

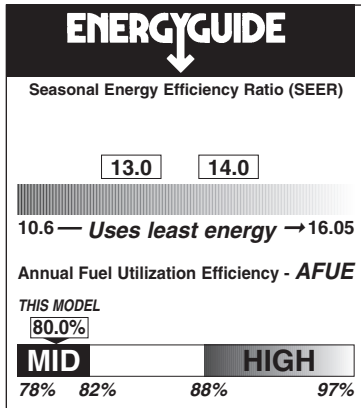
INSTALLATION INSTRUCTIONS

PACKAGE GAS ELECTRIC

FEATURING EARTH-FRIENDLY R-410A REFRIGERANT 

TGRG**C/TGRG**E (2-5 TONS)

TGRG**D- 14 SEER (2-5 TONS)



⚠️ RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION!

⚠️ WARNING

IF THE INFORMATION IN THESE INSTRUCTIONS IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT, CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

⚠️ WARNING

THESE INSTRUCTIONS ARE INTENDED AS AN AID TO QUALIFIED 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, CARBON MONOXIDE POISONING, EXPLOSION, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

⚠️ WARNING

PROPOSITION 65: THIS FURNACE CONTAINS FIBERGLASS INSULATION. RESPIRABLE PARTICLES OF FIBERGLASS ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER. EXHAUST GAS FROM THIS FURNACE CONTAINS CHEMICALS, INCLUDING CARBON MONOXIDE, KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

⚠️ 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.
- DO NOT RELY ON SMELL ALONE TO DETECT LEAKS. DUE TO VARIOUS FACTORS, YOU MAY NOT BE ABLE TO SMELL FUEL GASES.
 - U.L. recognized fuel gas and CO (carbon monoxide) detectors are recommended in all applications, and their installation should be in accordance with the manufacturer's recommendations and/or local laws, rules, regulations, or customs.
- Improper installation, adjustment, alteration, service or maintenance can cause injury, property damage 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.

DO NOT DESTROY THIS MANUAL. PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE BY A SERVICEMAN.

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I. SAFETY INFORMATION

WARNING

PROPOSITION 65: THIS FURNACE CONTAINS FIBERGLASS INSULATION. RESPIRABLE PARTICLES OF FIBERGLASS ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER. EXHAUST GAS FROM THIS FURNACE CONTAINS CHEMICALS, INCLUDING CARBON MONOXIDE, KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

WARNING

THE MANUFACTURER'S WARRANTY DOES NOT COVER ANY DAMAGE OR DEFECT TO THE AIR CONDITIONER 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 AIR CONDITIONER. YOU SHOULD BE AWARE THAT THE USE OF UNAUTHORIZED COMPONENTS, ACCESSORIES OR DEVICES MAY ADVERSELY AFFECT THE OPERATION OF THE AIR CONDITIONER 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

UNITS ARE NOT DESIGN CERTIFIED TO BE INSTALLED INSIDE THE STRUCTURE. DOING SO CAN CAUSE INADEQUATE UNIT PERFORMANCE AS WELL AS PROPERTY DAMAGE AND CARBON MONOXIDE POISONING RESULTING IN PERSONAL INJURY OR DEATH.

WARNING

DISCONNECT ALL POWER TO UNIT BEFORE STARTING MAINTENANCE. FAILURE TO DO SO CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

WARNING

THESE UNITS ARE 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

THIS UNIT MUST NOT BE INSTALLED DIRECTLY ON WOOD FLOORING, CLASS A, CLASS B OR CLASS C ROOF COVERING MATERIALS, OR ANY OTHER COMBUSTIBLE STRUCTURE EXCEPT AS SPECIFIED IN FIGURE 13. FAILURE TO ADHERE TO THIS WARNING CAN CAUSE A FIRE OR EXPLOSION RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

WARNING

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

 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

DO NOT USE AN OPEN FLAME TO CHECK FOR LEAKS. THE USE OF AN OPEN FLAME CAN RESULT IN FIRE, EXPLOSION, 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 SUPPLIED BY THE DISTRIBUTOR OR MANUFACTURER. MAILING ADDRESSES ARE LISTED ON THE FURNACE RATING PLATE, PARTS LIST AND WARRANTY. FAILURE TO USE THE PROPER CONVERSION KIT CAN CAUSE FIRE, CARBON MONOXIDE POISONING, EXPLOSION, PERSONAL INJURY, PROPERTY DAMAGE OR DEATH.

 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 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.

 WARNING

IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

 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

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!

 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

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

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.

 WARNING

LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING THE UNIT. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION RESULTING IN FIRE, ELECTRICAL SHOCK, PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH.

 WARNING

DISCONNECT MAIN ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING TO CHANGE BLOWER SPEEDS. FAILURE TO DO SO MAY RESULT IN ELECTRICAL SHOCK OR SEVERE PERSONAL INJURY OR DEATH.

 WARNING

DISCONNECT ALL POWER TO UNIT BEFORE SERVICING. CONTACTOR MAY BREAK ONLY ONE SIDE. FAILURE TO SHUT OFF POWER CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

 CAUTION

R-410A systems operate at higher pressures than R-22 systems. Do not use R-22 service equipment or components on R-410A equipment.

WARNING

IMPORTANT: ALL MANUFACTURER PRODUCTS MEET CURRENT FEDERAL OSHA GUIDELINES FOR SAFETY. CALIFORNIA PROPOSITION 65 WARNINGS ARE REQUIRED FOR CERTAIN PRODUCTS, WHICH ARE NOT COVERED BY THE OSHA STANDARDS.

CALIFORNIA'S PROPOSITION 65 REQUIRES WARNINGS FOR PRODUCTS SOLD IN CALIFORNIA THAT CONTAIN, OR PRODUCE, ANY OF OVER 600 LISTED CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR BIRTH DEFECTS SUCH AS FIBERGLASS INSULATION, LEAD IN BRASS, AND COMBUSTION PRODUCTS FROM NATURAL GAS.

ALL "NEW EQUIPMENT" SHIPPED FOR SALE IN CALIFORNIA WILL HAVE LABELS STATING THAT THE PRODUCT CONTAINS AND/OR PRODUCES PROPOSITION 65 CHEMICALS. ALTHOUGH WE HAVE NOT CHANGED OUR PROCESSES, HAVING THE SAME LABEL ON ALL OUR PRODUCTS FACILITATES MANUFACTURING AND SHIPPING. WE CANNOT ALWAYS KNOW "WHEN, OR IF" PRODUCTS WILL BE SOLD IN THE CALIFORNIA MARKET.

YOU MAY RECEIVE INQUIRIES FROM CUSTOMERS ABOUT CHEMICALS FOUND IN, OR PRODUCED BY, SOME OF OUR HEATING AND AIR-CONDITIONING EQUIPMENT, OR FOUND IN NATURAL GAS USED WITH SOME OF OUR PRODUCTS. LISTED BELOW ARE THOSE CHEMICALS AND SUBSTANCES COMMONLY ASSOCIATED WITH SIMILAR EQUIPMENT IN OUR INDUSTRY AND OTHER MANUFACTURERS.

- GLASS WOOL (FIBERGLASS) INSULATION
- CARBON MONOXIDE (CO)
- FORMALDEHYDE
- BENZENE

MORE DETAILS ARE AVAILABLE AT THE WEBSITES FOR OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION), AT WWW.OSHA.GOV AND THE STATE OF CALIFORNIA'S OEHHA (OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT), AT WWW.OEHHA.ORG. CONSUMER EDUCATION IS IMPORTANT SINCE THE CHEMICALS AND SUBSTANCES ON THE LIST ARE FOUND IN OUR DAILY LIVES. MOST CONSUMERS ARE AWARE THAT PRODUCTS PRESENT SAFETY AND HEALTH RISKS, WHEN IMPROPERLY USED, HANDLED AND MAINTAINED.

II. INTRODUCTION

This booklet contains the installation and operating instructions for your combination gas heating/electric cooling 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.

III. CHECKING PRODUCT RECEIVED

Upon receiving the unit, inspect it for any damage from shipment. Claims for damage, either shipping or concealed, should be filed immediately with the shipping company. **IMPORTANT:** Check the unit model number, heating size, electrical characteristics, and accessories to determine if they are correct.

IV. SPECIFICATIONS

A. GENERAL

The Combination Gas Heating/Electric Cooling Rooftop is available in 40,60, 80 and 100 BTU/Hr. heating inputs and cooling capacities of 2, 2½, 3, 3½, 4 and 5 nominal tons of cooling. Units are convertible from end supply and return to bottom supply and return by relocation of supply and return air access panels. See cover installation detail.

The units are weatherized for mounting outside of the building.

WARNING

UNITS ARE NOT DESIGN CERTIFIED TO BE INSTALLED INSIDE THE STRUCTURE. DOING SO CAN CAUSE INADEQUATE UNIT PERFORMANCE AS WELL AS PROPERTY DAMAGE AND CARBON MONOXIDE POISONING RESULTING IN PERSONAL INJURY OR DEATH.

The information on the rating plate is in compliance with the FTC and DOE rating for single phase units. The following information is for three phase units which **are not** covered under the DOE certification program.

1. The energy consumption of the ignition system used with this unit is 9 watts.
2. The efficiency rating of this unit is a product thermal efficiency rating determined under continuous operating conditions independent of any installed system.

B. MAJOR COMPONENTS

The unit includes a hermetically-sealed refrigerating system (consisting of a compressor, condenser coil, evaporator coil with thermostatic expansion 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 with R-410A refrigerant and performance tested. Refrigerant amount is indicated on rating plate.

C. R410A REFRIGERANT

All units are factory charged with R-410A refrigerant.

1. Specification of R-410A:

Application: **R-410A is not a drop-in replacement for R-22;** equipment designs must accommodate its higher pressures. It cannot be retrofitted into R-22 units.

Pressure: **The pressure of R-410A is approximately 60% (1.6 times) greater than R-22.** Recovery and recycle equipment, pumps, hoses and the like need to have design pressure ratings appropriate for R-410A. *Manifold sets need to range up to 800 psig high-side and 250 psig low-side with a 550 psig low-side retard. Hoses need to have a service pressure rating of 800 psig. Recovery cylinders need to have a 400 psig service pressure rating.* DOT 4BA400 or DOT BW400.

Combustibility: At pressures above 1 atmosphere, mixture of R-410A and air can become combustible. **R-410A and air should never be mixed in tanks or supply lines, or be allowed to accumulate in storage tanks. Leak checking should never be done with a mixture of R-410A and air.** Leak checking can be performed safely with nitrogen or a mixture of R-410A and nitrogen.

2. Quick Reference Guide For R-410A

- R-410A refrigerant operates at approximately 60% higher pressure (1.6 times) than R-22. Ensure that servicing equipment is designed to operate with R-410A.
- R-410A refrigerant cylinders are pink.
- R-410A, as with other HFC's is only compatible with POE oils.
- Vacuum pumps will not remove moisture from POE oil.
- R-410A systems are to be charged with liquid refrigerants. Prior to March 1999, R-410A refrigerant cylinders had a dip tube. These cylinders should be kept upright for equipment charging. Post March 1999 cylinders do not have a dip tube and should be inverted to ensure liquid charging of the equipment.
- Do not install a suction line filter drier in the liquid line.
- A liquid line filter drier is standard on every unit.
- Desiccant (drying agent) must be compatible for POE oils and R-410A

3. Evaporator Coil / TXV

The thermostatic expansion valve is specifically designed to operate with R-410A. **DO NOT use an R-22 TXV. The existing evaporator must be replaced with the factory specified TXV evaporator specifically designed for R-410A.**

4. Tools Required For Installing & Servicing R-410A Models

Manifold Sets:

- Up to 800 PSIG High side
- Up to 250 PSIG Low Side
- 550 PSIG Low Side Retard

Manifold Hoses:

- Service Pressure Rating of 800 PSIG

Recovery Cylinders:

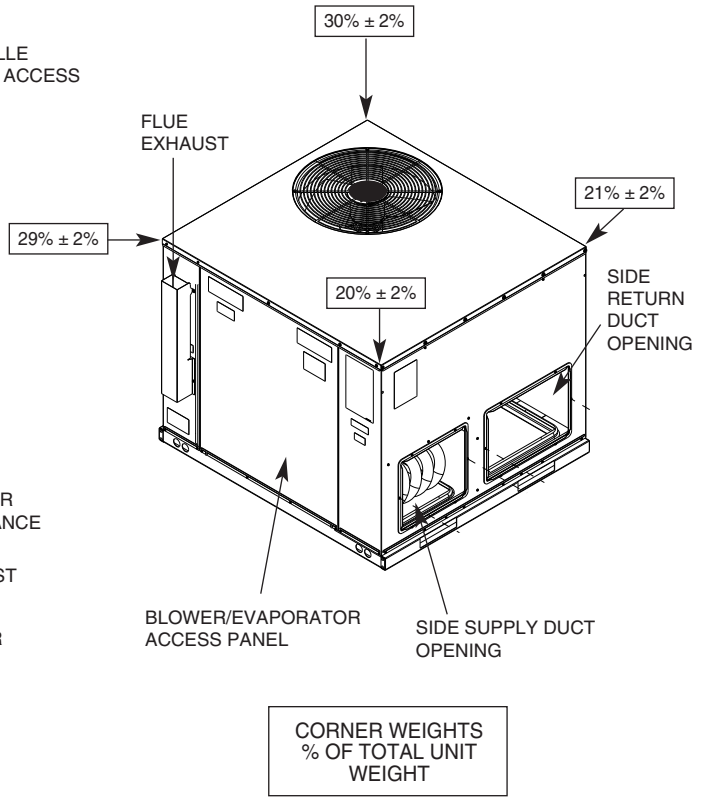
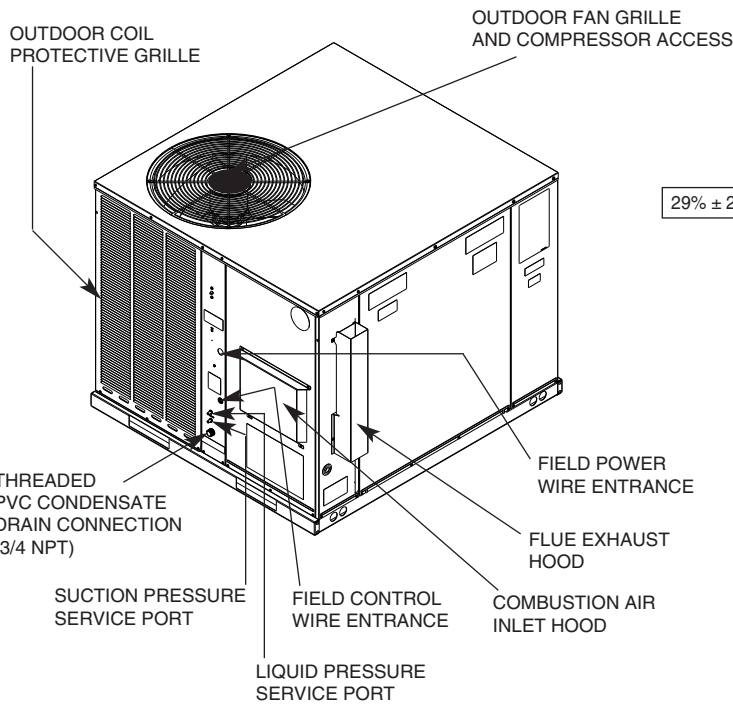
- 400 PSIG Pressure Rating
- Dept. of Transportation 4BA400 or BW400

▲ CAUTION

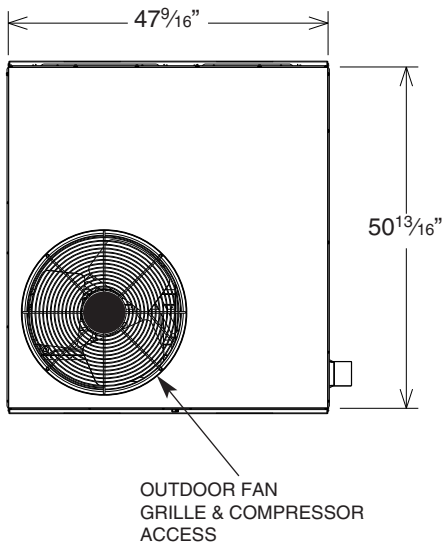
R-410A systems operate at higher pressures than R-22 systems. Do not use R-22 service equipment or components on R-410A equipment.

V. UNIT DIMENSIONS FOR CLEARANCES SEE FIGURE 9.

FIGURE 1



TOP VIEW



BOTTOM VIEW

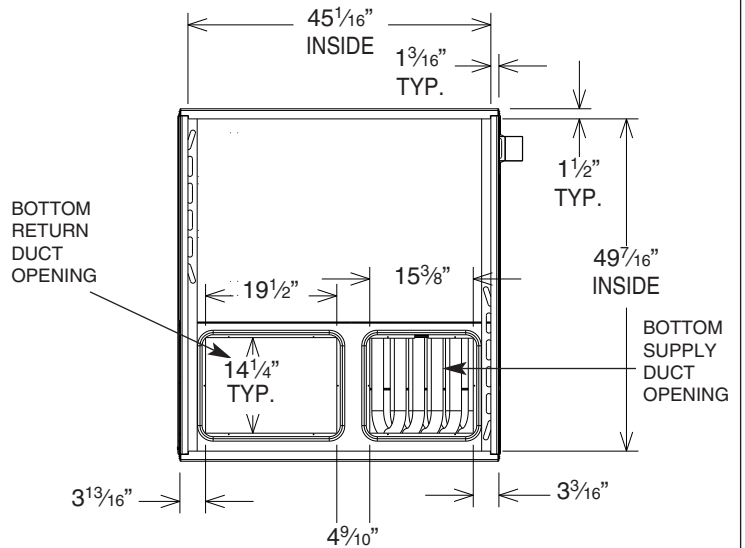
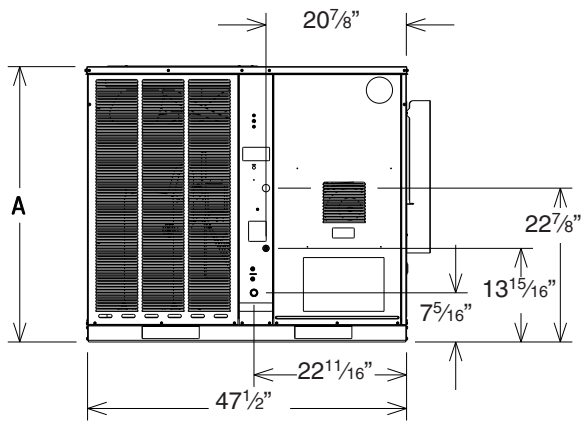
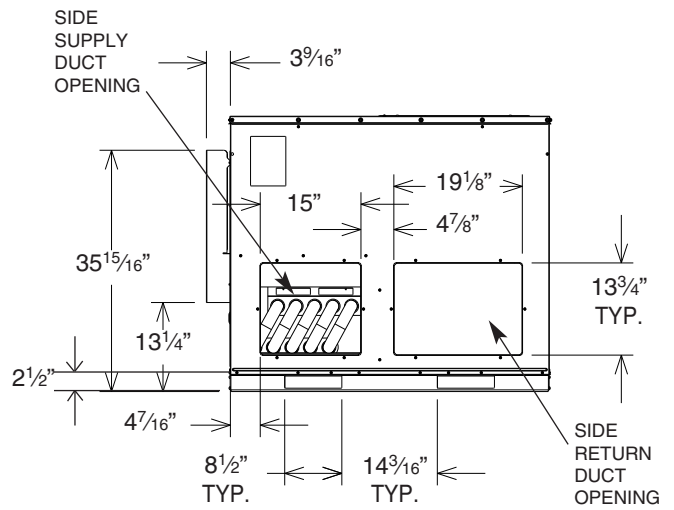


FIGURE 1 (CONTINUED)

FRONT VIEW



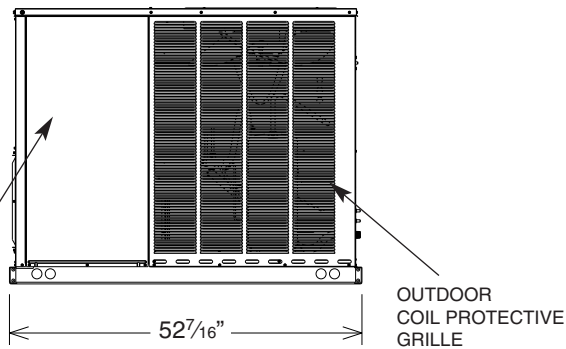
BACK VIEW



SHOWN WITH DUCT COVERS REMOVED.

MODELS TGRG**C/ TGRG**E	MODEL TGRG**D	"A" HEIGHT
024, 030, 036	024	35 ¹⁵ / ₁₆ "
042, 048, 060, 060	036, 048, 060	41

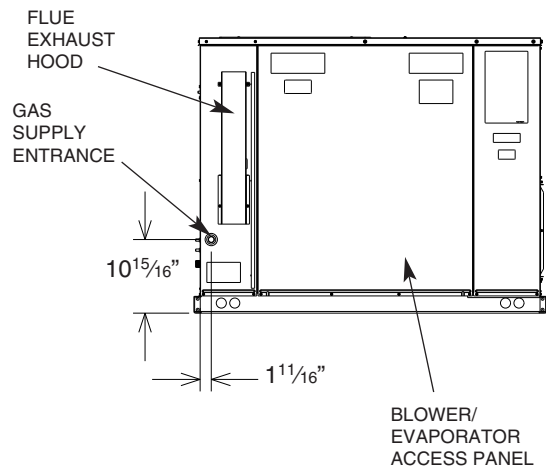
SIDE VIEW



FILTER ACCESS PANEL
(FOR UNIT MOUNTED FILTER
ACCESSORY)

OUTDOOR
COIL PROTECTIVE
GRILLE

SIDE VIEW



FLUE
EXHAUST
HOOD

GAS
SUPPLY
ENTRANCE

10¹⁵/₁₆"

11¹/₁₆"

BLOWER/
EVAPORATOR
ACCESS PANEL

VI. INSTALLATION

A. GENERAL

1. PRE-INSTALLATION CHECK-POINTS — Before attempting any installation, carefully consider the following points:

- Structural strength of supporting members
(Rooftop Installation)
- Clearances and provision for servicing
- Power supply and wiring
- Gas supply and piping
- Air duct connections and sizing
- Drain facilities and connections
- Location for minimum noise and vibration

2. LOCATION CONSIDERATIONS (CORROSIVE ENVIRONMENT)

The metal parts of this unit may be subject to rust or deterioration if exposed to a corrosive environment. This oxidation could shorten the equipment's useful life. Corrosive elements include, but are not limited to, 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.

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.
3. Shielding by a fence or shrubs may give some protection.

WARNING

DISCONNECT ALL POWER TO UNIT BEFORE STARTING MAINTENANCE. FAILURE TO DO SO CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

1. 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.
2. Regular cleaning and waxing of the cabinet with a good automobile polish will provide some protection.
3. 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.

B. OUTSIDE INSTALLATION

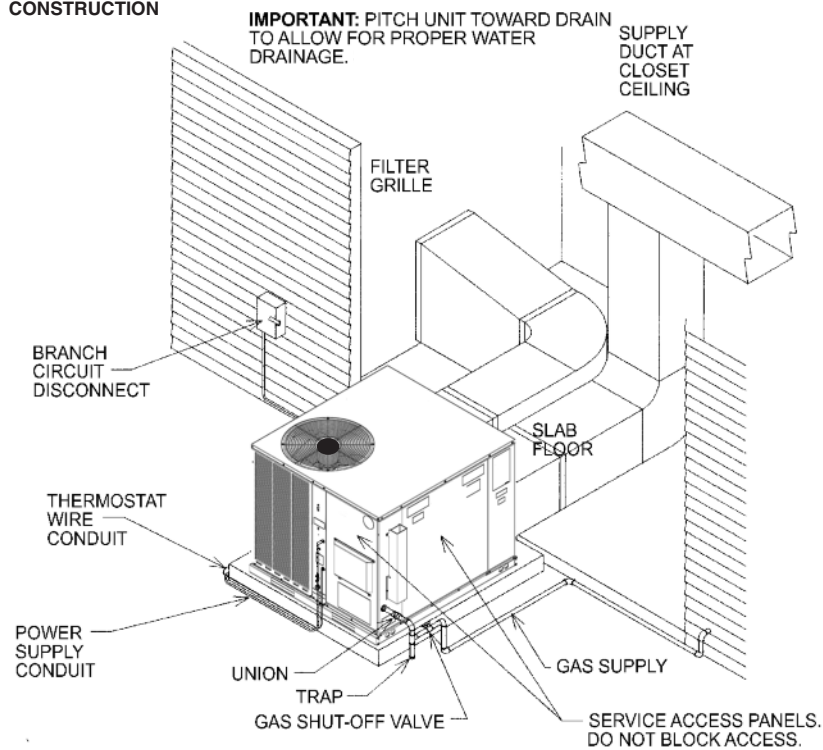
WARNING

THESE UNITS ARE 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 slab installation is shown in Figure 2.)

1. Select a location where external water drainage cannot collect around unit.

FIGURE 2
OUTSIDE SLAB INSTALLATION. CLOSET DISTRIBUTION SYSTEM. SLAB FLOOR
CONSTRUCTION



I251

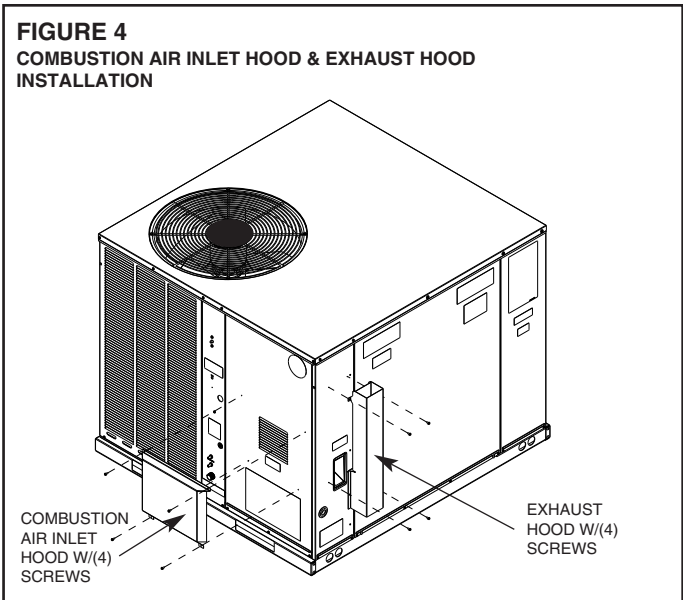
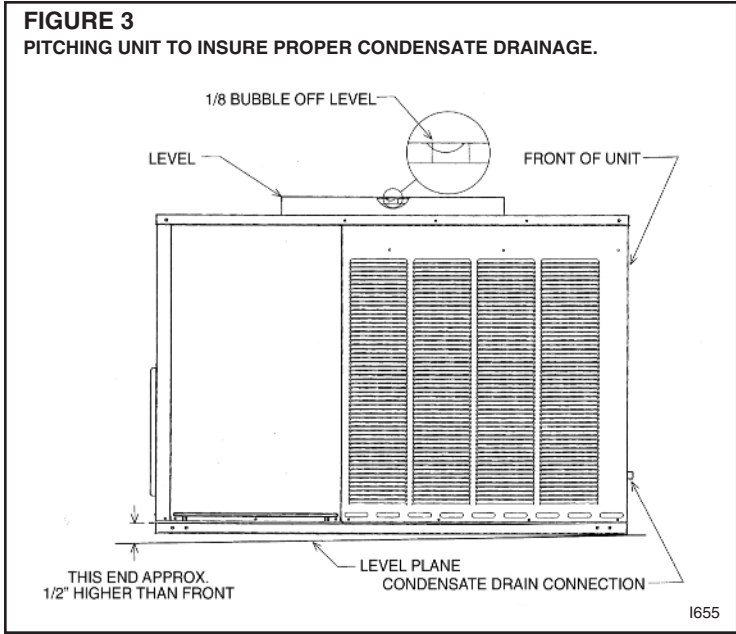
2. Provide a slab sufficiently high enough above grade to prevent surface water from entering the unit. Where snowfall is anticipated, mount the unit above the anticipated maximum snow depth for your area. Do not locate unit in an area where excessive snow drifting may block combustion air inlet.
3. Pitch the slab approximately $\frac{1}{2}''$ so that the unit will be pitched toward the drain. See Figure 3.
4. The location of the unit should be such as to provide proper access for inspection and servicing as shown in Figure 9.
5. Locate unit where operating sounds will not disturb owner or neighbors. The slab should be isolated from the foundation wall.
6. Locate unit so roof runoff water does not pour directly on the unit. Provide gutter or other shielding at roof level.

