INSTALLATION INSTRUCTIONS
FOR PACKAGED AIR CONDITIONERS
RACB SERIES (2-5 TONS) WITH R-454B REFRIGERANT

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

92-110312-01-02

RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION!

⚠ WARNING

THESE INSTRUCTIONS ARE INTENDED AS AN AID TO QUALIFIED, LICENSED SERVICE PERSONNEL FOR PROPER INSTALLATION, ADJUSTMENT AND OPERATION OF THIS UNIT. READ THESE INSTRUCTIONS THOROUGHLY BEFORE ATTEMPTING INSTALLATION OR OPERATION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN IMPROPER INSTALLATION, ADJUSTMENT, SERVICE OR MAINTENANCE POSSIBLY RESULTING IN FIRE, ELECTRICAL SHOCK, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

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Unitary Large AC
AHRI Standard 340/360
Certification applies only when the complete system is listed with AHRI.

Accredited by the RvA
ABS Quality Evaluations, Inc. Management System Certification
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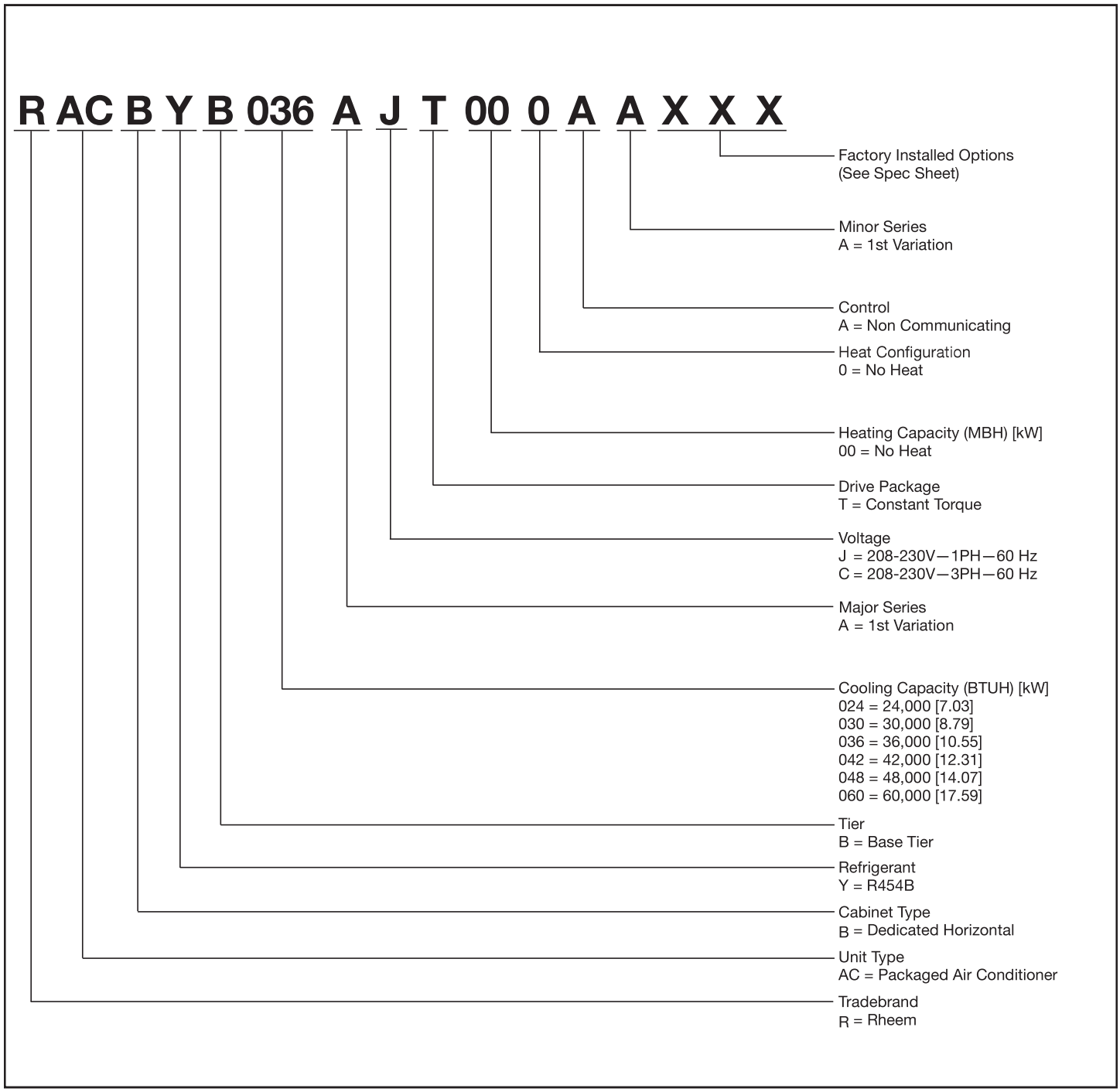


2. IMPORTANT SAFETY AND GENERAL INFORMATION

2.1 Introduction

This booklet contains the installation and operating instructions for your 3 ton, 4 ton, 5 ton, or 6 ton combination gas heating/electric cooling unit. There are some precautions that should be taken to ensure proper operation. 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.

⚠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.

2.2 Agency Performance Audit and Efficiency Testing Notice

NOTICE: BREAK-IN PERIOD

Prior to agency testing, run the compressor for 16 hours at 115°f outdoor ambient temperature and 80° dry bulb / 75° wet bulb indoor ambient temperature.

NOTICE: EFFICIENCY TESTING NOTICE

For purposes of verifying or testing efficiency ratings, the test procedure in title 10 Appendix M to Subpart B of Part 430 (Uniform Test Method for Measuring the Energy Consumption of Central Air Conditioners and Heat Pumps) and the clAHRIfying provisions provided in the standards listed below that were applicable at the date of manufacture should be used for test set up and performance.

SETUP

- ASHRAE 37 - 2009 (RA 2019)

PERFORMANCE:

- ANSI/ASHRAE 90.1 - 2019
- ANSI/ASHRAE 103 (2017)
- AHRI Operations for Unitary Small AC Equipment 210/240 (2017) for 3-5T

SAFETY

UL 60335 4th Edition

2.3. Importance of a Quality Installation

Optimal system performance and longevity depend upon a quality and proper installation. Failure to properly setup and commission this unit could result in undesirable operation and subsequent faults and potential failures.

Carefully follow all guidelines listed in the manual and industry best practices. Conform to all local code requirements. Contact your local technical representative with any questions or concerns.

2.4. Importance of Air Flow and Setup

Optimal system performance is also dependent upon having the ideal airflow across the condensing and evaporating coils, and upon matching the charge weight to the manufacturer's spec for the unit. Improper or restricted air flow, and incorrect charge weight, will hinder the performance of the unit. Please refer to the manufacturer's recommended clearances for setting the unit and the included guide for setting air flow. Refer to the rating plate for the charge weight.

2.5. Checking Product and Inspection

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.

2.6. Safety Information

⚠ WARNING

PROPOSITION 65: THIS APPLIANCE CONTAINS FIBERGLASS INSULATION. RESPIRABLE PARTICLES OF FIBERGLASS ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

⚠ 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

DISCONNECT ALL POWER TO THE UNIT BEFORE STARTING MAINTENANCE. FAILURE TO DO SO CAN RESULT IN SEVERE ELECTRICAL SHOCK OR DEATH.

⚠ 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

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

⚠ WARNING

THE UNIT MUST BE PERMANENTLY GROUNDED. A GROUNDING LUG IS PROVIDED IN THE ELECTRIC HEAT KIT FOR A GROUND WIRE. FAILURE TO GROUND THIS UNIT CAN RESULT IN FIRE OR ELECTRICAL SHOCK CAUSING PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH.

⚠ WARNING

ONLY ELECTRIC HEATER KITS SUPPLIED BY THIS MANUFACTURER AS DESCRIBED IN THIS PUBLICATION HAVE BEEN DESIGNED, TESTED, AND EVALUATED BY A NATIONALLY RECOGNIZED SAFETY TESTING AGENCY FOR USE WITH THIS UNIT. USE OF ANY OTHER MANUFACTURED ELECTRIC HEATERS INSTALLED WITHIN THIS UNIT MAY CAUSE HAZARDOUS CONDITIONS RESULTING IN PROPERTY DAMAGE, FIRE, BODILY 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.

⚠ CAUTION

DO NOT USE R-410A SERVICE EQUIPMENT OR COMPONENTS ON R-454B 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.

EFFICIENCY TESTING NOTICE

For purposes of verifying or testing efficiency ratings, the test procedure in Title 10 Part 431 Appendix A to Subpart F (Uniform Test Method for Measuring the Energy Consumption of Small Large and Very Large Commercial Packaged Air Conditioning and Heating Equipment), Title 10 Part 431.76 Subpart D (Uniform Test Method for Measuring Energy Consumption of Commercial Warm Air Furnaces), and the clAHRIfying provisions provided in the AHRI Operations Manuals for Unitary Large Equipment 340/360, 365 and Commercial Furnaces that were applicable at the date of manufacture should be used for test set up and performance.

2.6. Safety Information

⚠ WARNING
IF ANY HOT WORK IS TO BE CONDUCTED ON THE REFRIGERATING EQUIPMENT OR ANY ASSOCIATED PARTS, APPROPRIATE FIRE EXTINGUISHING EQUIPMENT MUST BE ON SITE. A DRY POWDER CO2 FIRE EXTINGUISHER MUST BE NEAR THE CHARGING AREA AT ALL TIMES DURING INSTALLATION, COMMISSIONING, SERVICE, AND DECOMMISSIONING.

⚠ WARNING
THE UNIT MUST BE PERMANENTLY GROUNDED. A GROUNDING LUG IS PROVIDED IN THE ELECTRIC HEAT ACCESS AREA FOR A GROUND WIRE. FAILURE TO GROUND THIS UNIT CAN RESULT IN FIRE OR ELECTRICAL SHOCK CAUSING PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH.

⚠ WARNING
ONLY ELECTRIC HEATER KITS SUPPLIED BY THIS MANUFACTURER AS DESCRIBED IN THIS PUBLICATION HAVE BEEN DESIGNED, TESTED, AND EVALUATED FOR USE WITH THIS UNIT. USE OF ANY OTHER MANUFACTURED ELECTRIC HEATERS INSTALLED WITHIN THIS UNIT MAY CAUSE HAZARDOUS CONDITIONS RESULTING IN PROPERTY DAMAGE, FIRE, BODILY INJURY OR DEATH.

⚠ DANGER
RISK OF FIRE OR EXPLOSION. FLAMMABLE REFRIGERANT USED. TO BE REPAIRED ONLY BY TRAINED SERVICE PERSONNEL. DO NOT PUNCTURE REFRIGERANT TUBING.

⚠ WARNING
RISK OF FIRE OR EXPLOSION. DISPOSE OF PROPERLY IN ACCORDANCE WITH FEDERAL OR LOCAL REGULATIONS. FLAMMABLE REFRIGERANT USED.

⚠ DANGER
RISK OF FIRE OR EXPLOSION. FLAMMABLE REFRIGERANT USED. CONSULT THE REPAIR MANUAL/OWNER'S GUIDE BEFORE ATTEMPTING TO SERVICE THIS PRODUCT. ALL SAFETY PRECAUTIONS MUST BE FOLLOWED.

⚠ DANGER
RISK OF FIRE OR EXPLOSION DUE TO FLAMMABLE REFRIGERANT USED. FOLLOW HANDLING INSTRUCTIONS CAREFULLY IN COMPLIANCE WITH NATIONAL REGULATIONS.

⚠ WARNING
DO NOT USE MEANS TO ACCELERATE THE DEFROSTING PROCESS OR TO CLEAN, OTHER THAN THOSE RECOMMENDED BY THE MANUFACTURER.

⚠ WARNING
AUXILIARY DEVICES WHICH MAY BE A POTENTIAL IGNITION SOURCE SHALL NOT BE INSTALLED IN THE DUCTWORK.

⚠ WARNING
THE APPLIANCE SHALL BE STORED IN A ROOM WITHOUT CONTINUOUSLY OPERATING IGNITION SOURCES (FOR EXAMPLE: OPEN FLAMES, AN OPERATING GAS APPLIANCE, OR AN OPERATING ELECTRIC HEATER).

⚠ WARNING
DO NOT PIERCE OR BURN.

⚠ WARNING
BE AWARE THAT REFRIGERANTS MAY NOT CONTAIN AN ODOR.

