

50LC*B WeatherExpert® Series
Ultra High Efficient
Single Package Multi Zone VAV Rooftop
Cooling Only with Optional Electric Heat
Sizes: 14–26, with Puron® (R-410A) Refrigerant
12.5 – 23 Ton



Advanced Product Data



Unit shown with economizer and power exhaust

C14120

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50LC*B

Carrier’s new Multi Zone – Variable Air Volume (MZ-VAV) Electric Heat / Electric Cooling WeatherExpert® 12.5 to 23 ton Package Rooftop models are designed to help provide total low cost of ownership by providing some of the highest cooling efficiencies in the industry with low installed costs, low maintenance costs, and high reliability. These MZ-VAV models not only provide comfort control to multi zone applications but also provides high IEER’s (Integrated Energy Efficiency Ratios) which are a measurement of cooling part load performance and where actual buildings operate nearly all of the time. These high part load values are achieved by using Carrier’s strategically designed compressor staging, indoor fan motor and condenser fan motor speed control. These models are in addition to the 6 to 10 ton MZ-VAV models with IEERs up to 21.0 to provide a full range offering.

Ultra high efficiency:

With IEER’s up to 19.3, these new WeatherExpert MZ-VAV models well exceed the latest efficiency standards for ASHRAE 90.1, Energy Star, and exceeds Consortium for Energy Efficiency (CEE) Tier 2 performance criteria. These models help to contribute in LEED credits and help qualify for rebates. The high IEER efficiencies are achieved by utilizing a proven staged compressor design on a single refrigerant circuit that provides three stages of cooling capacity control. The indoor fan motors are high efficiency belt drive and controlled by a VFD (Variable Frequency Drive) that adjusts speed based on the duct static pressure sensor and also match cooling capacity stages for optimum comfort and efficient control. Models also have multi heat capacities.

Easy to install:

Units are designed for dedicated factory- supplied vertical or horizontal air flow duct configuration. No special field kits are required. Designed to fit on pre- installed curbs by another manufacturer, these units also fit on past designed Carrier installed curbs with an authorized adapter curb. The cabinet design also integrates a large control box that gives you room to work and room to mount Carrier accessory controls.

Easy to maintain:

Easy access door handles by Carrier provide quick access to all normally serviced components. Our “no-strip” screw system has superior holding power and guides screws into position while preventing the screw from stripping the unit’s metal. Units come with accessible 2 inch filter that have a dedicate access door for easy replacement. Optional hinged panels allow easy access with pull tabs and quarter turn latches. Units come with installed supply air temperature sensor, return air temperature sensor, outdoor air temperature sensor and duct static pressure sensor located in the control box for remote positioning in the field.

Reliable:

Carrier conducts rigorous testing to ensure your unit will perform as designed. Extensive rain testing is conducted in special designed test areas and under conditions that simulate actual job sites. In addition, units are both shake tested and driven around the country to make sure not only the packaging holds up, but the unit components within. Condensate pans are made of non corrosive – composite material, motors are permanently lubricated and compressors use crankcase heaters, all to further strengthen the units reliability.

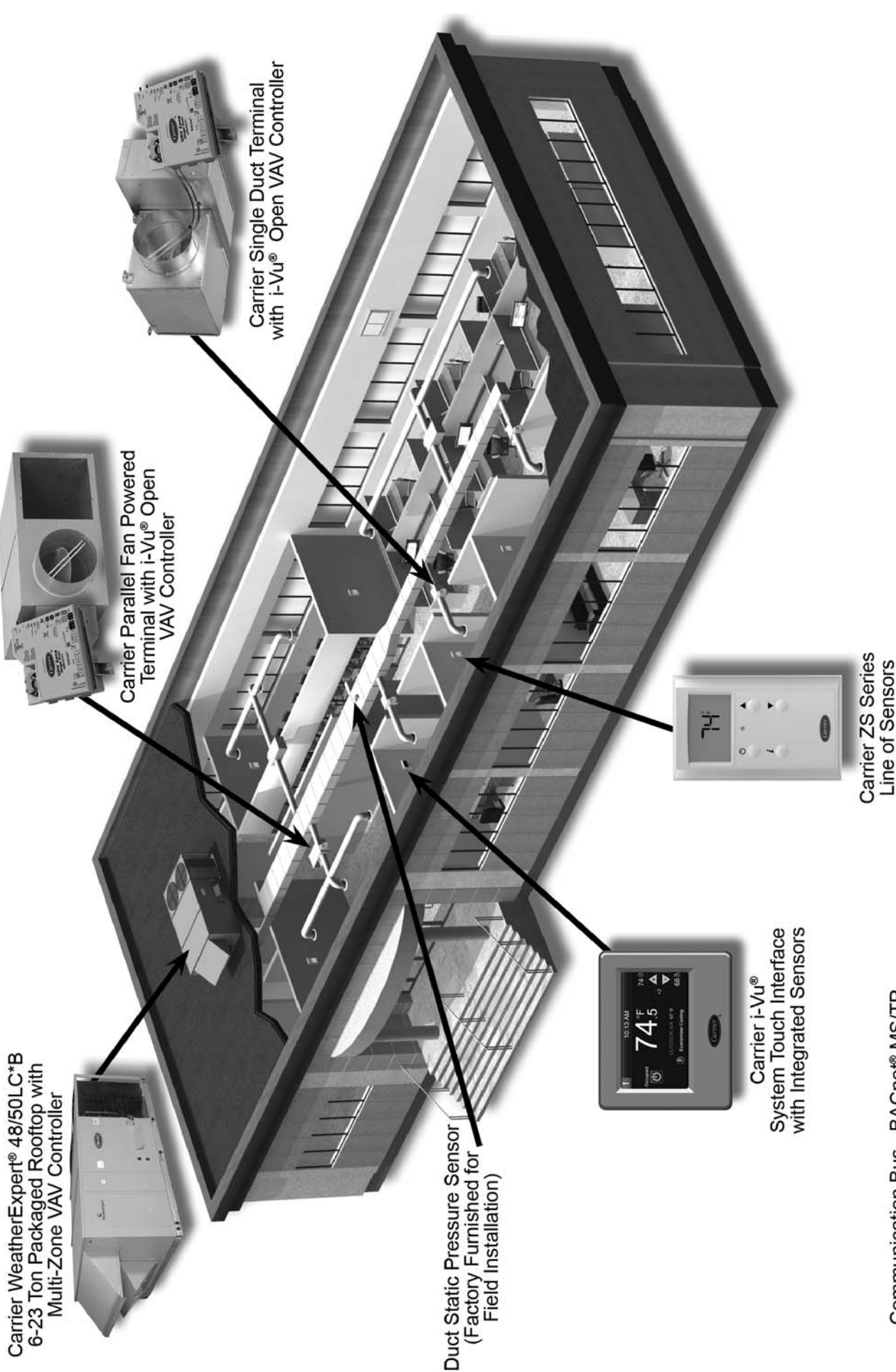


UNIT FEATURES

- Three stage cooling capacity control with staged scroll compressors design. Each stage is different in capacity output to better match typical building load profiles. Cooling capacity turndown to 25%
- Single refrigerant circuit design with precision sized multi TXV refrigerant metering devices to provide optimum operation through the entire operating range.
- Single fully activated faced evaporator coil for full surface utilization, even at part load operation. This allows for better dehumidification than split face coils and helps eliminate the need for additional dehumidification packages.
- Integrated economizer in either standard low leak or ultra-low leak versions to properly help supplement compressor unloading in all operating conditions
- Crankcase heater on each compressor designed to cycle off during the on cycle.
- IEER up to 19.3 and EER's up to 12.6.
- High efficient permanently lubricated belt driven evaporator-fan motor with VFD (Variable Frequency Drive) controller.
- VAV-RTU Open controller provides:
 - Integrated system control to required Carrier i-Vu[®] VAV zoning controls for single duct and fan terminals using BACnet[®] MS/TP protocol.
 - Unit control of all stages of cooling in order to maintain the desired supply air temperature setting
 - Supply Air temperature control including reset algorithm will calculate a proportional reset value between occupied cooling setpoint and 1 degree F above the occupied heating setpoint. The amount of reset is user configurable.
 - Control for morning warm-up cycle the first time of transition from unoccupied to occupied periods.
 - Provide linkage from the RTU to the VAV zones in morning warm up cycle to ensure sufficient airflow while in the heating mode.
 - Provide optional selected "occupied" heating which will allow heating whenever required during the occupied period.
 - Configurable setpoint differential between heating and cooling to prevent the unit from prematurely entering the opposite mode.
 - The ability to utilize outdoor air for maintaining the supply air setpoint by using the Outdoor Air temperature average zone temperature
 - BACnet test points to activate specific test models that can be used to commission the rooftop and the system. Tests shall include Fan test, Heat test, cooling test, power exhaust test, and economizer test
 - Linkage to required Carrier i-Vu[®] VAV zoning controls for single duct and fan terminals using BACnet[®] MS/TP protocol
 - Standalone BACnet MS/TP or BAS network capabilities
 - Two economizer minimum position settings to accommodate both minimum and maximum air flow settings
 - Indoor fan motor modulation
 - Field and factory wiring connections
 - Outdoor fan motor staging
 - Crank case heater control
- Sound levels as low as 84 dB.
- Non-corrosive composite condensate pan in accordance with ASHRAE 62 Standard, sloping design; side or bottom drain.
- Single point electrical connections
- Pre-painted exterior panels and primer-coated interior panels tested to 500 hours salt spray protection.
- Fully insulated with foil faced insulation throughout the entire cabinet.
- High ambient cooling operation and ratings up to 125°F (52°C).
- Low ambient mechanical cooling operation down to 45°F (7°C). An economizer shall be the source of cooling in low ambient conditions. When the outside air temperature is below 45°F (7°C), to improve system reliability, reduce energy usage, and improve system efficiency: mechanical cooling shall not be utilized.

UNIT FEATURES (cont.)

- Access panels with easy grip handles.
- Innovative , easy starting, no-strip screw feature on unit access panels.
- Two-inch disposable return air filters.
- Tool-less filter access door.
- Dedicated vertical and horizontal airflow models available ordered as factory option. No special kits required.
- Provisions for thru-the-bottom power entry capability as standard.
- Full perimeter base rail with built-in rigging adapters and fork truck slots.
- 24-volt control circuit protected with resettable circuit breaker.
- Totally enclosed high efficient ECM outdoor fan motor with permanently lubricated bearings.
- Low Pressure switch and high-pressure switch protection.
- Evaporator coil freeze protection
- High capacity liquid line filter drier.
- Standard Limited Parts Warranty: 5 yr. electric heat, 5 yr. compressor, 1 yr. parts.



Carrier WeatherExpert® 48/50LC*B
6-23 Ton Packaged Rooftop with
Multi-Zone VAV Controller

Carrier Parallel Fan Powered
Terminal with i-Vu® Open
VAV Controller

Carrier Single Duct Terminal
with i-Vu® Open VAV Controller

Duct Static Pressure Sensor
(Factory Furnished for
Field Installation)

Carrier i-Vu®
System Touch Interface
with Integrated Sensors

Carrier ZS Series
Line of Sensors

Communication Bus - BACnet® MS/TP

Fig. 1 - Typical VAV RTU-Open System Layout and Components

MODEL NUMBER NOMENCLATURE

Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Example:	5	0	L	C	0	B	2	4	A	1	A	5	-	1	N	0	A	0

Unit Heat Type

50 - Electric Heat
Packaged Rooftop

Model Series - WeatherExpert®

LC - Ultra High Efficiency

Electric Heat Options

0 = Standard, No Electric Heat
D = Low Electric Heat
E = Medium Electric Heat
F = High Electric Heat

Refrigerant System

B = Three stage cooling capacity control
with multi-zone VAV operation

Cooling Tons

14 - 12.5 ton
17 - 15 ton
20 - 17.5 ton
24 - 20 ton
26 - 23 ton

Sensor Options

A = None
B = RA Smoke Detector
C = SA Smoke Detector
D = RA + SA Smoke Detector
E = CO₂
F = RA Smoke Detector and CO₂
G = SA Smoke Detector and CO₂
H = RA + SA Smoke Detector and CO₂

Indoor Fan Motor Options

1 = Standard Static / Vertical Supply, Return Air Flow
2 = Medium Static / Vertical Supply, Return Air Flow
3 = High Static / Vertical Supply, Return Air Flow
4 = Ultra High Static / Vertical Supply, Return Air Flow
5 = Standard Static / Horizontal Supply, Return Air Flow
6 = Medium Static / Horizontal Supply, Return Air Flow
7 = High Static / Horizontal Supply, Return Air Flow
8 = Ultra High Static / Horizontal Supply, Return Air Flow

Coil Options: Fin/Tube (Condenser- Evaporator - Hail Guard)

A = Al/Cu - Al/Cu
B = Precoat Al/Cu - Al/Cu
C = E-coat Al/Cu - Al/Cu
D = E-coat Al/Cu - E-coat Al/Cu
E = Cu/Cu - Al/Cu
F = Cu/Cu - Cu/Cu
M = Al/Cu -Al/Cu — Louvered Hail Guard
N = Precoat Al/Cu - Al/Cu — Louvered Hail Guard
P = E-coat Al/Cu - Al/Cu — Louvered Hail Guard
Q = E-coat Al/Cu - E-coat Al/Cu — Louvered Hail Guard
R = Cu/Cu - Al/Cu — Louvered Hail Guard
S = Cu/Cu - Cu/Cu — Louvered Hail Guard

Packaging

0 = Standard
1 = LTL

Electrical Options

A = None
B = HACR Circuit Breaker
C = Non-Fused Disconnect

Service Options

0 = None
1 = Unpowered Convenience Outlet
2 = Powered Convenience Outlet
3 = Hinged Panels
4 = Hinged Panels and
Unpowered Convenience Outlet
5 = Hinged Panels and
Powered Convenience Outlet

Intake / Exhaust Options (required on each unit)

B = Temperature Standard Leak Economizer
with Barometric Relief
C = Temperature Standard Leak Economizer
with Centrifugal Power Exhaust - Vertical Only
E = Enthalpy Standard Leak Economizer
with Barometric Relief
F = Enthalpy Standard Leak Economizer
with Centrifugal Power Exhaust - Vertical Only
N = Temperature Ultra Low Leak Economizer
with Barometric Relief
P = Temperature Ultra Low Leak Economizer
with Centrifugal Power Exhaust - Vertical Only
R = Enthalpy Ultra Low Leak Economizer
with Barometric Relief
S = Enthalpy Ultra Low Leak Economizer
with Centrifugal Power Exhaust - Vertical Only

Base Unit Controls

1 = VAV-RTU Open Controller
(required on each model)

Design Revision

- = Factory Design Revision

Voltage

1 = 575/3/60
5 = 208-230/3/60
6 = 460/3/60

NOTE: Not all possible options can be displayed above. Refer to other support material or your local Carrier Expert

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Table 1 – FACTORY-INSTALLED OPTIONS AND FIELD-INSTALLED ACCESSORIES

CATEGORY	ITEM	FACTORY INSTALLED OPTION	FIELD INSTALLED ACCESSORY
Cabinet	Hinged access panels	X	
Coil Options	Cu/Cu indoor and/or outdoor coils	X	
	Pre-coated outdoor coils	X	
	Premium, E-coated outdoor coils	X	
Condenser Protection	Condenser coil hail guard (louvered design)	X	X
Controls	VAV-RTU Open	Required	
	Smoke detector (supply and/or return air)	X	
	Time Guard II compressor delay control circuit		X
	Phase Monitor		X
	i-Vu® Equipment Touch; Carrier brand 4.3" color touch screen zone sensor and local user interface for a single Open (BACnet MS/TP) equipment controller. Includes built-in temperature and humidity sensor.		X
	i-Vu System Touch; Carrier brand 4.3" color touch screen user interface connects to a network of up to 60 Open (BACnet MS/TP) equipment controllers. Includes built-in temperature and humidity sensor.		X
Economizers & Outdoor Air Dampers	EconoMiSer 2 for VAV-RTU Open controls, complies with FDD. (Standard and Ultra Low Leak air damper models) ⁶	Required	
	Barometric relief ¹	X	X
	Power exhaust (Prop design)		X
Economizer Sensors & IAQ Devices	Single dry bulb temperature sensors ²	X	X
	Differential dry bulb temperature sensors ²		X
	Single enthalpy sensors ²	X	X
	Differential enthalpy sensors ²		X
	CO ₂ sensor (wall, duct, or unit mounted) ²	X	X
Zone Air Terminal Sensors	Full range of Carrier zone air terminal space sensors are available with capabilities of combining: Space temperature, sensors with communication ports, sensors with CO ₂ sensing, sensors with LCD display, sensors with local override and indicating light.		X
VAV Zone Air Terminals	A full range of zone air terminals shall be a i-Vu VAV Zone Single Duct and Fan Terminal type for optimum integrated system solution. This includes: <ul style="list-style-type: none"> • 35E – Single Duct Air Terminals • 45J – Series Fan Powered Air Terminals • 45K – Quiet Series Fan Powered Air Terminals • 45M – Parallel Fan Powered Air Terminals • 45N – Quiet Parallel Fan Powered Air Terminals • 45Q – Low Profile Series Fan Powered Air Terminals • 45R – Low Profile Parallel Fan Powered Air Terminals • 35J – Single Duct Retrofit Air Terminals 		X
Electric Heat	Electric Resistance Heaters	X	X
	Single Point Kit	X	X
Indoor Motor & Drive	Multiple motor and drive packages	X	
Power Options	Convenience outlet (powered)	X	
	Convenience outlet (unpowered)	X	
	HACR Circuit Breaker ^{3, 5}	X	
	Non-fused disconnect ⁴	X	
Roof Curbs	Roof curb 14-in (356mm)		X
	Roof curb 24-in (610mm)		X

NOTES:

1. Included with economizer.
2. Sensors used to optimize economizer performance.
3. On 575V applications, HACR breaker can only be used with WYE power distribution systems. Using on Delta power distribution systems is prohibited.
4. On 208/230-460 units with FIOP Non-Fused Disconnect, and Single Point Box accessory may be required. Refer to Electric Heat-Electrical Data Table for more information.
5. When selecting a factory installed HACR breaker or non-fused disconnect, note they are sized for the unit as ordered from the factory. The sizing of these do not accommodate any field items such as power exhaust devices etc.
6. FDD – (Fault Detection and Diagnostic) capability per California Title 24 section 120.2.

FACTORY OPTIONS AND/OR ACCESSORIES

Economizer (Standard on all models)

Economizers save energy, money and improve comfort levels in the conditioned space. They bring in fresh, outside air for ventilation; and provide cool outside air to cool your building. This also is the preferred method of low ambient cooling. When integrated with CO₂ sensors, economizers can provide even more savings by coupling the ventilation air to only that amount required based on space occupancy.

Economizers are available, installed and tested by the factory, with either enthalpy or temperature dry-bulb inputs. Additional sensors are available as accessories to optimize the economizer.

Economizers include gravity controlled barometric relief that helps equalize building pressure and ambient air pressures. This can be a cost effective solution to prevent building pressurization. Economizers are available in Ultra Low Leak and standard low leak versions.

Ultra Low Leak Economizer

This meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (3 cfm/ft²@1" wg exterior air, 4 cfm/ft²@1" wg return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief.

Fault Detection & Diagnostics (FDD)

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements

CO₂ Sensor

Improves productivity and saves money by working with the economizer to intake only the correct amount of outside air for ventilation. As occupants fill your building, the CO₂ sensor detects their presence through increasing CO₂ levels, and opens the economizer appropriately.

When the occupants leave, the CO₂ levels decrease, and the sensor appropriately closes the economizer. This intelligent control of the ventilation air, called Demand Control Ventilation (DCV) reduces the overall load on the rooftop, saving money.

Smoke Detectors

Trust the experts. Smoke detectors make your application safer and your job easier. Carrier smoke detectors immediately shut down the rooftop unit when smoke is detected. They are available, installed by the factory, for supply air, return air, or both.

Louvered Hail Guards

Sleek, louvered panels protect the condenser coil from hail damage, foreign objects, and incidental contact.

Convenience Outlet (powered or un-powered)

Reduce service and/or installation costs by including a convenience outlet in your specification. Carrier will install this service feature at our factory. Provides a convenient, 15 amp, 115v GFCI receptacle with "Wet in Use" cover. The "powered" option allows the installer to power the outlet from the line side of the disconnect or load side as required by code. The "unpowered" option is to be powered from a separate 115/120v power source.

Non-fused Disconnect

This OSHA-compliant, factory-installed, safety switch allows a service technician to locally secure power to the rooftop.

When selecting a factory installed non-fused disconnect, note they are sized for the unit as ordered from the factory. The sizing of these do not accommodate any field items such as power exhaust devices etc.

Power Exhaust

Superior internal building pressure control. This field-installed accessory may eliminate the need for costly, external pressure control fans coordinating with economizer position and supply fan system airflow.

Time Guard II Control Circuit

This accessory protects your compressor by preventing short-cycling in the event of some other failure, prevents the compressor from restarting for 30 seconds after stopping. Not required if built into the building management system.

Hinged Access Panels

Allows access to unit's major components with specifically designed hinged access panels. Panels are: filter, control box, fan motor and compressor. Comes with quarter turn latches and lift tabs.

Alternate Motors and Drives

Some applications need larger horsepower motors, some need more airflow, and some need both. Regardless of the case, your Carrier expert has a factory installed combination to meet your application. A wide selection of motors and pulleys (drives) are available, factory installed, to handle nearly any application.

Thru-the-Base Connections

Thru-the-base connections, available as either an accessory or as a factory option, are necessary to ensure proper connection and seal when routing wire and piping through the rooftop's basepan and curb. These couplings eliminate roof penetration and should be considered for main power lines, as well as control power.

Electric Heaters

Carrier offers a full-line of field-installed accessory heaters. The heaters are very easy to use, install and are all pre-engineered and certified.

FACTORY OPTIONS AND/OR ACCESSORIES (cont.)

HACR Breaker

These manual reset devices provide overload and short circuit protection for the unit. Factory wired and mounted with the units with access cover to help provide environment protection.

When selecting a factory installed Non-fused disconnect, note they are sized for the unit as ordered from the factory. The sizing of these do not accommodate any field items such as power exhaust devices etc.

On 575V applications, HACR breaker can only be used with WYE power distribution systems. Use on Delta power distribution systems is prohibited.

Zone Terminal Sensors

A full range of Carrier zone air terminal space sensors are available with capabilities of combining:

- Space temperature sensing
- Sensors with communication ports
- Sensors with CO₂ sensing
- Sensors with LCD display
- Sensors with local override and indicating light
- Sensors with Humidity sensing

Plus compatibility with:

- i-Vu[®] Equipment Touch; Carrier brand 4.3” color touch screen zone sensor and local user interface for a single Open (BACnet MS/TP) equipment controller. Includes built-in temperature and humidity sensor.
- i-Vu System Touch; Carrier brand 4.3” color touch screen user interface connects to a network of up to 60 Open (BACnet MS/TP) equipment controllers. Includes built-in temperature and humidity sensor.

VAV Zone Air Terminals

A full range of zone air terminals shall be a i-Vu VAV Zone Single Duct and Fan Terminal type for optimum integrated system solution. This includes:

- 35E – Single Duct Air Terminals
- 45J – Series Fan Powered Air Terminals
- 45K – Quiet Series Fan Powered Air Terminals
- 45M – Parallel Fan Powered Air Terminals
- 45N – Quiet Parallel Fan Powered Air Terminals
- 45Q – Low Profile Series Fan Powered Air Terminals
- 45R – Low Profile Parallel Fan Powered Air Terminals
- 35J – Single Duct Retrofit Air Terminals

Table 2 – AHRI COOLING RATING TABLE

208V

50LC*B UNIT	COOLING STAGES	NOM. CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (KW)	EER	IEER
14	3	12.5	146.0	11.7	12.5	19.3
17	3	15	172.0	13.7	12.6	18.5
20	3	17.5	194.0	15.9	12.2	17.9
24	3	20	232.0	19.0	12.2	18.2
26	3	23	274.0	23.6	11.6	18.3

Table 3 – AHRI COOLING RATING TABLE

230/460/575V

50LC*B UNIT	COOLING STAGES	NOM. CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (KW)	EER	IEER
14	3	12.5	146.0	11.6	12.6	19.3
17	3	15	174.0	13.8	12.6	18.5
20	3	17.5	194.0	15.9	12.2	17.7
24	3	20	234.0	19.2	12.2	18.2
26	3	23	274.0	23.6	11.6	18.3

LEGEND

- Not Applicable
- AHRI - Air Conditioning, Heating and Refrigeration Institute Test Standard
- ASHRAE - American Society of Heating, Refrigerating and Air Conditioning, Inc.
- EER - Energy Efficiency Ratio
- IEER - Integrated Energy Efficiency Ratio

NOTES:

1. Rated in accordance with AHRI Standards.
2. Ratings are based on:
Cooling Standard: 80°F (27°C) db, 67°F (19°C) wb indoor air temp and 95°F (35°C) db outdoor air temp.
3. All 50LC*B units comply with ASHRAE 90.1 Energy Star and CEE Energy Standard for minimum IEER and EER requirements.
4. 50LC*B units comply with US Energy Policy Act. To evaluate code compliance requirements, refer to state and local codes.

Table 4 – COOLING MINIMUM - MAXIMUM AIRFLOW RATINGS

LC*B SIZE	COOLING STAGE	MAX CFM	MIN CFM	MAX OD AMBIENT TEMPERATURE ° F	MIN OD AMBIENT TEMPERATURE ° F
14	Stage-3	6250	2500	125°	40°
	Stage-2	3750	1500		
	Stage-1	2500	1000		
17	Stage-3	7500	3000	125°	40°
	Stage-2	4500	1900		
	Stage-1	3000	1250		
20	Stage-3	8750	3500	125°	40°
	Stage-2	5400	1600		
	Stage-1	4600	1400		
24	Stage-3	10000	4000	125°	40°
	Stage-2	5700	1950		
	Stage-1	4300	1550		
26	Stage-3	11250	4500	125°	40°
	Stage-2	8100	2400		
	Stage-1	6750	2100		

Table 5 – HEATING MINIMUM / MAXIMUM CFM TABLE

UNIT	MIN AIR FLOW (CFM)	MAX AIR FLOW (CFM)
50LC*B14	3,750	6,250
50LC*B17	4,500	7,500
50LC*B20	5,250	8,750
50LC*B24	6,000	10,000
50LC*B26	6,750	11,250

Table 6 – SOUND PERFORMANCE TABLE

50LC*B	Cooling Stages	OUTDOOR SOUND (dB) AT 60 HZ									
		A-Weighted	31.5	63	125	250	500	1000	2000	4000	8000
14	3	84	92.6	92.2	83.9	80.4	81.8	78.7	76.5	72.2	65.4
17	3	86	101.3	97.1	88.3	84.4	83.3	80.7	77.4	73.4	67.3
20	3	86	101.3	97.1	88.3	84.4	83.3	80.7	77.4	73.4	67.3
24	3	86	101.3	97.1	88.3	84.4	83.3	80.7	77.4	73.4	67.3
26	3	86	101.3	97.1	88.3	84.4	83.3	80.7	77.4	73.4	67.3

LEGEND

dB – Decibel

NOTES:

1. Outdoor sound data is measure in accordance with AHRI.
2. Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
3. A-weighted sound ratings filter out very high and very low frequencies, to better approximate the response of "average" human ear. A-weighted measurements for Carrier units are taken in accordance with AHRI.

Table 7 – PHYSICAL DATA

(COOLING)

12.5-23 TONS

		50LC*B14	50LC*B17	50LC*B20	50LC*B24	50LC*B26
Refrigeration System						
# Circuits / # Comp. / Type		1 / 2 / Scroll	1 / 2 / Scroll	1/2/Scroll	1 / 2 / Scroll	1 / 2 / Scroll
R-410a charge (lbs – oz)		32-0	33-6	35-6	40-10	43-4
Metering device		TXV	TXV	TXV	TXV	TXV
High–press. Trip / Reset (psig)		630 / 505	630 / 505	630 / 505	630 / 505	630 / 505
Low–press. Trip / Reset (psig)		54 / 117	54 / 117	54/117	54 / 117	54 / 117
Evap. Coil						
Material		Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al
Coil type		5/16" RTPF	5/16" RTPF	5/16" RTPF	5/16" RTPF	5/16" RTPF
Coil Length (in)		72	72	72	72	72
Coil Height (in)		44	52	52	52	52
Rows / FPI		4 /15	4 /15	4 /15	4 /15	4 /15
Total Face Area (ft ²)		22.0	26.0	26.0	26.0	26.0
Condensate drain conn. size		3/4"	3/4"	3/4"	3/4"	3/4"
Evap. fan and motor						
VERTICAL						
Standard Static	Motor Qty / Belt Qty / Drive type	1 / 1Belt	1 / 1Belt	1 / 1Belt	1 / 1Belt	1 / 1Belt
	Max BHP	2.9	2.9	2.9	7.4	7.4
	RPM range	498-676	498-676	555-753	583-717	651-818
	Motor Frame Size	56	56	56HZ	184T	184T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in)	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15 x 15
Medium Static	Motor Qty / Belt Qty / Drive type	1 / 1Belt	1 / 1Belt	1 / 1Belt	1 / 1Belt	1 / 1Belt
	Max BHP	4.9	7.4	7.4	7.4	9.9
	RPM range	682-861	651-818	707-888	707-888	804-970
	Motor Frame Size	145TZ	184T	184T	184T	213T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in)	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15x 15	15 x 15 / 15 x 15
High Static	Motor Qty / Belt Qty / Drive type	1 / 1Belt	1 / 1Belt	1 / 1Belt	1 / 1Belt	1 / 2Belt
	Max BHP	7.4	9.9	9.9	9.9	13.6
	RPM range	782-963	804-970	872-1053	872-1053	948-1190
	Motor Frame Size	184T	213T	213T	213T	215T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in)	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15 x 15
Ultra High Static	Motor Qty / Belt Qty / Drive type	1 / 1Belt	1 / 2Belt	1 / 2Belt	1 / 2Belt	N/A
	Max BHP (208/230/460/575v)	9.9	13.6	13.6	13.6	N/A
	RPM range	933-1113	948-1190	948-1190	1049-1291	N/A
	Motor Frame Size	213T	215T	215T	215T	N/A
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	N/A
	Fan Diameter (in)	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15 x 15	15 x 15 / 15 x 15	N/A

Table 8 – PHYSICAL DATA (cont.)

