EnergyX® System
Factory Installed Energy Recovery
48/50HC WeatherMaster® Commercial Rooftop Units
15 to 25 Nominal Tons
with Puron® (R−410A) Refrigerant
and *ComfortLINK* Controls

Carrier
turn to the experts

Supplemental Installation Instructions

This document is a supplemental installation instruction for the EnergyX factory installed Energy Recovery Ventilator. It is to be used with the base HC 15 to 25 Ton rooftop unit Installation Instructions and ComfortLINK Controls Manual.

NOTE: Read the entire instruction manual before starting the installation

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SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock or other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloths for brazing operations and have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and appropriate national electrical codes (in USA, ANSI/NFPA70, National Electrical Code (NEC); in Canada, CSA C22.1) for special requirements.

It is important to recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol.

DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death.

CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage.

NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could cause personal injury or death.

Before performing service or maintenance operations on unit, always turn off main power switch to unit and install lock(s) and lockout tag(s). Unit may have more than one power switch. Ensure electrical service to rooftop unit agrees with voltage an amperage listed on the unit rating plate.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may cause equipment damage.

This unit uses a microprocessor-based electronic control system. Do not use jumpers or other tools to short out components or to bypass or otherwise depart from recommended procedures. Any short-to-ground of the control board or accompanying wiring may destroy the electronic modules or electrical components.

⚠ CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing air conditioning equipment.

GENERAL

This publication contains Installation, Start-Up, Controls, Operation, Troubleshooting and Service information for the EnergyX Energy Recovery System, factory installed on a 48/50HC (15 to 25 nominal ton) rooftop unit. This document is a supplemental installation instruction and is to be used in conjunction with the base rooftop unit Installation Instructions and the ComfortLINK Controls, Start-Up, Operation and Troubleshooting Instructions.

The EnergyX Energy Recovery system is designed to pre-condition the outside air prior to it entering the rooftop unit evaporator using building exhaust air as a heat sink / source. The EnergyX system provides latent and sensible energy exchange between the outside ventilation air and the building exhaust air. This preconditioning of air allows higher operating efficiencies, increased comfort control, potential downsizing of the base rooftop unit while still meeting the ASHRAE ventilation requirements. Operational cost savings are realized by the high efficiency Energy Recovery device meeting the cooling and heating call for a larger portion of the operating cycle than just a normal damper or economizer device. This is demonstrated by the EnergyX AHRI Guideline-V Combined Efficiency Factor.

EnergyX HC17-28 units are shipped in the vertical supply and return duct configurations only. A field installed horizontal curb adapter kit is available for horizontal return and supply configuration.

The EnergyX Energy Recovery Wheel is rated in accordance with AHRI 1060 and is UL listed.

See Table 1 for Physical Data.

Table 1 – Physical Data

Model	48/50HC Sizes 17 –20 (15 -17.5 Ton)	
EnergyX Size	NON ECONO CFM	ECONO CFM
EnergyX Unit Type	Modulating Air Flow Capability	
ERV WHEEL OA (CFM) Range	682 – 3675	
ERV WHEEL EA (CFM) Range	682 – 3675	
MAX ECONOMIZER OA (CFM)	N/A	6000-7000
MAX ECONOMIZER EA (CFM)		6000-7000
ENERGY RECOVERY WHEEL		
TYPE	Enthalpy Lightweight Polymer with Silica Gel Desiccant Coating	
MODEL (AirXchange)	ERC-3628	
SIZE (Dia. X Depth) (in.)	36 – in x 3 – in	
NOMINAL DRIVE MOTOR HP	1/20	
SUPPLY FAN #1		
QTY - TYPE	1 - Backward Curved	
DRIVE TYPE	Direct	
BLOWER SIZE (DIAMETER)	15.75 – in	
NOMINAL MOTOR HP	1.2	
SUPPLY FAN #2		
QTY - TYPE	1 - Backward Curved	
DRIVE TYPE	Direct	
BLOWER SIZE	15.75 – in	
NOMINAL MOTOR HP	1.2	
EXHAUST FAN #1		
QTY - TYPE	1 - Backward Curved	
DRIVE TYPE	Direct	
BLOWER SIZE	19.68 – in	
NOMINAL MOTOR HP	3.6	
EXHAUST FAN #2		
QTY - TYPE	N/A	1 - Backward Curved
DRIVE TYPE	N/A	Direct
BLOWER SIZE	N/A	19.68 – in
NOMINAL MOTOR HP	N/A	3.6
FILTERS		
TYPE	2-in. Pleated, 30% Efficiency	
SUPPLY AIR (QTY) - SIZE	(2) 20 – in x 16 – in x 2 – in	
EXHAUST AIR (QTY) - SIZE	(2) 20 – in x 16 – in x 2 – in	
TYPE	Aluminum Water Filter	
Water Entrapment (QTY) - SIZE	(2) 34.375 – in x 17.25 – in x 1 – in	

Table 1 - Physical Data (cont)

Model	48/50HC Sizes 24–28 (20 - 25 Ton)	
EnergyX Size	NON ECONO CFM	ECONO CFM
EnergyX Unit Type	Modulating Air Flow Capability	
ERV WHEEL OA (CFM) Range	1076–6000	
ERV WHEEL EA (CFM) Range	1076–6000	
MAX ECONOMIZER OA (CFM)	N/A	8000-10000
MAX ECONOMIZER EA (CFM)		8000-10000
ENERGY RECOVERY WHEEL		
TYPE	Enthalpy Lightweight Polymer with Silica Gel Desiccant Coating	
MODEL (AirXchange)	ERC-4646C	
SIZE (Dia. X Depth) (in.)	46–in x 3–in	
NOMINAL DRIVE MOTOR HP	1/6	
SUPPLY FAN #1		
QTY - TYPE	1 - Backward Curved	
DRIVE TYPE	Direct	
BLOWER SIZE (DIAMETER)	19.68–in	
NOMINAL MOTOR HP	3.6	
SUPPLY FAN #2		
QTY - TYPE	1 - Backward Curved	
DRIVE TYPE	Direct	
BLOWER SIZE	19.68–in	
NOMINAL MOTOR HP	3.6	
EXHAUST FAN #1		
QTY - TYPE	1 - Backward Curved	
DRIVE TYPE	Direct	
BLOWER SIZE	19.68–in	
NOMINAL MOTOR HP	3.6	
EXHAUST FAN #2		
QTY - TYPE	1 - Backward Curved	
DRIVE TYPE	Direct	
BLOWER SIZE	19.68–in	
NOMINAL MOTOR HP	3.6	
FILTERS		
TYPE	2-in. Pleated, 30% Efficiency	
SUPPLY AIR (QTY) - SIZE	(2) 25–in x 25–in x 2–in	
EXHAUST AIR (QTY) - SIZE	(2) 25–in x 25–in x 2–in	
TYPE	Aluminum Water Filter	
Water Entrapment (QTY) - SIZE	(2) 34.375–in x 24.5–in x 1–in	

INSTALLATION

An EnergyX unit is installed as a single piece unit. To install an EnergyX unit, follow the base rooftop unit installation instructions with the following exceptions and additions:

Install Roofcurb

Vertical Airflow Configurations —

The EnergyX unit uses the standard HC base unit roofcurb. No extra curb support rails or extensions are required. See the unit nameplate for model number designation. Refer to the base rooftop installation manual and "Install Hold Down Brackets" below for roofcurb instructions. Ductwork must be attached to the curb.

Horizontal Airflow Applications —

EnergyX units with a horizontal return and supply air configuration require a field installed horizontal curb adapter kit. Refer to the base rooftop installation manual and the horizontal curb adaptor kit manual for roofcurb instructions.

Install Iso-Exhaust Accessory Hood (if applicable) —

If an exhaust isolation hood has been ordered as an accessory to isolate return air that must be exhausted (e.g. bathroom exhaust), install it in the return air portion of the roof curb prior to setting the rooftop unit. The iso-exhaust hood should face with the opening out and the angled hood portion facing the interior of the curb. Refer to the accessory installation instructions for further guidance.

Rig and Place Unit on Curb

Inspect the EnergyX system for damage. File a claim with the shipping company if shipment is incomplete or damaged.

Install Hold Down Brackets —

Units are shipped with hold down brackets for securing the base unit with the ERV option to the roof curb. Install and secure the brackets as shown in Fig. 2.

NOTE: Hold down brackets must be affixed to the curb and rooftop unit prior to removing rigging support.

⚠ WARNING-NOTICE TO RIGGERS

PRIOR TO UNIT INSTALLATION, REMOVE ROOFCURB BRACKETS FROM SHIPPING SKID. BRACKETS MUST BE INSTALLED ON ROOFCURB WITH SCREWS PRIOR TO UNIT INSTALLATION. SEE INSTALLATION INSTRUCTIONS.

AVANT L'INSTALLATION DE L'UNITÉ, ENLEVER LES SUPPORTS DE REBORD DE TOIT DE LA PLATEFORME D'EXPÉDITION. LES SUPPORTS DOIVENT ÊTRE INSTALLÉS SUR LE REBORD DU TOIT AVEC DES BOULONS AVANT L'INSTALLATION DE L'UNITÉ. VOIR LES INSTRUCTIONS D'INSTALLATION.

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Fig. 1 - Label: Warning - Notice to Riggers

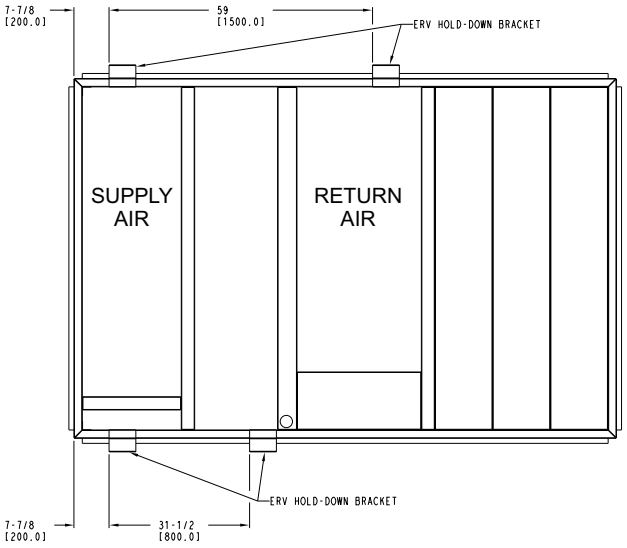
See the rigging label on the exterior of the base unit and Fig. 3. This label is provided for guidance purposes ONLY. The unit's actual weight and center of gravity will vary based on the specific combination of factory options included with the unit. Use prudent judgment when rigging and lifting the unit to account for weight variances and make adjustments for the actual center of gravity as necessary.

⚠ CAUTION

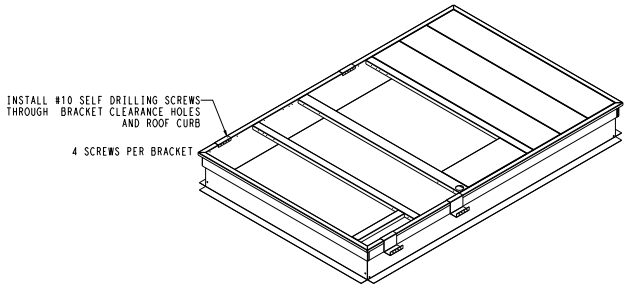
UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

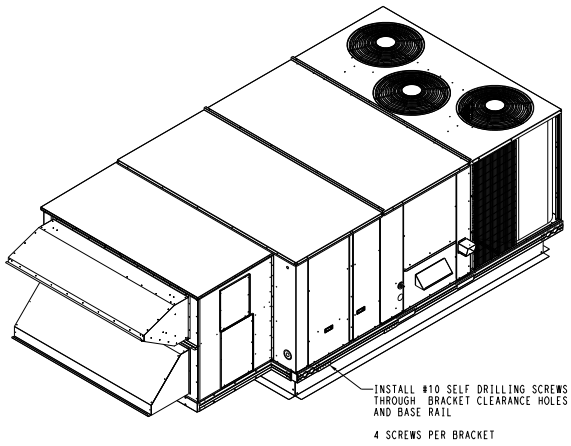
All panels must be in place when rigging. Unit is not designed for handling by fork truck.



BRACKET LOCATION ON ROOF CURB



BRACKET INSTALLATION TO ROOF CURB



BRACKET INSTALLATION TO BASE RAIL

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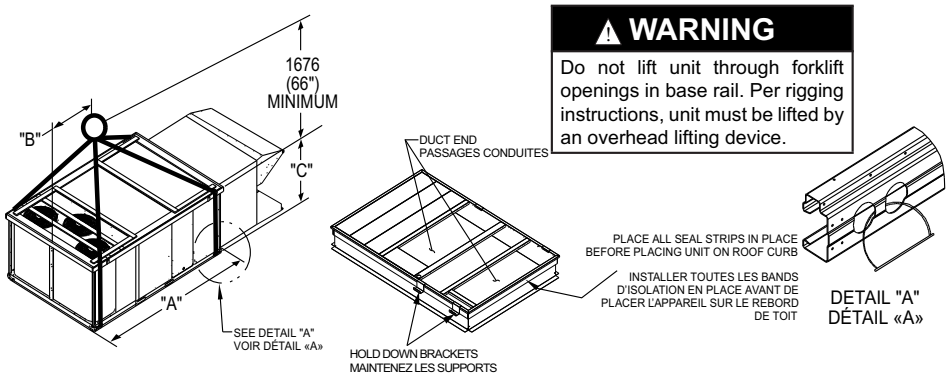
Fig. 2 - MRT ERV Hold Down Brackets — Location and Installation (48HC*17 shown)

⚠ CAUTION - NOTICE TO RIGGERS:
⚠ AVERTISSEMENT - REMARQUE À L´ATTENTION DES MONTEURS

ALL PANELS MUST BE IN PLACE WHEN RIGGING.
TOUS LES CAPOTS DOIVENT ÊTRE EN PLACE AVANT LE LEVAGE

UNIT IS NOT TO BE RIGGED WITH CHAINS THROUGH BASE RAIL HOLES.
NE PAS PASSÉ LES CHAINES AU TRAVERS LES TROUS DU GLISSIÈRE DE BASE POUR GRÉE L'UNITÉ

- Hook rigging shackles through holes in base rail, as shown in detail "A".
- Holes in base rails are centered around the unit center of gravity.
- Use wooden top skid, when rigging, to prevent rigging straps from damaging unit.
- Accrocher les manilles des élingues de levages dans les trous situés dans le rail de base comme indiqué au détail « A ».
- Les trous pratiqués dans le rail de base sont centrés autour de centre de gravité de l'appareil.
- Utiliser des cales en bois lors du levage pour éviter que les élingues n'endommagent le haut de l'appareil.



⚠ WARNING

Do not lift unit through forklift openings in base rail. Per rigging instructions, unit must be lifted by an overhead lifting device.

48/50HC Size 17-28 Units with High CFM ERV

UNIT	MAX. WEIGHT POIDS MAXIMUM		A		B		C	
	LB LIVRES	KG KG	IN PO	MM MM	IN PO	MM MM	IN PO	MM MM
48HC**17 w/ EnergyX	3694	1679	127.8	3249	89.7	2277	52.3	1328
48HC**20 w/ EnergyX	3904	1775	141.5	3595	92.4	2348	52.3	1328
48HC**24 w/ EnergyX	4259	1936	141.5	3595	98.9	2512	60.3	1532
48HC**28 w/ EnergyX	4304	1956	157.8	4007	105.0	2667	60.3	1532
50HC**17 w/ EnergyX	3567	1621	127.8	3249	89.7	2277	52.3	1328
50HC**20 w/ EnergyX	3777	1717	141.5	3595	93.2	2369	52.3	1328
50HC**24 w/ EnergyX	4132	1878	141.5	3595	93.2	2368	60.3	1532
50HC**28 w/ EnergyX	4177	1899	157.8	4007	105.8	2688	60.3	1532

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Fig. 3 - Rigging Label, 48-50HC Size 17-28 Units With High CFM ERV

Positioning

Maintain unit clearances as listed as shown in Fig. 23 through Fig. 38 for minimum distance from combustible materials, proper airflow, and service access. Follow all local codes for proper clearances – the local code requirements take precedence over any clearance listed in this document. Contact your local Carrier representative for clearance obstructions and any potential resulting affect on unit warranty.

Follow all other curb, rigging, and positioning installation guidance in base rooftop unit installation instructions.

NOTE: Install Fan and Filter Status accessories at this point. Refer to the accessories Installation Instructions for details.

Make Electrical Connections

See the base unit name plate for the ETL certified singlepoint electrical values and component electrical information. See the base unit and EnergyX access doors for the electrical wiring diagrams specific to each section.

Main Power —

Follow all base unit installation instructions, using electrical values shown on unit nameplate; only one main power supply is required The EnergyX base rooftop unit and energy recovery module is ETL listed as a single point power supply only.

On some voltage ERV's, there is a step down transformer that is factory supplied to power components that are not line side voltage. Field wiring or alteration of these components is neither required nor desired.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

Some electric heat modules require a dual-point electrical service connection independent from all other electrical circuits in the unit. Consult the unit installation instructions, unit wiring diagrams and/or electric heater installation instructions for verification.

Control Power —

Follow all base unit installation instructions for low voltage wiring. The ERV control board is factory wired into the base unit communications via the protocol converter module. See Fig. 6. All external control wires still connect to the RTU terminal strip as in the base unit installation instructions.

EnergyX modulating units can be equipped with an optional CO_2 sensor for Demand Control Ventilation. If the optional CO_2 sensor is used, install and connect the sensor to the base unit ComfortLINK controller per CO_2 sensor installation instructions. See the base unit ComfortLINK controls manual and the Configuration section of this manual for specific CO_2 sensor configurations.

Base Unit Components

Follow the base unit installation instructions to install all other base unit components, including (but not limited to) flue hoods, condensate trap and other accessory devices.

START UP

The EnergyX unit is operated in coordination with the base rooftop unit. Follow the base unit instructions and Controls book for proper start-up with addition of the following:

Start-Up Check List

Use the EnergyX Start-Up checklist (see page 75) in conjunction with the base unit Start-Up checklist from the base Controls book. Fill in all blank data entries that are applicable to the exact unit being installed. The ERV model and serial numbers are printed in the ERV control box. Save the checklist for future service and maintenance use. It is recommended that a copy of the checklist be left with the unit in the literature slot on the base unit control box access door.

Base Unit Evaporator Fan

First follow the base unit instructions to balance the RTU indoor fan. The ERV fans should be off during base unit fan set-up. Before start-up and testing the ERV, verify that the ComfortLINK minimum damper positions are set to 0 and if not change them to 0. ***Configuration →AIR.Q →AQ.MN*** = 0, and ***Configuration →ECON →MP.MX*** = 0. The ERVs communicate with ComfortLINK therefore the scrolling marquee can be used for test mode and configuration of the ERV. The following sections explain ERV testing and configuration. It is important that these configurations are set correctly in order for the ERV module to properly control the air performance. Finally, with service test disabled run unit under normal operation, verify proper supply airflow with ERV and indoor fan running.

ERV Test Mode —

ERV Test points should be used when starting up an EnergyX unit to verify proper ERV component operation. It can also be used for troubleshooting. To test the ERV, use the Scrolling Marquee to put the ComfortLINK RTU into test mode. Then go to Test Independent outputs (***Service Test →INDP***). Table 2 shows a list of test points that can be tested as independent outputs. There are five ERV tests which can be performed separately or together while in test mode. Use the scrolling marquee to change the value of the test point. Follow the ComfortLINK Controls, Start-Up, Operation, and Troubleshooting manual for testing the base rooftop unit.

The 5 ERV specific test points are OAU 2-position Damper, OAU Wheel Test, OAU OA Fan Speed test, OAU PE Fan Speed Test and OAU Tempering Heater Test. The 2 position damper can be opened and closed with the OA.DM point. The 2-position damper accessory can be installed on the exhaust opening of the ERV. The ERV wheel motor can be turned on and off with the WHL point. The ERV's outside air (OA.OF) and building exhaust air (OA.XF) motors can be ramped up and down during test mode with their corresponding fan speed test points. Table 2 shows the test mode test points in the order they appear under test mode. Communication failures will not allow these ERV test points to be changed. ComfortLINK will show active alarms during test mode.

NOTE: If a 2 position damper is installed, it must be opened in test mode while operating the exhaust test.

Table 2 – Service Test Mode Independent Test Points

ITEM	EXPANSION	RANGE
INDP	Test Independent Outputs	
ECON	Economizer Position Test	0 to 100
E.CAL	Calibrate Economizer	Off/On
PE.1	Power Exhaust 1 Test	Off/On
PE.2	Power Exhaust 2 Test	Off/On
ALRM	Alarm Relay Test	Off/On
CCH	Crankcase Heat Test	Off/On
OA.DM	OAU 2–position Damper	Close/Open
WHL	OAU Wheel Test	0 to 100
OA.OF	OAU OA Fan Speed Test	0 to 100
OA.XF	OAU PE Fan Speed Test	0 to 100
OA.HT	OAU Tempring Heater Test	0 to 100

ERV Configuration —

The ERV configuration menu can be accessed using the Scrolling Marquee. Enter the Outside Air Unit Configurations (***Configuration →OAU***) menu. Table 5 shows the list of complete outside air unit configurations that can be changed and the defaults from the factory. The critical job specific configurations are listed below and should be changed at start up for the specific job site. See the operation section for details all configurations.

OAU Unoccupied Operation (U.RUN) — This allows the ERV to run during the unoccupied period when the rooftop fan is brought on.

Min DCV Outside Air CFM (DCV.M) — This sets the lowest setting for ventilation using outside air. This number sets the absolute minimum for ventilation of contaminants and CO2 generated by sources other than people. This is only accessible if CO2 sensors are installed and ComfortLINK is configured properly.

NOTE: ERV must be equipped with optional economizer to operate with CO2 sensors.

Minimum Outside Air CFM (OA.MN) — This sets the outside air ventilation rate when not using a CO2 sensor to remove contaminants and CO2 generated by all sources in the building space. When using CO2 sensors and running DCV, this sets the maximum amount of outside air allowed for ventilation.

Power Exhaust CFM Offset (PE.OF) — This sets the offset for exhausting building air based on outside air being brought in. A negative setting causes a positive building pressure, and a positive setting causes a negative build pressure.

ERV with Economizer Additional Configurations

There are seven important ComfortLINK configurations that impact the ERV operation when equipped with optional economizer. To change these configuration use the ComfortLINK Scrolling Marquee, Navigator, or a CCN communication tool. Refer to the base unit Controls, Start-up, Operation, and Troubleshooting manual for more information on using these tools. Table 3 shows these ComfortLINK points that impact ERV operation, with brief descriptions. These points can be found on the Scrolling Marquee under the economizer and air quality configuration menus (***Configuration → ECON*** and ***Configuration → AIR.Q***). See operation section for details on individual configurations.

Adjusting ERV Options

The ERV can come with factory installed frost protection and/or an economizer (wheel bypass) damper. Other accessories can be added to the ERV in the field including but not limited to filter status, wheel status, and building pressure control. Refer to the major components section of this manual or the specific accessory literature for more detail on these.

Table 3 – ComfortLINK Configurations

DISPLAY ITEM	EXPANDED TEXT	DEFAULT	RANGE	DESCRIPTION
EC.EN	Economizer Installed	No: no FIOP Yes: FIOP	Yes/No	This tells the ERV that an optional economizer is installed
MP.MX	Econo Min at Max Fanspeed	0	0 to 100%	Must be set to 0 so the base rooftop does not use the economizer for ventilation, only free cooling
AQ.MN	Econo Min IAQ Position	0	0 to 100%	
IA.CF	IAQ Analog Input Config	0: no FIOP 1: FIOP	0=No IAQ 1=DCV 2=Override 3=Ctl Min Pos	This tells the ERV if a CO_2 sensor is installed
IA.FN	IAQ Analog Fan Config	0	0=Never 1=Occupied 2=Always	Tells the ERV if it can run during unoccupied for high CO_2 sensor
II.CF	IAQ Switch Input Config	0	0=No IAQ 1=DCV N/O 2=DCV N/C 3=Override N/O 4=Override N/c	This tells the ERV if a switch is installed for CO_2
II.FN	IAQ Switch Fan Config	0	0=Never 1=Occupied 2=Always	Tells the ERV if it can run during unoccupied for high CO_2 switch
AQD.L	AQ Differential Low	100	0 to 5000	These set the indoor air quality (IAQ) CO_2 DCV operating range. Differential is based off a 400PPM outside CO_2 value.
AQD.H	AQ Differential High	700	0 to 5000	
OVR.P	IAQ Override Position	100%	0–100%	Sets the speed fo the outside air fan during override.

OPERATING SEQUENCE

General

An EnergyX unit is a 48/50HC rooftop unit and energy recovery ventilator (ERV). It operates the ERV module in an integrated manner with the base rooftop unit. The base rooftop unit functions per the base unit sequence of operation, for information regarding ComfortLINK controller operation see the base rooftop unit Controls, Start-Up, Operations, and Troubleshooting manual. The ERV will operate based on communication from the ComfortLINK controller. The following section discusses the ERV operation in detail. In summary, the ERV operates to provide pre-conditioned outside air for ventilation requirements. If equipped with an optional economizer the ERV can provide free cooling when the outside air conditions are satisfactory.

In general the ERV monitors occupancy and indoor fan state of the base unit to determine when to activate. The outside air fan(s) bring in the outside air pass it through the enthalpy wheel and into the rooftop mixing box. The building return air is pulled through the enthalpy wheel by the exhaust fan(s) and released outside. During operation the enthalpy wheel is rotating to use the building air to pre-condition the outside air. When free cooling is desired and allowed the wheel is not needed to pre-condition the air therefore an economizer damper (wheel bypass) is used to bring in the outside air directly to the mixing box.

Communication

The ERV relies on communication with ComfortLINK to operate. The ERV monitors ComfortLINK points to determine operation. The ERV writes to points in ComfortLINK to provide the user with its running status. If communication is lost the ERV will shut down and remain in the Off mode until communication is established. Refer to the troubleshooting section for details on communication failures. Table 4 shows the ComfortLINK points that the ERV monitors for operation and a brief description of their functions. Table 5 shows the ComfortLINK points that the ERV uses for its configurations and a brief description of each. Table 6 shows the ComfortLINK points that the ERV writes to based on its running status.

Table 4 – Inputs - Points the ERV Reads from ComfortLINK

CCN Point	Marquee Point	Expanded Text	Range	Units	Default	Function
NVO_MODE		nvoUnitStatus.mode	xxxx			Determine what mode RTU is in
OCCUPIED	OCC	Currently Occupied	No/Yes			Determine if RTU is occupied
IDFSTATE		Indoor Fan State	Off/On			Determine if the RTU indoor fan is running
FANSPEED	F.SPD	Commanded Fan Speed	xxx	%		Determine if the RTU indoor fan is running
ECONOCMD	EC.CP	Econo Commanded Position	0 to 100	%		Determine if the RTU commands free cooling
IAQ	IAQ	IAQ Level (sensor)	xxxx			Space CO2 sensor level (PPM)
IAQIN	IAQ.S	IAQ Level (switch)	Low/High			Determine if CO2 is high or low
SAT	SAT	Supply Air Temperature	xxx.x	°F		RTU supply air temp
OA_TEMP	OAT	Outdoor Air Temperature	xxx.x	°F		RTU Outdoor Temp
SPACE_T	SPT	Space Temperature	xxx.x	°F		Building Space Air Temp
RETURN_T	RAT	Return Air Temperature	xxx.x	°F		Building Return Air Temp
PE_1	PE.1	Power Exhaust 1 Relay	Off/On			N/A
PE_2	PE.2	Power Exhaust 2 Relay	Off/On			N/A
ECONO	EC.EN	Economizer Installed	No/Yes		No: no FIOP Yes: FIOP	Determine if there is a Economizer damper (wheel Bypass)
IAQANCFG	IA.CF	IAQ Analog Input Config	0=No IAQ 1=DCV 2=Override IAQ 3=Ctrl Min Pos		0: no FIOP 1: FIOP	Tells if a sensor is installed for DCV or override
IAQANFAN	IA.FN	IAQ Analog Fan Config	0=Never 1=Occupied 2=Always		0	Tells if the ERV can run during unoccupied for high CO2
IAQINCFG	II.CF	IAQ Switch Input Config	0=No IAQ 1=DCV N/O 2=DCV N/C 3=Override N/O 4=Override N/C		0	Tells if a switch is installed for DCV or override
IAQINFAN	II.FN	IAQ Switch Fan Config	0=Never 1=Occupied 2=Always		0	Tells if the ERV can run during unoccupied for high CO2
DAQ_LOW	AQD.L	AQ Differential Low	0 to 5000		100	Sets indoor/outdoor PPM difference to start ventilating more
DAQ_HIGH	AQD.H	AQ Differential High	0 to 5000		700	Sets indoor/outdoor PPM at which max vent occurs
IAQOVPOS	OVR.P	IAQ Override Position	0 to 100	%	100	Sets OA fan speed during override
S_OADMPR	OA.DM	OAU 2–position Damper	Close/Open		Close	Test damper while in test mode
S_WHEEL	WHL	OAU Wheel Test	0 to100	%	0	Test wheel while in test mode
S_OAFAN	OA.OF	OAU OA Fan Speed Test	0 to100	%	0	Test intake fan(s) while in test mode
S_EXFAN	OA.XF	OAU PE Fan Speed Test	0 to100	%	0	Test exhaust fan(s) while in test mode
S_OAHEAT	OA.HT	OAU Tempring Heater Test	0 to 100	%	0	Test tempering heater while in test mode

These can be viewed under a variety of menus on the Scrolling Marquee or Navigator

These can be viewed under a variety of CCN tables with a CCN device.

Table 5 – Configurations - ERV Configurations Read from ComfortLINK

CCN Point	Marquee Point	Expanded Text	Range	Units	Default	Function
OAU_TYPE	OA.TY	Outdoor Air Unit Type	0=No OAU 1=ERV Module 2=Economizer 3=Pwr Exhaust 4=OA Monitor 5=100% OA unit 6=EXv1 ERV		0: no FIOP 1: FIOP EXv2	Defines what kind of OAU is installed
OAFANCRV	OA.FC	Outside Air Fan Curve	0 to 999		1: 04 2: 05–06 3: 07 4: 08–12 5: 14 6: 17–20 7: 24–28	Determine what outside air fan curve to use
PEFANCRV	PE.FC	Exhaust Air Fan Curve	0 to 999		1: 04, 1ph, and econ 2: 04, 3ph, and econ 3: 04, 1ph, and no econ 4: 04, 3ph, and no econ 5: 05–06 1ph 6: 05–06 3ph 7: 07 8: 08–12 9: 14 10: 17–20 and econ 11: 17–20 and no econ 12: 24–28	Determine what exhaust air fan curve to use
UNOCCRUN	U.RUN	OAU Unoccupied Operation	No/Yes		NO	Tells OAU to run in unoccupied mode
FATALOAU	OAU.F	Shut Down on Fan Failure	No/Yes		YES	Tells OAU to shut off if one of it's fans fail
MODWHEEL	M.WHL	Modulating Wheel Install	No/Yes		NO	Determine if the OAU's wheel is a modulating one
MINOACFM	OA.MN	Minimum Outside Air CFM	0 to 32000	CFM	375: 04 800: 05–06 1000: 07 2500: 08–12 3000: 14 4000: 17–20 5000: 24–28	Sets Design OA CFM for ventilation
MINDCVSP	DCV.M	Min DCV Outside Air CFM	0 to 32000	CFM	100: 04 250: 05–06 600: 07 1000: 08–12 1500: 14–24 2000: 24–28	Sets absolute minimum OA CFM for ventilation
PEX_CTL	PEX.C	Power Exhaust Control	0=offset CFM 1=BP		0	Determine how to control the exhaust fans
EXOFFSET	PE.OF	Power Exhaust CFM Offset	–17000 to 17000	CFM	–200	Sets offset CFM setpoint of exhaust based on intake
OAU_BPSP	BP.SP	Building Pressure Setpnt	–0.25 to 0.25	inH_2O	0.05	Sets required building pressure
OATEMPER	OA.TM	Outside Air Tempering	Disable/Enable		Disable	Determine if there is tempering heater installed
OATMPLOC	TM.LO	OA Tempring Lockout Temp	0 to 80	°F	60	Sets the outside temp and below to allow tempering
OATMPSPT	TM.SP	OA Tempring SAT Setpoint	35 to 80	°F	55	Sets target Supply air temperature during tempering
OACFM_K	OAC.K	Outside Air CFM k Factor	0.8 to 1.2		1.0	Sets outside air curve correction factor
EXCFM_K	EXC.K	Exhaust Air CFM k Factor	0.8 to 1.2		1.0	Sets exhaust air curve correction factor
EFB_ENBL	EFBE	ERV Fan Boost Enable	No/Yes		NO	Tells RTU to adjust fan speed for low outside air CFM

These can be viewed under Configuration → OAU on the Scrolling Marquee or Navigator.

These can be viewed under the CCN Table OAU_CFG with a CCN device.

Table 6 – Status Points - ERV Writes these points to ComfortLINK

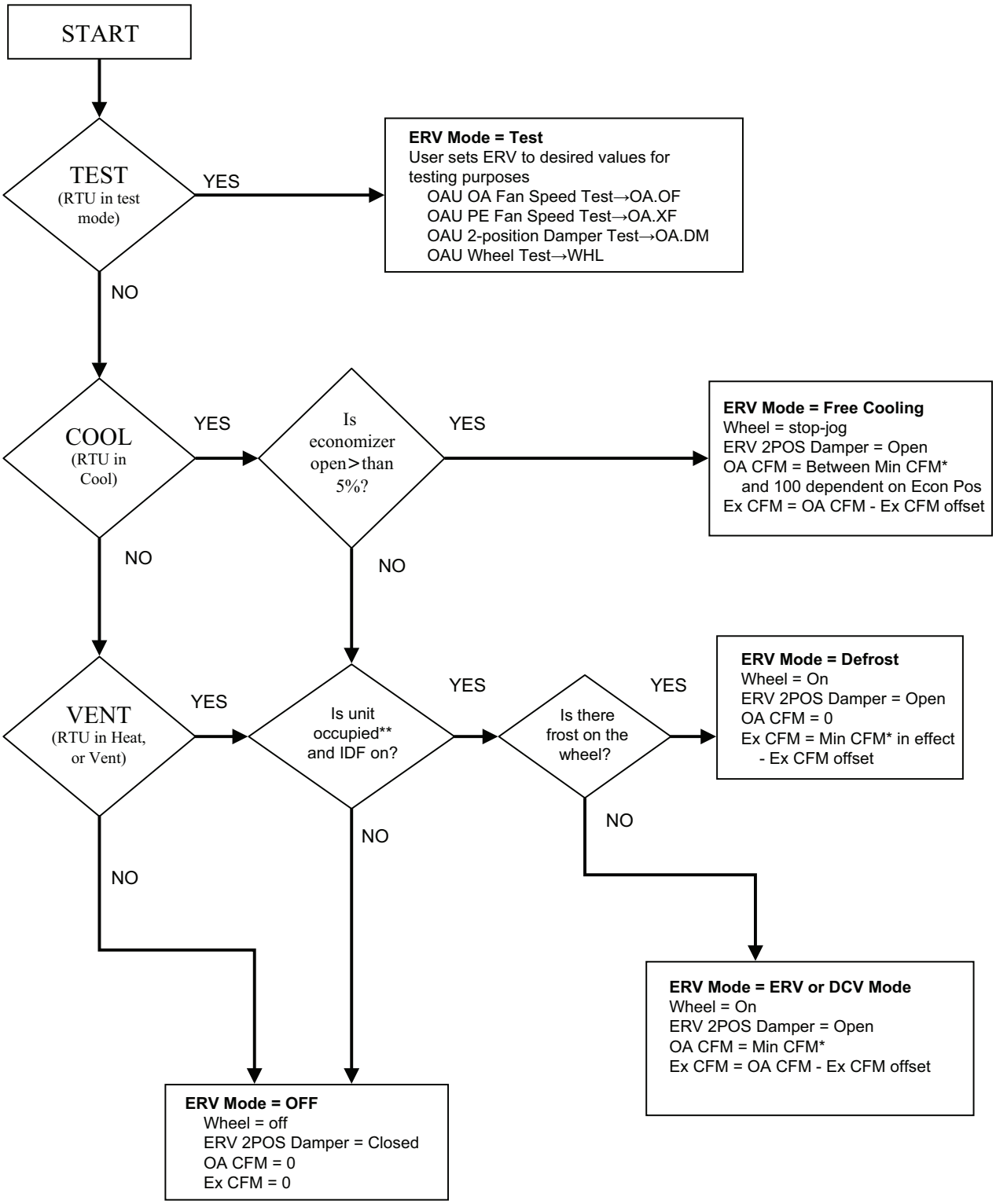
CCN Point	Marquee Point	Expanded Text	Range	Units	Function
OAU_RUN	OA.RN	OAU System Run State	1=AUTO 2=OFF 3=TEST		High level ERV state
OAU_MODE	OA.OP	OAU Operating Mode	0=Off 1=ERV (DCV) 2=Free Cooling 3=OA Tempering 4=Defrost 5=Test 6=Ext. Mode 1 7=Ext. Mode 2 8=Ext. Mode 3		ERV's current operating mode
UPC_VER	UPC	UPC Software Version	0 to 9999		Active UPC software version
OAU_VER	OAU	OA Unit Software Version	0 to 9999		Active EXCB software version
ACTOACFM	A.OA	Actual Outside Air CFM	0 to 32000	CFM	Real Time CFM being brought in
ACTEXCFM	A.EX	Actual Exhaust Air CFM	0 to 32000	CFM	Real Time CFM being exhausted
CMDOACFM	C.OA	Command Outside Air CFM	0 to 32000	CFM	Commanded CFM to bring in
CMDEXCFM	C.EX	Command Exhaust Air CFM	0 to 32000	CFM	Commanded CFM to exhaust
OAU_LAT	LAT	OAU Leaving Air Temp	xxx.x	°F	Air temperature leaving the ERV (RTU intake)
OAU_EXAT	EXAT	OAU Exhaust Air Temp	xxx.x	°F	Air Temperature leaving the ERV (exhaust)
OAU_BP	BP	Building Pressure	–0.25 to 0.25	inH_2O	Current building pressure
OAUDMPR	2P.DM	OAU 2–position Damper	Close/Open		Exhaust damper position status
OAUWHEEL	WHL	OAU Wheel Speed	0 to100	%	Current ERV wheel speed
OAFANSPD	OA.FS	OAU OA Fan Speed	0 to100	%	Current ERV's intake fan(s) speed
OAUPESPD	EX.FS	OAU Exhaust Fan Speed	0 to100	%	Current ERV's exhaust fan(s) speed
OAHEATER	OA.HT	OAU Tempering Heater	0 to 100	%	ERV's SCR heater commanded capacity
OAUALRM1	ALM.1	OAU Motor Failure Alarm	Off/On		ERV's motor failure alarm status
OAUALRM2	ALM.2	OAU Dirty Filter Alarm	Off/On		ERV's dirty filter alarm status
OAUALRM3	ALM.3	OA Low CFM Alarm	Off/On		ERV's low CFM alarm status
OAUALRM4	ALM.4	OAU Alarm	Off/On		ERV's General Alarm status

These can be viewed under Run Status → OAU or Operating Modes → OAU on the Scrolling Marquee or Navigator.

