolt TSP2

5.2 HOOK-UP

To wire unit, refer to the following Fig. 5-1.
Wiring to be done in the field between the unit and devices not attached to the unit, or between separate devices which are field installed and located, shall conform with the temperature limitation for Type T wire [63°F rise] when installed in accordance with the manufacturer's instructions.

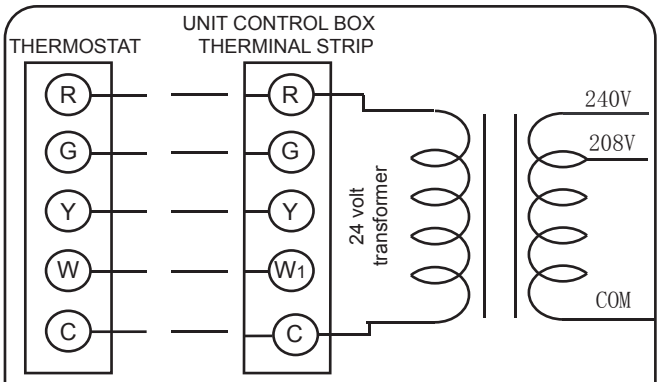


Fig. 5-1 Typical Field Control Wiring Diagram

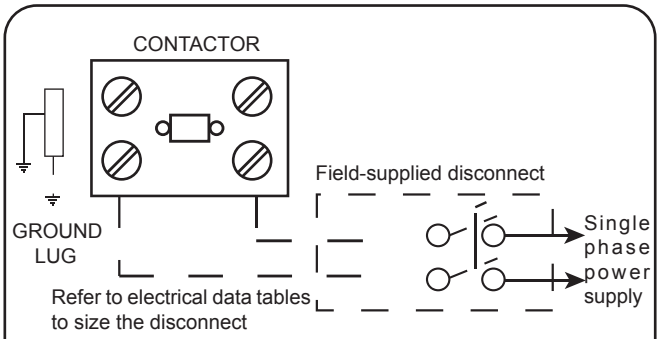


Fig. 6-2 Typical Field Power Wiring Diagram

5.3 INTERNAL WIRING

IMPORTANT: Some single phase units are equipped with a single pole contactor. Caution must be exercised when servicing as only one leg of the power supply is broken with the contactor.
Some models are equipped with an electronically commutated blower motor which is constantly energized unless the main unit disconnect is in the off position.
A diagram of the internal wiring of this unit is located under the electrical box cover and in this manual. If any of the original wire as supplied with the appliance must be replaced, the wire gauge and insulation must be the same as the original wiring.
Transformer is factory wired for 230 volt on 208/230 volt models and must be changed to 208 volt applications. See unit wiring diagram for 208 volt wiring.

5.4 THERMOSTAT

The room thermostat must be specifically designed to control package gas electric units.

6.0 FURNACE SECTION CONTROLS AND IGNITION SYSTEM

6.1 NORMAL FURNACE OPERATING SEQUENCE

This unit is equipped with an integrated direct spark ignition control.
1. The thermostat calls for gas heat.
2. The control board will run a self check to verify that the limit control and manual reset overtemperature control are closed and that the pressure switch is open. If so, the induced draft blower (inducer) begin a prepurge cycle.
3. The air proving negative pressure switch closes.
4. 15 seconds after the pressure switch closes, the gas valve opens and the spark is initiated for a 7 second trial for ignition.
5. Burners ignite and flame sensor proves all burners have lit.
6. The circulating air blower is energized after 45 seconds.
7. The control board enters a normal operation loop in which all safety controls are monitored continuously.
8. Thermostat is satisfied and opens.
9. The gas valve is de-energized and closes, shutting down the burner flame.
10. The control board will de-energized the inducer after a five second post purge.
11. The circulating air blower BLOWER-LOW is de-energized after max. 90 seconds.

- The integrated control board has a three times ignition system.
- After a total of 3 trials for ignition without sensing main burner flame, the system goes into lockout mode.
- After 1 hour, the ignition control repeats the prepurge and ignition cycles for 3 tries and then goes into lockout mode again.
- It continues this sequence of cycles and lockout each hour until ignition is successful or power is interupted.
- During the lockout mode, neither the spark ignition control or gas valve will be energized until the system is reset by turning the thermostat to the “OFF” position or interrupting the electrical power to the unit for 3 seconds or longer.
- The induced draft blower and main burner will shut off when the thermostat is satisfied.
- The circulating air blower will start and run on the heating speed if the thermostat fan switch is in the ”ON” position.

The integrated furnace control is equipped with diagnostic LED. The LED is lit continuously when there is power to the control without a call for heat. If the LED is not lit, there is either no power to the control or there is an internal component failure within the control, and the control should be replaced.
If the control detects the following failures, the LED will flash for designated failure detections.
2 Flash: Failed to detect or sustain flame,system locked out.
3 Flash: Pressure switch or induced draft blower problem detected.
4 Flash: High limit or auxiliary limit open.
5 Flash: Flame sensed and gas valve not energized or flame sensed with no “W” signal.
6 Flash: Overtemperature switch open.
7 Flash: Thermostat miswired; W1 and W2 swapped.
Slow flash rate:Normal,call for heat.

6.2 OPERATING INSTRUCTIONS

This appliance is equipped with a direct spark intermittent ignition device. This device lights the main burners each time the room thermostat (closes) calls for gas heat. See operating instructions on the back of the furnace/controls access panel.

⚠ WARNING

Do not attempt to manually light this furnace with a match or any open flame. Attempting to do so can cause an explosion or fire resulting in property damage, personal injury or death.

6.3 TO START THE FURNACE

1. Set the thermostat to its lowest setting.
2. Turn off all electric power to the appliance.
3. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
4. Remove control door.
5. Turn the gas valve to the “OFF” position.
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow B in the safety information on the Operating Instructions located on the back of the controls/access panel. If you don’t smell gas, go to the next step.
7. Turn the gas valve to the “ON” position.
8. Replace the control door.
9. Turn on all electric power to the appliance.
10. Set the thermostat to the desired setting.
11. If the appliance will not operate, follow the instructions below to shut down the furnace.

⚠ WARNING

The spark ignitor and ignition lead from the ignition control are high voltage. Keep hands or tools away to prevent electrical shock. Shut off electrical power before servicing any of the controls. Failure to adhere to this warning can result in personal injury or death.

The initial start-up on a new installation may require the control system to be energized in some time until any air has bled through the system and fuel gas is available at the burners.

6.4 TO SHUT DOWN FURNACE

1. Set the thermostat to the lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control door.
4. Move gas valve to the“OFF”position.
5. Replace control door.

⚠ WARNING

Should overheating occur or the gas supply fail to shut off. Shut off the Manual Gas valve to the appliance before shutting off the electrical supply. Failure to do so can result in an explosion or fire causing property damage, severe personal injury or death.

6.5 BURNERS

Burners for these units have been designed so that field adjustment is not required. Burners are tray-mounted and accessible for easy cleaning when required.

6.6 MANUAL RESET OVERTEMPERATURE CONTROL

A manual reset overtemperature control is located on the burner shield. This device senses blockage in the heat exchanger or insufficient combustion air. This shuts off the main burners if excessive temperatures occur in the burner compartment.
Operation of this control indicates an abnormal condition. Therefore, the unit should be examined by a qualified installer, service agency, or the gas supplier before being placed back into operation.

⚠ WARNING

DO NOT JUMPER THIS DEVICE! Do not reset the overtemperature control without taking corrective action to assure that an adequate supply of combustion air is maintained under all conditions of operation. Failure to do so can result in Carbon Monoxide poisoning or death. Replace this control only with the identical replacement part.

6.7 PRESSURE SWITCH

This furnace has a negative pressure switch for sensing a blocked exhaust or a failed induced draft blower. It is normally closed when the induced draft blower starts, indicating air flow through the combustion chamber.

6.8 LIMIT CONTROL

The supply air high temperature limit cut-off is set at the factory and cannot be adjusted. It is calibrated to prevent the air temperature leaving the furnace from exceeding the maximum outlet air temperature. **WARNING: DO NOT JUMPER THIS DEVICE! Replace this control only with the identical replacement part.**

7.0 SYSTEM OPERATING INFORMATION

7.1 ADVISE THE CUSTOMER

1. Keep the air filters clean. The heating system operates better, more efficiently and more economically.
2. Arrange the furniture and drapes so that the supply air registers and the return air grilles are unobstructed.
3. Close doors and windows. This reduces the heating load on the system.
4. Avoid excessive use of exhaust fans.
5. Do not permit the heat generated by television, lamps or radios to influence the thermostat operation.
6. Except for the mounting platform, keep all combustible articles three feet from the unit and exhaust system.
7. IMPORTANT: Replace all blower doors and compartment after servicing the unit. Do not operate the unit without all panels and doors securely in place.
8. Do not allow snow or other debris to accumulate in the vicinity of the appliance.

7.2 FURNACE SECTION MAINTENANCE

The unit’s furnace should operate for many years without excessive scale build-up in flue passageways; and it should have a qualified installer, service agency, or gas supplier annually inspect the flue passageways, the exhaust system and the burners for continued safe operation, paying particular attention to deterioration from corrosion or other sources.
If during inspection the flue passageways and exhaust system are determined to require cleaning, the following procedures should be followed (by a qualified installer, service agency, or gas supplier):
1. Turn off the electrical power to the unit and set the thermostat to the lowest temperature.
2. Shut off the gas supply to the unit either at the meter or at manual valve in the supply piping.

⚠ WARNING

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation resulting in fire ,electrical shock, property damage, personal injury or death.

3. Remove the furnace controls access panel and the control box cover.
4. Disconnect the gas supply piping from the gas valve.
5. Disconnect the wiring to the induced draft blower motor, gas valve, flame sensor, and flame roll-out control, and igniter cable. Mark all wires disconnected for proper reconnection.
6. Remove the screws (4) connecting the burner tray to the heat exchanger mounting panel.
7. Remove the burner tray and the manifold assembly from the unit.
8. Remove the screws (4) connecting the induced draft blower to the collector box and screws (16) connecting the collector box to the heat exchanger mounting panel. Remove the induced draft blower and the collector box from the unit.
9. Remove the turbulators from inside the heat exchangers by inserting the blade of a screwdriver under the locking tabs. Pop the tabs out of the expanded grooves of the heat exchanger. Slide the turbulators out of the heat exchangers.
10. Direct a water hose into the outlet of the heat exchanger top. Flush the inside of each heat exchanger tube with water. Blow out each tube with air to remove excessive moisture.
11. Reassemble (steps 1 through 10 in reverse order). **Be careful not to strip out the screw holes used to mount the collector box and inducer blower. Replace inducer blower gasket and collector box gasket with factory replacements if damaged.**

⚠ WARNING

Holes in the exhaust transition or heat exchanger can cause toxic fumes to enter the home. The exhaust transition or heat exchanger must be replaced if they have holes or cracks in them. Failure to do so can cause Carbon Monoxide poisoning resulting in personal injury or death.

The manufacturer recommends that a qualified installer, service agency or the gas suppler visually inspect the burner flames for the desired flame appearance at the beginning of the heating season and approximately midway in heating season.
The manufacturer also recommends that a qualified installer, service agency or the gas supplier clean the flame sensor with steel wool at the beginning of the heating season.

WARNING

Disconnect main electrical power to the unit before attempting maintenance. Failure to do so may result in electrical shock or severe personal injury or death.

7.3 LUBRICATION

IMPORTANT: DO NOT attempt to lubricate the bearings on the blower motor or the induced draft blower motor. Addition of lubricants can reduce the motor life and void the warranty.

