

INSTALLATION AND OPERATION MANUAL

EV450RT



WARNING: TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING RULES:

1. Use the unit only in the manner intended by the manufacturer. If you have questions, call the manufacturer.
2. Before servicing or cleaning the unit, switch power off at service panel or disconnect switch. Lock-out to prevent power from being switched on accidentally. CAUTION: More than one disconnect switch may be required to de-energize the equipment for servicing.
3. When connecting this unit to heating or air-conditioning equipment, follow the heating equipment manufacturer's guidelines and safety standards such as those published by the National Fire Protection Association (NFPA), the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and local code authorities.
4. Do not connect this unit to fume hoods or collection systems for toxins.
5. Installation and electrical work must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction codes and standards.
6. When cutting or drilling into wall or ceiling locate existing electrical wiring and other hidden utilities to prevent wiring from being damaged.
7. This unit must be grounded.

CAUTION

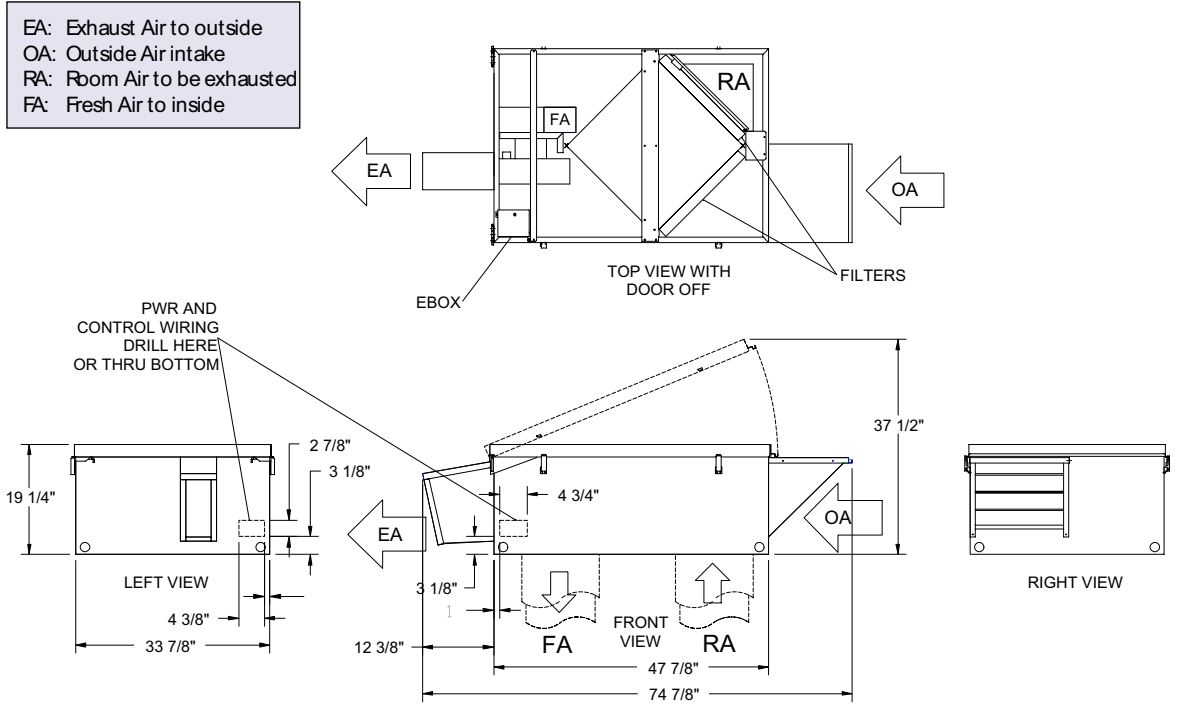
1. For general ventilating use only. Do not use to exhaust hazardous or explosive materials and vapors.
2. To avoid motor bearing damage and noisy and/or unbalanced impellers, keep drywall spray, construction dust, etc., off power unit.
3. This installation manual shows the suggested installation method. Any structural alterations necessary for installation must comply with all applicable building, health, and safety code requirements.

