INSTALLATION INSTRUCTIONS

FRONT RETURN AIR HANDLERS

EARTH-FRIENDLY R-410A REFRIGERANT:

RHBL High Efficiency

RHAL Standard Efficiency



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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Accredited by the RvA

ABS Quality Evaluations, Inc. Management System Certification

ANAB ACCREDITED

ISO 9001:2008

Certificate Number: 30164

DO NOT DESTROY THIS MANUAL

PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE BY A SERVICEMAN

92-20521-56-02

SUPERSEDES 92-20521-56-01

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⚠ WARNING (SEE SECTION 4.0: ELECTRICAL WIRING)

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

⚠ WARNING (SEE SECTION 12.5: BLOWER ASSEMBLY REMOVAL & REPLACEMENT)

If removal of the blower assembly is required, all disconnect switches supplying power to the equipment must be de-energized and locked (if not in sight of unit) so the field power wires can be safely removed from the blower assembly. Failure to do so can cause electrical shock resulting in personal injury or death.

⚠ WARNING

Because of possible damage to equipment or personal injury, installation, service, and maintenance should be performed by a trained, qualified service personnel. Consumer service is recommended only for filter cleaning/ replacement. Never operate the unit with the access panels removed.

1.0 SAFETY INFORMATION

⚠ WARNING

Duct leaks can create an unbalanced system and draw pollutants such as dirt, dust, fumes and odors into the home causing property damage. Fumes and odors from toxic, volatile or flammable chemicals, as well as automobile exhaust and carbon monoxide (CO), can be drawn into the living space through leaking ducts and unbalanced duct systems causing personal injury or death (see Figure 1).

- **If air-moving equipment or ductwork is located in garages or off-garage storage areas - all joints, seams, and openings in the equipment and duct must be sealed to limit the migration of toxic fumes and odors including carbon monoxide from migrating into the living space.**
- **If air-moving equipment or ductwork is located in spaces containing fuel burning appliances such as water heaters or boilers - all joints, seams, and openings in the equipment and duct must also be sealed to prevent depressurization of the space and possible migration of combustion byproducts including carbon monoxide into the living space.**

⚠ WARNING

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

⚠ WARNING (SEE WARNINGS IN REGARD TO DUCTWORK)

Do not install this unit in manufactured (mobile) homes. Improper installation is more likely in manufactured housing due to ductwork material, size, location, and arrangement. Installations in manufactured housing can cause a fire resulting in property damage, personal injury or death.

EXCEPTION: Manufactured housing installations are approved only with documentation by a recognized inspection authority that the installation has been made in compliance with the instructions and all warnings have been observed.

⚠ WARNING (SEE SECTION 4.3: GROUNDING)

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

⚠ WARNING (SEE SECTION 12.0: MAINTENANCE)

Units with circuit breaker(s) meet requirements as a service disconnect switch, however, if access is required to the line side (covered) of the circuit breaker, this side of the breaker(s) will be energized with the breaker(s) de-energized. Contact with the line side can cause electrical shock resulting in personal injury or death.

⚠ WARNING (SEE SECTION 5.0: DUCTWORK)

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.

Continued on next page ➜

⚠ WARNING

PROPOSITION 65: This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to the State of California to cause cancer.

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.

⚠ WARNING (SEE SECTION 12.6: MOTOR REPLACEMENT)

To avoid electrical shock which can result in personal injury or death, use only the screws furnished in the motor shell mounting holds. Screws are #8-18 x .25 in. long blunt nose thread forming. Screws longer than 1/4 in. may contact the motor winding.

⚠ WARNING (SEE SECTION 7.0: AIR FILTER)

Do not operate the system without filters. A portion of the dust entrained in the air may temporarily lodge in the duct runs and at the supply registers. Any circulated dust particles could be heated and charred by contact with the air handler elements. This residue could soil ceilings, walls, drapes, carpets and other articles in the house.

Soot damage may occur with filters in place, when certain types of candles, oil lamps or standing pilots are burned.

⚠ WARNING

The first 36 inches of supply air plenum and ductwork must be constructed of sheet metal as required by NFPA 90B. The supply air plenum or duct must have a solid sheet metal bottom directly under the unit with no openings, registers or flexible air ducts located in it. If flexible supply air ducts are used they may be located only in the vertical walls of a rectangular plenum, a minimum of 6 inches from the solid bottom. Metal plenum or duct may be connected to the combustible floor base, if not, it must be connected to the unit supply duct flanges such that combustible floor or other combustible material is not exposed to the supply air opening from the downflow unit. Exposing combustible (non-metal) material to the supply opening of a downflow unit can cause a fire resulting in property damage, personal injury or death.

⚠ CAUTION (SEE SECTION 2.1: RECEIVING)

In compliance with recognized codes, it is recommended that an auxiliary drain pan be installed under all evaporator coils or units containing evaporator coils that are located in any area of a structure where damage to the building or building contents may occur as a result of an overflow of the coil drain pan or a stoppage in the primary condensate drain piping.

⚠ CAUTION

When used in cooling applications, excessive sweating may occur when unit is installed in an unconditioned space. This can result in property damage.

⚠ NOTICE

Improper installation, or installation not made in accordance with the Underwriters Laboratory (UL) certification or these instructions, can result in unsatisfactory operation and/or dangerous conditions and are not covered by the unit warranty.

⚠ NOTICE

Use of this air-handler during construction is not recommended. If operation during construction is absolutely required, the following temporary installation requirements must be followed:

Installation must comply with all Installation Instructions in this manual including the following items:

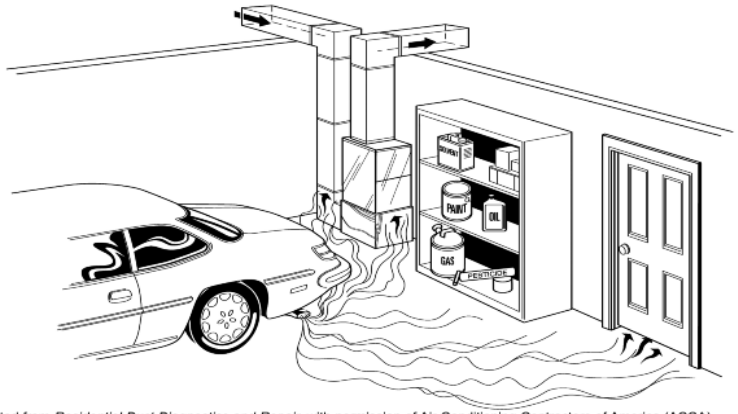
- **Properly sized power supply and circuit breaker/fuse**
- **Air-handler operating under thermostatic control;**
- **Return air duct sealed to the air-handler;**
- **Air filters must be in place;**
- **Correct air-flow setting for application**
- **Removing the coil and storing it in a clean safe place is highly recommended until construction is completed and the outdoor unit is installed.**
- **Clean air-handler, duct work, and components including coil upon completion of the construction process and verify proper air-handler operating conditions according as stated in this instruction manual.**
- **NOTE: Electric strip heater elements tend to emit a burning odor for a few days if dust has accumulated during construction. Heater elements are easily damaged. Take great care when cleaning them. Low pressure compressed air is recommended for cleaning elements.**

2.0 GENERAL INFORMATION

2.1 IMPORTANT INFORMATION ABOUT EFFICIENCY AND INDOOR AIR QUALITY

Central cooling and heating equipment is only as efficient as the duct system that carries the cooled or heated air. To maintain efficiency, comfort and good indoor air quality, it is

FIGURE 1
MIGRATION OF DANGEROUS SUBSTANCES, FUMES, AND ODORS INTO LIVING SPACES



Adapted from *Residential Duct Diagnostics and Repair,* with permission of Air Conditioning Contractors of America (ACCA).

⚠ WARNING

Duct leaks can create an unbalanced system and draw pollutants such as dirt, dust, fumes and odors into the home causing property damage. Fumes and odors from toxic, volatile or flammable chemicals, as well as automobile exhaust and carbon monoxide (CO), can be drawn into the living space through leaking ducts and unbalanced duct systems causing personal injury or death (see Figure 1).

- **If air-moving equipment or ductwork is located in garages or off-garage storage areas - all joints, seams, and openings in the equipment and duct must be sealed to limit the migration of toxic fumes and odors including carbon monoxide from migrating into the living space.**
- **If air-moving equipment or ductwork is located in spaces containing fuel burning appliances such as water heaters or boilers - all joints, seams, and openings in the equipment and duct must also be sealed to prevent depressurization of the space and possible migration of combustion byproducts including carbon monoxide into the living space.**

⚠ NOTICE

Improper installation, or installation not made in accordance with the Underwriters Laboratory (UL) certification or these instructions, can result in unsatisfactory operation and/or dangerous conditions and are not covered by the unit warranty.

important to have the proper balance between the air being supplied to each room and the air returning to the cooling and heating equipment.

Proper balance and sealing of the duct system improves the efficiency of the heating and air conditioning system and improves the indoor air quality of the home by reducing the amount of airborne pollutants that enter homes from spaces where the ductwork and/or equipment is located. The manufacturer and the U.S. Environmental Protection Agency's Energy Star Program recommend that central duct systems be checked by a qualified contractor for proper balance and sealing.

⚠ NOTICE

In compliance with recognized codes, it is recommended that an auxiliary drain pan be installed under all evaporator coils or units containing evaporator coils that are located in any area of a structure where damage to the building or building contents may occur as a result of an overflow of the coil drain pan or a stoppage in the primary condensate drain piping.

2.2 RECEIVING

Immediately upon receipt, all cartons and contents should be inspected for transit damage. Units with damaged cartons should be opened immediately. If damage is found, it should be noted on the delivery papers, and a damage claim filed with the last carrier.

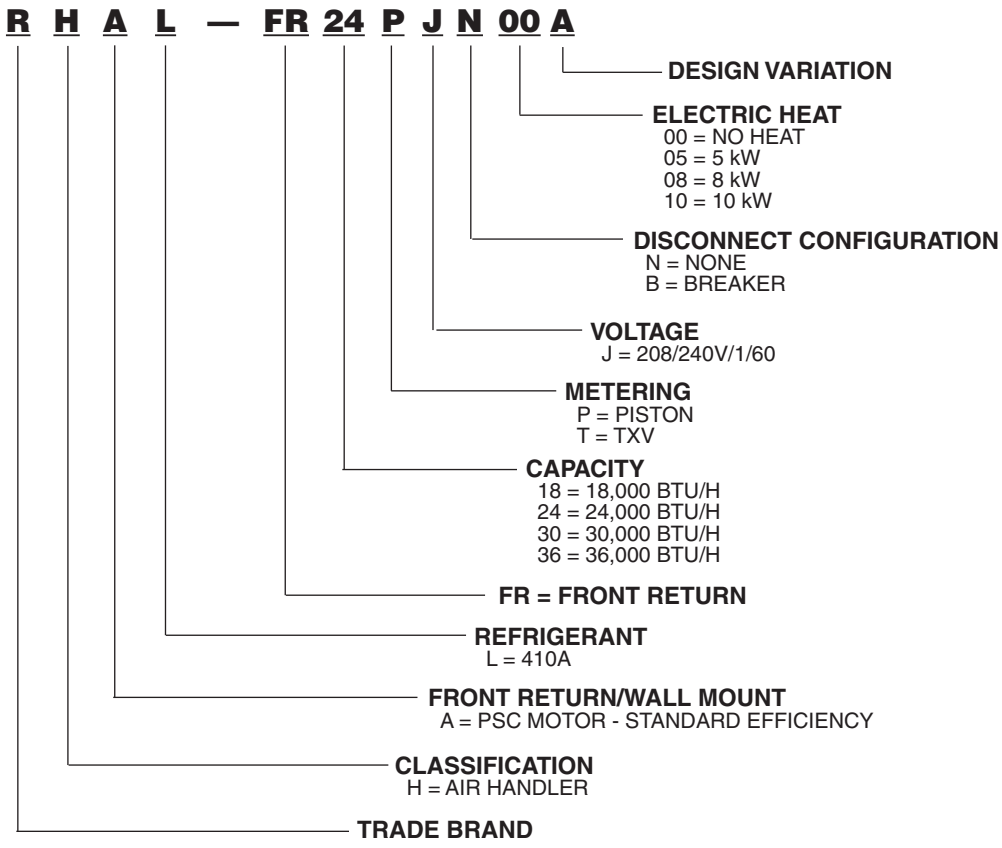
- After unit has been delivered to job site, remove carton taking care not to damage unit.
- Check the unit rating plate for unit size, electric heat, coil, voltage, phase, etc. to be sure equipment matches what is required for the job specification.
- Read the entire instructions before starting the installation.
- Some building codes require extra cabinet insulation and gasketing when unit is installed in attic applications.
- If installed in an unconditioned space, apply caulking around the power wires, control wires, refrigerant tubing and condensate line where they enter the cabinet. Seal the power wires on the inside where they exit conduit opening. Caulking is required to pre-vent air leakage into and condensate from forming inside the unit, control box, and on electrical controls.
- Install the unit in such a way as to allow necessary access to the coil/filter rack and blower/control compartment.
- Install the unit in a level position to ensure proper condensate drainage. Make sure unit is level in both directions within 1/8".
- Install the unit in accordance with any local code which may apply and the national codes. Latest editions are available from: "National Fire Protection Association, Inc., Batterymarch Park, Quincy, MA 02269." These publications are:
  - ANSI/NFPA No. 70-(Latest Edition) National Electrical Code.
  - NFPA90A Installation of Air Conditioning and Ventilating Systems.
  - NFPA90B Installation of warm air heating and air conditioning systems.
- The equipment has been evaluated in accordance with the Code of Federal Regulations, Chapter XX, Part 3280.

