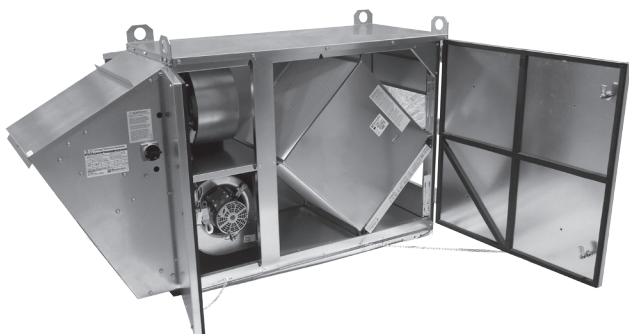




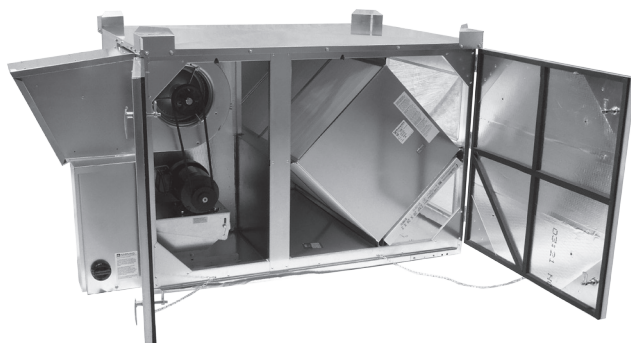
## INSTALLATION, OPERATION & MAINTENANCE MANUAL

### ENERGY RECOVERY VENTILATOR

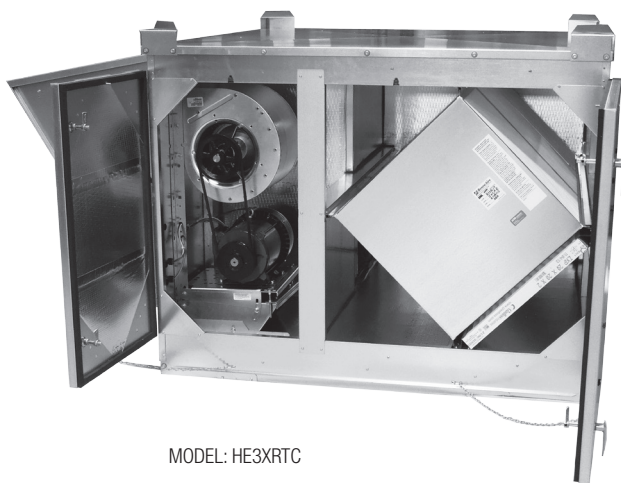
HE1XRTC  
HE2XRTC  
HE3XRTC  
HE4XRTC



MODEL: HE1XRTC



MODEL: HE2XRTC



MODEL: HE3XRTC



## RTC INFO

## TABLE OF CONTENTS

RTC info.....	2-12
Installation.....	12-23
Start-up & Operation.....	24-29
Maintenance.....	30-35

## RTC CONFIGURATION CHART

DIGIT NUMBER    1   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16   17   18   19   20   21   22   23   24   25

<b>Digits 1-5:</b>	Model
"HE-1X", "HE-2X", "HE-3X", "HE-4X"	
<b>Digit 11:</b>	Wall Type
"S" = Single "D" = Double	
<b>Digit 12:</b>	Phase
"1" = Single Phase "3" = Three Phase	
<b>Digit 13:</b>	Voltage (see Restrictions 1, 2, 3 & 4)
"1" = 115V "4" = 460V "5" = 208-230V "8" = 575V "9" = 277V	
<b>Digit 14:</b>	FA Horsepower (see Restriction 5 and 6)
"H" = 0.75 HP Standard Direct-Drive (HE-1X only) "E" = EC Direct Drive Motors ( HE-1X only) "V" = 2HP (HE-2X only) "W" = 3HP (HE-3X only) "X" = 5HP (HE-4X only)	
<b>Digit 15:</b>	EA Horsepower (see Restriction 5 and 6)
"H" = 0.75 HP Standard Direct-Drive (HE-1X only) "E" = EC Direct Drive Motors ( HE-1X only) "V" = 2HP (HE-2X only) "W" = 3HP (HE-3X only) "X" = 5HP (HE-4X only)	

<b>Digit 19:</b>	Unit Control (see Restrictions 7, 9 & 10)
"A" = Standard Unit Control Wiring "V" = Onboard VFD Both Airstreams "F" = Onboard VFD FA Airstream "E" = Onboard VFD EA Airstream "G" = Terminal Strip for EC Motors	
<b>Digit 20:</b>	Disconnect
"N" = Non-Fused (Standard) "F" = Fused	
<b>Digit 21:</b>	Unit Control Enhancements
"T" = Transformer with Isolation Relay (Standard) "1" = Enhanced Controls "2" = Premium Controls "3" = Enhanced Controls with BACNET License "4" = Premium Controls with BACNET License	
<b>Digit 22:</b>	Filter Options
"-" = None "F" = Filter Monitor Both Airstreams	
<b>Digit 23:</b>	Other Options
"-" = None (Reserved)	
<b>Digit 24:</b>	Paint and Customization
"-" = None "W" = White Paint "C" = Custom Paint "X" = Custom Unit	
<b>Digit 25:</b>	Safety Listing (see Restriction 8)
"L" = Listed "N" = Non-Listed	

**\*NOTES:**

Digit 6 "J" = G5 Core Type      Digits 10, 16, 17 and 18 are not used in these models.

<b>Restrictions:</b>	
1: Voltage Codes "1" and "9" only available with Phase Code "1" (Single-Phase). 2: Voltage Codes "4" & "8" only available with Phase Code "3" (Three-Phase). 3: Voltage Code "9" only available with FA/EA Horsepower Codes "H" and "E". 4: Voltage Code "1" only available with FA/EA Horsepower Codes "V", "H" and "E". 5: FA/EA Horsepower Codes "E" only available in Phase Code "1". 6: FA/EA Horsepower Codes "X" only available in Phase Code "3". 7: Unit Control Code "G" only available with FA/EA Horsepower Codes "E". 8: Some units with Customization Code "X" are not safety listed. 9: Unit Control Codes "V", "E" & "F" not available with Voltage Code "1". 10: Unit Control Code "V", "E" & "F" not available with FA/EA Horsepower Code "E".	

**NOTE:** RenewAire reserves the right to make changes in the design or specifications of products at any time without notice. Unless otherwise specified, dimensions are rounded to the nearest eighth of an inch.

**⚠ WARNING**

**RISK OF FIRE, ELECTRIC SHOCK, OR INJURY. OBSERVE ALL CODES AND THE FOLLOWING:**

1. Before servicing or cleaning the unit, switch power off at disconnect switch or service panel and lock-out/tag-out to prevent power from being switched on accidentally. More than one disconnect switch may be required to de-energize the equipment for servicing.
2. This installation manual shows the suggested installation method. Additional measures may be required by local codes and standards.
3. Installation work and electrical wiring must be done by qualified professional(s) in accordance with all applicable codes, standards and licensing requirements.
4. Any structural alterations necessary for installation must comply with all applicable building, health, and safety code requirements.
5. This unit must be grounded.
6. Danger of severe injury to bystanders and damage to unit or property if high winds move this unit. Secure this unit to the building!
7. Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment that might be installed in the area affected by this equipment. If this unit is exhausting air from a space in which chimney-vented fuel burning equipment is located, take steps to assure that combustion air supply is not affected. Follow the heating equipment manufacturer's requirements and the combustion air supply requirements of applicable codes and standards.
8. Use the unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
9. This unit is intended for general ventilating only. Do not use to exhaust hazardous or explosive materials and vapors. Do not connect this unit to range hoods, fume hoods or collection systems for toxics.
10. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.

**⚠ WARNING**

**DANGER OF INJURY OR DAMAGE.**

The relay must be set for correct FLA rating depending on the motor horsepower. See Unit Rating Label on motor for HP and FLA specifications.

**⚠ 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.

**⚠ WARNING**

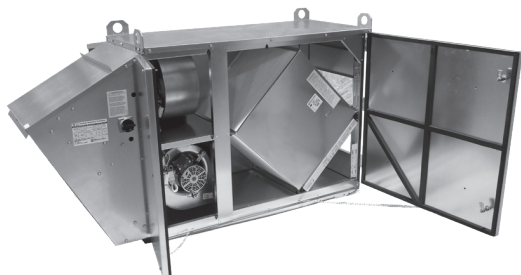
**DANGER OF INJURY OR DAMAGE.**

The motors in this unit must not be run at an amperage that exceeds the motor's rated full load amps and overload relays on the motor starters must be set at or below motor full load amps. For safest operation, the overload relays should also be used in hand reset mode with trip test capability.

It is the installer's responsibility to measure the operating amperage of each motor. If the full load amp rating is exceeded, the amp draw must be reduced by substituting a smaller motor pulley or by adjusting the variable sheave. Continue these adjustments until the actual amperage is no more than the motor's faceplate full load amps.

Failure to make this adjustment may result in unsafe motor winding temperatures or tripping of the supplied motor starter's overload relay motor protection devices set at full load amps.

### ROOFTOP UNIT Direct Connect



Download specification at:  
[renewaire.com/specifications](http://renewaire.com/specifications)

### SPECIFICATIONS

#### Ventilation Type:

Static plate, heat and humidity transfer

**Typical Airflow Range:** 500-900 CFM

**AHRI 1060 Certified Core:** One L125-G5

#### Standard Features:

Non-fused disconnect

24 VAC transformer/relay package

#### Filters:

Total qty. 2, MERV 8: 20" x 20" x 2"

#### Unit Dimensions & Weight:

73 1/4" L x 40 1/4" W x 50" H

269-356 lbs., varies by option(s)

#### Max. Shipping Dimensions & Weight (on pallet):

96" L x 47" W x 50" H

450 lbs.

#### Motor(s):

Qty. 2, 0.75 HP ea., Direct drive blower/standard motor packages

#### Options:

Qty. 2, EC Motor (see HE1XRTC EC Motor submittal) -

0.5 HP 120V/1Ph/60HZ,

0.5 HP 208-230V/1Ph/60HZ

Integrated programmable controls

Fused disconnect

Double wall construction

Qty. 2, Factory mounted filter alarms

Independent blower control

Exterior paint - white, custom colors

Rooftop RTC transition paint - white, custom colors

#### Accessories:

Filters - MERV 13, 2" (shipped loose)

RTC transition kit - for vertical RTU, for horizontal RTU

Digital time clock - wall mount (TC7D-W),

in exterior enclosure (TC7D-E)

Motion occupancy control - ceiling mount (MC-C),

wall mount (MC-W)

Carbon dioxide control - wall mount (CO2-W),

duct mount (CO2-D)

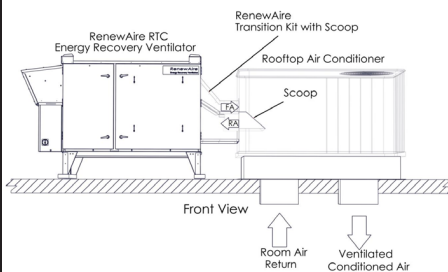
**Note:** Electric Duct Heater and Indirect Gas-Fired Duct Furnace are not available on RTC units.

### AIRFLOW PERFORMANCE

Damper Position	Total Watts		Tie-In Directly to Rooftop A/C Unit						Unit Ducted Independently							
			Static Pressure in Adjacent Air Handler (Inches Water Column)						External Static Pressure (Inches Water Column)							
	1 Phase	3 Phase	-0.75		-0.5		-0.25		0.0		+0.25		+0.5		+0.75	
			EA	FA	EA	FA	EA	FA	EA	FA	EA	FA	EA	FA	EA	FA
100% Open	1,295	1,135	735	1035	865	990	920	945	975	890	920	845	865	790	735	605
65% Open	1,285	1,088	715	995	825	950	880	905	935	855	880	805	825	760	715	605
55% Open	1,275	1,074	715	980	815	935	870	890	925	845	870	795	815	755	715	615
45% Open	1,265	1,030	680	940	790	895	840	850	895	810	840	760	790	720	680	570
35% Open	1,265	951	630	865	745	825	795	785	850	745	795	700	745	665	630	515
25% Open	1,265	866	570	795	700	755	750	715	800	680	750	640	700	605	570	440
15% Open	1,260	774	510	725	655	685	705	645	750	615	705	580	655	545	510	365

**Note:** Watts is for the entire unit (2 motors).

**Note:** Airflow performance includes effect of clean, standard filter supplied with unit.



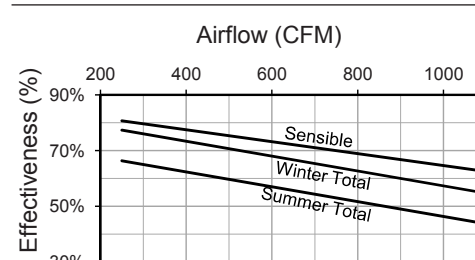
Installation Details - Applicable to all RTC units

Refer to IOM for more details.

### ELECTRICAL DATA

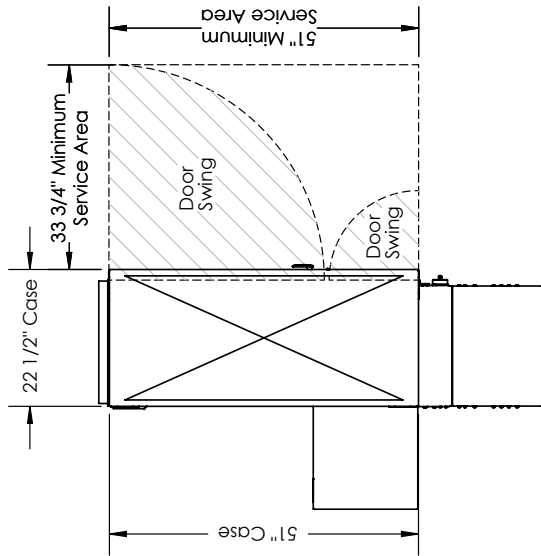
HP	Volts	HZ	Phase	FLA per motor	Min. Cir. Amps	Max. Overcurrent Protection Device
0.75	120	60	Single	9.0	20.3	25
0.75	208-230	60	Single	4.5	10.1	15
0.75	277	60	Single	3.9	8.8	15
0.75	208-230	60	Three	1.7-2.3	5.2	15
0.75	460	60	Three	1.15	2.6	15

### CORE PERFORMANCE

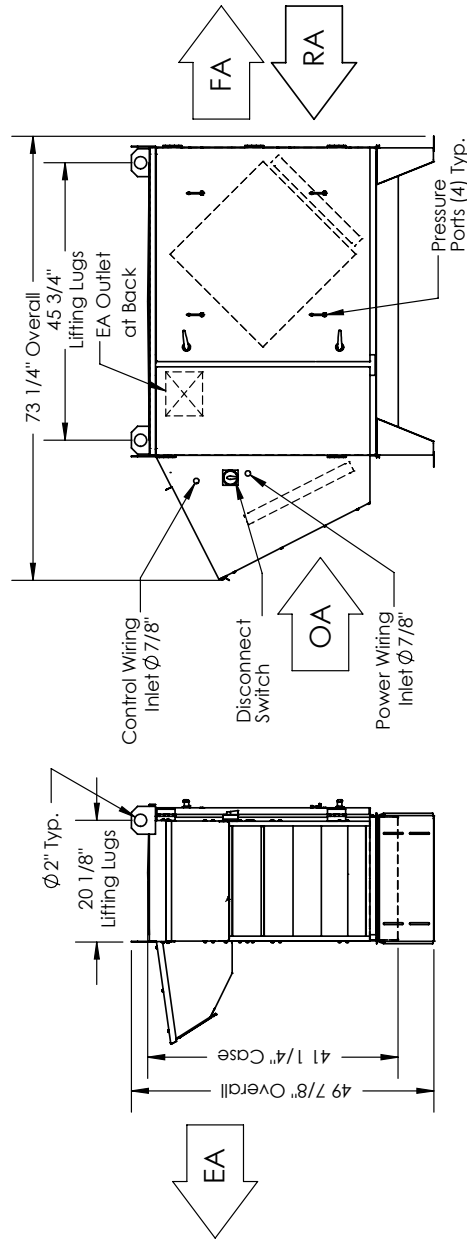


At AHRI 1060 standard conditions. See all AHRI certified ratings at [www.ahrinet.org](http://www.ahrinet.org).