Quick Guide

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Units should be installed by properly licensed contractor(s) according to local code requirements.

DIMENSIONS



Specifications

| Ventilation Type: Static Plate, Heat and Humidity Transfer | | | |
|---|----|--------|---------|
| Typical Airflow Range: 240-550 CFM | | | |
| ARI 1060 Certified Core: One L85 | | | |
| Airflow Rating Points (for ARI): 450 CFM and 338 CFM | | | |
| Motors: One, 0.6 hp(Single Phase) One, 0.5hp(Three Phase) | | | |
| Field Selectable Voltage | | | |
| V | HZ | Phase | FLA |
| 115 | 60 | Single | 7.0 |
| 208-230 | 60 | Single | 3.5 |
| 208-230 | 60 | Three | 1.7-1.5 |
| 460 | 60 | Three | 0.8 |
| Control Voltage: Use line voltage controls, or use optional contactor kit | | | |
| Filters: T wo total, 30/30, 2" pleated, 14" x 20" nominal size | | | |
| Weight: 170 lbs (unit), 240 lbs (on pallet) | | | |
| Shipping Dimensions: 48" W x 90" L x 25" H (on pallet) | | | |

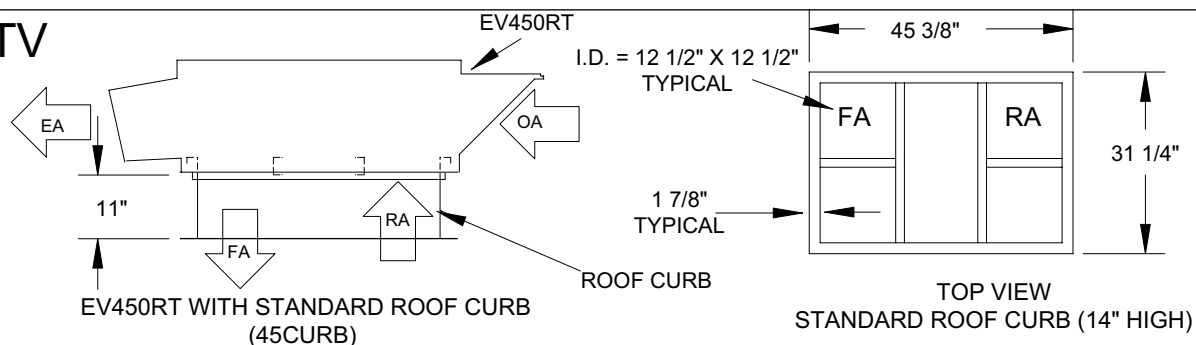
Performance

| Airflow CFM | ESP in. H ₂ O | Watts | | Temp EFF% | Total EFF% Winter/Summer* |
|-------------|--------------------------|-------|-----|-----------|---------------------------|
| | | 1P | 3P | | |
| 240 | 1.00 | 360 | 243 | 80 | 72/56 |
| 338 | 0.85 | 395 | 313 | 76 | 68/50 |
| 380 | 0.75 | 408 | 345 | 75 | 67/48 |
| 450 | 0.50 | 428 | 412 | 72 | 64/44 |
| 500 | 0.25 | 440 | 461 | 71 | 62/41 |
| 550 | 0.00 | 452 | 516 | 69 | 61/39 |
| 600 | -0.25 | 463 | 572 | 67 | 59/37 |

*At ARI 1060 standard conditions
 (See certified data for core components.)

