INSTALLATION INSTRUCTIONS

RBHM AIR HANDLER

ELECTRIC HEAT WITH
INDOOR COOLING COIL

RBHM FAN COIL UNIT

WITHOUT ELECTRIC HEAT
WITH INDOOR COOLING COIL

featuring R-410A

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.

c UL us LISTED

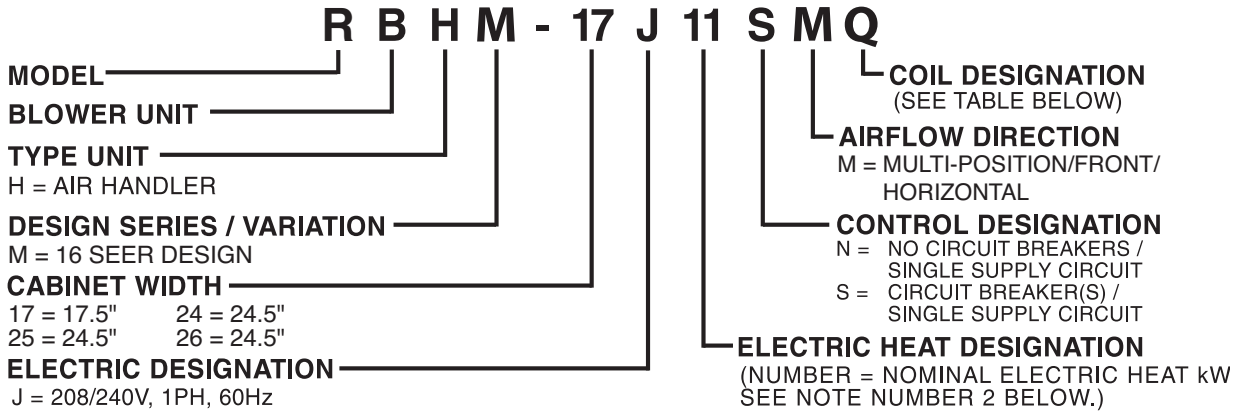
Accredited by the RvA

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

92-20521-30-05
SUPERSEDES 92-20521-30-04

FIGURE 1
MODEL NUMBER EXPLANATION



	J 208/240V 1 PH 60 Hz		Indoor Coil Codes	1) MOTOR 2) BLOWER CFM 1st/2nd STAGE 3) BLOWER WHEEL DIA./WIDTH 4) FILTER SIZE 5) OUTDOOR UNIT
	CONTROL DESIGNATION			
	N	S		
RBHM 17 = 17.5"	00 06 07 11	06 07 11	Q = RCQD-2417AS	1) 1/3 H.P. 2) 600/800 CFM 3) $11^{29}/_{32}$ X $3^{13}/_{16}$ 4) N/A[5] 5) -024
RBHM 24 = 24.5"	00 07 11	07 11	R = RCQD-3624AS	1) 1/2 H.P. 2) 900/1200 CFM 3) $11^{29}/_{32}$ X $7^{1}/_{8}$ 4) N/A[5] 5) -036
RBHM 25 = 24.5"	00 11	11 14 18	S = RCQD-4824AS	1) 3/4 H.P. 2) 1200/1600 CFM 3) $11^{29}/_{32}$ X $9^{1}/_{2}$ 4) N/A[5] 5) -048
RBHM 26 = 24.5"	11	11 14 18 15	T = RCQD-6024AS	1) 1 H.P. 2) 1275/1700 CFM 3) $11^{29}/_{32}$ X $9^{1}/_{2}$ 4) N/A[†] 5) -060

1) RBHM Air Handler cannot be ordered without coil.
2) Electrical heat designation: see electric heat data for actual heater kW represented by number above.
3) Electric heat BTUH = (heater watts + motor watts) x 3.412 (see airflow table for motor watts).
4) †Air handlers with A-coils do not come with a factory installed air filter. External filter rack or other means of filtration is required.

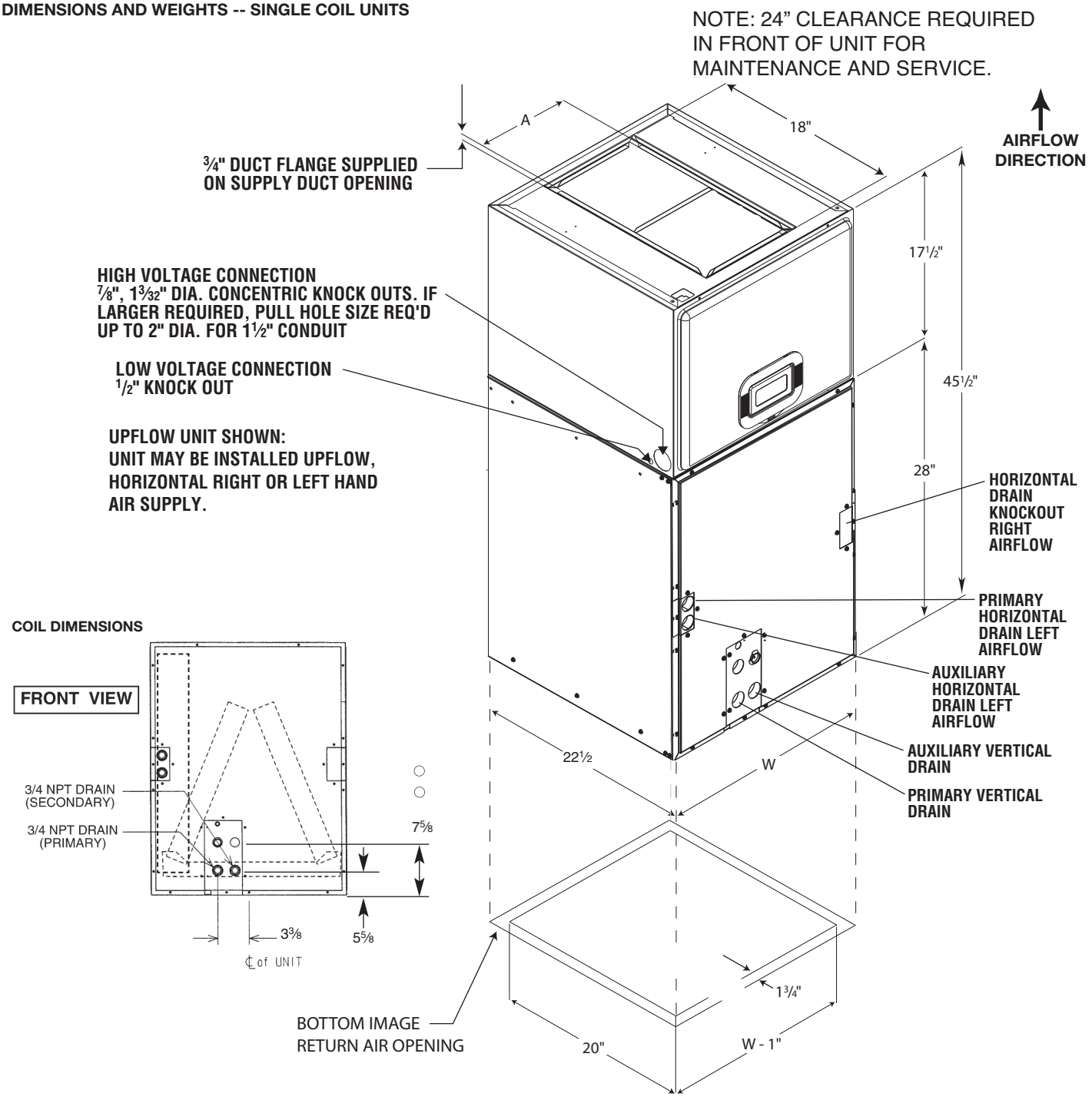
CONTENTS

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. This is particularly important if this is the first installation for this specific model series.

FIGURE 2
DIMENSIONS AND WEIGHTS -- SINGLE COIL UNITS



DIMENSIONAL DATA - FIGURE 2

MODEL	UNIT WIDTH "W" IN.	SUPPLY DUCT "A" IN.	NOMINAL COIL AIRFLOW STAGE 1ST ODD	NOMINAL COIL AIRFLOW STAGE 1ST Normal	NOMINAL COIL AIRFLOW STAGE 2ND ODD	NOMINAL COIL AIRFLOW STAGE 2ND Normal	UNIT WEIGHT / SHIPPING WEIGHT (LBS.)* (MAX. kW.)
RBHM17	17½"	7 9/16"	450	600	600	800	136 / 143
RBHM24	24½"	11¾"	720	900	960	1200	190 / 199
RBHM25	24½"	11¾"	960	1200	1280	1600	196 / 205
RBHM26	24½"	11¾"	1050	1275	1350	1700	197 / 206

SAFETY INFORMATION

⚠ 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.

⚠ WARNING

BECAUSE OF POSSIBLE DAMAGE TO EQUIPMENT OR PERSONAL INJURY, INSTALLATION, SERVICE AND MAINTENANCE SHOULD BE PERFORMED BY A TRAINED, QUALIFIED SERVICE PERSON. CONSUMER SERVICE IS RECOMMENDED ONLY FOR FILTER CLEANING/REPLACEMENT. NEVER OPERATE THE UNIT WITH THE ACCESS PANELS REMOVED.

⚠ WARNING

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

All Rheem 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

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.

⚠ CAUTION

When installing unit over a finished ceiling and/or living space, installation of an auxiliary drain pan under the entire unit, to avoid damage to ceiling, is recommended.

⚠ 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.

⚠ CAUTION

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

- 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 prevent 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 free access to the coil compartment 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., Batterysmarch 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.

GENERAL

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

UNIT CONFIGURATION

All units are modular construction allowing installer to disassemble unit into a 17-1/2" tall blower compartment, and a 28" tall coil compartment for ease of installation, then reassemble in location.

TO DISASSEMBLE:

Remove both access panels and remove six screws holding coil casing to blower unit, lift blower unit from coil casing being careful not to tear insulation.

TO REASSEMBLE:

To attach coil casing to blower unit, make sure 3/4" flanges on back and sides of return air opening of blower casing are bent along perforated edge to inside of casing. Clearance holes in flange should match up with drive holes on inside of blower casing. Make sure 3/4" flanges on coil casing are bent up (back and 2 sides only) on supply air side of coil casing along perforated edge. Do not bend flange on front of coil casing. Set supply air side of coil casing (3/4" flanges) into return air opening of blower casing. Drive screws through stiffening bracket. Replace 6 - #8 screws through flange in coil casing, flange in blower casing and into drive holes on inside of blower casing, two screws in back and two screws in each side. Do not overtighten sheet metal screws.