(COOLING)

12.5 - 23 TONS

		50LC*B14	50LC*B17	50LC*B20	50LC*B24	50LC*B26
Evap. fan and motor (cont.)						
HORIZONTAL						
Standard Static	Motor Qty / Belt Qty / Drive type	1 / 1 Belt	1 / 1 Belt	1 / 1 Belt	1 / 1 Belt	1 / 1 Belt
	Max BHP	2.9	2.9	2.9	7.4	7.4
	RPM range	498–676	498–676	555–753	583–717	707–888
	Motor Frame Size	56	56	56HZ	184T	184T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in)	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11
Medium Static	Motor Qty / Belt Qty / Drive type	1 / 1 Belt	1 / 1 Belt	1 / 1 Belt	1 / 1 Belt	1 / 1 Belt
	Max BHP	4.9	7.4	7.4	7.4	9.9
	RPM range	644–808	651–818	651–818	707–888	859–1026
	Motor Frame Size	184T	213T	213T	213T	213T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in)	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11
High Static	Motor Qty / Belt Qty / Drive type	1 / 1 Belt	1 / 1 Belt	1 / 1 Belt	1 / 1 Belt	1 / 2Belt
	Max BHP	7.4	9.9	9.9	9.9	13.6
	RPM range	707–888	804–970	804–970	872–1053	948–1190
	Motor Frame Size	184T	213T	213T	213T	215T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in)	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11
Ultra High Static	Motor Qty / Belt Qty / Drive type	1 / 1 Belt	1 / 2Belt	1 / 2Belt	1 / 2Belt	N/A
	Max BHP (208/230/460/575v)	9.9	13.6	13.6	13.6	N/A
	RPM range	872–1053	948–1190	948–1190	948–1190	N/A
	Motor frame size	213T	215T	215T	215T	N/A
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	N/A
	Fan Diameter (in)	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11	18 x 15 / 15 X 11	N/A
Cond. Coil 1						
	Material	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil type	5/16" RTPF	5/16" RTPF	5/16" RTPF	5/16" RTPF	5/16" RTPF
	Coil Length (in)	68	82	82	98	98
	Coil Height (in)	44	52	52	52	52
	Rows / FPI	2/18	2 / 18	2/18	2 / 18	2 / 18
	Total Face Area (ft2)	20.8	29.6	29.6	35.4	35.4
Cond. Coil 2						
	Material	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil type	5/16" RTPF	5/16" RTPF	5/16" RTPF	5/16" RTPF	5/16" RTPF
	Coil Length (in)	68	82	82	98	98
	Coil Height (in)	44	52	52	52	52
	Rows / FPI	2/18	2 / 18	2/18	2 / 18	2 / 18
	Total Face Area (ft ²)	20.8	29.6	29.6	35.4	35.4
Cond. fan / motor						
	Qty / Motor drive type	3 / direct	4 / direct	4 / direct	6 / direct	6 / Direct
	Motor HP / RPM	1/3 / 1000	1/3 / 1000	1/3 /1000	1/3 / 1000	1/3 /1000
	Fan diameter (in)	22	22	22	22	22
Filters						
	RA Filter # / size (in)	6 / 20 x 25 x 2	9 / 16x25x2	9 / 16x25x2	9 / 16x25x2	9 / 16x25x2
	OA inlet screen # / size (in)	4 / 16 x 25 x 1	4 / 16x25x1	4 / 16x25x1	4 / 16x25x1	4 / 16x25x1

UNIT 50LC	NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER***A00 VERT/HORZ	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXA00			
						NO C.O. or UNPWRD C.O.		w/PWRD C.O.	
						NO P.E.	w/ P.E. (pwrd fr/unit)	NO P.E.	w/ P.E. (pwrd fr/unit)
14	208/ 230-3-60	STD	302/305A00	15.0	11.3/13.8	-	-	-	-
			279/270A00	25.0	18.8/23.0	-	-	-	-
			309/312A00	50.0	37.6/45.9	056	056	056	056
		MED	302/305A00	15.0	11.3/13.8	-	-	-	-
			279/270A00	25.0	18.8/23.0	-	-	-	-
			309/312A00	50.0	37.6/45.9	056	056	056	056
		HIGH	302/305A00	15.0	11.3/13.8	-	-	-	-
			279/270A00	25.0	18.8/23.0	-	-	-	-
			309/312A00	50.0	37.6/45.9	056	056	056	056
		ULTRA HIGH	302/305A00	15.0	11.3/13.8	-	-	-	-
			279/270A00	25.0	18.8/23.0	-	-	-	056
			309/312A00	50.0	37.6/45.9	056	056	056	056
	460-3-60	STD	303/306A00	15.0	13.8	-	-	-	-
			282/273A00	25.0	23.0	-	-	-	-
			310/313A00	50.0	45.9	-	057	057	057
		MED	303/306A00	15.0	13.8	-	-	-	-
			282/273A00	25.0	23.0	-	-	-	-
			310/313A00	50.0	45.9	057	057	057	057
		HIGH	303/306A00	15.0	13.8	-	-	-	-
			282/273A00	25.0	23.0	-	-	-	-
			310/313A00	50.0	45.9	057	057	057	057
		ULTRA HIGH	303/306A00	15.0	13.8	-	-	-	-
			282/273A00	25.0	23.0	-	-	-	-
			310/313A00	50.0	45.9	057	057	057	057
	575-3-60	STD	304/307A00	15.0	13.8	-	-	-	-
			285/276A00	24.8	22.8	-	-	-	-
			311/314A00	49.6	45.6	-	057	-	057
		MED	304/307A00	15.0	13.8	-	-	-	-
			285/276A00	24.8	22.8	-	-	-	-
			311/314A00	49.6	45.6	-	057	-	057
HIGH		304/307A00	15.0	13.8	-	-	-	-	
		285/276A00	24.8	22.8	-	-	-	-	
		311/314A00	49.6	45.6	-	057	057	057	
ULTRA HIGH		304/307A00	15.0	13.8	-	-	-	-	
		285/276A00	24.8	22.8	-	-	-	-	
		311/314A00	49.6	45.6	057	057	057	057	

LEGEND

APP PWR – 208 / 230V / 460V / 575V

C.O. – Convenient outlet

IFM – Indoor fan motor

NOM PWR – 240V / 480V / 600V

P.E. – Power exhaust

PWRD – Powered convenient outlet

UNPWRD – Unpowered convenient outlet

UNIT 50LC	NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER***A00 VERT/HORZ	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXA00			
						NO C.O. or UNPWRD C.O.		w/PWRD C.O.	
						NO P.E.	w/ P.E. (pwrd fr/unit)	NO P.E.	w/ P.E. (pwrd fr/unit)
17	208/ 230-3-60	STD	279/270A00	25.0	18.8/23.0	-	-	-	-
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		MED	279/270A00	25.0	18.8/23.0	-	-	-	-
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		HIGH	279/270A00	25.0	18.8/23.0	-	-	-	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		ULTRA HIGH	279/270A00	25.0	18.8/23.0	-	056	056	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
	460-3-60	STD	282/273A00	25.0	23.0	-	-	-	-
			283/274A00	50.0	45.9	-	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		MED	282/273A00	25.0	23.0	-	-	-	-
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		HIGH	282/273A00	25.0	23.0	-	-	-	-
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		ULTRA HIGH	282/273A00	25.0	23.0	-	-	-	-
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
	575-3-60	STD	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	-	057	-	057
			287/278A00	74.4	68.3	057	057	057	057
		MED	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	-	057	057	057
			287/278A00	74.4	68.3	057	057	057	057
		HIGH	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	057	057	057	057
			287/278A00	74.4	68.3	057	057	057	057
		ULTRA HIGH	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	057	057	057	057
			287/278A00	74.4	68.3	057	057	057	057

LEGEND

APP PWR – 208 / 230V / 460V / 575V

C.O. – Convenient outlet

IFM – Indoor fan motor

NOM PWR – 240V / 480V / 600V

P.E. – Power exhaust

PWRD – Powered convenient outlet

UNPWRD – Unpowered convenient outlet

UNIT 50LC	NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER***A00 VERT/HORZ	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXA00			
						NO C.O. or UNPWRD C.O.		w/PWRD C.O.	
						NO P.E.	w/ P.E. (pwrd fr/unit)	NO P.E.	w/ P.E. (pwrd fr/unit)
20	208/ 230-3-60	STD	279/270A00	25.0	18.8/23.0	-	-	-	-
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		MED	279/270A00	25.0	18.8/23.0	-	-	-	-
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		HIGH	279/270A00	25.0	18.8/23.0	-	-	-	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		ULTRA HIGH	279/270A00	25.0	18.8/23.0	-	056	056	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
	460-3-60	STD	282/273A00	25.0	23.0	-	-	-	-
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		MED	282/273A00	25.0	23.0	-	-	-	-
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		HIGH	282/273A00	25.0	23.0	-	-	-	-
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		ULTRA HIGH	282/273A00	25.0	23.0	-	-	-	-
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
	575-3-60	STD	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	-	057	-	057
			287/278A00	74.4	68.3	057	057	057	057
		MED	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	-	057	057	057
			287/278A00	74.4	68.3	057	057	057	057
		HIGH	285/276A00	24.8	22.8	-	-	-	-
			286A/27700	49.6	45.6	057	057	057	057
			287/278A00	74.4	68.3	057	057	057	057
		ULTRA HIGH	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	057	057	057	057
			287/278A00	74.4	68.3	057	057	057	057

LEGEND

APP PWR – 208 / 230V / 460V / 575V

C.O. – Convenient outlet

IFM – Indoor fan motor

NOM PWR – 240V / 480V / 600V

P.E. – Power exhaust

PWRD – Powered convenient outlet

UNPWRD – Unpowered convenient outlet

UNIT 50LC	NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER***A00 VERT/HORZ	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXA00			
						NO C.O. or UNPWRD C.O.		w/PWRD C.O.	
						NO P.E.	w/ P.E. (pwrd fr/unit)	NO P.E.	w/ P.E. (pwrd fr/unit)
24	208/ 230-3-60	STD	279/270A00	25.0	18.8/23.0	-	-	-	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		MED	279A/27000	25.0	18.8/23.0	-	-	-	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		HIGH	279/270A00	25.0	18.8/23.0	-	056	-	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		ULTRA HIGH	279/270A00	25.0	18.8/23.0	056	056	056	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
	460-3-60	STD	282/273A00	25.0	23.0	-	057	-	057
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		MED	282/273A00	25.0	23.0	-	057	-	057
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		HIGH	282/273A00	25.0	23.0	-	057	057	057
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		ULTRA HIGH	282/273A00	25.0	23.0	057	057	057	057
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
	575-3-60	STD	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	-	057	057	057
			287/278A00	74.4	68.3	057	057	057	057
		MED	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	-	057	057	057
			287/278A00	74.4	68.3	057	057	057	057
		HIGH	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	057	057	057	057
			287/278A00	74.4	68.3	057	057	057	057
		ULTRA HIGH	285/276A00	24.8	22.8	-	-	-	-
			286/277A00	49.6	45.6	057	057	057	057
			287/278A00	74.4	68.3	057	057	057	057

LEGEND

APP PWR – 208 / 230V / 460V / 575V

C.O. – Convenient outlet

IFM – Indoor fan motor

NOM PWR – 240V / 480V / 600V

P.E. – Power exhaust

PWRD – Powered convenient outlet

UNPWRD – Unpowered convenient outlet

UNIT 50LC	NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER***A00 VERT/HORZ	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXA00			
						NO C.O. or UNPWRD C.O.		w/PWRD C.O.	
						NO P.E.	w/ P.E. (pwrd fr/unit)	NO P.E.	w/ P.E. (pwrd fr/unit)
26	208/ 230-3-60	STD	279/270A00	25.0	18.8/23.0	056	056	056	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		MED	279/270A00	25.0	18.8/23.0	056	056	056	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
		HIGH	279/270A00	25.0	18.8/23.0	056	056	056	056
			280/271A00	50.0	37.6/45.9	056	056	056	056
			281/272A00	75.0	56.3/68.9	056	056	056	056
	460-3-60	STD	282/273A00	25.0	23.0	057	057	057	057
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		MED	282/273A00	25.0	23.0	057	057	057	057
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
		HIGH	282/273A00	25.0	23.0	057	057	057	057
			283/274A00	50.0	45.9	057	057	057	057
			284/275A00	75.0	68.9	057	057	057	057
	575-3-60	STD	285/276A00	24.8	22.8	-	-	-	057
			286/277A00	49.6	45.6	-	057	057	057
			287/278A00	74.4	68.3	057	057	057	057
		MED	285/276A00	24.8	22.8	-	057	-	057
			286/277A00	49.6	45.6	057	057	057	057
			287/278A00	74.4	68.3	057	057	057	057
		HIGH	285/276A00	24.8	22.8	057	057	057	057
			286/277A00	49.6	45.6	057	057	057	057
			287/278A00	74.4	68.3	057	057	057	057

LEGEND

- APP PWR – 208 / 230V / 460V / 575V
- C.O. – Convenient outlet
- IFM – Indoor fan motor
- NOM PWR – 240V / 480V / 600V
- P.E. – Power exhaust
- PWRD – Powered convenient outlet
- UNPWRD – Unpowered convenient outlet

UNIT: DIMENSIONS, WEIGHTS & CURBS

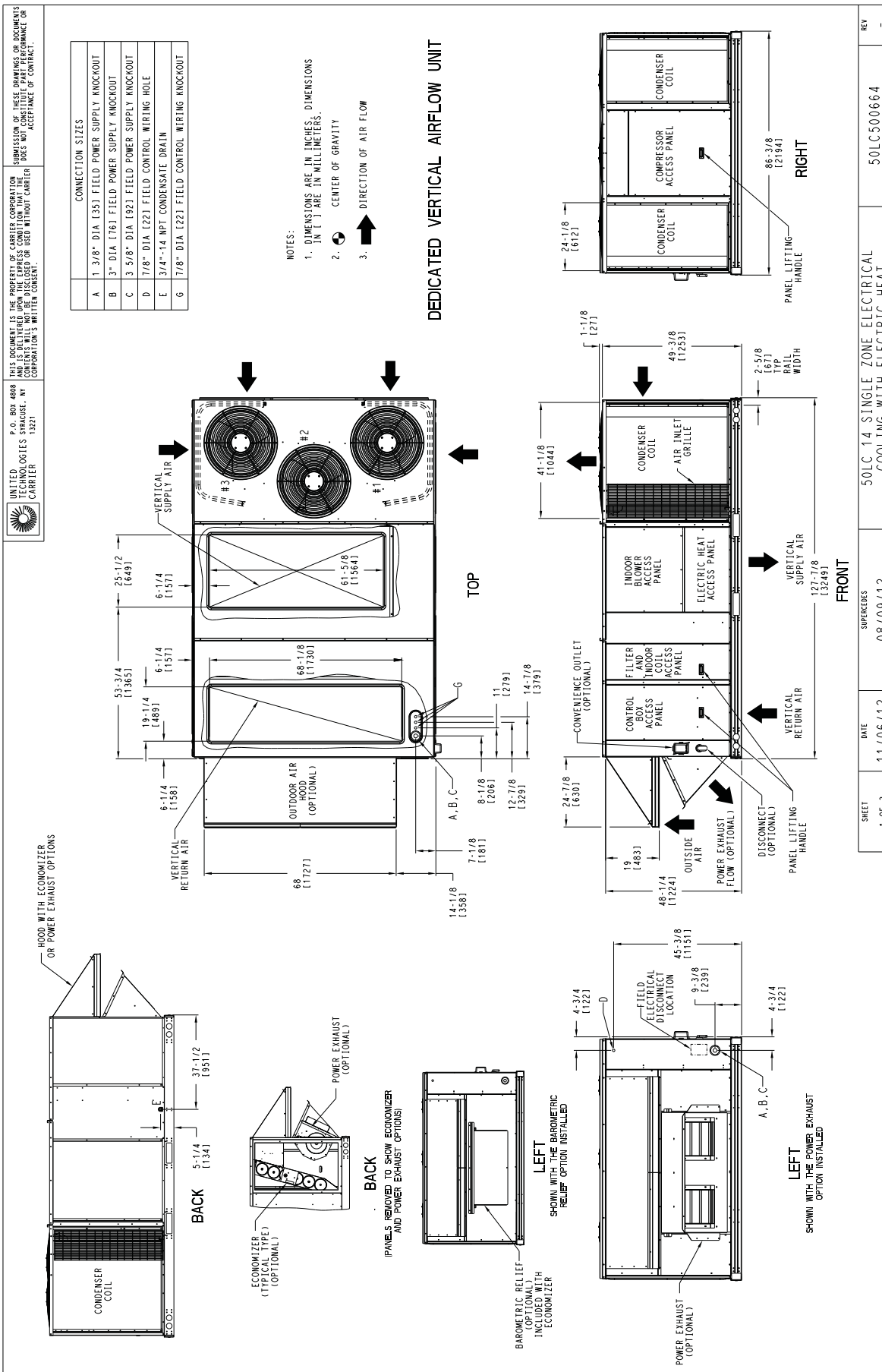


Fig. 2 - Dimensions 50LC*B14, Sheet 1 of 3

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)

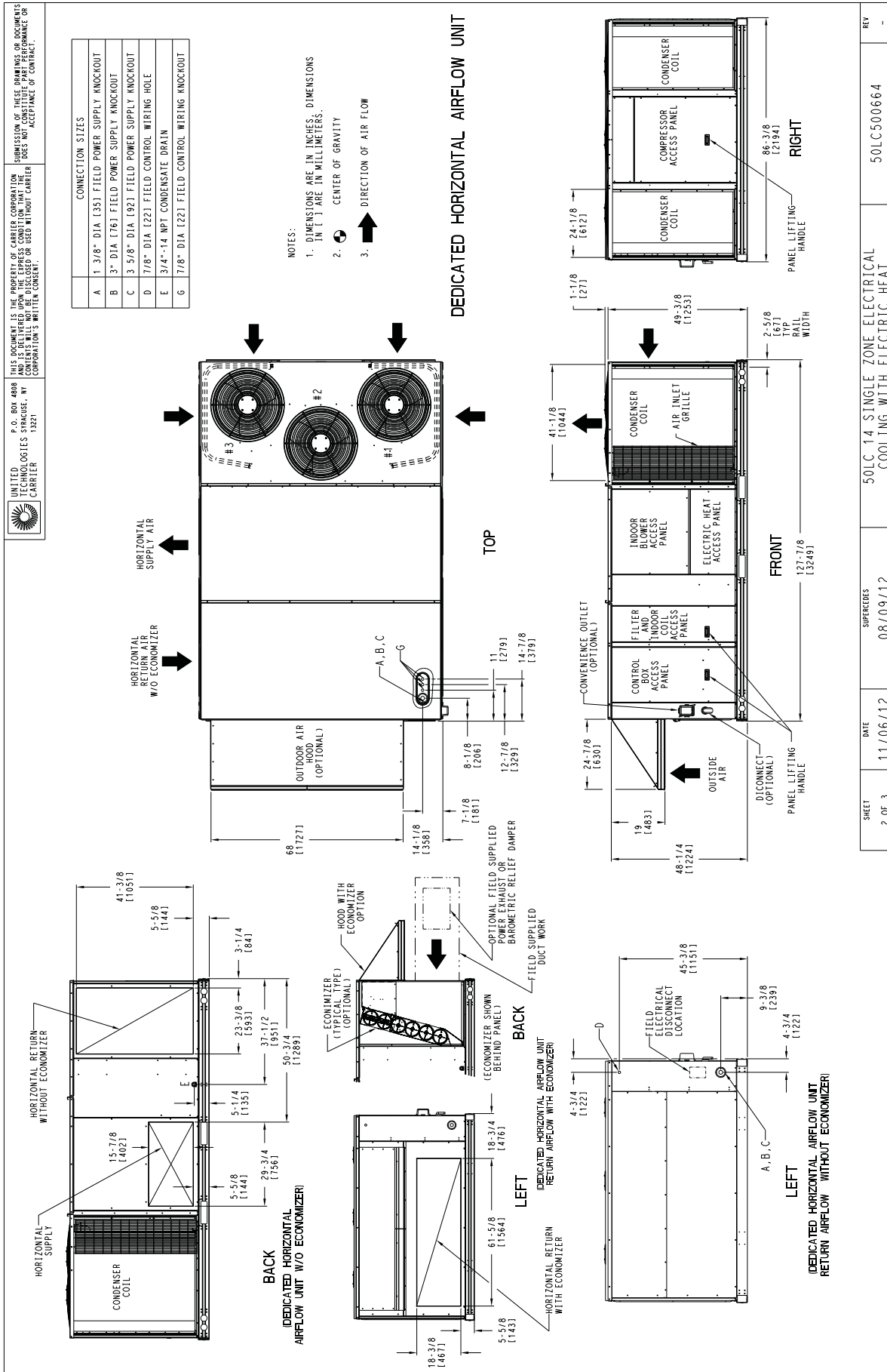


Fig. 3 - Dimensions 50LC*B14, Sheet 2 of 3

SHEET	DATE	SUPERCEDES	REV
2 OF 3	11/06/12	08/09/12	50LC500664

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)

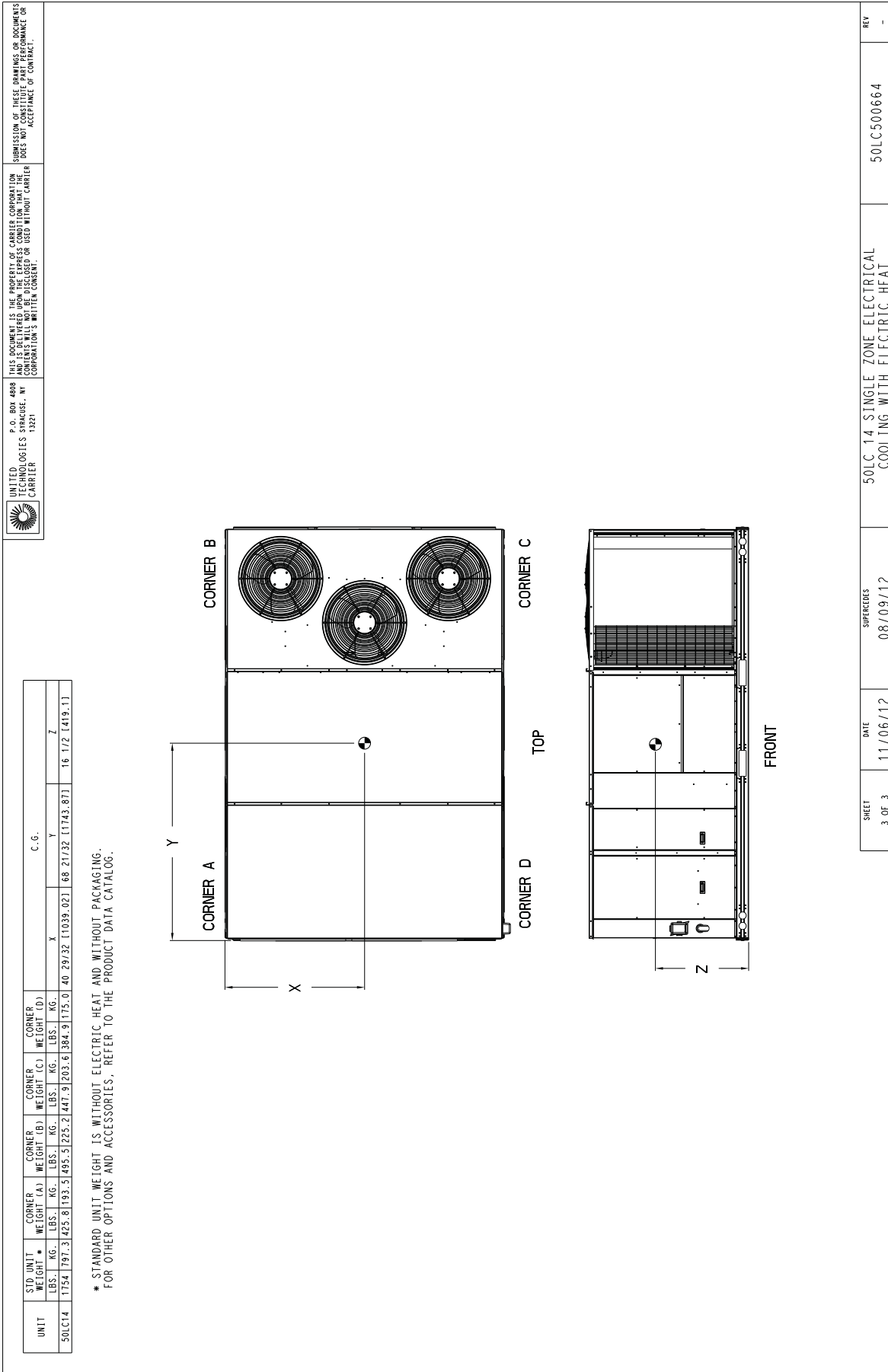
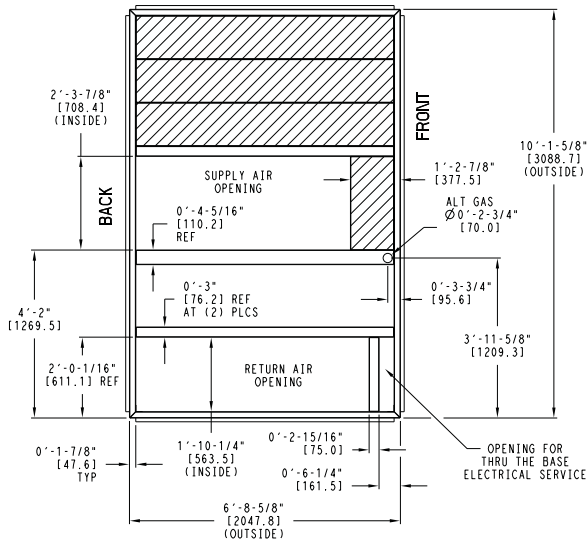


Fig. 4 - Dimensions 50LC*B14, Sheet 3 of 3

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)

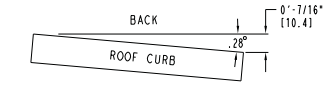
UNIT SIZE	"A"	ROOF CURB ACCESSORY
14	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB045A00 CRRFCURB046A00



NOTES:

- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
- 2 DIMENSIONS IN [] ARE IN MILLIMETERS.
- 3 ROOF CURB GALVANIZED STEEL.
- 4 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
- 5 SERVICE CLEARANCE 4 FT ON EACH SIDE

➔ DIRECTION OF AIR FLOW



MAX CURB LEVELING TOLERANCES

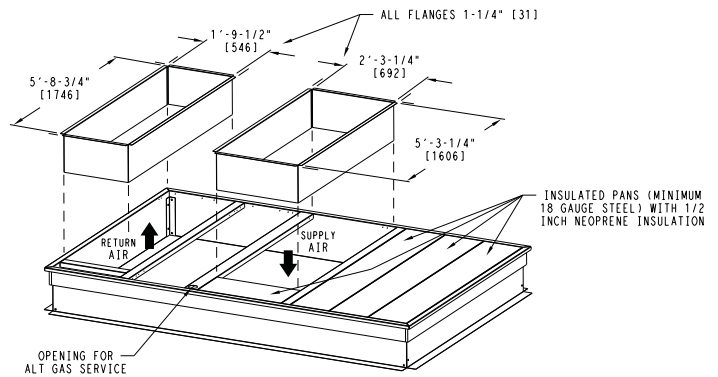
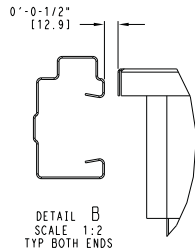
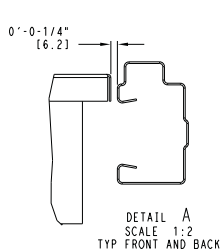
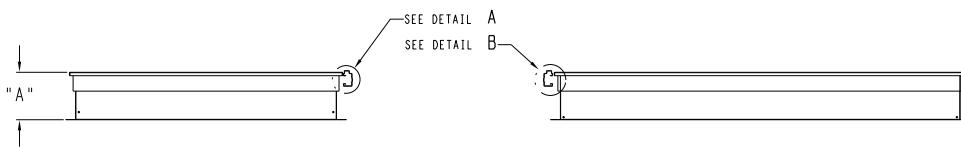
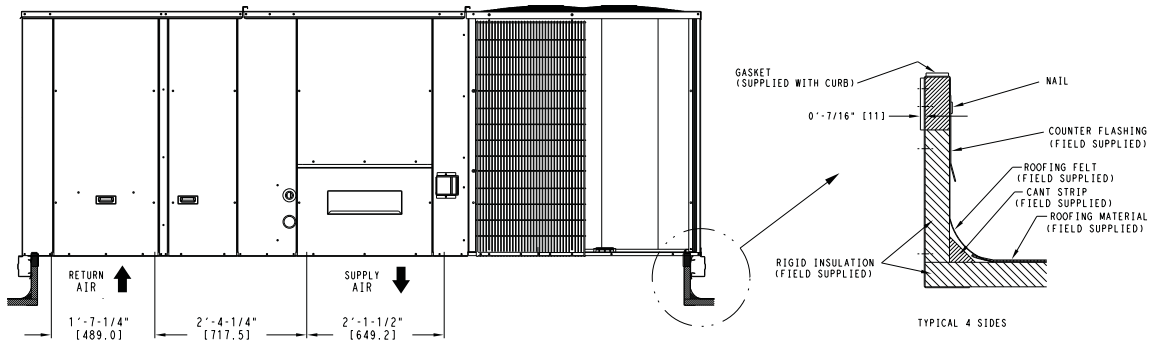
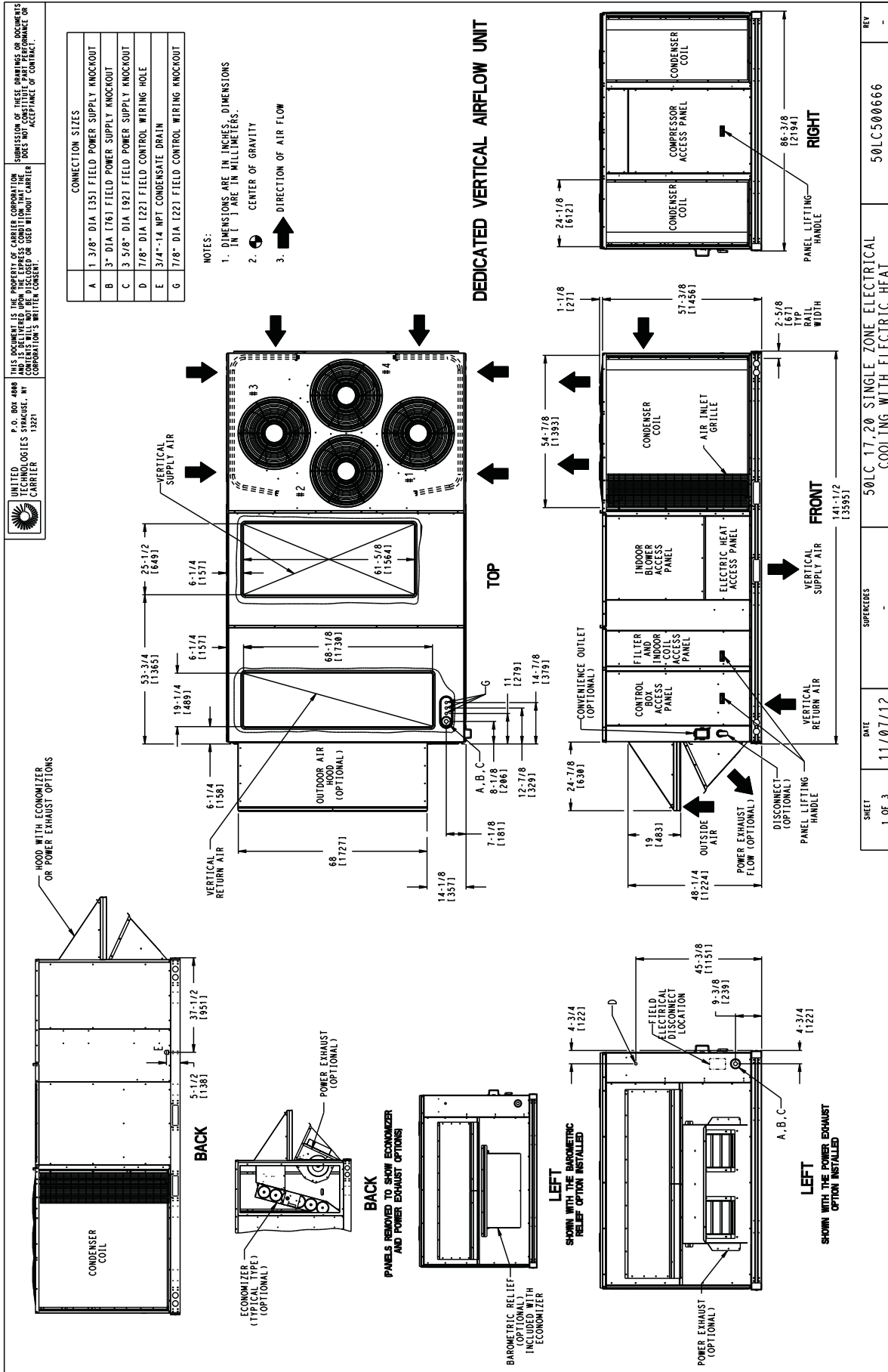