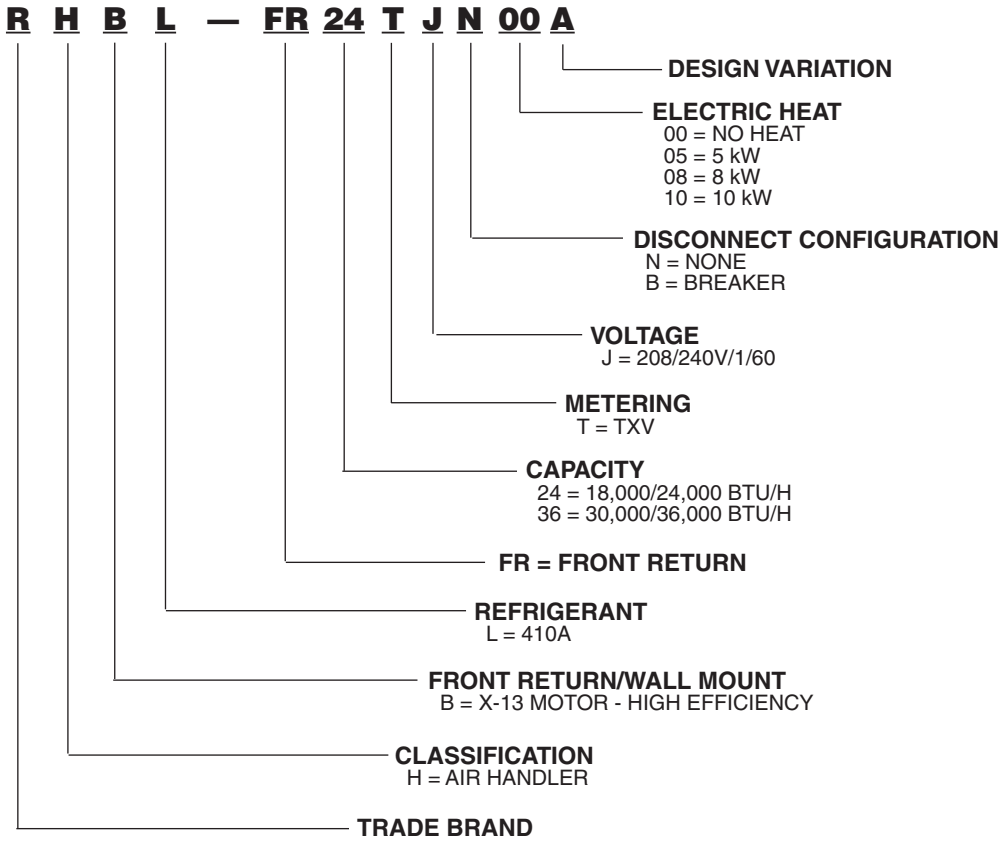
2.3 CLEARANCES

- All units are designed for "0" inches clearance to combustible material on all cabinet surfaces.
- All units require 24 inches minimum access to the front of the unit for service.
- These units may be installed in either ventilated or nonventilated spaces.

2.4 MODEL NUMBER EXPLANATION

FIGURE 2
MODEL NUMBER EXPLANATION





2.4A AVAILABLE MODELS

AVAILABLE MODELS AT J VOLTAGE

RHAL-FR18PJ		RHAL-FR36TJ
RHAL-FR24PJ		RHBL-FR24TJ
RHAL-FR30PJ		RHBL-FR36TJ
RHAL-FR36PJ		

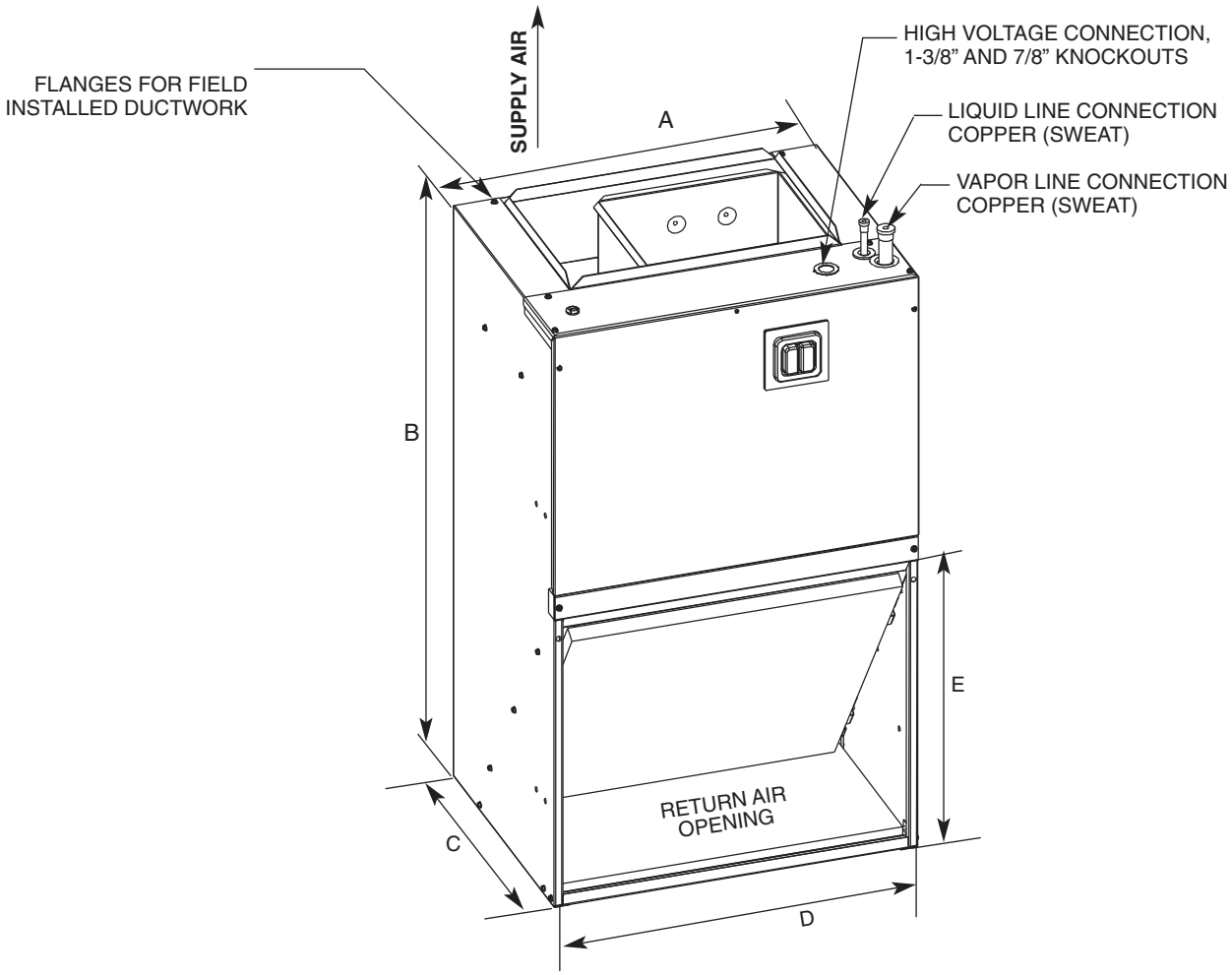
Notes:

- Supply circuit protective devices may be fuses or “HACR” type circuit breakers.
- Largest motor load is included in single circuit and multiple circuit 1.
- If non-standard fuse size is specified, use next size larger fuse size.
- J Voltage (208/240V) single phase air handler is designed to be used with single or three phase 208/240V power. In the case of connecting 3-phase power to the air handler terminal block, bring only two leads to the terminal block. Cap, insulate and fully secure the third lead.
- The air handlers are shipped from the factory with the proper indoor coil installed, and cannot be ordered without a coil.

2.5 DIMENSIONS & WEIGHTS

FIGURE 3
DIMENSIONS AND WEIGHTS

NOTE: 24" CLEARANCE REQUIRED IN FRONT OF UNIT FOR FILTER AND COIL MAINTENANCE.



ALL UNITS ARE CONFIGURED FOR VERTICAL UPFLOW. UNITS CANNOT BE INSTALLED IN ANY OTHER CONFIGURATION.

FRONT RETURN SHOWN. UNITS MAY ALSO BE INSTALLED AS BOTTOM RETURN. SEE THE APPLICATIONS SECTION FOR MORE DETAIL.

DIMENSIONAL DATA

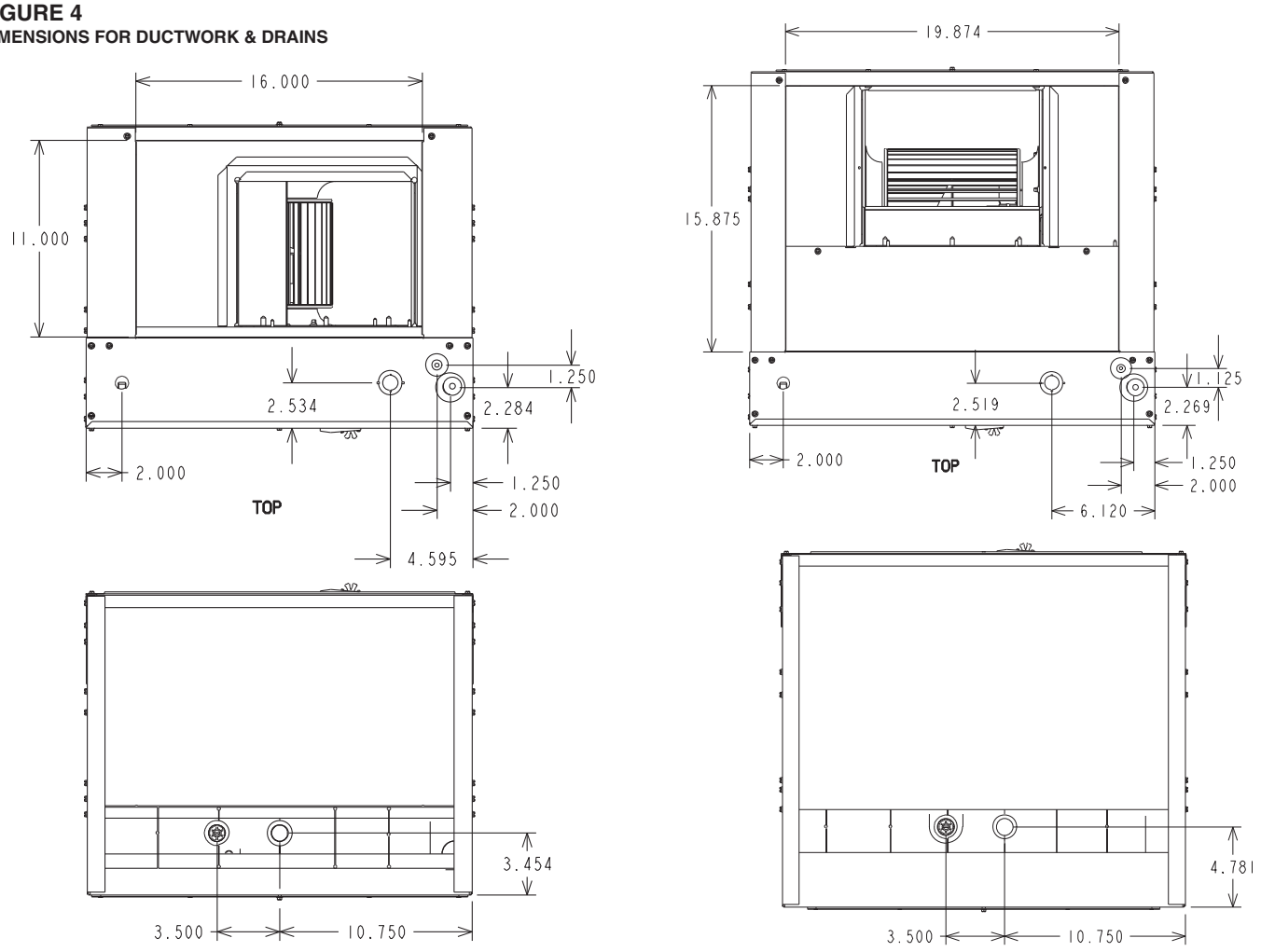
MODEL	(A) UNIT WIDTH IN. [mm]	(B) UNIT HEIGHT IN. [mm]	(C) UNIT DEPTH IN. [mm]	(D) RETURN AIR OPENING WIDTH IN. [mm]	(E) RETURN AIR OPENING HEIGHT IN. [mm]	AIRFLOW COIL / [L/s]	UNIT WEIGHT / SHIPPING WEIGHT LBS. / [kg]
RHAL-18	21-1/2 [546.1]	36 [914.4]	17 [431.8]	20 [508]	17-7/16 [442.9]	600 [283]	80/90 [36]/[41]
RHAL-24	21-1/2 [546.1]	36 [914.4]	17 [431.8]	20 [508]	17-7/16 [442.9]	800 [378]	80/90 [36]/[41]
RHAL-30	24 [609.6]	36 [914.4]	21 [533.4]	23 [584.2]	21-3/8 [542.9]	1000 [472]	95/105 [43]/[48]
RHAL-36	24 [609.6]	36 [914.4]	21 [533.4]	23 [584.2]	21-3/8 [542.9]	1200 [566]	95/105 [43]/[48]
RHBL-24	21-1/2 [546.1]	36 [914.4]	17 [431.8]	20 [508]	17-7/16 [442.9]	600/800 [283/378]	80/90 [36]/[41]
RHBL-36	24 [609.6]	36 [914.4]	21 [533.4]	23 [584.2]	21-3/8 [542.9]	1000/1200 [472/566]	95/105 [43]/[48]

3.0 APPLICATIONS

3.1 VERTICAL UPFLOW

- Vertical Upflow is the factory configuration for all models (see Figure 3).
- If return air is to be ducted, install duct flush with floor. Use fireproof resilient gasket 1/8 to 1/4 in. thick between duct, unit and floor. Set unit on floor over opening.

FIGURE 4
DIMENSIONS FOR DUCTWORK & DRAINS



4.0 AIR HANDLER MOUNTING OPTIONS

The air handler comes standard with two different options for mounting, wall mount or frame mount. Both mounting options require the unit to be level from side to side and from front to back in order to allow condensate to properly drain from the unit. Failure to do this will result in condensate to leak out from the unit potentially causing structural damage to the surrounding support structures, dry wall, carpet, etc. around the unit. Also, both mounting structures require the ability to accommodate a minimum of 150 lb. load. Failure to do this will cause damage to the support structure and potentially damage the unit.

4.1 WALL MOUNT

The air handler comes standard with a wall mounting bracket and air handler mounting bracket. Reference figure 5 for more detail.