⚠ WARNING
IF THIS UNIT IS CONNECTED VIA AN AIR DUCT SYSTEM TO ONE OR MORE ROOMS WITH AN AREA LESS THAN AMIN, THAT ROOM SHALL BE WITHOUT CONTINUOUSLY OPERATING FLAMES OR OTHER POTENTIAL IGNITION SOURCES. SEE APPENDIX H - A2L REFRIGERANT INSTALLATION SAFETY DATA.

⚠ WARNING
IF THIS UNIT IS CONNECTED VIA DUCT TO ONE OR MORE ROOMS, ONLY AUXILIARY DEVICES APPROVED BY THE MANUFACTURER THAT ARE DECLARED SUITABLE WITH A2L REFRIGERANTS SHALL BE INSTALLED IN THE CONNECTING DUCTWORK.

⚠ WARNING
APPLIANCE SHALL BE INSTALLED, OPERATED, AND STORED IN A ROOM WITH A FLOOR AREA LARGER THAN 'X'M2. SEE APPENDIX H - A2L REFRIGERANT INSTALLATION SAFETY DATA.

3. GENERAL SPECIFICATIONS

3.1. Major Components

The unit includes a hermetically-sealed refrigerating system consisting of a scroll compressor, condenser coil, evaporator coil with TXV, a circulation air blower, a condenser fan, a heat exchanger assembly, gas burner and control assembly, combustion air motor and fan, and all necessary internal electrical wiring. The cooling system of these units is factory evacuated, charged, and performance tested. Refrigerant amount and type are indicated on rating plate.

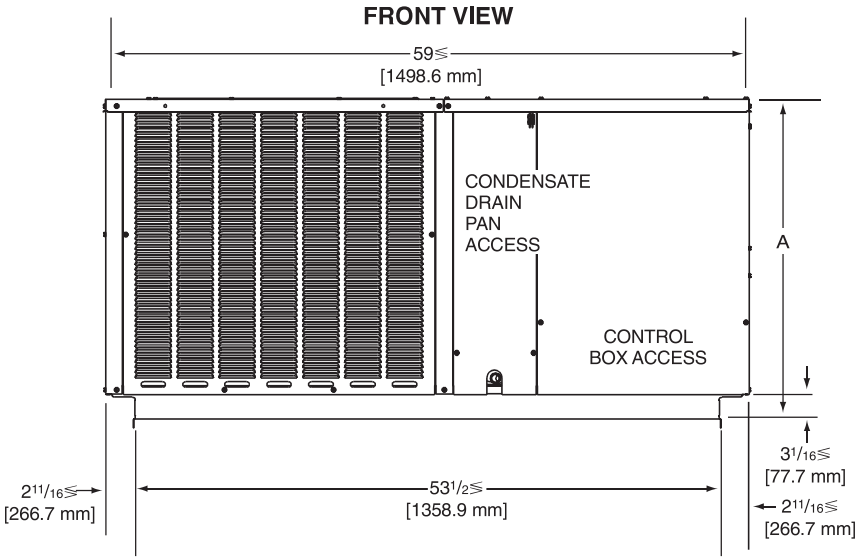
3.2. Product Data Information

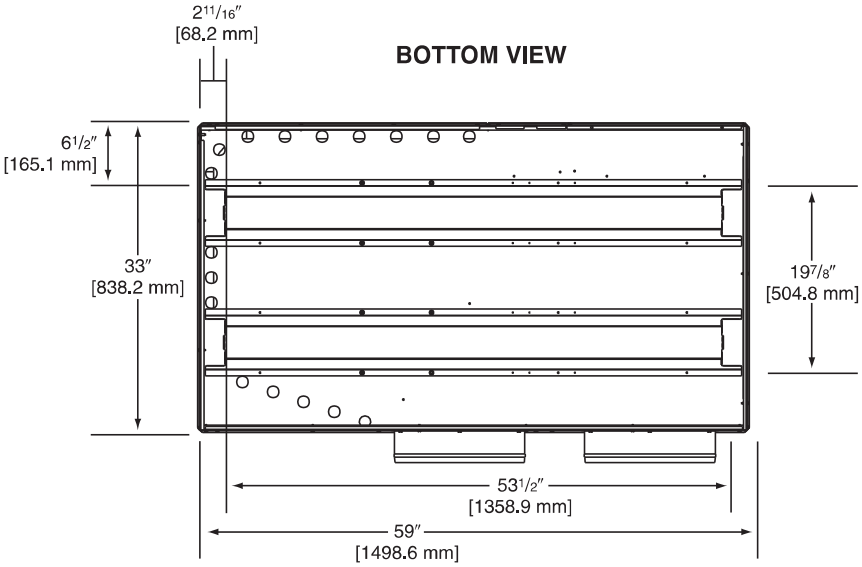
3.2.1. Dimensional Information

IMPORTANT: This unit must be mounted level in both directions to allow water to drain from the condenser section and condensate pan.

FIGURE 1
UNIT DIMENSIONS AND ACCESS LOCATIONS

Model	Height "A"
024, 030, 036, 042	29 1/8"
048, 060	37 1/8"





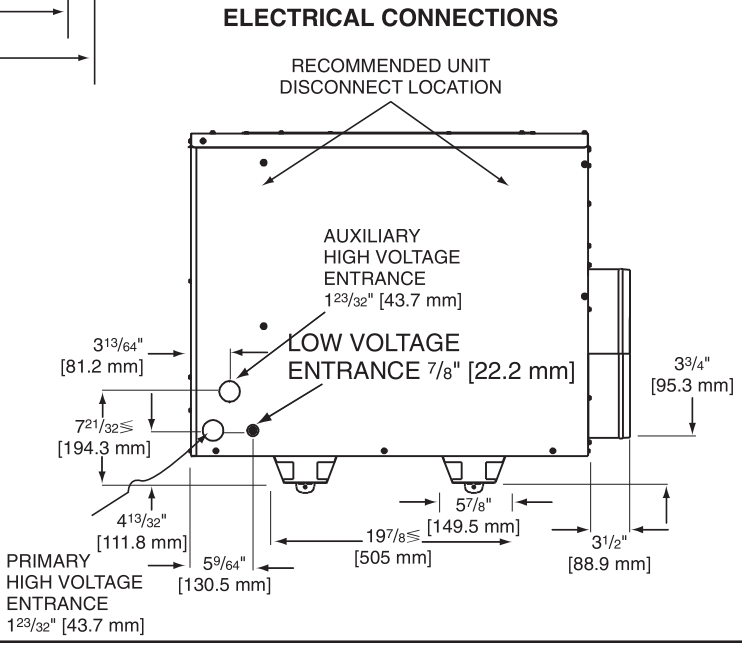
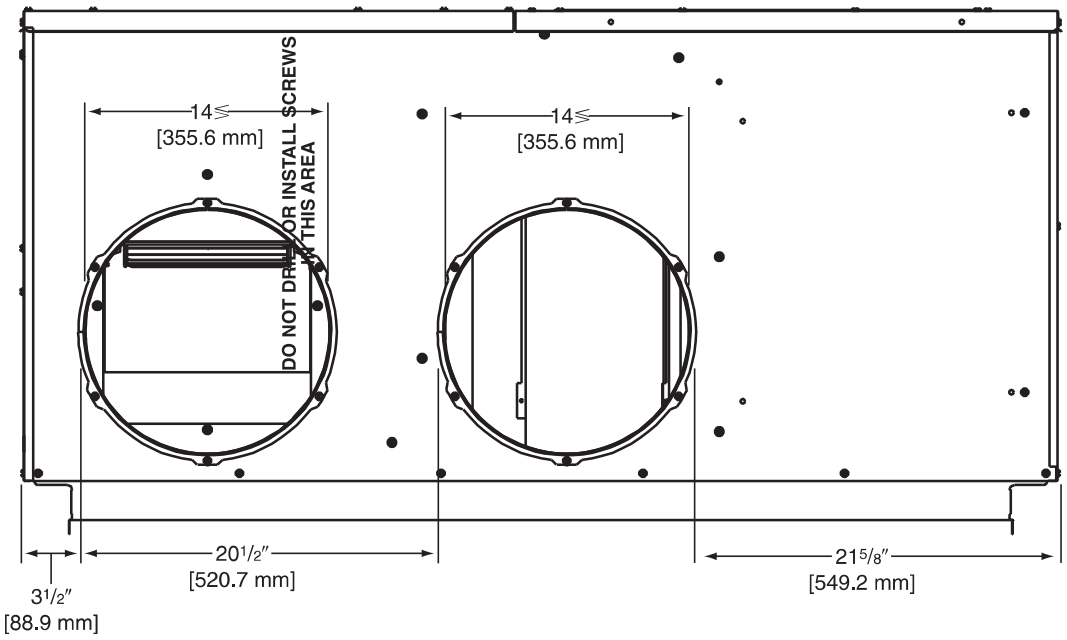
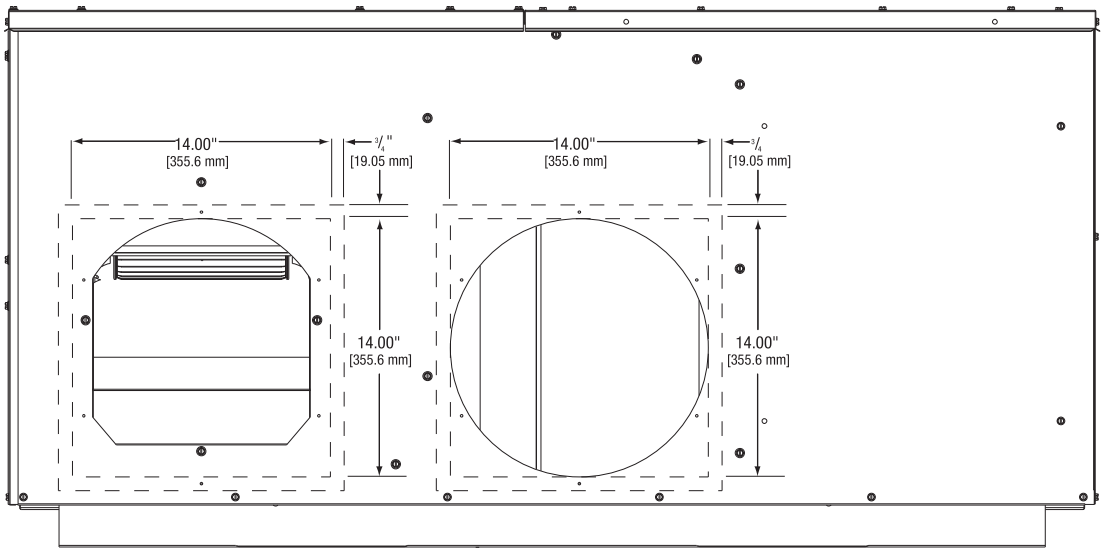


FIGURE 1 (continued)
DUCT CONNECTIONS

ROUND DUCT CONNECTIONS



SQUARE DUCT CONNECTIONS



IMPORTANT: DO NOT SCREW OR DRILL OUTSIDE THE DESIGNATED AREAS.

IMPORTANT: This product is designed to be operated with 14(round supply and return air ducts. Square ducts may be used, provided that a minimum length of 24(of round duct is used on the supply and return connections. This requirement is necessary to maintain blower performance.

4. INSTALLATION OF THE UNIT

4.1. General

4.1.1. Installation

Install this unit in accordance with The American National Standard Z223.1-latest edition booklet entitled “National Fuel Gas Code”, and the requirements or codes of the local utility or other authority having jurisdiction. Additional helpful publications available from the “National Fire Protection Association” are:

- NFPA-90A - Installation of Air Conditioning and Ventilating Systems 2018 or latest edition.
- NFPA-90B - Warm Air Heating and Air Conditioning Systems 2018 or latest edition.

These publications are available from:

National Fire Protection

Association, Inc.

NFPA.ORG

4.1.2. Pre-Installation Checkpoints

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 - away from bedroom windows

4.2. Tool and Refrigerant

4.2.1. Tools Required for Installing and Servicing R-454B 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
- Zero-loss fittings

Recovery Cylinders:

- 400 PSIG Pressure Rating

Dept. of Transportation

- 4BA400 or BW400

4.2.2 R454b Refrigerant

All units are factory charged with R-454B refrigerant.

4.2.3. Specifications of R-454B

Application: R-454B is not a drop-in replacement for R-410A; equipment designs must accommodate the safety group A2L of R454B.It cannot be retrofitted into R-410A units.