Fig. 5 - Roof Curb Details 50LC*B14

C13054

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)



SHEET 1 OF 3	DATE 11/07/12	SUPERCEDES -	REV -
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50LC 17-20 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT

Fig. 6 - Dimensions 50LC*B17 - 20, Sheet 1 of 3

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)

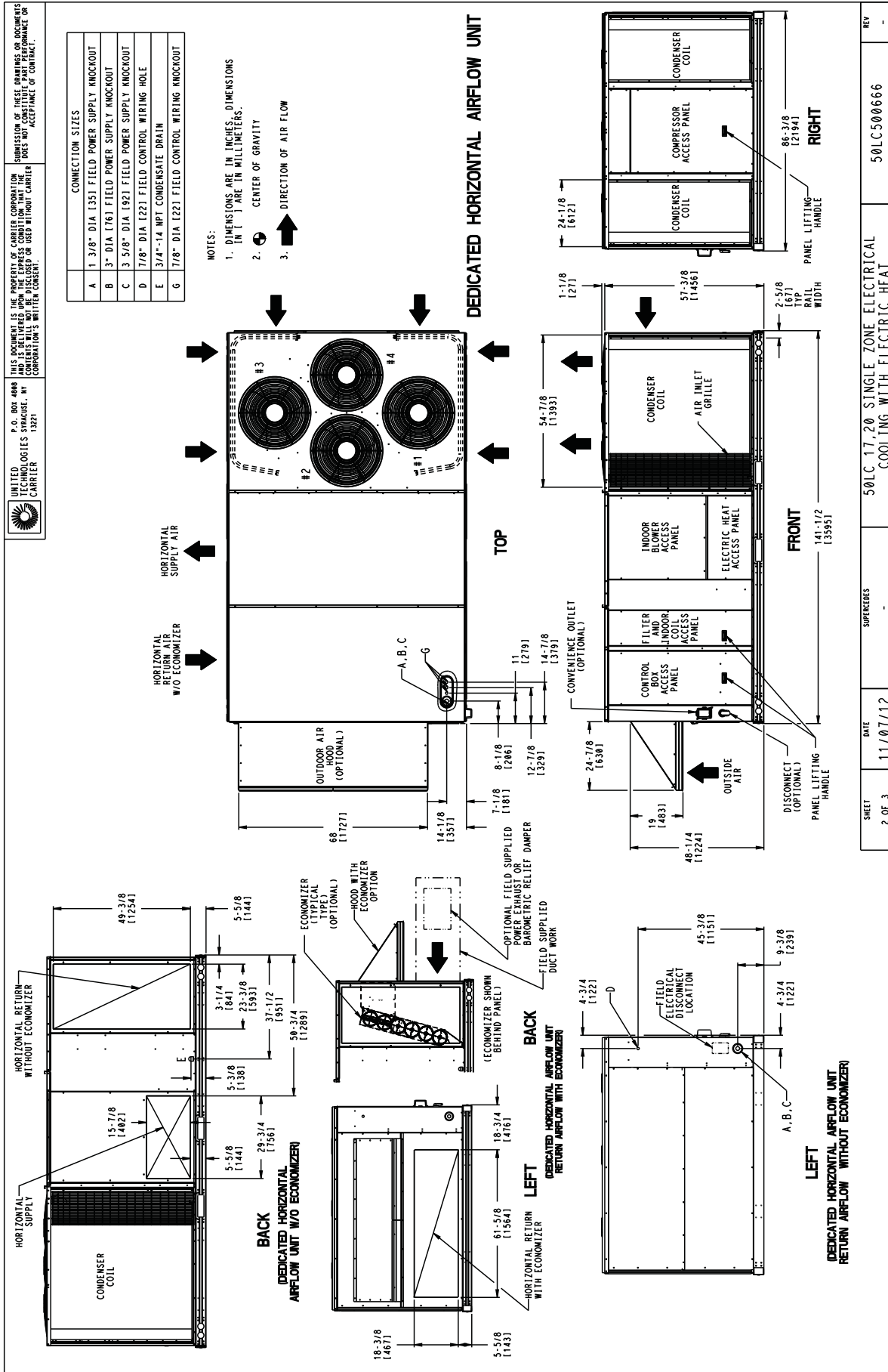


Fig. 7 - Dimensions 50LC*B17 - 20, Sheet 2 of 3

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)

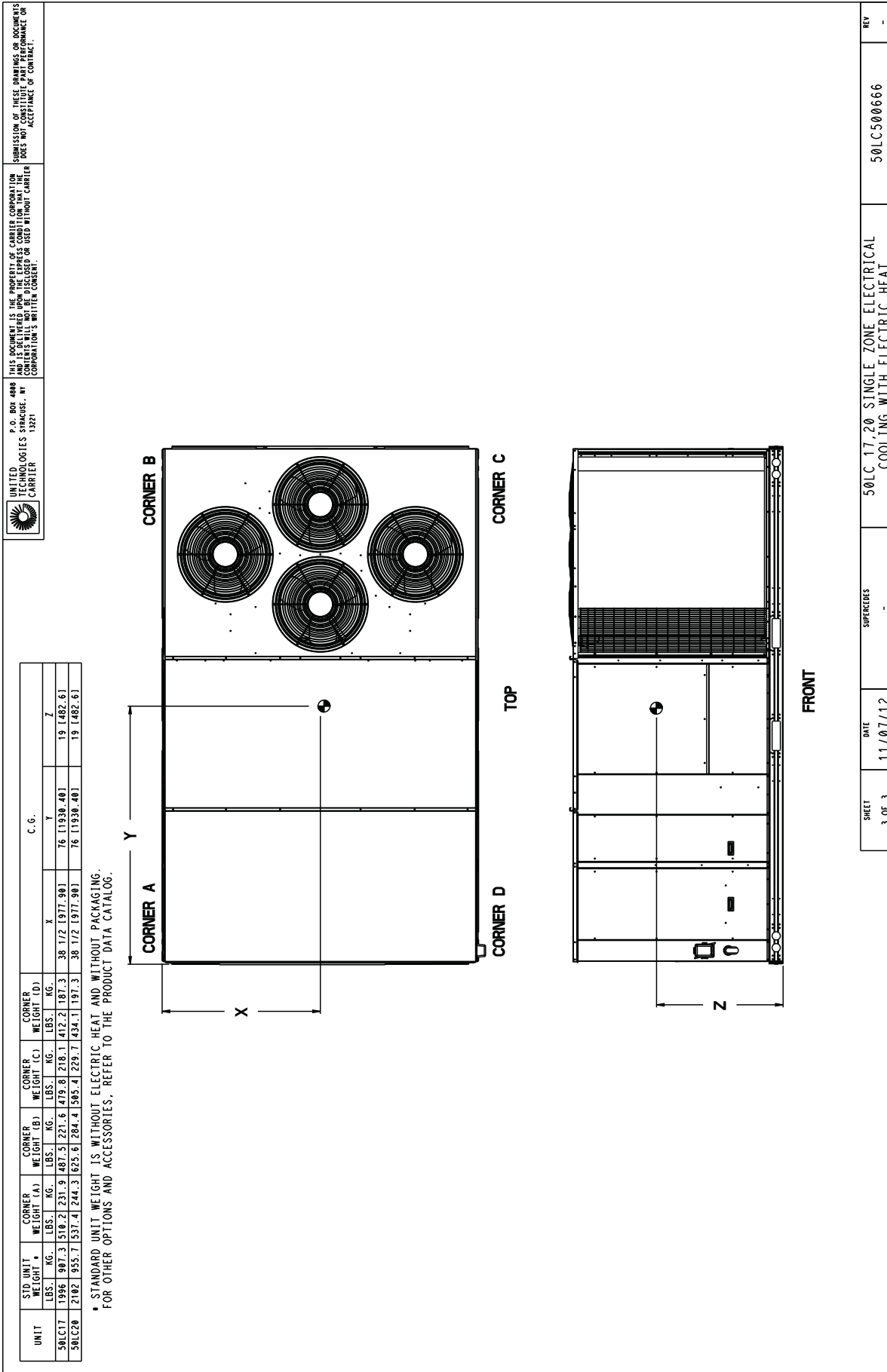
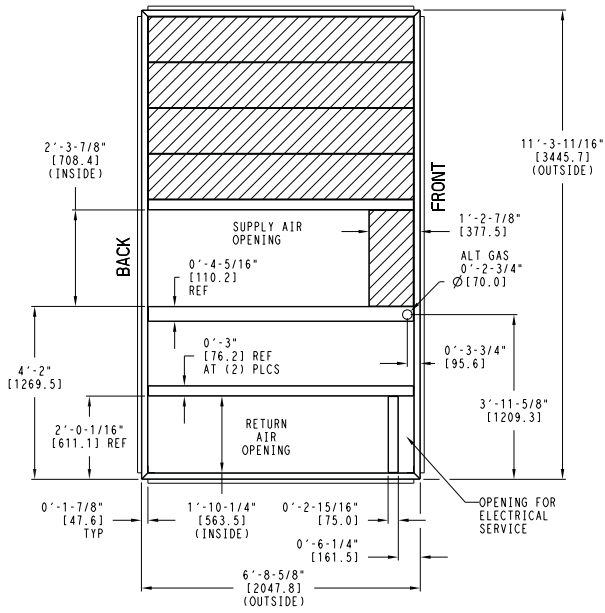


Fig. 8 - Dimensions 50LC*B17 - 20, Sheet 3 of 3

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)

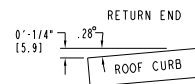
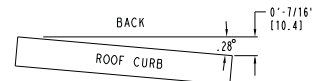
UNIT SIZE	"A"	ROOF CURB ACCESSORY
17, 20	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB047A00 CRRFCURB048A00



NOTES:

- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
- 2 DIMENSIONS IN [] ARE IN MILLIMETERS.
- 3 ROOF CURB GALVANIZED STEEL.
- 4 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
- 5 SERVICE CLEARANCE 4 FT ON EACH SIDE

➔ DIRECTION OF AIR FLOW



MAX CURB LEVELING TOLERANCES

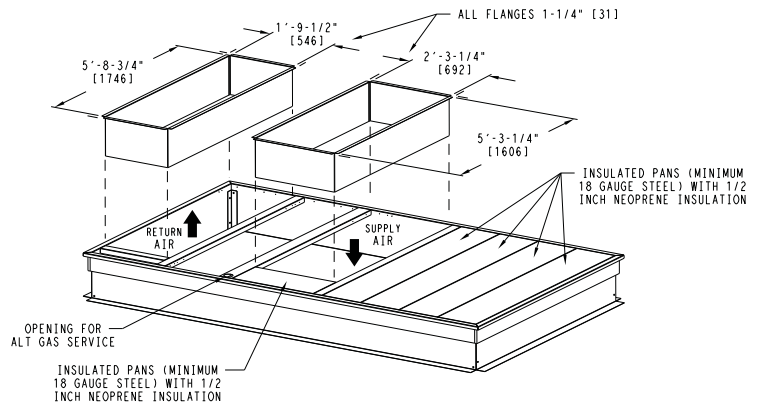
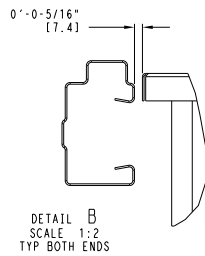
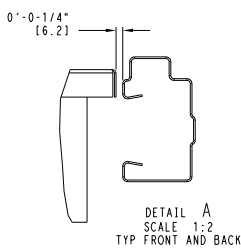
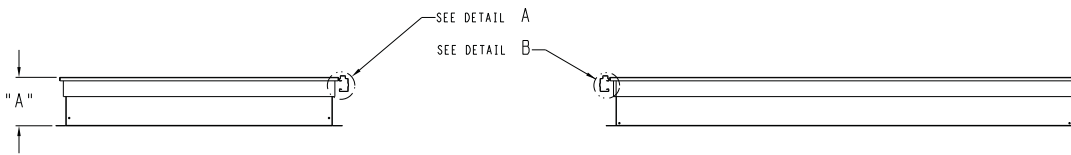
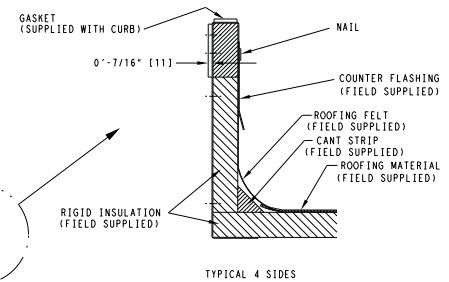
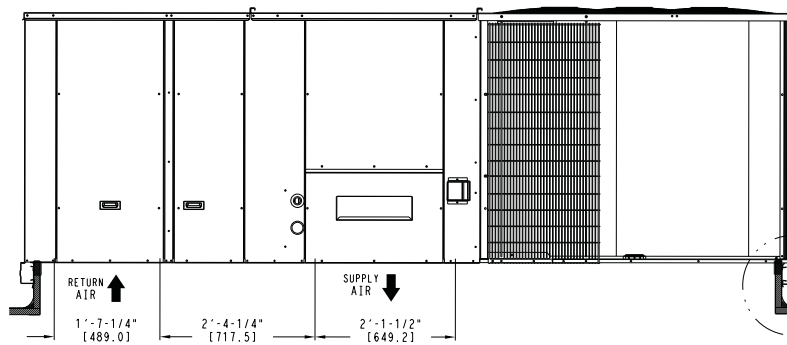
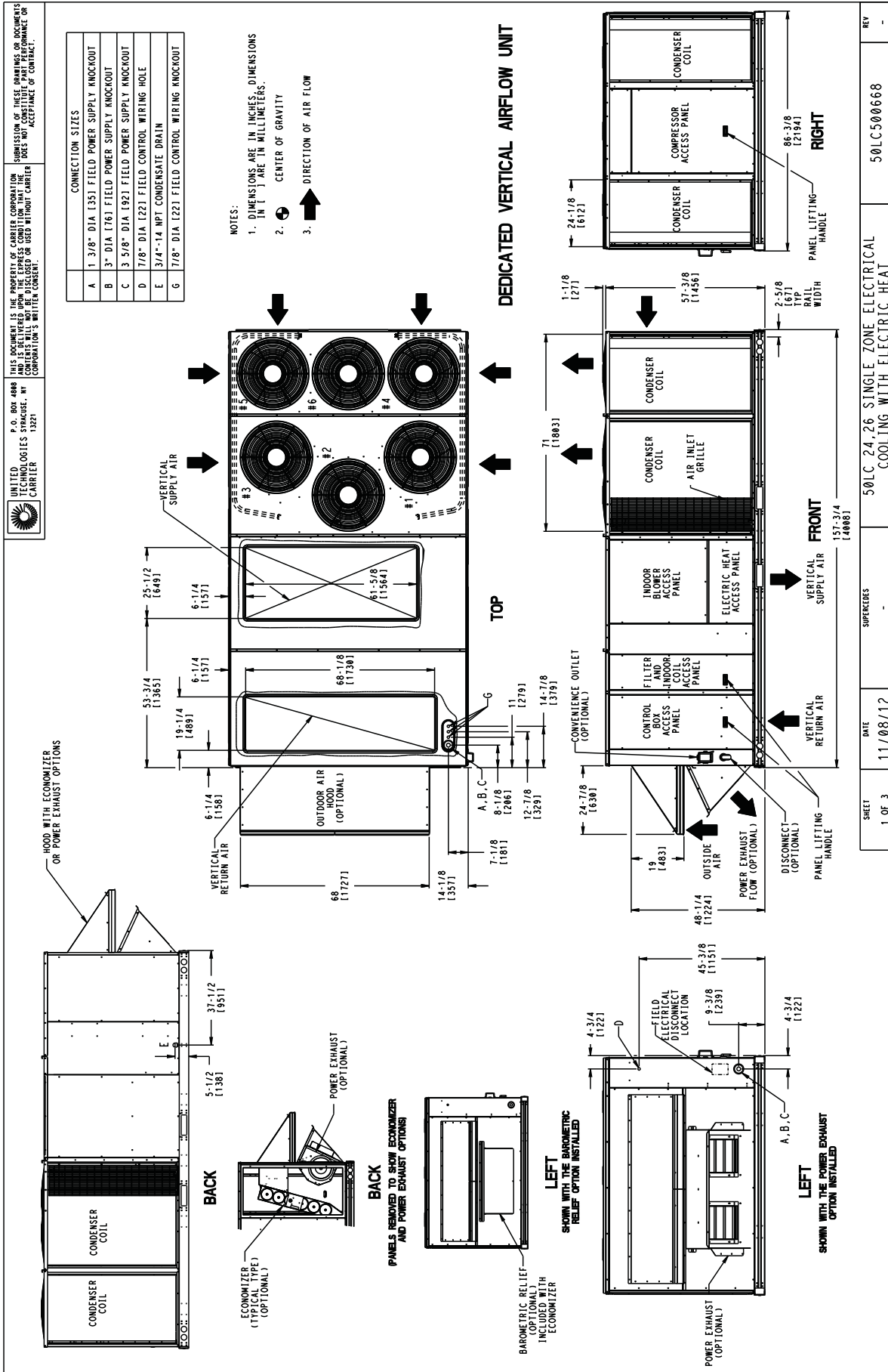


Fig. 9 - Roof Curb Details 50LC*B17-20

C13055

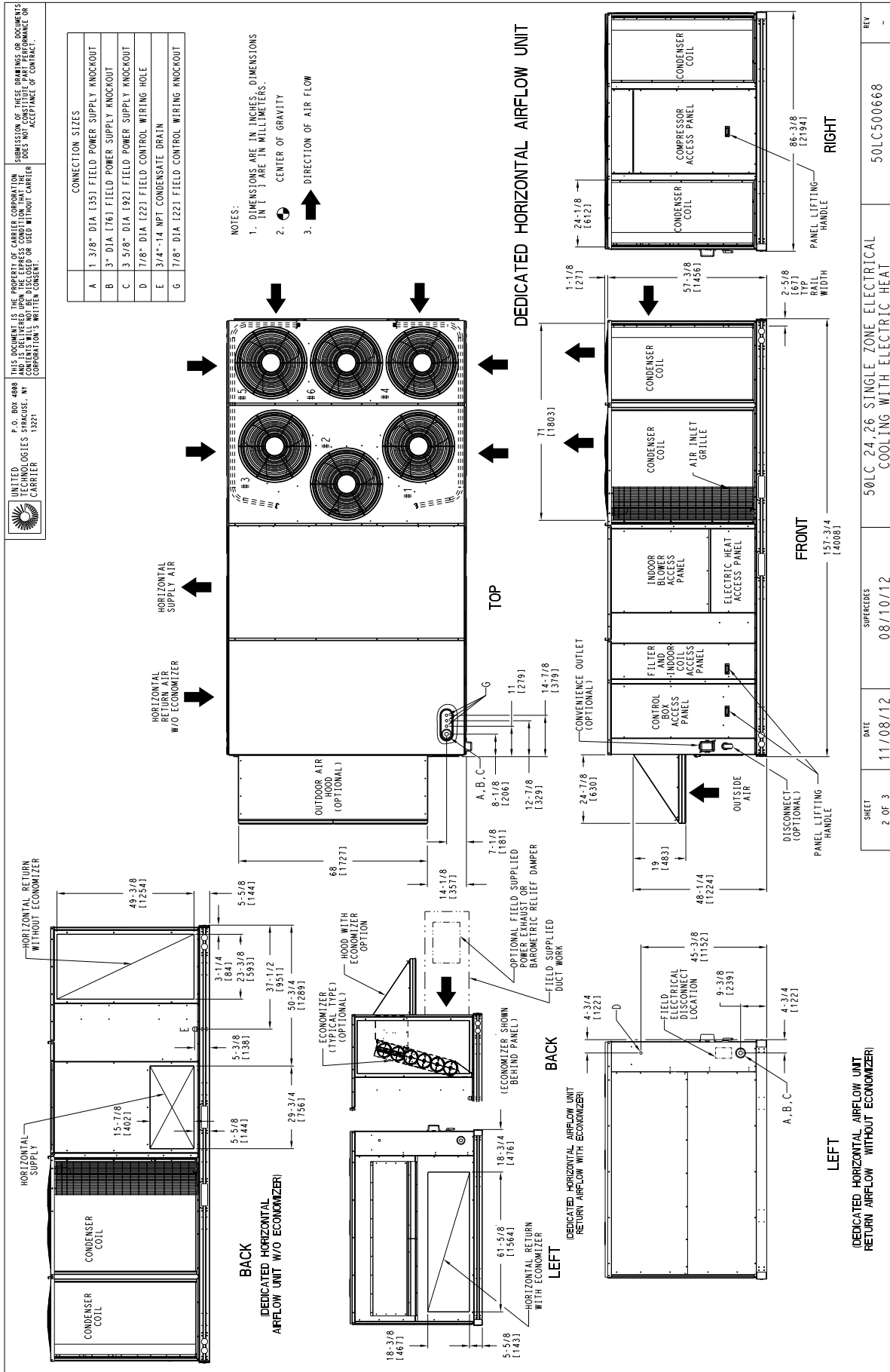
UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)



SHEET 1 OF 3	DATE 11/08/12	SUPERCEDES -	REV -
50LC 24, 26 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT			50LC500668

Fig. 10 - Dimensions 50LC*B24, 26, Sheet 1 of 3

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)



SHEET	DATE	SUPERSEDES	REV
2 OF 3	11/08/12	08/10/12	50LC500668
50LC 24, 26 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT			

Fig. 11 - Dimensions 50LC*B24, 26, Sheet 2 of 3

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)

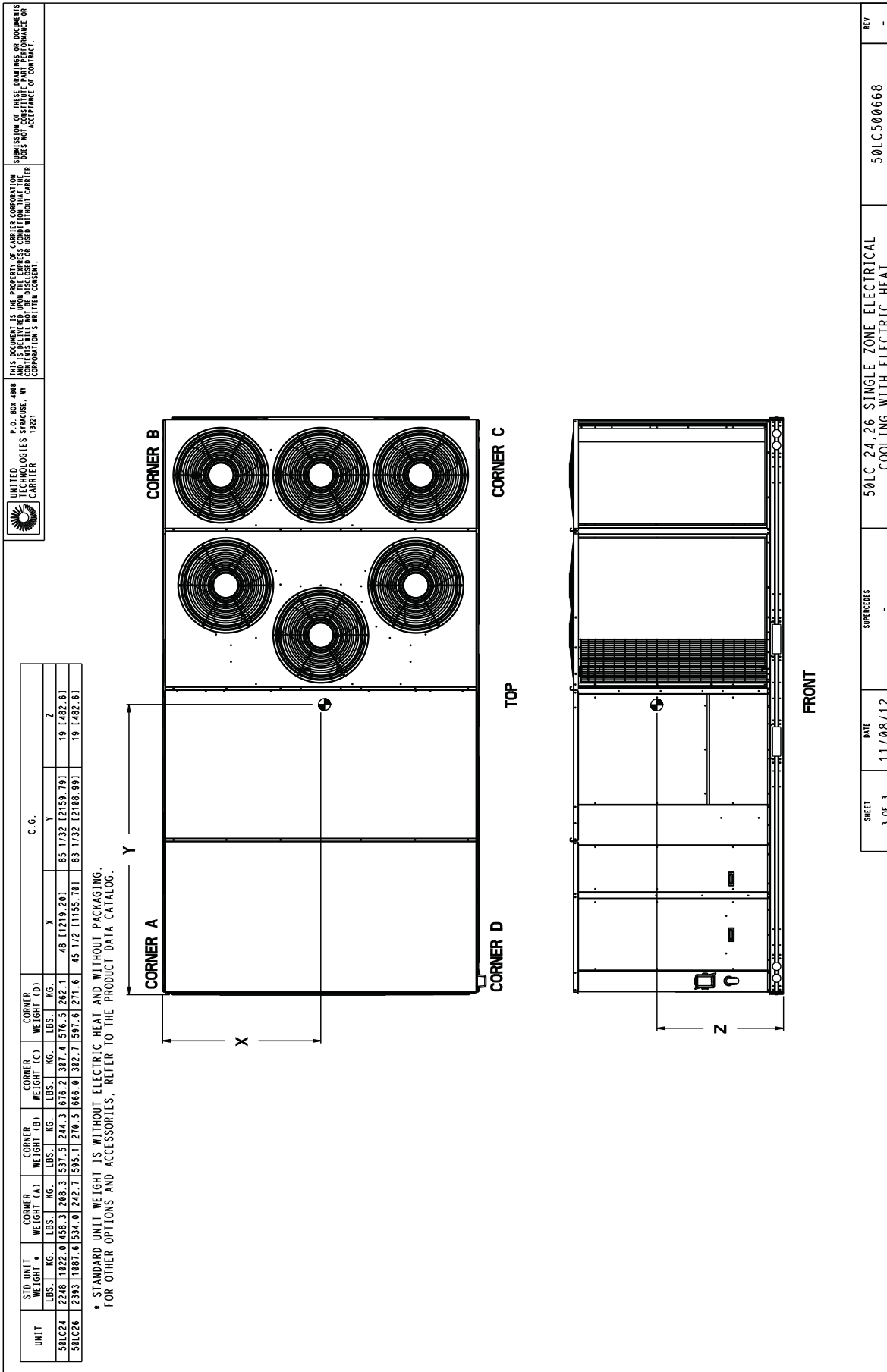
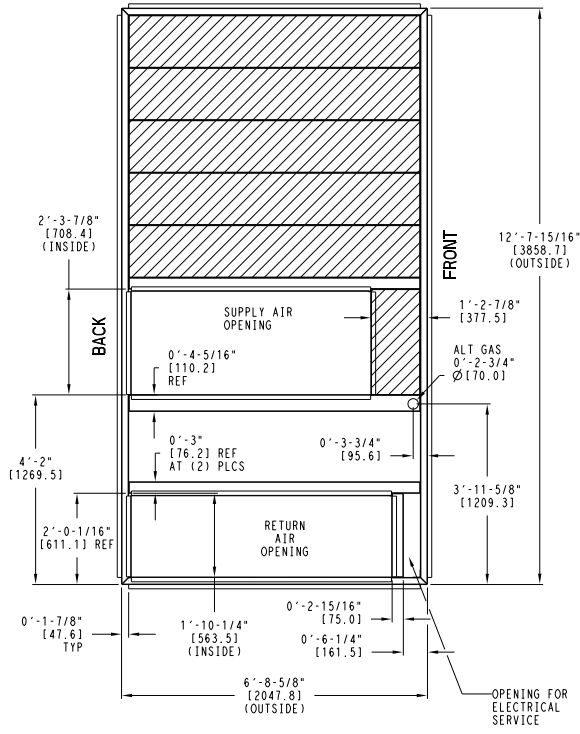


Fig. 12 - Dimensions 50LC*B24, 26, Sheet 3 of 3

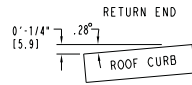
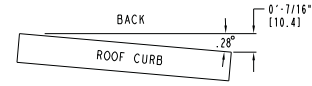
UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)

UNIT SIZE	"A"	ROOF CURB ACCESSORY
24, 26	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB049A00 CRRFCURB050A00



- NOTES:
- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
 - 2 BOLT HEADS TO BE ON INSIDE OF FLANGE. CLEARANCE IS (11) 0-0-7/16" TYP ALL CORNERS.
 - 3 DIMENSIONS IN () ARE IN MILLIMETERS.
 - 4 ROOF CURB GALVANIZED STEEL.
 - 5 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
 - 6 SERVICE CLEARANCE 4 FT ON EACH SIDE
 - 7 GAS SERVICE PLATE IS PART OF A SEPERATELY SHIPPED ACCESSORY PACKAGE.
 - 8 GAS SERVICE PLATE CAN BE USED WITH EITHER ACCESSORY ROOFCURB.