1. Remove the wall mounting bracket from the back of the unit by removing one screw which attaches the bracket to the air handler. Note: Discard the screw after you have removed the wall mounting bracket.
2. Install bracket one the wall by using 6 wood screws (not provided). Make sure the bracket is level in order to provided proper drainage from the unit. Note: Do not attach the wall mounting bracket into unsupported dry wall. Make sure that the wood screws are going into a structure that can support a minimum of 150 lb load.

3. Lift the air handler above the wall mounting bracket and attached the unit to the installed bracket. Reference figure 5.

4.2 FRAME MOUNT

The air handler comes with 8 clearance holes 4 on each side. These holes are used to mount the air handler inside of a frame structure (see figure 6). When mounting in this fashion, make sure that the wood screws are mounted from within the air handler and not outside of the unit. Installing the screws from the outside could cause damage to the coil.

FIGURE 5
WALL MOUNT

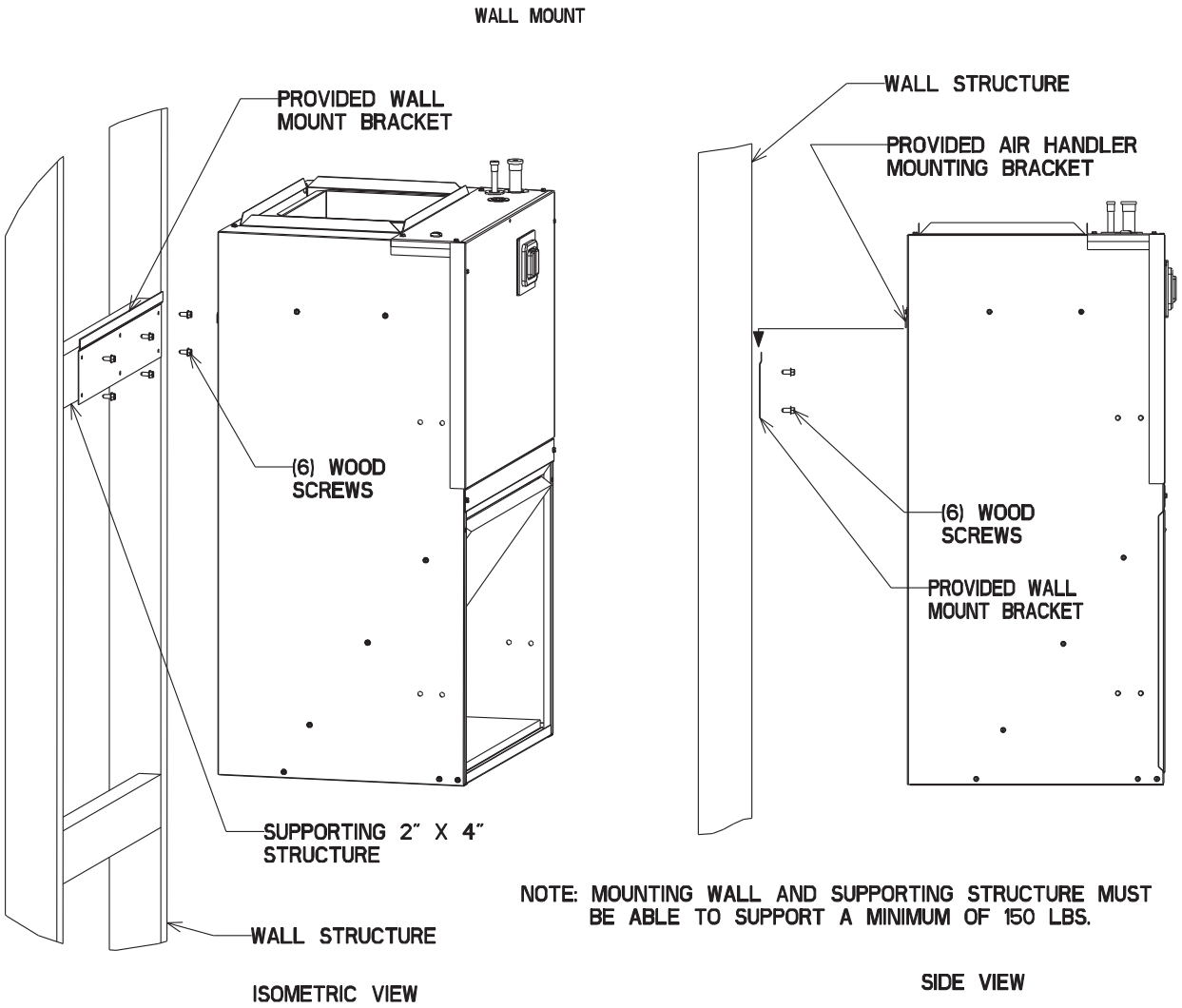
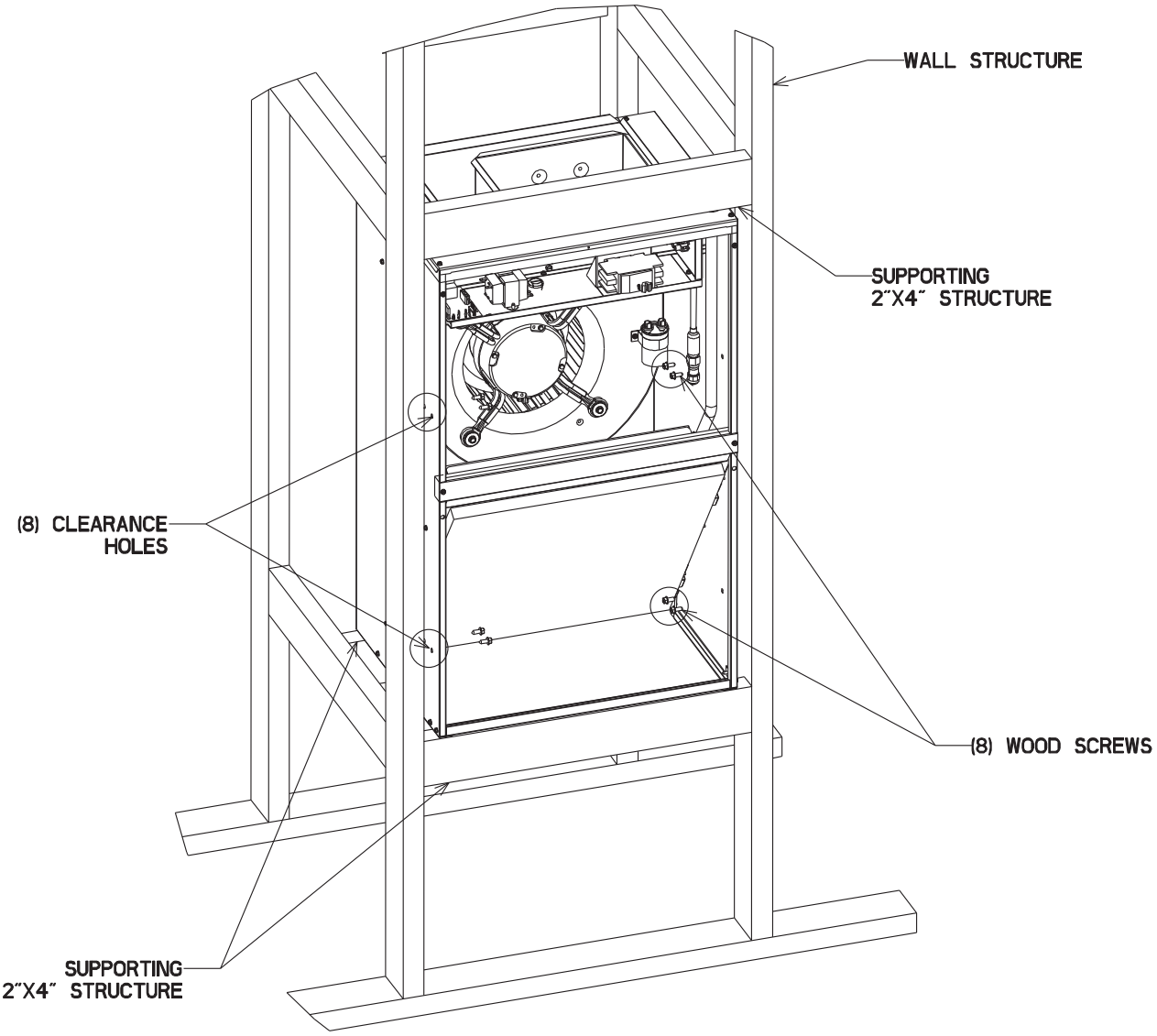


FIGURE 6
FRAME MOUNT



5.0 ELECTRICAL WIRING

Field wiring must comply with the National Electric Code (C.E.C. in Canada) and any applicable local ordinance.

⚠ WARNING

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

5.1 POWER WIRING

It is important that proper electrical power is available for connection to the unit model being installed. See the unit nameplate, wiring diagram and electrical data in the installation instructions.

- If required, install a branch circuit disconnect of adequate size, located within sight of, and readily accessible to the unit.
- **IMPORTANT:** After the Electric Heater is installed, units may be equipped with a circuit breaker. This circuit breaker protects the internal wiring in the event of a short circuit and serves as a disconnect. Circuit breakers installed within the unit do not pro-

vide over-current protection of the supply wiring and therefore may be sized larger than the branch circuit protection.

- Supply circuit power wiring must be 75°C minimum copper conductors only. See Electrical Data in this section for ampacity, wire size and circuit protector requirement. Supply circuit protective devices may be either fuses or “HACR” type circuit breakers.
- Power wiring is connected through the $^{7}/_{8}$”, $1^{3}/_{8}$” knockout located on the top right hand side of the unit.
- Power wiring is connected to the power terminal block in unit control compartment.

5.2 CONTROL WIRING

IMPORTANT: Class 2 low voltage control wire should not be run in conduit with power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used.

- Low voltage control wiring should be 18 Awg. color-coded. For lengths longer than 100 ft., 16 Awg. wire should be used.
- Low voltage control connections are made to low voltage pigtails extending from top of air handler. Connections for control wiring are made with wire nuts. Control wiring knockouts are also provided on the left side of the unit.
- See wiring diagrams attached to indoor and outdoor sections to be connected, or control wiring diagram booklet supplied with outdoor heat pump section for wiring connection.
- Make sure, after installation, separation of control wiring and power wiring has been maintained.

5.3 GROUNDING

⚠ WARNING

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

- Grounding may be accomplished by grounding metal conduit when installed in accordance with electrical codes to the unit cabinet.
- Grounding may also be accomplished by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.
- Ground lug(s) are located close to wire entrance on left side of unit.
- Use of multiple supply circuits require grounding of each circuit to lug(s) provided in unit.

5.4 ELECTRICAL WIRING

POWER WIRING

- Field wiring must comply with the National Electrical Code (C.E.C. in Canada) and any applicable local ordinance.
- Supply wiring must be 75°C minimum copper conductors only.
- See electrical data for product Ampacity rating and Circuit Protector requirement.

GROUNDING

- This product must be sufficiently grounded in accordance with National Electrical Code (C.E.C. in Canada) and any applicable local ordinance.
- A grounding lug is provided.

5.5 ELECTRICAL DATA – BLOWER MOTOR ONLY – NO ELECTRIC HEAT

5.5A Electrical Data – Blower Motor Only – No Electric Heat: RHAL

MODEL/ NOMINAL COOLING TONS	VOLTAGE	PHASE	HERTZ	HP	RPM	SPEEDS	CIRCUIT AMPS	MINIMUM CIRCUIT AMPACITY	MAXIMUM CIRCUIT PROTECTION
RHAL-FR18	208/230	1	60	1/5	1075	2	1.5	3	15
RHAL-FR24	208/230	1	60	1/5	1075	2	1.5	3	15
RHAL-FR30	208/230	1	60	1/4	1075	2	2.5	4	15
RHAL-FR36	208/230	1	60	1/3	1075	2	2.5	4	15

5.5B Electrical Data – Blower Motor Only – No Electric Heat: RHBL

MODEL/ NOMINAL COOLING TONS	VOLTAGE	PHASE	HERTZ	HP	RPM	SPEEDS	CIRCUIT AMPS	MINIMUM CIRCUIT AMPACITY	MAXIMUM CIRCUIT PROTECTION
1.5	208/230	1	60	1/3	300-1100	4	1.6	3	15
2	208/230	1	60	1/3	300-1100	4	1.6	3	15
2.5	208/230	1	60	1/2	300-1100	4	2.7	4	15
3	208/230	1	60	1/2	300-1100	4	2.7	4	15

*Blower motors are all single phase motors.

5.6 ELECTRICAL DATA – WITH ELECTRIC HEAT

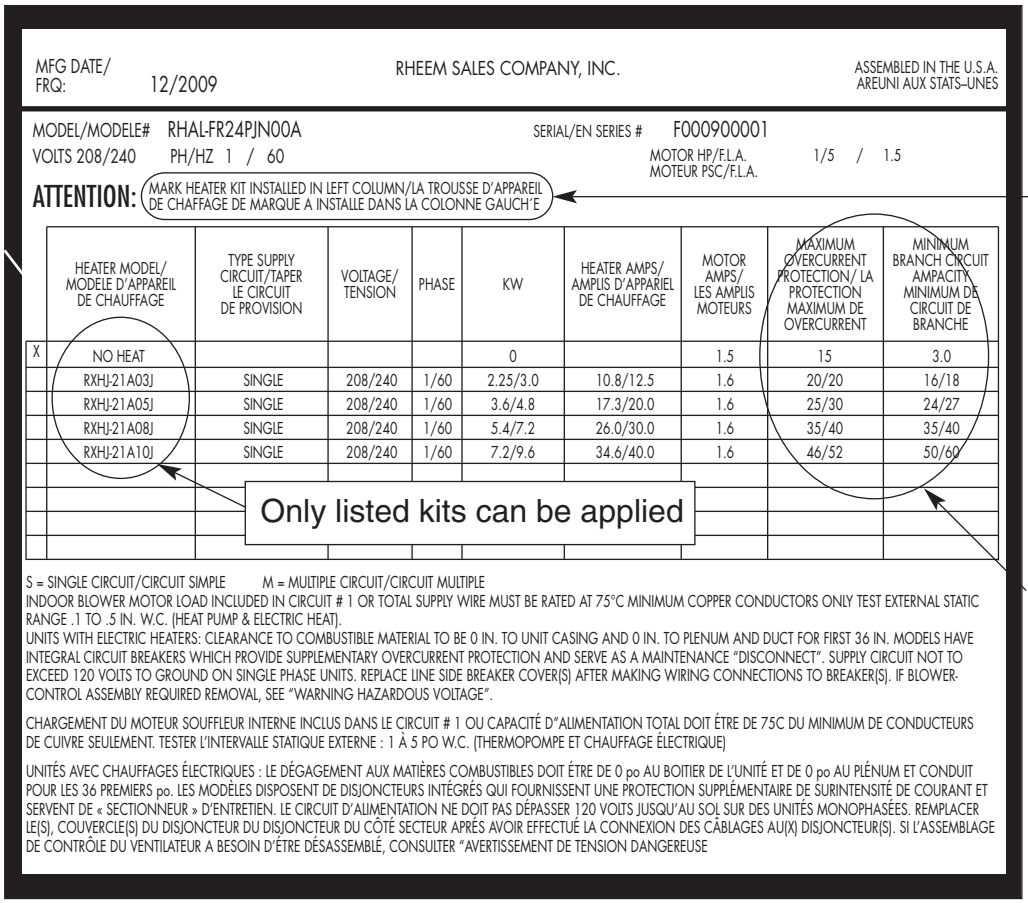
Installation of the UL Listed original equipment manufacturer provided heater kits listed in the following table is recommended for all auxiliary heating requirements.