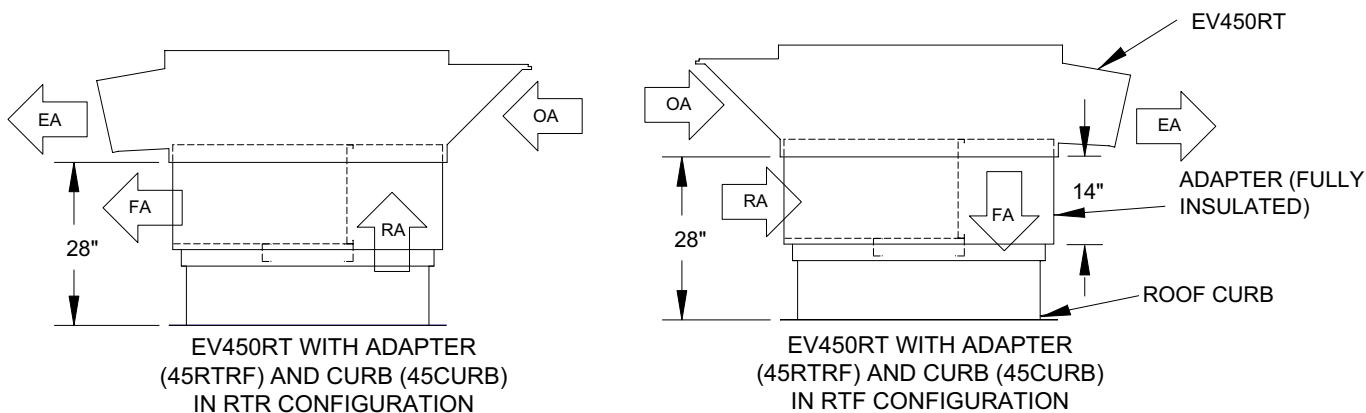
ACCESSORIES

RTV



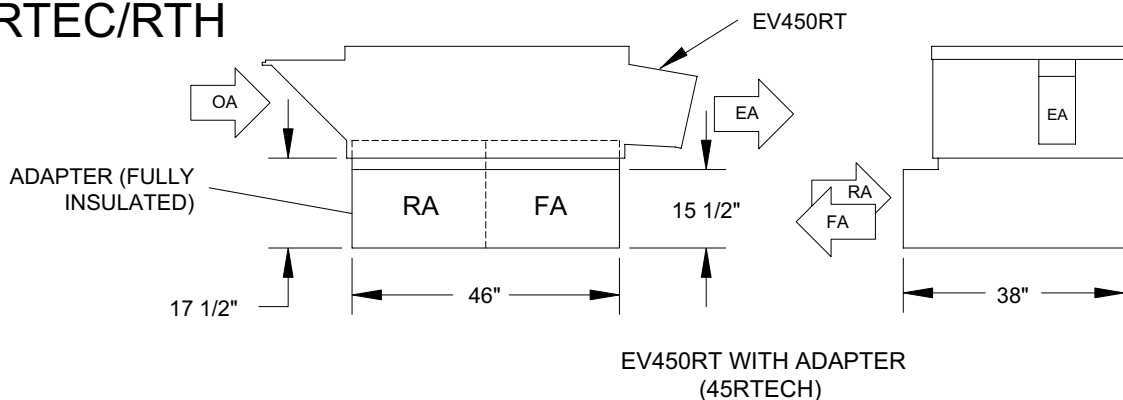
Standard Roof Curb Shown (available option).
Curbs for sloped roofs or metal roofing are available on a custom basis from RenewAire or from local curb fabricators.

RTR/RTF



For horizontal connection of either the Fresh Air duct or the Return Air duct, stack the optional RTF/RTR Adapter on the Standard Roof Curb. Duct connection may be cut into adaptor in a variety of locations.

RTEC/RTH



The RTH/RTEC Adapter allows horizontal connection of both the Fresh Air and the Return Air ducts. It is also possible to connect the adapter directly to the return plenum of most Rooftop Units (openings must be cut into RTU).

EA: Exhaust Air to outside
OA: Outside Air intake
RA: Room Air to be exhausted
FA: Fresh Air to inside

LOCATION

The EV450RT is designed for installation on a roof or other outside location. Select a location that is central to the inside duct runs, and close to any other air handler that might be part of the system. The fresh air inlet should be at least 10' away from exhausts such as dryer vents, chimneys, furnace and water heater exhausts, or other sources of contamination or carbon monoxide. Provide service access to the unit to allow for cleaning the core and filter.