IMPORTANT: Configure the unit with the indoor coil casing installed on air inlet (return) side of the blower section. Do not try to configure unit with indoor coil on discharge (supply) side of blower section.

CLEARANCES

- All units are designed for “0” inches clearance to combustible material on all cabinet surfaces.
- Units with electric heating kW equal to or less than the values listed in the table do not require supply ductwork clearances or combustible floor bases.
- Vertical units require clearance on at least one side of the unit for electrical conduit. Horizontal units require clearance on either side for electrical conduit. Refrigerant and condensate drain connections are made on the front of the unit.
- All units require 24 inches free access to the front of the unit for service.
- These units may be installed in either ventilated or nonventilated spaces.

VERTICAL UPFLOW AND HORIZONTAL LEFT INSTALLATION

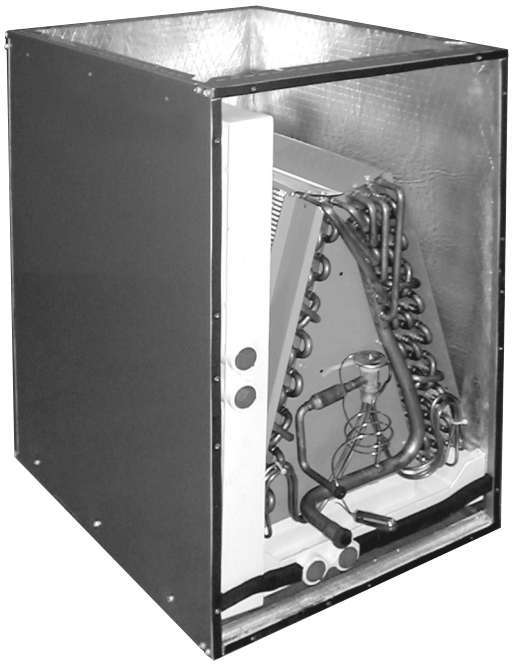
See Figure 3

1. For vertical installation or horizontal left, no modification from current factory configuration is required.
2. Seal the gap around the refrigerant lines with the permagum provided in the parts bag.

   NOTE: The coil is shipped from factory for the vertical or horizontal left position. The coil must be converted for use in horizontal right position.

FIGURE 3
FACTORY SHIPPED COIL INSTALLATION

HORIZONTAL LEFT



UPFLOW

VERTICAL DOWNFLOW

IMPORTANT: The RBHM-series air handlers are not approved for vertical downflow applications.

⚠ CAUTION

Severe condensate blowoff can occur if the RBHM air handler is applied in a vertical downflow application.

HORIZONTAL LEFT INSTALLATION

All RBHM-series air handlers are shipped for vertical and horizontal left applications. Conversion is required for horizontal right applications.

HORIZONTAL RIGHT INSTALLATION

See Figure 4

THE FOLLOWING COIL MODIFICATIONS MUST BE IMPLEMENTED:

1. Remove the entire front panel assembly by removing all necessary screws.
2. Remove the refrigerant access panel from the front panel and reinstall it with the right-hand side mounting holes (see Figure 5).
3. Switch the positions of the left condensate plate and right blank plate on the front panel.
4. Slide the coil outside of the coil box.
5. Remove the vertical bracket on the right side of the vertical drain pan (see Figure 6).
6. Remove the horizontal drain pan and place it on the right side of the coil (see Figure 7).
7. Re-install the vertical bracket on the left side of the vertical drain pan.
8. Remove all screws from the top of the air stop (see Figure 8).
9. Remove the center drain trough by removing the screw located at the back triangular plate (see Figure 8). Ensure glue stays on the bottom of drain trough.
10. Rotate the center drain trough 180°, front to back (see Figure 9).

    NOTE: Failure to properly rotate the center drain trough may permit condensate water to blow off the cooling coil.

FIGURE 4
HORIZONTAL RIGHT INSTALLATION

FIGURE 5
REFRIGERANT ACCESS PANEL

NOTE: WHEN CONVERTING TO HORIZONTAL RIGHT INSTALLATION, USE THE RIGHT-HAND SIDE MOUNTING HOLES IN THE REFRIGERANT ACCESS PANEL

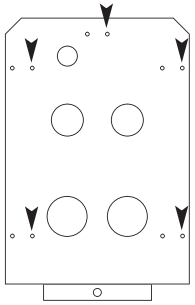


FIGURE 6
VERTICAL BRACKET

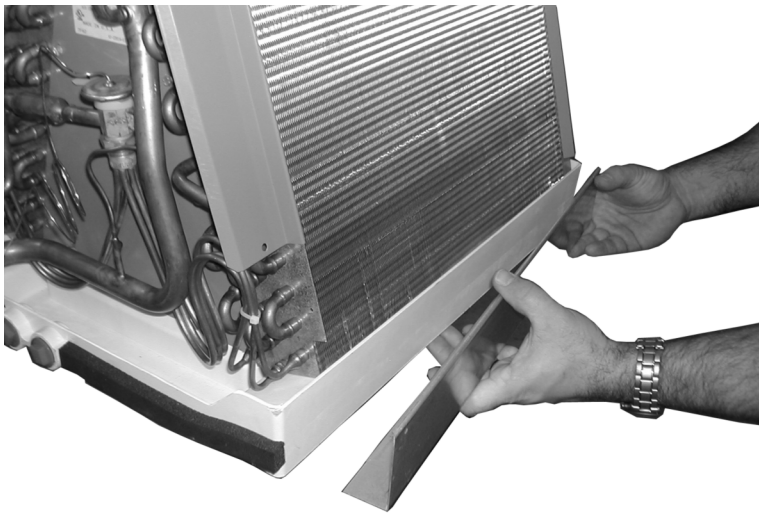


FIGURE 7
DRAIN PAN PLACEMENT

FIGURE 8
AIR STOP SCREWS

FIGURE 9
ROTATE DRAIN TROUGH

FIGURE 10
PERMAGUM APPLICATION

11. Apply permagum supplied in parts bag to underside of drain trough (see Figure 10) in four corners.
12. Re-install the center drain trough and secure it by tightening the screw through the hole located on the front triangular plate. Reinstall the top air stop.

⚠ CAUTION

When reinstalling top air stop, ensure screws do not puncture copper tubing.

13. Replace the coil assembly into the coil box (be sure to align the vertical brackets properly with the side rail), taking care not to tear insulation.
14. Locate TXV sensing bulb and slide it through the universal grommet on the access panel.
15. Reinstall front panel.
16. Seal the gap around the refrigerant lines with the permagum provided in the parts bag.

DUCTWORK

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

⚠ WARNING (SEE SPECIFIC AIRFLOW POSITION FOR ADDITIONAL WARNINGS)

UNITS ARE FOR DUCTED APPLICATIONS ONLY. A MINIMUM OF 36 INCHES OF SUPPLY AIR PLENUM AND DUCTWORK IS REQUIRED. NO SUPPLY AIR OPENINGS, REGISTERS OR FLEXIBLE AIR DUCTS MAY BE LOCATED WITHIN THE FIRST 36 INCHES OF SUPPLY PLENUM AND DUCTWORK ON UNITS WITH ELECTRIC HEATERS. FAILURE TO OBSERVE SUPPLY PLENUM/DUCT WARNINGS CAN CAUSE A FIRE RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

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 on the unit around the blower outlet. Flanges are flat for shipping purposes and must be bent up along perforated edge around blower opening. Be sure to bend flanges completely up so they do not interfere with air being discharged from blower.

IMPORTANT: Flanges around blower opening for attaching supply duct must be bent up out of blower discharge even if not used so they do not restrict airflow from blower.

- Supply plenum should be the same size as the flanges provided around the blower outlet. Ideally, it should extend 3 feet from the unit before turning or branching off plenum into duct runs. The plenum forms an extension of the blower housing and minimizes air expansion losses from the blower. Changing the size, shape or length will degrade blower performance. If supply discharges directly into a larger duct or plenum as much as .1” W.C., static pressure will be lost. If 3 feet is not possible, even 6, 12 or 18 inches will help.

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.

- Some units with electric heaters require 1 in. clearance to supply plenum and branch ducts to combustible material for the first 3 feet from the unit. See CLEARANCES on page 4.
- A 3/4” return duct flange is supplied on all sides of the air inlet opening of the unit coil casing. If the unit is to be installed without a coil casing (no indoor coil), a 3/4”flange is supplied on the back and sides of the air inlet opening of the blower casing. No flange is provided on the front of the opening to the blower casing. If return duct is attached

to the inlet of the blower casing, the front flange of the duct should be run up into the opening or 90° brake made on the front flange to tape to the front of the blower casing.

- **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.
- Return duct flanges on blower or coil casing are flat for shipping purposes and must be bent out along perforated edge around opening.
- 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.

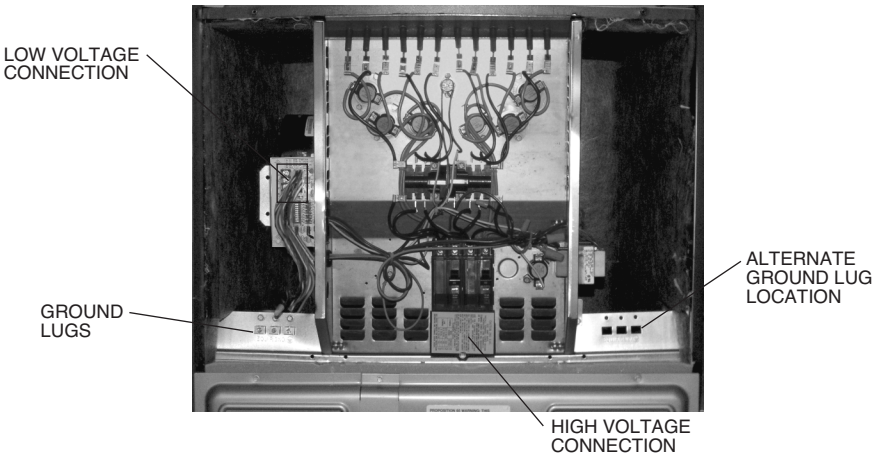
ELECTRICAL WIRING

⚠ WARNING

TURN OFF ELECTRIC POWER AT FUSE BOX OR SERVICE PANEL BEFORE MAKING ANY ELECTRICAL CONNECTIONS. FAILURE TO DO SO CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

Field wiring must comply with the National Electric Code (C.E.C. in Canada) and any applicable local ordinance. See Figure 11.