Pressure: The pressure of R-454B is similar to that of R-410A. Recovery and recycle equipment, pumps, hoses and the like need to have design pressure ratings appropriate for R-454B. 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 ser-vice pressure rating. DOT 4BA400 or DOT BW400.

Flammability: R-454B is classified as safety group A2L, where the 2L flammability class indicated flammability. **R-454B 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-454B and air.** Leak checking should never be done with a mixture of R-454B and air

4.2.4. Quick Reference Guide for R-454B

•Ensure that servicing equipment is designed to operate with R-454B.

•R-454B refrigerant cylinders are no longer color coded. R454B cylinders are light green grey in color with a red band on the shoulder or top of the cylinder to indicate flammability.

•R-454B, as with other HFC’s is only compatible with POE oils.

•Vacuum pumps will not remove moisture from POE oil.

•R-454B systems are to be charged with liquid refrigerants. These cylinders should be kept upright for equipment charging.

•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-454B

4.2.5. Evaporator Coil/TXV

The thermostatic expansion valve is specifically designed to operate with R-454B. **The existing evaporator must be replaced with the factory specified TXV evaporator specifically designed for R-454B.**

4.2.6 Tools and Refrigerant

A Leak detection system is installed in this unit. The unit must be powered at all times except during service. This unit is equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all the times after installation, other than when servicing.

4.2.7 Refrigerant Recovery

When removing refrigerant from a unit, either for service or decommissioning, the following practices are required to safely remove the refrigerant.

When transferring the refrigerant into cylinders, ensure that only the appropriate recovery cylinders are employed.

• Ensure that the correct number of recovery cylinders are available to hold the total system charge.

• All cylinders used must be designed for recovering R-454B refrigerant.

• Cylinders shall be complete with a pressure relief valve and shut-off valves, all in working order.

• Empty recovery cylinders must be evacuated and cooled before refrigerant recovery occurs.

• The following equipment is required to be on site and in good working condition prior to and during refrigerant recovery:

• The technician's recovery equipment

• The recovery equipment's instructions that details the proper recovery of flammable refrigerant.

• A set of calibrated weighing scales

• Hoses, which much be complete with leak free disconnect couplings.

4.3. Choosing a Location

4.3.1.Unit Location: Allowable Clearances and Operational Issues

The unit location must comply with the allowable clearances listed in ***Figure 2.*** Failure to comply with the recommended clearances may result in operational issues such as decreased capacity, restricted condenser airflow, and condenser motor fatigue.

4.3.2. 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.

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

2. Provide a level slab sufficiently high enough above grade to prevent surface water from entering the unit

3. Locate the unit to provide proper access for inspection and servicing as shown in ***Figure 2.***

4. Locate unit where operating sounds will not disturb owner or neighbors.

5. Locate unit so roof runoff water does not pour directly on the unit. Provide gutter or other shielding at roof level. Do not locate unit in an area where excessive snow drifting may occur or accumulate.

6. Where snowfall is anticipated, the height of the unit above the ground level must be considered. Mount unit high enough to be above anticipated maximum area snowfall and to allow combustion air to enter the combustion air inlet.

7. Select an area which will keep the areas of the vent, air intake, and A/C condenser fins free and clear of obstructions such as weeds, shrubs, vines, snow, etc. Inform the user accordingly.

4.3.3. 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 manual.) **THIS IS VERY IMPORTANT AND IS THE INSTALLER'S RESPONSIBILITY.**

2. 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.*

4.3.4. Corrosive Environments

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

If the unit is to be installed in an area where contaminants are likely to be a problem, give special attention to the equipment location and exposure.

1. Avoid having lawn sprinkler heads spray directly on the unit cabinet.

2. In coastal areas, install the unit on the side of the building away from the waterfront.

3. In some situations, fencing or shrubs may give some protection against contaminants. Be mindful of the allowable clearances.

⚠WARNING: Disconnect all power to unit before starting maintenance. Failure to do so can cause electrical shock resulting in personal injury or death. Regular maintenance will reduce the buildup of contaminants and help to protect the unit's finish.

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 an automobile polish will provide some protection.

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.

4.3.5 Minimum Room Area

Because this unit uses refrigerant R-454B, UL requires a minimum room area for the total conditioned space (TAmin) that is supplied by this equipment. The UL Safety Standard defines an individual room area as the room area enclosed by floors walls, partitions, and doors of the space where the unit is installed, also as the room area into which refrigerant can leak. Each room/conditioned space will need to be considered for the total area requirements. The minimum room area of the total conditioned space for each base model is listed in Appendix H - A2L Refrigerant Installation Safety Data.

4.3.6 No Ignition Sources

When performing work that involves exposing any pipework, no person working on or near the refrigerating system may use any ignition sources that could lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept far away from the site during installation, repair, removal, or disposal, during which refrigerant can possibly be released into the surrounding space. Before work takes place, the area around the equipment must be surveyed to ensure that there are no flammable hazards or ignition risks. Additionally, “No Smoking” signs must be displayed.

Model		RACBYB024	RACBYB030	RACBYB036	RACBYB042	RACBYB048	RACBYB060
Refrigerant Charge Weight (oz)		52	53	49	48	56.7	83.6
Minimum circulation airflow, Qmin (cfm)		173	176	163	160	189	278
Altitude above Sea Level (ft)	Altitude Adjustment Factor	Minimum total space area, TAmin (sq-ft)					
0	1.000	-	-	-	-	-	154
1000	1.025	-	-	-	-	-	158
2000	1.051	-	-	-	-	-	162
3000	1.078	-	-	-	-	-	166
4000	1.107	-	-	-	-	-	171
5000	1.138	-	-	-	-	-	175
6000	1.170	-	-	-	-	-	180
6500	1.187	-	-	-	-	-	183

FIGURE 2
PACKAGED AIR CONDITIONER
OUTSIDE SLAB INSTALLATION, BASEMENT OR CRAWL SPACE DISTRIBUTION SYSTEM

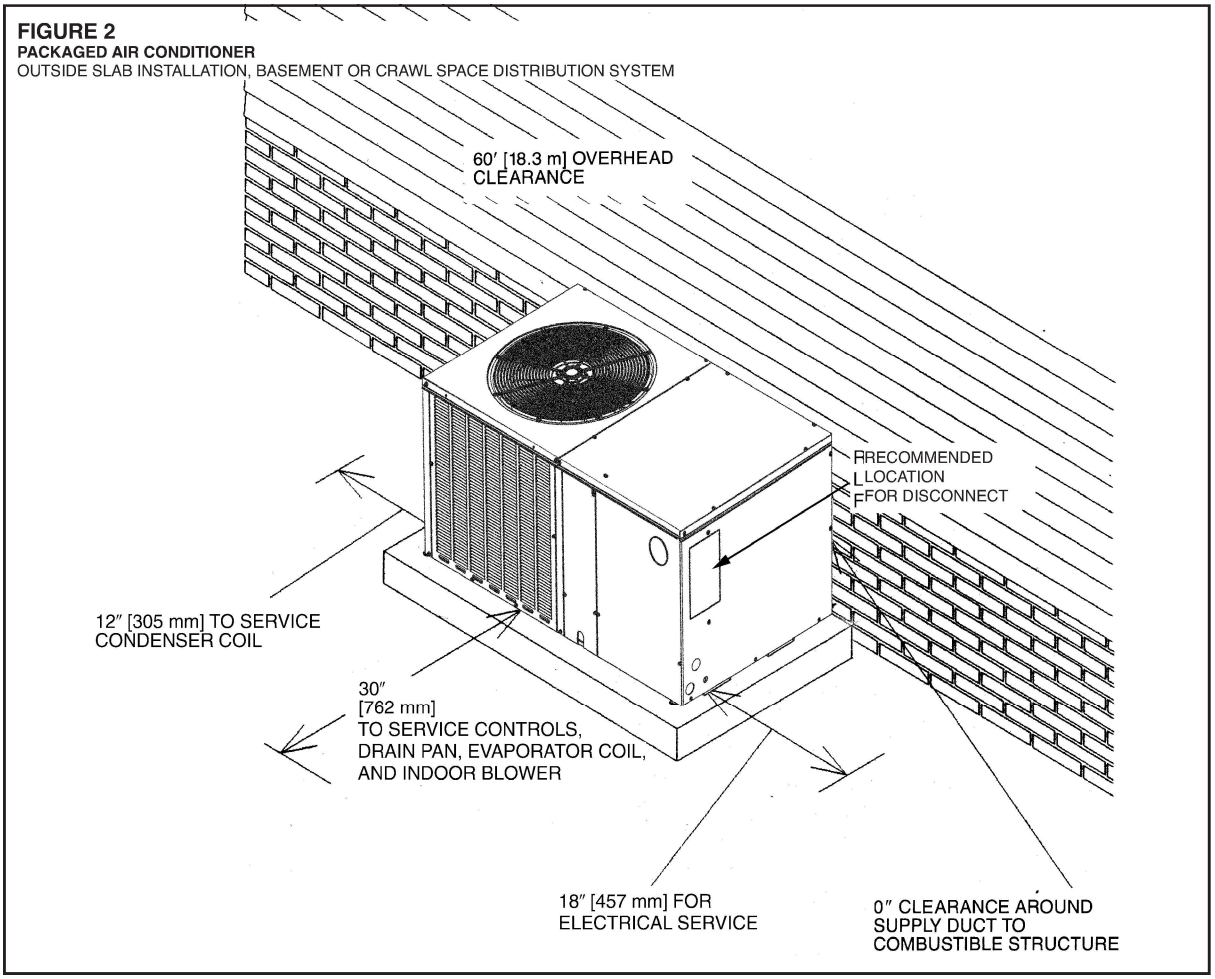
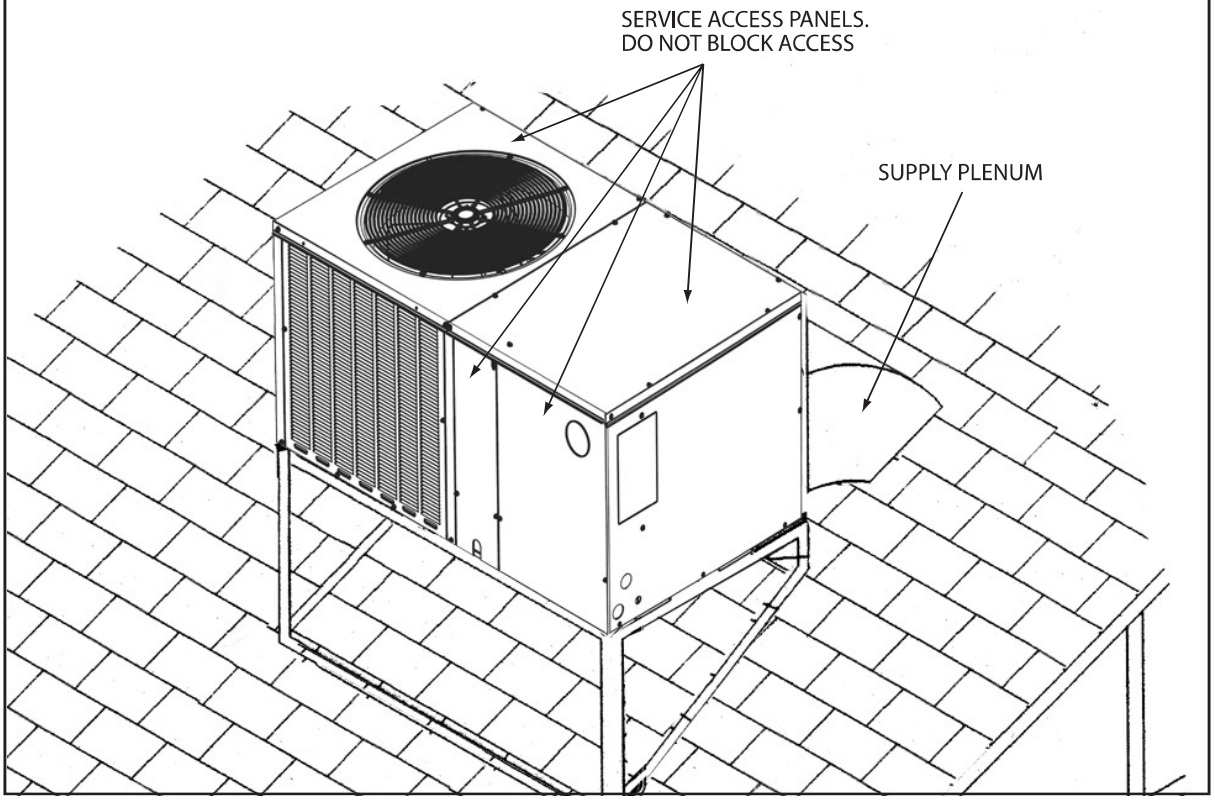


FIGURE 3
PACKAGED AIR CONDITIONER
PITCHED ROOFTOP INSTALLATION, ATTIC OR DROP CEILING DISTRIBUTING SYSTEM.
MUST BE MOUNTED LEVEL.