C. ATTACHING EXHAUST AND COMBUSTION AIR INLET HOODS

IMPORTANT: Do not operate this unit without the exhaust and combustion air inlet hood properly installed. These hoods are shipped in a carton in the return air compartment inside the unit and must be attached when the unit is installed. See Figure 4.

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 Figure 1.
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 each with 4 screws as shown in Figure 4. 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 or addition. The only exception is with factory approved additions. Consult your local utility or other authority having jurisdiction for accepted venting techniques.



D. COVER PANEL INSTALLATION/CONVERSION PROCEDURE

1. HORIZONTAL TO DOWNFLOW
 - a. Remove screws and covers from the supply and return bottom sections. NOTE: Rotate the supply cover 90° and remove.
 - b. Install gasket (supplied with parts bag) around perimeter of cover on the insulated side. See Figure 6.
 - c. Secure covers to the side of the unit using existing screws and those supplied in the parts bag.
2. DOWNFLOW TO HORIZONTAL
 - a. Remove screws and covers from the supply and return bottom sections.
 - b. Install gasket (supplied with parts bag) around perimeter of cover as illustrated in Figure 5.
 - c. Install covers in the unit bottom with the insulated side up. NOTE: Supply cover must be inserted through supply opening with narrow side toward unit. Once cover is through opening, rotate 90° and slip back flange of cover under tab at the back of bottom duct opening. See Figure 8.
 - d. Secure supply cover to base of unit with 2 screws, engaging prepunched holes in raised duct opening flange.
 - e. Secure return covers to base of unit with screws engaging prepunched holes in raised duct opening flange.

⚠ WARNING

THIS UNIT MUST NOT BE INSTALLED DIRECTLY ON WOOD FLOORING, CLASS A, CLASS B OR CLASS C ROOF COVERING MATERIALS, OR ANY OTHER COMBUSTIBLE STRUCTURE EXCEPT AS SPECIFIED IN FIGURE 13. FAILURE TO ADHERE TO THIS WARNING CAN CAUSE A FIRE OR EXPLOSION RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

E. CLEARANCES

The following minimum clearances must be observed for proper unit performance and serviceability. See Figure 9.

1. Provide 48" minimum clearance at front of the unit. Provide 24" minimum clearance on right side of unit. If economizer is used, a 24" minimum clearance is required on

FIGURE 5
COVER GASKET DETAIL FOR UNITS SHIPPED FOR DOWNFLOW
APPLICATION BEING CONVERTED TO SIDE DISCHARGE

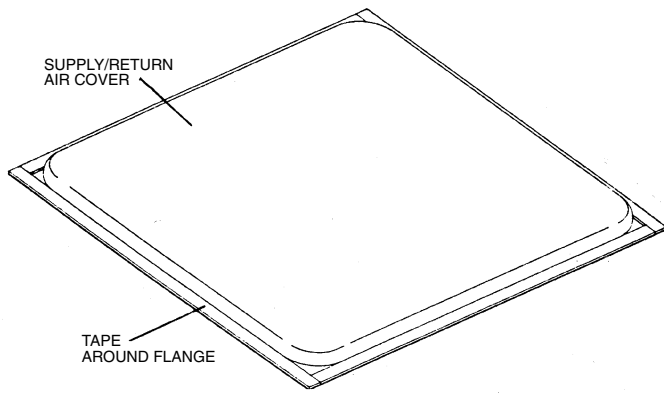
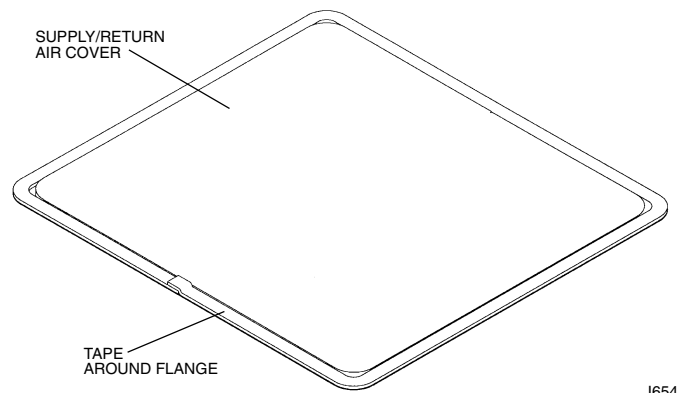
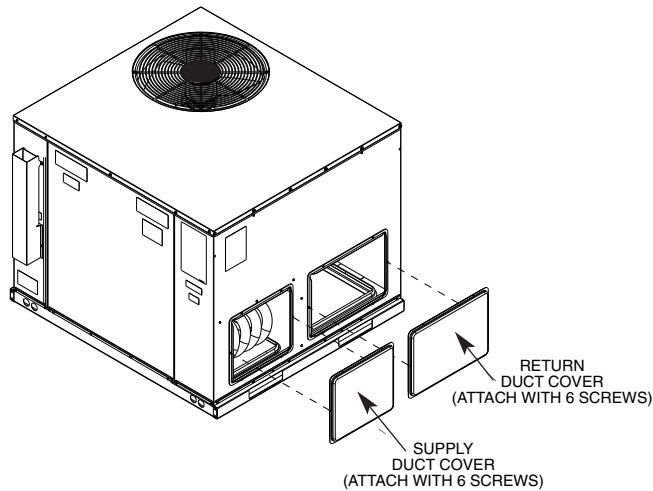


FIGURE 6
COVER GASKET DETAIL FOR UNITS SHIPPED FOR SIDE DISCHARGE
APPLICATION BEING CONVERTED TO DOWNFLOW



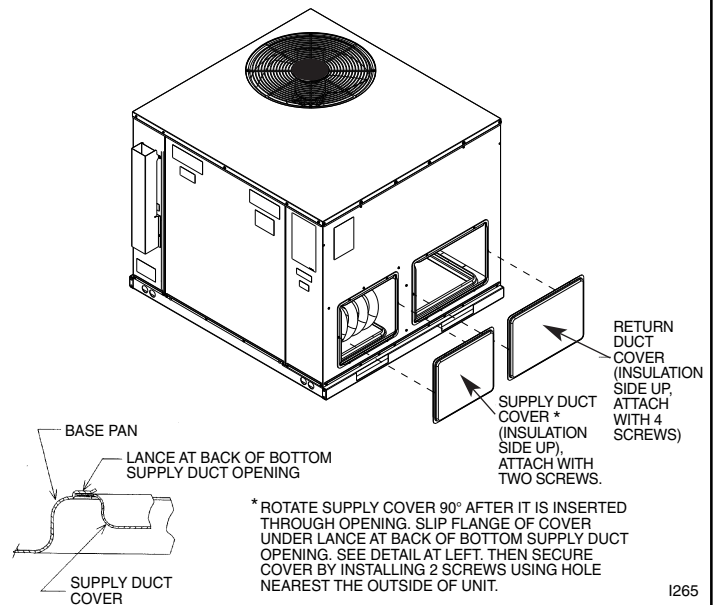
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FIGURE 7
DUCT COVER INSTALLATION SIDE MOUNTING



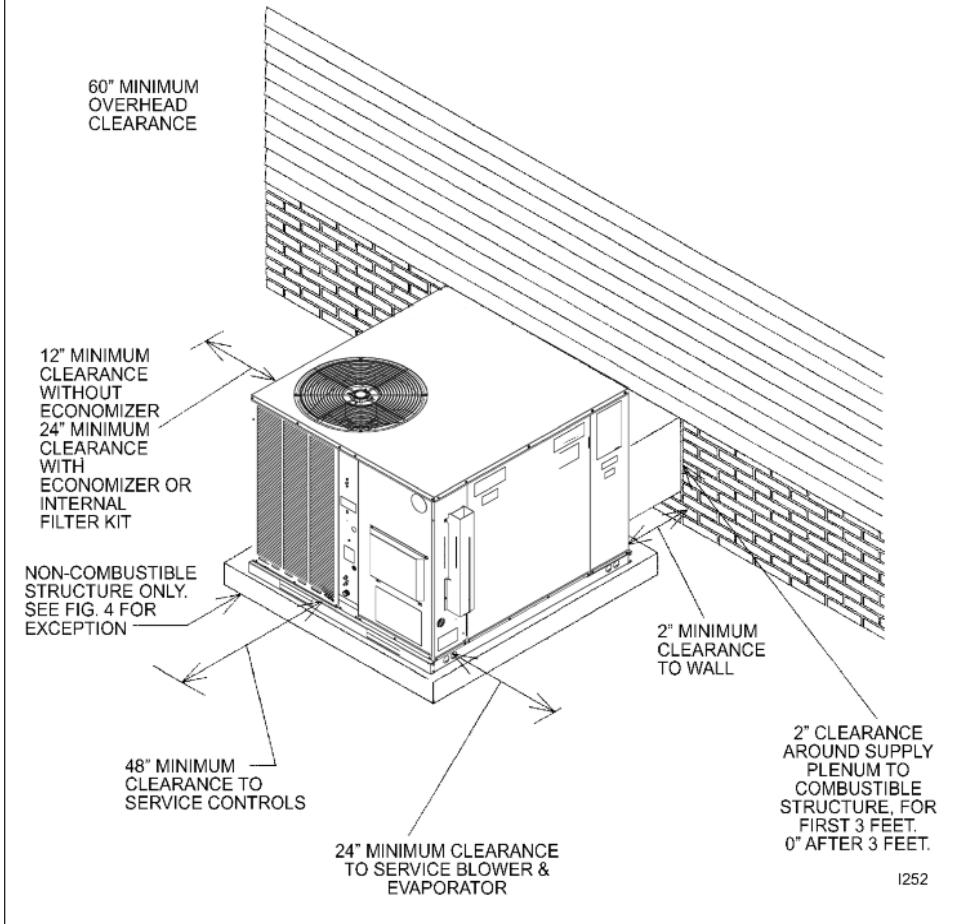
1264

FIGURE 8
DUCT COVER INSTALLATION BASE PAN MOUNTING



1265

**FIGURE 9
CLEARANCES**



left side of unit. (See Figure 9.) If no economizer is required, then a 12" clearance is required on left side of unit.

2. Provide 60" minimum clearance between top of unit and maximum 3 foot overhang.
3. Unit is design certified for 2" minimum clearance between supply duct and a combustible structure for the first 3 feet of duct. 0" clearance is allowed after 3 feet.

F. ROOFTOP INSTALLATION

1. Before locating the unit on the roof, make sure that the roof structure is adequate to support the weight involved. (See electrical & physical tables in this book for weight of unit.) **THIS IS VERY IMPORTANT AND THE INSTALLER'S RESPONSIBILITY.**
2. For rigging and roofcurb details, see Figures 14, 15, and 16.
3. The location of the unit on the roof should be such as to provide proper access for inspection and servicing.

IMPORTANT: If unit will not be put into service immediately, block off supply and return air openings to prevent excessive condensation.

G. DUCTWORK

The installing contractor should fabricate ductwork in accordance with local codes. Use industry manuals as a guide when sizing and designing the duct system. Contact Air Conditioning Contractors of America, 1513 16th St. N.W., Washington, D.C. 20036.

⚠ WARNING

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

FIGURE 10
EXCEPTION TO NON-COMBUSTIBLE FLOORING REQUIREMENT

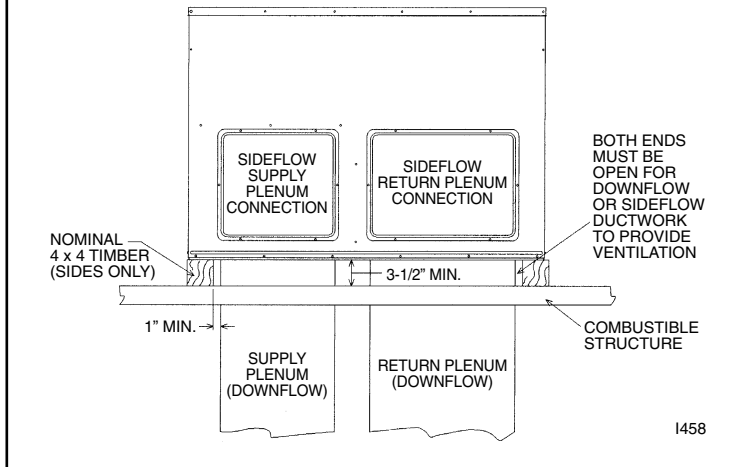


FIGURE 11
FLAT ROOFTOP INSTALLATION, ATTIC OR DROP CEILING DISTRIBUTING SYSTEM. MOUNTED ON ROOFCURB, PITCH UNIT TOWARD DRAIN.

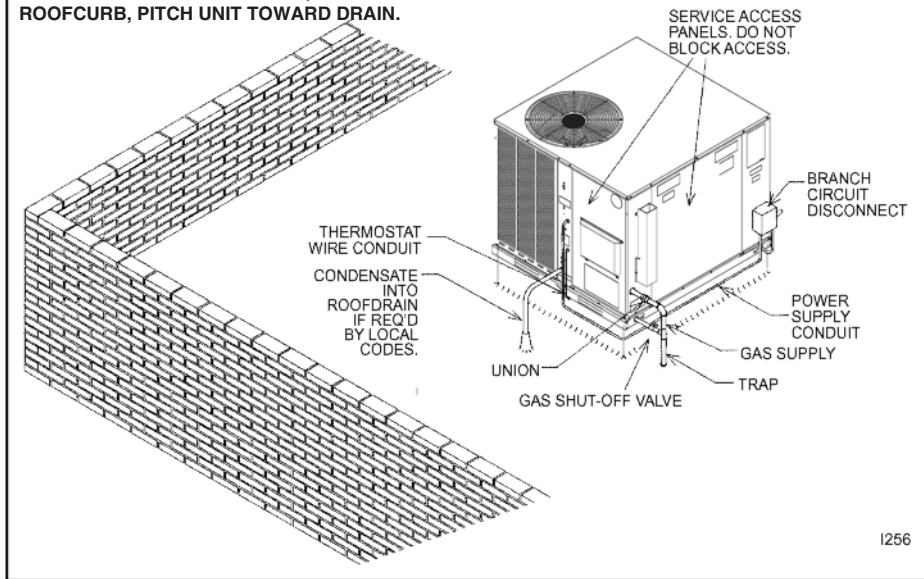


FIGURE 12
PITCHED ROOFTOP INSTALLATION, ON ANGLE-IRON STAND, SIDE FLOW DUCTWORK, ATTIC OR DROP CEILING DISTRIBUTING SYSTEM. PITCH UNIT TOWARD DRAIN.

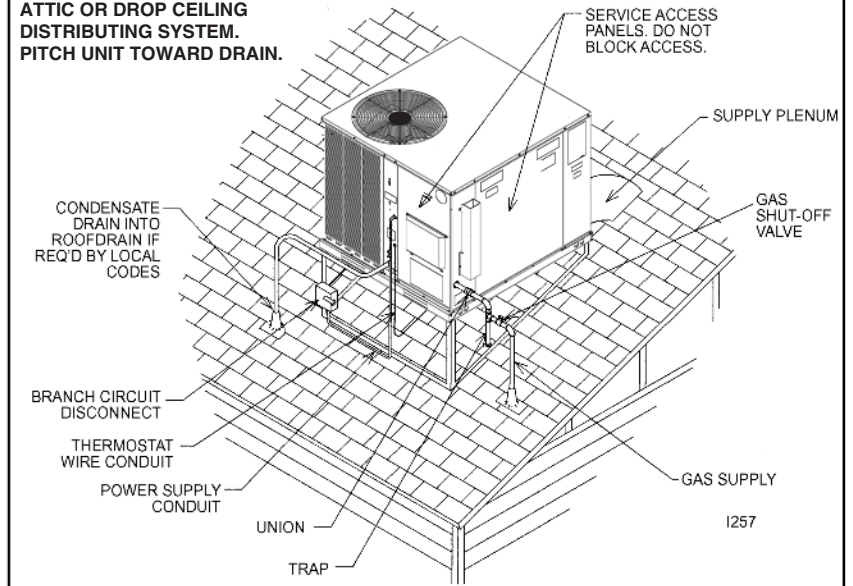
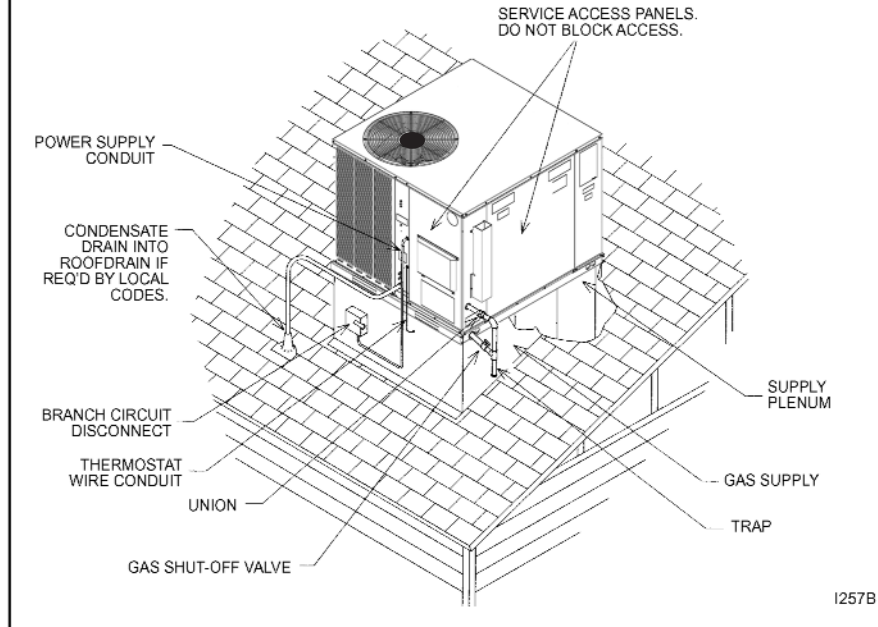


FIGURE 13

PITCHED ROOFTOP INSTALLATION, ON ROOFJACK, DOWNFLOW DUCTWORK, ATTIC OR DROP CEILING DISTRIBUTING SYSTEM. PITCH UNIT TOWARD DRAIN.



Place the unit as close to the conditioned space as possible allowing clearances as indicated. Run ducts as directly as possible to supply and return outlets. Use of non-flammable weatherproof flexible connectors on both supply and return connections at unit to reduce noise transmission is recommended.

On ductwork exposed to outside temperature and humidity, use a minimum of 2" of insulation and a vapor barrier. Distribution system in attic, furred space or crawl space should be insulated with at least 2" of insulation. ½" to 1" thick insulation is usually sufficient for ductwork inside the air conditioned space.

Provide balancing dampers for each branch duct in the supply system. Properly support ductwork from the structure.

IMPORTANT: In the event that the return air ducts must be run through an "unconfined" space containing other fuel burning equipment, it is imperative that the user/homeowner must be informed against future changes in construction which might change this to a "confined space." Also, caution the user/homeowner against any future installation of additional equipment (such as power ventilators, clothes dryers, etc., within the existing unconfined and/or confined space which might create a negative pressure within the vicinity of other solid, liquid, or gas fueled appliances.

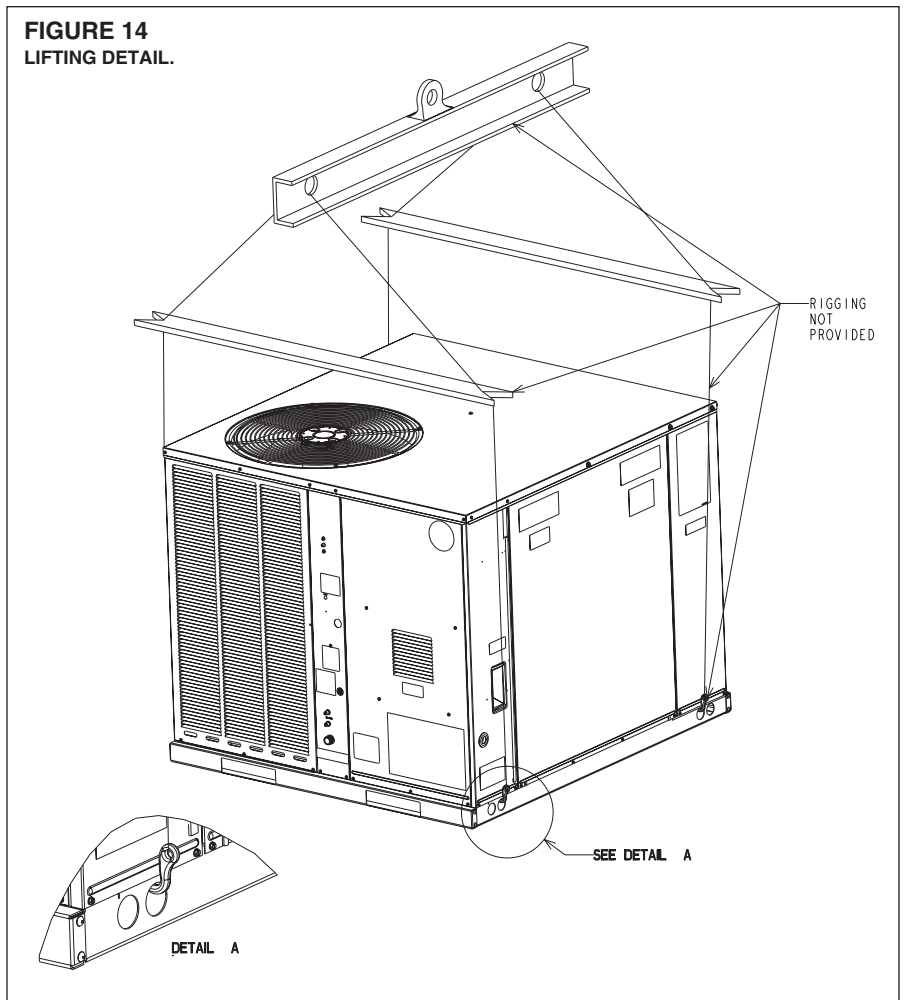
H. RETURN AIR

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.

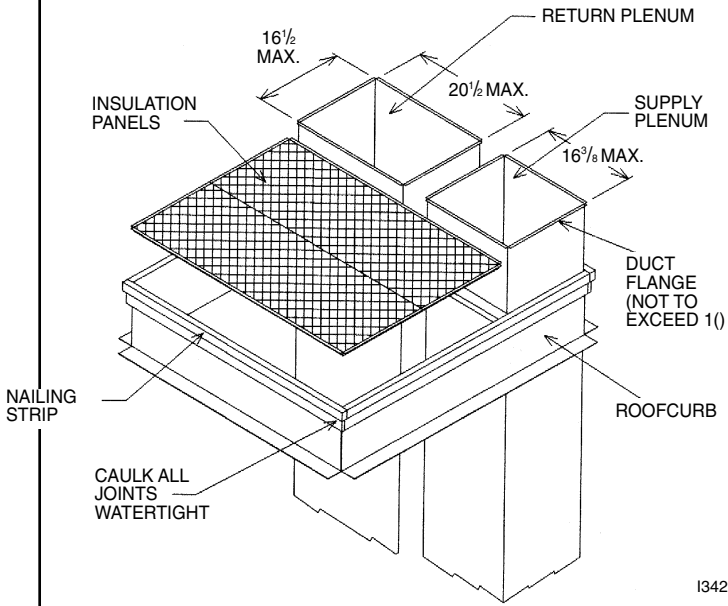
FIGURE 14
LIFTING DETAIL.



I. FILTERS

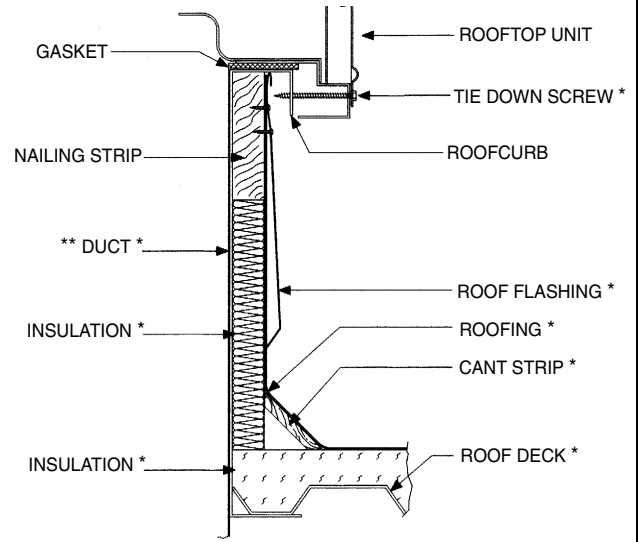
The installer must install field supplied filters in the return air duct. A field installed filter grille is recommended for easy and convenient access to the filters for periodic inspection and cleaning. Filters must have adequate face area for the rated air quantity of the unit. See air delivery tables for recommended filter size. A field installed internal filter kit RXRY-B01 is available.