FIGURE 11
BLOWER COMPARTMENT

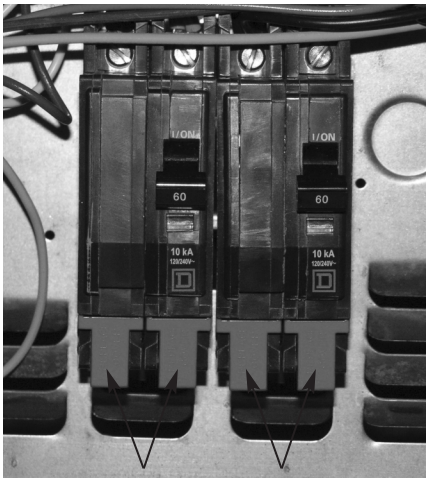


POWER WIRING

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.

- Units with factory installed circuit breaker(s) meet UL and CSA requirements as a service disconnect and should make above requirement for a field installed branch circuit disconnect unnecessary.
- **IMPORTANT:** Units may be equipped with one or two 60 amp. circuit breakers. These breaker(s) protect the internal wiring in the event of a short circuit and serve as a disconnect. Circuit breakers installed within the unit do not provide 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 for ampacity, wire size and circuit protector requirement. Supply circuit protective devices may be either fuses or “HACR” type circuit breakers.
- Power wiring may be connected to either the right or left side (vertical) top or bottom (horizontal). A 7/8”, 1-3/32” dia. concentric knockout is provided for connection of power wiring to unit. If a larger opening is required, dependent upon kW electric heat supplied, pull appropriate size hole required for conduit size being used. Using a conduit hole punch (Greenlee type), center punch using outside cabinet around 7/8” knockout as a template to center punch location and punch desired hole size. Holes may be punched for any size conduit up to a 2” hole for 1-1/2” conduit.
- Power wiring is connected to either the power terminal block or circuit breaker(s) in unit control compartment.
- Single phase units above 10.5 kW may be supplied with circuit breaker(s) requiring separate supply circuits. Units come standard with a jumper bar assembly connecting separate circuits into one single supply circuit.

FIGURE 12
FINGER SAFE COVERS



- Jumper bar assemblies are connected to the line side lugs of the circuit breakers. Jumper bar is assembled for left (upflow) cabinet power wiring entrance. To convert to right (upflow) power entrance: Remove jumper cover, remove jumper bar from circuit breakers, remove screw on back holding left lug in upper hole to bar, reassemble lug in lower hole and retighten screw. Use the same procedure to move the right lug to the upper mounting hole. Reassemble jumper bar into circuit breakers and tighten lugs. Jumper bar is now ready for wiring from the opposite side.
- If a factory supplied jumper bar for single supply circuit is removed from unit to make multiple supply circuits the line side of the individual circuit breakers must be covered with finger safe covers (see Figure 12). (See information on accessories for part numbers.)
- After wiring is complete, make sure finger safe cover(s) are replaced over circuit breaker(s) lugs covering lug where field connections are made. On units with jumper bar, make sure jumper bar cover is replaced and secured in place. Covers provided for jumper bar must have side of cover broken off on the side wiring has been connected so that field supply will clear under appropriate side of cover. Units with circuit breakers must have covers in place to meet requirements as a service disconnect.

TABLE 1
BLOWER MOTOR ELECTRICAL DATA RBHM SERIES

Model Size/Elec. Designation	HP	Voltage	Phase	Hertz	RPM	Circuit Amps	Minimum Circuit Ampacity	Max. Circuit Protector
RBHM-17J	1/3	208/230	1	60	300-1100	3.0 / 2.8	4 / 4	15
RBHM-24J	1/2	208/230	1	60	300-1100	5.0 / 4/3	7 / 6	15
RBHM-25J	3/4	208/230	1	60	300-1100	6.6 / 5.9	9 / 8	15
RBHM-26J	1	208/230	1	60	300-1100	9.4 / 9.1	12 / 12	15

TABLE 2

ELECTRIC HEAT ELECTRICAL DATA RBHM SERIES

Model Elec./KW Designation	PH/HZ	Type Supply Circuit Single Circuit Multiple Circuit*	Heater No./KW @ 240V	Heater KW 208/240 V.	Circuit Amps.	Minimum Circuit Ampacity	Maximum Circuit Protector
RBHM-17J06	1/60	Single Circuit	2/2.5	3.7/4.9	20.6/23.2	26/29	30/30
RBHM-17J11	1/60	Single Circuit	3/3.5	7.9/10.5	40.8/46.6	51/59	60/60
RBHM-24J07	1/60	Single Circuit	2/3.5	5.3/7.0	30.2/33.5	38/42	40/45
RBHM-24J11	1/60	Single Circuit	3/3.5	7.9/10.5	42.8/48.1	54/61	60/70
		Single Circuit	4/3.5	10.5/14.0	55.4/62.7	70/79	70/80
RBHM-24J14	1/60	Multiple Ckt. 1	2/3.5	5.3/7.0	30.2/33.5	38/42	40/45
		Multiple Ckt. 2	2/3.5	5.3/7.0	25.2/29.2	32/37	35/40
RBHM-25J11	1/60	Single Circuit	3/3.5	7.9/10.5	44.4/49.7	56/63	60/70
		Single Circuit	4/3.5	10.5/14.0	57.0/64.3	72/81	80/90
RBHM-25J14	1/60	Multiple Ckt. 1	2/3.5	5.3/7.0	31.8/35.1	40/44	40/45
		Multiple Ckt. 2	2/3.5	5.3/7.0	25.2/29.2	32/37	35/40
		Single Circuit	5/3.5	13.1/17.5	69.6/78.9	87/99	90/100
RBHM-25J18	1/60	Multiple Ckt. 1	2/3.5	5.3/7.0	31.8/35.1	40/44	40/45
		Multiple Ckt. 2	3/3.5	7.9/10.5	37.8/43.8	48/55	50/60
RBHM-26J11	1/60	Single Circuit	3/3.5	7.9/10.5	47.2/52.9	59/67	60/70
		Single Circuit	4/3.5	10.5/14.0	59.8/67.5	75/85	80/90
RBHM-26J14	1/60	Multiple Ckt. 1	2/3.5	5.3/7.0	34.6/38.3	44/48	45/50
		Multiple Ckt. 2	2/3.5	5.3/7.0	25.2/29.2	32/37	35/40
		Single Circuit	6/3.5	15.8/21.0	85.0/96.7	107/121	110/125
RBHM-26J21	1/60	Multiple Ckt. 1	3/3.5	7.9/10.5	47.2/52.9	59/67	60/70
		Multiple Ckt. 2	3/3.5	7.9/10.5	37.8/43.8	48/55	50/60

*Unit shipped from factory wired for single supply circuit. Unit may be field converted to multiple supply circuit.

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.

NOTE: Transformer is factory-wired for 230 volt applications. To convert to 280V, refer to wiring diagram on unit.

- Low voltage control wiring should be 18 AWG color-coded (105°C minimum). For lengths longer than 100 ft. (50 ft. from air handler), 16 AWG wire should be used.
- Control wiring should be routed through 1/2" dia. knockout near power wiring entrance on either left or right side of unit. After opening selected knockout, install bushing (supplied in parts bag) in openings.
- If control wiring is routed through right side (upflow), it must be routed through extruded holes in lower front of blower housing behind power raceway to the left side of blower housing. If routed through left side (upflow), it should be routed through extruded hole in lower front left blower side.
- Field control connections are made to terminals extending from left side of control compartment (upflow position).
- See wiring diagrams attached to indoor and outdoor sections to be connected or to the Typical Low-Voltage Wiring Diagrams section in this manual.

- Do not leave excess field control wiring inside unit, pull excess control wire to outside of unit and provide strain relief for field control wiring on inside of cabinet at point wiring penetrates cabinet.
- Make sure, after installation, separation of control wiring and power wiring has been maintained.

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 (upflow). Lug(s) may be moved to marked locations near wire entrance on right side of unit (upflow), if alternate location is more convenient.
- Use of multiple supply circuits require grounding of each circuit to lug(s) provided in unit.

ECM MOTOR INFORMATION

The ECM (Brushless permanent magnet) motor used on the blower in this product is programmed to operate over a wide range of external static pressures (0.0" - 1.0" W.C.) with essentially constant air flow (CFM). Motor efficiency on ECM type motors is higher than that of P.S.C. type motors normally used on this type product. See air flow performance data tables.

The ECM motor is programmed to provide a "soft" start and stop. On a call for heat or cool, the motor will gradually ramp up to the field selected CFM speed. This eliminates the sudden rush of air and noise normally associated with a P.S.C. type motor. Once the thermostat and blower delay are satisfied, the motor will gradually ramp down as well.

IMPORTANT: Units equipped with ECM motors cannot be used in by-pass zoning applications.

IMPORTANT: Not for use in twinning applications.

IMPORTANT: The A.C. power plug to the blower motor has locking tabs. It has been shown that by applying excessive force to the A.C. cable half of the connector it is possible to force the connector in backwards. It will not seat and "click" properly but will make connection. If A.C. power is applied with the connector reversed the motor will be immediately destroyed. Do not force power plug into motor connector backwards.

NOTE: Because of the harmonic content of the A.C. Line current to the ECM motor a conventional ammeter will not read correct motor amps. Only a true RMS meter will give accurate AMP readings.

IMPORTANT: The flexibility of ECM motors and the fact that this flexibility is contained in programmed memory, not hardware, emphasizes the need for exact motor numbers for replacement motors. Because they all look the same, ECM MOTORS FROM DIFFERENT PRODUCTS OR DIFFERENT MODELS OF THE SAME PRODUCT MUST NOT BE INTERCHANGED.