➔ DIRECTION OF AIR FLOW



MAX CURB LEVELING TOLERANCES

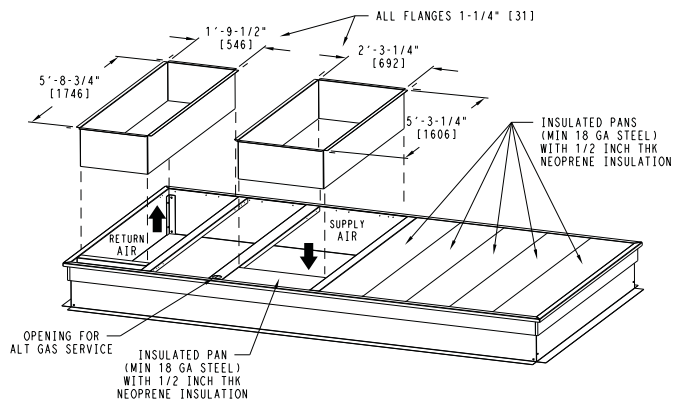
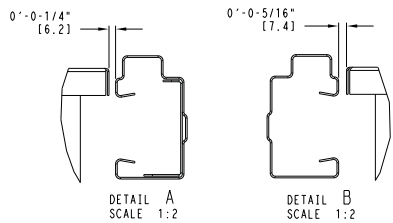
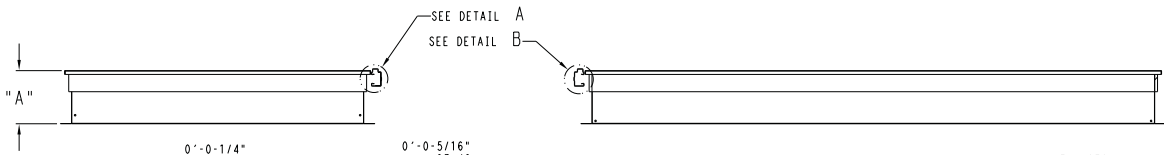
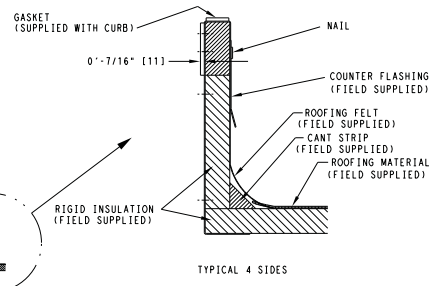
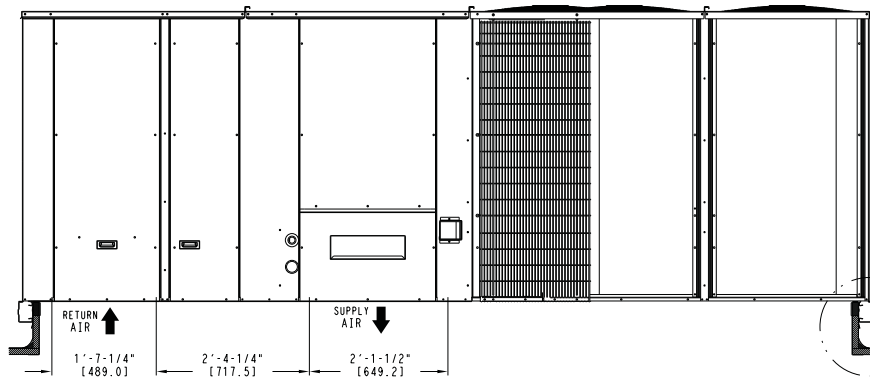
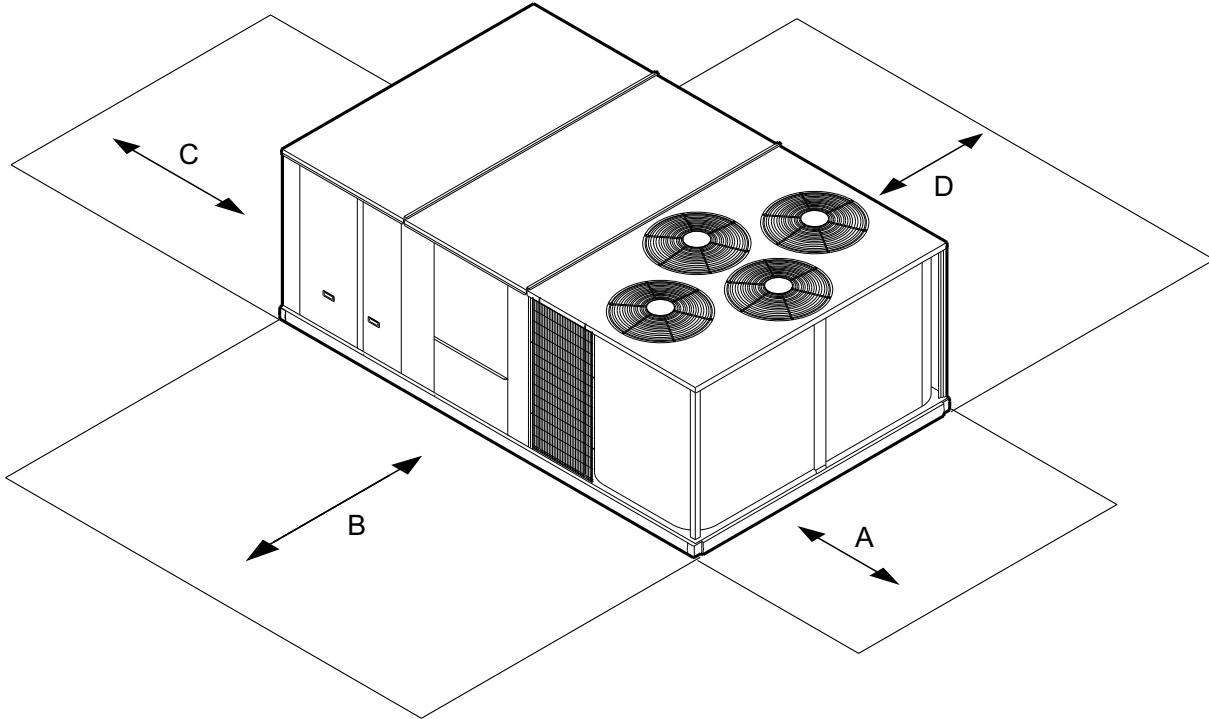


Fig. 13 - Roof Curb Details 50LC*B24, 26

C13056

UNIT: DIMENSIONS, WEIGHTS & CURBS (cont.)



C13292

LOCATION	DIMENSION	CONDITION
A	36-in (914 mm)	<ul style="list-style-type: none"> • Recommended clearance for air flow and service
B	42-in (1067 mm)	<ul style="list-style-type: none"> • Recommended clearance for air flow and service
C	18-in (457 mm)	<ul style="list-style-type: none"> • No Convenience Outlet • No field installed disconnect on economizer hood side (Factory-installed disconnect installed).
	36-in (914 mm)	<ul style="list-style-type: none"> • Convenience Outlet installed. • Vertical surface behind servicer is electrically non-conductive (e.g.: wood, fiberglass).
	42-in (1067 mm)	<ul style="list-style-type: none"> • Convenience Outlet installed. • Vertical surface behind servicer is electrically conductive (e.g.: metal, masonry).
	96-in (2438 mm)	<ul style="list-style-type: none"> • Economizer and/or Power Exhaust installed. • Check for sources of flue products with 10 feet (3 meters) of economizer fresh air intake.
D	42-in (1067 mm)	<ul style="list-style-type: none"> • Recommended clearance for service.

NOTE: 1. Unit not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or for vertical clearances.

2. The number of fans varies with the unit size. Depending on size unit will have three to six fans.

Fig. 14 - Service Clearance Dimensional Drawing — Typical All 50LC*B14-26 Units

OPTIONS & ACCESSORY WEIGHTS

OPTION / ACCESSORY	WEIGHTS in LBS				
	50LC*B14	50LC*B17	50LC*B20	50LC*B24	50LC*B26
Low Electric Heat	85	85	85	85	85
Medium Electric Heat	100	100	100	100	100
High Electric Heat	100	100	100	100	100
Return Smoke Detector	5	5	5	5	5
Supply Smoke Detector	5	5	5	5	5
RA & SA Smoke Detector	10	10	10	10	10
CO ₂ sensor	5	5	5	5	5
RA Smoke Detector & CO ₂	10	10	10	10	10
SA Smoke Detector & CO ₂	10	10	10	10	10
RA & SA Smoke Detector & CO ₂	15	15	15	15	15
Medium Static Option	5	6	6	10	10
High Static Option	11	16	16	20	20
Cu/Cu Cond & Al/Cu Evap	28	34	34	34	34
Cu/Cu Cond & Cu/Cu Evap	53	64	64	64	64
Al/Cu Cond & Al/Cu Evap + Hail Guard	60	150	150	150	150
Precoat Al/Cu Cond & Al/Cu Evap + Hail Guard	60	150	150	150	150
Ecoat Al/Cu Cond & Al/Cu Evap + Hail Guard	60	150	150	150	150
Ecoat Al/Cu Cond & Ecoat Al/Cu Evap + Hail Guard	60	150	150	150	150
Cu/Cu Cond & Al/Cu Evap + Hail Guard	88	184	184	184	184
Cu/Cu Cond & Cu/Cu Evap + Hail Guard	113	214	214	214	214
Temp Ultra Low Leak Econo w/Baro Relief	246	246	246	246	246
Temp Ultra Low Leak Econo w/PE (cent) Power Exhaust	371	371	371	371	371
Enthalpy Ultra Low Leak Econo w/Baro Relief	246	246	246	246	246
Enthalpy Ultra Low Leak Econo w/PE (cent) Power Exhaust	371	371	371	371	371
Unpowered Convenience Outlet	5	5	5	5	5
Powered Convenience outlet	35	35	35	35	35
Hinged Panels	5	5	5	5	5
Hinged Panels with Unpowered Convenience Outlet	10	10	10	10	10
Hinged Panels with Powered Convenience Outlet	40	40	40	40	40
HACR Breaker	10	10	10	10	10
Non – Fused Disconnect	15	15	15	15	15

APPLICATION DATA

Min operating ambient temp (cooling):

In mechanical cooling mode, your Carrier rooftop can safely operate down to an outdoor ambient temperature of 45°F (7°C).

An economizer shall be the source of cooling in low ambient conditions. When the outside air temperature is below 45°F (7°C), to improve system reliability, reduce energy usage, and improve system efficiency: mechanical cooling shall not be utilized. Therefore, an economizer shall be used in these conditions to provide efficient low ambient cooling. Using an economizer for low ambient cooling merely requires fan energy to satisfy space requirements. The compressors shall not be required to run which will provide exceptional energy savings due to less power draw, improved system reliability due to fewer compressor run hours, improved reliability through fewer starts/stops, and lower life cycle costs due to reduced compressor maintenance.

Max operating ambient temp (cooling):

The maximum operating ambient temperature for cooling mode is 125°F (52°C). While cooling operation above 125°F (52°C) may be possible, it could cause either a reduction in performance, reliability, or a protective action by the unit's internal safety devices.

Min and max airflow (heating and cooling):

To maintain safe and reliable operation of your rooftop, operate within the heating airflow limits during heating mode and cooling airflow limits during cooling mode. Operating above the max may cause blow-off, undesired airflow noise, or airflow related problems with the rooftop unit. Operating below the min may cause problems with coil freeze-up and unsafe heating operation. For proper minimum and maximum CFM values, see Tables 4 and 5.

Airflow:

All units are draw-through in cooling mode.

Outdoor air application strategies:

Economizers reduce operating expenses and compressor run time by providing a free source of cooling and a means of ventilation to match application changing needs. Consider the various economizer control methods and their benefits, as well as sensors required to accomplish your application goals. Please contact your local Carrier representative for assistance.

Motor limits, break horsepower (BHP):

Due to Carrier's internal unit design, air path, and specially designed motors, the full horsepower (maximum continuous BHP) band, as listed in Table 7 can be used with the utmost confidence. There is no need for extra safety factors, as Carrier's motors are designed and rigorously tested to use the entire, listed BHP range without either nuisance tripping or premature motor failure.

Sizing a rooftop

Bigger isn't necessarily better. While an air conditioner needs to have enough capacity to meet the load, it doesn't need excess capacity. In fact, having excess capacity typically results in very poor part load performance and humidity control.

Using higher design temperatures than ASHRAE recommends for your location, adding "safety factors" to the calculated load, and rounding up to the next largest unit, are all signs of oversizing air conditioners. Oversizing can cause short-cycling, and short cycling leads to poor humidity control, reduced efficiency, higher utility bills, drastic indoor temperature swings, excessive noise, and increased wear and tear on the air conditioner.

Rather than oversizing an air conditioner, wise contractors and engineers "right-size" or even slightly undersize air conditioners. Correctly sizing an air conditioner controls humidity better; promotes efficiency; reduces utility bills; extends equipment life, and maintains even, comfortable temperatures.

Table 10 – SYSTEM OVERVIEW

	Standalone No BAS	Carrier i-Vu® BAS	Third Party BAS
VAV-RTU Open Controller Accessible points	X	X	Limited, See Controls, Start-up, Operation and Troubleshooting manual
Average Space Temperature	X	X	X
Supply Air Temperature	X	X	X
Return Air Temperature	Monitor Only	Monitor Only	Monitor Only
Duct Static Pressure	X	X	X
Zone Setpoints	X	X	N/A
i-Vu VAV Zone space/CO ₂ /RH	X	X	N/A
System Touch	X	X	N/A
Equipment Touch	X	X	N/A

Table 19 – COOLING CAPACITIES - THIRD STAGE, FULL LOAD

17.5 TONS

Table with columns for Size 20, Ambient Temperature (65, 75, 85, 95, 105, 115, 125), and rows for Cfm (3500, 3950, 4400, 5250, 6150, 7000, 7900, 8750) and EA (wb). Each row contains multiple sub-rows for different units (THC, SHC) and temperature points (75, 80, 85, 95, 105, 115, 125).

- LEGEND:
- Do not operate
Cfm - Cubic feet per minute (supply air)
EAT(db) - Entering air temperature (dry bulb)
EAT(wb) - Entering air temperature (wet bulb)
SHC - Sensible heat capacity
TC - Total capacity

Table 25 – COOLING CAPACITIES - THIRD STAGE, FULL LOAD

23 TONS

Size 26				Ambient Temperature																							
				65			75			85			95			105			115			125					
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)					
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	75	80	85			
4500 Cfm	EA (WB)	58	THC	-	-	-	-	-	-	222.4	222.4	225.8	214.3	214.3	221	205.5	205.5	215.9	195.9	195.9	210.1	185.3	185.3	203.5			
		SHC	-	-	-	-	-	-	-	180.3	203	225.8	175.6	198.3	221	170.6	193.2	215.9	165	187.6	210.1	158.7	181.2	203.5			
		62	THC	254.4	254.4	254.4	246.7	246.7	246.7	238.5	238.5	238.5	229.7	229.7	229.7	220.1	220.1	220.1	209.4	209.4	209.4	197.6	197.6	197.6	197.6		
		SHC	171.3	194	216.8	167.1	189.8	212.6	162.6	185.4	208.3	158	180.8	203.5	152.9	175.7	198.5	147.4	170.2	193	141.5	164.3	187	187			
		67	THC	278.8	278.8	278.8	270.3	270.3	270.3	261.3	261.3	261.3	251.7	251.7	251.7	241.4	241.4	241.4	230	230	230	217.4	217.4	217.4	217.4		
SHC	149.1	172	195	144.8	167.7	190.7	140.4	163.3	186.2	135.7	158.6	181.5	130.7	153.7	176.6	125.4	148.3	171.2	119.6	142.4	165.4	165.4					
5100 Cfm	EA (WB)	72	THC	305.6	305.6	305.6	295.8	295.8	295.8	286.3	286.3	286.3	275.9	275.9	275.9	264.7	264.7	264.7	252.3	252.3	252.3	238.7	238.7	238.7			
		SHC	125.2	149.4	173.5	120.9	144.9	168.9	116.8	140.6	164.4	112.4	136	159.6	107.6	131.1	154.6	102.5	125.8	149.2	96.8	120	143.3	143.3			
		76	THC	-	328.6	328.6	-	318.8	318.8	-	308.5	308.5	-	297.3	297.3	-	285	285	-	271.7	271.7	-	257	257	257		
		SHC	-	129.4	153.5	-	125.4	149.5	-	121.2	145.3	-	116.7	140.9	-	111.9	136.1	-	106.9	130.9	-	101.3	125.4	125.4			
		58	THC	245.9	245.9	250.9	238.4	238.4	246.5	230.6	230.6	241.9	222.1	222.1	222.1	212.9	212.9	212.9	203.1	203.1	203.1	192.7	192.7	192.7	192.7		
SHC	200.1	225.4	250.9	195.7	221.1	246.5	191.2	216.5	241.9	186.3	211.6	236.8	181.1	206.1	231.3	175.1	200.1	224.9	168.2	192.7	217	217	217				
5650 Cfm	EA (WB)	62	THC	263.3	263.3	263.3	255.1	255.1	255.1	246.3	246.3	246.3	236.9	236.9	236.9	226.8	226.8	226.8	215.7	215.7	215.7	203.5	203.5	203.5			
		SHC	180.1	205.5	231.1	175.7	201.2	226.7	171.1	196.7	222.1	166.3	191.8	217.2	161.2	186.6	212.1	155.6	181.1	206.5	149.7	175	200.5	200.5			
		67	THC	288	288	288	279	279	279	269.5	269.5	269.5	259.4	259.4	259.4	248.6	248.6	248.6	236.5	236.5	236.5	223.3	223.3	223.3			
		SHC	154.9	180.6	206.2	150.5	176.2	201.8	146.1	171.7	197.3	141.3	166.9	192.6	136.3	161.9	187.5	130.7	156.4	181.9	124.9	150.4	176	176			
		72	THC	315.8	315.8	315.8	305.6	305.6	305.6	295.4	295.4	295.4	284.3	284.3	284.3	272.4	272.4	272.4	259.3	259.3	259.3	244.8	244.8	244.8			
SHC	128.8	155.4	181.9	124.4	150.8	177.3	120.1	146.4	172.8	115.4	141.7	167.8	110.5	136.6	162.7	105.1	131.1	157.2	99.4	125.3	151.2	151.2					
6750 Cfm	EA (WB)	76	THC	-	339.3	339.3	-	329	329	-	317.9	317.9	-	306	306	-	293	293	-	278.9	278.9	-	263.4	263.4			
		SHC	-	133.3	160.6	-	129.2	156.5	-	124.9	152.2	-	120.3	147.7	-	115.4	142.7	-	110.2	137.6	-	104.6	131.9	131.9			
		58	THC	245.1	245.1	257.2	234.2	234.2	249.4	222.8	222.8	241.3	211	211	232.7	198.7	198.7	223.4	186	186	212.6	173.2	173.2	198.5			
		SHC	201.7	229.5	257.2	194	221.7	249.4	186.1	213.7	241.3	177.8	205.3	232.7	169.1	196.3	223.4	159.4	186	212.6	147.8	173.2	198.5	198.5			
		62	THC	263.5	263.5	263.5	251.6	251.6	251.6	239.3	239.3	239.3	226.3	226.3	226.3	212.6	212.6	212.6	197.9	197.9	197.9	182.2	182.2	186.4			
SHC	181	208.8	236.7	173.3	201.1	229	165.4	193.2	221.1	157.3	185.2	213	148.9	176.8	204.7	140.1	167.9	195.8	130.8	158.6	186.4	186.4					
7900 Cfm	EA (WB)	67	THC	290.6	290.6	290.6	277.5	277.5	277.5	264.5	264.5	264.5	250.8	250.8	250.8	236.2	236.2	236.2	220.5	220.5	220.5	203.3	203.3	203.3			
		SHC	155.2	183.3	211.4	147.3	175.4	203.4	139.5	167.6	195.6	131.5	159.5	187.5	123.1	151.1	179.1	114.5	142.4	170.3	105.2	133.1	161	161			
		72	THC	319.9	319.9	319.9	306.5	306.5	306.5	292.6	292.6	292.6	277.9	277.9	277.9	262.1	262.1	262.1	245.2	245.2	245.2	227.1	227.1	227.1			
		SHC	128.2	157	185.7	120.7	149.4	178.1	113	141.7	170.2	105.1	133.6	162.1	96.7	125.2	153.7	88.1	116.5	144.9	79.1	107.3	135.6	135.6			
		76	THC	-	345.7	345.7	-	331.6	331.6	-	316.8	316.8	-	301.1	301.1	-	284.3	284.3	-	266.4	266.4	-	247.1	247.1			
SHC	-	134.8	165.1	-	127.4	157.8	-	119.8	150.2	-	111.9	142.3	-	103.7	134.1	-	95.3	126.6	-	86.4	116.7	116.7					

LEGEND:
 - - Do not operate
 Cfm - Cubic feet per minute (supply air)
 EAT(db) - Entering air temperature (dry bulb)
 EAT(wb) - Entering air temperature (wet bulb)
 SHC - Sensible heat capacity
 TC - Total capacity

Table 26 – STATIC PRESSURE ADDERS (IN. WG)

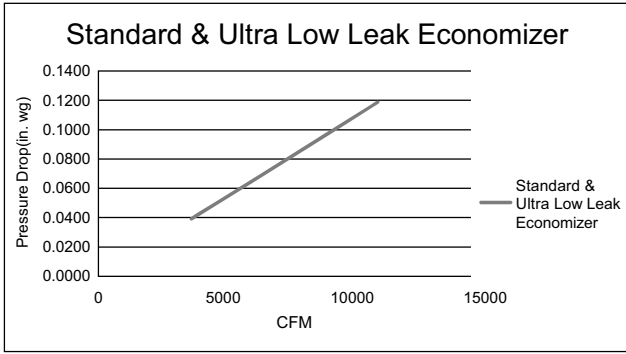
Standard & Ultra Low Leak Economizers

14 – 26 Tons											
CFM	3750	4000	4250	4500	4750	5000	5250	5500	5750	6000	6250
Economizer	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.07
CFM	6500	6750	7000	7250	7500	7750	8000	8250	8500	8750	9000
Economizer	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09
CFM	9250	9500	9750	10000	10250	10500	10750	11000	11250		
Economizer	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.12	0.12		

Electric Heaters

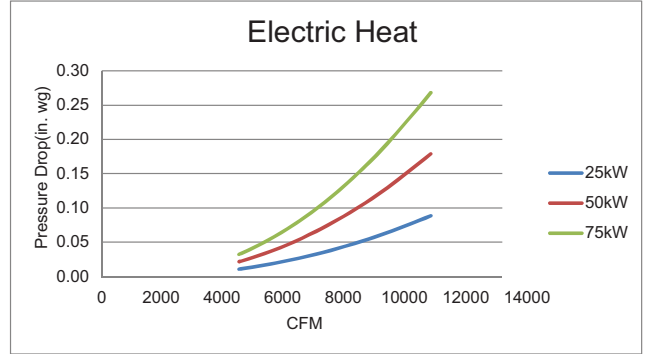
Unit 50LC*B	ELECTRIC HEATERS							
	Unit Voltages	CFM	NOMINAL HEATER SIZE (kW)	PRESSURE DROP (in wg.)	NOMINAL HEATER SIZE (kW)	PRESSURE DROP (in wg.)	NOMINAL HEATER SIZE (kW)	PRESSURE DROP (in wg.)
014, 017 020, 024, 026	208/240-3-60	4800	25	0.01	50	0.02	75	0.03
		5000		0.01		0.02		0.04
		6000		0.02		0.04		0.06
		7000		0.03		0.06		0.08
		8000		0.04		0.08		0.12
		9000		0.05		0.10		0.15
		10000		0.06		0.13		0.20
		11500		0.09		0.18		0.27
		480-3-60		4800		0.01		0.02
	5000			0.01		0.02		0.04
	6000			0.02		0.04		0.06
	7000			0.03		0.06		0.08
	8000			0.04		0.08		0.12
	9000			0.05		0.10		0.15
	10000			0.06		0.13		0.20
	575-3-60	4800		0.01		0.02		0.03
		5000		0.01		0.02		0.04
		6000		0.02		0.04		0.06
		7000		0.03		0.06		0.08
		8000		0.04		0.08		0.12
		9000		0.05		0.10		0.15
		10000		0.06		0.13		0.20
		11500		0.09		0.18		0.27

ECONOMIZER, BAROMETRIC RELIEF and PE PERFORMANCE



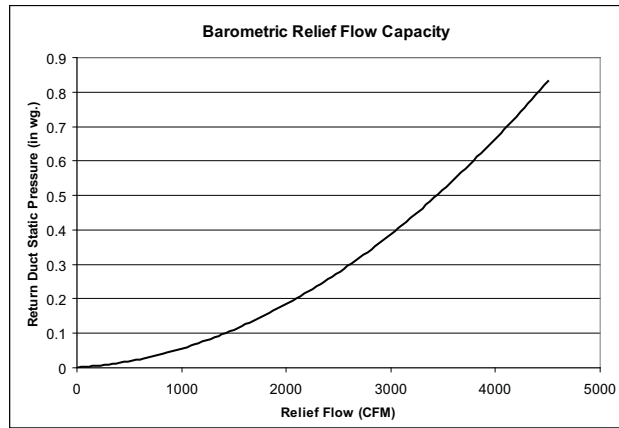
C150374

Fig. 15 - Pressure Drop - Standard & Ultra Low Leak Economizer



C13091

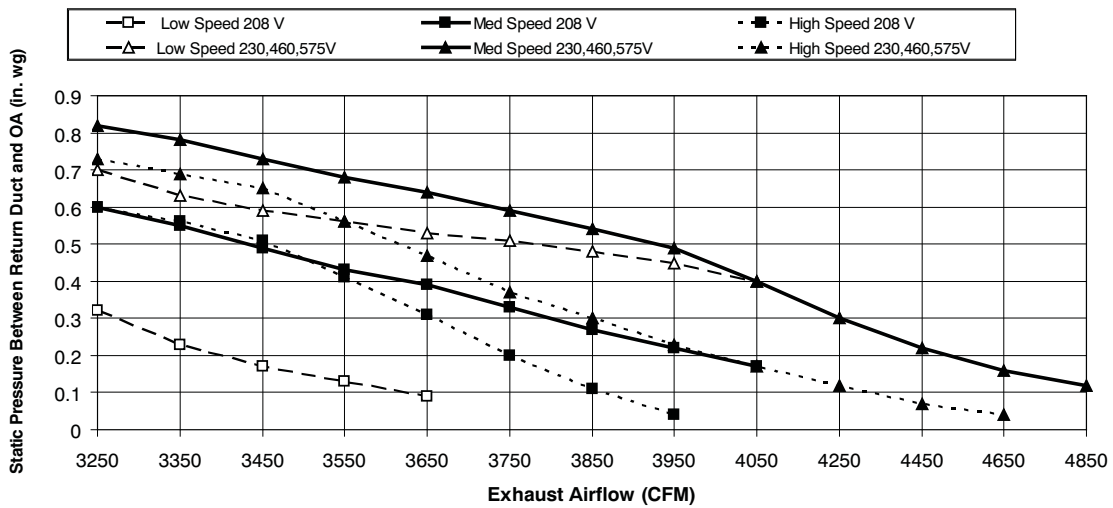
Fig. 16 - Pressure Drop - Electric Heat



C13107

Fig. 17 - Barometric Pressure Drop

Power Exhaust Fan Performance



C09270A

Fig. 18 - Power Exhaust Fan Performance

GENERAL FAN PERFORMANCE NOTES:

1. Interpolation is permissible. Do not extrapolate.
2. External static pressure is the static pressure difference between the return duct and the supply duct plus the static pressure caused by any FIOPs or accessories.
3. Tabular data accounts for pressure loss due to clean filters, unit casing, and wet coils. Factory options and accessories may add static pressure losses. Selection software is available, through your salesperson, to help you select the best motor/drive combination for your application.
4. The Fan Performance tables offer motor/drive recommendations. In cases when two motor/drive combinations would work, Carrier recommended the lower horsepower option.
5. For information on the electrical properties of Carrier motors, please see the Electrical information section of this book.
6. For more information on the performance limits of Carrier motors, see the application data section of this book.
7. The EPACT (Energy Policy Act) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements.