FIGURE 15
ROOFCURB



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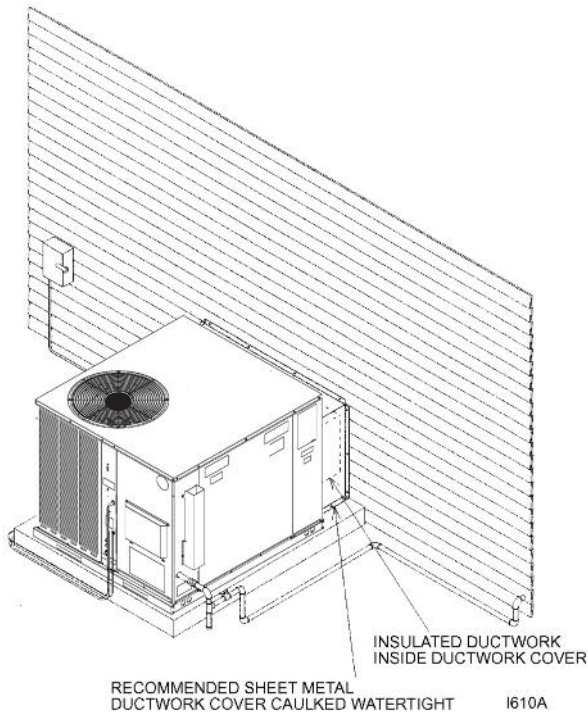
FIGURE 16
ROOFCURB



*BY CONTRACTOR
**FOR INSTALLATION OF DUCT AS SHOWN. USE RECOMMENDED DUCT SIZES FROM ROOFCURB INSTALLATION INSTRUCTIONS. FOR DUCT FLANGE ATTACHMENT TO UNIT, SEE UNIT INSTALLATION INSTRUCTIONS (FIGURE 1) FOR SIZE OF DUCT OPENINGS.

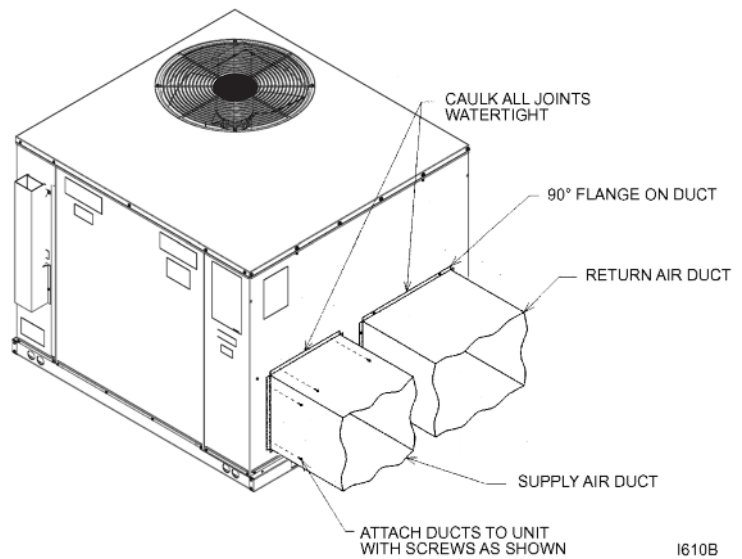
1255

FIGURE 17
DUCTWORK COVER INSTALLATION DETAIL



1610A

FIGURE 18
RESIDENTIAL ROOFTOP DUCTWORK INSTALLATION DETAIL.



1610B

VII. GAS SUPPLY, CONDENSATE DRAIN AND PIPING

A. 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.

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 Figure 2 for typical piping.
3. Size the gas line to the furnace adequate enough to prevent undue pressure drop and never less than 1/2".
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.
6. Gas valves have been factory installed. Install a manual gas valve where local codes specify a shut-off valve outside the unit casing. (See Figure 19.)
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 from 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 pressure testing of this gas supply system at pressures equal to or less than 1/2 PSIG.

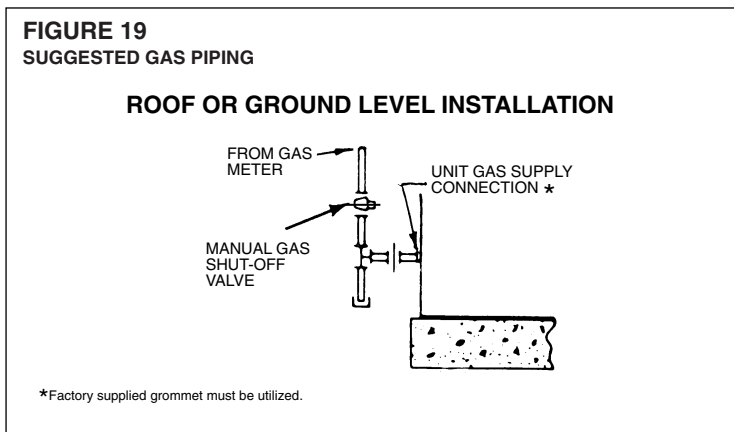


TABLE 1
GAS PIPE CAPACITY TABLE (CU. FT./HR.)

Nominal Iron Pipe Size, Inches	Equivalent Length of Pipe, Feet							
	10	20	30	40	50	60	70	80
1/2	132	92	73	63	56	50	46	43
3/4	278	190	152	130	115	105	96	90
1	520	350	285	245	215	195	180	170
1 1/4	1,050	730	590	500	440	400	370	350
1 1/2	1,600	1,100	890	760	670	610	560	530

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

⚠ WARNING

DO NOT USE AN OPEN FLAME TO CHECK FOR LEAKS. THE USE OF AN OPEN FLAME CAN RESULT IN FIRE, EXPLOSION, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

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 line 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 capacities of gas pipe of different diameters and lengths in cu. ft. per hr. with pressure drop of 0.5 in. and specific gravity of 0.60 (natural gas) are shown in Table 2.

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:

$$\text{Cu. Ft. Per Hr. Required} = \frac{\text{Gas Input of Furnace (BTU/HR)}}{\text{Heating Value of Gas (BTU/FT}^3\text{)}}$$

The gas input of the furnace is marked on the furnace rating plate. The heating value of the gas (BTU/FT³) may be determined by consulting the local natural gas utility or the L.P. gas supplier.

B. LP CONVERSION

⚠ WARNING

THIS UNIT IS EQUIPPED AT THE FACTORY FOR USE ON NATURAL GAS ONLY. CONVERSION TO LP GAS REQUIRES A SPECIAL KIT SUPPLIED BY THE DISTRIBUTOR OR MANUFACTURER. MAILING ADDRESSES ARE LISTED ON THE FURNACE RATING PLATE, PARTS LIST AND WARRANTY. FAILURE TO USE THE PROPER CONVERSION KIT CAN CAUSE 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. See Figure 20.

NOTE: Order the correct LP conversion kit from the furnace manufacturer. *See Conversion Kit Index shipped with unit for proper LP kit number. Furnace conversion to LP gas must be performed by a qualified technician.*

FIGURE 20



C. NOx MODELS

When converting units equipped with NOx inserts to LP gas, the stainless steel mesh inserts in the entrance of the tubular exchangers are not required to meet SCAQMD NOx emission levels. Carefully remove these inserts before firing this furnace on LP gas. This furnace is not designed to operate on LP gas with the NOx inserts in place.

Step by step instructions on removing the NOx inserts and retaining rod are included in the Conversion Kit Installation Instructions.

TABLE 2
LP GAS PIPE CAPACITY TABLE (CU. FT./HR.)

Maximum capacity of pipe in thousands of BTU per hour of undiluted liquefied petroleum gases (at 11 inches water column inlet pressure).
(Based on a Pressure Drop of 0.5 Inch Water Column)

Nominal Iron Pipe Size, Inches	Length of Pipe, Feet											
	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	1,071	732	590	504	448	409	378	346	322	307	275	252
1-1/4	2,205	1,496	1,212	1,039	913	834	771	724	677	630	567	511
1-1/2	3,307	2,299	1,858	1,559	1,417	1,275	1,181	1,086	1,023	976	866	787
2	6,221	4,331	3,465	2,992	2,646	2,394	2,205	2,047	1,921	1,811	1,606	1,496

Example (LP): Input BTU requirement of unit, 150,000
Equivalent length of pipe, 60 ft. = 3/4" IPS required.

D. ADJUSTING OR CHECKING FURNACE INPUT

- Natural Gas Line Pressure 5" - 10.5" W.C.
- LP Gas Line Pressure 11" - 13" W.C.
- Natural Gas Manifold Pressure 3.5" W.C
- LP Gas Manifold 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 manifold 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 counterclockwise 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 2,000 feet, rating plate input ratings apply. For high altitudes (elevations over 2,000 ft.), see conversion kit index 92-21519-XX for derating and orifice spud sizes.

Check of input is important to prevent over-firing of the furnace beyond its designed input. NEVER SET INPUT ABOVE THAT SHOWN ON THE RATING PLATE. Use the following table or formula to determine input rate.

$$\text{Cu. Ft. Per Hr. Required} = \frac{\text{Heating Value of Gas (BTU/Cu. Ft.)} \times 3600}{\text{Time in Seconds (for 1 Cu. Ft.) of Gas}}$$

TABLE 3

**METER TIME IN MINUTES AND SECONDS FOR NORMAL
INPUT RATING OF FURNACES EQUIPPED FOR NATURAL
OR LP GAS**

INPUT BTU/HR	METER SIZE CU. FT.	HEATING VALUE OF GAS BTU PER CU. FT.									
		900		1000		1040		1100		2500	
		MIN.	SEC.	MIN.	SEC.	MIN.	SEC.	MIN.	SEC.	MIN.	SEC.
40,000	ONE	1	21	1	30	1	34	1	39	3	45
	TEN	13	30	15	0	15	36	16	30	37	30
60,000	ONE	0	54	1	0	1	3	1	6	2	30
	TEN	9	0	10	0	10	24	11	0	25	0
80,000	ONE	0	41	0	45	0	47	0	50	1	53
	TEN	6	45	7	30	7	48	8	15	18	45
100,000	ONE	0	33	0	36	0	38	0	40	1	30
	TEN	5	24	6	0	6	15	6	36	15	0

Start the furnace and measure the time required to burn one 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 ALTITUDES ABOVE 2,000 FEET (610 METERS): 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 2,000 feet in the USA or Canada, or for elevations of 2,000 - 4,500 feet (610 - 1,373 meters) in Canada if the unit has been derated at the factory. For elevations above 2,000 feet (610 meters) **IN THE USA ONLY** (see ANSI-Z223.1), the burner orifices must be sized to reduce the input 4% for each 1,000 feet (305 meters) 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 2,000 FEET (610 METERS) 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 2,000 - 4,500 FEET (610 - 1,373 METERS).

E. 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. Connection to a vented sewer line is allowed. 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.

VIII. WIRING

A. 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.

- 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.
- 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%.
- For branch circuit wiring (main power supply to unit disconnect), the minimum wire size for the length of run can be determined from Table 4 using the circuit ampacity found on the unit rating plate. Use the smallest wire size allowable in Table 4 from the unit disconnect to unit. The disconnect must be in sight and readily accessible of the unit.

**TABLE 4
BRANCH CIRCUIT COPPER WIRE SIZE
(BASED ON 1% VOLTAGE DROP)***

	200	6	4	4	4	3	3	2	2
SUPPLY WIRE	150	8	6	6	4	4	4	3	3
LENGTH-FEET	100	10	8	8	6	6	6	4	4
	50	14	12	10	10	8	8	6	6
		15	20	25	30	35	40	45	50

BRANCH CIRCUIT AMPACITY

***Taken from National Electric Code**

NOTES:

- Wire size based on 60°C rated wire insulation and 30°C Ambient Temp. (86°F).
- 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 with 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, L1, L2 and L3 for three 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 following instructions very carefully to obtain a positive and lasting connection:

- Strip insulation from aluminum conductor.
- 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.
- Clean and recoat aluminum conductor with inhibitor.
- Make the splice using the above listed wire nuts or split bolt connectors.
- Coat the entire connection with inhibitor and wrap with electrical insulating tape.

TABLE 5

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

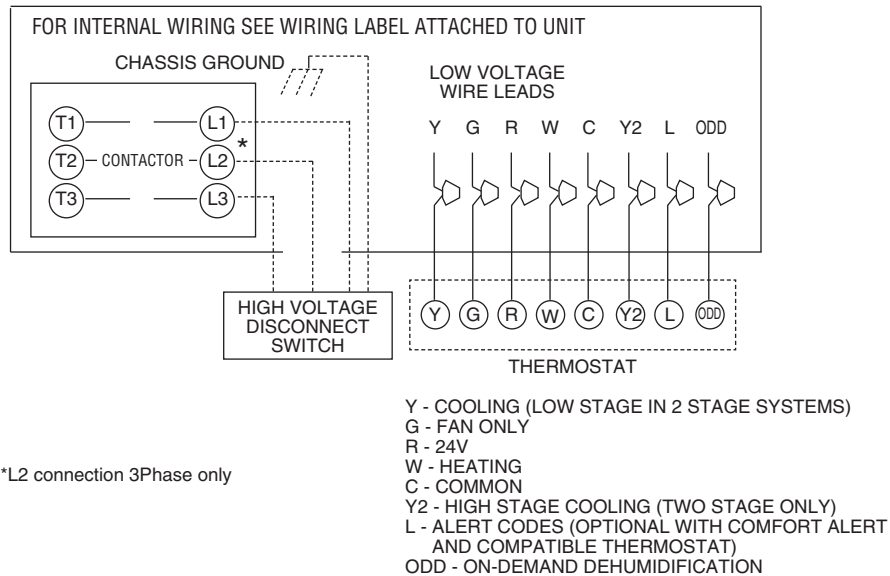
B. HOOK-UP

To wire unit, refer to the following hook-up diagram (see Figure 21).

Refer to Figure 1 for location of wiring entrances.

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 (35°C)] when installed in accordance with the manufacturer's instructions.

FIGURE 21
WIRE HOOK-UP DIAGRAM



C. 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.

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 same as original wiring.

Transformer is factory wired for 230 volts on 208/230 volt models and must be changed for 208 volt applications. See unit wiring diagram for 208 volt wiring.

D. THERMOSTAT

The room thermostat must be compatible with the spark ignition control on the unit. Generally, all thermostats that are not of the "current robbing" type are compatible with the integrated furnace control. Two stage units (5 ton) require use of a thermostat capable of 2 stages of cooling. (See Section IV.) See chart below for recommendations. The low voltage wiring should be sized as shown in Table 6.

Install the room thermostat in accordance with the instruction sheet packed in the box with the thermostat. Never install the thermostat on an outside wall or where it will be influenced by drafts, concealed hot or cold water pipes or ducts, lighting fixtures, radiation from fireplace, sun rays, lamps, televisions, radios or air streams from registers. Refer to instructions packed with the thermostat for "heater" selection or adjustment.

TABLE 6

FIELD WIRE SIZE FOR 24 VOLT THERMOSTAT CIRCUITS						
Thermostat Load - Amps	SOLID COPPER WIRE - AWG.					
	3.0	16	14	12	10	10
2.5	16	14	12	12	12	10
2.0	18	16	14	12	12	10
	50	100	150	200	250	300
	Length of Run – Feet (1)					

(1) The total wire length is the distance from the furnace to the thermostat and back to the furnace.

NOTE: DO NOT USE CONTROL WIRING SMALLER THAN NO. 18 AWG.

IX. FURNACE SECTION CONTROLS AND IGNITION SYSTEM

A. NORMAL FURNACE OPERATING SEQUENCE

This unit is equipped with an integrated direct spark ignition control.

1. The thermostat calls for 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) begins 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 30 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-energize the inducer after a five second post purge.
 11. The circulating air blower is de-energized after 90 seconds.
- The integrated control board has a three ignition system.
 - After a total of three trials for ignition without sensing main burner flame, the system goes into a 100% lockout mode.
 - After one hour, the ignition control repeats the prepurge and ignition cycles for 3 tries and then goes into 100% lockout mode again.
 - It continues this sequence of cycles and lockout each hour until ignition is successful or power is interrupted.
 - 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, with or 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 on for approximately 1/4 second, then off for 3/4 second for designated failure detections.

1 Flash: Failed to detect flame within the three tries for ignition.

2 Flash: Pressure switch or induced draft blower problem detected.

3 Flash: High limit or auxiliary limit open.

4 Flash: Flame sensed and gas valve not energized or flame sensed with no "W" signal.

5 Flash: Overtemperature switch open.

B. 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 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.

TO START THE FURNACE

1. STOP! Read the safety information on the Operating Instructions Label located on this appliance.

WARNING

IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

2. Set the thermostat to its lowest setting.
3. Turn off all electric power to the appliance.
4. 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.
5. Remove control door/access panel.
6. Move switch to the "OFF" position.
7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP!
 - Do not try to light any appliance.
 - Do not touch any electric 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.If you don't smell gas, go to the next step.
8. Move the switch from "OFF" position to "ON" position.
9. Replace the control door.
10. Turn on all electric power to the appliance.
11. Set the thermostat to the desired setting.
12. If the appliance will not operate, follow the instructions below on how 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 for some time until any air has bled through the system and fuel gas is available at the burners.

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 switch 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!

C. 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.

D. 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.

E. PRESSURE SWITCH

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

F. 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.**

X. SYSTEM OPERATING INFORMATION

A. 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 cover 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.

B. FURNACE SECTION MAINTENANCE

The unit's furnace should operate for many years without excessive scale build-up in flue passageways; however, it is recommended that a qualified installer, service agency, or the 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 ignitor 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 supplier 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.

C. 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 instructions, 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.

D. COOLING SECTION MAINTENANCE

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.

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 THE UNIT. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION RESULTING IN FIRE, ELECTRICAL SHOCK, PROPERTY DAMAGE, SEVERE 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 Evaporator 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 condenser coil.

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

1. Remove the screws from the condenser coil protective grille and remove the grille from the unit. Ensure the filter access panel is still removed to access all of the screws securing the grille.
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 fins 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 condenser 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. 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 if 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 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.

E. REPLACEMENT PARTS

Contact your local distributor for a complete parts list.

F. CHARGING

Refer to the appropriate charge chart included in this manual.

G. TGRG**C/TGRG**D/TGRG**E BLOWER MOTOR SPEED ADJUSTMENTS

WARNING

DISCONNECT MAIN ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING TO CHANGE BLOWER SPEEDS. FAILURE TO DO SO MAY RESULT IN ELECTRICAL SHOCK OR SEVERE PERSONAL INJURY OR DEATH.

Note: These instructions to be used in conjunction with airflow data tables.

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

Units with PSC Blower Motors:

1. Remove the furnace/control access panel.
2. Remove the control box cover. See Figure 22 for location of the furnace control board.
3. Reference Figure 23 for the proper location of the wires on the speed tap block and on the furnace control board to obtain the speed tap you have chosen.
Note: 460V units have dedicated heating and cooling speeds and should not be adjusted.
4. After adjusting the wires accordingly, attach the control box cover, furnace control access panel and the blower access panel to the unit.

Units with X-13 Motors

1. Remove blower access panel.
2. Locate wire terminals on the motor. Numbered terminals are 24V blower taps (See airflow tables for corresponding speed). The C terminal is 24V common. L, N, and G terminals are high voltage and must remain unchanged.

FIGURE 22
INTEGRATED FURNACE CONTROL BOARD

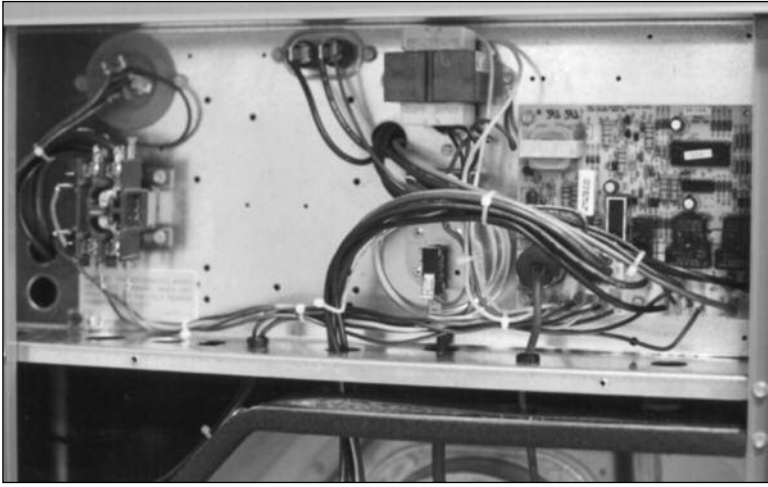
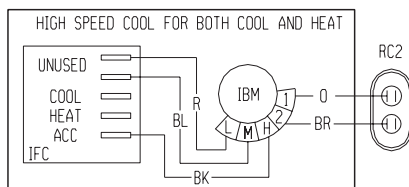
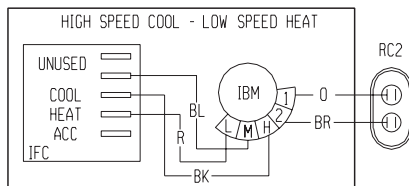
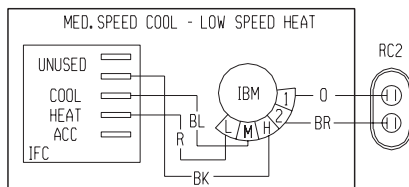
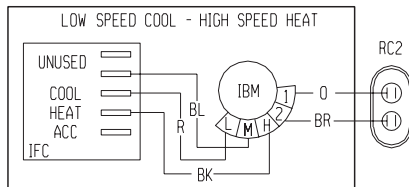
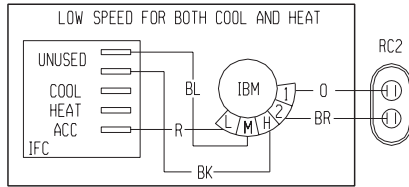


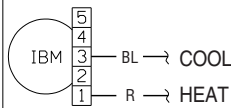
FIGURE 23

208/230 Volt PSC Motor



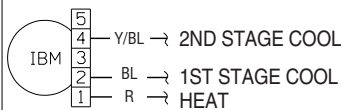
208/230 Volt X-13 Motor

2, 2.5, 3, 3.5, 4 TON MODELS



COOLING SPEED MAY BE ADJUSTED TO LOW COOL BY MOVING BLUE WIRE TO TAP 2. HEAT SPEED IS DEDICATED AND SHOULD NOT BE ADJUSTED.

5 TON MODELS



SECOND STAGE COOLING SPEED MAY BE ADJUSTED TO LOW COOL BY MOVING YELLOW WITH BLUE STRIPE WIRE TO TAP 3. FIRST STAGE COOLING SPEED IS DEDICATED AND SHOULD NOT BE ADJUSTED. HEAT SPEED IS DEDICATED AND SHOULD NOT BE ADJUSTED

NOTE: 460 Volt motors have dedicated speeds and are not adjustable.

FIGURE 24
FACTORY SET BLOWER SPEEDS

MODEL	PSC MOTOR		X-13 MOTOR	
	COOL	HEAT	COOL	HEAT
2.0 TON W/40K HEAT	HIGH	LOW	HIGH (Tap 3)	DEDICATED (Tap 1)
2.0 TON W/60K HEAT	HIGH	HEAT	HIGH (Tap 3)	DEDICATED (Tap 1)
2.0 TON W/80K HEAT	HIGH	HEAT	HIGH (Tap 3)	DEDICATED (Tap 1)
2.5 TON ALL HEAT INPUTS	LOW	LOW	HIGH (Tap 3)	DEDICATED (Tap 1)
3.0 TON ALL HEAT INPUTS	MED	LOW	HIGH (Tap 3)	DEDICATED (Tap 1)
3.5 TON ALL HEAT INPUTS	HIGH	LOW	HIGH (Tap 3)	DEDICATED (Tap 1)
4.0 TON ALL HEAT INPUTS	HIGH	LOW	HIGH (Tap 3)	DEDICATED (Tap 1)
5.0 TON ALL HEAT INPUTS	N/A	N/A	1st Stage - DEDICATED (Tap 2) 2nd Stage - HIGH (Tap 4)	DEDICATED (Tap 1)

*460 volt units: Do not adjust from factory speed.

3. Cooling speeds can be adjusted as noted in Figure 23 by moving appropriate wire between taps at the blower (Do not connect wires to unspecified speed taps).

Note: Heat speed is dedicated and should not be changed. The first stage cooling speed on 5-ton models is dedicated and should not be changed.

4. Replace blower access panel.

XI. GENERAL DATA - TGRG**C/TGRG**E MODELS

NOMINAL SIZES 2-5 TONS [7-15.8 kW]

Model TGR- Series	G24C-1K-40	G24C-1K-60	G24C-1K-80	G30C-1K-60
Cooling Performance¹				Continued ->
Gross Cooling Capacity Btu [kW]	24,400 [7.15]	24,400 [7.15]	24,400 [7.15]	29,800 [8.73]
EER, SEER ²	11.1/13	11.1/13	11.1/13	11.1/13
Nominal CFM/ARI Rated CFM [L/s]	787/800 [371/378]	787/800 [371/378]	787/800 [371/378]	953/1000 [450/472]
ARI Net Cooling Capacity Btu [kW]	23,600 [6.91]	23,600 [6.91]	23,600 [6.91]	28,600 [8.38]
Net Sensible Capacity Btu [kW]	17,340 [5.08]	17,340 [5.08]	17,340 [5.08]	20,810 [6.1]
Net Latent Capacity Btu [kW]	6,260 [1.83]	6,260 [1.83]	6,260 [1.83]	7,790 [2.28]
Net System Power kW	2.12	2.12	2.12	2.58
Heating Performance (Gas)⁴				
Heating Input Btu [kW]	40,000 [11.72]	60,000 [17.58]	80,000 [23.44]	60,000 [17.58]
Heating Output Btu [kW]	31,000 [9.08]	47,000 [13.77]	62,000 [18.17]	47,000 [13.77]
Temperature Rise Range °F [°C]	30-60 [16.7/33.3]	40-70 [22.2/38.9]	55-85 [30.6/47.2]	30-60 [16.7/33.3]
AFUE %	80	80	80	80
Steady State Efficiency (%)	81	81	81	81
No. Burners	2	3	4	3
No. Stages	1	1	1	1
Gas Connection Pipe Size in. [mm]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)⁵	76	76	76	76
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled	Rifled
Tube Size in. [mm] OD	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	10.56 [0.98]	10.56 [0.98]	10.56 [0.98]	10.56 [0.98]
Rows / FPI [FPcm]	1 / 18 [7]	1 / 18 [7]	1 / 18 [7]	1 / 18 [7]
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled	Rifled
Tube Size in. [mm]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	5.54 [0.51]	5.54 [0.51]	5.54 [0.51]	5.54 [0.51]
Rows / FPI [FPcm]	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	2500 [1180]	2500 [1180]	2500 [1180]	2500 [1180]
No. Motors/HP	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP
Motor RPM	1075	1075	1075	1075
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/9x7 [229x178]	1/9x7 [229x178]	1/9x7 [229x178]	1/10x9 [254x229]
Drive Type/No. Speeds	Direct/2	Direct/2	Direct/2	Direct/3
No. Motors	1	1	1	1
Motor HP	1/4	1/4	1/4	1/2
Motor RPM	1075	1075	1075	1075
Motor Frame Size	48	48	48	48
Filter - Type	Field Supplied	Field Supplied	Field Supplied	Field Supplied
Furnished	No	No	No	No
(NO.) Size Recommended in. [mm x mm x mm]	(1)1x20x20 [25x508x508]	(1)1x20x20 [25x508x508]	(1)1x20x20 [25x508x508]	(1)1x24x24 [25x610x610]
Refrigerant Charge Oz. [g]	77.8 [2206]	77.8 [2206]	77.8 [2206]	76.8 [2177]
Weights				
Net Weight lbs. [kg]	381 [173]	385 [175]	390 [177]	404 [183]
Ship Weight lbs. [kg]	421 [191]	425 [193]	430 [195]	444 [201]

NOTES:

- Cooling Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on ARI Standard 210/240 or 360.
- EER and/or SEER are rated at ARI conditions and in accordance with DOE test procedures.
- Heating Performance limit settings and rating data were established and approved under laboratory test conditions using American National Standard Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level.
- APUE is rated in accordance with DOE test procedures.
- Outdoor Sound Rating shown is tested in accordance with ARI Standard 270.