These can be viewed under the CCN tables OAUDISP or OAU_DIAG with a CCN device.

15-25 Ton Modulating ERV

The modulating ERV is an intelligent ERV with variable speed fan motors. The ERV can provide a variety of volumes of outside air and offset it with different exhaust speeds. CO_2 sensors can also be tied into it for Demand control ventilation (DCV) operation. The modulating ERV will operate based on occupancy and the rooftop's operating mode, the following sections explain operation in detail. Refer to Figure 4 for the overview flow diagram of a modulating ERV operation.



Notes:

* Min CFM represents the minimum outside air CFM requirement based on CO_2 values and setpoints.

** Occupied also means being in the unoccupied period but configured to run.

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Fig. 4 - Modulating ERV Control & Operation Flow Chart

Occupancy

The ERV will not be allowed to run unless it is determined to be occupied. The ERV monitors the rooftop's occupancy point (***Run Status →MODE →OCC***) to determine when it is occupied. The ERV watches the rooftop's indoor fan state point (***CCN Point = IDFSTATE***) to know when its indoor fan has started. When the rooftop is occupied and its indoor fan is on, the ERV is considered to be occupied and allowed to run.

The ERV can also operate during the rooftop's unoccupied period. If the ERV is configured for unoccupied operation (***Configurations →OAU →U.RUN = YES***), then it will ignore the building occupancy of ComfortLINK and allow occupancy any time the rooftop fan is on. If not configured for unoccupied operation but there is a CO_2 sensor or switch installed and ComfortLINK is configured to turn on its indoor fan for CO_2 ventilation at any time (***Configuration →AIR.Q →IA.FN = 2***, or ***Configuration →AIR.Q →II.FN = 2***), the ERV will be occupied any time the CO_2 needs the fan.

Modes of Operation

The ERV has 3 basic functions: Auto, Off, or Test. These are defined as System run states and displayed in the OAU run status menu (***Run Status →OAU →OA.RN***). The ERV will always operate in one of the following operating modes depending upon the ComfortLINK mode and outside conditions: Off, ERV (DCV) Free Cooling, OA Tempering, Defrost, or Test. The ERV monitors the ComfortLINK CCN point NVO_MODE to determine the rooftops operating mode. The NVO_MODE values tell the ERV what the rooftop operating mode is in a numeric form. The ERV's operating mode is displayed numerically as OAU Operating Mode (***Run Status →OAU →OA.OP***). These modes and their corresponding numbers are described below.

Off Mode (*OA.OP = 0*) —

The ERV will be set to the Off mode whenever the rooftop indoor fan is turned off, ERV is unoccupied, NVO_MODE equals 6, or if communication fails. During Off Mode, the ERV 2 position dampers will be closed and the wheel, outside air fans(s), and exhaust fan(s) will be off.

Test Mode (*OA.OP = 5*) —

If at any time during operation, the rooftop is put in Service Test mode (NVO_MODE equals 7) the ERV will be set to Test Mode. Refer to Start-Up section for Test mode operation.

Free Cooling Mode (*OA.OP = 2*) —

Free Cooling Mode is only available if an optional economizer damper is factory installed in the ERV (***Configuration →ECON →EC.EN = Yes***). Free Cooling Mode will be active when the rooftop unit is in Unoccupied Free Cooling Mode, Free Cooling Mode, or in Cooling Mode and the economizer damper position (***Outputs →ECON →EC.CP***) is greater than 5% (***NVO_MODE = 10 or 3***). ERV occupancy tells the control which speed to start the outside air fan(s) during free cooling, because the outside fan(s) are needed to assist the indoor fan in bringing in outside air.

When in Free Cooling Mode, the ERV's 2 position damper will be open and the wheel will be set to stop/jog operation. The rooftop unit will modulate the economizer damper to provide free cooling as if an ERV was not installed. As the economizer damper opens the ERV outside air fan(s) will maintain a speed that produces minimum outside air CFM. Once the economizer damper position passes that percent fan speed of the outside air fan(s), the fan(s) speed will ramp up directly with the economizer damper position, up to 100%. The exhaust fan(s) will run at a speed equal to the required offset CFM. Refer to Exhaust Control for details on determining offset CFM.

IMPORTANT: Refer to the base unit Controls, Start Up, operation, and Troubleshooting manual for details on how the rooftop unit modulates the economizer damper for free cooling.

Defrost Mode (OA.OP = 4) —

Defrost Mode is only available when the optional Frost Protection is factory installed in the ERV. The ERV will be set to defrost mode any time the ERV wheel is running and frost is detected on the wheel. The EXCB D14 LED will turn on to indicate the frost switch is active. Defrost Mode runs for at least 2 minutes but continues to run until the frost is removed. The frost protection device senses a pressure differential across the wheel and trips when that differential is greater than the setpoint (default 2.0 in wc). For information on the frost protection device, refer to the Major Component section.

When in Defrost Mode, the ERV 2 position damper will be open and the wheel will be rotating. The outside air fan(s) will ramp down to 0% speed (shut-off). The exhaust fan(s) will run at a speed equal to the required offset CFM. Refer to Exhaust Control for details on determining offset CFM.

ERV (DCV) Mode (OA.OP = 1) —

General ERV Mode – ERV Mode is the basic operating mode of the ERV. With no options installed on the ERV this will be the only operating mode besides off and test. ERV Mode will be active when the rooftop ComfortLINK mode is Heating, Cooling, Fan Only, or Dehumidification (NVO_MODE = 1, 3, 9, or 14) and the ERV is occupied.

When in ERV mode, the ERV 2 position damper will be open and the wheel will be rotating. The outside air fan(s) will run at a speed that produces a CFM equal to the minimum outside air CFM setpoint (***Configuration →OAU →OA.MN***). The exhaust fan(s) will run at a speed equal to the required offset CFM. Refer to Exhaust Control for details on determining offset CFM.

ERV Mode with DCV – If an optional economizer is factory installed in the ERV (***Configuration →ECON →EC.EN = Yes***) and an optional CO_2 sensor or switch is

installed (***Configuration →AIR.Q →IA.CF = 1 or 2***) or (***Configuration →AIR.Q →II.CF = 1 or 2***), DCV ERV Mode will be active when the rooftop ComfortLINK mode is Heating, Cooling, Fan Only, or Dehumidification (NVO_MODE = 1, 3, 9, or 14) and the ERV is occupied.

When in DCV ERV mode, the ERV 2 position damper will be open and the wheel will be rotating. The outside air fan(s) will run at a speed that produces a CFM equal to the minimum outside air CFM determined by Demand Control Ventilation (DCV). The exhaust fan(s) will run at a speed equal to the required offset CFM. Refer to Exhaust Control for details on determining offset CFM.

Sensor Demand Control Ventilation (DCV) uses the indoor air quality levels (CO_2 PPM) to determine how much outside air is required for ventilation. The ERV monitors the IAQ (***Inputs →AIR.Q →IAQ***) reading from the rooftop's installed CO_2 sensor and compares it to a hard coded outside air value of 400PPM. The difference is then weighed on scale between AQ Differential Low (***Configuration →AIR.Q →AQD.L***) and AQ Differential High (***Configuration →AIR.Q →AQD.H***) to determine the minimum outside air CFM required for ventilation. The minimum outside air CFM can be equal to or between the Min DCV outside air CFM (***Configuration →OAU →DCV.M***) setpoint and the minimum outside air CFM (***Configuration →OAU →OA.MN***) setpoint. As the CO2 differential rises from AQD.L to AQD.H, the ERV outside air CFM requirement will rise from DCV.M to OA.MN. The outside air fan(s) will ramp its speed % up or down to produce the required CFM. If at any time the CO_2 sensor fails or IAQ reads 0ppm, the DCV minimum outside air requirement will be forced to the maximum value (OA.MN). Fig. 5 shows the DCV minimum outside air CFM determination curve.

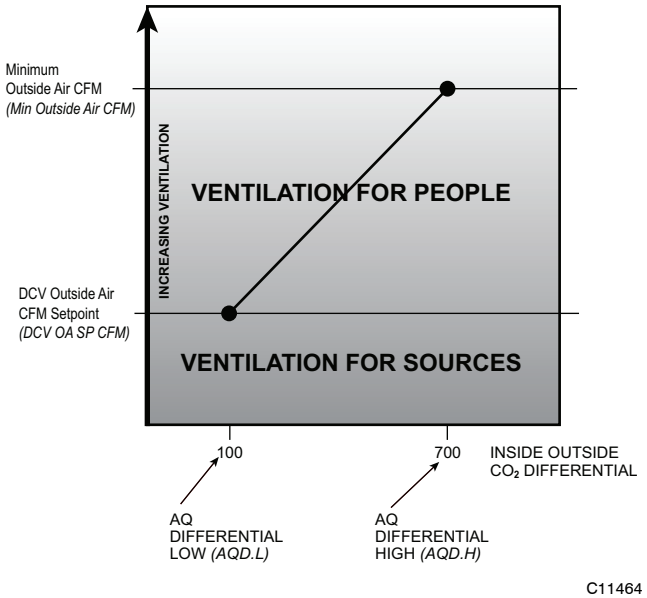

Fig. 5 - IAQ DCV Control

Switch Demand Control Ventilation (DCV) uses the indoor air quality levels (High/Low) to determine how much outside air is required for ventilation. The ERV monitors the IAQ switch (I***nputs →AIR.Q →IAQ.S***) reading from the rooftop's installed CO_2 switch. The minimum outside air CFM will be equal to one of the following: Min DCV outside air CFM (***Configuration →OAU →DCV.M***) setpoint, or the minimum outside air CFM (***Configuration →OAU →OA.MN***) setpoint. If the CO_2 switch reads low the outside air CFM requirement will be DCV.M. If the switch reads high the outside air CFM requirement will be OA.MN. The outside air fan(s) will ramp its speed % up or down to produce the required CFM.

OA Tempering Mode (*OA.OP = 3*) —

OA Tempering Mode is only available when the optional electric heater is field installed in the ERV and enabled (***Configuration →OAU →OA.TM = Enable***). The ERV can only be set to OA Tempering mode when the ERV is occupied and the rooftop is not running cooling or heating. The rooftop must be in Ventilation (Fan-Only) mode (NVO_MODE = 9) and the outside air temperature (***Inputs →AIR.T →OAT***) must be less than the OA Tempering Lockout Temp (***Configuration →OAU →TM.LO***) to allow the ERV to run OA Tempering Mode. The electric heater will then be turned on and modulated 0-100% based on the supply air temperature (***Inputs →AIR.T →SAT***) relative to the OA Tempering SAT setpoint (***Configuration →OAU →TM.SP***).

When in OA Tempering Mode, the ERV runs as standard ERV (DCV) mode: 2 position damper will be open and the wheel will be rotating. The outside air fan(s) will ramp to maintain correct outside air CFM. The exhaust fan(s) will ramp for the required offset CFM. Additionally the ERV's Electric Heater will ramp up 1% every 2 seconds and ramp down 2% every 1 second based on how far the SAT is away from the setpoint. If the SAT equals the setpoint then the Electric heater will remain at current percentage.

Exhaust Control

When the Power Exhaust control is set of Offset CFM (***Configuration →OAU →PEX.C = 0***), the ERV exhaust fan(s) operate to offset the outside air being introduced to the building. The required exhaust offset CFM is determined based on the exhaust offset setpoint (***Configuration →OAU →PE.OF***). The exhaust offset setpoint can be set as a negative or positive number to accommodate a requirement of positive or negative building pressure. A positive setpoint will produce a negative building pressure. A negative setpoint will produce a positive building pressure.

The ERV will determine the required amount of outside air CFM based on setpoints and current mode of operation. The commanded exhaust air CFM (***Run Status →OAU →C.EX***) is then calculated by the sum of the actual outside air CFM (***Run Status →OAU →A.OA***) and the exhaust air offset setpoint (PE.OF). During defrost mode the exhaust will run the same as if the outside air fan(s) were still running.

When the Power Exhaust Control is set for Building pressure control (***Configuration →OAU →PEX.C = 1***), the ERV exhaust fan(s) operate to maintain a building pressure. A building pressure transducer must be purchased separately and properly field installed in the ERV. A desired building pressure is set as Building Pressure Setpoint (***Configuration →OAU →BP.SP***). The actual building pressure (***Run Status →OAU →BP***) is compared to the setpoint (BP.SP). The exhaust fan will then be ramped up and down at the rate of 1% every 2 seconds to try and maintain the desired building pressure. The exhaust fan(s) will slow to increase the building pressure and speed up to decrease the building pressure.

Wheel Stop/Jog

During free cooling the wheel utilizes a "stop-jog" operation to periodically rotate the wheel and minimize potential dirt build-up and excess wear on one section of the wheel. The wheel will rotate for 5 seconds then stop for 5 minutes.

Status Points

The ERV updates points within ComfortLINK to represent its running status. These points are shown in Table 6 and can be viewed on the scrolling marquee or handheld navigator under the run status outside air menu (***Run Status →OAU***). These points include but not limited to: commanded and actual outside air CFM, commanded and actual exhaust air CFM, ERV outputs, software versions, and internal ERV air temperatures.

TROUBLESHOOTING

EnergyX units are a combination of the base rooftop unit and an integrated ERV. The ERV requires communication from the rooftop for operation. This section covers ERV troubleshooting only. For rooftop troubleshooting refer to the base unit's Service manual.

Complete ERV Stoppage

There are several conditions that can cause the ERV to shutdown or appear to be shutdown:

- General power failure.
- Transformer's circuit breaker tripped.
- ERV main power fuses blown.
- Communication failures.
- Active alarm on the base rooftop unit or the ERV preventing operation. Review alarms.
- Programmed occupancy schedule. Rooftop Unoccupied
- Rooftop indoor fan is off.
- The airflow sensor tubing connected to the incorrect high/low sensor ports in the outside air.

Check Alarms

The ERV has 4 possible alarms based on options installed in the ERV. These alarms are described in detail below. They all show up as a T418 alarm in ComfortLINK. Pressing enter and escape together on the scrolling marquee or navigator will expand the text and provide the specific alarm condition. There are 4 status points viewed under Operating Modes on the Scrolling Marquee or Navigator (***Operating Modes → OAU***) for each alarm to help diagnose which alarm caused the T418 in ComfortLINK. These will all reset automatically when the situation has been resolved.

T418 OAU Filter Dirty

The ERV's dirty filter alarm should only occur if the optional Filter Maintenance Switch is installed on the ERV. The dirty filter alarm activates due to an increase in differential pressure across the filters. The EXCB's D16 LED will be turn on and the OAU Dirty Filter Alarm point will be turned to on (***Operating Modes → OAU → ALM.2 = On***). The alarm does not affect unit operation but serves as a warning to replace the filters. It will automatically reset when the pressure differential falls below setpoint. Verify proper operation by partially blocking airflow through the ERV filters and confirming that the alarm does trip.

T418 OAU Motor Failure

This alarm indicates a motor problem in the ERV, any one of the motors can trip this alarm (outside intake, exhaust and/or the wheel motor). The intake and exhaust motors have build in motor diagnostics and the wheel motor status is a field accessory. Since these are feed into the same alarm, it is important to determine which one is having the problem. In test mode run the components individually to determine which is causing the problem. If the Shut Down on fan failure configuration is set to Yes (***Configuration → OAU → OAU.F = Yes***), the ERV will shutdown with this alarm active. If set to no, the ERV will continue to run as if the alarm did not occur, outside air CFM, exhaust CFM, or pre-conditions might not be achievable if a motor fails. The two classes of motor status are explained below.

Intake and Exhaust Motor Status – If any one of the ERV's outside or exhaust motors detects a problem, it will close its build in normally open alarm contact, which will be seen as 24vac at EXCB J8-3. The EXCB's D18 LED will be turn on and the OAU Motor Failure Alarm point will be turned to on (***Operating Modes → OAU → ALM.1 = On***). This alarm will automatically reset when the motor opens its alarm relay. This alarm is tripped by one of the following: phase loss, locked rotor, thermal overload, communication error, incorrect signal, or a fan failure.

Wheel Status – This alarm will occur when the ERV wheel is turned on and the wheel proxy sensor does not detect wheel motion within the set time. It will open its

contact which energizes the normally closed rotation monitor relay. This is seen as 24vac at EXCB J5-3 and causes the alarm. The EXCB's D12 LED will be turned on and the OAU Motor Failure Alarm point will be turned to on (***Operating Modes → OAU → ALM.1 = On***). This alarm will automatically reset when motion is detected. Possible causes of this alarm are: the wheel belt breaking or slipping, wheel motor failure, proxy sensor failure or incorrect setting, or wiring error.

T418 OAU Low CFM

This alarm indicates that the ERV cannot bring in the desired amount of outside air. The alarm occurs when the actual outside air CFM (***Operating Modes → OAU → A.OA***) is less than 10% of the commanded outside air CFM (***Operating Modes → OAU → C.OA***) after 10 minutes. This alarm will not occur in test mode or defrost mode. The Rooftop unit might be able to help by ramping its indoor fan up. Refer to the base controls, start up, operation, and troubleshooting manual for details. The OAU Low CFM Alarm point will be turned to on (***Operating Modes → OAU → ALM.3 = On***). This alarm will automatically reset if the actual CFM is within 10% of the commanded CFM. Possible causes of this are: outside air CFM setpoint set too high, dirty filter or plugged screen, pressure tubing wrong or disconnected, wrong OA CFM curve programmed, or RTU indoor fan speed running too low.

T418 OAU General Alarm

This alarm is not currently used by the ERV.

Check Diagnostic LEDs

Use the on board LEDs to assist in troubleshooting the EnergyX system. The EnergyX Control Board (EXCB) and the Universal Protocol Converter (UPC) each have LEDs that can help in the troubleshooting process. See Tables 7 to 9.

The EXCB has five green LEDs and one red LED. The red LED is for power indication and the green LEDs are status indicators.

The UPC has seven LEDs. There are four communication LEDs and three status LEDs. The communication LEDs indicate if the translator is speaking to the devices on the network and should reflect communication traffic based on the baud rate set. The higher the baud rate, the LEDs would become more solid.

Communication Failures

Communication is critical for ERV operation. It can fail on two different paths; between the UPC and the rooftop (LEN), or between the UPC and the EXCB. This makes the UPC critical to ERV operation. Make sure the UPC DIP switches and rotary switches are set correctly. Make sure the board hardware jumpers are set on EIA 485 and 2W. During normal operation the 4 communication LEDs will flash interchangeably. If all 4 LEDs are not flashing then there is a communication problem. Check connections between Port 1a and rooftop's LEN connection and Port 2 and the EXCB J23 (verify with the proper unit schematic).

The ERVs, LCD screen will show specific communication failures when they occur. Use the LCD screen to help troubleshoot communications failures. If communication is established, the LED shows "communication connected".

Comm Failure1 – UPC to LEN Fail —

This will be displayed if the EXCB can communicate with the UPC, but the UPC does not receive information from ComfortLINK. This will occur if the cable is pinched or disconnected, wired wrong or loose, or if the UPC is configured wrong.

Comm Failure2 – UPC to EXCB Fail —

This will be displayed if the EXCB cannot communicate with the UPC. This will occur if the connection between them is disconnected or pinched. This will also occur if the UPC does not have power or software, or if it has an error or configured wrong.

On-board Pressure Transducers

The EXCB uses on-board pressure transducers to measure the air pressure of the incoming outside air and the building exhaust air. The CFM values are then calculated based on these readings and the fan speed. There is a pressure transducer for the outside air and one for the exhaust air. These are screwed into the EXCB board to J24 and J25 respectively. They have three pins: IN, GND, and OUT. The IN pin is 5vdc input power and GND is the common or ground pin. The OUT pin will be 0.26 to 4.5vdc based on the pressure reading. There are two different transducers used, two inch of water column (inWC) and 5 inWC. Table 10 shows the voltage/pressure characteristics of each.

Table 7 – EXCB LED Indicators

LED	COLOR	DESCRIPTION	STATUS IF LIGHT IS LIT
D9	Red	24vAC board power	Board has power
D2	Green	Run light Flashing	ERV is Running
D12	Green	ERV Wheel Status Alarm	ERV Wheel not rotating when it should be
D14	Green	ERV Wheel Frost Protection	ERV detects frost on the wheel and running in Frost Mode
D16	Green	ERV Dirty Filter Alarm	Dirty Filter
D18	Green	ERV Blower Status Alarm	Fan Failure

Table 8 – EXUPC LED Indicators

LED	COLOR	DESCRIPTION	STATUS IF LIGHT IS LIT
Power	Green	Power Indicator	Lights when power is being supplied to the translator.
Rx1	Green	Port 1 Receiving Data	Lights when the translator receives data from ComfortLINK MBB via LEN
Rx2	Green	Port 2 Receiving Data	Lights when the translator receives data from the Modbus EXCB
Tx1	Green	Port 1 Transmitting Data	Lights when the translator transmits data to the ComfortLINK MBB via LEN
Tx2	Green	Port 2 Transmitting Data	Lights when the translator transmits data to the Modbus EXCB
Run	Green	Run indicator	Lights based on translator health. See Table 9.
Error	Red	Internal Error indicator	Lights based on translator health, See Table 9.

Table 9 – EXUPC LED Flash Code Diagnostics

Run LED Status	Error LED Status	ERV Module Status
2 flashes per second	Off	Normal
2 flashes per second	2 flashes, alternating with Run LED	5 minute auto–restart delay after system error
2 flashes per second	3 flashes then off	Module has just been formatted
2 flashes per second	4 flashes then pause	Two or more devices on this network have the same ARC156 network address
2 flashes per second	1 flash per second	Module is alone on the network
2 flashes per second	On	Operation halted after frequent system errors or control programs halted
5 flashes per second	On	Operation start–up aborted. Boot is running
5 flashes per second	Off	Firmware transfer in progress. Boot is running
7 flashes per second	7 flashes per second, alternating with Run LED	Ten second recovery period after brownout
14 flashes per second	14 flashes per second, alternating with Run LED	Brownout
Alternating with Error	Alternating with Run	Restoring memory from Archive

Table 10 – Transducer/Voltage vs. Pressure

Voltage (vDC)	Pressure (inWC)	
	2” transducer	5” transducer
<=–0.26	0	0
0.5	0.12	0.28
1	0.34	0.87
1.5	0.53	1.46
2	0.82	2.05
2.5	1.06	2.64
3	1.30	3.23
3.5	1.52	3.82
4	1.76	4.41
4.5	2.00	5.00

MAJOR SYSTEM COMPONENTS

An EnergyX unit has a factory installed energy recovery (ERV) device on a 48/50HC rooftop unit. The EnergyX energy recovery unit is integrated into the base rooftop unit construction and is factory wired. The energy recovery unit contains a control box, supply fan(s), exhaust fan(s), and an enthalpy wheel assembly. All control operations of the ERV are based on the rooftop units operation through communication with ComfortLINK. See Fig. 6 and 7 for ERV wiring schematic and component arrangement.

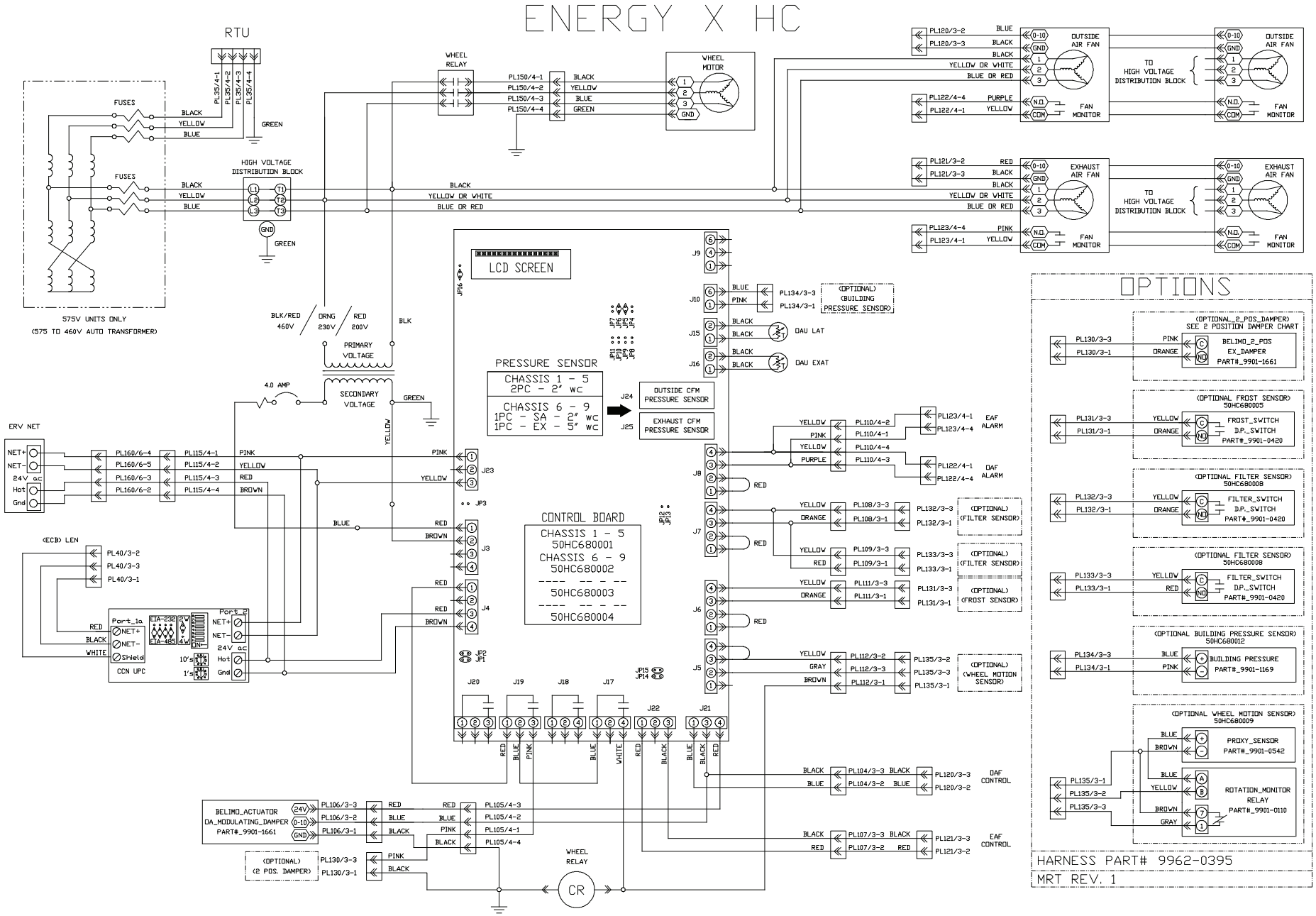

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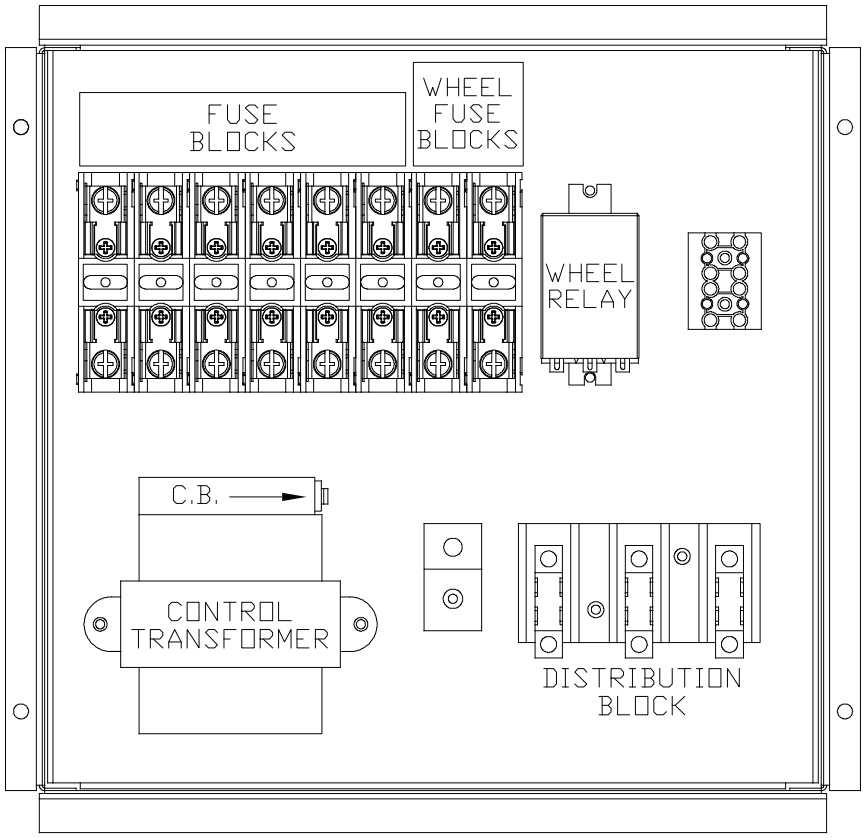
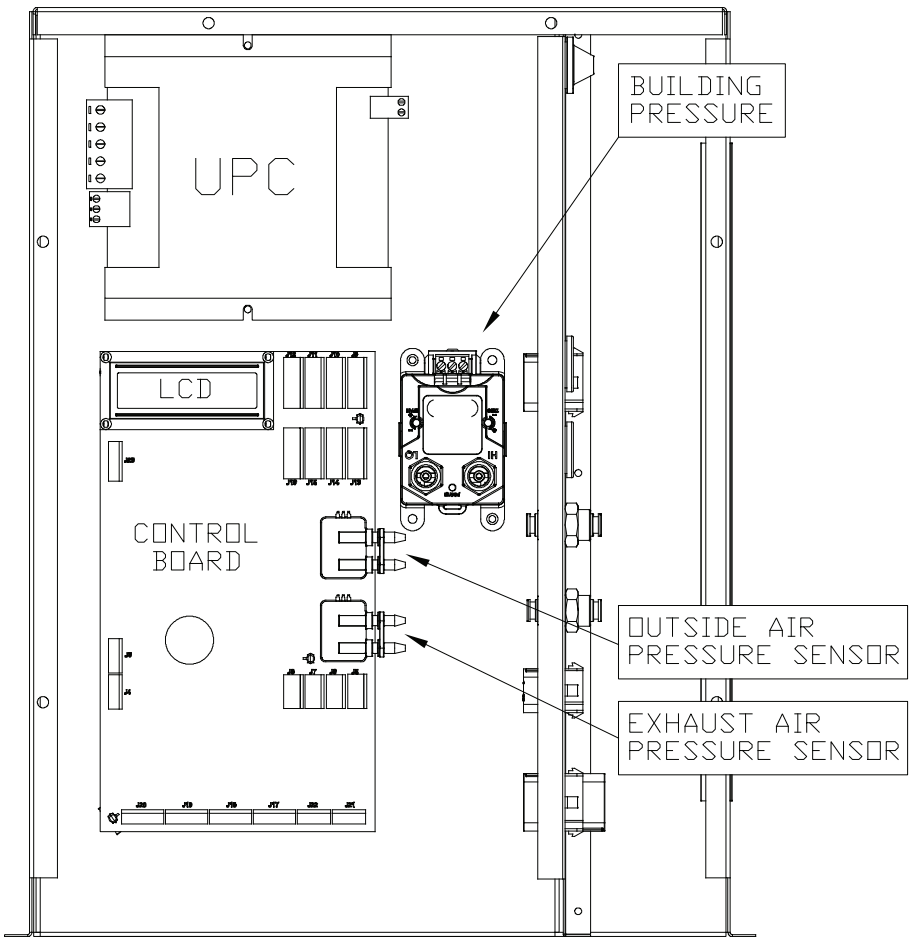
Fig. 6 - Modulating ERV Wiring Schematic

NOTE: THE UPPER AND LOWER CONTROL BOXES ARE REVERSED FOR CHASSIS 1





2 POSITION DAMPER CHART	
CHASSIS 1 -	50HC680014
CHASSIS 2 -	50HC680015
CHASSIS 3 -	50HC680016
CHASSIS 4 -	50HC680017
CHASSIS 5 -	50HC680018
CHASSIS 6/7 -	50HC680019
CHASSIS 8/9 -	50HC680020

AIR FLOW TUBING			
BLUE	FROST PROTECTION	GREEN	OUTSIDE AIR HIGH
BLACK	DIRTY FILTER EX HIGH	YELLOW	OUTSIDE AIR LOW
PRUPLE	DIRTY FILTER EX LOW	RED	EXHAUST AIR HIGH
GRAY	DIRTY FILTER SA HIGH	CLEAR	EXHAUST AIR LOW
ORANGE	DIRTY FILTER SA LOW	WHITE	EzERV SA & EX

C11465

Fig. 7 - EnergyX Component Layout

EnergyX Control Board (EXCB)

See Fig. 8 and Table 11.

The EXCB board is the muscle of the ERV control system. It acts as just an I/O board that does what the UPC commands. The EXCB continuously monitors input/output channel information received from its inputs and from the Universal Protocol Converter (UPC). The EXCB receives inputs from transducers and discrete inputs. See Options and Accessories section. The EXCB has relay analog outputs, and is equipped with a LCD screen. The EXCB communicates with a Modbus protocol and is not a CCN device. The EXCB has a reset button that is used to force all the outputs and reset communication.

NOTE: There are hardware jumpers set throughout the board. Do not change these jumpers.

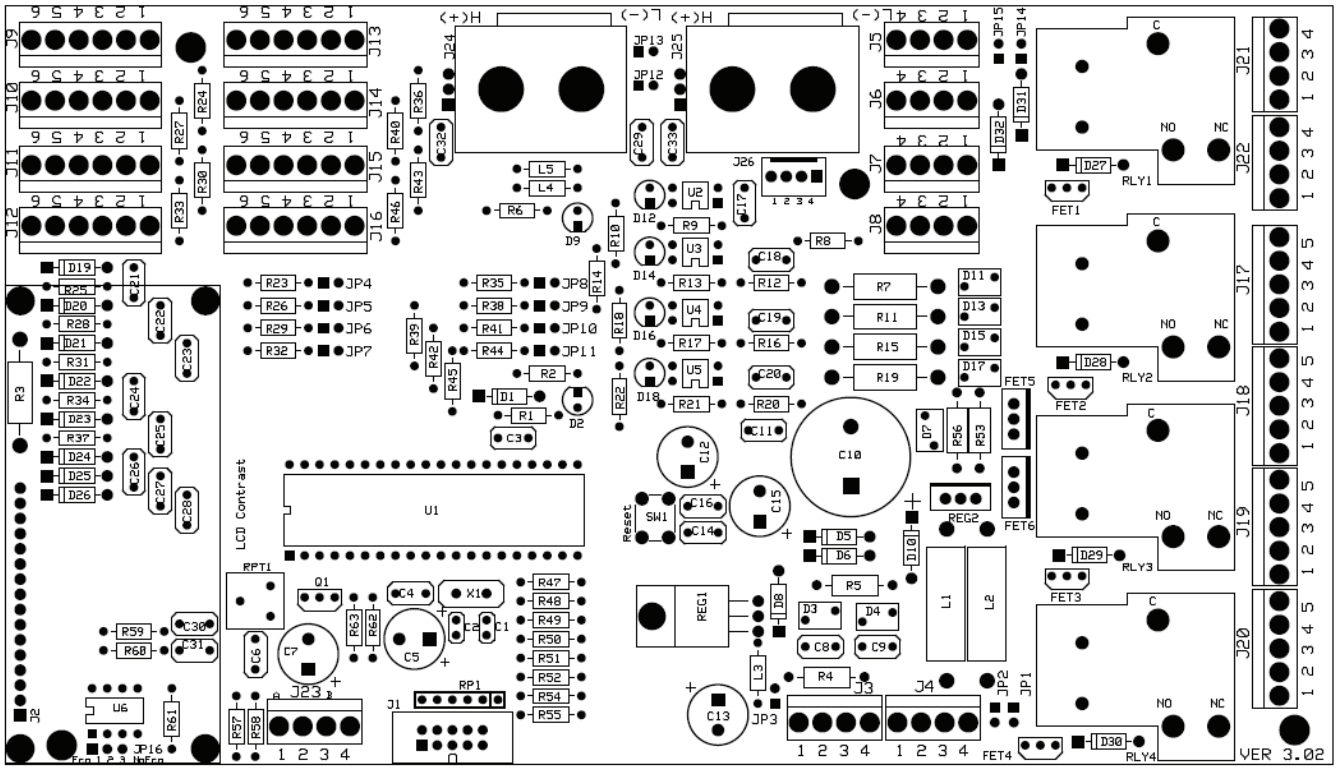


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Fig. 8 - EnergyX Control Board (EXCB)

Table 11 – EXCB Input/Output Connections

POINT DESCRIPTION	SENSOR LOCATION	Input/Output	TYPE OF Input/Output	CONNECTION PIN NUMBER
Download	N/A	Both	Communication	J1
LCD	Low voltage control box	Both	Communication	J2
Power from TRANS	Control box	Input	24VAC	J3, 1 – 2
Power to Relays	Low voltage control box	Output	24VAC	J4, 1
Power to UPC	Low voltage control box	Output	24VDC	J4, 3 – 4
Wheel Rotation Sensor	Attached to scoop	Input	Switch	J5, 2 – 4
Frost Switch	Attached to scoop	Input	Switch	J6, 3 – 4
Filter Status Switch	Attached to scoop and in Exhaust air section	Input	Switch	J7, 3 – 4
Motor Status Switches	Integrated in motors	Input	Switch	J8, 3 – 4
Leaving Air Temp	Scoop section	Input	10K	J15, 1 – 2
Exhaust Air Temp	Exhaust air section	Input	10K	J16, 1 – 2
Wheel Relay	High voltage control box	Output	Relay	J17, 4
2 – position Exhaust damper relay	Exhaust damper assembly	Output	Relay	J19, 4
OA fan speed signal	N/A	Output	2 – 10vdc	J21, 1 – 3
OA Modulating Damper	Intake damper assembly	Output	2 – 10vdc	J21, 1 – 4
EX fan speed signal	N/A	Output	2 – 10dvc	J22, 1 – 3
Modbus to UPC	Control box	Both	Communication	J23, 1 – 3
Outside Air pressure Transducer	Low voltage control box	Input	Digital 0 – 5vdc	J24
Exhaust Air pressure Transducer	Low voltage control box	Input	Digital 0 – 5vdc	J25
Building Pressure Sensor	Low voltage control box	Input	4 – 20mA	J10, 1 – 6

Universal Protocol Converter (UPC)

See Fig. 9 and Table 12.

The UPC board is required to convert CCN into Modbus. It is also the brains behind the ERV. It contains the operating software that runs the ERV logically. The UPC is connected to the ComfortLINK LEN bus on the rooftop unit.