5.6A ELECTRICAL DATA – WITH ELECTRIC HEAT: RHAL/RHBL

COOLING CAPACITY TONS	MODEL NO.	HEATER KW (208/240V)	PH/HZ	NO. ELEMENTS - KW PER	TYPE SUPPLY CIRCUIT	CIRCUIT AMPS.	MOTOR AMPACITY	MINIMUM CIRCUIT AMPACITY	MAXIMUM CIRCUIT PROTECTION
RHAL/RHBL 18	RXHJ-21A03J	2.25/3.0	1/60	1-3.0	SINGLE	10.8/12.5	1.5	16/18	20/20
	RXHJ-21A05J	3.6/4.8	1/60	1-4.8	SINGLE	17.3/20.0	1.5	24/27	25/30
	RXHJ-21A08J	5.4/7.2	1/60	2-3.6	SINGLE	26.0/30.0	1.5	35/40	35/40
RHAL/RHBL 24	RXHJ-21A03J	2.25/3.0	1/60	1-3.0	SINGLE	10.8/12.5	1.5	16/18	20/20
	RXHJ-21A05J	3.6/4.8	1/60	1-4.8	SINGLE	17.3/20.0	1.5	24/27	25/30
	RXHJ-21A08J	5.4/7.2	1/60	2-3.6	SINGLE	26.0/30.0	1.5	35/40	35/40
	RXHJ-21A10J	7.2/9.6	1/60	2-4.8	SINGLE	34.6/40.0	1.5	50/60	46/52
RHAL/RHBL 30	RXHJ-24A03J	2.25/3.0	1/60	1-3.0	SINGLE	10.8/12.5	2.5	17/19	20/20
	RXHJ-24A05J	3.6/4.8	1/60	1-4.8	SINGLE	17.3/20.0	2.5	25/29	25/30
	RXHJ-24A08J	5.4/7.2	1/60	2-3.6	SINGLE	26.0/30.0	2.5	36/41	40/45
	RXHJ-24A10J	7.2/9.6	1/60	2-4.8	SINGLE	34.6/40.0	2.5	47/54	50/60
RHAL/RHBL 36	RXHJ-24A03J	2.25/3.0	1/60	1-3.0	SINGLE	10.8/12.5	2.5	17/19	20/20
	RXHJ-24A05J	3.6/4.8	1/60	1-4.8	SINGLE	17.3/20.0	2.5	25/29	25/30
	RXHJ-24A08J	5.4/7.2	1/60	2-3.6	SINGLE	26.0/30.0	2.5	36/41	40/45
	RXHJ-24A10J	7.2/9.6	1/60	2-4.8	SINGLE	34.6/40.0	2.5	47/54	50/60

NOTES:
- Electric heater BTUH - (heater watts + motor watts) x 3.414 (see airflow table for motor watts.)
- Supply circuit protective devices may be fuses or “HACR” type circuit breakers.
- If non-standard fuse size is specified, use next size larger standard fuse size.
- Largest motor load is included in single circuit or circuit 1 of multiple circuits.
- J Voltage (230V) single phase air handler is designed to be used with single or three phase 230 volt electric heaters. In the case of connecting 3 phase power to air handler terminal block without the heater, bring only two leads to terminal block, cap, insulate and fully secure the third lead.

5.6B HEATER KIT SUPPLEMENTAL INFORMATION



MFG DATE/ FRQ: 12/2009

RHEEM SALES COMPANY, INC.

ASSEMBLED IN THE U.S.A. AREUNI AUX STATS–UNES

MODEL/MODELE# RHAL-FR24PJN00A SERIAL/EN SERIES # F000900001

VOLTS 208/240 PH/HZ 1 / 60 MOTOR HP/F.L.A. 1/5 / 1.5
MOTEUR PSC/F.L.A.

ATTENTION: MARK HEATER KIT INSTALLED IN LEFT COLUMN/LA TROUSSE D'APPAREIL DE CHAFFAGE DE MARQUE A INSTALLE DANS LA COLONNE GAUCH'E

	HEATER MODEL/ MODELE D'APPAREIL DE CHAUFFAGE	TYPE SUPPLY CIRCUIT/TAPER LE CIRCUIT DE PROVISION	VOLTAGE/ TENSION	PHASE	KW	HEATER AMPS/ AMPLIS D'APPARIEL DE CHAUFFAGE	MOTOR AMPS/ LES AMPLIS MOTEURS	MAXIMUM OVERCURRENT PROTECTION/ LA PROTECTION MAXIMUM DE OVERCURRENT	MINIMUM BRANCH CIRCUIT AMPACITY MINIMUM DE CIRCUIT DE BRANCHE
X	NO HEAT				0		1.5	15	3.0
	RXHJ-21A03J	SINGLE	208/240	1/60	2.25/3.0	10.8/12.5	1.6	20/20	16/18
	RXHJ-21A05J	SINGLE	208/240	1/60	3.6/4.8	17.3/20.0	1.6	25/30	24/27
	RXHJ-21A08J	SINGLE	208/240	1/60	5.4/7.2	26.0/30.0	1.6	35/40	35/40
	RXHJ-21A10J	SINGLE	208/240	1/60	7.2/9.6	34.6/40.0	1.6	46/52	50/60

Only listed kits can be applied

S = SINGLE CIRCUIT/CIRCUIT SIMPLE M = MULTIPLE CIRCUIT/CIRCUIT MULTIPLE

INDOOR BLOWER MOTOR LOAD INCLUDED IN CIRCUIT # 1 OR TOTAL SUPPLY WIRE MUST BE RATED AT 75°C MINIMUM COPPER CONDUCTORS ONLY TEST EXTERNAL STATIC RANGE .1 TO .5 IN. W.C. (HEAT PUMP & ELECTRIC HEAT).

UNITS WITH ELECTRIC HEATERS: CLEARANCE TO COMBUSTIBLE MATERIAL TO BE 0 IN. TO UNIT CASING AND 0 IN. TO PLENUM AND DUCT FOR FIRST 36 IN. MODELS HAVE INTEGRAL CIRCUIT BREAKERS WHICH PROVIDE SUPPLEMENTARY OVERCURRENT PROTECTION AND SERVE AS A MAINTENANCE "DISCONNECT". SUPPLY CIRCUIT NOT TO EXCEED 120 VOLTS TO GROUND ON SINGLE PHASE UNITS. REPLACE LINE SIDE BREAKER COVER(S) AFTER MAKING WIRING CONNECTIONS TO BREAKER(S). IF BLOWER-CONTROL ASSEMBLY REQUIRED REMOVAL, SEE "WARNING HAZARDOUS VOLTAGE".

CHARGEMENT DU MOTEUR SOUFFLEUR INTERNE INCLUS DANS LE CIRCUIT # 1 OU CAPACITÉ D"ALIMENTATION TOTAL DOIT ÊTRE DE 75C DU MINIMUM DE CONDUCTEURS DE CUIVRE SEULEMENT. TESTER L'INTERVALLE STATIQUE EXTERNE : 1 À 5 PO W.C. (THERMOPOMPE ET CHAUFFAGE ÉLECTRIQUE)

UNITÉS AVEC CHAUFFAGES ÉLECTRIQUES : LE DÉGAGEMENT AUX MATIÈRES COMBUSTIBLES DOIT ÊTRE DE 0 po AU BOITIER DE L'UNITÉ ET DE 0 po AU PLÉNUM ET CONDUIT POUR LES 36 PREMIERS po. LES MODÈLES DISPOSENT DE DISJONCTEURS INTÉGRÉS QUI FOURNISSENT UNE PROTECTION SUPPLÉMENTAIRE DE SURINTENSITÉ DE COURANT ET SERVENT DE « SECTIONNEUR » D'ENTRETIEN. LE CIRCUIT D'ALIMENTATION NE DOIT PAS DÉPASSER 120 VOLTS JUSQU'AU SOL SUR DES UNITÉS MONOPHASÉES. REMPLACER LE(S), COUVERCLE(S) DU DISJONCTEUR DU DISJONCTEUR DU CÔTÉ SECTEUR APRÉS AVOIR EFFECTUÉ LA CONNEXION DES CÂBLAGES AU(X) DISJONCTEUR(S). SI L'ASSEMBLAGE DE CONTRÔLE DU VENTILATEUR A BESOIN D'ÉTRE DÉSASSEMBLÉ, CONSULTER "AVERTISSEMENT DE TENSION DANGEREUSE

Contractor should "mark or check" the left column for the kit installed

These are the required maximum and minimum circuit breaker sizes for overcurrent protection and should not be confused with the size of the breakers installed in the heater kit.

Heater Kit Supplemental Information: What allows the manufacturer to use standard Circuit Breakers up to 60 amps inside the air handler, when using an approved Heater Kit?

National Electric Code (Section 424-22b) and our UL requirements allow us to subdivide heating element circuits, of less than 48 amps, using breakers of not more than 60 amps and, additionally by, NEC 424-3b, a rating not less than 125 percent of the load and NEC 424-22c, which describes the supplementary overcurrent protection required to be factory-installed within, or on the heater. The breakers in the heater kit are not, and have never been, by NEC, intended to protect power wiring leading to the air handler unit. The breakers in the heating kit are for short circuit protection. All internal unit wiring, where the breakers apply, has been UL approved for short circuit protection.

Ampacity, (not breaker size), determines supply circuit wire size. The ampacity listed on the unit rating plate and the Maximum and Minimum circuit breaker size (noted above) or in the units specification sheet or installation instructions provides the information to properly select wire and circuit breaker/protector size. The National Electric Code (NEC) specifies that the supply or branch circuit must be protected at the source.

6.0 AIRFLOW PERFORMANCE

Airflow performance data is based on cooling performance with a coil and filter in place. Select performance table for appropriate unit size, voltage and number of electric heaters to be used. Make sure external static applied to unit allows operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation. For optimum blower performance, operate the unit in the .3 to .7 in W.C. external static range. Units with coils should be applied with a minimum of .1 in W.C. external static.

6.1 AIRFLOW OPERATING LIMITS

Cooling BTUH x 1,000 **Cooling Tons Nominal**	**-018** **1.5**	**-024** **2**	**-030** **2.5**	**-036** **3**
Heat Pump or Air Conditioning Maximum Heat/Cool CFM [L/s] (37.5 CFM [18 L/s]/1,000 BTUH) (450 CFM [212 L/s]/Ton Nominal)	675 [319]	900 [425]	1125 [531]	1350 [637]
Heat Pump or Air Conditioning Nominal Heat/Cool CFM [L/s] (33.3 CFM [16 L/s]/1,000 BTUH) (400 CFM [189 L/s]/Ton Nominal)	600 [283]	800 [378]	1000 [472]	1200 [566]
Heat Pump or Air Conditioning Minimum Heat/Cool CFM [L/s] (30.0 CFM [14 L/s]/1,200 BTUH) (360 CFM [170 L/s]/Ton Nominal)	540 [255]	720 [340]	900 [425]	1080 [510]
Maximum kW Electric Heating & Minimum Electric Heat CFM [L/s]	8 450 [212]	10 690 [325]	10 690 [325]	10 690 [325]
Maximum Electric Heat Rise °F [°C]	53° [11.65]	93° [33.8]	93° [33.8]	93° [33.8]

6.2 240V AIRFLOW PERFORMANCE DATA – RHAL (PSC MOTOR)

Nominal Cooling Capacity Tons	Manufacturer Recommended Air-Flow Range (Max/Min) CFM	Blower Size/ Motor HP # of Speeds	Motor Speed From Factory	Motor Speed	PSC Motor CFM wet coil with filter & heaters External Static Pressure-Inches W.C.							
						0.10	0.20	0.30	0.40	0.50	0.60	0.70
1.5	850/450 8 kW max	10X6 1/5 hp 2 speed dual voltage	High	High	CFM	850	807	763	723	644	568	538
					RPM	948	970	989	1003	1021	1037	1046
					Watts	269	262	252	245	238	226	221
				Low	CFM	642	606	575	521	450	—	—
					RPM	766	798	817	864	912	—	—
					Watts	175	170	168	158	149	—	—
2	1016/690 10 kW max	10X6 1/5 hp 2 speed dual voltage	High	High	CFM	1016	966	927	885	834	780	718
					RPM	1083	1090	1096	1101	1109	1114	1121
					Watts	380	365	360	349	338	328	311
				Low	CFM	830	805	772	735	690	—	—
					RPM	932	950	974	994	1014	—	—
					Watts	270	262	253	244	235	—	—
2.5	1190/808 10 kW max	10X8T 1/4 hp 2 speed dual voltage	High	High	CFM	1190	1116	1058	997	927	851	762
					RPM	900	927	950	974	997	1018	1038
					Watts	374	361	346	331	320	307	290
				Low	CFM	1034	983	931	868	808	—	—
					RPM	836	860	892	921	944	—	—
					Watts	300	291	281	269	260	—	—
3	1330/976 10 kW max	10X8T 1/3 hp 2 speed dual voltage	High	High	CFM	1330	1262	1184	1066	968	871	—
					RPM	1029	1047	1060	1082	1095	1104	—
					Watts	478	456	437	403	376	355	—
				Low	CFM	1189	1135	1054	976	—	—	—
					RPM	958	984	1012	1037	—	—	—
					Watts	402	385	362	341	—	—	—

NOTE:

- All 208/240V PSC motors have voltage taps for 208 and 240 volts.
- All 208/240V PSC motors have shipped on high speed and 240 volts.
- If the application external static is less than 0.5" WC, adjust the motor speed to the low static speed as described below.
  - Unplug the black motor wire off the relay on the control board and plug in the red motor wire.
  - Replace the cap on the black motor wire.
- Voltage change (208/240V motors):
  - Move the orange lead to transformer 208V tap. Replace the wire cap on 240V tap.
  - Unplug the purple motor wire off the transformer and plug in the yellow motor wire.
  - Replace the cap on the purple motor wire.
- The above airflow table lists the airflow information for air handlers with maximum heater allowed for each mode.