GENERAL DATA - TGRG**C/TGRG**E MODELS

NOMINAL SIZES 2-5 TONS [7-15.8 kW]

Model TGR- Series	G30C-1K-80	G30C-1K-100	G36C-1K-80	G36C-1K-100
Cooling Performance¹				Continued ->
Gross Cooling Capacity Btu [kW]	29,800 [8.73]	29,800 [8.73]	37,000 [10.84]	37,000 [10.84]
EER, SEER ²	11.1/13	11.1/13	11.1/13	11.1/13
Nominal CFM/ARI Rated CFM [L/s]	953/1000 [450/472]	953/1000 [450/472]	1187/1200 [560/566]	1187/1200 [560/566]
ARI Net Cooling Capacity Btu [kW]	28,600 [8.38]	28,600 [8.38]	35,600 [10.43]	35,600 [10.43]
Net Sensible Capacity Btu [kW]	20,810 [6.1]	20,810 [6.1]	26,390 [7.73]	26,390 [7.73]
Net Latent Capacity Btu [kW]	7,790 [2.28]	7,790 [2.28]	9,210 [2.7]	9,210 [2.7]
Net System Power kW	2.58	2.58	3.15	3.15
Heating Performance (Gas)⁴				
Heating Input Btu [kW]	80,000 [23.44]	100,000 [29.3]	80,000 [23.44]	100,000 [29.3]
Heating Output Btu [kW]	62,000 [18.17]	77,000 [22.56]	62,000 [18.17]	77,000 [22.56]
Temperature Rise Range °F [°C]	40-70 [22.2/38.9]	45-85 [25/47.2]	40-70 [22.2/38.9]	45-85 [25/47.2]
AFUE %	80	80	80	80
Steady State Efficiency (%)	81	81	81	81
No. Burners	4	5	4	5
No. Stages	1	1	1	1
Gas Connection Pipe Size in. [mm]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)⁵				
	76	76	76	76
Outdoor Coil - Fin Type				
Tube Type	Louvered	Louvered	Louvered	Louvered
Tube Size in. [mm] OD	Rifled	Rifled	Rifled	Rifled
Face Area sq. ft. [sq. m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows / FPI [FPcm]	10.56 [0.98]	10.56 [0.98]	14.8 [1.37]	14.8 [1.37]
	1 / 18 [7]	1 / 18 [7]	1 / 22 [9]	1 / 22 [9]
Indoor Coil - Fin Type				
Tube Type	Louvered	Louvered	Louvered	Louvered
Tube Size in. [mm]	Rifled	Rifled	Rifled	Rifled
Face Area sq. ft. [sq. m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows / FPI [FPcm]	5.54 [0.51]	5.54 [0.51]	5.54 [0.51]	5.54 [0.51]
	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type				
No. Used/Diameter in. [mm]	Propeller	Propeller	Propeller	Propeller
Drive Type/No. Speeds	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]
CFM [L/s]	Direct/1	Direct/1	Direct/1	Direct/1
No. Motors/HP	2500 [1180]	2500 [1180]	2700 [1274]	2700 [1274]
Motor RPM	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP
	1075	1075	1075	1075
Indoor Fan - Type				
No. Used/Diameter in. [mm]	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
Drive Type/No. Speeds	1/10x9 [254x229]	1/10x9 [254x229]	1/10x9 [254x229]	1/10x9 [254x229]
No. Motors	Direct/3	Direct/3	Direct/3	Direct/3
Motor HP	1	1	1	1
Motor RPM	1/2	1/2	1/2	1/2
Motor Frame Size	1075	1075	1075	1075
	48	48	48	48
Filter - Type				
Furnished	Field Supplied	Field Supplied	Field Supplied	Field Supplied
(NO.) Size Recommended in. [mm x mm x mm]	No	No	No	No
	(1)1x24x24 [25x610x610]	(1)1x24x24 [25x610x610]	(1)1x24x24 [25x610x610]	(1)1x24x24 [25x610x610]
Refrigerant Charge Oz. [g]				
	76.8 [2177]	76.8 [2177]	92.8 [2631]	92.8 [2631]
Weights				
Net Weight lbs. [kg]	409 [186]	414 [188]	422 [191]	426 [193]
Ship Weight lbs. [kg]	449 [204]	454 [206]	462 [210]	466 [211]

NOTES:

- Cooling Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on ARI Standard 210/240 or 360.
- EER and/or SEER are rated at ARI conditions and in accordance with DOE test procedures.
- Heating Performance limit settings and rating data were established and approved under laboratory test conditions using American National Standard Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level.
- APUE is rated in accordance with DOE test procedures.
- Outdoor Sound Rating shown is tested in accordance with ARI Standard 270.

GENERAL DATA - TGRG**C/TGRG**E MODELS

NOMINAL SIZES 2-5 TONS [7-15.8 kW]

Model TGR- Series	G42C-1K-100	G48C-1K-100	G60E-1K-100
Cooling Performance¹			
Gross Cooling Capacity Btu [kW]	44,000 [12.89]	50,000 [14.65]	59,500 [17.43]
EER, SEER ²	11.2/13	11.2/13	10.5/13
Nominal CFM/ARI Rated CFM [L/s]	1400/1400 [661/661]	1600/1600 [755/755]	1900/1850 [897/873]
ARI Net Cooling Capacity Btu [kW]	42,000 [12.31]	48,000 [14.06]	57,500 [16.85]
Net Sensible Capacity Btu [kW]	30,510 [8.94]	33,990 [9.96]	40,460 [11.85]
Net Latent Capacity Btu [kW]	11,490 [3.37]	14,010 [4.1]	17,040 [4.99]
Net System Power kW	3.73	4.28	5.48
Heating Performance (Gas)⁴			
Heating Input Btu [kW]	100,000 [29.3]	100,000 [29.3]	100,000 [29.3]
Heating Output Btu [kW]	77,000 [22.56]	77,000 [22.56]	77,000 [22.56]
Temperature Rise Range °F [°C]	45-85 [25/47.2]	45-85 [25/47.2]	45-85 [25/47.2]
AFUE %	80	80	80
Steady State Efficiency (%)	81	81	81
No. Burners	5	5	5
No. Stages	1	1	1
Gas Connection Pipe Size in. [mm]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]
Compressor			
No./Type	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)⁵			
	76	78	78
Outdoor Coil - Fin Type			
Tube Type	Louvered	Louvered	Louvered
Tube Size in. [mm] OD	Rifled	Rifled	Rifled
Face Area sq. ft. [sq. m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows / FPI [FPcm]	16.65 [1.55]	16.23 [1.51]	16.23 [1.51]
	1 / 22 [9]	2 / 22 [9]	2 / 22 [9]
Indoor Coil - Fin Type			
Tube Type	Louvered	Louvered	Louvered
Tube Size in. [mm]	Rifled	Rifled	Rifled
Face Area sq. ft. [sq. m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows / FPI [FPcm]	7.39 [0.69]	7.39 [0.69]	7.39 [0.69]
	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]
Refrigerant Control	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type			
No. Used/Diameter in. [mm]	Propeller	Propeller	Propeller
Drive Type/No. Speeds	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]
CFM [L/s]	Direct/1	Direct/1	Direct/1
No. Motors/HP	3500 [1652]	3300 [1557]	3300 [1557]
Motor RPM	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP
	1075	1075	1075
Indoor Fan - Type			
No. Used/Diameter in. [mm]	FC Centrifugal	FC Centrifugal	FC Centrifugal
Drive Type/No. Speeds	1/10x9 [254x229]	1/10x9 [254x229]	1/12x9 [305x229]
No. Motors	Direct/3	Direct/3	Direct/3
Motor HP	1	1	1
Motor RPM	1/2	3/4	1
Motor Frame Size	1075	1075	1075
	48	48	48
Filter - Type			
Furnished	Field Supplied	Field Supplied	Field Supplied
(NO.) Size Recommended in. [mm x mm x mm]	No	No	No
	(1)1x24x24 [25x610x610]	(1)1x24x24 [25x610x610]	(1)1x24x30 [25x610x762]
Refrigerant Charge Oz. [g]			
	112 [3175]	161.2 [4570]	172.8 [4899]
Weights			
Net Weight lbs. [kg]	437 [198]	471 [214]	532 [241]
Ship Weight lbs. [kg]	477 [216]	511 [262]	577 [262]

Continued ->

NOTES:

- Cooling Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on ARI Standard 210/240 or 360.
- EER and/or SEER are rated at ARI conditions and in accordance with DOE test procedures.
- Heating Performance limit settings and rating data were established and approved under laboratory test conditions using American National Standard Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level.
- APUE is rated in accordance with DOE test procedures.
- Outdoor Sound Rating shown is tested in accordance with ARI Standard 270.

GENERAL DATA - TGRG**D MODELS

NOMINAL SIZES 2-5 TONS [7-15.8 kW]

Model TGR- Series	G24D-1K-40	G24D-1K-60	G24D-1K-80	G30D-1K-60
Cooling Performance¹				Continued ->
Gross Cooling Capacity Btu [kW]	24,400 [7.15]	24,400 [7.15]	24,400 [7.15]	29,600 [8.67]
EER, SEER ²	12/14	12/14	12/14	12/14
Nominal CFM/ARI Rated CFM [L/s]	800/800 [378/378]	800/800 [378/378]	800/800 [378/378]	967/1000 [456/472]
ARI Net Cooling Capacity Btu [kW]	24,000 [7.03]	24,000 [7.03]	24,000 [7.03]	29,200 [8.56]
Net Sensible Capacity Btu [kW]	17,790 [5.21]	17,790 [5.21]	17,790 [5.21]	21,700 [6.36]
Net Latent Capacity Btu [kW]	6,210 [1.82]	6,210 [1.82]	6,210 [1.82]	7,500 [2.2]
Net System Power kW	2.01	2.01	2.01	2.43
Heating Performance (Gas)⁴				
Heating Input Btu [kW]	40,000 [11.72]	60,000 [17.58]	80,000 [23.44]	60,000 [17.58]
Heating Output Btu [kW]	31,000 [9.08]	47,000 [13.77]	62,000 [18.17]	47,000 [13.77]
Temperature Rise Range °F [°C]	30-60 [16.7/33.3]	40-70 [22.2/38.9]	55-85 [30.6/47.2]	30-60 [16.7/33.3]
AFUE %	80	80	80	80
Steady State Efficiency (%)	81	81	81	81
No. Burners	2	3	4	3
No. Stages	1	1	1	1
Gas Connection Pipe Size in. [mm]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)⁵	76	76	76	76
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled	Rifled
Tube Size in. [mm] OD	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	10.56 [0.98]	10.56 [0.98]	10.56 [0.98]	10.56 [0.98]
Rows / FPI [FPcm]	1 / 18 [7]	1 / 18 [7]	1 / 18 [7]	1 / 18 [7]
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled	Rifled
Tube Size in. [mm]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	5.54 [0.51]	5.54 [0.51]	5.54 [0.51]	5.54 [0.51]
Rows / FPI [FPcm]	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	2500 [1180]	2500 [1180]	2500 [1180]	2500 [1180]
No. Motors/HP	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP
Motor RPM	1075	1075	1075	1075
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/9x7 [229x178]	1/9x7 [229x178]	1/9x7 [229x178]	1/10x9 [254x229]
Drive Type/No. Speeds	Direct/2	Direct/2	Direct/2	Direct/3
No. Motors	1	1	1	1
Motor HP	1/3	1/3	1/3	1/2
Motor RPM	1075	1075	1075	1075
Motor Frame Size	48	48	48	48
Filter - Type	Field Supplied	Field Supplied	Field Supplied	Field Supplied
Furnished	No	No	No	No
(NO.) Size Recommended in. [mm x mm x mm]	(1)1x20x20 [25x508x508]	(1)1x20x20 [25x508x508]	(1)1x20x20 [25x508x508]	(1)1x24x24 [25x610x610]
Refrigerant Charge Oz. [g]	77.8 [2206]	77.8 [2206]	77.8 [2206]	76.8 [2177]
Weights				
Net Weight lbs. [kg]	381 [173]	385 [175]	390 [177]	404 [183]
Ship Weight lbs. [kg]	421 [191]	425 [193]	430 [195]	444 [201]

NOTES:

- Cooling Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on ARI Standard 210/240 or 360.
- EER and/or SEER are rated at ARI conditions and in accordance with DOE test procedures.
- Heating Performance limit settings and rating data were established and approved under laboratory test conditions using American National Standard Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level.
- APUE is rated in accordance with DOE test procedures.
- Outdoor Sound Rating shown is tested in accordance with ARI Standard 270.

GENERAL DATA - TGRG**D MODELS

NOMINAL SIZES 2-5 TONS [7-15.8 kW]

Model TGR- Series	G30D-1K-80	G30D-1K-100	G36D-1K-80	G36D-1K-100
Cooling Performance¹				Continued ->
Gross Cooling Capacity Btu [kW]	29,600 [8.67]	29,600 [8.67]	36,800 [10.78]	36,800 [10.78]
EER, SEER ²	12/14	12/14	12/14	12/14
Nominal CFM/ARI Rated CFM [L/s]	967/1000 [456/472]	967/1000 [456/472]	1200/1200 [566/566]	1200/1200 [566/566]
ARI Net Cooling Capacity Btu [kW]	29,200 [8.56]	29,200 [8.56]	36,000 [10.55]	36,000 [10.55]
Net Sensible Capacity Btu [kW]	21,700 [6.36]	21,700 [6.36]	26,420 [7.74]	26,420 [7.74]
Net Latent Capacity Btu [kW]	7,500 [2.2]	7,500 [2.2]	9,580 [2.81]	9,580 [2.81]
Net System Power kW	2.43	2.43	3	3
Heating Performance (Gas)⁴				
Heating Input Btu [kW]	80,000 [23.44]	80,000 [23.44]	80,000 [23.44]	100,000 [29.3]
Heating Output Btu [kW]	62,000 [18.17]	77,000 [22.56]	62,000 [18.17]	77,000 [22.56]
Temperature Rise Range °F [°C]	40-70 [22.2/38.9]	45-85 [25/47.2]	40-70 [22.2/38.9]	45-85 [25/47.2]
AFUE %	80	80	80	80
Steady State Efficiency (%)	81	81	81	81
No. Burners	4	5	4	5
No. Stages	1	1	1	1
Gas Connection Pipe Size in. [mm]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)⁵				
	76	76	76	76
Outdoor Coil - Fin Type				
Tube Type	Louvered	Louvered	Louvered	Louvered
Tube Size in. [mm] OD	Rifled	Rifled	Rifled	Rifled
Face Area sq. ft. [sq. m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows / FPI [FPcm]	10.56 [0.98]	10.56 [0.98]	14.8 [1.37]	14.8 [1.37]
	1 / 18 [7]	1 / 18 [7]	1 / 22 [9]	1 / 22 [9]
Indoor Coil - Fin Type				
Tube Type	Louvered	Louvered	Louvered	Louvered
Tube Size in. [mm]	Rifled	Rifled	Rifled	Rifled
Face Area sq. ft. [sq. m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows / FPI [FPcm]	5.54 [0.51]	5.54 [0.51]	5.54 [0.51]	5.54 [0.51]
	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type				
No. Used/Diameter in. [mm]	Propeller	Propeller	Propeller	Propeller
Drive Type/No. Speeds	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]
CFM [L/s]	Direct/1	Direct/1	Direct/1	Direct/1
No. Motors/HP	2500 [1180]	2500 [1180]	2700 [1274]	2700 [1274]
Motor RPM	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP
	1075	1075	1075	1075
Indoor Fan - Type				
No. Used/Diameter in. [mm]	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
Drive Type/No. Speeds	1/10x9 [254x229]	1/10x9 [254x229]	1/10x9 [254x229]	1/10x9 [254x229]
No. Motors	Direct/3	Direct/3	Direct/3	Direct/3
Motor HP	1	1	1	1
Motor RPM	1/2	1/2	1/2	1/2
Motor Frame Size	1075	1075	1075	1075
	48	48	48	48
Filter - Type				
Furnished	Field Supplied	Field Supplied	Field Supplied	Field Supplied
(NO.) Size Recommended in. [mm x mm x mm]	No	No	No	No
	(1)1x24x24 [25x610x610]	(1)1x24x24 [25x610x610]	(1)1x24x24 [25x610x610]	(1)1x24x24 [25x610x610]
Refrigerant Charge Oz. [g]				
	76.8 [2177]	76.8 [2177]	92.8 [2631]	92.8 [2631]
Weights				
Net Weight lbs. [kg]	409 [186]	414 [188]	422 [191]	426 [193]
Ship Weight lbs. [kg]	449 [204]	454 [206]	462 [210]	466 [211]

NOTES:

- Cooling Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on ARI Standard 210/240 or 360.
- EER and/or SEER are rated at ARI conditions and in accordance with DOE test procedures.
- Heating Performance limit settings and rating data were established and approved under laboratory test conditions using American National Standard Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level.
- APUE is rated in accordance with DOE test procedures.
- Outdoor Sound Rating shown is tested in accordance with ARI Standard 270.

GENERAL DATA - TGRG**D MODELS

NOMINAL SIZES 2-5 TONS [7-15.8 kW]

Model TGR- Series	G42D-1K-100	G48D-1K-100	G48D-1K-100
Cooling Performance¹			
Gross Cooling Capacity Btu [kW]	44,000 [12.89]	50,500 [14.8]	59,500 [17.43]
EER, SEER ²	12/14	12/14	10.8/14
Nominal CFM/ARI Rated CFM [L/s]	1400/1400 [661/661]	1600/1600 [755/755]	2000/1850 [944/873]
ARI Net Cooling Capacity Btu [kW]	43,000 [12.6]	49,000 [14.36]	57,500 [16.85]
Net Sensible Capacity Btu [kW]	31,270 [9.16]	34,990 [10.25]	40,460 [11.85]
Net Latent Capacity Btu [kW]	11,730 [3.44]	14,010 [4.1]	17,040 [4.99]
Net System Power kW	3.58	4.08	5.32
Heating Performance (Gas)⁴			
Heating Input Btu [kW]	100,000 [29.3]	100,000 [29.3]	100,000 [29.3]
Heating Output Btu [kW]	77,000 [22.56]	77,000 [22.56]	77,000 [22.56]
Temperature Rise Range °F [°C]	45-85 [25/47.2]	45-85 [25/47.2]	45-85 [25/47.2]
AFUE %	80	80	80
Steady State Efficiency (%)	81	81	81
No. Burners	5	5	5
No. Stages	1	1	1
Gas Connection Pipe Size in. [mm]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]
Compressor			
No./Type	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)⁵			
	76	76	76
Outdoor Coil - Fin Type			
Tube Type	Louvered	Louvered	Louvered
Tube Size in. [mm] OD	Rifled	Rifled	Rifled
Face Area sq. ft. [sq. m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows / FPI [FPcm]	16.65 [1.55]	16.23 [1.51]	16.23 [1.51]
	1 / 22 [9]	2 / 22 [9]	2 / 22 [9]
Indoor Coil - Fin Type			
Tube Type	Louvered	Louvered	Louvered
Tube Size in. [mm]	Rifled	Rifled	Rifled
Face Area sq. ft. [sq. m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows / FPI [FPcm]	7.39 [0.69]	7.39 [0.69]	7.39 [0.69]
	2 / 15 [6]	2 / 15 [6]	2 / 15 [6]
Refrigerant Control	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type			
No. Used/Diameter in. [mm]	Propeller	Propeller	Propeller
Drive Type/No. Speeds	1/22 [558.8]	1/22 [558.8]	1/22 [558.8]
CFM [L/s]	Direct/1	Direct/1	Direct/1
No. Motors/HP	3500 [1652]	3300 [1557]	3300 [1557]
Motor RPM	1 at 1/3 HP	1 at 1/3 HP	1 at 1/3 HP
	1075	1075	1075
Indoor Fan - Type			
No. Used/Diameter in. [mm]	FC Centrifugal	FC Centrifugal	FC Centrifugal
Drive Type/No. Speeds	1/10x9 [254x229]	1/10x9 [254x229]	1/10x9 [254x229]
No. Motors	Direct/3	Direct/3	Direct/3
Motor HP	1	1	1
Motor RPM	1/2	3/4	1
Motor Frame Size	1075	1075	1075
	48	48	48
Filter - Type			
Furnished	Field Supplied	Field Supplied	Field Supplied
(NO.) Size Recommended in. [mm x mm x mm]	No	No	No
	(1)1x24x24 [25x610x610]	(1)1x24x24 [25x610x610]	(1)1x24x30 [25x610x762]
Refrigerant Charge Oz. [g]			
	112 [3175]	161.2 [4570]	172.8 [4899]
Weights			
Net Weight lbs. [kg]	437 [198]	471 [214]	532 [241]
Ship Weight lbs. [kg]	477 [216]	511 [232]	577 [262]

NOTES:

- Cooling Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. ARI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on ARI Standard 210/240 or 360.
- EER and/or SEER are rated at ARI conditions and in accordance with DOE test procedures.
- Heating Performance limit settings and rating data were established and approved under laboratory test conditions using American National Standard Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level.
- APUE is rated in accordance with DOE test procedures.
- Outdoor Sound Rating shown is tested in accordance with ARI Standard 270.

XII. MISCELLANEOUS

ELECTRICAL DATA – TGRG**C/TGRG**E SERIES										
		G24C-1K-40	G24C-1K-60	G24C-1K-80	G30C-1K-60	G30C-1K-80	G30C-1K-100	G36C-1K-80	G36C-1K-100	G42C-1K-100
Unit Information	Unit Operating Voltage Range	187-253	187-253	187-253	187-253	187-253	187-253	187-253	187-253	187-253
	Minimum Circuit Ampacity	19/19	19/19	19/19	22/22	22/22	22/22	25/25	25/25	27/27
	Minimum Overcurrent Protection Device Size	20/20	20/20	20/20	25/25	25/25	25/25	25/25	25/25	30/30
	Maximum Overcurrent Protection Device Size	30/30	30/30	30/30	35/35	35/35	35/35	40/40	40/40	40/40
Compressor Motor	No.	1	1	1	1	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1	1	1	1	1
	HP	2 1/6	2 1/6	2 1/6	2 2/3	2 2/3	2 2/3	3 1/3	3 1/3	3 1/2
	RPM	3450	3450	3450	3450	3450	3450	3450	3450	3450
	Amps (RLA)	12.8/12.8	12.8/12.8	12.8/12.8	14.1/14.1	14.1/14.1	14.1/14.1	16.7/16.7	16.7/16.7	17.9/17.9
	Amps (LRA)	58.3/58.3	58.3/58.3	58.3/58.3	73/73	73/37	73/73	79/79	79/79	112/112
Condenser Motor	No.	1	1	1	1	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1	1	1	1	1
	HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3
	Amps (FLA)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2
	Amps (LRA)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	3.9
Evaporator Fan	No.	1	1	1	1	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1	1	1	1	1
	HP	1/4	1/4	1/4	1/2	1/2	1/2	1/2	1/2	1/2
	Amps (FLA)	1.3	1.3	1.3	2.4	2.4	2.4	2.4	2.4	2.4
	Amps (LRA)	2.3	2.3	2.3	5.1	5.1	5.1	5.1	5.1	5.1

1. Horsepower per Compressor
2. Amp Draw Per Motor. Multiply Value by Number of Motors to Determine Total Amps.

ELECTRICAL DATA – TGRG**C/TGRG**E SERIES

		G48C-1K-100	G60E-1K-100
Unit Information	Unit Operating Voltage Range	187-253	187-253
	Minimum Circuit Ampacity	34/34	43/43
	Minimum Overcurrent Protection Device Size	35/35	45/45
	Maximum Overcurrent Protection Device Size	50/50	60/60
Compressor Motor	No.	1	1
	Volts	208/230	208/230
	Phase	1	1
	HP	4	5
	RPM	3450	3450
	Amps (RLA)	21.8/21.8	26.4/26.4
	Amps (LRA)	117/117	134/134
Condenser Motor	No.	1	1
	Volts	208/230	208/230
	Phase	1	1
	HP	1/3	1/3
	Amps (FLA)	2	2
	Amps (LRA)	3.9	3.9
Evaporator Fan	No.	1	1
	Volts	208/230	208/230
	Phase	1	1
	HP	3/4	1
	Amps (FLA)	4.4	7.6
	Amps (LRA)	9.5	0

1. Horsepower per Compressor
2. Amp Draw Per Motor. Multiply Value by Number of Motors to Determine Total Amps.

ELECTRICAL DATA – TGRG**D SERIES									
		G24D-1K-40	G24D-1K-60	G24D-1K-80	G30D-1K-60	G30D-1K-80	G30D-1K-100	G36D-1K-80	G36D-1K-100
Unit Information	Unit Operating Voltage Range	187-253	187-253	187-253	187-253	187-253	187-253	187-253	187-253
	Minimum Circuit Ampacity	21/21	21/21	21/21	24/24	24/24	24/24	27/27	27/27
	Minimum Overcurrent Protection Device Size	25/25	25/25	25/25	25/25	25/25	25/25	30/30	30/30
	Maximum Overcurrent Protection Device Size	30/30	30/30	30/30	35/35	35/35	35/35	40/40	40/40
Compressor Motor	No.	1	1	1	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1	1	1	1
	HP	2 1/6	2 1/6	2 1/6	2 2/3	2 2/3	2 2/3	3 1/3	3 1/3
	RPM	3450	3450	3450	3450	3450	3450	3450	3450
	Amps (FLA)	12.8/12.8	12.8/12.8	12.8/12.8	14.1/14.1	14.1/14.1	14.1/14.1	16.7/16.7	16.7/16.7
	Amps (LRA)	58.3/58.3	58.3/58.3	58.3/58.3	73/73	73/73	73/73	79/79	79/79
Condenser Motor	No.	1	1	1	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1	1	1	1
	HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3
	Amps (FLA)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
	Amps (LRA)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Evaporator Fan	No.	1	1	1	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1	1	1	1
	HP	1/3	1/3	1/3	1/2	1/2	1/2	1/2	1/2
	Amps (FLA)	2.8	2.8	2.8	4.1	4.1	4.1	4.1	4.1
	Amps (LRA)	0	0	0	0	0	0	0	0

1. Horsepower per Compressor
2. Amp Draw Per Motor. Multiply Value by Number of Motors to Determine Total Amps.

ELECTRICAL DATA – TGRG**D SERIES				
		G42D-1K-100	G48D-1K-100	G48D-1K-100
Unit Information	Unit Operating Voltage Range	187-253	187-253	187-253
	Minimum Circuit Ampacity	29/29	36/36	42/42
	Minimum Overcurrent Protection Device Size	30/30	40/40	45/45
	Maximum Overcurrent Protection Device Size	45/45	50/50	60/60
Compressor Motor	No.	1	1	1
	Volts	208/230	208/230	208/230
	Phase	1	1	1
	HP	3 1/2	4	5
	RPM	3450	3450	3450
	Amps (RLA)	17.9/17.9	21.8/21.8	25.6/25.6
	Amps (LRA)	112/112	117/117	118/118
Condenser Motor	No.	1	1	1
	Volts	208/230	208/230	208/230
	Phase	1	1	1
	HP	1/3	1/3	1/3
	Amps (FLA)	2	2	2
	Amps (LRA)	3.9	3.9	3.9
Evaporator Fan	No.	1	1	1
	Volts	208/230	208/230	208/230
	Phase	1	1	1
	HP	1/2	3/4	1
	Amps (FLA)	4.1	6	7.6
	Amps (LRA)	0	0	0