NOTE: The DIP switches should be set as follows: 1=off, 2=off, 3=on, 4=on, 5=off, 6=off, 7=on, and 8=off. The address rotary switches should be set to 01 (10's=0 and 1's=1). **Do not change these settings.**

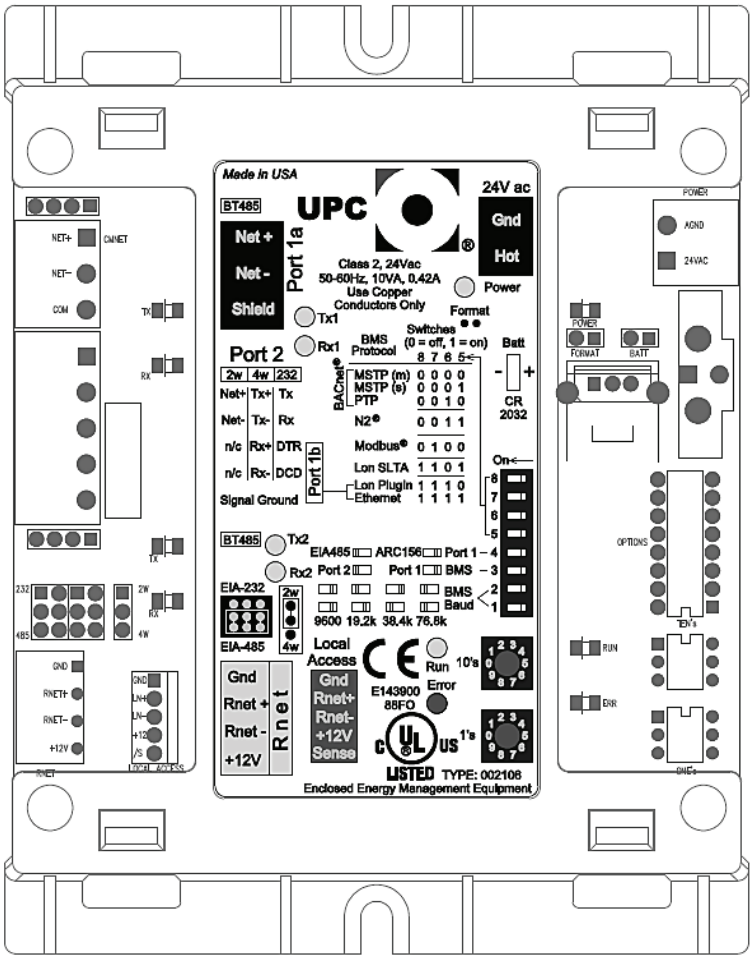

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Fig. 9 - Universal Protocol Converter (UPC)

Table 12 – UPC Input/Output Connections

TERMINAL NAME	DESCRIPTION	Input/Output	TYPE OF Input/Output	CONNECTION PIN NUMBER
24VAC	Supply power to UPC	Input	24VAC	1 – 2
Port 2	UPC Modbus	both	Communication	1 – 2
Port 1a	UPC LEN	both	Communication	1 – 3
Port 1b	Not used	N/A	N/A	N/A
Rnet	BACview User Interface or Download Connection	both	Communication	1 – 4
Local Access		both	Communication	1 – 5

User Interface

All ERV set point adjustment, service tests, and monitoring are accomplished through the ComfortLINK scrolling marquee interface. See the ComfortLINK Controls, Start-Up, Operation and Troubleshooting Instructions for further details on ComfortLINK operation. The ERV EXCB board has a LCD screen that can be used to help troubleshoot communication problems. The following are examples of the text that can be seen on the EXCB's LCD screen.

LCD Texts —

Initialize_LEN Communication – This will occur when the ERV is turned on from a power reset.

Communication Connected – This will be displayed when correct communication is established between the RTU and ERV and within the ERV.

Comm Failure1 UPC_to_LEN_Fail – This occurs if there is a communication problem between the UPC and ComfortLINK MBB.

Comm Failure2 UPC_to_EXCB_Fail – This will occur if there is a communication problem between the UPC and the EXCB.

Warning UPC TestMODE_Enabled – This will occur if the UPC was left in a factory Test mode a BACview Handheld is needed to pull the ERV out of this mode back to normal running mode.

Enthalpy Wheel

The enthalpy wheel is the "heat exchangers" of the ERV. It consists of several wheel segments aligned in a cassette assembly. These are not "filters" but made of a desiccant material. The wheel is rotated by a motor and belt, no adjustments required. When the wheel rotates it uses the building exhaust air to pre-conditions the outside air as it passes through the wheel.

Modulating Fan

The modulating ERV is equipped with direct drive variable speed plenum fans for outside air intake and exhaust air. The motors have built in VFDs that accept a 2-10vdc signal from the EXCB. This 2-10vdc signal is used by the VFD to determine the speed to run the motor at (0-100%). Some ERV models are equipped with multiple outside air and/or exhaust air fans. The additional motor's signal is parallel off the first motor through the coupling signal plug. Motor status switches are also paralleled for additional motors.

Each motor is capable of diagnosing problems within the motor to provide fan status. The fan status switches are built into each motor and provide a feedback to the EXCB if a problem is detected. The feedback signal is a discrete input that is normally open, when closed the EXCB will initiate the motor status alarm.

Modulating Outside Air Damper

ERV units include a factory installed modulating outside air damper. This damper is controlled in parallel with the modulating intake fan(s). This damper adds static to the outside air and will be open to the same percentage as the outside air fan(s) is running. The modulating outside air damper will also close in the unoccupied mode to prevent unwanted air from being introduced to the rooftop unit.

Options and Accessories

The modulating ERV has several optional factory installed options and field installed accessories: Frost Protection, Economizer, Wheel Motor Status, Filter Maintenance, horizontal adaptor curb, building pressure sensor, Outside Air Tempering Kit, and 2-Position Exhaust Damper. Refer to Table 11 for where these options wire into the EXCB.

Economizer Damper (factory installed only)

The economizer damper is a factory installed option that provides a wheel bypass damper. This damper is controlled by the base unit rooftop as an economizer for the purpose of free cooling. The damper is installed adjacent to the ERV wheel to allow outside air to flow through it when opened instead of the wheel. The ERV's outside air fan(s) will run as this damper is opened to allow proper airflow.

Frost Protection (factory installed only)

Frost protection is a factory installed pressure sensor device which senses a differential pressure across the wheel. This occurs if frost builds up on the wheel. The sensor closes its contact when the pressure differential is greater than the setpoint. When the EXCB reads the contact closer it will activate defrost mode. The setpoint is a dial on the sensor, is adjustable from 0.2 to 2.0 inWC, and is factory preset to 2.0 inWC. Changing this setting may cause false signal causing defrost mode when not needed.

Wheel Motor Status (field install only)

The wheel motor status accessory can be installed in the field and consists of a wheel motion proxy sensor and a relay. The wheel motion sensor is aimed at the wheel to detect rotation. If the wheel does not rotate at the appropriate speed the sensor will open causing the rotation monitor relay to close a contact to initiate the wheel status alarm. The motion sensor is factory set at the highest speed (clockwise until stop) and should not be changed. Refer to the troubleshooting section for details on the alarms.

Filter Maintenance (field install only)

Filter maintenance consists of two field installed pressure sensor devices which sense differential pressure across the ERV filters. This occurs if dirt builds up on the filters. There is a separate pressure sensor for each filter (outside air and exhaust air). The sensor closes its contact when the

pressure differential is greater than the setpoint. The sensors are wired in parallel, so when the EXCB reads a contact closer from either sensor it will activate the filter alarm. The setpoint is a dial on the sensor, is adjustable from 0.2 to 2.0 inWC, and is factory preset to 2.0 inWC. Changing this setting may cause false signal causing false dirty filter alarms.

Horizontal Transition Curb (field install only)

EnergyX units must receive vertical return. If the application requires horizontal return then a horizontal transition curb must be used. The 15-25 ton units cannot be field converted to horizontal supply. To accomplish horizontal supply on a 15-25 ton unit a horizontal transition curb must be used.

SERVICE & MAINTENANCE

Refer to base unit's Service manual for base unit service and maintenance. This section contains service and maintenance for just the ERV unit.

Cleaning

Wheel and Segment Cleaning

Wheel cleaning periodicity is application dependent. Field experience shows that offices, schools and other "clean" environments will often go 10 years before any build up of dust and dirt is noticed. Other applications such as restaurants, casinos and factory environments may experience fairly rapid build-up of contaminants and may require multiple cleanings per year to maintain airflow and recovery efficiencies.

All air-to-air energy recovery devices will become dirty over time, even with well-maintained filtration. Proper filtration usage and changes will improve the life of the wheel transfer segments. Once the wheel is exposed to oils, tars or greases in either the supply or exhaust air streams, these pollutants deposit on the rotary surface which then become "sticky" and begin to attract and hold the dust particles that previously passed thru the wheel. Over time this particle build up can lead to blocked airflow passages, loss of recovery, excessive pressure drop through the wheel and loss of energy savings.

1. Follow steps for wheel and segment removal to remove the affected energy transfer matrix segments.
2. Gently brush the wheel face to remove loose accumulated dirt.
3. Wash the segments with a non-acid based (evaporator) coil cleaner or alkaline detergent solution. Non-acid based coil cleaner such as KMP Acti-Clean AK-1 concentrate in a 5% solution has been demonstrated to provide excellent results. **DO NOT** use acid based cleaners, aromatic solvents, temperatures in excess of 170°F or steam! Damage to the wheel will result.
4. Soak the wheel and/or segments in the cleaning solution until all grease and tar deposits are loosened. An overnight soak may be required to adequately loosen heavy deposits of tar and oil based contaminants.
5. Internal heat exchange surfaces may be examined by separating the polymer strips by hand. (Note: some staining of the desiccant may remain and is not harmful to performance.)
6. After soaking, rinse the dirty solution from the wheel segments until the water runs clear.
7. Allow excess water to drain prior to replacing segments in the wheel. A small amount of water remaining in the wheel will be dried out by the airflow.

Filters

Clean or replace at start of each heating and cooling seasons, or more often if operating conditions require (based on filter manufacture recommendation or filter status alarm indication). Refer to Table 1 for type and size of filters.

Outdoor-Air Inlet Screens

Clean screens with steam or hot water and a mild detergent at the beginning of each heating and cooling season. Do not use throwaway filters in place of screens.

Lubrication

All component bearings are sealed and do not require lubrication.

Wheel Drive Adjustment

The wheel motor and drives do not require adjustment. The wheel drive pulley is secured to the drive motor shaft by a set screw. The set screw is secured with removable locktite to prevent loosening. Annually confirm set screw is secure. The wheel drive belt is a urethane stretch belt designed to provide constant tension throughout the life of the belt. Inspect the drive belt annually for proper tracking and tension. A properly tensioned belt will turn the wheel immediately after power is applied with no visible slippage during start-up.

Wheel Air Seal Adjustment

Diameter seals are provided on each wheel cassette to minimize transfer of air between the counter flowing airstreams. Follow below instructions if adjustment is needed.

1. Loosen diameter seal adjusting screws and back seals away from the wheel surface. See Fig. 10.
2. Rotate the wheel clockwise until two opposing spokes are hidden behind the bearing support beam.
3. Using a folded piece of paper as a feeder gauge, position the paper between the seal and wheel surface.
4. Adjust the seal towards wheel surface until a slight friction on the feeder gauge (paper) is detected while moving the gauge along the length of the spoke.
5. Re-tighten adjustment screws and re-check clearance with the feeder gauge.

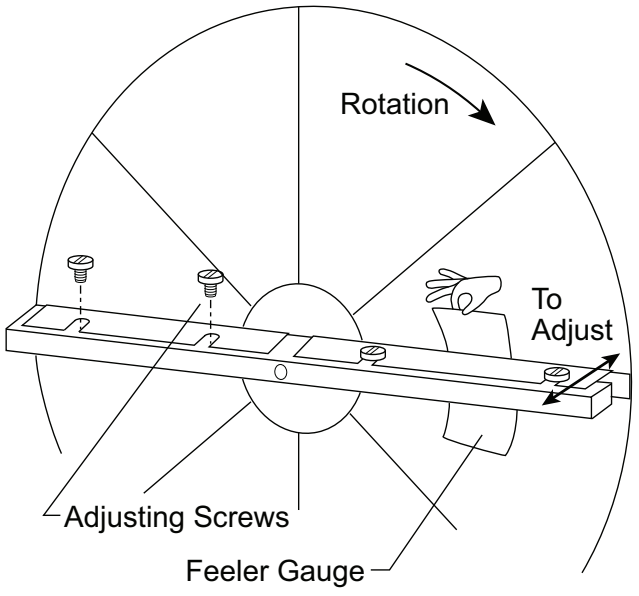

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Fig. 10 - Diameter Seal Adjustment

Wheel and Segment Removal / Installation

The wheel and segments represent a substantial portion of the value of the cassette therefore must be handled with care and never be dropped. Use a suitable crate or harness to lift wheel and segments to a roof surface, never use the shipping cartons for this purpose. Wheel and segments may require "slight" persuasion during installation and removal but never forced or impacted with a hammer or similar tool. The wheel assembly can be removed and installed or the wheel or segments can be removed from the assembly.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

The weight of the wheel assembly must be supported when the assembly is extended from the unit chassis to avoid damage to wheel or unit.

ERV wheels on 15 to 25 ton units are segmented wheel assemblies. To remove or installed the whole assembly, simply side in or out the assembly noting the motor power plug.

Wheel Segment Removal / Installation

1. Turn off, lockout and tag-out electrical power to unit.
2. Open access door to the EnergyX module on back side of the unit.
3. Slide the entire wheel assembly out until the necessary segment(s) of the wheel can be accessed. Support the weight of the wheel assembly as necessary to avoid damage to wheel or unit.

⚠ CAUTION

PERSONAL INJURY HAZARD

Failure to follow this caution may result in personal injury.

Weight of the installed segment will cause the wheel to accelerate in rotation as segments are removed. Failure to maintain control of the wheel rotation while installing all segments could cause severe injury to fingers or hand caught between revolving spokes and the bearing support beam. The handle of a tool such as a hammer, should be inserted through spokes and above or below bearing support beams to limit rotation of unbalanced wheel. See Fig. 11.

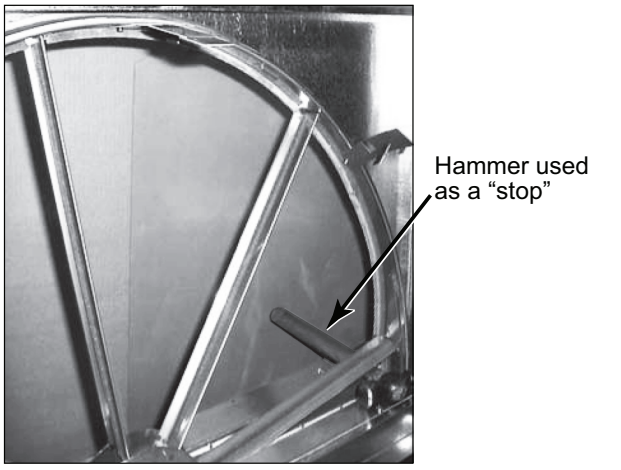

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Fig. 11 - Wheel Stop

4. Position one segment opening at the top of the cassette.
5. Unlock and open the segment retaining brackets on both sides of the selected segment opening. See Fig. 12.

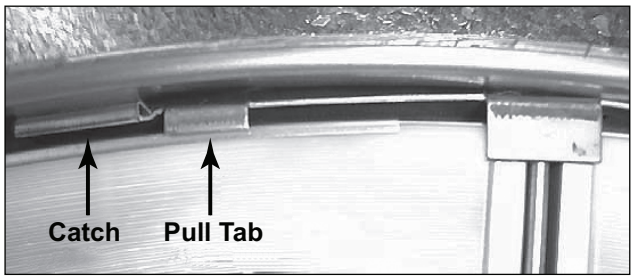

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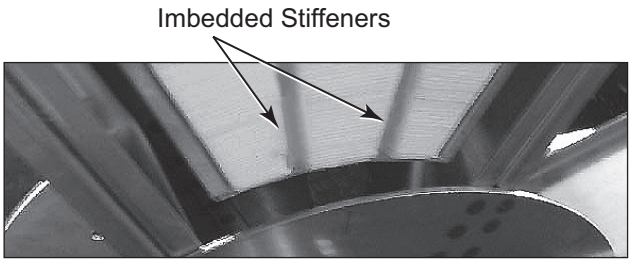
Fig. 12 - Segment Retaining Brackets

6. Gently lift segment outward.
7. Close segment retaining latches and rotate wheel 180° to remove next segment. Follow this pattern to remove all segments and keep wheel balanced.
8. To install the wheel segments, hold the segment as vertically as possible and centered between spokes, insert nose of segment downward between the hub plates. See Fig. 13.

NOTE: The face of the segment, with the imbedded stiffener (vertical support between nose and rim end of segment) must face the motor side of the cassette. See Fig. 14.

C11472

Fig. 13 - Segment Removal



C11473

Fig. 14 - Imbedded Wheel Stiffeners
(shown from motor side of wheel assembly)

9. Ease the segment downward until its outer rim clears the inside of the wheel rim. Press the segment inward against the spoke flanges.
10. Close and latch segment retaining brackets to the position shown in Fig. 12 Make certain the retaining bracket is fully engaged under the catch.
11. Slowly rotate, by hand, the first installed segment to the bottom of the cassette, and then install the second segment opposite the first. Repeat this sequence with the two installed segments rotated to the horizontal position to balance the weight of installed segments.
12. Continue this sequence with the remaining segments as necessary.
13. When complete, close access door and remove lockout and tag-out to apply power to unit.

Whole Wheel Removal/Installation (36" & 46" wheels)

These wheels include the shaft and are secured to two wheel support beams by two flange bearings with locking collars.

Follow the steps below for removal and reverse for installation. See Fig. 15.

1. Loosen the two set screws on each to the two wheel bearings.
2. Remove belt from pulley and position temporarily around wheel rim.
3. Remove pulley side wheel support beam with bearing, by removing four support beam screws.
4. Pull the wheel with the shaft straight out of the motor side wheel support beam and bearing. Handle wheel with care.
5. When replacing wheel be certain to tighten four bearing set screws. Premature bearing failure can occur if not set tightly.

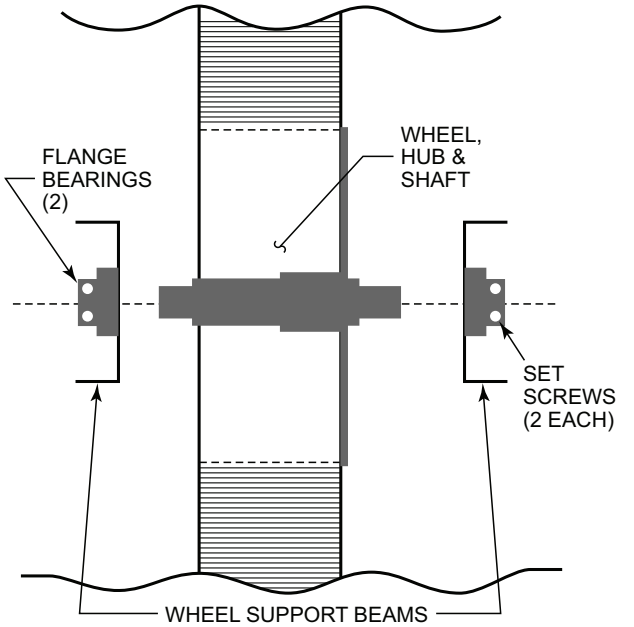


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Fig. 15 - 36" & 46" Wheel Mount

Outside Air and Exhaust Air Hood Removal

Outside Air Hood Removal

1. Turn off, lockout and tag-out electrical power to unit.
2. Remove the hood by removing the seal-tek screws along the perimeter of the hood. See Fig. 16.

NOTE: Even after all screws have been removed from entire perimeter of hood, it will still be difficult to remove due to the gasket applied from original installation. Take care not to damage the gasket. If damage occurs use 9430-2300 gasket to replace before reattaching the hood.

3. Disconnect the green (HIGH) and yellow (LOW) tubes attached to the quick connects located inside the ERV. Do NOT damage the tubes.

Exhaust Air Hood Removal

1. Turn off, lockout and tag-out electrical power to unit.
2. Remove the hood by removing the seal-tek screws along the perimeter of the hood.

NOTE: Even after all screws have been removed from entire perimeter of hood, it will still be difficult to remove due to the gasket applied from original installation. Take care not to damage the gasket. If damage occurs use 9430-2300 gasket to replace before reattaching the hood.

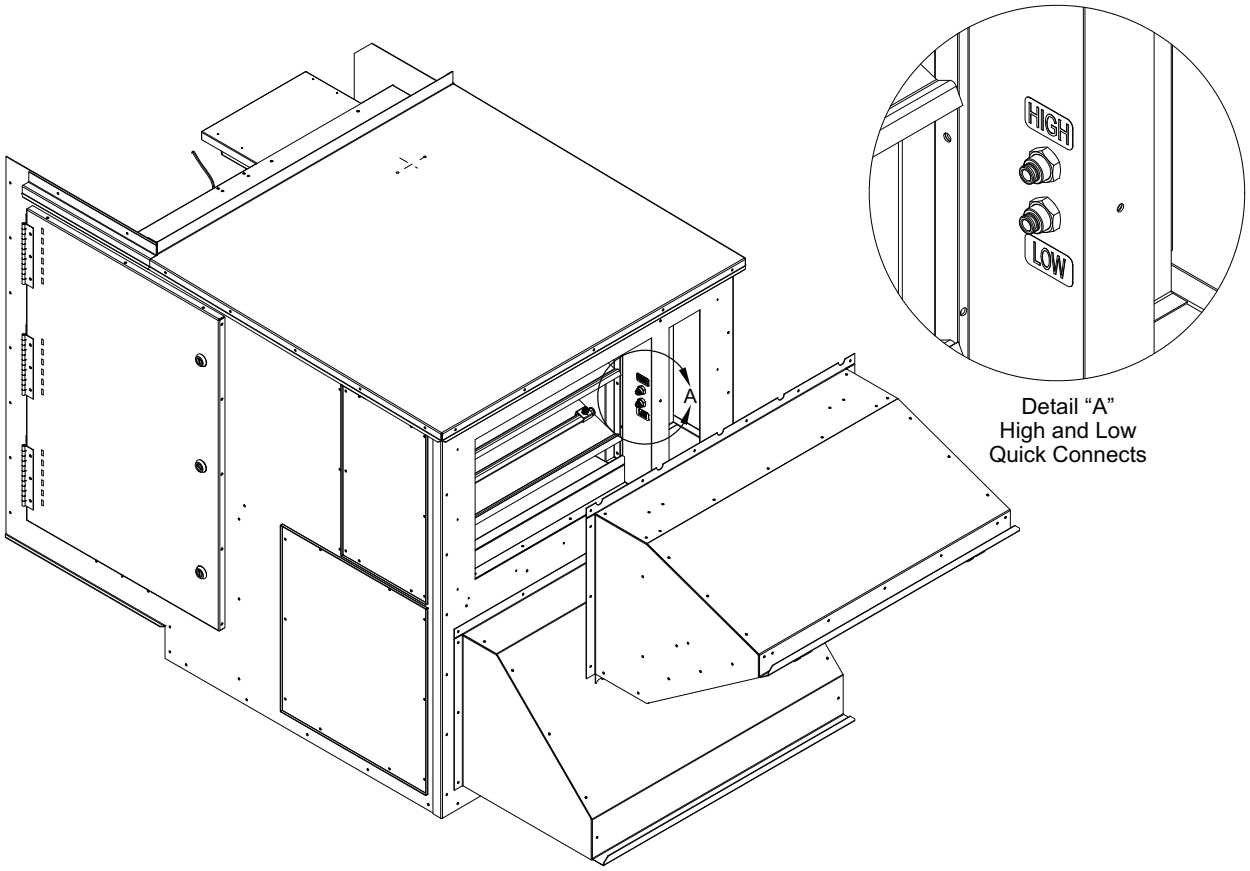

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Fig. 16 - Outside Air Hood Removal

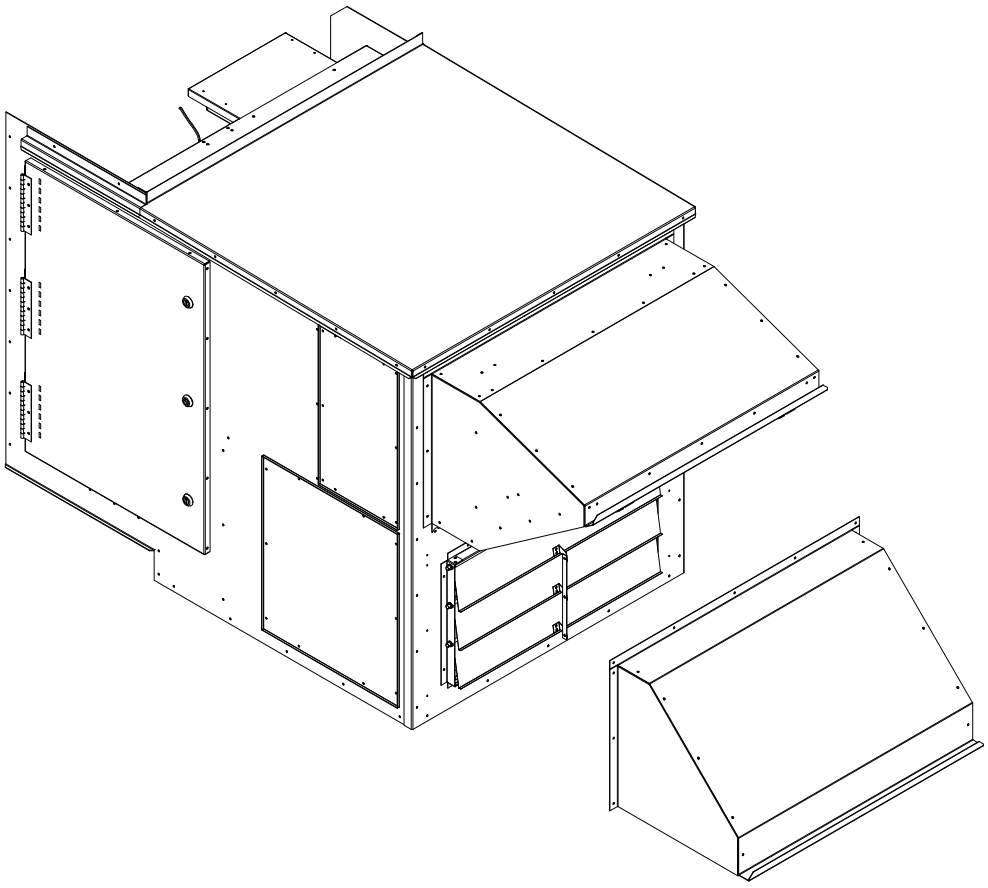

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Fig. 17 - Exhaust Air Hood Removal

Outside Air Motorized Damper Removal

1. Turn off, lockout and tag-out electrical power to unit.
2. Remove the outside air motorized damper access panel by removing the seal-tek screws around the perimeter (see Fig. 18).

NOTE: Even after all of the screws have been removed from the panel it still may be difficult to remove due to the gasket applied from the original installation. Take care not to damage the gasket. If damage occurs use 9430-2300 gasket to replace before reattaching the panel.

3. Disconnect the connector labeled PL06 for the damper motor from the wiring harness inside the air chamber of the EnergyX unit.
4. Slide out the outside air motorized damper by pulling it along the track guides. See Fig. 18.

Outside Air and Exhaust Fan Replacement

Outside Air Fan Removal

1. Turn off, lockout and tag-out electrical power to unit.
2. Remove outside air hood (see procedure on page 28).
3. Remove outside air motorized damper (see procedure on page 30).
4. Remove the lower and upper guides for the outside air motorized damper by removing the screws along the length of the flanges connecting them to the inside fo the ERV unit.
5. Disconnect the connector PL121, PL123 and the power wires for the exhaust fan motor from the wiring harness inside the air chamber fo the EnergyX.
6. Remove the fasteners at each corner of the outside air fan that secure the outside air fan front panel to the dividing wall by access through the hood opening of the ERV. See Fig. 19.

NOTE: See instructions for removing the wheel and supply filters if more room is needed to access the outside air fan through the door for better maneuverability.

7. Remove the four bolts holding the front fan panel onto the rest of the outside air fan assembly. Completely remove this panel from the EVR.

NOTE: Tilt the fan assembly front panel to fit it through the hood opening.

8. Pull the outside air fan out through the hood opening. See Fig. 20.

NOTE: Tilt the fan assembly to fit its back panel through the opening in the dividing wall.

9. Repeat steps 6, 7, and 8 to remove the second fan.

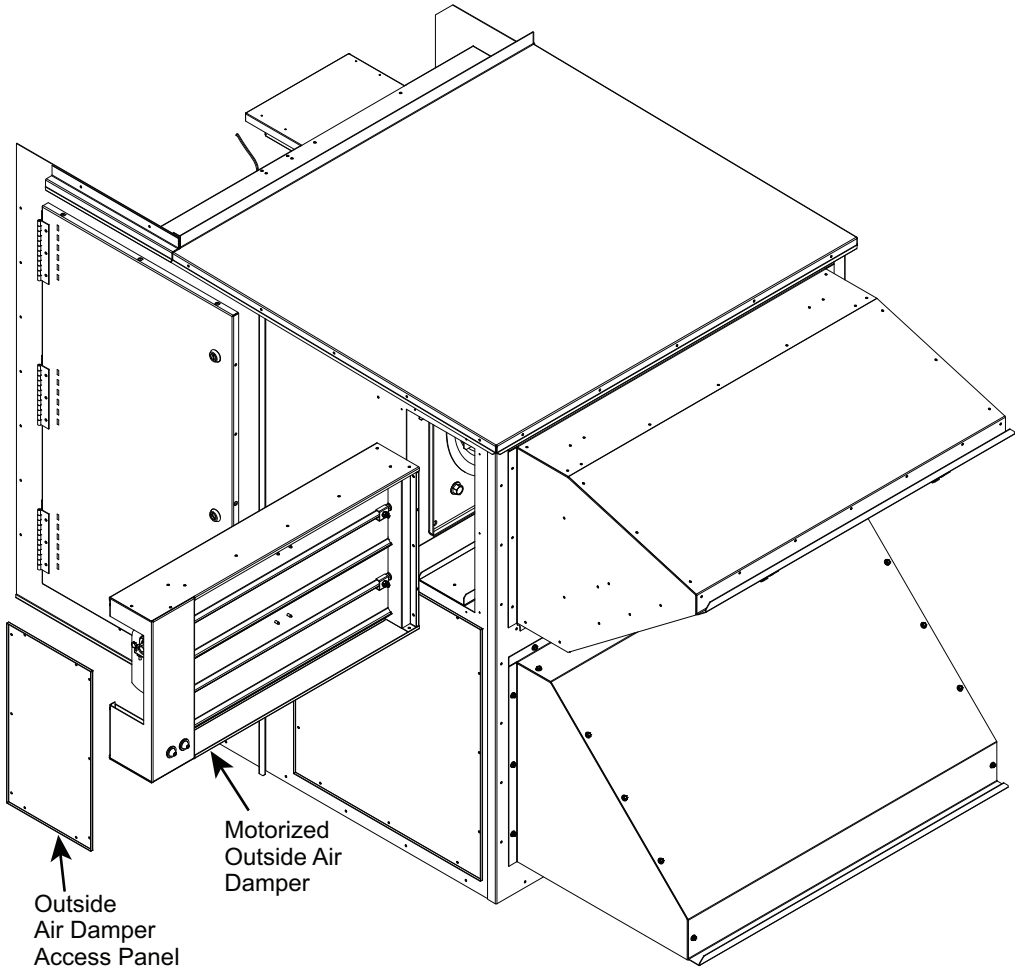

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Fig. 18 - Outside Air Motorized Damper Removal

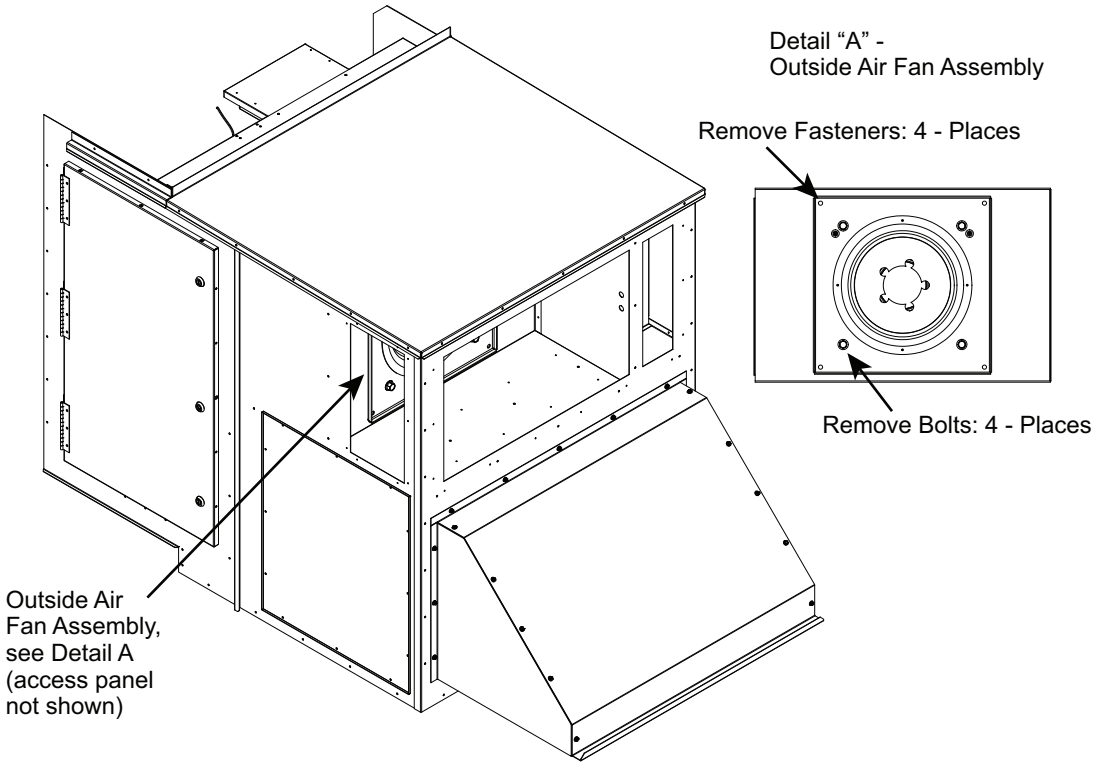

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Fig. 19 - Remove Fasteners from Corners of Outside Air Fan Assemble

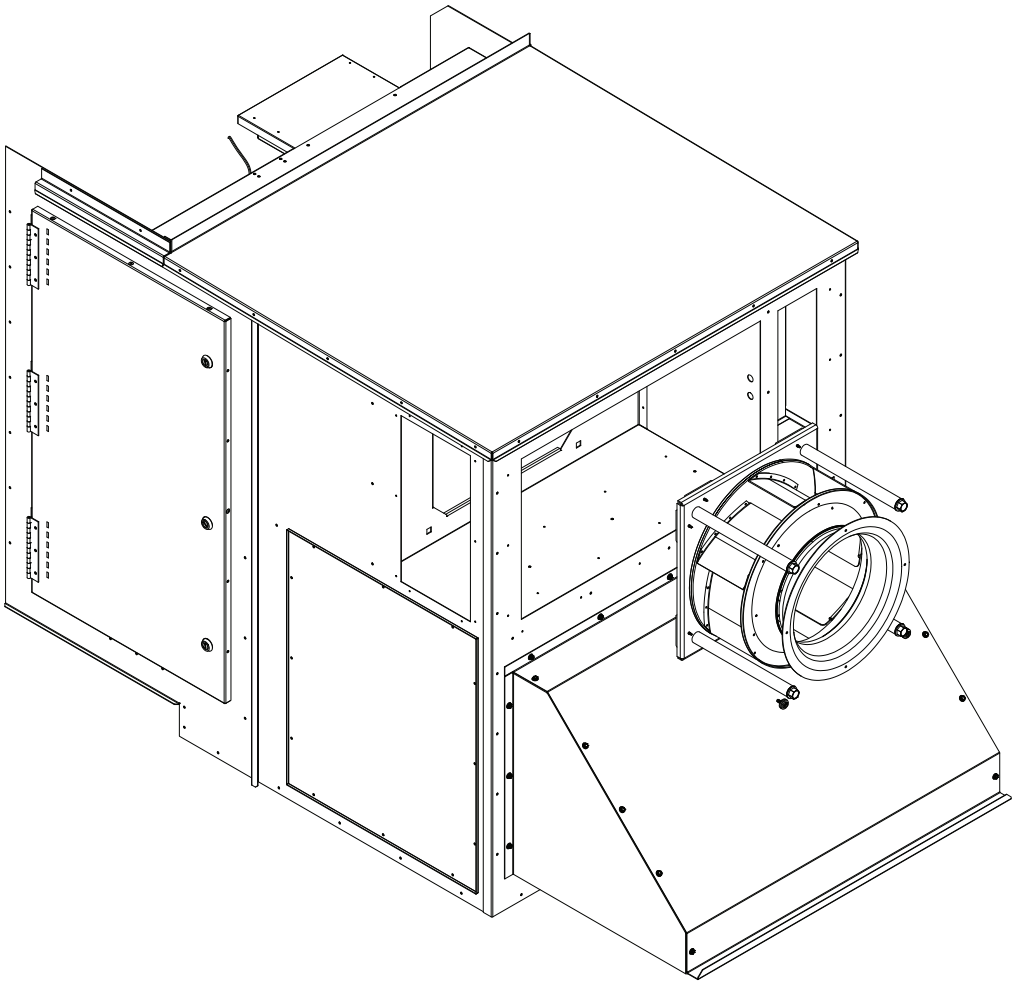

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Fig. 20 - Outside Air Fan Removal

Exhaust Fan Removal

1. Turn off, lockout and tag-out electrical power to unit.
2. Remove the exhaust fan access panel by removing the seal-tek screws around the perimeter (see Fig. 18).

NOTE: Even after all of the screws have been removed from the panel it still may be difficult to remove due to the gasket applied from the original installation. Take care not to damage the gasket. If damage occurs use 9430-2300 gasket to replace before reattaching the panel.

3. Open the door to the EnergyX unit in order to gain access to the exhaust fan front panel.

NOTE: See instructions for removing the wheel and exhaust filters if more room is needed to access the exhaust fan front panel.

4. If installed, remove the exhaust motorized damper.
5. Remove the fasteners around the perimeter of the exhaust fan that secure the exhaust fan front panel to the dividing wall by access through the door of the unit. See Fig. 21.
6. Disconnect connectors PL120 and PL122 as well as the power wires for the exhaust fan motor from the wiring harness inside the air chamber of the EnergyX unit.
7. Remove the exhaust fan by moving it back and then out the side of the unit through the exhaust motorized damper access panel. See Fig. 22.
8. Repeat steps 5, 6, and 7 to remove the second exhaust fan on size 20, 24, and 28 models..