DUCTING

BASIC REQUIREMENTS

- You must always connect an RA and an FA duct to each Rooftop units.
- With RTV units, both ducts are inside the building. In all other units, at least one of the ducts is outside and must be weatherized.
- Any weatherized duct must be thermally insulated to prevent condensation on the inside or outside of the duct. The duct lining must be vapor-sealed, and the duct exterior must be raintight.
- With Rooftop units, you cannot interchange the RA and FA ducts.

DUCT LAYOUT OPTIONS

The duct system for the ERV can be either:

- Wholly separate from the building's ductwork (stand-alone);
- Wholly dependent on the building's ducts; or
- A hybrid of the two.

Stand-alone systems don't rely on the operation of the building's heating and airconditioning system to distribute the fresh air. Because ventilation delivery is the system's only requirement, it can be designed for maximum ventilation effectiveness.

Systems that rely on the existing air distribution system are less expensive to install. In addition, the fresh air is always passed through the heating or cooling equipment for further tempering to room conditions.

Connecting Ducts to Unit

The basic unit has a Room Air (RA) inlet and Fresh Air (FA) outlet on the underside of the unit. The nominal duct size for connection to the underside of the unit is 10" x 10".

See previous page for available Curb or Adapter, which are usually used to complete the installation.

It is important to connect the ducts to the correct Curb or Adapter compartment.

SOUND ATTENUATION

General Practices

The EV450RT is a quiet unit. However, it is good practice to take standard steps to minimize sound transmission.

- Outside the building:
The exhaust hood is the primary source of noise outside the building. When practical, orient the exhaust air hood to point away houses or public areas.
- At the Curb:
Cut the holes in the roof deck to fit closely around the duct(s) passing through the roof deck. Seal all gaps around the duct(s).
- Ducts:
Make sure the ductwork at the unit outlets is stiff enough to resist the flexure and resulting booming associated with system start-up and shut-off, as well as the turbulent flow conditions at the blower outlets.

In general, provide smooth transitions from the ERV's outlets to the duct. The ducts connecting to the outlets should be straight for a sufficient distance, with cross-section gradually changing to meet the main body of the duct.

Radiated Noise

The EV450RT is insulated with high-density fiberglass (as are the Adapters). This provides some attenuation of radiated sound. Radiated sound power data is not available for the EV450RT at this time.

Aerodynamic (Velocity) Noise

When sound attenuation is a design concern, the primary consideration is velocity noise at the unit's Fresh Air blower outlet.

The average velocity at the blower outlet is 2800 FPM when the unit is operating at 450 CFM.

The average velocity at the Exhaust Hood outlet is 1370 FPM when the unit is operating at 450 CFM.

WIRING

WARNING: Danger of Electrical Shock when servicing an installed unit.

ALWAYS DISCONNECT POWER SOURCE BEFORE SERVICING! More than one disconnect switch may be required.

Proper Wiring Size Selection and Wiring Installation are the Responsibility of the Electrical Contractor.

POWER SUPPLY

BRINGING POWER TO UNIT

WARNING! Before Proceeding:

Check Unit Nameplate to confirm it matches the voltage and phase of the power you are supplying. Remember that your field connections need to be accessible for inspection.

Remove both access panels to the electrical box.

Two 7/8" holes or knock-outs are provided in the bottom of the electrical box. These may be used to bring power into the unit through a curb, where allowed.

It is also possible to bring wiring into the unit through the sides of the electrical box. This is allowed only in the area below the electrical boxes' inner wall, and above the bottom panel. This area is marked on the unit. (see below)

Connect power supply to black power pigtails. In Single Phase Units, one is marked with white tape. If supplying 115V power, connect neutral to pigtail marked with white tape. Otherwise, remove white tape.