1. Horsepower per Compressor
2. Amp Draw Per Motor. Multiply Value by Number of Motors to Determine Total Amps.

XIII. AIRFLOW PERFORMANCE DATA

INDOOR AIRFLOW PERFORMANCE FOR 2-5 TON PACKAGE GAS ELECTRIC UNITS—TGRG**C/TGRG**E DIRECT DRIVE

INDOOR AIRFLOW PERFORMANCE — 208 VOLTS

Nominal Cooling Capacity Tons [kW]	Motor Speed From Factory		Heating Input BTU/HR [kW]	Blower Size/ Motor HP [W] & # of Speeds	Motor Speed	External Static Pressure — Inches W.C. [kPa] Side Discharge — Wet Coil									
	Cool	Heat				0.1 [0.2]	0.2 [0.5]	0.3 [0.7]	0.4 [1.0]	0.5 [1.2]	0.6 [1.5]	0.7 [1.7]	0.8 [2.0]		
2.0 [7.03]	High	Low	40,000 [11.72]	9 x 7 Blower 1/4 HP [186W] 2 Speed (PSC Motor)	Low	CFM [L/s]	675 [319]	657 [310]	634 [299]	602 [284]	560 [264]	505 [238]	435 [205]		
						RPM	695	785	870	905	940	980	1020		
	High	High	60,000 [17.58] 80,000 [23.45]		High	Watts	221	214	203	191	171	193	149		
						CFM [L/s]	898 [424]	861 [406]	822 [388]	777 [367]	721 [340]	651 [307]	562 [265]		
2.5 [8.79]	Low	Low	All Inputs		Low	CFM [L/s]	940	965	995	1020	1045	1070	1090		
						RPM	292	278	266	253	239	221	199		
	High	High	80,000 [23.45] 100,000 [29.31]		High	CFM [L/s]	1076 [508]	1059 [500]	1032 [490]	996 [470]	950 [448]	896 [423]	832 [393]		
						RPM	730	775	820	865	905	940	975		
3.0 [10.55]	Med	Low	All Inputs	10 x 9 Blower 1/2 HP [373W] 3 Speed (PSC Motor)	Med	Watts	356	349	341	331	320	305	287		
						CFM [L/s]	1222 [577]	1197 [565]	1179 [556]	1162 [548]	1137 [537]	1097 [518]	1033 [488]		
	High	High	80,000 [23.45] 100,000 [29.31]		High	CFM [L/s]	765	810	855	890	920	960	995		
						RPM	423	415	407	397	386	370	351		
3.5 [12.31]	High	Low	All Inputs		High	CFM [L/s]	1514 [715]	1461 [670]	1415 [668]	1370 [647]	1322 [624]	1266 [597]	1197 [565]		
						RPM	895	930	965	985	1005	1025	1045		
	High	High	80,000 [23.45] 100,000 [29.31]		High	Watts	538	514	493	473	454	434	412		
						CFM [L/s]	1204 [568]	1202 [567]	1191 [562]	1171 [553]	1143 [539]	1107 [522]	1065 [503]		
4.0 [14.07]	High	High	All Inputs	10 x 9 Blower 3/4 HP [559W] 3 Speed (PSC Motor)	High	CFM [L/s]	734	810	886	923	959	988	1016		
						RPM	476	468	450	427	403	380	363		
	High	High	80,000 [23.45] 100,000 [29.31]		High	CFM [L/s]	1674 [790]	1620 [765]	1566 [739]	1511 [713]	1451 [685]	1384 [653]	1305 [616]		
						RPM	997	1019	1040	1058	1076	1088	1100		
5.0 [17.59]	High	High	All Inputs	12 x 9 Blower 1 HP [746W] 3 Speed (X13 Motor)	High	Watts	625	596	567	539	512	484	455		
						CFM [L/s]	1843 [870]	1763 [832]	1693 [799]	1627 [768]	1560 [736]	1485 [701]	1398 [660]		
	High	High	80,000 [23.45] 100,000 [29.31]		High	CFM [L/s]	1085	1094	1102	1110	1118	1126	1134		
						RPM	699	663	632	604	576	548	517		
5.0 [17.59]	High	High	All Inputs		High	CFM [L/s]	1418 [669]	1386 [654]	1352 [638]	1307 [617]	1270 [599]	1221 [576]	1180 [557]	1117 [527]	
						RPM	774	794	829	860	892	922	955	1015	
	High	High	80,000 [23.45] 100,000 [29.31]		High	CFM [L/s]	267	273	287	295	308	316	328	343	
						RPM	1858 [877]	1821 [859]	1782 [841]	1752 [827]	1714 [809]	1678 [792]	1640 [774]	1607 [758]	
5.0 [17.59]	High	High	All Inputs	12 x 9 Blower 1 HP [746W] 3 Speed (X13 Motor)	High	CFM [L/s]	944	968	994	1019	1041	1072	1089	1111	
						RPM	541	555	564	578	586	598	611	617	
	High	High	80,000 [23.45] 100,000 [29.31]		High	CFM [L/s]	2017 [952]	1985 [937]	1949 [920]	1909 [901]	1879 [887]	1843 [870]	1792 [846]	1737 [820]	
						RPM	1018	1033	1070	1076	1112	1124	1147	1152	
High	High	80,000 [23.45] 100,000 [29.31]		High	Watts	690	701	711	723	735	741	742	728		
					CFM [L/s]	1018	1033	1070	1076	1112	1124	1147	1152		

NOTES:
5 ton cooling speed must be changed to low cool for ARI testing.

DOWN DISCHARGE PRESSURE DROP (ADD TO EXTERNAL STATIC PRESSURE)										
CFM [L/s]	600 [283]	800 [378]	1000 [472]	1200 [566]	1440 [661]	1600 [755]	1800 [850]	2000 [944]		
Pressure Drop—Inches W.C. [kPa]	.00	.01 [0.02]	.02 [0.05]	.03 [0.07]	.05 [0.12]	.07 [0.17]	.08 [0.19]	.09 [0.22]		
MINIMUM RECOMMENDED FILTER SIZES										
Nominal Cooling Capacity Tons [kW]	2.0 [7.03]			2.5 [8.79] – 4.0 [14.07]			5.0 [17.59]			
Minimum Filter Size—Inches [mm]	20 x 20 x 1 [508 x 508 x 25]			24 x 24 x 1 [610 x 610 x 25]			24 x 30 x 1 [610 x 762 x 1]			

INDOOR AIRFLOW PERFORMANCE FOR 2-5 TON PACKAGE GAS ELECTRIC UNITS—TGRG**C/TGRG**E DIRECT DRIVE

INDOOR AIRFLOW PERFORMANCE — 230 VOLTS

Nominal Cooling Capacity Tons [kW]	Motor Speed From Factory		Heating Input BTU/HR [kW]	Blower Size/ Motor HP [W] & # of Speeds	Motor Speed	External Static Pressure — Inches W.C. [kPa] Side Discharge — Wet Coil									
	Cool	Heat				0.1 [.02]	0.2 [.05]	0.3 [.07]	0.4 [.10]	0.5 [.12]	0.6 [.15]	0.7 [.17]	0.8 [.20]		
2.0 [7.03]	High	Low	40,000 [11.72]	9 x 7 Blower 1/4 HP [186W] 2 Speed (PSC Motor)	Low	CFM[L/s]	771 [364]	751 [354]	725 [342]	691 [326]	654 [304]	584 [276]	546 [258]		
		Watts	825			870	910	950	985	1010	1030				
	High	High	60,000 [17.58] 80,000 [23.45]		High	CFM[L/s]	946 [446]	922 [435]	882 [416]	830 [392]	769 [363]	701 [331]	630 [298]		
2.5 [8.79]	Low	Low	All Inputs	10 x 9 Blower 1/2 HP [373W] 3 Speed (PSC Motor)	Low	Watts	315	303	288	273	257	241	226		
		CFM[L/s]				1206 [569]	1182 [558]	1157 [546]	1128 [532]	1091 [515]	1044 [493]	983 [464]			
	Med	Low	40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		Med	RPM	760	815	870	910	950	975	1000		
3.0 [10.55]	High	High			High	Watts	419	406	394	381	368	353	334		
		Med	Low		Med	CFM[L/s]	1411 [666]	1368 [646]	1327 [626]	1285 [606]	1238 [584]	1183 [558]	1116 [527]		
	High	High	60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		High	RPM	865	900	935	970	1000	1020	1035		
4.0 [14.07]	High	High	All Inputs	10 x 9 Blower 3/4 HP [559W] 3 Speed (PSC Motor)	High	Watts	498	481	464	447	430	411	391		
		CFM[L/s]				1641 [774]	1577 [744]	1515 [715]	1455 [687]	1393 [657]	1329 [627]	1262 [596]			
	High	High	60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		High	RPM	980	1000	1020	1035	1050	1065	1080		
5.0 [17.59]	High	High	All Inputs	12 x 9 Blower 1 HP [746W] 3 Speed (X13 Motor)	High	Watts	589	565	543	523	503	481	456		
		CFM[L/s]				1412 [666]	1395 [658]	1371 [647]	1339 [632]	1296 [612]	1242 [586]	1176 [555]			
	High	High	60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		High	RPM	859	905	951	981	1011	1034	1057		
5.0 [17.59]	High	High	All Inputs	12 x 9 Blower 1 HP [746W] 3 Speed (X13 Motor)	High	Watts	557	530	506	483	461	437	409		
		CFM[L/s]				1793 [846]	1731 [817]	1665 [786]	1594 [752]	1519 [717]	1440 [680]	1356 [640]			
	High	High	60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		High	RPM	1053	1067	1080	1091	1101	1110	1119		
5.0 [17.59]	High	High	All Inputs	12 x 9 Blower 1 HP [746W] 3 Speed (X13 Motor)	High	Watts	667	637	606	574	543	512	483		
		CFM[L/s]				1889 [892]	1826 [862]	1753 [827]	1672 [789]	1586 [749]	1499 [707]	1413 [667]			
	High	High	60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		High	RPM	1110	1117	1124	1129	1133	1139	1144		
5.0 [17.59]	High	High	All Inputs	12 x 9 Blower 1 HP [746W] 3 Speed (X13 Motor)	High	Watts	736	715	683	646	608	574	551		
		CFM[L/s]				1423 [672]	1390 [656]	1357 [640]	1311 [619]	1377 [603]	1233 [582]	1192 [563]	1137 [537]		
	High	High	60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		High	RPM	776	796	830	861	895	927	958		
5.0 [17.59]	High	High	All Inputs	12 x 9 Blower 1 HP [746W] 3 Speed (X13 Motor)	High	Watts	272	278	292	300	315	326	337	352	
		CFM[L/s]				1872 [883]	1847 [872]	1808 [853]	1772 [836]	1743 [823]	1703 [804]	1670 [788]	1639 [774]		
	High	High	60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		High	RPM	956	973	1010	1023	1057	1085	1110	1146	
5.0 [17.59]	High	High	All Inputs	12 x 9 Blower 1 HP [746W] 3 Speed (X13 Motor)	High	Watts	562	572	584	598	613	622	636	646	
		CFM[L/s]				2046 [966]	2010 [949]	1980 [934]	1942 [917]	1904 [899]	1867 [881]	1822 [860]	1758 [839]		
	High	High	60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		High	RPM	1035	1046	1079	1086	1114	1141	1171	1163	
5.0 [17.59]	High	High	All Inputs	12 x 9 Blower 1 HP [746W] 3 Speed (X13 Motor)	High	Watts	721	731	743	754	770	777	770	751	
		CFM[L/s]				1412 [666]	1395 [658]	1371 [647]	1339 [632]	1296 [612]	1242 [586]	1176 [555]			
	High	High	60,000 [17.58] 80,000 [23.45] 100,000 [29.31]		High	RPM	859	905	951	981	1011	1034	1057		

NOTES: 5 ton cooling speed must be changed to low cool for ARI testing.

INDOOR AIRFLOW PERFORMANCE FOR 2-5 TON PACKAGE GAS ELECTRIC UNITS-TGRG ** D DIRECT DRIVE

Indoor Airflow Performance - 208 Volts

Nominal Cooling Capacity Tons [kW]	Motor Speed from Factory		Heating Input BTU/Hr [kW]	Blower Size/ Motor HP [W] & # of Speeds	Motor Speed	External Static Pressure - Inches W.C. [kPa] (Side Discharge-Wet Coil)										
	Cool	Heat				0.1 [0.2]	0.2 [0.5]	0.3 [0.7]	0.4 [1.0]	0.5 [1.2]	0.6 [1.5]	0.7 [1.7]	0.8 [2.0]			
2.0 [7.03]	High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	9 x 7 Blower 1/3 HP [249 W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	821 [387]	799 [377]	775 [366]	742 [350]	706 [333]	681 [321]	641 [303]	611 [288]		
						RPM	878	903	953	996	1032	1075	1119	1176		
						Watts	131	134	142	145	147	154	156	161		
	Low Cool (Tap 2)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	9 x 7 Blower 1/3 HP [249 W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	843 [398]	820 [387]	786 [371]	760 [359]	726 [343]	699 [330]	662 [312]	608 [287]		
						RPM	896	924	961	1015	1045	1092	1125	1172		
						Watts	141	144	147	155	157	163	165	168		
High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	9 x 7 Blower 1/3 HP [249 W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	896 [423]	884 [417]	847 [400]	825 [389]	789 [372]	752 [355]	720 [340]	642 [303]			
					RPM	935	966	1008	1047	1084	1118	1154	1176			
					Watts	165	171	175	182	184	186	189	174			
2.5 [8.79]	High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	10 x 9 Blower 1/2 HP [373W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	1153 [544]	1126 [531]	1087 [513]	1042 [492]	1002 [473]	966 [456]	903 [426]	856 [404]		
						RPM	866	887	930	966	1010	1038	1082	1121		
						Watts	207	210	220	226	234	241	246	251		
	Low Cool (Tap 2)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	10 x 9 Blower 1/2 HP [373W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	1030 [486]	1010 [477]	967 [456]	922 [435]	888 [410]	825 [389]	763 [360]	709 [335]		
						RPM	794	829	868	912	956	1002	1040	1093		
						Watts	155	164	169	178	183	192	195	203		
High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	10 x 9 Blower 1/2 HP [373W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	1242 [586]	1213 [572]	1173 [554]	1132 [534]	1086 [513]	1044 [493]	1003 [473]	952 [449]			
					RPM	912	934	972	1012	1055	1081	1109	1146			
					Watts	249	252	262	271	275	282	283	288			
3.0 [10.55]	High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	10 x 9 Blower 1/2 HP [373W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	1454 [666]	1433 [676]	1392 [657]	1354 [639]	1322 [624]	1283 [606]	1238 [584]	1192 [563]		
						RPM	761	808	841	884	920	960	999	1038		
						Watts	150	170	180	183	185	190	195	215		
	Low Cool (Tap 2)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	10 x 9 Blower 1/2 HP [373W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	1454 [666]	1433 [676]	1392 [657]	1354 [639]	1322 [624]	1283 [606]	1238 [584]	1192 [563]		
						RPM	923	946	976	1015	1044	1085	1126	1146		
						Watts	301	309	316	327	337	348	356	363		
High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	10 x 9 Blower 1/2 HP [373W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	1544 [729]	1531 [723]	1473 [695]	1440 [680]	1398 [660]	1361 [642]	1317 [622]	1263 [596]			
					RPM	958	973	1025	1046	1078	1109	1147	1163			
					Watts	343	350	364	371	382	391	401	386			
4.0 [14.07]	High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	10 x 9 Blower 3/4 HP [559W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	1836 [855]	1821 [851]	1776 [838]	1694 [799]	1603 [757]	1528 [721]	1424 [672]	1316 [621]		
						RPM	1146	1147	1159	1171	1173	1180	1188	1195		
						Watts	405	412	422	435	442	449	440	414		
	Low Cool (Tap 2)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	10 x 9 Blower 3/4 HP [559W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	1836 [855]	1821 [851]	1776 [838]	1694 [799]	1603 [757]	1528 [721]	1424 [672]	1316 [621]		
						RPM	1146	1147	1159	1171	1173	1180	1188	1195		
						Watts	405	412	422	435	442	449	440	414		
High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	10 x 9 Blower 3/4 HP [559W] 3 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	1836 [855]	1821 [851]	1776 [838]	1694 [799]	1603 [757]	1528 [721]	1424 [672]	1316 [621]			
					RPM	1146	1147	1159	1171	1173	1180	1188	1195			
					Watts	405	412	422	435	442	449	440	414			
5.0 [17.59]	High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	12 x 9 Blower 1 HP [746W] 4 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	2288 [1051]	2288 [1051]	2238 [1024]	2154 [984]	2061 [942]	1968 [900]	1875 [858]	1782 [816]		
						RPM	774	794	829	860	892	922	955	1015		
						Watts	690	701	711	723	735	741	742	728		
	Low Cool (Tap 2)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	12 x 9 Blower 1 HP [746W] 4 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	2288 [1051]	2288 [1051]	2238 [1024]	2154 [984]	2061 [942]	1968 [900]	1875 [858]	1782 [816]		
						RPM	774	794	829	860	892	922	955	1015		
						Watts	690	701	711	723	735	741	742	728		
High Cool (Tap 3)	Heat (Tap 1)	All Inputs 40,000 [11.72] 60,000 [17.58] 80,000 [23.45] 100,000 [29.31]	12 x 9 Blower 1 HP [746W] 4 Speed X13 Motor	Heat (Tap 1)	CFM [l/s]	2288 [1051]	2288 [1051]	2238 [1024]	2154 [984]	2061 [942]	1968 [900]	1875 [858]	1782 [816]			
					RPM	774	794	829	860	892	922	955	1015			
					Watts	690	701	711	723	735	741	742	728			

Notes: (1) Do not operate 2 ton models below 700 CFM. (2) Do not operate 2-1/2 or 3 ton models below 875 CFM. (3) Cooling speed must be changed to Low Cool to achieve ARI performance (all models).

Down Discharge Pressure Drop (Add to External Static Pressure)	
CFM [L/s]	600 [283]
Pressure Drop - Inches W.C. [kPa]	0

INDOOR AIRFLOW PERFORMANCE FOR 2-5 TON PACKAGE GAS ELECTRIC UNITS-TGRG**D DIRECT DRIVE

Indoor Airflow Performance - 230 Volts

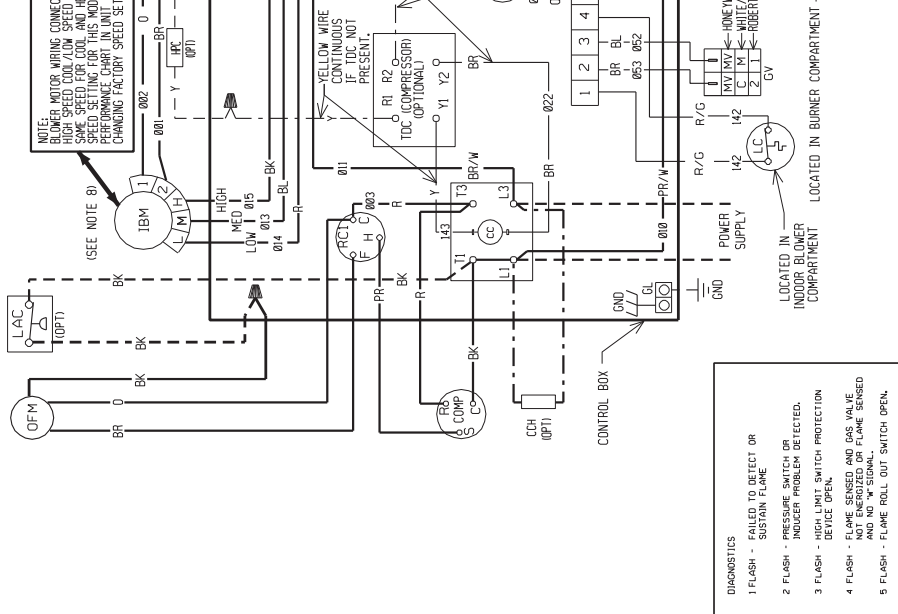
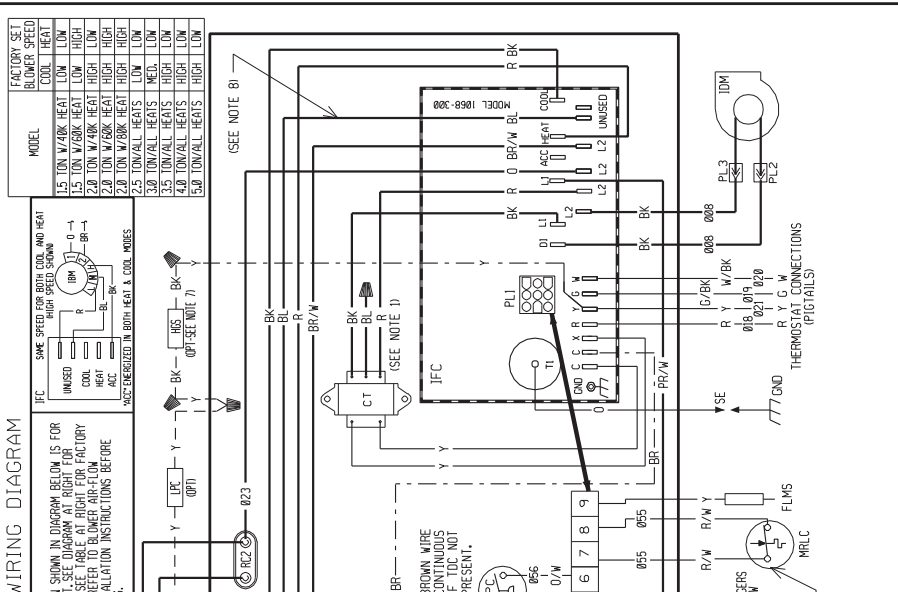
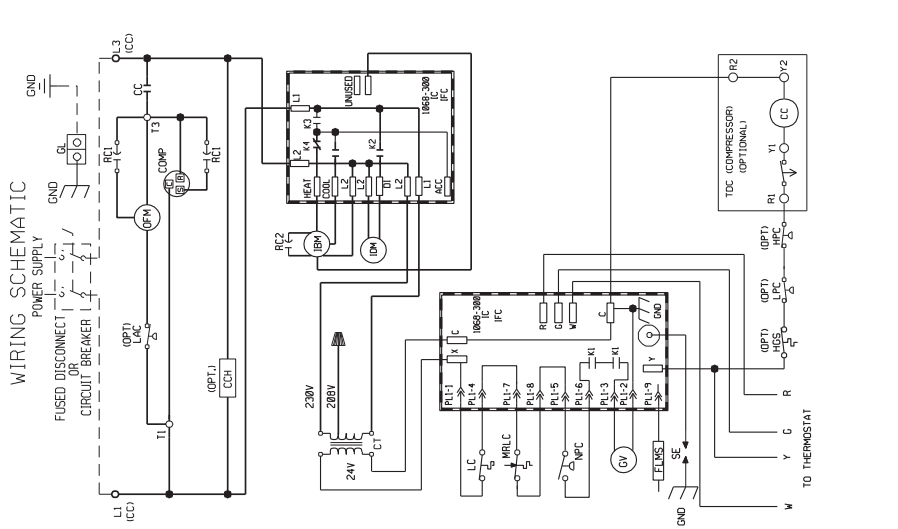
Nominal Cooling Capacity Tons [kW]	Motor Speed from Factory		Heating Input BTU/Hr [kW]	Blower Size/ Motor HP [W] & # of Speeds	Motor Speed	External Static Pressure - Inches W.C. [kPa]																		
	Cool	Heat				0.1 [0.2]	0.2 [0.5]	0.3 [0.7]	0.4 [1.0]	0.5 [1.2]	0.6 [1.5]	0.7 [1.7]	0.8 [2.0]											
2.0 [7.03]	High Cool (Tap 3)	Heat (Tap 1)	All Inputs	9 x 7 Blower 1/3 HP [249 W] 3 Speed X13 Motor	Heat Dedicated (Tap 1)	CFM [l/s]	829 [391]	808 [381]	789 [372]	756 [357]	737 [348]	697 [329]	668 [315]	615 [290]	CFM [l/s]	850	915	961	1000	1046	1089	1121	1173	
						Watts	137	139	148	151	160	163	166	167	Watts	148	151	160	163	166	167			
						CFM [l/s]	853 [403]	832 [393]	804 [379]	779 [368]	745 [352]	724 [342]	688 [325]	630 [297]	CFM [l/s]	890	928	984	1013	1054	1099	1137	1185	
						Watts	146	149	159	161	165	173	176	173	Watts	159	168	175	185	189	200	210	213	
						CFM [l/s]	912 [430]	896 [423]	863 [407]	839 [396]	815 [385]	787 [371]	736 [347]	656 [310]	CFM [l/s]	940	977	1017	1062	1088	1139	1165	1181	
	Watts	171	179	183	192	194	203	199	182	Watts	183	192	198	203	203	203	199	182						
	CFM [l/s]	1169 [552]	1140 [538]	1111 [524]	1068 [504]	1030 [486]	995 [470]	949 [448]	895 [422]	CFM [l/s]	1213	1183	1148	1108	1068	1028	988	948						
	Watts	213	217	228	239	244	254	258	268	Watts	217	228	239	244	244	254	258	268						
	CFM [l/s]	1039 [490]	1021 [482]	971 [458]	932 [440]	887 [419]	839 [396]	797 [376]	735 [347]	CFM [l/s]	1074	1053	1018	976	932	887	843	799						
	Watts	159	168	175	185	189	200	210	213	Watts	168	175	185	189	189	200	210	213						
2.5 [8.79]	High Cool (Tap 3)	Heat (Tap 1)	All Inputs	10 x 9 Blower 1/2 HP [373W] 3 Speed X13 Motor	Heat Dedicated (Tap 1)	CFM [l/s]	1256 [593]	1231 [581]	1201 [567]	1161 [548]	1115 [526]	1076 [508]	1043 [492]	999 [471]	CFM [l/s]	1289	1263	1228	1188	1148	1108	1068	1028	
						Watts	289	284	272	284	290	299	309	307	Watts	289	284	272	284	290	299	309	307	
						CFM [l/s]	1357 [640]	1330 [628]	1292 [610]	1262 [606]	1225 [578]	1178 [556]	1110 [524]	1033 [488]	CFM [l/s]	1401	1371	1336	1296	1256	1216	1176	1136	
						Watts	318	323	333	343	347	356	345	328	Watts	318	323	333	343	347	356	345	328	
						CFM [l/s]	1241 [586]	1203 [568]	1155 [545]	1119 [528]	1082 [511]	1032 [487]	994 [469]	950 [448]	CFM [l/s]	1285	1255	1210	1170	1130	1090	1050	1010	
	Watts	771	815	848	886	910	948	965	1004	Watts	771	815	848	886	910	948	965	1004						
	CFM [l/s]	1459 [689]	1438 [679]	1409 [665]	1371 [647]	1337 [631]	1296 [612]	1258 [594]	1223 [577]	CFM [l/s]	1499	1469	1434	1394	1354	1314	1274	1234						
	Watts	931	958	993	1031	1058	1097	1133	1158	Watts	931	958	993	1031	1058	1097	1133	1158						
	CFM [l/s]	1662 [784]	1648 [778]	1607 [758]	1579 [745]	1538 [726]	1477 [697]	1392 [657]	1305 [616]	CFM [l/s]	1706	1676	1641	1601	1561	1521	1481	1441						
	Watts	1016	1037	1072	1098	1129	1156	1169	1179	Watts	1016	1037	1072	1098	1129	1156	1169	1179						
3.0 [10.55]	High Cool (Tap 3)	Heat (Tap 1)	All Inputs	10 x 9 Blower 1/2 HP [373W] 3 Speed X13 Motor	Heat Dedicated (Tap 1)	CFM [l/s]	1562 [737]	1538 [726]	1500 [708]	1456 [687]	1434 [677]	1383 [653]	1339 [632]	1270 [599]	CFM [l/s]	1606	1581	1546	1506	1466	1426	1386	1346	
						Watts	960	991	1017	1055	1089	1121	1154	1169	Watts	960	991	1017	1055	1089	1121	1154	1169	
						CFM [l/s]	1438 [679]	1409 [665]	1371 [647]	1337 [631]	1296 [612]	1258 [594]	1223 [577]	CFM [l/s]	1482	1452	1417	1377	1337	1297	1257	1217		
						Watts	353	364	375	388	398	408	418	405	Watts	353	364	375	388	398	408	418	405	
						CFM [l/s]	1459 [689]	1438 [679]	1409 [665]	1371 [647]	1337 [631]	1296 [612]	1258 [594]	1223 [577]	CFM [l/s]	1503	1473	1438	1403	1363	1323	1283	1243	
	Watts	931	958	993	1031	1058	1097	1133	1158	Watts	931	958	993	1031	1058	1097	1133	1158						
	CFM [l/s]	1662 [784]	1648 [778]	1607 [758]	1579 [745]	1538 [726]	1477 [697]	1392 [657]	1305 [616]	CFM [l/s]	1706	1676	1641	1601	1561	1521	1481	1441						
	Watts	1016	1037	1072	1098	1129	1156	1169	1179	Watts	1016	1037	1072	1098	1129	1156	1169	1179						
	4.0 [14.07]	High Cool (Tap 3)	Heat (Tap 1)	All Inputs	10 x 9 Blower 3/4 HP [559W] 3 Speed X13 Motor	Heat Dedicated (Tap 1)	CFM [l/s]	1910 [901]	1873 [884]	1798 [849]	1715 [809]	1621 [765]	1536 [725]	1422 [671]	1323 [624]	CFM [l/s]	1954	1929	1894	1854	1814	1774	1734	1694
							Watts	1149	1160	1163	1169	1175	1187	1184	1205	Watts	1149	1160	1163	1169	1175	1187	1184	1205
CFM [l/s]							1423 [672]	1390 [656]	1357 [640]	1311 [619]	1277 [603]	1233 [582]	1192 [563]	1137 [537]	CFM [l/s]	1467	1437	1402	1362	1322	1282	1242	1202	
Watts							638	625	601	571	536	506	469	440	Watts	638	625	601	571	536	506	469	440	
CFM [l/s]							1459 [689]	1438 [679]	1409 [665]	1371 [647]	1337 [631]	1296 [612]	1258 [594]	1223 [577]	CFM [l/s]	1503	1473	1438	1403	1363	1323	1283	1243	
Watts		931	958	993	1031	1058	1097	1133	1158	Watts	931	958	993	1031	1058	1097	1133	1158						
CFM [l/s]		1662 [784]	1648 [778]	1607 [758]	1579 [745]	1538 [726]	1477 [697]	1392 [657]	1305 [616]	CFM [l/s]	1706	1676	1641	1601	1561	1521	1481	1441						
Watts		1016	1037	1072	1098	1129	1156	1169	1179	Watts	1016	1037	1072	1098	1129	1156	1169	1179						
5.0 [17.59]		1st Stage Cool (Tap 2)	Heat (Tap 1)	All Inputs	12 x 9 Blower 1 HP [746W] 4 Speed X13 Motor	Heat Dedicated (Tap 1)	CFM [l/s]	1319 [622]	1289 [608]	1242 [586]	1201 [567]	1148 [542]	1111 [524]	1047 [494]	985 [465]	CFM [l/s]	1363	1333	1298	1258	1218	1178	1138	1098
							Watts	728	760	790	832	859	894	939	982	Watts	728	760	790	832	859	894	939	982
	CFM [l/s]						1872 [883]	1847 [872]	1808 [853]	1772 [836]	1743 [823]	1703 [804]	1670 [788]	1639 [774]	CFM [l/s]	1916	1891	1856	1821	1786	1751	1716	1681	
	Watts						956	973	1010	1023	1057	1085	1110	1146	Watts	956	973	1010	1023	1057	1085	1110	1146	
	CFM [l/s]						2046 [966]	2010 [949]	1980 [934]	1942 [917]	1904 [899]	1867 [881]	1822 [860]	1758 [830]	CFM [l/s]	2090	2060	2025	1985	1945	1905	1865	1825	
	Watts	1035	1046	1079	1086	1114	1141	1171	1163	Watts	1035	1046	1079	1086	1114	1141	1171	1163						
	CFM [l/s]	1423 [672]	1390 [656]	1357 [640]	1311 [619]	1277 [603]	1233 [582]	1192 [563]	1137 [537]	CFM [l/s]	1467	1437	1402	1362	1322	1282	1242	1202						
	Watts	776	796	830	861	895	927	958	999	Watts	776	796	830	861	895	927	958	999						
	CFM [l/s]	1319 [622]	1289 [608]	1242 [586]	1201 [567]	1148 [542]	1111 [524]	1047 [494]	985 [465]	CFM [l/s]	1363	1333	1298	1258	1218	1178	1138	1098						
	Watts	728	760	790	832	859	894	939	982	Watts	728	760	790	832	859	894	939	982						