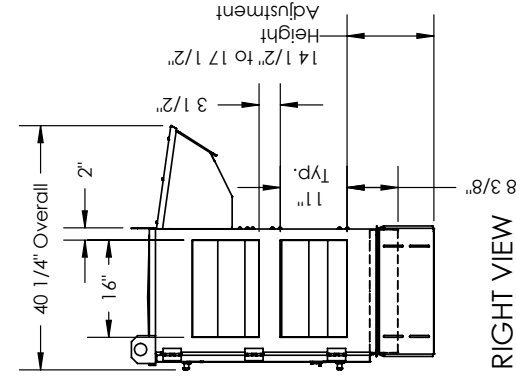
Specifications may be subject to change without notice.



TOP VIEW



LEFT VIEW



RIGHT VIEW

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

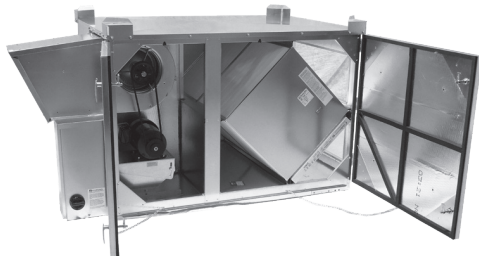
**INSTALLATION ORIENTATION**  
Unit must be installed in orientation shown.

**NOTE**  
1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE ROUNDED TO THE NEAREST EIGHTH OF AN INCH.  
2. SPECIFICATIONS MAY BE SUBJECT TO CHANGE WITHOUT NOTICE.

**AIRFLOW CONFIGURATION**  
Available as shown in dimension drawing.

**UNIT MOUNTING & APPLICATION**  
Must be mounted as shown. Airstreams can not be switched.

### ROOFTOP UNIT Direct Connect



Download specification at:  
[renewaire.com/specifications](http://renewaire.com/specifications)

### SPECIFICATIONS

#### Ventilation Type:

Static plate, heat and humidity transfer

**Typical Airflow Range:** 500-1,700 CFM

**AHRI 1060 Certified Core:** Two L125-G5

#### Standard Features:

TEFC Premium efficiency motors  
Motor starters  
Non-fused disconnect  
24 VAC transformer/relay package

#### Filters:

Total qty. 4, MERV 8: (2) 20" x 20" x 2" and  
(2) 14" x 20" x 2"

#### Unit Dimensions & Weight:

77 1/4" L x 61" W x 50" H  
566-711 lbs., varies by option(s)

#### Max. Shipping Dimensions & Weight (on pallet):

80" L x 90" W x 50" H  
850 lbs.

#### Motor(s):

Qty. 2, 2.0 HP ea., Belt drive blower/standard motor packages with adjustable sheaves (see table below)

#### Options:

Integrated programmable controls  
Fused disconnect  
Double wall construction  
Factory supplied and mounted variable frequency drives (VFDs) - one or both airstreams  
Shaft grounding ring on motors with VFDs  
Qty. 2, Factory mounted filter alarms  
Exterior paint - white, custom colors  
Rooftop RTC transition paint - white, custom colors

#### Accessories:

Filters - MERV 13, 2" (shipped loose)  
RTC transition kit - for vertical RTU, for horizontal RTU  
Digital time clock - wall mount (TC7D-W),  
in exterior enclosure (TC7D-E)  
Motion occupancy control - ceiling mount (MC-C),  
wall mount (MC-W)  
Carbon dioxide control - wall mount (CO2-W),  
duct mount (CO2-D)

**Note:** Electric Duct Heater and Indirect Gas-Fired Duct Furnace are not available on RTC units.

### AIRFLOW PERFORMANCE

	Blower RPM Nominal	Sheave Adj. Turns Open	Tie-In Directly to Rooftop A/C Unit*						Unit Ducted Independently*							
			Static Pressure in Adjacent Air Handler (Inches Water Column)						External Static Pressure (Inches Water Column)							
			-0.75		-0.5		-0.25		0.0		+0.25		+0.5		+0.75	
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
Exhaust Air	1450	0	1664	1.6	1785	1.9							1785	1.9	1664	1.6
	1370	1	1400	1.4	1570	1.6	1740	1.8	1900	1.9	1740	1.8	1570	1.6	1400	1.4
	1290	2	1125	1.3	1350	1.4	1575	1.5	1727	1.6	1575	1.5	1350	1.4	1125	1.3
	1210	3	945	1.0	1165	1.1	1385	1.3	1560	1.4	1385	1.3	1165	1.1	945	1.0
	1130	4	721	0.7	978	0.9	1235	1.1	1365	1.1	1235	1.1	978	0.9	721	0.7
	1050	5	560	0.7	810	0.8	1060	0.9	1200	1.0	1060	0.9	810	0.8	560	0.7
	945	6	635	0.6	765	0.6	895	0.6	1025	0.7	895	0.6	765	0.6	635	0.6
Fresh Air	1705	0									1600	2.0	1480	1.9	1360	1.7
	1610	1					1635	2.0	1555	1.9	1490	1.8	1375	1.7	1260	1.5
	1515	2	1742	2.0	1631	1.9	1520	1.7	1430	1.6	1355	1.6	1230	1.4	1105	1.3
	1420	3	1620	1.7	1515	1.6	1410	1.5	1300	1.4	1230	1.4	1115	1.2	1000	1.1
	1325	4	1465	1.5	1370	1.4	1275	1.3	1190	1.3	1120	1.2	995	1.1	870	0.9
	1230	5	1325	1.3	1245	1.2	1165	1.1	1080	1.0	985	0.9	850	0.8	715	0.6
	1090	6	1170	1.0	1085	0.9	1000	0.8	905	0.8	824	0.7	743	0.6	662	0.6

**Note:** Brake Horse Power (BHP) is for one blower motor package only.

**Operation in this zone will likely exceed FLA limits.**

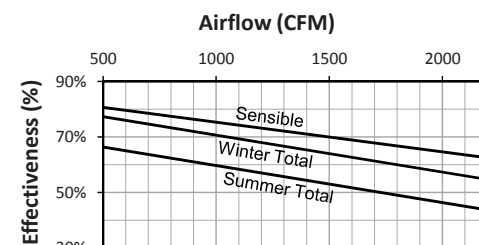
**Note:** Airflow performance includes effect of clean, standard filter supplied with unit.

\* See page 30 for installation details.

### ELECTRICAL DATA

Standard Electrical Specifications							Optional Factory Installed VFD Electrical Specifications		
HP	Volts	HZ	Phase	FLA per motor	Min. Cir. Amps	Max. Overcurrent Protection Device	FLA per motor	Min. Cir. Amps	Max. Overcurrent Protection Device
2.0	208-230	60	Single	10.8-10.0	24.3	35	6.6-5.8	28.3	30
	208-230	60	Three	6.6-5.8	14.9	20	6.6-5.8	16.3	20
	460	60	Three	2.9	6.5	15	2.9	7.2	15
	575	60	Three	2.4	5.4	15	2.4	5.9	15

### CORE PERFORMANCE



At AHRI 1060 standard conditions.

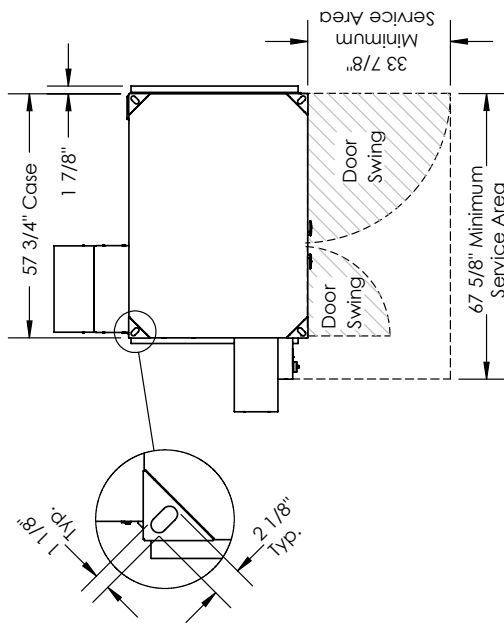
See all AHRI certified ratings at [www.ahrinet.org](http://www.ahrinet.org).

Specifications may be subject to change without notice.

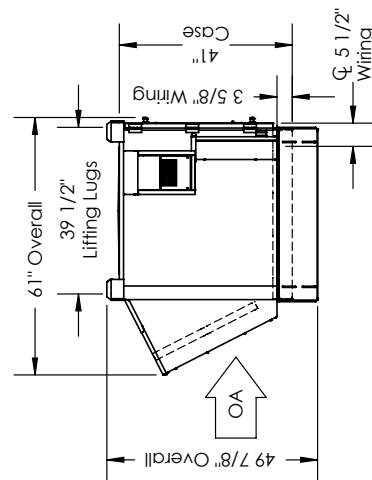
**ABBREVIATION**  
 EA: Exhaust Air to outside  
 OA: Outside Air intake  
 RA: Room Air to be exhausted  
 FA: Fresh Air to inside

**INSTALLATION ORIENTATION**  
 Unit must be installed in orientation shown.

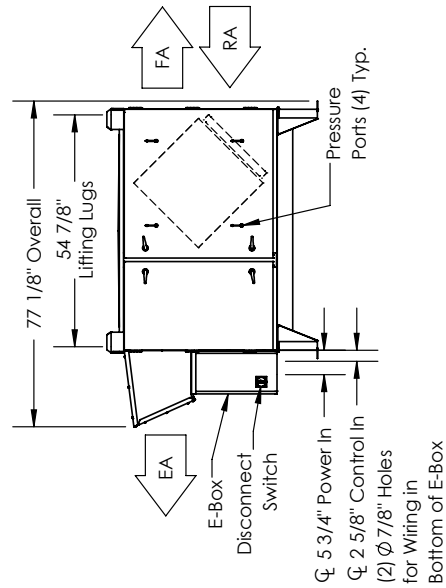
**NOTE:**  
 1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE ROUNDED TO THE NEAREST EIGHTH OF AN INCH.  
 2. SPECIFICATIONS MAY BE SUBJECT TO CHANGE WITHOUT NOTICE.



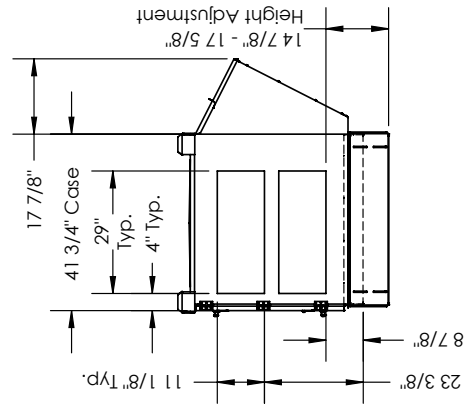
TOP VIEW



LEFT VIEW



FRONT VIEW



RIGHT VIEW

**AIRFLOW CONFIGURATION**  
 Available as shown in dimension drawing.

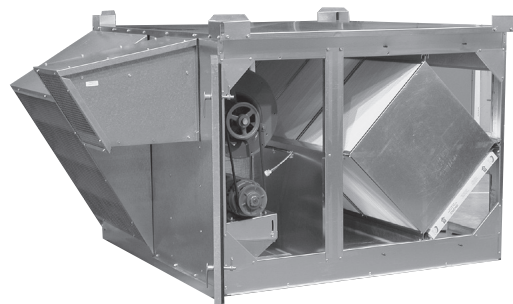


**UNIT MOUNTING & APPLICATION**  
 Must be mounted as shown. Airstreams can not be switched.





### ROOFTOP UNIT Direct Connect



Download specification at:  
[renewaire.com/specifications](http://renewaire.com/specifications)

### SPECIFICATIONS

#### Ventilation Type:

Static plate, heat and humidity transfer

**Typical Airflow Range:** 1,100-2,400 CFM

**AHRI 1060 Certified Core:** Three L125-G5

#### Standard Features:

TEFC Premium efficiency motors

Motor starters

Non-fused disconnect

24 VAC transformer/relay package

#### Filters:

Total qty. 5, MERV 8: (3) 20" x 20" x 2" and  
(2) 16" x 25" x 2"

#### Unit Dimensions & Weight:

81 1/4" L x 63 1/2" W x 48 1/4" H

713-1,084 lbs., varies by option(s)

#### Max. Shipping Dimensions & Weight (on pallet):

80" L x 90" W x 80" H

1,225 lbs.

#### Motor(s):

Qty. 2, 3.0 HP ea., Belt drive blower/standard motor packages with adjustable sheaves

#### Options:

Integrated programmable controls

Fused disconnect

Double wall construction

Factory supplied and mounted variable frequency

drives (VFDs) - one or both airstreams

Shaft grounding ring on motors with VFDs

Qty. 2, Factory mounted filter alarms

Exterior paint - white, custom colors

Rooftop RTC transition paint - white, custom colors

#### Accessories:

Filters - MERV 13, 2" (shipped loose)

RTC transition kit - for vertical RTU, for horizontal RTU

Digital time clock - wall mount (TC7D-W),

in exterior enclosure (TC7D-E)

Motion occupancy control - ceiling mount (MC-C),

wall mount (MC-W)

Carbon dioxide control - wall mount (CO2-W),

duct mount (CO2-D)

**Note:** Electric Duct Heater and Indirect Gas-Fired Duct Furnace are not available on RTC units.

### AIRFLOW PERFORMANCE

	Blower RPM Nominal	Sheave Adj. Turns Open	Tie-In Directly to Rooftop A/C Unit*						Unit Ducted Indirectly*							
			Static Pressure in Adjacent Air Handler (Inches Water Column)						External Static Pressure (Inches Water Column)							
			-0.75		-0.5		-0.25		0.0		+0.25		+0.5		+0.75	
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
Exhaust Air	1510	0	2010	2.7											2010	2.7
	1465	1	1920	2.3	2130	2.9							2130	2.9	1920	2.3
	1420	2	1830	1.9	2035	2.5	2240	3.0			2240	3.0	2035	2.5	1830	1.9
	1375	3	1750	1.1	1945	1.9	2140	2.6	2400	2.7	2140	2.6	1945	1.9	1750	1.1
	1330	4	1690	1.0	1860	1.5	2030	1.9	2330	2.6	2030	1.9	1860	1.5	1690	1.0
	1285	5	1510	0.9	1725	1.0	1940	1.1	2250	2.1	1940	1.1	1725	1.0	1510	0.9
	1240	6	1320	0.8	1590	0.5	1860	0.3	2165	1.5	1860	0.3	1590	0.5	1320	0.8
Fresh Air	1825	0							2250	2.9	2100	2.5	1865	2.3	1630	2.1
	1770	1			2525	3.0	2338	2.7	2195	2.6	2025	2.3	1785	2.1	1545	1.8
	1715	2	2605	2.7	2430	2.6	2255	2.4	2120	2.3	1960	2.0	1700	1.2	1440	1.4
	1660	3	2515	2.4	2345	2.2	2175	1.9	2050	1.8	1900	1.6	1620	0.6	1340	1.0
	1605	4	2430	2.2	2270	1.8	2110	1.3	1980	1.3	1830	1.3	1560	0.4	1290	0.5
	1550	5	2355	1.2	2185	1.1	2015	1.0	1900	0.6	1765	0.4	1540	0.3	1200	0.4
	1495	6	2230	0.8	2090	0.7	1950	0.5	1840	0.4	1730	0.3	1500	0.2	1100	0.2

**Note:** Brake Horse Power (BHP) is for one blower motor package only. Operation in this zone will likely exceed FLA limits.

**Note:** Airflow performance includes effect of clean, standard filter supplied with unit.

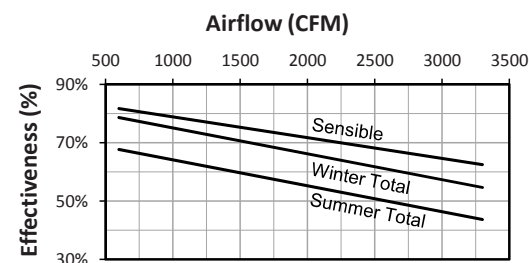
\* See page 30 for installation details.

### ELECTRICAL DATA

Standard Electrical Specifications							Optional Factory Installed VFD Electrical Specifications		
HP	Volts	HZ	Phase	FLA per motor	Min. Cir. Amps	Max. Overcurrent Protection Device	FLA per motor	Min. Cir. Amps	Max. Overcurrent Protection Device
3.0	208-230	60	Single	14.7-14	33.1	40	9.4-8.5	40.2	45
	208-230	60	Three	9.4-8.5	21.1	25	9.4-8.5	23.2	25
	460	60	Three	4.2	9.5	15	4.24	10.5	15
	575	60	Three	3.3	7.4	15	3.3	8.2	15

Specifications may be subject to change without notice.