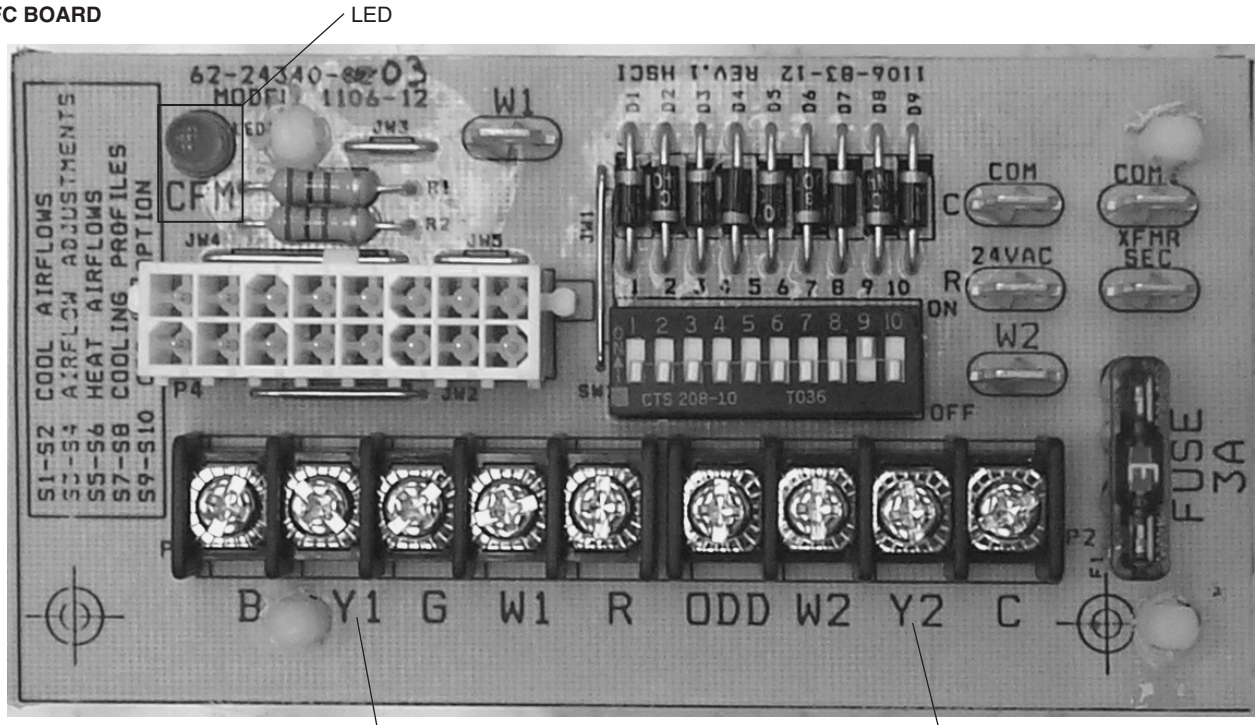
IMPORTANT: If a ECM motor is replaced, for proper motor cooling, it is important that the motor be mounted as the original, as far into the blower wheel as practical.

IMPORTANT: The ECM motor is controlled directly from the room thermostat (no blower relay). In cooling or heat pump heating, the motor is controlled from the thermostat "Y" terminal. When the "Y" or "R" thermostat circuit is opened a 45 second delay will occur before the blower motor will cycle off. In heating with electric heat or aux. electric heat with heat pump the motor is controlled from either the "W1", "W2" or "E" terminals from the thermostat. When the "W1" to "R" thermostat circuit is opened, a 2.5-minute delay will occur before the blower will cycle off. When the "G" to "R" thermostat circuit is opened for low speed blower, there is no "off" delay. All thermostat sub-base combinations as recommended and provided through the Parts Department have been tested and are compatible with the ECM motor used in this equipment. Some thermostats may not be compatible with the ECM motor provided in this unit. With thermostat in off state, the voltage on control lines "G", "Y", W or W2 with respect to 24 vac common should be less than 3.5 VAC. If the measured voltage is too high, thermostat is incompatible with the ECM motor and will cause the motor to run when it should be off.

IMPORTANT: "RXMD-CO2" accessory blower time delay. Blower time delay is programmed into the ECM motor as standard. Do not use "RXMD-C02" blower timer delay on air handlers using ECM motors.

ECM MOTOR INTERFACE CONTROL AND SETTINGS

FIGURE 13
IFC BOARD



The RBHM series air handlers have ECM blower motors, which deliver a constant level of airflow over a wide range of external static pressures (up to 1.0" W.C.). The interface board provides the required communications between the thermostat and the ECM blower motor. The RBHM series of air handlers feature:

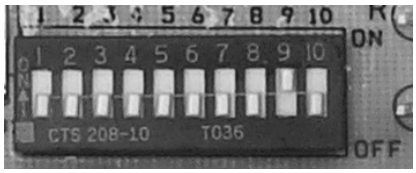
- An automotive-style ATC blade fuse for transformer protection (3 amp).
- An on-board LED to indicate blower CFM.
- Inputs for two-stages of cooling (Y1, first stage cooling; Y2 second stage cooling)
- Four (4) cooling delay profiles

There is a bank of 10 DIP switches on the interface board that define the operation of the ECM motor (see Table 3).

TABLE 3
SWITCH FUNCTIONS

Switch	Function
1 & 2	Cooling Airflow Settings
3 & 4	Cooling Airflow Adjustment
5 & 6	Heating Airflow Settings
7 & 8	Cooling Delay Profiles
9 & 10	On-Demand Dehumidification

FIGURE 14
ECM MOTOR SETTINGS



Refer to Figure 14 for switch identification and factory default settings.

IMPORTANT: Disconnect power to air handler when changing DIP switch positions. Even if blower is not operating, the motor will not recognize changes in DIP switch positions until unit power is removed and then restored.

TRANSFORMER PROTECTION

The ECM interface board is equipped with an automotive-style 3 amp ATC blade fuse for transformer protection. (See Figure 13.) If a short circuit occurs on the secondary side of the transformer, the fuse will open.

USING THE ON-BOARD LED TO DETERMINE BLOWER CFM

The RBHM interface board LED (see Figure 13) indicates blower output by flashing one (1) second for every 100 CFM of airflow. The LED will pause 1/10 second between each flash. After the blower CFM has been displayed, the LED will illuminate dimly for 10 seconds before repeating the sequence. (See Table 4.)

NOTE: If airflow is not a multiple of 100 CFM, the last LED flash is a fraction of a second of 100 CFM.

TABLE 4
LED FLASH CODES

Interface board DIP switch settiings	LED Output
1200 CFM	• Flashes 12 times • Illuminate dimly 10 seconds, repeat sequence
600 CFM	• Flashes 6 times • Illuminate dimly 10 seconds, repeat sequence
950 CFM	• Flashes 9 times, flash once for 1/2 second • Illuminate dimly 10 seconds, repeat sequence

AIR HANDLER OPERATION WITH TWO-STAGE COOLING

The RBHM air handler provides distinct airflows for two-stage cooling. (See Figure 13.) Unit operation is defined as:

• **Y1** – First Stage Cooling

• **Y2** – Second Stage Cooling

A 24VAC signal provides input for the cooling stages.

NOTE: A 24VAC input to the Y2 terminal overrides the input to the Y1 terminal.

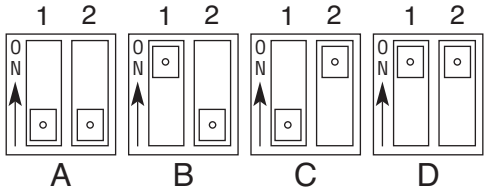
TABLE 5
TWO-STAGE OPERATION

Y1 INPUT	Y2 INPUT	COOLING OPERATION
NONE	NONE	OFF
24 VAC	NONE	1ST STAGE
24 VAC	24 VAC	2ND STAGE

COOLING AIRFLOW SETTINGS

The RBHM-series of air handlers allow a wide range of airflow settings for cooling. Each air handler is factory programmed and shipped with the optimum airflow for cooling performance. These airflow settings are selected via DIP switches 1 & 2 on the interface board. DIP switches 1 & 2 allow the user to tailor the airflow for the particular installation.

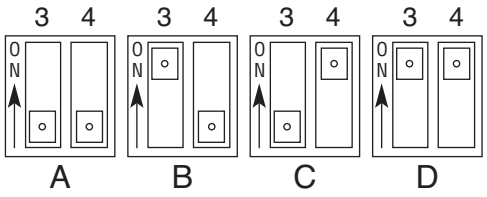
FIGURE 15
FACTORY AIRFLOW SETTINGS



SELECTION	SWITCH 1 POSITION	SWITCH 2 POSITION	COOLING AIRFLOW							
			RBHM-17		RBHM-24		RBHM-25		RBHM-26	
			Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
A	OFF	OFF	600	800	900	1200	1200	1600	1275	1700
B	ON	OFF	600	800	900	1200	1200	1600	1275	1700
C	OFF	ON	600	800	900	1200	1200	1600	1275	1700
D	ON	ON	600	800	900	1200	1200	1600	1275	1700

COOLING AIRFLOW ADJUSTMENTS

FIGURE 16
COOLING AIRFLOW ADJUSTMENTS



SELECTION	SWITCH 3 POSITION	SWITCH 4 POSITION	COOLING AIRFLOW ADJUSTMENT
A	OFF	OFF	NONE
B	ON	OFF	10%
C	OFF	ON	-10%
D	ON	ON	NONE

Cooling airflow may be adjusted +10% or –10% from nominal airflow using switches 3 & 4.

Refer to Figure 16 for switch positions to achieve the desired adjustments in airflow.

NOTE: Continuous fan speed is NOT affected by switches 3 & 4.

IMPORTANT: The use of On Demand Dehumidification overrides the cooling airflow adjustments when high humidity is detected by a dehumidifying thermostat or humidistat when connected to the ODD terminal as shown in Figure 17. Refer to the Cooling Mode Dehumidification section for more information.