FAN PERFORMANCE

Table 27 – 50LC*B14

12.5 TON VERTICAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3750	--	--	514	0.61	600	0.82	673	1.03	738	1.25	797	1.46	851	1.68	901	1.90	948	2.12	992	2.34
4063	--	--	526	0.70	610	0.93	684	1.15	749	1.39	807	1.62	861	1.85	912	2.09	958	2.32	1003	2.56
4375	--	--	539	0.80	621	1.04	694	1.28	759	1.53	818	1.78	872	2.03	922	2.28	969	2.53	1013	2.79
4688	--	--	553	0.91	633	1.16	705	1.42	769	1.69	828	1.95	882	2.22	932	2.49	979	2.76	1024	3.03
5000	--	--	568	1.03	645	1.30	716	1.57	779	1.85	838	2.14	892	2.42	942	2.70	990	2.99	1034	3.28
5313	505	0.90	584	1.16	659	1.44	727	1.74	790	2.03	848	2.33	902	2.63	952	2.93	1000	3.23	1045	3.54
5625	525	1.04	600	1.31	672	1.61	739	1.91	801	2.22	859	2.54	912	2.85	963	3.17	1010	3.49	1055	3.81
5938	546	1.20	618	1.48	687	1.78	752	2.10	813	2.42	870	2.75	923	3.09	973	3.42	1020	3.76	1065	4.10
6250	568	1.37	636	1.66	702	1.97	765	2.30	825	2.64	881	2.99	934	3.34	983	3.69	1030	4.04	1075	4.39
STD Static (498 – 676rpm) 2.9 Max BHP			MID Static (682 – 861 rpm) 4.9 Max BHP						HIGH Static (782 – 963 rpm) 7.4 Max BHP						ULTRA HIGH Static (933 – 1113 rpm) 9.9 Max BHP					

Table 28 – 50LC*B14

12.5 TON HORIZONTAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3750	--	--	513	1.01	584	1.43	645	1.88	700	2.36	749	2.85	794	3.36	836	3.88	875	4.42	913	4.98
4063	--	--	530	1.13	600	1.58	661	2.05	715	2.55	764	3.06	809	3.60	851	4.15	891	4.71	928	5.29
4375	--	--	547	1.27	617	1.74	677	2.24	731	2.75	780	3.29	825	3.85	867	4.42	906	5.01	944	5.62
4688	--	--	565	1.41	633	1.91	693	2.43	747	2.97	795	3.54	840	4.12	882	4.71	922	5.33	959	5.95
5000	506	1.09	584	1.58	650	2.09	709	2.64	762	3.21	811	3.79	856	4.40	898	5.02	937	5.65	974	6.31
5313	527	1.25	602	1.75	668	2.29	726	2.86	779	3.45	827	4.06	871	4.69	913	5.34	953	6.00	990	6.67
5625	549	1.42	622	1.95	686	2.51	743	3.10	795	3.72	843	4.35	887	5.00	929	5.67	968	6.36	1005	7.06
5938	571	1.61	641	2.16	704	2.74	760	3.36	812	4.00	859	4.66	903	5.33	945	6.03	984	6.73	1021	7.46
6250	593	1.82	661	2.39	722	3.00	778	3.64	829	4.30	876	4.98	919	5.68	961	6.40	1000	7.13	1037	7.87
STD Static (498 – 676rpm) 2.9 Max BHP			MID Static (682 – 861 rpm) 4.9 Max BHP* *At 575V, Max BPH is 4.7						HIGH Static (782 – 963 rpm) 7.4 Max BHP						ULTRA HIGH Static (933 – 1113 rpm) 9.9 Max BHP					

FAN PERFORMANCE (cont.)

Table 29 – 50LC*B17

15 TON VERTICAL SUPPLY

CFM	Available External Static Pressure (in. wg)																							
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0					
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP				
4500	--	--	535	0.88	620	1.19	689	1.48	751	1.79	809	2.10	864	2.43	917	2.78	968	3.14	1018	3.53				
4875	--	--	547	0.99	634	1.34	703	1.66	764	1.99	821	2.32	874	2.66	925	3.01	975	3.38	1023	3.77				
5250	--	--	557	1.11	647	1.50	717	1.86	778	2.20	834	2.55	886	2.91	936	3.28	983	3.66	1030	4.05				
5625	--	--	568	1.24	659	1.67	731	2.06	793	2.44	848	2.81	899	3.18	948	3.56	994	3.96	1039	4.36				
6000	508	1.08	580	1.38	670	1.84	745	2.27	807	2.68	862	3.08	913	3.47	961	3.87	1006	4.28	1050	4.70				
6375	534	1.26	595	1.55	681	2.01	757	2.49	821	2.94	877	3.37	927	3.79	975	4.21	1019	4.63	1062	5.07				
6750	560	1.47	613	1.74	691	2.20	769	2.72	834	3.21	891	3.67	942	4.12	989	4.56	1033	5.01	1076	5.46				
7125	587	1.71	633	1.97	702	2.40	779	2.95	847	3.48	904	3.98	956	4.46	1003	4.94	1047	5.41	1090	5.88				
7500	615	1.97	655	2.22	716	2.63	790	3.19	858	3.76	917	4.31	970	4.83	1017	5.33	1062	5.83	1104	6.32				
STD Static (498 – 676 rpm) 2.9 Max BHP			MID Static (651 – 818 rpm) 7.4 Max BHP						HIGH Static (804 – 970rpm)9.9 Max BHP						ULTRA HIGH Static (948 – 1190 rpm) 13.6 Max BHP									

Table 30 – 50LC*B17

15 TON HORIZONTAL SUPPLY

CFM	Available External Static Pressure (in. wg)																							
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0					
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP				
4500	--	--	546	1.48	615	2.01	677	2.59	732	3.21	783	3.85	829	4.52	873	5.22	914	5.94	953	6.68				
4875	--	--	567	1.69	634	2.25	695	2.86	749	3.50	799	4.17	846	4.87	889	5.59	930	6.34	969	7.11				
5250	517	1.40	589	1.93	654	2.51	713	3.14	767	3.81	817	4.51	863	5.24	906	5.99	947	6.77	986	7.56				
5625	543	1.65	612	2.20	674	2.80	732	3.46	785	4.15	834	4.88	880	5.63	923	6.42	964	7.22	1002	8.05				
6000	570	1.93	635	2.50	696	3.13	752	3.81	804	4.53	852	5.28	897	6.06	940	6.87	980	7.70	1019	8.55				
6375	598	2.24	660	2.83	718	3.49	772	4.19	823	4.93	870	5.71	915	6.52	957	7.35	998	8.21	1036	9.09				
6750	626	2.59	685	3.20	740	3.88	793	4.60	843	5.37	889	6.17	933	7.01	975	7.87	1015	8.75	1053	9.66				
7125	654	2.98	710	3.62	764	4.31	815	5.06	863	5.85	909	6.67	952	7.53	993	8.42	1033	9.33	1070	10.27				
7500	683	3.41	736	4.07	788	4.78	837	5.55	884	6.37	929	7.22	971	8.10	1012	9.01	1051	9.95	1088	10.91				
STD Static (498 – 676 rpm) 2.9 Max BHP			MID Static (651 – 818 rpm) 7.4 Max BHP						HIGH Static (804 – 970 rpm) 9.9 Max BHP						ULTRA HIGH Static(948 – 1190rpm)13.6 Max BHP									

FAN PERFORMANCE (cont.)

17.5 TON VERTICAL SUPPLY

Table 31 – 50LC*B20

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	--	--	557	1.11	647	1.50	717	1.86	778	2.20	834	2.55	886	2.91	936	3.27	983	3.66	1030	4.05
5688	--	--	569	1.26	661	1.69	734	2.09	795	2.47	850	2.85	901	3.23	950	3.61	996	4.01	1041	4.41
6125	--	--	584	1.43	674	1.89	749	2.34	812	2.76	867	3.17	918	3.58	965	3.98	1011	4.40	1054	4.82
6563	--	--	603	1.64	686	2.11	763	2.60	828	3.07	884	3.52	934	3.95	982	4.38	1026	4.82	1069	5.26
7000	578	1.63	626	1.89	698	2.33	776	2.87	842	3.39	900	3.88	951	4.35	998	4.81	1043	5.27	1085	5.74
7438	610	1.93	651	2.18	713	2.59	788	3.15	856	3.72	915	4.25	967	4.76	1015	5.26	1059	5.75	1101	6.25
7875	642	2.26	678	2.51	731	2.89	800	3.44	869	4.05	929	4.64	983	5.20	1031	5.74	1076	6.26	1118	6.78
8313	675	2.64	707	2.88	752	3.24	814	3.77	881	4.40	943	5.03	998	5.64	1047	6.23	1092	6.79	1135	7.35
8750	707	3.06	737	3.30	776	3.64	830	4.13	893	4.77	955	5.44	1011	6.10	1062	6.73	1108	7.34	1151	7.94
STD Static (555 – 753 rpm) 2.9 Max BHP			MID Static (707 – 888 rpm) 7.4 Max BHP						HIGH Static (872 – 1053 rpm) 9.9 Max BHP						ULTRA HIGH Static (948 – 1190 rpm) 13.6 Max BHP					

17.5 TON HORIZONTAL SUPPLY

Table 32 – 50LC*B20

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	--	--	589	1.93	654	2.51	713	3.14	767	3.81	817	4.51	863	5.24	906	5.99	947	6.77	986	7.56
5688	--	--	615	2.24	678	2.86	735	3.52	788	4.21	837	4.94	883	5.70	926	6.49	966	7.30	1005	8.13
6125	580	2.03	643	2.61	703	3.24	758	3.93	810	4.66	858	5.42	903	6.21	946	7.02	986	7.87	1024	8.73
6563	612	2.41	672	3.01	729	3.68	783	4.39	833	5.15	880	5.94	924	6.76	966	7.60	1006	8.48	1044	9.37
7000	645	2.85	702	3.47	756	4.16	807	4.90	856	5.68	902	6.50	946	7.35	987	8.23	1027	9.14	1064	10.06
7438	678	3.34	732	3.99	784	4.70	833	5.47	881	6.28	925	7.12	968	8.00	1009	8.91	1048	9.84	1085	10.80
7875	712	3.88	763	4.56	812	5.30	860	6.09	906	6.93	949	7.80	991	8.71	1031	9.64	1069	10.61	--	--
8313	746	4.49	794	5.19	841	5.96	887	6.78	931	7.64	974	8.54	1015	9.47	1054	10.44	1092	11.43	--	--
8750	780	5.16	826	5.89	871	6.68	915	7.53	958	8.41	999	9.34	1039	10.30	1077	11.29	--	--	--	--
STD Static (555 – 753 rpm) 2.9 Max BHP			MID Static (651 – 818 rpm) 7.4 Max BHP						HIGH Static (804 – 970 rpm) 9.9 Max BHP						ULTRA HIGH Static (948 – 1190 rpm) 13.6 Max BHP					

FAN PERFORMANCE (cont.)

Table 33 – 50LC*B24

20 TON VERTICAL SUPPLY

CFM	Available External Static Pressure (in. wg)																												
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0										
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP									
6000	--	--	--	--	670	1.84	745	2.27	807	2.68	862	3.08	913	3.47	961	3.87	1006	4.28	1050	4.70									
6500	--	--	600	1.61	684	2.07	761	2.57	825	3.03	881	3.47	932	3.90	979	4.33	1024	4.76	1067	5.19									
7000	--	--	626	1.89	698	2.33	776	2.87	842	3.39	900	3.88	951	4.35	998	4.81	1043	5.27	1085	5.74									
7500	615	1.97	655	2.22	716	2.63	790	3.19	858	3.76	917	4.31	970	4.83	1017	5.33	1062	5.83	1104	6.32									
8000	651	2.37	686	2.61	737	2.99	804	3.53	872	4.15	933	4.75	987	5.32	1036	5.88	1081	6.41	1123	6.94									
8500	689	2.81	720	3.05	762	3.41	820	3.92	886	4.55	948	5.21	1004	5.84	1054	6.44	1099	7.03	1142	7.60									
9000	726	3.32	754	3.56	791	3.89	840	4.37	900	4.99	962	5.68	1019	6.37	1070	7.03	1117	7.67	1160	8.29									
9500	764	3.87	789	4.12	822	4.44	864	4.88	917	5.47	976	6.18	1033	6.91	1086	7.63	1134	8.33	1178	9.00									
10000	802	4.50	825	4.74	854	5.05	891	5.47	937	6.03	991	6.71	1047	7.48	1100	8.25	1149	9.00	1195	9.73									
STD Static (583 – 717 rpm) 7.4 Max BHP			MID Static (707 – 888 rpm) 7.4 Max BHP			HIGH Static (872 – 1053 rpm) 9.9 Max BHP			ULTRA HIGH Static (1049 – 1291 rpm) 13.6 Max BHP																				

Table 34 – 50LC*B24

20 TON HORIZONTAL SUPPLY

CFM	Available External Static Pressure (in. wg)																												
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0										
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP									
6000	--	--	635	2.50	696	3.13	752	3.81	804	4.53	852	5.28	897	6.06	940	6.87	980	7.70	1019	8.55									
6500	607	2.36	668	2.95	725	3.61	779	4.32	829	5.07	877	5.86	921	6.68	963	7.52	1003	8.39	1041	9.28									
7000	645	2.85	702	3.47	756	4.16	807	4.90	856	5.68	902	6.50	946	7.35	987	8.23	1027	9.14	1064	10.06									
7500	683	3.41	736	4.07	788	4.78	837	5.55	884	6.37	929	7.22	971	8.10	1012	9.01	1051	9.95	1088	10.91									
8000	721	4.05	772	4.74	821	5.48	868	6.28	913	7.12	956	8.00	998	8.92	1037	9.86	1076	10.84	1112	11.83									
8500	760	4.77	808	5.48	854	6.26	899	7.09	943	7.96	985	8.87	1025	9.82	1064	10.80	1101	11.80	1137	12.83									
9000	799	5.57	844	6.32	889	7.13	932	7.98	974	8.88	1014	9.83	1053	10.80	1091	11.81	1128	12.85	--	--									
9500	839	6.46	882	7.25	924	8.08	965	8.97	1005	9.90	1044	10.87	1082	11.88	1119	12.91	--	--	--	--									
10000	879	7.45	919	8.27	960	9.14	999	10.05	1038	11.01	1075	12.01	1112	13.05	--	--	--	--	--	--									
STD Static (583 – 717 rpm) 7.4 Max BHP			MID Static (707 – 888 rpm) 7.4 Max BHP			HIGH Static (872 – 1053 rpm) 9.9 Max BHP			ULTRA HIGH Static (948 – 1190 rpm) 13.6 Max BHP																				

FAN PERFORMANCE (cont.)

23 TON VERTICAL SUPPLY

Table 35 – 50LC*B26

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6750	--	--	--	--	2.20	2.72	769	3.21	891	3.67	942	4.12	989	4.56	1033	5.01	1076	5.46		
7313	--	--	--	--	2.52	3.07	785	3.62	911	4.14	963	4.64	1010	5.13	1055	5.61	1097	6.10		
7875	--	--	678	2.51	2.89	3.45	800	4.05	930	4.64	983	5.20	1031	5.74	1076	6.26	1118	6.79		
8438	684	2.76	715	3.00	3.35	3.87	884	4.50	947	5.15	1002	5.77	1052	6.37	1097	6.95	1140	7.52		
9000	726	3.32	754	3.56	3.89	4.37	900	4.99	962	5.68	1019	6.37	1070	7.03	1117	7.67	1160	8.29		
9563	769	3.95	794	4.19	4.51	4.95	919	5.54	978	6.24	1035	6.98	1088	7.71	1136	8.41	1180	9.09		
10125	811	4.66	834	4.91	5.22	5.63	942	6.18	995	6.86	1050	7.62	1104	8.41	1153	9.18	--	--		
10688	854	5.46	875	5.71	6.01	6.41	969	6.92	1015	7.56	1067	8.31	1119	9.13	1169	9.96	--	--		
11250	897	6.34	917	6.59	6.90	7.28	1000	7.76	1039	8.36	1085	9.08	1135	9.90	1185	10.77	--	--		
STD Static (651 – 818 rpm) 7.4 Max BHP				MID Static (804 – 970 rpm) 9.9 Max BHP				HIGH Static (948 – 1190 rpm) 13.6 Max BHP												

23 TON HORIZONTAL SUPPLY

Table 36 – 50LC*B26

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6750	--	--	--	--	3.88	4.60	793	5.37	889	6.17	933	7.01	975	7.87	1015	8.75	1053	9.66		
7313	--	--	723	3.84	4.54	5.30	826	6.10	919	6.94	962	7.81	1003	8.71	1042	9.64	1079	10.59		
7875	712	3.88	763	4.56	5.30	6.09	860	6.93	949	7.80	991	8.71	1031	9.64	1069	10.61	1106	11.60		
8438	755	4.67	803	5.39	6.16	6.98	895	7.85	981	8.76	1021	9.70	1060	10.67	1098	11.68	1134	12.70		
9000	799	5.57	844	6.32	7.13	7.98	932	8.88	1014	9.83	1053	10.80	1091	11.81	1128	12.85	--	--		
9563	844	6.58	886	7.37	8.21	9.10	969	10.03	1048	11.01	1086	12.02	1123	13.06	--	--	--	--		
10125	889	7.72	929	8.54	9.42	10.34	1008	11.30	1083	12.31	1120	13.35	--	--	--	--	--	--		
10688	933	8.98	972	9.84	10.75	11.71	1047	12.71	--	--	--	--	--	--	--	--	--	--		
11250	979	10.38	1015	11.28	12.22	13.21	1087	13.21	--	--	--	--	--	--	--	--	--	--		
STD Static (707 – 888 rpm) 7.4 Max BHP				MID Static (859 – 1026 rpm) 9.9 Max BHP				HIGH Static (948 – 1190 rpm) 13.6 Max BHP												

FAN PERFORMANCE (cont.)

Table 37 – PULLEY ADJUSTMENT

VERTICAL

UNIT	MOTOR/DRIVE COMBO	MOTOR PULLEY TURNS OPEN (RPM)												
		0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
14	Standard Static	N/A	N/A	676	658	640	623	605	587	569	551	534	516	498
	Medium Static	N/A	N/A	861	843	825	807	789	772	754	736	718	700	682
	High Static	963	948	933	918	903	888	873	857	842	827	812	797	782
	Ultra High Static	1113	1098	1083	1068	1053	1038	1023	1008	993	978	963	948	933
17	Standard Static	N/A	N/A	676	658	640	623	605	587	569	551	534	516	498
	Medium Static	818	804	790	776	762	748	735	721	707	693	679	665	651
	High Static	970	956	942	929	915	901	887	873	859	846	832	818	804
	Ultra High Static	1190	1170	1150	1130	1109	1089	1069	1049	1029	1009	988	968	948
20	Standard Static	N/A	N/A	753	733	713	694	674	654	634	614	595	575	555
	Medium Static	888	873	858	843	828	813	798	782	767	752	737	722	707
	High Static	1053	1038	1023	1008	993	978	963	947	932	917	902	887	872
	Ultra High Static	1190	1170	1150	1130	1109	1089	1069	1049	1029	1009	988	968	948
24	Standard Static	717	706	695	684	672	661	650	639	628	617	605	594	583
	Medium Static	888	873	858	843	828	813	798	782	767	752	737	722	707
	High Static	1053	1038	1023	1008	993	978	963	947	932	917	902	887	872
	Ultra High Static	1291	1271	1251	1231	1210	1190	1170	1150	1130	1110	1089	1069	1049
26	Standard Static	818	804	790	776	762	748	735	721	707	693	679	665	651
	Medium Static	970	956	942	929	915	901	887	873	859	846	832	818	804
	High Static	1190	1170	1150	1130	1109	1089	1069	1049	1029	1009	988	968	948

- – Factory settings
- Standard static uses direct drive motor

Table 38 – PULLEY ADJUSTMENT

HORIZONTAL

UNIT	MOTOR/DRIVE COMBO	MOTOR PULLEY TURNS OPEN (RPM)												
		0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
14	Standard Static	N/A	N/A	676	658	640	623	605	587	569	551	534	516	498
	Medium Static	808	794	781	767	753	740	726	712	699	685	671	658	644
	High Static	888	873	858	843	828	813	798	782	767	752	737	722	707
	Ultra High Static	1053	1038	1023	1008	993	978	963	947	932	917	902	887	872
17	Standard Static	N/A	N/A	676	658	640	623	605	587	569	551	534	516	498
	Medium Static	818	804	790	776	762	748	735	721	707	693	679	665	651
	High Static	970	956	942	929	915	901	887	873	859	846	832	818	804
	Ultra High Static	1190	1170	1150	1130	1109	1089	1069	1049	1029	1009	988	968	948
20	Standard Static	N/A	N/A	753	733	713	694	674	654	634	614	595	575	555
	Medium Static	818	804	790	776	762	748	735	721	707	693	679	665	651
	High Static	970	956	942	929	915	901	887	873	859	846	832	818	804
	Ultra High Static	1190	1170	1150	1130	1109	1089	1069	1049	1029	1009	988	968	948
24	Standard Static	717	706	695	684	672	661	650	639	628	617	605	594	583
	Medium Static	888	873	858	843	828	813	798	782	767	752	737	722	707
	High Static	1053	1038	1023	1008	993	978	963	947	932	917	902	887	872
	Ultra High Static	1190	1170	1150	1130	1109	1089	1069	1049	1029	1009	988	968	948
26	Standard Static	888	873	858	843	828	813	798	782	767	752	737	722	707
	Medium Static	1026	1012	998	984	970	956	943	929	915	901	887	873	859
	High Static	1190	1170	1150	1130	1109	1089	1069	1049	1029	1009	988	968	948

- – Factory settings
- Standard static uses direct drive motor

ELECTRICAL INFORMATION

Table 39 – 50LC*B14 - 026

15 - 23 TONS

50LC*B UNIT	V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		IFM		
		MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
14	208-3-60	187	253	17.6	123	23.2	164	185	1.3	STD	85.0%	8.6
										MED	83.6%	13.6
										HIGH	89.5%	21.2
										ULTRA HIGH	91.7%	28.0
	230-3-60	187	253	17.6	123	23.2	164	185	1.3	STD	85.0%	7.8
										MED	83.6%	12.7
										HIGH	89.5%	21.2
										ULTRA HIGH	91.7%	28.0
	460-3-60	414	506	9.6	62	11.2	75	185	1.3	STD	85.0%	3.8
										MED	83.6%	6.4
										HIGH	89.5%	9.7
										ULTRA HIGH	91.7%	13.7
575-3-60	518	633	6.1	40	7.9	54	185	1.3	STD	81.1%	4.5	
									MED	83.6%	6.2	
									HIGH	89.5%	7.2	
									ULTRA HIGH	91.7%	8.9	
17	208-3-60	187	253	19.1	123	27.6	191	185	1.3	STD	85.0%	8.6
										MED	89.5%	21.2
										HIGH	91.7%	28.0
										ULTRA HIGH	91.7%	37.3
	230-3-60	187	253	19.1	123	27.6	191	185	1.3	STD	85.0%	7.8
										MED	89.5%	21.2
										HIGH	91.7%	28.0
										ULTRA HIGH	91.7%	37.3
	460-3-60	414	506	9.8	62	12.8	100	185	1.3	STD	85.0%	3.8
										MED	89.5%	9.7
										HIGH	91.7%	13.7
										ULTRA HIGH	91.7%	16.9
575-3-60	518	633	7.5	50	10.2	78	185	1.3	STD	81.1%	4.5	
									MED	89.5%	7.2	
									HIGH	91.7%	8.9	
									ULTRA HIGH	91.7%	12.6	
20	208-3-60	187	253	25.0	164	27.6	191	185	1.3	STD	85.0%	8.6
										MED	89.5%	21.2
										HIGH	91.7%	28.0
										ULTRA HIGH	91.7%	37.3
	230-3-60	187	253	25.0	164	27.6	191	185	1.3	STD	85.0%	7.8
										MED	89.5%	21.2
										HIGH	91.7%	28.0
										ULTRA HIGH	91.7%	37.3
	460-3-60	414	506	12.2	100	12.8	100	185	1.3	STD	85.0%	3.8
										MED	89.5%	9.7
										HIGH	91.7%	13.7
										ULTRA HIGH	91.7%	16.9
575-3-60	518	633	9.3	78	10.2	78	185	1.3	STD	81.1%	4.5	
									MED	89.5%	7.2	
									HIGH	91.7%	8.9	
									ULTRA HIGH	91.7%	12.6	

ELECTRICAL INFORMATION (cont.)

Table 39 (cont.) - 50LC*B14 - 026

15 - 23 TONS

50LC*B UNIT	V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		IFM		
		MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
24	208-3-60	187	253	29.5	195	33.3	239	190	1.6	STD	89.5%	21.2
										MED	89.5%	21.2
										HIGH	91.7%	28.0
										ULTRA HIGH	91.7%	37.3
	230-3-60	187	253	29.5	195	33.3	239	190	1.6	STD	89.5%	21.2
										MED	89.5%	21.2
										HIGH	91.7%	28.0
										ULTRA HIGH	91.7%	37.3
	460-3-60	414	506	14.8	95	18.0	125	190	1.6	STD	89.5%	9.7
										MED	89.5%	9.7
										HIGH	91.7%	13.7
										ULTRA HIGH	91.7%	16.9
575-3-60	518	633	12.2	80	12.8	80	190	1.6	STD	89.5%	7.2	
									MED	89.5%	7.2	
									HIGH	91.7%	8.9	
									ULTRA HIGH	91.7%	12.6	
26	208-3-60	187	253	30.1	225	51.2	300	190	1.6	STD	89.5%	21.2
										MED	91.7%	28.0
										HIGH	91.7%	37.3
	230-3-60	187	253	30.1	225	51.2	300	190	1.6	STD	89.5%	21.2
										MED	91.7%	28.0
										HIGH	91.7%	37.3
	460-3-60	414	506	16.7	114	23.1	150	190	1.6	STD	89.5%	9.7
										MED	91.7%	13.7
										HIGH	91.7%	16.9
	575-3-60	518	633	12.2	80	19.9	109	190	1.6	STD	89.5%	7.2
										MED	91.7%	8.9
										HIGH	91.7%	12.6

ELECTRICAL DATA

Table 40 – UNIT WIRE/FUSE OR HACR BREAKER SIZING DATA

UNIT	NO. M. V.-P.H.-HZ	ELEC. HTR						NO. C.O. or UNPWR C.O.						w/ PWRD C.O.					
		CRHEATER***A00 VERT/HORZ	Nom (KW)	FLA	NO P.E.			w/ P.E. (pwrd frunt)			NO P.E.			w/ P.E. (pwrd frunt)					
					MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA			
STD	208/230-3-60	NONE	-	-	61/60	343	75/74	363	63.9/63.1	80/80	67/66	348	75.7/74.9	348	80/79	368			
		302/305A00	11.3/15.0	31.3/36.1	61/60	343/343	75/74	363/363	63.9/63.1	80/80	67/66	348/348	75.7/75.6	348/348	80/79	368/368			
		279/270A00	18.8/25.0	52.1/60.1	70/78	343/343	83/92	363/363	81.9/90.9	90/100	75/84	348/348	96.6/105.6	348/348	89/97	368/368			
MED	208/230-3-60	309/312A00	37.6/50.0	104.2/120.3	130/147	343/343	143/161	363/363	147.0/136.1	150/150	135/153	348/348	161.8/150.8	348/348	149/166	368/368			
		NONE	-	-	67/66	378	81/80	398	68.9/68.0	90/90	73/72	383	80.7/79.8	383	86/85	403			
		302/305A00	11.3/15.0	31.3/36.1	67/66	378/378	81/80	398/398	68.9/68.0	90/90	73/72	383/383	80.7/81.8	383/383	86/85	403/403			
HIGH	208/230-3-60	309/312A00	37.6/50.0	104.2/120.3	150/150	378/378	89/97	398/398	88.1/97.0	90/100	141/158	383/383	102.9/111.8	383/383	95/103	403/403			
		NONE	-	-	76	382	89	402	76.5	90	81	387	88.3	387	95	407			
		302/305A00	11.3/15.0	31.3/36.1	76/76	382/382	89/89	402/402	76.5/77.6	90/90	81/81	387/387	88.3/92.4	387/387	95/95	407/407			
ULTRA HIGH	208/230-3-60	309/312A00	37.6/50.0	104.2/120.3	144/163	382/382	158/176	402/402	162.8/152.8	175/175	150/168	387/387	177.5/167.6	387/387	163/182	407/407			
		NONE	-	-	84	456	97	476	84.5	100	89	461	96.3	461	103	481			
		302/305A00	11.3/15.0	31.3/36.1	84/84	456/456	97/97	476/476	84.5/86.1	100/100	89/89	461/461	96.3/100.9	461/461	103/103	481/481			
STD	460-3-60	303/306A00	15.0	18.0	33	167	40	179	33.5	40	35	169	39.7	35	42	181			
		282/273A00	25.0	30.1	39	167	46	179	45.1	50	42	169	52.9	60	49	181			
		310/313A00	50.0	60.1	70	73	67	169	72.6	80	76	179	75.4	80	83	181			
MED	460-3-60	NONE	-	-	36	184	43	196	36.1	45	38	186	42.3	45	198				
		303/306A00	15.0	18.0	36	184	43	196	36.1	45	38	186	42.3	45	198				
		282/273A00	25.0	30.1	42	184	49	196	48.4	50	45	186	56.1	60	52	198			
HIGH	460-3-60	310/313A00	50.0	60.1	80	76	184	75.9	80	84	196	78.6	80	86	198				
		NONE	-	-	40	186	47	198	39.4	50	42	188	45.6	50	49	200			
		303/306A00	15.0	18.0	40	186	47	198	39.4	50	42	188	45.6	50	49	200			
ULTRA HIGH	460-3-60	282/273A00	25.0	30.1	48	186	53	198	52.5	60	48	188	60.3	70	55	200			
		310/313A00	50.0	60.1	80	186	87	198	75.0	80	83	188	82.7	90	90	200			
		NONE	-	-	44	223	51	235	44.0	50	47	225	50.2	60	54	237			
STD	575-3-60	304/307A00	15.0	14.4	30	26	119	29.2	35	31	127	26.1	30.9	35	33	129			
		285/276A00	24.8	23.9	35	119	38.5	40	41	39	37.6	43.6	45	40	33	129			
		311/314A00	49.6	47.7	60	60	66	119	71.3	80	66	121	73.4	80	68	129			
MED	575-3-60	NONE	-	-	28	133	33	141	27.8	30	30	135	32.6	40	35	143			
		304/307A00	15.0	14.4	30	133	33	141	27.9	30	30	135	33.9	40	35	143			
		285/276A00	24.8	23.9	37	133	40	141	39.8	40	37	135	45.8	50	42	143			
HIGH	575-3-60	311/314A00	49.6	47.7	62	133	68	73.4	80	68	141	75.5	80	69	143				
		NONE	-	-	29	131	34	139	28.8	35	31	133	33.6	40	36	141			
		304/307A00	15.0	14.4	29	131	34	139	29.1	35	31	133	35.1	40	36	141			
ULTRA HIGH	575-3-60	285/276A00	24.8	23.9	40	139	41	139	41.0	45	38	133	47.0	50	43	141			
		311/314A00	49.6	47.7	63	131	69	139	70.8	80	65	133	76.8	80	71	141			
		NONE	-	-	31	158	36	166	30.7	35	33	160	35.5	40	38	168			
ULTRA HIGH	575-3-60	304/307A00	15.0	14.4	31	158	36	166	31.3	40	36	166	37.3	40	38	168			
		285/276A00	24.8	23.9	45	158	43	166	43.1	45	40	160	49.1	50	45	168			
		311/314A00	49.6	47.7	65	158	71	166	72.9	80	67	160	78.9	80	73	168			

See Legend and Notes on page 70

ELECTRICAL DATA (cont.)