### CORE PERFORMANCE



At AHRI 1060 standard conditions.

See all AHRI certified ratings at [www.ahrinet.org](http://www.ahrinet.org).



### ABBREVIATIONS

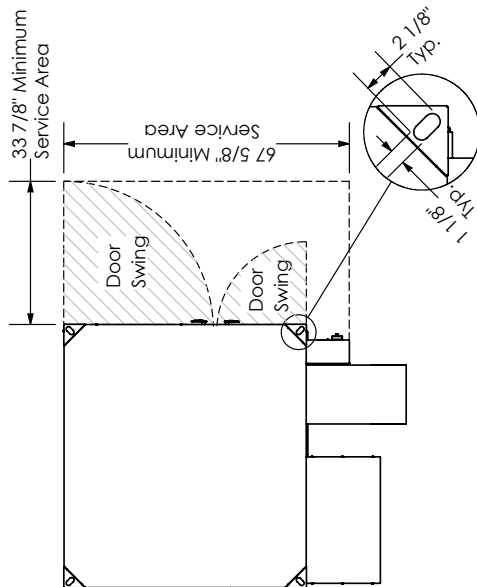
EA: Exhaust Air to outside  
OA: Outside Air intake  
RA: Room Air to be exhausted  
FA: Fresh Air to inside

### INSTALLATION ORIENTATION

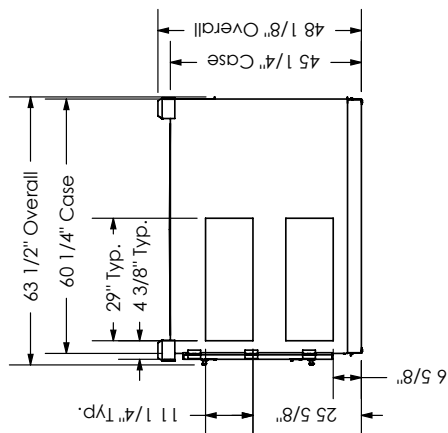
Unit must be installed in orientation shown.

### NOTE:

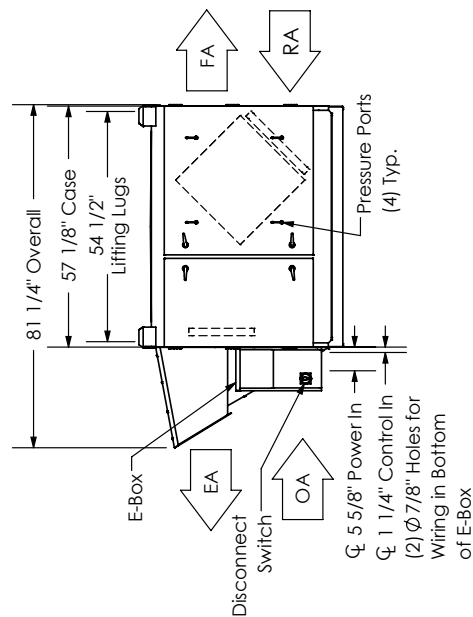
1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE ROUNDED TO THE NEAREST EIGHTH OF AN INCH.
2. SPECIFICATIONS MAY BE SUBJECT TO CHANGE WITHOUT NOTICE.



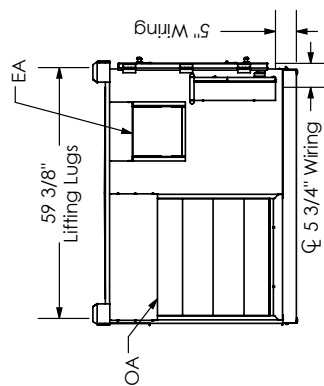
TOP VIEW



RIGHT VIEW



FRONT VIEW



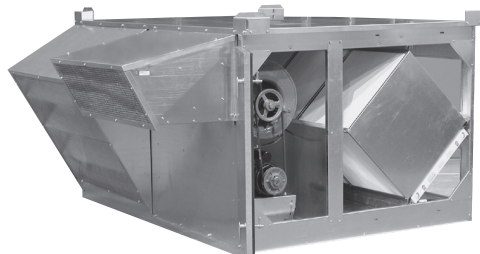
LEFT VIEW

**AIRFLOW CONFIGURATION**  
Available as shown in dimension drawing.



**UNIT MOUNTING & APPLICATION**  
Must be mounted as shown. Airstreams can not be switched.

### ROOFTOP UNIT Direct Connect



Download specification at:  
[renewaire.com/specifications](http://renewaire.com/specifications)

### SPECIFICATIONS

#### Ventilation Type:

Static plate, heat and humidity transfer

**Typical Airflow Range:** 2,500-3,900 CFM

**AHRI 1060 Certified Core:** Four L125-G5

#### Standard Features:

TEFC Premium efficiency motors  
Motor starters  
Non-fused disconnect  
24 VAC transformer/relay package

#### Filters:

Total qty. 8, MERV 8: (4) 20" x 20" x 2" and  
(4) 16" x 20" x 2"

#### Unit Dimensions & Weight:

81 1/4" L x 83 1/4" W x 48 1/4" H  
887-1,169 lbs., varies by option(s)

#### Max. Shipping Dimensions & Weight (on pallet):

80" L x 90" W x 80" H  
1,300 lbs.

#### Motor(s):

Qty. 2, 5.0 HP ea., Belt drive blower/standard motor  
packages with adjustable sheaves

#### Options:

Integrated programmable controls  
Fused disconnect  
Double wall construction  
Factory supplied and mounted variable frequency  
drives (VFDs) - one or both airstreams  
Shaft grounding ring on motors with VFDs  
Qty. 2, Factory mounted filter alarms  
Exterior paint - white, custom colors  
Rooftop RTC transition paint - white, custom colors

#### Accessories:

Filters - MERV 13, 2" (shipped loose)  
RTC transition kit - for vertical RTU, for horizontal RTU  
Digital time clock - wall mount (TC7D-W),  
in exterior enclosure (TC7D-E)  
Motion occupancy control - ceiling mount (MC-C),  
wall mount (MC-W)  
Carbon dioxide control - wall mount (CO2-W),  
duct mount (CO2-D)

**Note:** Electric Duct Heater and Indirect Gas-Fired Duct Furnace are not available on RTC units.

### AIRFLOW PERFORMANCE

	Blower RPM Nominal	Sheave Adj. Turns Open	Tie-In Directly to Rooftop A/C Unit*						Unit Ducted Independently*							
			Static Pressure in Adjacent Air Handler (Inches Water Column)						External Static Pressure (Inches Water Column)							
			-0.75		-0.5		-0.25		0.0		+0.25		+0.5		+0.75	
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
Exhaust Air	1510	0	3400	3.1	3700	3.3	4000	3.6	4250	4.1	4000	3.6	3700	3.3	3400	3.1
	1465	1	3275	3.0	3600	3.2	3925	3.4	4225	3.8	3925	3.4	3600	3.2	3275	3.0
	1420	2	3125	2.8	3450	2.9	3775	3.0	4156	3.6	3775	3.0	3450	2.9	3125	2.8
	1375	3	2935	2.3	3300	2.5	3665	2.8	4067	3.4	3665	2.8	3300	2.5	2935	2.3
	1330	4	2780	2.0	3150	2.3	3520	2.5	3900	3.1	3520	2.5	3150	2.3	2780	2.0
	1285	5	2685	1.6	3050	2.0	3415	2.4	3760	2.8	3415	2.4	3050	2.0	2685	1.6
	1240	6	2620	1.4	2950	1.7	3280	2.0	3600	2.4	3280	2.0	2950	1.7	2620	1.4
Fresh Air	1825	0													3245	5.0
	1770	1											3225	4.9	3125	4.6
	1715	2							3450	4.8	3275	4.6	3140	4.5	3005	4.3
	1660	3	3920	5.0	3760	5.0	3600	5.0	3360	4.5	3180	4.1	3060	4.0	2940	3.9
	1605	4	3790	4.6	3670	4.6	3550	4.7	3270	4.1	3090	3.7	2970	3.7	2850	3.7
	1550	5	3724	4.2	3582	4.3	3440	4.5	3190	3.6	3010	3.4	2890	3.3	2770	3.3
	1495	6	3680	4.2	3500	4.1	3320	3.9	3100	3.5	2910	2.9	2790	2.8	2670	2.8

**Note:** Brake Horse Power (BHP) is for one blower motor package only.   Operation in this zone will likely exceed FLA limits.

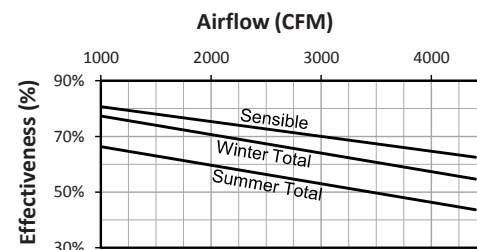
**Note:** Airflow performance includes effect of clean, standard filter supplied with unit.

\* See page 30 for installation details.

### ELECTRICAL DATA

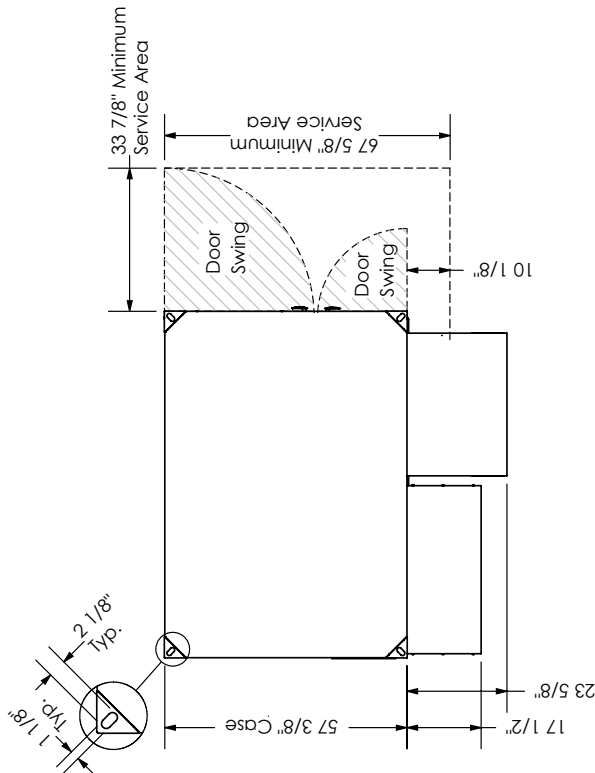
Standard Electrical Specifications							Optional Factory Installed VFD Electrical Specifications		
HP	Volts	HZ	Phase	FLA per motor	Min. Cir. Amps	Max. Overcurrent Protection Device	FLA per motor	Min. Cir. Amps	Max. Overcurrent Protection Device
5.0	208-230	60	Three	14.5-13.4	32.6	45	14.5-13.4	35.9	45
	460	60	Three	6.7	15.1	20	6.7	16.6	20
	575	60	Three	5.3	11.9	15	5.3	13.1	15

### CORE PERFORMANCE

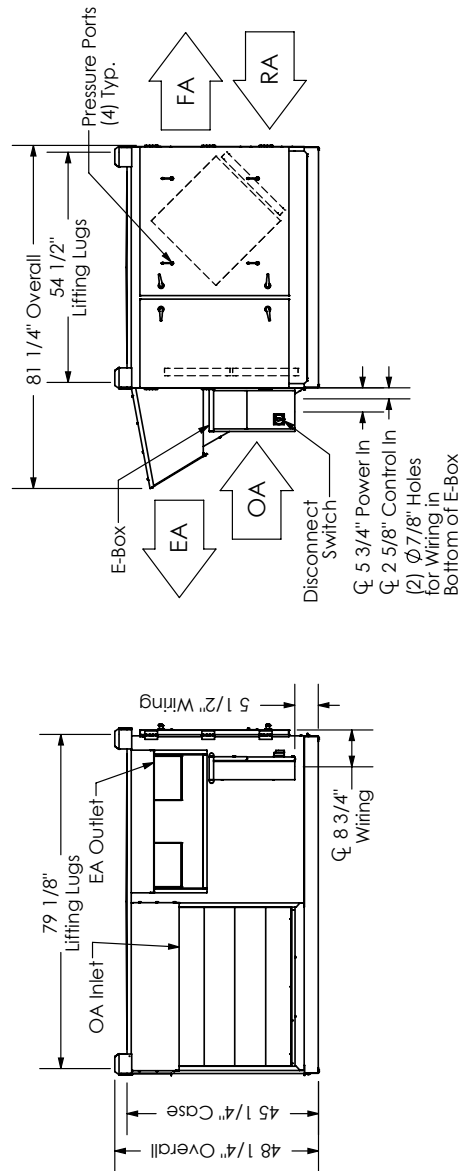


Specifications may be subject to change without notice.

# HE4XRTC Energy Recovery Ventilator Standard

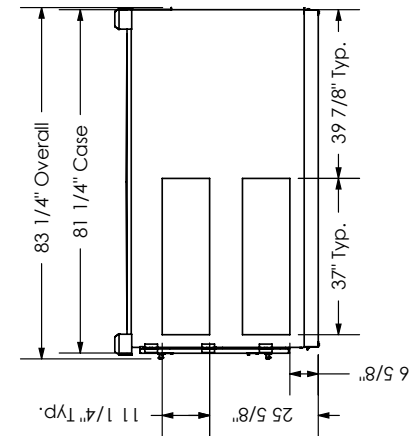


TOP VIEW



LEFT VIEW

FRONT VIEW



RIGHT VIEW

## ABBREVIATIONS

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

## INSTALLATION ORIENTATION

Unit must be installed in orientation shown.

## NOTE:

1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE ROUNDED TO THE NEAREST EIGHTH OF AN INCH.
2. SPECIFICATIONS MAY BE SUBJECT TO CHANGE WITHOUT NOTICE.

## AIRFLOW CONFIGURATION

Available as shown in dimension drawing.



**UNIT MOUNTING & APPLICATION**  
Must be mounted as shown. Airstreams can not be switched.

## RTC INFO

## FEATURES

RenewAire's RTC units bring the convenience of single-end connection to rooftop Energy Recovery Ventilators (ERVs). Now you can more easily connect an ERV to an existing Rooftop Air conditioning Unit (RTU), without additional roof penetrations.

The RTC units also offer airflow measurement and balancing features. Simply by using a manometer or a magnehelic, you can measure the amount of fresh air supplied by the RTC and the amount of stale air being exhausted. Then you can adjust these amounts using the supplied dampers (HE1XRTC only) or variable sheaves (all other sizes).

## USE WITH ECONOMIZERS

In most applications, the RTC unit itself provides far greater savings and ROI than any economizer, and codes often recognize this and allow for use of an ERV as an alternative to an economizer. With many RTUs, the RTC unit is connected to the RTU in the same place an economizer might have been installed. In these cases, an economizer cannot be installed.

There are some RTUs that will allow for installation of both an RTC unit and an economizer. For these

installations, the installer will need to:

1. Prepare the RTU for connection of the RTC;
2. Prepare a location on the roof for the RTC unit;
3. Connect the RTC to the RTU (or an exposed Return Air Duct) with a Transition Piece (either built on site, or a factory-built accessory kit);
4. Provide operating power and control connections to the RTC;
5. Measure and balance the airflows.

installations, the Independent Blower Control option must be ordered and installed for the HE1XRTC only. This optional feature allows for separate control of the exhaust and the supply blowers, for optimized operation with the economizer.

Another alternative, if use of an economizer is required, is to use our standard RTV models, connecting into the system ductwork below the roofline.

## INSTALLATION

PLANNING YOUR  
INSTALLATION

## TIE-IN DIRECTLY TO ROOFTOP A/C UNIT

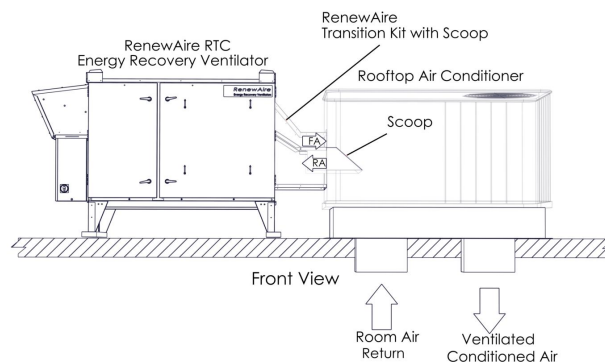
The RTC can be connected to the Return Air Compartment of most rooftop packaged air handling units (RTUs).