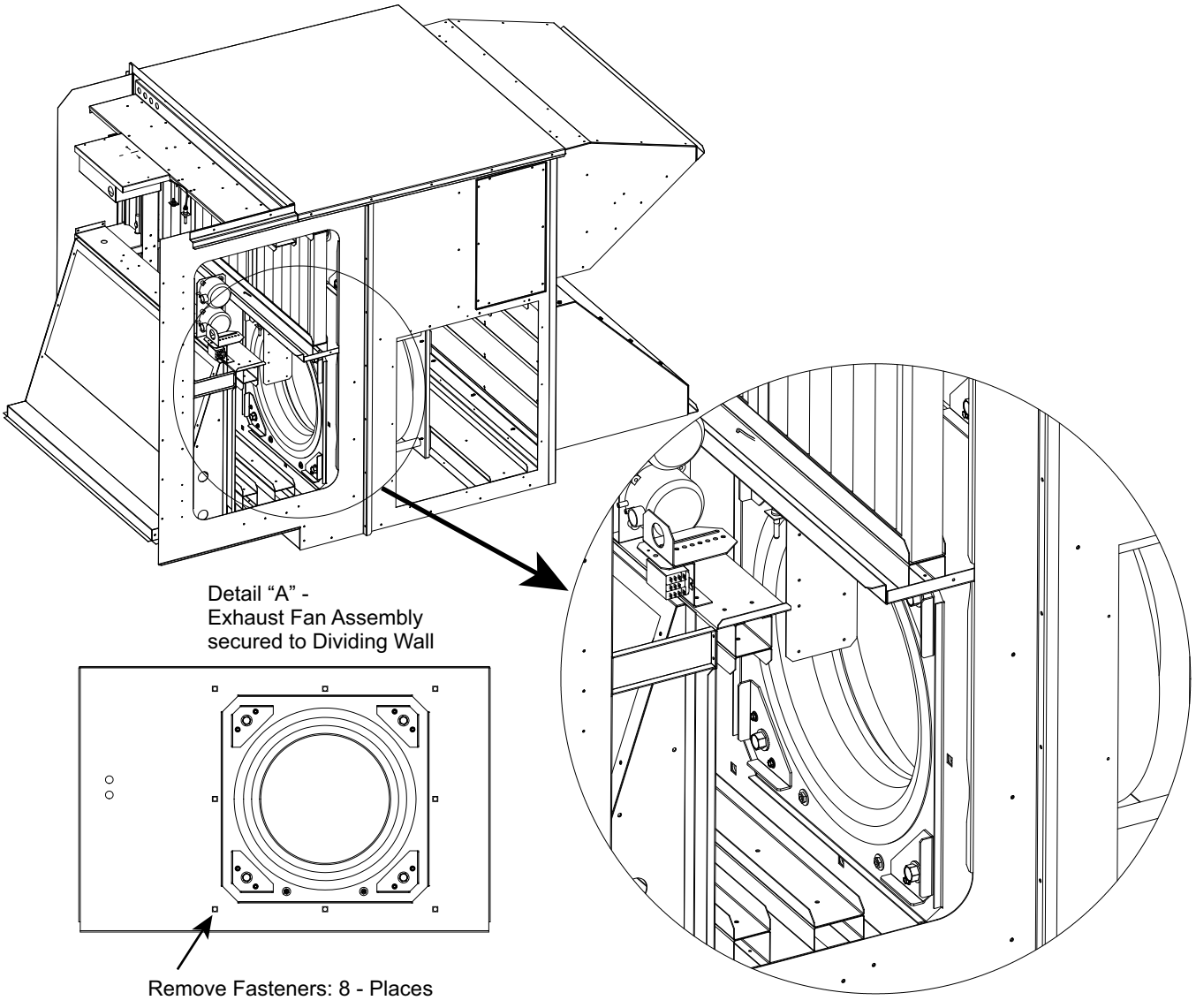
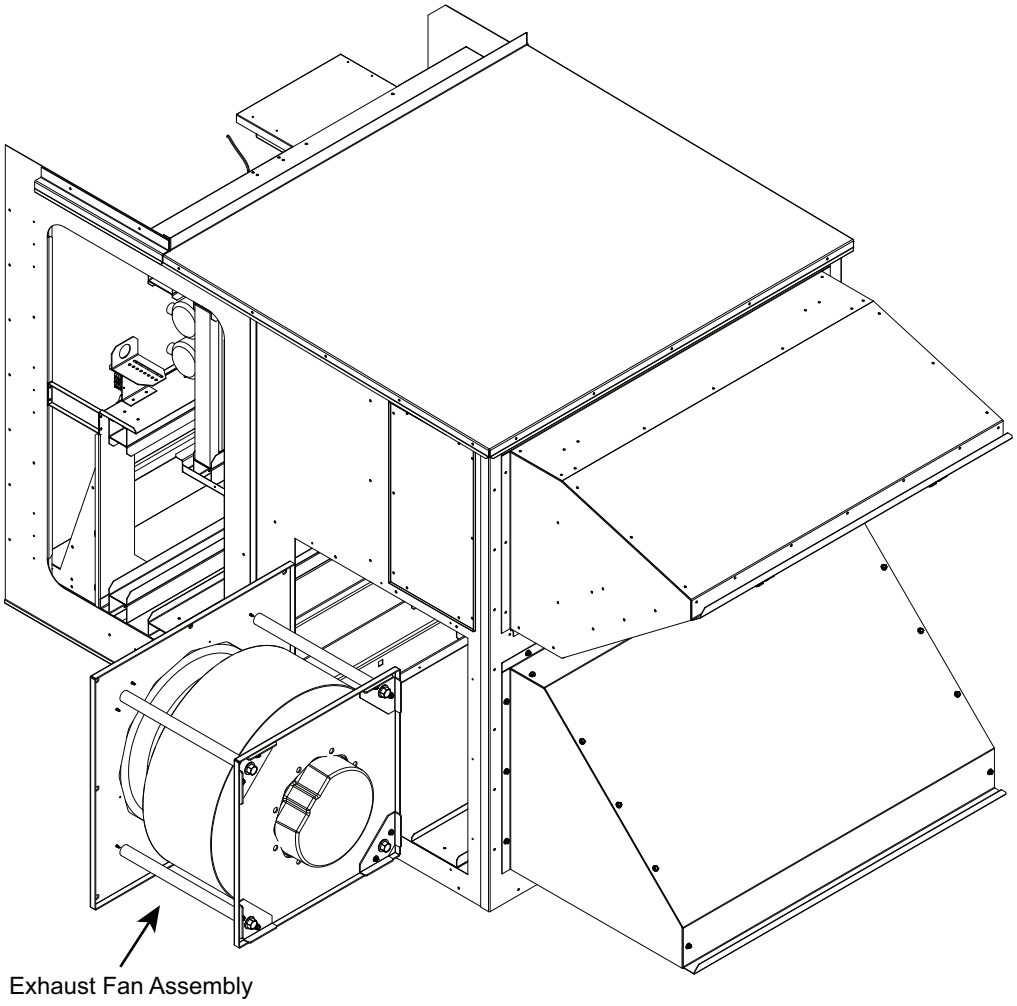


Fig. 21 - Exhaust Fan Assembly - Fastener Locations



C11498

Fig. 22 - Exhaust Fan Assembly - Removal

APPENDIX

Appendix A — Certified Dimension Drawings

Appendix B — Exhaust Fan Performance Curves

EnergyX Modulating Volume 15-25 Ton Units

Appendix C — Electrical Data

48HC with ERV: Unit Wire/Fuse or HACR Breaker Sizing Data

48HC with ERV and Factory-Installed HACR Breaker

48HC with ERV and 2-Speed Indoor Fan Option

48HC with ERV, Factory-Installed HACR Breaker and 2-Speed Indoor Fan Option

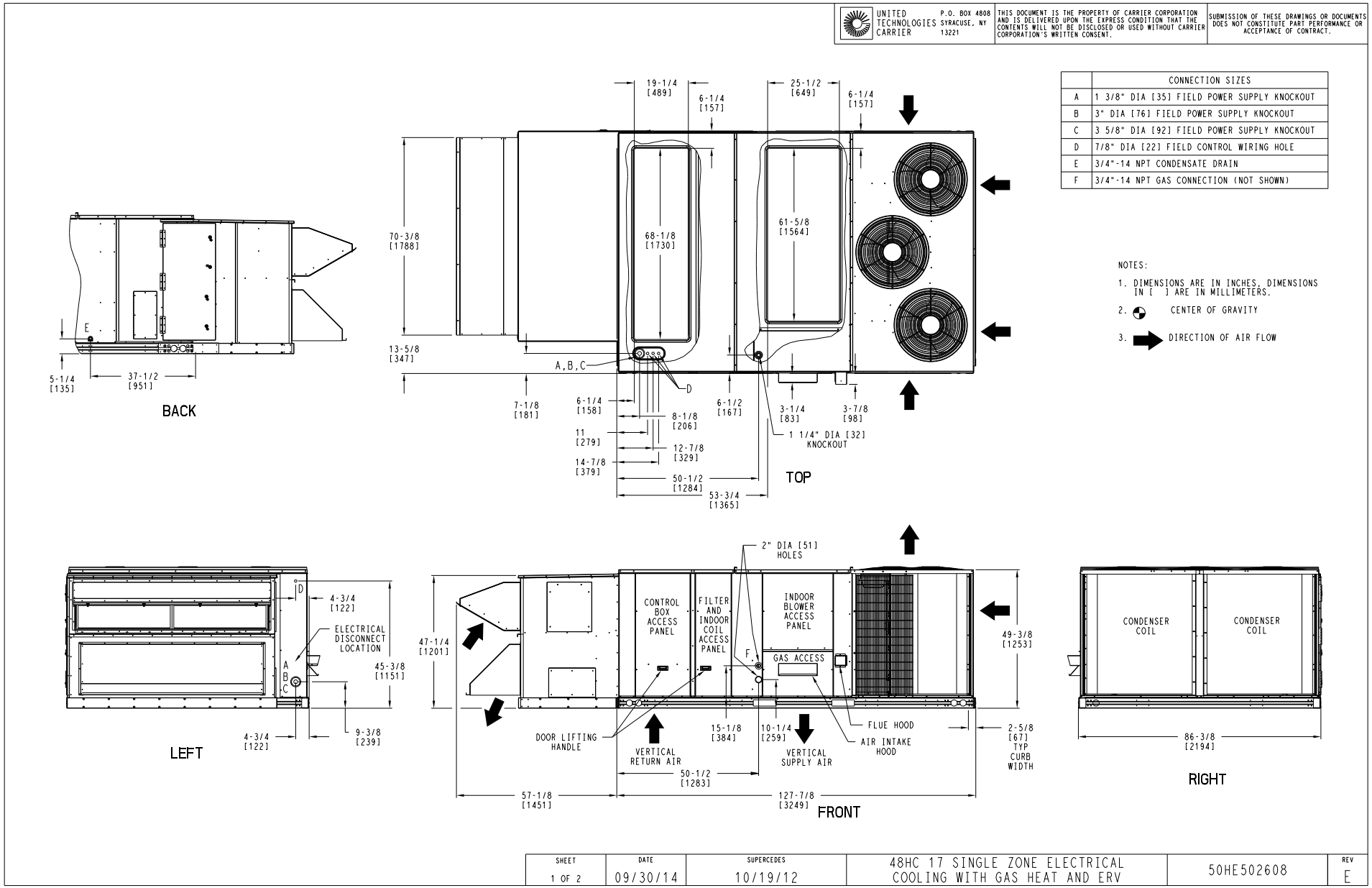
50HC with Electric Heat and ERV: Unit Wire/Fuse or HACR Breaker Sizing Data

50HC with Electric Heat, ERV and Factory-Installed HACR Breaker

50HC with Electric Heat, ERV and 2-Speed Indoor Fan Option

50HC with Electric Heat, ERV, Factory-Installed HACR Breaker and 2-Speed Indoor Fan Option

APPENDIX A — CERTIFIED DIMENSION DRAWINGS



C150121

Fig. 23 - 48HC-17 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 1 of 2)

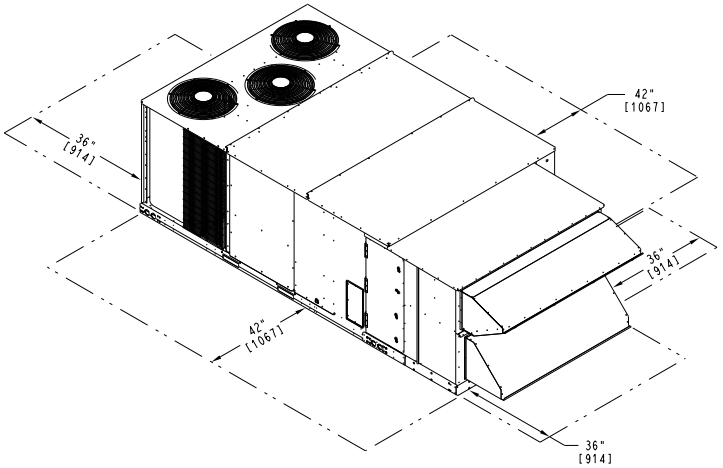
APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	ERV **	STD UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48HC17	HIGH CFM	3330	1514	1168	531	495	225	496	226	1171	532	43 1/8 [1095]	38 [965]	16 1/2 [419]
48HC17	LOW CFM	2919	1324	954	433	551	250	518	235	896	406	41 7/8 [1063]	47 [1190]	19 1/8 [486]

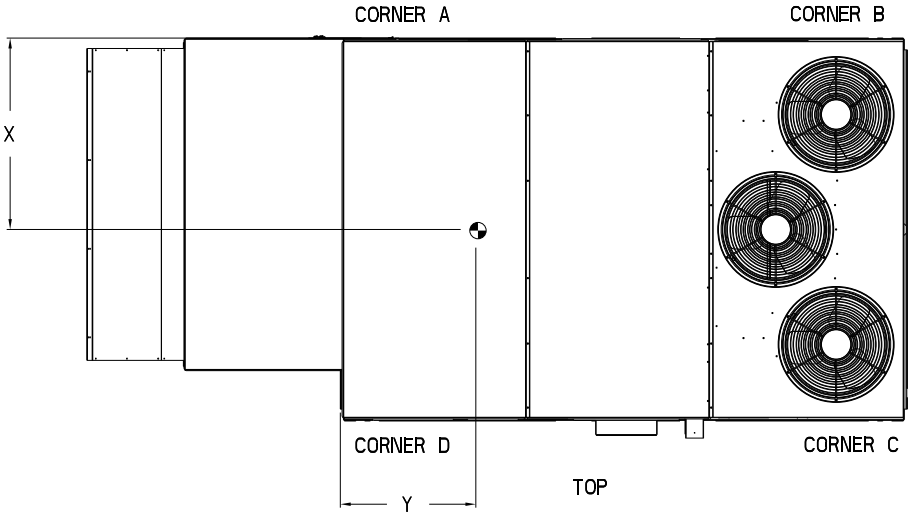
* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

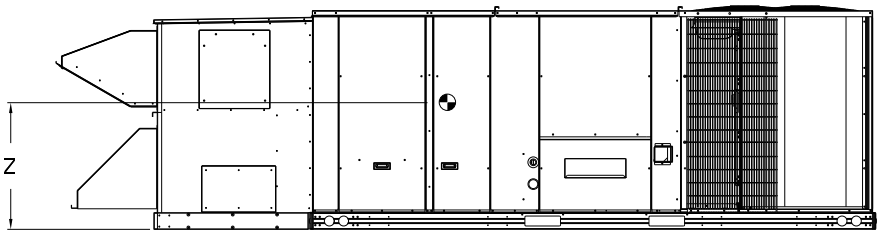
** FOR COMFORT LINK UNITS, ONLY HIGH CFM ERV IS AVAILABLE.

NOTE:
UNIT IS NOT DESIGNED TO HAVE OVERHEAD OBSTRUCTION. CONTACT APPLICATION ENGINEERING FOR GUIDANCE ON ANY APPLICATION PLANNING OVERHEAD OBSTRUCTION OF FOR VERTICAL CLEARANCES.



CLEARANCES





WARNING:
DO NOT LIFT UNIT THROUGH FORK LIFT OPENINGS IN UNIT BASERAIL. PER RIGGING LABEL INSTRUCTIONS, UNIT MUST BE LIFTED BY AN OVERHEAD LIFTING DEVICE

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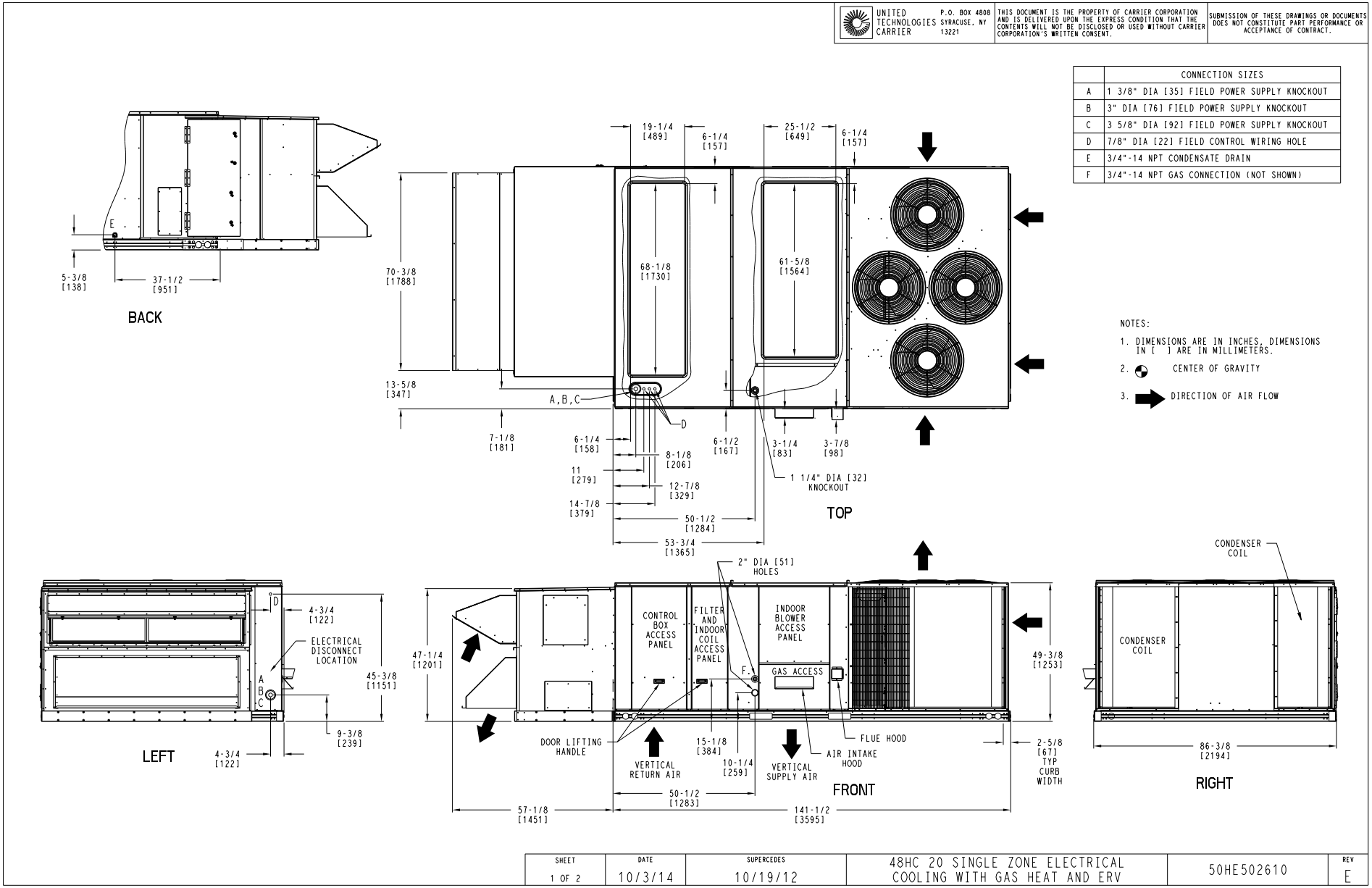
SHEET	DATE	SUPERCEDES			REV
2 OF 2	09/30/14	10/19/12	48HC 17 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT AND ERV	50HE502608	E

C150122

Fig. 24 - 48HC-17 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 2 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS



C150123

Fig. 25 - 48HC-20 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 1 of 2)

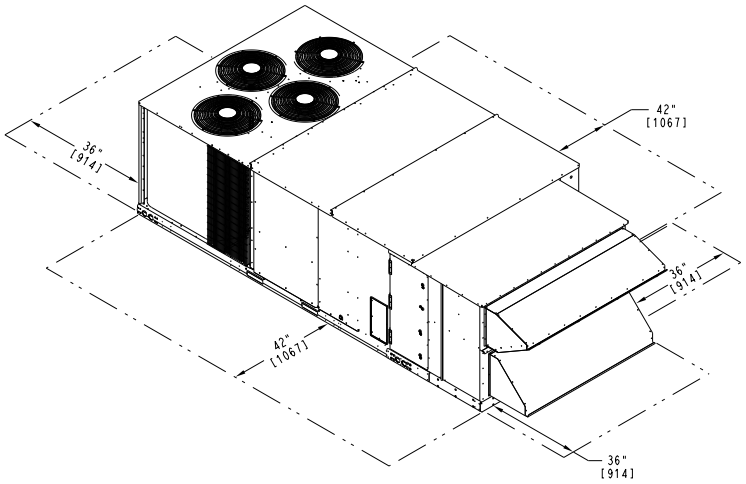
APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	ERV **	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48HC20	HIGH CFM	3540	1609	1161	528	449	204	613	279	1146	521	42 3/4 [1087]	49 [1251]	16 1/2 [419]
48HC20	LOW CFM	3129	1419	1032	468	578	262	545	247	973	441	41 7/8 (1065)	50 7/8 (1291)	19 (482)

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

** FOR COMFORT LINK UNITS, ONLY HIGH CFM ERV IS AVAILABLE.

NOTE:
UNIT IS NOT DESIGNED TO HAVE OVERHEAD OBSTRUCTION. CONTACT APPLICATION ENGINEERING FOR GUIDANCE ON ANY APPLICATION PLANNING OVERHEAD OBSTRUCTION OF FOR VERTICAL CLEARANCES.



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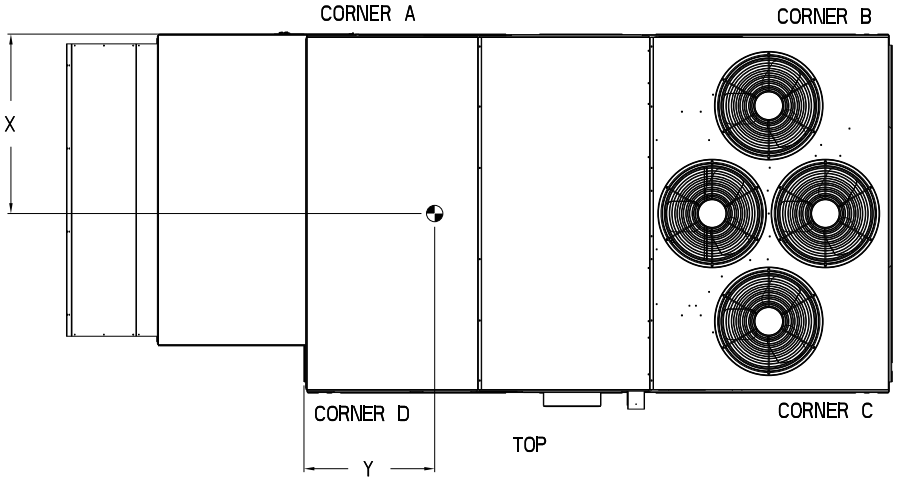

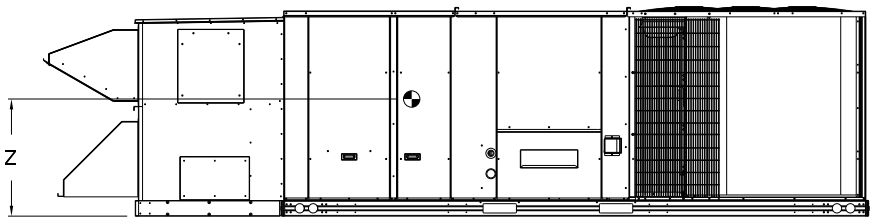

FRONT

WARNING:
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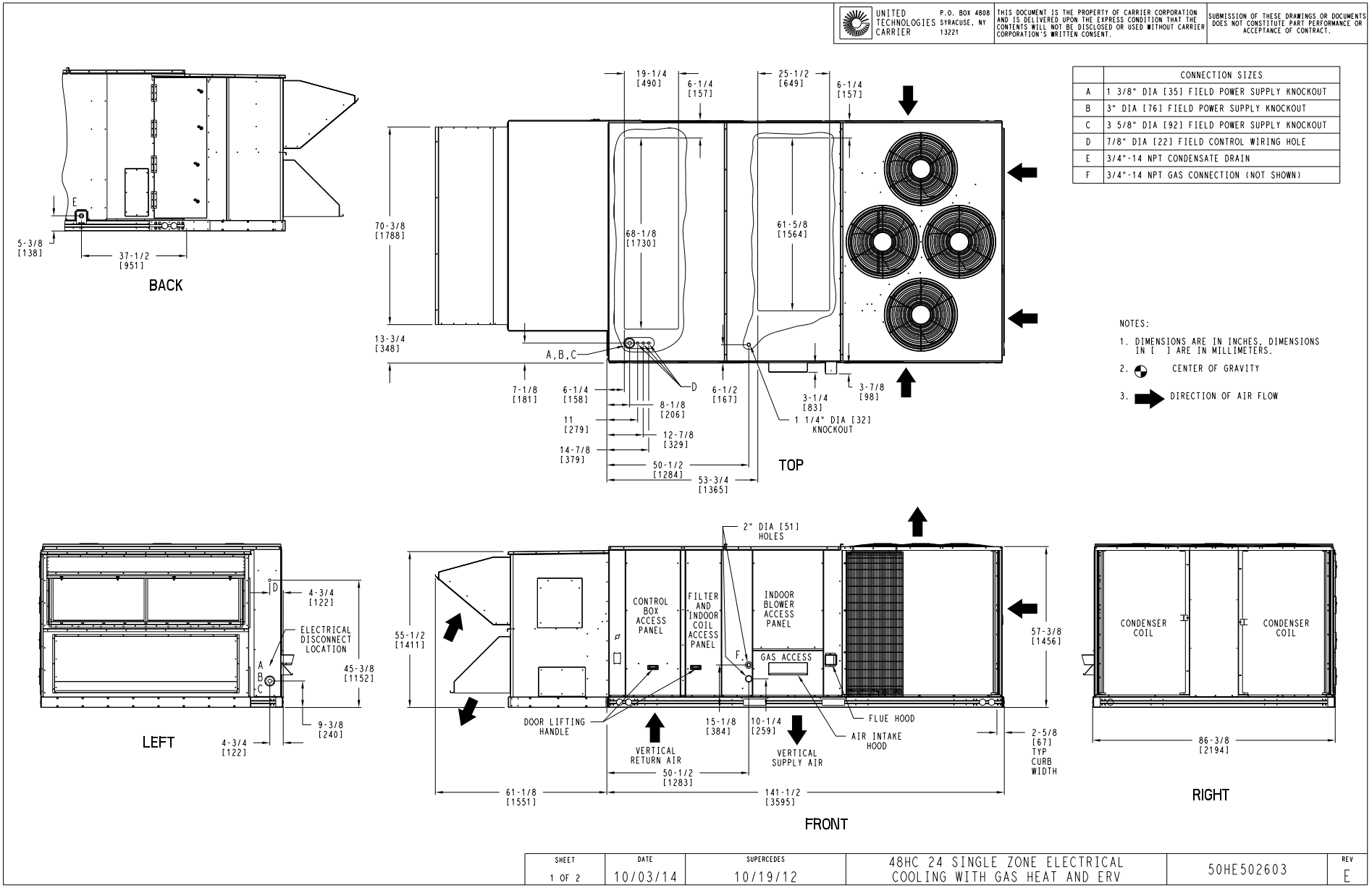
SHEET	DATE	SUPERCEDES			REV
2 OF 2	10/3/14	10/19/12	48HC 20 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT AND ERV	50HE502610	E

C150124

Fig. 26 - 48HC-20 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 2 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS



C150125

Fig. 27 - 48HC-24 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	ERV **	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48HC24	HIGH CFM	3895	1770	1358	617	582	264	586	267	1369	622	43 1/4 [1099]	42 3/8 [1076]	19 [483]
48HC24	LOW CFM	3542	1607	1189	539	633	287	587	266	1103	500	41 5/8 [1056]	49 1/8 [1249]	20 3/4 [529]

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

** FOR COMFORT LINK UNITS, ONLY HIGH CFM ERV IS AVAILABLE.

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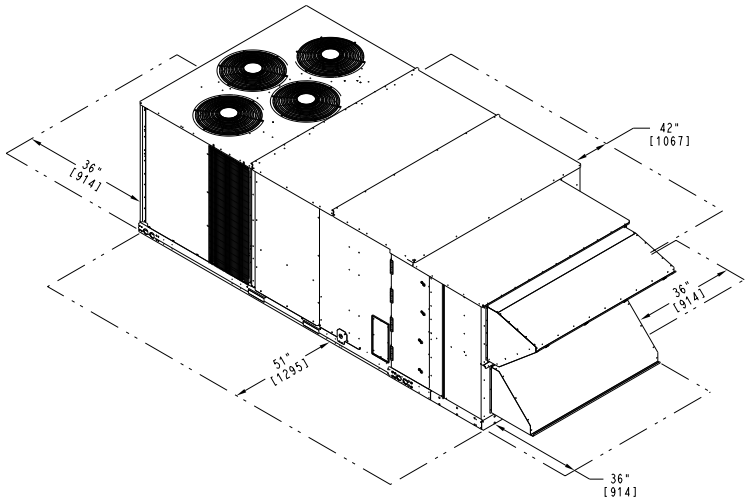

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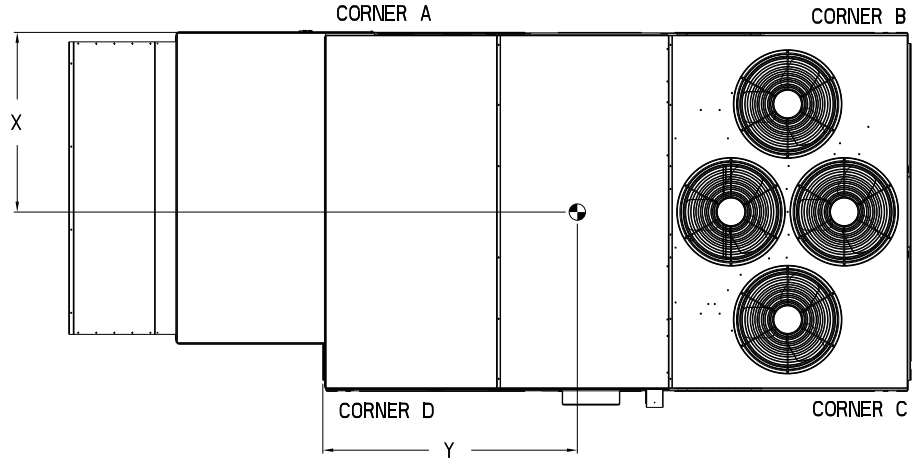

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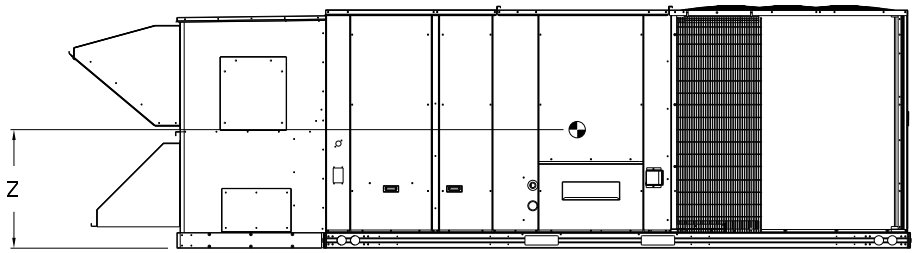

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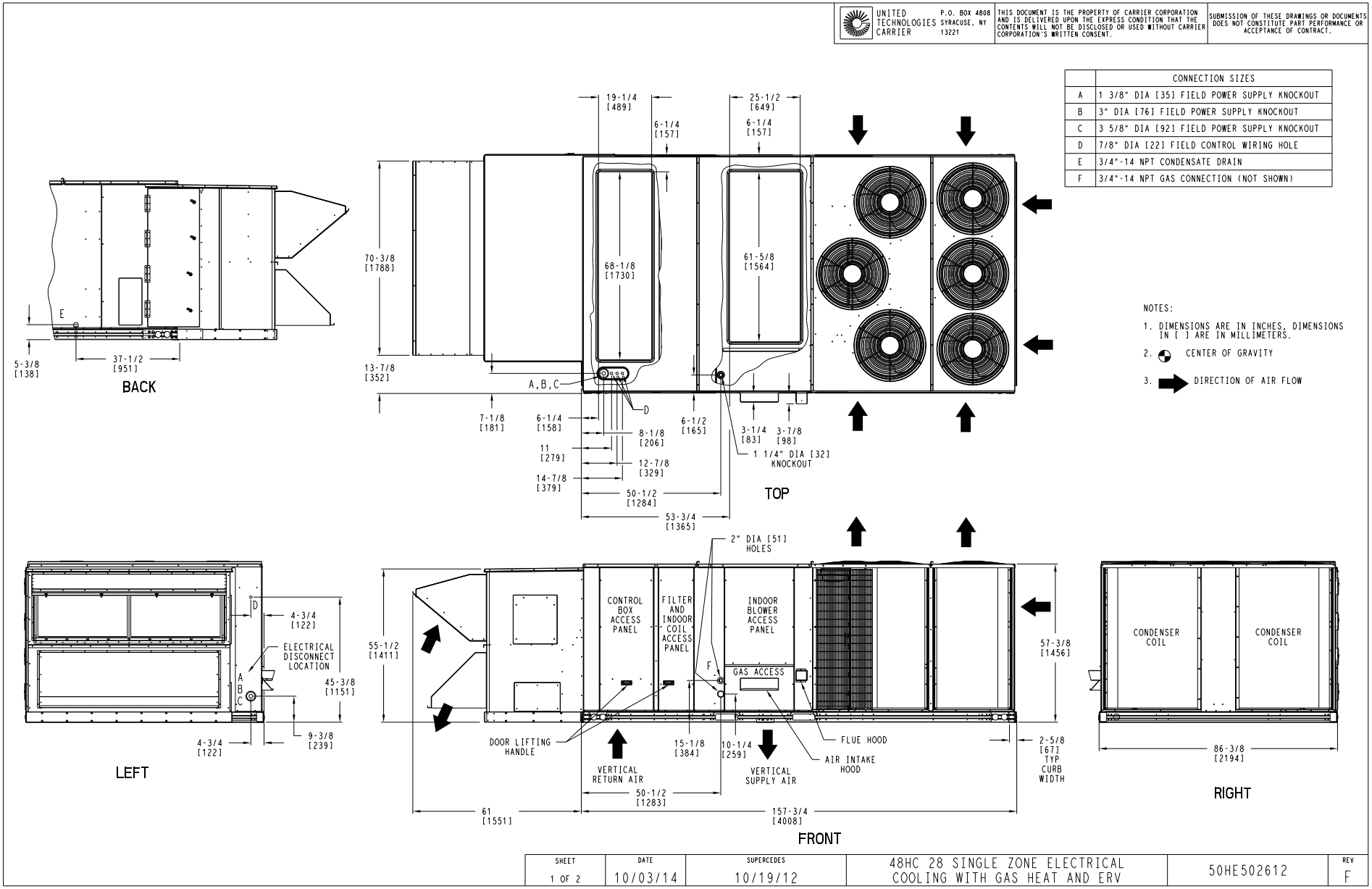
SHEET	DATE	SUPERCEDES			REV
2 OF 2	10/03/14	10/19/12	48HC 24 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT AND ERV	50HE502603	E

C150126

Fig. 28 - 48HC-24 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 2 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS



C150127

Fig. 29 - 48HC-28 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	ERV **	STD UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48HC28	HIGH CFM	3940	1791	1423	647	720	327	603	274	1194	543	39 1/4 [998]	52 7/8 [1344]	19 [483]
48HC28	LOW CFM	3488	1582	1272	577	633	287	526	238	1057	479	39 1/4 [995]	52 3/8 [1331]	22 3/8 [569]

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

** FOR COMFORT LINK UNITS, ONLY HIGH CFM ERV IS AVAILABLE.

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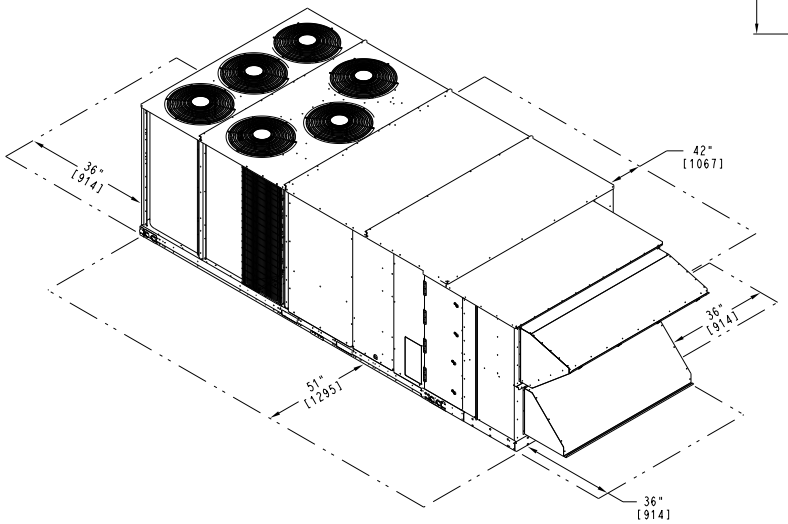

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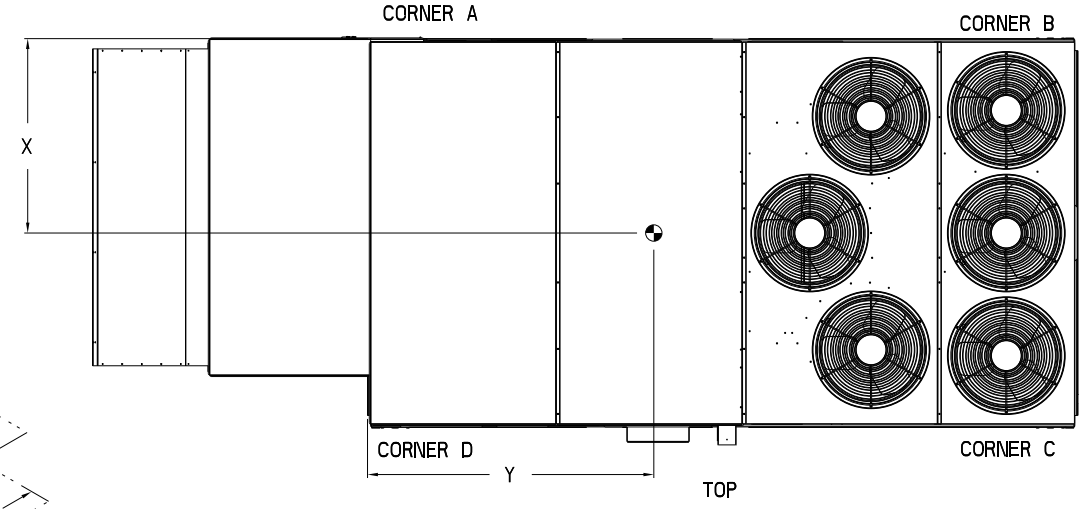