Table 40 (cont.) - UNIT WIRE/FUSE OR HACR BREAKER SIZING DATA

UNIT	NO. M. V-PH-HZ	ELEC. HTR.			NO. C.O. or UNPWR C.O.					NO. P.E.					NO. P.W.R. C.O.					
		CR-HEATER***A00 VERT/HORZ	Nom (kW)	FLA	MAX FUSE or HACR BRKR	MCA	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	MCA	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	MCA	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	MCA	DISC. SIZE FLA LRA	MCA
STD	208/230-3-60	NONE	-	-	101.9	108	538	113.7	125	121	558	106.7	125	113	543	118.5	150	127	563	563
		279/270A00	18.8/25.0	52.1/60.1	101.9/101.9	108/108	538/538	113.7/113.7	125/125	121/121	558/558	106.7/106.7	125/125	113/113	543/543	118.5/118.5	150/150	127/127	563/563	563/563
MED	208/230-3-60	280/271A00	37.6/50.0	104.2/120.3	156.8/146.8	144/163	538/538	171.5/161.6	175/175	158/176	588/558	162.8/152.8	175/175	150/168	543/543	177.5/167.6	200/175	163/182	563/563	563/563
		281/272A00	56.3/75.0	156.4/180.4	182.9/206.9	204/232	538/538	197.7/221.7	225/250	218/245	588/558	188.9/212.9	200/250	210/237	543/543	203.7/227.7	225/250	223/251	563/563	563/563
HIGH	208/230-3-60	NONE	-	-	101.9	108	538	113.7	125	121	558	106.7	125	113	543	118.5	150	127	563	563
		279/270A00	18.8/25.0	52.1/60.1	101.9/101.9	108/108	538/538	113.7/113.7	125/125	121/121	558/558	106.7/106.7	125/125	113/113	543/543	118.5/118.5	150/150	127/127	563/563	563/563
ULTRA HIGH	208/230-3-60	280/271A00	37.6/50.0	104.2/120.3	165.3/155.3	144/163	538/538	171.5/161.6	175/175	158/176	588/558	162.8/152.8	175/175	150/168	543/543	177.5/167.6	200/175	163/182	563/563	563/563
		281/272A00	56.3/75.0	156.4/180.4	191.4/215.4	204/232	538/538	197.7/221.7	225/250	218/245	588/558	188.9/212.9	200/250	210/237	543/543	203.7/227.7	225/250	223/251	563/563	563/563
STD	460-3-60	NONE	-	-	56.6	60	278	62.8	70	67	290	58.8	70	62	280	65.0	80	70	292	292
		282/273A00	25.0	30.1	56.6	60	278	62.8	70	67	290	58.8	70	62	280	65.0	80	70	292	292
MED	460-3-60	283/274A00	50.0	60.1	72.2	80	278	80.0	90	87	290	75.0	90	83	280	82.7	90	90	292	292
		284/275A00	75.0	90.2	102.3	115	278	110.1	125	122	290	105.1	125	117	280	112.8	125	125	292	292
HIGH	460-3-60	NONE	-	-	60.6	65	315	66.8	70	72	327	62.8	70	67	290	65.0	80	74	329	329
		282/273A00	25.0	30.1	56.6	60	278	62.8	70	67	290	58.8	70	62	280	65.0	80	70	292	292
ULTRA HIGH	460-3-60	283/274A00	50.0	60.1	77.2	89	315	85.0	90	92	327	80.0	90	87	290	82.7	90	95	329	329
		284/275A00	75.0	90.2	107.3	119	315	115.1	125	127	327	110.1	125	122	290	112.8	125	129	329	329
STD	575-3-60	NONE	-	-	45.0	48	206	49.8	50	54	214	46.7	50	50	208	51.5	60	56	216	216
		285/276A00	24.8	23.9	45.0	48	206	49.8	50	54	214	46.7	50	50	208	51.5	60	56	216	216
MED	575-3-60	286/277A00	49.6	47.7	68.6	70	206	74.6	80	69	214	70.8	80	65	208	76.8	80	71	216	216
		287/278A00	74.4	71.6	88.6	91	206	86.6	90	96	214	82.7	90	93	208	88.7	90	98	216	216
HIGH	575-3-60	NONE	-	-	46.7	50	233	51.5	60	56	241	48.4	60	52	235	53.2	60	58	243	243
		285/276A00	24.8	23.9	46.7	50	233	51.5	60	56	241	48.4	60	52	235	53.2	60	58	243	243
ULTRA HIGH	575-3-60	286/277A00	49.6	47.7	70.8	80	241	72.9	80	71	249	72.9	80	67	235	78.9	80	73	243	243
		287/278A00	74.4	71.6	82.7	90	233	88.7	90	98	241	84.9	90	95	235	90.9	100	100	243	243
STD	575-3-60	NONE	-	-	50.4	54	244	55.2	60	60	252	52.1	60	56	246	56.9	70	62	254	254
		285/276A00	24.8	23.9	46.7	50	244	55.2	60	60	252	52.1	60	56	246	56.9	70	62	254	254
MED	575-3-60	286/277A00	49.6	47.7	75.4	81.4	244	81.4	90	75	252	77.5	80	71	246	83.5	90	77	254	254
		287/278A00	74.4	71.6	87.4	97	244	93.4	100	102	252	89.5	100	99	246	95.5	100	104	254	254

See Legend and Notes on page 70

ELECTRICAL DATA (cont.)

Table 40 (cont.) - UNIT WIRE/FUSE OR HACR BREAKER SIZING DATA

UNIT	NO M, V-Ph-Hz	ELEC. HTR				NO C.O. or UNPWR C.O.						w/ PWRD C.O.									
		IFM TYPE	CRHEATER***A00 VERT/HORZ	Nom (kW)	FLA	NO P.E.			w/ P.E. (pwrd frtunit)			NO P.E.			w/ P.E. (pwrd frtunit)						
						MAX FUSE or HACR BRKR	FLA	LRA	MCA	MAX FUSE or HACR BRKR	FLA	LRA	MCA	MAX FUSE or HACR BRKR	FLA	LRA	MCA	MAX FUSE or HACR BRKR	FLA	LRA	MCA
208/230-3-60	STD	NONE	-	-	-	129	69	136.7	175	142	649	129.7	175	134	634	141.5	141.5	175	175	148	654
		279/270A00	18.8/25.0	52.1/60.1	129/129	62/96/29	136.7/36.7	175/175	142/142	649/649	129.7/129.7	175/175	134/134	634/634	141.5/141.5	175/175	175/175	175	175	148/148	654/654
		280/271A00	37.6/50.0	104.2/120.3	144/163	62/96/29	171.5/161.6	175/175	158/176	649/649	162.8/152.8	175/175	150/168	634/634	177.5/167.6	200/175	200/175	200/175	200/175	163/182	654/654
208/230-3-60	MED	NONE	-	-	-	204/232	703	143.5	175	150	723	188.9/212.9	200/250	210/237	634/634	203.7/227.7	225/250	225/250	225/250	223/251	654/654
		279/270A00	18.8/25.0	52.1/60.1	137/137	703/703	143.5/43.5	175/175	150/150	723/723	136.5/136.5	175/175	142/142	708	148.3	175	175	175	175	156/156	728
		280/271A00	37.6/50.0	104.2/120.3	152/171	703/703	180.0/70.1	200/200	166/184	723/723	171.3/161.3	175/175	158/176	708/708	186.0/176.1	200/200	200/200	200/200	200/200	171/190	728/728
208/230-3-60	HIGH	NONE	-	-	-	212/240	703/703	206.2/230.2	225/250	226/253	723/723	197.4/221.4	225/250	218/245	708/708	212.2/236.2	225/250	225/250	225/250	231/259	728/728
		279/270A00	18.8/25.0	52.1/60.1	147/147	743	152.8	200	161	763	145.8/145.8	175	153/153	748	157.6	200	200	200	167	768	
		280/271A00	37.6/50.0	104.2/120.3	163/181	743/743	191.6/181.7	200/200	176/195	763/763	182.9/172.9	200/200	168/187	748/748	197.6/187.7	200/200	200/200	200/200	182/200	768/768	
460-3-60	STD	NONE	-	-	-	223/250	743/743	217.8/241.8	250/250	236/264	763/763	209.0/233.0	225/250	228/256	748/748	223.8/247.8	250/300	250/300	250/300	242/259	768/768
		282/273A00	25.0	30.1	68	322	71.1	90	75	334	67.1	90	70	324	73.3	90	90	90	78	336	
		283/274A00	50.0	60.1	80	322	80.0	90	87	334	75.0	90	83	324	82.7	90	90	90	90	336	
460-3-60	MED	NONE	-	-	-	115	322	110.1	125	334	334	105.1	125	334	112.8	125	125	125	125	125	336
		282/273A00	25.0	30.1	73	359	75.1	90	80	371	71.1	90	75	361	77.3	100	100	100	82	373	
		283/274A00	50.0	60.1	85	359	85.0	90	92	371	80.0	90	87	361	87.7	100	100	100	95	373	
460-3-60	HIGH	NONE	-	-	-	123	379	119.1	125	391	114.1	125	391	122	117.8	125	125	125	129	373	
		282/273A00	25.0	30.1	76	379	78.3	100	83	391	74.3	90	79	381	80.5	100	100	100	86	393	
		283/274A00	50.0	60.1	89	379	89.0	100	96	391	84.0	100	91	381	91.7	100	100	100	98	393	
575-3-60	STD	NONE	-	-	-	123	379	119.1	125	391	114.1	125	391	122	117.8	125	125	125	133	393	
		285/276A00	24.8	23.9	56	235	58.7	70	62	243	55.6	70	58	237	60.4	80	80	80	64	245	
		286/277A00	49.6	47.7	63	235	74.6	80	69	243	70.8	80	65	237	76.8	80	80	80	71	245	
575-3-60	MED	NONE	-	-	-	91	262	88.7	90	96	82.7	90	93	264	88.7	90	90	90	98	245	
		285/276A00	24.8	23.9	58	262	60.4	70	64	270	57.3	70	60	264	62.1	80	80	80	66	272	
		286/277A00	49.6	47.7	70.8	262	76.8	80	71	270	72.9	80	67	264	78.9	80	80	80	73	272	
575-3-60	HIGH	NONE	-	-	-	93	262	88.7	90	98	84.9	90	95	264	90.9	100	100	100	100	272	
		285/276A00	24.8	23.9	62	273	64.1	80	68	281	61.0	80	64	275	65.8	80	80	80	70	283	
		286/277A00	49.6	47.7	75.4	273	81.4	80	75	281	77.5	80	71	275	83.5	80	80	80	77	283	

See Legend and Notes on page 70

ELECTRICAL DATA (cont.)

Table 41 – UNIT WIRE/FUSE OR HACR BREAKER SIZING DATA WITH HACR

UNIT	NO M. V-PH-HZ	ELEC. HTR				NO C.O. or UNPWR C.O.						w/ PWRD C.O.								
		CRHEATER***A00 VERT/HORZ	Nom (kW)	FLA	MCA	NO P.E.			w/ P.E. (pwrd frunt)			NO P.E.			w/ P.E. (pwrd frunt)					
						HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA			
STD	208/230-3-60	NONE	-	-	59.1159.1	80/80	61/60	343	75/74	363	70.970.9	90/90	67/66	348	75.775.7	80/80	67/66	348	80/79	368
		302/305A00	11.3/15.0	31.3/36.1	59.1159.1	80/80	61/60	343/343	75/74	363/363	70.970.9	90/90	67/66	348/348	75.775.7	90/90	67/66	348/348	80/79	368/368
		2792/70A00	18.8/25.0	52.1/60.1	84.984.9	90/90	70/78	343/343	83/92	363/363	99.699.6	100/100	75/84	348/348	105.6105.6	110/110	75/84	348/348	89/97	368/368
MED	208/230-3-60	NONE	-	-	141.0141.0	150/150	130/147	343/343	143/161	363/363	155.8155.8	175/175	135/153	348/348	161.8161.8	175/175	135/153	348/348	149/166	368/368
		302/305A00	11.3/15.0	31.3/36.1	64.1164.1	80/80	67/66	378	81/80	398	75.975.9	90/90	68/68	383	88.780.7	100/100	68/68	383	86/85	403
		2792/70A00	18.8/25.0	52.1/60.1	91.091.0	100/100	76/84	378/378	89/97	398/398	105.8105.8	110/110	81/80	398/398	111.8111.8	125/125	81/80	398/398	95/103	403/403
HIGH	208/230-3-60	NONE	-	-	147.3147.3	150/150	135/153	378/378	149/167	398/398	162.0162.0	175/175	141/158	383/383	168.0168.0	175/175	141/158	383/383	155/172	403/403
		302/305A00	11.3/15.0	31.3/36.1	71.7171.7	90/90	76/76	382	89	402	83.5	100	81	387	88.3	100	81	387	95	407
		2792/70A00	18.8/25.0	52.1/60.1	101.6101.6	110/110	84/93	382/382	98/107	402/402	116.4116.4	125/125	90/99	387/387	122.4122.4	150/150	90/99	387/387	103/113	407/407
ULTRA HIGH	208/230-3-60	NONE	-	-	156.8156.8	175/175	144/163	382/382	158/176	402/402	171.5171.5	175/175	150/168	387/387	177.5177.5	200/200	150/168	387/387	163/182	407/407
		302/305A00	11.3/15.0	31.3/36.1	79.7	100	84	456	97	476	91.5	100	89	461	96.3	110	89	461	103	481
		2792/70A00	18.8/25.0	52.1/60.1	110.1110.1	125/125	92/101	456/456	106/115	476/476	124.9124.9	125/125	98/107	461/461	130.9130.9	150/150	98/107	461/461	111/120	481/481
STD	460-3-60	NONE	-	-	165.3165.3	175/175	152/171	456/456	166/184	476/476	180.0180.0	200/200	158/176	461/461	186.0186.0	200/200	158/176	461/461	171/190	481/481
		303/306A00	15.0	18.0	31.3	40	33	167	40	179	37.5	45	35	169	39.7	50	35	169	42	181
		282/273A00	25.0	30.1	42.4	45	39	167	46	179	50.1	60	42	169	52.9	60	42	169	49	181
MED	460-3-60	NONE	-	-	64.9	70	73	67.6	81	75.4	72.6	80	76	69	75.4	80	76	69	83	181
		303/306A00	15.0	18.0	33.9	45	36	184	43	196	40.1	50	45	186	42.3	50	45	186	45	198
		282/273A00	25.0	30.1	45.6	50	42	184	49	196	53.4	60	48	186	56.1	60	48	186	52	198
HIGH	460-3-60	NONE	-	-	68.1	80	76	184	84	196	75.9	80	79	186	78.6	80	79	186	86	198
		303/306A00	15.0	18.0	37.2	45	40	186	47	198	43.4	50	42	188	45.6	50	42	188	49	200
		282/273A00	25.0	30.1	49.8	50	46	186	53	198	57.5	60	48	188	60.3	60	48	188	55	200
ULTRA HIGH	460-3-60	NONE	-	-	72.2	80	75.0	186	87	198	80.0	90	87	188	82.7	90	87	188	90	200
		303/306A00	15.0	18.0	41.8	50	44	223	51	235	48.0	60	47	225	50.2	60	47	225	54	237
		282/273A00	25.0	30.1	54.8	60	50	223	58	235	62.5	70	53	225	65.3	70	53	225	60	237
STD	575-3-60	NONE	-	-	77.2	90	85	223	92	235	85.0	90	92	235	88.0	90	92	235	95	237
		304/307A00	15.0	14.4	24.4	30	26	119	31	127	29.2	35	28	121	30.9	35	28	121	33	129
		285/276A00	24.8	23.9	35.5	40	33	119	38	127	41.5	45	35	121	43.6	45	35	121	33	129
MED	575-3-60	NONE	-	-	65.3	70	60	119	66	71.3	67.4	70	66	121	73.4	70	66	121	68	129
		304/307A00	15.0	14.4	26.1	30	28	133	33	141	30.9	30	30	135	32.6	40	30	135	35	143
		285/276A00	24.8	23.9	37.6	40	35	133	40	141	43.6	45	37	135	45.8	40	37	135	42	143
HIGH	575-3-60	NONE	-	-	67.4	70	62	133	68	73.4	69.5	70	67	135	75.5	80	69	135	69	143
		304/307A00	15.0	14.4	27.1	30	29	131	34	139	31.9	35	31	133	33.6	40	31	133	36	141
		285/276A00	24.8	23.9	38.9	40	36	131	41	139	41.0	45	38	133	47.0	40	38	133	41	141
ULTRA HIGH	575-3-60	NONE	-	-	68.6	70	63	131	69	74.6	70.8	80	65	133	76.8	80	65	133	71	141
		304/307A00	15.0	14.4	29.0	35	31	158	36	166	33.8	40	35	160	35.5	40	35	160	38	168
		285/276A00	24.8	23.9	41.0	45	38	158	43	166	43.1	50	40	160	49.1	50	40	160	45	168

See Legend and Notes on page 70

ELECTRICAL DATA (cont.)

Table 41 (cont.) - UNIT WIRE/FUSE OR HACR BREAKER SIZING DATA WITH HACR

UNIT	NO M.V.-P-H-HZ	ELEC. HTR										NO C.O. or UNPWR C.O.										w/ PWRD C.O.									
		IFM TYPE	CRHEATER***A00 VERT/HORZ	Nom (kW)	FLA	NO P.E.			w/ P.E. (pwrd frunt)			NO P.E.			w/ P.E. (pwrd frunt)			NO P.E.			w/ P.E. (pwrd frunt)										
						MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA											
STD	208/230-3-60	NONE	NONE	18.8/25.0	52.1/60.1	70/69	371	83/92	391	79.2/79.2	100/100	83/92	391	72.2/72.2	90/90	75/74	376	84.0/84.0	100/100	89/88	396										
		279/270A00	279/270A00	18.8/25.0	52.1/60.1	70/69	371	83/92	391	79.2/79.2	100/100	83/92	391	72.2/72.2	90/90	75/74	376	84.0/84.0	100/100	89/88	396										
		280/271A00	280/271A00	37.6/50.0	104.2/120.3	1300/147	371/371	143/161	391/391	155.8/155.8	175/175	175/175	143/161	391/391	147.0/147.0	150/150	135/153	376/376	161.8/161.8	175/175	149/166	396/396									
MED	208/230-3-60	NONE	NONE	56.3/75.0	156.4/180.4	190/216	371/371	204.9/204.9	252/225	204.9/204.9	200/200	190/216	371/371	204.9/204.9	200/200	195/222	376/376	210.9/210.9	225/225	209/236	396/396										
		279/270A00	279/270A00	18.8/25.0	52.1/60.1	84	98	430	91.8	116.4/116.4	100	98	430	84.8	100	415	96.6	110	110	103	435										
		280/271A00	280/271A00	37.6/50.0	104.2/120.3	84/93	410/410	144/163	410/410	171.5/171.5	110/110	98/107	430/430	107.6/107.6	110/110	90/99	415/415	122.4/122.4	125/125	103/113	435/435										
HIGH	208/230-3-60	NONE	NONE	56.3/75.0	156.4/180.4	204/232	410/410	221.7/221.7	225/250	221.7/221.7	225/250	204/232	410/410	221.7/221.7	225/250	210/237	415/415	227.7/227.7	250/250	233/251	435/435										
		279/270A00	279/270A00	18.8/25.0	52.1/60.1	92	484	504	91.7	124.9/124.9	125	105	504	91.7	100	489	103.5	111	111	509											
		280/271A00	280/271A00	37.6/50.0	104.2/120.3	92/101	484/484	124.9/124.9	125/125	124.9/124.9	125/125	106/115	504/504	116.1/116.1	125/125	98/107	489/489	130.9/130.9	150/150	117/120	509/509										
ULTRA HIGH	208/230-3-60	NONE	NONE	56.3/75.0	156.4/180.4	212/240	484/484	230.2/230.2	250/250	230.2/230.2	250/250	212/240	484/484	230.2/230.2	250/250	218/245	489/489	236.2/236.2	250/250	231/259	509/509										
		279/270A00	279/270A00	18.8/25.0	52.1/60.1	103	524	110.3	110.3	136.5/136.5	125	116	544	103.3	125	108	529	115.1	150	122	549										
		280/271A00	280/271A00	37.6/50.0	104.2/120.3	103/112	524/524	136.5/136.5	125/125	136.5/136.5	125/125	116/126	544/544	127.8/127.8	150/150	108/118	529/529	142.5/142.5	200/200	182/200	549/549										
STD	460-3-60	NONE	NONE	25.0	30.1	36	193	41.0	41.0	41.0	45	43	205	37.0	45	39	195	43.2	50	46	207										
		282/273A00	282/273A00	25.0	30.1	39	193	50.1	50.1	50.1	60	46	205	45.1	50	42	195	52.9	60	49	207										
		283/274A00	283/274A00	50.0	60.1	73	193	72.6	72.6	72.6	80	81	205	67.6	80	76	195	75.4	80	83	207										
MED	460-3-60	NONE	NONE	75.0	90.2	108	193	102.7	102.7	110	115	205	97.7	110	111	205	111	105.5	110	118	207										
		282/273A00	282/273A00	25.0	30.1	43	212	46.9	46.9	46.9	60	50	224	42.9	60	46	214	49.1	60	53	226										
		283/274A00	283/274A00	50.0	60.1	46	212	57.5	57.5	57.5	60	53	224	52.5	60	48	214	60.3	70	55	226										
HIGH	460-3-60	NONE	NONE	75.0	90.2	115	212	110.1	110.1	125	125	224	105.1	125	117	214	112.8	125	125	125	226										
		282/273A00	282/273A00	25.0	30.1	48	249	51.1	51.1	51.1	60	55	261	47.1	60	50	251	53.3	60	57	263										
		283/274A00	283/274A00	50.0	60.1	50	249	62.5	62.5	62.5	70	58	261	57.5	70	53	251	65.3	70	60	263										
ULTRA HIGH	460-3-60	NONE	NONE	75.0	90.2	119	249	115.1	115.1	125	125	249	110.1	125	122	251	117.8	125	125	129	263										
		282/273A00	282/273A00	25.0	30.1	51	269	55.1	55.1	55.1	60	59	281	51.1	60	54	271	57.3	70	61	283										
		283/274A00	283/274A00	50.0	60.1	54	269	66.5	66.5	66.5	70	61	281	61.5	70	57	271	69.3	70	64	283										
STD	575-3-60	NONE	NONE	24.8	23.9	32	154	34.8	34.8	40	37	162	31.7	40	33	162	36.5	45	39	164											
		285/276A00	285/276A00	24.8	23.9	33	154	41.5	41.5	41.5	45	38	162	37.6	40	35	156	43.6	45	40	164										
		286/277A00	286/277A00	49.6	47.7	60	154	71.3	71.3	71.3	80	66	162	67.4	70	62	156	73.4	80	68	164										
MED	575-3-60	NONE	NONE	74.4	71.6	88	166	83.2	83.2	90	93	162	79.4	90	89	162	85.4	90	95	164											
		285/276A00	285/276A00	24.8	23.9	35	166	37.5	37.5	37.5	45	40	174	34.4	40	37	168	39.2	45	42	176										
		286/277A00	286/277A00	49.6	47.7	63	166	69.6	69.6	69.6	80	69	174	70.8	80	66	168	76.8	80	76	176										
HIGH	575-3-60	NONE	NONE	74.4	71.6	91	166	86.6	86.6	90	96	166	82.7	90	93	168	88.7	90	98	176											
		285/276A00	285/276A00	24.8	23.9	37	193	39.2	39.2	39.2	45	42	201	36.1	45	39	195	40.9	50	44	203										
		286/277A00	286/277A00	49.6	47.7	65	193	76.8	76.8	76.8	80	71	201	72.9	80	67	195	78.9	80	73	203										
ULTRA HIGH	575-3-60	NONE	NONE	74.4	71.6	93	193	88.7	88.7	90	98	193	84.9	90	95	195	90.9	100	100	203											
		285/276A00	285/276A00	24.8	23.9	41	204	43.5	43.5	43.5	50	46	212	40.4	50	43	206	45.2	50	48	214										
		286/277A00	286/277A00	49.6	47.7	69	204	81.4	81.4	81.4	80	75	212	77.5	80	71	206	83.5	90	77	214										

See Legend and Notes on page 70

ELECTRICAL DATA (cont.)

Table 41 (cont.) – UNIT WIRE/FUSE OR HACR BREAKER SIZING DATA WITH HACR

UNIT	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.														
		CRHEATER**A00 VERT/HORZ	Nom (kW)	FLA	NO P.E.				NO P.E.				NO P.E.						
					MCA	HACR BRKR	FLA	LRA	DISC. SIZE	MCA	HACR BRKR	FLA	LRA	DISC. SIZE	MCA	HACR BRKR	FLA	LRA	
208/230-3-60	STD	NONE	-	-	73.3/73.3	100/100	76/75	412	90/89	432	82/81	417	88/98/9.9	100/100	82/81	417	95/95	437	
		2792/70A00	18.8/25.0	52.1/60.1	84.9/84.9	412/412	100/100	76/78	412/412	90/92	432/432	82/84	417/417	105.6/105.6	100/100	82/84	417/417	95/97	437/437
		2802/71A00	37.6/50.0	104.2/120.3	141.0/141.0	130/147	150/150	135/153	143/161	143/161	432/432	147.0/147.0	150/150	161.8/161.8	150/150	135/153	143/161	149/166	437/437
	MED	NONE	-	156.4/180.4	190.2/190.2	190/216	200/200	190/216	412/412	203/230	432/432	196.2/196.2	200/225	210.9/210.9	200/225	195/222	417/417	209/236	437/437
		2792/70A00	18.8/25.0	52.1/60.1	85.9/85.9	451	100	91	451	104	471	90.7	100	102.5	100	96	456	110	476
		2802/71A00	37.6/50.0	104.2/120.3	156.8/156.8	144/163	175/175	144/163	451/451	158/176	471/471	162.8/162.8	175/175	171.5/171.5	150/150	150/168	456/456	163/182	476/476
HIGH	NONE	-	156.4/180.4	206.9/206.9	204/232	225/250	204/232	451/451	218/245	471/471	212.9/212.9	225/250	227.7/227.7	225/250	210/237	456/456	223/251	476/476	
	2792/70A00	18.8/25.0	52.1/60.1	110.1/110.1	99	100	99	525	112	545	97.6	125	109.4	125	104	530	118	550	
	2802/71A00	37.6/50.0	104.2/120.3	165.3/165.3	152/171	175/175	152/171	525/525	166/184	545/545	171.3/171.3	175/175	186.0/186.0	200/200	158/176	530/530	171/190	550/550	
460-3-60	ULTRA HIGH	NONE	-	-	104.4	125	109	565	123	585	109.2	125	121.0	150	115	570	128	590	
		2792/70A00	18.8/25.0	52.1/60.1	121.8/121.8	109/112	125/125	109/112	565/565	123/126	585/585	127.8/127.8	150/150	142.5/142.5	150/150	115/118	570/570	128/131	590/590
		2802/71A00	37.6/50.0	104.2/120.3	176.9/176.9	163/181	200/200	163/181	565/565	176/195	585/585	182.9/182.9	200/200	197.6/197.6	200/200	168/187	570/570	182/200	590/590
	STD	NONE	-	156.4/180.4	227.0/227.0	223/250	250/250	223/250	565/565	241.8/241.8	250/264	233.0/233.0	250/250	247.8/247.8	250/250	228/256	250/250	242/269	590/590
		2802/73A00	25.0	30.1	42.4	39	50	39	231	46	243	39.4	50	45.6	50	42	233	49	245
		2832/74A00	50.0	60.1	64.9	73	80	73	231	81	243	75.4	80	83	80	76	233	83	245
MED	NONE	-	90.2	108	108	108	231	115	115	243	102.7	110	105.5	100	111	233	118	245	
	2802/73A00	25.0	30.1	49.8	46	50	46	250	53	262	45.3	60	51.5	50	48	252	56	264	
	2832/74A00	50.0	60.1	72.2	80	80	80	250	87	262	75.0	80	82.7	80	83	252	86	264	
HIGH	NONE	-	102.3	115	115	125	250	122	122	262	105.1	125	112.8	125	117	252	125	264	
	2802/73A00	25.0	30.1	54.8	50	60	50	287	58	299	49.5	60	55.7	60	53	289	60	301	
	2832/74A00	50.0	60.1	77.2	85	90	85	287	92	299	80.0	90	87.7	90	87	289	90	301	
575-3-60	ULTRA HIGH	NONE	-	-	111.3	125	119	287	127	299	110.1	125	117.8	125	122	309	129	321	
		2802/73A00	25.0	30.1	58.8	60	60	54	307	61	319	53.5	60	59.7	60	57	309	64	321
		2832/74A00	50.0	60.1	81.2	89	90	89	307	96	319	84.0	100	91.7	100	91	309	98	321
	STD	NONE	-	90.2	111.3	111.3	125	307	130	319	114.1	125	114.1	125	126	309	133	321	
		2802/73A00	25.0	30.1	81.2	80	90	80	287	84	299	66.5	70	69.3	70	64	309	64	321
		2832/74A00	50.0	60.1	104.2/120.3	81.2	90	81.2	287	96	319	84.0	100	91.7	100	91	309	98	321
MED	NONE	-	71.6	88.6	88.6	90	194	130	319	88.6	90	88.6	90	89	184	95	192		
	2802/73A00	25.0	30.1	88.6	40	40	34	182	39	190	33.5	40	38.3	40	36	184	41	192	
	2832/74A00	50.0	60.1	104.2/120.3	34	40	34	182	39	190	33.5	40	38.3	40	36	184	41	192	
HIGH	NONE	-	88.6	102.3	102.3	110	194	130	319	88.6	90	88.6	90	89	184	95	192		
	2802/73A00	25.0	30.1	88.6	40	40	34	182	39	190	33.5	40	38.3	40	36	184	41	192	
	2832/74A00	50.0	60.1	104.2/120.3	34	40	34	182	39	190	33.5	40	38.3	40	36	184	41	192	
ULTRA HIGH	NONE	-	71.6	88.6	88.6	90	194	130	319	88.6	90	88.6	90	89	184	95	192		
	2802/73A00	25.0	30.1	88.6	40	40	34	182	39	190	33.5	40	38.3	40	36	184	41	192	
	2832/74A00	50.0	60.1	104.2/120.3	34	40	34	182	39	190	33.5	40	38.3	40	36	184	41	192	

See Legend and Notes on page 70

ELECTRICAL DATA (cont.)