Typical connection points:

- a hole cut in a side panel of the RTU by the installer;
- the economizer port (if no economizer is installed); or
- the panel for connection of a horizontal return duct (in convertible RTUs);

A Transition Piece is usually required. The Transition Piece includes a Scoop that diverts return air from the RTU into the RTC; a Fresh Air Duct; and Sealing Flanges to make weather-tight connections between the RTU and the RTC.

A variety of Transition Pieces are available from RenewAire to fit various combinations of RTC models and popular RTUs. It is also possible to fabricate the Transition Piece on site, or to request the factory design and build one for you



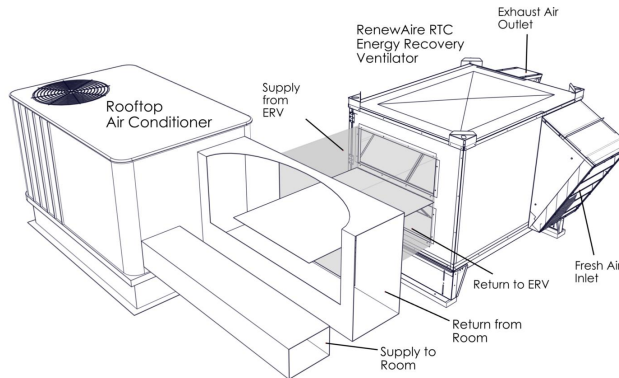
## INSTALLATION

### TIE-IN TO RETURN AIR DUCT ON ROOF

Use this approach when you have access on the roof to Return Air (RA) ductwork going to the air-handler. A Horizontal Duct Transition Piece is available from RenewAire for each RTC model.

The horizontal baffle in the Transition Piece separates that section of duct into an upper and a lower section. Returning Room Air is taken from the lower section. Fresh Air from the RTC enters the upper section. The horizontal baffle prevents recapture of fresh air by the RTC unit.

Alternatively, a site-fabricated transition assembly of similar design may be used.



### GENERAL PRACTICES

Take these simple steps to attenuate noise from the unit.

#### 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 from 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) at the roof deck.

#### 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 gradual transitions to the final duct size.

These guidelines are consistent with SMACNA recommended duct layout practices for efficient and quiet air movement. Follow SMACNA guidelines.

### RADIATED NOISE

The RTC units are insulated with high-density fiberglass. This provides significant attenuation of radiated sound from the unit itself.

The outlet ducts can be significant sources of radiated sound as well. The FA duct should be insulated for sound control. This insulation should start at the unit. At a minimum the first ten feet of duct should be insulated. All parts of the FA and RA ducts located in a mechanical space with noise-generating equipment also should be insulated for sound control, both to minimize sound radiation out of the FA duct, and also to control sound radiation into both ducts.

### AERODYNAMIC (VELOCITY) NOISE

When sound attenuation is a design concern, the primary consideration is velocity noise at the unit's Exhaust Air blower outlet. The average velocity at the Exhaust Hood outlet is shown below.

	CFM	Velocities
HE1XRTC	750	2482
HE2XRTC	1500	2072
HE3XRTC	2250	2093
HE4XRTC	3000	1203

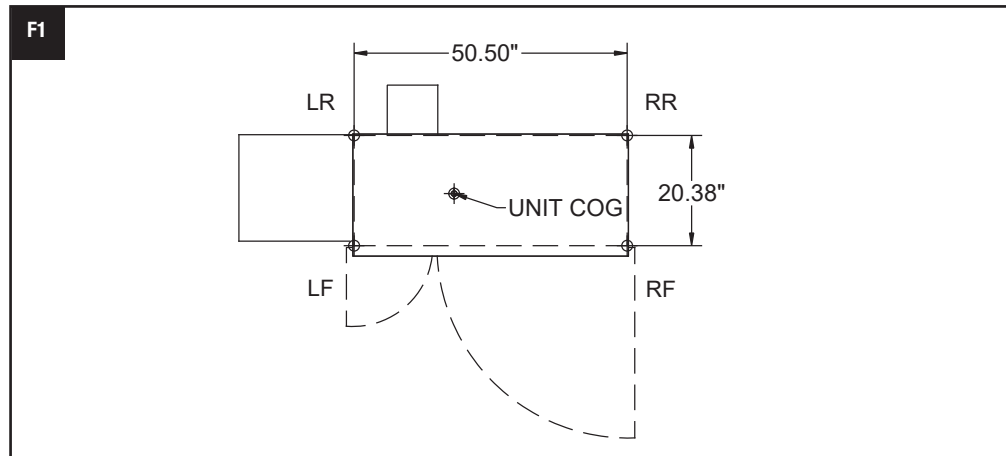
### PLANNING YOUR INSTALLATION

### SOUND ATTENUATION

## INSTALLATION

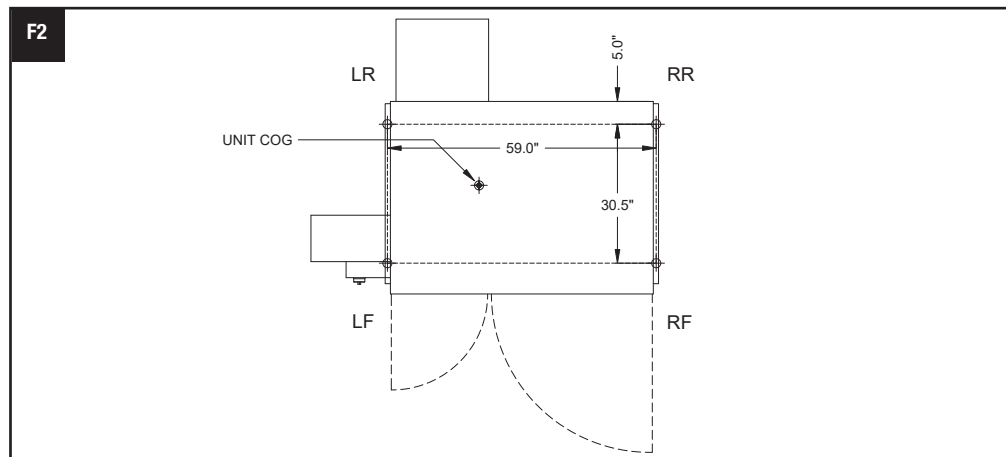
**RIGGING  
INFORMATION**

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

**HE1XRTC UNIT CORNER WEIGHTS (LBS.)****SINGLE-WALL**

HP & PHASE	UNIT	LF	LR	RR	RF
(2) .75HP, 1-PHASE	319	97	90	69	63
(2) .75HP, 3-PHASE	326	100	93	70	64

⊕ INDICATES LOCATIONS AT WHICH CORNER WEIGHTS ARE CALCULATED AT HOLES PROVIDED IN LEVELING LEGS.

**HE2XRTC UNIT CORNER WEIGHTS (LBS.)****SINGLE-WALL**

HP & PHASE	UNIT	LF	LR	RR	RF
(2) 2HP, 1-PHASE	566	174	174	108	109
(2) 3HP, 3-PHASE	573	177	177	109	110

⊕ INDICATES LOCATIONS AT WHICH CORNER WEIGHTS ARE CALCULATED AT HOLES PROVIDED IN LEVELING LEGS.



## INSTALLATION

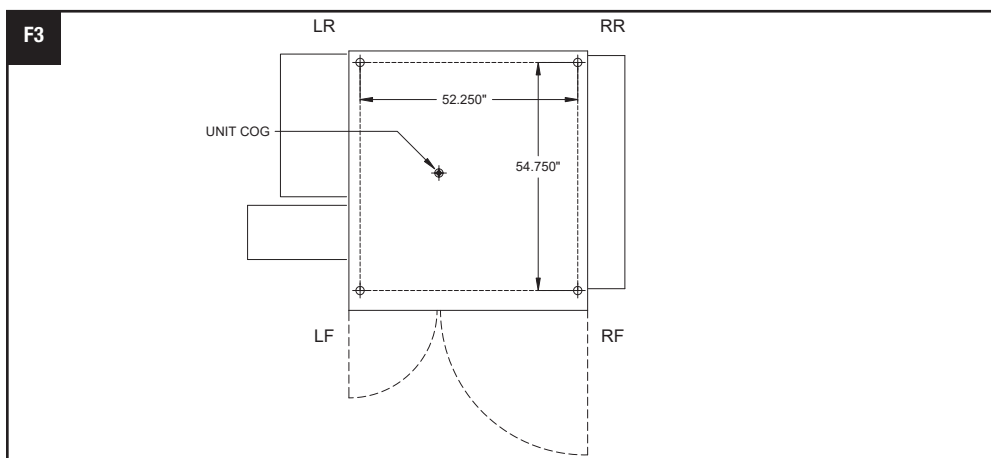
### RIGGING INFORMATION

#### CAUTION

To avoid motor bearing damage and noisy and/or unbalanced impellers, keep drywall spray, construction dust, etc., out of unit.

#### CAUTION

Do not remove or disable the wiring interconnection between the Overload Relays and the Contactors. Without this interconnection the motor(s) will not be protected against overload.

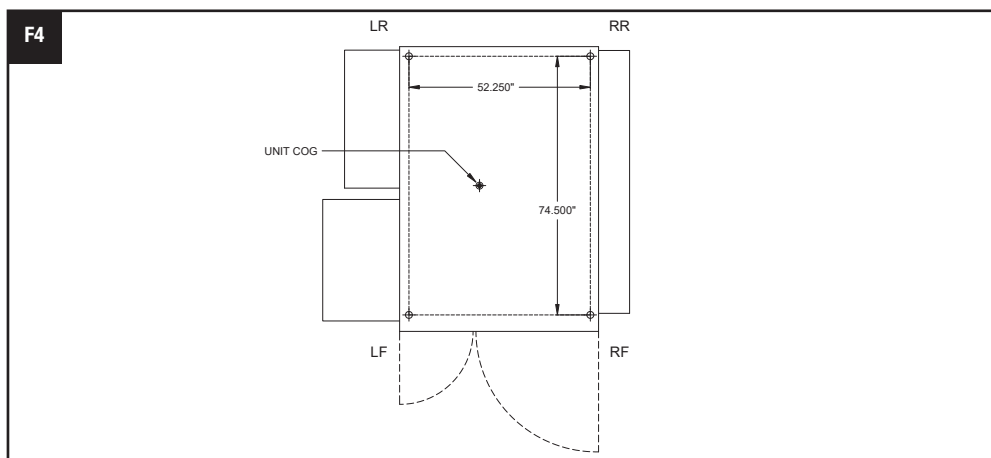


**HE3XRTC UNIT CORNER WEIGHTS (LBS.)**

#### SINGLE-WALL

HP & PHASE	UNIT	LF	LR	RR	RF
(2) 3HP, 1-PHASE	762	216	218	165	163
(2) 3HP, 3-PHASE	769	219	221	166	164

⊕ INDICATES LOCATIONS AT WHICH CORNER WEIGHTS ARE CALCULATED ALONG CENTERS OF CURB RAILS.



**HE4XRTC UNIT CORNER WEIGHTS (LBS.)**

#### SINGLE-WALL

HP & PHASE	UNIT	LF	LR	RR	RF
(2) 5HP, 3-PHASE	1005	294	292	209	211

⊕ INDICATES LOCATIONS AT WHICH CORNER WEIGHTS ARE CALCULATED ALONG CENTERS OF CURB RAILS.

## INSTALLATION

### PLANNING YOUR INSTALLATION

#### WARNING

The fresh air inlet should be at least 10' away from chimneys, furnace and water heater exhausts, and other sources of carbon monoxide, humidity or other contamination. Do not locate the fresh air inlet where vehicles may be serviced or left idling. Never locate the fresh air inlet inside a structure.

#### CAUTION

If installed indoors, this unit must be properly ducted to the outdoors.

### PREPARING A SPACE FOR THE UNIT

#### You'll need to:

- decide which side of the Rooftop Air Conditioning unit (RTU) you will connect the RTC to;
- lay out the location of the RTC unit;
- prepare the roof surface to support the RTC unit; and
- make provisions to position the RTC unit at the right height.

#### Which Side of the RTU?

The Transition Piece and the RTC unit will always be attached where Return Air enters the RTU. This might be an end or side panel of the RTU. Some Transition Pieces are designed to replace a panel provided in the RTU, perhaps for an economizer or a horizontal duct connection. In all cases, the Transition Piece should be positioned so the Scoop catches some of the Return Air as it enters the RTU. The Scoop will divert a portion of the Return Air to the RTC unit.

#### How Big A Space?

The standard length of Transition Pieces is 16". Therefore, the end of the RTC unit will be 16" away from the side of the RTU.

Check the latest Specification Sheet for your RTC model, or measure the unit itself, to determine the footprint of the unit.

#### Prepare the Roof Surface

In most installations, simple equipment rails or pads will be sufficient to support the RTC unit and prevent damage to the roofing system.

When preparing the Roof, you must:

- ensure there is structural support for the weight of the RTC unit;
- protect the roof system from the base of the RTC unit;
- provide a surface for the RTC unit to be tied down;
- elevate the RTC unit so the Transition Piece will align with the opening in the RTU.

#### How High?

The RTC must be installed at the right height for the transition to connect to the opening in the RTU (or horizontal Return Air Duct).

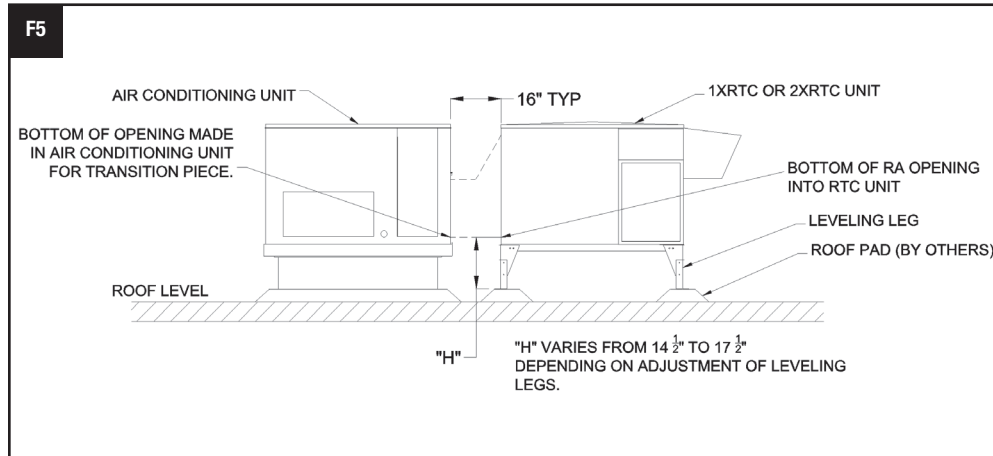
## INSTALLATION

### HE1XRTC and HE2XRTC

The HE1XRTC and HE2XRTC models include leveling leg systems that provide for some height adjustment.

Use the Leveling Legs to raise or lower the RTC unit to align to bottoms of the RA openings in the RTC and the RTU. If additional height is required for the RTC, place appropriately sized roof pads under base of legs.

### PLANNING YOUR INSTALLATION

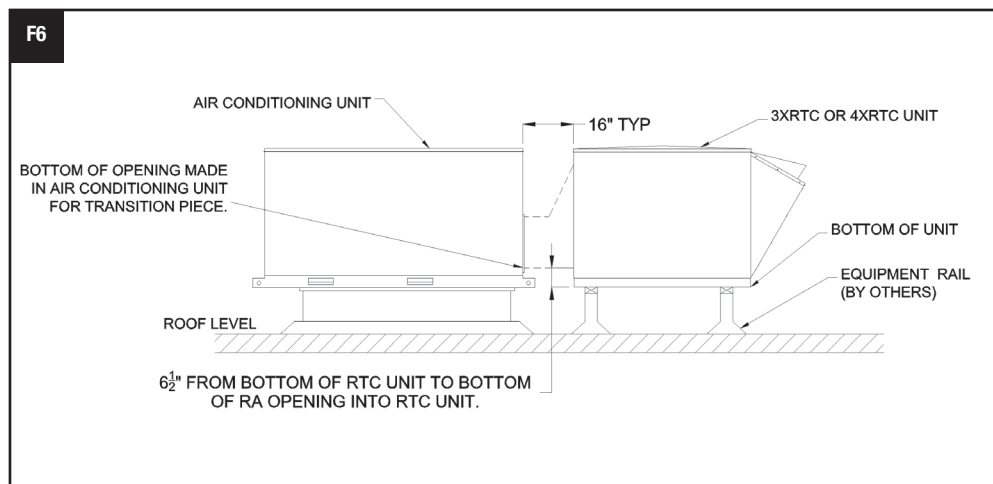


### HE3XRTC & HE4XRTC

The HE3XRTC and HE4XRTC require equipment rails to support the unit. Position the equipment rails so you have some room to adjust the RTC unit back and forth. Be prepared with shims so you can adjust the vertical alignment of the RTC unit as you connect the Transition Piece.