The blower motor and induced draft blower motor are prelubricated by the manufacturer and do not require further attention.

A qualified installer, service agency or the gas supplier must periodically clean the motors to prevent the possibility of overheating due to an accumulation of dust and dirt on the windings or on the motor exterior. And, as suggested elsewhere in these instruct ions, the air filters should be kept clean because dirty filters can restrict air flow and the motor depends upon sufficient air flowing across and through it to prevent overheating.

7.4 COOLING SECTION MAINTENANCE

It is recommended that at the beginning of each cooling season a qualified installer or service agency inspect and clean the cooling section of this unit. The following areas should be addressed: evaporator coil, condenser coil, condenser fan motor and venturi area.

To inspect the evaporator coil:

1. Remove the filter access panel and the blower/evaporator coil access panel.

WARNING

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation resulting in fire ,electrical shock, property damage, personal injury or death.

2. Unplug the wires from the circulating air blower and the limit control. Remove the two screws and slide the blower out of the unit sideways.
3. Shine a flashlight on the evaporator coil (both sides) and inspect for accumulation of lint, insulation, etc.
4. If coil requires cleaning, follow the steps shown below.

Cleaning Condenser Coil

1. Remove screws from condenser fan grille assembly and lay grille over on the unit top panel.
2. Remove the controls access panel and the control box cover.
3. Disconnect the outdoor fan motor wiring from the compressor contactor and capacitor. Remove the strain relief in the bulkhead and pull the fan motor wires through. Set grille assembly to the side.
4. Remove the screws that secure the unit top to the unit. Remove the top and set the unit top to the side.
5. The coil should be cleaned when it is dry. If the coil is coated with dirt or lint, vacuum it with a soft brush attachment. Be careful not to bend the coil fins.
6. If the coil is coated with oil or grease, clean it with a mild detergent-and-water solution. Rinse the coil thoroughly with water. IMPORTANT: Do not use excessive water pressure. Excessive water pressure can bend the fins and tubing of the coil and lead to inadequate unit performance. Be careful not to splash water excessively into unit.
7. Go to next section for cleaning the evaporator coil.

Cleaning Evaporator Coil, Drain Pan, Condensate Drain, Condenser Fan, Circulation Air Blower and Venturi

1. Remove the screws from the filter access panel and the blower/evaporator coil access panel from the unit. Remove the filter access panel and the blower/evaporator coil access panel.
2. The coil should be cleaned when it is dry. If the coil is coated with dirt or lint, vacuum it with a soft brush attachment. Be careful not to bend the Coil fins.
3. If the coil is coated with oil or grease, clean it with a mild detergent-and-water solution. Rinse the coil thoroughly with water. IMPORTANT: Do not use excessive water pressure. Excessive water pressure can bend the tins and tubing of the coil and lead to inadequate unit performance. Be careful not to splash water excessively into unit.
4. Inspect the drain pan and condensate drain at the same time the evaporator coil is checked. Clean the drain pan by flushing with water and removing any matters of obstructions which may be present.
5. Flush the drain tube with water. If the drain tube is blocked, it can usually be cleared with high pressure water.
6. The venturi should also be inspected for items of obstruction such as collections of grass, dirt or spider webs. Remove any that are present.
7. Inspect the circulating air blower wheel and motor for accumulation of lint, dirt or other obstruction and clean if necessary. Inspect the blower motor mounts and the blower housing for loose mounts or other damage. Repair or replace it necessary.

Re-assembly

1. Place the condenser coil protective grille back on unit and replace all screws.
2. Place top panel back on unit and replace all screws.
3. Set condenser fan grille assembly on top of the unit with the fan on top and the motor wires on the venturi side. Run the fan motor wires through the bulkhead and pull wires through the hole on the bottom of the control box on the left side and into the control box. Reconnect fan motor wires per the wiring diagram attached to the back of the control box cover.
4. Replace wire strain relief in bulkhead after the slack is pulled out of the wires on the fan side. This will assure wires will not be damaged by the fan during unit operation.
5. Turn the condenser fan grille assembly over and into the recess in the unit top. Secure the grille to the unit with the four long #8 screws removed earlier.
6. Replace the circulating air blower, making sure that all wires are properly reconnected per the unit wiring diagram.
7. Replace the filter and blower/evaporator coil access panels.
8. Replace the control box cover and controls access panel.
9. Restore electrical power to the unit and check for proper operation, especially the condenser fan motor.

7.5 REPLACEMENT PARTS

Contact your local distributor for a complete parts list.

7.6 TROUBLE SHOOTING

Refer to Troubleshooting Chart included in this manual.

7.7 WIRING DIAGRAMS

Refer to the appropriate wiring diagram included in this manual.

7.8 CHARGING

Refer to the appropriate charge chart included in this manual.

7.9 BLOWER MOTOR SPEED TAPS

After determining necessary CFM and speed tap data, follow the steps below to change speeds.

1. Remove control door.
2. Please refer to the Table 10-1 & Table 10-2 and wiring diagram for the proper location of the wire on the speed tap block of the indoor blower motor to obtain the speed you have chosen.
3. After adjusting the wires accordingly,replace control door.

8.0 OPERATION

Most single phase units are equipped with Permanent Split Capacitor (PSC) motors (no start relay or start capacitor). It is important that such systems be off for a minimum of 5 minutes before restarting to allow equalization of pressures. Do not move the thermostat to cycle unit without waiting five minutes. To do so may cause the compressor to stop on an automatic open overload device or blow a fuse. Poor electrical service can cause nuisance tripping in overloads or blow fuses.

IMPORTANT: The compressor has an internal overload protector. Under some conditions, it can take up to 2 hours for this overload to reset. Make sure overload has had time to reset before condemning the compressor.

The control allows the blower to operate for up to 90 seconds after the thermostat is satisfied.

8.1 CONTROL SYSTEM OPERATION

1. Heating mode

The wall thermostat “calls for heat,” closing the R--to--W circuit. The furnace control performs a “NORMAL FURNACE OPERATING SEQUENCE”.

2. Cooling mode

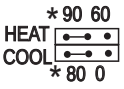
In the cooling mode, The thermostat closes the R-to-G-and-Y circuits. The thermostat will energize the compressor contactor and the indoor blower relay. the blower motor will operate on BLOWER-SINGLE/HI speed , After the thermostat is satisfied, the compressor is de-energized and the cool mode delay-to-fan-off period begins. After the delay-to-fan- off period ends, the circulator fan is de-energized. The indoor blower can be operated continuously by setting the thermostat fan switch at the “ON” position.

3. Fan mode

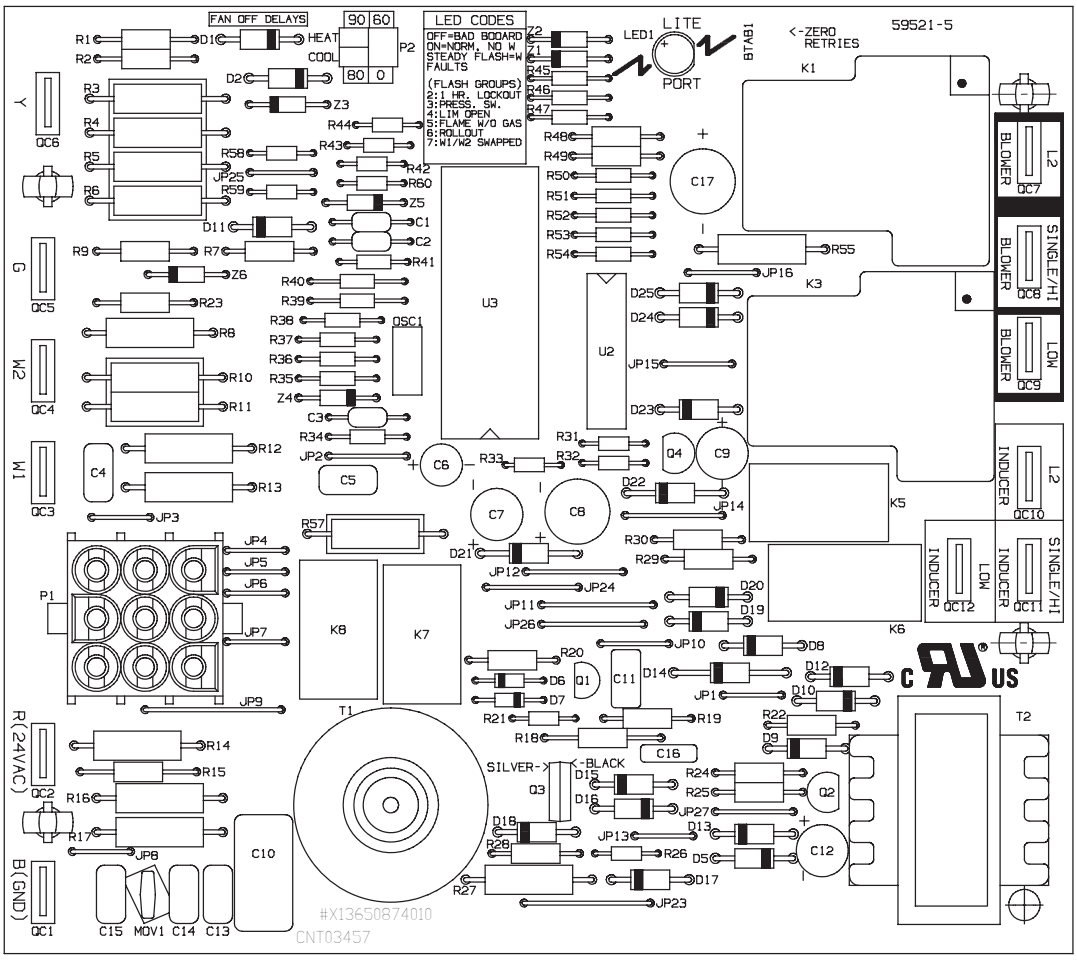
When the circuit R-to-G is closed by the thermostat, the blower motor will operate on BLOWER-LOW speed , If the thermostat fan switch is moved to the ON position, the circulator fan will be energized. When the fan switch is returned to the AUTO position, the circulator fan will be de-energized.

8.2 FAN DELAY ADJUSTMENT

As shipped, the circulator blower fan will remain on for 90 seconds after the gas valve closes. When a call for cooling occurs，the circulator fan comes on and remains on for 80 seconds after the call for cooling ends. During normal heating operation, the circulator fan will come on approximately 45 seconds after the gas valve opens.