4.4. Ductwork

Ductwork should be fabricated by the installing contractor in accordance with local codes and NFPA90A. Industry manuals may be used 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 A FIREPLACE INSERT, STOVE, ETC. UNAUTHORIZED USE OF SUCH DEVICES MAY RESULT IN FIRE, CARBON MONOXIDE POISONING, EXPLOSION, PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH.

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

It is preferable to install the unit on the roof of the structure if the registers or diffusers are located on the wall or in the ceiling. Consider a slab installation when the registers are low on a wall or in the floor.

On ductwork exposed to outside air conditions of 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 with vapor barrier. One-half to 1" thickness of insulation is usually sufficient for ductwork inside the air conditioned space.

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

4.5. Filters

Filters are not provided with this unit. They must be supplied and installed in the return air duct by the installer. 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 General Database for recommended filter size.

4.6. Condensate Drain

The indoor coil condensate drain ends with a PVC stub. A trap is provided in for proper condensate drainage and to prevent debris from being drawn into the unit. Do not connect drain to closed sewer line. It is not recommended that a PVC cement or other permanent installation be used so that the drain line and/or drain pan can be easily cleaned in the future. The drain trap is located in the control box during shipping. To install, slide clear plastic tube over drain pan connection. The white PVC trap can be oriented as required by installation.

FIGURE 4
REMOVABLE CONDENSATE DRAIN PAN AND REMOVAL PROCEDURE

A small side panel grants access to a removable, sloped drain pan, which helps to ensure indoor air quality (IAQ) throughout the life of the unit. A drain trap assembly is provided for convenience.

4.7. Electrical Wiring

4.7.1. Electrical Wiring

Field wiring must comply with the National Electrical Code* and applicable local codes.

*C.E.C. in Canada

4.7.2. Power Wiring

1. 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 rating plate. On three phase units, phases must be balanced within 3%.
2. Install a branch circuit disconnect within sight of the unit and of adequate size to handle the starting current. (See Heater Kit Tables.)
3. For branch circuit wiring (main power supply to unit disconnect), the minimum wire size can be determined from the National Electrical Code or Canadian Electrical Code or nameplate or from Heater Kit Tables.
4. This unit supports both single and dual point electrical connection for unit and electric heat accessory.
5. Power wiring must be run in grounded rain-tight conduit.

4.7.3. Power Wiring And Electrical Heater Kit

⚠ WARNING

TURN OFF ELECTRIC POWER AT THE FUSE BOX OR SERVICE PANEL BEFORE MAKING ANY ELECTRICAL CONNECTIONS.

ALSO, THE GROUND CONNECTION MUST BE COMPLETED BEFORE MAKING LINE VOLTAGE CONNECTIONS. FAILURE TO DO SO CAN RESULT IN ELECTRICAL SHOCK, SEVERE PERSONAL INJURY OR DEATH.

1. Turn off power to unit.
2. Remove control box access panel.
3. Remove unit indoor section top cover.
4. Remove wire notch cover from control bulkhead and discard. Retain screw.
5. Remove heater element cover plate from blower outlet opening and discard. Retain screws.
6. Mount heater fuse block assembly in location indicated with the three included screws.
7. Route wire harness assembly through wire notch in control bulkhead and mount element assembly in blower outlet opening with screws previously retained.
8. Center wire routing plate over notch in blower bulkhead and secure with screw previously retained.
9. Route and tie wiring as shown in Figure 5. Wiring must not contact moving parts or uninsulated electrical connections.
10. Replace unit indoor top cover.
11. Connect power and control wiring as indicated below:
    a. Single-point wiring: Connect high voltage field power leads to heater kit fuse block and connect included unit power pigtails from heater kit fuse block to unit contactor L1 and L3 connections for single-phase or L1, L2 and L3 for three-phase. Connect ground lead to ground lug on heater kit fuse block.
    b. Dual-circuit wiring: Remove unit power pigtails from heater kit fuse block and discard. Connect one set of high voltage field power circuit leads to the heater kit fuse block and connect ground lead to ground lug on heater kit fuse block.
    Connect the second set of high voltage field power leads to L1 ans L3 for single-phase or L1, L2 and L3 for three-phase on the unit contactor. Connect ground lead to ground lug on control box bulkhead.
    c. Connect heater kit control plug to receptacle in control box.
12. Replace control box access panel.
13. Restore power to unit and verify proper unit and heater kit operation.

4.7.4. Control Wiring (Class II)

1. Do not run low voltage wiring in conduit with power wiring.
2. Control wiring is routed through the 7/8" hole corner adjacent to the control box. See Electrical Connections, Figure 1. Use a minimum #18 AWG thermostat wire. For wire lengths exceeding 50', use #16 AWG thermostat wire. The low voltage wires are connected to the unit pigtails which are supplied with the unit in the low voltage connection box located within the unit control box. See Figure 5.
3. Figure 6 shows representative low voltage connection diagrams. Read your thermostat installation instructions for any special requirements for your specific thermostat.

   NOTE — Units installed in Canada require that an outdoor thermostat (30,000 min. cycles of endurance) be installed and be wired with C.E.C. Class I wiring.

FIGURE 5

HEATER KIT INSTALLATION

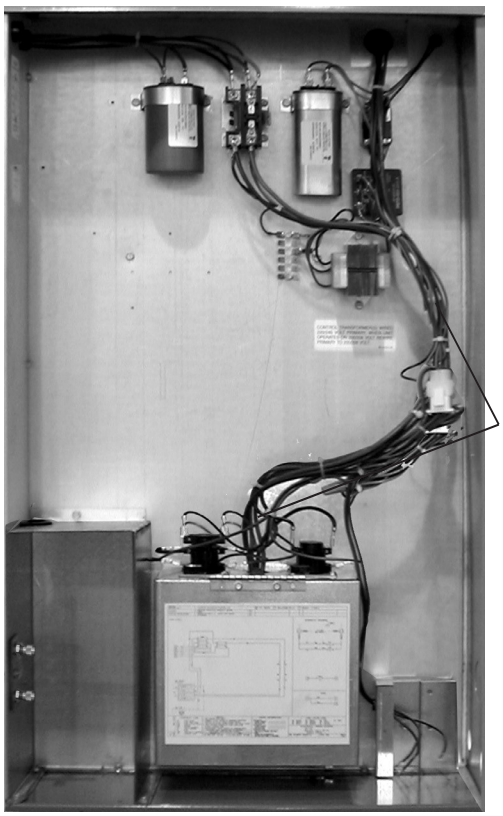
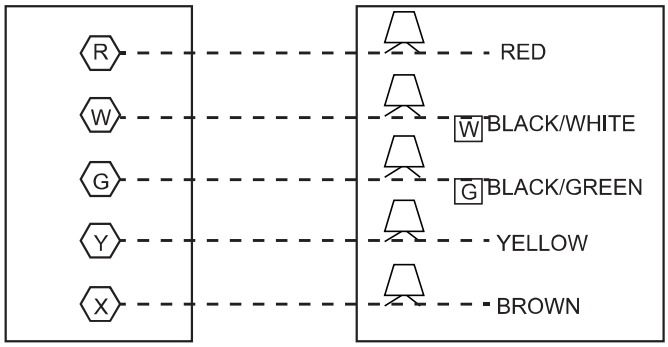


FIGURE 6

VOLTAGE CONNECTION DIAGRAM - STANDARD CONTROL WIRING



4.7.5. Internal Wiring

A diagram of the internal wiring of this unit is located on the electrical control box cover. If any of the original wire as supplied with the appliance must be replaced, the wire gauge and insulation must be the same as original wiring.

4.7.6. Grounding

⚠ WARNING

THE UNIT MUST BE PERMANENTLY GROUNDED. A GROUNDING LUG IS PROVIDED. FAILURE TO GROUND THIS UNIT CAN RESULT IN FIRE OR ELECTRICAL SHOCK CAUSING PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH.

4.7.7. Thermostat

Mount the thermostat on an inside wall about five feet above the floor, in a location where it will not be affected by unconditioned air, sun, or drafts from open doors or other sources. READ installation instructions in air conditioner thermostat package CAREFULLY because each has some different wiring requirements.

4.7.8 Potential Ignition Sources

The UL safety standard defines potential ignition sources as hot surfaces, flames, and current carrying devices which can be the source of arcing or sparking. In case any internal electrical components need to be replaced, those replacement parts must be ordered from the unit manufacturer's website to ensure that the internal electrical components are not potential ignition sources. Examples of internal electrical components include contactors, relays, and control boards. This is not an exhaustive list. For the safety of customers and technicians, refer to the unit manufacturer's website for proper unit component replacement.

4.7.9 Check Wiring

After completing refrigerant removal, evacuation, and charging, check that the internal and field wiring will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects, taking into account the effects of aging or continual vibration from sources such as compressors or fans.

4.8. Indoor Airflow Data

All 208/230 volt units are equipped with multi-speed indoor blower motors. Each unit is shipped factory wired for the proper speed at a normal external static. See Airflow Performance Table for blower performance.

4.9. Pre-Start Check

1. Is unit properly located and level?
2. Is ductwork insulated, weatherproofed, with proper spacing to combustible materials?
3. Is air free to travel to and from outdoor coil? (See Figure 1.)
4. Is the wiring correct, tight, and according to unit wiring diagram?
5. Is unit grounded?
6. Are field supplied air filters in place and clean?
7. Do the outdoor fan and indoor blower turn freely without rubbing, and are they tight on the motor shafts?

4.10. Pre-Start Check

1. Turn thermostat to "OFF," turn "on" power supply at disconnect switch.
2. Turn temperature setting as high as it will go.
3. Turn fan switch to "ON."
4. Indoor blower should run. Be sure it is running in the right direction.
5. Turn fan switch to "AUTO." Turn system switch to "COOL" and turn temperature setting below room temperature. Unit should run in cooling mode.
6. Is outdoor fan operating correctly in the right direction?
7. Is compressor running correctly?.
8. Turn thermostat system switch to "HEAT." Unit should stop. Wait 5 minutes, then raise temperature setting to above room temperature. After about 30 to 50 seconds auxiliary heaters, if installed, should come on.
9. Check the refrigerant charge using the ***Refrigerant Charge Verification And Adjustment Process Section 4.11***. Replace service port caps. Service port cores are for system access only and will leak if not tightly capped.
10. Turn thermostat system switch to proper mode "HEAT" or "COOL" and set thermostat to proper temperature setting. Record the following after the unit has run some time.
    a. Operating Mode _____
    b. Discharge Pressure (High) _____ PSIG
    c. Vapor Pressure at Compressor (Low)_____ PSIG
    d. Vapor Line Temperature at Compressor _____°F.
    e. Indoor Dry Bulb _____°F.
    f. Indoor Wet Bulb _____°F.
    g. Outdoor Dry Bulb _____°F.
    h. Outdoor Wet Bulb _____°F.
    i. Voltage at Contactor _____Volts
    j. Current at Contactor _____ Amps
    k. Model Number _____
    l. Serial Number_____
    m. Location _____
    n. Owner _____
    o. Date _____
11. Adjust discharge air grilles and balance system.
12. Check ducts for condensation and air leaks.
13. Check unit for tubing and sheet metal rattles.
14. Instruct the owner on operation and maintenance.
15. Leave "USE AND CARE" instructions with owner.

4.11. Refrigerant Charge Verification And Adjustment Process

This unitary packaged system comes fully charged and tested with R-454B refrigerant from the factory. Adjustment of the refrigerant charge is not required unless the unit is suspected of not

having the proper refrigerant charge. Any adjustment must not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

Note: Factory charge chart and/or design target subcooling are for gross charge verification.