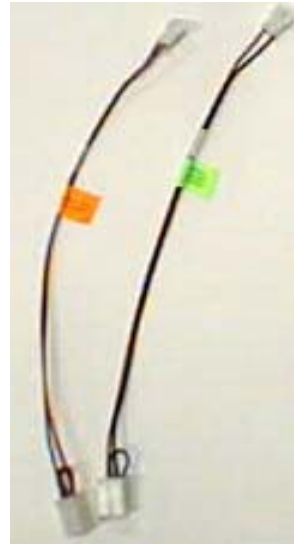
A Contactor Accessory, the 45CONT, is available. This allows for remote switching of the unit with a different voltage and circuit. Instructions for installation are included with the accessory.

Note if installing 45CONT:

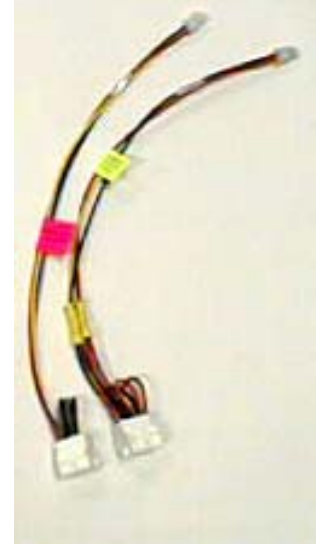
All field-connected wire in the unit (including control circuit wire) must have a minimum insulation rating of 300V for units supplied with 115, 208, or 230V power; 600V for units supplied with 460V power.

INSTALL VOLTAGE ADAPTER

One of these must be installed.



Single Phase



Three Phase

EV450RT Units require field-setting of the blower's operating voltage. Follow these steps:

1. Completely remove the unit access panel (roof).
2. Open the unit's electrical box and find the two loose wiring harnesses. These are the "voltage adapters" (see picture
3. Determine voltage of the power supply for the unit.
4. Install the voltage adapter. The adapter connects the motor power pigtail to the plug on the electrical box wall (see picture below). Discard the other harness.



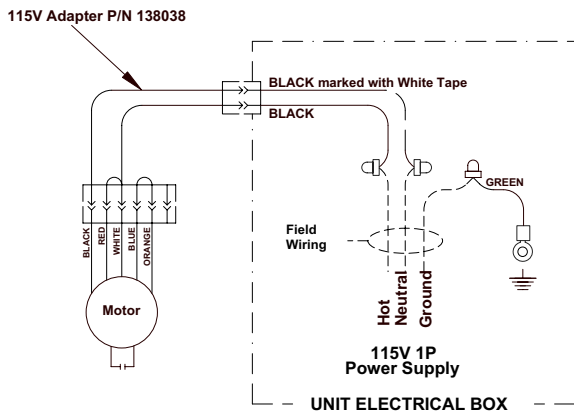
WIRING SCHEMATICS

See page 2 for additional electrical data

EV450RT WIRING SCHEMATIC For SINGLE-PHASE UNITS Without Contactors Field Wires 300V Insulation Rating Minimum

Wiring to 115VAC 1P

Set voltage by connecting 115V voltage adapter as shown.
115V only -- Neutral is marked with White Tape.

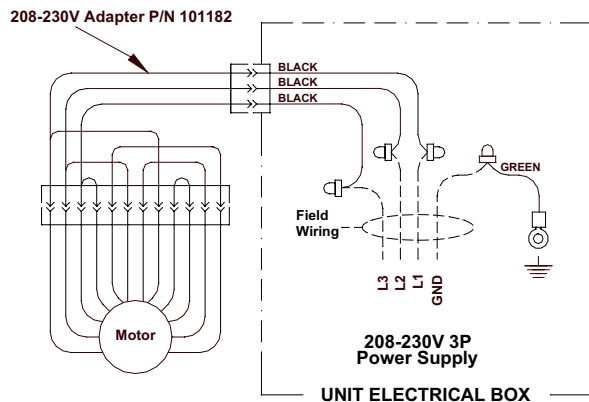


UNIT MOTOR COMPARTMENT

EV450RT WIRING SCHEMATIC For THREE-PHASE UNITS Without Contactors Field Wires 600V Insulation Rating Minimum