FIGURE 17
COOLING "ON" DELAY PROFILES

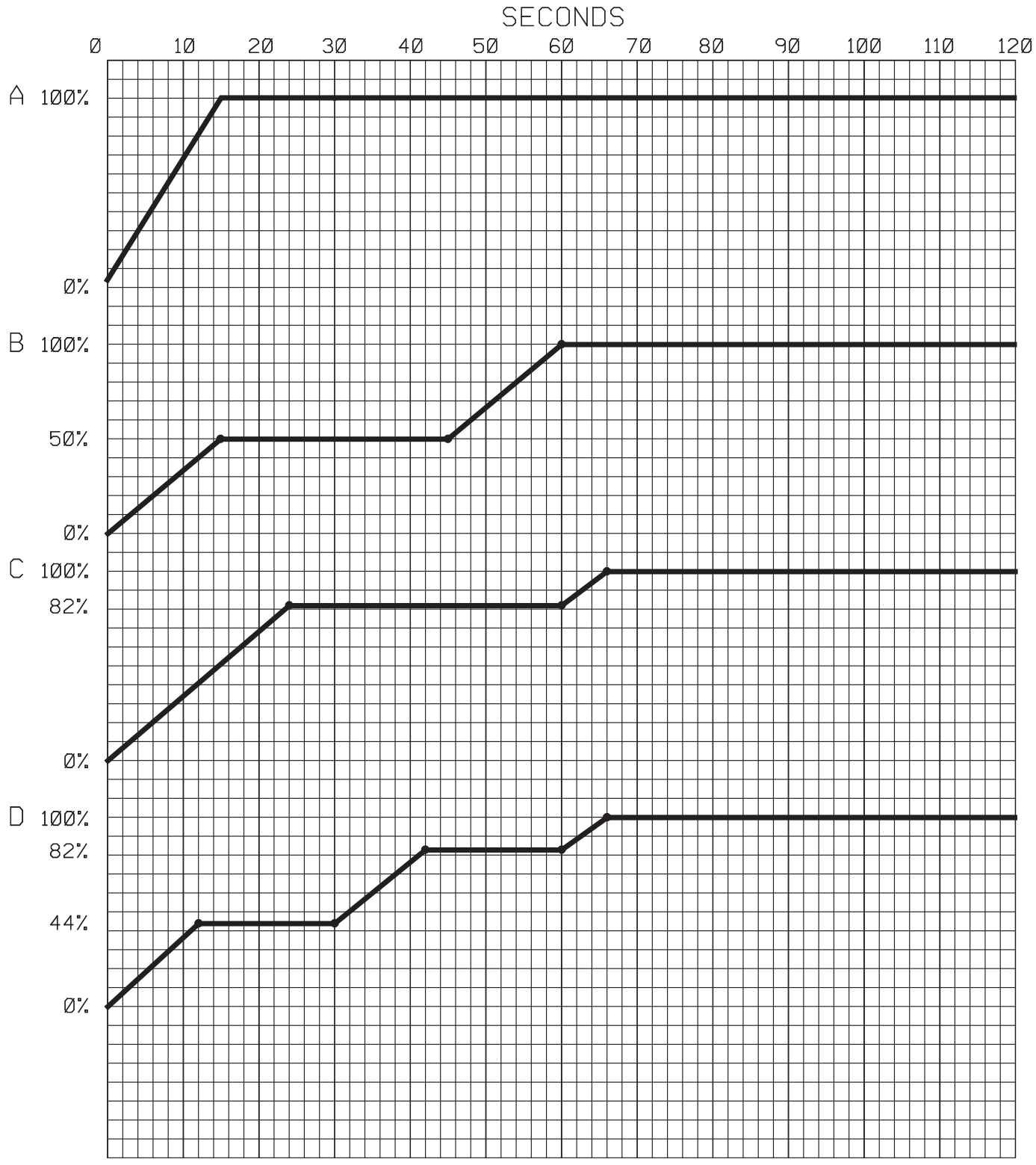


FIGURE 18
RBHM17 "OFF" DELAY PROFILES

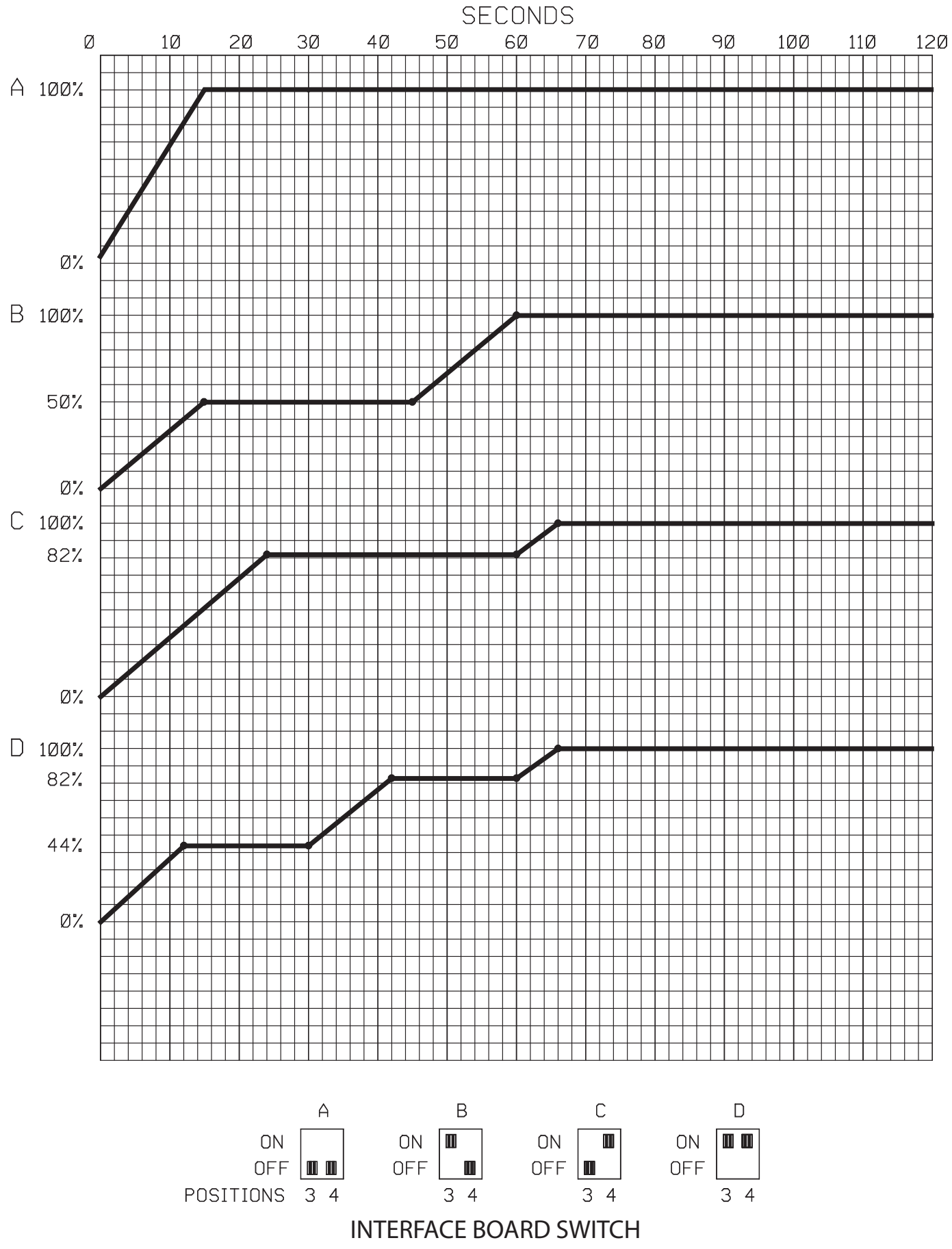
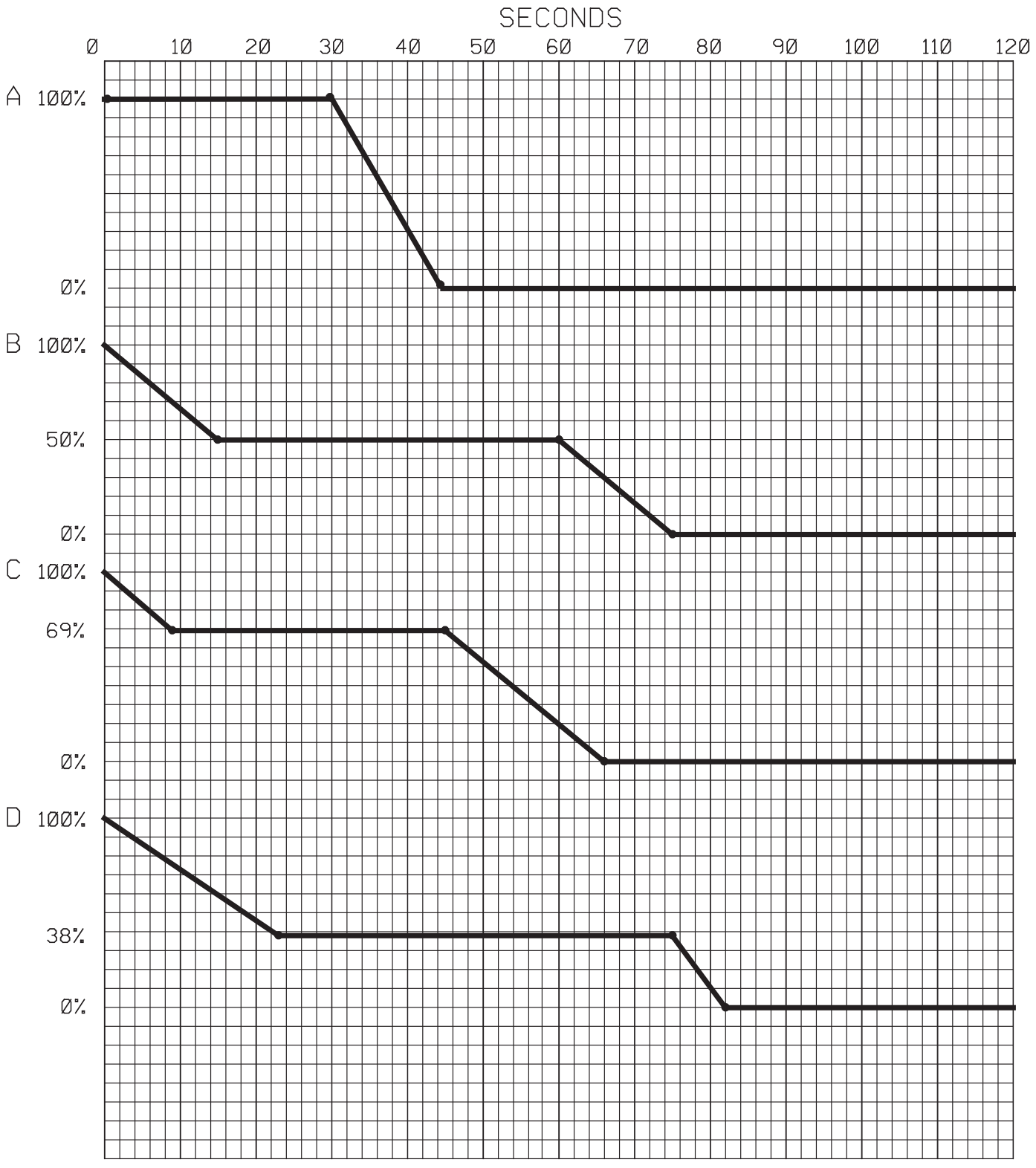
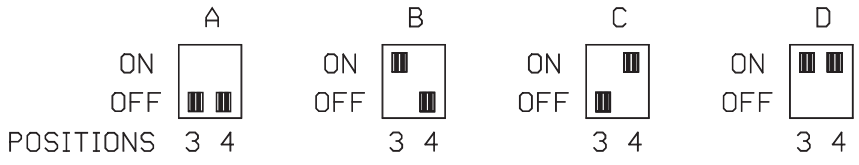