Charge verification instructions:

1. Allow the unit to operate for 15 minutes before checking or adjusting the charge.

2. Return air temperature must be within comfort conditions (72°F - 82°F).

3. Remove caps from the high-side and low-side pressure service fittings.

4. Record the following measurements:

   a. High-side pressure at service fitting

   b. Low-side pressure at service fitting

   c. Outdoor ambient (air temperature) near the condenser coil

5. Place an “X” on the chart where the high-side and low-side pressures intersect.

6. If the “X” is above the outdoor ambient line by more than 20 PSI, verify the airflow and check for component issues. If no issues are found, reclaim the refrigerant, evacuate the system, and weigh in the refrigerant quantity listed on the rating plate.

7. If the “X” is above the outdoor ambient line by less than 20 PSI, the system can be considered properly charged and no adjustment is necessary.

8. If the “X” is below the outdoor ambient line by more than 20 PSI, inspect the unit for potential loss of refrigerant. Recover the refrigerant and perform a leak check using nitrogen to pressurize the system. If necessary, make repairs and perform a leak check again. Then, evacuate nitrogen from the system, and weigh in the refrigerant quantity listed on the rating plate.

9. If the “X” is below the outdoor ambient line by less than 20 PSI, the refrigerant charge can be increased. If the unit requires an adjustment greater than 2% of the refrigerant quantity listed on the rating plate; follow inspection, repair, and recharge procedures in step 8.

4.12 Refrigerant Leak Inspection

4.12.1 Check for Refrigerant Leaks

Before beginning any work on the system or conducting any hot work, ensure that the area is in the open or that it is adequately ventilated. Ventilation must continue while the unit is being worked on. Ventilation is required to safely disperse any released refrigerant into the atmosphere. Inspect the unit for any damage to the coils and tubing that could cause a leak. Under no circumstances shall potential sources of ignition be used to search for or detect refrigerant leaks. A halide torch or any other detector using a naked flame must not be used. Electronic leak detectors may be used to detect refrigerant leaks, but the sensitivity may not be accurate and may need recalibration to accurately detect R-454B. Before use, ensure that the detector is not a potential ignition source and is suitable for R-454B. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and must be calibrated to R-454B. Leak detection fluids are also suitable but do not use detergents containing chlorine. Examples of leak detection fluids are the bubble method and fluorescent method agents. If a leak is suspected, all naked flames must be extinguished. If a refrigerant leak is found that requires brazing, all of the refrigerants must be removed from the system.Before beginning any work on the system or conducting any hot work, ensure that the area is in the open or that it is adequately ventilated. Ventilation must continue while the unit is being worked on. Ventilation is required to safely disperse any released refrigerant into the atmosphere. Inspect the unit for any damage to the coils and tubing that could cause a leak. Under no circumstances shall potential sources of ignition be used to search for or detect refrigerant leaks. A halide torch or any other detector using a naked flame must not be used. Electronic leak detectors may be used to detect refrigerant leaks, but the sensitivity may not be accurate and may need recalibration to accurately detect R-454B. Before use, ensure that the detector is not a potential ignition source and is suitable for R-454B. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and must be calibrated to R-454B. Leak detection fluids are also suitable but do not use detergents containing chlorine. Examples of leak detection fluids are the bubble method and fluorescent method agents. If a leak is suspected, all naked flames must be extinguished. If a refrigerant leak is found that requires brazing, all of the refrigerants must be removed from the system.

4.12.2 Refrigerant Leak Detection System

The refrigerant leak detection system will continuously monitor the air for a refrigerant leak. If the leak detection system detects a leak, the system will begin mitigation procedures: the blower will turn on and the compressors will shut down. Note: Gas or electric heat functions may continue during mitigation. At the end of 15 years or if the refrigerant leak detection system becomes inoperable, the leak detection system must be replaced with components specified by the unit’s manufacturer. Refer to the manufacturer’s website for replacement components. Refer to the alarm code diagnostics section for refrigerant leak detection system error codes.

FIGURE 7

REFRIGERANT LEAK DETECTION SYSTEM LOCATION

4.12.3 Operation When a Leak is Detected

When the unit receives a signal from the A2L sensor, circulation airflow is activated, and the control board will display an error (for DDC units) or a fault code (for Non-DDC units). The following mitigation actions will also be activated: 1. Energize the fan(s) of the appliance to deliver indoor airflow at or above the minimum airflow. See Appendix H, A2L Refrigerant

Installation Safety Data.

• The fans shall be energized following the input signal to turn on the fans(s). 2.The system de-energizes compressor operation. 3.Activate additional mechanical ventilation, if applicable. The above-mentioned actions shall continue for at least 5 minutes after the leak detection system begins mitigation. If the leak is no longer detected, the leak detection system will reset. If the leak is still present, mitigation actions will continue for another 5 minutes. This cycle will repeat until no leak is detected.

4.12.4 Removal and Evacuation of Refrigerant

The refrigerant charge shall be recovered into R-454B recovery cylinders. The unit system must be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants, such as R-454B, again. This process might need to be repeated several times. DO NOT USE compressed air or oxygen for purging R-454B refrigerant systems.

Refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to the atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to the atmospheric pressure to enable work to take place. The outlet for the vacuum pump must not be close to any potential ignition sources. Ventilation is required during removal and evacuation. When breaking into the refrigeration circuit for any reason, this procedure must be followed:

1. Ensure there is no power to the unit.

2. With an accurate scale, ½ oz., set the refrigerant recovery cylinder in the upright position.

3. Connect the recovery cylinder to the unit using the service valves.

4. Evacuate refrigerant from the unit until the vacuum pump reads a minimum of 500 microns.

5. Purge the refrigeration circuit with inert gas until there is no refrigerant within the system.

6. Evacuate the circuit again.

7. Once all inert gas is removed, pull a vacuum on the unit to check for any leaks in the system.

8. If leaks are present, spray a soapy substance over the refrigeration circuit. Bubbles will help locate the leak.

   a. Patch the leak and pull a vacuum again.

   b. If leaks If leaks are still detected, repeat steps seven and eight.

   c. Check how sub-steps are formatted in existing I&Os.

9. If no leaks are present, charge the system as directed in the next section.

10. Remove the vacuum pump from suction, discharge and liquid shut-off.

4.13 Charging Procedure

Prior to recharging the system, complete a leak check and purge the system with inert gas as detailed in Removal and Evacuation of Refrigerant.

The charging procedure steps are as follows:

1. Ensure that the unit is properly grounded before beginning charging.

2. Install the R-454B refrigerant cylinder to the unit service valve.

3. Before tightening, purge the cylinder and service valve hose to ensure that the contamination of different refrigerants does not occur when using the charging equipment.

a. Hoses of lines shall be as short as possible to minimize the amount of refrigerant contained in them.

4. Position the refrigerant cylinder in the upright position. The cylinder must remain in the upright position for the entire charging procedure.

5. Use the charging charts located in this manual to properly charge the unit.

   a. TAKE EXTREME CARE NOT TO OVERCHARGE THE UNIT.

   b. Connect pressure gauges to suction and liquid ports on the condenser.

   c. Measure the air temperature (Dry Bulb ºF) entering the outdoor coil.

   d. Place an “X” on the intersection of the suction and liquid pressures on the chart.

   e. If “X” is below the outdoor ambient line, ADD charge and repeat step D.

   f. If “X” is above the outdoor ambient line, RECOVER excess charge and repeat step D.

   g. If the condenser fans are not running, the head pressure control may require jumping.

   h. Conditions required at indoor and outdoor unit 80/67 (Indoor DB/WB ºF) and 95 (Outdoor DB ºF)

   i. Connect pressure gauges to the liquid port on the condenser and install a thermocouple within 6” of the liquid port.

   j. Calculate your subcooling by taking the pressure reading at the liquid port and the temperature value at the liquid port.

   k. TARGET SUBCOOLING = Refer to the Charge Chart

   l. Note: SUBCOOLING Tolerance = +/- 1.0 ºF

   m. If subcooling is below target, ADD charge and repeat step J.

   n. If subcooling is above target, RECOVER excess charge and repeat step J.

6. Close the service ports on the suctions and liquid valves. Then, remove service gauges.

7. Replace service port caps and valve stern caps. These caps must be replaced to prevent leaks.

8. Label the system with the total refrigerant charge when charging is complete. This label is located on the exterior of the outdoor unit next to the rating plate.

After charging is complete, a leak test must be done. Before leaving the site, an additional leak test must also be done at the end of installation.

5. DECOMMISSIONING

5.1 Before Beginning Decommissioning

Before carrying out decommissioning, the technician performing decommissioning must be familiar with the equipment and its safety procedures, and ensure electrical power is available to the unit. See Section 4.1.2 Working Personnel for more information.

Before recovering the refrigerant, an oil and refrigerant sample must be taken if the technician intends to reuse the recovered refrigerant to have a record.

Before beginning any work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. See 4.1.6 No Ignition Sources.

Before beginning any work on the system or conducting any hot work, ensure that the area is in the open or that it is adequately ventilated. Ventilation must continue while the unit is being worked on. Ventilation is required to safely disperse any released refrigerant into the atmosphere.

Work shall be undertaken under a controlled procedure so as to minimize the risk of flammable gas or vapor being present while work is being performed. See 2.2 Importance of a Quality Installation.

All maintenance staff and others working in the local area shall be instructed on the nature of the work being performed. Work in confined spaces shall be avoided.

The area shall be checked with an appropriate refrigerant detector before and during work to ensure the technician is aware of potentially toxic or flammable atmospheres.

5.2 Decommissioning Procedure

Follow the decommissioning procedure outlined below:

READ ALL STEPS BEFORE BEGINNING.

1. Become familiar with the equipment, its operation, and its safety procedures.

2. Isolate the system electrically.

3. Ensure that mechanical handling equipment for the refrigerant cylinders is at hand, if required.

4. Ensure personal, protective equipment is being used correctly.

5. A competent supervisor must be present during the refrigerant recovery process. Ensure such a person is available on site.

6. Confirm that the recovery equipment and cylinders are correct for the equipment and its refrigerant.

7. Follow the steps outlines in Section 4.6 Leak Testing and Section 4.7 Removal and Evacuation.

8. If possible, pump down the refrigerant system.

9. If a vacuum is not possible, make a manifold so that the refrigerant can be removed from vAHRIous parts of the system.

10. Make sure that the recovery cylinder is situated on the scale before recovery begins.

11. Start the recovery machine and operate it in accordance with its instructions.

12. Do not overflow the cylinders. No more than 80% volume liquid charge is allowed.

13. Do not exceed the maximum working pressure of the cylinder, even temporAHRIly.

14. When the cylinders have been filled correctly and the process is complete, make sure that the cylinders and the recovery equipment are removed from the site promptly.

15. Verify all isolation valves on the unit are closed (off).

16. Recovered refrigerant shall not be charged into another unit unless a sample was taken prior to recovering the refrigerant and it's been cleaned and checked.

When performing any maintenance or troubleshooting on the refrigerating equipment or associated parts, a dry powder or CO2 fire extinguisher shall be nearby for emergency use. Equipment must be labelled stating that is has been decommissioned and emptied of refrigerant. The label must be dated and signed. Ensure that there are label(s) on the unit stating that this equipment contains flammable refrigerant.