Wiring to 208-230VAC 3P

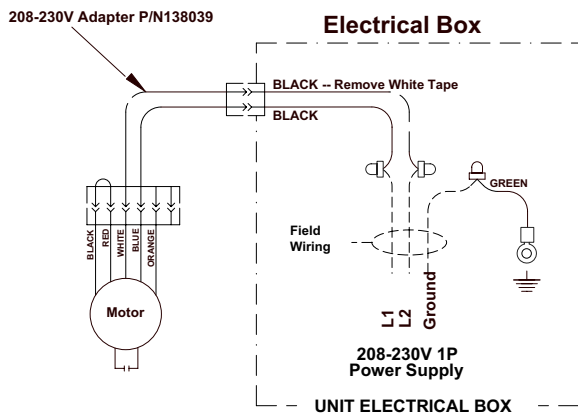
Set voltage by connecting 208-230V voltage adapter as shown.



UNIT MOTOR COMPARTMENT

Wiring to 208-230VAC 1P

Set voltage by connecting 208-230V voltage adapter as shown.
For 208-230V only, remove White Tape.

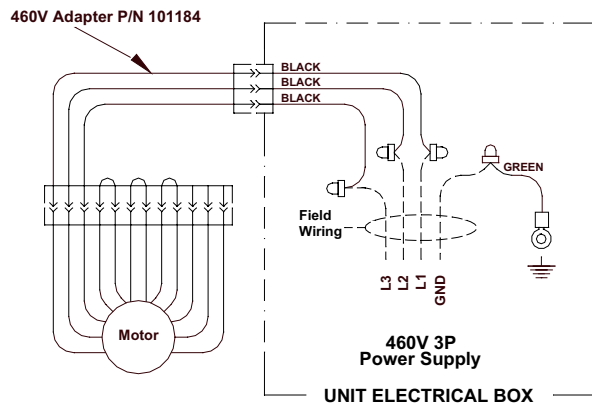


UNIT MOTOR COMPARTMENT

P/N 138043_001

Wiring to 460VAC 3P

Set voltage by connecting 460V voltage adapter as shown.