*FACTORY SET



9.0 PHYSICAL DATA

Table 9-1: 14 SEER Physical Data

Component	Models			
	M4PG4024A1060AA	M4PG4030A1060AA	M4PG4036A1090AA	M4PG4042A1090AA
Nominal Tonnage	2.0	2.5	3.0	3.5
ARI COOLING PERFORMANCE				
Gross Capacity @ ARI A point (Btu)	23517	29521	36570	42570
ARI net capacity (Btu)	22800	28600	35000	41000
EER	11.0	11.0	11.0	11.0
SEER	14	14	14	14
Nominal CFM	850	1050	1300	1400
System power (kW)	2.07	2.60	3.18	3.73
Refrigerant type	R410a	R410a	R410a	R410a
Refrigerant charge (lb-oz)	3-12	4-1	4-7	6-12
GAS HEATING PERFORMANCE				
Heating input (Btu)	60000	60000	90000	90000
Heating output (Btu)	48600	48600	72900	72900
Temperature rise range (0F)	35-65	25-55	25-55	25-55
AFUE (%)	81	81	81	81
Steady state efficiency (%)	81	81	81	81
No. burners	3	3	4	4
No. stages	1	1	1	1
Gas connection pipe size (in.)	1/2	1/2	1/2	1/2
DIMENSIONS (Inches)				
Length	57-15/32	57-15/32	57-15/32	57-15/32
Width	44-5/8	44-5/8	44-5/8	44-5/8
Height	41-7/16	41-7/16	41-7/16	41-7/16
OPERATING WT. (lbs)	481	500	531	582
COMPRESSORS				
Type	Rotate	Rotate	Scroll	Scroll
Quantity	1	1	1	1
CONDENSER COIL DATA				
Face area (Sq. Ft)	17.7	17.7	17.7	17.7
Rows	1	1	1	1
Fin type	Microchannel condenser coil			
EVAPORATOR COIL DATA				
Face area (Sq. Ft)	4.35	6.53	6.53	8.7
Rows	3	3	3	3
Fins per inch	14	14	14	16
Tube diameter	3/8	3/8	3/8	5/16
Circuitry type	interlaced	interlaced	interlaced	interlaced
Refrigerant control	Orifice	Orifice	Orifice	Orifice
CONDENSER FAN DATA				
Fan diameter (inch)	22	22	22	22
Type	Prop	Prop	Prop	Prop
Drive type	Direct	Direct	Direct	Direct
No. speeds	1	1	1	1
Number of motors	1	1	1	1
Motor HP each	1/12	1/6	1/6	1/3
RPM	1075	845	845	1100
Nominal total CFM	2500	3000	3000	3000
DIRECT DRIVE EVAP FAN DATA				
Quantity	1	1	1	1
Fan Size (Inch)	10×8	10×8	11×8	11×8
Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal
No. speeds	4	4	4	4
Motor HP each	1/3	1/2	3/4	3/4
RPM	1075	1075	1075	1075
Motor frame size	48	48	48	48

Table 9-1: 14 SEER Physical Data (Continued)

Component	Models			
	M4PG4048A1090AA	M4PG4060B1090AA	M4PG4060B1130AA	
Nominal Tonnage	4.0	5.0	5.0	
ARI COOLING PERFORMANCE				
Gross Capacity @ ARI A point (Btu)	48911	58860	58860	
ARI net capacity (Btu)	47000	57000	57000	
EER	11.0	11.0	11.0	
SEER	14	14	14	
Nominal CFM	1600	1750	1750	
System power (kW)	4.36	5.18	5.18	
Refrigerant type	R410a	R410a	R410a	
Refrigerant charge (lb-oz)	7-1	5-6	5-6	
GAS HEATING PERFORMANCE				
Heating input (Btu)	90000	90000	130000	
Heating output (Btu)	72900	72900	105300	
Temperature rise range (0F)	25-55	25-55	35-65	
AFUE (%)	81	81	81	
Steady state efficiency (%)	81	81	81	
No. burners	4	4	6	
No. stages	1	1	1	
Gas connection pipe size (in.)	1/2	1/2	1/2	
DIMENSIONS (Inches)				
Length	57-15/32	57-15/32	57-15/32	
Width	44-5/8	44-5/8	44-5/8	
Height	41-7/16	41-7/16	41-7/16	
OPERATING WT. (lbs)	584	606	628	
COMPRESSORS				
Type	Scroll	Scroll	Scroll	
Quantity	1	1	1	
CONDENSER COIL DATA				
Face area (Sq. Ft)	17.7	17.7	17.7	
Rows	1	1	1	
Fin type	Microchannel condenser coil			
EVAPORATOR COIL DATA				
Face area (Sq. Ft)	8.7	8.7	8.7	
Rows	3	3	3	
Fins per inch	14	16	16	
Tube diameter	3/8	5/16	5/16	
Circuitry type	interlaced	interlaced	interlaced	
Refrigerant control	Orifice	Orifice	Orifice	
CONDENSER FAN DATA				
Fan diameter (inch)	22	22	22	
Type	Prop	Prop	Prop	
Drive type	Direct	Direct	Direct	
No. speeds	1	1	1	
Number of motors	1	1	1	
Motor HP each	1/3	1/3	1/3	
RPM	1100	1100	1100	
Nominal total CFM	3000	3680	3680	
DIRECT DRIVE EVAP FAN DATA				
Quantity	1	1	1	
Fan Size (Inch)	12×9	12×9	12×9	
Type	Centrifugal	Centrifugal	Centrifugal	
No. speeds	5	5	5	
Motor HP each	3/4	3/4	3/4	
RPM	1050	1050	1050	
Motor frame size	48	48	48	

10.0 AIRFLOW PERFORMANCE

Airflow performance data is based on cooling performance with a coil and no filter in place. Use this performance table for appropriate unit size, external static applied to unit and allow operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation.

Table 10-1 Indoor Airflow Performance - 230 Volts

Model	Motor Speed		External Static Pressure-Inches W.C.								
			0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
M4PG4024A1060AA 1/3HP PSC motor	Low	CFM	647	587							
		RPM	480	540							
		Watts	148	145							
		Amps	0.66	0.64							
	Middle-Low	CFM	906	848	794	737	681	621	555		
		RPM	650	700	740	780	830	870	910		
		Watts	246	240	234	227	219	212	204		
		Amps	1.08	1.05	1.02	0.99	0.95	0.92	0.89		
	Middle-High	CFM	1008	958	909	864	798	729	661		
		RPM	730	770	800	840	870	910	940		
		Watts	290	282	274	268	259	249	240		
		Amps	1.26	1.23	1.19	1.17	1.13	1.08	1.05		
	High	CFM				1038	983	910	828	747	651
		RPM				950	970	990	1010	1030	1050
		Watts				352	345	332	318	305	294
		Amps				1.54	1.51	1.46	1.4	1.35	1.3
M4PG4030A1060AA 1/2HP PSC motor	Low	CFM	917	859	806	753	694				
		RPM	664	714	768	807	853				
		Watts	254	249	243	236	229				
		Amps	1.11	1.09	1.06	1.03	0.99				
	Middle-Low	CFM	1190	1117	1049	980	910	835	752		
		RPM	869	893	921	945	968	991	1011		
		Watts	340	332	323	315	306	296	286		
		Amps	1.52	1.49	1.47	1.44	1.42	1.39	1.36		
	Middle-High	CFM	1306	1226	1153	1083	1005	926	839	738	
		RPM	938	959	977	996	1012	1029	1043	1058	
		Watts	426	416	406	396	386	375	364	352	
		Amps	1.94	1.91	1.89	1.86	1.83	1.8	1.77	1.74	
	High	CFM		1295	1217	1133	1055	974	884	793	689
		RPM		990	1005	1021	1035	1047	1060	1071	1082
		Watts		480	469	457	445	434	423	411	400
		Amps		2.23	2.2	2.17	2.13	2.1	2.07	2.04	2.01
M4PG4036A1090AA 3/4HP PSC motor	Low	CFM	1034	982	932	885	838				
		RPM	645	687	725	763	794				
		Watts	412	398	385	373	362				
		Amps	1.93	1.9	1.87	1.85	1.82				
	Middle-Low	CFM	1401	1339	1283	1223	1164	1100	1035	968	888
		RPM	864	879	900	919	936	953	969	982	1002
		Watts	458	449	439	429	419	409	399	388	375
		Amps	2.15	2.13	2.11	2.08	2.06	2.03	2.01	1.98	1.95
	Middle-High	CFM	1535	1465	1402	1343	1277	1216	1145	1072	996
		RPM	938	951	967	976	989	1002	1014	1025	1036
		Watts	551	544	528	517	506	495	483	470	459
		Amps	2.7	2.67	2.64	2.62	2.59	2.56	2.53	2.5	2.47
	High	CFM		1588	1516	1453	1383	1313	1249	1170	1087
		RPM		1014	1021	1030	1038	1046	1054	1062	1069
		Watts		674	659	648	636	623	611	598	583
		Amps		3.47	3.43	3.4	3.37	3.34	3.31	3.27	3.23

Table 10-1 Indoor Airflow Performance - 230 Volts (Continued)

Model	Motor Speed		External Static Pressure-Inches W.C.								
			0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
M4PG4042A1090AA 3/4HP PSC motor	Low	CFM	988	946							
		RPM	600	645							
		Watts	427	414							
		Amps	2	1.9							
	Middle-Low	CFM	1390	1339	1286	1234	1179	1125	1064	1000	
		RPM	826	855	873	897	914	933	950	971	
		Watts	479	463	454	446	436	425	414	403	
		Amps	2.2	2.1	2.1	2.1	2.1	2	2	2	
	Middle-High	CFM	1544	1485	1435	1380	1322	1256	1189	1124	1045
		RPM	913	927	944	959	963	974	990	1004	1015
		Watts	578	566	556	539	529	514	502	491	476
		Amps	2.7	2.7	2.6	2.6	2.6	2.5	2.5	2.5	2.4
	High	CFM	1683	1628	1564	1494	1433	1370	1307	1227	1151
		RPM	993	999	1010	1022	1031	1041	1050	1057	1066
		Watts	710	701	684	675	656	645	633	615	601
		Amps	3.5	3.4	3.4	3.4	3.3	3.3	3.3	3.2	3.2
M4PG4048A1090AA 3/4HP X13 DC motor	Low	CFM	1450	1403	1355	1296	1254	1212	1163		
		RPM	770	804	834	863	891	915	936		
		Watts	320	331	343	351	362	373	377		
		Amps	2.4	2.47	2.53	2.59	2.66	2.73	2.76		
	Middle-1	CFM	1564	1514	1466	1420	1372	1332	1289	1251	1210
		RPM	833	856	884	912	940	965	985	1008	1030
		Watts	396	403	417	429	443	453	459	470	481
		Amps	2.87	2.91	3.01	3.1	3.19	3.27	3.31	3.37	3.44
	Middle-2	CFM	1640	1594	1548	1505	1452	1415	1376	1338	1302
		RPM	871	901	925	950	978	1003	1021	1042	1060
		Watts	457	470	483	495	510	520	527	538	546
		Amps	3.28	3.36	3.45	3.54	3.62	3.69	3.73	3.8	3.87
	Middle-3	CFM	1790	1744	1704	1661	1621	1578	1535	1482	1427
		RPM	953	975	997	1020	1042	1068	1091	1101	1114
		Watts	599	612	625	637	650	661	672	670	657
		Amps	4.22	4.32	4.4	4.49	4.57	4.64	4.71	4.69	4.63
	High	CFM	1876	1843	1792	1751	1711	1647	1582	1521	1458
		RPM	996	1019	1046	1064	1083	1098	1111	1118	1124
		Watts	706	715	734	744	751	745	729	712	691
		Amps	4.89	4.98	5.09	5.16	5.22	5.18	5.05	4.94	4.83
M4PG4060B1090AA M4PG4060B1130AA 3/4HP DM2XFS DC motor	Low	CFM	1553	1493	1436	1382	1329	1270	1206		
		RPM	857	882	913	941	965	991	1018		
		Watts	263	272	282	292	302	313	318		
		Amps	1.91	1.97	2.04	2.11	2.18	2.26	2.29		
	Middle-1	CFM	1673	1620	1555	1507	1454	1392	1339	1273	1208
		RPM	924	944	968	992	1014	1041	1064	1082	1101
		Watts	333	346	356	364	372	381	389	396	400
		Amps	2.39	2.47	2.54	2.6	2.65	2.71	2.76	2.81	2.84
	Middle-2	CFM	1771	1720	1659	1602	1555	1493	1434	1377	1312
		RPM	983	1005	1018	1035	1060	1078	1105	1119	1142
		Watts	417	426	434	444	446	453	457	461	466
		Amps	2.96	3.02	3.08	3.12	3.14	3.19	3.22	3.25	3.28
	Middle-3	CFM	1923	1872	1817	1758	1704	1656	1601	1545	1492
		RPM	1062	1074	1093	1112	1128	1143	1163	1186	1204
		Watts	563	569	575	581	587	594	597	599	608
		Amps	3.92	3.96	3.99	4.03	4.07	4.11	4.14	4.15	4.21
	High	CFM	2033	1975	1919	1870	1814	1763	1715	1655	1601
		RPM	1113	1118	1142	1161	1175	1188	1208	1222	1241
		Watts	664	675	682	688	694	702	712	719	729
		Amps	4.59	4.66	4.7	4.74	4.78	4.83	4.89	4.93	5

* The above airflow data for reference only.