6. GENERAL DATA

GENERAL DATA - RACB
NOMINAL SIZES 2-5 TONS [7-17.6 kW]

Model RACBYB Series	024AJT	030ACT	030AJT	036ACT	036AJT	042ACT
Cooling Performance[1]						
Nominal Cooling Capacity Btu/h [kW]	24,000 [7.03]	30,000 [8.79]	30,000 [8.79]	36,000 [10.55]	36,000 [10.55]	42,000 [12.31]
EER2/SEER2[2]	10.6/13.4	10.6/13.4	10.6/13.4	10.6/13.4	10.6/13.4	10.6/13.4
Nominal CFM/AHRI Rated CFM [L/s]	753/750 [355/354]	1060/1000 [500/472]	1060/1000 [500/472]	1304/1200 [615/566]	1304/1200 [615/566]	1458/1400 [688/661]
AHRI Net Cooling Capacity Btu/h [kW]	22800 [6.68]	28500 [8.35]	28500 [8.35]	34200 [10.02]	34200 [10.02]	39900 [11.69]
Net Sensible Capacity Btu/h [kW]	16084 [4.71]	20105 [5.89]	20105 [5.89]	24126 [7.07]	24126 [7.07]	28147 [8.25]
Net Latent Capacity Btu/h [kW]	6716 [1.97]	8395 [2.46]	8395 [2.46]	10074 [2.95]	10074 [2.95]	11753 [3.44]
Net System Power kW	2.15	2.69	2.69	3.23	3.23	3.76
Compressor						
No./Stg/Type	1/1/Scroll	1/1/Scroll	1/1/Scroll	1/1/Scroll	1/1/Scroll	1/1/Scroll
Outdoor Sound Rating (dB)[3]	81	81	81	81	81	81
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel	MicroChannel	MicroChannel
Rifled: Tube Size OD or MicroChannel: Depth in. [mm]	0.47 [11.99]	0.47 [11.99]	0.47 [11.99]	0.47 [11.99]	0.47 [11.99]	0.47 [11.99]
Face Area sq. ft. [sq. m]	10.1 [0.94]	12.36 [1.15]	12.36 [1.15]	12.36 [1.15]	12.36 [1.15]	12.36 [1.15]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel	MicroChannel	MicroChannel
Rifled: Tube Size OD or MicroChannel: Depth in. [mm]	0.81 [20.62]	0.81 [20.62]	0.81 [20.62]	1.00 [25.40]	1.00 [25.40]	1.26 [32.00]
Face Area sq. ft. [sq. m]	4.3 [0.40]	4.3 [0.40]	4.3 [0.40]	4.3 [0.40]	4.3 [0.40]	4.3 [0.40]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]	1 / 18 [7]	1 / 18 [7]	1 / 20 [8]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1 / 1.000 [25.40]	1 / 1.000 [25.40]	1 / 1.000 [25.40]	1 / 1.000 [25.40]	1 / 1.000 [25.40]	1 / 1.000 [25.40]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	1/24.0 [609.6]	1/24.0 [609.6]	1/24.0 [609.6]	1/24.0 [609.6]	1/24.0 [609.6]	1/24.0 [609.6]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	3400 [1604]	3400 [1604]	3400 [1604]	3400 [1604]	3400 [1604]	3400 [1604]
No. Motors/HP	1 at 1/3	1 at 1/3	1 at 1/3	1 at 1/3	1 at 1/3	1 at 1/3
Motor RPM	825	825	825	825	825	825
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/10x9 [254x229]	1/10x9 [254x229]	1/10x9 [254x229]	1/10x9 [254x229]	1/10x9 [254x229]	1/11x9 [279x229]
Drive Type	Direct	Direct	Direct	Direct	Direct	Direct
No. Speeds	Multiple Speed	Multiple Speed	Multiple Speed	Multiple Speed	Multiple Speed	Multiple Speed
No. Motors	1	1	1	1	1	1
Motor HP	1/2	1/2	1/2	1/2	1/2	3/4
Motor RPM	1050	1050	1050	1050	1050	1050
Motor Frame Size	48	48	48	48	48	48
Filter - Type	Field Supplied	Field Supplied	Field Supplied	Field Supplied	Field Supplied	Field Supplied
Furnished	No	No	No	No	No	No
(NO.) Size Recommended in. [mm x mm x mm]	(1) 1x20x16 [25x508x406]	(1) 1x20x20 [25x508x508]	(1) 1x20x20 [25x508x508]	(1) 1x24x24 [25x610x610]	(1) 1x24x24 [25x610x610]	(1) 1x24x24 [25x610x610]
Refrigerant Charge Oz. [g]	52 [1474]	53 [1503]	53 [1503]	49 [1389]	49 [1389]	48 [1361]
Weights						
Net Weight lbs. [kg]	277 [126]	285 [129]	285 [129]	285 [129]	285 [129]	317 [144]
Ship Weight lbs. [kg]	304 [138]	312 [142]	312 [142]	312 [142]	312 [142]	344 [156]

NOTES:

1. 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. AHRI 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 AHRI Standard 210/240 or 360.
2. EER2 and/or SEER2 are rated at AHRI conditions and in accordance with DOE test procedures.
3. Outdoor Sound Rating shown is tested in accordance with AHRI Standard 270.

[ ] Designates Metric Conversions

GENERAL DATA - RACB
NOMINAL SIZES 2-5 TONS [7-17.6 kW]

Model RACBYB Series	042AJT	048ACT	048AJT	060ACT	060AJT
Cooling Performance[1]					
Nominal Cooling Capacity Btu/h [kW]	42,000 [12.31]	48,000 [14.06]	48,000 [14.06]	60,000 [17.58]	60,000 [17.58]
EER2/SEER2[2]	10.6/13.4	10.6/13.4	10.6/13.4	10.6/13.4	10.6/13.4
Nominal CFM/AHRI Rated CFM [L/s]	1458/1400 [688/661]	1603/1600 [757/755]	1603/1600 [757/755]	2003/2000 [945/944]	2003/2000 [945/944]
AHRI Net Cooling Capacity Btu/h [kW]	39900 [11.69]	45600 [13.36]	45600 [13.36]	57000 [16.7]	57000 [16.7]
Net Sensible Capacity Btu/h [kW]	28147 [8.25]	32168 [9.43]	32168 [9.43]	40210 [11.78]	40210 [11.78]
Net Latent Capacity Btu/h [kW]	11753 [3.44]	13432 [3.94]	13432 [3.94]	16790 [4.92]	16790 [4.92]
Net System Power kW	3.76	4.3	4.3	5.38	5.38
Compressor					
No./Stg/Type	1/1/Scroll	1/1/Scroll	1/1/Scroll	1/1/Scroll	1/1/Scroll
Outdoor Sound Rating (dB)[3]	81	84	84	84	84
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel	MicroChannel
Rifled: Tube Size OD or MicroChannel: Depth in. [mm]	0.47 [11.99]	0.63 [16.00]	0.63 [16.00]	0.984 [25.00]	0.984 [25.00]
Face Area sq. ft. [sq. m]	12.36 [1.15]	16.14 [1.5]	16.14 [1.5]	16.19 [1.5]	16.19 [1.5]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel	MicroChannel
Rifled: Tube Size OD or MicroChannel: Depth in. [mm]	1.26 [32.00]	1.00 [25.40]	1.00 [25.40]	1.26 [32.00]	1.26 [32.00]
Face Area sq. ft. [sq. m]	4.3 [0.40]	5.8 [0.53]	5.8 [0.53]	5.8 [0.53]	5.8 [0.53]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1 / 1.000 [25.40]	1 / 1.000 [25.40]	1 / 1.000 [25.40]	1 / 1.000 [25.40]	1 / 1.000 [25.40]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	1/24.0 [609.6]	1/24.0 [609.6]	1/24.0 [609.6]	1/24.0 [609.6]	1/24.0 [609.6]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	3400 [1604]	4500 [2124]	4500 [2124]	4500 [2124]	4500 [2124]
No. Motors/HP	1 at 1/3	1 at 1/2	1 at 1/2	1 at 1/2	1 at 1/2
Motor RPM	825	1075	1075	1075	1075
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/11x9 [279x229]	1/11x9 [279x229]	1/11x9 [279x229]	1/11x9 [279x229]	1/11x9 [279x229]
Drive Type	Direct	Direct	Direct	Direct	Direct
No. Speeds	Multiple Speed	Multiple Speed	Multiple Speed	Multiple Speed	Multiple Speed
No. Motors	1	1	1	1	1
Motor HP	3/4	3/4	3/4	1	1
Motor RPM	1050	1050	1050	1050	1050
Motor Frame Size	48	48	48	48	48
Filter - Type	Field Supplied	Field Supplied	Field Supplied	Field Supplied	Field Supplied
Furnished	No	No	No	No	No
(NO.) Size Recommended in. [mm x mm x mm]	(1) 1x24x24 [25x610x610]	(1) 1x24x24 [25x610x610]	(1) 1x24x24 [25x610x610]	(1) 1x24x24 [25x610x610]	(1) 1x24x24 [25x610x610]
Refrigerant Charge Oz. [g]	48 [1361]	56.7 [1607]	56.7 [1607]	83.6 [2370]	83.6 [2370]
Weights					
Net Weight lbs. [kg]	317 [144]	357 [162]	357 [162]	384 [174]	384 [174]
Ship Weight lbs. [kg]	344 [156]	384 [174]	384 [174]	411 [186]	411 [186]

NOTES:

1. 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. AHRI 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 AHRI Standard 210/240 or 360.
2. EER2 and/or SEER2 are rated at AHRI conditions and in accordance with DOE test procedures.
3. Outdoor Sound Rating shown is tested in accordance with AHRI Standard 270.

[ ] Designates Metric Conversions

7. ELECTRICAL DATA

ELECTRICAL DATA – RACBYB SERIES

ELECTRICAL DATA - RACBYB SERIES							
		024AJT	**030ACT**	**030AJT**	**036ACT**	**036AJT**	**042ACT**
Unit Information	Unit Operating Voltage Range	187-253	187-253	187-253	187-253	187-253	187-253
	Volts	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	3	1	3	1	3
	Hz	60	60	60	60	60	60
	Minimum Circuit Ampacity	20	18	22	21	27	24
	Minimum Overcurrent Protection	25	20	25	25	35	30
	Maximum Overcurrent Protection	30	25	30	30	40	35
Compressor Motor	No.	1	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	3	1	3	1	3
	Amps (RLA), Comp. 1	12.7	9.6	12.7	12.2	16.7	14.9
	Amps (LRA), Comp. 1	64.4	67.7	75.6	97.5	93.5	90
	Amps (RLA), Comp. 2	N/A	N/A	N/A	N/A	N/A	N/A
	Amps (LRA), Comp. 2	N/A	N/A	N/A	N/A	N/A	N/A
Condenser Motor	No.	1	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1	1
	HP	1/3	1/3	1/3	1/3	1/3	1/3
	Amps (FLA, each)	1.5	1.5	1.5	1.5	1.5	1.5
	Amps (LRA, each)	3	3	3	3	3	3
Evaporator Fan	No.	1	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1	1
	HP	1/2	1/2	1/2	1/2	1/2	3/4
	Amps (FLA, each)	4.1	4.1	4.1	4.1	4.1	6
	Amps (LRA, each)	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 – RACBYB SERIE

ELECTRICAL DATA - RACBYB SERIES						
		042AJT	**048ACT**	**048AJT**	**060ACT**	**060AJT**
Unit Information	Unit Operating Voltage Range	187-253	187-253	187-253	187-253	187-253
	Volts	208/230	208/230	208/230	208/230	208/230
	Phase	1	3	1	3	1
	Hz	60	60	60	60	60
	Minimum Circuit Ampacity	30	25	37	30	40
	Minimum Overcurrent Protection	35	30	45	35	50
	Maximum Overcurrent Protection	45	35	50	45	60
Compressor Motor	No.	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230
	Phase	1	3	1	3	1
	Amps (RLA), Comp. 1	15.8	12.8	22.4	20.4	22.6
	Amps (LRA), Comp. 1	96	120.4	126	93	148
	Amps (RLA), Comp. 2	N/A	N/A	N/A	N/A	N/A
	Amps (LRA), Comp. 2	N/A	N/A	N/A	N/A	N/A
Condenser Motor	No.	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1
	HP	1/3	1/2	1/2	1/2	1/2
	Amps (FLA, each)	1.5	2.3	2.3	2.3	2.3
	Amps (LRA, each)	3	5.5	5.5	5.5	5.5
Evaporator Fan	No.	1	1	1	1	1
	Volts	208/230	208/230	208/230	208/230	208/230
	Phase	1	1	1	1	1
	HP	3/4	3/4	3/4	1	1
	Amps (FLA, each)	6	6	6	7.6	7.6
	Amps (LRA, each)	0	0	0	0	0

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

Indoor Airflow Performance RACBYB - (208/230V, 1 & 3-Phase) Constant Torque Motor