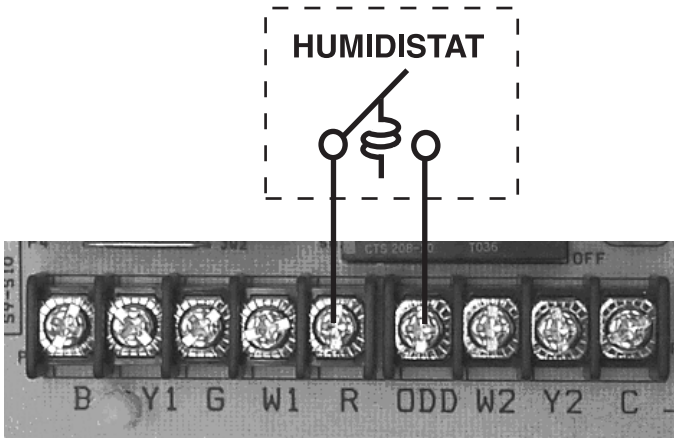
FIGURE 19
RBHM24 & 25 "OFF" DELAY PROFILES





INTERFACE BOARD SWITCH

FIGURE 20
HUMIDISTAT WIRING



ELECTRIC HEATING AIRFLOW

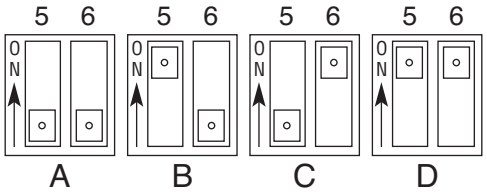
Heating airflow adjustments are available for the RBHM and-series of air handlers. DIP switches 5 & 6 control electric heat airflow levels.

MODEL	MAX Kw	CFM
RBHM-17	11	500
RBHM-24	14	1000
RBHM-25	18	1400
RBHM-26	21	1600

ELECTRIC HEAT AIRFLOW SETTINGS

The RBHM-series of air handler allow a range of airflow setting for electric heat backup. These airflow settings are selected via DIP switches of the interface board.

FIGURE 21



SELECTION	SWITCH 5 POSITION	SWITCH 6 POSITION	ELECTRIC HEAT AIRFLOW ADJUSTMENT			
			BHM-17	BHM-12	BHM-25	BHM-26
A	OFF	OFF	500	1000	1400	1600
B	ON	OFF	500	600	800	800
C	OFF	ON	500	1000	1400	1600
D	ON	ON	500	600	800	800

COOLING DELAY PROFILES

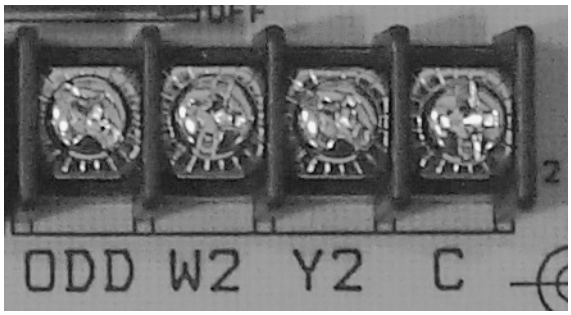
The RBHM air handlers are shipped with a default ON/OFF delay profile for maximum efficiency. This default may be overridden to maximize comfort by using one of the alternate profiles. All RBHM air handlers share common ON delay profiles as shown in Figure 18.

The RBHM-17 uses a unique *OFF* delay profile as shown in Figure 19. The RBHM-24 and RBHM-25 OFF delay profile is shown in Figure 20.

IMPORTANT: Blower *ON* delay profiles are not used in heating mode.

COOLING MODE DEHUMIDIFICATION

FIGURE 22



The first optional 24-volt AC-only input to the interface board is the “On Demand Dehumidification”, ODD, terminal input. The “ODD” terminal input allows the user to have automatic dehumidification in the cooling mode that is controlled by the user’s dehumidifying thermostat or humidistat setting. When the humidity exceeds the humidistat setting, the airflow is decreased by a preprogrammed amount. This results in higher latent capacity and increases the level of comfort.

Use of the On Demand Dehumidification feature is important with the RBHM air handlers. These systems typically have a latent capacity between 23% to 25% of total system capacity. On Demand Dehumidification drops cooling airflow to boost latent capacity without sacrificing total system capacity.

An Explanation of On Demand Dehumidification Terminal Use

The interface board “ODD” terminal input is designed to be used with a dehumidifying thermostat or a traditional humidistat (see Figure 17). For proper operation, the dehumidifying thermostat or humidistat must conform to these conditions:

Refer to the thermostat wiring section of this manual for recommended dehumidifying thermostats.

IMPORTANT: Do not use a dehumidistat. Dehumidistats are not compatible with the interface board. Typical dehumidistats apply a 24V signal when humidity is high and are incompatible with the interface board.

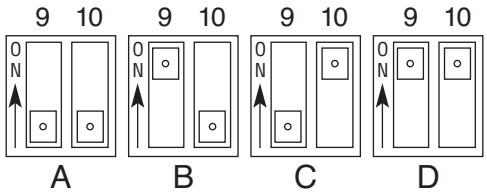
TABLE 6
ODD TERMINAL

INDOOR AMBIENT CONDITION	INPUT TO “ODD” TERMINAL (FROM HUMIDISTAT)
HIGH HUMIDITY	Ø VAC
LOW HUMIDITY	24 VAC

ON DEMAND DEHUMIDIFICATION AIRFLOW ADJUSTMENT

Use switches 9 & 10 to lower cooling airflow as defined in the following table:
IMPORTANT: Selection A turns off the input of the ODD terminal. DO NOT USE SELECTION A WITH A DEHUMIDIFYING THERMOSTAT OR HUMIDISTAT (refer to Figure 28).

FIGURE 23



SELECTION	SWITCH 9 POSITION	SWITCH 10 POSITION	COOLING AIRFLOW ADJUSTMENT
A	OFF	OFF	MAXIMUM LATENT REMOVAL (WITHOUT ODD INPUT)
B	ON	OFF	NONE (FACTORY SETTING)
C	OFF	ON	ON DEMAND DEHUMIDIFICATION1 (WITH ODD INPUT)
D	ON	ON	NONE

TABLE 7

MODEL	SWITCH 9 POSITION	SWITCH 10 POSITION	Y1 CFM	Y2 CFM
RBHM17	OFF	OFF	450	600
RBHM24	OFF	OFF	720	960
RBHM25	OFF	OFF	960	1280
RBHM26	OFF	OFF	1050	1350

EXPLANATION OF ABOVE SELECTIONS:

Selection A: Maximum Latent Removal

This selection lowers cooling airflow to maximize latent removal anytime there is a call for cooling. This selection can be used in environments where there is always a high latent load as in coastal and southern regions of the USA (see Table 7).

NOTE: Use of selection A in arid environments is not necessary and may cause unnecessary power consumption.

Selection B: Factory Setting

This is the factory setting and provides cooling airflows as defined in the COOLING AIRFLOWS section.

Selection C: On Demand Dehumidification

This selection allows On Demand Dehumidification when using a dehumidifying thermostat or humidistat connected to the ODD terminal (as shown in Figure 17). Nominal airflow is reduced by a preprogrammed amount to maximize latent removal. When high humidity is detected, the cooling airflow is:

TABLE 8

CABINET WIDTH	SWITCH 9 POSITION	SWITCH 10 POSITION	ODD INPUT	Y1 CFM	Y2 CFM
RBHM17	OFF	ON	NONE	450	600
			24VAC	600	800
RBHM24	OFF	ON	NONE	720	960
			24VAC	900	1200
RBHM25	OFF	ON	NONE	960	1280
			24VAC	1200	1600
RBHM26	OFF	ON	NONE	1050	1350
			24VAC	1275	1700

IMPORTANT: A humidistat or dehumidifying thermostat MUST be connected to the ODD terminal when using this setting. Refer to the explanation of On Demand Dehumidification terminal use for more information.

Selection D: No Adjustment

This selection is the same as the factory setting and provides cooling airflows as defined in the NOMINAL AIRFLOW ADJUSTMENT section.

ON DEMAND DEHUMIDIFICATION INTERACTIONS WITH AIRFLOW ADJUSTMENT SETTINGS

On Demand Dehumidification switch settings (5 & 6) override the cooling airflow adjustment switch settings (3 & 4). The +/-10% adjustments are turned OFF when Selection A (switch 5 & 6 are OFF) or Selection C (switch 5 OFF; switch 10 ON and no signal to ODD terminal) is used.

AIRFLOW PERFORMANCE

Airflow performance data is based on cooling performance with a dry coil and no filter in place. Select airflow 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 .2" to .5" W.C. external static range. Units with coils should be installed with a minimum of .1" W.C. external static range.

Units without coils should be applied with a minimum of .2" W.C. external static pressure. In general, the indoor motor dip switches should be set as shown in Figure 15 for the appropriate cooling capacity shown, however, at extremes of external static, voltage and number of heaters the higher or lower dip switches may be necessary or more desirable. Always check for proper dip switch settings as units are shipped from the factory for high speed operation.