Table 10-2 Motor Speed from factory

Model	Cooling		Gas Heat		Blow er Size	Motor HP	Temperature rise range (℉)
	Usable Motor Speed	Motor Speed from factory	Usable Motor Speed	Motor Speed from factory			
M4PG4024A1060AA	All	Middle-Low	Middle-Low Middle-High High	Middle-Low	10×8	1/3	35-65
M4PG4030A1060AA	All	Middle-Low	Low Middle-Low Middle-High	Low	10×8	1/2	25-55
M4PG4036A1090AA	All	Middle-Low	Middle-Low Middle-High High	Middle-Low	11×8	3/4	25-55
M4PG4042A1090AA	All	Middle-Low	Middle-Low Middle-High High	Middle-Low	11×8	3/4	25-55
M4PG4048A1090AA	All	Middle-2	Low Middle-1 Middle-2	Middle-1	12×9	3/4	25-55
M4PG4060B1090AA	All	Middle-3	Low Middle-1 Middle-2	Middle-1	12×9	3/4	25-55
M4PG4060B1130AA	All	Middle-3	Middle-2 Middle-3 High	High	12×9	3/4	35-65

- The air distribution system has the greatest effect on airflow. The duct system is totally controlled by the contractor. For this reason, the contractor should use only industry-recognized procedures.
- Each ton of cooling requires between 350 and 450 cubic feet of air per minute (CFM), or 400 CFM nominally.
- Duct design and construction should be carefully done. System performance can be lowered dramatically through bad planning or workmanship.
- Air supply diffusers must be selected and located carefully. They must be sized and positoined to deliver treated air along the perimerter of the space. If they are too small for their intended airflow, they become noisy. If they are not located properly, they cause drafts. Return air grilles must be properly sized to carry air back to the blower. If they are too small, they also cause noise.
- The installers should balance the air distribution system to ensure proper quiet airflow to all rooms in the home. This ensures a comfortable living space.
- An air velocity meter or airflow hood can give a reading of system CFM.
- When installation, installer should select the air speed according to the actual setting static pressure. Please refer to the *Table 10-1 & Table 10-2*.

Table 10-3 Refrigerant charge for 24K A/C system

24K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement												
		Outdoor Ambient Temperature(°F)/Temperature Amdiante Exterieure(en F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)												
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig) 165			269	288	307	326	349	371	393	414	435	456	476
	161			269	288	307	326	349	371	393	414	434	454	474
	157			267	286	305	324	347	369	391	412	432	452	472
	153		245	265	284	303	322	345	367	389	410	430	450	470
	149		243	263	282	301	320	343	365	387	408	428	448	468
	145		241	261	280	299	318	341	363	385	406	426	446	466
	141	220	239	259	278	297	316	339	361	383	404	424	444	464
	137	218	237	257	276	295	314	337	359	381	402	422	442	462
	133	216	235	255	274	293	312	335	357	379	400	420	440	460
	129	214	233	253	272	291	310	333	355	377	398	418	438	458
	125	212	231	251	270	289	308	331	353	375	396	416	436	456
	121	210	229	249	268	287	306	329	351	373	394	414	434	454
	117	208	227	247	266	285	304	327	349	371	392	412	432	452
	113	206	225	245	264	283	302	325	347	369	390	410	430	450
	109	204	223	243	262	281	300	323	345	367	388	408	428	448
	105	202	221	241	260	279	298	321	343	365	386	406	426	446

Table 10-4 Refrigerant charge for 30K A/C system

30K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement												
		Outdoor Ambient Temperature(°F)/Temperature Amdiante Exterieure(en F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)												
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig) 165			269	290	310	331	350	370	390	411	432	453	474
	161			269	290	310	331	350	370	390	411	431	452	472
	157			267	288	308	329	348	368	388	409	429	450	470
	153		245	265	286	306	327	346	366	386	407	427	448	468
	149		243	263	284	304	325	344	364	384	405	425	446	466
	145		241	261	282	302	323	342	362	382	403	423	444	464
	141	219	239	259	280	300	321	340	360	380	401	421	442	462
	137	217	237	257	278	298	319	338	358	378	399	419	440	460
	133	215	235	255	276	296	317	336	356	376	397	417	438	458
	129	213	233	253	274	294	315	334	354	374	395	415	436	456
	125	211	231	251	272	292	313	332	352	372	393	413	434	454
	121	209	229	249	270	290	311	330	350	370	391	411	432	452
	117	207	227	247	268	288	309	328	348	368	389	409	430	450
	113	205	225	245	266	286	307	326	346	366	387	407	428	448
	109	203	223	243	264	284	305	324	344	364	385	405	426	446
	105	201	221	241	262	282	303	322	342	362	383	403	424	444

Table 10-5 Refrigerant charge for 36K A/C system

36K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement												
		Outdoor Ambient Temperature(°F)/Temperature Amdiante Exterieure(en F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)												
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig) 165			273	294	314	335	359	383	407	430	453	475	498
	161			273	294	314	335	359	383	407	429	452	474	496
	157			271	292	312	333	357	381	405	427	450	472	494
	153		249	269	290	310	331	355	379	403	425	448	470	492
	149		247	267	288	308	329	353	377	401	423	446	468	490
	145		245	265	286	306	327	351	375	399	421	444	466	488
	141	223	243	263	284	304	325	349	373	397	419	442	464	486
	137	221	241	261	282	302	323	347	371	395	417	440	462	484
	133	219	239	259	280	300	321	345	369	393	415	438	460	482
	129	217	237	257	278	298	319	343	367	391	413	436	458	480
	125	215	235	255	276	296	317	341	365	389	411	434	456	478
	121	213	233	253	274	294	315	339	363	387	409	432	454	476
	117	211	231	251	272	292	313	337	361	385	407	430	452	474
	113	209	229	249	270	290	311	335	359	383	405	428	450	472
	109	207	227	247	268	288	309	333	357	381	403	426	448	470
	105	205	225	245	266	286	307	331	355	379	401	424	446	468

Table 10-6 Refrigerant charge for 42K A/C system

42K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement												
		Outdoor Ambient Temperature(°F)/Temperature Amdiante Exterieure(en F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig)	High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)												
	165			265	284	303	323	347	371	395	417	440	462	484
	161			265	284	303	323	347	371	395	417	439	460	482
	157			263	282	301	321	345	369	393	415	437	458	480
	153		241	261	280	299	319	343	367	391	413	435	456	478
	149		239	259	278	297	317	341	365	389	411	433	454	476
	145		237	257	276	295	315	339	363	387	409	431	452	474
	141	216	235	255	274	293	313	337	361	385	407	429	450	472
	137	214	233	253	272	291	311	335	359	383	405	427	448	470
	133	212	231	251	270	289	309	333	357	381	403	425	446	468
	129	210	229	249	268	287	307	331	355	379	401	423	444	466
	125	208	227	247	266	285	305	329	353	377	399	421	442	464
	121	206	225	245	264	283	303	327	351	375	397	419	440	462
	117	204	223	243	262	281	301	325	349	373	395	417	438	460
	113	202	221	241	260	279	299	323	347	371	393	415	436	458
	109	200	219	239	258	277	297	321	345	369	391	413	434	456
	105	198	217	237	256	275	295	319	343	367	389	411	432	454

Table 10-7 Refrigerant charge for 48K A/C system

48K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement												
		Outdoor Ambient Temperature(°F)/Temperature Amdiante Exterieure(en F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig)	High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)												
	165			277	299	320	342	364	387	410	434	457	481	505
	161			277	299	320	342	364	387	410	433	456	480	503
	157			275	297	318	340	362	385	408	431	454	478	501
	153		252	273	295	316	338	360	383	406	429	452	476	499
	149		250	271	293	314	336	358	381	404	427	450	474	497
	145		248	269	291	312	334	356	379	402	425	448	472	495
	141	224	246	267	289	310	332	354	377	400	423	446	470	493
	137	222	244	265	287	308	330	352	375	398	421	444	468	491
	133	220	242	263	285	306	328	350	373	396	419	442	466	489
	129	218	240	261	283	304	326	348	371	394	417	440	464	487
	125	216	238	259	281	302	324	346	369	392	415	438	462	485
	121	214	236	257	279	300	322	344	367	390	413	436	460	483
	117	212	234	255	277	298	320	342	365	388	411	434	458	481
	113	210	232	253	275	296	318	340	363	386	409	432	456	479
	109	208	230	251	273	294	316	338	361	384	407	430	454	477
	105	206	228	249	271	292	314	336	359	382	405	428	452	475

Table 10-8 Refrigerant charge for 60K A/C system

60K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement												
		Outdoor Ambient Temperature(°F)/Temperature Amdiante Exterieure(en F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig)	High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)												
	165			289	311	334	357	379	400	431	457	482	508	533
	161			287	309	332	355	377	398	430	455	479	505	530
	157			285	307	330	353	375	396	428	453	478	503	528
	153		260	283	305	328	351	373	394	426	451	476	501	526
	149		258	281	303	326	349	371	392	424	449	474	499	524
	145		256	279	301	324	347	369	390	422	447	472	497	522
	141	232	254	277	299	322	345	367	388	420	445	470	495	520
	137	230	252	275	297	320	343	365	386	418	443	468	493	518
	133	228	250	273	295	318	341	363	384	416	441	466	491	516
	129	226	248	271	293	316	339	361	382	414	439	464	489	514
	125	224	246	269	291	314	337	359	380	412	437	462	487	512
	121	222	244	267	289	312	335	357	378	410	435	460	485	510
	117	220	242	265	287	310	333	355	376	408	433	458	483	508
	113	218	240	263	285	308	331	353	374	406	431	456	481	506
	109	216	238	261	283	306	329	351	372	404	429	454	479	504
	105	214	236	259	281	304	327	349	370	402	427	452	477	502

11.0 TROUBLE SHOOTING

WARNING

Components trouble shooting requires opening control box with power on. Use extreme care while working on this condition. Check nameplate and this instruction when making wire connections.