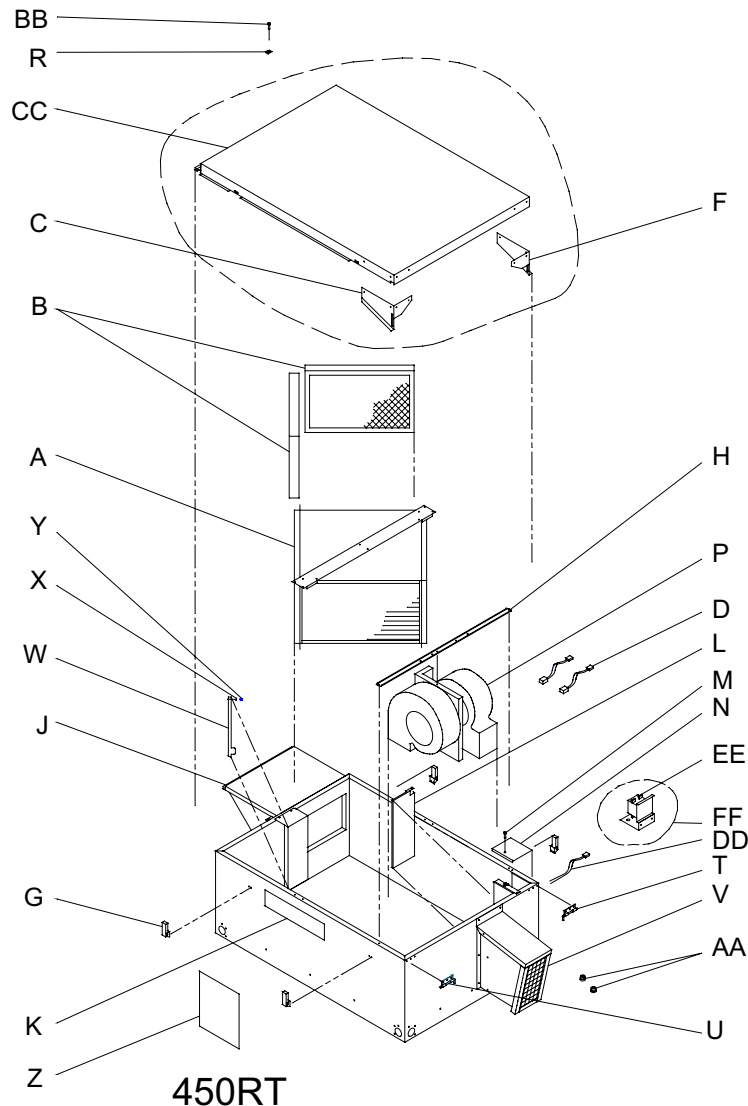


UNIT ELECTRICAL BOX

P/N 138078_000

Due to continuing product development, specifications are subject to change without notice.

REPLACEMENT PARTS



EV450RT PARTS LIST

DESCRIPTION

PART NUMBER

| | | |
|----|-----------------------------------|--------|
| A. | CORE ASSEMBLY | 994695 |
| B. | FILTER SET OF 2 | 990080 |
| | FILTER SET OF 12 | 990091 |
| C. | CORNER SLIDE BRACKET LEFT | 103241 |
| D. | VOLTAGE ADAPTERS 115V(P1)* | 138038 |
| | VOLTAGE ADAPTERS 208-230V(P1)* | 138039 |
| | VOLTAGE ADAPTERS 208-230V(P3)** | 101182 |
| | VOLTAGE ADAPTERS 406V(P3)** | 101184 |
| F. | CORNER SLIDE BRACKET RIGHT | 103242 |
| G. | LATCH DRAW EXPOSED BASE | 103187 |
| H. | CHANNEL DIVIDER STRAP | 102612 |
| J. | INTAKE HOOD | 990093 |
| K. | LABEL RENEWAIRE | 134760 |
| L. | E-Box Access Panel | 990095 |
| M. | E-Box Fasteners | 990099 |
| N. | Pan E-Box Top | 103202 |
| P. | Blower Motor Divid Assy(P1)* | 990096 |
| | Blower Motor Divid Assy(P3)** | 990098 |
| R. | Nut U Tinnerman 1/4-20 X 1/2 Thrt | 135388 |
| T. | Hinge Pin Right | 134527 |
| U. | Hinge Pin Left | 134526 |
| V. | Exhaust Hood | 990094 |

| | | |
|-----|-----------------------------------|--------|
| W. | Door Prop | 103244 |
| X. | Washer Nylon 1/4" | 135173 |
| Y. | Rivet Pop 3/16" Long SS64D | 135003 |
| Z. | Literature Packet | 990097 |
| AA. | Bushing Strain Relief #1240 | 102266 |
| BB. | Screw Pan PH HD 1/4-20X1 | 135142 |
| CC. | Door Assembly | 990092 |
| DD. | Wire Harness For E-Box(P1)* | 138042 |
| | Wire Harness For E-Box(P3)** | 138076 |
| EE. | CONTACTOR (OPTIONAL) | |
| | 24V COIL (P1)* | 135101 |
| | 115V COIL (P1)* | 135385 |
| | 208-230V COIL (P1)* | 135411 |
| | 24V COIL (P3)** | 135102 |
| | 115V COIL (P3)** | 135399 |
| | 208-230V COIL (P3)** | 135534 |
| FF. | 45CONT CONTACTOR KIT (OPTIONAL) | |
| | 45CONT P1 C0 24V COIL (P1)* | 102044 |
| | 45CONT P1 C1 115V COIL (P1)* | 102045 |
| | 45CONT P1 C2 208-230V COIL (P1)* | 102046 |
| | 45CONT P3 C0 24V COIL (P3)** | 102047 |
| | 45CONT P3 C1 115V COIL (P3)** | 102048 |
| | 45CONT P3 C2 208-230V COIL (P3)** | 102049 |