6.3 208/240V AIRFLOW PERFORMANCE DATA – RHBL (X-13 MOTOR)

Nominal Cooling Capacity Tons	Manufacturer Recommended Air-Flow Range (Max/Min) CFM	Blower Size/ Motor HP # of Speeds	Motor Speed From Factory	Motor Speed	X-13 Motor CFM wet coil with filter & heaters External Static Pressure-Inches W.C.							
						0.10	0.20	0.30	0.40	0.50	0.60	0.70
1.5	827/474 8 kW max	10X6 1/3 hp 2 speed dual voltage	5	3	CFM	827	804	779	740	708	659	608
					RPM	1020	1035	1068	1095	1119	1138	1147
					Watts	198	207	206	204	211	205	189
				2	CFM	599	578	544	509	474	—	—
					RPM	832	875	905	935	963	—	—
					Watts	95	96	108	102	112	—	—
2	977/708 10 kW max	10X6 1/3 hp 2 speed dual voltage	5	5	CFM	977	930	898	850	801	746	687
					RPM	1120	1132	1136	1141	1146	1153	1160
					Watts	294	271	266	257	239	231	214
				4	CFM	811	785	759	726	708	—	—
					RPM	982	1008	1026	1050	1081	—	—
					Watts	177	186	182	188	189	—	—
2.5	1170/897 10 kW max	10X8 1/2 hp 2 speed dual voltage	5	3	CFM	1170	1127	1085	1048	1012	973	943
					RPM	886	921	958	986	1022	1053	1083
					Watts	267	275	287	290	301	305	315
				2	CFM	1053	1003	969	928	897	—	—
					RPM	835	864	903	933	973	—	—
					Watts	212	216	227	232	242	—	—
3	1316/1049 10 kW max	10X8 1/2 hp 2 speed dual voltage	5	5	CFM	1316	1275	1229	1191	1151	1093	1039
					RPM	974	1006	1036	1063	1098	1120	1131
					Watts	365	378	383	390	399	393	377
				4	CFM	1208	1172	1125	1087	1049	—	—
					RPM	906	938	968	1002	1030	—	—
					Watts	284	299	306	315	322	—	—

NOTE:
X-13 motor speed changes

All X-13 motors have 5 speed taps. Speed tap 1 is for continuous fan. Speed tap 2 (low static) and speed tap 3 (high static) are for lower tonnage. Speed tap 4 (low static) and speed tap 5 (high static) are for higher tonnage.

X-13 air handlers are always shipped from factory at speed tap 5. To change to 1.5-ton or 2.5 ton airflow, move the blue wire to speed tap 2 or 3 on the X-13 motor.

The low static speed tap 2 (lower tonnage) and 4 (higher tonnage) are used for external static below 0.5" WC. The high static speed tap 3 (lower tonnage) and 5 (higher tonnage) are used for external static exceeding 0.5" WC. Move the blue wire to the appropriate speed tap as required by the application needs.

- The airflow for continuous fan (speed tap 1) is always set at 50% of the speed tap 4.
- The above airflow table lists the airflow information for air handlers with maximum heater allowed for each model.

7.0 DUCTWORK

Field ductwork must comply with the National Fire Protection Association NFPA 90A, NFPA 90B and any applicable local ordinance.

⚠ 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.

Sheet metal ductwork run in unconditioned spaces must be insulated and covered with a vapor barrier. Fibrous ductwork may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Ductwork must comply with National Fire Protection Association as tested by U/L Standard 181 for Class I Air Ducts. Check local codes for requirements on ductwork and insulation.

- Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system airflow be adequate. Make sure supply and return ductwork, grills, special filters, accessories, etc. are accounted for in total resistance. See airflow performance tables in this manual.
- Design the duct system in accordance with “ACCA” Manual “D” Design for Residential Winter and Summer Air Conditioning and Equipment Selection. Latest editions are available from: “ACCA” Air Conditioning Contractors of America, 1513 16th Street, N.W., Washington, D.C. 20036. If duct system incorporates **flexible air duct,** be sure **pressure drop** information (straight length plus all turns) shown in “ACCA” Manual “D” is accounted for in system.
- Supply plenum is attached to the 3/4” duct flanges supplied with the unit. Attach flanges around the blower outlet.

IMPORTANT: If an elbow is included in the plenum close to the unit, it must not be smaller than the dimensions of the supply duct flange on the unit.

- **IMPORTANT:** The front flange on the return duct if connected to the blower casing must not be screwed into the area where the power wiring is located. Drills or sharp screw points can damage insulation on wires located inside unit.
- Secure the supply and return ductwork to the unit flanges, using proper fasteners for the type of duct used and tape the duct-to-unit joint as required to prevent air leaks.

8.0 REFRIGERANT CONNECTIONS

Keep the coil connections sealed until refrigerant connections are to be made. See the Installation Instructions for the outdoor unit for details on line sizing, tubing installation, and charging information.

Coil is shipped with a low (5 - 10 PSIG) pressure charge of dry nitrogen. Evacuate the system before charging with refrigerant.

Install refrigerant tubing so that it does not block service access to the front of the unit.

Nitrogen should flow through the refrigerant lines while brazing.

Use a brazing shield to protect the cabinet from being damaged by torch flames.

After the refrigerant connections are made, seal the gap around the connections with pressure sensitive gasket. If necessary, cut the gasket into two pieces for a better seal (See Figure 4.)

8.1 CONDENSATE DRAIN TUBING

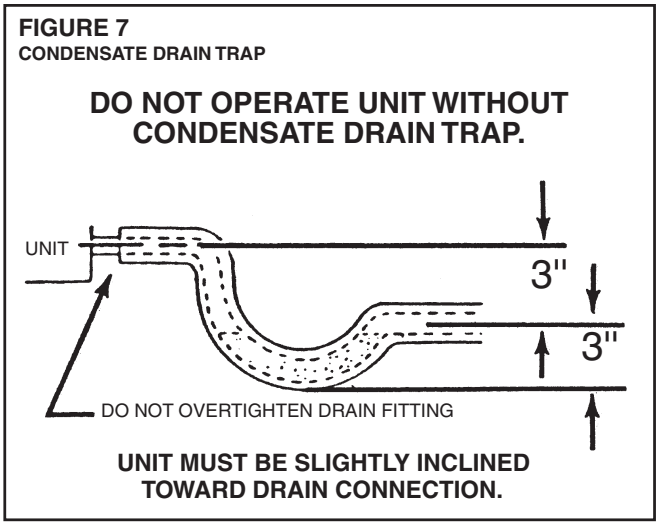
Consult local codes or ordinances for specific requirements.

IMPORTANT: When making drain fitting connections to the drain pan, use a thin layer of Teflon paste, silicone or Teflon tape and install hand tight.

IMPORTANT: When making drain fitting connections to drain pan, do not overtighten. Overtightening fittings can split pipe connections on the drain pan.

- Install drain lines so they do not block service access to front of the unit. Minimum clearance of 24 inches is required for filter, coil or blower removal and service access.
- Make sure unit is level or pitched slightly toward primary drain connection so that water will drain completely from the pan. (See Figure 7.)
- Do not reduce drain line size less than connection size provided on condensate drain pan.

FIGURE 7
CONDENSATE DRAIN TRAP



- All drain lines must be pitched downward away from the unit a minimum of 1/8" per foot of line to ensure proper drainage.
- Do not connect condensate drain line to a closed or open sewer pipe. Run condensate to an open drain or outdoors.
- The drain line should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the line.
- Make provisions for disconnecting and cleaning of the primary drain line should it become necessary. Install a 3 in. trap in the primary drain line as close to the unit as possible. Make sure that the top of the trap is below connection to the drain pan to allow complete drainage of pan (See Figure 7).
- Auxiliary drain line should be run to a place where it will be noticeable if it becomes operational. Occupant should be warned that a problem exists if water should begin running from the auxiliary drain line.
- Plug the unused drain connection with the plugs provided in the parts bag, using a thin layer of teflon paste, silicone or teflon tape to form a water tight seal.
- Test condensate drain pan and drain line after installation is complete. Pour water into drain pan, enough to fill drain trap and line. Check to make sure drain pan is draining completely, no leaks are found in drain line fittings, and water is draining from the termination of the primary drain line.

9.0 AIR FILTER

Filter application and placement are critical to airflow, which may affect the heating and cooling system performance. Reduced airflow can shorten the life of the system's major components, such as motor, limits, elements, heat relays, evaporator coil or compressor. Consequently, we recommend that the return air duct system have only one filter location. Systems with a return air filter grill or multiple filter grills, can have a filter installed at each of the return air openings.

If high efficiency filters or electronic air cleaners are used in the system, it is important that the airflow is not reduced to maximize system performance and life. Always verify that the system's airflow is not impaired by the filtering system that has been installed, by performing a temperature rise and temperature drop test.

IMPORTANT: DO NOT DOUBLE FILTER THE RETURN AIR DUCT SYSTEM. DO NOT FILTER THE SUPPLY AIR DUCT SYSTEM.

⚠ WARNING

Do not operate the system without filters. A portion of the dust entrained in the air may temporarily lodge in the duct runs and at the supply registers. Any circulated dust particles could be heated and charred by contact with the air handler elements. This residue could soil ceilings, walls, drapes, carpets and other articles in the house.

Soot damage may occur with filters in place, when certain types of candles, oil lamps or standing pilots are burned.

10.0 SYSTEM CHARGING

10.1 ORIFICE SIZE

The air handler comes standard with a flow check piston installed. The piston may need to be changed to a different orifice size depending upon the outdoor unit. The table below lists the recommended orifice size for various outdoor units.

INDOOR UNIT	FACTORY PISTON	SEER RATING OD UNIT	NOMINAL TONS	REFRIGERANT	ORIFICE SIZE
RHAL-FR18PJ	0.047	13	1.5	R410a	0.047
		14	1.5	R410a	0.049
		13	1.5	R22	0.049
		12	1.5	R22	0.051
		10	1.5	R22	0.053
RHAL-FR24PJ	0.053	13	2	R410a	0.053
		14	2	R410a	0.057
		13	2	R22	0.057
		12	2	R22	0.061
		10	2	R22	0.063
RHAL-FR30PJ	0.061	13	2.5	R410a	0.061
		14	2.5	R410a	0.063
		13	2.5	R22	0.065
		12	2.5	R22	0.065
		10	2.5	R22	0.065
RHAL-FR36PJ	0.065	13	3	R410a	0.065
		14	3	R410a	0.068
		13	3	R22	0.069
		12	3	R22	0.070
		10	3	R22	0.070

10.2 CHARGING CHARTS

When charging the unit during cooling, the factory charging chart that comes with the outdoor unit can be used. When charging the system in heating, use the charging charts listed below for the various outdoor units.

Heating Mode		Heating Charge Chart for RHAL-FR18 Matched with 13PJL18											
		Indoor Dry Bulb Temperature (F)											
		60	62	64	66	68	70	72	74	76	78	80	82
		Discharge Pressure at Large Service Valve (psig)											
Pressure after Switchover Valve - Suction to Compressor (psig)	135	301	309	317	325	333	341	349	357	366	374	382	391
	128	295	303	311	318	326	335	343	351	359	368	376	384
	121	289	296	304	312	320	328	336	345	353	361	370	378
	114	282	290	298	306	314	322	330	338	347	355	363	372
	107	276	284	291	299	307	316	324	332	340	349	357	365
	100	269	277	285	293	301	309	317	326	334	342	351	359
	93	263	271	279	287	295	303	311	319	327	336	344	353
	86	257	265	272	280	288	296	305	313	321	329	338	346
	79	250	258	266	274	282	290	298	306	315	323	332	340
	72		252	260	268	276	284	292	300	308	317	325	334
	65			253	261	269	277	286	294	302	310	319	327
	58				255	263	271	279	287	296	304	313	321
	51					257	265	273	281	289	298	306	315
	44					250	258	267	275	283	291	300	308
	37						252	260	268	277	285	293	302
	30							254	262	270	279	287	296

Heating Mode		Heating Charge Chart for RHAL-FR24 Matched with 13PJL24											
		Indoor Dry Bulb Temperature (F)											
		60	62	64	66	68	70	72	74	76	78	80	82
		Discharge Pressure at Large Service Valve (psig)											
Pressure after Switchover Valve - Suction to Compressor (psig)	135	320	328	336	344	352	360	368	376	385	393	401	410
	128	313	321	329	337	345	353	361	369	378	386	394	403
	121	306	314	322	330	338	346	354	362	370	379	387	396
	114	299	307	314	322	330	338	347	355	363	371	380	388
	107	291	299	307	315	323	331	339	348	356	364	373	381
	100	284	292	300	308	316	324	332	340	349	357	365	374
	93	277	285	293	301	309	317	325	333	341	350	358	367
	86	270	278	285	293	301	310	318	326	334	343	351	359
	79	263	270	278	286	294	302	310	319	327	335	344	352
	72	255	263	271	279	287	295	303	311	320	328	336	345
	65		256	264	272	280	288	296	304	313	321	329	338
	58			257	265	273	281	289	297	305	314	322	330
	51				257	265	273	282	290	298	306	315	323
	44				250	258	266	274	283	291	299	308	316
	37					251	259	267	275	284	292	300	309
	30						252	260	268	276	285	293	302