Nominal Cooling Capacity Tons [kW]	Motor Speed from Factory		Manufacturer Recommended Cooling Airflow (Min/Max) [Tap 2 Only]	Blower Size/ Motor HP [W] & # of Speeds	Motor Speed / Tap		External Static Pressure - Inches W.C. [kPa] (Side Discharge-Dry 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]	0.9 [.22]	1.0 [.25]
2.0 [7.03]	Tap 2	Tap 1	700 CFM / 900 CFM	10X9 Blower 1/2 HP [372] 2 Speed (Constant Torque)	Tap 1 - Low Electric Heat / Fan-Only	CFM	1038	979	919	849	751	700	647	595	524	457
						RPM	496	571	635	710	785	833	878	948	991	1036
						Watts	89	99	109	120	130	137	143	153	159	166
					Tap 2 - High *	CFM	-	-	-	984	896	813	782	727	675	603
						RPM	-	-	-	709	794	856	895	939	1017	1068
						Watts	-	-	-	141	155	165	173	179	193	201
2.5 [2.79]	Tap 2	Tap 1	875 CFM / 1125 CFM	12x9T Blower 1/2 HP [372] 2 Speed (Constant Torque)	Tap 1 - Low Electric Heat / Fan-Only	CFM	1211	1162	1114	1064	1014	866	813	754	699	636
						RPM	546	611	674	736	795	889	932	985	1037	1066
						Watts	124	136	147	159	169	186	193	204	213	219
					Tap 2 - High *	CFM	-	-	1222	1183	1141	1083	1027	910	884	851
						RPM	-	-	687	736	791	845	910	998	1026	1068
						Watts	-	-	176	188	199	210	224	244	249	259
3.0 [10.55]	Tap 2	Tap 1	1050 CFM / 1350 CFM	12x9T Blower 1/2 HP [372] 2 Speed (Constant Torque)	Tap 1 - Low Electric Heat / Fan-Only	CFM	1350	1313	1272	1230	1176	1131	1062	980	947	911
						RPM	622	664	717	771	8228	878	951	1010	1044	1079
						Watts	178	187	200	213	225	236	253	266	275	284
					Tap 2 - High *	CFM	-	-	1438	1398	1362	1319	1266	1226	1153	1058
						RPM	-	-	763	811	859	908	964	1009	1076	1120
						Watts	-	-	266	280	293	307	321	336	355	358
3.5 [12.31]	Tap 2	Tap 1	1225 CFM / 1575 CFM	12x9T Blower 3/4 HP [559] 2 Speed (Constant Torque)	Tap 1 - Low Electric Heat / Fan-Only	CFM	1575	1531	1478	1431	1389	1345	1297	1242	1184	1132
						RPM	604	639	684	726	768	810	854	898	947	988
						Watts	237	248	263	276	289	304	318	332	348	362
					Tap 2 - High *	CFM	-	-	1667	1619	1584	1550	1507	1465	1426	1379
						RPM	-	-	723	762	799	837	875	917	957	999
						Watts	-	-	341	355	371	386	402	418	434	451
4.0 [14.07]	Tap 2	Tap 1	1400 CFM / 1800 CFM	12x9T Blower 3/4 HP [559] 2 Speed (Constant Torque)	Tap 1 - Low Electric Heat / Fan-Only	CFM	1725	1669	1622	1573	1529	1478	1431	1377	1338	1294
						RPM	591	626	662	708	749	793	841	904	937	967
						Watts	273	281	294	311	326	342	360	383	395	407
					Tap 2 - High *	CFM	1826	1789	1745	1696	1651	1615	1556	1519	1468	1412
						RPM	616	646	684	722	764	809	853	895	945	997
						Watts	320	331	349	359	382	401	417	437	457	477
5.0 [17.59]	Tap 2	Tap 1	1750 CFM / 2250 CFM	12x9R Blower 1 HP [746] 2 Speed (Constant Torque)	Tap 1 - Low Electric Heat / Fan-Only	CFM	2153	2125	2073	2051	2005	1974	1937	1898	1865	1839
						RPM	695	718	757	780	818	843	883	919	947	978
						Watts	472	484	504	518	538	550	574	591	607	628
					Tap 2 - High *	CFM	-	2256	2219	2171	2163	2128	2091	2045	2026	1987
						RPM	-	755	786	822	840	876	907	943	961	999
						Watts	-	581	600	621	632	655	673	695	708	735

Notes: (1) * Use motor tap 2 to achieve rated airflow at AHRI minimum external static pressure.

Down Discharge Pressure Drop (Add to External Static Pressure)							
CFM [L/s]	800 [378]	1000 [472]	1200 [566]	1400 [661]	1600 [755]	1800 [849]	2000 [944]
Pressure Drop - Inches W.C. [kPa]	.02 [.005]	.05 [.012]	.07 [.017]	.1 [.025]	.12 [.030]	.15 [.037]	.17 [.042]

AUXILIARY ELECTRIC HEATER KITS CHARACTERISTICS AND APPLICATION - RACBYB - SINGLE-PHASE

208/230 VOLT, THREE PHASE, 60 Hz, AUXILIARY ELECTRIC HEATER KITS CHARACTERISTICS AND APPLICATION												
Single Power Supply for Both Unit and Heater Kit								Separate Power Supply for Both Unit and Heater Kit				
UNIT MODEL NUMBER	Heater Kit				Air Conditioner			Heater Kit		Air Conditioner		
	RXJJ- Heater Kit Nominal kW	Rated Heater kW @ Rated Voltage	Heater MBH @ Rated Voltage	Heater Amps @ Rated Voltage	Unit Min. Ckt. Ampacity @ Rated Voltage	Overcurrent Protective Device Size		Min. Ckt. Ampacity @ Rated Voltage	Max. Fuse Size @ Rated Voltage	Min. Ckt. Ampacity @ Rated Voltage	Overcurrent Protective Device Size	
						Min./Max. @ Min Voltage	Min./Max. @ Max Voltage				Min./Max. @ Min Voltage	Min./Max. @ Max Voltage
RACBYB024AJT	NONE*	-/-	-/-	-/-	20/20	25/30	25/30	-	-	20/20	25/30	25/30
	C05J	3.6/4.8	12.28/16.38	17.3/20.0	27/31	30/30	35/35	22/25	25/25	20/20	25/30	25/30
	C07J	5.4/7.2	18.42/24.56	26.0/30.0	38/43	40/40	45/45	33/38	35/40	20/20	25/30	25/30
	C10J	7.2/9.6	24.56/32.75	34.6/40.0	49/56	50/50	60/60	44/50	45/50	20/20	25/30	25/30
RACBYB030AJT	NONE*	-/-	-/-	-/-	22/22	25/30	25/30	-	-	22/22	25/30	25/30
	C05J	3.6/4.8	12.28/16.38	17.3/20.0	27/31	30/30	35/35	22/25	25/25	22/22	25/30	25/30
	C07J	5.4/7.2	18.42/24.56	26.0/30.0	38/43	40/40	45/45	33/38	35/40	22/22	25/30	25/30
	C10J	7.2/9.6	24.56/32.75	34.6/40.0	49/56	50/50	60/60	44/50	45/50	22/22	25/30	25/30
	C15J	10.8/14.4	36.84/49.13	51.9/60.0	70/81	70/70	90/90	65/75	70/80	22/22	25/30	25/30
RACBYB036AJT	NONE*	-/-	-/-	-/-	27/27	35/40	35/40	-	-	27/27	35/40	35/40
	C05J	3.6/4.8	12.28/16.38	17.3/20.0	27/31	35/40	35/40	22/25	25/25	27/27	35/40	35/40
	C07J	5.4/7.2	18.42/24.56	26.0/30.0	38/43	40/40	45/45	33/38	35/40	27/27	35/40	35/40
	C10J	7.2/9.6	24.56/32.75	34.6/40.0	49/56	50/50	60/60	44/50	45/50	27/27	35/40	35/40
	C15J	10.8/14.4	36.84/49.13	51.9/60.0	70/81	70/70	90/90	65/75	70/80	27/27	35/40	35/40
RACBYB042AJT	NONE*	-/-	-/-	-/-	30/30	35/45	35/45	-	-	30/30	35/45	35/45
	C05J	3.6/4.8	12.28/16.38	17.3/20.0	30/33	35/45	35/45	22/25	25/25	30/30	35/45	35/45
	C07J	5.4/7.2	18.42/24.56	26.0/30.0	40/45	40/45	45/45	33/38	35/40	30/30	35/45	35/45
	C10J	7.2/9.6	24.56/32.75	34.6/40.0	51/58	60/60	60/60	44/50	45/50	30/30	35/45	35/45
	C15J	10.8/14.4	36.84/49.13	51.9/60.0	73/83	80/80	90/90	65/75	70/80	30/30	35/45	35/45
	C20J	14.4/19.2	49.13/65.50	69.3/80.0	95/108	100/100	110/110	87/100	90/100	30/30	35/45	35/45
RACBYB048AJT	NONE*	-/-	-/-	-/-	37/37	45/50	45/50	-	-	37/37	45/50	45/50
	C05J	3.6/4.8	12.28/16.38	17.3/20.0	37/37	45/50	45/50	22/25	25/25	37/37	45/50	45/50
	C07J	5.4/7.2	18.42/24.56	26.0/30.0	40/45	45/50	45/50	33/38	35/40	37/37	45/50	45/50
	C10J	7.2/9.6	24.56/32.75	34.6/40.0	51/58	60/60	60/60	44/50	45/50	37/37	45/50	45/50
	C15J	10.8/14.4	36.84/49.13	51.9/60.0	73/83	80/80	90/90	65/75	70/80	37/37	45/50	45/50
	C20J	14.4/19.2	49.13/65.50	69.3/80.0	95/108	100/100	110/110	87/100	90/100	37/37	45/50	45/50
RACBYB060AJT	NONE*	-/-	-/-	-/-	40/40	50/60	50/60	-	-	40/40	50/60	50/60
	C05J	3.6/4.8	12.28/16.38	17.3/20.0	40/40	50/60	50/60	22/25	25/25	40/40	50/60	50/60
	C07J	5.4/7.2	18.42/24.56	26.0/30.0	42/47	50/60	50/60	33/38	35/40	40/40	50/60	50/60
	C10J	7.2/9.6	24.56/32.75	34.6/40.0	53/60	60/60	60/60	44/50	45/50	40/40	50/60	50/60
	C15J	10.8/14.4	36.84/49.13	51.9/60.0	75/85	80/80	90/90	65/75	70/80	40/40	50/60	50/60
	C20J	14.4/19.2	49.13/65.50	69.3/80.0	97/110	100/100	110/110	87/100	90/100	40/40	50/60	50/60

AUXILIARY ELECTRIC HEATER KITS CHARACTERISTICS AND APPLICATION - RACBYB - 3-PHASE

208/230 VOLT, THREE PHASE, 60 Hz, AUXILIARY ELECTRIC HEATER KITS CHARACTERISTICS AND APPLICATION												
Single Power Supply for Both Unit and Heater Kit								Separate Power Supply for Both Unit and Heater Kit				
UNIT MODEL NUMBER	Heater Kit				Air Conditioner			Heater Kit		Air Conditioner		
	RXJJ- Heater Kit Nominal kW	Rated Heater kW @ Rated Voltage	Heater MBH @ Rated Voltage	Heater Amps @ Rated Voltage	Unit Min. Ckt. Ampacity @ Rated Voltage	Overcurrent Protective Device Size		Min. Ckt. Ampacity @ Rated Voltage	Max. Fuse Size @ Rated Voltage	Min. Ckt. Ampacity @ Rated Voltage	Overcurrent Protective Device Size	
						Min./Max. @ Min Voltage	Min./Max. @ Max Voltage				Min./Max. @ Min Voltage	Min./Max. @ Max Voltage
RACBYB030ACT	NONE*	-/-	-/-	-/-	18/18	20/25	20/25	-	-	18/18	20/25	20/25
	C10C	12.5/16.6	42.64/56.63	34.6/40.0	49/56	50/50	60/60	44/50	45/50	18/18	20/25	20/25
	C15C	18.7/24.9	63.80/84.95	52.0/60.0	71/81	80/80	90/90	65/75	70/80	18/18	20/25	20/25
RACBYB036ACT	NONE*	-/-	-/-	-/-	21/21	25/30	25/30	-	-	21/21	25/30	25/30
	C10C	12.5/16.6	42.64/56.63	34.6/40.0	49/56	50/50	60/60	44/50	45/50	21/21	25/30	25/30
	C15C	18.7/24.9	63.80/84.95	52.0/60.0	71/81	80/80	90/90	65/75	70/80	21/21	25/30	25/30
RACBYB042ACT	NONE*	-/-	-/-	-/-	24/24	30/35	30/35	-	-	24/24	30/35	30/35
	C10C	12.5/16.6	42.64/56.63	34.6/40.0	51/58	60/60	60/60	44/50	45/50	24/24	30/35	30/35
	C15C	18.7/24.9	63.80/84.95	52.0/60.0	73/83	80/80	90/90	65/75	70/80	24/24	30/35	30/35
	C20C	25.0/33.2	85.29/113.26	69.3/79.9	95/108	100/100	110/110	87/100	90/100	24/24	30/35	30/35
RACBYB048ACT	NONE*	-/-	-/-	-/-	25/25	30/35	30/35	-	-	25/25	30/35	30/35
	C10C	12.5/16.6	42.64/56.63	34.6/40.0	51/58	60/60	60/60	44/50	45/50	25/25	30/35	30/35
	C15C	18.7/24.9	63.80/84.95	52.0/60.0	73/83	80/80	90/90	65/75	70/80	25/25	30/35	30/35
	C20C	25.0/33.2	85.29/113.26	69.3/79.9	95/108	100/100	110/110	87/100	90/100	25/25	30/35	30/35
RACBYB060ACT	NONE*	-/-	-/-	-/-	30/30	35/45	35/45	-	-	30/30	35/45	35/45
	C10J	7.2/9.6	24.56/32.75	34.6/40.0	53/60	60/60	60/60	44/50	45/50	30/30	35/45	35/45
	C15C	18.7/24.9	63.80/84.95	52.0/60.0	75/85	80/80	90/90	65/75	70/80	30/30	35/45	35/45
	C20C	25.0/33.2	85.29/113.26	69.3/79.9	97/110	100/100	110/110	87/100	90/100	30/30	35/45	35/45