Another alternative for supporting the HE3XRTC and HE4XRTC units is to use a standard Roof Curb. Use the same curbs as for our standard HE3XRT and HE4XRT models.

However, if you use a standard Roof Curb, you must locate it very accurately so the Transition Piece fits properly.



## INSTALLATION

### PLANNING YOUR INSTALLATION

#### INSTALLING THE TRANSITION PIECE

After the roof and the Rooftop Air-conditioning Unit (RTU) have been prepared, you need to attach the Transition Piece to the RTU. Then you will be able to install the RTC.

##### Direct tie-in Method

1. You have already decided where you will connect the Transition Piece to the RTU. Double check, considering the height of the RTC. Check for anything inside the RTU (for example, filter racks) that would interfere with the Transition Piece's airflow or its Scoop.
2. Cut a hole in the RTU (or remove a panel, in some cases) to accommodate the transition piece.
3. Insert the transition scoop into the opening. Adjust its location and screw and caulk its flanges to the panel of the air handler.
4. Set the RTC unit against the Transition Piece. Check that the RA and FA openings are properly aligned with the corresponding pieces in the Transition Piece.
5. Screw and caulk the flanges of the Transition Piece to the RTC unit.

##### Horizontal Duct Transition

1. Cut a hole in the Return Air duct to accommodate the transition piece. Consider the height of the RTC unit.
2. Insert the transition. The horizontal baffle has a sliding section. Push it back against the far side of the duct and screw it in place.
3. Screw and caulk the transition's flanges to the duct.
4. Set the RTC unit against the Transition Piece. Check that the RA and FA openings are properly aligned with the corresponding pieces in the Transition Piece.
5. Screw and caulk the flanges of the Transition Piece to the RTC unit.

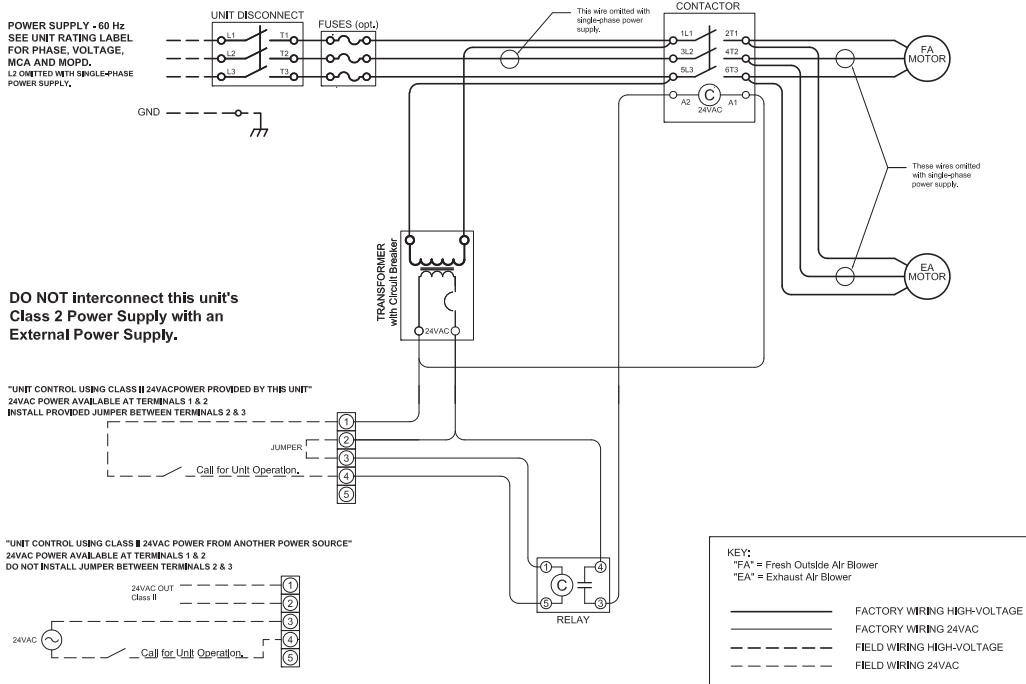
##### Securing the RTC Unit

Although the RTC unit is attached to the RTU via the Transition Piece, we recommend that the RTC unit be secured to the building structure as appropriate to withstand winds or earthquakes.

Follow local codes and standards. The Leveling Legs of the HE1XRTC and HE2XRTC can be bolted to equipment rails. Brackets can be attached to the base of the HE3XRTC and HE4XRTC for bolting to equipment rails.

## INSTALLATION

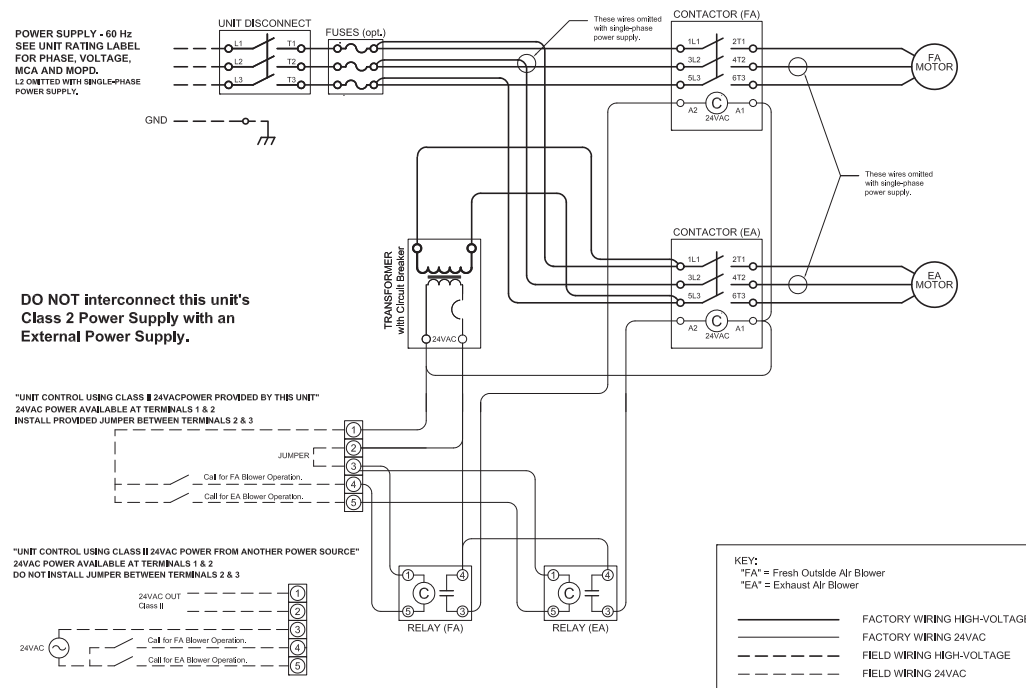
### HE1XRTC P1 AND P3 SINGLE AND THREE PHASE UNIT WITH STANDARD WIRING



### WIRING SCHEMATICS

**NOTE:** Schematics shown are representative of standard units. See Unit Schematic label for detailed information.

### HE1XRTC P1 AND P3 IBC SINGLE AND THREE PHASE UNIT WITH INDEPENDENT BLOWER CONTROL

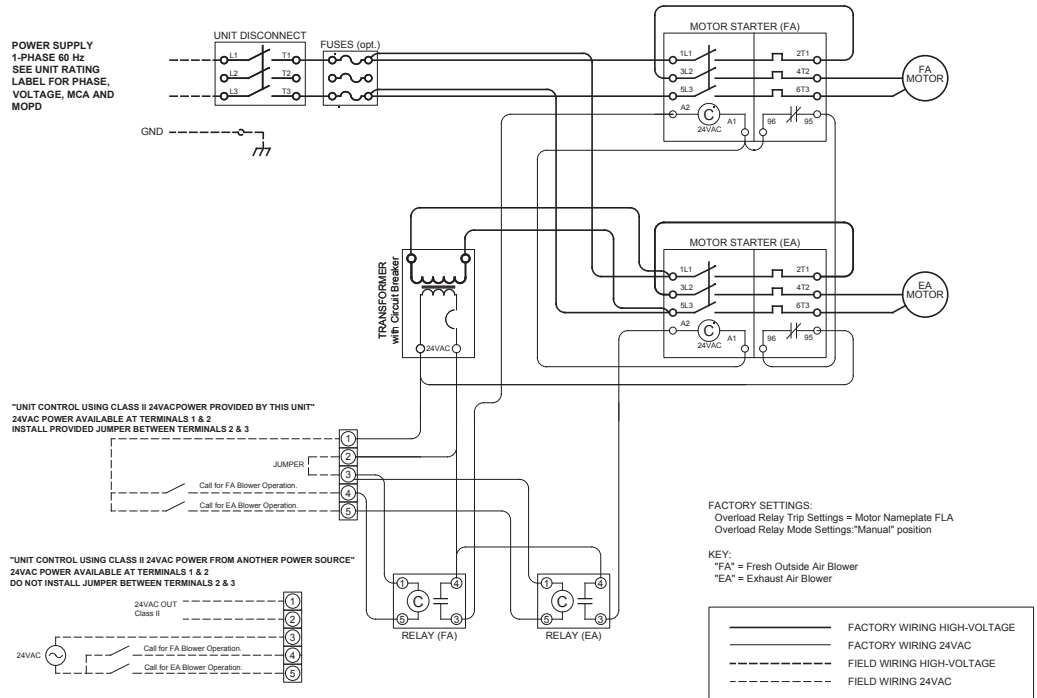


## INSTALLATION

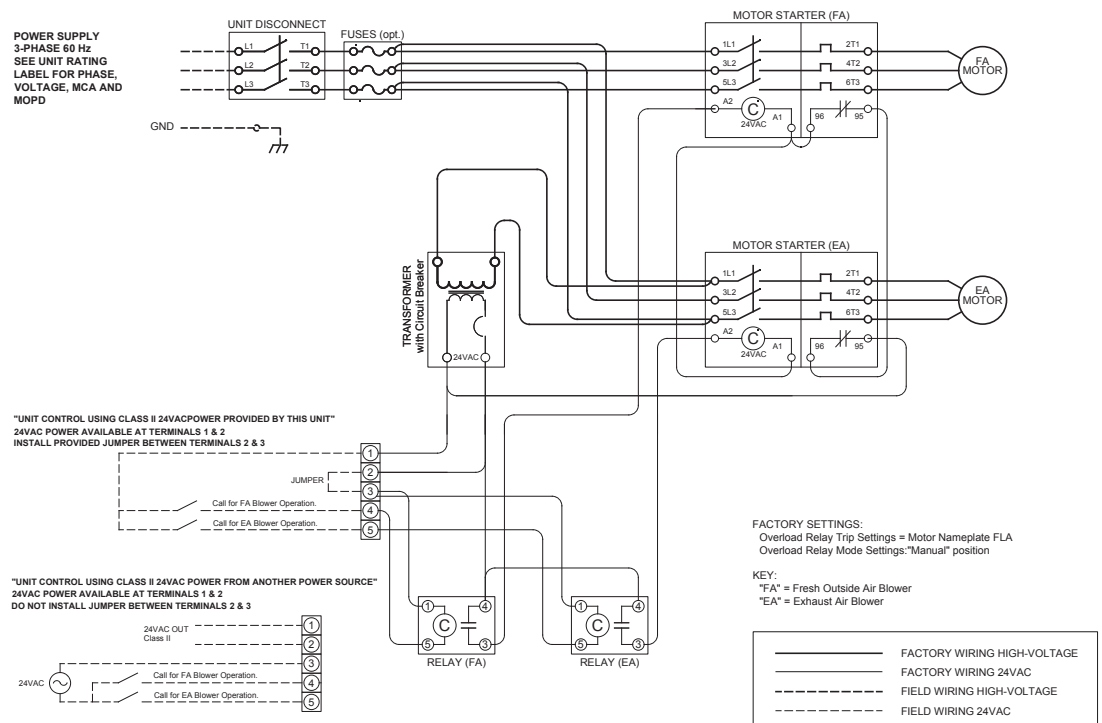
## WIRING SCHEMATICS

**NOTE:** Schematics shown are representative of standard units. See Unit Schematic label for detailed information.

## HE2XRTC AND HE3XRTC P1 IBC SINGLE PHASE UNIT WITH INDEPENDENT BLOWER CONTROL



## HE2XRTC, HE3XRTC AND HE4XRTC THREE PHASE UNIT WITH INDEPENDENT BLOWER CONTROL





## INSTALLATION

### LOW VOLTAGE CONTROL SYSTEM

This ERV is provided with a Class II 24VAC power supply system that operates the unit's contactors. The ERV's 24VAC Power Supply can also be used to power the externally-installed controls system: up to 8VA of power is available.

The unit's power supply system includes isolation relays so you can use external controls whose contact ratings are as low as 50mA (1.2VA). Also, it is possible to operate the isolation relays with 24VAC power from an external source (with proper wiring connections).

A built-in circuit-breaker prevents damage to the transformer and other low-voltage components in the event of a short-circuit or overload. In extreme cases, the transformer itself is designed to fail safely.

### SPECIFICATIONS

- Nominal Output Voltage under load: 24VAC
- Typical Output Voltage at no load: 29-31V
- Minimum contact rating for connected control device: 50mA (1.2VA)
- Circuit Breaker Trip Point: 3A

### INSTALLATION INSTRUCTION

#### CAUTION

Before bringing power to the unit 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.

#### CAUTION

1. Connect only to components intended for use with 24VAC power.
2. Do not undersize the low-voltage wires connected to this device. Observe the wire length and gauge limits indicated in this manual.
3. Do not overload this unit's 24VAC power supply system. Confirm that the power requirements of devices you connect to this power supply system do not exceed 8VA in total.
4. If an external source of 24VAC power is used to control the unit, consult the wiring schematics and connect the external power only to the specified terminals in order to avoid damaging the unit or external controls. Connect only CLASS II power to the control terminals of this unit.
5. Unit is not equipped to receive analog signals (such as 1-10vdc or 4-20mA).
6. Unit is not equipped to communicate directly with Building Management Systems (such as BACNET, LONWORKS, etc.). However, the unit can be controlled by powered or non-powered contacts operated by any kind of control system.

### HOW TO RESET THE 24VAC CIRCUIT BREAKER

If the transformer is subjected to an excessive load or a short circuit, the circuit breaker will trip to prevent the failure of the transformer. When it trips the circuit breaker's button pops up. Shut off the primary-side power to the unit, and remove the excessive load or the short. The circuit breaker can be reset about fifteen seconds after it trips by pressing in the button.

### LIMITS OF POWER OUTPUT

If limits on wire gauge and length are observed, you may connect control devices that draw up to 8VA to the blue and red wires. More than one device can be connected as long as total steady-state load does not exceed 8VA.

### INSTALLATION NOTES

If primary-side voltage is 230VAC, move black primary-side lead from transformer's "208V" terminal to the transformer's terminal marked "240V" ("230V" in some units).

Do not move the black primary-side lead that is connected to the transformer's "COM" terminal.

#### OBSERVE THESE LIMITS TO WIRE LENGTH AND GAUGE in order to ensure reliable operation of the control system.

Wire Gauge	#22	#20	#18	#16	#14	#12
Circuit Length	100'	150'	250'	400'	700'	1000'

"Circuit Length" is distance from ERV to Control Device.

## INSTALLATION

CONTROL WIRING  
SCHEMATICS

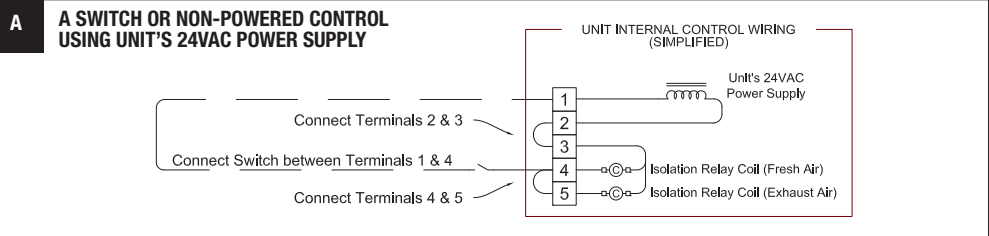
**NOTE:** The simplified schematics below show only the relevant portions of the low-voltage control circuit in the ERV unit and representational external control approaches. See the complete unit schematics elsewhere in this manual.