AIRFLOW PERFORMANCE DATA

Model Tonnage Cabinet Size	Electric Heaters	Blower Motor		CFM RPM WATTS	External Static Pressure - In. W.C.									
		Volts	Thermostat Input		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
RBHM17 **2-ton** -17	3 (Max.)	208	Y1		585 552 59	588 610 76	589 667 93	590 725 110	589 782 127	588 840 144	585 898 161	582 955 179	577 1013 197	572 1070 214
			Y2		792 684 135	795 731 156	797 777 177	798 824 197	797 870 218	795 917 238	791 963 259	786 1009 279	779 1056 299	771 1102 319
		230	Y1		585 557 67	590 615 82	593 673 98	595 731 114	595 788 131	594 846 148	592 904 166	589 961 184	585 1019 203	579 1077 222
			Y2		786 664 131	790 713 151	793 762 172	795 811 193	795 861 214	794 910 236	792 959 258	788 1009 281	783 1058 304	777 1107 328
	None	208	Y1		606 549 60	609 605 77	611 660 95	611 716 112	609 772 129	606 828 146	602 884 163	596 940 179	589 996 196	580 1052 212
			Y2		819 681 136	821 724 156	822 768 175	821 812 194	819 855 213	815 899 232	809 943 251	802 986 270	793 1030 288	782 1074 307
		230	Y1		613 545 55	614 601 74	614 657 93	613 712 111	611 768 129	608 824 146	605 879 163	600 935 179	595 991 195	589 1046 210
			Y2		819 677 139	821 721 156	823 765 173	822 809 191	821 853 210	817 897 230	812 941 249	806 985 270	798 1029 291	789 1073 313
RBHM24 **3-ton** -24	5 (Max.)	208	Y1		870 496 71	876 551 95	881 607 119	883 663 143	883 718 167	881 774 191	877 829 215	871 885 239	863 941 264	852 996 288
			Y2		1147 544 115	1163 598 154	1175 653 192	1183 707 229	1187 762 264	1187 816 298	1183 871 331	1175 925 362	1163 980 391	1148 1034 419
		230	Y1		867 489 74	874 547 98	880 604 122	884 661 147	886 719 172	885 776 198	883 833 223	879 890 249	872 948 275	864 1005 301
			Y2		1139 550 124	1158 604 162	1172 657 198	1182 710 234	1189 764 269	1191 817 302	1189 870 334	1184 924 365	1174 977 395	1160 1030 424
	None	208	Y1		880 451 65	888 506 87	895 560 108	900 615 129	903 670 151	906 725 172	906 779 194	905 834 215	903 889 236	899 944 258
			Y2		1127 514 126	1151 564 153	1171 614 180	1186 664 207	1196 714 235	1202 764 263	1204 813 292	1201 863 321	1194 913 351	1183 963 381
		230	Y1		881 448 63	891 503 83	899 559 104	906 614 126	911 670 149	914 725 172	916 780 196	916 836 222	914 891 247	910 947 274
			Y2		1134 509 124	1158 559 151	1178 610 177	1194 660 205	1205 711 233	1212 761 262	1214 812 292	1213 862 323	1206 913 354	1196 964 386
RBHM25 **4-ton** -24	6 (Max.)	208	Y1		1182 545 133	1184 599 162	1184 653 193	1181 708 223	1177 762 255	1170 816 286	1160 871 319	1149 925 352	1134 979 385	1118 1033 419
			Y2		1554 634 235	1567 680 286	1576 726 333	1583 772 378	1586 818 420	1586 864 460	1583 910 496	1577 956 530	1568 1002 562	1556 1048 591
		230	Y1		1186 546 126	1190 600 162	1191 654 196	1190 709 230	1185 763 264	1179 818 296	1169 872 328	1157 926 359	1143 981 389	1125 1035 419
			Y2		1566 630 241	1579 676 287	1588 722 332	1595 769 376	1598 815 418	1598 861 458	1595 907 497	1589 954 534	1579 1000 571	1567 1046 605
	None	208	Y1		1200 478 117	1202 530 139	1204 582 162	1204 633 186	1204 685 212	1203 737 240	1201 789 269	1198 841 299	1195 893 331	1191 945 364
			Y2		1558 578 220	1571 621 252	1581 664 284	1590 707 318	1597 750 352	1602 792 386	1604 835 421	1605 878 457	1604 921 494	1601 964 531
		230	Y1		1202 480 117	1205 532 140	1207 584 165	1207 636 191	1207 688 217	1206 740 245	1204 792 274	1201 844 303	1197 896 334	1192 948 365
			Y2		1566 583 216	1575 625 250	1583 668 285	1590 711 321	1596 753 356	1602 796 393	1607 839 429	1611 881 467	1614 924 504	1616 967 543

AIRFLOW PERFORMANCE DATA - continued

Model Tonnage Cabinet Size	Electric Heaters	Blower Motor		CFM RPM WATTS	External Static Pressure - In. W.C.									
		Volts	Thermostat Input		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
RBHM26 **5-ton** -26	6 (Max.)	208	Y1		1276 543 144	1278 598 173	1276 652 203	1272 706 233	1264 761 265	1252 815 298	1238 869 331	1220 924 366	1198 978 402	1174 1032 439
			Y2		1707 659 303	1706 701 339	1704 744 376	1699 786 414	1693 829 451	1685 871 488	1674 914 526	1662 957 564	1648 999 602	1632 1042 640
		230	Y1		1289 540 161	1288 595 186	1284 649 212	1277 704 241	1268 758 271	1255 813 303	1240 867 337	1223 922 372	1202 976 409	1179 1031 448
			Y2		1707 669 311	1706 710 350	1704 751 389	1700 793 426	1695 834 464	1689 876 501	1682 917 537	1674 959 573	1664 1000 608	1653 1042 643
	None	208	Y1		1287 496 130	1285 547 152	1282 597 176	1279 648 202	1276 699 229	1273 750 258	1269 801 289	1266 851 321	1262 902 356	1258 953 391
			Y2		1692 630 288	1695 668 316	1697 705 346	1699 742 375	1699 780 406	1698 817 437	1696 854 469	1693 892 502	1689 929 536	1683 966 570
		230	Y1		1294 505 133	1291 555 158	1288 605 184	1285 654 211	1281 704 239	1278 754 267	1274 804 296	1270 854 325	1266 903 356	1261 953 387
			Y2		1699 615 287	1703 655 318	1705 695 349	1706 735 380	1706 775 412	1705 815 443	1703 855 474	1700 895 505	1695 935 536	1691 976 567

FIGURE 24
WHITE-RODGERS 90-SERIES THERMOSTAT

THERMOSTAT USAGE WITH THE RBHM-SERIES OF AIR HANDLERS

A two-stage cooling thermostat is required for proper unit operation.

In applications where additional latent removal (dehumidification) is required or desired, Rheem recommends the use of the White-Rodgers 90-Series thermostat (model 1F95-CA397). This thermostat provides the following functionality when used with the RBHM-series of air handlers connected to the (-)ARL-series of condensing unit:

- Humidity input to the ECM interface control board via the RBHM terminal on the thermostat. Refer to System wiring for proper connections.
- Compressor protection via the L terminal when the Comfort-Alert module on the condensing unit is connected to the L terminal on the thermostat.

COMFORT ALERT

NOTE: Refer to outdoor unit instructions for Comfort Alert information.

RESETTING THE WHITE-RODGERS THERMOSTAT AFTER A HARD LOCKOUT

The White-Rodgers thermostat will automatically reset after a hard lockout once the Comfort Alert trouble code has been cleared.

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.

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

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

Coil is shipped with a low (5 - 10 PSIG) pressure charge of dry nitrogen. Evacuate the system before charging with R-410a refrigerant.

TXV SENSING BULB

IMPORTANT: Do not perform any brazing with the TXV bulb attached to the line.

After brazing operations have been completed, clamp the TXV bulb securely on the suction line at the 2 o'clock position with the strap provided in the parts bag.