Notes: (1) Do not operate 2 ton models below 700 CFM. (2) Do not operate 2-1/2 or 3 ton models below 875 CFM. (3) Cooling speed must be changed to Low Cool to achieve ARI performance (all models).

Down Discharge Pressure Drop (Add to External Static Pressure)	
CFM [L/s]	600 [283]
Pressure Drop - Inches W.C. [kPa]	0

XIV. WIRING DIAGRAMS

FIGURE 25
WIRING DIAGRAM



WIRE COLOR CODE

BK	BLACK
BR	BROWN
BL	BLUE
G	GREEN
GY	GRAY
O	ORANGE
PR	PURPLE
R	RED
W	WHITE
Y	YELLOW

ELECTRICAL WIRING DIAGRAM
1.5 - 5.0 TON GAS/ELECTRIC W/INTEGRATED FURNACE CONTROL W/PSC BLOWER MOTOR 208/230V, 1 - PHASE

REV	08
DWG. NO.	90-23626-04
APP. BY	AMF/PB
DATE	08-1-95

WIRING INFORMATION

LINE VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED

LOW VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED

REPLACEMENT WIRE
-MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105 C MIN.)

WARNING
-CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C. AND LOCAL CODES AS APPLICABLE.

- NOTES:**
1. MAIN UNIT TRANSFORMER PRIMARY LEADS: 60 HZ AMMON BLUE-208 V. BLACK-230 V INTERCHANGE BLACK & BLUE LEADS FOR 208 V TRANSFORMER OPERATION.
 2. MOTORS & COMPRESSOR THERMALLY PROTECTED. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTOR ONLY.
 3. CONDUCTOR WIRE IN ROUNDED RAIN TIGHT CONDUIT TO GO H/F USED DISCONNECT.
 4. A CLASS 2 TRANSFORMER 24 VOLT, 50/60 HERTZ SUPPLIED.
 5. SIZE AND TYPE OF WIRE MUST BE SAME TYPE & SIZE AS SPECIFIED IN TOP OF COPELAND ZR**KI COMPRESSORS ONLY.
 6. HGS LOCATED IN TOP OF COPELAND ZR**KI COMPRESSORS ONLY.
 7. HGS LOCATED IN TOP OF COPELAND ZR**KI COMPRESSORS ONLY.
 8. ON 2.5 - 4.0 TON MODELS ONLY.

COMPONENT CODE

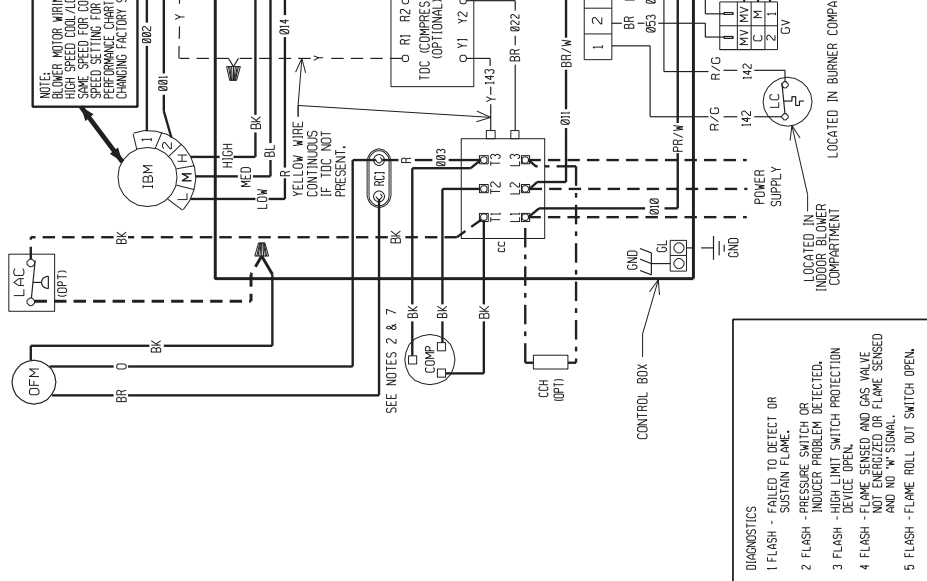
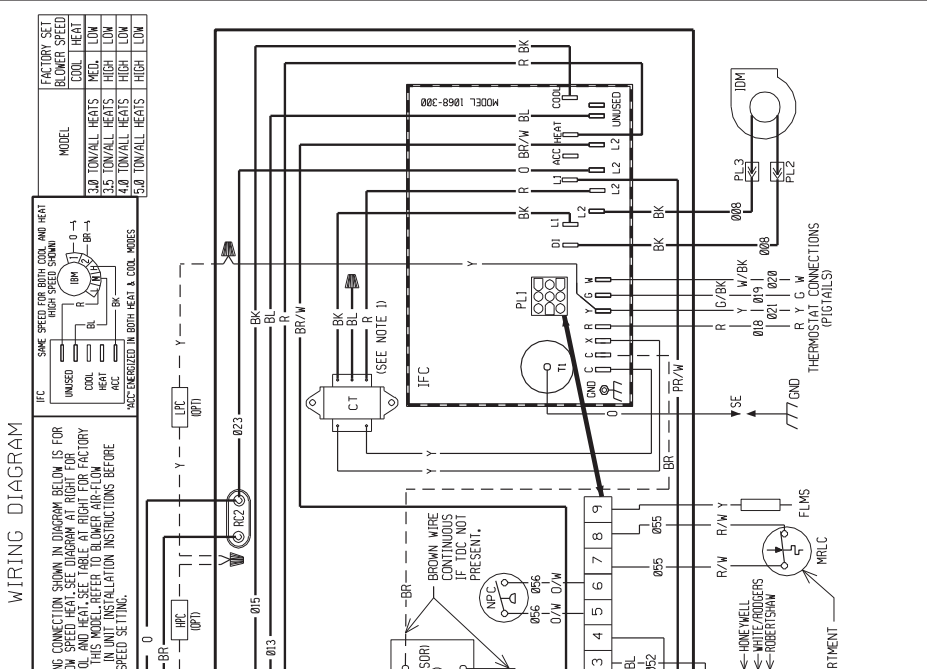
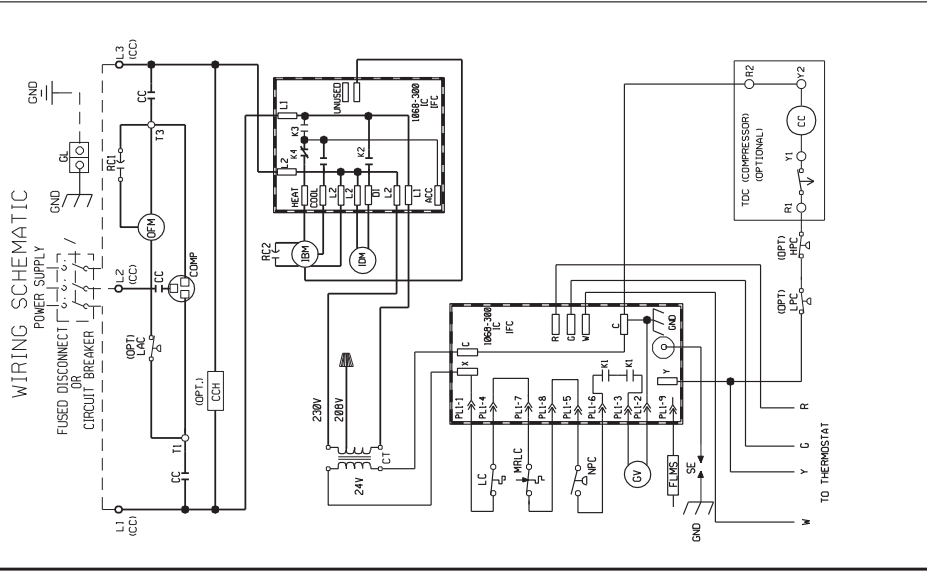
CC	COMPRESSOR CONTACTOR
CCH	CRANKCASE HEATER
COMP	COMPRESSOR
CT	CONTROL TRANSFORMER
FLMS	FLAME SENSOR
GL	GROUND LUG
GR	GROUND
GV	GAS VALVE
HPC	HIGH PRESSURE CONTROL
IBM	INDOOR BLOWER MOTOR
IEC	INDUCED DRAFT MOTOR
IFC	INTEGRATED FURNACE CONTROL
HGS	HOT GAS SENSOR
LAC	LOW AMBIENT COOLING CONTROL
LC	LIMIT CONTROL
LPC	LOW PRESSURE CONTROL
MRLC	MAN. RESET LIMIT CONTROL
NFC	NEG. PRESSURE CONTROL
OFM	OUTDOOR FAN MOTOR
OPL	OPTIONAL
PL	PLUG
RC	RUN CAPACITOR
SE	SPARK ELECTRODE
TDC	TIME DELAY CONTROL

DWG. NO. 90-23626-04

REV	08
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DIAGNOSTICS
1 FLASH - FAILED TO DETECT OR INDUCE SPARK
2 FLASH - INDUCE SPARK DETECTED
3 FLASH - DEVICE SPEC SWITCH PROTECTION
4 FLASH - FLAME SENSOR AND GAS VALVE NOT ENERGIZED OR FLAME SENSED AND NO "S" SIGNAL
5 FLASH - FLAME ROLL OUT SWITCH OPEN

FIGURE 26
WIRING DIAGRAM



WIRE COLOR CODE

BK	BLACK
BR	BROWN
BL	BLUE
G	GREEN
GY	GRAY
O	ORANGE
PR	PURPLE
R	RED
W	WHITE
Y	YELLOW

ELECTRICAL WIRING DIAGRAM
3.0 - 5.0 TON GAS/ELECTRIC
W/INTEGRATED FURNACE CONTROL
W/PSC BLOWER MOTOR
208/230V, 3 - PHASE

DR. BY: AMF/PB
DATE: 08-1-96
DWG. NO.: 90-23626-05
REV: 09

WIRING INFORMATION

LINE VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
LOW VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
REPLACEMENT WIRE
-MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105 C MIN.)
-CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C. AND LOCAL CODES AS APPLICABLE.

NOTES:

1. MAIN UNIT TRANSFORMER PRIMARY LEADS: 50 HZ. 240V. BL, UE-208V. BL, UE-230V. V. INTERCHANGE BL, UE. BLUE LEADS FOR 208 V. TRANSFORMER OPERATION.
2. MOTORS & COMPRESSOR THERMALLY PROTECTED. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
3. CONNECT TO 60 HZ. FUSED DISCONNECT. CONDUIT TO 60 HZ. FUSED DISCONNECT.
4. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2, WITH HEAT SENSITIVE FUSES.
5. REPLACEMENT FUSES MUST BE SAME TYPE & SIZE AS ORIGINAL.
6. SINGLE - PHASE CONDITIONS.

COMPONENT CODE

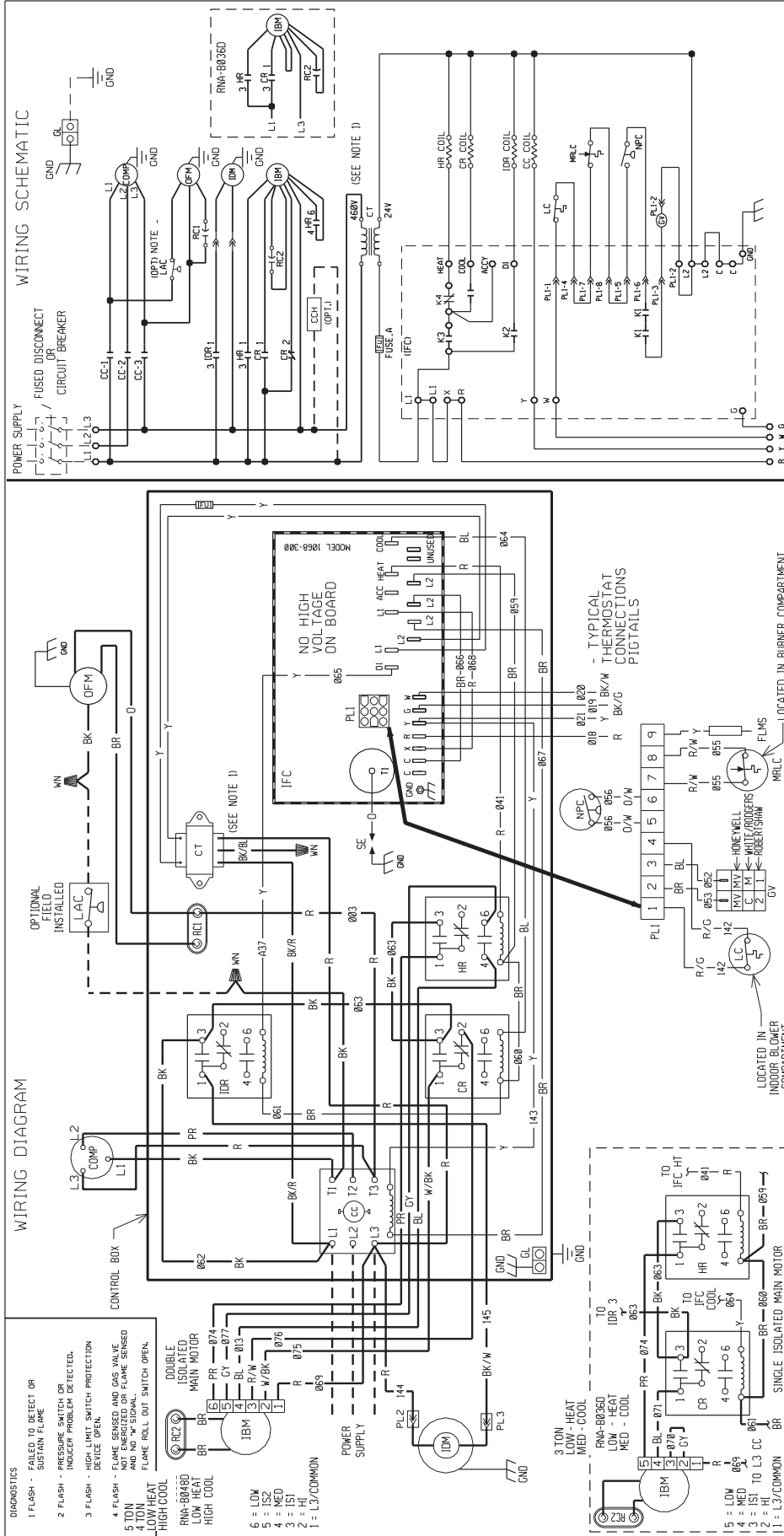
CC	LOW PRESSURE CONTROL
CCH	LPC
COMP	MRLC
CT	NEG. PRESSURE CONTROL
FLMS	NPFC
GV	OPTIONAL OUTDOOR FAN MOTOR
GND	PLUG
IBM	RC
IFC	RUN CAPACITOR
LAC	SPARK ELECTRODE
LC	TIME DELAY CONTROL
	WIRE NUT

DIAGNOSTICS

- 1 FLASH - FAILED TO DETECT OR SUSTAIN FLAME.
- 2 FLASH - PRESSURE SWITCH OR INDUCER PROBLEM DETECTED.
- 3 FLASH - HIGH LIMIT SWITCH PROTECTION DEVICE OPEN.
- 4 FLASH - FLAME SENSED AND GAS VALVE NOT ENERGIZED OR FLAME SENSED AND NO "W" SIGNAL.
- 5 FLASH - FLAME ROLL OUT SWITCH OPEN.

DWG. NO.: 90-23626-05
REV: 09

FIGURE 27
WIRING DIAGRAM



- DIAGNOSTICS**
- 1 FLASH - FAILED TO DETECT OR SUSTAIN FLAME
 - 2 FLASH - PRESSURE SWITCH OR INDUCER PROBLEM DETECTED.
 - 3 FLASH - HIGH LIMIT SWITCH PROTECTION DEVICE OPEN.
 - 4 FLASH - FLAME SENSED AND GAS VALVE NOT ENERGIZED OR FLAME SENSED AND NO "W" SIGNAL.
 - 5 TON - FLAME ROLL OUT SWITCH OPEN.
- LOW HEAT**
HIGH COOL
- RNA-B0360
LOW HEAT
HIGH COOL
- 5 = LOW
 - 4 = MED
 - 3 = HI
 - 2 = HI
 - 1 = L3/Common
- POWER SUPPLY**
- PL2 144
 - PL3
 - 15
 - 14 = MED
 - 13 = HI
 - 12 = L3/Common
 - 11 = L3/Common

WIRE COLOR CODE

BK	BLACK	O	ORANGE
BR	BROWN	PR	PURPLE
BL	BLUE	R	RED
G	GREEN	W	WHITE
GY	GRAY	Y	YELLOW

ELECTRICAL WIRING DIAGRAM

3.0, 4.0 & 5.0 TON GAS/ELECTRIC W/INTEGRATED FURNACE CONTROL 460V, 3 - PHASE

DR. BY APP. BY DATE DWG. NO. REV
JRJ 3-28-05 90-23626-10 03

- WIRING INFORMATION**
- LINE VOLTAGE
 - FACTORY STANDARD
 - FIELD OPTION
 - FIELD INSTALLED
 - LOW VOLTAGE
 - FACTORY STANDARD
 - FACTORY OPTION
 - FIELD INSTALLED
 - REPLACEMENT WIRE
 - MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105 C. MIN.)
 - WARNING
 - CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C., NATIONAL WIRING REGULATIONS, AND LOCAL CODES AS APPLICABLE.

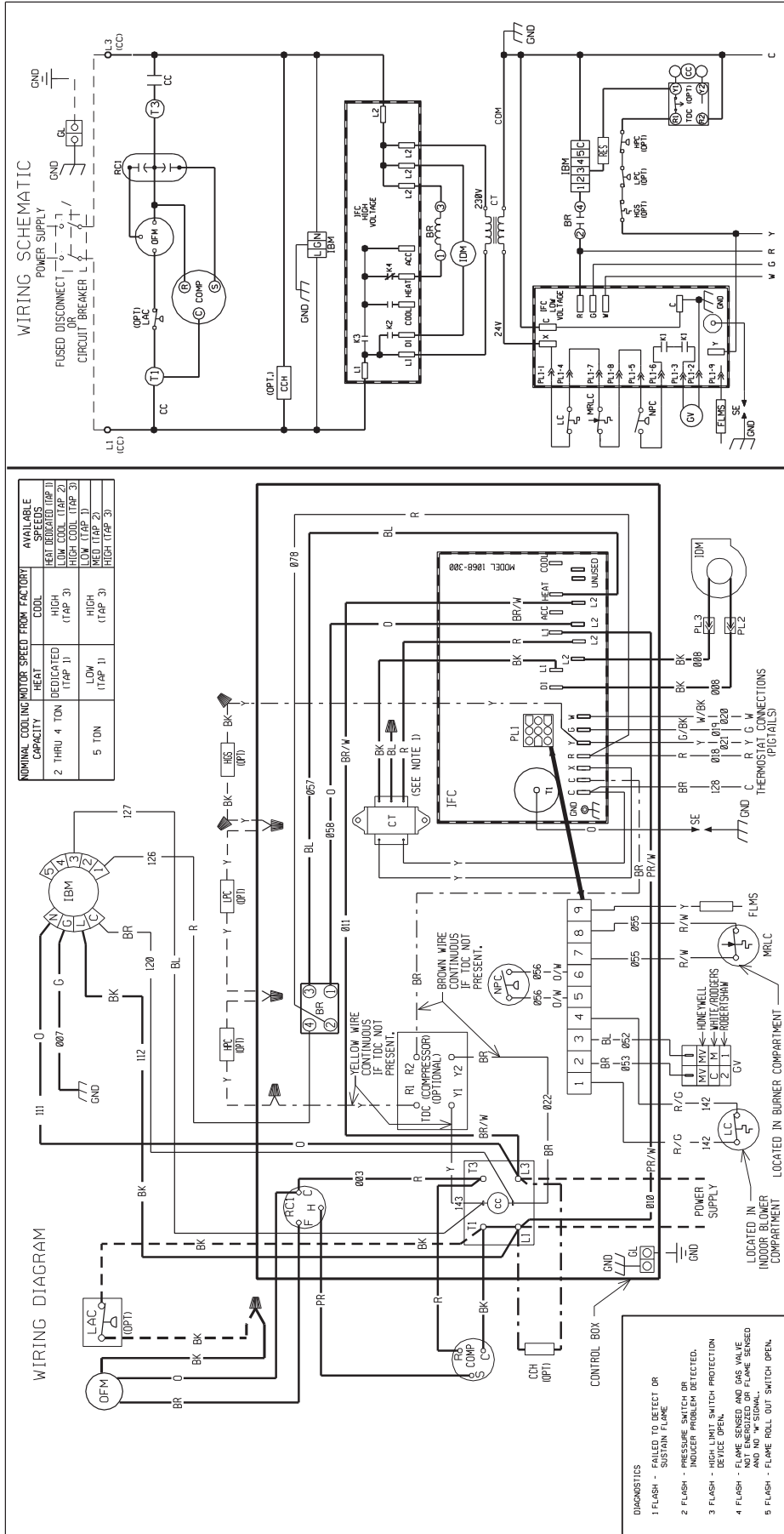
- NOTES:**
1. MAIN UNIT TRANSFORMER PRIMARY LEADS: 60 HZ. RED-COMMON BK/BL 60V R/W 60V Y BK/W 60V G BK/G 60V D/W 0/W
 2. MOTORS & COMPRESSOR SUITABLE FOR USE WITH COPPER CONNECTORS ONLY.
 3. CONDUCTORS W/WRING IN GROUNDED RAIN-TIGHT CONDUCIT TO BE FUSED DISCONNECT. 2 WITH A CLASS 2 TRANSFORMER 24 VOLTS, 50/60 HERTZ SUPPLIED.
 4. REPLACEMENT FUSES MUST BE SAME TYPE & SIZE AS ORIGINAL.