## CONTROL WIRING EXAMPLES BY TYPE OF APPLICATION

**A. Single 2-wire Control:** Use schematic below if the control requires no power from the unit to operate and acts like a simple on/off switch. The control must not supply any power to the ERV unit. Install jumper (provided) between terminals 2 & 3. Connect the control's contacts to terminals 1 & 4 to operate the ERV's Isolation Relay for OA/FA Blower. Install jumper between terminals 4 & 5 to operate the ERV's Isolation Relay for the RA/EA Blower.

## CAUTION

Make sure the control provides no voltage or current at its output terminals.

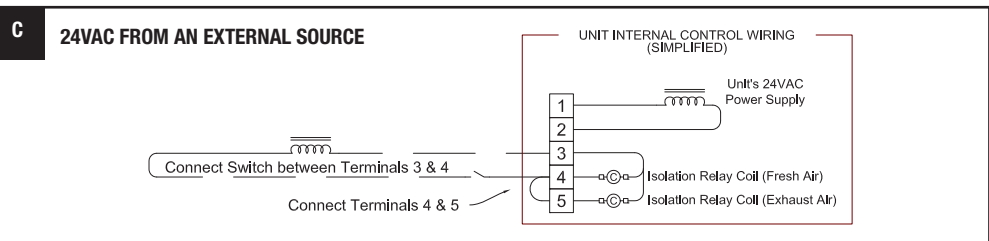


**B. Single 2-wire Control on separate Power Supply, no power present at Control Output:** Wire as shown for the Single 2-wire control (A. above).

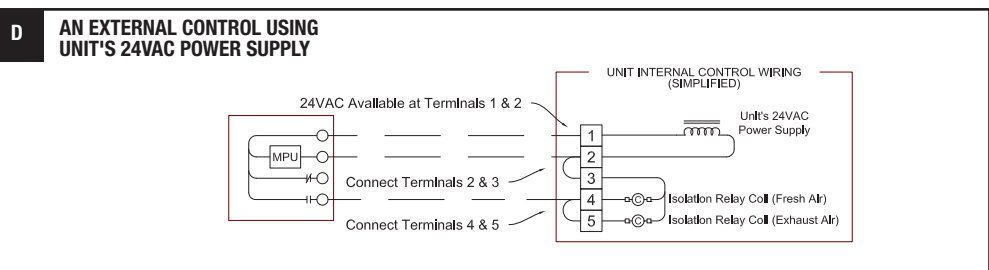
## CAUTION

Supply only 24VAC (not VDC) from a Class II Power Source.

**C. Control Sending 24VAC "On" Signal (from an external power source) to ERV:** Make sure jumper is NOT installed between Terminals 2 & 3. Now you safely can apply 24VAC to the Terminals 3 & 4 to operate the ERV's Isolation Relay for OA/FA Blower. Install jumper (provided) between terminals 4 & 5 to operate the ERV's Isolation Relay for the RA/EA Blower.

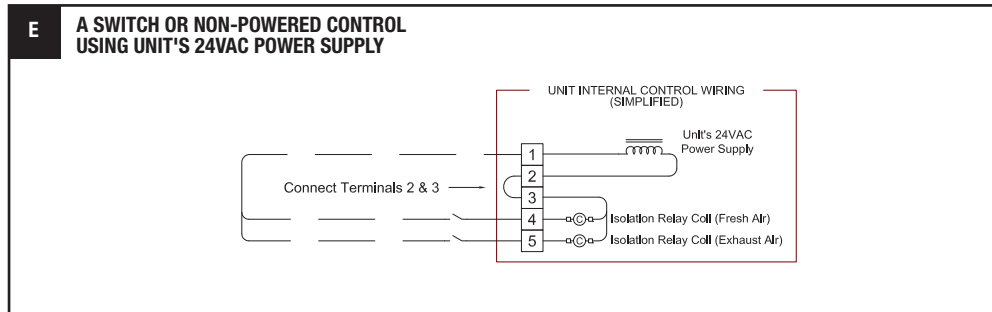


**D. Control operating on Unit's 24VAC Power Supply:** 24VAC power is available at the Terminals 1 & 2. **CAUTION:** external control system should not draw more than 8VA. Install jumper (provided) between terminals 2 & 3. Connect the switched output of the Control to Terminal 4 to operate the ERV's Isolation Relay for OA/FA Blower. Install jumper between terminals 4 & 5 to operate the ERV's Isolation Relay for the RA/EA Blower.



## INSTALLATION

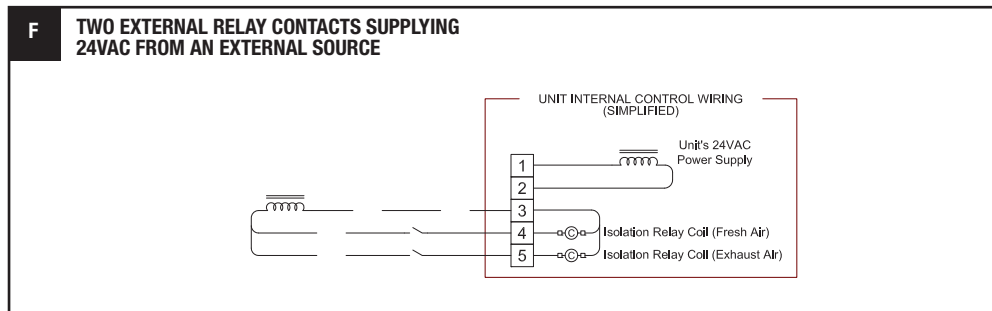
**E. Control System with 2 Non-powered Relay Contacts:** Use this schematic if the external control system provides no voltage or current at its output contacts. Install jumper (provided) between terminals 2 & 3. Connect one side of each of the output contacts to Terminal 1. Connect the other side of the output contact to control the FA Blower to Terminal 4, and the output contacts to control the EA Blower to Terminal 5.



### CAUTION

Make sure the control provides no voltage or current at its output terminals.

**F. Control System Sending two 24VAC "On" Signals from an external power source:** Make sure the jumper is NOT installed between Terminals 2 & 3. Now you safely can apply one of the 24VAC signals to Terminals 3 & 4 to operate the ERV's isolation relay for the Fresh Air Blower. Apply the second 24VAC signal to Terminals 3 & 5 to operate the ERV's isolation relay for the Exhaust Blower (make sure the polarity of each wire connected to Terminal 3 is the same).



### CAUTION

Supply only 24VAC (not VDC) from a Class II Power Source.

**G. Control System Operating Isolation Dampers with End Switches:** Use Isolation Dampers with electrically separate end switches. The end switches are used to separately control the ERV unit's Isolation Relays. This ensures that each damper is open before the respective blower starts up.

**NOTE:** Because the ERV's Motor Starters will only be operating once the Dampers are open, the power draw of the Damper Actuators is allowed to be as much as 35VA while opening (including power draw of the external control system, if any). However, the power draw of the fully-opened (stalled) Actuators (and external control system if any) must be less than 8VA. (Most damper actuators have much lower power draws.)

## START-UP & OPERATION

### OPERATION

#### PRINCIPAL OF OPERATION

The RTC has one basic purpose: to exhaust air from a structure and bring in fresh air from outside, while transferring heating or cooling energy from the exhaust air to the fresh air.

The RTC is a very simple device, and will accomplish this purpose as long as the blowers for both airstreams are able to move air through the energy-exchange core.

#### CHECKING THAT UNIT IS OPERATING

##### Air Flow

Airflow should be occurring in both airstreams. Sometimes the easiest place to confirm that air is moving is at the weatherhoods.

If exact airflow is critical, it may be desirable to permanently install flow measuring stations and manometers in the ductwork connected to the unit. These also can be used to determine when filters should be cleaned or changed.

##### Use Static Taps in Doors to Measure Airflow Rates

See “Cross-Core Static Drop” in MEASURING AIRFLOW table. These may be used to directly measure airflow in the unit.

##### Energy Exchange

Precise determination of installed sensible energy exchange effectiveness requires careful measurement of temperatures and air flows in all four air streams, and in practice is somewhat difficult.

It is possible to confirm that energy is being exchanged simply by feeling the ducts. If the Fresh Air duct from the unit into the room is closer to room temperature than to the outside temperature, energy is being recovered.

##### Operating Controls

A wide variety of control schemes may be selected by the engineer, installer, or owner to meet the ventilation needs of the facility. These may include timer clocks, occupancy sensors, dehumidistats (for cool-weather operation), carbon dioxide sensors, and others. DDC systems may also control the unit. Most control schemes will operate the unit only when needed.

#### CONTINUOUS OPERATION

Continuous operation is acceptable in virtually all conditions. Unit will not be damaged by continuous operation as long as air flow occurs. Blower motors may overheat if filters become completely blocked due to lack of maintenance. Motors are thermally protected. With continuous operation, some external frosting may occur in very cold weather (see OPERATION IN EXTREME COLD WEATHER).

#### OPERATION IN EXTREME COLD WEATHER

Unit is capable of operating at outside temperatures down to -10°F, with indoor humidities below 40%, without any internal frosting. Unit can operate at more severe conditions occasionally with little or no impact on its performance. At lower humidities, it can operate at lower outside temperatures without freezing the energy-exchange core.

#### MOTOR STARTERS

This unit uses IEC-style motor starters to protect the motors against overload.

IEC-style motor starters use Overload Relays to detect excessive current and interrupt the control circuit that engages the motor's contactors.

## START-UP & OPERATION

### WARNING

The Overload Relay output contacts 95 & 96 must remain in series with the low-voltage control circuit! Altering this will create a hazardous situation in which the motor is not protected against overload!

Adhere to applicable local codes when adjusting the dial setting of the overload relays.

Overload Relays are sized to Full Load Amp (FLA) rating of the protected motor. The Overload Relays can be adjusted to trip (interrupt the control circuit) at a specific setting within a range.

Overload Relays should initially be set at the FLA rating of the motor (see Unit Rating Label). If necessary to prevent nuisance tripping at start-up, the Relays can be adjusted to trip no higher than 115% of the motor's FLA rating.

For safest operation, the overload relays should also be used in manual reset mode with trip test capability.

**NOTE:** As factory-wired, if one blower motor is shut down due to overload by its Motor Starter, the other motor will also be shut down.

**NOTE:** Terminals 96 & 97 of the Overload Relays and terminals 14 & 13 of the Contactors are normally-open dry contacts that may be used to signal that the contactors are closed and/or that the Overload Relays have tripped.

### WARNING

#### DANGER OF INJURY OR DAMAGE.

The motors in this unit must not be run at an amperage that exceeds the motor's rated full load amps and overload relays on the motor starters must be set at or below motor full load amps. For safest operation, the overload relays should also be used in hand reset mode with trip test capability.

It is the installer's responsibility to measure the operating amperage of each motor. If the full load amp rating is exceeded, the amp draw must be reduced by substituting a smaller motor pulley or by adjusting the variable sheave. Continue these adjustments until the actual amperage is no more than the motor's faceplate full load amps.

Failure to make this adjustment may result in unsafe motor winding temperatures or tripping of the supplied motor starter's overload relay motor protection devices set at full load amps.

#### EQUIPMENT REQUIRED

- A magnehelic gauge or other device capable of measuring 0 to 1.5 in. water of differential pressure.
- 2 pieces of natural rubber latex tubing, 1/8" ID, 1/16" Wall works the best.

**NOTE:** Be sure to remove cap from pressure port before inserting tubing. Insure tubing is well seated in pressure ports.

**NOTE:** The tubing should extend in the pressure port approx. 1 inch.

#### CROSS CORE STATIC PRESSURE MEASUREMENT INSTRUCTIONS

The individual differential static pressures (DSP) can be measured using the installed pressure ports located in the front of the units core access doors.

**NOTE:** These ports have been carefully located on the unit as to give you the most accurate airflow measurement. Do not relocate pressure ports.

- To read SCFM of Fresh Air (FA) install the "high" pressure side (+) of your measuring device to the Outside Air (OA) port and the "low" pressure side (-) to the Fresh Air (FA) port.

- To read SCFM of Room Air (RA) install the "high" pressure side (+) of your measuring device to the Room Air (RA) port and the "low" pressure side (-) to the Exhaust Air (EA) port.

- Use the reading displayed on your measurement device to cross reference the CFM output using the conversion chart.

**NOTE:** Be sure to replace cap into pressure port when air flow measuring is completed.

#### OPERATION

### WARNING

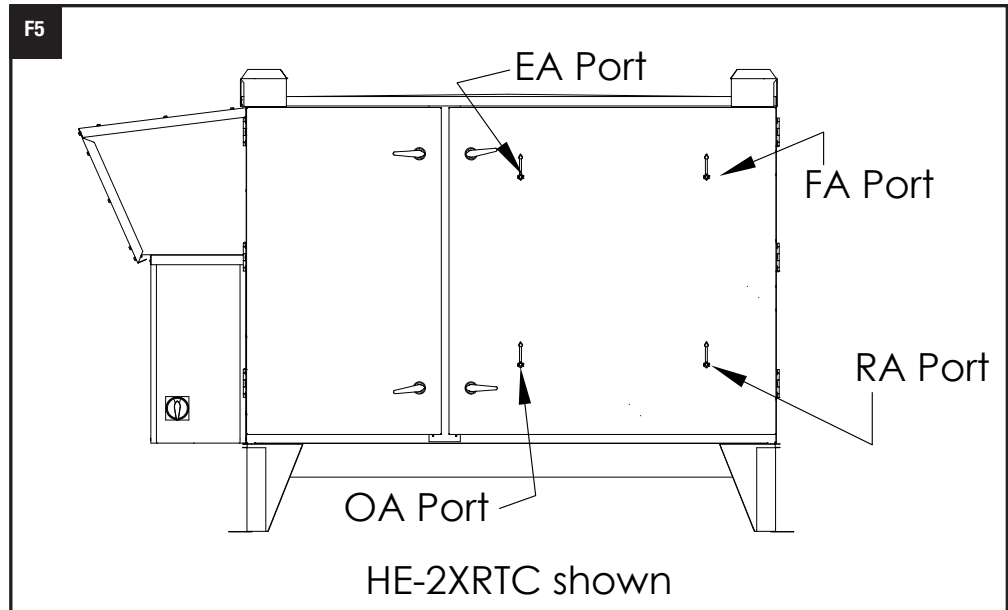
#### DANGER OF INJURY OR DAMAGE.

The relay must be set for correct FLA rating depending on the motor horsepower. See Unit Rating Label on motor for HP and FLA specifications.

#### MEASURING AIRFLOW

## START-UP & OPERATION

### MEASURING AIR FLOW



### CAUTION

The proper operating airflow range for this model is 500 - 1100 CFM.

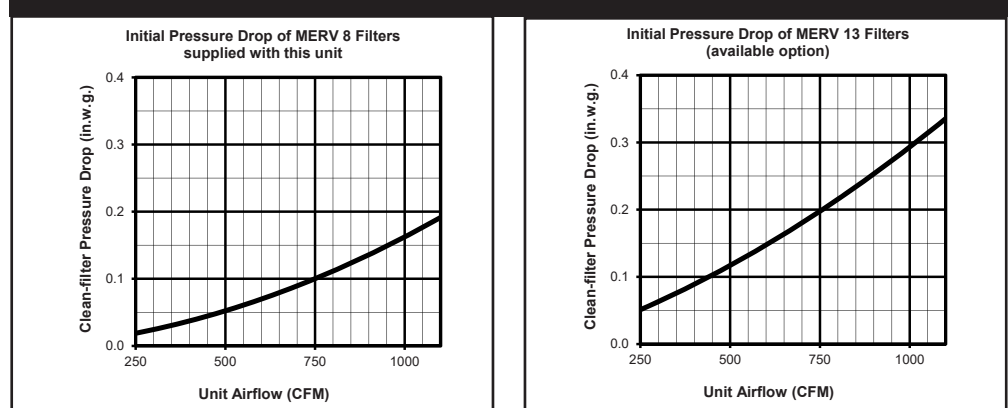
### DIFFERENTIAL STATIC ACROSS CORE DSP VS. CFM

HE1XRTC		DSP	0.50	0.60	0.70	0.80	0.90	1.00
	Fresh Air (FA)	CFM	650	725	815	890	975	1060
		DSP	0.60	0.70	0.80	0.90	1.00	1.10
	Exhaust Air (EA)	CFM	555	665	775	880	995	1100

### FILTER SPECIFICATIONS HE1XRTC

- (2) 20" x 20" x 2" (nominal) pleated filters. Actual size: 19.5" x 19.5" x 1.75".
- Unit shipped with MERV-8 Filters. Minimum recommended effectiveness: MERV-6

### INITIAL PRESSURE DROP OF FILTERS SUPPLIED WITH HE1XRTC



NOTE: pressure drop of standard filter supplied is included in unit airflow performance tables



## START-UP & OPERATION

### MEASURING AIR FLOW

#### CAUTION

The proper operating airflow range for this model is 500 - 1700 CFM.