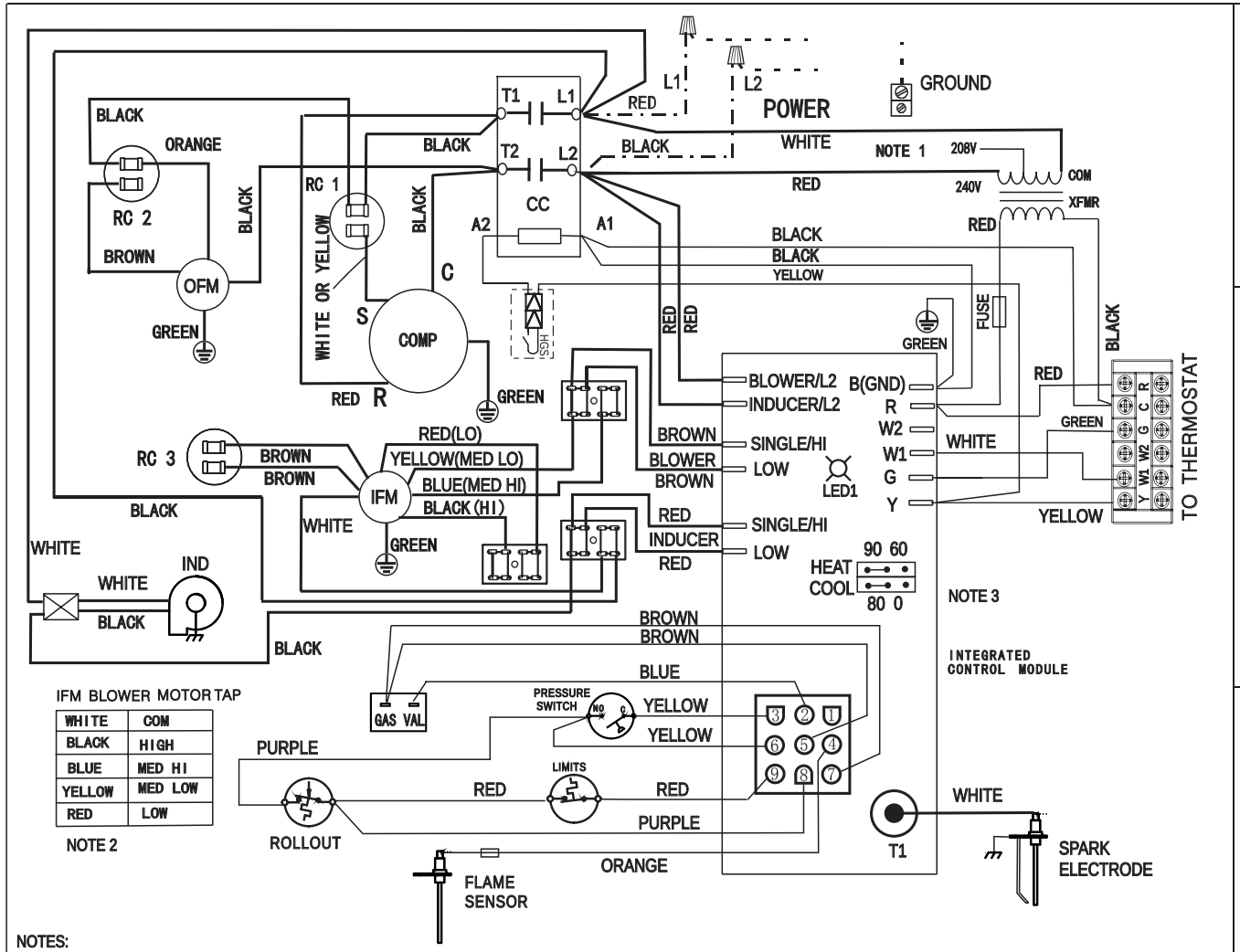
Table 11-1 Trouble shooting chart

SYMPTOM	POSSIBLE CAUSE	REMEDY
Unit will not run	Power off or loose electrical connection	Check for correct voltage at compressor contactor in control box
	Thermostat out of calibration-set too high	Reset
	Failed contactor	Check for 24 volts at contactor coil - replace if contacts are open
	Blown fuses	Replace fuses
	Transformer defective	Check wiring - replace transformer
	Interconnecting low voltage wiring damaged	Replace thermostat wiring
Condenser fan runs, compressor doesn't	Run or start capacitor failed (single phase only)	Replace
	Loose connection	Check for correct voltage at compressor - check & tighten all connection
	Compressor stuck, grounded or open motor winding open internal overload	Wait at least 2 hours for overload to reset. If still open, replace the compressor.
	Low voltage condition	Determine cause and correct. At compressor terminals, voltages must be within 10% of rating plate volts when unit is operating.
Insufficient cooling	Improperly sized unit	Recalculate load
	Improper airflow	Check - should be approximately 400 CFM per ton.
	Incorrect refrigerant charge	Charge per procedure attached to unit service panel.
	Air, non-condensible or moisture in system	Recover refrigerant, evacuate & recharge, add filter drier
	Incorrect voltage	Determine cause and correct. At compressor terminals, voltages must be within 10% of rating plate volts when unit is operating.
Compressor short cycles	Incorrect voltage	At compressor terminals, voltage must be ±10% or nameplate marking when unit is operating.
	Defective overload protector	Replace - check for correct voltage
	Refrigerant undercharge	Add refrigerant

Table 11-1 Trouble shooting chart (Continued)

SYMPTOM	POSSIBLE CAUSE	REMEDY
Compressor operates continuously	Dirty air filter	Replace filter
	Unit undersized for load	Decrease load or increase unit size
	Thermostat temperature set too low	Reset thermostat
	Low refrigerant charge	Locate leak, repair, and recharge
	Air in system	Recover refrigerant, evacuate system, and recharge
	Outdoor coil dirty or restricted	Clean coil or remove restriction
Registers sweat	Low evaporator airflow	Increase speed of blower or reduce restriction - replace air filter
High head-low vapor pressure	Restriction in liquid line, expansion device or filter drier	Remove or replace defective component
	Flow check piston size too small	Change to correct size piston
	Incorrect capillary tubes	Change coil assembly
	TXV does not open	Replace TXV
High head-high or normal vapor pressure - Cooling mode	Dirty condenser coil	Clean coil
	Refrigerant overcharge	Correct system charge
	Condenser fan not running	Repair or replace
	Air or non-condensible in system	Recover refrigerant, evacuate & recharge
Low head-high vapor pressures	Defective compressor valves	Replace compressor
	Incorrect capillary tubes	Replace coil assembly
Low vapor - cool compressor - iced evaporator coil	Low evaporator airflow	Increase speed of blower or reduce restriction - replace air filter
	Operating below 65°F outdoors	Add Low Ambient Kit
	Moisture in system	Recover refrigerant - evacuate & recharge - add filter drier
High vapor pressure	Excessive load	Recheck load calculation
	Defective compressor	Replace
Fluctuating head & vapor pressure	TXV hunting	Check TXV bulb clamp - check air distribution on coil - replace TXV
	Air or non-condensible in system	Recover refrigerant - evacuate & recharge
Gurgle or pulsing noise at expansion device or liquid line	Air or non-condensible in system	Recover refrigerant - evacuate & recharge
Circulating air blower & inducer run continuously, compressor will not start	Manual reset overtemperature control tripped	Reset or replace
	Wire loose in limit circuit	Check wiring
Burners will not ignite	Water in gas line	Drain. Install drip leg.
	No power to furnace	Check power supply fuses, wiring or circuit breaker.
	No 24 volts power supply to control circuit	Check transformer.
	Miswired or loose connections	Check all wiring and wire nut connections
	Misaligned spark electrodes	Check flame ignition and sense electrode positioning. Adjust as necessary.
	No gas at main burners	Check gas line for air. Purge as necessary. NOTE: After purging gas line of air, wait at least 5 minutes for any gas to dissipate before attempting to light unit.
		Check gas valve.
Inadequate heating	Dirty air filter	Clean or replace filter as necessary
	Gas input to furnace too low	Check gas pressure at manifold with that on unit nameplate
	Unit undersized for application	Replace with proper unit or add additional unit
	Restricted airflow	Clean or replace filter, remove any restriction
	Limit switch cycles main burners	Check rotation of blower, temperature rise of unit. Adjust as necessary
Poor flame characteristics	Incomplete combustion results in: Aldehyde odors, carbon monoxide, sooting flame, floating flame	Tighten all screws around burner compartment
		Cracked heat exchanger. Replace as necessary.
		Unit over-fired. Reduce input (change orifices or adjust gas line or manifold pressure).
		Check burner alignment
		Inspect heat exchanger for blockage. Clean as necessary.
Both condenser fan and compressor startup and shutdown frequently (about three minutes per cycle)	Abnormal high discharge pressure caused the high pressure switch act	Reference to the remedy of 'High head-high or normal vapor pressure-cooling mode'.

Wiring Diagram (For M4PG4024A1060AA & M4PG4036A1090AA & M4PG4042A1090AA)



NOTES:
1: Remove the red lead from "240V" terminal and then connect the red lead to "208V" terminal on the transformer for 208 volts.
2: Please refer to installation instruction for the proper wire to obtain the speed you have chosen.
3:Fan off delay jump.

CC	COMPRESSOR CONTACTOR
COMP	COMPRESSOR
OFM	OUTDOOR FAN MOTOR
RC 1	COMPRESSOR RUN CAPACITOR
RC 2	OUTDOOR FAN MOTOR RUN CAPACITOR
RC 3	INDOOR FAN MOTOR RUN CAPACITOR
RV	REVERSING VALVE
GND	GROUND CHASSIS
IFM	INDOOR FAN MOTOR
IND	INDUCED DRAFT BLOWER
XFMR	TRANSFORMER
FUSE	T3. 15A/250V

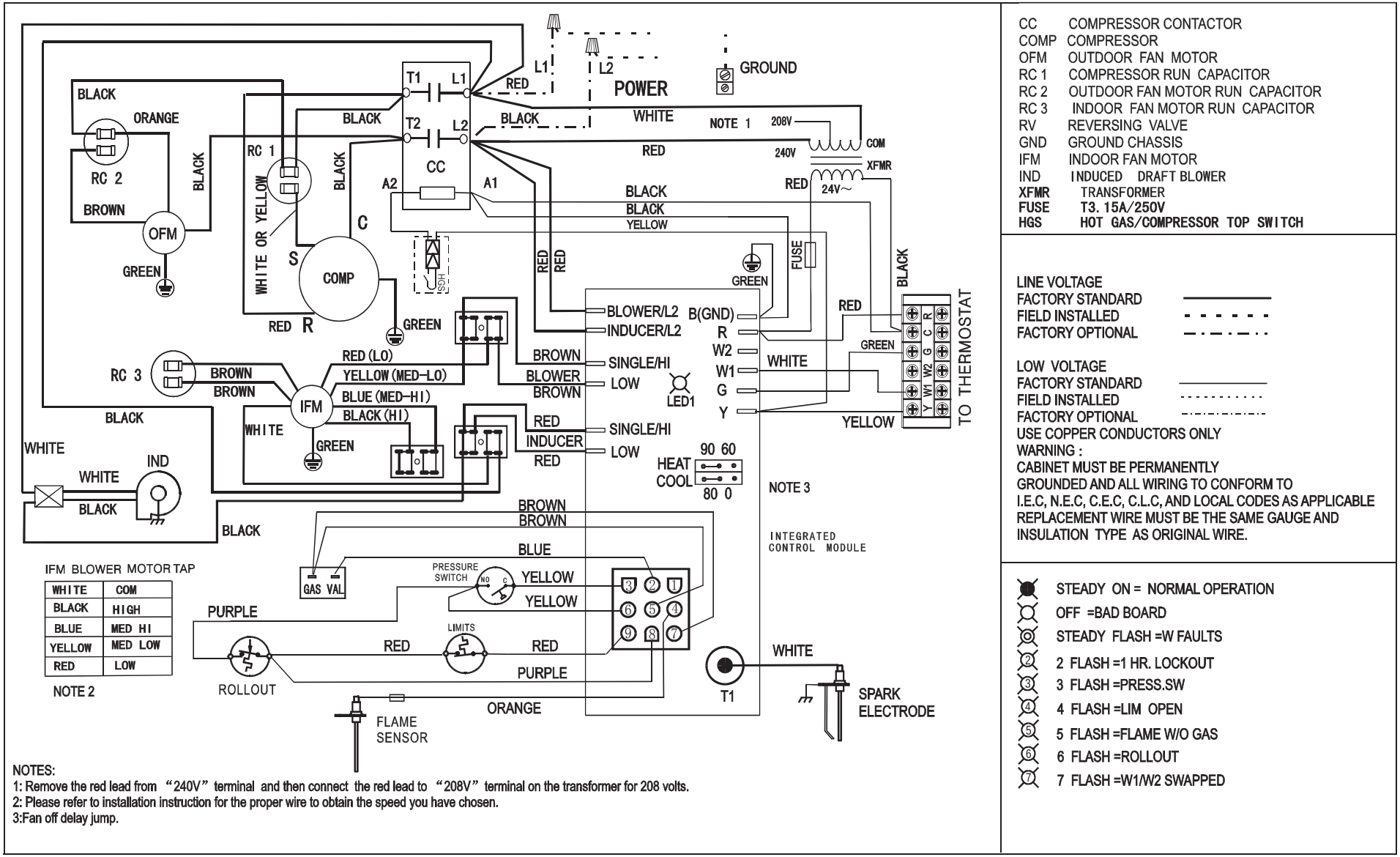
LINE VOLTAGE
FACTORY STANDARD ——————
FIELD INSTALLED - - - - - -
FACTORY OPTIONAL — · — · — ·

LOW VOLTAGE
FACTORY STANDARD ——————
FIELD INSTALLED - - - - - - - - - - -
FACTORY OPTIONAL — · — · — · — · —

USE COPPER CONDUCTORS ONLY
WARNING :
CABINET MUST BE PERMANENTLY GROUNDED AND ALL WIRING TO CONFORM TO I.E.C, N.E.C, C.E.C, C.L.C, AND LOCAL CODES AS APPLICABLE
REPLACEMENT WIRE MUST BE THE SAME GAUGE AND INSULATION TYPE AS ORIGINAL WIRE.