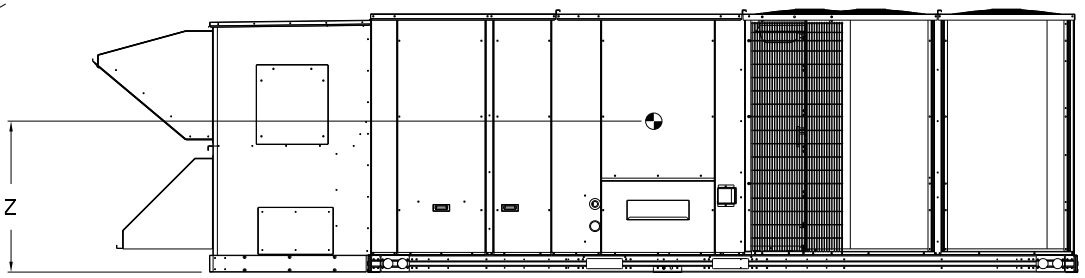

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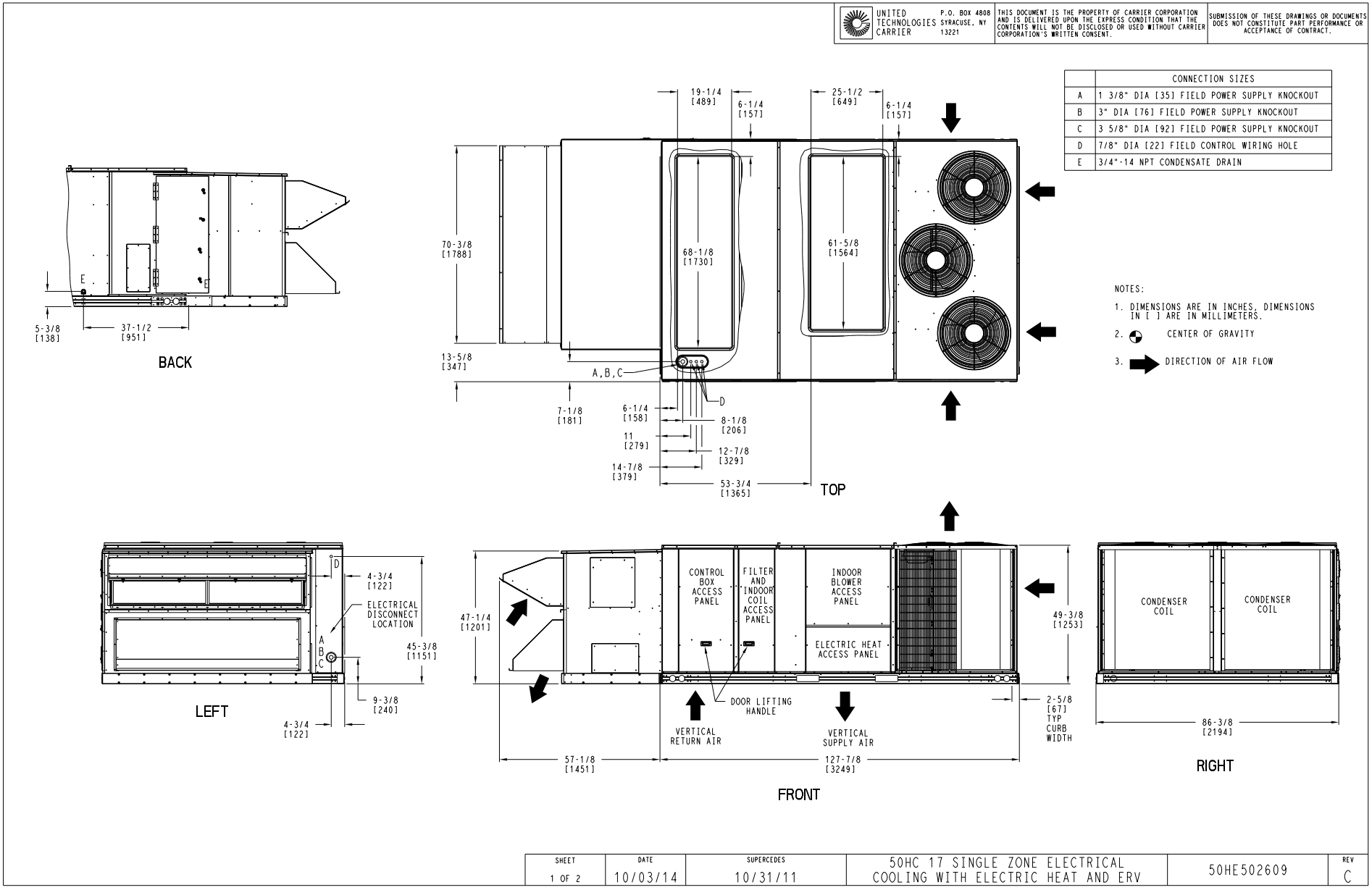
SHEET	DATE	SUPERCEDES			REV
2 OF 2	10/03/14	10/19/12	48HC 28 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT AND ERV	50HE502612	F

C150128

Fig. 30 - 48HC-28 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 2 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS



C150129

Fig. 31 - 50HC-17 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	ERV **	STD UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HC17	HIGH CFM	3231	1469	1133	515	480	218	481	219	1136	516	43 1/8 [1095]	38 [965]	16 1/2 [419]
50HC17	LOW CFM	2835	1286	991	449	584	265	467	212	793	360	38 3/8 (975)	47 3/8 (1205)	19 1/4 (488)

* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

** FOR COMFORT LINK UNITS, ONLY HIGH CFM ERV IS AVAILABLE.

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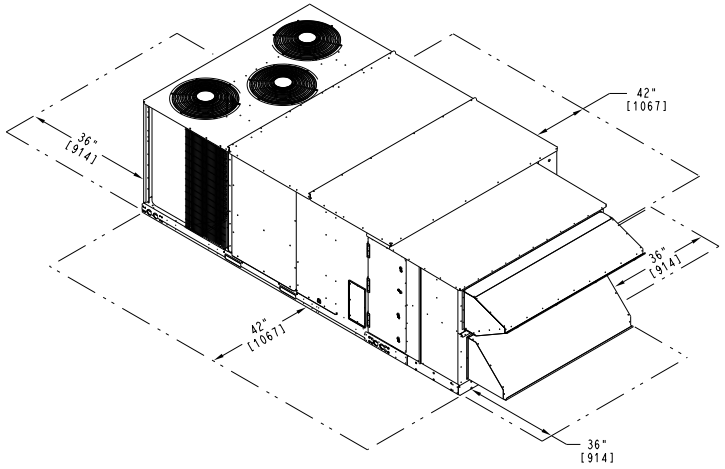

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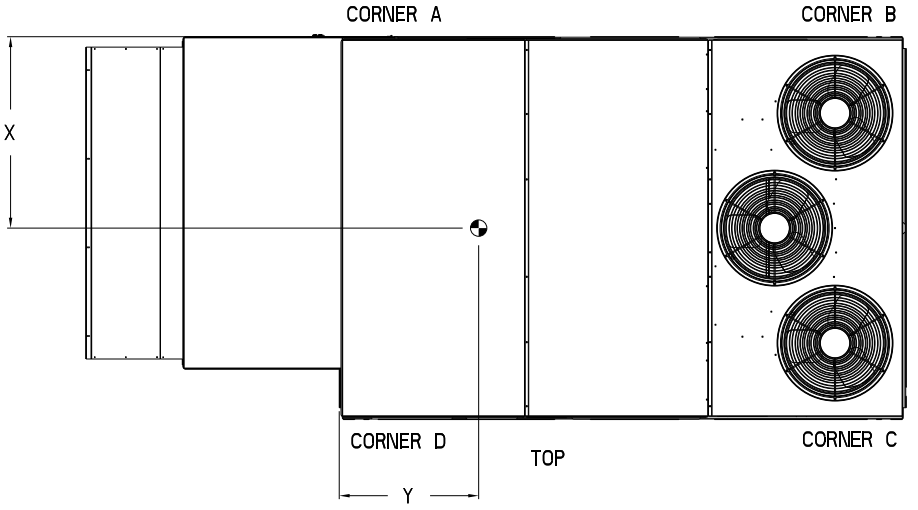

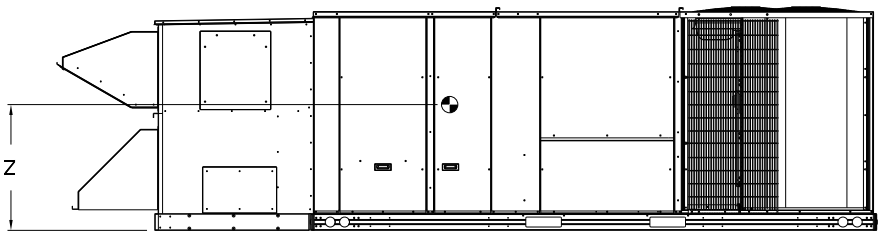

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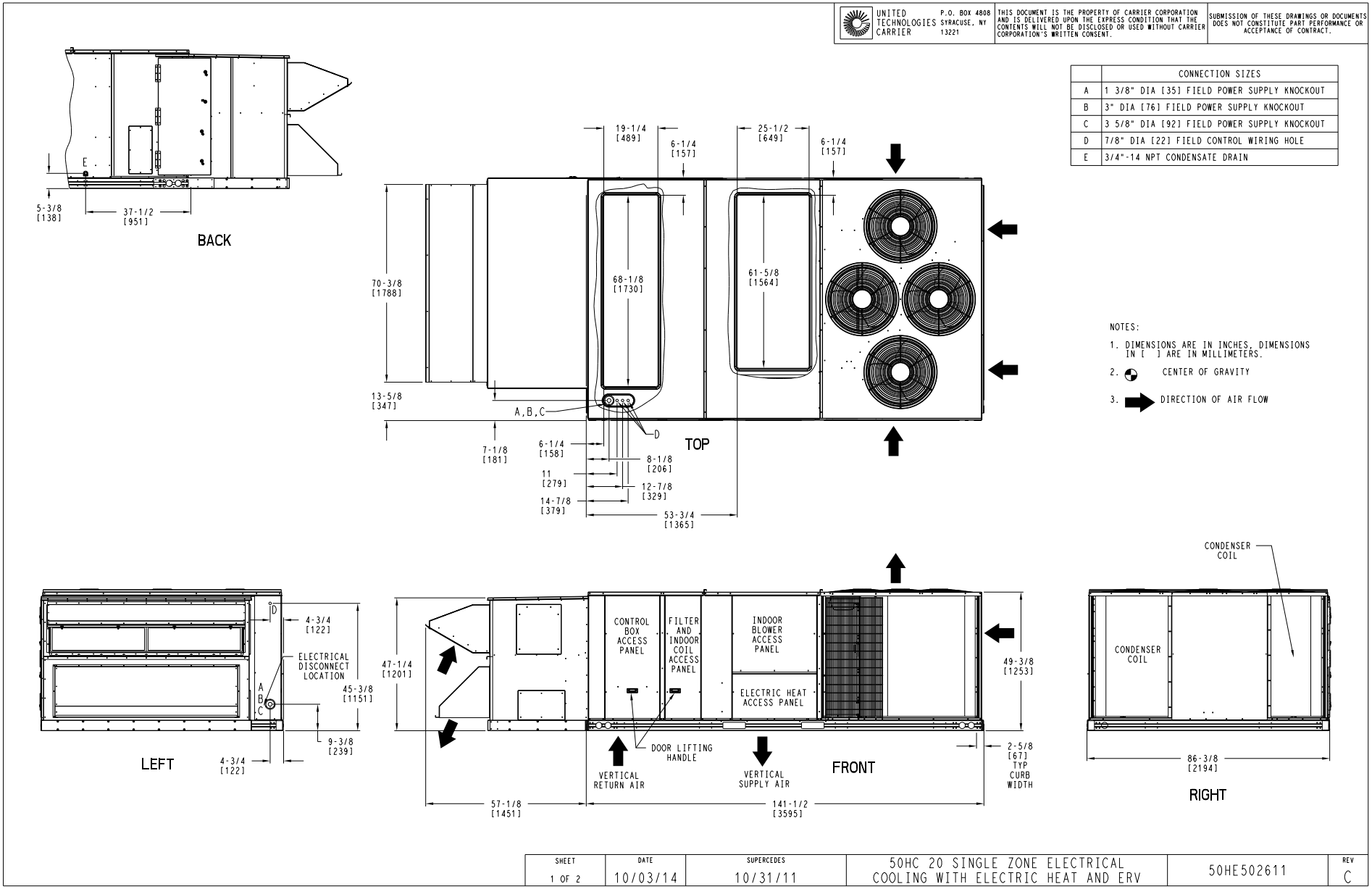
SHEET	DATE	SUPERCEDES			REV
2 OF 2	10/03/14	10/31/11	50HC 17 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT AND ERV	50HE502609	C

C150130

Fig. 32 - 50HC-17 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 2 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS



C150131

Fig. 33 - 50HC-20 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	ERV **	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HC20	HIGH CFM	3441	1564	1157	526	427	194	574	261	1114	507	42 1/4 [1074]	48 [1220]	16 1/2 [419]
50HC20	LOW CFM	3030	1374	1011	459	555	252	519	235	945	429	41 3/4 (1060)	50 1/8 (1274)	19 (484)

* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

** FOR COMFORT LINK UNITS, ONLY HIGH CFM ERV IS AVAILABLE.

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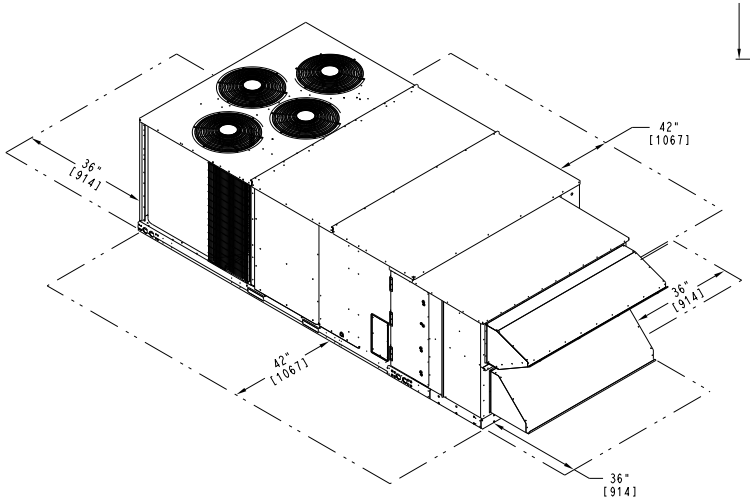

CLEARANCES

WARNING:
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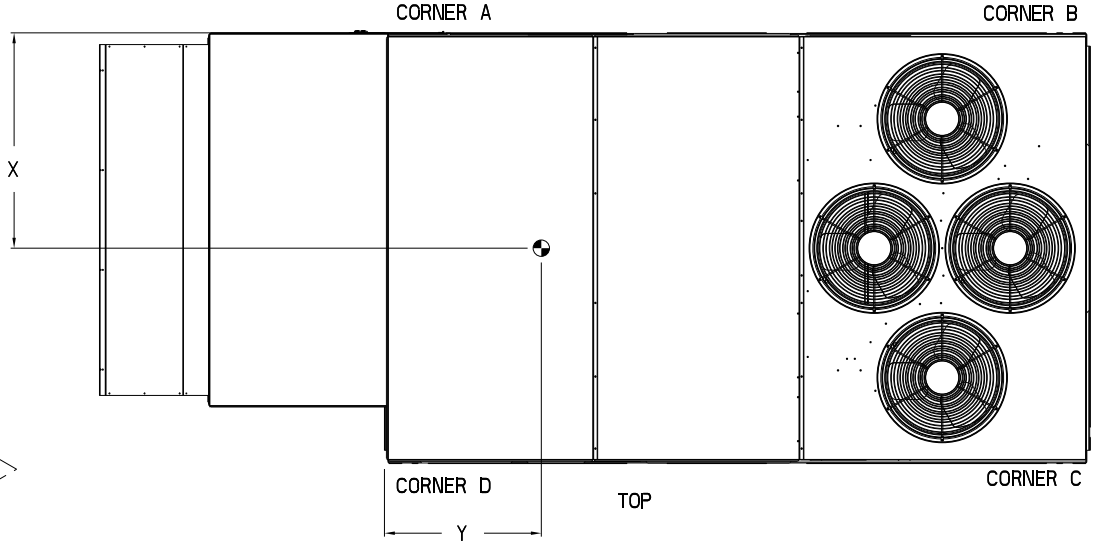
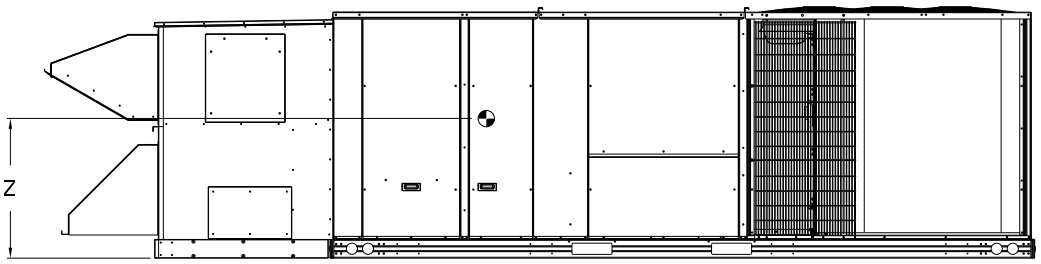
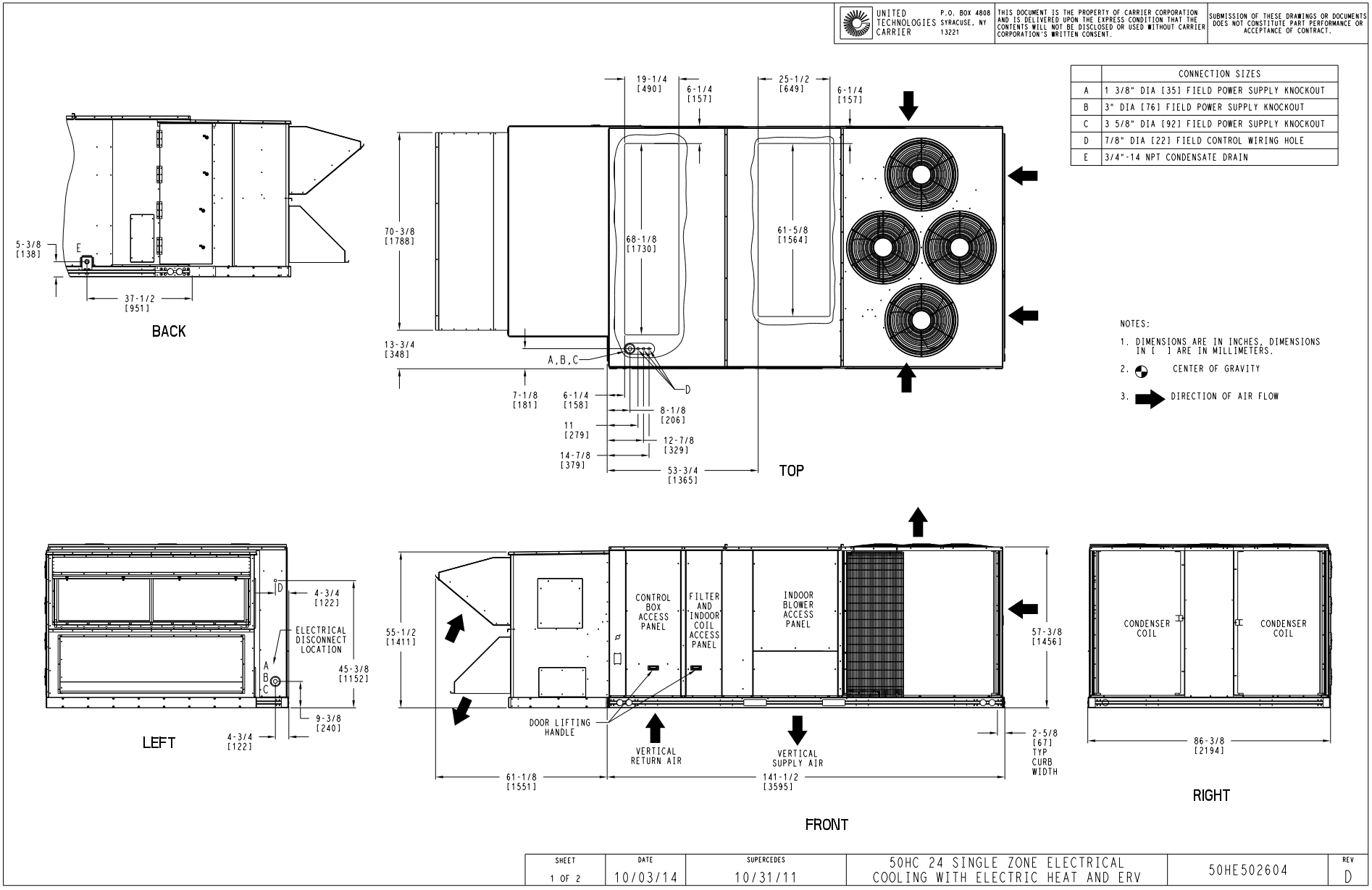




SHEET	DATE	SUPERCEDES			REV
2 OF 2	10/03/14	10/31/11	50HC 20 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT AND ERV	50HE502611	C

C150132

Fig. 34 - 50HC-20 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 2 of 2)



C150133

Fig. 35 - 50HC-24 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	ERV **	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HC24	HIGH CFM	3796	1725	1366	621	704	320	587	267	1139	518	39 1/8 [995]	48 [1220]	19 [483]
50HC24	LOW CFM	3443	1562	1229	557	639	290	539	245	1036	470	39 1/2 [1004]	48 3/8 [1230]	22 1/2 [570]

* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

** FOR COMFORT LINK UNITS, ONLY HIGH CFM ERV IS AVAILABLE.

UNITED TECHNOLOGIES CARRIER P.O. BOX 4808 SYRACUSE, NY 13221

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NOTE:
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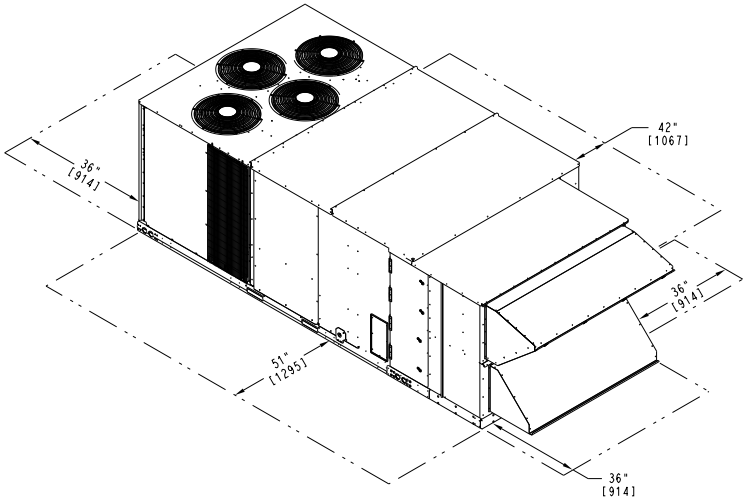
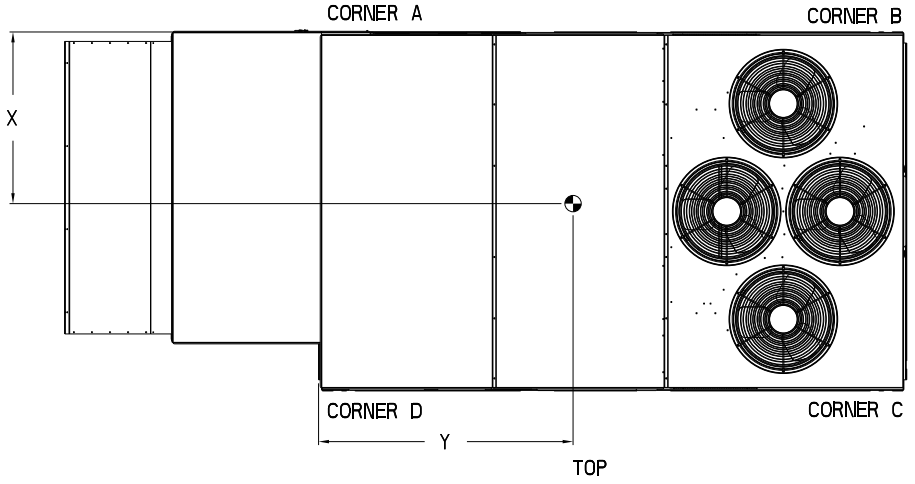
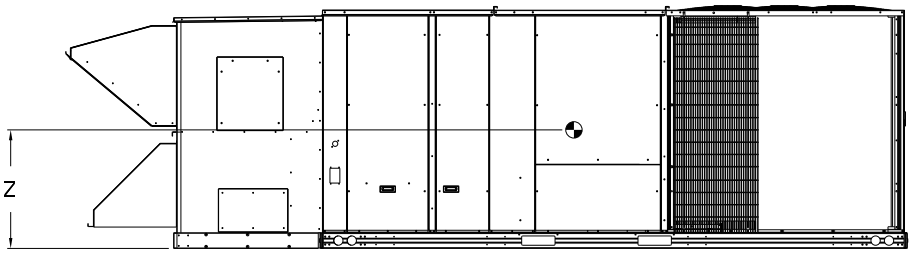


CLEARANCES



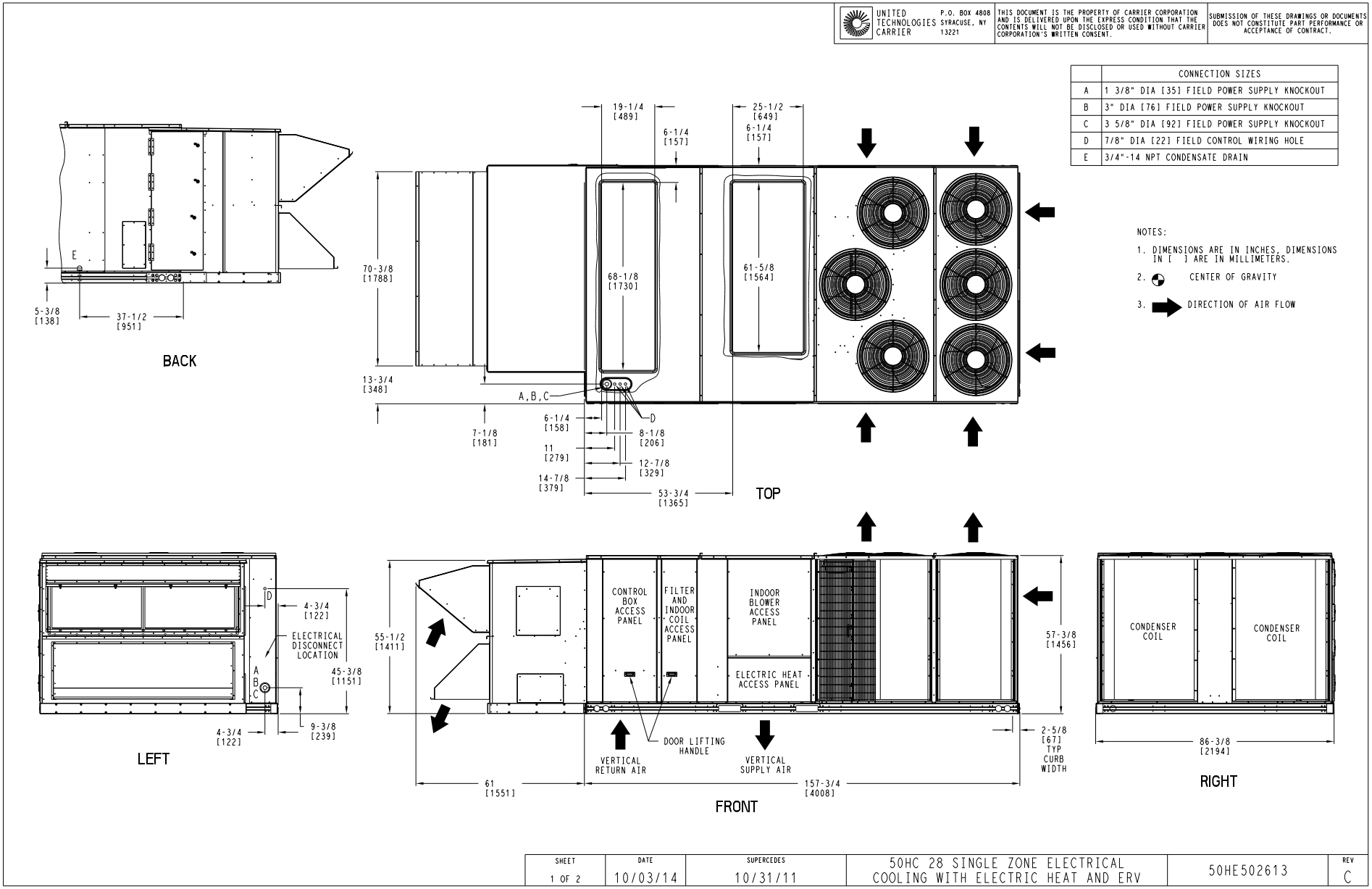


WARNING:
DO NOT LIFT UNIT THROUGH FORK LIFT OPENINGS IN UNIT BASERAIL. PER RIGGING LABEL INSTRUCTIONS, UNIT MUST BE LIFTED BY AN OVERHEAD LIFTING DEVICE

SHEET	DATE	SUPERCEDES			REV
2 OF 2	10/03/14	10/31/11	50HC 24 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT AND ERV	50HE502604	D

C150134

Fig. 36 - 50HC-24 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 2 of 2)



C150135

Fig. 37 - 50HC-28 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	ERV **	STD UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HC28	HIGH CFM	3841	1746	1417	644	692	315	568	258	1164	529	38 7/8 [987]	51 3/4 [1313]	19 [483]
50HC28	LOW CFM	3488	1582	1272	577	633	287	526	238	1057	479	39 1/4 [995]	52 3/8 [1331]	22 3/8 [569]

* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

** FOR COMFORT LINK UNITS, ONLY HIGH CFM ERV IS AVAILABLE.

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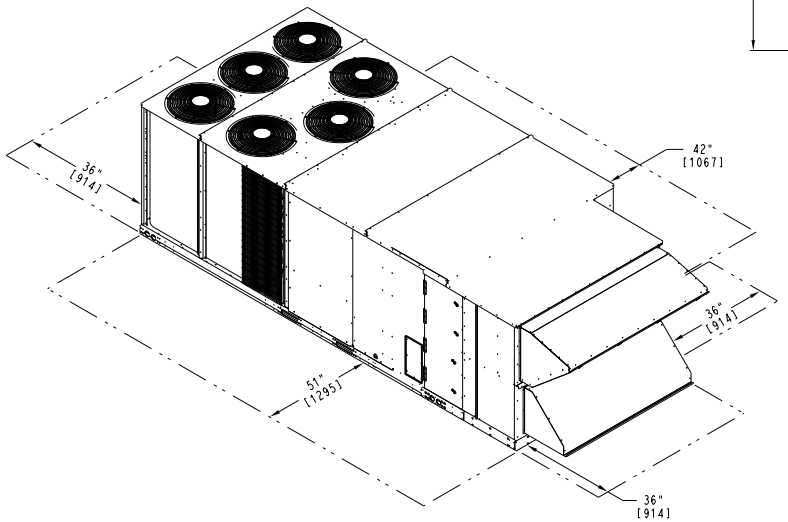
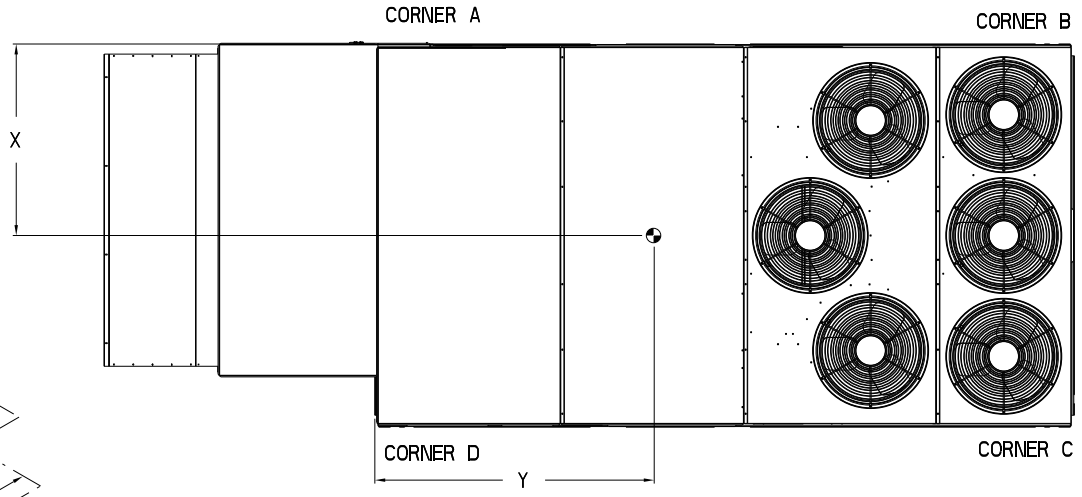
NOTE:
UNIT IS NOT DESIGNED TO HAVE OVERHEAD OBSTRUCTION. CONTACT APPLICATION ENGINEERING FOR GUIDANCE ON ANY APPLICATION PLANNING OVERHEAD OBSTRUCTION OF FOR VERTICAL CLEARANCES.

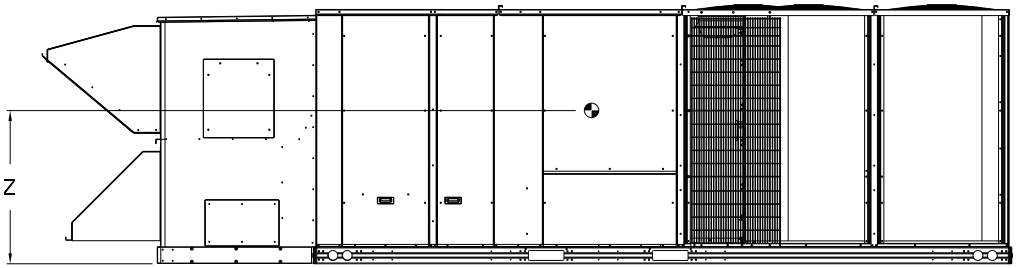


CLEARANCES

WARNING:
DO NOT LIFT UNIT THROUGH FORK LIFT OPENINGS IN UNIT BASERAIL. PER RIGGING LABEL INSTRUCTIONS, UNIT MUST BE LIFTED BY AN OVERHEAD LIFTING DEVICE



TOP



FRONT

SHEET	DATE	SUPERCEDES			REV
2 OF 2	10/03/14	10/31/11	50HC 28 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT AND ERV	50HE502613	C

C150136

Fig. 38 - 50HC-28 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 2 of 2)

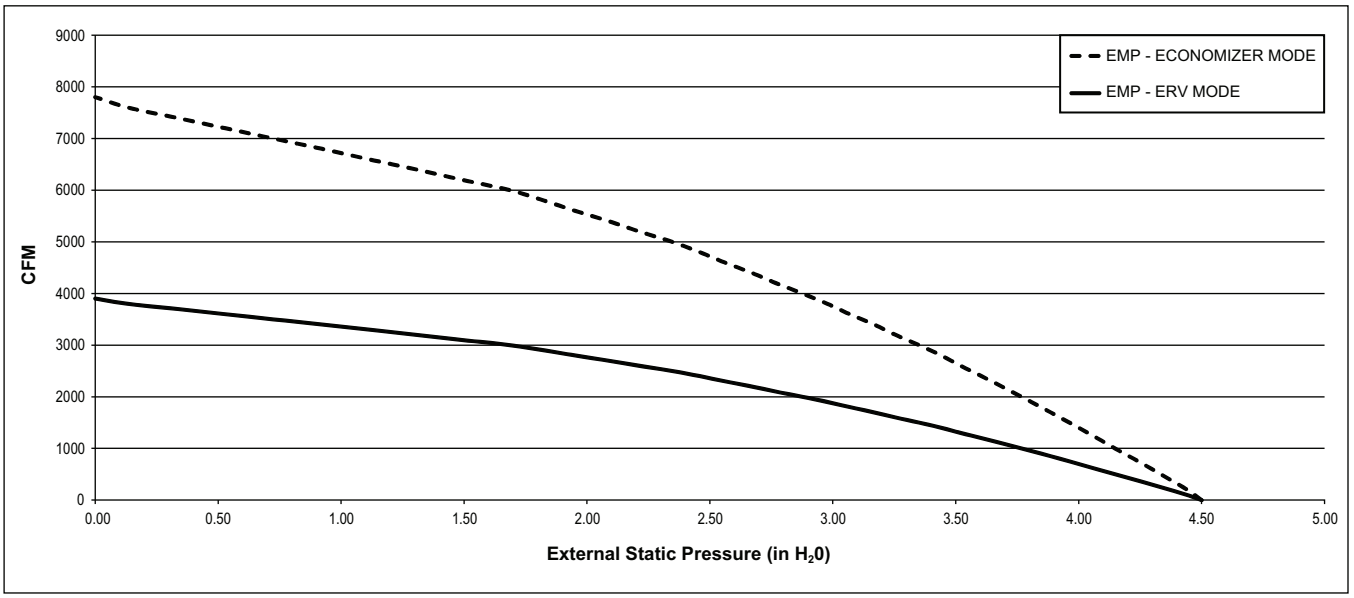
APPENDIX B — EXHAUST FAN PERFORMANCE

Many applications that utilize energy recovery incorporate ducted return/exhaust air paths. In these applications it is important to consider the duct pressure of the return/exhaust just as a designer would consider the effects of the supply duct static pressure on the airflow of the rooftop unit itself.