Table 41 (cont.) - UNIT WIRE/FUSE OR HACR BREAKER SIZING DATA WITH HACR

UNIT	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.						w/ PWRD C.O.									
		CRHEATER***A00 VERT/HORZ	Nom (kW)	FLA	NO P.E.			w/ P.E. (pwrd frunit)			NO P.E.			w/ P.E. (pwrd frunit)						
					MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA	MCA	HACR BRKR	DISC. SIZE FLA LRA				
50LC*B26	STD	NONE	-	-	-	129	69	136.7	136.7	175	142	649	129.7	175	134	634	141.5	175	148	654
		2792/70A00	18.8/25.0	52.1/60.1	129/129	69/69	136.7/136.7	136.7/136.7	175/175	142/142	649/649	129.7/129.7	175/175	134/134	634/634	141.5/141.5	175/175	148/148	654/654	
		2802/71A00	37.6/50.0	104.2/120.3	144/163	69/69	171.5/171.5	171.5/171.5	158/176	158/176	649/649	162.8/162.8	175/175	150/168	634/634	177.5/177.5	200/200	163/182	654/654	
		2812/72A00	56.3/75.0	156.4/180.4	204/232	69/69	221.7/221.7	221.7/221.7	225/250	218/245	649/649	212.9/212.9	225/250	210/237	634/634	227.7/227.7	250/250	223/251	654/654	
		NONE	-	-	-	137	703	143.5	143.5	175	150	723	136.5	175	142	708	148.3	175	156	728
		2792/70A00	18.8/25.0	52.1/60.1	137/137	703/703	143.5/143.5	143.5/143.5	175/175	150/150	723/723	136.5/136.5	175/175	142/142	708/708	148.3/148.3	175/175	156/156	728/728	
575-3-60	MED	2802/71A00	37.6/50.0	104.2/120.3	152/171	703/703	180.0/180.0	180.0/180.0	200/200	166/184	723/723	171.3/171.3	175/175	158/176	708/708	186.0/186.0	200/200	171/190	728/728	
		2812/72A00	56.3/75.0	156.4/180.4	212/240	703/703	230.2/230.2	230.2/230.2	250/250	226/253	723/723	221.4/221.4	225/250	218/245	708/708	236.2/236.2	250/250	231/259	728/728	
		NONE	-	-	147	743	152.8	152.8	200	161	763	145.8	175	153	748	157.6	200	167	768	
		2792/70A00	18.8/25.0	52.1/60.1	147/147	743/743	152.8/152.8	152.8/152.8	200/200	161/161	763/763	145.8/145.8	175/175	153/153	748/748	157.6/157.6	200/200	167/167	768/768	
		2802/71A00	37.6/50.0	104.2/120.3	163/181	743/743	191.6/191.6	191.6/191.6	200/200	176/195	763/763	182.9/182.9	200/200	168/187	748/748	197.6/197.6	200/200	182/200	768/768	
		2812/72A00	56.3/75.0	156.4/180.4	223/250	743/743	241.8/241.8	241.8/241.8	250/250	236/264	763/763	233.0/233.0	250/250	228/256	748/748	241.8/241.8	250/300	242/269	768/768	
460-3-60	STD	NONE	-	-	68	322	71.1	71.1	90	75	334	67.1	90	70	324	73.3	90	78	336	
		282/73A00	25.0	30.1	68	322	71.1	71.1	90	75	334	67.1	90	70	324	73.3	90	78	336	
		283/74A00	50.0	60.1	80	322	80.0	80.0	90	87	334	75.0	90	83	324	82.7	90	90	336	
		284/75A00	75.0	90.2	115	322	110.1	110.1	125	122	334	105.1	125	117	324	112.8	125	125	336	
		NONE	-	-	73	359	75.1	75.1	90	80	371	71.1	90	75	361	77.3	100	82	373	
		282/73A00	25.0	30.1	73	359	75.1	75.1	90	80	371	71.1	90	75	361	77.3	100	82	373	
575-3-60	MED	283/74A00	50.0	60.1	85	359	85.0	85.0	90	92	371	80.0	90	87	361	87.7	100	95	373	
		284/75A00	75.0	90.2	119	359	115.1	115.1	125	127	371	110.1	125	122	361	117.8	125	129	373	
		NONE	-	-	76	379	78.3	78.3	100	83	391	74.3	90	79	381	80.5	100	86	393	
		282/73A00	25.0	30.1	76	379	78.3	78.3	100	83	391	74.3	90	79	381	80.5	100	86	393	
		283/74A00	50.0	60.1	89	379	89.0	89.0	100	96	391	84.0	100	91	381	91.7	100	98	393	
		284/75A00	75.0	90.2	123	379	119.1	119.1	125	130	391	114.1	125	126	381	121.8	125	133	393	
575-3-60	STD	NONE	-	-	56	235	58.7	58.7	70	62	243	55.6	70	58	237	60.4	80	64	245	
		285/76A00	24.8	23.9	56	235	58.7	58.7	70	62	243	55.6	70	58	237	60.4	80	64	245	
		286/77A00	49.6	47.7	63	235	74.6	74.6	80	69	243	70.8	80	65	237	76.8	80	71	245	
		281/78A00	74.4	71.6	91	235	86.6	86.6	90	96	243	82.7	90	93	237	88.7	90	98	245	
		NONE	-	-	58	262	60.4	60.4	80	64	270	57.3	70	60	264	62.1	80	66	272	
		285/76A00	24.8	23.9	58	262	60.4	60.4	80	64	270	57.3	70	60	264	62.1	80	66	272	
575-3-60	MED	286/77A00	49.6	47.7	65	262	76.8	76.8	80	71	270	72.9	80	67	264	78.9	80	73	272	
		281/78A00	74.4	71.6	93	262	88.7	88.7	90	98	270	84.9	90	95	264	90.9	100	100	272	
		NONE	-	-	62	273	64.1	64.1	80	68	281	61.0	80	64	275	65.8	80	70	283	
		285/76A00	24.8	23.9	62	273	64.1	64.1	80	68	281	61.0	80	64	275	65.8	80	70	283	
		286/77A00	49.6	47.7	69	273	81.4	81.4	90	75	281	77.5	80	71	275	83.5	90	77	283	
		281/78A00	74.4	71.6	97	273	93.4	93.4	100	102	281	89.5	100	99	275	95.5	100	104	283	

See Legend and Notes on page 70

ELECTRICAL DATA (cont.)

LEGEND & NOTES

- LEGEND:**
- BRKR - Circuit breaker
 - CO - Convenience outlet
 - DISC - Disconnect
 - FLA - Full load amps
 - IFM - Indoor Fan Motor
 - LRA - Locked rotor amps
 - MCA - Minimum circuit amps
 - MOCB - 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

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

Determine maximum deviation from average voltage.

$$(AB) 227 - 224 = 3 \text{ V}$$

$$(BC) 231 - 227 = 4 \text{ V}$$

$$(AC) 227 - 226 = 1 \text{ V}$$

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.

WIRING DIAGRAMS

HIGH TIER PAC CONTROL VAV 208/230V, 460V, 575V

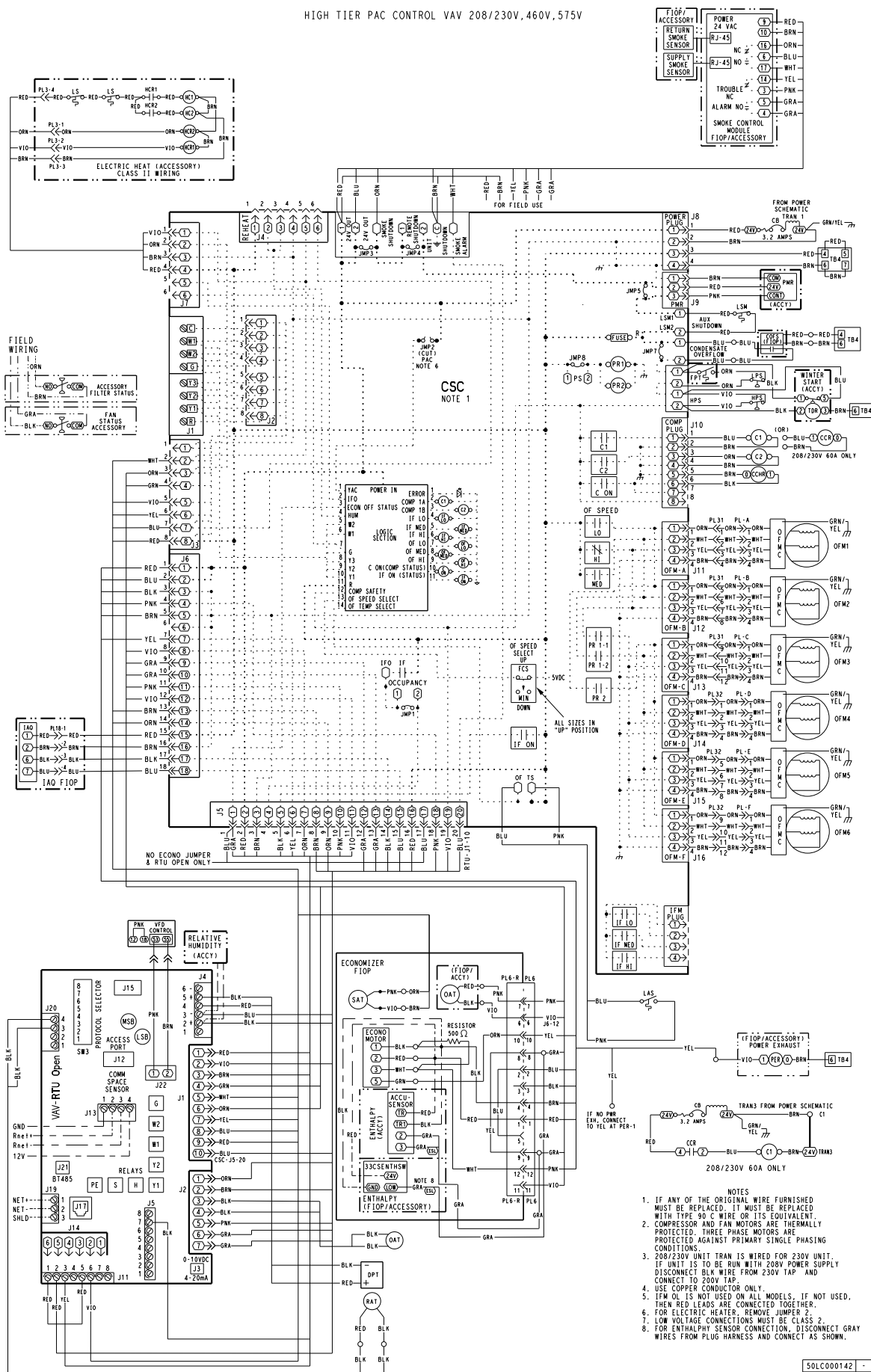


Fig. 19 - 50LC*B14-26 VAV-RTU Open Control Wiring Diagram

WIRING DIAGRAMS (cont.)

12.5 - 22.5 TON YAC, PAC POWER 460,575V 3 PH
WITH/WITHOUT HOT GAS REHEAT FIOP

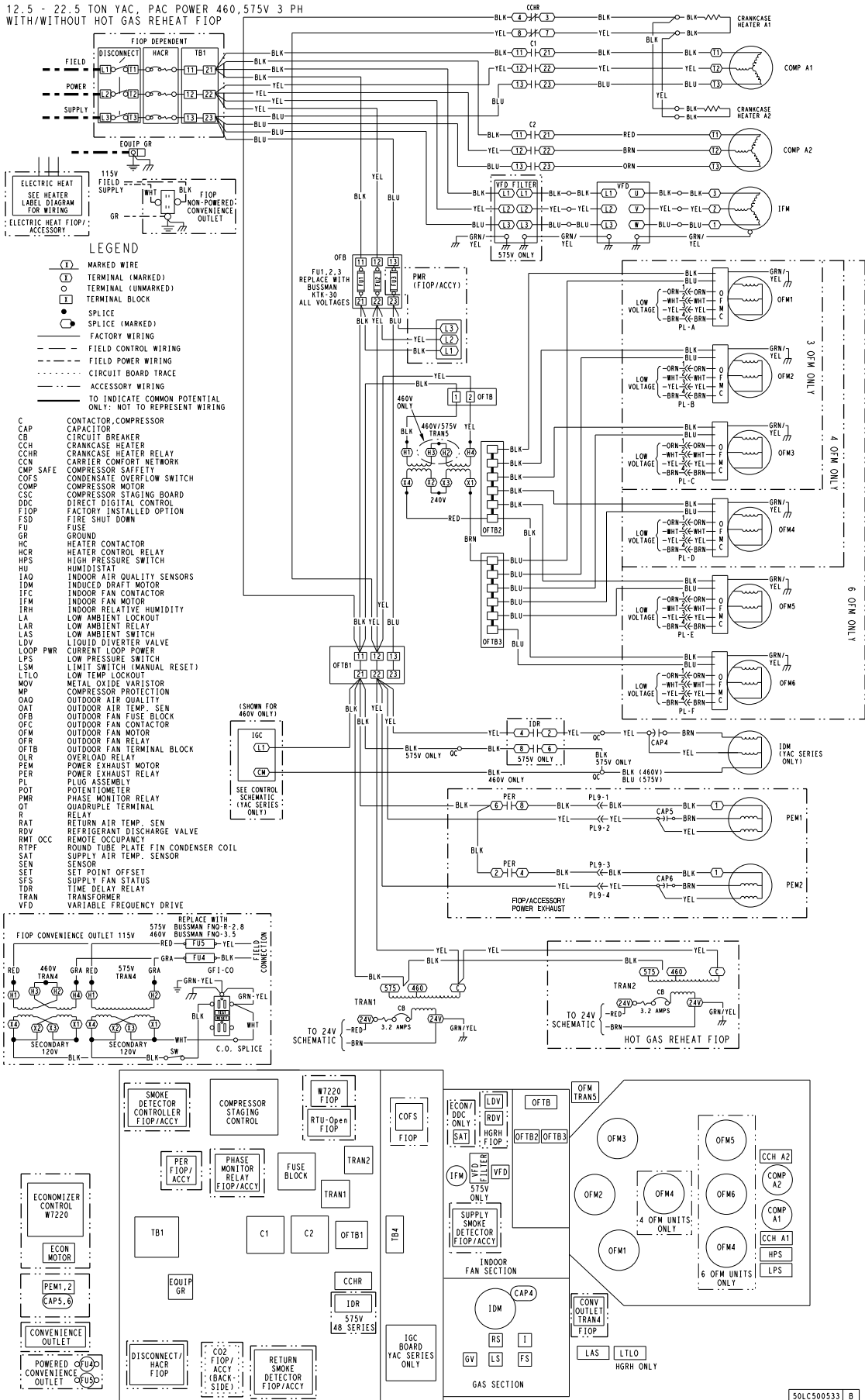


Fig. 20 - 50LC*B14-26 Power Wiring Diagram

C150372

SEQUENCE OF OPERATION

VAV-RTU Open

The VAV-RTU Open control is designed to provide VAV system operation when using a LC chassis small packaged rooftop and Carrier i-Vu[®] Open VAV terminal controls. Functionality includes:

- Duct Static Pressure Control (w/ optional Reset function)
- Supply Air Temperature Control (w/ optional Reset function)
- Morning Warm-up Cycle
- Occupied Heating (available)
- Heating and Cooling Setpoint Separation
- Economizer Cooling Cycle
- Mechanical Cooling Cycle
- Integrated Cooling Cycle
- Minimum Ventilation
- Unoccupied Free Cooling
- Supply Air Tempering
- Demand Controlled Ventilation [DCV]
- Open Airside Linkage
- Field Test/Commissioning

Duct Static Pressure Control (w/ optional Reset function) –

The supply fan VFD will be controlled using a PID and an analog input from a duct static pressure transducer. The supply fan will modulate its speed to maintain the desired duct static pressure setpoint.

Supply Air Temperature Control (w/ optional Reset function) –

The control will maintain the desired supply air temperature setpoint whenever cooling is required. A user configurable setpoint will be provided (default 53°F). The control will use the appropriate method (economizer cooling, mechanical cooling, or a combination of both) to achieve this setpoint whenever the zone temperature is greater than the current cooling setpoint (occupied or unoccupied). If Supply Air Reset is enabled, the reset algorithm will calculate a proportional reset value between the Occupied Cooling setpoint and 1°F above the Occupied Heating setpoint. The amount of reset (reset ratio and maximum reset limit value) is user configurable.

Morning Warm-up –

The control will provide a Morning Warm-up cycle the first time if transition from unoccupied to occupied and if the heating is required and the unit goes into heating immediately. Whenever the unit enters the heating mode, before any heat stage is enabled, the control will provide a Linkage mode to the system that will cause the terminals to maintain sufficient airflow. The Linkage mode of Warm-up (2) will be sent to the terminal system to ensure

sufficient airflow while in the heating mode but also providing a controlled warm-up cycle to prevent overheating of some zones. As a safety measure, should the heating cycle continue and the SAT approach the “Maximum Heating SAT” limit, the Linkage mode sent will change to Pressurization (6) to ensure all terminals open to their maximum airflow. The Linkage mode will remain Pressurization until that heating cycle ends. Once the heating demand is met and the heat cycle is completed or if cooling is required, heating will be locked out until the beginning of the next occupied period.

Occupied Heating –

Optionally, the user may enable occupied heating which will allow heating whenever heating is needed during the occupied period. The cycle will operate exactly the same as Morning Warm-up above, except it will not be limited by the transition into an occupied period.

Heating and Cooling Setpoint Separation –

By default, the control will maintain a 5°F (configurable) separation between the heating and cooling setpoints. This will prevent the unit from prematurely entering the opposite mode.

Economizer Cooling Cycle –

The VAV-RTU Open provides variable supply airflow to the VAV system and maintain constant minimum ventilation. As the supply airflow changes, the economizer minimum position is adjusted to provide a constant amount of outdoor air. The control will provide the ability to utilize outdoor air for maintaining the supply air setpoint should the outdoor air be suitable. The economizer control will utilize an OAT temperature check, a RAT temperature check if RAT is available or a SPT temperature check comparison and optionally, an OA enthalpy check to determine if OA conditions are suitable for economizing. Economizer operation, if available, will begin whenever cooling is required. The economizer will modulate the position of the OA damper to maintain the desired calculated economizer setpoint. The economizer will be controlled to meet CEC Title 24 requirements so that it will remain open 100% during integrated cooling and only partially close if required. The VAV-RTU Open also provides FDD (Fault Detection and Diagnostics) for economizer operation. The FDD logic will detect an economizer that fails to close, fails to open, is stuck fully open, and fails to fully open. Each condition will cause an Economizer Operation alarm to occur and the specific fault condition will be displayed.

Mechanical Cooling Cycle –

The control will operate three stages of mechanical cooling in order to maintain the desired supply air temperature whenever economizer cooling operation is unavailable but cooling is required. This condition will be determined if the OA has high enthalpy or at a temperature above the Economizer Lockout temperature. The two compressors will be staged in a binary fashion so that three stages of cooling are provided. Mechanical cooling stages will be added as

required to meet the desired SA setpoint. The number of stages will depend on the return air conditions and the system load (airflow through the coil). Stages will be added or dropped as required to maintain the setpoint while also maintaining the minimum on time and minimum off time for compressor operation. Anytime the SA falls below the desired SA setpoint, stages will be dropped until only stage 1 is operating. At that point, should the SA fall below 45°F (7°C), the economizer will modulate to increase the amount of outdoor air in order to maintain this minimum SA temperature. Should the economizer reach the maximum OA position and if the SA is still below the minimum SA temperature, the 1st cooling stage will be disabled and the economizer will return to the minimum position.

Integrated Cooling Cycle -

If economizer cooling operation is insufficient to maintain the desired SA setpoint, mechanical cooling will be activated to supplement the free economizer cooling. This condition will be determined if the OA has low enthalpy but is at a temperature at least 5°F above the desired SA setpoint and below the Economizer Lockout temperature. Mechanical cooling stages will be added as required to meet the desired SA setpoint. The number of stages will depend on the return air conditions and the system load (airflow through the coil). Stages will be added or dropped as required to maintain the setpoint while also maintaining the minimum on time and minimum off time for compressor operation. Anytime the SA falls below the desired SA setpoint, stages will be dropped until only stage 1 is operating. At that point, should the SA fall below the minimum SA temperature, the economizer will modulate to increase the amount of return air in order to maintain this minimum SA temperature. Should the economizer reach the minimum OA position and if the SA is still below the minimum SA temperature, the 1st cooling stage will be disabled.

Minimum Ventilation –

The economizer minimum position will be adjusted as required based on the supply fan speed. Two user configurable minimum economizer positions will be provided. The economizer will be positioned at the “Low Fan Econ Min Pos” when the fan is operating at its slowest speed. When the fan is operating at its maximum speed, the economizer will be positioned at the “Vent Dmpr Pos / DCV Min Pos”. For any supply fan speed between these two points, the economizer minimum position will be calculated proportionally.

Unoccupied Free Cooling -

Unoccupied Free Cooling allows the rooftop with the economizer damper to use outdoor air for free cooling during unoccupied periods.

When the VAV-RTU Open is unoccupied and the space temperature rises at least 2°F above the Occupied Cooling Setpoint, the supply fan starts. The economizer damper opens as necessary to maintain the Supply Air Setpoint and cool the space. The VAV-RTU Open continues to operate in this mode until the space temperature drops to 1°F below

the Occupied Cooling Setpoint or the outside air conditions are no longer suitable for free cooling.

Demand Controlled Ventilation [DCV] –

Whenever the unit is in an occupied mode and “DCV Control” is set to enable, a unique economizer minimum position will be calculated based on the output of the DCV algorithm. The algorithm monitors the CO₂ sensor value and compares that value to the user defined setpoint. A control algorithm calculates the required minimum economizer position required to satisfy the ventilation requirements of the space. A user adjustable DCV Max Vent Damper Position is provided to limit the maximum amount of outdoor air that can be brought into the unit due to the DCV algorithm. Demand Controlled Ventilation can be used in either a differential mode where both the indoor air and outdoor air CO₂ levels are provided to the control or it may be used in a single indoor air mode with only the indoor air CO₂ level. In the latter case, the outdoor air CO₂ level is assumed at 400 ppm.

Supply Air Tempering -

The VAV-RTU Open provides the capability to operate the optional electric heat, if equipped, to maintain a minimum supply air temperature during conditions where very cold outdoor air causes the supply air temperature to fall below the configured Supply Air (SA) Tempering Setpoint. This occurs during periods where DCV is active and increasing the amount of outdoor air or in cases where the system is operating at very low airflow and the calculated economizer position has increased to maintain a constant ventilation rate.

Heat operation is subject to anti-recycle timers to protect the equipment from short-cycling. There are fixed application specific minimum on and off times for each heating output (15 seconds on and 10 seconds off).

Open Airside Linkage –

The control will support Airside Linkage to accommodate system operation using Carrier VAV terminal controls. The VAV-RTU Open will receive zone information (occupancy status, occ & unocc zone temperatures, occ & unocc heating and cooling setpoints, zone CO₂ level for DCV, and zone RH level). The VAV-RTU Open will operate in the mode required to satisfy the zones. Airside Linkage will provide operating mode information to the zones so that the system operation is fully coordinated between the rooftop and the terminal zones. The VAV air terminals offer a minimum airflow setting in AHU heating mode. This shall be configured to maintain the required airflow (CFM) whenever the VAV RTU is in a heating mode per the unit’s specification. The VAV terminals will recognize the Heating or Warm-up modes as a heat mode and utilize the higher airflow minimum setpoint as configured. For heating cycles, initially utilize the Linkage Morning Warm-Up mode to open dampers on all zones below the midpoint of the occupied heating and cooling setpoints. This provides a controlled heat cycle and prevents the overheating of random zones where heating may not be required. Any zone below this middle setpoint will have its airflow at the maximum value. Further monitor the SAT of the VAV RTU

to determine if the SAT is approaching the configured maximum limit. As the limit is approached, the Linkage mode is changed to Linkage Pressurization to ensure all terminals open to their maximum airflow.

Field Test/Commissioning –

The control will provide BACnet test points to activate specific test modes that can be used to commission the rooftop and the system. Test modes will be available in the Service Test screen on the Property pages and shall also be available on the local Equipment Touch device for standalone commissioning. Tests include: Fan Test, Low Heat Test, High Heat Test, Cooling Test, Power Exhaust Test, and an Economizer Test. When any test is active, the appropriate Linkage mode will be sent to the system's terminals. This will ensure appropriate system operation and airflow during any test mode.

GUIDE SPECIFICATIONS – 50LC*B14-26

Note about this specification:

This specification is in the “Masterformat” as published by the Construction Specification Institute. Please feel free to copy this specification directly into your building spec.

Weather Expert[®] Ultra High Efficient Cooling Only/Electric Heat Packaged Variable Air Volume (VAV) Rooftop



HVAC Guide Specifications:

Size Range: 12.5 to 23 Nominal Tons

<u>Section</u>	<u>Description</u>
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23 06 80	Schedules for Packaged VAV HVAC Equipment
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23 06 80.13	Unitary Packaged VAV HVAC Equipment Schedule
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23 06 80.13.A.	Rooftop unit schedule
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1. Schedule is per the project specification requirements.

23 07 16	HVAC Equipment Insulation
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23 07 16.13	Decentralized, Rooftop Units:
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23 07 16.13.A.	Evaporator fan compartment:
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1. Interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, minimum 1 1/2 lb density aluminum foil-faced insulation on the air side.
2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

23 07 16.13.B.	Electric heat compartment:
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1. Aluminum foil-faced fiberglass insulation shall be used.
2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

23 09 13	Instrumentation and Control Devices for HVAC
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23 09 13.23	Sensors and Zone Air Terminals
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23 09 13.23.A.	Space terminal sensors
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1. Carrier zone air terminal space sensors shall be available with capabilities of combining:
 - a. Space temperature sensing
 - b. Sensors with communication port
 - c. Sensors with CO₂ sensing
 - d. Sensors with LCD display
 - e. Sensors with RH sensing
 - f. Sensors with local override and indicating light
2. i-Vu Equipment Touch; Carrier brand 4.3” color touch screen zone sensor and local user interface for a single Open (BACnet MS/TP) equipment controller. Includes built-in temperature sensor.
3. i-Vu System Touch; Carrier brand 4.3” color touch screen user interface connects to a network of up to 60 Open (BACnet MS/TP) equipment controllers. Includes built-in temperature sensor.

23 09 13.23.B.	Zone terminals
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1. Zone air terminals shall be a i-Vu VAV Zone Single Duct and Fan Terminal type for optimum integrated system solution. This includes:
 - a. 35E – Single Duct Air Terminals
 - b. 45J – Series Fan Powered Air Terminals
 - c. 45K – Quiet Series Fan Powered Air Terminals
 - d. 45M – Parallel Fan Powered Air Terminals
 - e. 45N – Quiet Parallel Fan Powered Air Terminals
 - f. 45Q – Low Profile Series Fan Powered Air Terminals

- g. 45R – Low Profile Parallel Fan Powered Air Terminals
- h. 35J – Single Duct Retrofit Air Terminals

23 09 33 Integrated Staging Control (ISC) Board System for HVAC

23 09 33.13 Packaged VAV, Rooftop Units:

23 09 33.13.A. General:

1. Shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-v transformer side. Transformer shall have 75VA capability.
2. Shall utilize color-coded wiring.
3. Shall include an electro-mechanical control board, to conveniently and safely provide connection points for vital control functions such as: smoke detectors, phase monitor, economizer, thermostat, and safety switches. Shall control all three stages of compressor logic, fully variable the indoor fan motor logic as well as staging of the outdoor fan motor. Shall also have a green LED indicator to indicate GO operation as well as a fault LED indicator for thermostat mis-wiring, no fan operation and safety switches.
4. Unit shall include a minimum of one 8-pin screw terminal connection board for connection of control wiring.

23 09 33.23.B. Safeties:

1. Compressor over-temperature, over current.
2. Low-pressure protection switch.
 - a. Low pressure switch shall use different color wire than the high pressure switch. The purpose is to assist the installer and service technician to correctly wire and or troubleshoot the rooftop unit.
3. High-pressure protection switch.
 - a. High pressure switch shall use different color wire than the low pressure switch. The purpose is to assist the installer and service technician to correctly wire and or troubleshoot the rooftop unit.
4. Automatic reset, motor thermal overload protector.

23 09 93 Sequence of Operations for HVAC Controls

23 09 93.13 Packaged VAV, Rooftop Units:

- A. Duct Static Pressure Control (w/ optional Reset function) – The supply fan VFD will be controlled using a PID and an analog input from a duct static pressure transducer. The supply fan will modulate its speed to maintain the desired duct static pressure setpoint.
- B. Supply Air Temperature Control (w/ optional Reset function) – The control will maintain the desired supply air temperature setpoint whenever cooling is required. A user configurable setpoint will be provided (default 53°F). The control will use the appropriate method (economizer cooling, mechanical cooling, or a combination of both) to achieve this setpoint whenever the zone temperature is greater than the current cooling setpoint (occupied or unoccupied). If Supply Air Reset is enabled, the reset algorithm will calculate a proportional reset value between the Occupied Cooling setpoint and 1°F above the Occupied Heating setpoint. The amount of reset (reset ratio and maximum reset limit value) is user configurable.
- C. Morning Warm-up – The control will provide a Morning Warm-up cycle the first time if transition from unoccupied to occupied and if the heating is required and the unit goes into heating immediately. Whenever the unit enters the heating mode, before any heat stage is enabled, the control will provide a Linkage mode to the system that will cause the terminals to maintain sufficient airflow. The Linkage mode of Warm-up (2) will be sent to the terminal system to ensure sufficient airflow while in the heating mode but also providing a controlled warm-up cycle to prevent overheating of some zones. As a safety measure, should the heating cycle continue and the SAT approach the “Maximum Heating SAT” limit, the Linkage mode sent will change to Pressurization (6) to ensure all terminals open to their maximum airflow. The Linkage mode will remain Pressurization until that heating cycle ends. Once the heating demand is met and the heat cycle is completed or if cooling is required, heating will be locked out until the beginning of the next occupied period.
- D. Occupied Heating – Optionally, the user may enable occupied heating which will allow heating whenever heating is needed during the occupied period. The cycle will operate exactly the same as Morning Warm-up above, except it will not be limited by the transition into an occupied period.
- E. Heating and Cooling Setpoint Separation – By default, the control will maintain a 5 deg F (configurable) separation between the heating and cooling setpoints. This will prevent the unit from prematurely entering the opposite mode.
- F. Economizer Cooling Cycle – The VAV-RTU Open provides variable supply airflow to the VAV system and maintain constant minimum ventilation. As the supply airflow changes, the economizer minimum position is adjusted to provide a constant amount of outdoor air. The control will provide the ability to utilize outdoor air for maintaining the supply air setpoint should the outdoor air be suitable. The economizer control will utilize an OAT temperature check, a RAT temperature check if RAT is available or a SPT temperature check comparison and optionally, an OA enthalpy check to determine if OA conditions are suitable for economizing. Economizer operation, if available, will begin whenever cooling is required. The economizer will modulate the position of the OA damper to maintain the desired

calculated economizer setpoint. The economizer will be controlled to meet CEC Title 24 requirements so that it will remain open 100% during integrated cooling and only partially close if required. The VAV-RTU Open also provides FDD (Fault Detection and Diagnostics) for economizer operation. The FDD logic will detect an economizer that fails to close, fails to open, is stuck fully open, and fails to fully open. Each condition will cause an Economizer Operation alarm to occur and the specific fault condition will be displayed.