- STEADY ON = NORMAL OPERATION
- OFF =BAD BOARD
- STEADY FLASH =W FAULTS
- 2 FLASH =1 HR. LOCKOUT
- 3 FLASH =PRESS.SW
- 4 FLASH =LIM OPEN
- 5 FLASH =FLAME W/O GAS
- 6 FLASH =ROLLOUT
- 7 FLASH =W1/W2 SWAPPED

Wiring Diagram (M4PG4030A1060AA)



NOTES:
1: Remove the red lead from "240V" terminal and then connect the red lead to "208V" terminal on the transformer for 208 volts.
2: Please refer to installation instruction for the proper wire to obtain the speed you have chosen.
3:Fan off delay jump.

CC	COMPRESSOR CONTACTOR
COMP	COMPRESSOR
OFM	OUTDOOR FAN MOTOR
RC 1	COMPRESSOR RUN CAPACITOR
RC 2	OUTDOOR FAN MOTOR RUN CAPACITOR
RC 3	INDOOR FAN MOTOR RUN CAPACITOR
RV	REVERSING VALVE
GND	GROUND CHASSIS
IFM	INDOOR FAN MOTOR
IND	INDUCED DRAFT BLOWER
XFMR	TRANSFORMER
FUSE	T3. 15A/250V
HGS	HOT GAS/COMPRESSOR TOP SWITCH

LINE VOLTAGE
FACTORY STANDARD
FIELD INSTALLED
FACTORY OPTIONAL

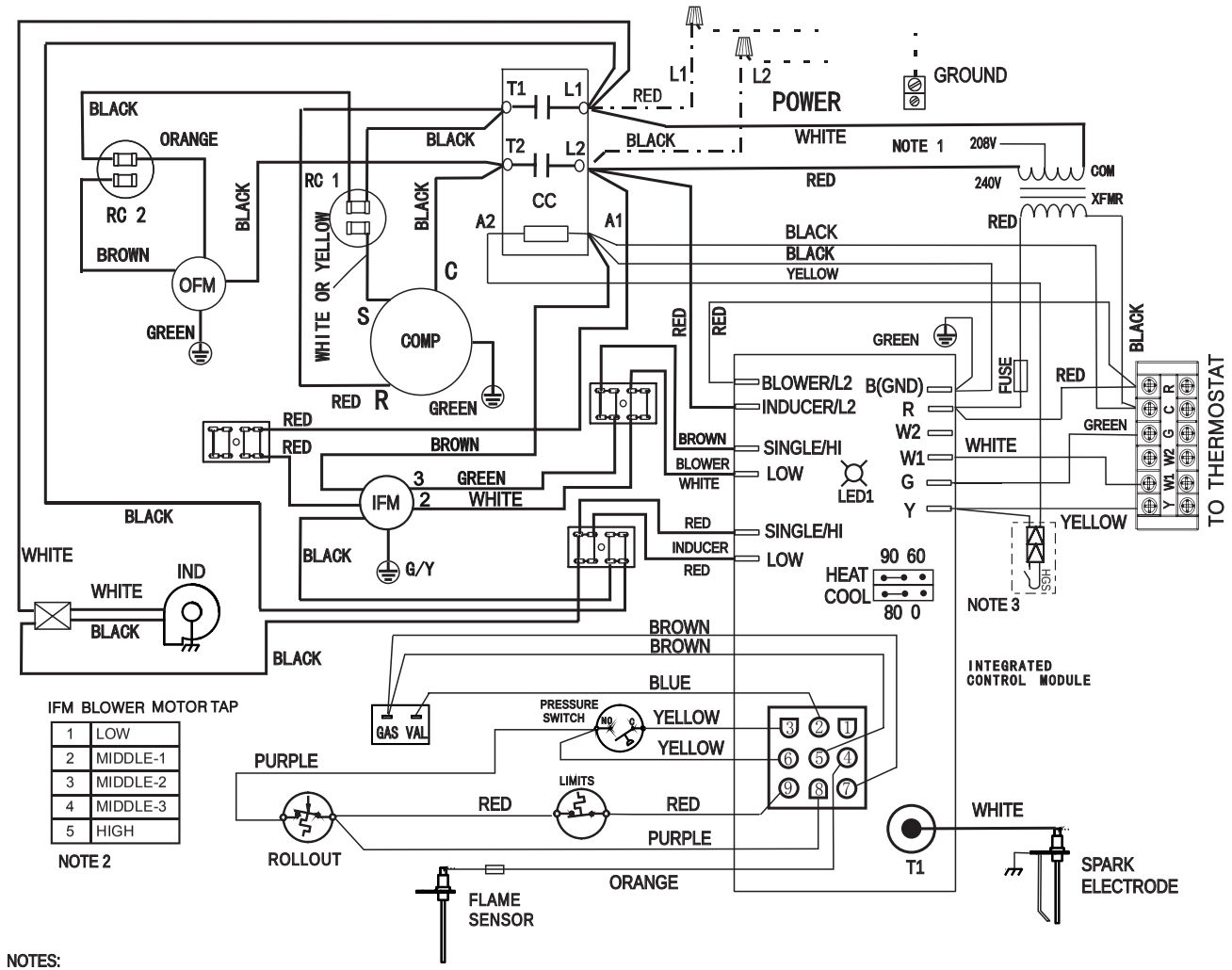
LOW VOLTAGE
FACTORY STANDARD
FIELD INSTALLED
FACTORY OPTIONAL

USE COPPER CONDUCTORS ONLY

WARNING :
CABINET MUST BE PERMANENTLY GROUNDED AND ALL WIRING TO CONFORM TO I.E.C, N.E.C, C.E.C, C.L.C, AND LOCAL CODES AS APPLICABLE REPLACEMENT WIRE MUST BE THE SAME GAUGE AND INSULATION TYPE AS ORIGINAL WIRE.

- STEADY ON = NORMAL OPERATION
- OFF =BAD BOARD
- STEADY FLASH =W FAULTS
- 2 FLASH =1 HR. LOCKOUT
- 3 FLASH =PRESS.SW
- 4 FLASH =LIM OPEN
- 5 FLASH =FLAME W/O GAS
- 6 FLASH =ROLLOUT
- 7 FLASH =W1/W2 SWAPPED

Wiring Diagram (For M4PG4048A1090AA)



NOTES:
1: Remove the red lead from "240V" terminal and then connect the red lead to "208V" terminal on the transformer for 208 volts.
2: Please refer to installation instruction for the proper wire to obtain the speed you have chosen.
3:Fan off delay jump.

CC	COMPRESSOR CONTACTOR
COMP	COMPRESSOR
OFM	OUTDOOR FAN MOTOR
RC 1	COMPRESSOR RUN CAPACITOR
RC 2	OUTDOOR FAN MOTOR RUN CAPACITOR
RC 3	INDOOR FAN MOTOR RUN CAPACITOR
RV	REVERSING VALVE
GND	GROUND CHASSIS
IFM	INDOOR FAN MOTOR
IND	INDUCED DRAFT BLOWER
XFMR	TRANSFORMER
FUSE	T3. 15A/250V

LINE VOLTAGE
FACTORY STANDARD
FIELD INSTALLED
FACTORY OPTIONAL

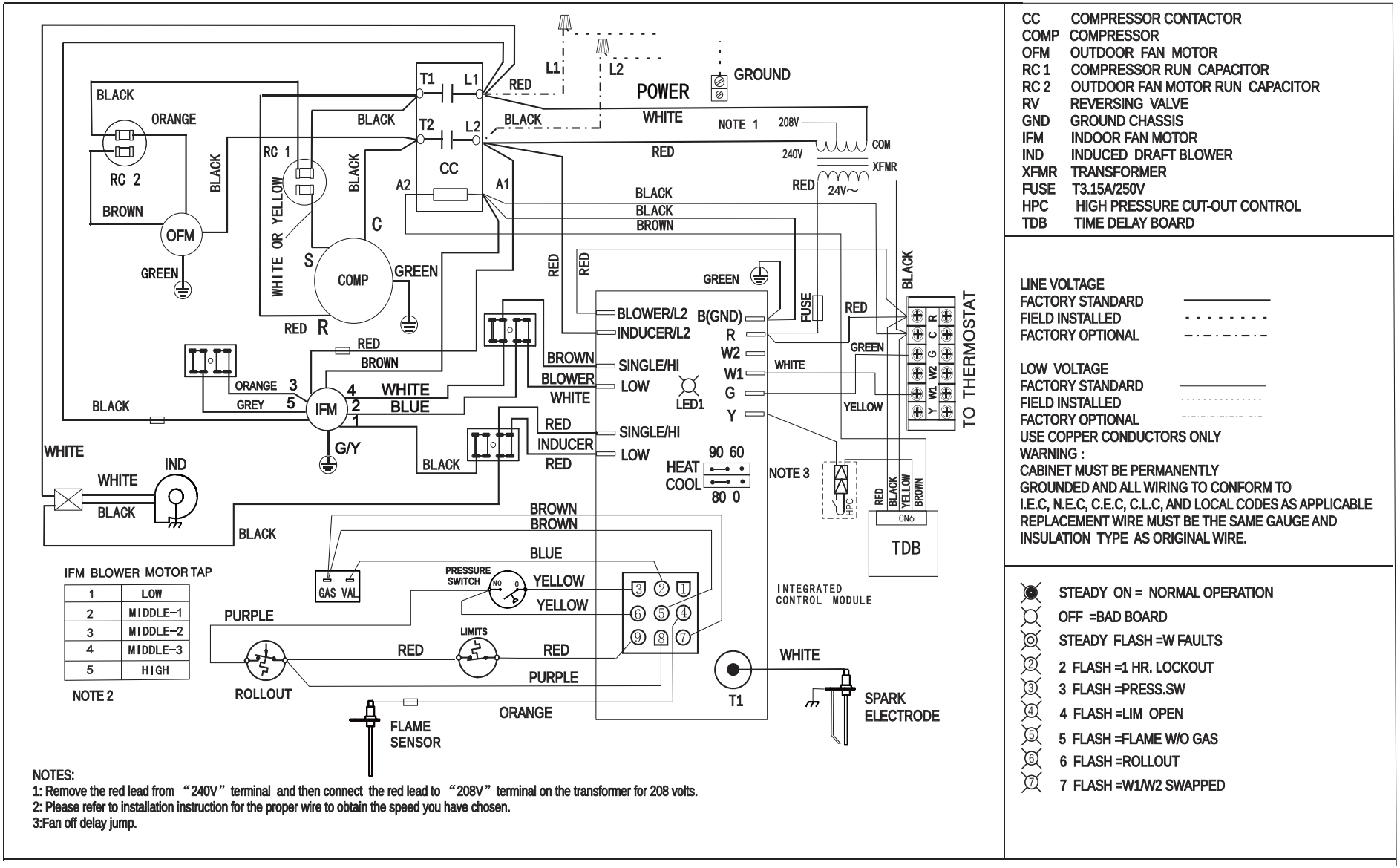
LOW VOLTAGE
FACTORY STANDARD
FIELD INSTALLED
FACTORY OPTIONAL

USE COPPER CONDUCTORS ONLY

WARNING :
CABINET MUST BE PERMANENTLY GROUNDED AND ALL WIRING TO CONFORM TO I.E.C, N.E.C, C.E.C, C.L.C, AND LOCAL CODES AS APPLICABLE
REPLACEMENT WIRE MUST BE THE SAME GAUGE AND INSULATION TYPE AS ORIGINAL WIRE.