EnergyX Modulating Volume 15-25 Ton Units

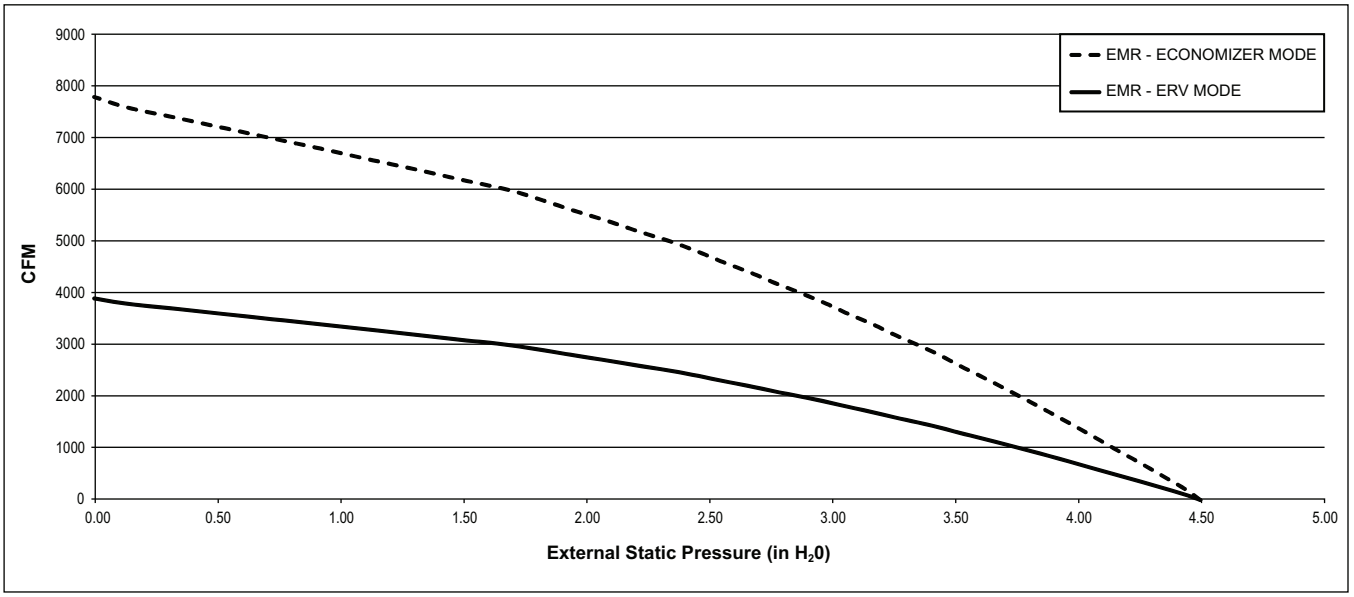
The exhaust fan in the Modulated Volume EnergyX unit will assist the rooftop unit fan in pulling air through the exhaust/return duct. These exhaust fans are backwards curved impeller designs which are capable of significant more static pressure operation than typical forward curved fan designs. The following exhaust fan performance curves are provided for additional guidance when considering return/exhaust duct design.

NOTE: If application designs require two separate ducts (one for exhaust air, one for return air) contact your Carrier Sales Engineer for additional guidance prior to specification or ordering.



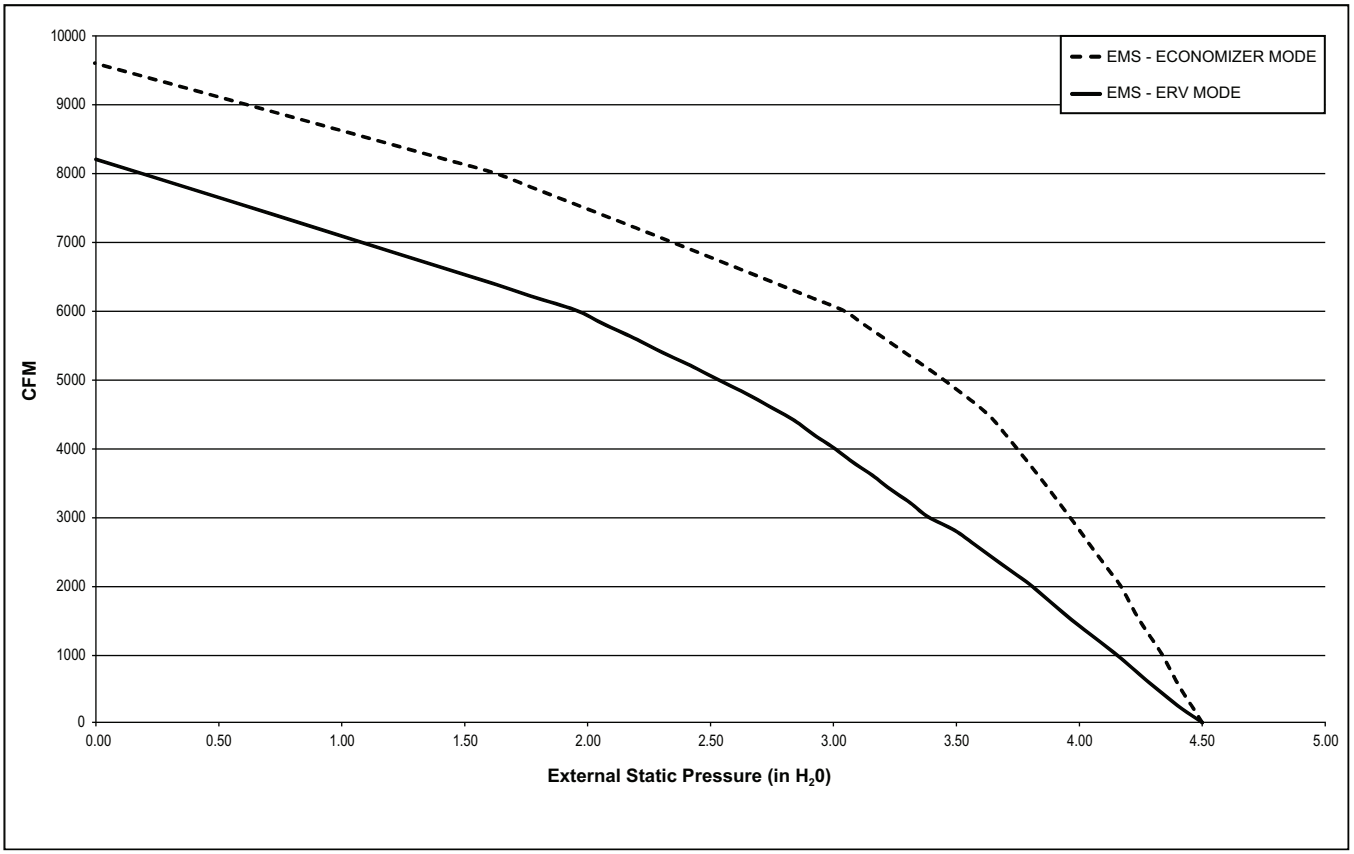
C11437

Fig. 39 - 15 Ton MRT Unit ERV Supply and Exhaust Fan Performance Curves



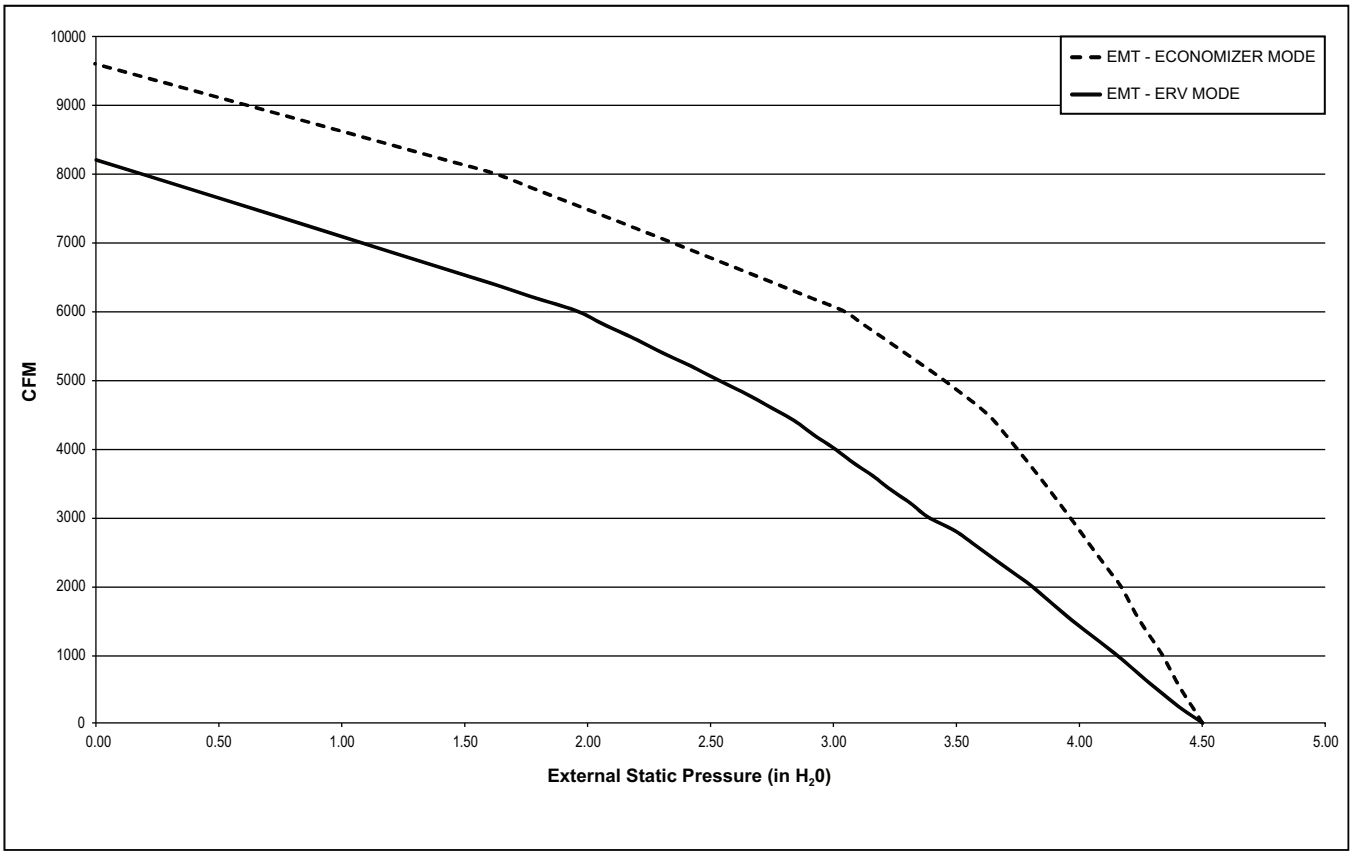
C11438

Fig. 40 - 17.5 Ton MRT Unit ERV Supply and Exhaust Fan Performance Curves



C11439

Fig. 41 - 20 Ton MRT Unit ERV Supply and Exhaust Fan Performance Curves



C11440

Fig. 42 - 25 Ton MRT Unit ERV Supply and Exhaust Fan Performance Curves

ELECTRICAL DATA

Legend and Notes for Tables 13 - 20

LEGEND:

BRKR	–	Circuit breaker
CO	–	Convenient outlet
DISC	–	Disconnect
FLA	–	Full load amps
IFM	–	Indoor fan motor
LRA	–	Locked rotor amps
MCA	–	Minimum circuit amps
MOCP	–	MAX FUSE or HACR Breaker
PE	–	Power exhaust
PWRD CO	–	Powered convenient outlet
UNPWR CO	–	Unpowered convenient outlet

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60

AB = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{(224 + 231 + 226)}{3} = \frac{681}{3}$$

$$= 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

EnergyX

APPENDIX C — ELECTRICAL DATA

Table 13 – 48HC - with ERV: Unit Wire/Fuse or HACR Breaker Sizing Data

UNIT	NOM. V–Ph–Hz	IFM TYPE	NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
			w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
48HC**17	208/230–3–60	STD	85.4/85.3	100/100	91/91	425	93.1/93.0	100/100	100/100	433	90.2/90.1	100/100	96/96	430	97.9/97.8	110/110	105/105	438
		MED	87.6	100	93	439	95.3	110	102	447	92.4	100	99	444	100.1	125	108	452
		HIGH	90.6/89.7	100/100	97/96	441	98.3/97.4	110/110	106/105	449	95.4/94.5	110/110	102/101	446	103.1/102.2	125/125	111/110	454
	460–3–60	STD	43	50	46	249	46.3	50	50	253	45.2	50	48	251	48.5	60	52	255
		MED	44.1	50	47	256	47.4	60	51	260	46.3	50	50	258	49.6	60	53	262
		HIGH	45.2	50	48	257	48.5	60	52	261	47.4	60	51	259	50.7	60	55	263
	575–3–60	STD	33.5	40	36	191	36.8	45	40	195	35.2	40	38	193	38.5	45	42	197
		MED	33.5	40	36	191	36.8	45	40	195	35.2	40	38	193	38.5	45	42	197
		HIGH	36.3	45	39	205	39.6	45	43	209	38	45	41	207	41.3	50	45	211
48HC**20	208/230–3–60	STD	92.3	100	98	469	100.0	125	107	477	97.1	110	104	474	104.8	125	113	482
		MED	95.3/94.4	110/110	102/101	471	103.0/102.1	125/125	111/110	479	100.1/99.2	125/125	107/106	476	107.8/106.9	125/125	116/115	484
		HIGH	98.8	125	106	467	106.5	125	115	475	103.6	125	111	472	111.3	125	120	480
	460–3–60	STD	44.4	50	47	258	47.7	60	51	262	46.6	50	50	260	49.9	60	54	264
		MED	45.5	50	49	259	48.8	60	52	263	47.7	60	51	261	51.0	60	55	265
		HIGH	47.7	60	51	257	51.0	60	55	261	49.9	60	54	259	53.2	60	58	263
	575–3–60	STD	33.5	40	36	193	36.8	45	40	197	35.2	40	38	195	38.5	45	42	199
		MED	36.3	45	39	207	39.6	45	43	211	38.0	45	41	209	41.3	50	45	213
		HIGH	38.3	45	41	205	41.6	50	45	209	40	45	43	207	43.3	50	47	211
48HC**24	208/230–3–60	STD	119.6/118.7	150/150	129/128	583	119.6/118.7	150/150	129/128	583	124.4/123.5	150/150	134/133	588	124.4/123.5	150/150	134/133	588
		MED	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
		HIGH	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
	460–3–60	STD	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
		MED	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
		HIGH	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
	575–3–60	STD	49.6	60	54	219	49.6	60	54	219	51.3	60	55	221	51.3	60	55	221
		MED	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
		HIGH	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
48HC**28	208/230–3–60	STD	148.3/147.4	175/175	157/156	623	148.3/147.4	175/175	157/156	623	153.1/152.2	200/200	162/161	628	153.1/152.2	200/200	162/161	628
		MED	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
		HIGH	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
	460–3–60	STD	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
		MED	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
		HIGH	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
	575–3–60	STD	54.5	60	58	243	54.5	60	58	243	56.2	60	60	245	56.2	60	60	245
		MED	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
		HIGH	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 14 – 48HC - with ERV and Factory-Installed HACR Breaker

UNIT	NOM. V–Ph–Hz	IFM TYPE	NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
			w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
48HC**17	208/230–3–60	STD	85.4/85.4	100/100	91/91	425	93.1/93.1	100/100	100/100	433	90.2/90.2	100/100	96/96	430	97.9/97.9	110/110	105/105	438
		MED	87.6	100	93	439	95.3	110	102	447	92.4	100	99	444	100.1	125	108	452
		HIGH	90.6/90.6	100/100	97/96	441	98.3/98.3	110/110	106/105	449	95.4/95.4	110/110	102/101	446	103.1/103.1	125/125	111/110	454
	460–3–60	STD	43	50	46	249	46.3	50	50	253	45.2	50	48	251	48.5	60	52	255
		MED	44.1	50	47	256	47.4	60	51	260	46.3	50	50	258	49.6	60	53	262
		HIGH	45.2	50	48	257	48.5	60	52	261	47.4	60	51	259	50.7	60	55	263
	575–3–60	STD	33.5	40	36	191	36.8	45	40	195	35.2	40	38	193	38.5	45	42	197
		MED	33.5	40	36	191	36.8	45	40	195	35.2	40	38	193	38.5	45	42	197
		HIGH	36.3	45	39	205	39.6	45	43	209	38	45	41	207	41.3	50	45	211
48HC**20	208/230–3–60	STD	92.3	100	98	469	100.0	125	107	477	97.1	110	104	474	104.8	125	113	482
		MED	95.3/95.3	110/110	102/101	471	103.0/103.0	125/125	111/110	479	100.1/100.1	125/125	107/106	476	107.8/107.8	125/125	116/115	484
		HIGH	98.8	125	106	467	106.5	125	115	475	103.6	125	111	472	111.3	125	120	480
	460–3–60	STD	44.4	50	47	258	47.7	60	51	262	46.6	50	50	260	49.9	60	54	264
		MED	45.5	50	49	259	48.8	60	52	263	47.7	60	51	261	51.0	60	55	265
		HIGH	47.7	60	51	257	51.0	60	55	261	49.9	60	54	259	53.2	60	58	263
	575–3–60	STD	33.5	40	36	193	36.8	45	40	197	35.2	40	38	195	38.5	45	42	199
		MED	36.3	45	39	207	39.6	45	43	211	38.0	45	41	209	41.3	50	45	213
		HIGH	38.3	45	41	205	41.6	50	45	209	40	45	43	207	43.3	50	47	211
48HC**24	208/230–3–60	STD	119.6/119.6	150/150	129/128	583	119.6/119.6	150/150	129/128	583	124.4/124.4	150/150	134/133	588	124.4/124.4	150/150	134/133	588
		MED	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
		HIGH	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
	460–3–60	STD	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
		MED	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
		HIGH	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
	575–3–60	STD	49.6	60	54	219	49.6	60	54	219	51.3	60	55	221	51.3	60	55	221
		MED	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
		HIGH	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
48HC**28	208/230–3–60	STD	148.3/148.3	175/175	157/156	623	148.3/148.3	175/175	157/156	623	153.1/153.1	200/200	162/161	628	153.1/153.1	200/200	162/161	628
		MED	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
		HIGH	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
	460–3–60	STD	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
		MED	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
		HIGH	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
	575–3–60	STD	54.5	60	58	243	54.5	60	58	243	56.2	60	60	245	56.2	60	60	245
		MED	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
		HIGH	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 15 – 48HC - with ERV and 2-Speed Indoor Fan Option

UNIT	NOM. V–Ph–Hz	IFM TYPE	NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
			w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
48HC**17	208/230–3–60	STD	85.6/84.8	100/100	91/90	406	93.3/92.5	100/100	100/99	414	90.4/89.6	100/100	97/96	411	98.1/97.3	110/110	106/105	419
		MED	87.8/86.8	100/100	94/93	430	95.5/94.5	110/110	103/101	438	92.6/91.6	100/100	99/98	435	100.3/99.3	125/110	108/107	443
		HIGH	90.6/89.7	100/100	97/96	441	98.3/97.4	110/110	106/105	449	95.4/94.5	110/110	102/101	446	103.1/102.2	125/125	111/110	454
	460–3–60	STD	42.6	50	45	240	45.9	50	49	244	44.8	50	48	242	48.1	60	52	246
		MED	43.7	50	47	252	47.0	60	50	256	45.9	50	49	254	49.2	60	53	258
		HIGH	45.2	50	48	257	48.5	60	52	261	47.4	60	51	259	50.7	60	55	263
	575–3–60	STD	35.2	40	38	191	38.5	45	42	195	36.9	45	40	193	40.2	45	43	197
		MED	35.2	40	38	191	38.5	45	42	195	36.9	45	40	193	40.2	45	43	197
		HIGH	36.9	45	40	205	40.2	45	43	209	38.6	45	42	207	41.9	50	45	211
48HC**20	208/230–3–60	STD	92.5/91.5	100/100	98/97	460	100.2/99.2	125/125	107/106	468	97.3/96.3	110/110	104/103	465	105.0/104.0	125/125	113/112	473
		MED	95.3/94.4	110/110	102/101	471	103.0/102.1	125/125	111/110	479	100.1/99.2	125/125	107/106	476	107.8/106.9	125/125	116/115	484
		HIGH	98.8	125	106	467	106.5	125	115	475	103.6	125	111	472	111.3	125	120	480
	460–3–60	STD	44	50	47	254	47.3	60	51	258	46.2	50	49	256	49.5	60	53	260
		MED	45.5	50	49	259	48.8	60	52	263	47.7	60	51	261	51.0	60	55	265
		HIGH	47.7	60	51	257	51.0	60	55	261	49.9	60	54	259	53.2	60	58	263
	575–3–60	STD	35.2	40	38	193	38.5	45	42	197	36.9	45	40	195	40.2	45	43	199
		MED	36.9	45	40	207	40.2	45	43	211	38.6	45	42	209	41.9	50	45	213
		HIGH	38.3	45	41	205	41.6	50	45	209	40	45	43	207	43.3	50	47	211
48HC**24	208/230–3–60	STD	119.6/118.7	150/150	129/128	583	119.6/118.7	150/150	129/128	583	124.4/123.5	150/150	134/133	588	124.4/123.5	150/150	134/133	588
		MED	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
		HIGH	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
	460–3–60	STD	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
		MED	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
		HIGH	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
	575–3–60	STD	50.2	60	54	219	50.2	60	54	219	51.9	60	56	221	51.9	60	56	221
		MED	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
		HIGH	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
48HC**28	208/230–3–60	STD	148.3/147.4	175/175	157/156	623	148.3/147.4	175/175	157/156	623	153.1/152.2	200/200	162/161	628	153.1/152.2	200/200	162/161	628
		MED	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
		HIGH	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
	460–3–60	STD	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
		MED	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
		HIGH	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
	575–3–60	STD	55.1	60	59	243	55.1	60	59	243	56.8	70	61	245	56.8	70	61	245
		MED	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
		HIGH	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 16 – 48HC - with ERV, Factory-installed HACR Breaker and 2-Speed Indoor Fan Option

UNIT	NOM. V–Ph–Hz	IFM TYPE	NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
			w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
48HC**17	208/230–3–60	STD	85.6/85.6	100/100	91/90	406	93.3/93.3	100/100	100/99	414	90.4/90.4	100/100	97/96	411	98.1/98.1	110/110	106/105	419
		MED	87.8/87.8	100/100	94/93	430	95.5/95.5	110/110	103/101	438	92.6/92.6	100/100	99/98	435	100.3/100.3	125/125	108/107	443
		HIGH	90.6/90.6	100/100	97/96	441	98.3/98.3	110/110	106/105	449	95.4/95.4	110/110	102/101	446	103.1/103.1	125/125	111/110	454
	460–3–60	STD	42.6	50	45	240	45.9	50	49	244	44.8	50	48	242	48.1	60	52	246
		MED	43.7	50	47	252	47.0	60	50	256	45.9	50	49	254	49.2	60	53	258
		HIGH	45.2	50	48	257	48.5	60	52	261	47.4	60	51	259	50.7	60	55	263
	575–3–60	STD	35.2	40	38	191	38.5	45	42	195	36.9	45	40	193	40.2	45	43	197
		MED	35.2	40	38	191	38.5	45	42	195	36.9	45	40	193	40.2	45	43	197
		HIGH	36.9	45	40	205	40.2	45	43	209	38.6	45	42	207	41.9	50	45	211
48HC**20	208/230–3–60	STD	92.5/92.5	100/100	98/97	460	100.2/100.2	125/125	107/106	468	97.3/97.3	110/110	104/103	465	105.0/105.0	125/125	113/112	473
		MED	95.3/95.3	110/110	102/101	471	103.0/103.0	125/125	111/110	479	100.1/100.1	125/125	107/106	476	107.8/107.8	125/125	116/115	484
		HIGH	98.8	125	106	467	106.5	125	115	475	103.6	125	111	472	111.3	125	120	480
	460–3–60	STD	44	50	47	254	47.3	60	51	258	46.2	50	49	256	49.5	60	53	260
		MED	45.5	50	49	259	48.8	60	52	263	47.7	60	51	261	51.0	60	55	265
		HIGH	47.7	60	51	257	51.0	60	55	261	49.9	60	54	259	53.2	60	58	263
	575–3–60	STD	35.2	40	38	193	38.5	45	42	197	36.9	45	40	195	40.2	45	43	199
		MED	36.9	45	40	207	40.2	45	43	211	38.6	45	42	209	41.9	50	45	213
		HIGH	38.3	45	41	205	41.6	50	45	209	40	45	43	207	43.3	50	47	211
48HC**24	208/230–3–60	STD	119.6/119.6	150/150	129/128	583	119.6/119.6	150/150	129/128	583	124.4/124.4	150/150	134/133	588	124.4/124.4	150/150	134/133	588
		MED	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
		HIGH	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
	460–3–60	STD	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
		MED	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
		HIGH	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
	575–3–60	STD	50.2	60	54	219	50.2	60	54	219	51.9	60	56	221	51.9	60	56	221
		MED	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
		HIGH	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
48HC**28	208/230–3–60	STD	148.3/148.3	175/175	157/156	623	148.3/148.3	175/175	157/156	623	153.1/153.1	200/200	162/161	628	153.1/153.1	200/200	162/161	628
		MED	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
		HIGH	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
	460–3–60	STD	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
		MED	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
		HIGH	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
	575–3–60	STD	55.1	60	59	243	55.1	60	59	243	56.8	70	61	245	56.8	70	61	245
		MED	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
		HIGH	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 17 – 50HC - With Electric Heat and ERV: Unit Wire/Fuse or HACR Breaker Sizing Data

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **17	208/230–3–60	STD	NONE	–	–	85.4/85.3	100/100	91/91	425	93.1/93.0	100/100	100/100	433	90.2/90.1	100/100	96/96	430	97.9/97.8	110/110	105/105	438
			279A00	18.8/25.0	52.1/60.1	95.9/105.8	100/110	91/97	425/425	105.6/115.4	110/125	100/106	433/433	101.9/111.8	110/125	96/103	430/430	111.6/121.4	125/125	105/112	438/438
			280A00	37.6/50.0	104.2/120.3	161.0/150.9	175/175	148/167	425/425	170.7/160.6	175/175	157/175	433/433	167.0/156.9	175/175	154/172	430/430	176.7/166.6	200/175	163/181	438/438
			281A00	56.3/75.0	156.4/180.4	187.2/211.0	200/225	208/236	425/425	196.8/220.7	200/225	217/245	433/433	193.2/217.0	200/225	214/241	430/430	202.8/226.7	225/250	223/250	438/438
		MED	NONE	–	–	87.6	100	93	439	95.3	110	102	447	92.4	100	99	444	100.1	125	108	452
			279A00	18.8/25.0	52.1/60.1	98.6/108.6	100/110	93/100	439/439	108.3/118.3	110/125	102/109	447/447	104.6/114.6	110/125	99/105	444/444	114.3/124.3	125/125	108/114	452/452
			280A00	37.6/50.0	104.2/120.3	163.8/153.8	175/175	151/169	439/439	173.4/163.5	175/175	160/178	447/447	169.8/159.8	175/175	156/175	444/444	179.4/169.5	200/175	165/184	452/452
			281A00	56.3/75.0	156.4/180.4	189.9/213.9	200/225	211/238	439/439	199.6/223.6	200/250	220/247	447/447	195.9/219.9	200/250	216/244	444/444	205.6/229.6	225/250	225/253	452/452
		HIGH	NONE	–	–	90.6/89.7	100/100	97/96	441	98.3/97.4	110/110	106/105	449	95.4/94.5	110/110	102/101	446	103.1/102.2	125/125	111/110	454
			279A00	18.8/25.0	52.1/60.1	102.4/111.3	110/125	97/102	441/441	112.1/120.9	125/125	106/111	449/449	108.4/117.3	110/125	102/108	446/446	118.1/126.9	125/150	111/117	454/454
			280A00	37.6/50.0	104.2/120.3	167.5/156.4	175/175	154/172	441/441	177.2/166.1	200/175	163/180	449/449	173.5/162.4	175/175	160/177	446/446	183.2/172.1	200/175	169/186	454/454
			281A00	56.3/75.0	156.4/180.4	193.7/216.5	200/250	214/241	441/441	203.3/226.2	225/250	223/250	449/449	199.7/222.5	200/250	220/246	446/446	209.3/232.2	225/250	229/255	454/454
	460–3–60	STD	NONE	–	–	43.0	50	46	249	46.3	50	50	253	45.2	50	48	251	48.5	60	52	255
			282A00	25.0	30.1	52.0	60	48	249	56.1	60	52	253	54.8	60	50	251	58.9	60	54	255
			283A00	50.0	60.1	74.5	80	82	249	78.6	80	86	253	77.2	80	85	251	81.4	90	89	255
			284A00	75.0	90.2	104.6	110	117	249	108.7	125	121	253	107.3	110	119	251	111.5	125	123	255
		MED	NONE	–	–	44.1	50	47	256	47.4	60	51	260	46.3	50	50	258	49.6	60	53	262
			282A00	25.0	30.1	53.4	60	49	256	57.5	60	53	260	56.1	60	52	258	60.3	70	55	262
			283A00	50.0	60.1	75.9	80	84	256	80.0	80	87	260	78.6	80	86	258	82.7	90	90	262
			284A00	75.0	90.2	106.0	110	118	256	110.1	125	122	260	108.7	125	121	258	112.8	125	125	262
		HIGH	NONE	–	–	45.2	50	48	257	48.5	60	52	261	47.4	60	51	259	50.7	60	55	263
			282A00	25.0	30.1	54.8	60	50	257	58.9	60	54	261	57.5	60	53	259	61.6	70	57	263
			283A00	50.0	60.1	77.2	80	85	257	81.4	90	89	261	80.0	80	87	259	84.1	90	91	263
			284A00	75.0	90.2	107.3	125	119	257	111.5	125	123	261	110.1	125	122	259	114.2	125	126	263
	575–3–60	STD	NONE	–	–	33.5	40	36	191	36.8	45	40	195	35.2	40	38	193	38.5	45	42	197
			285A00	24.8	23.9	42.5	45	39	191	46.6	50	43	195	44.6	45	41	193	48.8	50	45	197
			286A00	49.6	47.7	72.3	80	66	191	76.4	80	70	195	74.4	80	68	193	78.5	80	72	197
			287A00	74.4	71.6	84.2	90	94	191	88.4	90	98	195	86.4	90	96	193	90.5	100	100	197
		MED	NONE	–	–	33.5	40	36	191	36.8	45	40	195	35.2	40	38	193	38.5	45	42	197
			285A00	24.8	23.9	42.5	45	39	191	46.6	50	43	195	44.6	45	41	193	48.8	50	45	197
			286A00	49.6	47.7	72.3	80	66	191	76.4	80	70	195	74.4	80	68	193	78.5	80	72	197
			287A00	74.4	71.6	84.2	90	94	191	88.4	90	98	195	86.4	90	96	193	90.5	100	100	197
		HIGH	NONE	–	–	36.3	45	39	205	39.6	45	43	209	38.0	45	41	207	41.3	50	45	211
			285A00	24.8	23.9	46.0	50	42	205	50.1	60	46	209	48.1	50	44	207	52.3	60	48	211
			286A00	49.6	47.7	75.8	80	70	205	79.9	80	73	209	77.9	80	72	207	82.0	90	75	211
			287A00	74.4	71.6	87.7	90	97	205	91.9	100	101	209	89.9	90	99	207	94.0	100	103	211

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 17 - 50HC - With Electric Heat and ERV: Unit Wire/Fuse or HACR Breaker Sizing Data (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **20	208/230–3–60	STD	NONE	–	–	92.3	100	98	469	100.0	125	107	477	97.1	110	104	474	104.8	125	113	482
			279A00	18.8/25.0	52.1/60.1	98.6/108.6	100/110	98/100	469/469	108.3/118.3	125/125	107/109	477/477	104.6/114.6	110/125	104/105	474/474	114.3/124.3	125/125	113/114	482/482
			280A00	37.6/50.0	104.2/120.3	163.8/153.8	175/175	151/169	469/469	173.4/163.5	175/175	160/178	477/477	169.8/159.8	175/175	156/175	474/474	179.4/169.5	200/175	165/184	482/482
			281A00	56.3/75.0	156.4/180.4	189.9/213.9	200/225	211/238	469/469	199.6/223.6	200/250	220/247	477/477	195.9/219.9	200/250	216/244	474/474	205.6/229.6	225/250	225/253	482/482
		MED	NONE	–	–	95.3/94.4	110/110	102/101	471	103.0/102.1	125/125	111/110	479	100.1/99.2	125/125	107/106	476	107.8/106.9	125/125	116/115	484
			279A00	18.8/25.0	52.1/60.1	102.4/111.3	110/125	102/102	471/471	112.1/120.9	125/125	111/111	479/479	108.4/117.3	125/125	107/108	476/476	118.1/126.9	125/150	116/117	484/484
			280A00	37.6/50.0	104.2/120.3	167.5/156.4	175/175	154/172	471/471	177.2/166.1	200/175	163/180	479/479	173.5/162.4	175/175	160/177	476/476	183.2/172.1	200/175	169/186	484/484
			281A00	56.3/75.0	156.4/180.4	193.7/216.5	200/250	214/241	471/471	203.3/226.2	225/250	223/250	479/479	199.7/222.5	200/250	220/246	476/476	209.3/232.2	225/250	229/255	484/484
		HIGH	NONE	–	–	98.8	125	106	467	106.5	125	115	475	103.6	125	111	472	111.3	125	120	480
			279A00	18.8/25.0	52.1/60.1	106.8/116.8	125/125	106/107	467/467	116.4/126.4	125/150	115/116	475/475	112.8/122.8	125/125	111/113	472/472	122.4/132.4	125/150	120/122	480/480
			280A00	37.6/50.0	104.2/120.3	171.9/161.9	175/175	158/177	467/467	181.6/171.6	200/175	167/186	475/475	177.9/167.9	200/175	164/182	472/472	187.6/177.6	200/200	173/191	480/480
			281A00	56.3/75.0	156.4/180.4	198.0/222.0	200/250	218/246	467/467	207.7/231.7	225/250	227/255	475/475	204.0/228.0	225/250	224/251	472/472	213.7/237.7	225/250	233/260	480/480
	460–3–60	STD	NONE	–	–	44.4	50	47	258	47.7	60	51	262	46.6	50	50	260	49.9	60	54	264
			282A00	25.0	30.1	53.4	60	49	258	57.5	60	53	262	56.1	60	52	260	60.3	70	55	264
			283A00	50.0	60.1	75.9	80	84	258	80.0	80	87	262	78.6	80	86	260	82.7	90	90	264
			284A00	75.0	90.2	106.0	110	118	258	110.1	125	122	262	108.7	125	121	260	112.8	125	125	264
		MED	NONE	–	–	45.5	50	49	259	48.8	60	52	263	47.7	60	51	261	51.0	60	55	265
			282A00	25.0	30.1	54.8	60	50	259	58.9	60	54	263	57.5	60	53	261	61.6	70	57	265
			283A00	50.0	60.1	77.2	80	85	259	81.4	90	89	263	80.0	80	87	261	84.1	90	91	265
			284A00	75.0	90.2	107.3	125	119	259	111.5	125	123	263	110.1	125	122	261	114.2	125	126	265
		HIGH	NONE	–	–	47.7	60	51	257	51.0	60	55	261	49.9	60	54	259	53.2	60	58	263
			282A00	25.0	30.1	57.5	60	53	257	61.6	70	57	261	60.3	70	55	259	64.4	70	59	263
			283A00	50.0	60.1	80.0	90	87	257	84.1	90	91	261	82.7	90	90	259	86.9	90	94	263
			284A00	75.0	90.2	110.1	125	122	257	114.2	125	126	261	112.8	125	125	259	117.0	125	128	263
	575–3–60	STD	NONE	–	–	33.5	40	36	193	36.8	45	40	197	35.2	40	38	195	38.5	45	42	199
			285A00	24.8	23.9	42.5	45	39	193	46.6	50	43	197	44.6	45	41	195	48.8	50	45	199
			286A00	49.6	47.7	72.3	80	66	193	76.4	80	70	197	74.4	80	68	195	78.5	80	72	199
			287A00	74.4	71.6	84.2	90	94	193	88.4	90	98	197	86.4	90	96	195	90.5	100	100	199
		MED	NONE	–	–	36.3	45	39	207	39.6	45	43	211	38.0	45	41	209	41.3	50	45	213
			285A00	24.8	23.9	46.0	50	42	207	50.1	60	46	211	48.1	50	44	209	52.3	60	48	213
			286A00	49.6	47.7	75.8	80	70	207	79.9	80	73	211	77.9	80	72	209	82.0	90	75	213
			287A00	74.4	71.6	87.7	90	97	207	91.9	100	101	211	89.9	90	99	209	94.0	100	103	213
		HIGH	NONE	–	–	38.3	45	41	205	41.6	50	45	209	40.0	45	43	207	43.3	50	47	211
			285A00	24.8	23.9	48.5	50	45	205	52.6	60	48	209	50.6	60	47	207	54.8	60	50	211
			286A00	49.6	47.7	78.3	80	72	205	82.4	90	76	209	80.4	90	74	207	84.5	90	78	211
			287A00	74.4	71.6	90.2	100	99	205	94.4	100	103	209	92.4	100	101	207	96.5	100	105	211