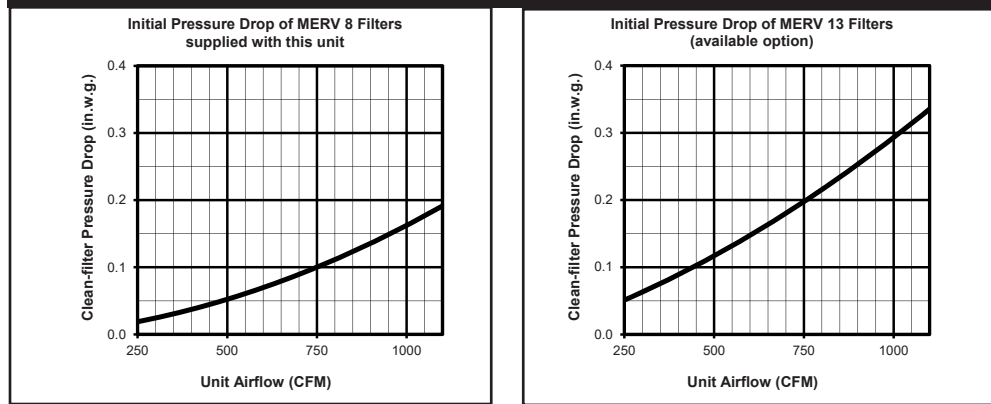
### DIFFERENTIAL STATIC ACROSS CORE DSP VS. CFM

HE2XRTC		DSP	0.30	0.40	0.50	0.60	0.70	0.80
	Fresh Air (FA)	CFM	870	1130	1450	1780	2000	2250
		DSP	0.60	0.65	0.70	0.75	0.80	0.85
	Exhaust Air (EA)	CFM	1070	1225	1400	1540	1740	1900

### FILTER SPECIFICATIONS HE2XRTC EXHAUST AIRSTREAM

- (2) 20" x 20" x 2" (nominal) pleated filters. Actual size: 19.5" x 19.5" x 1.75".
- Unit shipped with MERV-8 Filters. Minimum recommended effectiveness: MERV-6

### INITIAL PRESSURE DROP OF FILTERS SUPPLIED WITH HE2XRTC EXHAUST AIRSTREAM

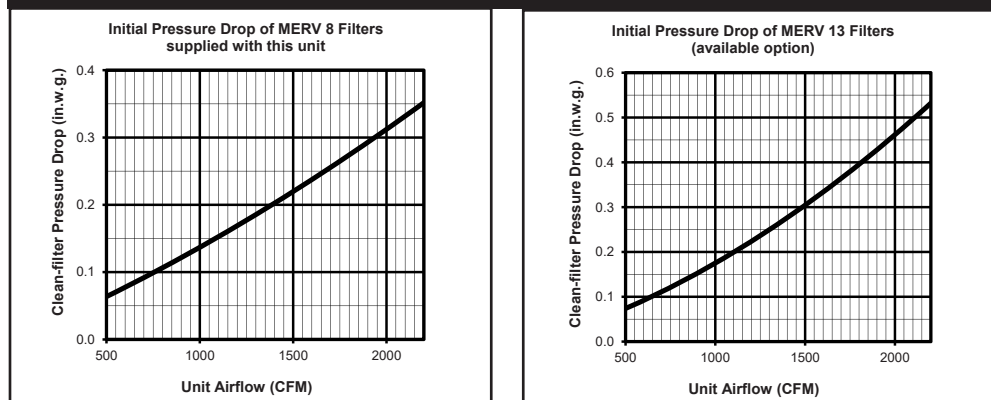


NOTE: pressure drop of standard filter supplied is included in unit airflow performance tables

### FILTER SPECIFICATIONS HE2XRTC FRESH AIRSTREAM

- (2) 14" x 20" x 2" (nominal) pleated filters. Actual size: 13.5" x 19.5" x 1.75".
- Unit shipped with MERV-8 Filters. Minimum recommended effectiveness: MERV-6

### INITIAL PRESSURE DROP OF FILTERS SUPPLIED WITH HE2XRTC FRESH AIRSTREAM



NOTE: pressure drop of standard filter supplied is included in unit airflow performance tables

## START-UP &amp; OPERATION

## MEASURING AIR FLOW

**CAUTION**

The proper operating airflow range for this model is 1100 - 2400 CFM.

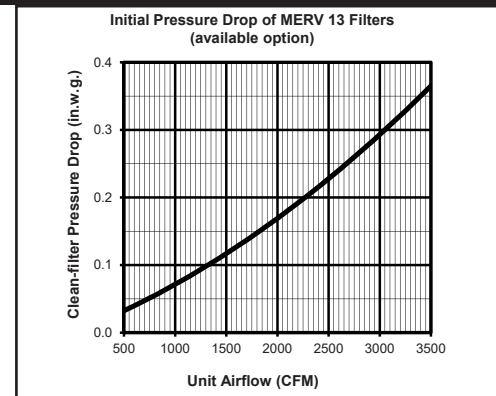
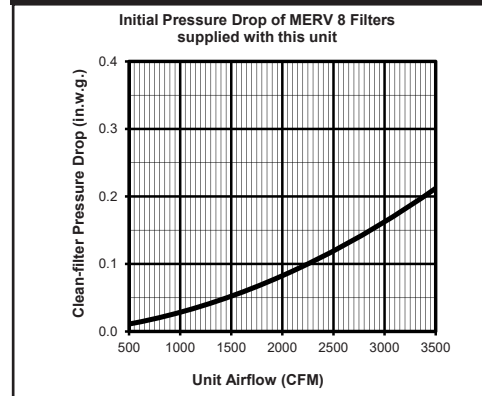
## DIFFERENTIAL STATIC ACROSS CORE DSP VS. CFM

HE3XRTC		DSP	0.25	0.35	0.45	0.50	0.55	0.6
	Fresh Air (FA)	CFM	1050	1470	1890	2100	2310	2520
		DSP	0.35	0.45	0.55	0.60	0.65	0.70
	Exhaust Air (EA)	CFM	1210	1550	1900	2070	2240	2420

## FILTER SPECIFICATIONS HE3XRTC EXHAUST AIRSTREAM

- (3) 20" x 20" x 2" (nominal) pleated filters. Actual size: 19.5" x 19.5" x 1.75".
- Unit shipped with MERV-8 Filters. Minimum recommended effectiveness: MERV-6

## INITIAL PRESSURE DROP OF FILTERS SUPPLIED WITH HE3XRTC EXHAUST AIRSTREAM

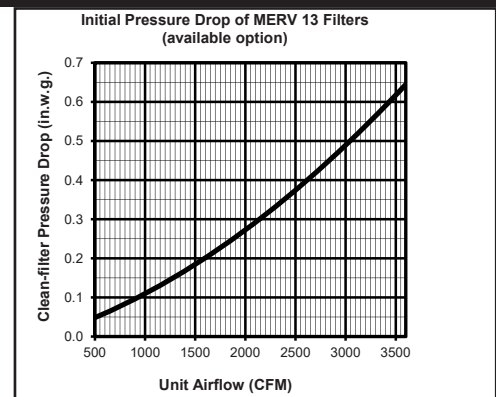
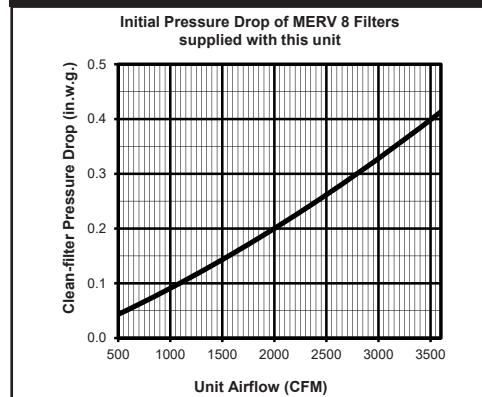


NOTE: pressure drop of standard filter supplied is included in unit airflow performance tables

## FILTER SPECIFICATIONS HE3XRTC FRESH AIRSTREAM

- (2) 16" x 25" x 2" (nominal) pleated filters. Actual size: 15.5" x 24.5" x 1.75".
- Unit shipped with MERV-8 Filters. Minimum recommended effectiveness: MERV-6

## INITIAL PRESSURE DROP OF FILTERS SUPPLIED WITH HE3XRTC FRESH AIRSTREAM



NOTE: pressure drop of standard filter supplied is included in unit airflow performance tables

## START-UP & OPERATION

### MEASURING AIR FLOW

#### CAUTION

The proper operating airflow range for this model is 2500- 3900 CFM.

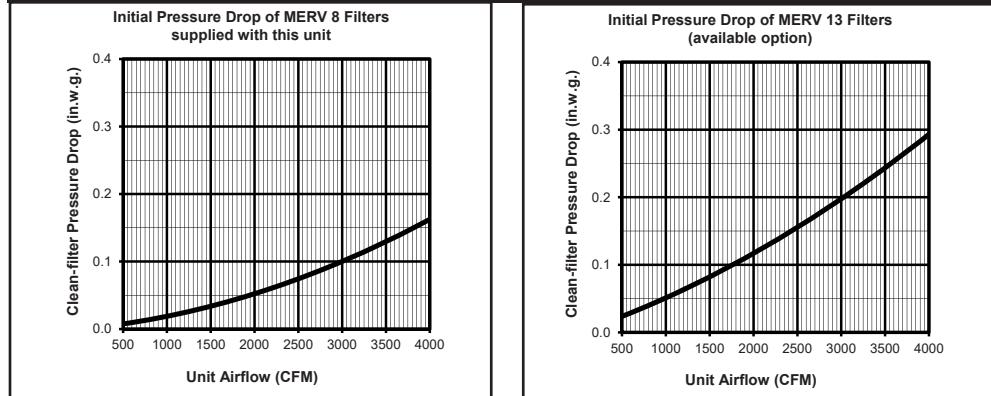
### DIFFERENTIAL STATIC ACROSS CORE DSP VS. CFM

HE4XRTC		DSP	0.60	0.70	0.80	0.85	0.90	0.95
	Fresh Air (FA)	CFM	2520	2940	3360	3570	3780	3990
		DSP	0.75	0.85	0.95	1.05	1.15	1.25
	Exhaust Air (EA)	CFM	2590	2930	3280	3620	2970	4310

### FILTER SPECIFICATIONS HE4XRTC EXHAUST AIRSTREAM

- (4) 20" x 20" x 2" (nominal) pleated filters. Actual size: 19.5" x 19.5" x 1.75".
- Unit shipped with MERV-8 Filters. Minimum recommended effectiveness: MERV-6

### INITIAL PRESSURE DROP OF FILTERS SUPPLIED WITH HE4XRTC EXHAUST AIRSTREAM

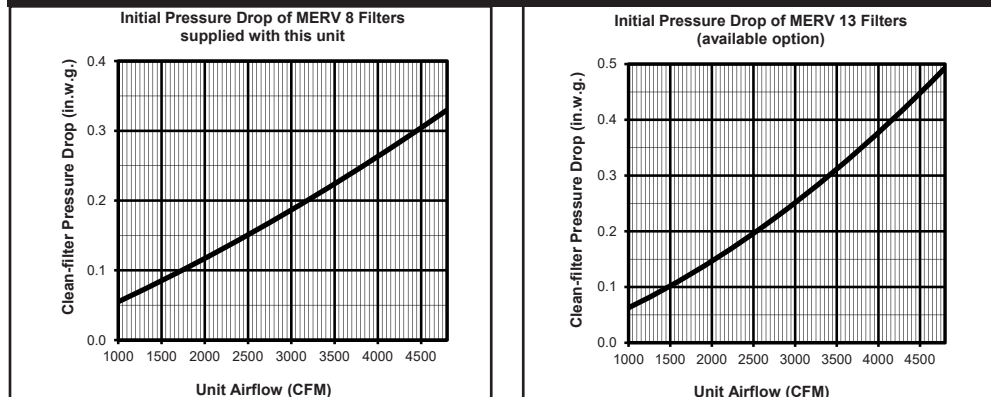


NOTE: pressure drop of standard filter supplied is included in unit airflow performance tables

### FILTER SPECIFICATIONS HE4XRTC FRESH AIRSTREAM

- (4) 16" x 20" x 2" (nominal) pleated filters. Actual size: 15.5" x 19.5" x 1.75".
- Unit shipped with MERV-8 Filters. Minimum recommended effectiveness: MERV-6

### INITIAL PRESSURE DROP OF FILTERS SUPPLIED WITH HE4XRTC FRESH AIRSTREAM



NOTE: pressure drop of standard filter supplied is included in unit airflow performance tables