10. WIRING DIAGRAMS

FIGURE 8
WIRING DIAGRAM- RACBYB SINGLE-PHASE

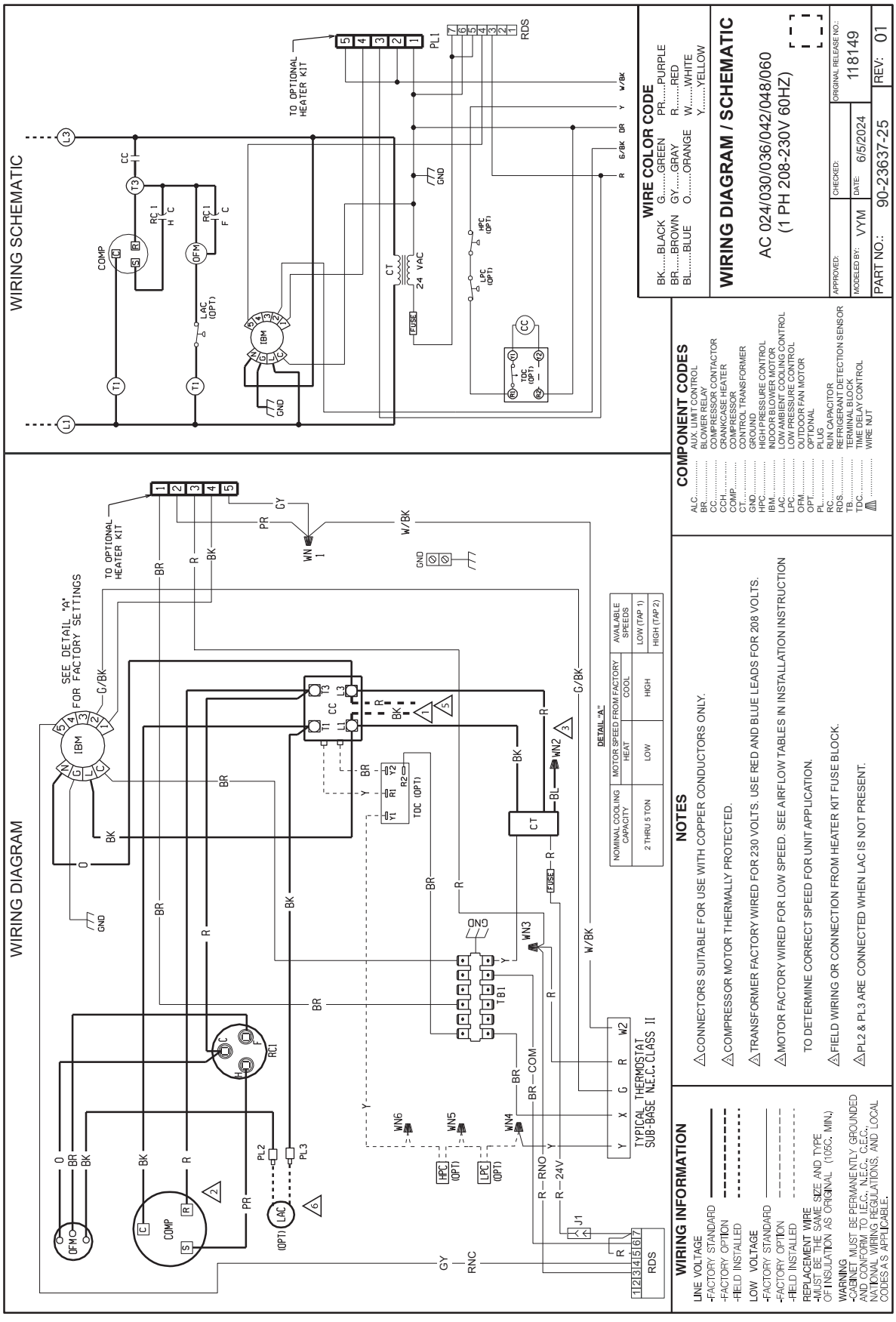
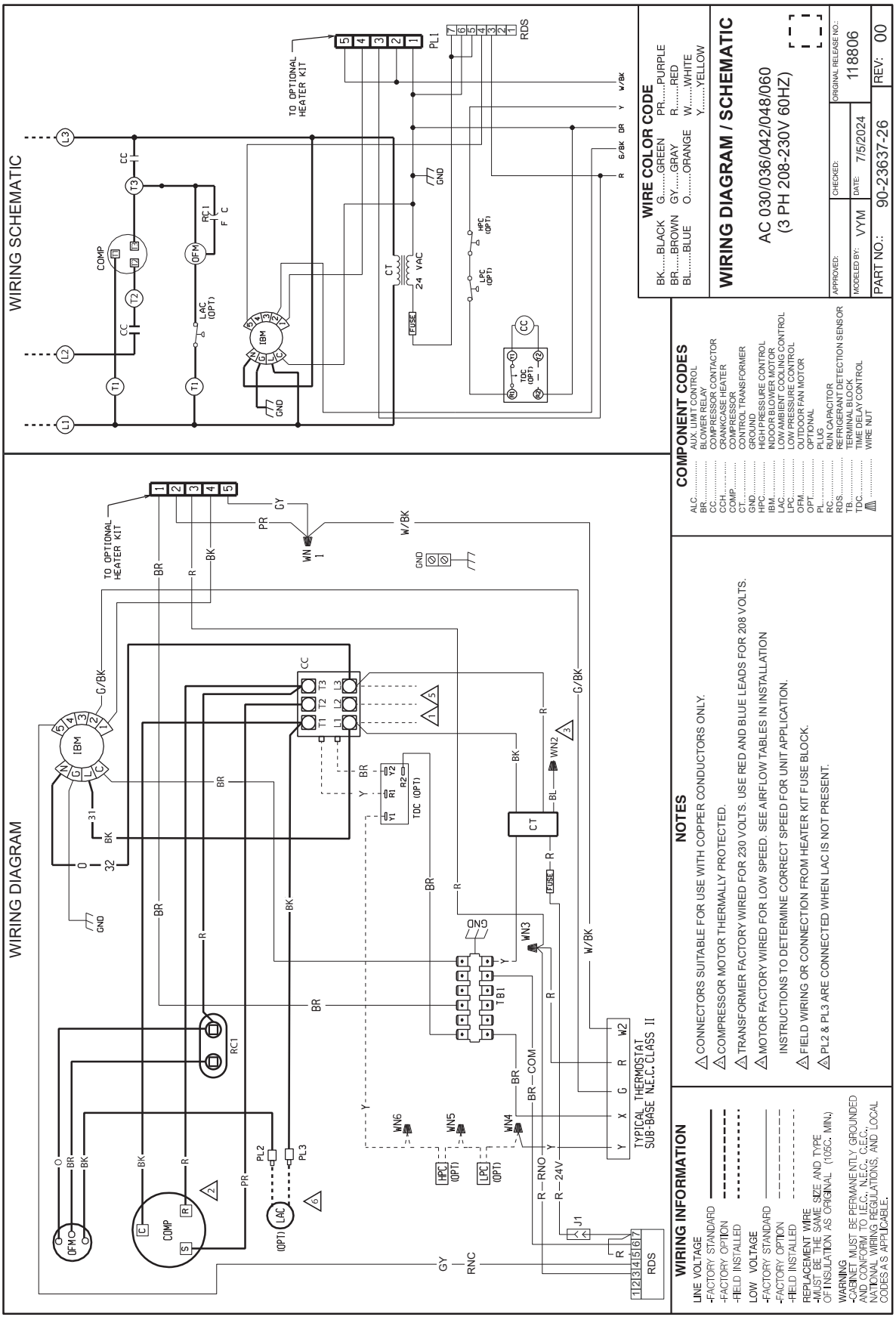


FIGURE 9
WIRING DIAGRAM- RACBYB SINGLE-PHASE



11. TROUBLESHOOTING 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	• Power off or loose electrical connection	• Check for correct voltage at compressor contactor in control box
	• Thermostat out of calibration-set too high	• Reset
	• Defective contactor	• Check for 24 volts at contactor coil - replace if contacts are open
	• Blown fuses	• Replace fuses
	• Transformer defective	• Check wiring-replace transformer
	• High pressure control open (if provided)	• Reset-also see high head pressure remedy-The high pressure control opens at 450 PSIG
	• Interconnecting low voltage wiring damaged	• Replace thermostat wiring
Condenser fan runs, compressor doesn't	• Run or start capacitor defective (single phase only)	• Replace
	• Start relay defective (single phase only)	• Replace
	• Loose connection	• Check for correct voltage at compressor - check & tighten all connections
	• Compressor stuck, grounded or open motor winding, open internal overload.	• Wait at least 2 hours for overload to reset. If still open, replace the compressor.
	• Low voltage condition	At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating.
	• Low voltage condition	• Add start kit components
Insufficient cooling	• Improperly sized unit	• Recalculate load
	• Improper airflow	• Check - should be approximately 400 CFM per ton.
	• Incorrect refrigerant charge	• Charge per procedure attached to unit service panel
	• Air, non-condensibles or moisture in system	• Recover refrigerant, evacuate & recharge, add filter drier
	• Incorrect voltage	• At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating.
Compressor short cycles	• Incorrect voltage	• At compressor terminals, voltage must be ±10% of nameplate marking when unit is operating.
	• Defective overload protector	• Replace - check for correct voltage
	• Refrigerant undercharge	• Add refrigerant
Registers sweat	• Low evaporator airflow	• Increase speed of blower or reduce restriction - replace air filter
High head-low vapor pressures	• Restriction in liquid line, expansion device or filter drier	• Remove or replace defective component
	• Flow check piston size too small	• Change to correct size piston
	• Incorrect capillary tubes	• Change coil assembly
	• TXV does not open	• Replace TXV
High head-high or normal vapor pressure - Cooling mode	• Dirty condenser coil	• Clean coil
	• Refrigerant overcharge	• Correct system charge
	• Condenser fan not running	• Repair or replace
	• Air or non-condensibles in system	• Recover refrigerant, evacuate & recharge
High head-high or normal vapor pressure - Heating mode	• Low air flow - condenser coil	• Check filters - correct to speed
	• Refrigerant overcharge	• Correct system charge
	• Air or non-condensibles in system	• Recover refrigerant, evacuate & recharge
	• Dirty condenser coil	• Check filter - clean coil
Low head-high vapor pressures	• Flow check piston size too large	• Change to correct size piston
	• Defective Compressor valves	• Replace compressor
	• Incorrect capillary tubes	• Replace coil assembly
Low vapor - cool compressor - iced evaporator coil	• Low evaporator airflow	• Increase speed of blower or reduce restriction - replace air filter
	• Operating below 65°F outdoors	• Add Low Ambient Kit
	• Moisture in system	• Recover refrigerant - evacuate & recharge - add filter drier
	• TXV limiting refrigerant flow	• Replace TXV
High vapor pressure	• Excessive load	• Recheck load calculation
	• Defective compressor	• Replace
Fluctuating head & vapor pressures	• TXV hunting	• Check TXV bulb clamp - check air distribution on coil - replace TXV
	• Air or non-condensate in system	• Recover refrigerant, evacuate & recharge
Gurgle or pulsing noise at expansion device or liquid line	• Air or non-condensibles in system	• Recover refrigerant, evacuate & recharge