COMPONENT CODE

CC	COMPRESSOR CONTACTOR	LAC	LOW AMBIENT COOLING CONTROL
COMP	COMPRESSOR	LC	LIMIT CONTROL
CR	CONTROL TRANSFORMER	MRLC	MAN. RESET LIMIT CONTROL
FU	FUSE	NPC	NEG. PRESSURE CONTROL
FLS	FLAME SENSOR	OFM	OUTDOOR FAN MOTOR
GL	GROUND LUG	OPT	OPTIONAL
GV	GAS VALVE	PL	PLUG
HR	HEATING BLOWER RELAY	RC	RUN CAPACITOR
IBM	INDUCED BLOWER MOTOR	SE	SCREW
IDM	INDUCED DRAFT MOTOR	SP	SPIRIT NUT
IDR	INDUCED DRAFT RELAY		
IFC	INTEGRATED FURNACE CONTROL		
IS	ISOLATED MAIN		

DWG. NO. 90-23626-10 REV 03

FIGURE 28
WIRING DIAGRAM



WIRING SCHEMATIC

POWER SUPPLY
FUSED DISCONNECT
CIRCUIT BREAKER

WIRING INFORMATION

LINE VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED

LOW VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED

REPLACEMENT WIRE
-MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105 C MIN.)
-CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C. AND LOCAL CODES AS APPLICABLE.

NOTES:

1. MAIN UNIT TRANSFORMER PRIMARY LEADS: RED - COMMON, BLUE - 208 V, BLACK - 230 V, INTERCHANGE BLACK & BLUE LEADS FOR 208 V TRANSFORMER OPERATION.
2. MOTORS & COMPRESSOR THERMALLY PROTECTED. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
3. CONDUCTORS ONLY WIRING IN GROUNDED RAIN-TIGHT CONDUIT TO 50 HZ FUSED DISCONNECT.
4. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH HERTZ SUPPLIED.
5. REPLACEMENT FUSES MUST BE SAME TYPE & SIZE AS ORIGINAL.

COMPONENT CODE

LC - LIMIT CONTROL
LPC - LOW PRESSURE CONTROL
MRLC - MAIN RESET LIMIT CONTROL
NFC - NEG. PRESSURE CONTROL
OPM - OUTDOOR FAN MOTOR
OPT - OPTIONAL
PL - PLUG
RC - RUN CAPACITOR
SE - SPARK ELECTRODE
TDC - TIME DELAY CONTROL
WIRE NUT

BR - BLOWER RELAY
CC - COMPRESSOR CONTACTOR
CCH - CRANKCASE HEATER
COMP - COMPRESSOR
CT - CONTROL TRANSFORMER
FLM - FLAME SENSOR
GL - GROUND LUG
GND - GROUND
GV - GAS VALVE
HPC - HIGH PRESSURE CONTROL
IBM - INDOOR BLOWER MOTOR
IDM - INDUCED DRAFT MOTOR
IFC - INTEGRATED FURNACE CONTROL
HOS - HOT GAS SENSOR
LAC - LOW AMBIENT COOLING CONTROL

DIAGNOSTICS

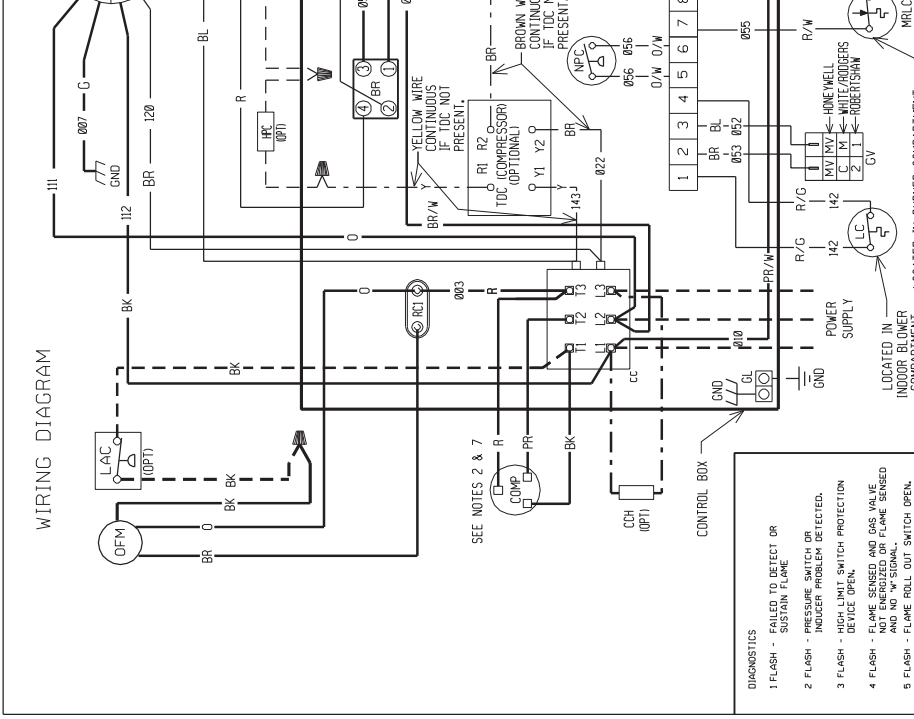
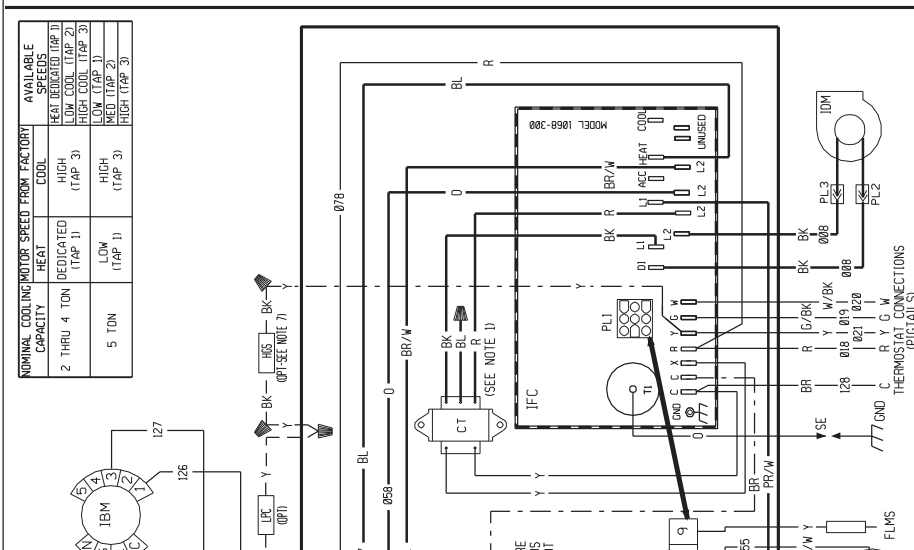
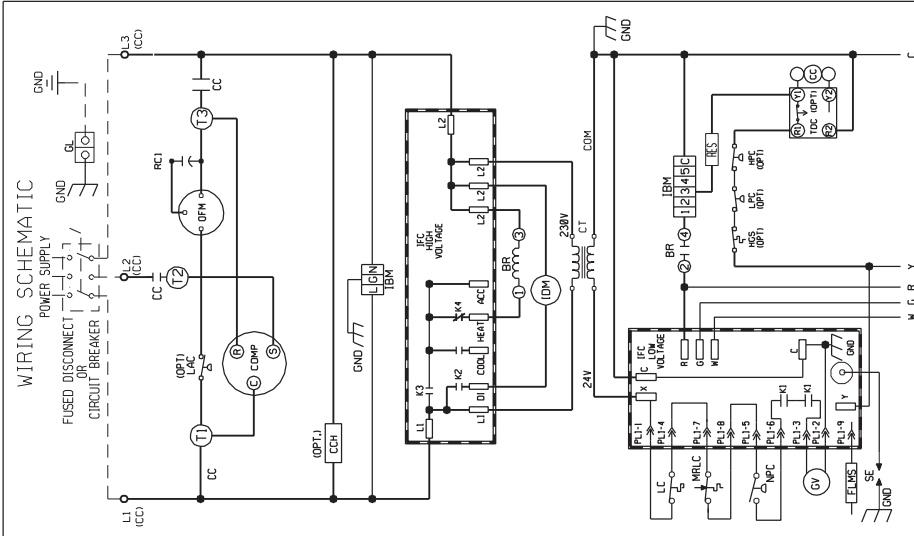
- 1 FLASH - FAILED TO DETECT OR SUSTAIN FLAME.
- 2 FLASH - PRESSURE SWITCH OR INDOOR BLOWER DETECTED.
- 3 FLASH - HIGH LIMIT SWITCH PROTECTION DEVICE OPEN.
- 4 FLASH - FLAME SENSED AND GAS VALVE NOT ENERGIZED OR FLAME SENSED AND NO "W" SIGNAL.
- 5 FLASH - FLAME ROLL OUT SWITCH OPEN.

ELECTRICAL WIRING DIAGRAM

2.0-5.0 TON SINGLE STAGE GAS/ELECTRIC W/X-13 BLOWER MOTOR AND INTEGRATED FURNACE CONTROL 208/230V, 1 - PHASE

DR. BY: JRJ
APP. BY: DATE: 8-16-05
DWG. NO.: 90-23626-11
REV: 07

FIGURE 29
WIRING DIAGRAM



WIRE COLOR CODE

BK	BLACK	GY	GRAY	R	RED
BR	BROWN	O	ORANGE	W	WHITE
BL	BLUE	PK	PINK	Y	YELLOW
G	GREEN	PR	PURPLE		

ELECTRICAL WIRING DIAGRAM

3.0-5.0 TON SINGLE STAGE GAS/ELECTRIC
W/X-13 BLOWER MOTOR AND
INTEGRATED FURNACE CONTROL
208/230V, 3 - PHASE

DR. BY: JRU APP. BY: DATE: 9-26-05 DWG. NO. 90-23626-12 REV 06

WIRING INFORMATION

LINE VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
LOW VOLTAGE
-FACTORY STANDARD
-FACTORY OPTION
-FIELD INSTALLED
REPLACEMENT WIRE
-MUST BE THE SAME SIZE AND TYPE OF
INSULATION AS ORIGINAL (105 C MIN.)
WARNING
-CABINET MUST BE PERMANENTLY
GROUNDED AND CONFORM TO I.E.C., N.E.C.,
C.E.C. AND LOCAL CODES AS APPLICABLE.

NOTES:

1. MAIN UNIT TRANSFORMER PRIMARY LEADS:
RED-COMMON BLUE-208 V. BLACK-230 V
INTERCHANGE BLACK & BLUE LEADS FOR
208 V TRANSFORMER OPERATION.
MOTORS & COMPRESSOR THERMALLY PROTECTED.
CONNECTORS SUITABLE FOR USE WITH COPPER
CONDUCT TO 60 HZ WIRING IN GROUNDED RAIN-TIGHT
A CLASS 2 TRANSFORMER IS N.E.C. CLASS 2 WITH
HERTZ SUPPLIED.
6. RE-ACE PERMITS USES MUST BE SAME TYPE &
COMPRESSOR PROTECTED UNDER
7. PRIMARY SINGLE PHASE CONDITIONS.

COMPONENT CODE

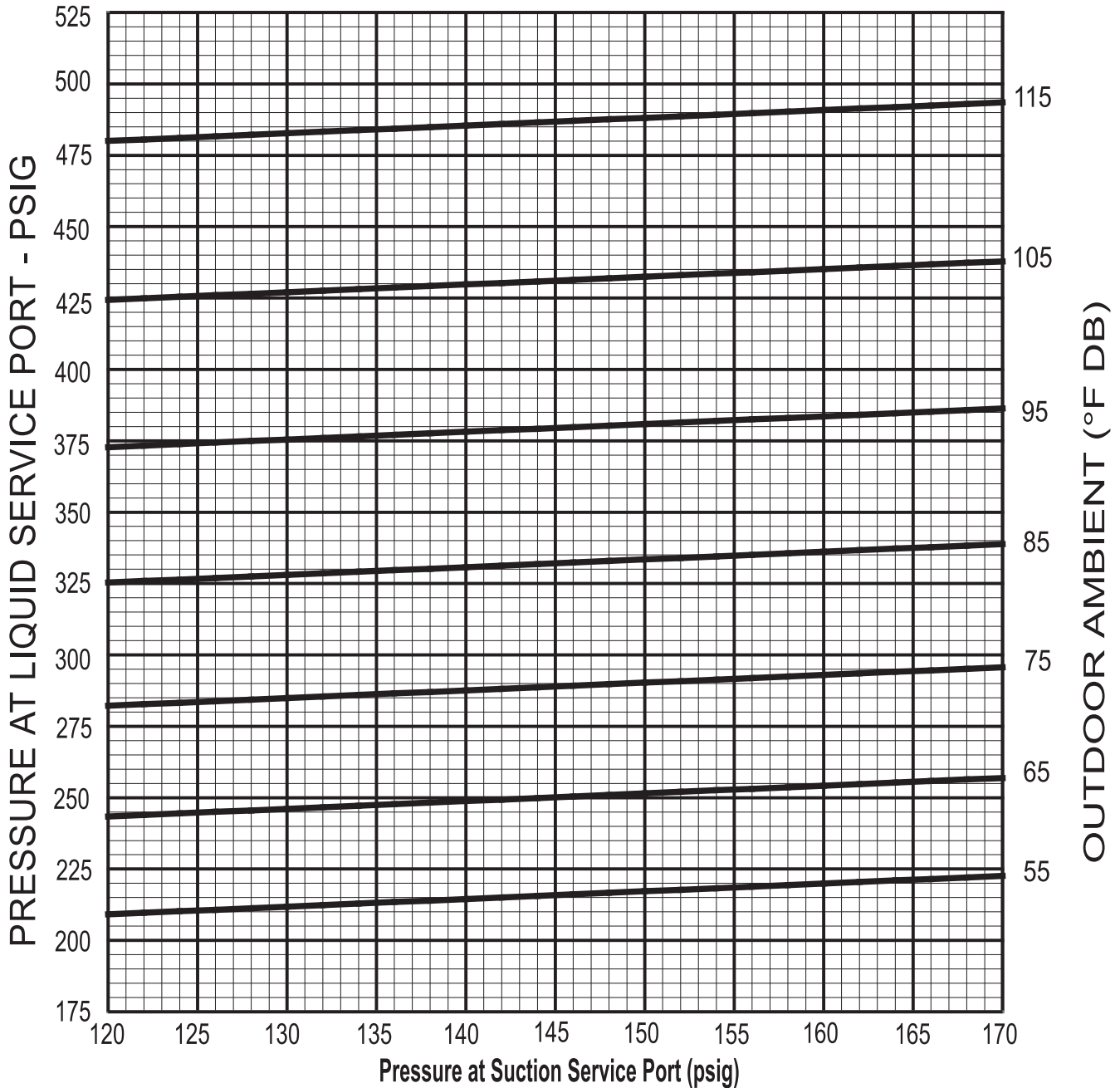
BR	BLOWER RELAY	LAC	LOW AMBIENT COOLING CONTROL
CC	COMPRESSOR CONTACTOR	LC	LIMIT CONTROL
CH	CRANKCASE HEATER	LFC	LOW PRESSURE CONTROL
COMP	COMPRESSOR	MRLC	MAN RESET LIMIT CONTROL
CT	CONTROL TRANSFORMER	NFC	NEG. PRESSURE CONTROL
FLMS	FLAME SENSOR	OPM	OPTIONAL INDOOR FAN MOTOR
FLUG	GROUND LUG	PL	PLUG
GN	GROUND	PL	PLUG
GV	GAS VALVE	RC	RUN CAPACITOR
HPC	HIGH PRESSURE CONTROL	RES	RESISTOR
IBM	INDOOR BLOWER MOTOR	SE	SPARK ELECTRODE
IC	INTEGRATED FURNACE CONTROL	TDC	TIME DELAY CONTROL
HCS	HOT GAS SENSOR	W	WIRE NUT
LAC	LOW AMBIENT COOLING CONTROL		

DWC. NO. 90-23626-12 REV 06

XV. CHARGE CHARTS

FIGURE 30
SYSTEM CHARGE CHARTS

TGRG**C/TGRG**E – 2 TON COOLING SYSTEM CHARGE CHART - REFRIGERANT 410A



CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

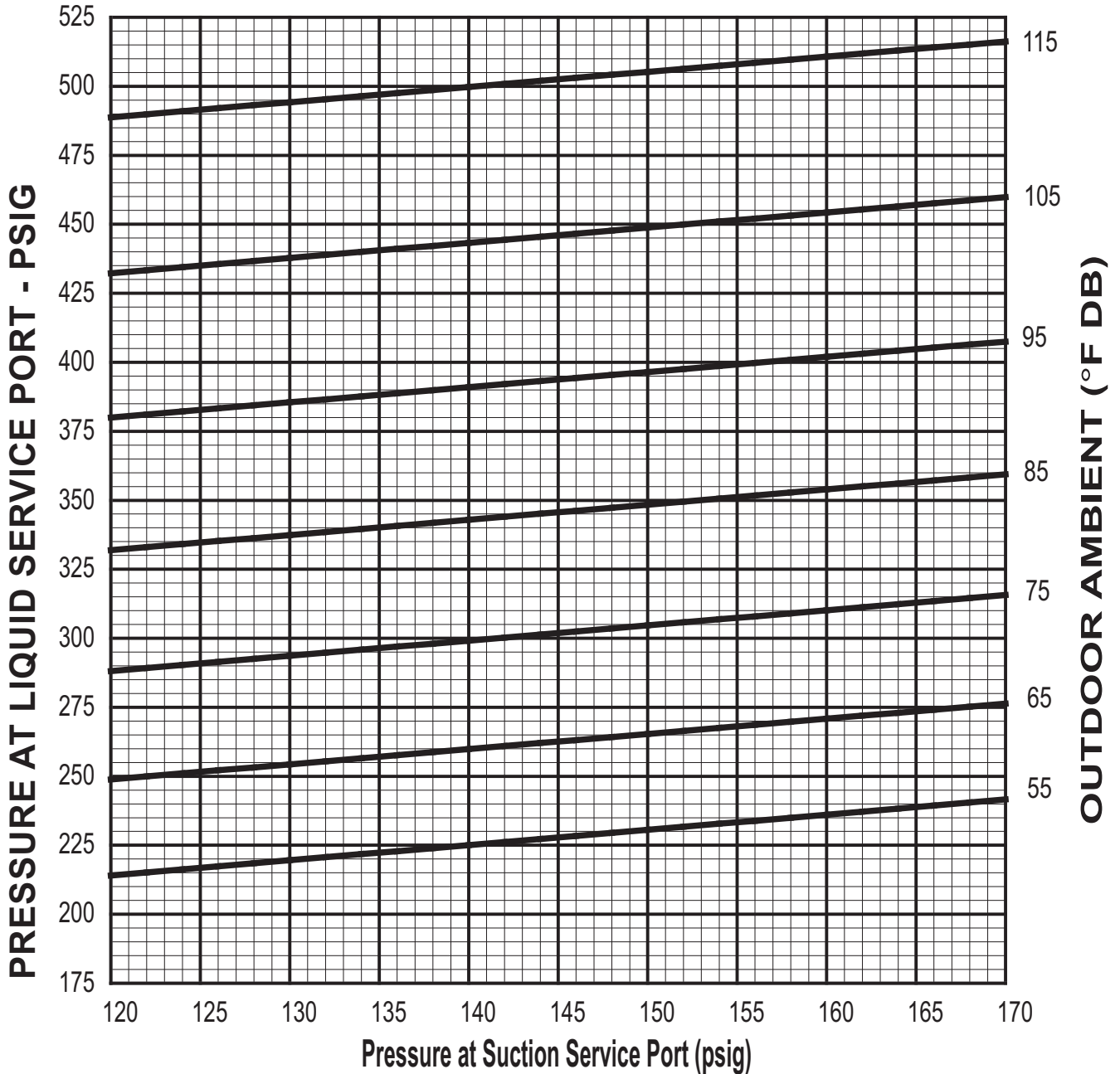
INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AN "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

92 - 22904 - 40 - 02

FIGURE 31
SYSTEM CHARGE CHARTS

TGRGC/TGRG**E – 2 1/2 TON COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A**



CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

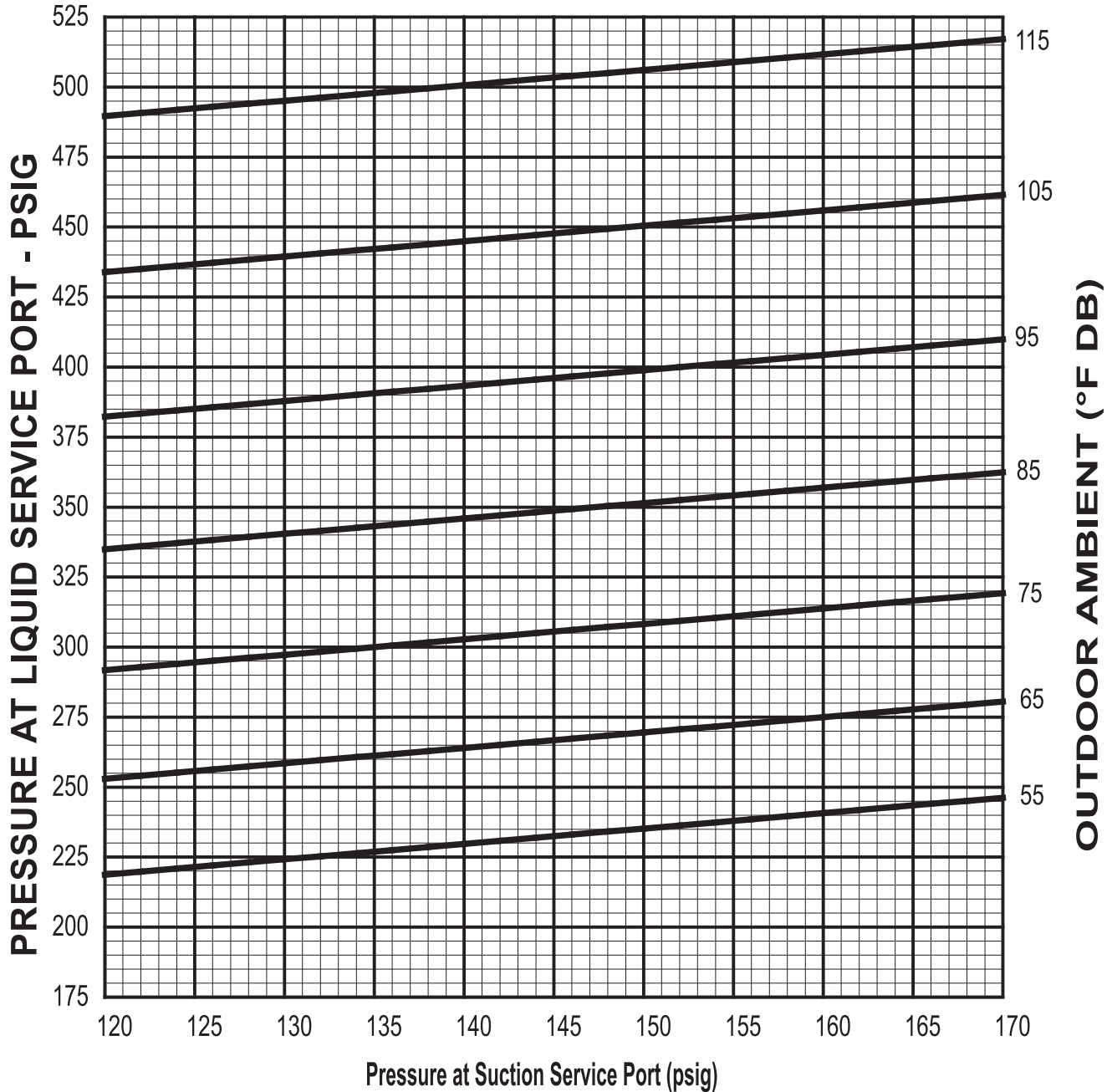
INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AN "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

92-22904-41-02

FIGURE 32
SYSTEM CHARGE CHARTS

TGRGC/TGRG**E – 3 TON COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A**



CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

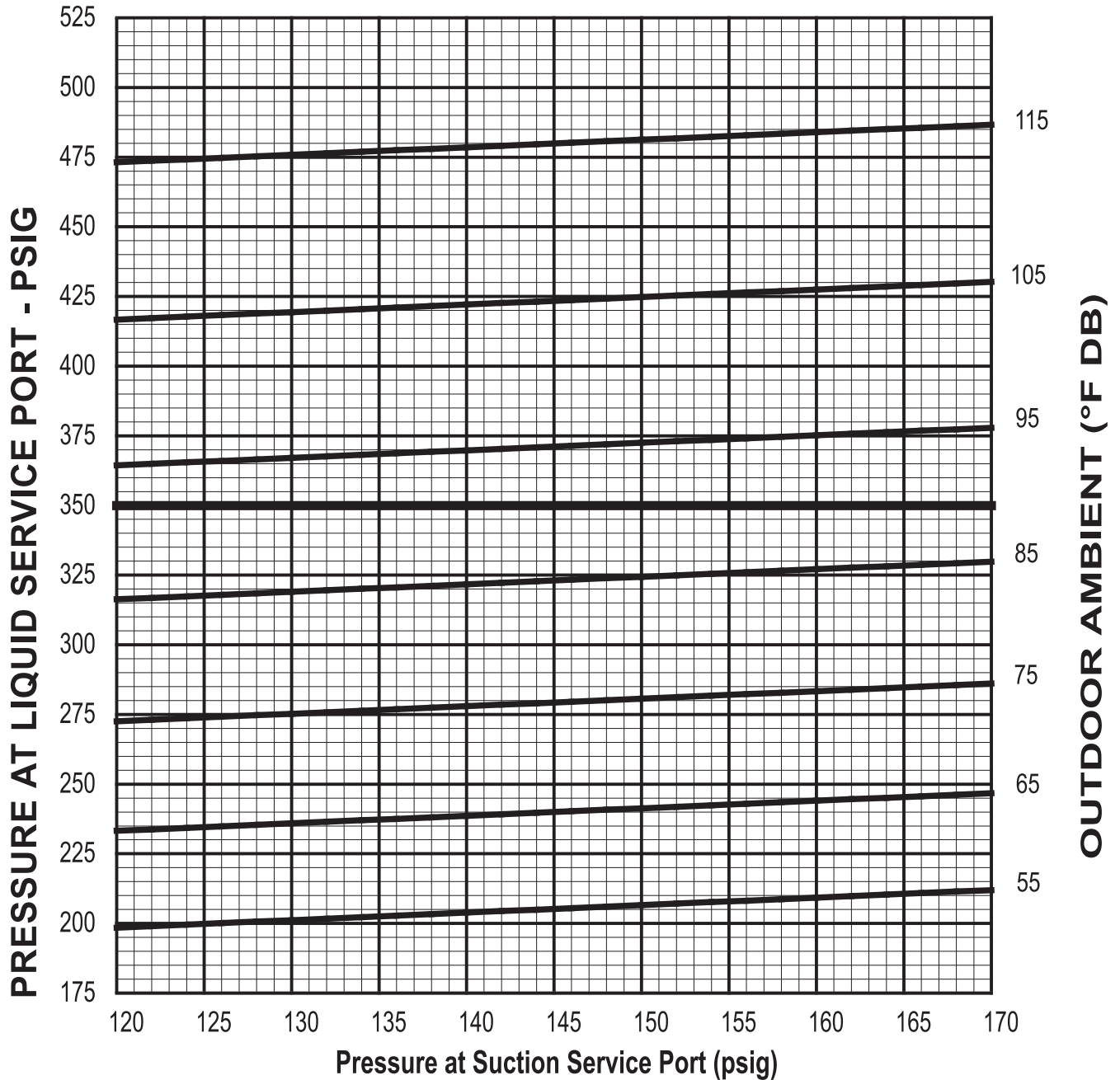
INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AN "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