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 17 - 50HC - With Electric Heat and ERV: Unit Wire/Fuse or HACR Breaker Sizing Data (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer				w/ERV w/o Economizer				w/ERV w/Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **24	208/230–3–60	STD	NONE	–	–	119.6/118.7	150/150	129/128	583	119.6/118.7	150/150	129/128	583	124.4/123.5	150/150	134/133	588	124.4/123.5	150/150	134/133	588
			279A00	18.8/25.0	52.1/60.1	122.5/131.4	150/150	129/128	583/583	122.5/131.4	150/150	129/128	583/583	128.5/137.4	150/150	134/133	588/588	128.5/137.4	150/150	134/133	588/588
			280A00	37.6/50.0	104.2/120.3	187.7/176.6	200/200	173/190	583/583	187.7/176.6	200/200	173/190	583/583	193.7/182.6	200/200	178/196	588/588	193.7/182.6	200/200	178/196	588/588
			281A00	56.3/75.0	156.4/180.4	213.8/236.7	225/250	233/259	583/583	213.8/236.7	225/250	233/259	583/583	219.8/242.7	225/250	238/265	588/588	219.8/242.7	225/250	238/265	588/588
		MED	NONE	–	–	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
			279A00	18.8/25.0	52.1/60.1	126.9/136.9	150/150	133/133	579/579	126.9/136.9	150/150	133/133	579/579	132.9/142.9	150/150	138/138	584/584	132.9/142.9	150/150	138/138	584/584
			280A00	37.6/50.0	104.2/120.3	192.0/182.1	200/200	177/195	579/579	192.0/182.1	200/200	177/195	579/579	198.0/188.1	200/200	182/201	584/584	198.0/188.1	200/200	182/201	584/584
			281A00	56.3/75.0	156.4/180.4	218.2/242.2	225/250	237/264	579/579	218.2/242.2	225/250	237/264	579/579	224.2/248.2	225/250	242/270	584/584	224.2/248.2	225/250	242/270	584/584
		HIGH	NONE	–	–	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
			279A00	18.8/25.0	52.1/60.1	141.2/151.2	150/175	146/146	658/658	141.2/151.2	150/175	146/146	658/658	147.2/157.2	150/175	152/152	663/663	147.2/157.2	150/175	152/152	663/663
			280A00	37.6/50.0	104.2/120.3	206.3/196.3	225/200	190/208	658/658	206.3/196.3	225/200	190/208	658/658	212.3/202.3	225/225	195/214	663/663	212.3/202.3	225/225	195/214	663/663
			281A00	56.3/75.0	156.4/180.4	232.4/256.4	250/300	250/277	658/658	232.4/256.4	250/300	250/277	658/658	238.4/262.4	250/300	255/283	663/663	238.4/262.4	250/300	255/283	663/663
	460–3–60	STD	NONE	–	–	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
			282A00	25.0	30.1	63.3	70	66	295	63.3	70	66	295	66.1	80	69	297	66.1	80	69	297
			283A00	50.0	60.1	85.8	90	93	295	85.8	90	93	295	88.6	90	95	297	88.6	90	95	297
			284A00	75.0	90.2	115.9	125	127	295	115.9	125	127	295	118.7	125	130	297	118.7	125	130	297
		MED	NONE	–	–	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
			282A00	25.0	30.1	66.1	80	69	293	66.1	80	69	293	68.8	80	71	295	68.8	80	71	295
			283A00	50.0	60.1	88.6	90	95	293	88.6	90	95	293	91.3	100	98	295	91.3	100	98	295
			284A00	75.0	90.2	118.7	125	130	293	118.7	125	130	293	121.4	125	132	295	121.4	125	132	295
		HIGH	NONE	–	–	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
			282A00	25.0	30.1	73.2	80	75	333	73.2	80	75	333	76.0	80	78	335	76.0	80	78	335
			283A00	50.0	60.1	95.7	100	102	333	95.7	100	102	333	98.4	100	104	335	98.4	100	104	335
			284A00	75.0	90.2	125.8	150	136	333	125.8	150	136	333	128.5	150	139	335	128.5	150	139	335
	575–3–60	STD	NONE	–	–	49.6	60	54	219	49.6	60	54	219	51.3	60	55	221	51.3	60	55	221
			285A00	24.8	23.9	54.6	60	54	219	54.6	60	54	219	56.7	60	55	221	56.7	60	55	221
			286A00	49.6	47.7	84.3	90	78	219	84.3	90	78	219	86.5	90	80	221	86.5	90	80	221
			287A00	74.4	71.6	96.3	100	105	219	96.3	100	105	219	98.4	100	107	221	98.4	100	107	221
		MED	NONE	–	–	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
			285A00	24.8	23.9	57.1	60	56	217	57.1	60	56	217	59.2	60	58	219	59.2	60	58	219
			286A00	49.6	47.7	86.8	90	80	217	86.8	90	80	217	89.0	90	82	219	89.0	90	82	219
			287A00	74.4	71.6	98.8	100	107	217	98.8	100	107	217	100.9	110	109	219	100.9	110	109	219
		HIGH	NONE	–	–	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
			285A00	24.8	23.9	59.5	60	58	244	59.5	60	58	244	61.6	70	60	246	61.6	70	60	246
			286A00	49.6	47.7	89.2	90	82	244	89.2	90	82	244	91.3	100	84	246	91.3	100	84	246
			287A00	74.4	71.6	101.2	110	110	244	101.2	110	110	244	103.3	110	112	246	103.3	110	112	246

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 17 - 50HC - With Electric Heat and ERV: Unit Wire/Fuse or HACR Breaker Sizing Data (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer				w/ERV w/o Economizer				w/ERV w/Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **28	208/230–3–60	STD	NONE	–	–	148.3/147.4	175/175	157/156	623	148.3/147.4	175/175	157/156	623	153.1/152.2	200/200	162/161	628	153.1/152.2	200/200	162/161	628
			279A00	18.8/25.0	52.1/60.1	148.3/147.4	175/175	157/156	623/623	148.3/147.4	175/175	157/156	623/623	153.1/152.2	200/200	162/161	628/628	153.1/152.2	200/200	162/161	628/628
			280A00	37.6/50.0	104.2/120.3	187.7/176.6	200/200	173/190	623/623	187.7/176.6	200/200	173/190	623/623	193.7/182.6	200/200	178/196	628/628	193.7/182.6	200/200	178/196	628/628
			281A00	56.3/75.0	156.4/180.4	213.8/236.7	225/250	233/259	623/623	213.8/236.7	225/250	233/259	623/623	219.8/242.7	225/250	238/265	628/628	219.8/242.7	225/250	238/265	628/628
		MED	NONE	–	–	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
			279A00	18.8/25.0	52.1/60.1	151.8/151.8	175/175	161/161	619/619	151.8/151.8	175/175	161/161	619/619	156.6/156.6	200/200	166/166	624/624	156.6/156.6	200/200	166/166	624/624
			280A00	37.6/50.0	104.2/120.3	192.0/182.1	200/200	177/195	619/619	192.0/182.1	200/200	177/195	619/619	198.0/188.1	200/200	182/201	624/624	198.0/188.1	200/200	182/201	624/624
			281A00	56.3/75.0	156.4/180.4	218.2/242.2	225/250	237/264	619/619	218.2/242.2	225/250	237/264	619/619	224.2/248.2	225/250	242/270	624/624	224.2/248.2	225/250	242/270	624/624
		HIGH	NONE	–	–	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
			279A00	18.8/25.0	52.1/60.1	163.2/163.2	200/200	174/174	698/698	163.2/163.2	200/200	174/174	698/698	168.0/168.0	200/200	179/179	703/703	168.0/168.0	200/200	179/179	703/703
			280A00	37.6/50.0	104.2/120.3	206.3/196.3	225/200	190/208	698/698	206.3/196.3	225/200	190/208	698/698	212.3/202.3	225/225	195/214	703/703	212.3/202.3	225/225	195/214	703/703
			281A00	56.3/75.0	156.4/180.4	232.4/256.4	250/300	250/277	698/698	232.4/256.4	250/300	250/277	698/698	238.4/262.4	250/300	255/283	703/703	238.4/262.4	250/300	255/283	703/703
	460–3–60	STD	NONE	–	–	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			282A00	25.0	30.1	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			283A00	50.0	60.1	85.8	90	93	321	85.8	90	93	321	88.6	90	95	323	88.6	90	95	323
			284A00	75.0	90.2	115.9	125	127	321	115.9	125	127	321	118.7	125	130	323	118.7	125	130	323
		MED	NONE	–	–	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			282A00	25.0	30.1	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			283A00	50.0	60.1	88.6	90	95	319	88.6	90	95	319	91.3	100	98	321	91.3	100	98	321
			284A00	75.0	90.2	118.7	125	130	319	118.7	125	130	319	121.4	125	132	321	121.4	125	132	321
		HIGH	NONE	–	–	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			282A00	25.0	30.1	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			283A00	50.0	60.1	95.7	100	102	359	95.7	100	102	359	98.4	100	104	361	98.4	100	104	361
			284A00	75.0	90.2	125.8	150	136	359	125.8	150	136	359	128.5	150	139	361	128.5	150	139	361
	575–3–60	STD	NONE	–	–	54.5	60	58	243	54.5	60	58	243	56.2	60	60	245	56.2	60	60	245
			285A00	24.8	23.9	54.6	60	58	243	54.6	60	58	243	56.7	60	60	245	56.7	60	60	245
			286A00	49.6	47.7	84.3	90	78	243	84.3	90	78	243	86.5	90	80	245	86.5	90	80	245
			287A00	74.4	71.6	96.3	100	105	243	96.3	100	105	243	98.4	100	107	245	98.4	100	107	245
		MED	NONE	–	–	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
			285A00	24.8	23.9	57.1	70	61	241	57.1	70	61	241	59.2	70	63	243	59.2	70	63	243
			286A00	49.6	47.7	86.8	90	80	241	86.8	90	80	241	89.0	90	82	243	89.0	90	82	243
			287A00	74.4	71.6	98.8	100	107	241	98.8	100	107	241	100.9	110	109	243	100.9	110	109	243
		HIGH	NONE	–	–	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270
			285A00	24.8	23.9	59.5	70	63	268	59.5	70	63	268	61.6	70	65	270	61.6	70	65	270
			286A00	49.6	47.7	89.2	90	82	268	89.2	90	82	268	91.3	100	84	270	91.3	100	84	270
			287A00	74.4	71.6	101.2	110	110	268	101.2	110	110	268	103.3	110	112	270	103.3	110	112	270

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 18 – 50HC - With Electric Heat, ERV and Factory-Installed HACR Breaker

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **17	208/230–3–60	STD	NONE	–	–	85.4/85.4	100/100	91/91	425	93.1/93.1	100/100	100/100	433	90.2/90.2	100/100	96/96	430	97.9/97.9	110/110	105/105	438
			279A00	18.8/25.0	52.1/60.1	105.8/105.8	110/110	91/97	425/425	115.4/115.4	125/125	100/106	433/433	111.8/111.8	125/125	96/103	430/430	121.4/121.4	125/125	105/112	438/438
			280A00	37.6/50.0	104.2/120.3	161.0/161.0	175/175	148/167	425/425	170.7/170.7	175/175	157/175	433/433	167.0/167.0	175/175	154/172	430/430	176.7/176.7	200/200	163/181	438/438
			281A00	56.3/75.0	156.4/180.4	211.0/211.0	225/225	208/236	425/425	220.7/220.7	225/225	217/245	433/433	217.0/217.0	225/225	214/241	430/430	226.7/226.7	250/250	223/250	438/438
		MED	NONE	–	–	87.6	100	93	439	95.3	110	102	447	92.4	100	99	444	100.1	125	108	452
			279A00	18.8/25.0	52.1/60.1	108.6/108.6	110/110	93/100	439/439	118.3/118.3	125/125	102/109	447/447	114.6/114.6	125/125	99/105	444/444	124.3/124.3	125/125	108/114	452/452
			280A00	37.6/50.0	104.2/120.3	163.8/163.8	175/175	151/169	439/439	173.4/173.4	175/175	160/178	447/447	169.8/169.8	175/175	156/175	444/444	179.4/179.4	200/200	165/184	452/452
			281A00	56.3/75.0	156.4/180.4	213.9/213.9	225/225	211/238	439/439	223.6/223.6	225/250	220/247	447/447	219.9/219.9	225/250	216/244	444/444	229.6/229.6	250/250	225/253	452/452
		HIGH	NONE	–	–	90.6/90.6	100/100	97/96	441	98.3/98.3	110/110	106/105	449	95.4/95.4	110/110	102/101	446	103.1/103.1	125/125	111/110	454
			279A00	18.8/25.0	52.1/60.1	111.3/111.3	125/125	97/102	441/441	120.9/120.9	125/125	106/111	449/449	117.3/117.3	125/125	102/108	446/446	126.9/126.9	150/150	111/117	454/454
			280A00	37.6/50.0	104.2/120.3	167.5/167.5	175/175	154/172	441/441	177.2/177.2	200/200	163/180	449/449	173.5/173.5	175/175	160/177	446/446	183.2/183.2	200/200	169/186	454/454
			281A00	56.3/75.0	156.4/180.4	216.5/216.5	225/250	214/241	441/441	226.2/226.2	250/250	223/250	449/449	222.5/222.5	225/250	220/246	446/446	232.2/232.2	250/250	229/255	454/454
	460–3–60	STD	NONE	–	–	43.0	50	46	249	46.3	50	50	253	45.2	50	48	251	48.5	60	52	255
			282A00	25.0	30.1	52.0	60	48	249	56.1	60	52	253	54.8	60	50	251	58.9	60	54	255
			283A00	50.0	60.1	74.5	80	82	249	78.6	80	86	253	77.2	80	85	251	81.4	90	89	255
			284A00	75.0	90.2	104.6	110	117	249	108.7	125	121	253	107.3	110	119	251	111.5	125	123	255
		MED	NONE	–	–	44.1	50	47	256	47.4	60	51	260	46.3	50	50	258	49.6	60	53	262
			282A00	25.0	30.1	53.4	60	49	256	57.5	60	53	260	56.1	60	52	258	60.3	70	55	262
			283A00	50.0	60.1	75.9	80	84	256	80.0	80	87	260	78.6	80	86	258	82.7	90	90	262
			284A00	75.0	90.2	106.0	110	118	256	110.1	125	122	260	108.7	125	121	258	112.8	125	125	262
		HIGH	NONE	–	–	45.2	50	48	257	48.5	60	52	261	47.4	60	51	259	50.7	60	55	263
			282A00	25.0	30.1	54.8	60	50	257	58.9	60	54	261	57.5	60	53	259	61.6	70	57	263
			283A00	50.0	60.1	77.2	80	85	257	81.4	90	89	261	80.0	80	87	259	84.1	90	91	263
			284A00	75.0	90.2	107.3	125	119	257	111.5	125	123	261	110.1	125	122	259	114.2	125	126	263
	575–3–60	STD	NONE	–	–	33.5	40	36	191	36.8	45	40	195	35.2	40	38	193	38.5	45	42	197
			285A00	24.8	23.9	42.5	45	39	191	46.6	50	43	195	44.6	45	41	193	48.8	50	45	197
			286A00	49.6	47.7	72.3	80	66	191	76.4	80	70	195	74.4	80	68	193	78.5	80	72	197
			287A00	74.4	71.6	84.2	90	94	191	88.4	90	98	195	86.4	90	96	193	90.5	100	100	197
		MED	NONE	–	–	33.5	40	36	191	36.8	45	40	195	35.2	40	38	193	38.5	45	42	197
			285A00	24.8	23.9	42.5	45	39	191	46.6	50	43	195	44.6	45	41	193	48.8	50	45	197
			286A00	49.6	47.7	72.3	80	66	191	76.4	80	70	195	74.4	80	68	193	78.5	80	72	197
			287A00	74.4	71.6	84.2	90	94	191	88.4	90	98	195	86.4	90	96	193	90.5	100	100	197
		HIGH	NONE	–	–	36.3	45	39	205	39.6	45	43	209	38.0	45	41	207	41.3	50	45	211
			285A00	24.8	23.9	46.0	50	42	205	50.1	60	46	209	48.1	50	44	207	52.3	60	48	211
			286A00	49.6	47.7	75.8	80	70	205	79.9	80	73	209	77.9	80	72	207	82.0	90	75	211
			287A00	74.4	71.6	87.7	90	97	205	91.9	100	101	209	89.9	90	99	207	94.0	100	103	211

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 18 - 50HC - With Electric Heat, ERV and Factory-Installed HACR Breaker (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **20	208/230–3–60	STD	NONE	–	–	92.3	100	98	469	100.0	125	107	477	97.1	110	104	474	104.8	125	113	482
			279A00	18.8/25.0	52.1/60.1	108.6/108.6	110/110	98/100	469/469	118.3/118.3	125/125	107/109	477/477	114.6/114.6	125/125	104/105	474/474	124.3/124.3	125/125	113/114	482/482
			280A00	37.6/50.0	104.2/120.3	163.8/163.8	175/175	151/169	469/469	173.4/173.4	175/175	160/178	477/477	169.8/169.8	175/175	156/175	474/474	179.4/179.4	200/200	165/184	482/482
			281A00	56.3/75.0	156.4/180.4	213.9/213.9	225/225	211/238	469/469	223.6/223.6	225/250	220/247	477/477	219.9/219.9	225/250	216/244	474/474	229.6/229.6	250/250	225/253	482/482
		MED	NONE	–	–	95.3/95.3	110/110	102/101	471	103.0/103.0	125/125	111/110	479	100.1/100.1	125/125	107/106	476	107.8/107.8	125/125	116/115	484
			279A00	18.8/25.0	52.1/60.1	111.3/111.3	125/125	102/102	471/471	120.9/120.9	125/125	111/111	479/479	117.3/117.3	125/125	107/108	476/476	126.9/126.9	150/150	116/117	484/484
			280A00	37.6/50.0	104.2/120.3	167.5/167.5	175/175	154/172	471/471	177.2/177.2	200/200	163/180	479/479	173.5/173.5	175/175	160/177	476/476	183.2/183.2	200/200	169/186	484/484
			281A00	56.3/75.0	156.4/180.4	216.5/216.5	225/250	214/241	471/471	226.2/226.2	250/250	223/250	479/479	222.5/222.5	225/250	220/246	476/476	232.2/232.2	250/250	229/255	484/484
		HIGH	NONE	–	–	98.8	125	106	467	106.5	125	115	475	103.6	125	111	472	111.3	125	120	480
			279A00	18.8/25.0	52.1/60.1	116.8/116.8	125/125	106/107	467/467	126.4/126.4	150/150	115/116	475/475	122.8/122.8	125/125	111/113	472/472	132.4/132.4	150/150	120/122	480/480
			280A00	37.6/50.0	104.2/120.3	171.9/171.9	175/175	158/177	467/467	181.6/181.6	200/200	167/186	475/475	177.9/177.9	200/200	164/182	472/472	187.6/187.6	200/200	173/191	480/480
			281A00	56.3/75.0	156.4/180.4	222.0/222.0	225/250	218/246	467/467	231.7/231.7	250/250	227/255	475/475	228.0/228.0	250/250	224/251	472/472	237.7/237.7	250/250	233/260	480/480
	460–3–60	STD	NONE	–	–	44.4	50	47	258	47.7	60	51	262	46.6	50	50	260	49.9	60	54	264
			282A00	25.0	30.1	53.4	60	49	258	57.5	60	53	262	56.1	60	52	260	60.3	70	55	264
			283A00	50.0	60.1	75.9	80	84	258	80.0	80	87	262	78.6	80	86	260	82.7	90	90	264
			284A00	75.0	90.2	106.0	110	118	258	110.1	125	122	262	108.7	125	121	260	112.8	125	125	264
		MED	NONE	–	–	45.5	50	49	259	48.8	60	52	263	47.7	60	51	261	51.0	60	55	265
			282A00	25.0	30.1	54.8	60	50	259	58.9	60	54	263	57.5	60	53	261	61.6	70	57	265
			283A00	50.0	60.1	77.2	80	85	259	81.4	90	89	263	80.0	80	87	261	84.1	90	91	265
			284A00	75.0	90.2	107.3	125	119	259	111.5	125	123	263	110.1	125	122	261	114.2	125	126	265
		HIGH	NONE	–	–	47.7	60	51	257	51.0	60	55	261	49.9	60	54	259	53.2	60	58	263
			282A00	25.0	30.1	57.5	60	53	257	61.6	70	57	261	60.3	70	55	259	64.4	70	59	263
			283A00	50.0	60.1	80.0	90	87	257	84.1	90	91	261	82.7	90	90	259	86.9	90	94	263
			284A00	75.0	90.2	110.1	125	122	257	114.2	125	126	261	112.8	125	125	259	117.0	125	128	263
	575–3–60	STD	NONE	–	–	33.5	40	36	193	36.8	45	40	197	35.2	40	38	195	38.5	45	42	199
			285A00	24.8	23.9	42.5	45	39	193	46.6	50	43	197	44.6	45	41	195	48.8	50	45	199
			286A00	49.6	47.7	72.3	80	66	193	76.4	80	70	197	74.4	80	68	195	78.5	80	72	199
			287A00	74.4	71.6	84.2	90	94	193	88.4	90	98	197	86.4	90	96	195	90.5	100	100	199
		MED	NONE	–	–	36.3	45	39	207	39.6	45	43	211	38.0	45	41	209	41.3	50	45	213
			285A00	24.8	23.9	46.0	50	42	207	50.1	60	46	211	48.1	50	44	209	52.3	60	48	213
			286A00	49.6	47.7	75.8	80	70	207	79.9	80	73	211	77.9	80	72	209	82.0	90	75	213
			287A00	74.4	71.6	87.7	90	97	207	91.9	100	101	211	89.9	90	99	209	94.0	100	103	213
		HIGH	NONE	–	–	38.3	45	41	205	41.6	50	45	209	40.0	45	43	207	43.3	50	47	211
			285A00	24.8	23.9	48.5	50	45	205	52.6	60	48	209	50.6	60	47	207	54.8	60	50	211
			286A00	49.6	47.7	78.3	80	72	205	82.4	90	76	209	80.4	90	74	207	84.5	90	78	211
			287A00	74.4	71.6	90.2	100	99	205	94.4	100	103	209	92.4	100	101	207	96.5	100	105	211

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 18 - 50HC - With Electric Heat, ERV and Factory-Installed HACR Breaker (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer				w/ERV w/o Economizer				w/ERV w/Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **24	208/230–3–60	STD	NONE	–	–	119.6/119.6	150/150	129/128	583	119.6/119.6	150/150	129/128	583	124.4/124.4	150/150	134/133	588	124.4/124.4	150/150	134/133	588
			279A00	18.8/25.0	52.1/60.1	131.4/131.4	150/150	129/128	583/583	131.4/131.4	150/150	129/128	583/583	137.4/137.4	150/150	134/133	588/588	137.4/137.4	150/150	134/133	588/588
			280A00	37.6/50.0	104.2/120.3	187.7/187.7	200/200	173/190	583/583	187.7/187.7	200/200	173/190	583/583	193.7/193.7	200/200	178/196	588/588	193.7/193.7	200/200	178/196	588/588
			281A00	56.3/75.0	156.4/180.4	236.7/236.7	250/250	233/259	583/583	236.7/236.7	250/250	233/259	583/583	242.7/242.7	250/250	238/265	588/588	242.7/242.7	250/250	238/265	588/588
		MED	NONE	–	–	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
			279A00	18.8/25.0	52.1/60.1	136.9/136.9	150/150	133/133	579/579	136.9/136.9	150/150	133/133	579/579	142.9/142.9	150/150	138/138	584/584	142.9/142.9	150/150	138/138	584/584
			280A00	37.6/50.0	104.2/120.3	192.0/192.0	200/200	177/195	579/579	192.0/192.0	200/200	177/195	579/579	198.0/198.0	200/200	182/201	584/584	198.0/198.0	200/200	182/201	584/584
			281A00	56.3/75.0	156.4/180.4	242.2/242.2	250/250	237/264	579/579	242.2/242.2	250/250	237/264	579/579	248.2/248.2	250/250	242/270	584/584	248.2/248.2	250/250	242/270	584/584
		HIGH	NONE	–	–	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
			279A00	18.8/25.0	52.1/60.1	151.2/151.2	175/175	146/146	658/658	151.2/151.2	175/175	146/146	658/658	157.2/157.2	175/175	152/152	663/663	157.2/157.2	175/175	152/152	663/663
			280A00	37.6/50.0	104.2/120.3	206.3/206.3	225/225	190/208	658/658	206.3/206.3	225/225	190/208	658/658	212.3/212.3	225/225	195/214	663/663	212.3/212.3	225/225	195/214	663/663
			281A00	56.3/75.0	156.4/180.4	256.4/256.4	300/300	250/277	658/658	256.4/256.4	300/300	250/277	658/658	262.4/262.4	300/300	255/283	663/663	262.4/262.4	300/300	255/283	663/663
	460–3–60	STD	NONE	–	–	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
			282A00	25.0	30.1	63.3	70	66	295	63.3	70	66	295	66.1	80	69	297	66.1	80	69	297
			283A00	50.0	60.1	85.8	90	93	295	85.8	90	93	295	88.6	90	95	297	88.6	90	95	297
			284A00	75.0	90.2	115.9	125	127	295	115.9	125	127	295	118.7	125	130	297	118.7	125	130	297
		MED	NONE	–	–	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
			282A00	25.0	30.1	66.1	80	69	293	66.1	80	69	293	68.8	80	71	295	68.8	80	71	295
			283A00	50.0	60.1	88.6	90	95	293	88.6	90	95	293	91.3	100	98	295	91.3	100	98	295
			284A00	75.0	90.2	118.7	125	130	293	118.7	125	130	293	121.4	125	132	295	121.4	125	132	295
		HIGH	NONE	–	–	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
			282A00	25.0	30.1	73.2	80	75	333	73.2	80	75	333	76.0	80	78	335	76.0	80	78	335
			283A00	50.0	60.1	95.7	100	102	333	95.7	100	102	333	98.4	100	104	335	98.4	100	104	335
			284A00	75.0	90.2	125.8	150	136	333	125.8	150	136	333	128.5	150	139	335	128.5	150	139	335
	575–3–60	STD	NONE	–	–	49.6	60	54	219	49.6	60	54	219	51.3	60	55	221	51.3	60	55	221
			285A00	24.8	23.9	54.6	60	54	219	54.6	60	54	219	56.7	60	55	221	56.7	60	55	221
			286A00	49.6	47.7	84.3	90	78	219	84.3	90	78	219	86.5	90	80	221	86.5	90	80	221
			287A00	74.4	71.6	96.3	100	105	219	96.3	100	105	219	98.4	100	107	221	98.4	100	107	221
		MED	NONE	–	–	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
			285A00	24.8	23.9	57.1	60	56	217	57.1	60	56	217	59.2	60	58	219	59.2	60	58	219
			286A00	49.6	47.7	86.8	90	80	217	86.8	90	80	217	89.0	90	82	219	89.0	90	82	219
			287A00	74.4	71.6	98.8	100	107	217	98.8	100	107	217	100.9	110	109	219	100.9	110	109	219
		HIGH	NONE	–	–	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
			285A00	24.8	23.9	59.5	60	58	244	59.5	60	58	244	61.6	70	60	246	61.6	70	60	246
			286A00	49.6	47.7	89.2	90	82	244	89.2	90	82	244	91.3	100	84	246	91.3	100	84	246
			287A00	74.4	71.6	101.2	110	110	244	101.2	110	110	244	103.3	110	112	246	103.3	110	112	246

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 18 - 50HC - With Electric Heat, ERV and Factory-Installed HACR Breaker (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer				w/ERV w/o Economizer				w/ERV w/Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **28	208/230–3–60	STD	NONE	–	–	148.3/148.3	175/175	157/156	623	148.3/148.3	175/175	157/156	623	153.1/153.1	200/200	162/161	628	153.1/153.1	200/200	162/161	628
			279A00	18.8/25.0	52.1/60.1	148.3/148.3	175/175	157/156	623/623	148.3/148.3	175/175	157/156	623/623	153.1/153.1	200/200	162/161	628/628	153.1/153.1	200/200	162/161	628/628
			280A00	37.6/50.0	104.2/120.3	187.7/187.7	200/200	173/190	623/623	187.7/187.7	200/200	173/190	623/623	193.7/193.7	200/200	178/196	628/628	193.7/193.7	200/200	178/196	628/628
			281A00	56.3/75.0	156.4/180.4	236.7/236.7	250/250	233/259	623/623	236.7/236.7	250/250	233/259	623/623	242.7/242.7	250/250	238/265	628/628	242.7/242.7	250/250	238/265	628/628
		MED	NONE	–	–	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
			279A00	18.8/25.0	52.1/60.1	151.8/151.8	175/175	161/161	619/619	151.8/151.8	175/175	161/161	619/619	156.6/156.6	200/200	166/166	624/624	156.6/156.6	200/200	166/166	624/624
			280A00	37.6/50.0	104.2/120.3	192.0/192.0	200/200	177/195	619/619	192.0/192.0	200/200	177/195	619/619	198.0/198.0	200/200	182/201	624/624	198.0/198.0	200/200	182/201	624/624
			281A00	56.3/75.0	156.4/180.4	242.2/242.2	250/250	237/264	619/619	242.2/242.2	250/250	237/264	619/619	248.2/248.2	250/250	242/270	624/624	248.2/248.2	250/250	242/270	624/624
		HIGH	NONE	–	–	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
			279A00	18.8/25.0	52.1/60.1	163.2/163.2	200/200	174/174	698/698	163.2/163.2	200/200	174/174	698/698	168.0/168.0	200/200	179/179	703/703	168.0/168.0	200/200	179/179	703/703
			280A00	37.6/50.0	104.2/120.3	206.3/206.3	225/225	190/208	698/698	206.3/206.3	225/225	190/208	698/698	212.3/212.3	225/225	195/214	703/703	212.3/212.3	225/225	195/214	703/703
			281A00	56.3/75.0	156.4/180.4	256.4/256.4	300/300	250/277	698/698	256.4/256.4	300/300	250/277	698/698	262.4/262.4	300/300	255/283	703/703	262.4/262.4	300/300	255/283	703/703
	460–3–60	STD	NONE	–	–	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			282A00	25.0	30.1	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			283A00	50.0	60.1	85.8	90	93	321	85.8	90	93	321	88.6	90	95	323	88.6	90	95	323
			284A00	75.0	90.2	115.9	125	127	321	115.9	125	127	321	118.7	125	130	323	118.7	125	130	323
		MED	NONE	–	–	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			282A00	25.0	30.1	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			283A00	50.0	60.1	88.6	90	95	319	88.6	90	95	319	91.3	100	98	321	91.3	100	98	321
			284A00	75.0	90.2	118.7	125	130	319	118.7	125	130	319	121.4	125	132	321	121.4	125	132	321
		HIGH	NONE	–	–	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			282A00	25.0	30.1	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			283A00	50.0	60.1	95.7	100	102	359	95.7	100	102	359	98.4	100	104	361	98.4	100	104	361
			284A00	75.0	90.2	125.8	150	136	359	125.8	150	136	359	128.5	150	139	361	128.5	150	139	361
	575–3–60	STD	NONE	–	–	54.5	60	58	243	54.5	60	58	243	56.2	60	60	245	56.2	60	60	245
			285A00	24.8	23.9	54.6	60	58	243	54.6	60	58	243	56.7	60	60	245	56.7	60	60	245
			286A00	49.6	47.7	84.3	90	78	243	84.3	90	78	243	86.5	90	80	245	86.5	90	80	245
			287A00	74.4	71.6	96.3	100	105	243	96.3	100	105	243	98.4	100	107	245	98.4	100	107	245
		MED	NONE	–	–	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
			285A00	24.8	23.9	57.1	70	61	241	57.1	70	61	241	59.2	70	63	243	59.2	70	63	243
			286A00	49.6	47.7	86.8	90	80	241	86.8	90	80	241	89.0	90	82	243	89.0	90	82	243
			287A00	74.4	71.6	98.8	100	107	241	98.8	100	107	241	100.9	110	109	243	100.9	110	109	243
		HIGH	NONE	–	–	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270
			285A00	24.8	23.9	59.5	70	63	268	59.5	70	63	268	61.6	70	65	270	61.6	70	65	270
			286A00	49.6	47.7	89.2	90	82	268	89.2	90	82	268	91.3	100	84	270	91.3	100	84	270
			287A00	74.4	71.6	101.2	110	110	268	101.2	110	110	268	103.3	110	112	270	103.3	110	112	270

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 19 – 50HC - With Electric Heat, ERV and 2-Speed Indoor Fan Option

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **17	208/230–3–60	STD	NONE	–	–	85.6/84.8	100/100	91/90	406	93.3/92.5	100/100	100/99	414	90.4/89.6	100/100	97/96	411	98.1/97.3	110/110	106/105	419
			279A00	18.8/25.0	52.1/60.1	96.1/105.1	100/110	91/97	406/406	105.8/114.8	110/125	100/106	414/414	102.1/111.1	110/125	97/102	411/411	111.8/120.8	125/125	106/111	419/419
			280A00	37.6/50.0	104.2/120.3	161.3/150.3	175/175	148/166	406/406	170.9/160.0	175/175	157/175	414/414	167.3/156.3	175/175	154/171	411/411	176.9/166.0	200/175	163/180	419/419
			281A00	56.3/75.0	156.4/180.4	187.4/210.4	200/225	208/235	406/406	197.1/220.1	200/225	217/244	414/414	193.4/216.4	200/225	214/241	411/411	203.1/226.1	225/250	223/249	419/419
		MED	NONE	–	–	87.8/86.8	100/100	94/93	430	95.5/94.5	110/110	103/101	438	92.6/91.6	100/100	99/98	435	100.3/99.3	125/110	108/107	443
			279A00	18.8/25.0	52.1/60.1	98.9/107.6	100/110	94/99	430/430	108.6/117.3	110/125	103/108	438/438	104.9/113.6	110/125	99/105	435/435	114.6/123.3	125/125	108/113	443/443
			280A00	37.6/50.0	104.2/120.3	164.0/152.8	175/175	151/168	430/430	173.7/162.5	175/175	160/177	438/438	170.0/158.8	175/175	156/174	435/435	179.7/168.5	200/175	165/183	443/443
			281A00	56.3/75.0	156.4/180.4	190.2/212.9	200/225	211/237	430/430	199.8/222.6	200/250	220/246	438/438	196.2/218.9	200/225	216/243	435/435	205.8/228.6	225/250	225/252	443/443
		HIGH	NONE	–	–	90.6/89.7	100/100	97/96	441	98.3/97.4	110/110	106/105	449	95.4/94.5	110/110	102/101	446	103.1/102.2	125/125	111/110	454
			279A00	18.8/25.0	52.1/60.1	102.4/111.3	110/125	97/102	441/441	112.1/120.9	125/125	106/111	449/449	108.4/117.3	110/125	102/108	446/446	118.1/126.9	125/150	111/117	454/454
			280A00	37.6/50.0	104.2/120.3	167.5/156.4	175/175	154/172	441/441	177.2/166.1	200/175	163/180	449/449	173.5/162.4	175/175	160/177	446/446	183.2/172.1	200/175	169/186	454/454
			281A00	56.3/75.0	156.4/180.4	193.7/216.5	200/250	214/241	441/441	203.3/226.2	225/250	223/250	449/449	199.7/222.5	200/250	220/246	446/446	209.3/232.2	225/250	229/255	454/454
	460–3–60	STD	NONE	–	–	42.6	50	45	240	45.9	50	49	244	44.8	50	48	242	48.1	60	52	246
			282A00	25.0	30.1	51.5	60	47	240	55.6	60	51	244	54.3	60	50	242	58.4	60	54	246
			283A00	50.0	60.1	74.0	80	82	240	78.1	80	86	244	76.7	80	84	242	80.9	90	88	246
			284A00	75.0	90.2	104.1	110	116	240	108.2	110	120	244	106.8	110	119	242	111.0	125	123	246
		MED	NONE	–	–	43.7	50	47	252	47.0	60	50	256	45.9	50	49	254	49.2	60	53	258
			282A00	25.0	30.1	52.9	60	49	252	57.0	60	52	256	55.6	60	51	254	59.8	60	55	258
			283A00	50.0	60.1	75.4	80	83	252	79.5	80	87	256	78.1	80	86	254	82.2	90	89	258
			284A00	75.0	90.2	105.5	110	118	252	109.6	125	122	256	108.2	125	120	254	112.3	125	124	258
		HIGH	NONE	–	–	45.2	50	48	257	48.5	60	52	261	47.4	60	51	259	50.7	60	55	263
			282A00	25.0	30.1	54.8	60	50	257	58.9	60	54	261	57.5	60	53	259	61.6	70	57	263
			283A00	50.0	60.1	77.2	80	85	257	81.4	90	89	261	80.0	80	87	259	84.1	90	91	263
			284A00	75.0	90.2	107.3	125	119	257	111.5	125	123	261	110.1	125	122	259	114.2	125	126	263
	575–3–60	STD	NONE	–	–	35.2	40	38	191	38.5	45	42	195	36.9	45	40	193	40.2	45	43	197
			285A00	24.8	23.9	44.6	45	41	191	48.8	50	45	195	46.8	50	43	193	50.9	60	47	197
			286A00	49.6	47.7	74.4	80	68	191	78.5	80	72	195	76.5	80	70	193	80.6	90	74	197
			287A00	74.4	71.6	86.4	90	96	191	90.5	100	100	195	88.5	90	98	193	92.6	100	102	197
		MED	NONE	–	–	35.2	40	38	191	38.5	45	42	195	36.9	45	40	193	40.2	45	43	197
			285A00	24.8	23.9	44.6	45	41	191	48.8	50	45	195	46.8	50	43	193	50.9	60	47	197
			286A00	49.6	47.7	74.4	80	68	191	78.5	80	72	195	76.5	80	70	193	80.6	90	74	197
			287A00	74.4	71.6	86.4	90	96	191	90.5	100	100	195	88.5	90	98	193	92.6	100	102	197
		HIGH	NONE	–	–	36.9	45	40	205	40.2	45	43	209	38.6	45	42	207	41.9	50	45	211
			285A00	24.8	23.9	46.8	50	43	205	50.9	60	47	209	48.9	50	45	207	53.0	60	49	211
			286A00	49.6	47.7	76.5	80	70	205	80.6	90	74	209	78.6	80	72	207	82.8	90	76	211
			287A00	74.4	71.6	88.5	90	98	205	92.6	100	102	209	90.6	100	100	207	94.7	100	104	211