FIGURE 25
TYPICAL THERMOSTAT: STD COOLING W / ELECTRIC HEAT

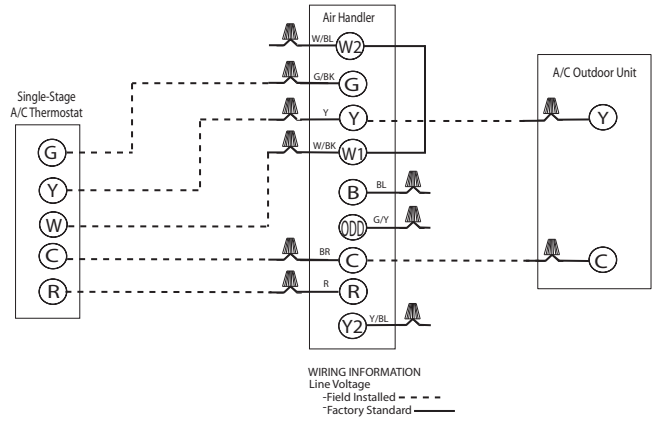


FIGURE 26
TYPICAL THERMOSTAT: STD COOLING W / ELECTRIC HEAT USING A HUMIDISTAT FOR DEHUMIDIFICATION

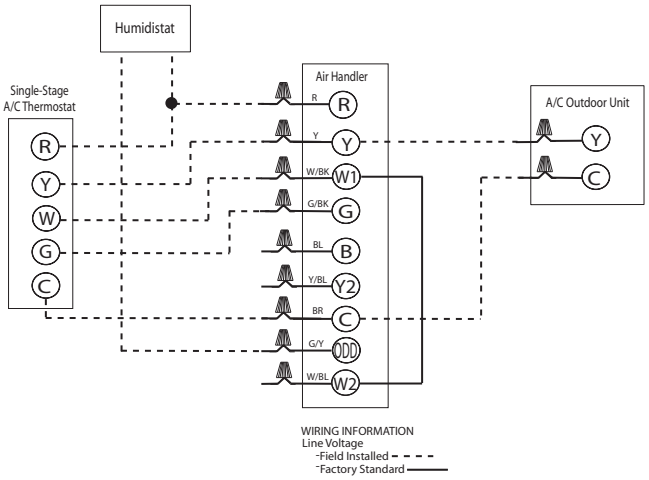


FIGURE 27
TYPICAL THERMOSTAT: STD COOLING W / ELECTRIC HEAT USING A 2-STG DEHUMIDIFYING THERMOSTAT

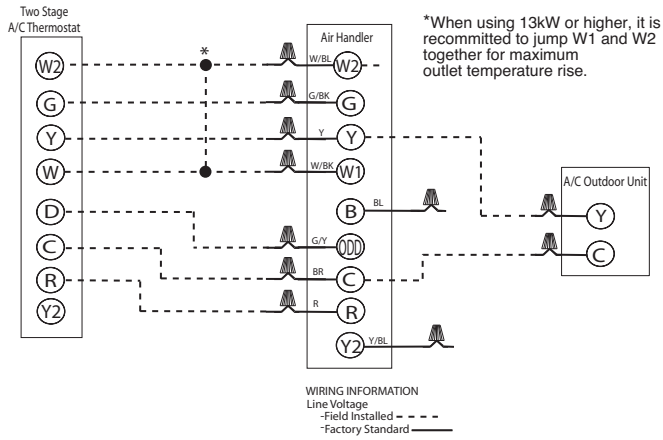


FIGURE 28
TYPICAL THERMOSTAT: HEAT PUMP W / ELECTRIC HEAT

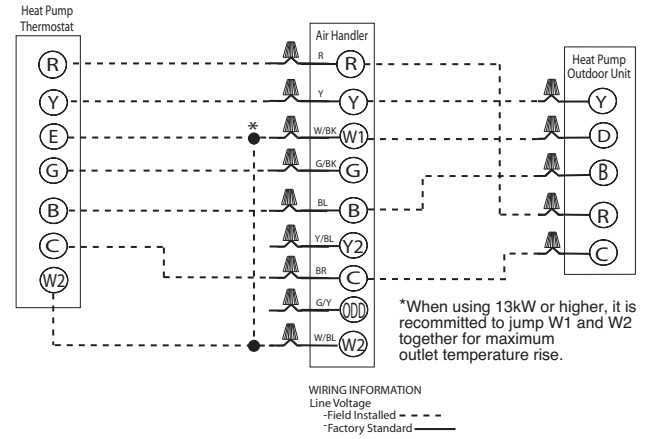


FIGURE 29
TYPICAL THERMOSTAT: HEAT PUMP W / ELECTRIC HEAT USING A HUMIDIFSTAT FOR DEHUMIDIFICATION

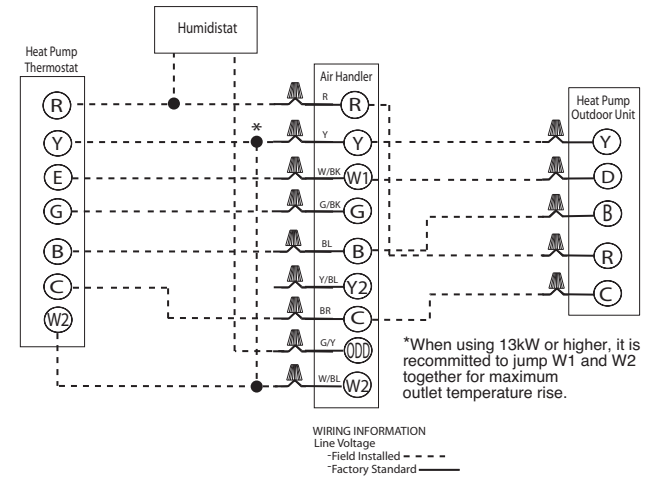
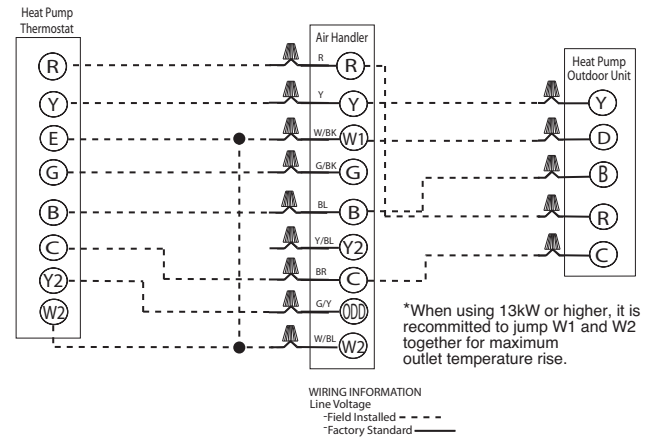


FIGURE 30
TYPICAL THERMOSTAT: HEAT PUMP W / ELECTRIC HEAT USING A 2-STG DEHUMIDIFYING THERMOSTAT



Insulate the TXV sensing bulb and suction line with the provided pressure sensitive insulation (size 4" x 7") and secure with provided wire ties.

NOTE: TXV sensing bulb should be located on a horizontal section of suction line, just outside of coil box.

CONDENSATE DRAIN TUBING

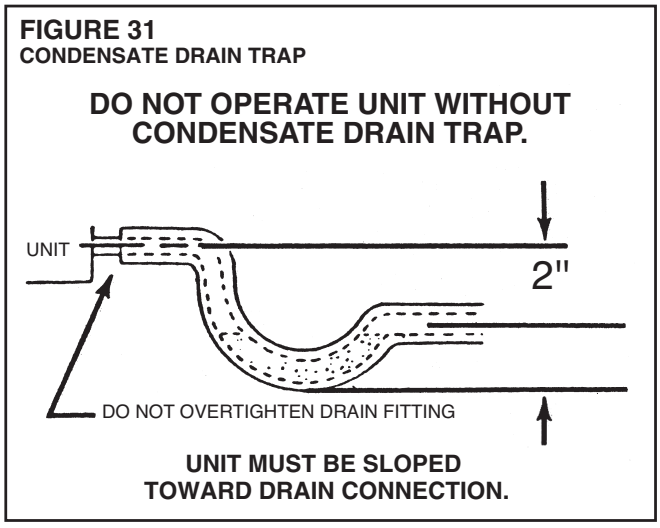
Consult local codes or ordinances for specific requirements.

IMPORTANT: When making drain fitting connections to 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 drain pan.

- Do not reduce drain line size less than connection size provided on condensate drain pan.
- 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 2 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 24).
- Auxiliary drain if used 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.
- Test condensate drain pan and drain line after installation is complete. Pour several quarts of 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.

FIGURE 31
CONDENSATE DRAIN TRAP



AIR FILTER

NOTE: The RBHM air handler does not have an internal filter. A remote filter should be installed in the return air system. It should be sized for a maximum of 300 feet/min. air velocity for the CFM required.

IMPORTANT: Do not operate system without a filter. A filter is required to protect the coil, blower and internal parts from excessive dirt and dust.

SEQUENCE OF OPERATION

Cooling

- When the thermostat "calls for cooling," the circuit between R, G and Y is completed, causing the blower to energize. This circuit also closes the contactor (CC) in the outdoor unit starting the compressor (COMP) and outdoor fan motor (OFM).

Heating (electric heat only)

- When the thermostat "calls for heat," the circuit between R and W_1 is completed, and the heater sequencer (HR_1) is energized. A time delay will follow then: 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. W_1 on the furnace board MUST be connected for heating blower operation.

ROOM THERMOSTAT (ANTICIPATOR SETTING)

See instructions with outdoor section, condensing unit 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.
- 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.

NOTE: Some thermostats, particularly solid-state digital types, contain fixed, non-adjustable heat anticipators and adjustment is not permitted.

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

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

CALCULATING AIRFLOW CFM

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

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

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:

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

PRE-START CHECK

❍ 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	Have the supply duct flanges on the unit been turned up?
❍ 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 indoor coil flowcheck piston and valve size correct?
❍ 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 (fuse)?
❍ 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.

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 “WARNINGS” listed on page 6 of these installation instructions.

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.

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

INDOOR COIL - DRAIN PAN - DRAIN LINE

Inspect the indoor coil once each year for cleanliness and clean as necessary. It is necessary to remove the filter and check the return air side of the coil for debris.

- Generally, the coil can be easily cleaned when it is dry. If the coil is coated with dirt or lint, blow compressed air or nitrogen through the supply side of the coil fins blowing dirt or lint from the return air side of the coil onto the filter or cardboard placed

between filter and coil. Be sure lint and dirt is removed from the filter and return air system.

- If the coil is coated with oil or grease, clean it with a mild detergent and water solution. Rinse the coil thoroughly with clear water. Be careful not to splash water excessively into unit and system.
- Inspect the drain pan and condensate drain at the same time the cooling coil is checked. Clean the drain pan and condensate drain by removing any foreign matter from the pan. Flush the pan and drain tube with clear water.
- If the drain tube is restricted, it can generally be cleaned with high pressure water. Remove the drain line from the unit away from the pan and coil to clear the drain line.

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

BLOWER MOTOR AND WHEEL

Inspect the blower motor and wheel for cleanliness. With the system air filter in place, 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.

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.

TROUBLESHOOTING ECM MOTOR

MOTOR RUNS WHEN IT SHOULD BE OFF

- See above thermostat compatibility with ECM note normal 45 second cooling and 2.5 minute heating delays described above.

MOTOR DOES NOT RUN

- Verify that blower wheel is free and properly tightened on the shaft. Verify line voltage on power connector at motor.
- Be sure all connectors are properly seated. Do not force the power connector. It should snap easily when correctly positioned.
- Put thermostat in continuous fan mode. If motor does not run, verify 24 vac on the “G” to common lines at motor connector.

MOTOR OPERATION IS INTERMITTENT

- Check motor to be sure no water is dripping on or running into it. Verify motor mounting orientation. The wire connectors on motor shell should point straight to the front of the unit. Verify proper drip loops in motor connector cables - If water is found correct source problem.
- Verify all connectors are firmly seated. Gently pull motor connector wires (both ends of cables) individually to be sure they are properly crimped into housings.

MOTOR HESITATES WHEN STARTING

- This is normal operation while the motor is verifying proper rotation direction.

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).

ACCESSORIES-KITS-PARTS

- **Jumper Bar Kit 3 Ckt. to 1 Ckt. RXBJ-A31** is used to convert single phase multiple three circuit units to a single supply circuit. Kit includes cover and screw for line side terminals.
- **Jumper Bar Kit 2 Ckt. to 1 Ckt. RXBJ-A21** is used to convert single phase multiple two circuit units to a single supply circuit. Kit includes cover and screw for line side terminals.

  If a factory supplied jumper bar for single supply circuit is removed from unit to make multiple supply circuits, the line side of the circuit breakers must be covered with finger safe covers. Each circuit breaker pole must be covered with a finger safe cover.
- **Finger Safe Circuit Breaker Cover - Part number 45-23203-01**. One is required for each circuit breaker pole, if jumper bar is removed to provide multiple supply circuits.
- **Filter Bases**

Model Cabinet Size	Filter Size	Filter Width	Part Number
-17	16 x 20	1" or 2"	54-1620-E3
-24	25 x 20	1" or 2"	54-2025-E3
-25	25 x 20	1" or 2"	54-2025-E3