- STEADY ON = NORMAL OPERATION
- OFF =BAD BOARD
- STEADY FLASH =W FAULTS
- 2 FLASH =1 HR. LOCKOUT
- 3 FLASH =PRESS.SW
- 4 FLASH =LIM OPEN
- 5 FLASH =FLAME W/O GAS
- 6 FLASH =ROLLOUT
- 7 FLASH =W1/W2 SWAPPED

Wiring Diagram (For M4PG4060B1090AA)



NOTES:
1: Remove the red lead from "240V" terminal and then connect the red lead to "208V" terminal on the transformer for 208 volts.
2: Please refer to installation instruction for the proper wire to obtain the speed you have chosen.
3:Fan off delay jump.

CC	COMPRESSOR CONTACTOR
COMP	COMPRESSOR
OFM	OUTDOOR FAN MOTOR
RC 1	COMPRESSOR RUN CAPACITOR
RC 2	OUTDOOR FAN MOTOR RUN CAPACITOR
RV	REVERSING VALVE
GND	GROUND CHASSIS
IFM	INDOOR FAN MOTOR
IND	INDUCED DRAFT BLOWER
XFMR	TRANSFORMER
FUSE	T3.15A/250V
HPC	HIGH PRESSURE CUT-OUT CONTROL
TDB	TIME DELAY BOARD

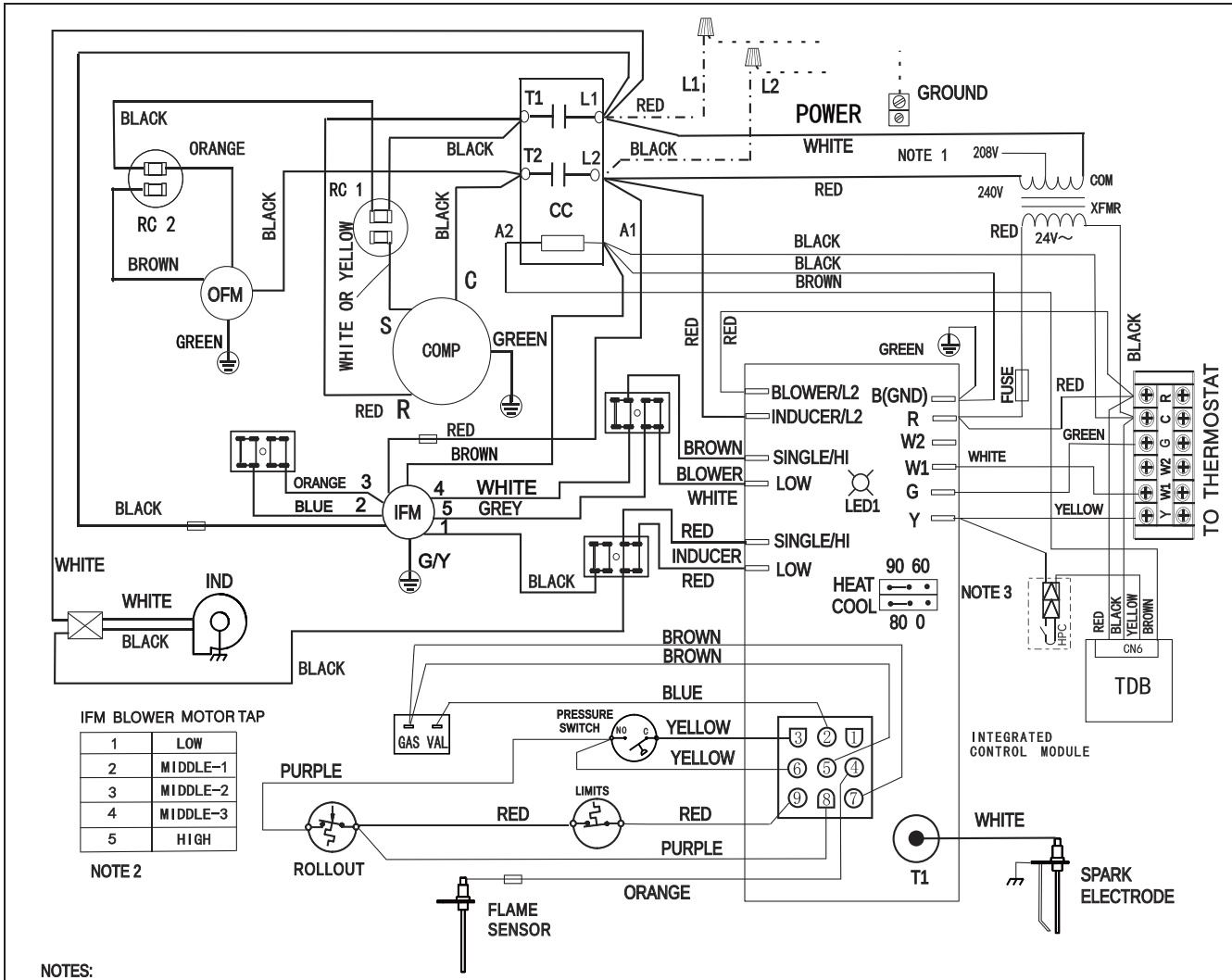
LINE VOLTAGE
FACTORY STANDARD
FIELD INSTALLED
FACTORY OPTIONAL

LOW VOLTAGE
FACTORY STANDARD
FIELD INSTALLED
FACTORY OPTIONAL

USE COPPER CONDUCTORS ONLY
WARNING :
CABINET MUST BE PERMANENTLY GROUNDED AND ALL WIRING TO CONFORM TO I.E.C, N.E.C, C.E.C, C.L.C, AND LOCAL CODES AS APPLICABLE
REPLACEMENT WIRE MUST BE THE SAME GAUGE AND INSULATION TYPE AS ORIGINAL WIRE.

- STEADY ON = NORMAL OPERATION
- OFF =BAD BOARD
- STEADY FLASH =W FAULTS
- 2 FLASH =1 HR. LOCKOUT
- 3 FLASH =PRESS.SW
- 4 FLASH =LIM OPEN
- 5 FLASH =FLAME W/O GAS
- 6 FLASH =ROLLOUT
- 7 FLASH =W1/W2 SWAPPED

Wiring Diagram (For M4PG4060B1130AA)



NOTES:
1: Remove the red lead from "240V" terminal and then connect the red lead to "208V" terminal on the transformer for 208 volts.
2: Please refer to installation instruction for the proper wire to obtain the speed you have chosen.
3:Fan off delay jump.

CC	COMPRESSOR CONTACTOR
COMP	COMPRESSOR
OFM	OUTDOOR FAN MOTOR
RC 1	COMPRESSOR RUN CAPACITOR
RC 2	OUTDOOR FAN MOTOR RUN CAPACITOR
RV	REVERSING VALVE
GND	GROUND CHASSIS
IFM	INDOOR FAN MOTOR
IND	INDUCED DRAFT BLOWER
XFMR	TRANSFORMER
FUSE	T3.15A/250V
HPC	HIGH PRESSURE CUT-OUT CONTROL
TDB	TIME DELAY BOARD

LINE VOLTAGE
FACTORY STANDARD ———
FIELD INSTALLED - - - - - - - -
FACTORY OPTIONAL —·—·—·—

LOW VOLTAGE
FACTORY STANDARD ———
FIELD INSTALLED . . . . . .
FACTORY OPTIONAL —··—··—

USE COPPER CONDUCTORS ONLY
WARNING :
CABINET MUST BE PERMANENTLY GROUNDED AND ALL WIRING TO CONFORM TO I.E.C, N.E.C, C.E.C, C.L.C, AND LOCAL CODES AS APPLICABLE
REPLACEMENT WIRE MUST BE THE SAME GAUGE AND INSULATION TYPE AS ORIGINAL WIRE.

- STEADY ON = NORMAL OPERATION
- OFF =BAD BOARD
- STEADY FLASH =W FAULTS
- 2 FLASH =1 HR. LOCKOUT
- 3 FLASH =PRESS.SW
- 4 FLASH =LIM OPEN
- 5 FLASH =FLAME W/O GAS
- 6 FLASH =ROLLOUT
- 7 FLASH =W1/W2 SWAPPED

High Altitude

TOTAL FURNACE RATING PLATE INPUT (BTU/HR)	NUMBER OF BURNERS	NATURAL GAS				
		HEATING VALVE 1075BTU/CU.FT.				
		SPECIFIC ARAVITY 0.65/MANIFOLD PRESSURE @3.5"W.C.				
		ELEVATION 0-2000' (USA/CANADA)	ELEVATION 4000' (USA ONLY)	ELEVATION 6000' (USA ONLY)	ELEVATION 8000' (USA ONLY)	ELEVATION 2000-4500' (CANADA)
40000	2	45	47	48	49	45
45000	2	43	44	45	46	43
60000	3	45	47	48	49	45
90000	4	43	44	45	46	43
110000	5	43	44	45	46	43
130000	6	43	44	45	46	43
TOTAL FURNACE RATING PLATE INPUT (BTU/HR)	NUMBER OF BURNERS	PROPANE GAS				
		HEATING VALVE 2500BTU/CU.FT.				
		SPECIFIC ARAVITY 1.53/MANIFOLD PRESSURE @10.0"W.C.				
		ELEVATION 0-2000' (USA/CANADA)	ELEVATION 4000' (USA ONLY)	ELEVATION 6000' (USA ONLY)	ELEVATION 8000' (USA ONLY)	ELEVATION 2000-4500' (CANADA)
40000	2	55	56	57	58	55
45000	2	55	56	57	58	55
60000	3	55	56	57	58	55
85000	4	55	56	57	58	55
105000	5	55	56	57	58	55
125000	6	55	56	57	58	55

For addressing derating at altitudes above 2000 ft (610 m), the instructions shall indicate one of the following:

1. Installation of this furnace at altitudes above 2000 ft (610 m) shall be in accordance with local codes, or in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or National Standard of Canada, Natural Gas and Propane Installation Code, CSA B149.1.
2. For furnaces requiring modifications other than only gas orifice and/or manifold pressure adjustment for installation at high altitude, “Installation of this furnace at altitudes above 2000 ft (610 m) shall be made in accordance with the Listed High Altitude Conversion Kit available with this furnace.”
3. For furnaces requiring only gas orifice and/or manifold pressure adjustment for installation at high altitude, the furnace installation instructions shall provide adequate details on proper adjustments for various altitudes.