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 19 - 50HC - With Electric Heat, ERV and 2-Speed Indoor Fan Option (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **20	208/230–3–60	STD	NONE	–	–	92.5/91.5	100/100	98/97	460	100.2/99.2	125/125	107/106	468	97.3/96.3	110/110	104/103	465	105.0/104.0	125/125	113/112	473
			279A00	18.8/25.0	52.1/60.1	98.9/107.6	100/110	98/99	460/460	108.6/117.3	125/125	107/108	468/468	104.9/113.6	110/125	104/105	465/465	114.6/123.3	125/125	113/113	473/473
			280A00	37.6/50.0	104.2/120.3	164.0/152.8	175/175	151/168	460/460	173.7/162.5	175/175	160/177	468/468	170.0/158.8	175/175	156/174	465/465	179.7/168.5	200/175	165/183	473/473
			281A00	56.3/75.0	156.4/180.4	190.2/212.9	200/225	211/237	460/460	199.8/222.6	200/250	220/246	468/468	196.2/218.9	200/225	216/243	465/465	205.8/228.6	225/250	225/252	473/473
		MED	NONE	–	–	95.3/94.4	110/110	102/101	471	103.0/102.1	125/125	111/110	479	100.1/99.2	125/125	107/106	476	107.8/106.9	125/125	116/115	484
			279A00	18.8/25.0	52.1/60.1	102.4/111.3	110/125	102/102	471/471	112.1/120.9	125/125	111/111	479/479	108.4/117.3	125/125	107/108	476/476	118.1/126.9	125/150	116/117	484/484
			280A00	37.6/50.0	104.2/120.3	167.5/156.4	175/175	154/172	471/471	177.2/166.1	200/175	163/180	479/479	173.5/162.4	175/175	160/177	476/476	183.2/172.1	200/175	169/186	484/484
			281A00	56.3/75.0	156.4/180.4	193.7/216.5	200/250	214/241	471/471	203.3/226.2	225/250	223/250	479/479	199.7/222.5	200/250	220/246	476/476	209.3/232.2	225/250	229/255	484/484
		HIGH	NONE	–	–	98.8	125	106	467	106.5	125	115	475	103.6	125	111	472	111.3	125	120	480
			279A00	18.8/25.0	52.1/60.1	106.8/116.8	125/125	106/107	467/467	116.4/126.4	125/150	115/116	475/475	112.8/122.8	125/125	111/113	472/472	122.4/132.4	125/150	120/122	480/480
			280A00	37.6/50.0	104.2/120.3	171.9/161.9	175/175	158/177	467/467	181.6/171.6	200/175	167/186	475/475	177.9/167.9	200/175	164/182	472/472	187.6/177.6	200/200	173/191	480/480
			281A00	56.3/75.0	156.4/180.4	198.0/222.0	200/250	218/246	467/467	207.7/231.7	225/250	227/255	475/475	204.0/228.0	225/250	224/251	472/472	213.7/237.7	225/250	233/260	480/480
	460–3–60	STD	NONE	–	–	44.0	50	47	254	47.3	60	51	258	46.2	50	49	256	49.5	60	53	260
			282A00	25.0	30.1	52.9	60	49	254	57.0	60	52	258	55.6	60	51	256	59.8	60	55	260
			283A00	50.0	60.1	75.4	80	83	254	79.5	80	87	258	78.1	80	86	256	82.2	90	89	260
			284A00	75.0	90.2	105.5	110	118	254	109.6	125	122	258	108.2	125	120	256	112.3	125	124	260
		MED	NONE	–	–	45.5	50	49	259	48.8	60	52	263	47.7	60	51	261	51.0	60	55	265
			282A00	25.0	30.1	54.8	60	50	259	58.9	60	54	263	57.5	60	53	261	61.6	70	57	265
			283A00	50.0	60.1	77.2	80	85	259	81.4	90	89	263	80.0	80	87	261	84.1	90	91	265
			284A00	75.0	90.2	107.3	125	119	259	111.5	125	123	263	110.1	125	122	261	114.2	125	126	265
		HIGH	NONE	–	–	47.7	60	51	257	51.0	60	55	261	49.9	60	54	259	53.2	60	58	263
			282A00	25.0	30.1	57.5	60	53	257	61.6	70	57	261	60.3	70	55	259	64.4	70	59	263
			283A00	50.0	60.1	80.0	90	87	257	84.1	90	91	261	82.7	90	90	259	86.9	90	94	263
			284A00	75.0	90.2	110.1	125	122	257	114.2	125	126	261	112.8	125	125	259	117.0	125	128	263
	575–3–60	STD	NONE	–	–	35.2	40	38	193	38.5	45	42	197	36.9	45	40	195	40.2	45	43	199
			285A00	24.8	23.9	44.6	45	41	193	48.8	50	45	197	46.8	50	43	195	50.9	60	47	199
			286A00	49.6	47.7	74.4	80	68	193	78.5	80	72	197	76.5	80	70	195	80.6	90	74	199
			287A00	74.4	71.6	86.4	90	96	193	90.5	100	100	197	88.5	90	98	195	92.6	100	102	199
		MED	NONE	–	–	36.9	45	40	207	40.2	45	43	211	38.6	45	42	209	41.9	50	45	213
			285A00	24.8	23.9	46.8	50	43	207	50.9	60	47	211	48.9	50	45	209	53.0	60	49	213
			286A00	49.6	47.7	76.5	80	70	207	80.6	90	74	211	78.6	80	72	209	82.8	90	76	213
			287A00	74.4	71.6	88.5	90	98	207	92.6	100	102	211	90.6	100	100	209	94.7	100	104	213
		HIGH	NONE	–	–	38.3	45	41	205	41.6	50	45	209	40.0	45	43	207	43.3	50	47	211
			285A00	24.8	23.9	48.5	50	45	205	52.6	60	48	209	50.6	60	47	207	54.8	60	50	211
			286A00	49.6	47.7	78.3	80	72	205	82.4	90	76	209	80.4	90	74	207	84.5	90	78	211
			287A00	74.4	71.6	90.2	100	99	205	94.4	100	103	209	92.4	100	101	207	96.5	100	105	211

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 19 - 50HC - With Electric Heat, ERV and 2-Speed Indoor Fan Option (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer				w/ERV w/o Economizer				w/ERV w/Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **24	208/230–3–60	STD	NONE	–	–	119.6/118.7	150/150	129/128	583	119.6/118.7	150/150	129/128	583	124.4/123.5	150/150	134/133	588	124.4/123.5	150/150	134/133	588
			279A00	18.8/25.0	52.1/60.1	122.5/131.4	150/150	129/128	583/583	122.5/131.4	150/150	129/128	583/583	128.5/137.4	150/150	134/133	588/588	128.5/137.4	150/150	134/133	588/588
			280A00	37.6/50.0	104.2/120.3	187.7/176.6	200/200	173/190	583/583	187.7/176.6	200/200	173/190	583/583	193.7/182.6	200/200	178/196	588/588	193.7/182.6	200/200	178/196	588/588
			281A00	56.3/75.0	156.4/180.4	213.8/236.7	225/250	233/259	583/583	213.8/236.7	225/250	233/259	583/583	219.8/242.7	225/250	238/265	588/588	219.8/242.7	225/250	238/265	588/588
		MED	NONE	–	–	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
			279A00	18.8/25.0	52.1/60.1	126.9/136.9	150/150	133/133	579/579	126.9/136.9	150/150	133/133	579/579	132.9/142.9	150/150	138/138	584/584	132.9/142.9	150/150	138/138	584/584
			280A00	37.6/50.0	104.2/120.3	192.0/182.1	200/200	177/195	579/579	192.0/182.1	200/200	177/195	579/579	198.0/188.1	200/200	182/201	584/584	198.0/188.1	200/200	182/201	584/584
			281A00	56.3/75.0	156.4/180.4	218.2/242.2	225/250	237/264	579/579	218.2/242.2	225/250	237/264	579/579	224.2/248.2	225/250	242/270	584/584	224.2/248.2	225/250	242/270	584/584
		HIGH	NONE	–	–	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
			279A00	18.8/25.0	52.1/60.1	141.2/151.2	150/175	146/146	658/658	141.2/151.2	150/175	146/146	658/658	147.2/157.2	150/175	152/152	663/663	147.2/157.2	150/175	152/152	663/663
			280A00	37.6/50.0	104.2/120.3	206.3/196.3	225/200	190/208	658/658	206.3/196.3	225/200	190/208	658/658	212.3/202.3	225/225	195/214	663/663	212.3/202.3	225/225	195/214	663/663
			281A00	56.3/75.0	156.4/180.4	232.4/256.4	250/300	250/277	658/658	232.4/256.4	250/300	250/277	658/658	238.4/262.4	250/300	255/283	663/663	238.4/262.4	250/300	255/283	663/663
	460–3–60	STD	NONE	–	–	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
			282A00	25.0	30.1	63.3	70	66	295	63.3	70	66	295	66.1	80	69	297	66.1	80	69	297
			283A00	50.0	60.1	85.8	90	93	295	85.8	90	93	295	88.6	90	95	297	88.6	90	95	297
			284A00	75.0	90.2	115.9	125	127	295	115.9	125	127	295	118.7	125	130	297	118.7	125	130	297
		MED	NONE	–	–	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
			282A00	25.0	30.1	66.1	80	69	293	66.1	80	69	293	68.8	80	71	295	68.8	80	71	295
			283A00	50.0	60.1	88.6	90	95	293	88.6	90	95	293	91.3	100	98	295	91.3	100	98	295
			284A00	75.0	90.2	118.7	125	130	293	118.7	125	130	293	121.4	125	132	295	121.4	125	132	295
		HIGH	NONE	–	–	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
			282A00	25.0	30.1	73.2	80	75	333	73.2	80	75	333	76.0	80	78	335	76.0	80	78	335
			283A00	50.0	60.1	95.7	100	102	333	95.7	100	102	333	98.4	100	104	335	98.4	100	104	335
			284A00	75.0	90.2	125.8	150	136	333	125.8	150	136	333	128.5	150	139	335	128.5	150	139	335
	575–3–60	STD	NONE	–	–	50.2	60	54	219	50.2	60	54	219	51.9	60	56	221	51.9	60	56	221
			285A00	24.8	23.9	55.3	60	54	219	55.3	60	54	219	57.5	60	56	221	57.5	60	56	221
			286A00	49.6	47.7	85.1	90	78	219	85.1	90	78	219	87.2	90	80	221	87.2	90	80	221
			287A00	74.4	71.6	97.1	100	106	219	97.1	100	106	219	99.2	100	108	221	99.2	100	108	221
		MED	NONE	–	–	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
			285A00	24.8	23.9	57.1	60	56	217	57.1	60	56	217	59.2	60	58	219	59.2	60	58	219
			286A00	49.6	47.7	86.8	90	80	217	86.8	90	80	217	89.0	90	82	219	89.0	90	82	219
			287A00	74.4	71.6	98.8	100	107	217	98.8	100	107	217	100.9	110	109	219	100.9	110	109	219
		HIGH	NONE	–	–	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
			285A00	24.8	23.9	59.5	60	58	244	59.5	60	58	244	61.6	70	60	246	61.6	70	60	246
			286A00	49.6	47.7	89.2	90	82	244	89.2	90	82	244	91.3	100	84	246	91.3	100	84	246
			287A00	74.4	71.6	101.2	110	110	244	101.2	110	110	244	103.3	110	112	246	103.3	110	112	246

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 19 - 50HC - With Electric Heat, ERV and 2-Speed Indoor Fan Option (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer				w/ERV w/o Economizer				w/ERV w/Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **28	208/230–3–60	STD	NONE	–	–	148.3/147.4	175/175	157/156	623	148.3/147.4	175/175	157/156	623	153.1/152.2	200/200	162/161	628	153.1/152.2	200/200	162/161	628
			279A00	18.8/25.0	52.1/60.1	148.3/147.4	175/175	157/156	623/623	148.3/147.4	175/175	157/156	623/623	153.1/152.2	200/200	162/161	628/628	153.1/152.2	200/200	162/161	628/628
			280A00	37.6/50.0	104.2/120.3	187.7/176.6	200/200	173/190	623/623	187.7/176.6	200/200	173/190	623/623	193.7/182.6	200/200	178/196	628/628	193.7/182.6	200/200	178/196	628/628
			281A00	56.3/75.0	156.4/180.4	213.8/236.7	225/250	233/259	623/623	213.8/236.7	225/250	233/259	623/623	219.8/242.7	225/250	238/265	628/628	219.8/242.7	225/250	238/265	628/628
		MED	NONE	–	–	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
			279A00	18.8/25.0	52.1/60.1	151.8/151.8	175/175	161/161	619/619	151.8/151.8	175/175	161/161	619/619	156.6/156.6	200/200	166/166	624/624	156.6/156.6	200/200	166/166	624/624
			280A00	37.6/50.0	104.2/120.3	192.0/182.1	200/200	177/195	619/619	192.0/182.1	200/200	177/195	619/619	198.0/188.1	200/200	182/201	624/624	198.0/188.1	200/200	182/201	624/624
			281A00	56.3/75.0	156.4/180.4	218.2/242.2	225/250	237/264	619/619	218.2/242.2	225/250	237/264	619/619	224.2/248.2	225/250	242/270	624/624	224.2/248.2	225/250	242/270	624/624
		HIGH	NONE	–	–	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
			279A00	18.8/25.0	52.1/60.1	163.2/163.2	200/200	174/174	698/698	163.2/163.2	200/200	174/174	698/698	168.0/168.0	200/200	179/179	703/703	168.0/168.0	200/200	179/179	703/703
			280A00	37.6/50.0	104.2/120.3	206.3/196.3	225/200	190/208	698/698	206.3/196.3	225/200	190/208	698/698	212.3/202.3	225/225	195/214	703/703	212.3/202.3	225/225	195/214	703/703
			281A00	56.3/75.0	156.4/180.4	232.4/256.4	250/300	250/277	698/698	232.4/256.4	250/300	250/277	698/698	238.4/262.4	250/300	255/283	703/703	238.4/262.4	250/300	255/283	703/703
	460–3–60	STD	NONE	–	–	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			282A00	25.0	30.1	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			283A00	50.0	60.1	85.8	90	93	321	85.8	90	93	321	88.6	90	95	323	88.6	90	95	323
			284A00	75.0	90.2	115.9	125	127	321	115.9	125	127	321	118.7	125	130	323	118.7	125	130	323
		MED	NONE	–	–	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			282A00	25.0	30.1	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			283A00	50.0	60.1	88.6	90	95	319	88.6	90	95	319	91.3	100	98	321	91.3	100	98	321
			284A00	75.0	90.2	118.7	125	130	319	118.7	125	130	319	121.4	125	132	321	121.4	125	132	321
		HIGH	NONE	–	–	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			282A00	25.0	30.1	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			283A00	50.0	60.1	95.7	100	102	359	95.7	100	102	359	98.4	100	104	361	98.4	100	104	361
			284A00	75.0	90.2	125.8	150	136	359	125.8	150	136	359	128.5	150	139	361	128.5	150	139	361
	575–3–60	STD	NONE	–	–	55.1	60	59	243	55.1	60	59	243	56.8	70	61	245	56.8	70	61	245
			285A00	24.8	23.9	55.3	60	59	243	55.3	60	59	243	57.5	70	61	245	57.5	70	61	245
			286A00	49.6	47.7	85.1	90	78	243	85.1	90	78	243	87.2	90	80	245	87.2	90	80	245
			287A00	74.4	71.6	97.1	100	106	243	97.1	100	106	243	99.2	100	108	245	99.2	100	108	245
		MED	NONE	–	–	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
			285A00	24.8	23.9	57.1	70	61	241	57.1	70	61	241	59.2	70	63	243	59.2	70	63	243
			286A00	49.6	47.7	86.8	90	80	241	86.8	90	80	241	89.0	90	82	243	89.0	90	82	243
			287A00	74.4	71.6	98.8	100	107	241	98.8	100	107	241	100.9	110	109	243	100.9	110	109	243
		HIGH	NONE	–	–	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270
			285A00	24.8	23.9	59.5	70	63	268	59.5	70	63	268	61.6	70	65	270	61.6	70	65	270
			286A00	49.6	47.7	89.2	90	82	268	89.2	90	82	268	91.3	100	84	270	91.3	100	84	270
			287A00	74.4	71.6	101.2	110	110	268	101.2	110	110	268	103.3	110	112	270	103.3	110	112	270

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 20 – 50HC - With Electric Heat, ERV, Factory-Installed HACR Breaker and 2-Speed Indoor Fan Option

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **17	208/230–3–60	STD	NONE	–	–	85.6/85.6	100/100	91/90	406	93.3/93.3	100/100	100/99	414	90.4/90.4	100/100	97/96	411	98.1/98.1	110/110	106/105	419
			279A00	18.8/25.0	52.1/60.1	105.1/105.1	110/110	91/97	406/406	114.8/114.8	125/125	100/106	414/414	111.1/111.1	125/125	97/102	411/411	120.8/120.8	125/125	106/111	419/419
			280A00	37.6/50.0	104.2/120.3	161.3/161.3	175/175	148/166	406/406	170.9/170.9	175/175	157/175	414/414	167.3/167.3	175/175	154/171	411/411	176.9/176.9	200/200	163/180	419/419
			281A00	56.3/75.0	156.4/180.4	210.4/210.4	225/225	208/235	406/406	220.1/220.1	225/225	217/244	414/414	216.4/216.4	225/225	214/241	411/411	226.1/226.1	250/250	223/249	419/419
		MED	NONE	–	–	87.8/87.8	100/100	94/93	430	95.5/95.5	110/110	103/101	438	92.6/92.6	100/100	99/98	435	100.3/100.3	125/125	108/107	443
			279A00	18.8/25.0	52.1/60.1	107.6/107.6	110/110	94/99	430/430	117.3/117.3	125/125	103/108	438/438	113.6/113.6	125/125	99/105	435/435	123.3/123.3	125/125	108/113	443/443
			280A00	37.6/50.0	104.2/120.3	164.0/164.0	175/175	151/168	430/430	173.7/173.7	175/175	160/177	438/438	170.0/170.0	175/175	156/174	435/435	179.7/179.7	200/200	165/183	443/443
			281A00	56.3/75.0	156.4/180.4	212.9/212.9	225/225	211/237	430/430	222.6/222.6	225/250	220/246	438/438	218.9/218.9	225/225	216/243	435/435	228.6/228.6	250/250	225/252	443/443
		HIGH	NONE	–	–	90.6/90.6	100/100	97/96	441	98.3/98.3	110/110	106/105	449	95.4/95.4	110/110	102/101	446	103.1/103.1	125/125	111/110	454
			279A00	18.8/25.0	52.1/60.1	111.3/111.3	125/125	97/102	441/441	120.9/120.9	125/125	106/111	449/449	117.3/117.3	125/125	102/108	446/446	126.9/126.9	150/150	111/117	454/454
			280A00	37.6/50.0	104.2/120.3	167.5/167.5	175/175	154/172	441/441	177.2/177.2	200/200	163/180	449/449	173.5/173.5	175/175	160/177	446/446	183.2/183.2	200/200	169/186	454/454
			281A00	56.3/75.0	156.4/180.4	216.5/216.5	225/250	214/241	441/441	226.2/226.2	250/250	223/250	449/449	222.5/222.5	225/250	220/246	446/446	232.2/232.2	250/250	229/255	454/454
	460–3–60	STD	NONE	–	–	42.6	50	45	240	45.9	50	49	244	44.8	50	48	242	48.1	60	52	246
			282A00	25.0	30.1	51.5	60	47	240	55.6	60	51	244	54.3	60	50	242	58.4	60	54	246
			283A00	50.0	60.1	74.0	80	82	240	78.1	80	86	244	76.7	80	84	242	80.9	90	88	246
			284A00	75.0	90.2	104.1	110	116	240	108.2	110	120	244	106.8	110	119	242	111.0	125	123	246
		MED	NONE	–	–	43.7	50	47	252	47.0	60	50	256	45.9	50	49	254	49.2	60	53	258
			282A00	25.0	30.1	52.9	60	49	252	57.0	60	52	256	55.6	60	51	254	59.8	60	55	258
			283A00	50.0	60.1	75.4	80	83	252	79.5	80	87	256	78.1	80	86	254	82.2	90	89	258
			284A00	75.0	90.2	105.5	110	118	252	109.6	125	122	256	108.2	125	120	254	112.3	125	124	258
		HIGH	NONE	–	–	45.2	50	48	257	48.5	60	52	261	47.4	60	51	259	50.7	60	55	263
			282A00	25.0	30.1	54.8	60	50	257	58.9	60	54	261	57.5	60	53	259	61.6	70	57	263
			283A00	50.0	60.1	77.2	80	85	257	81.4	90	89	261	80.0	80	87	259	84.1	90	91	263
			284A00	75.0	90.2	107.3	125	119	257	111.5	125	123	261	110.1	125	122	259	114.2	125	126	263
	575–3–60	STD	NONE	–	–	35.2	40	38	191	38.5	45	42	195	36.9	45	40	193	40.2	45	43	197
			285A00	24.8	23.9	44.6	45	41	191	48.8	50	45	195	46.8	50	43	193	50.9	60	47	197
			286A00	49.6	47.7	74.4	80	68	191	78.5	80	72	195	76.5	80	70	193	80.6	90	74	197
			287A00	74.4	71.6	86.4	90	96	191	90.5	100	100	195	88.5	90	98	193	92.6	100	102	197
		MED	NONE	–	–	35.2	40	38	191	38.5	45	42	195	36.9	45	40	193	40.2	45	43	197
			285A00	24.8	23.9	44.6	45	41	191	48.8	50	45	195	46.8	50	43	193	50.9	60	47	197
			286A00	49.6	47.7	74.4	80	68	191	78.5	80	72	195	76.5	80	70	193	80.6	90	74	197
			287A00	74.4	71.6	86.4	90	96	191	90.5	100	100	195	88.5	90	98	193	92.6	100	102	197
		HIGH	NONE	–	–	36.9	45	40	205	40.2	45	43	209	38.6	45	42	207	41.9	50	45	211
			285A00	24.8	23.9	46.8	50	43	205	50.9	60	47	209	48.9	50	45	207	53.0	60	49	211
			286A00	49.6	47.7	76.5	80	70	205	80.6	90	74	209	78.6	80	72	207	82.8	90	76	211
			287A00	74.4	71.6	88.5	90	98	205	92.6	100	102	209	90.6	100	100	207	94.7	100	104	211

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 20 - 50HC - With Electric Heat, ERV, Factory-installed HACR Breaker and 2-Speed Indoor Fan Option (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ ERV, w/o Economizer				w/ ERV, w/ Economizer				w/ ERV, w/o Economizer				w/ ERV, w/ Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **20	208/230–3–60	STD	NONE	–	–	92.5/92.5	100/100	98/97	460	100.2/100.2	125/125	107/106	468	97.3/97.3	110/110	104/103	465	105.0/105.0	125/125	113/112	473
			279A00	18.8/25.0	52.1/60.1	107.6/107.6	110/110	98/99	460/460	117.3/117.3	125/125	107/108	468/468	113.6/113.6	125/125	104/105	465/465	123.3/123.3	125/125	113/113	473/473
			280A00	37.6/50.0	104.2/120.3	164.0/164.0	175/175	151/168	460/460	173.7/173.7	175/175	60/177	468/468	170.0/170.0	175/175	156/174	465/465	179.7/179.7	200/200	165/183	473/473
			281A00	56.3/75.0	156.4/180.4	212.9/212.9	225/225	211/237	460/460	222.6/222.6	225/250	220/246	468/468	218.9/218.9	225/225	216/243	465/465	228.6/228.6	250/250	225/252	473/473
		MED	NONE	–	–	95.3/95.3	110/110	102/101	471	103.0/103.0	125/125	111/110	479	100.1/100.1	125/125	107/106	476	107.8/107.8	125/125	116/115	484
			279A00	18.8/25.0	52.1/60.1	111.3/111.3	125/125	102/102	471/471	120.9/120.9	125/125	111/111	479/479	117.3/117.3	125/125	107/108	476/476	126.9/126.9	150/150	116/117	484/484
			280A00	37.6/50.0	104.2/120.3	167.5/167.5	175/175	154/172	471/471	177.2/177.2	200/200	163/180	479/479	173.5/173.5	175/175	160/177	476/476	183.2/183.2	200/200	169/186	484/484
			281A00	56.3/75.0	156.4/180.4	216.5/216.5	225/250	214/241	471/471	226.2/226.2	250/250	223/250	479/479	222.5/222.5	225/250	220/246	476/476	232.2/232.2	250/250	229/255	484/484
		HIGH	NONE	–	–	98.8	125	106	467	106.5	125	115	475	103.6	125	111	472	111.3	125	120	480
			279A00	18.8/25.0	52.1/60.1	116.8/116.8	125/125	106/107	467/467	126.4/126.4	150/150	115/116	475/475	122.8/122.8	125/125	111/113	472/472	132.4/132.4	150/150	120/122	480/480
			280A00	37.6/50.0	104.2/120.3	171.9/171.9	175/175	158/177	467/467	181.6/181.6	200/200	167/186	475/475	177.9/177.9	200/200	164/182	472/472	187.6/187.6	200/200	173/191	480/480
			281A00	56.3/75.0	156.4/180.4	222.0/222.0	225/250	218/246	467/467	231.7/231.7	250/250	227/255	475/475	228.0/228.0	250/250	224/251	472/472	237.7/237.7	250/250	233/260	480/480
	460–3–60	STD	NONE	–	–	44.0	50	47	254	47.3	60	51	258	46.2	50	49	256	49.5	60	53	260
			282A00	25.0	30.1	52.9	60	49	254	57.0	60	52	258	55.6	60	51	256	59.8	60	55	260
			283A00	50.0	60.1	75.4	80	83	254	79.5	80	87	258	78.1	180	86	256	82.2	90	89	260
			284A00	75.0	90.2	105.5	110	118	254	109.6	125	122	258	108.2	125	120	256	112.3	125	124	260
		MED	NONE	–	–	45.5	50	49	259	48.8	60	52	263	47.7	60	51	261	51.0	60	55	265
			282A00	25.0	30.1	54.8	60	50	259	58.9	60	54	263	57.5	60	53	261	61.6	70	57	265
			283A00	50.0	60.1	77.2	80	85	259	81.4	90	89	263	80.0	80	87	261	84.1	90	91	265
			284A00	75.0	90.2	107.3	125	119	259	111.5	125	123	263	110.1	125	122	261	114.2	125	126	265
		HIGH	NONE	–	–	47.7	60	51	257	51.0	60	55	261	49.9	60	54	259	53.2	60	58	263
			282A00	25.0	30.1	57.5	60	53	257	61.6	70	57	261	60.3	70	55	259	64.4	70	59	263
			283A00	50.0	60.1	80.0	90	87	257	84.1	90	91	261	82.7	90	90	259	86.9	90	94	263
			284A00	75.0	90.2	110.1	125	122	257	114.2	125	126	261	112.8	125	125	259	117.0	125	128	263
	575–3–60	STD	NONE	–	–	35.2	40	38	193	38.5	45	42	197	36.9	45	40	195	40.2	45	43	199
			285A00	24.8	23.9	44.6	45	41	193	48.8	50	45	197	46.8	50	43	195	50.9	60	47	199
			286A00	49.6	47.7	74.4	80	68	193	78.5	80	72	197	76.5	80	70	195	80.6	90	74	199
			287A00	74.4	71.6	86.4	90	96	193	90.5	100	100	197	88.5	90	98	195	92.6	100	102	199
		MED	NONE	–	–	36.9	45	40	207	40.2	45	43	211	38.6	45	42	209	41.9	50	45	213
			285A00	24.8	23.9	46.8	50	43	207	50.9	60	47	211	48.9	50	45	209	53.0	60	49	213
			286A00	49.6	47.7	76.5	80	70	207	80.6	90	74	211	78.6	80	72	209	82.8	90	76	213
			287A00	74.4	71.6	88.5	90	98	207	92.6	100	102	211	90.6	100	100	209	94.7	100	104	213
		HIGH	NONE	–	–	38.3	45	41	205	41.6	50	45	209	40.0	45	43	207	43.3	50	47	211
			285A00	24.8	23.9	48.5	50	45	205	52.6	60	48	209	50.6	60	47	207	54.8	60	50	211
			286A00	49.6	47.7	78.3	80	72	205	82.4	90	76	209	80.4	90	74	207	84.5	90	78	211
			287A00	74.4	71.6	90.2	100	99	205	94.4	100	103	209	92.4	100	101	207	96.5	100	105	211

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 20 - 50HC - With Electric Heat, ERV, Factory-installed HACR Breaker and 2-Speed Indoor Fan Option (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer				w/ERV w/o Economizer				w/ERV w/Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **24	208/230–3–60	STD	NONE	–	–	119.6/119.6	150/150	129/128	583	119.6/119.6	150/150	129/128	583	124.4/124.4	150/150	134/133	588	124.4/124.4	150/150	134/133	588
			279A00	18.8/25.0	52.1/60.1	131.4/131.4	150/150	129/128	583/583	131.4/131.4	150/150	129/128	583/583	137.4/137.4	150/150	134/133	588/588	137.4/137.4	150/150	134/133	588/588
			280A00	37.6/50.0	104.2/120.3	187.7/187.7	200/200	173/190	583/583	187.7/187.7	200/200	173/190	583/583	193.7/193.7	200/200	178/196	588/588	193.7/193.7	200/200	178/196	588/588
			281A00	56.3/75.0	156.4/180.4	236.7/236.7	250/250	233/259	583/583	236.7/236.7	250/250	233/259	583/583	242.7/242.7	250/250	238/265	588/588	242.7/242.7	250/250	238/265	588/588
		MED	NONE	–	–	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
			279A00	18.8/25.0	52.1/60.1	136.9/136.9	150/150	133/133	579/579	136.9/136.9	150/150	133/133	579/579	142.9/142.9	150/150	138/138	584/584	142.9/142.9	150/150	138/138	584/584
			280A00	37.6/50.0	104.2/120.3	192.0/192.0	200/200	177/195	579/579	192.0/192.0	200/200	177/195	579/579	198.0/198.0	200/200	182/201	584/584	198.0/198.0	200/200	182/201	584/584
			281A00	56.3/75.0	156.4/180.4	242.2/242.2	250/250	237/264	579/579	242.2/242.2	250/250	237/264	579/579	248.2/248.2	250/250	242/270	584/584	248.2/248.2	250/250	242/270	584/584
		HIGH	NONE	–	–	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
			279A00	18.8/25.0	52.1/60.1	151.2/151.2	175/175	146/146	658/658	151.2/151.2	175/175	146/146	658/658	157.2/157.2	175/175	152/152	663/663	157.2/157.2	175/175	152/152	663/663
			280A00	37.6/50.0	104.2/120.3	206.3/206.3	225/225	190/208	658/658	206.3/206.3	225/225	190/208	658/658	212.3/212.3	225/225	195/214	663/663	212.3/212.3	225/225	195/214	663/663
			281A00	56.3/75.0	156.4/180.4	256.4/256.4	300/300	250/277	658/658	256.4/256.4	300/300	250/277	658/658	262.4/262.4	300/300	255/283	663/663	262.4/262.4	300/300	255/283	663/663
	460–3–60	STD	NONE	–	–	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
			282A00	25.0	30.1	63.3	70	66	295	63.3	70	66	295	66.1	80	69	297	66.1	80	69	297
			283A00	50.0	60.1	85.8	90	93	295	85.8	90	93	295	88.6	90	95	297	88.6	90	95	297
			284A00	75.0	90.2	115.9	125	127	295	115.9	125	127	295	118.7	125	130	297	118.7	125	130	297
		MED	NONE	–	–	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
			282A00	25.0	30.1	66.1	80	69	293	66.1	80	69	293	68.8	80	71	295	68.8	80	71	295
			283A00	50.0	60.1	88.6	90	95	293	88.6	90	95	293	91.3	100	98	295	91.3	100	98	295
			284A00	75.0	90.2	118.7	125	130	293	118.7	125	130	293	121.4	125	132	295	121.4	125	132	295
		HIGH	NONE	–	–	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
			282A00	25.0	30.1	73.2	80	75	333	73.2	80	75	333	76.0	80	78	335	76.0	80	78	335
			283A00	50.0	60.1	95.7	100	102	333	95.7	100	102	333	98.4	100	104	335	98.4	100	104	335
			284A00	75.0	90.2	125.8	150	136	333	125.8	150	136	333	128.5	150	139	335	128.5	150	139	335
	575–3–60	STD	NONE	–	–	50.2	60	54	219	50.2	60	54	219	51.9	60	56	221	51.9	60	56	221
			285A00	24.8	23.9	55.3	60	54	219	55.3	60	54	219	57.5	60	56	221	57.5	60	56	221
			286A00	49.6	47.7	85.1	90	78	219	85.1	90	78	219	87.2	90	80	221	87.2	90	80	221
			287A00	74.4	71.6	97.1	100	106	219	97.1	100	106	219	99.2	100	108	221	99.2	100	108	221
		MED	NONE	–	–	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
			285A00	24.8	23.9	57.1	60	56	217	57.1	60	56	217	59.2	60	58	219	59.2	60	58	219
			286A00	49.6	47.7	86.8	90	80	217	86.8	90	80	217	89.0	90	82	219	89.0	90	82	219
			287A00	74.4	71.6	98.8	100	107	217	98.8	100	107	217	100.9	110	109	219	100.9	110	109	219
		HIGH	NONE	–	–	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
			285A00	24.8	23.9	59.5	60	58	244	59.5	60	58	244	61.6	70	60	246	61.6	70	60	246
			286A00	49.6	47.7	89.2	90	82	244	89.2	90	82	244	91.3	100	84	246	91.3	100	84	246
			287A00	74.4	71.6	101.2	110	110	244	101.2	110	110	244	103.3	110	112	246	103.3	110	112	246

See: “Legend and Notes for Tables 13 – 20 on page 53

APPENDIX C — ELECTRICAL DATA

Table 20 - 50HC - With Electric Heat, ERV, Factory-installed HACR Breaker and 2-Speed Indoor Fan Option (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer				w/ERV w/o Economizer				w/ERV w/Economizer			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **28	208/230–3–60	STD	NONE	–	–	148.3/148.3	175/175	157/156	623	148.3/148.3	175/175	157/156	623	153.1/153.1	200/200	162/161	628	153.1/153.1	200/200	162/161	628
			279A00	18.8/25.0	52.1/60.1	148.3/148.3	175/175	157/156	623/623	148.3/148.3	175/175	157/156	623/623	153.1/153.1	200/200	162/161	628/628	153.1/153.1	200/200	162/161	628/628
			280A00	37.6/50.0	104.2/120.3	187.7/187.7	200/200	173/190	623/623	187.7/187.7	200/200	173/190	623/623	193.7/193.7	200/200	178/196	628/628	193.7/193.7	200/200	178/196	628/628
			281A00	56.3/75.0	156.4/180.4	236.7/236.7	250/250	233/259	623/623	236.7/236.7	250/250	233/259	623/623	242.7/242.7	250/250	238/265	628/628	242.7/242.7	250/250	238/265	628/628
		MED	NONE	–	–	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
			279A00	18.8/25.0	52.1/60.1	151.8/151.8	175/175	161/161	619/619	151.8/151.8	175/175	161/161	619/619	156.6/156.6	200/200	166/166	624/624	156.6/156.6	200/200	166/166	624/624
			280A00	37.6/50.0	104.2/120.3	192.0/192.0	200/200	177/195	619/619	192.0/192.0	200/200	177/195	619/619	198.0/198.0	200/200	182/201	624/624	198.0/198.0	200/200	182/201	624/624
			281A00	56.3/75.0	156.4/180.4	242.2/242.2	250/250	237/264	619/619	242.2/242.2	250/250	237/264	619/619	248.2/248.2	250/250	242/270	624/624	248.2/248.2	250/250	242/270	624/624
		HIGH	NONE	–	–	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
			279A00	18.8/25.0	52.1/60.1	163.2/163.2	200/200	174/174	698/698	163.2/163.2	200/200	174/174	698/698	168.0/168.0	200/200	179/179	703/703	168.0/168.0	200/200	179/179	703/703
			280A00	37.6/50.0	104.2/120.3	206.3/206.3	225/225	190/208	698/698	206.3/206.3	225/225	190/208	698/698	212.3/212.3	225/225	195/214	703/703	212.3/212.3	225/225	195/214	703/703
			281A00	56.3/75.0	156.4/180.4	256.4/256.4	300/300	250/277	698/698	256.4/256.4	300/300	250/277	698/698	262.4/262.4	300/300	255/283	703/703	262.4/262.4	300/300	255/283	703/703
	460–3–60	STD	NONE	–	–	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			282A00	25.0	30.1	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			283A00	50.0	60.1	85.8	90	93	321	85.8	90	93	321	88.6	90	95	323	88.6	90	95	323
			284A00	75.0	90.2	115.9	125	127	321	115.9	125	127	321	118.7	125	130	323	118.7	125	130	323
		MED	NONE	–	–	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			282A00	25.0	30.1	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			283A00	50.0	60.1	88.6	90	95	319	88.6	90	95	319	91.3	100	98	321	91.3	100	98	321
			284A00	75.0	90.2	118.7	125	130	319	118.7	125	130	319	121.4	125	132	321	121.4	125	132	321
		HIGH	NONE	–	–	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			282A00	25.0	30.1	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			283A00	50.0	60.1	95.7	100	102	359	95.7	100	102	359	98.4	100	104	361	98.4	100	104	361
			284A00	75.0	90.2	125.8	150	136	359	125.8	150	136	359	128.5	150	139	361	128.5	150	139	361
	575–3–60	STD	NONE	–	–	55.1	60	59	243	55.1	60	59	243	56.8	70	61	245	56.8	70	61	245
			285A00	24.8	23.9	55.3	60	59	243	55.3	60	59	243	57.5	70	61	245	57.5	70	61	245
			286A00	49.6	47.7	85.1	90	78	243	85.1	90	78	243	87.2	90	80	245	87.2	90	80	245
			287A00	74.4	71.6	97.1	100	106	243	97.1	100	106	243	99.2	100	108	245	99.2	100	108	245
		MED	NONE	–	–	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
			285A00	24.8	23.9	57.1	70	61	241	57.1	70	61	241	59.2	70	63	243	59.2	70	63	243
			286A00	49.6	47.7	86.8	90	80	241	86.8	90	80	241	89.0	90	82	243	89.0	90	82	243
			287A00	74.4	71.6	98.8	100	107	241	98.8	100	107	241	100.9	110	109	243	100.9	110	109	243
		HIGH	NONE	–	–	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270
			285A00	24.8	23.9	59.5	70	63	268	59.5	70	63	268	61.6	70	65	270	61.6	70	65	270
			286A00	49.6	47.7	89.2	90	82	268	89.2	90	82	268	91.3	100	84	270	91.3	100	84	270
			287A00	74.4	71.6	101.2	110	110	268	101.2	110	110	268	103.3	110	112	270	103.3	110	112	270

See: “Legend and Notes for Tables 13 – 20 on page 53

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Replaces: ERV1–01SI

ENERGYX UNIT START-UP CHECKLIST

(To be used in conjunction with base Rooftop Unit Start-Up Checklist. Remove and Store in Job File)

RTU MODEL NO.:_____ RTU SERIAL NO.:_____

ERV MODEL NO.:_____ ERV SERIAL NO.:_____

DATE:_____ TECHNICIAN:_____

I. PRE-START-UP (insert checkmark in box as each item is completed)

- ☐ VERIFY THAT ALL PACKAGING MATERIALS HAVE BEEN REMOVED FROM UNIT
- ☐ VERIFY INSTALLATION OF OUTDOOR AIR HOODS
- ☐ CHECK THAT AIR FILTERS ARE CLEAN AND IN PLACE ON SUPPLY AND EXHAUST OF ERV WHEEL
- ☐ CHECK THAT OUTDOOR AIR INLET SCREENS ARE IN PLACE
- ☐ VERIFY CONFIGURAITON VALUES FOR ELECTRONIC CONTROLS

II. START-UP (REFER TO UNIT SERVICE/MAINTENANCE MANUAL FOR START-UP INSTRUCTIONS)

ELECTRICAL

SUPPLY VOLTAGE*	L1-L2_____	L2-L3_____	L3-L1_____
ERV SUPPLY FAN-1 AMPS	L1-L2_____	L2-L3_____	L3-L1_____
ERV SUPPLY FAN-2 AMPS	L1-L2_____	L2-L3_____	L3-L1_____
ERV EXHAUST FAN-1 AMPS	L1-L2_____	L2-L3_____	L3-L1_____
ERV EXHAUST FAN-2 AMPS	L1-L2	L2-L3	L3-L1

*Distribution Block on 575v units will be 460v

TEMPERATURES

OUTDOOR-AIR TEMPERATURE (OAT) _____F dB (Dry Bulb)

RETURN-AIR TEMPERATURE (SPT or RAT) _____F dB/F wB (Dry Bulb/Wet Bulb)

ERV INTAKE LEAVING AIR TEMPERATURE (LAT) _____F

ERV EXHAUST AIR TEMPERATURE (EXAT) _____F

GENERAL

- ☐ COMFORTLINK MINIMUM DAMPER POSITION SET TO “0”
- ☐ ERV MINIMUM VENTILATION POSITION PER JOB REQUIREMENTS
- ☐ VERIFY ENERGY RECOVERY WHEEL IS ROTATING
- ☐ VERIFY SUPPLY AND EXHAUST BLOWER FANS ROTATING IN PROPER DIRECTION
- ☐ VERIFY ALL EXTERNAL PANELS FULLY SHUT AND LATCHED
- ☐ VERIFY NO ACTIVE ALARMS
- ☐ FOLLOW ALL ACCESSORY START-UP PROCEDURES

III. CONFIGURATION (Used in conjunction with Base Unit start-up configurations)

Minimum DCV Outside Air CFM (DCV.M) _____

Minimum Outside Air CFM (OA.MN) _____

Exhaust Air Offset CFM (PE.OF) _____

Building Pressure Setpoint (BP.SP) _____

Frost Protection Dial Setpoint _____

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