92-22904-42-02

FIGURE 33
SYSTEM CHARGE CHARTS

TGRGC/TGRG**E – 3 1/2 TON COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A**



CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

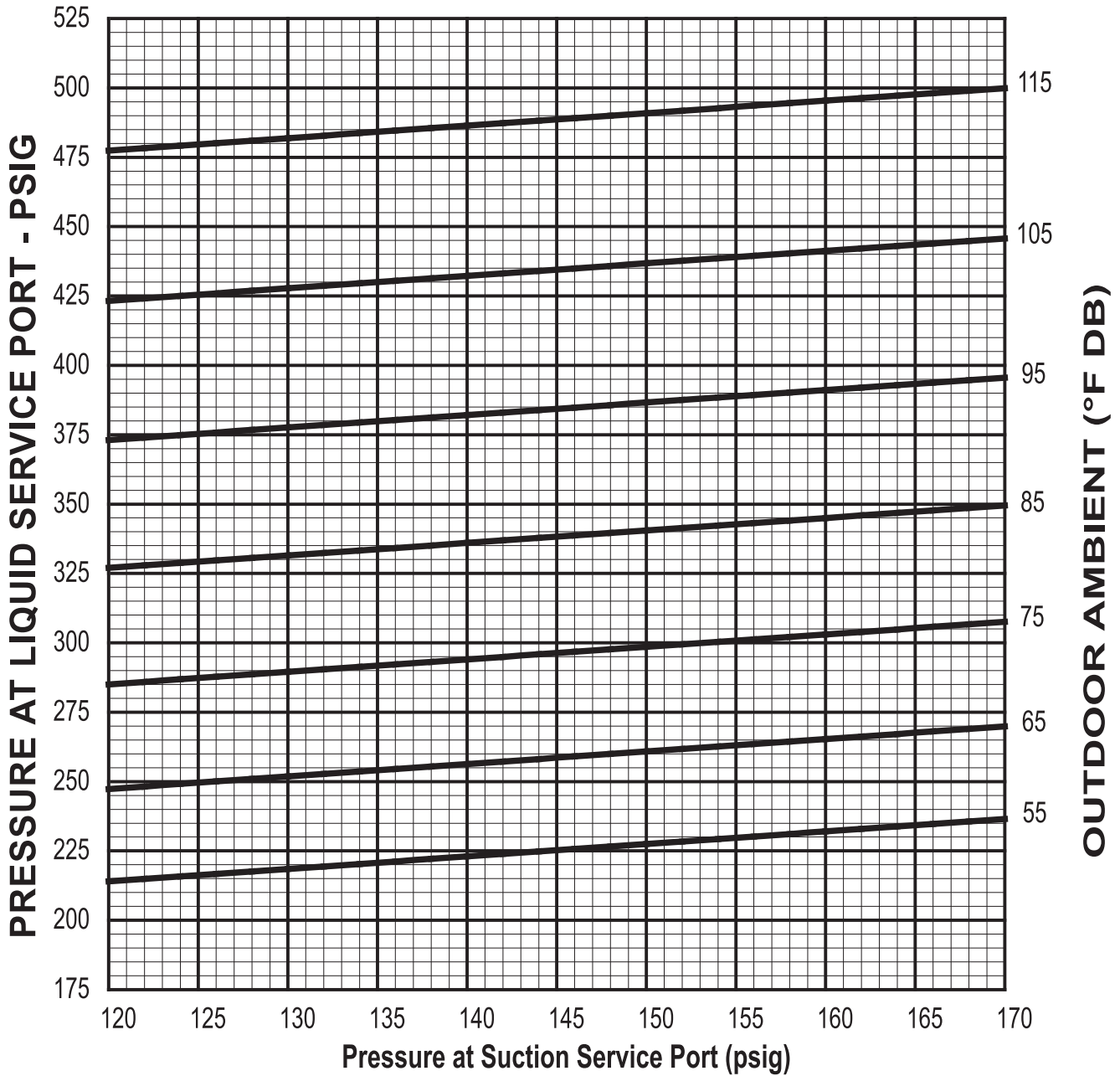
INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AN "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

92-22904- 43 -02

FIGURE 34
SYSTEM CHARGE CHARTS

TGRGC/TGRG**E – 4 TON COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A**



CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

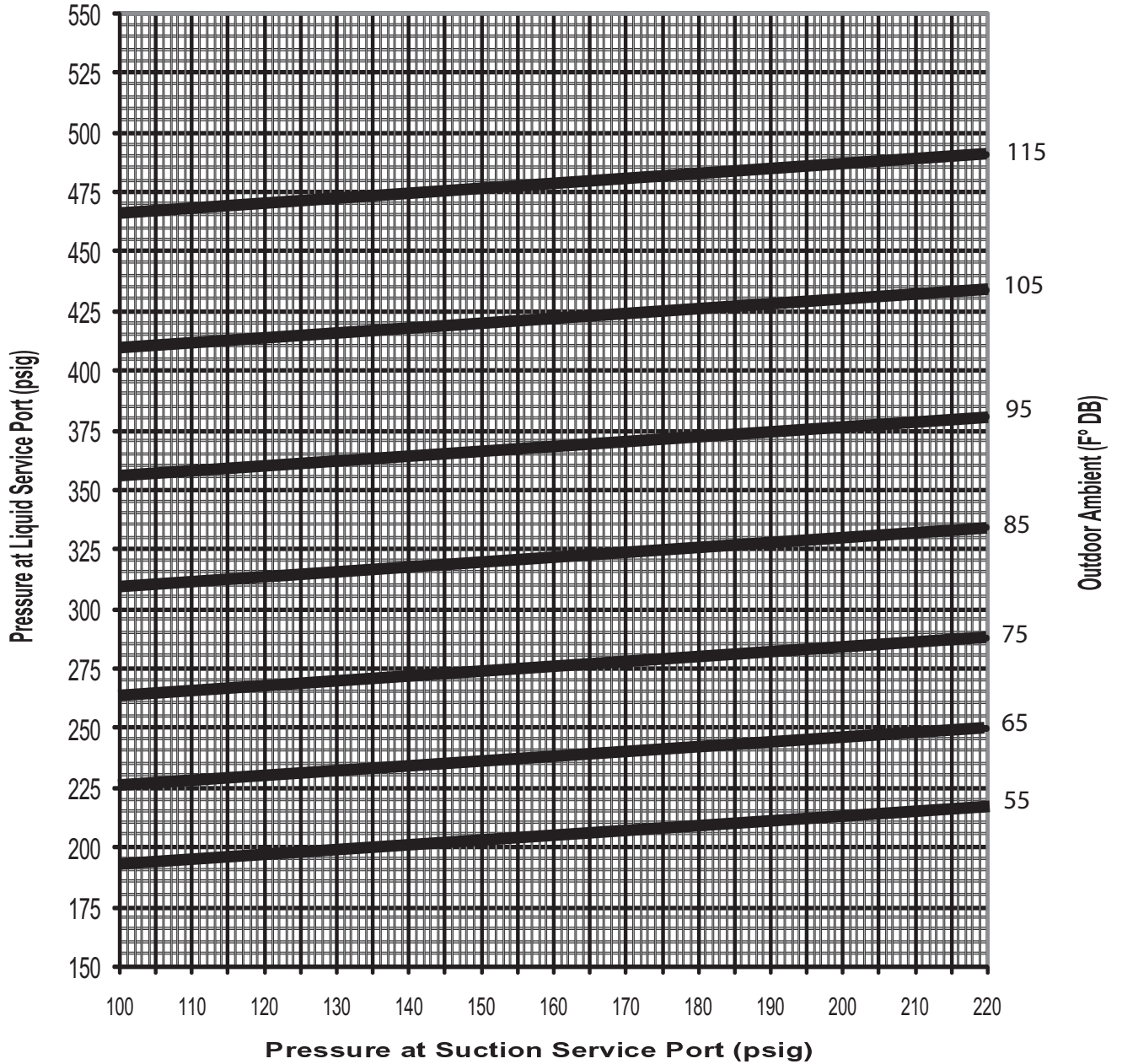
INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AN "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

92-22904- 44 -02

FIGURE 35
SYSTEM CHARGE CHARTS

TGRGC/TGRG**E – 5 TON COOLING
SYSTEM CHARGE CHART
R-410A REFRIGERANT**



INSTRUCTIONS:

1. CONNECT PRESSURE GUAGES TO SUCTION AND LIQUID PORTS AT OUTDOOR UNIT.
2. MEASURE AIR TEMPERATURE TO THE UNIT (OUTDOOR DRY BULB AMBIENT).
3. PLACE AN "X" ON THE CHART WHERE THE SUCTION AND LIQUID PRESSURE CROSS.
4. IF "X" IS BELOW OUTDOOR TEMPERATURE LINE, ADD CHARGE AND REPEAT 3.
5. IF "X" IS ABOVE OUTDOOR TEMPERATURE LINE, RECOVER CHARGE AND REPEAT.

92-22904-57-01

FIGURE 36
SYSTEM CHARGE CHARTS

TGRGD – 5 TON COOLING**
1st (LOW) STAGE CHARGE CHART
R-410A REFRIGERANT

THE CHART BELOW IS FOR REFERENCE ONLY
 CHARGE ADJUSTMENT SHOULD BE MADE DURING 2nd (HIGH) STAGE OPERATION ONLY

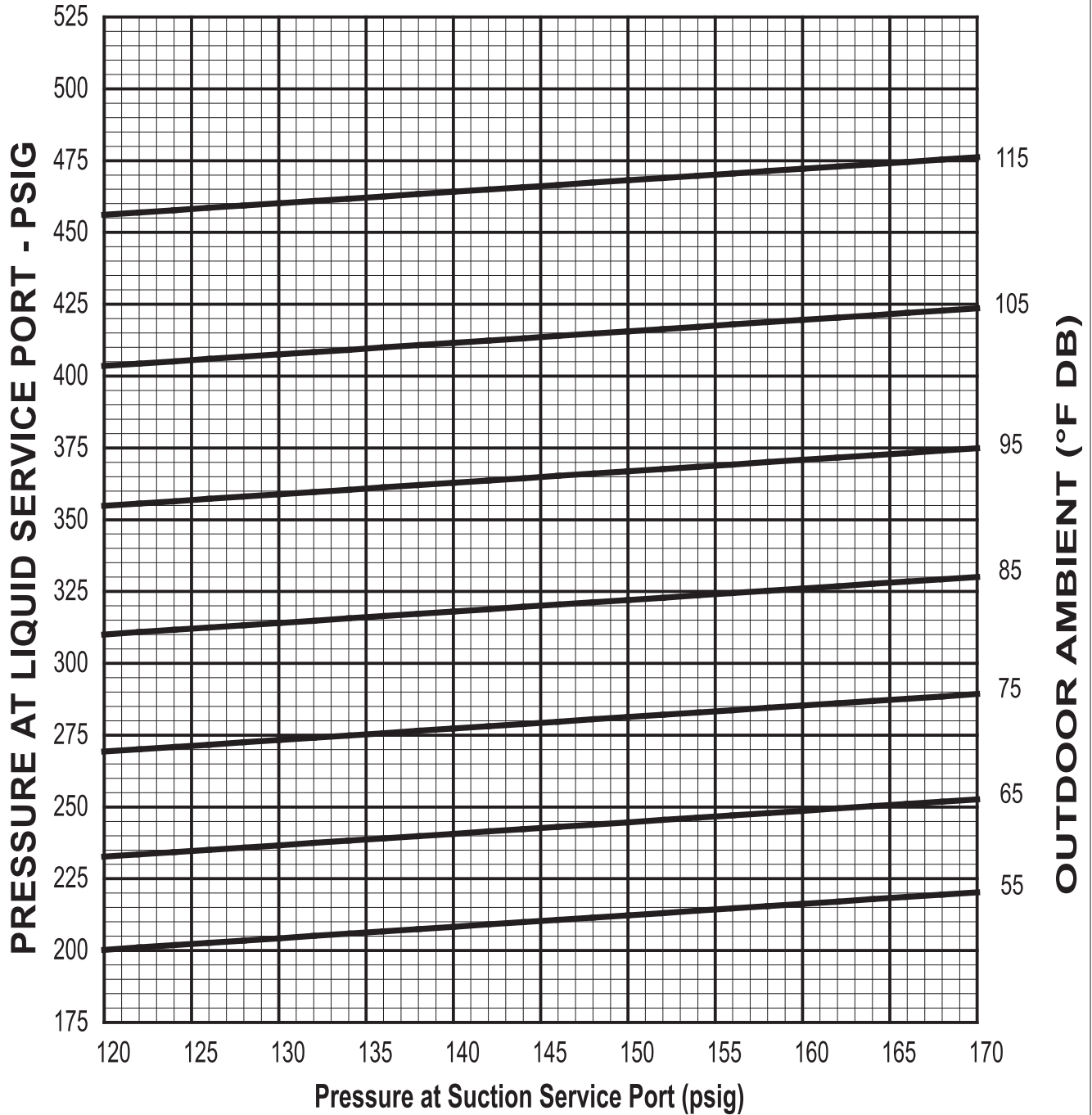
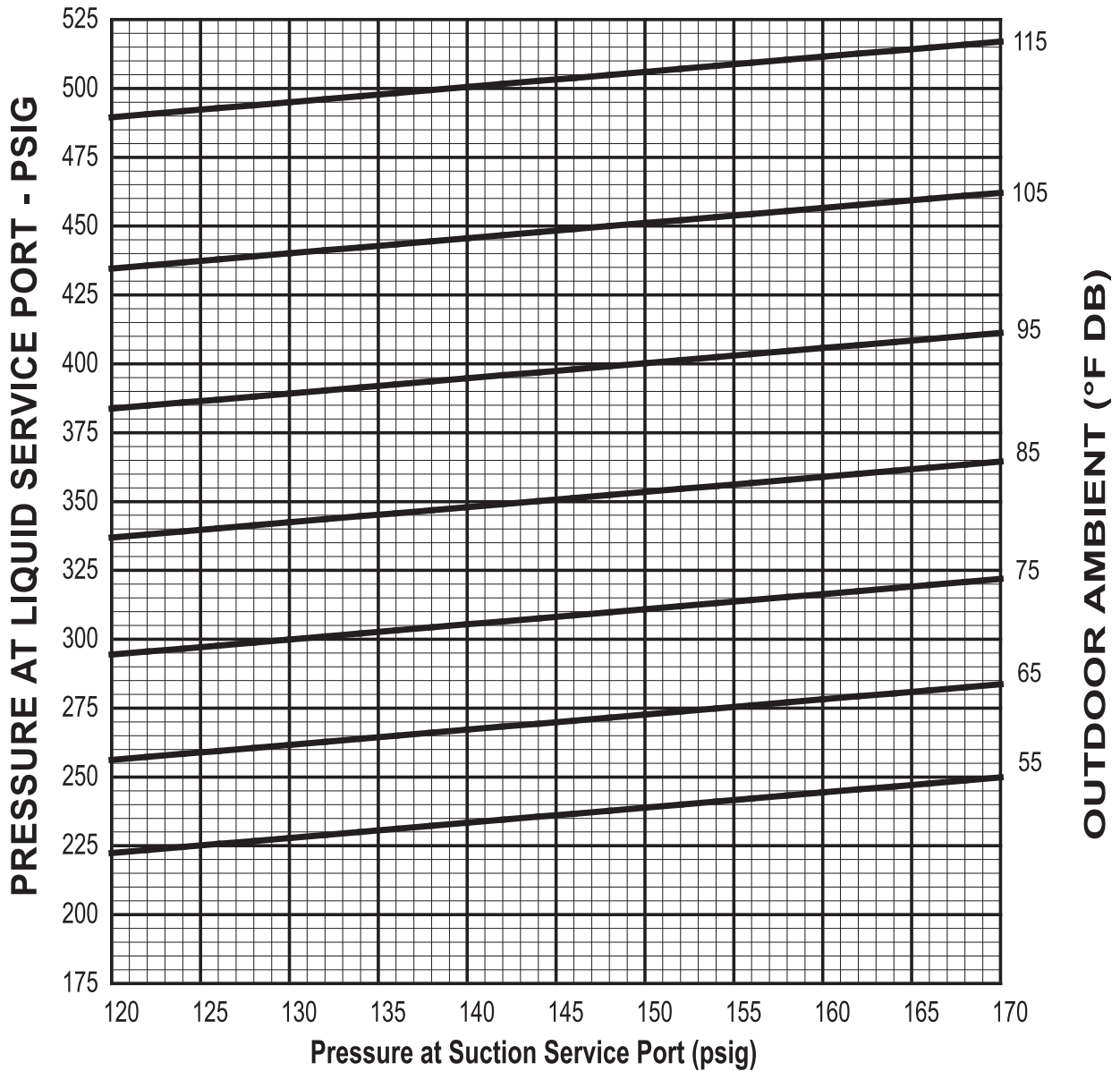


FIGURE 37
SYSTEM CHARGE CHARTS

TGRGD – 5 TON COOLING**
2nd (HIGH) STAGE CHARGE CHART
R-410A REFRIGERANT

THE CHART BELOW IS FOR REFERENCE ONLY
CHARGE ADJUSTMENT SHOULD BE MADE DURING 2nd (HIGH) STAGE OPERATION ONLY



CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AN "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

92-22904-46-02

XVI. TROUBLESHOOTING

FIGURE 38

COOLING TROUBLE SHOOTING CHART

▲ WARNING

DISCONNECT ALL POWER TO UNIT BEFORE SERVICING. CONTACTOR MAY BREAK ONLY ONE SIDE. FAILURE TO SHUT OFF POWER CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

SYMPTOM	POSSIBLE CAUSE	REMEDY
Unit will not run	<ul style="list-style-type: none"> Power off or loose electrical connection Thermostat out of calibration-set too high Failed contactor Blown fuses Transformer defective High pressure control open (if provided) Interconnecting low voltage wiring damaged 	<ul style="list-style-type: none"> Check for correct voltage at compressor contactor in control box Reset Check for 24 volts at contactor coil - replace if contacts are open Replace fuses Check wiring-replace transformer Reset-also see high head pressure remedy-The high pressure control opens at 610 PSIG Replace thermostat wiring
Condenser fan runs, compressor doesn't	<ul style="list-style-type: none"> Run or start capacitor failed (single phase only) Start relay defective (single phase only) Loose connection Compressor stuck, grounded or open motor winding open internal overload. Low voltage condition Low voltage condition 	<ul style="list-style-type: none"> Replace Replace Check for correct voltage at compressor - check & tighten all connections Wait at least 2 hours for overload to reset. If still open, replace the compressor. At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating. Add start kit components
Insufficient cooling	<ul style="list-style-type: none"> Improperly sized unit Improper airflow Incorrect refrigerant charge Air, non-condensibles or moisture in system Incorrect voltage 	<ul style="list-style-type: none"> Recalculate load Check - should be approximately 400 CFM per ton. Charge per procedure attached to unit service panel. Recover refrigerant, evacuate & recharge, add filter drier At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating.
Compressor short cycles	<ul style="list-style-type: none"> Incorrect voltage Defective overload protector Refrigerant undercharge 	<ul style="list-style-type: none"> At compressor terminals, voltage must be \pm 10% of nameplate marking when unit is operating. Replace - check for correct voltage Add refrigerant
Registers sweat	<ul style="list-style-type: none"> Low evaporator airflow 	<ul style="list-style-type: none"> Increase speed of blower or reduce restriction - replace air filter
High head-low vapor pressures	<ul style="list-style-type: none"> Restriction in liquid line, expansion device or filter drier Flow check piston size too small Incorrect capillary tubes TXV does not open 	<ul style="list-style-type: none"> Remove or replace defective component Change to correct size piston Change coil assembly Replace TXV
High head-high or normal vapor pressure - Cooling mode	<ul style="list-style-type: none"> Dirty condenser coil Refrigerant overcharge Condenser fan not running Air or non-condensibles in system 	<ul style="list-style-type: none"> Clean coil Correct system charge Repair or replace Recover refrigerant, evacuate & recharge
Low head-high vapor pressures	<ul style="list-style-type: none"> Defective Compressor valves Incorrect capillary tubes 	<ul style="list-style-type: none"> Replace compressor Replace coil assembly
Low vapor - cool compressor - iced evaporator coil	<ul style="list-style-type: none"> Low evaporator airflow Operating below 65°F outdoors Moisture in system 	<ul style="list-style-type: none"> Increase speed of blower or reduce restriction - replace air filter Add Low Ambient Kit Recover refrigerant - evacuate & recharge - add filter drier
High vapor pressure	<ul style="list-style-type: none"> Excessive load Defective compressor 	<ul style="list-style-type: none"> Recheck load calculation Replace
Fluctuating head & vapor pressures	<ul style="list-style-type: none"> TXV hunting Air or non-condensibles in system 	<ul style="list-style-type: none"> Check TXV bulb clamp - check air distribution on coil - replace TXV Recover refrigerant, evacuate & recharge
Gurgle or pulsing noise at expansion device or liquid line	<ul style="list-style-type: none"> Air or non-condensibles in system 	<ul style="list-style-type: none"> Recover refrigerant, evacuate & recharge
Circulating air blower & inducer run continuously, compressor will not start	<ul style="list-style-type: none"> Manual reset overtemperature control tripped Wire loose in limit circuit 	<ul style="list-style-type: none"> Reset or replace Check wiring

FIGURE 39

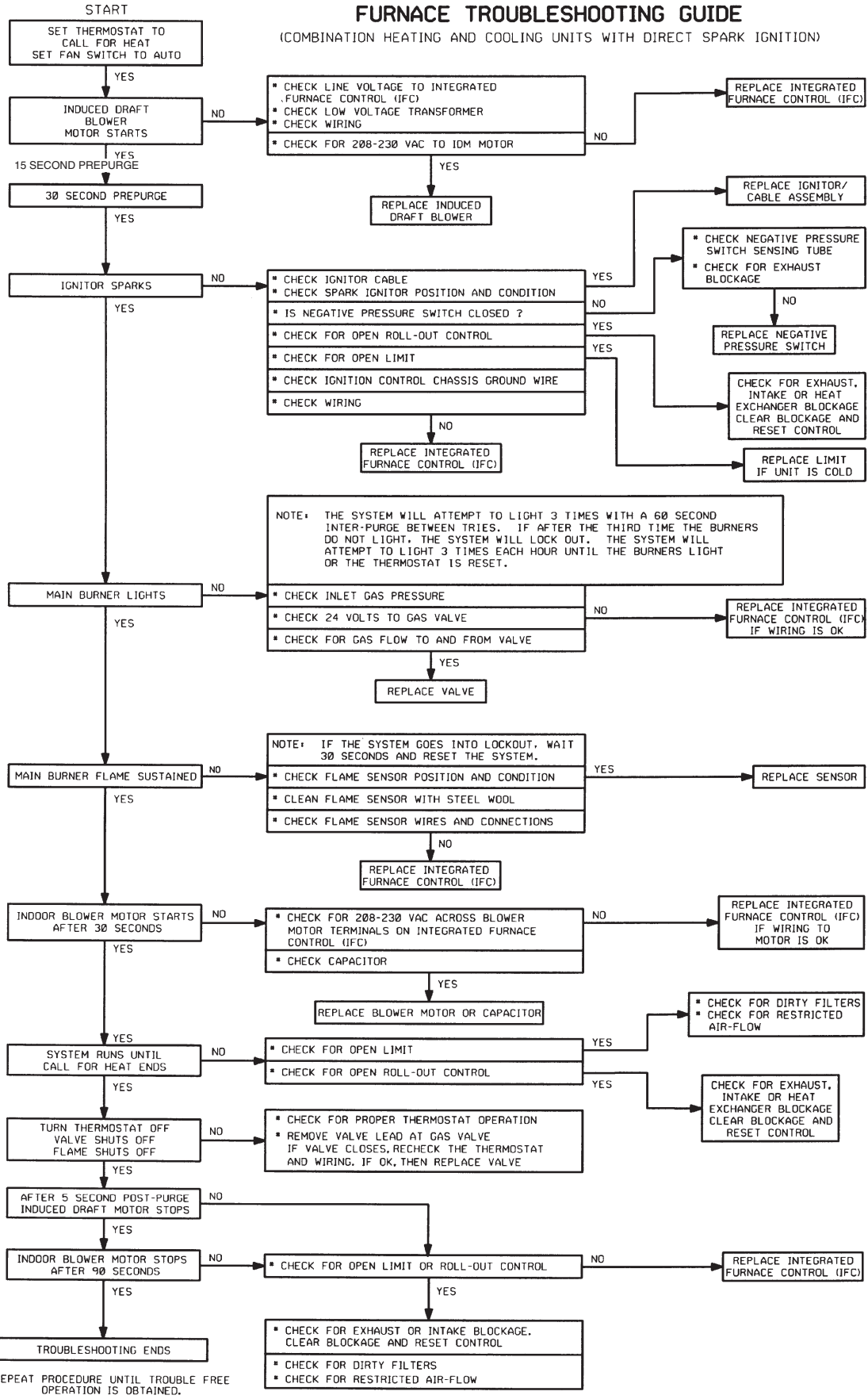
WARNING

DISCONNECT POWER BEFORE SERVICING.
HAZARDOUS VOLTAGE LINE VOLTAGE CONNECTIONS
SERVICE MUST BE BY A TRAINED, QUALIFIED SERVICE TECHNICIAN.



FURNACE TROUBLESHOOTING GUIDE

(COMBINATION HEATING AND COOLING UNITS WITH DIRECT SPARK IGNITION)



ILL 1651
5-9-96
PB

REPEAT PROCEDURE UNTIL TROUBLE FREE OPERATION IS OBTAINED.