- G. Mechanical Cooling Cycle – The control will operate three stages of mechanical cooling in order to maintain the desired supply air temperature whenever economizer cooling operation is unavailable but cooling is required. This condition will be determined if the OA has high enthalpy or at a temperature above the Economizer Lockout temperature. The two compressors will be staged in a binary fashion so that three stages of cooling are provided. Mechanical cooling stages will be added as required to meet the desired SA setpoint. The number of stages will depend on the return air conditions and the system load (airflow through the coil). Stages will be added or dropped as required to maintain the setpoint while also maintaining the minimum on time and minimum off time for compressor operation. Anytime the SA falls below the desired SA setpoint, stages will be dropped until only stage 1 is operating. At that point, should the SA fall below 45°F, the economizer will modulate to increase the amount of outdoor air in order to maintain this minimum SA temperature. Should the economizer reach the maximum OA position and if the SA is still below the minimum SA temperature, the 1st cooling stage will be disabled and the economizer will return to the minimum position.
- H. Integrated Cooling Cycle - If economizer cooling operation is insufficient to maintain the desired SA setpoint, mechanical cooling will be activated to supplement the free economizer cooling. This condition will be determined if the OA has low enthalpy but is at a temperature at least 5°F above the desired SA setpoint and below the Economizer Lockout temperature. Mechanical cooling stages will be added as required to meet the desired SA setpoint. The number of stages will depend on the return air conditions and the system load (airflow through the coil). Stages will be added or dropped as required to maintain the setpoint while also maintaining the minimum on time and minimum off time for compressor operation. Anytime the SA falls below the desired SA setpoint, stages will be dropped until only stage 1 is operating. At that point, should the SA fall below the minimum SA temperature, the economizer will modulate to increase the amount of return air in order to maintain this minimum SA temperature. Should the economizer reach the minimum OA position and if the SA is still below the minimum SA temperature, the 1st cooling stage will be disabled.
- I. Minimum Ventilation – The economizer minimum position will be adjusted as required based on the supply fan speed. Two user configurable minimum economizer positions will be provided. The economizer will be positioned at the “Low Fan Econ Min Pos” when the fan is operating at its slowest speed. When the fan is operating at its maximum speed, the economizer will be positioned at the “Vent Dmpr Pos / DCV Min Pos”. For any supply fan speed between these two points, the economizer minimum position will be calculated proportionally.
- J. Unoccupied Free Cooling - Unoccupied Free Cooling allows the rooftop with the economizer damper to use outdoor air for free cooling during unoccupied periods.
When the VAV-RTU Open is unoccupied and the space temperature rises at least 2°F above the Occupied Cooling Setpoint, the supply fan starts. The economizer damper opens as necessary to maintain the Supply Air Setpoint and cool the space. The VAV-RTU Open continues to operate in this mode until the space temperature drops to 1°F below the Occupied Cooling Setpoint or the outside air conditions are no longer suitable for free cooling.
- K. Demand Controlled Ventilation [DCV] – Whenever the unit is in an occupied mode and “DCV Control” is set to enable, a unique economizer minimum position will be calculated based on the output of the DCV algorithm. The algorithm monitors the CO₂ sensor value and compares that value to the user defined setpoint. A control algorithm calculates the required minimum economizer position required to satisfy the ventilation requirements of the space. A user adjustable DCV Max Vent Damper Position is provided to limit the maximum amount of outdoor air that can be brought into the unit due to the DCV algorithm. Demand Controlled Ventilation can be used in either a differential mode where both the indoor air and outdoor air CO₂ levels are provided to the control or it may be used in a single indoor air mode with only the indoor air CO₂ level. In the latter case, the outdoor air CO₂ level is assumed at 400 ppm.
- L. Supply Air Tempering – The VAV-RTU Open provides the capability to operate the optional electric heat, if equipped, to maintain a minimum supply air temperature during conditions where very cold outdoor air causes the supply air temperature to fall below the configured Supply Air (SA) Tempering Setpoint. This occurs during periods where DCV is active and increasing the amount of outdoor air or in cases where the system is operating at very low airflow and the calculated economizer position has increased to maintain a constant ventilation rate. Heat operation is subject to anti-recycle timers to protect the equipment from short-cycling. There are fixed application specific minimum on and off times for each heating output (15 seconds on and 10 seconds off).
- M. Open Airside Linkage – The control will support Airside Linkage to accommodate system operation using Carrier VAV terminal controls. The VAV-RTU Open will receive zone information (occupancy status, occ & unocc zone temperatures, occ & unocc heating and cooling setpoints, zone CO₂ level for DCV, and zone RH level). The VAV-RTU Open will operate in the mode required to satisfy the zones. Airside Linkage will provide operating mode information to the zones so that the system operation is fully coordinated between the rooftop and the terminal zones. The VAV air terminals offer a minimum airflow setting in AHU heating mode. This shall be configured to maintain the

required airflow (CFM) whenever the VAV RTU is in a heating mode per the unit's specification. The VAV terminals will recognize the Heating or Warm-up modes as a heat mode and utilize the higher airflow minimum setpoint as configured. For heating cycles, initially utilize the Linkage Morning Warm-Up mode to open dampers on all zones below the midpoint of the occupied heating and cooling setpoints. This provides a controlled heat cycle and prevents the overheating of random zones where heating may not be required. Any zone below this middle setpoint will have its airflow at the maximum value. Further monitor the SAT of the VAV RTU to determine if the SAT is approaching the configured maximum limit. As the limit is approached, the Linkage mode is changed to Linkage Pressurization to ensure all terminals open to their maximum airflow.

- N. Field Test/Commissioning – The control will provide BACnet test points to activate specific test modes that can be used to commission the rooftop and the system. Test modes will be available in the Service Test screen on the Property pages and shall also be available on the local Equipment Touch device for standalone commissioning. Tests include: Fan Test, Low Heat Test, High Heat Test, Cooling Test, Power Exhaust Test, and an Economizer Test. When any test is active, the appropriate Linkage mode will be sent to the system's terminals. This will ensure appropriate system operation and airflow during any test mode.

23 09 93.13

23 40 13 Panel Air Filters

23 40 13.13 Packaged VAV, Rooftop Units:

23 40 13.13.A. Standard filter section

1. Shall consist of factory-installed, low velocity, throwaway 2-in. thick fiberglass filters of commercially available sizes.
2. Unit shall use only one filter size. Multiple sizes are not acceptable.
3. Filters shall be accessible through an access panel with “no-tool” removal as described in the unit cabinet section of this specification (23 81 19.13.G).
4. 4-in filter capabilities shall be capable with pre-engineered and approved Carrier filter track field installed accessory. This kit requires field furnished filters.

23 81 19 Self-Contained Air Conditioners

23 81 19.13 Small-Capacity Self-Contained Air Conditioners (50LC*B14-26)

23 81 19.13.A. General

1. Outdoor, rooftop mounted, DDC electrically controlled, heating and cooling VAV unit utilizing fully hermetic scroll compressors for cooling duty and electrical elements for heating duty.
VAV-RTU Open - BACnet, direct digital controller:
 - a. Shall be ASHRAE 62-2001 compliant.
 - b. Shall accept 18-30VAC, 50-60Hz, and consumer 15VA or less power.
 - c. Shall have an operating temperature range from -40°F (-40°C) to 130°F (54°C), 10% - 90% RH (non-condensing).
 - d. Shall include built-in protocol for BACnet MS/TP.
 - e. Shall allow access of up to 62 network variables (SNVT). Shall be compatible with all open controllers
 - f. Baud rate Controller shall be selectable using a dipswitch.
 - g. Shall have an LED display independently showing the status of serial communication, running, errors, power, all digital outputs, and all analog inputs.
 - h. Shall accept the following inputs: space temperature, setpoint adjustment, outdoor air temperature, indoor air quality, outdoor air quality, compressor lock-out, fire shutdown, enthalpy switch, and fan status/filter status/ humidity/ remote occupancy.
 - i. Shall provide the following outputs: Economizer, Fan Speed, Fan Start/Stop, Cooling Stage 1, Cooling Stage 2, Cooling Stage 3, Heating Stage 1, Heating Stage 2, Power Exhaust.
 - j. Shall have built-in surge protection circuitry through solid state polyswitches. Polyswitches shall be used on incoming power and network connections. Polyswitches will return to normal when the “trip” condition clears.
 - k. Shall have a battery back-up capable of a minimum of 10,000 hours of data and time clock retention during power outages.
 - l. Shall have built-in support for Carrier technician tool.
 - m. Shall include an EIA-485 protocol communication port (BACnet MS/TP only), an access port for connection of either a computer or a Carrier technician tool, an EIA-485 port for network communication to intelligent space sensors and displays.
 - n. Software upgrades will be accomplished by either local or remote download. No software upgrades through chip replacements are allowed.

2. Factory assembled, single-piece heating and VAV cooling rooftop unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and special features required prior to field start-up.
 - a. Return air temperature sensor to control multi stage of cooling capacity
 - b. Supply air temperature sensor to control multi stage of cooling capacity
 - c. Duct static pressure transducer – located in control box for remote field mounting
 - d. Evaporator coil freeze protection
3. Unit shall use Puron® (R-401A) refrigerant.
4. Unit shall be installed in accordance with the manufacturer’s instructions.
5. Unit must be selected and installed in compliance with local, state, and federal codes.
6. To properly control to the desired supply air temperature comfort setting, an integrated EconoMi\$er2 is provided standard. Two versions shall be available: Standard air leak and Ultra-low leak versions.
 - a. Integrated Standard Leak:
 - (1.) Integrated, gear driven opposing modulating blade design type capable of simultaneous economizer and compressor operation.
 - (2.) Independent modules for vertical or horizontal return configuration shall be available. Vertical return modules shall be available as a factory installed option.
 - (3.) Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on intake or return shall not be acceptable.
 - (4.) Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.
 - (5.) Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.
 - (6.) Standard leak rate models shall be equipped with leakage dampers, not to exceed 2% leakage at 1 in. wg pressure differential.
 - (7.) Economizer controller shall be a 4-20mA design controlled directly by the VAV - RTU Open controller. VAV - RTU Open meets California Title 24 Fault Detection & Diagnostic (FDD) requirements.
 - (8.) Shall be capable of introducing up to 100% outdoor air.
 - (9.) Shall be equipped with a barometric relief damper capable of relieving up to 100% return air and contain seals that meet ASHRAE 90.1 requirements.
 - (10.) Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.
 - (11.) Dry bulb outdoor air temperature sensor shall be provided as standard. Enthalpy sensor is also available on factory installed only. Outdoor air sensor setpoint shall be adjustable and shall range from 40 to 100°F / 4 to 38°C. Additional sensor options shall be available as accessories.
 - (12.) VAV-RTU Open controller shall also provide control of an accessory power exhaust unit function.
 - (13.) The economizer shall maintain minimum airflow into the building during occupied period and provide design ventilation rate for full occupancy.
 - (14.) Dampers shall be completely closed when the unit is in the unoccupied mode
 - (15.) Economizer controller shall accept a 2-10 Vdc CO₂ sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor air damper to provide ventilation based on the sensor input.
 - (16.) Compressor lockout temperature is adjustable from 45°F to 80°F, set at a factory default of 45°F. Others shall open at 35°F (2°C) and closes at 50°F (10°C).
 - (17.) Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
 - (18.) Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.
 - b. Integrated Ultra Low Leak Models
 - (1.) Integrated, gear driven opposing modulating blade design type capable of simultaneous economizer and compressor operation.
 - (2.) Independent modules for vertical or horizontal return configuration shall be available. Vertical return modules shall be available as a factory installed option.
 - (3.) Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on intake or return shall not be acceptable.
 - (4.) Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.
 - (5.) Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.

- (6.) Ultra Low Leak design meets California Title 24 section 140.4 and ASHRAE 90.1 requirements of 4cfm per sq. ft. on the outside dampers and 10cfm per sq. ft. on the return dampers.
- (7.) Economizer controller shall be a 4-20mA design controlled directly by the VAV - RTU Open controller. VAV - RTU Open meets California Title 24 Fault Detection & Diagnostic (FDD) requirements.
- (8.) Shall be capable of introducing up to 100% outdoor air.
- (9.) Shall be equipped with a barometric relief damper capable of relieving up to 100% return air and contain seals that meet ASHRAE 90.1 requirements.
- (10.) Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.
- (11.) Dry bulb outdoor air temperature sensor is also available on factory installed only. Outdoor air sensor setpoint shall be adjustable and shall range from 40 to 100°F / 4 to 38°C. Additional sensor options shall be available as accessories.
- (12.) The economizer controller shall also provide control of an accessory power exhaust unit function. Factory set at 100%, with a range of 0% to 100%.
- (13.) The economizer shall maintain minimum airflow into the building during occupied period and provide design ventilation rate over the entire system airflow range.
- (14.) Dampers shall be completely closed when the unit is in the unoccupied mode.
- (15.) Economizer controller shall accept a 2-10 Vdc CO₂ sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor air damper to provide ventilation based on the sensor input.
- (16.) Compressor lockout temperature is adjustable from 45°F to 80°F, set at a factory default of 45°F.
- (17.) Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
- (18.) Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.

23 81 19.13.B. Quality Assurance

1. Unit meets and exceeds ASHRAE 90.1 minimum efficiency requirements.
2. Unit meets and exceeds Energy Star and Consortium for Energy Efficiency (CEE) performance criteria.
3. Unit shall be rated in accordance with AHRI Standards 340/360.
4. Unit shall be designed to conform to ASHRAE 15.
5. Unit shall be ETL/UL-tested and certified in accordance with ANSI Z21.47 Standards and UL-listed and certified under Canadian standards as a total package for safety requirements.
6. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
7. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
8. Unit shall be designed in accordance with ISO 9001, and shall be manufactured in a facility registered by ISO 9001.
9. Roof curb shall be designed to conform to NRCA Standards.
10. Unit shall be subjected to a completely automated run test on the assembly line. The data for each unit will be stored at the factory, and must be available upon request.
11. Unit shall be designed in accordance with UL Standard 1995, including tested to withstand rain.
12. Unit shall be constructed to prevent intrusion of snow and tested to prevent snow intrusion into the control box up to 40 mph.
13. Unit shake tested to assurance level 1, ASTM D4169 to ensure shipping reliability.
14. High Efficient Motors listed shall meet section 313 of the Energy Independence and Security Act of 2007 (EISA 2007).

23 81 19.13.C. Delivery, Storage, and Handling

1. Unit shall be stored and handled per manufacturer's recommendations.
2. Lifted by crane requires either shipping top panel or spreader bars.
3. Unit shall only be stored or positioned in the upright position.

23 81 19.13.D. Project Conditions

1. As specified in the contract.

23 81 19.13.E. Operating Characteristics

1. Unit shall be capable of starting and running at 125°F (52°C) ambient outdoor temperature, meeting maximum load criteria of AHRI Standard 340/360 at ± 10% voltage.
2. Compressor with standard controls shall be capable of operation down to 45°F (7°C) ambient outdoor temperatures. For lower operation an integrated economizer shall be utilized to allow lower temperatures and accommodate indoor air quality initiatives.
3. Unit shall discharge supply air vertically or horizontally as shown on contract drawings.

4. Unit shall be factory configured and ordered for vertical supply & return configurations.
5. Unit shall be factory furnished for either vertical or horizontal configuration without the use of special conversion kits. No field kits conversion is possible.
6. Unit shall be capable of mixed operation: vertical supply with horizontal return or horizontal supply with vertical return.

23 81 19.13.F. Electrical Requirements

1. Main power supply voltage, phase, and frequency must match those required by the manufacturer.

23 81 19.13.G. Unit Cabinet

1. Unit cabinet shall be constructed of galvanized steel, and shall be bonderized and coated with a pre-painted baked enamel finish on all externally exposed surfaces.
2. Unit cabinet exterior paint shall be: film thickness, (dry) 0.003 inches minimum, gloss (per ASTM D523, 60°F): 60, Hardness: H-2H Pencil hardness.
3. Evaporator fan compartment interior cabinet insulation shall conform to AHRI Standards 340/360 minimum exterior sweat criteria. Interior surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density, aluminum foil faced fiberglass insulation, Aluminum foil-faced fiberglass insulation shall also be used in the heat compartment.
4. Base of unit shall have a minimum of four locations for thru-the-base gas and electrical connections (factory installed or field installed), standard.
5. Base Rail
 - a. Unit shall have base rails on a minimum of 4 sides.
 - b. Holes shall be provided in the base rails for rigging shackles to facilitate maneuvering and overhead rigging.
 - c. Holes shall be provided in the base rail for moving the rooftop by fork truck.
 - d. Base rail shall be a minimum of 16 gauge thickness.
6. Condensate pan and connections:
 - a. Shall be an internally sloped condensate drain pan made of a non-corrosive material.
 - b. Shall comply with ASHRAE Standard 62.
 - c. Shall use a 3/4" -14 NPT drain connection, possible either through the bottom or end of the drain pan. Connection shall be made per manufacturer's recommendations.
7. Top panel:
 - a. Shall be a multi-piece top panel linked with water tight flanges and interlocking systems.
8. Electrical Connections
 - a. All unit power wiring shall enter unit cabinet at a single, factory-prepared, knockout location.
 - b. Thru-the-base capability
 - (1.) Standard unit shall have a thru-the-base electrical location(s) using a raised, embossed portion of the unit basepan.
 - (2.) No basepan penetration, other than those authorized by the manufacturer, is permitted.
9. Component access panels (standard)
 - a. Cabinet panels shall be easily removable for servicing.
 - b. Unit shall have one factory installed, tool-less, removable, filter access panel.
 - c. Panels covering control box, indoor fan, indoor fan motor and compressors shall have molded composite handles.
 - d. Handles shall be UV modified, composite, permanently attached, and recessed into the panel.
 - e. Screws on the vertical portion of all removable access panel shall engage into heat resistant, molded composite collars.
 - f. Collars shall be removable and easily replaceable using manufacturer recommended parts.

23 81 19.13.H. Coils

1. Standard Aluminum Fin/Copper Tube Coils:
 - a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved 5/16" diameter copper tubes with all joints brazed.
 - b. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
 - c. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.
2. Optional Pre-coated aluminum-fin condenser coils:
 - a. Shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments.

- b. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube.
 - c. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.
 - d. Corrosion durability of fin stock shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90.
 - e. Corrosion durability of fin stock shall be confirmed through testing to have no visible corrosion after 48 hour immersion in a room temperature solution of 5% salt, 1% acetic acid.
 - f. Fin stock coating shall pass 2000 hours of the following: one week exposure in the prohesion chamber followed by one week in a QUV. Prohesion chamber: the solution shall contain 3.5% sodium chloride and 0.35% ammonium sulfate. The exposure cycle is one hour of salt fog application at ambient followed by one hour drying at 95°F (35°C).
 - g. Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90.
3. Optional Copper-fin evaporator and condenser coils:
- a. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
 - b. Galvanized steel tube sheets shall not be acceptable.
 - c. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.
4. Optional E-coated aluminum-fin evaporator and condenser coils:
- a. Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins.
 - b. Coating process shall ensure complete coil encapsulation of tubes, fins and headers.
 - c. Color shall be high gloss black with gloss per ASTM D523-89.
 - d. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges.
 - e. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93.
 - f. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93).
 - g. Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92).
 - h. Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90.

23 81 19.13.I. Refrigerant Components

1. Refrigerant circuit shall include the following control, safety, and maintenance features:
 - a. Multi Thermostatic Expansion Valve (TXV) system shall help provide optimum performance across the entire operating range. Shall contain removable power element to allow change out of power element and bulb without removing the valve body.
 - b. Refrigerant filter drier.
 - c. Service gauge connections on suction and discharge lines.
 - d. Pressure gauge access through a specially designed screen on the side of the unit.
 - e. Single circuit design with tandem compressor and fully activated evaporator coil.
 - f. Shall be capable of providing cooling capacity turndown to 25% of rated full capacity without the need of hot gas by-pass devices.
2. Compressors
 - a. Models shall use fully hermetic tandem scroll compressors optimized for comfort staging and IEER energy savings.
 - b. Models shall be available with a single refrigerant circuit and three stages of cooling operation on all models.
 - c. Compressor motors shall be cooled by refrigerant gas passing through motor windings.
 - d. Compressors shall be internally protected from high discharge temperature conditions.
 - e. Compressors shall be protected from an over-temperature and over-ampereage conditions by an internal, motor overload device.
 - f. Compressor shall be factory mounted on rubber grommets.
 - g. Compressor motors shall have internal line break thermal, current overload and high pressure differential protection.
 - h. Crankcase heater shall be standard on each compressor and deactivated whenever a compressor is in operation.

23 81 19.13.J. Filter Section

1. Filters access is specified in the unit cabinet section of this specification.

2. Filters shall be held in place by a pivoting filter tray, facilitating easy removal and installation.
3. Shall consist of factory-installed, low velocity, throw-away 2-in. thick fiberglass filters.
4. Filters shall be standard, commercially available sizes.
5. Only one size filter per unit is allowed.
6. 4-in filter capability is possible with a field installed pre-engineered slide out filter track accessory. 4-in filters are field furnished.

23 81 19.13.K. Evaporator Fan and Motor

1. Evaporator fan motor:
 - a. Shall have permanently lubricated bearings.
 - b. Shall have inherent automatic-reset thermal overload protection or circuit breaker.
 - c. Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating shall be required. .
 - d. Shall be Variable Frequency duty to match the three stage compression logic.
 - e. Shall contain motor shaft grounding ring to prevent electrical bearing fluting damage by safely diverting harmful shaft voltages and bearing currents to ground.
2. Variable Frequency Drive (VFD). For indoor fan motor controlled by duct static pressure transducer:
 - a. Shall be installed inside the unit cabinet, mounted, wired and tested.
 - b. Shall contain Electromagnetic Interference (EMI) frequency protection.
 - c. Insulated Gate Bi-Polar Transistors (IGBT) used to produce the output pulse width modulated (PWM) waveform, allowing for quiet motor operation.
 - d. Self diagnostics with fault and power code LED indicator. Field accessory Display Kit available for further diagnostics and special setup applications.
 - e. RS485 capability standard.
 - f. Electronic thermal overload protection.
 - g. 5% swinging chokes for harmonic reduction and improved power factor.
 - h. All printed circuit boards shall be conformal coated.
 - i. Shall not contain visual display to adjust internal setting. Only available as field installed kit.
3. Belt-driven Evaporator Fan:
 - a. Belt drive shall include an adjustable-pitch motor pulley.
 - b. Shall use sealed, permanently lubricated ball-bearing type.
 - c. Blower fan shall be double-inlet type with forward-curved blades.
 - d. Shall be constructed from steel with a corrosion resistant finish and dynamically balanced.

23 81 19.13.L. Condenser Fans and Motors

1. Condenser fan motors:
 - a. Shall be a totally enclosed - multi speed ECM motor..
 - b. Shall use permanently lubricated bearings.
 - c. Shall have inherent thermal overload protection with an automatic reset feature.
 - d. Shall use a shaft-down design.
2. Condenser Fans:
 - a. Shall be a direct-driven propeller type fan.
 - b. Shall have galvanized aluminum (galvalum) blades riveted to corrosion-resistant steel spiders and shall be dynamically balanced.

23 81 19.13.M. Special Features, Options and Accessories

1. Condenser Coil Hail Guard Assembly (Factory or field installed)
 - a. Shall protect against damage from hail.
 - b. Shall be louvered design.
2. Unit-Mounted, Non-Fused Disconnect Switch:
 - a. Switch shall be factory-installed, internally mounted.
 - b. National Electric Code (NEC) and ETL/UL approved non-fused switch shall provide unit power shutoff.
 - c. Shall be accessible from outside the unit
 - d. Shall provide local shutdown and lockout capability
 - e. Sized only for the unit as ordered from the factory. Does not accommodate field installed devices.
3. HACR Breaker

- a. These manual reset devices provide overload and short circuit protection for the unit. Factory wired and mounted with the units, with access cover to help provide environmental protection. On 575V applications, HACR breaker can only be used with WYE power distribution systems. Use on Delta power distribution systems is prohibited.
 - b. Sized only for the unit as ordered from the factory. Does not accommodate field installed devices.
4. Convenience Outlet:
- a. Powered convenience outlet:
 - (1.) Outlet shall be powered from main line power to the rooftop unit.
 - (2.) Outlet shall be powered from line side or load side of disconnect by installing contractor, as required by code. If outlet is powered from load side of disconnect, unit electrical ratings shall be ETL/UL certified and rated for additional outlet amperage.
 - (3.) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
 - (4.) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
 - (5.) Voltage required to operate convenience outlet shall be provided by a factory-installed step-down transformer.
 - (6.) Outlet shall be accessible from outside the unit.
 - (7.) Outlet shall include a field-installed "Wet in Use" cover.
 - b. Non-Powered convenience outlet.
 - (1.) Outlet shall be powered from a separate 115/120v power source.
 - (2.) A transformer shall not be included.
 - (3.) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
 - (4.) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
 - (5.) Outlet shall be accessible from outside the unit.
 - (6.) Outlet shall include a field-installed "Wet in Use" cover.
5. Fan/Filter Status Switch:
- a. Switch shall provide status of indoor evaporator fan (ON/OFF) or filter (CLEAN/DIRTY).
 - b. Status shall be displayed either over communication bus (when used with direct digital controls) or with an indicator light at the thermostat
6. Centrifugal Power Exhaust:
- a. Power exhaust shall be used in conjunction with an integrated economizer.
 - b. Independent modules for vertical or horizontal return configurations shall be available.
 - c. Horizontal power exhaust is shall be mounted in return ductwork.
 - d. Power exhaust shall be controlled by economizer controller operation. Exhaust fans shall be energized when dampers open past the 0-100% adjustable setpoint on the economizer control.
7. Roof Curbs (Vertical):
- a. Full perimeter roof curb with exhaust capability providing separate air streams for energy recovery from the exhaust air without supply air contamination.
 - b. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
 - c. Permits installation and securing of ductwork to curb prior to mounting unit on the curb.
8. High-Static Indoor Fan Motor(s) and Drive(s):
- a. High-static motor(s) and drive(s) shall be factory-installed to provide additional performance range.
9. Outdoor Air Enthalpy Sensor:
- a. The outdoor air enthalpy sensor shall be used to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the unit will provide differential enthalpy control. The sensor allows the unit to determine if outside air is suitable for free cooling.
10. Return Air Enthalpy Sensor:
- a. The return air enthalpy sensor shall be used in conjunction with an outdoor air enthalpy sensor to provide differential enthalpy control.
11. Indoor Air Quality (CO₂) Sensor:
- a. Shall be able to provide demand ventilation indoor air quality (IAQ) control.
 - b. The IAQ sensor shall be available in duct mount, wall mount, or wall mount with LED display. The set-point shall have adjustment capability.
12. Smoke detectors (factory-installed only):
- a. Shall be a Four-Wire Controller and Detector.
 - b. Shall be environmental compensated with differential sensing for reliable, stable, and drift-free sensitivity.

- c. Shall use magnet-activated test/reset sensor switches.
 - d. Shall have tool-less connection terminal access.
 - e. Shall have a recessed momentary switch for testing and resetting the detector.
 - f. Controller shall include:
 - (1.) One set of normally open alarm initiation contacts for connection to an initiating device circuit on a fire alarm control panel.
 - (2.) Two Form-C auxiliary alarm relays for interface with rooftop unit or other equipment.
 - (3.) One Form-C supervision (trouble) relay to control the operation of the Trouble LED on a remote test/reset station.
 - (4.) Capable of direct connection to two individual detector modules.
 - (5.) Can be wired to up to 14 other duct smoke detectors for multiple fan shutdown applications.
13. Time Guard
- a. Shall prevent compressor short cycling by providing a 5-minute delay (± 2 minutes) before restarting a compressor after shutdown for any reason.
 - b. One device shall be required per compressor.
14. Electric Heat:
- a. Heating Section
 - (1.) Heater element open coil resistance wire, nickel-chrome alloy, 0.29 inches inside diameter, strung through ceramic insulators mounted on metal frame. Coil ends are staked and welded to terminal screw slots.
 - (2.) Heater assemblies are provided with integral fusing for protection of internal heater circuits not exceeding 48 amps each. Auto reset thermo limit controls, magnetic heater contactors (24 v coil) and terminal block all mounted in electric heater control box (minimum 18 ga galvanized steel) attached to end of heater assembly.
15. Barometric Hood (Horizontal Economizer Applications)
- a. Shall be required when a horizontal economizer and barometric relief are required. Barometric relief damper must be installed in the return air (horizontal) duct work. This hood provides weather protection.
16. Hinged access panels:
- a. Shall provide easy access through integrated quarter turn latches.
 - b. Shall be on major panels of; filter, control box, fan motor and compressor.
17. Display Kit for Variable Frequency Drive
- a. Kit allows the ability to access the VFD controller programs to provide special setup capabilities and diagnostics.
 - b. Kit contains display module, mounting bracket and communication cable.
 - c. Display Kit can be permanently installed in the unit or used on any VFD controller as needed.