Base Limited Warranty

Single Phase R-410A Outdoor Units, Single Phase R-22 Outdoor Units, Air Handlers, Furnaces, Packaged Units, Cased Coils, Ductless and Specific Terms for Commercial Applications.

Subject to the terms and conditions of this limited warranty, Ingersoll Rand ("Company') extends a limited warranty against manufacturing defects for the product(s) identified in **Table 1** attached hereto ("Products') that are installed in a residential/multi-family application (personal, family or household purposes) under normal use and maintenance in the United States and Canada.

In order to maximize the available benefits under this limited warranty, the Purchaser (as defined below) should read it in its entirety. All repairs of Product parts covered under this limited warranty must be made with authorized service parts and by a licensed HVAC service provider. Additionally, commercial applications are treated differently under this limited warranty as stated in **Table 1** attached hereto. For purposes of this limited warranty, "commercial applications" shall mean any application other than for personal, family, or household use.

TERM: The limited warranty period for Products is as stated in **Table 1** attached hereto. If the Purchaser properly registers the Products, the limited warranty period shall be extended as stated in **Table 1** attached hereto. Regardless of registration, the Commencement Date for a limited warranty period shall be the date that the original installation is complete and all Product start-up procedures have been properly completed and verified by an installer's invoice. If the installation and start-up date cannot be verified by the installer's invoice, the Commencement Date shall be sixty (60) days after the factory manufacture date which is verified by the Product serial number. Where a Product is installed in a newly constructed home, the Commencement Date is the date the Purchaser purchased the residence from the builder. Proof of Product purchase, installation, and/or closing date of the residence may be required to confirm the Commencement Date.

The installation of Product replacement parts under this limited warranty shall not extend the original warranty period. The warranty period for any Product part replaced under this limited warranty is the applicable warranty period remaining under the original Product warranty.

WHO IS COVERED: This limited warranty is provided only to the original owner and his or her spouse ("Purchaser') of the residence where the Products are originally installed. This warranty is not transferable except according to terms stated on the applicable website identified below under Registration Requirements. Company has the right to request any and all proof of Product purchase or installation and/or closing date of the residence.

WHAT COMPANY WILL DO: Company may request proof of Product purchase and/or installation in order to provide Product parts under this limited warranty. As Company's only responsibility and Purchaser's only remedy under this limited warranty, Company will furnish a replacement part to the licensed HVAC service provider, without charge for the part only, to replace any Product part that fails due to a manufacturing defect under normal use and maintenance. The Purchaser must pay for any and all shipping and handling charges and other costs of warranty service for the replacement part. If a Product part is not available, Company will, at its option, provide a free suitable substitute part or provide a credit in the amount of the then factory selling price for a new suitable substitute part to be used by the Purchaser towards the retail purchase price of a new Company product. Any new Product purchase shall be at Purchaser's sole cost and expense including, but not limited to, all shipping, removal, and installation costs and expenses.

REGISTRATION REQUIREMENTS: All Products must be properly registered online by the Purchaser within sixty (60) days after the Commencement Date to receive the registered limited warranty terms. To register online, go to:

http://www.ameristarac.com

and click "Begin Online Registration." If a Purchaser does not register within this stated time period, the base limited warranty terms shall apply.

ELIGIBILITY REQUIREMENTS: The following items are required in order for the Products to be covered under this limited warranty:

- The Products must be in the same location where they were originally installed.
- The Products must be properly installed, operated, and maintained by a licensed HVAC service provider in accordance with the Product specifications or installation, operation, and maintenance instructions provided by Company with each Product. Failure to conform to such specifications and/or instructions shall void this limited warranty. Company may request written documentation showing the proper preventative maintenance.
- All Product parts replaced by Company under this limited warranty must be given to the servicing provider for return to Company.
- Air handlers, air conditioners, heat pumps, cased or uncased coils, stand-alone furnaces, and packaged units must be part of an Air Conditioning, Heating, and Refrigeration Institute rated and matched system or a specification in a Company provided bulletin or otherwise approved in writing by a Company authorized representative.

EXCLUSIONS: The following are not covered by this limited warranty:

- Labor costs including, but not limited to, costs for diagnostic calls or the removal and reinstallation of Products and/or Product parts.
- Shipping and freight expenses required to ship Product replacement parts.
- Failures, defects, or damage (including, but not limited to, any loss of data or property) caused by (1) any third party product, service, or system connected or used in conjunction with the Products; (2) any use that is not designed or intended for the Products; (3) modification, alteration, abuse, misuse, negligence, or accident; (4) improper storage, installation, maintenance, or operation including, but not limited to, operation of electrical equipment at voltages other than the range specified on the Product nameplate; (5) any use in violation of written instructions or specifications provided by Company; (6) any acts of God including, but not limited to, fire, water, storms, lightning, or earthquakes; or any theft or riots; or (7) a corrosive atmosphere or contact with corrosive materials such as, but not limited to, chlorine, fluorine, salt, sulfur, recycled waste water, urine, fertilizers, rust, or other damaging substances or chemicals.
- Products purchased direct including, but not limited to, Internet or auction purchases and purchases made on an uninstalled basis.
- Cabinets or cabinet pieces that do not affect product performance, air filters, refrigerant, refrigerant line sets, belts, wiring, fuses, surge protection devices, non-factory installed driers, and Product accessories.
- Increased utility usage costs.

REFRIGERANT POLICY: (1) Manufacturer-Installed Refrigerant: Beginning on January 1, 2010, R-22 refrigerant will no longer be used as a manufacturer-installed refrigerant as required by federal regulation. All Products with manufacturer-installed refrigerant will include R410-A refrigerant. Any and all expenses or costs associated with replacing Product parts that are not R-410A compatible will not be covered by the terms and conditions of this limited warranty. (2) Non-Manufacturer installed Refrigerant: For Products manufactured and sold by the Company without refrigerant, only manufacturer approved and genuine alternate refrigerants shall be used. The use of contaminated, counterfeit, non-genuine, or non-manufacturer approved alternate refrigerant will void this limited warranty. (3) All Products: Products include a liquid line filter drier which must be replaced when a compressor replacement is necessary. A suction line filter drier must be added for compressors defined as burnouts and failure to do so will void this warranty. Non-approved refrigerant and/or non-approved refrigerant system additives including, but not limited to dyes will void this limited warranty.

ADDITIONAL TERMS:

THIS LIMITED WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE APPLICABLE PRODUCT WARRANTY. COMPANY DOES NOT AUTHORIZE ANY PERSON TO CREATE FOR IT ANY OBLIGATION OR LIABILITY IN CONNECTION WITH THE PRODUCTS.

NOTWITHSTANDING ANYTHING IN THIS LIMITED WARRANTY TO THE CONTRARY, COMPANY SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL AND/OR PUNITIVE DAMAGES, WHETHER BASED ON CONTRACT, WARRANTY, TORT (INCLUDING, BUT NOT LIMITED TO, STRICT LIABILITY OR NEGLIGENCE), PATENT INFRINGEMENT, OR OTHERWISE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. COMPANY'S MAXIMUM LIABILITY HEREUNDER IS LIMITED TO THE ORIGINAL PURCHASE PRICE OF THE PRODUCTS.

No action arising out of any claimed breach of this limited warranty may be brought by a Purchaser more than one (1) year after the cause of action has arisen.

This limited warranty gives you specific legal rights, and you may also have other rights as otherwise permitted by law. If this Product is considered a consumer product, please be advised that some local laws do not allow limitations on incidental or consequential damages, how long a warranty lasts based on registration, or how long an implied warranty lasts, so that the above limitations may not fully apply. Refer to your local laws for your specific rights under this limited warranty. If you have any questions regarding this limited warranty, please contact your original installation dealer, or any participating dealer, should your original installation dealer no longer be available.

GW-659-5116

TABLE 1: Warranty Time Periods

COVERAGE TERMS FOR RESIDENTIAL APPLICATIONS: Pursuant to the Ingersoll Rand ("Company") limited warranty terms and conditions, the following Products are covered for the base time periods as stated below ("Base Limited Warranty Period'). If registered, the Base Limited Warranty Periods for certain Products will be extended as stated below ("Registered Limited Warranty Period").

FURNACES:
M801P, M951P, M952V
Base Limited Warranty Period: Parts – five (5) years, Heat Exchanger – twenty (20) years.
Registered Limited Warranty Period: Parts – ten (10) years, Heat Exchanger: twenty (20) years.

AIR HANDLERS:
M4AH3, M4AH4
Base Limited Warranty Period: Indoor Coil and Parts – five (5) years.
Registered Limited Warranty Period: Indoor Coil and Parts – ten (10) years.

TMM4, TMM5
Base Limited Warranty Period: Indoor Coil and Parts – three (3) years.
Registered Limited Warranty Period: Indoor Coil and Parts – ten (10) years.

ELECTRIC HEATERS, installed in M4A3/4 AIR HANDLERS:
MAYHTR1A
Limited Warranty Period: Parts – ten (10) years.

SINGLE PHASE R410 OUTDOOR UNITS:
M4AC3 **(M4AC3018, 24, 30, 36, 42, 48, 60 only)**, M4HP3, M4AC4, M4HP4
Base Limited Warranty Period: Compressor, Outdoor Coil, Parts: five (5) years.
Registered Limited Warranty Period: Compressor, Outdoor Coil, Parts – ten (10) years.

SINGLE PHASE R410 OUTDOOR UNITS:
M4AC3 **(M4AC3017, 23, 29 only)**
Base Limited Warranty Period: Compressor, Outdoor Coil, Parts: one (1) year.
Registered Limited Warranty Period: Compressor, Outdoor Coil, Parts – five (5) years.

SINGLE PHASE R22 OUTDOOR UNITS:
M2AC3, M2HP3
Base Limited Warranty Period: Compressor, Outdoor Coil, Parts - one (1) year.
Registered Limited Warranty Period: Compressor, Outdoor Coil, Parts – five (5) years.

CASED COILS:
M4CXC
Base Limited Warranty Period: Coil, Parts –five (5) years.
Registered Limited Warranty Period: Coil and Parts – ten (10) years.

PACKAGED UNITS:
M4PH3, M4PG3, M4PH4, M4PW4, M4PG4
Base Limited Warranty Period: Compressor, Coil, Parts – five (5) years, Heat Exchanger – ten (10) years.
Registered Limited Warranty Period: Compressor, Coil, Parts – ten (10) years, Heat Exchanger – ten (10) years.

ELECTRIC HEATERS, installed in M4PH4 PACKAGED UNITS:
MAYHTR1P
Limited Warranty Period: Parts – ten (10) years.

DUCTLESS SYSTEMS:**
M4THS22/M4MHW22, M4THS15/M4MHW15, M4TCS15/M4MCW15:
Base Limited Warranty Period:
All Parts – five (5) year.
Registered Limited Warranty Period:
All Parts – ten (10) years.
**If any part of your Ductless System fails because of a manufacturing defect under normal use and maintenance within the Limited Warranty Period, the Company will furnish the required replacement part. The Purchaser must pay for any and all shipping and handling charges and other costs of warranty service for the replacement part including, but not limited to, any related service labor, diagnosis calls and refrigerant. There is no distinction between residential and commercial use for this Limited Warranty term and coverage.

SPECIFIC TERMS FOR COMMERCIAL APPLICATIONS
Base Limited Warranty Period Applies

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此页不做菲林 仅作为电子文档说明
规格：大A4（210*297）
印刷颜色：黑白
材料：双胶纸100g

A升级B
更改保修卡