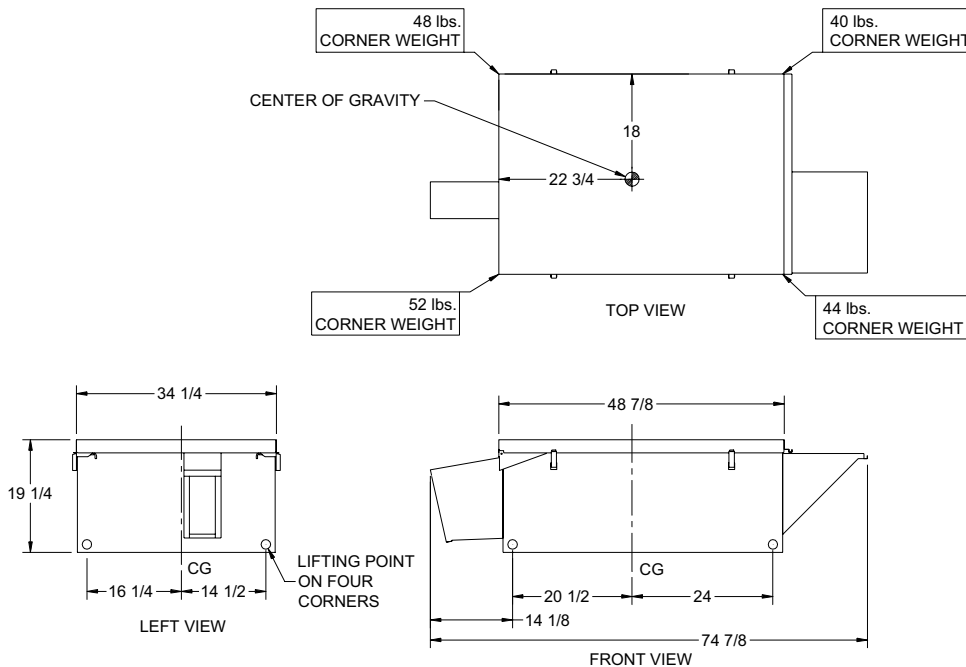
* (P1)=Single Phase

** (P3)=Three Phase

Due to continuing product development, specifications are subject to change without notice.

RIGGING INFORMATION

There are pairs of rigging holes at each lower corner of the unit. Use slings or shackles at all four corners. Spreader bars are recommended in order to avoid damage to the unit.



MAINTENANCE

WARNING: Danger of Electrical Shock when servicing an installed unit. ALWAYS DISCONNECT POWER SOURCE BEFORE WIRING OR SERVICING. More than one Disconnect Switch may be required to de-energize the equipment for servicing.

Inspect and change the filters regularly

Inspect and/or replace filters every two or three months when the EV450RT is in regular use, every 2000 hours of operation, or as needed to maintain proper airflow. Filters are located in both the return air stream and the outside air stream.

NOTE: Filters must be used or the energy exchange core will become blocked by dust and the EV450RT won't do its job. The filters supplied in the unit are usually able to keep the energy exchange core clear for several months. Finer filters can be used but must be cleaned more often. If using finer filters, their increased resistance to flow must be allowed for in the system design.

Inspect Blowers and Motors Regularly

Motor bearings generally need no lubrication.

Clean the blower wheels as necessary.

Vacuum the faces of the energy exchange core every 5000 operating hours, or annually, whichever comes first.

1. Remove the unit door and filters;
2. Vacuum the exposed faces of the energy exchange core with a soft brush;
3. Vacuum out dust from the rest of the unit case
4. Install new filters.

Note: Dust collects only on the faces of the energy exchange core. The interior of the energy exchange core stays clean even if the core faces are dust-covered.

CAUTION: Do not wash the energy exchange core. Always handle the core carefully. Keep it away from water or fire to avoid damaging it.

WARNING: Always replace securing screw when closing door after inspection or maintenance.