Heating Mode		Heating Charge Chart for RHAL-FR30 Matched with 13PJL30											
		Indoor Dry Bulb Temperature (F)											
		60	62	64	66	68	70	72	74	76	78	80	82
		Discharge Pressure at Large Service Valve (psig)											
Pressure after Switchover Valve - Suction to Compressor (psig)	135	320	329	337	345	353	362	371	380	390	400	410	420
	130	315	323	331	340	348	356	365	375	384	394	404	414
	125	310	318	326	334	343	351	360	369	378	388	398	408
	120	305	313	321	329	337	346	354	363	373	382	392	402
	115	300	308	316	324	332	340	349	358	367	376	386	395
	110	294	302	310	318	327	335	343	352	361	370	380	389
	105	289	297	305	313	321	329	338	346	355	364	374	383
	100	284	292	300	308	316	324	332	341	349	358	368	377
	95	279	287	295	302	310	318	327	335	344	352	361	371
	90	274	281	289	297	305	313	321	329	338	347	355	365
	85	269	276	284	292	300	308	316	324	332	341	349	358
	80	263	271	279	286	294	302	310	318	326	335	343	352
	75	258	266	273	281	289	297	305	312	321	329	337	346
	70	253	261	268	276	284	291	299	307	315	323	331	340
	65		255	263	270	278	286	293	301	309	317	325	334
	60		250	258	265	273	281	288	295	303	311	319	328
	55			252	260	267	275	282	290	297	305	313	321
	50				255	262	270	277	284	292	299	307	315
	45					257	264	271	278	286	293	301	309
	40					251	259	266	273	280	287	295	303
	35						253	260	267	274	282	289	297
	30							255	262	269	276	283	291

Heating Mode		Heating Charge Chart for RHAL-FR36 Matched with 13PJL36											
		Indoor Dry Bulb Temperature (F)											
		60	62	64	66	68	70	72	74	76	78	80	82
		Discharge Pressure at Large Service Valve (psig)											
Pressure after Switchover Valve - Suction to Compressor (psig)	135	348	356	364	373	381	390	398	407	416	424	433	442
	128	340	348	356	365	373	382	390	399	407	416	425	434
	121	332	340	348	356	365	373	382	390	399	408	417	426
	114	323	332	340	348	357	365	374	382	391	400	409	417
	107	315	323	332	340	348	357	365	374	383	392	400	409
	100	307	315	323	332	340	349	357	366	375	383	392	401
	93	299	307	315	323	332	340	349	358	366	375	384	393
	86	290	299	307	315	324	332	341	349	358	367	376	385
	79	282	290	299	307	315	324	333	341	350	359	367	376
	72	274	282	290	299	307	316	324	333	342	350	359	368
	65	266	274	282	291	299	308	316	325	333	342	351	360
	58	258	266	274	282	291	299	308	316	325	334	343	352
	51		258	266	274	283	291	300	308	317	326	335	343
	44			258	266	274	283	291	300	309	318	326	335
	37				258	266	275	283	292	301	309	318	327
	30					258	266	275	284	292	301	310	319

Heating Mode		Heating Charge Chart for RHBL-FR24 Matched with 14PJM18											
		Indoor Dry Bulb Temperature (F)											
		60	62	64	66	68	70	72	74	76	78	80	82
		Discharge Pressure at Large Service Valve (psig)											
Pressure after Switchover Valve - Suction to Compressor (psig)	135	301	310	319	327	336	345	355	365	376	386	396	407
	130	298	306	315	324	333	341	351	362	372	382	392	403
	125	294	303	312	320	329	338	348	358	368	378	389	399
	120	291	299	308	317	325	334	344	354	364	374	385	395
	115	287	296	304	313	322	331	340	350	361	371	381	391
	110	284	292	301	310	318	327	337	347	357	367	377	387
	105	281	289	297	306	315	323	333	343	353	363	373	383
	100	277	285	294	302	311	320	329	339	349	359	369	380
	95	274	282	290	299	307	316	326	336	345	355	365	376
	90	270	278	287	295	304	312	322	332	342	352	362	372
	85	267	275	283	292	300	309	318	328	338	348	358	368
	80	263	271	280	288	297	305	315	324	334	344	354	364
	75	260	268	276	285	293	301	311	321	330	340	350	360
	70	256	264	273	281	289	298	307	317	327	336	346	356
	65	253	261	269	277	286	294	304	313	323	333	342	352
	60		257	266	274	282	290	300	309	319	329	339	348
	55		254	262	270	278	287	296	306	315	325	335	345
	50		250	259	267	275	283	292	302	312	321	331	341
	45			255	263	271	279	289	298	308	317	327	337
	40			251	260	268	276	285	295	304	314	323	333
	35				256	264	272	281	291	300	310	319	329
	30				252	260	268	278	287	296	306	316	325

Heating Mode		Heating Charge Chart for RHBL-FR24 Matched with 14PJM24											
		Indoor Dry Bulb Temperature (F)											
		60	62	64	66	68	70	72	74	76	78	80	82
		Discharge Pressure at Large Service Valve (psig)											
Pressure after Switchover Valve - Suction to Compressor (psig)	135	319	327	336	345	354	362	371	380	389	398	407	416
	128	314	322	331	339	348	357	366	375	384	393	402	411
	121	308	317	325	334	343	352	361	369	378	387	396	405
	114	303	311	320	329	338	346	355	364	373	382	391	400
	107	298	306	315	323	332	341	350	359	368	377	386	395
	100	292	301	309	318	327	336	344	353	362	371	380	389
	93	287	295	304	313	322	330	339	348	357	366	375	384
	86	282	290	299	307	316	325	334	343	352	361	370	379
	79	276	285	293	302	311	320	328	337	346	355	364	373
	72	271	279	288	297	306	314	323	332	341	350	359	368
	65	266	274	283	291	300	309	318	327	336	345	354	363
	58	260	269	277	286	295	304	312	321	330	339	348	357
	51	255	263	272	281	289	298	307	316	325	334	343	352
	44		258	267	275	284	293	302	311	320	329	338	347
	37		253	261	270	279	288	296	305	314	323	332	341
	30			256	265	273	282	291	300	309	318	327	336

Heating Mode		Heating Charge Chart for RHBL-FR36 Matched with 14PJM30											
		Indoor Dry Bulb Temperature (F)											
		60	62	64	66	68	70	72	74	76	78	80	82
		Discharge Pressure at Large Service Valve (psig)											
Pressure after Switchover Valve - Suction to Compressor (psig)	135	329	337	345	353	361	369	378	386	395	403	412	421
	128	321	329	337	346	354	362	371	379	387	396	405	413
	121	314	322	330	338	347	355	363	372	380	389	397	406
	114	307	315	323	331	339	348	356	365	373	382	390	399
	107	300	308	316	324	332	340	349	357	366	374	383	392
	100	292	300	309	317	325	333	342	350	359	367	376	384
	93	285	293	301	309	318	326	334	343	351	360	368	377
	86	278	286	294	302	310	319	327	336	344	353	361	370
	79	271	279	287	295	303	312	320	328	337	345	354	363
	72	263	271	280	288	296	304	313	321	330	338	347	355
	65	256	264	272	280	289	297	305	314	322	331	339	348
	58		257	265	273	281	290	298	307	315	324	332	341
	51			258	266	274	283	291	299	308	316	325	334
	44			251	259	267	275	284	292	301	309	318	326
	37				252	260	268	276	285	293	302	310	319
	30					252	261	269	278	286	295	303	312

Heating Mode		Heating Charge Chart for RHBL-FR36 Matched with 14PJM36											
		Indoor Dry Bulb Temperature (F)											
		60	62	64	66	68	70	72	74	76	78	80	82
		Discharge Pressure at Large Service Valve (psig)											
Pressure after Switchover Valve - Suction to Compressor (psig)	135	355	363	371	380	389	397	406	415	424	433	442	
	128	346	355	363	372	380	389	398	407	416	425	434	443
	121	338	346	355	363	372	381	389	398	407	416	425	434
	114	329	338	346	355	363	372	381	390	399	408	417	426
	107	321	329	338	346	355	364	373	381	390	399	409	418
	100	313	321	329	338	347	355	364	373	382	391	400	409
	93	304	313	321	330	338	347	356	365	374	383	392	401
	86	296	304	313	321	330	339	347	356	365	374	383	392
	79	287	296	304	313	322	330	339	348	357	366	375	384
	72	279	287	296	304	313	322	331	339	348	357	367	376
	65	271	279	287	296	305	313	322	331	340	349	358	367
	58	262	271	279	288	296	305	314	323	332	341	350	359
	51	254	262	271	279	288	297	305	314	323	332	341	350
	44		254	262	271	280	288	297	306	315	324	333	342
	37			254	262	271	280	289	298	306	315	325	334
	30				254	263	271	280	289	298	307	316	325

11.0 SEQUENCE OF OPERATION

11.1 COOLING (COOLING ONLY OR HEAT PUMP)

- When the thermostat “calls for cooling,” the circuit between R and G is completed, causing the blower relay (BR) to energize. The N.O. contacts will close, causing the indoor blower motor (IBM) to operate. The circuit between R and Y is also completed: This circuit closes the contactor (CC) in the outdoor unit starting the compressor (COMP) and outdoor fan motor (OFM).

11.2 HEATING (ELECTRIC HEAT ONLY)

- When the thermostat “calls for heat,” the circuit between R and W is completed, and the heater sequencer (HR_1) is energized. The heating elements (HE) and the indoor blower motor (IBM) will come on. Units with a second heater sequencer (HR_2) can be connected with the first sequencer (HR_1) to W on the thermostat sub-base or connected to a second stage W_2 on the sub-base.

11.3 HEATING (HEAT PUMP)

- When the thermostat “calls for heat,” the circuits between R and B, R and Y and R and G are completed. Circuit R and B energizes the reversing valve (RV) switching it to the heating position (remains energized as long as selector switch is in “heat” position). Circuit R and Y energizes the contactor (CC) starting the outdoor fan motor (OFM) and compressor (COMP). Circuit R and G energizes the blower relay (BR) starting the indoor blower motor (IBM).

- If the room temperature should continue to fall, circuit R and W_2 is completed by the second-stage heat room thermostat. Circuit R-W_2 energizes a heat sequencer (HR_1). The completed circuit will energize supplemental electric heat. Units with a second heater sequencer (HR_2) can be connected with first sequencer (HR_1) to W_2 on thermostat or connected to a third heating stage W_2 on the thermostat sub-base. A light on the thermostat indicates when supplemental heat is being energized.

11.4 BLOWER TIME DELAY (HEATING OR COOLING)

- All models are equipped with a blower time delay (BTD) in lieu of a blower relay (BR) (see wiring diagram). The blower will run for 30 seconds after the blower time delay (BTD) is de-energized.

11.5 DEFROST (DEFROST HEAT CONTROL)

- For sequence of operation for defrost controls, see outdoor heat pump installation instructions.
- Supplemental heat during defrost can be provided by connecting the purple (PU) pigtail in the outdoor unit to the W on the thermostat. This will complete the circuit between R and W through a set of contacts in the defrost relay (DR) when the outdoor heat pump is in defrost. This circuit, if connected, will help prevent cold air from being discharged from the indoor unit during defrost.
- For most economical operation, if cold air is not of concern during defrost, the purple wire can be left disconnected. Supplemental heat will then come on only when called for by second stage room thermostat.

11.6 EMERGENCY HEAT (HEATING HEAT PUMP)

- If selector switch on thermostat is set to the emergency heat position, the heat pump will be locked out of the heating circuit, and all heating will be electric heat. Jumper should be placed between W_2 and E on the thermostat sub-base so that the electric heat control will transfer to the first stage heat on the thermostat. This will allow the indoor blower to cycle on and off with the electric heat when the fan switch is in the auto position.

11.7 ROOM THERMOSTAT (ANTICIPATOR SETTING)

See instructions with outdoor section, condensing unit or heat pump for recommended room thermostats.

- On units with one electric heat sequencer (HR_1) (see wiring diagram on unit), heat anticipator setting should be .16.
- On units with two electric heat sequencers (HR_1 & HR_2) (see wiring diagram on unit), heat anticipator setting should be .32 if both are connected to same stage on thermostat. Setting should be .16 if (HR_1 & HR_2) are connected to separate stages.

  NOTE: Some thermostats contain a fixed, non-adjustable heat anticipator. Adjustment is not permitted.
- The thermostat should be mounted 4 to 5 feet above the floor on an inside wall of the living room or a hallway that has good air circulation from the other rooms being controlled by the thermostat. It is essential that there be free air circulation at the location of the same average temperature as other rooms being controlled. Movement of air should not be obstructed by furniture, doors, draperies, etc. The thermostat should not be mounted where it will be affected by drafts, hot or cold water pipes or air ducts in walls, radiant heat from fireplace, lamps, the sun, T.V. or an outside wall. See instruction sheet packaged with thermostat for mounting and installation instructions.