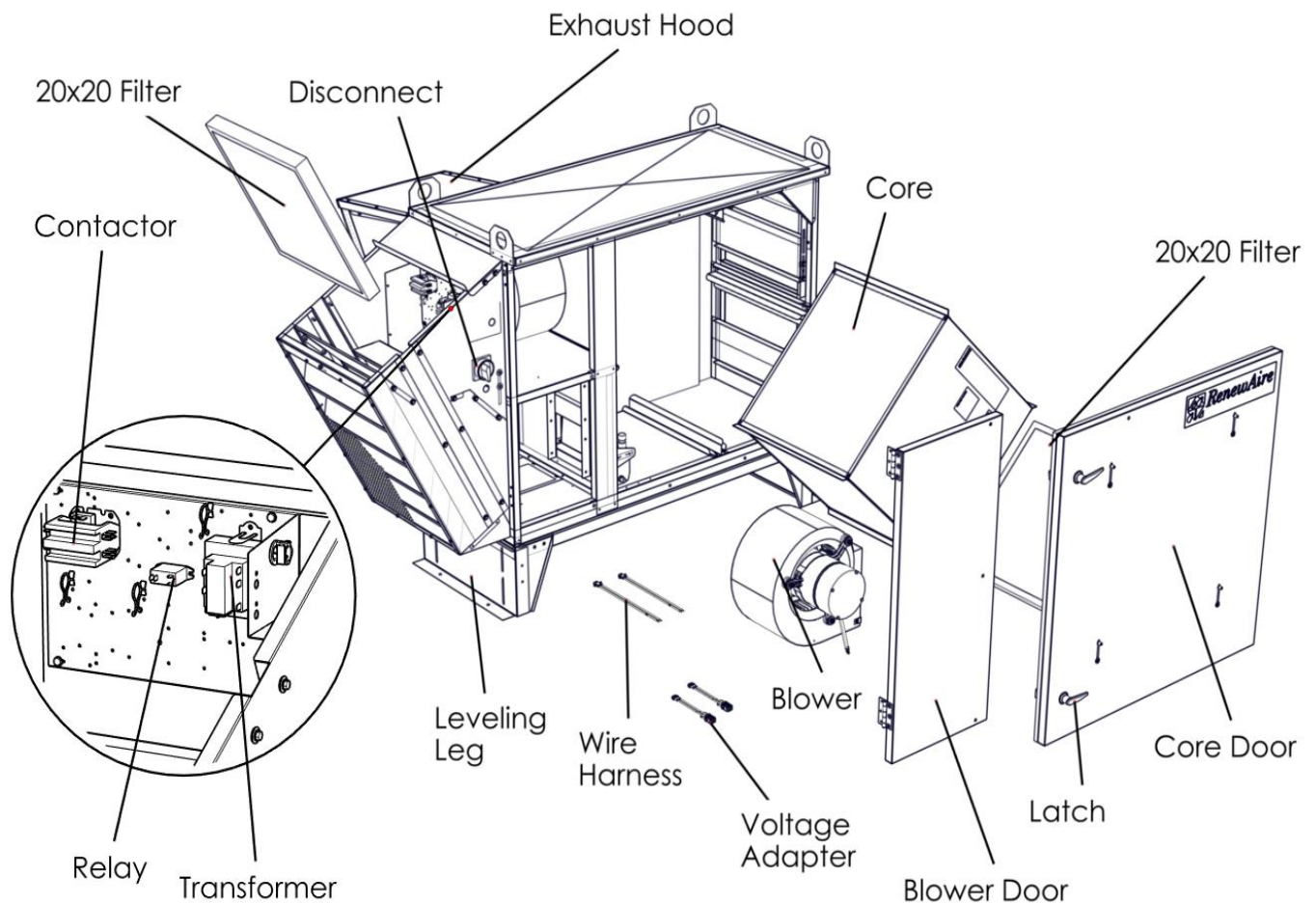
**MAINTENANCE**

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## MAINTENANCE

### SERVICE PARTS

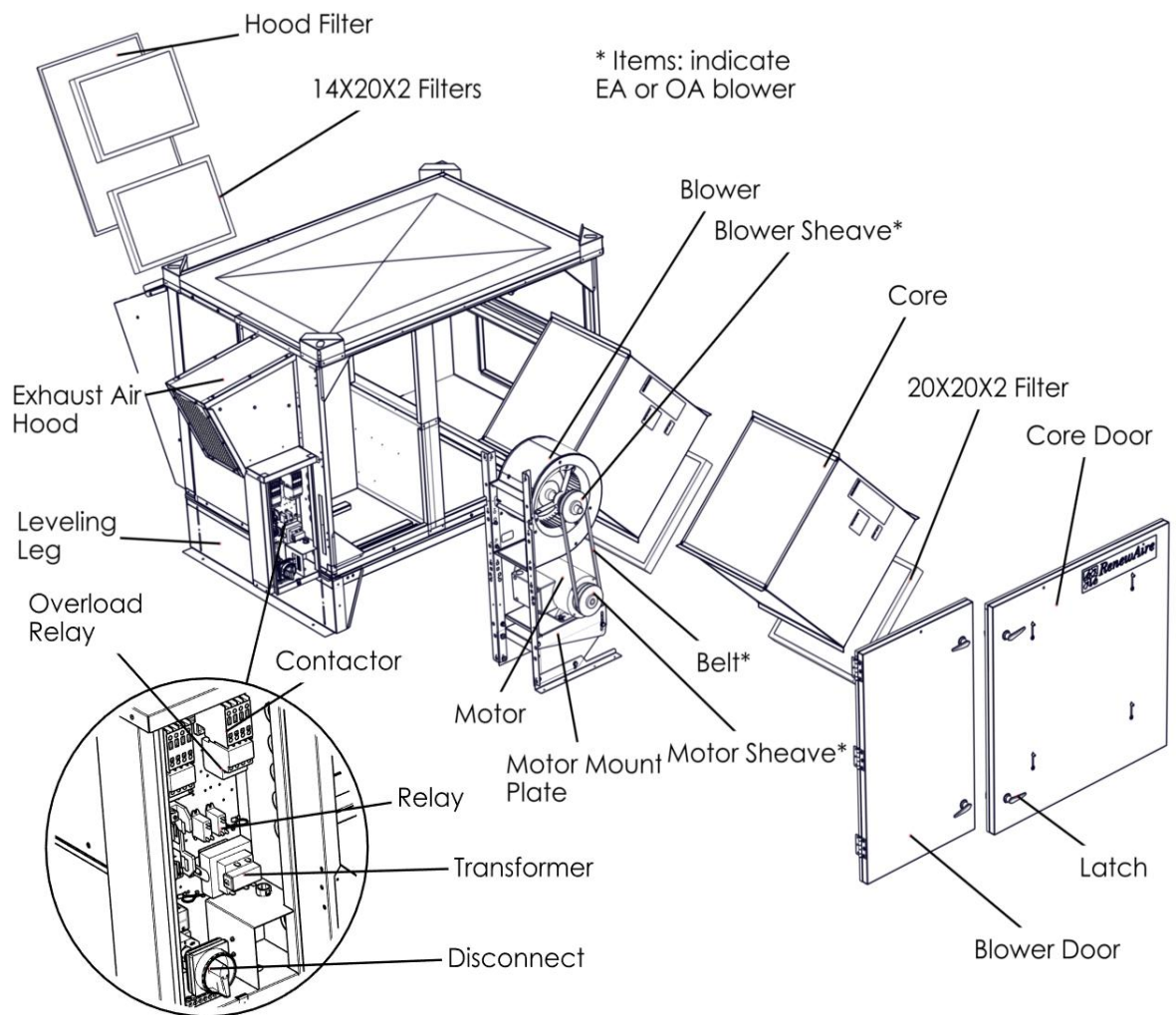
#### HE1XRTC



## MAINTENANCE

### SERVICE PARTS

#### HE2XRTC

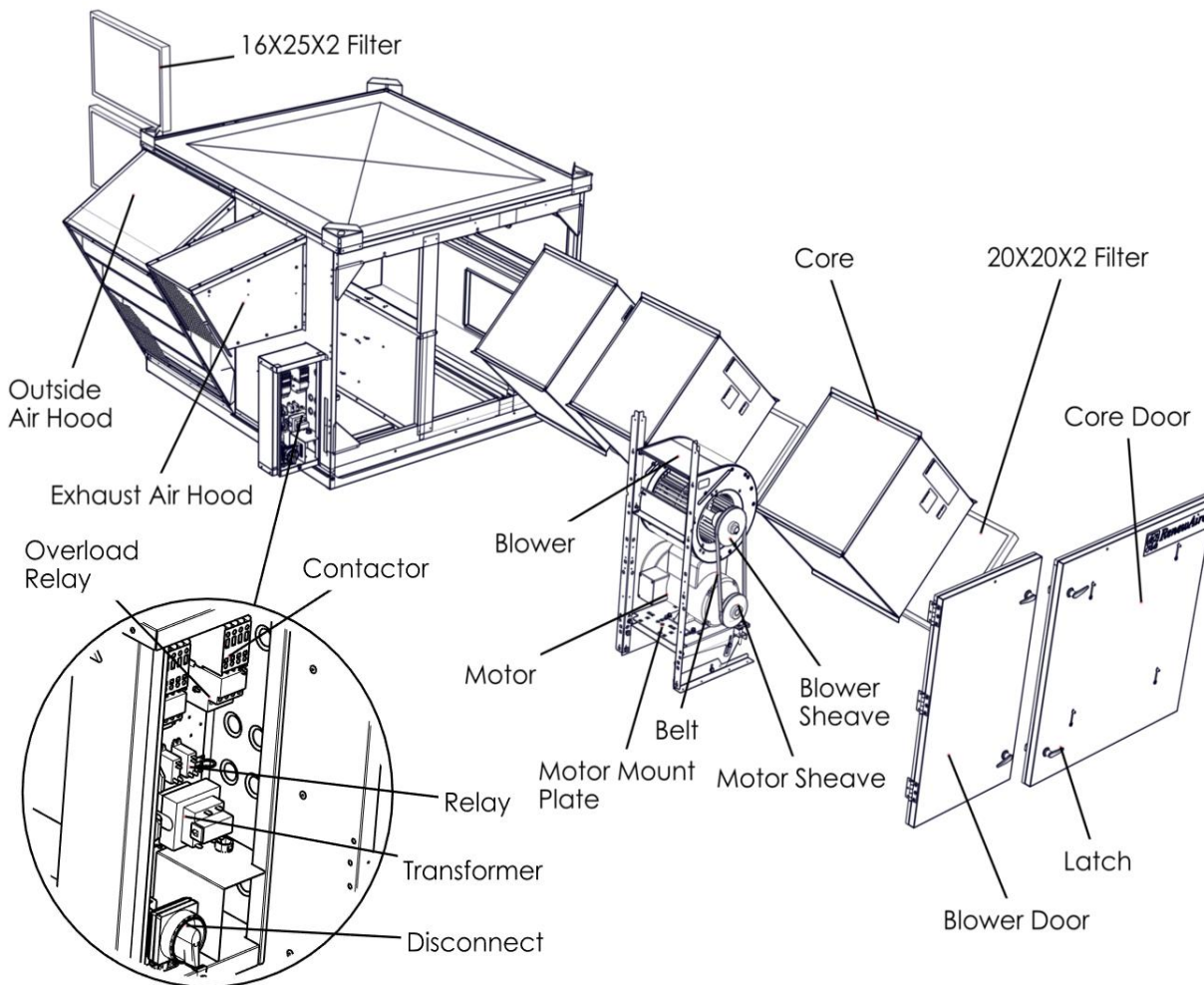




## MAINTENANCE

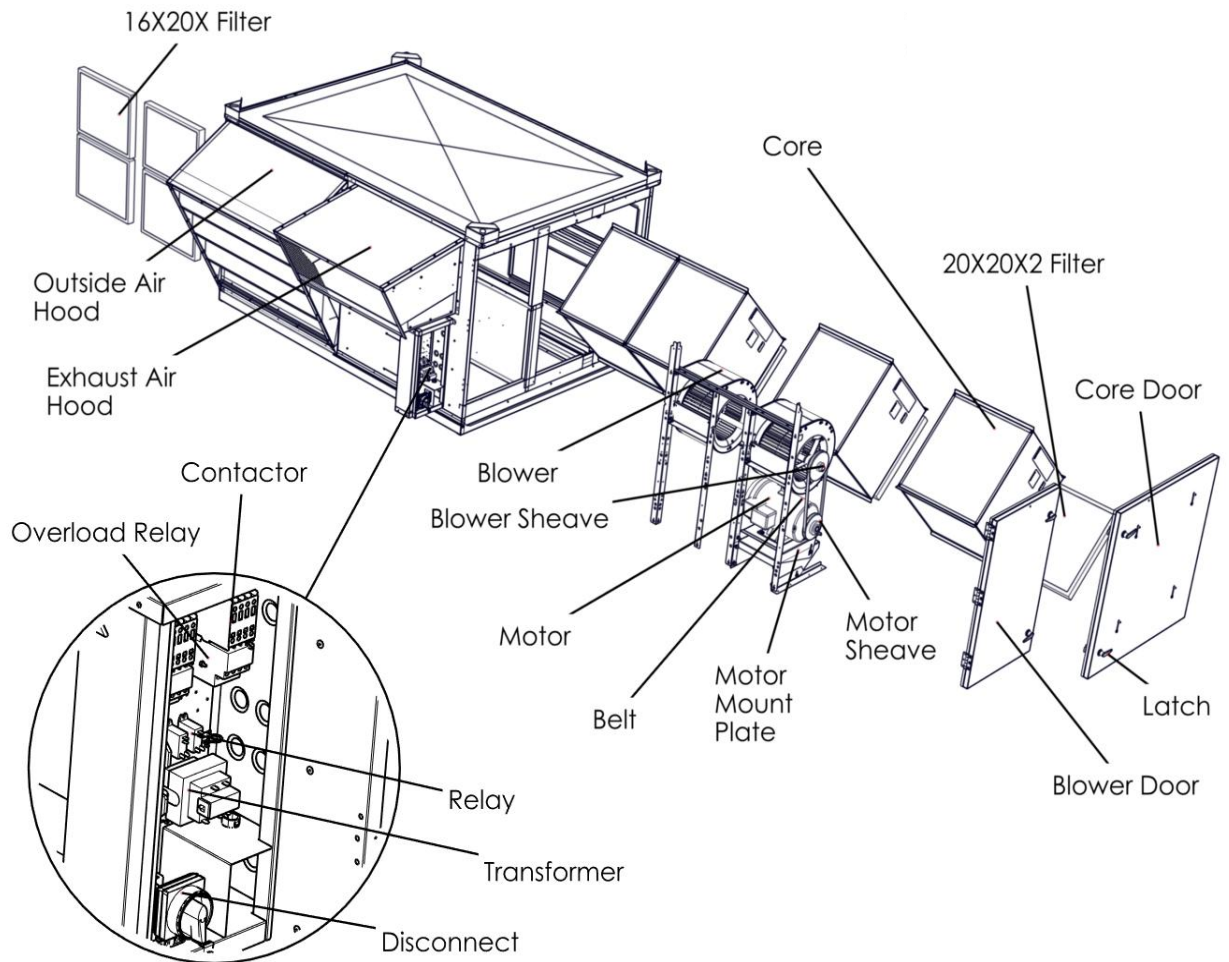
### SERVICE PARTS

#### HE3XRTC



## MAINTENANCE

### SERVICE PARTS HE4XRTC



## MAINTENANCE

### REQUIREMENTS

#### WARNING

Danger of injury from un-guarded drive belts in unit. Disconnect power to unit before opening door.  
 Danger of injury if unit starts unexpectedly. Switch power off at service disconnect.  
 Lock-out/tag-out the disconnect.

#### TO CLEAN THE ENERGY EXCHANGE ELEMENT

Vacuum the face of the energy exchange element yearly. Dust collects only on the entering face of the energy exchange element, right where the filter sits. The interior of the energy exchange element stays clean even if the element faces are dust covered. The RenewAire core airflow paths are designed to transport the air in a laminar motion. The core flutes move the air in a laminar airflow such that particulate deposition is maintained at virtually nill.

1. Remove the 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.

#### INSPECT AND CHANGE THE FILTERS REGULARLY

Inspect and/or replace filters every two or three months when the unit is in regular use, or as needed.

1. Turn off unit completely! Lock-out and tag-out the unit disconnect switch.
2. Open the Door. The door is secured with turn-type latches or draw latches, plus one Phillips-head securing screw. Keep the securing screw. **NOTE:** Always replace securing screw when reinstalling door for safety reasons.
3. Remove and dispose of all (6) filters. Replace all (6) filters. **NOTE:** See chart for information on the initial resistance of the filters originally supplied with this unit. If replacement filters have higher resistance, the airflow of the system will be lower.
4. Close door; reinstall securing screw.

#### BLOWER INSPECTION

Inspect Blowers every time you change the filters.

1. Confirm bearings are still secure to blower shaft. It should not be possible to move the blower shaft back and forth along its length.
2. Confirm blower wheel is not rubbing against the blower inlet or housing by rotating wheel manually.

#### BLOWER BELT TENSION

Check belt tension every time you change the filters.

1. Inspect belt(s) for cracking or uneven wear.
2. Check that sheaves are properly aligned so that belt runs straight.

Properly tensioned belt will deflect 0.25" when pressed at the center point with the following force:

- 2 HP BLOWER - 3 pounds
- 3 HP BLOWER - 4 pounds
- 5 HP BLOWER - 5 pounds

#### GENERAL CLEANING AND INSPECTION

Perform general cleaning and visual inspection when changing filters.

1. Remove dust from blower wheels periodically.
2. Remove paper, leaves, etc. from inlet and outlet screens.
3. Inspect for insect nests.

#### MOTOR MAINTENANCE

If the motors used in this ERV are equipped with grease fittings, motors must be lubricated as part of routine maintenance. Use Exxon Polyrex or equivalent at 2500 operating hour intervals.

#### CAUTION

##### DO NOT WASH THE ENERGY EXCHANGE CORE.

Keep it away from water or fire to avoid damaging it. Always handle the core carefully.

Filters must be used or the energy exchange core will become blocked by dust and reduce unit efficacy. In extreme cases components may be damaged.

#### CAUTION

Incorrect Belt Tension will damage this blower and bearings.



#### ABOUT RENEWAIRE

For over 30 years, RenewAire has been a pioneer in improving people's health, cognitive function, productivity and wellbeing by enhancing indoor air quality (IAQ) in homes and buildings of every type. This is done energy-efficiently, cost-effectively and sustainably via our fifth-generation, static-plate, enthalpy-core Energy Recovery Ventilators (ERVs) and Dedicated Outdoor Air Systems (DOAS) that reuse otherwise-wasted energy to condition incoming outdoor air. This process optimizes energy efficiency, lowers capital costs by reducing HVAC loads and decreases operational expenses by downsizing equipment, resulting in major energy and cost savings. RenewAire technologies also enjoy the industry's best warranty with the fewest claims due to tremendous reliability, flexibility and ease of use.

RenewAire was the first innovator with static-plate, enthalpy-core technology in the U.S., and is currently one of the largest ERV companies in the country. Committed to sustainability and protecting the environment, our manufacturing facility in Madison, WI is 100% powered by renewable energy and is on track to be one of the few buildings worldwide with LEED Gold, Green Globes and ENERGY STAR certifications. Our technology excels in every geography, every climate, every building and every application, enabling RenewAire to be everywhere. In 2010, RenewAire joined the Soler & Palau Ventilation Group, providing direct access to state-of-the-art, air-moving technology. For more information, visit: [www.renewaire.com](http://www.renewaire.com).

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