12.0 CALCULATIONS

12.1 CALCULATING TEMPERATURE RISE

- The formula for calculating air temperature rise for electric resistance heat is:

$$\text{Temperature Rise °F} = \frac{3.16 \times \text{Watts}}{\text{CFM}}$$

Where: 3.16 = Constant, CFM = Airflow

12.2 CALCULATING BTUH HEATING CAPACITY

- The formula for calculating BTUH heating capacity for electric resistance heat is:

  BTUH Heating = Watts x 3.412

  Where: 1 kW = 1000 Watts, 3.412 = Btuh/Watt

12.3 CALCULATING AIRFLOW CFM

- The formula for calculating airflow using temperature rise and heating BTUH for units with electric resistance heat is:

$$CFM = \frac{\text{Heating BTUH}}{1.08 \times \text{Temp. Rise}}$$

12.4 CALCULATING CORRECTION FACTOR

- For correction of electric heat output (kW or BTUH) or temperature rise at voltages other than rated voltage multiply by the following correction factor:

$$\text{Correction Factor} = \frac{\text{Applied Voltage}^2}{\text{Rated Voltage}^2}$$

13.0 PRE-START CHECKLIST

PRE-START CHECKLIST	
❍ YES ❍ NO	Is unit properly located, level, secure and serviceable?
❍ YES ❍ NO	Has auxiliary pan been provided under the unit with separate drain? (Units installed above a finished ceiling).
❍ YES ❍ NO	Is condensate line properly sized, run, trapped, pitched and tested?
❍ YES ❍ NO	Is ductwork correctly sized, run, taped and insulated?
❍ YES ❍ NO	Have all cabinet openings and wiring been sealed with caulking?
❍ YES ❍ NO	Is the filter clean, in place and of adequate size?
❍ YES ❍ NO	Is the wiring tight, correct and to the wiring diagram?
❍ YES ❍ NO	Is the unit properly grounded and protected (fused)?
❍ YES ❍ NO	Is the thermostat heat anticipator been set properly?
❍ YES ❍ NO	Is the unit circuit breaker(s) rotated properly “on” up - “off” down?
❍ YES ❍ NO	Are the unit circuit breaker(s) line lug cover(s) in place?
❍ YES ❍ NO	Are all access panels in place and secure?
Refer to outdoor unit installation instructions for system start-up instructions and refrigerant charging instructions.	

14.0 MAINTENANCE

For continuing high performance, and to minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment. Consult your local dealer as to the proper frequency of maintenance and the availability of a maintenance contract

IMPORTANT: Before performing any service or maintenance procedures, see the “Safety Information” section at the front of this manual.

⚠ WARNING

Units with circuit breaker(s) meet requirements as a service disconnect switch, however, if access is required to the line side (covered) of the circuit breaker, this side of the breaker(s) will be energized with the breaker(s) de-energized. Contact with the line side can cause electrical shock resulting in personal injury or death.

14.1 AIR FILTER

Check the system filter every ninety days or as often as found to be necessary and if obstructed, clean or replace at once.

FILTER MAINTENANCE

Have your qualified installer, service agency or HVAC professional instruct you on how to access your filters for regular maintenance.

IMPORTANT: Do not operate the system without a filter in place.

- New filters are available from your local distributor.

14.2 INDOOR COIL - DRAIN PAN - DRAIN LINE

Inspect the indoor coil once each year for cleanliness and clean as necessary. In some cases, it may be necessary to remove the filter and check the return side of the coil with a mirror and flashlight.

It is recommended that upon initial start up and annually thereafter, the coil should be cleaned using an evaporator coil cleaner (Part # 85-401 or equivalent). This will help to insure proper drainage of condensate from the coil assembly.

IMPORTANT: Do not use caustic household drain cleaners, such as bleach, in the condensate pan or near the indoor coil. Drain cleaners will quickly damage the indoor coil.

14.3 BLOWER MOTOR AND WHEEL

Inspect the blower motor and wheel for cleanliness. It should be several years before it would become necessary to clean the blower motor and wheel.

- If it becomes necessary to remove the blower assembly from the unit, see instructions on removal and disassembly of motor, blower and heater parts.
- The blower motor and wheel may be cleaned by using a vacuum with a soft brush attachment. Remove grease with a mild solvent such as hot water and detergent. Be careful not to disturb the balance weights (clips) on the blower wheel blades. Do not drop or bend wheel as balance will be affected.

14.4 LUBRICATION

The blower motor sleeve bearings are pre-lubricated by the motor manufacturer and do not have oiling ports. Motor should be run for an indefinite period of time without additional lubrication.

14.5 BLOWER ASSEMBLY REMOVAL AND REPLACEMENT

Removing the blower assembly is not required for normal service and maintenance. Removal is necessary for replacement of defective parts such as motor, blower wheel. After extended use, removal of the blower assembly may become necessary for a thorough cleaning of the blower motor and wheel.

⚠ WARNING

If removal of the blower assembly is required, all disconnect switches supplying power to the equipment must be de-energized and locked (if not in sight of unit) so the field power wires can be safely removed from the blower assembly. Failure to do so can cause electrical shock resulting in personal injury or death.

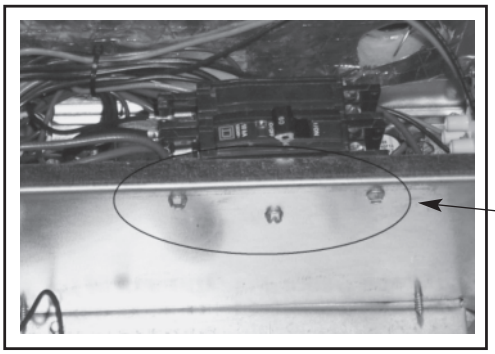
- Mark field power supply wiring (for replacement) attached to terminal block or circuit breaker(s) on blower assembly. Remove wiring from terminal block or circuit breaker(s).
- Mark low voltage control wiring (for replacement) where attached to unit control pigtails on right side of blower housing. Remove wire nuts attaching field control wiring to unit control pigtails.

⚠ WARNING

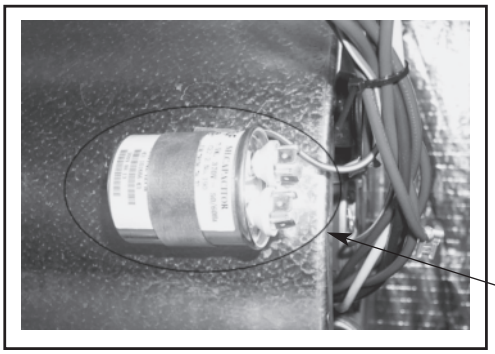
To avoid electrical shock which can result in personal injury or death, use only the screws furnished in the motor shell mounting holds. Screws are #8-18 x .25 in. long blunt nose thread forming. Screws longer than 1/4 in. may contact the motor winding.

14.6 BLOWER MOTOR REMOVAL PROCEDURE (RHAL-FR30,RHAL-FR36, AND RHBL-FR36)

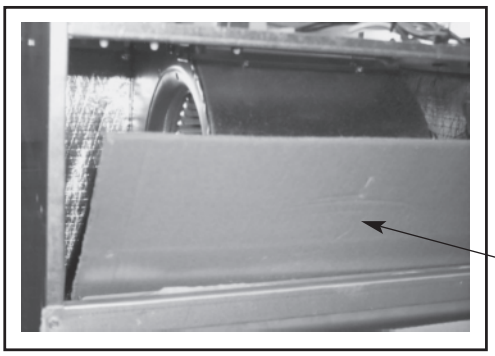
1. Disconnect all power to the air handler.
2. Disconnect all blower motor leads from the control board, capacitor, and speed tap. Reference wiring diagram for more detail.
3. If equipped with a heater kit, remove the 3 screws which attach the breaker/terminal block assembly to the blower shelf. This will help gain access to the screws in step 8. (1/4" Socket)



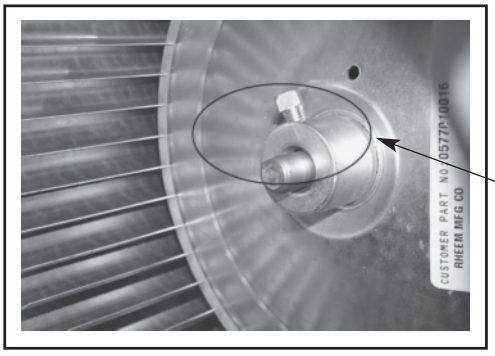
4. Remove capacitor to help prevent damage to the coil. (1/4" Socket)



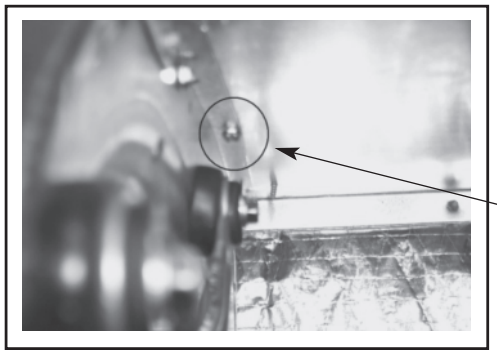
5. Install a 21" x 24" piece of cardboard over the coil as illustrated below to help protect the coil from damage.



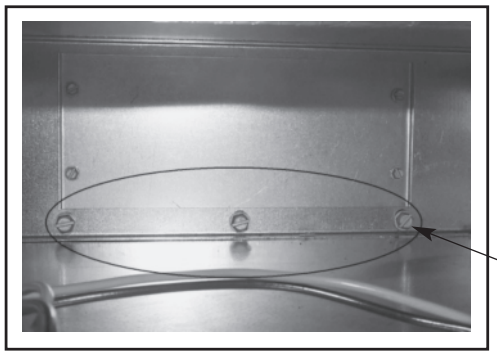
6. Remove/loosen set screw from the hub located on the left side of the blower.



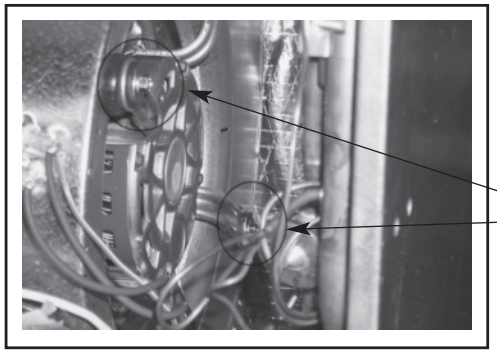
7. Remove the 2 sheet metal screws that attached the blower to the bottom of the blower shelf. (1/4” Socket)



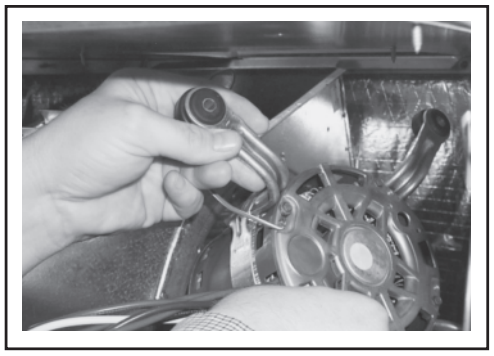
8. Remove the 3 sheet metal screws which attached the blower to the blower shelf located in the air handler control box. (3/8” Socket)



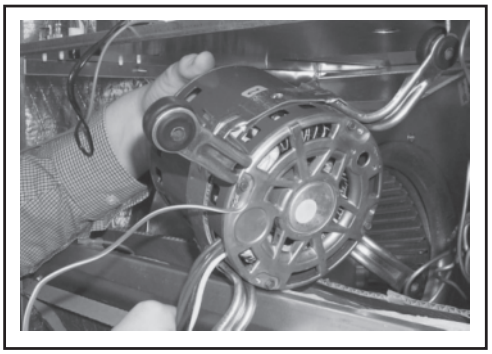
9. Lower the blower and slide the blower to the left side of the air handler.
10. Remove the 4 motor mount screws from the right side of the blower housing. (3/8” Socket)



11. Remove the motor assembly from the blower housing by sliding the motor shaft out of the blower hub.

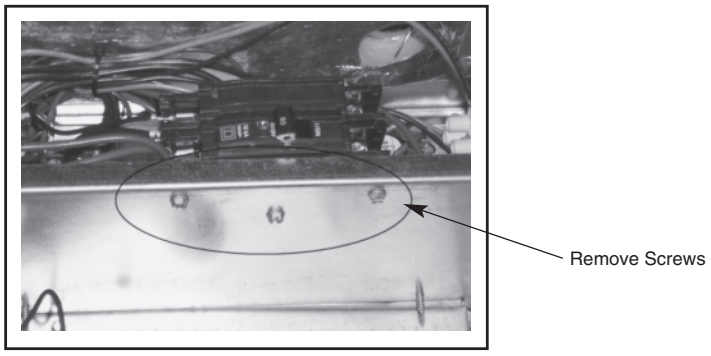


12. Remove the motor assembly from the air handler.

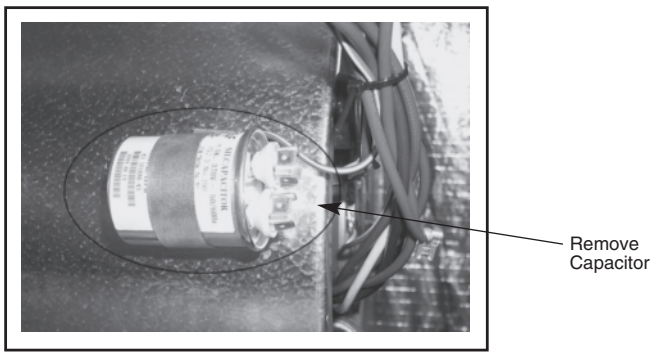


14.7 SMALL CABINET BLOWER ASSEMBLY REMOVAL PROCEDURE (RHAL-FR18, RHAL-FR24, AND RHBL-FR24)

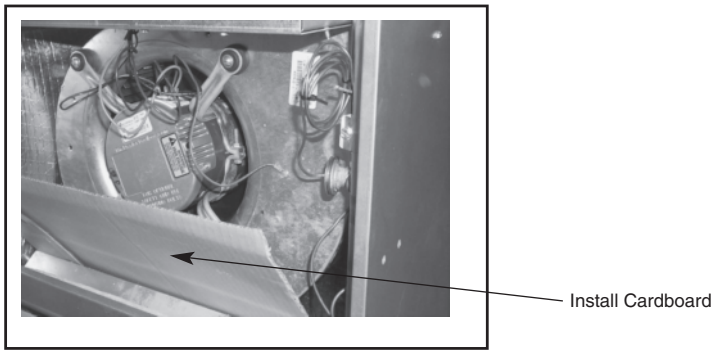
1. Disconnect all power to the air handler.
2. Disconnect all blower motor leads from the control board, capacitor, and speed tap. Reference wiring diagram for more detail.
3. If equipped with a heater kit, remove the 3 screws which attach the breaker/terminal block assembly to the blower shelf. This will help gain access to the screws in step 6. (1/4" Socket)



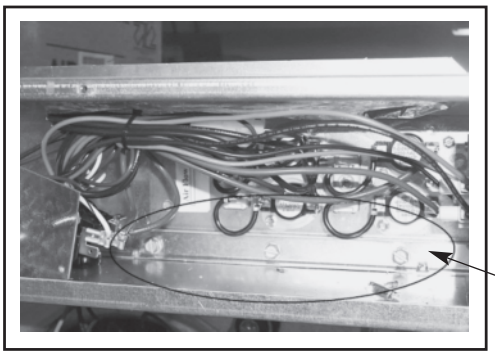
4. Remove capacitor to help prevent damage to the coil. (1/4" Socket)



5. Install an 18" x 20" piece of cardboard over the coil as illustrated below to help protect the coil from damage.



6. Remove the 3 sheet metal screws which attached the blower to the blower shelf located in the air handler control box. (3/8” Socket)

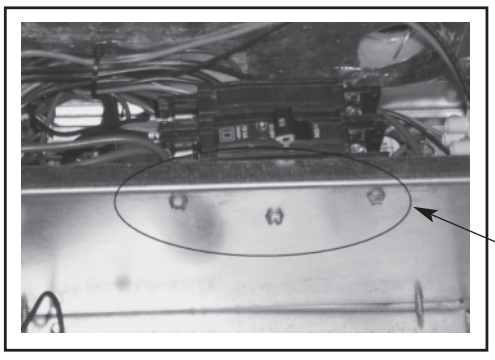


7. Lower the blower and remove from air handler.

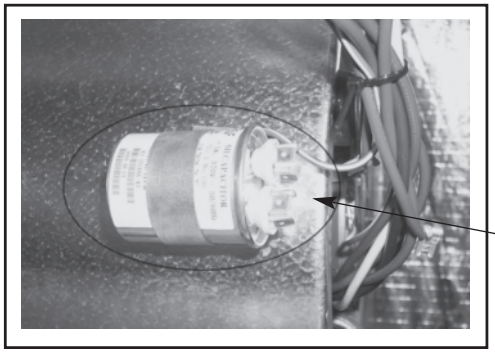


14.8 LARGE CABINET BLOWER ASSEMBLY REMOVAL PROCEDURE (RHAL-FR30, RHAL-FR36, AND RHBL-FR36)

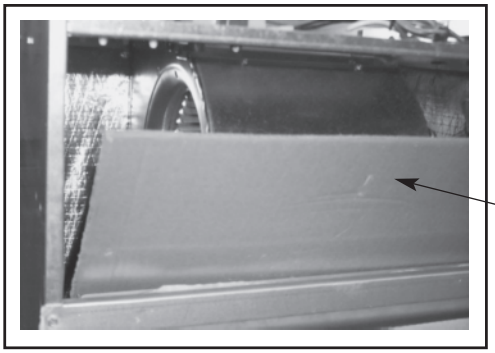
1. Disconnect all power to the air handler.
2. Disconnect all blower motor leads from the control board, capacitor, and speed tap. Reference wiring diagram for more detail.
3. If equipped with a heater kit, remove the 3 screws which attach the breaker/terminal block assembly to the blower shelf. This will help gain access to the screws in step 8. (1/4” Socket)



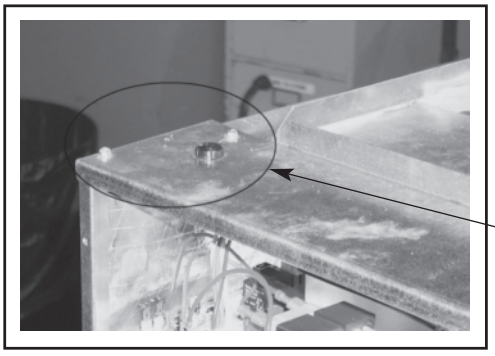
4. Remove capacitor to help prevent damage to the coil. (1/4” Socket)



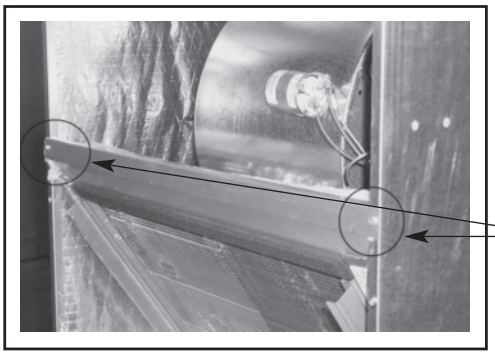
5. Install a 21” x 24” piece of cardboard over the coil as illustrated below to help protect the coil from damage.



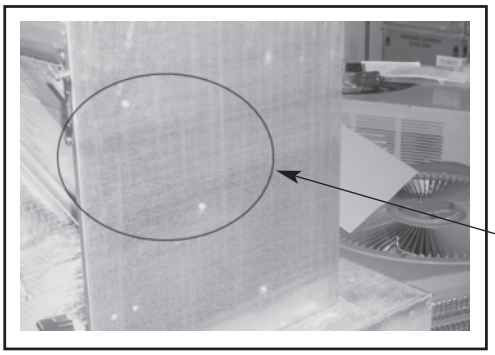
6. Remove the top plate of the air handler by removing the 6 sheet metal screws attaching the plate to the top of the air handler. (1/4” Socket)



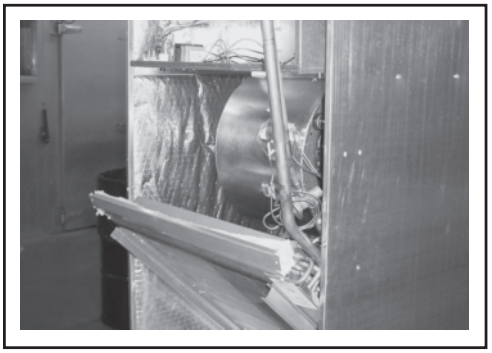
7. Remove 2 sheet metal screws attaching the middle brace to the air handler cabinet. (1/4” Socket)



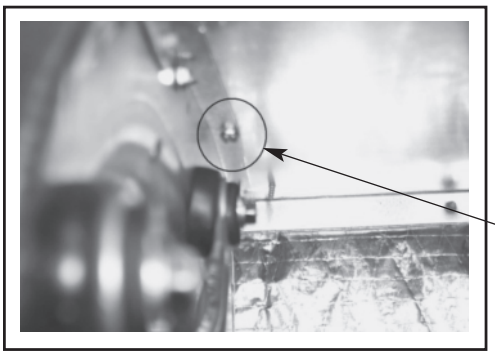
8. Remove 4 sheet metal screws (2 on each side of the air handler)



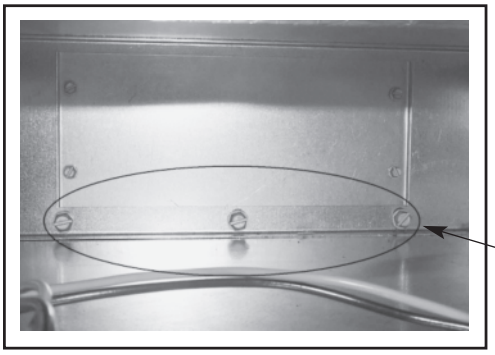
9. Tilt the coil assembly forward. (Note: Depending upon the amount of slack in the refrigerant lines, the system may have to be evacuated and the suction and liquid line of the air handler may have to be uninstalled from the system in order to prevent damage to the refrigerant lines which could result in a total loss of refrigerant)



10. Remove the 2 sheet metal screws that attached the blower to the bottom of the blower shelf. (1/4" Socket)



11. Remove the 3 sheet metal screws which attached the blower to the blower shelf located in the air handler control box. (3/8" Socket)



12. Lower the blower and turn assembly counter clockwise with the motor pointing towards the top of the air handler.



13. Remove the blower assembly from the air handler.



15.0 REPLACEMENT PARTS

Any replacement part used to replace parts originally supplied on equipment must be the same as or an approved alternate to the original part supplied. The manufacturer will not be responsible for replacement parts not designed to physically fit or operate within the design parameters the original parts were selected for.

These parts include but are not limited to: Circuit breakers, heater controls, heater limit controls, heater elements, motor, motor capacitor, blower relay, control transformer, blower wheel, filter, indoor coil and sheet metal parts.

When ordering replacement parts, it is necessary to order by part number and include with the order the complete model number and serial number from the unit data plate. (See parts list for unit component part numbers).

16.0 ACCESSORIES-KITS-PARTS

- **Drain Pan Over Flow Switch RXHK-A01** is used to detect condensate drain blockage and will shut down the outdoor unit in order to prevent structural damage to the surrounding structures of the air handler. This accessory is also available as a factory installed option.

FIGURE 29

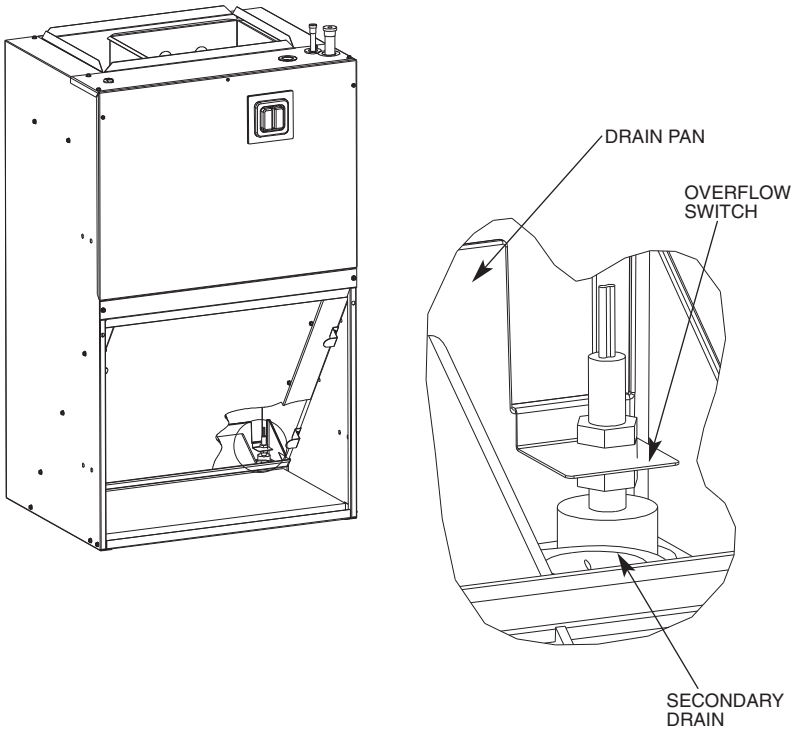
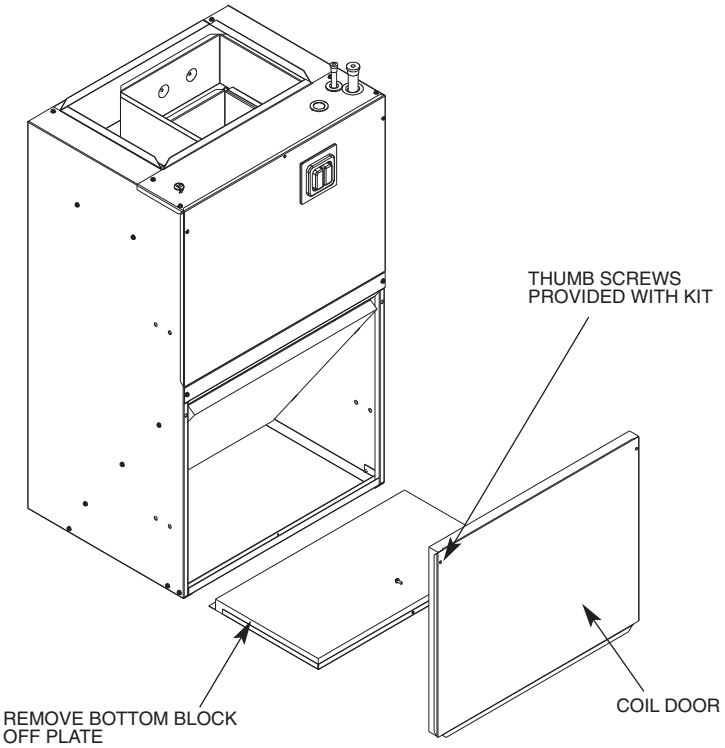


FIGURE 30

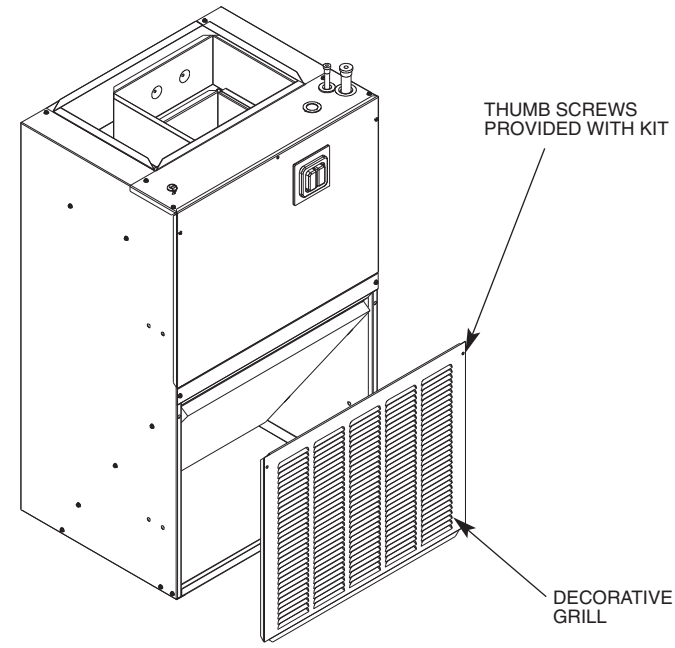


- **Bottom Return Conversion Kit RXHK-** is used to divert the return air from the factory standard front return to a bottom return.

Accessory Number	Indoor Unit
RXHK-C01	RHAL-FR18
	RHAL-FR24
	RHBL-FR24
RXHK-C02	RHAL-FR30
	RHAL-FR36
	RHBL-FR36

- **Louvered Cabinet Grill RXHK-** is used as decorative grill which covers the return air opening of the front return air handler.

FIGURE 31



Accessory Number	Indoor Unit
RXHK-B01	RHAL-FR18
	RHAL-FR24
	RHBL-FR24
RXHK-B02	RHAL-FR30
	RHAL-FR36
	RHBL-FR36

- **Decorative Wall Grill RXHK-D01** is used in applications where the air handler is installed in a closet or interior wall and allows adequate return air back to the unit.

FIGURE 32

